


ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Architect and Registered Landscape Architect:



1) Registered Architect

May 7, 2021

Date





2) Registered Landscape Architect

May 7, 2021

Date





3) For City Engineer

05/07/2021

Date



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REQUIRED DOCUMENTS SCHEDULE DURING BIDDING AND AWARDING

The Bidder's attention is directed to the City's Municipal Code §22.0807(e), (3)-(5) for important information regarding grounds for debarment for failure to submit required documentation.

The specified Equal Opportunity Contracting Program (EOCP) forms are available for download from the City's web site at:

<http://www.sandiego.gov/eoc/forms/index.shtml>

ITEM	DOCUMENT TO BE SUBMITTED	WHEN DUE	FROM
1.	Tier II Prequal Submittal	At Time of Bid	ALL BIDDERS
2.	Bid Bond (PDF via PlanetBids)	At Time of Bid	ALL BIDDERS
3.	Contractors Certification of Pending Actions	At Time of Bid	ALL BIDDERS
4.	List of Subcontractors for Alternate Items	At Time of Bid	ALL BIDDERS
5.	Mandatory Disclosure of Business Interests	At Time of Bid	ALL BIDDERS
6.	Debarment and Suspension Certification for Prime Contractors	At Time of Bid	ALL BIDDERS
7.	Debarment and Suspension Certification for Subcontractors, Suppliers & Mfgs	At Time of Bid	ALL BIDDERS
8.	Bid Bond (Original)	By 5PM 3 working days after bid opening	ALL BIDDERS
9.	SLBE Good Faith Effort Documentation	By 5 PM 3 working days after bid opening	ALL BIDDERS
10.	Form AA60 – List of Work Made Available	By 5 PM 3 working days after bid opening with Good Faith Effort (GFE) documentation	ALL BIDDERS
11.	Payment & Performance Bond; Certificates of Insurance & Endorsements; and Signed Contract Agreement Page	Within 10 working days of receipt by bidder of contract forms and NOI	AWARDED BIDDER
12.	Listing of "Other Than First Tier" Subcontractors	Within 10 working days of receipt by bidder of contract forms	AWARDED BIDDER

NOTICE INVITING BIDS

1. **SUMMARY OF WORK:** This is the City of San Diego's (City) solicitation process to acquire Construction services for **Mission Bay Golf Course (MBGC) Irrigation & Electrical Upgrades + Mission Bay Golf Course (MBGC) Clubhouse Demo/Prtbl Building Instl.** For additional information refer to Attachment A.
2. **FULL AND OPEN COMPETITION:** This solicitation is subject to full and open competition and may be bid by Contractors on the City's approved Prequalified Contractors List. For information regarding the Contractors Prequalified list visit the City's web site: <http://www.sandiego.gov>.
3. **ESTIMATED CONSTRUCTION COST:** The City's estimated construction cost for this project is **\$6,600,000.**
4. **BID DUE DATE AND TIME ARE: JUNE 10, 2021 at 2:00 PM**
5. **PREVAILING WAGE RATES APPLY TO THIS CONTRACT:** Refer to Attachment D.
6. **LICENSE REQUIREMENT:** To be eligible for award of this contract, Prime contractor must possess the following licensing classification: **A**
 - 6.1. **ADDITIONAL LICENSE REQUIREMENTS:** See Hazardous Building Materials Abatement Specifications in Technicals. Contractor or Subcontractor performing abatement work must have **C-22 License.**
7. **SUBCONTRACTING PARTICIPATION PERCENTAGES:** Subcontracting participation percentages apply to this contract.
 - 7.1. The City has incorporated **mandatory** SLBE-ELBE subcontractor participation percentages to enhance competition and maximize subcontracting opportunities. For the purpose of achieving the mandatory subcontractor participation percentages, a recommended breakdown of the SLBE and ELBE subcontractor participation percentages based upon certified SLBE and ELBE firms has also been provided to achieve the mandatory subcontractor participation percentages:

1. SLBE participation	3.9%
2. ELBE participation	5.2%
3. Total mandatory participation	9.1%
 - 7.2. The Bid may be declared non-responsive if the Bidder fails to meet the following requirements:
 - 7.2.1. Attend the Pre-Bid Meeting as described herein.
 - 7.2.2. Include SLBE-ELBE certified subcontractors at the overall mandatory participation percentage identified in this document; OR

- 7.2.3.** Submit Good Faith Effort (GFE) documentation, saved in searchable Portable Document Format (PDF), demonstrating the Bidder made a good faith effort to **conduct** outreach to and include SLBE-ELBE Subcontractors as required in this solicitation by 5 PM 3 Working Days after the Bid opening if the overall mandatory participation percentage is not met.

All submittals in searchable PDF shall be submitted electronically within the prescribed time identified in the contract documents via PlanetBids by invitation to the point of contact named in the bid provided by the Contract Specialist to all bidders.

8. MANDATORY ONLINE PRE-BID MEETING VIA GOTOMEETING:

Bidders are required to attend the Pre-Bid Meeting.

Mandatory Pre-Bid Meeting: **May 25, 2021 at 10:00 AM**

Please join the pre-bid meeting from your computer, tablet or smartphone.

<https://global.gotomeeting.com/join/175246613>

You can also dial in using your phone.

United States: [+1 \(408\) 650-3123](tel:+14086503123)

Access Code: 175-246-613

New to GoToMeeting? Get the app now and be ready when your first meeting starts:

<https://global.gotomeeting.com/install/883640213>

Please Note: You will need to join the meeting with a computer tablet or smartphone with the GoToMeetings App in place in order to sign in via the Chat feature as attendance at the meeting will be evidenced by the Chat sign-in. The Chat feature will also be used for attendees to ask any questions.

The purpose of the meetings is to discuss the scope of the project, submittal requirements, the pre-qualification process, , and Equal Opportunity Contracting Program requirements and reporting procedures. Failure to attend the Mandatory Pre-Bid Meeting may result in the Bid being deemed non-responsive.

Upon entering the meeting, all attendees **must** use the chat feature to sign in with the following information: Name of firm, Attendee's name, Phone number, and Email address.

The GoToMeetings will open thirty minutes prior to the start times listed above to allow the attendees the opportunity to sign in by the deadline.

Bidders may not be admitted after the specified start time of the mandatory Pre-Bid Meeting.

9. **PRE-BID SITE VISIT:** All those wishing to submit a bid **MUST** visit the Work Site with the Engineer. The purpose of the Site visit is to acquaint Bidders with the Site conditions. To request a sign language or oral interpreter for this visit, call the Engineering & Capital Projects Department, Contracts Division at (619) 533-3450 at least 5 Working Days prior to the meeting to ensure availability. Failure to attend the **Mandatory** Pre-Bid Site Visit may result in the Bidder's Bid being deemed non-responsive. The Pre-Bid Site Visit is scheduled as follows:

Time: 12:00 PM
Date: May 25, 2021
Location: 2702 North Mission Bay Drive, San Diego, CA 92109

10. **AWARD PROCESS:**

- 10.1. The Award of this contract is contingent upon the Contractor's compliance with all conditions of Award as stated within these documents and within the Notice of Intent to Award.
- 10.2. Upon acceptance of bids and determination of the apparent low bidder, the City will prepare the contract documents for execution within approximately 21 days of the date of the bid opening. The City will then award the contract upon receipt of properly signed Contract, bonds, and insurance documents.
- 10.3. This contract will be deemed executed and effective only upon the signing of the Contract by the Mayor or his designee and approval as to form by the City Attorney's Office.
- 10.4. The low Bid will be determined by the Base Bid plus all the Alternates.
- 10.5. Once the low bid has been determined, the City may, at its sole discretion, award the contract for the Base Bid alone; or for the Base Bid plus one or more alternates.

11. **SUBMISSION OF QUESTIONS:**

- 11.1. The Director (or Designee) of the Engineering & Capital Projects Department is the officer responsible for opening, examining, and evaluating the competitive Bids submitted to the City for the acquisition, construction and completion of any public improvement except when otherwise set forth in these documents. Any questions related to this solicitation shall be submitted to:

BFriedenreic@sandiego.gov

- 11.2. Questions received less than 14 days prior to the date for opening of Bids may not be considered.
- 11.3. Questions or clarifications deemed by the City to be material shall be answered via issuance of an addendum and posted to the City's online bidding service.
- 11.4. Only questions answered by formal written addenda shall be binding. Oral and other interpretations or clarifications shall be without legal effect. It is the Bidder's

responsibility to be informed of any addenda that have been issued and to include all such information in its Bid.

12. ADDITIVE/DEDUCTIVE ALTERNATES:

12.1. The additive/deductive alternates have been established to allow the City to compare the cost of specific portions of the Work with the Project's budget and enable the City to make a decision whether to incorporate these portions prior to award. The award will be established as described in the Bid. The City reserves the right to award the Contract for the Base Bid only or for the Base Bid plus one or more Alternates.

13. CONTRACTOR EXPERIENCE: To be considered a qualified and responsible Bidder, the CONTRACTOR shall provide documentation establishing that they and/or their subcontractor have satisfied the experience requirements to perform the work.

See prequalification questionnaire in the CERTIFICATION AND FORMS Section below. Submission of this questionnaire does not constitute qualification. Qualification may be denied for any reason the City of San Diego deems necessary for the successful completion of the project.

13.1. The intent of City of San Diego is to pre-qualify golf course builders (PRIME SUBMITTING FIRM OR SPECIALTY CONTRACTOR) for this project who must have prior specialty golf course construction experience, having worked on a golf course facility while maintaining its ability to be open during construction. This statement will determine the specialty contractor's qualification for this project.

13.2. In addition to golf course construction experience, firms must also demonstrate an ability to work with two different design teams, coordinating two sets of drawings, implementing both projects to meet the client's objectives and to meet minimum guidelines as set in the SPECIAL PROVISIONS of the Contract Documents.

INSTRUCTIONS TO BIDDERS

1. PREQUALIFICATION OF CONTRACTORS:

- 1.1. Contractors submitting a Bid must be pre-qualified for the total amount proposed, including all alternate items, prior to the date of submittal. Bids from contractors who have not been pre-qualified as applicable and Bids that exceed the maximum dollar amount at which contractors are pre-qualified may be deemed **non-responsive** and ineligible for award.
- 1.2. The completed application must be submitted online no later than 2 weeks prior to the bid opening.
- 1.3. **Joint Venture Bidders Cumulative Maximum Bidding Capacity:** For projects with an engineer's estimate of \$30,000,000 or greater, Joint Ventures submitting bids may be deemed responsive and eligible for award if the cumulative maximum bidding capacity of the individual Joint Venture entities is equal to or greater than the total amount proposed.
 - 1.3.1. Each of the entities of the Joint Venture must have been previously prequalified at a minimum of \$15,000,000.
 - 1.3.2. Bids submitted with a total amount proposed of less than \$30,000,000 are not eligible for Cumulative Maximum Bidding Capacity prequalification. To be eligible for award in this scenario, the Joint Venture itself or at least one of the Joint Venture entities must have been prequalified for the total amount proposed.
 - 1.3.3. Bids submitted by Joint Ventures with a total amount proposed of \$30,000,000 or greater on a project with an engineer's estimate of less than \$30,000,000 are not eligible for Cumulative Maximum Bidding Capacity prequalification.
 - 1.3.4. The Joint Venture designated as the Apparent Low Bidder shall provide evidence of its corporate existence and furnish good and approved bonds in the name of the Joint Venture within 14 Calendar Days of receipt by the Bidder of a form of contract for execution.
- 1.4. Complete information and links to the on-line prequalification application are available at:

<http://www.sandiego.gov/cip/bidopps/prequalification>
- 1.5. Due to the City's responsibility to protect the confidentiality of the contractors' information, City staff will not be able to provide information regarding contractors' prequalification status over the telephone. Contractors may access real-time information about their prequalification status via their vendor profile on [PlanetBids™](#).

2. **ELECTRONIC FORMAT RECEIPT AND OPENING OF BIDS:** Bids will be received in electronic format (eBids) EXCLUSIVELY at the City of San Diego’s electronic bidding (eBidding) site, at: <http://www.sandiego.gov/cip/bidopps/index.shtml> and are due by the date, and time shown on the cover of this solicitation.
- 2.1. **BIDDERS MUST BE PRE-REGISTERED** with the City’s bidding system and possess a system-assigned Digital ID in order to submit an electronic bid.
- 2.2. The City’s bidding system will automatically track information submitted to the site including IP addresses, browsers being used and the URLs from which information was submitted. In addition, the City’s bidding system will keep a history of every login instance including the time of login, and other information about the user’s computer configuration such as the operating system, browser type, version, and more. Because of these security features, Contractors who disable their browsers’ cookies will not be able to log in and use the City’s bidding system.
- 2.3. The City’s electronic bidding system is responsible for bid tabulations. Upon the bidder’s or proposer’s entry of their bid, the system will ensure that all required fields are entered. **The system will not accept a bid for which any required information is missing.** This includes all necessary pricing, subcontractor listing(s) and any other essential documentation and supporting materials and forms requested or contained in these solicitation documents.
- 2.4. **BIDS REMAIN SEALED UNTIL BID DEADLINE.** eBids are transmitted into the City’s bidding system via hypertext transfer protocol secure (https) mechanism using SSL 128-256 bit security certificates issued from Verisign/Thawte which encrypts data being transferred from client to server. Bids submitted prior to the “Bid Due Date and Time” are not available for review by anyone other than the submitter who has until the “Bid Due Date and Time” to change, rescind or retrieve its proposal should it desire to do so.
- 2.5. **BIDS MUST BE SUBMITTED BY BID DUE DATE AND TIME.** Once the bid deadline is reached, no further submissions are accepted into the system. Once the Bid Due Date and Time has lapsed, bidders, proposers, the general public, and City staff are able to immediately see the results on line. City staff may then begin reviewing the submissions for responsiveness, EOCB compliance and other issues. The City may require any Bidder to furnish statement of experience, financial responsibility, technical ability, equipment, and references.
- 2.6. **RECAPITULATION OF THE WORK.** Bids shall not contain any recapitulation of the Work. Conditional Bids may be rejected as being non-responsive. Alternative proposals will not be considered unless called for.
- 2.7. **BIDS MAY BE WITHDRAWN** by the Bidder only up to the bid due date and time.
- 2.7.1. Important Note: Submission of the electronic bid into the system may not be instantaneous. Due to the speed and capabilities of the user’s internet service provider (ISP), bandwidth, computer hardware and other variables, it may take

time for the bidder's submission to upload and be received by the City's eBidding system. It is the bidder's sole responsibility to ensure their bids are received on time by the City's eBidding system. The City of San Diego is not responsible for bids that do not arrive by the required date and time.

- 2.8. ACCESSIBILITY AND AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANCE:** To request a copy of this solicitation in an alternative format, contact the Public Works Contract Specialist listed on the cover of this solicitation at least five (5) working days prior to the Bid/Proposal due date to ensure availability.

3. ELECTRONIC BID SUBMISSIONS CARRY FULL FORCE AND EFFECT:

- 3.1.** The bidder, by submitting its electronic bid, acknowledges that doing so carries the same force and full legal effect as a paper submission with a longhand (wet) signature.
- 3.2.** By submitting an electronic bid, the bidder certifies that the bidder has thoroughly examined and understands the entire Contract Documents (which consist of the plans and specifications, drawings, forms, affidavits and the solicitation documents), and that by submitting the eBid as its bid proposal, the bidder acknowledges, agrees to and is bound by the entire Contract Documents, including any addenda issued thereto, and incorporated by reference in the Contract Documents.
- 3.3.** The Bidder, by submitting its electronic bid, agrees to and certifies under penalty of perjury under the laws of the State of California, that the certification, forms and affidavits submitted as part of this bid are true and correct.
- 3.4.** The Bidder agrees to the construction of the project as described in Attachment "A-Scope of Work" for the City of San Diego, in accordance with the requirements set forth herein for the electronically submitted prices. The Bidder guarantees the Contract Price for a period of 120 days from the date of Bid opening. The duration of the Contract Price guarantee shall be extended by the number of days required for the City to obtain all items necessary to fulfill all conditions precedent.

- 4. BIDS ARE PUBLIC RECORDS:** Upon receipt by the City, Bids shall become public records subject to public disclosure. It is the responsibility of the respondent to clearly identify any confidential, proprietary, trade secret or otherwise legally privileged information contained within the Bid. General references to sections of the California Public Records Act (PRA) will not suffice. If the Contractor does not provide applicable case law that clearly establishes that the requested information is exempt from the disclosure requirements of the PRA, the City shall be free to release the information when required in accordance with the PRA, pursuant to any other applicable law, or by order of any court or government agency, and the Contractor will hold the City harmless for release of this information.

5. CONTRACTOR REGISTRATION AND ELECTRONIC REPORTING SYSTEM:

- 5.1.** Prior to the Award of the Contract or Task Order, you and your Subcontractors and Suppliers must register with the City's web-based vendor registration and bid management system. For additional information go to:

<http://www.sandiego.gov/purchasing/bids-contracts/vendorreg>

- 5.2.** The City may not award the contract until registration of all subcontractors and suppliers is complete. In the event this requirement is not met within the time frame specified in the Notice of Intent to Award letter, the City reserves the right to rescind the Notice of Award / Intent to Award and to make the award to the next responsive and responsible bidder / proposer.
- 6. JOINT VENTURE CONTRACTORS:** Provide a copy of the Joint Venture agreement and the Joint Venture license to the City within 14 Calendar Days after receiving the Contract forms.
- 7. INSURANCE REQUIREMENTS:**
- 7.1.** All certificates of insurance and endorsements required by the contract are to be provided upon issuance of the City's Notice of Intent to Award letter.
- 7.2.** Refer to sections 5-4, "INSURANCE" of the Supplementary Special Provisions (SSP) for the insurance requirements which must be met.
- 8. REFERENCE STANDARDS:** Except as otherwise noted or specified, the Work shall be completed in accordance with the following standards:

Title	Edition	Document Number
Standard Specifications for Public Works Construction ("The GREENBOOK") http://www.greenbookspecs.org/	2018	PWPI010119-01
City of San Diego Standard Specifications for Public Works Construction ("The WHITEBOOK")* https://www.sandiego.gov/ecp/edocref/greenbook	2018	PWPI010119-02
City of San Diego Standard Drawings* https://www.sandiego.gov/ecp/edocref/standarddraw	2018	PWPI010119-03
Citywide Computer Aided Design and Drafting (CADD) Standards https://www.sandiego.gov/ecp/edocref/drawings	2018	PWPI010119-04
California Department of Transportation (CALTRANS) Standard Specifications – https://dot.ca.gov/programs/design/ccs-standard-plans-and-standard-specifications	2018	PWPI030119-05
CALTRANS Standard Plans https://dot.ca.gov/programs/design/ccs-standard-plans-and-standard-specifications	2018	PWPI030119-06
California Manual on Uniform Traffic Control Devices Revision 5 (CA MUTCD 2014 Rev 5) http://www.dot.ca.gov/programs/safety-programs/camutcd/camutcd-rev5	2014	PWPI042220-09
<p>NOTE: *Available online under Engineering Documents and References at: https://www.sandiego.gov/ecp/edocref/</p> <p>*Electronic updates to the Standard Drawings may also be found in the link above</p>		

9. **CITY'S RESPONSES AND ADDENDA:** The City, at its discretion, may respond to any or all questions submitted in writing via the City's eBidding web site in the **form of an addendum**. No other responses to questions, oral or written shall be of any force or effect with respect to this solicitation. The changes to the Contract Documents through addenda are made effective as though originally issued with the Bid. The Bidders shall acknowledge the receipt of Addenda at the time of bid submission.
10. **CITY'S RIGHTS RESERVED:** The City reserves the right to cancel the Notice Inviting Bids at any time, and further reserves the right to reject submitted Bids, without giving any reason for such action, at its sole discretion and without liability. Costs incurred by the Bidder(s) as a result of preparing Bids under the Notice Inviting Bids shall be the sole responsibility of each bidder. The Notice Inviting Bids creates or imposes no obligation upon the City to enter a contract.
11. **CONTRACT PRICING:** This solicitation is for a Lump Sum contract with Unit Price provisions as set forth herein. The Bidder agrees to perform construction services for the City of San Diego in accordance with these contract documents for the prices listed below. The Bidder further agrees to guarantee the Contract Price for a period of 120 days from the date of Bid opening. The duration of the Contract Price guarantee may be extended, by mutual consent of the parties, by the number of days required for the City to obtain all items necessary to fulfill all contractual conditions.
12. **SUBCONTRACTOR INFORMATION:**
- 12.1. **LISTING OF SUBCONTRACTORS.** In accordance with the requirements provided in the "Subletting and Subcontracting Fair Practices Act" of the California Public Contract Code, the Bidder shall provide the **NAME** and **ADDRESS** of each Subcontractor who will perform work, labor, render services or who specially fabricates and installs a portion [type] of the work or improvement, in an amount in excess of 0.5% of the Contractor's total Bid. The Bidder shall also state within the description, whether the subcontractor is a **CONSTRUCTOR, CONSULTANT** or **SUPPLIER**. The Bidder shall state the **DIR REGISTRATION NUMBER** for all subcontractors and shall further state within the description, the **PORTION** of the work which will be performed by each subcontractor under this Contract. The Contractor shall list only one Subcontractor for each portion of the Work. The **DOLLAR VALUE** of the total Bid to be performed shall be stated for all subcontractors listed. Failure to comply with this requirement may result in the Bid being rejected as **non-responsive** and ineligible for award. The Bidder's attention is directed to the Special Provisions – General; Paragraph 2-3 "Subcontracts" , which stipulates the percent of the Work to be performed with the Bidders' own forces. The Bidder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors for which Bidders are seeking recognition towards achieving any mandatory, voluntary (or both) subcontracting participation goals.

Additionally, pursuant to California Senate Bill 96 and in accordance with the requirements of Labor Code sections 1771.1 and 1725.5, by submitting a bid or proposal to the City, Contractor is certifying that he or she has verified that all subcontractors used on this public work project are registered with the California

Department of Industrial Relations (DIR). **The Bidder shall provide the name, address, license number, DIR registration number of any Subcontractor – regardless of tier** - who will perform work, labor, render services or specially fabricate and install a portion [type] of the work or improvement pursuant to the contract.

- 12.2. LISTING OF SUPPLIERS.** Any Bidder seeking the recognition of Suppliers of equipment, materials, or supplies obtained from third party Suppliers towards achieving any mandatory or voluntary (or both) subcontracting participation goals shall provide, at a minimum, the **NAME, LOCATION (CITY), DIR REGISTRATION NUMBER** and the **DOLLAR VALUE** of each supplier. The Bidder will be credited up to 60% of the amount to be paid to the Suppliers for materials and supplies unless vendor manufactures or substantially alters materials and supplies, in which case, 100% will be credited. The Bidder is to indicate within the description whether the listed firm is a supplier or manufacturer. If no indication is provided, the listed firm will be credited at 60% of the listed dollar value for purposes of calculating the Subcontractor Participation Percentage.
- 12.3. LISTING OF SUBCONTRACTORS OR SUPPLIERS FOR ALTERNATES.** For subcontractors or suppliers to be used on additive or deductive alternate items, in addition to the above requirements, bidder shall further note “ALTERNATE” and alternate item number within the description.
- 13. SUBMITTAL OF “OR EQUAL” ITEMS:** See Section 4-6, “Trade Names” in The WHITEBOOK and as amended in the SSP.
- 14. AWARD:**
- 14.1.** The Award of this contract is contingent upon the Contractor’s compliance with all conditions precedent to Award.
- 14.2.** Upon acceptance of a Bid, the City will prepare contract documents for execution within approximately 21 days of the date of the Bid opening and award the Contract approximately within 7 days of receipt of properly executed Contract, bonds, and insurance documents.
- 14.3.** This contract will be deemed executed and effective only upon the signing of the Contract by the Mayor or his designee and approval as to form the City Attorney’s Office.
- 15. SUBCONTRACT LIMITATIONS:** The Bidder’s attention is directed to Standard Specifications for Public Works Construction, Section 3-2, “SELF-PERFORMANCE” in The GREENBOOK and as amended in the SSP which requires the Contractor to self-perform not less than the specified amount. Failure to comply with this requirement shall render the bid **non-responsive** and ineligible for award.
- 16. AVAILABILITY OF PLANS AND SPECIFICATIONS:** Contract Documents may be obtained by visiting the City’s website: <http://www.sandiego.gov/cip/>. Plans and Specifications for this contract are also available for review in the office of the City Clerk or Engineering & Capital Projects Department, Contracts Division.

- 17. ONLY ONE BID PER CONTRACTOR SHALL BE ACCEPTED:** No person, firm, or corporation shall be allowed to make, file, or be interested in more than one (1) Bid for the same work unless alternate Bids are called for. A person, firm or corporation who has submitted a sub-proposal to a Bidder, or who has quoted prices on materials to a Bidder, is not hereby disqualified from submitting a sub-proposal or quoting prices to other Bidders or from submitting a Bid in its own behalf. Any Bidder who submits more than one bid will result in the rejection of all bids submitted.
- 18. SAN DIEGO BUSINESS TAX CERTIFICATE:** The Contractor and Subcontractors, not already having a City of San Diego Business Tax Certificate for the work contemplated shall secure the appropriate certificate from the City Treasurer, Civic Center Plaza, First floor and submit to the Contract Specialist upon request or as specified in the Contract Documents. Tax Identification numbers for both the Bidder and the listed Subcontractors must be submitted on the City provided forms within these documents.
- 19. BIDDER'S GUARANTEE OF GOOD FAITH (BID SECURITY) FOR DESIGN-BID-BUILD CONTRACTS:**
- 19.1.** For bids \$250,000 and above, bidders shall submit Bid Security at bid time. Bid Security shall be in one of the following forms: a cashier's check, or a properly certified check upon some responsible bank; or an approved corporate surety bond payable to the City of San Diego for an amount of not less than 10% of the total bid amount.
- 19.2.** This check or bond, and the monies represented thereby, will be held by the City as a guarantee that the Bidder, if awarded the contract, will in good faith enter into the contract and furnish the required final performance and payment bonds.
- 19.3.** The Bidder agrees that in the event of the Bidder's failure to execute this contract and provide the required final bonds, the money represented by the cashier's or certified check will remain the property of the City; and the Surety agrees that it will pay to the City the damages, not exceeding the sum of 10% of the amount of the Bid, that the City may suffer as a result of such failure.
- 19.4.** At the time of bid submission, bidders must upload and submit an electronic PDF copy of the aforementioned bid security. Whether in the form of a cashier's check, a properly certified check or an approved corporate surety bond payable to the City of San Diego, the bid security must be uploaded to the City's eBidding system. By 5PM, 3 working days after the bid opening date, all bidders must provide the City with the original bid security.
- 19.5.** Failure to submit the electronic version of the bid security at the time of bid submission AND failure to provide the original by 5PM, 3 working days after the bid opening date shall cause the bid to be rejected and deemed **non-responsive**.

Due to circumstances related to Covid-19, until further notice, all original bid bond submittals must be received by 5 PM, 3 working days after bid opening.

Upon circumstances returning to normal business as usual, the original bid bond shall once again be due by 5 PM the day after bid opening.

Original Bid Bond shall be submitted to:
Engineering & Capital Projects Department, Contracts Division
525 B Street, Suite 750 (7th Floor)
San Diego, California, 92101
To the Attention of the Contract Specialist on the Front Page of this solicitation.

20. AWARD OF CONTRACT OR REJECTION OF BIDS:

- 20.1.** This contract may be awarded to the lowest responsible and reliable Bidder.
- 20.2.** Bidders shall complete ALL eBid forms as required by this solicitation. Incomplete eBids will not be accepted.
- 20.3.** The City reserves the right to reject any or all Bids, to waive any informality or technicality in Bids received, and to waive any requirements of these specifications as to bidding procedure.
- 20.4.** Bidders will not be released on account of their errors of judgment. Bidders may be released only upon receipt by the City within 3 Working Days of the bid opening, written notice from the Bidder which shows proof of honest, credible, clerical error of a material nature, free from fraud or fraudulent intent; and of evidence that reasonable care was observed in the preparation of the Bid.
- 20.5.** A bidder who is not selected for contract award may protest the award of a contract to another bidder by submitting a written protest in accordance with the San Diego Municipal Code.
- 20.6.** The City of San Diego will not discriminate in the award of contracts with regard to race, religion creed, color, national origin, ancestry, physical handicap, marital status, sex or age.
- 20.7.** Each Bid package properly signed as required by these specifications shall constitute a firm offer which may be accepted by the City within the time specified herein.
- 20.8.** The City reserves the right to evaluate all Bids and determine the lowest Bidder on the basis of the base bid and any proposed alternates or options as detailed herein.

21. BID RESULTS:

- 21.1.** The availability of the bids on the City's eBidding system shall constitute the public announcement of the apparent low bidder. In the event that the apparent low bidder is subsequently deemed non-responsive or non-responsible, a notation of such will be made on the eBidding system. The new ranking and apparent low bidder will be adjusted accordingly.

- 21.2.** To obtain the bid results, view the results on the City's web site, or request the results by U.S. mail and provide a self-addressed, stamped envelope. If requesting by mail, be sure to reference the bid name and number. The bid tabulations will be mailed to you upon their completion. The results will not be given over the telephone.

22. THE CONTRACT:

- 22.1.** The Bidder to whom award is made shall execute a written contract with the City of San Diego and furnish good and approved bonds and insurance certificates specified by the City within 14 days after receipt by Bidder of a form of contract for execution unless an extension of time is granted to the Bidder in writing.
- 22.2.** If the Bidder takes longer than 14 days to fulfill these requirements, then the additional time taken shall be added to the Bid guarantee. The Contract shall be made in the form adopted by the City, which includes the provision that no claim or suit whatsoever shall be made or brought by Contractor against any officer, agent, or employee of the City for or on account of anything done or omitted to be done in connection with this contract, nor shall any such officer, agent, or employee be liable hereunder.
- 22.3.** If the Bidder to whom the award is made fails to enter into the contract as herein provided, the award may be annulled and the Bidder's Guarantee of Good Faith will be subject to forfeiture. An award may be made to the next lowest responsible and reliable Bidder who shall fulfill every stipulation embraced herein as if it were the party to whom the first award was made.
- 22.4.** Pursuant to the San Diego City Charter section 94, the City may only award a public works contract to the lowest responsible and reliable Bidder. The City will require the Apparent Low Bidder to (i) submit information to determine the Bidder's responsibility and reliability, (ii) execute the Contract in form provided by the City, and (iii) furnish good and approved bonds and insurance certificates specified by the City within 14 Days, unless otherwise approved by the City, in writing after the Bidder receives notification from the City, designating the Bidder as the Apparent Low Bidder and formally requesting the above mentioned items.
- 22.5.** The award of the Contract is contingent upon the satisfactory completion of the above-mentioned items and becomes effective upon the signing of the Contract by the Mayor or designee and approval as to form by the City Attorney's Office. If the Apparent Low Bidder does not execute the Contract or submit required documents and information, the City may award the Contract to the next lowest responsible and reliable Bidder who shall fulfill every condition precedent to award. A corporation designated as the Apparent Low Bidder shall furnish evidence of its corporate existence and evidence that the officer signing the Contract and bond for the corporation is duly authorized to do so.
- 23. EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK:** The Bidder shall examine carefully the Project Site, the Plans and Specifications, other materials as described in the Special Provisions, Section 3-9, "TECHNICAL STUDIES AND SUBSURFACE DATA", and the

proposal forms (e.g., Bidding Documents). The submission of a Bid shall be conclusive evidence that the Bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of Work, the quantities of materials to be furnished, and as to the requirements of the Bidding Documents Proposal, Plans, and Specifications.

24. CITY STANDARD PROVISIONS: This contract is subject to the following standard provisions. See The WHITEBOOK for details.

- 24.1.** The City of San Diego Resolution No. R-277952 adopted on May 20, 1991 for a Drug-Free Workplace.
- 24.2.** The City of San Diego Resolution No. R-282153 adopted on June 14, 1993 related to the Americans with Disabilities Act.
- 24.3.** The City of San Diego Municipal Code §22.3004 for Contractor Standards.
- 24.4.** The City of San Diego's Labor Compliance Program and the State of California Labor Code §§1771.5(b) and 1776.
- 24.5.** Sections 1777.5, 1777.6, and 1777.7 of the State of California Labor Code concerning the employment of apprentices by contractors and subcontractors performing public works contracts.
- 24.6.** The City's Equal Benefits Ordinance (EBO), Chapter 2, Article 2, Division 43 of The San Diego Municipal Code (SDMC).
- 24.7.** The City's Information Security Policy (ISP) as defined in the City's Administrative Regulation 90.63.

25. PRE-AWARD ACTIVITIES:

- 25.1.** The contractor selected by the City to execute a contract for this Work shall submit the required documentation as specified herein and in the Notice of Intent to Award. Failure to provide the information as specified may result in the Bid being rejected as **non-responsive**.
- 25.2.** The decision that bid is non-responsive for failure to provide the information required within the time specified shall be at the sole discretion of the City.

Bond Number: 1016751

Premium: \$64,499.00

Premium is for contract term and subject to adjustment based on final contract price.

PERFORMANCE BOND, LABOR AND MATERIALMEN'S BOND

FAITHFUL PERFORMANCE BOND AND LABOR AND MATERIALMEN'S BOND:

3-D Enterprises, Inc. _____, a corporation, as principal, and
The Hanover Insurance Company _____, a corporation authorized to do
business in the State of California, as Surety, hereby obligate themselves, their successors and assigns,
jointly and severally, to The City of San Diego a municipal corporation in the sum of **Nine Million One
Hundred Ninety Nine Thousand Seven Hundred Dollars (\$9,199,700)**, for the faithful performance of
the annexed contract, and in the sum of **Nine Million One Hundred Ninety Nine Thousand Seven
Hundred Dollars (\$9,199,700)**, for the benefit of laborers and materialmen designated below.

Conditions:

If the Principal shall faithfully perform the annexed contract with the City of San Diego, California, then the obligation herein with respect to a faithful performance shall be void; otherwise it shall remain in full force.

If the Principal shall promptly pay all persons, firms and corporations furnishing materials for or performing labor in the execution of this contract, and shall pay all amounts due under the California Unemployment Insurance Act then the obligation herein with respect to laborers and materialmen shall be void; otherwise it shall remain in full force.

The obligation herein with respect to laborers and materialmen shall inure to the benefit of all persons, firms and corporations entitled to file claims under the provisions of Article 2. Claimants, (iii) public works of improvement commencing with Civil Code Section 9100 of the Civil Code of the State of California.

Changes in the terms of the annexed contract or specifications accompanying same or referred to therein shall not affect the Surety's obligation on this bond, and the Surety hereby waives notice of same.

The Surety shall pay reasonable attorney's fees should suit be brought to enforce the provisions of this bond.

The Surety expressly agrees that the City of San Diego may reject any contractor or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Principal.

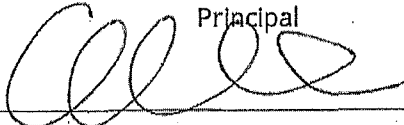
The Surety shall not utilize the Principal in completing the improvements and work specified in the Agreement in the event the City terminates the Principal for default.

PERFORMANCE BOND, LABOR AND MATERIALMEN'S BOND (continued)

Dated August 5, 2021

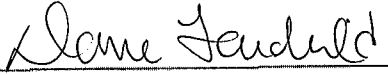
Approved as to Form

3-D Enterprises, Incorporated

By  Principal

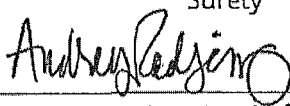
Shahrokh Elinw
Printed Name of Person Signing for Principal

Mara W. Elliott, City Attorney


By 
Deputy City Attorney

Date 11/15/2021

The Hanover Insurance Company

By  Surety
Attorney-in-fact Audrey Rodriguez

Approved:

By 
Cindy Crocker
Acting Deputy Director
Purchasing & Contracting Department
Public Works Division

Date 11/15/2021

5 Hutton Centre Dr., Suite 1060
Local Address of Surety

Santa Ana, CA 92707
Local Address (City, State) of Surety

714-415-3808
Local Telephone No. of Surety

Premium \$ 64,499.00 is for contract term and subject to adjustment based on final contract price.

Bond No. 1016751

ALL- PURPOSE CERTIFICATE OF ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California }

County of San Diego }

On August 5, 2021 before me, B. Lafrenz, Notary Public
(Here insert name and title of the officer)

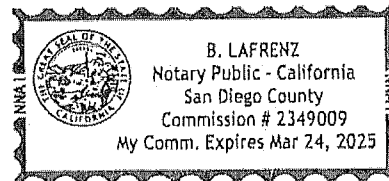
personally appeared Audrey Rodriguez
 who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

B. Lafrenz
 Notary Public Signature

(Notary Public Seal)



ADDITIONAL OPTIONAL INFORMATION

DESCRIPTION OF THE ATTACHED DOCUMENT

(Title or description of attached document)

(Title or description of attached document continued)

Number of Pages _____ Document Date _____

CAPACITY CLAIMED BY THE SIGNER

- Individual (s)
 Corporate Officer

- _____ (Title)
 Partner(s)
 Attorney-in-Fact
 Trustee(s)
 Other _____

INSTRUCTIONS FOR COMPLETING THIS FORM

This form complies with current California statutes regarding notary wording and, if needed, should be completed and attached to the document. Acknowledgments from other states may be completed for documents being sent to that state so long as the wording does not require the California notary to violate California notary law.

- State and County information must be the State and County where the document signer(s) personally appeared before the notary public for acknowledgment.
- Date of notarization must be the date that the signer(s) personally appeared which must also be the same date the acknowledgment is completed.
- The notary public must print his or her name as it appears within his or her commission followed by a comma and then your title (notary public).
- Print the name(s) of document signer(s) who personally appear at the time of notarization.
- Indicate the correct singular or plural forms by crossing off incorrect forms (i.e. he/she/they, is /are) or circling the correct forms. Failure to correctly indicate this information may lead to rejection of document recording.
- The notary seal impression must be clear and photographically reproducible. Impression must not cover text or lines. If seal impression smudges, re-seal if a sufficient area permits, otherwise complete a different acknowledgment form.
- Signature of the notary public must match the signature on file with the office of the county clerk.
 - ❖ Additional information is not required but could help to ensure this acknowledgment is not misused or attached to a different document.
 - ❖ Indicate title or type of attached document, number of pages and date.
 - ❖ Indicate the capacity claimed by the signer. If the claimed capacity is a corporate officer, indicate the title (i.e. CEO, CFO, Secretary).
- Securely attach this document to the signed document with a staple.

**THE HANOVER INSURANCE COMPANY
MASSACHUSETTS BAY INSURANCE COMPANY
CITIZENS INSURANCE COMPANY OF AMERICA**

POWER OF ATTORNEY

THIS Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

KNOW ALL PERSONS BY THESE PRESENTS:

That THE HANOVER INSURANCE COMPANY and MASSACHUSETTS BAY INSURANCE COMPANY, both being corporations organized and existing under the laws of the State of New Hampshire, and CITIZENS INSURANCE COMPANY OF AMERICA, a corporation organized and existing under the laws of the State of Michigan, (hereinafter individually and collectively the "Company") does hereby constitute and appoint,

Brooke Lafrenz, Larry D. Cogdill, Michael Thomas, and /or Audrey Rodriguez

Of **Venbrook Insurance Services of Del Mar, CA** each individually, if there be more than one named, as its true and lawful attorney(s)-in-fact to sign, execute, seal, acknowledge and deliver for, and on its behalf, and as its act and deed any place within the United States, any and all surety bonds, recognizances, undertakings, or other surety obligations. The execution of such surety bonds, recognizances, undertakings or surety obligations, in pursuance of these presents, shall be as binding upon the Company as if they had been duly signed by the president and attested by the secretary of the Company, in their own proper persons. Provided however, that this power of attorney limits the acts of those named herein; and they have no authority to bind the Company except in the manner stated and to the extent of any limitation stated below:

Any such obligations in the United States, not to exceed Thirty Million and No/100 (\$30,000,000) in any single instance

That this power is made and executed pursuant to the authority of the following Resolutions passed by the Board of Directors of said Company, and said Resolutions remain in full force and effect:

RESOLVED: That the President or any Vice President, in conjunction with any Vice President, be and they hereby are authorized and empowered to appoint Attorneys-in-fact of the Company, in its name and as it acts, to execute and acknowledge for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, waivers of citation and all other writings obligatory in the nature thereof, with power to attach thereto the seal of the Company. Any such writings so executed by such Attorneys-in-fact shall be binding upon the Company as if they had been duly executed and acknowledged by the regularly elected officers of the Company in their own proper persons.

RESOLVED: That any and all Powers of Attorney and Certified Copies of such Powers of Attorney and certification in respect thereto, granted and executed by the President or Vice President in conjunction with any Vice President of the Company, shall be binding on the Company to the same extent as if all signatures therein were manually affixed, even though one or more of any such signatures thereon may be facsimile. (Adopted October 7, 1981 – The Hanover Insurance Company; Adopted April 14, 1982 – Massachusetts Bay Insurance Company; Adopted September 7, 2001 – Citizens Insurance Company of America)

IN WITNESS WHEREOF, THE HANOVER INSURANCE COMPANY, MASSACHUSETTS BAY INSURANCE COMPANY and CITIZENS INSURANCE COMPANY OF AMERICA have caused these presents to be sealed with their respective corporate seals, duly attested by two Vice Presidents, this 11th day of March, 2020.



THE HANOVER INSURANCE COMPANY
MASSACHUSETTS BAY INSURANCE COMPANY
CITIZENS INSURANCE COMPANY OF AMERICA

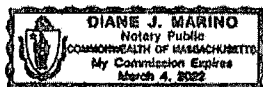
Robert Thomas
Robert Thomas, Vice President

THE HANOVER INSURANCE COMPANY
MASSACHUSETTS BAY INSURANCE COMPANY
CITIZENS INSURANCE COMPANY OF AMERICA

J. Michael Pate
J. Michael Pate, Vice President

THE COMMONWEALTH OF MASSACHUSETTS)
COUNTY OF WORCESTER) ss.

On this 11th day of March 2020 before me came the above named Vice Presidents of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, to me personally known to be the individuals and officers described herein, and acknowledged that the seals affixed to the preceding instrument are the corporate seals of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, respectively, and that the said corporate seals and their signatures as officers were duly affixed and subscribed to said instrument by the authority and direction of said Corporations.



Diane J. Marino
Diane J. Marino, Notary Public
My Commission Expires March 4, 2022

I, the undersigned Vice President of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, hereby certify that the above and foregoing is a full, true and correct copy of the Original Power of Attorney issued by said Companies, and do hereby further certify that the said Powers of Attorney are still in force and effect.

GIVEN under my hand and the seals of said Companies, at Worcester, Massachusetts, this 5th day of August, 2021

CERTIFIED COPY

Theodore G. Martinez
Theodore G. Martinez, Vice President

ATTACHMENTS

ATTACHMENT A
SCOPE OF WORK

SCOPE OF WORK

1. **SCOPE OF WORK** for MBGC Irrigation & Electrical Upgrades includes demolition, grading, installation of new golf course irrigation, electrical service and distribution equipment, electrical equipment pre-manufactured building, water service lines and drinking fountains, fencing, turf repair, potholing, all necessary special inspections, permits and fees and all other incidental work and appurtenances in accordance with Plans 39986-01-D through 39986-29-D, inclusive, and these specifications.

SCOPE OF WORK for MBGC Clubhouse Demo/Prtbl Building Instl provides for the Demolition of the existing clubhouse building, construction of two separate pre-manufactured buildings; one for golf operations and one for food service, one (1) temporary trailer for Golf Operations and one (1) temporary trailer for bathrooms throughout construction, according to the list of requirements, floor plan and location map provided, inclusive, and these specifications, turf repair, drainage, shade trellises, landscaping, irrigation, hardscape, parking lot and path of travel accessibility upgrades, potholing, all necessary special inspections, permits and fees and all other incidental work and appurtenances in accordance with Plans 40268-01-D through 40268-65-D, inclusive, and these specifications, except improvements related to Additive Alternate A.

1.1. SCOPE OF WORK – ADDITIONAL INFORMATION

- 1.1.1. It is to be understood that this project has several components with various types of work and delivery methods. Overall scope of work is, but not limited to, and as further conveyed in the plans and specifications noted above, the following:
- 1.1.2. Demolish of the old structures inclusive of lights, plants, pavement, walls, foundations, and all other items as shown on the plans and in the specifications. Exception: Musco lights to remain.
- 1.1.3. Demolish structures and accessories to structures as shown on the plans utilizing procedures written in the City's, "Hazardous Building Materials Abatement Specifications Mission Bay Golf Course 2702 N. Mission Bay Drive, SD, CA, dated August 9, 2018". Contractor to abate buildings and associated structures/accessories noted. Abatement includes, but may not be limited to: asbestos, lead, and PCBs associated with all buildings inclusive of the electrical building and electrical transformers.
- 1.1.4. Provide a foundation for, then purchase, provide and install an electrical building (basis of design is Tuff Shed, Inc.) as detailed in the plans and specifications with required incidentals including all coordination associated with utility placement and hookups. As a Design/Build element, the Contractor to provide all required professionals to design the structure and obtain a permit through the City of San Diego Development Services Department. Within the contract documents, minimum requirements and standards have been specified.
- 1.1.5. Provide a foundation for, purchase, then provide and install two premanufactured buildings identified as the Golf Operation Building and the Food Service Building

as detailed in the plans and specifications with required incidentals including all coordination associated with utility placement and hookups. As a Design/Build, the Contractor to provide all required professionals to obtain a permit through the City of San Diego Development Services Department. Within the contract documents, minimum standards and requirements have been specified.

- 1.1.6.** Minimum requirements for building (and bid alternate bridge) foundations are specified in these documents. Contractor's professional designers to review the latest geotechnical report and shall meet or exceed the minimum foundations provided in these documents. These foundations are not to be minimized.
- 1.1.7.** Purchase, provide and install awnings attached to the prefabricated buildings. Scope of attachments is shown as minimum requirements. Contractor is to coordinate final attachments with building manufacturer if additional requirements are required.
- 1.1.8.** Purchase, provide and install trellises as outlined in the drawings inclusive of foundations and all required elements. This is not a design/build element. Designs have been provided, and permit reviews completed.
- 1.1.9.** Provide decorative paving as outlined in the plans inclusive of site soil preparations as outlined in the referenced geotechnical report.
- 1.1.10.** Provide site lighting as outline in the plans.
- 1.1.11.** Provide a trailer for temporary offices for golf operations and food service while construction is active. Obtain all necessary approvals for such.
- 1.1.12.** Provide a trailer with restrooms for the use of the temporary offices and the public who use the site amenities. The contractor shall provide separate facilities for their employees. Contractor shall provide for daily cleaning of these facilities.
- 1.1.13.** Provide a complete new irrigation system while maintaining play as outlined in the plans and specifications. This includes the removal of the old irrigation system as noted in the specifications and plans.
- 1.1.14.** Provide and install prefabricated pump station housing with pump(s) as shown on the drawings.
- 1.1.15.** Provide and install two (2) new drinking fountains.
- 1.1.16.** Coordinate the electrical, including all splice locations and other hookups between the drawings. Stop and start points for this work is somewhat schematic and the contractor shall coordinate between subcontractors to ensure each hookup is provided in full.
- 1.1.17.** Provide and install all parking lot and all other site work as identified on the plans inclusive of, but not limited to, drainage improvements, sidewalk, seating benches, slabs, curbs, walls, fences, disabled parking re-arrangements.

1.1.18. The buildings, trellis and bridges have all been reviewed by the Development Services Department. The environmental document has been generated with the aforementioned elements incorporated. Permits for same are to be obtained and paid for by the contractor.

1.1.19. All design/build elements may utilize the project environmental document to obtain applicable permits and for construction information.

1.1.20. All design/build elements to utilize the referenced geotechnical report.

1.1.21. The general contractor shall coordinate all aspects of the different construction delivery methods; types of construction to be performed; work around the public as the course itself will remain open; and, coordinate with Golf staff who will maintain the course during the Work (including irrigating).

1.2. Additive Alternate A - SCOPE OF WORK is for the "Island Patio Remodel": All Work on Island including flatwork, landscaping, trellis, electrical and pre-manufactured bridges, potholing, if applicable, all necessary special inspections, permits and fees and all other incidental work and appurtenances for Additive Alternate A as shown in accordance with Plans 40268-01-D through 40268-65-D, inclusive, and these specifications.

1.2.1. Additive Alternate A – Scope of Work – Additional Information: Contractor to provide CA registered engineers to design, purchase, provide and install/build bridges as outlined in the drawings inclusive of foundations and all required calculations and permits. ICON was used as the basis of bridge design. The plans and specifications show the minimum requirements of the finish product in detail. Provide space within the bridge to hide all utilities crossing the pond. Obtain all required permits. Note that foundation details have been provided, however, the bridge provider to confirm its acceptability and if changes are required, designer to keep within the framework of original intent.

1.3. The Work shall be performed in accordance with:

1.3.1. The Notice Inviting Bids and Plans numbered **39986-01-D** through **39986-29-D**, inclusive, and Plans numbered **40268-01-D** through **40268-65-D**, inclusive.

2. LOCATION OF WORK: The location of the Work is as follows:

2702 North Mission Bay Drive, San Diego, CA 92109

See **Appendix E – Location Map.**

3. CONTRACT TIME: The Contract Time for completion of the Work, including the Plant Establishment Period, shall be **330 Working Days.**

ATTACHMENT B

RESERVED

ATTACHMENT C

RESERVED

ATTACHMENT D
PREVAILING WAGE

PREVAILING WAGE

1. **PREVAILING WAGE RATES:** Pursuant to San Diego Municipal Code section 22.3019, construction, alteration, demolition, repair and maintenance work performed under this Contract is subject to State prevailing wage laws. For construction work performed under this Contract cumulatively exceeding \$25,000 and for alteration, demolition, repair and maintenance work performed under this Contract cumulatively exceeding \$15,000, the Contractor and its subcontractors shall comply with State prevailing wage laws including, but not limited to, the requirements listed below.

- 1.1. **Compliance with Prevailing Wage Requirements.** Pursuant to sections 1720 through 1861 of the California Labor Code, the Contractor and its subcontractors shall ensure that all workers who perform work under this Contract are paid not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations (DIR). This includes work performed during the design and preconstruction phases of construction including, but not limited to, inspection and land surveying work.

- 1.1.1. Copies of such prevailing rate of per diem wages are on file at the City and are available for inspection to any interested party on request. Copies of the prevailing rate of per diem wages also may be found at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Contractor and its subcontractors shall post a copy of the prevailing rate of per diem wages determination at each job site and shall make them available to any interested party upon request.

- 1.1.2. The wage rates determined by the DIR refer to expiration dates. If the published wage rate does not refer to a predetermined wage rate to be paid after the expiration date, then the published rate of wage shall be in effect for the life of this Contract. If the published wage rate refers to a predetermined wage rate to become effective upon expiration of the published wage rate and the predetermined wage rate is on file with the DIR, such predetermined wage rate shall become effective on the date following the expiration date and shall apply to this Contract in the same manner as if it had been published in said publication. If the predetermined wage rate refers to one or more additional expiration dates with additional predetermined wage rates, which expiration dates occur during the life of this Contract, each successive predetermined wage rate shall apply to this Contract on the date following the expiration date of the previous wage rate. If the last of such predetermined wage rates expires during the life of this Contract, such wage rate shall apply to the balance of the Contract.

- 1.2. **Penalties for Violations.** Contractor and its subcontractors shall comply with California Labor Code section 1775 in the event a worker is paid less than the prevailing wage rate for the work or craft in which the worker is employed. This shall be in addition to any other applicable penalties allowed under Labor Code sections 1720 – 1861.

- 1.3. Payroll Records.** Contractor and its subcontractors shall comply with California Labor Code section 1776, which generally requires keeping accurate payroll records, verifying and certifying payroll records, and making them available for inspection. Contractor shall require its subcontractors to also comply with section 1776. Contractor and its subcontractors shall submit weekly certified payroll records online via the City's web-based Labor Compliance Program. Contractor is responsible for ensuring its subcontractors submit certified payroll records to the City.
- 1.3.1.** Contractor and their subcontractors shall also furnish records specified in Labor Code section 1776 directly to the Labor Commissioner in the manner required by Labor Code section 1771.4.
- 1.4. Apprentices.** Contractor and its subcontractors shall comply with California Labor Code sections 1777.5, 1777.6 and 1777.7 concerning the employment and wages of apprentices. Contractor is held responsible for the compliance of their subcontractors with sections 1777.5, 1777.6 and 1777.7.
- 1.5. Working Hours.** Contractor and their subcontractors shall comply with California Labor Code sections 1810 through 1815, including but not limited to: (i) restrict working hours on public works contracts to eight hours a day and forty hours a week, unless all hours worked in excess of 8 hours per day are compensated at not less than 1½ times the basic rate of pay; and (ii) specify penalties to be imposed on contractors and subcontractors of \$25 per worker per day for each day the worker works more than 8 hours per day and 40 hours per week in violation of California Labor Code sections 1810 through 1815.
- 1.6. Required Provisions for Subcontracts.** Contractor shall include at a minimum a copy of the following provisions in any contract they enter into with a subcontractor: California Labor Code sections 1771, 1771.1, 1775, 1776, 1777.5, 1810, 1813, 1815, 1860 and 1861.
- 1.7. Labor Code Section 1861 Certification.** Contractor in accordance with California Labor Code section 3700 is required to secure the payment of compensation of its employees and by signing this Contract, Contractor certifies that "I am aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this Contract."
- 1.8. Labor Compliance Program.** The City has its own Labor Compliance Program authorized in August 2011 by the DIR. The City will withhold contract payments when payroll records are delinquent or deemed inadequate by the City or other governmental entity, or it has been established after an investigation by the City or other governmental entity that underpayment(s) have occurred. For questions or assistance, please contact the City of San Diego's Prevailing Wage Unit at 858-627-3200.
- 1.9. Contractor and Subcontractor Registration Requirements.** This project is subject to compliance monitoring and enforcement by the DIR. A contractor or subcontractor

shall not be qualified to bid on, be listed in a bid or proposal, subject to the requirements of section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Labor Code section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

1.9.1. A Contractor's inadvertent error in listing a subcontractor who is not registered pursuant to Labor Code section 1725.5 in response to a solicitation shall not be grounds for filing a bid protest or grounds for considering the bid non-responsive provided that any of the following apply: (1) the subcontractor is registered prior to bid opening; (2) within twenty-four hours after the bid opening, the subcontractor is registered and has paid the penalty registration fee specified in Labor Code section 1725.5; or (3) the subcontractor is replaced by another registered subcontractor pursuant to Public Contract Code section 4107.

1.9.2. By submitting a bid or proposal to the City, Contractor is certifying that he or she has verified that all subcontractors used on this public work project are registered with the DIR in compliance with Labor Code sections 1771.1 and 1725.5, and Contractor shall provide proof of registration for themselves and all listed subcontractors to the City at the time of bid or proposal due date or upon request.

1.10. Stop Order. For Contractor or its subcontractors engaging in the performance of any public work contract without having been registered in violation of Labor Code sections 1725.5 or 1771.1, the Labor Commissioner shall issue and serve a stop order prohibiting the use of the unregistered contractors or unregistered subcontractor(s) on ALL public works until the unregistered contractor or unregistered subcontractor(s) is registered. Failure to observe a stop order is a misdemeanor.

1.11. List of all Subcontractors. The Contractor shall provide the list of subcontractors (regardless of tier), along with their DIR registration numbers, utilized on this Contract prior to any work being performed; and the Contractor shall provide a complete list of all subcontractors with each invoice. Additionally, Contractor shall provide the City with a complete list of all subcontractors (regardless of tier) utilized on this contract within ten working days of the completion of the contract, along with their DIR registration numbers. The City shall withhold final payment to Construction Management Professional until at least thirty (30) days after this information is provided to the City.

1.12. Exemptions for Small Projects. There are limited exemptions for installation, alteration, demolition, or repair work done on projects of \$25,000 or less. The Contractor shall still comply with Labor Code sections 1720 et. seq. The only recognized exemptions are listed below:

1.12.1. Registration. The Contractor will not be required to register with the DIR for small projects. (Labor Code section 1771.1).

- 1.12.2.** Certified Payroll Records. The records required in Labor Code section 1776 shall be required to be kept and submitted to the City of San Diego, but will not be required to be submitted online with the DIR directly. The Contractor will need to keep those records for at least three years following the completion of the Contract. (Labor Code section 1771.4).
- 1.12.3.** List of all Subcontractors. The Contractor shall not be required to hire only registered subcontractors and is exempt from submitting the list of all subcontractors that is required in section 1.11 above. (Labor code section 1773.3).

ATTACHMENT E
SUPPLEMENTARY SPECIAL PROVISIONS

SUPPLEMENTARY SPECIAL PROVISIONS

The following Supplementary Special Provisions (SSP) modifies the following documents:

1. The **2018 Edition** of the Standard Specifications for Public Works Construction (The "GREENBOOK").
2. The **2018 Edition** of the City of San Diego Standard Specifications for Public Works Construction (The "WHITEBOOK"), including the following:
 - a) General Provisions (A) for all Construction Contracts.

PART 0 – EQUAL OPPORTUNITY CONTRACTING PROGRAM (EOCP)

SECTION A – GENERAL REQUIREMENTS

0-12 CONTRACT RECORDS AND REPORTS. To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. You shall maintain records of all subcontracts and invoices from your Subcontractors and Suppliers for work on this project. Records shall show name, telephone number including area code, and business address of each Subcontractor, Supplier, and joint venture partner, and the total amount actually paid to each firm. Project relevant records, regardless of tier, may be periodically reviewed by the City.
2. You shall retain all records, books, papers, and documents pertinent to the Contract for a period of not less than 5 years after Notice of Completion and allow access to said records by the City's authorized representatives.
3. You shall submit the following reports using the City's web-based contract compliance (Prism® portal):
 - a) **Monthly Payment.** You shall submit Monthly Payment Reporting by the 10th day of the subsequent month. Incomplete and/or delinquent reporting may cause payment delays, non-payment of invoices, or both.
4. The records maintained under item 1, described above, shall be consolidated into a Final Summary Report, certified as correct by an authorized representative of the Contractor. The Final Summary Report shall include all subcontracting activities and be sent to the EOCP Program Manager prior to Acceptance. Failure to comply may result in assessment of liquidated damages or withholding of retention. The City will review and verify 100% of subcontract participation reported in the Final Summary Report prior to approval and release of final retention to you. In the event your Subcontractors are owed

money for completed Work, the City may authorize payment to subcontractor via a joint check from the withheld retention.

SECTION 1 – GENERAL, TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS

1-2 TERMS AND DEFINITIONS. To the “WHITEBOOK”, items 43, 56, 69, and 102, DELETE in its entirety and SUBSTITUTE with the following:

43. **Field Order** - A Field Order is a written agreement by the Engineer to compensate you for Work items in accordance with 2-8, “EXTRA WORK” or 2-9, “CHANGED CONDITIONS”. A Field Order does not change the Contract Price, Contract Time, or the scope intent of the Contract.
56. **Notice of Completion (NOC)** - A document recorded with the County of San Diego to signify that the Contract Work has been completed and accepted by the City.
69. **Punchlist** - A list of items of Work or corrections generated after a Walk-through that is conducted when you consider that the Work and Services are complete, and as verified by the Owner. The Punchlist may be completed in phases if defined in the Contract.
102. **Walk-through** - The procedure the City uses to evaluate the status of the Project or the phase of the Project and to generate a Punchlist prior to Acceptance.

To the “WHITEBOOK”, item 54, “Normal Working Hours”, ADD the following:

The **Normal Working Hours** are **7:00 AM** to **5:00 PM**.

To the “WHITEBOOK”, ADD the following:

108. **Acceptance** – When all of the Contract Work, including all Punchlist items, is deemed officially complete by the City Asset Owning Department or Deputy City Engineer.
109. **Occupancy** – When the Owner deems a building is ready for use, the Owner will issue a certificate of Occupancy in writing.
110. **Substantial Completion** – When all Contract Work is deemed complete by the Contractor in writing, and as verified by the Owner. Substantial Completion may be completed in phases if defined in the Contract.

1-7.1.3 Requests for Information (RFI). To the “WHITEBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

1. Should You discover a conflict, omission, errors in the Contract Documents, differences with existing field conditions, or have any questions concerning

interpretation or clarification of Contract Documents, or when you propose deviations to the standards or design, you shall submit a Request for Information (RFI) to the City regarding your question or clarification within **1 Working Day**.

2. Your RFI shall meet the following requirements:
 - a) All RFIs, whether by You or your Subcontractor or supplier at any tier, shall be submitted by You to the City.
 - b) RFIs shall be numbered sequentially.
 - c) You shall clearly and concisely set forth the single issue for which interpretation or clarification is sought, indicate Specification Section numbers, Contract Drawing numbers, and details, or other items involved, and state why a response is required from the City.
 - d) RFIs shall be submitted within **1 Working Day** in order that they may be adequately researched and answered before the response affects any critical activity of the Work.
 - e) Should You believe that a response to an RFI causes a change to the requirements of the Contract, You shall, before proceeding, give written notice to the City, indicating that You believe that City response to the RFI to be a Change Order. Failure to give such written notice within **5 Working Days** of receipt of the City's response to the RFI shall waive Your right to seek additional time or cost.
3. The City will respond to RFIs within **5 Working Days** unless the City notifies You in writing that a response will take longer. The **5 Working Days** shall begin when the RFI is received and dated by the City. Responses from the City will not change any requirement of the Contract unless so noted by the City in the response to the RFI. The City will not issue a Change Order for Extra Work or additional time when the issue raised in the RFI was due to your fault, neglect, or any unauthorized deviations from the project design or specifications.
4. If You proceed in resolving a conflict, omission, or any error in the Contract Documents without sending the City an RFI in accordance with the requirements stated above, the City may require You to remove such work at Your cost or back charge You the cost to remove this work.

1-7.2 Contract Bonds. To the "WHITEBOOK", item 1, DELETE in its entirety and SUBSTITUTE with the following:

1. Before execution of the Contract, file payment and performance bonds with the City to be approved by the Board in the amounts and for the purposes noted. Bonds shall be executed by a responsible surety as follows:
 - a) If the Work is being funded with state or local money, consistent with California Code of Civil Procedure §995.670, the Surety shall be an "admitted surety" authorized by the State of California Department of Insurance to transact surety insurance in the State.

- b) If the Work is being funded with federal money, the Surety shall be listed in the U.S. Treasury Department Circular 570 and shall be in conformance with the specified Underwriting Limitations.

To the "WHITEBOOK", item 2, subsection "a", subsection "i", DELETE in its entirety and SUBSTITUTE with the following:

- i. A "Payment Bond" (Materials and Labor Bond) is optional. If no bond is submitted, no payment shall be made until 35 Calendar Days after Acceptance and any lien requirements have been fulfilled. If a bond is submitted, progress payments shall be made in accordance with these Specifications.

To the "WHITEBOOK", item 2, subsection "d", DELETE in its entirety and SUBSTITUTE with the following:

- d) For Contracts over \$100,000:
 - i. A "Payment Bond" (Materials and Labor Bond) for 100% of the Contract Price to satisfy claims of material Suppliers and of mechanics and laborers employed on the Work. You shall maintain the bond in full force and effect until Acceptance and until all claims for materials and labor are paid and shall otherwise comply with the Government Code.
 - ii. A "Faithful Performance Bond" for 100% of the Contract Price to guarantee faithful performance of Work, within the time prescribed and in a manner satisfactory to the City, that materials and workmanship shall be free from original or developed defects.

To the "WHITEBOOK", item 7, DELETE in its entirety and SUBSTITUTE with the following:

- 7. You shall require the Surety to mail its standard "Bond Status" form to the Engineer at the following address:

Deputy Director
Construction Management and Field Engineering Division
9573 Chesapeake Drive San Diego, CA 92123

SECTION 3 – CONTROL OF THE WORK

3-2 SELF-PERFORMANCE. To the "GREENBOOK", DELETE in its entirety and SUBSTITUTE with the following:

- 1. You shall perform, with your own organization, Contract Work amounting to at least 50% of the base Bid

3-3 SUBCONTRACTORS. To the "WHITEBOOK", ADD the following:

- 6. When a Subcontractor fails to prosecute a portion of the Work in a manner satisfactory to the City, you shall remove such Subcontractor immediately upon written request of the City, and shall request approval of a replacement

Subcontractor to perform the Work in accordance with California Public Contract Code (PCC), Subletting and Subcontracting, Section 4107, at no added cost to the City.

3-9 TECHNICAL STUDIES AND SUBSURFACE DATA. To the "WHITEBOOK", ADD the following:

5. In preparation of the Contract Documents, the designer has relied upon the following reports of explorations and tests at the Work Site:
 - a) Drainage Report Mission Bay Golf Course Practice Center Building Improvements dated August 10, 2018 by Kettler Leweck Engineering.
 - b) Preliminary Geotechnical Investigation Mission Bay Golf Course Clubhouse Replacement dated August 6, 2018 by SCST, INC.
 - c) Preliminary Geotechnical Investigation New Light Poles Mission Bay Golf Course dated November 18, 2015 by Geocon Incorporated.
 - d) Storm Water Quality Management Plan dated August 10, 2020 by Kettler Leweck Engineering.

6. The reports listed above are available for review at the following link:

<https://drive.google.com/drive/folders/17fibkQyjnYy-WujNwKmClspXZb2QDEFI>

3-10 SURVEYING. To the "GREENBOOK" and "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

3-10 SURVEYING (DESIGN-BID-BUILD).

3-10.1 General.

1. You shall provide all required site layout and general grade checking work not specified in 3-10.2, "Survey Services Provided by City (via City Consultant Surveyor)".
2. Notify the City, in writing, at least 2 Working Days prior to requesting survey services provided by the City.

3-10.2 Survey Services Provided by City (via City Consultant Surveyor).

1. Monument Perpetuation, including mark-outs, will be performed by the City Engineering Support & Technical Services Division's (ESTS), Land Survey Section (LSS), unless otherwise noted. You are responsible for requesting the coordination of these services.
 - a) If at any time a monument will be destroyed or covered, such monument shall be perpetuated in accordance with state law. Inform the LSS, via project Resident Engineer, if any monument will be destroyed or covered during any construction activity.

2. The following surveying services (including construction staking), as defined in California Business & Professions Code §8726, shall be provided by the City or a City consultant surveyor:
 - a) Locating or establishing alignment or elevations of all features or structures shown on project Plans.
 - b) Locating or establishing geodetic control points for all site feature or structure locations.
 - c) Produce topographic as-built data.
 - d) Locating, establishing, or re-establishing monuments, property lines, right-of-way lines, or easement lines.
 - e) Verifying structure finish grade elevations.
3. All construction survey stakes, control points, and other survey related marks provided by the City shall be preserved for the duration of the Project. If any construction survey stakes, control points, or other survey related marks are lost or disturbed and need to be replaced, such replacement shall be performed at the your expense.

3-10.3 Payment.

The payment for site layout and general grade checking Work, coordination, and preservation of all survey related marks shall be included in the Contract Price.

3-13.1 Completion. To the "GREENBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. You shall submit a written assertion that the Work has been completed and is ready for Owner Acceptance. If, in the Engineer's judgment, the Work has been completed in accordance with the Contract Documents, the Engineer will set forth in writing the date the Work was completed. This will be the date that you are relieved from responsibility to protect and maintain the Work and to which liquidated damages will be computed.

3-13.1.1 Requirements Before Requesting a Walk-through. To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

3-13.1.1 Requirements Before Requesting Substantial Completion.

1. The following items are required prior to requesting a Substantial Completion:
 - a) Remove temporary facilities from the Site.
 - b) Thoroughly cleaning the Site and removing all mark outs and construction staking.
 - c) Provide completed and signed Red-lines in accordance with 3-7.3 "Redlines and Record Documents".

- d) Provide all material and equipment maintenance and operation instructions and/or manuals.
- e) Provide all tools which are permanent parts of the equipment installed in the Project.
- f) Provide and properly identify all keys for construction and all keys for permanent Work.
- g) Provide all final Special Inspection reports required by the applicable building Code.
- h) Provide all items specified to be supplied as extra stock. Wrap, seal, or place in a container all items as necessary to allow for storage by the City for future use. Verify the specified quantities.
- i) Ensure that all specified EOCP and certified wage rate documentations covering the Contract Time have been submitted.
- j) Provide the spare parts for the proposed irrigation system as specified in the Special Provisions.
- k) If the Work includes sewer and storm drain installations, the inspection shall include televising in accordance with 306-18, "VIDEO INSPECTION".
- l) If the Work includes a Plant Establishment Period, Work in accordance with 801-6, "MAINTENANCE AND PLANT ESTABLISHMENT" shall be completed prior to requesting Substantial Completion, unless approved otherwise by the Owner.
- m) Notify the Engineer to arrange a final inspection of permanent BMPs installed.

3-13.1.2 Walk-through and Punchlist Procedure. To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. You shall notify the Engineer 15 Working Days in advance of date of anticipated Substantial Completion to allow time for Engineer to schedule a Walk-through. After you complete the requirements in 3-13.1.1, "Requirements Before Requesting Substantial Completion" and when you consider that the Work is Substantially Complete, you will notify the Engineer in writing that the Project is Substantially Complete. The Engineer will review your request and determine if the Project is ready for a Walk-through, by verifying whether you have completed all items as required by 3-13.1.1, "Requirements Before Requesting Substantial Completion". Within 7 Working Days, the City will either reject your request of a Walk-through in writing or schedule a Walk-through inspection. The Engineer shall facilitate the Walk-through.
2. The following documents shall be provided at the time of your Walk-through request: As-Built markup, Plans, specifications, technical data such as

submittals and equipment manuals, draft final payment, warranties, material certifications, bonds, guarantees, maintenance service agreements, and maintenance and operating manuals.

3. Written warranties, except manufacturer's standard printed warranties, shall be on a letterhead addressed to you. Warranties shall be submitted in the format described in this section, modified as approved by the City, to suit the conditions pertaining to the warranty. Lack of submitting these items will delay start of Walk-through.
4. The Engineer will provide you with the Punchlist within 15 Working Days after the date of the Walk-through. The City shall not provide a preliminary Punchlist.
5. If the Engineer finds that the Project is not Substantially Complete as defined herein, the Engineer will terminate the Walk-through and notify you in writing.
6. If, at any time during the Engineer's evaluation of the corrective Work required by the Punchlist, the Engineer discovers that additional corrective Work is required, the Engineer may include that corrective Work in the Punchlist.
7. You shall remain solely responsible for the Project Site until the Project is completely operational, all Punchlist items have been corrected, and all operation and maintenance manuals have been accepted by the City.
8. The Engineer shall meet with you until all Punchlist items are corrected. You shall complete the Punchlist within 30 Working Days, and Working Days will continue to be counted until Acceptance of the Project.

3-13.2 Acceptance. To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. You shall provide the completed, signed, and stamped DS-563 to the Engineer prior to Acceptance.
2. You shall deliver the final As-builts and final billing prior to Acceptance.
3. You shall assemble and deliver to the Engineer a Final Summary Report and Affidavit of Disposal prior to Acceptance.
4. Acceptance shall occur after all of the requirements contained in the Contract Documents have been fulfilled. If, in the Engineer's judgment, you have fully performed the Contract, the Engineer will recommend to the City Engineer that your performance of the Contract be accepted. You shall receive notification of Acceptance in writing from the Owner and counting of working days shall cease and Warranty begins.
5. Retention can be released 35 Calendar Days after NOC. Submit your request for retention to the Resident Engineer and they will mail to you a "Release of Claims" form which shall be completed and returned before the retention will be released.

3-13.3

Warranty. To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. You shall warranty and repair all defective materials and workmanship for a period of 1 year. This call back warranty period shall start on the date the Work was accepted by the City unless the City has Beneficial Use or takes Occupancy of the project earlier (excluding water, sewer, and storm drain projects).
2. You shall warranty the Work free from all latent defects for 10 years and patent defects for a period of 4 years.
3. The warranty period for specific items covered under manufacturers' or suppliers' warranties shall commence on the date they are placed into service at the direction of the Engineer in writing.
4. All express warranties from Subcontractors, manufacturers', or Suppliers', of any tier, for the materials furnished and Work performed shall be assigned, in writing, to the City, and shall be delivered to the Engineer prior to the Acceptance of your performance of the Contract.
5. Replace or repair defective materials and workmanship in a manner satisfactory to the Engineer after notice to do so from the Engineer and within the time specified in the notice. If you fail to make such replacements or repairs within the time specified in the notice, the City may perform the replacement or repairs at your expense. If you fail to reimburse the City for the actual costs, your Surety shall be liable for the cost
6. Items that shall be warranted free from defective workmanship and materials for a period longer than 1 year are as follows:

Specified Item	Minimum Warranty Period
Detectable Warning Tile Construction	3 Years of Manufacturer's Warranty
All Work Under SECTION 500 – PIPELINE REHABILITATION	3 Years
Fiber Optic Interconnect Cables	2 Years
Luminaires*	10 Years of Manufacturer's Warranty
LED Signal Modules	3 Years of Manufacturer's Warranty
Field Devices Associated with 700-6.3, "Adaptive Control Note"	See 700-6.3.9, "Warranty"

* Provide documentation verifying that the induction luminaire models being offered for the Project are covered by the 10 year warranty.

7. If, during the warranty period, any item of the Work is found to be Defective Work, you shall correct it promptly after receipt of written notice from the City to do so. The warranty period shall be extended with respect to portions of the Work corrected as part of the warranty requirements.

3-13.3.1 Defective Work. To the "WHITEBOOK", item 6, DELETE in its entirety and SUBSTITUTE with the following:

6. For Building Projects which require a certificate of occupancy, not including sewer and water facilities, if you fail to correct the defective Work listed on the City's Punchlist within 45 Working Days after the Contract Time, you shall reimburse the City for all costs to provide inspection services required to monitor Work beyond the 45 Working Days. The City shall bill you for the additional inspection at the City's established rates.

SECTION 4 - CONTROL OF MATERIALS

4-3.5 Special Inspection. To the "WHITEBOOK", ADD the following:

5. Building Compliance – Building Certificate of compliance for commercial coaches.
6. Special inspection as required by the City of San Diego Development Service Department for elements required in these documents including Food Service Building and Golf Operation Building.

4-3.6 Preapproved Materials. To the "WHITEBOOK", ADD the following:

3. You shall submit in writing a list of all products to be incorporated in the Work that are on the AML.

4-6 TRADE NAMES. To the "WHITEBOOK", ADD the following:

11. You shall submit your list of proposed substitutions for an "equal" item **no later than 5 Working Days after the determination of the Apparent Low Bidder** and on the City's Product Submittal Form available at:

<https://www.sandiego.gov/ecp/edocref/>

SECTION 5 – LEGAL RELATIONS AND RESPONSIBILITIES

5-4 INSURANCE. To the "GREENBOOK", DELETE in its entirety and SUBSTITUTE with the following:

5-4 INSURANCE.

1. The insurance provisions herein shall not be construed to limit your indemnity obligations contained in the Contract.

5-4.1 Policies and Procedures.

1. You shall procure the insurance described below, at its sole cost and expense, to provide coverage against claims for loss including injuries to persons or damage to property, which may arise out of or in connection with the performance of the Work by you, your agents, representatives, officers, employees or Subcontractors.
2. Insurance coverage for property damage resulting from your operations is on a replacement cost valuation. The market value will not be accepted.
3. You shall maintain this insurance for the duration of this Contract and at all times thereafter when you are correcting, removing, or replacing Work in accordance with this Contract. Your liabilities under the Contract, e.g., your indemnity obligations, is not deemed limited to the insurance coverage required by this Contract.
4. The payment for insurance shall be included in the Contract Price as bid by you. Except as specifically agreed to by the City in writing, you are not entitled to any additional payment. Do not begin any Work under this Contract until you have provided and the City has approved all required insurance.
5. Policies of insurance shall provide that the City is entitled to 30 Days (10 Days for cancellation due to non-payment of premium) prior written notice of cancellation or non-renewal of the policy. Maintenance of specified insurance coverage is a material element of the Contract. Your failure to maintain or renew coverage or to provide evidence of renewal during the term of the Contract may be treated by the City as a material breach of the Contract.

5-4.2 Types of Insurance.

5-4.2.1 Commercial General Liability Insurance.

1. Commercial General Liability Insurance shall be written on the current version of the ISO Occurrence form CG 00 01 07 98 or an equivalent form providing coverage at least as broad.
2. The policy shall cover liability arising from premises and operations, XCU (explosions, underground, and collapse), independent contractors, products/completed operations, personal injury and advertising injury, bodily injury, property damage, and liability assumed under an insured's contract (including the tort liability of another assumed in a business contract).
3. There shall be no endorsement or modification limiting the scope of coverage for either "insured vs. insured" claims or contractual liability. You shall maintain the same or equivalent insurance for at least 10 years following completion of the Work.

4. All costs of defense shall be outside the policy limits. Policy coverage shall be in liability limits of not less than the following:

<u>General Annual Aggregate Limit</u>	<u>Limits of Liability</u>
Other than Products/Completed Operations	\$2,000,000
Products/Completed Operations Aggregate Limit	\$2,000,000
Personal Injury Limit	\$1,000,000
Each Occurrence	\$1,000,000

5-4.2.2 Commercial Automobile Liability Insurance.

1. You shall provide a policy or policies of Commercial Automobile Liability Insurance written on the current version of the ISO form CA 00 01 12 90 or later version or equivalent form providing coverage at least as broad in the amount of \$1,000,000 combined single limit per accident, covering bodily injury and property damage for owned, non-owned, and hired automobiles ("Any Auto").
2. All costs of defense shall be outside the limits of the policy.

5-4.2.3 Contractors Pollution Liability Insurance.

1. You shall procure and maintain at your expense or require your Subcontractor, as described below, to procure and maintain the Contractors Pollution Liability Insurance including contractual liability coverage to cover liability arising out of cleanup, removal, storage, or handling of hazardous or toxic chemicals, materials, substances, or any other pollutants by you or any Subcontractor in an amount not less than \$2,000,000 limit for bodily injury and property damage.
2. All costs of defense shall be outside the limits of the policy. Any such insurance provided by your Subcontractor instead of you shall be approved separately in writing by the City.
3. For approval of a substitution of your Subcontractor's insurance, you shall certify that all activities for which the Contractors Pollution Liability Insurance will provide coverage will be performed exclusively by the Subcontractor providing the insurance. The deductible shall not exceed \$25,000 per claim.
4. Contractual liability shall include coverage of tort liability of another party to pay for bodily injury or property damage to a third person or organization. There shall be no endorsement or modification of the coverage limiting the scope of coverage for either "insured vs. insured" claims or contractual liability.
5. Occurrence based policies shall be procured before the Work commences and shall be maintained for the Contract Time. Claims Made policies shall be

procured before the Work commences, shall be maintained for the Contract Time, and shall include a 12 month extended Claims Discovery Period applicable to this contract or the existing policy or policies that shall continue to be maintained for 12 months after the completion of the Work without advancing the retroactive date.

6. Except as provided for under California law, the policy or policies shall provide that the City is entitled to 30 Days prior written notice (10 Days for cancellation due to non-payment of premium) of cancellation or non-renewal of the policy or policies.

5-4.2.4 Contractors Hazardous Transporters Pollution Liability Insurance.

1. You shall provide at your expense or require your Subcontractor to provide, as described below, Contractors Hazardous Transporters Pollution Liability Insurance including contractual liability coverage to cover liability arising out of transportation of hazardous or toxic, materials, substances, or any other pollutants by you or any Subcontractor in an amount not less than \$2,000,000 limit per occurrence/aggregate for bodily injury and property damage.
2. All costs of defense shall be outside the limits of the policy. The deductible shall not exceed \$25,000 per claim. Any such insurance provided by a subcontractor instead of you shall be approved separately in writing by the City.
3. For approval of the substitution of Subcontractor's insurance the Contractor shall certify that all activities for which Contractors Hazardous Transporters Pollution Liability Insurance will provide coverage will be performed exclusively by the Subcontractor providing the insurance.
4. Contractual liability shall include coverage of tort liability of another party to pay for bodily injury or property damage to a third person or organization. There shall be no endorsement or modification of the coverage limiting the scope of coverage for either "insured vs. insured" claims or contractual liability. Occurrence based policies shall be procured before the Work commences and shall be maintained for the duration of this Contract. Claims Made policies shall be procured before the Work commences, shall be maintained for the duration of this contract, and shall include a 12 month extended Claims Discovery Period applicable to this contract or the existing policy or policies that shall continue to be maintained for 12 months after the completion of the Work under this Contract without advancing the retroactive date.
5. Except as provided for under California law, the policy or policies shall provide that the City is entitled to 30 Days prior written notice (10 Days for cancellation due to non-payment of premium) of cancellation or non-renewal of the policy or policies.

5-4.2.5

Contractors Builders Risk Property Insurance.

1. You shall provide at your expense, and maintain until Final Acceptance of the Work, a Special Form Builders Risk Policy or Policies. This insurance shall be in an amount equal to the replacement cost of the completed Work (without deduction for depreciation) including the cost of excavations, grading, and filling. The policy or policies limits shall be 100% of this Contract value of the Work plus 15% to cover administrative costs, design costs, and the costs of inspections and construction management.
2. Insured property shall include material or portions of the Work located away from the Site but intended for use at the Site and shall cover material or portions of the Work in transit. The policy or policies shall include as insured property scaffolding, falsework, and temporary buildings located at the Site. The policy or policies shall cover the cost of removing debris, including demolition.
3. The policy or policies shall provide that all proceeds thereunder shall be payable to the City as Trustee for the insured, and shall name the City, the Contractor, Subcontractors, and Suppliers of all tiers as named insured. The City, as Trustee, will collect, adjust, and receive all monies which may become due and payable under the policy or policies, may compromise any and all claims thereunder, and will apply the proceeds of such insurance to the repair, reconstruction, or replacement of the Work.
4. Any deductible applicable to the insurance shall be identified in the policy or policies documents and responsibility for paying the part of any loss not covered because of the application of such deductibles shall be apportioned among the parties except for the City as follows: if there is more than one claimant for a single occurrence, then each claimant shall pay a pro-rata share of the per occurrence deductible based upon the percentage of their paid claim to the total paid for insured. The City shall be entitled to 100% of its loss. You shall pay the City any portion of that loss not covered because of a deductible at the same time the proceeds of the insurance are paid to the City as trustee.
5. Any insured, other than the City, making claim to which a deductible applies shall be responsible for 100% of the loss not insured because of the deductible. Except as provided for under California law, the policy or policies shall provide that the City is entitled to 30 Days prior written notice (10 Days for cancellation due to non-payment of premium) of cancellation or non-renewal of the policy or policies.

5-4.3

Rating Requirements. Except for the State Compensation Insurance Fund, all insurance required by this Contract as described herein shall be carried only by responsible insurance companies with a rating of, or equivalent to, at least "A-, VI" by A.M. Best Company, that are authorized by the California Insurance Commissioner to do business in the State, and that have been approved by the City.

5-4.3.1 Non-Admitted Carriers. The City will accept insurance provided by non-admitted, “surplus lines” carriers only if the carrier is authorized to do business in the State and is included on the List of Approved Surplus Lines Insurers (LASLI list).

All policies of insurance carried by non-admitted carriers shall be subject to all of the requirements for policies of insurance provided by admitted carriers described herein.

5-4.4 Evidence of Insurance. Furnish to the City documents e.g., certificates of insurance and endorsements evidencing the insurance required herein, and furnish renewal documentation prior to expiration of this insurance. Each required document shall be signed by the insurer or a person authorized by the insurer to bind coverage on its behalf. We reserve the right to require complete, certified copies of all insurance policies required herein.

5-4.5 Policy Endorsements.

5-4.5.1 Commercial General Liability Insurance.

5-4.5.1.1 Additional Insured.

1. You shall provide at your expense policy endorsement written on the current version of the ISO Occurrence form CG 20 10 11 85 or an equivalent form providing coverage at least as broad.
2. To the fullest extent allowed by law e.g., California Insurance Code §11580.04, the policy shall be endorsed to include the City and its respective elected officials, officers, employees, agents, and representatives as additional insured.
3. The additional insured coverage for projects for which the Engineer’s Estimate is \$1,000,000 or more shall include liability arising out of:
 - a) Ongoing operations performed by you or on your behalf,
 - b) your products,
 - c) your Work, e.g., your completed operations performed by you or on your behalf, or
 - d) premises owned, leased, controlled, or used by you.
4. The additional insured coverage for projects for which the Engineer’s Estimate is less than \$1,000,000 shall include liability arising out of:
 - a) Ongoing operations performed by you or on your behalf,
 - b) your products, or
 - c) premises owned, leased, controlled, or used by you.

5-4.5.1.2 Primary and Non-Contributory Coverage. The policy shall be endorsed to provide that the coverage with respect to operations, including the completed operations, if appropriate, of the Named Insured is primary to any insurance or self-insurance of the City and its elected officials, officers, employees, agents and representatives. Further, it shall provide that any insurance maintained by the City and its elected officials,

officers, employees, agents and representatives shall be in excess of your insurance and shall not contribute to it.

5-4.5.1.3 Project General Aggregate Limit. The policy or policies shall be endorsed to provide a Designated Construction Project General Aggregate Limit that will apply only to the Work. Only claims payments which arise from the Work shall reduce the Designated Construction Project General Aggregate Limit. The Designated Construction Project General Aggregate Limit shall be in addition to the aggregate limit provided for the products-completed operations hazard.

5-4.5.2 Commercial Automobile Liability Insurance.

5-4.5.2.1 Additional Insured. Unless the policy or policies of Commercial Auto Liability Insurance are written on an ISO form CA 00 01 12 90 or a later version of this form or equivalent form providing coverage at least as broad, the policy shall be endorsed to include the City and its respective elected officials, officers, employees, agents, and representatives as additional insured, with respect to liability arising out of automobiles owned, leased, hired or borrowed by you or on your behalf. This endorsement is limited to the obligations permitted by California Insurance Code §11580.04.

5-4.5.3 Contractors Pollution Liability Insurance Endorsements.

5-4.5.3.1 Additional Insured.

1. The policy or policies shall be endorsed to include as an Insured the City and its respective elected officials, officers, employees, agents, and representatives, with respect to liability arising out of:
 - a) Ongoing operations performed by you or on your behalf,
 - b) your products,
 - c) your work, e.g., your completed operations performed by you or on your behalf, or
 - d) premises owned, leased, controlled, or used by you.

Except that in connection with, collateral to, or affecting any construction contract to which the provisions of subdivision (b) of § 2782 of the California Civil Code apply, this endorsement shall not provide any duty of indemnity coverage for the active negligence of the City and its respective elected officials, officers, employees, agents, and representatives in any case where an agreement to indemnify the City and its respective elected officials, officers, employees, agents, and representatives would be invalid under subdivision (b) of §2782 of the California Civil Code.

2. In any case where a claim or loss encompasses the negligence of the Insured and the active negligence of the City and its respective elected officials, officers, employees, agents, and representatives that are not covered because

of California Insurance Code §11580.04, the insurer's obligation to the City and its respective elected officials, officers, employees, agents, and representatives shall be limited to obligations permitted by California Insurance Code §11580.04.

5-4.5.3.2 Primary and Non-Contributory Coverage. The policy or policies shall be endorsed to provide that the insurance afforded by the Contractors Pollution Liability Insurance policy or policies is primary to any insurance or self-insurance of the City and its elected officials, officers, employees, agents and representatives with respect to operations including the completed operations of the Named Insured. Any insurance maintained by the City and its elected officials, officers, employees, agents and representatives shall be in excess of your insurance and shall not contribute to it.

5-4.5.3.3 Severability of Interest. For Contractors Pollution Liability Insurance, the policy or policies shall provide that your insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability and shall provide cross-liability coverage.

5-4.5.4 Contractors Hazardous Transporters Pollution Liability Insurance Endorsements.

5-4.5.4.1 Additional Insured.

1. The policy or policies shall be endorsed to include as an Insured the City and its respective elected officials, officers, employees, agents, and representatives, with respect to liability arising out of:
 - a) Ongoing operations performed by you or on your behalf,
 - b) your products,
 - c) your work, e.g., your completed operations performed by you or on your behalf, or
 - d) premises owned, leased, controlled, or used by you.

Except that in connection with, collateral to, or affecting any construction contract to which the provisions of subdivision (b) of §2782 of the California Civil Code apply, this endorsement shall not provide any duty of indemnity coverage for the active negligence of the City and its respective elected officials, officers, employees, agents, and representatives in any case where an agreement to indemnify the City and its respective elected officials, officers, employees, agents, and representatives would be invalid under subdivision (b) of §2782 of the California Civil Code.

2. In any case where a claim or loss encompasses the negligence of the Insured and the active negligence of the City and its respective elected officials, officers, employees, agents, and representatives that are not covered because

of California Insurance Code §11580.04, the insurer's obligation to the City and its respective elected officials, officers, employees, agents, and representatives shall be limited to obligations permitted by California Insurance Code §11580.04.

- 5-4.5.4.2 Primary and Non-Contributory Coverage.** The policy or policies shall be endorsed to provide that the insurance afforded by the Contractors Pollution Liability Insurance policy or policies is primary to any insurance or self-insurance of the City and its elected officials, officers, employees, agents and representatives with respect to operations including the completed operations of the Named Insured. Any insurance maintained by the City and its elected officials, officers, employees, agents and representatives shall be in excess of your insurance and shall not contribute to it.
- 5-4.5.4.3 Severability of Interest.** For Contractors Hazardous Transporters Pollution Liability Insurance, the policy or policies shall provide that your insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability and shall provide cross-liability coverage.
- 5-4.5.5 Builders Risk Endorsements.**
- 5-4.5.5.1 Waiver of Subrogation.** The policy or policies shall be endorsed to provide that the insurer will waive all rights of subrogation against the City, and its respective elected officials, officers, employees, agents, and representatives for losses paid under the terms of the policy or policies and which arise from Work performed by the Named Insured for the City.
- 5-4.5.5.2 Builders Risk – Partial Utilization.** If the City desires to occupy or use a portion or portions of the Work prior to Acceptance in accordance with this Contract, the City will notify you and you shall immediately notify your Builder's Risk insurer and obtain an endorsement that the policy or policies shall not be cancelled or lapse on account of any such partial use or occupancy. You shall obtain the endorsement prior to the City's occupation and use.
- 5-4.6 Deductibles and Self-Insured Retentions.** You shall pay for all deductibles and self-insured retentions. You shall disclose deductibles and self-insured retentions to the City at the time the evidence of insurance is provided.
- 5-4.7 Reservation of Rights.** The City reserves the right, from time to time, to review your insurance coverage, limits, deductibles and self-insured retentions to determine if they are acceptable to the City. The City will reimburse you, without overhead, profit, or any other markup, for the cost of additional premium for any coverage requested by the Engineer but not required by this Contract.
- 5-4.8 Notice of Changes to Insurance.** You shall notify the City 30 Days prior to any material change to the policies of insurance provided under this Contract.
- 5-4.9 Excess Insurance.** Policies providing excess coverage shall follow the form of the primary policy or policies e.g., all endorsements.

5-4.10 Architects and Engineers Professional Insurance (Errors and Omissions Insurance).

1. For Contracts with required engineering services (e.g., Design-Build, preparation of engineered Traffic Control Plans (TCP), and etc) by you, you shall keep or require all of your employees or Subcontractors, who provide professional engineering services under this contract, Professional Liability coverage with a limit of **\$1,000,000** per claim and **\$2,000,000** annual aggregate in full force and effect.
2. You shall ensure the following:
 - a) The policy retroactive date is on or before the date of commencement of the Project.
 - b) The policy will be maintained in force for a period of 3 years after completion of the Project or termination of this Contract, whichever occurs last. You agree that for the time period specified above, there will be no changes or endorsements to the policy that affect the specified coverage.
3. If professional engineering services are to be provided solely by the Subcontractor, you shall:
 - a) Certify this to the City in writing and
 - b) Agree in writing to require the Subcontractor to procure Professional Liability coverage in accordance with the requirements set forth above.

5-4.11 Workers' Compensation Insurance and Employers Liability Insurance.

1. In accordance with the provisions of §3700 of the California Labor Code, you shall provide at your expense Workers' Compensation Insurance and Employers Liability Insurance to protect you against all claims under applicable state workers compensation laws. The City, its elected officials, and employees will not be responsible for any claims in law or equity occasioned by your failure to comply with the requirements of this section.
2. Limits for this insurance shall be not less than the following:

<u>Workers' Compensation</u>	<u>Statutory Employers Liability</u>
Bodily Injury by Accident	\$1,000,000 each accident
Bodily Injury by Disease	\$1,000,000 each employee
Bodily Injury by Disease	\$1,000,000 policy limit

3. By signing and returning the Contract you certify that you are aware of the provisions of §3700 of the Labor Code which requires every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code and you shall comply with such provisions before commencing the Work as required by §1861 of the California Labor Code.

5-4.11.1 Waiver of Subrogation. The policy or policies shall be endorsed to provide that the insurer will waive all rights of subrogation against the City and its respective elected officials, officers, employees, agents, and representatives for losses paid under the terms of the policy or policies and which arise from Work performed by the Named Insured for the City.

5-4.11.2 Workers' Compensation Insurance for Work In, Over, or Alongside Navigable Waters. In addition to the Workers' Compensation Insurance required under the General Conditions of this contract, the you shall provide additional insurance coverage for claims brought under the Longshore and Harbor Workers' Compensation Act, the Jones Act, general maritime law, and any other federal or state laws, resulting from the your Work in, over, or alongside navigable waters.

5-10.2.1 Public Notice by Contractor. To the "WHITEBOOK", item 3, DELETE in its entirety and SUBSTITUTE with the following:

2. No less than 5 Working Days in advance of Project construction activities and utility service interruptions, you shall notify all critical facilities, businesses, institutions, property owners, residents, or any other impacted stakeholders within a minimum 300-foot (90 m) radius of the Project. Verbal and written notifications shall be sent to critical facilities (including but not limited to police stations, fire stations, hospitals, and schools). A copy of written notifications sent to any critical facility shall also be sent to the Resident Engineer. You shall keep records of the people contacted, along with the dates of notification, and shall provide the record to the Engineer upon request. You shall identify all other critical facilities that need to be notified.
3. Furnish and distribute public notices in the form of door hangers using the City's format to all occupants and/or property owners along streets:
 - a) Where Work is to be performed at least Working 5 Working Days before starting construction or survey activities or impacting the community as approved by the Resident Engineer.
 - b) Within 5 Working Days of the completion of your construction activities where Work was performed, you shall distribute public notices in the form of door hangers, which outlines the anticipated dates of Asphalt Resurfacing or Slurry Seal.
 - c) 72 hours in advance of the scheduled resurfacing.

5-13

ELECTRONIC COMMUNICATION. To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. Virtual Project Manager shall be used on this Contract.
2. You shall post all communications addressed to the Engineer concerning construction including RFIs, submittals, daily logs including the Weekly Statement of Working Days (WSWD), Storm Water, and transmittals to the Virtual Project Manager (VPM) website established for the Projects. This shall not supersede any Federal requirements.
3. Maintain a list of scheduled activities including planned and actual execution dates for all major construction activities and milestones defined in the approved Schedule.
4. Review and act on all communications addressed to you in the VPM project website.
5. A user's guide to the VPM system is available on the City's website and shall be provided to you at the Pre-construction Meeting. Refer to the VPM training videos and forms at the location below:

<https://www.sandiego.gov/ecp/edocref/>
6. Submit the Sensitive Information Authorization Acknowledgement Form and VPM User Agreement located in the VPM user's guide at the Pre-construction Meeting.

5-15.1

General. To the "WHITEBOOK", item 10, DELETE in its entirety and SUBSTITUTE with the following:

10. If your construction activities have encountered flammable liquids or other hazardous substances, you shall ensure that construction staff have the required Hazardous Waste Operations and Emergency Response (HAZWOPER) certification. Construction staff shall include: City Engineers, City Laboratory Technicians, and City staff that perform onsite inspections.
 - a) If your Work encounters flammable liquids or other hazardous substances, you shall be responsible for scheduling training for all construction staff to attend and for submitting verification to the Engineer that construction staff have the required HAZWOPER certification prior to continuing that Work in that area. You shall maintain the HAZWOPER certifications annually until the construction activities triggering the requirement is complete, as approved by the Resident Engineer.
 - b) You shall be responsible for implementing, training, and submitting verification to the Engineer that construction staff have the required HAZWOPER certification before the Notice to Proceed (NTP) has been issued.

5-15.17 Payment. To the "WHITEBOOK", ADD the following:

5. Hazardous abatement and/or management as outlined in these contract documents and Hazardous Waste Operations and Emergency Response (HAZWOPER) certification and training for construction and City staff shall be paid for within the lump sum for the entire project.

SECTION 6 - PROSECUTION AND PROGRESS OF THE WORK

6-1.1 Construction Schedule. To the "GREENBOOK", paragraph (1), sentence (1), DELETE in its entirety and SUBSTITUTE with the following:

After notification of award of the Contract and prior to the start of any Work, you shall submit your proposed Cost Loaded Construction Schedule to the Engineer at the pre-construction meeting.

To the "WHITEBOOK", item 1, subsection "e" and "s", DELETE in their entirety and SUBSTITUTE with the following:

- e) Monthly progress payments are contingent upon the submittal of an updated Schedule to the Engineer. The Engineer may refuse to process the whole or part of any monthly payment if you refuse or fail to provide an acceptable schedule.
- s) Submit an updated cash flow forecast with every pay request (for each Project ID or WBS number provided in the Contract) showing periodic and cumulative construction billing amounts for the duration of the Contract Time. If there has been any Extra Work since the last update, include only the approved amounts.
 - i. Refer to the Sample City Invoice materials in **Appendix D - Sample City Invoice with Cash Flow Forecast** and use the format shown.
 - ii. See also the "Cash Flow Forecast Example" at the location below:
<https://www.sandiego.gov/ecp/edocref/>

To the "WHITEBOOK", ADD the following:

3. The **90 Calendar Day** Plant Establishment Period is included in the stipulated Contract Time and shall begin with the acceptance of installation of the vegetation plan in accordance with Section 801-6, "MAINTENANCE AND PLANT ESTABLISHMENT".
4. Contractor shall complete all work outlined in the contract documents, with the following additional stipulations:
 - a) The Contractor shall keep nine holes open for public play during construction and ensure operations allow for access in a reasonable flow from one hole to another. Contractor shall put safety measures in place for the public.

- b) Contractor shall provide a clear access from the parking lot to the temporary amenities provided for golf use.
 - c) Contractor shall provide a clear access and maintain the golf range open for use during construction.
 - d) Contractor shall keep parking lot for public use.
5. Contractor to contact SDG&E immediately upon award of contract to coordinate all energy needs for the project as they have strict timelines and longer leadtimes for scheduling their work.
- a. SDG&E has informed the City that there is no mechanism in the street for temporary power and that temporary power for all project requirements needs to come from the existing on site electrical building. So, the new electrical building needs to be installed, and transfer of power between the two facilities has to be done prior to demolition of the existing electrical building. No services can be interrupted during this transfer of power, so contractor shall assume to make this transfer at off-hours.

6-1.1.2 Contracts More Than \$500,000 In Value. To the “WHITEBOOK”, item 1, DELETE in its entirety and SUBSTITUTE with the following:

- 1. Provide the Schedule to the Engineer in accordance with 6-1.1, “Construction Schedule” and 6-1.2, “Commencement of the Work”.

To the “WHITEBOOK”, item 2, DELETE in its entirety.

6-1.2 Commencement of the Work. To the “WHITEBOOK”, ADD the following:

- 5. You shall submit a Cost Loaded Construction Schedule in accordance with 6-1.1, “Construction Schedule” at the scheduled pre-construction meeting.
- 6. If a Cost Loaded Construction Schedule is not provided, the pre-construction meeting will still be held. The Contract Time shall commence at issuance of the NTP, but you shall be limited to the following activities until the Cost Loaded Construction Schedule has been submitted to the Resident Engineer with no exceptions taken:
 - a) Mobilization of your trailers, associated utility setup, and grading for trailer area
 - b) Permit Procurement
 - c) Fencing and temporary utilities for your storage areas
 - d) Submittal of anticipated critical path submittals

6-1.5.2 Excusable Non-Compensable Delays. To the “WHITEBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

6-1.5.2 Excusable Non-Compensable and Concurrent Delays.

1. The City shall only issue an extension of time for Excusable Delays that meet the requirements of 6-4.2, “Extensions of Time” for the following circumstances:
 - a) Delays resulting from Force Majeure.
 - b) Delays caused by weather.
 - c) Delays caused by changes to County, State, or Federal law.
2. When a non-excusable delay is concurrent with an Excusable Delay, you shall not be entitled to an extension of Contract Time for the period the non-excusable delay is concurrent with the Excusable Delay.
3. When an Excusable Non-Compensable Delay is concurrent with an Excusable Compensable Delay, you shall be entitled to an extension of Contract Time, but shall not be entitled to compensation for the period the Excusable Non-Compensable Delay is concurrent with the Excusable Compensable Delay.

6-4.2 Extensions of Time. To the “WHITEBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

1. The Contract Time shall not be modified except by Change Order.
2. You shall notify the City in writing within **1 Working Day** after the occurrence and discovery of an event that impacts the Project Schedule.
 - a) If you believe this event requires a Change Order, you shall submit a **written Change Order request with a report to** the City that explains the request for Change Order within **5 Working Days**. The Change Order request must include supporting data, a general description of the discovery, the basis for extension, and the estimated length of extension. The City may grant an extension of time, in writing, for the Change Order request if you require more time to gather and analyze data.
3. The Engineer shall not grant an extension of Contract Time in accordance with 6-1.5, “Excusable Delays” unless you demonstrate, through an analysis of the critical path, the following:
 - a) The event causing the delay impacted the activities along the Project’s critical path.
 - b) The increases in the time to perform all or part of the Project beyond the Contract Time arose from unforeseeable causes beyond your control and without your fault or negligence and that all project float has been used.
4. Any modifications to the Contract Time will be incorporated into the weekly document that the Engineer issues that stipulates the Contract Time. If you do

not agree with this document, submit to the Engineer for review a written protest supporting your objections to the document within **30 Calendar Days** after receipt of the statement. Your failure to file a timely protest shall constitute your acceptance of the Engineer's weekly document.

- a) Your protest will be considered a claim for time extension and shall be subject to 2-10.1, "Claims".

6-4.4 Written Notice and Report. To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. Your failure to notify the Resident Engineer within **1 Working Day** OR provide a Change Order request within **5 Working Days** after the event, in accordance with 6-4.2, "Extensions of Time", will be considered grounds for refusal by the City to consider such request if your failure to notify prejudices the City in responding to the event.

ADD:

6-6.1.1 Environmental Document.

1. The City of San Diego has prepared a **Notice of Exemption (NOE) for MBGC Clubhouse Demo/Prtbl Building Instl** and a **Mitigated Negative Declaration (MND) has been prepared for MBGC Irrigation & Electrical Upgrades**, Project No. **607150** as referenced in the Contract Appendix. You shall comply with all requirements of the **Notice Of Exemption, Mitigated Negative Declaration and Coastal Development Waiver** as set forth in **Appendix A**.
2. Compliance with the City's environmental document shall be included in the Contract Price, unless separate bid items have been provided.

6-9 LIQUIDATED DAMAGES. To the "WHITEBOOK", ADD the following:

1. Your failure to complete the project within the contracted working days will cause the City to sustain damages. The City has estimated that it will incur damages in the amount of \$9,000 per day for your failure to deliver the project within the contracted working days. As such, you shall pay the City \$9,000 for each consecutive Calendar Day after the original construction contract end date until you are substantially complete with the project.
2. The contractor **shall keep nine (9) complete holes of the golf course open, with irrigation operating, throughout the construction period.** The other nine (9) being renovated shall be close in proximity as to not disrupt the golfer's experience of the open nine (9) holes. Customers and staff shall have access to the driving range during the entire project. The golf course shall have continuous power to run the operation throughout the entire project. Customers flow shall not be affected any time during construction. The contractor shall submit a sequenced phasing schedule to the Resident Engineer for comment and approval prior to construction.
 - a. If the contractor closes more than the allowed nine (9) holes and/or disturbs the customer experience and/or Golf staff operations, it will

cause the City to sustain damages. The contractor shall pay the City for these damages at the following rates:

- i. If more than the nine (9) allowed holes are closed, \$4,000 per day;
- ii. If customers and staff don't have access to the driving range any time during construction, \$2,500 per day;
- iii. If customer flow are disturbed, disrupting the golfer's experience any time during construction, \$2,500 per day;
- iv. If the power to run the operation of the golf course is affected anytime during construction, \$9,000 per day.

SECTION 7 – MEASUREMENT AND PAYMENT

7-3.1 General. To the “GREENBOOK” and “WHITEBOOK”, paragraph (8), DELETE in its entirety and SUBSTITUTE with the following:

If, within the time fixed by law, a properly executed notice to stop payment is filed with the City, due to your failure to pay for labor or materials used in the Work, all money due for such labor or materials will be withheld from payment in accordance with applicable laws.

To the “WHITEBOOK”, ADD the following:

1. Unless specified otherwise, the Contract Price includes use, consumer, and other taxes mandated by applicable legal requirements.
2. As provided in §7105 of the California Public Contract Code, if the Contract is not financed by revenue bonds, you are not responsible for the cost of repairing or restoring damage to the Project when damage was proximately caused by an act of God, in excess of 5% of the Contract Price, if the following occur:
 - a) The Project damaged was built in accordance with the Contract requirements.
 - b) There are no insurance requirements in the Contract for the damages.
3. The Lump Sum Bid item for “Construction of MBGC Irrigation & Electrical Upgrades shall include “Demolition, grading, installation of new golf course irrigation, electrical service and distribution equipment, electrical equipment pre-manufactured building, water service lines and drinking fountains, fencing, turf repair, potholing, if applicable, all necessary special inspections, permits and fees and all other incidental work and appurtenances in accordance with Plans 39986-01-D through 39986-29-D, inclusive and these specifications.
4. The Lump Sum Bid item for “Construction of MBGC Clubhouse Demo/Prtbl Building Instl shall include Demolition of the existing clubhouse building,

construction of two separate pre-manufactured buildings; one for golf operations and one for food service, turf repair, drainage, shade trellises, landscaping, irrigation, hardscape, parking lot and path of travel accessibility upgrades, potholing, if applicable, all necessary special inspections, permits and fees and all other incidental work and appurtenances in accordance with Plans 40268-01-D through 40268-65-D, inclusive, and these specifications, except improvements related to Additive Alternate A.

5. The allowance Bid item for "Temporary Trailers" shall include all work related to procurement, transportation, installation, including temporary power to these buildings and the ball washing facility in coordination with SDGE and maintenance for One (1) temporary trailer for Golf Operations and one (1) temporary trailer for bathrooms throughout construction, provided and installed by the contractor according to the list of requirements, floor plan and location map provided on Appendix E, inclusive, and these specifications".
6. The Lump Sum Bid item for "Island Patio Remodel" shall include all Work on Island including flatwork, landscaping, trellis, electrical, lights and pre-manufactured bridges, potholing, if applicable, all necessary special inspections, permits and fees and all other incidental work and appurtenances for Additive Alternate A in accordance with Plans 40268-01-D through 40268-65-D, inclusive and these specifications.

7-3.2

Partial and Final Payment. To the "WHITEBOOK", item 1, DELETE in its entirety and SUBSTITUTE with the following:

1. The Final Payment, which is the release of Retention, shall be paid to you after you have successfully submitted the following required documents:
 - a) An affidavit that payrolls and bills for materials, equipment, and other indebtedness connected with the Work for which the City or the City's property might be responsible for or encumbered by.
 - b) A certificate evidencing that insurances required by the Contract Documents shall remain in force after Final Payment is currently in effect and shall not be canceled or allowed to expire until at least a 30 Calendar Days prior written notice has been given to the Engineer.
 - c) Consent of Surety to Final Payment.
 - d) If required by the Engineer, other data establishing payment or satisfaction of obligations such as receipts, releases and waivers of liens, claims, and security interests or encumbrances arising out of the Contract Documents. If a Subcontractor refuses to furnish a release or waiver required by the City, you may furnish a bond satisfactory to the Engineer to indemnify the City against such lien.
 - e) If required in the Contract Documents, the successful completion and submittal of the required reports such as construction demolition, waste recycling, and hydrostatic discharge reports.
 - f) Required EOCP Final Summary Report in accordance with Section 0-12, "Contract Records and Reports", record drawings, operations

manuals, test reports, warranty documentation, and UL labels shall be submitted before requesting the release of retention.

- g) Acceptance of the completed Project by the asset owning Department.

To the "WHITEBOOK", ADD the following:

- 2. Submit an invoice for payment after you successfully complete the required documents and the City will pay the invoice within 30 Calendar Days. The City will pay 6% annually for late retention payments.

7-3.2.1 Application for Progress Payment. To the "WHITEBOOK", item 3, DELETE in its entirety and SUBSTITUTE with the following:

- 3. The City shall not pay progress or partial payments until you submit to the Engineer an acceptable updated Schedule. It is solely your responsibility to prepare and submit the Schedule updates.

7-3.2.2 Amount of Progress Payments. To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

- 1. The City will pay 6% annually for late progress payments.
- 2. Progress payments will be considered "late" if the following occur:
 - a) The City does not pay the contractor within 30 Calendar Days from receipt of an undisputed and properly submitted invoice. A properly submitted payment invoice means that the City has approved for payment the entire invoice amount or if the Resident Engineer has not disputed any portion of the application within 7 Calendar Days of the date of submission.
 - b) The application for payment does not require signing of a Contract Change Order.
- 3. The Engineer may withhold payment for any of the following reasons:
 - a) Defective or incomplete Work.
 - b) Not providing an updated and accurate Cost Loaded Construction Schedule in accordance with 6-1.1, "Construction Schedule".
 - c) Stop notices, wage orders, or other withholdings required by Applicable Law. Your failure to comply with 5-3.3, "Payroll Records" and the Contractor Registration and Electronic Reporting System requirements of the Contract Documents.
- 4. The Engineer may back charge the contract for any of the following reasons:
 - a) Defective or incorrect Work not remedied.
 - b) Damage to City property or a third party's property that was caused by you.
 - c) Liquidated Damages.

7-3.2.3 Waiver of Claims at Final Payment. To the “WHITEBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

1. Your acceptance of Final Payment constitutes a waiver of affirmative Claims by you, except those previously made in writing and identified as unsettled at the time of Final Payment.

7-3.2.4 Withholding of Payment and Back Charge. To the “WHITEBOOK”, DELETE in its entirety.

7-3.5.1 General. To the “WHITEBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

1. Unit Bid prices shall not be subject to adjustment regardless of quantity used, or if none is used, for the following Bid items:
 - a) imported backfill
 - b) shoring
 - c) water services
 - d) house connection sewers
 - e) water pollution control items
2. Upon discovery and prior to the Work, you shall notify the Resident Engineer if there is a change in Bid item quantity that increases the total Contract Price by 5% or \$100,000 or more, whichever is less.

7-3.9 Field Orders. To the “WHITEBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

2. If the cumulative total of Field Order items of Work does not exceed the “Field Orders” Bid Item, the City shall pay those Field Orders as shown below:

**TABLE 7-3.9
FIELD ORDER LIMITS**

Contract Price	Maximum Field Order Work Amount
Less than \$100,001	\$2,500
\$100,001 to \$1,000,000	\$5,000
\$1,000,001 to \$5,000,000	\$10,000
\$5,000,001 to \$15,000,000	\$20,000
\$15,000,001 to \$30,000,000	\$40,000
Greater than \$30,000,000	\$50,000

3. Field Order items of Work for contracts greater than \$15,000,000 will require additional approvals from the City prior to its approval by the Resident Engineer.

4. The City will issue a Field Order only after the City's acceptance of the cost of the field order amount.
5. Field Orders shall not be used to add scope or to include extensions of time related to changes in work.
6. If in the event there is a change related to the critical path on the project which necessitates an extension of time and the change amount is within the Field Order limits shown on Table 7-3.9, then a Field Order can be issued to compensate you for the approved costs. Any extensions of time associated with the change shall be included in a subsequent Change Order and no additional compensation shall be granted as part of the change order for the extension of time.
7. The unused portions of Field Orders Bid item shall revert to the City upon Acceptance.

7-3.11 Compensation Adjustments for Price Index Fluctuations. To the "WHITEBOOK" ADD the following:

5. This Contract is not subject to the provisions of The "WHITEBOOK" for Compensation Adjustments for Price Index Fluctuations for paving asphalt.

7-4.3 Markup. To the "WHITEBOOK", item 4, DELETE in its entirety and SUBSTITUTE with the following:

4. When a Subcontractor is performing Extra Work, the allowance for overhead and profit shall be applied to the labor, materials, and equipment costs of the Subcontractor as follows:
 - a) Regardless of the number of a Subcontractor's tasks for Extra Work, you may only apply 10% for the first \$50,000 of the Subcontractor's portion of accumulated total cost then 5% for any remaining costs. You shall not apply 10% to any costs after the first \$50,000 of accumulated total costs from performing Extra Work.
 - b) If the accumulated costs of single or subsequent tasks exceed the \$50,000 threshold, you shall instead only apply 5% to any amounts in excess of the \$50,000.
 - c) Regardless of the number of hierarchical tiers of Subcontractors, you may only markup a Subcontractor's Work once.

SECTION 206 - MISCELLANEOUS METAL ITEMS

206-1 STRUCTURAL STEEL, RIVETS, BOLTS, PINS, AND ANCHOR BOLTS.

206-1.1.1 General. To the "GREENBOOK", ADD the following:

All raw steel stock for steel fabrication shall be true, free of warping, smooth, and consist without pitting, spalls, blemishes, burs, or corrosion. Steel shall be consistent with the ASTM Steel Standards rating for the products intended use.

Standard Steel Sizing and ASTM rating for each steel component shall be clearly illustrated on all shop drawings for review by the Engineer or Landscape Architect.

Contractor shall submit a full scale mock-up (segment) of structural steel features, including key fabrication and attachment of steel members by welding or mechanical attachment methods compliant with the design, standards and requirements as stated on the plans. The mock-up submittal shall be a complete demonstration of the fabrication and finishing of the steel feature and will be reviewed and evaluated accordingly with the plans.

ADD:

206-8 ACCESSIBLE SIGNAGE.

206-8.1 General.

Signs shall be fabricated in conformance with the **SDM-117** standards for accessible parking signs and with the City of San Diego standards for signs. Sign Post shall be fabricated in conformance with **SDM-104**.

In the event **SDM-117** does not illustrate sign mounting details, refer to San Diego Regional Standard Drawing **SDM-104** for installation. Signs shall include:

1. Tow Away Sign

SECTION 209 – PRESSURE PIPE

209-1.1.1 General. To the “WHITEBOOK”, ADD the following:

2. PVC products, specifically type C900 and C905, as manufactured or distributed by J-M Manufacturing Company or JM Eagle shall not be used on the Contract for pressurized pipe.
3. Refer to AWWA C900-16 for all references to AWWA C905.

SECTION 210 – PAINT AND PROTECTIVE COATINGS

210-3 GALVANIZING.

210-3.1 General. To the “GREENBOOK”, ADD the following:

Prior to galvanizing of fabricated steel components or products, the fabricator shall provide clean-up of all welding spatter, imperfections, and sharp edges. Steel stock shall be free of any corrosion. The fabricated steel component or product shall then be bead blasted and pre-washed to ensure an abrasive raw steel surface is exposed for adhesion and free of any corrosion prior before entering the galvanizing bath. Galvanized coatings that are visibly uneven from outgassing shall be bead blasted down for a visually smooth appearance without exposing raw steel prior to powder coating operations.

210-3.5.3 Zinc Dust Paint. To the “GREENBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

When zinc surfaces have small areas of abrasion which occur after shop application of zinc coating, zinc dust paint may be used to repair these areas when approved by the Engineer. The damaged area shall be thoroughly cleaned by wire brushing and traces of welding flux and loose or cracked zinc coating removed prior to painting. The

cleaned area shall be painted with a minimum of 3 coats of an un-thinned zinc paint with a shiny finish to provide to provide a total minimum thickness of 4 mils. The zinc dust paint shall conform to requirements of ASTM A780, Annex A3, except that it shall have a 60 percent minimum dry film content of zinc dust by weight. The method of application shall be approved by the Landscape Architect.

Zinc Dust Paint shall conform to the following specifications:

Product: Galvanized Coatings OE SHINY GALV #16-842, **or approved equal.**

Manufacturer: Seymour of Sycamore

800-435-4482

www.seymourpaint.com

Dry Time: 5 minutes to touch

20 minutes to recoat

Temperature: Apply when outside and steel surface temperature is from 50-90°F

Abrasion Resistance: Good

Heat resistance: 250°F

SECTION 213 - ENGINEERING GEOSYNTHETICS.

213-5 GEOTEXTILES AND GEOGRIDS. To the "GREENBOOK", ADD the following:

Permeable Geotextile Fabrics used for general separation, drainage and filtration of landscapes materials shall be inert to biological degradation, and resist naturally encountered chemicals, alkalis and acids.

Permeable Geotextile fabrics shall conform to the following specifications:

Product: Mirafi 180N, or approved equal.

Description: Nonwoven Geotextile, N-Series

Manufacturer: TenCate Geosynthetics Americas

706-693-2226

www.tencate.com/amer/geosynthetics/default.aspx

Minimum Standards: Whitebook Table 213-5(A): NONWOVEN unless otherwise stated herein.

Grab Tensile Strength: ASTM D4632, 205 lbs (912 N)/ min. ave. roll value

CBR Puncture Strength: ASTM D6241, 500 Lbs (2224 N)/ min. ave. roll value

Permittivity: ASTM D4491, 1.4 sec-1 min.

Flow Rate: ASTM D4491, 95 gal./min./ft. sq.

Installation: Section 300-8 "Geotextiles for Drainage".

SECTION 217 – BEDDING AND BACKFILL MATERIALS

217-2 TRENCH BACKFILL.

217-2.1 General. To the “GREENBOOK”, DELETE TABLE 217-2.1, in its entirety and SUBSTITUTE with the following:

TABLE 217-2.1 – Table below is for On-Site Utility trench work, and Work in the Parking Lot and Right of Way. For golf course irrigation trench zone requirements, see irrigation technical specifications and drawings.

Zone	Zone Limits	Maximum Size (greatest dimension)	Backfill Requirements in Addition to 217-2.1
Street or Surface Zone	From ground surface to 12" (300 mm) below pavement subgrade or ground surface	2.5" (63 mm)	As required by the Plans or Special Provisions.
Street or Surface Zone Backfill of Tunnels beneath Concrete Flatwork		Sand	Sand equivalent of not less than 30.
Trench Zone	From 12" (300 mm) below pavement subgrade or ground surface to 12" (300 mm) above top of pipe or box	6" (150 mm)	
Deep Trench Zone (Trenches 3' (0.9 m) wide or wider)	From 60" (1.5 m) below finished surface to 12" (300 mm) above top of pipe or box	Rocks up to 12" (300 mm) excavated from trench may be placed as backfill	
Pipe Zone	From 12" (300 mm) above top of pipe or box to 6" (150 mm) below bottom of pipe or box exterior	2.5" (63 mm)	Sand equivalent of not less than 30 or a coefficient of permeability greater than 1-½ inches/hour (35 mm per hour).
Over excavation	Backfill more than 6" (150 mm) below bottom of pipe or box exterior	6" (150 mm)	Sand equivalent of not less than 30 or a coefficient of permeability greater than 1-½ inches/hour (35 mm per hour). Trench backfill slurry (100-E-100) per 201-1 may also be used.

ADD:

SECTION 300 - EARTHWORK

300-1 CLEARING AND GRUBBING.

300-1.1 General. To the “WHITEBOOK”, ADD the following:

10. Clearing and grubbing shall include the removal, relocation, adjusting, or salvaging of all facilities so indicated on the plans.

In addition, clearing and grubbing shall include, but not limited to the following items as shown on the plans or specified in the Specifications:

- a) Deleterious materials resulting from clearing and grubbing operations shall be hauled away and disposed of legally at a site obtained by the Contractor.
- b) Removal and disposal of pipe, steel posts, rubble, miscellaneous concrete and any additional items not specifically mentioned which may be found within the work limits and beneath the ground surface as a result of grading or trenching operations connected with the construction of project improvements.
- c) Furnishing and applying water.
- d) Adjustment to grade of miscellaneous items such as utility boxes, valves, manholes, pullboxes, posts.
- e) The Contractor shall remove and transport debris and rubbish in a manner that will prevent spillage on streets or adjacent areas. Clean-up of spillage will be at the Contractor's expense.

Any asphalt pavement and concrete footing material removed during clearing operations should be properly disposed at an approved off-site facility.

ADD:

300-2.1.1 Miscellaneous Grading Conditions.

Site Grading. Slope grades to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

300-2.1.2 Moisture Control.

Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy.
2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

300-2.1.3 **Compaction of Backfill and Fills.**

1. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
2. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

300-2.1.4 **Slope Repair Grading.**

Site runoff shall not be permitted to flow over the tops of slopes. Positive drainage shall be established away from the top of slopes:

1. Permanent cut and fill slopes shall not be steeper than 2:1 (horizontal:vertical)
2. Compaction of the face of fill slopes shall be performed by backrolling at intervals of 4 feet or less in vertical slope height, or as dictated by the capability of the available equipment, whichever is less. Fill slopes shall be backrolled utilizing a conventional sheepsfoot –type roller.³ Compact soil to not less than the following percentages of maximum density of 90% compaction according to ASTM D 1557:
 - a) Under all other pavement, subgrade shall be scarified and recompacted to a depth of twelve inches per the geotechnical report, unless indicated otherwise.

300-2.9 **Payment.** To the “GREENBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

Unclassified Excavation shall include full compensation for furnishing all labor, materials, tools, equipment, and incidents, and for doing all the work involved in the excavation and embankments to achieve the subgrades and final grades as shown on the plans and as specified and as directed by the Resident Engineer.

The contractor shall be required to prepare their own earthwork for bidding and construction purposes. Any reference to earthwork quantities on the plans is strictly for bonding purposes and shall not be used by the contractor for a price basis. No additional compensation for excavation, embankment, import, or export of material shall be allowed.

Payment for Unclassified Excavation shall be included in the SCOPE OF WORK for MBGC Irrigation & Electrical Upgrades, SCOPE OF WORK for MBGC Clubhouse Demo/Prtbl Building Instl and "Island Patio Remodel" lump sums project price and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in the excavation and embankments to achieve the subgrades and final grades as shown on the plans and as specified and as directed by the Resident Engineer.

300-4 UNCLASSIFIED FILL.

300-4.1 General. To the "GREENBOOK", ADD the following:

The suitability of unclassified excavation as fill material shall be in accordance with the Geotechnical Report and prescribed recommendations found therein. Unclassified fill material shall be free of deleterious material.

SECTION 301 – SUBGRADE PREPARATION, TREATED MATERIALS, AND PLACEMENT OF BASE MATERIALS

301-2 UNTREATED BASE.

301-2.1 General. To the "GREENBOOK", ADD the following:

Class II Aggregate Base shall be installed per this Section 301-2 "Untreated Base".

SECTION 302 – ROADWAY SURFACING

302-4.5 Scheduling, Public Convenience and Traffic Control. To the "GREENBOOK", paragraphs (1) and (2), DELETE in their entirety and SUBSTITUTE with the following:

1. In addition to the requirements of Part 6, you shall comply with the following:
 - a) At least 5 Working Days prior to commencing the Work, you shall submit your proposed Schedule to the Engineer for approval.
 - b) Based upon the approved schedule, you shall notify residents and businesses of the Work and post temporary "No Parking" signs 72 hours in advance.
 - c) Requests for changes in the approved Schedule shall be submitted to the Engineer for approval at least 3 Working Days before the street is scheduled to be sealed.

SECTION 303 - CONCRETE AND MASONRY CONSTRUCTION

303-1 CONCRETE STRUCTURES

303-1.1 General. To the "GREENBOOK", ADD the following:

This work shall consist of preparing the area on which the concrete work is to be placed, which may include preparation of sub-grade, removal of tree roots, and placement of base materials in accordance with these Specifications and as shown on the plans. The following types of miscellaneous concrete items are included:

- a) Concrete Footing and slab
- b) Concrete Paving

- c) Concrete vehicular slabs
- d) Concrete Sidewalk/Paving
- e) Concrete seating features
- f) Concrete for bridge abutments
- g) Concrete for storm drain feature
- h) Concrete vaults

303-5 CONCRETE CURBS, WALKS, GUTTERS, CROSS GUTTERS, ALLEY INTERSECTIONS, ACCESS RAMPS, AND DRIVEWAYS.

303-5.1.1 General. To the "WHITEBOOK", ADD the following:

- 7. For the purposes of this section, the terms "walk" and "access ramp" shall be synonymous with "sidewalk" and "curb ramp and pedestrian ramp", respectively.
- 8. This work shall consist of preparing the area on which the concrete work is to be placed, which may include preparation of sub-grade, removal of tree roots, and placement of base materials in accordance with these Specifications and as shown on the plans. The following types of miscellaneous concrete items are included:
 - a) Standard Concrete Paving installed per **Section 303-5.5.3.**

303-5.5 Finishing.

303-5.5.3 Walk. To the "GREENBOOK", DELETE in its entirety and SUBSTITUTE with the following:

The forms shall be set to place the finish surface in a plane sloping from one edge of paving to the other edge at a maximum of 1.5 percent perpendicular to the edge of paving, unless otherwise shown on the plans.

Following placing, the concrete shall be screened to the required grade, tamped to consolidate the concrete and to bring a thin layer of mortar to the surface, and floated to a smooth, flat, uniform surface. The concrete shall then be edged at all headers, given a preliminary troweling and provided with weakened plane joints.

Walk shall be steel troweled to a smooth and even finish. All formed edges shall be rounded to a radius of 1/2 inch (12.5 mm). Edges at expansion joints shall be rounded to a radius of 1/8 inch (3 mm). Preliminary troweling may be done with a long handled trowel or "Fresno," but the finish troweling, shall be done with a hand trowel. After final troweling, walk on grades of less than 6 percent shall be given a fine-hair-broom finish applied transversely to the centerline. On grades exceeding 6 percent, walk

shall be finished by hand with a wood float. Walk shall be remarked as necessary after final finish, to assure neat uniform edges, joints, and score lines.

Scoring lines, where required, shall have a minimum depth of 1/4 inch (6 mm) and a radius of 1/8 inch (3 mm). When longitudinal scoring lines are required, they shall be parallel to, or concentric with, the lines of the work. Walk 20 feet (6 m) or more in width shall have a longitudinal center scoring line. In walk returns, one scoring line shall be made radially midway between the BCR and ECR. When directed by the Engineer, longitudinal and transverse scoring lines shall match the adjacent walk. The Contractor shall have sufficient metal bars, straightedges, and joint tools on the Work site.

Headers shall remain in place for at least 16 hours after completion of the walk but must be removed before the Work is accepted.

After final troweling all walk surfaces shall receive a uniform light broom finish with a stiff fiber broom perpendicular to the edge of the walk, verify direction with Resident Engineer. Upon final curing walk surface shall meet or exceed a static coefficient of friction of .6 wet and approximately .8 dry. Finished surface shall meet ADAAG 4.5 requirements for paving.

SECTION 400 – PROTECTION AND RESTORATION

400-1 GENERAL. To the “GREENBOOK” ADD the following:

Items which are to remain or are to be salvaged and which are damaged during performance of work shall be repaired to their original condition or replaced with new by the Contractor at no additional cost to Owner. The Contractor shall protect all services and utilities which are to remain. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical utilities.

SECTION 401 – REMOVAL

401-1 GENERAL. To the “GREENBOOK” ADD the following:

Title to Materials: Title to all materials resulting from demolition, and all materials and equipment to be removed, is vested in the Contractor upon approval by the Resident Engineer of the Contractor's demolition and removal procedures, and authorization by the Resident Engineer to begin demolition. The City will not be responsible for the condition or loss of, or damage to, such property after notice to proceed. Materials and equipment shall not be viewed by prospective purchasers or sold on or near the site.

Re-use of materials and equipment: Carefully remove and store materials and equipment indicated to be re-used or relocated to prevent damage, and reinstall as the work progresses.

Salvaged Materials and Equipment: Contractor to carefully remove materials and equipment with minimal damage that are designated to be salvaged on the plans.

Debris and Rubbish: Remove and transport debris and rubbish in a manner that will prevent spillage on streets or adjacent areas. Clean up spillage from streets and adjacent roads.

Regulations: Comply with federal, state and local hauling and disposal regulations.

401-2 ASPHALT CONCRETE PAVING. To the "WHITEBOOK", ADD the following:

5. Repair of asphalt paving for copper piping installation shall comply with City Standard Drawing SDG-107.
6. Remove asphaltic concrete paving to depths as indicated on the plans or as required to allow for new improvements.

401- 3 CONCRETE AND MASONRY IMPROVEMENTS.

401- 3.1 Concrete Pavement. To the "WHITEBOOK", DELETE item 2 in its entirety and SUBSTITUTE the following:

2. Where concrete work is to be removed, saw cut concrete along straight lines to a depth of four inches minimum. At walls and other vertical surfaces, saw cuts shall be perpendicular to the vertical face and in alignment with the cut in the horizontal face. The remainder of the concrete shall be broken out, provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, it shall be ground smooth or the sawcut shall be made entirely through the concrete.

ADD

401- 3.4 Miscellaneous Materials. Buried pavements and other materials, old subsurface pavements and other materials such as concrete planters, and other materials encountered under existing pavements, which are within designated excavation areas on the demolition plans shall be removed.

SECTION 402 – UTILITIES

402-2 PROTECTION. To the "WHITEBOOK", item 2, ADD the following:

- g) Refer to **Appendix I - Advanced Metering Infrastructure (AMI) Device Protection** for more information on the protection of AMI devices.

SECTION 600 - ACCESS

600-1 GENERAL. To the "WHITEBOOK", item 5, DELETE in its entirety and SUBSTITUTE with the following:

5. You shall notify Environmental Services Department via email (trash@sandiego.gov) of street closures affecting the regular scheduled solid waste collection at least 3 Working Days prior to the street closure. Include your business name and phone number, days of closure, time of scheduled closure, and date of anticipated street reopening in the notification.
 - a) You shall verify waste collection schedules via the Environmental Services website at:

<http://www.sandiego.gov/environmental-services/collection/index.shtml>
 - b) You shall comply with the following requirements for trash, recycling, and yard waste collection:
 - i. Provide advance written notice to every property affected by blocked public right of way.
 - ii. Coordinate the relocation of trash, recycling, and yard waste containers to an accessible public street for the City's waste collection crews on collection day.
 - iii. When necessary, relocate the containers from the blocked streets to the accessible public right of way before the City's collection vehicles arrive to assist with collection on existing schedules. Return the containers to their point of origin to ensure the accuracy of inventory assignment by address.
 - c) If the City's crews are unable to provide the citizens with the mandated services due to your failure to comply with these specifications, you shall collect trash, recyclables, and yard waste on the City's schedule and deliver to the City's designated locations. If you fail to perform this Work, you shall incur additional costs for the City to reschedule pick up of an area.

SECTION 601 - TEMPORARY TRAFFIC CONTROL FOR CONSTRUCTION AND MAINTENANCE WORK ZONES

601-2.1.4 Traffic Control for Resurfacing and Slurry Sealing. To the "WHITEBOOK", item 3, subsection "d", DELETE in its entirety and SUBSTITUTE with the following:

- d) Place "NO PARKING - TOW-AWAY ZONE" signs 72 hours in advance of the scheduled slurry sealing. Reschedule street block segments which are not completed by the last posted Working Day. If a Work delay of 48 hours or more occurs from the originally scheduled Work date, remove the "NO PARKING - TOW-AWAY ZONE" signs for a minimum of 24 hours, then reset and re-post for the appropriate Work date.

601-3.5.1 General. To the "WHITEBOOK", item 3, DELETE in its entirety and SUBSTITUTE with the following:

3. Temporary "No Parking" and "No Stopping" signs shall be installed 72 hours before enforcement. Temporary "No Parking" and "No Stopping" signs shall be installed and removed as specified in the Special Provisions. Signs shall indicate specific days, dates, and times of restrictions. If violations occur, call Police Dispatch 619-531-2000 to enforce the Tow-Away notice.

601-3.6 Channelizing Devices. To the "WHITEBOOK", item 4, Barricades, ADD the following:

- h) You shall place "OPEN TRENCH" signs (C27(CA)) on Type 3 Barricade within the construction Work zone, ahead of any Work areas with open trenches that are greater than 3 inches in depth, in accordance with California MUTCD SECTION 6F.103 (CA). The barricades shall be placed in a continuous manner and shall prevent pedestrian, vehicular, and biker access to the open trench area.

SECTION 700 - MATERIALS

ADD:

700-10 GENERAL ELECTRICAL REQUIREMENTS.

700-10.1 Description.

All electrical work shall be in conformance with the plans, and State, Federal and Local Electric Codes, SDG&E Standards and City of San Diego Park and Recreation Department Consultant's Guide to Park Design and Development Design Manual, 2011. Work includes, but is not necessarily limited to, providing site power systems as follows:

1. Complete electrical primary & secondary conduit systems, including all metering/distribution equipment, panelboards, handholes, splice boxes, pads, and other associated components.
2. All conduit and feeder conductors for site work components.
3. All required trenching, soil removal/replacement, compaction and pavement repairs, to current City standards.
4. Payment of all permit fees, utility company installation charges, SDG&E service orders, engineering fees, relocation costs, and related charges, as applicable shall be included in the lump sum bid item.

700-10.2 Schedule.

The Contractor shall obtain information and instructions from other Contractors on the site and other trades and suppliers in ample time to schedule and coordinate the installation of items furnished by them under this section so that provisions for their work can be made without delaying the project.

700-10.3 Accuracy of Data.

The electrical drawings are diagrammatic, but shall be followed as closely as actual construction and work in other sections will permit. All deviations from drawings required to conform to site conditions and to the work of others, shall be made as directed.

700-10.4 Submittals.

1. Materials List - Provide complete materials list of all proposed products, including catalog cuts of manufactured items.

700-10.5 Quality Assurance.

1. Manufacturer shall have produced the specified products for a period of 2 years prior to beginning work of this section, and shall have the capability to produce the specified products to the delivery and quantity criteria of the project.
2. STAFF - For fabrication and installation of work, use only personnel who are thoroughly trained and experienced in the skills required, have installed similar applications of the specified products within one year prior to beginning work of this section, and who are completely familiar with the manufacturers' recommended methods of installation as well as the requirements of this work.

700-10.6 Guarantee.

The contractor shall furnish a written guarantee against defective work, materials, and operation for a period of one full year after final acceptance.

1. All materials and equipment shall be new, free from defects and or the quality or rating shown or specified.
2. Any defect due to missing or improper material or faulty workmanship existing or developed during the specified period shall be corrected and the resulting damage repaired without additional cost to the City. Such work shall be done at a time as directed by the Engineer.

700-10.7 Product Handling.

1. Protection - Use all means necessary to protect the materials of this section before, during, and after installation and to protect the work and materials, of all other trades.
2. Replacements - In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the City.

700-10.8 Covering Of Unreviewed Work.

No work shall be covered, or enclosed, without review, testing, and/or approval by Engineer. Work enclosed or covered prior to review and test shall be uncovered at Contractor's expense. After review, retest for approval and repair with material necessary to restore to original and proper condition.

ADD:

700-11 ELECTRICAL COMPONENTS.

700-11.1 Conduit.

1. Rigid Non-metallic Conduit - Heavy-wall rigid non-metallic conduit, where permitted, shall be Carlon or equal, PVC Schedule 40 manufactured in accordance with NEMA TC-2, UL-651 and WC 1094A specifications.
2. Conduit shall be delivered to site in standard lengths with each length bearing the manufacturer's trademark or stamp and U.L. Labeled.
3. Conduit shall be minimum 3/4 inch or larger in diameter.
4. All conduits shall contain equipment grounding conductors.

700-11.2 Wire/Conductors.

1. All wire and cable shall be rated for 600 volt, be color-coded, shall bear the Underwriters' Label, and shall be brought to the job in unbroken packages.
2. Wire coding shall be in accordance with the provisions of Section 210-5 of the latest edition of the National Electric Code.
3. All conductors unless noted otherwise shall be copper, No. 12 AWG minimum size. All conductors shall be stranded. Insulation type, unless otherwise noted, shall be as follows:
 - a. Feeder conductors: Type THW, 75 Degrees C.
 - b. Fixture and branch circuit conductors: Type THHN/THWN: XHHW or RHH - minimum 90 degrees C, unless otherwise noted.
 - c. Acceptable Manufacturers: General Wire and Cable Corp., Okonite Wire and Cable Corporation, Southwire or approved substitute.
 - d. All branch circuit conductors shall be labeled with circuit numbers.
 - e. One neutral conductor for each phase conductor pulled.
 - f. For wire #10 AWG and smaller provide Buchanan connectors or approved substitute. For wire #8 AWG and larger provide T&B "Lock-Tite" connectors or equal.
 - g. All connections shall be taped with rubber tape 1-1/2 times the thickness of the conductor insulation, then covered with Scotch #33 tape, or equal.
 - h. Splices in underground distribution systems shall be made only in accessible locations such as handholes, with a compression connector

on the conductor and by insulating and waterproofing by the following methods suitable for continuous submersion in water. Provide cast-type splice insulation by means of molded casting process employing a thermosetting epoxy resin insulating material applied by a gravity-poured method or by a pressure-injected method. Provide component materials of the resin insulation in a packaged form ready for convenient mixing without removing from the package. Do not allow the cables to be moved until after the splicing material has completely set.

700-11.3 Pull/Splice Boxes (Below Grade).

All pull boxes shall be standard sizes. Provide cover lid as required for pedestrian or vehicular traffic condition, with bolted connections, and labeled "ELECTRICAL". NOTE: Bolted cover lids are not required on the Golf Course premises. All boxes, except those pertaining to the Golf Course Irrigation System, shall be located 1" above grade in landscape areas and flush with pavement in paved or traffic areas. Coordinate with the Resident Engineer.

700-11.4 Site Lighting.

Lighting fixtures at the electrical distribution building shall be per the schedule on the drawings or approved equal as accepted by the Engineer and shall include all accessories for a complete system.

700-11.5 Other Materials.

All other required materials shall be new, of highest quality for applicable use, and per approval of local agency, servicing utility, and City of San Diego. Distribution Switchboard and panelboards shall have copper busing.

SECTION 800 – MATERIALS

800-1.2.4 Organic Soil Amendment. To the "GREENBOOK", ADD the following:

Type 4 organic soil amendment (compost) shall be derived from Green Material (yard waste and/or food waste) that is composted in accordance with California Code of Regulations, Title 14, Chapter 3 Article 7, 17868.3 (15-day Process to Further Reduce Pathogens and kill weed and other seeds). Incorporated into the soil, compost improves soil texture; increases both nutrient and water holding capacity; and reduces the need for commercial fertilizer. Where applicable, Organic Soil Amendment can qualify as a component of LEED certification.

Type 4 organic soil amendment must come from a compost facility that tests its compost on a quarterly basis and meets the requirements listed in Table 800-1.2.4(B). Contractor shall provide a copy of the most recent quarterly test results, and a current representative sample of the compost to be used on the project, to the City, prior to approval and the compost being used.

The City of San Diego’s Miramar Greenery produces Type 4 organic soil amendment (compost) and complies with the U.S. Composting Council’s Seal of Testing Assurance Program. The Miramar Greenery is located within the City’s Miramar Landfill at State Hwy. 52 and Convoy St. in San Diego.

<http://www.sandiego.gov/environmental-services/miramar/greenery>

Table 800-1.2.4 (B)

Test Criteria	Acceptable Range	Unit of Measure	TMCC Test Method
pH	6.0 - 8.0		04.11-A 1:5 Slurry pH
Soluble salts	0 - 10	dS/m (mmhos/cm)	04.10-A 1:5 Slurry Method
Organic Matter	30 - 75%	% dry weight basis	05.07-A Loss-on-ignition Organic Matter Method (LOI)
Stability	< 8	mg CO ₂ /g OM/day	05.08-B carbon Dioxide Evolution Rate
Maturity	> 80% emergence	average % of control	05.05-A Germination and vigor
Pathogens			
Fecal coliform	Pass	Pass/Fail per U.S. EPA Class A standard, 40CFR 503.32(a)	07.01-B Fecal coliforms
Salmonella	Pass	Pass/Fail per U.S. EPA Class A standard, 40CFR 503.32(a)	07.02 Salmonella
Heavy Metal	Pass	Pass/Fail per U.S. EPA Class A standard, 40CFR 503.13(a) Tables 1 and 3.	04.06-Heavy Metals standards, and Hazardous Elements.
Particle Size	> 90%	% dry weight passing through 11mm	02.02-B Sample Sieving for Aggregate Size Classification

800-1.2.5 Mulch. To the “WHITEBOOK”, item 3, subsection “i”, ADD the following:

Type 9 Mulch shall be 4 inches maximum in size.

Average dimensions shall be 1" to 3" in length, 1/2" in thickness, and a natural dark brown color. Submit two (2) samples for approval by the Resident Engineer prior to installation.

To the "WHITEBOOK", ADD the following:

4. Install a 3" minimum depth layer of mulch in all tree, shrub, and groundcover planting areas unless otherwise indicated on the plans. Mulch shall be installed with a uniform depth. Taper the mulch to within 3" clear of the trunk of the plant. Mulch shall not be installed in planting areas designated as turf, synthetic turf, decomposed granite, cobble, and/ or rock mulch.

Bark Mulch shall be measured by the square foot. The contract unit price paid for mulch shall be included in the lump sum project cost and shall include full compensation for furnishing all labor, materials, tools, equipment, all incidentals necessary to provide a complete installation, and for doing all the work involved in supplying and installing bark mulch, complete-in-place, as shown on the plans, as specified in these Special Provisions and as directed by the Resident Engineer.

800-1.2.6 Inorganic Soil Amendments. To the "WHITEBOOK", ADD the following:

3. Soil sulfur shall be 98% elemental sulfur.

ADD:

800-1.2.7 Herbicides and Pesticides.

Herbicides and pesticides shall be used in their appropriate applications with strict adherence to manufacturers' specifications and instructions. Herbicides and pesticides shall be applied by licensed applicators. The Contractor shall obtain approval for any and all pesticide and herbicide use in writing from the Resident Engineer.

Pre-emergent herbicide for shrub and groundcover areas (planted from flats) shall be Treflan, Surflan, Eptan, or approved equivalent.

Post-emergent herbicide for all areas shall be Round Up, Diquat, Montar, or approved equivalent, except for areas where it may contact standing or running water.

Post-emergent herbicide for all areas where herbicide may come in contact with standing or moving water shall be Aquamaster, Rodeo, or approved equal specifically approved for use near water bodies. These herbicides are approved for use within the riparian areas by the City and County of San Diego because it has been determined to be non-toxic to aquatic organisms. Other herbicides shall be approved by the City and County of San Diego prior to use on only the most noxious weeds, and only under the direct supervision of the Resident Engineer.

ADD:

800-1.7

Herbicide.

4. Pre-emergent herbicide shall be utilized. The purpose of the pre-emergent herbicide is to control the growth of weeds within planter areas below the bark mulch layer. Contractor shall submit a sample label and Material Safety Data Sheet (MSDS) to the Resident Engineer for approval prior to purchase and applications.
5. Post-emergent herbicide shall be non-selective type for total control of undesirable vegetation, available as Roundup or approved substitution as determined by the Contractor. Contractor shall submit a sample label and Material Safety Data Sheet (MSDS) to the Resident Engineer for approval prior to purchase and applications. Application shall be in accordance with precautions and rates suggested by the manufacturer.

800-2

IRRIGATION SYSTEM MATERIALS.

All irrigation components shall be provided per plans and as specified each respective irrigation specification.

800-2.1

Pipe and Fittings.

ADD:

800-2.1.7

Sand Encasement.

1. Sand Encasement for all irrigation pipe, direct burial control wire and electrical conduit shall be clean plaster or mortar sand, as per section 200 of the Greenbook, with a minimum sand equivalent of 50.

800-3

ELECTRICAL MATERIALS.

ADD:

800-3.2.2.4

Wire Testing.

Wire shall be tested for continuity, open circuits, and unintentional grounds prior to connecting to equipment. Any wiring that is defective shall be replaced, at the Contractor's expense.

SECTION 801 - LANDSCAPE AND IRRIGATION INSTALLATION

801-1

GENERAL. To the "WHITEBOOK", item 4, DELETE in its entirety and SUBSTITUTE with the following:

Trees or shrubs which have been identified to remain as shown on the Plans shall be protected. Construction fencing minimum 5 feet (1.5 m) high shall be placed around the drip line of the tree or cluster of trees to protect the entire area. No material shall

be stored nor shall equipment be permitted within the fenced area. Pruning of the tree canopy to accommodate the project shall not be permitted without written recommendation and shall be performed by a certified arborist submitted and approved by the Engineer. Digging or excavation shall not occur under the drip line of the tree unless authorized by the Engineer. Failure to properly protect the identified trees may result in charges based on the assessed value of the tree and other damages once valued by a certified arborist.

To the "WHITEBOOK", ADD the following:

4. All plants outside the limit of work shall be protected in place.
5. Do not operate equipment, which generates fumes or excessive heat, within 20' of the trees to remain. Fumes and heat can damage trees.
6. The grade around existing trees to remain shall remain as existing to avoid disturbance of roots and avoid burying the roots under additional soil.
7. When excavation must be carried out under or near the dripline of a tree identified to be protected in place, the construction of improvements shall minimally damage the root zone by root pruning as outlined in **Section 801-7.3 "Root Pruning for Sidewalk Replacement."** Depth of root pruning shall occur to the depth necessary to construction improvements. Exposed roots of trees shall be covered and shaded by moist burlap or canvas until backfill is placed.
8. Buried utilities and irrigation piping and equipment shall be located out of root zones wherever possible. In cases where utilities must cross root zones, tunnels shall be utilized in lieu of trenches. Tunneling within the rooting area of a tree to remain shall be done under the supervision of the Resident Engineer.
9. Trenching, excavation and soil disturbance within the drip line of vegetation to remain shall not be permitted except as specifically allowed by the Resident Engineer. It is the intent of the plans that the Contractor shall provide an alternate routing of irrigation, electrical and all trenching to avoid cutting through roots of existing vegetation to remain.
10. Upon completion of all work, remove tools, equipment, tree preservation materials and other measures from the site.
11. Repair all areas, structures and surfaces damaged and requiring repair resulting from tree preservation measures. Repair adjacent construction or surfaces soiled or damaged by tree preservation measures.
12. Payment for pruning of existing trees and vegetation to remain shall be included in the lump sum project cost and no additional payment will be made.

ADD:

801-2.2.1.1 Weed Eradication.

Soil preparation and planting shall not be allowed until all weeds are removed from within the limits of planting areas as indicated on the plans.

The Contractor's labor shall possess demonstrated ability to identify the difference between desirable native species and invasive weeds.

Weed eradication for entire project site. After irrigation installation, but before planting installation, the Contractor shall irrigate the entire project site three (3) to four (4) times over seven (7) to ten (10) days to germinate existing weed seeds. Allow weed seeds to grow until they reach a maximum height of two to three inches (2" - 3"). A post-emergent herbicide shall then be applied **per Section 800-1.2.7**. Avoid contact of herbicide with the existing plants to remain.

All herbicides used shall be compatible with use in the vicinity of water and shall be applied in accordance with the label specifications by personnel holding a valid pesticide and herbicide applicator's license. Herbicide use shall be approved by the Resident Engineer prior to application.

Pulled weeds and debris shall be transported and disposed of properly offsite immediately using approved methods to prevent any seed dispersal on the site.

The eradication of exotic plant species is required prior to any planting. All exotic vegetation within the planting areas shall be removed. Herbicide shall be applied to weedy vegetation (e.g., giant reed (*Arundo donax*), tamarisk (*Tamarix* sp.), pampas grass (*Cortaderia jubata*), tree tobacco (*Nicotina glauca*), yellow star-thistle (*Centaurea melitnesis*), cocklebur (*Xanthium* sp.), castor bean (*Ricinus communis*), annual beardgrass, and Bermuda grass (*Cynodon dactylon*), etc.) within the project area. All weedy species should be cleared approximately two weeks following herbicide application.

The Resident Engineer shall inspect the site prior to planting and during revegetation. The planting of hydroseed shall be conducted on a weed free site.

Manual weed eradication shall continue during planting and during the plant establishment period and maintenance period; no herbicides shall be used following the initial weed eradication unless authorized by the Resident Engineer. Weed seedlings and sprouts shall be removed before attaining 12-inches in height and/or before producing seed.

All areas where weed removal creates bare areas in excess of 25 square feet shall be reseeded.

Weed eradication for shrub and groundcover areas (planted from flats). Three (3) to four (4) days after these plants have been installed; the Contractor shall apply the pre-emergent herbicide per manufacturer's specifications and instructions.

801-2.3 Finish Grading. To the "WHITEBOOK", Paragraph 1, ADD the following:

Finish grade shall insure positive drainage from the site. Surface drainage shall be away from all building foundations. The Resident Engineer shall approve the final grades and elevations before planting operations may begin.

ADD:

801-4.8.3.1 Measurement and Payment.

Lawn Sod shall be measured by the square foot. Payment for Lawn Sod shall be included in the lump sum project cost and shall include full compensation for furnishing all labor, materials, tools, equipment, all incidentals necessary to provide a complete installation, and for doing all the work involved in installing lawn sod, complete-in-place, as shown on the plans, as specified in these Special Provisions and as directed by the Resident Engineer.

801-5 IRRIGATION SYSTEM INSTALLATION.

801-5.1 General. To the "GREENBOOK", ADD the following:

Contractor shall check and verify the water pressure at P.O.C. prior to beginning of work. Notify City of any discrepancy between pressure indicated on plans and actual water pressure.

Contractor shall check and verify all site conditions, utilities, and services prior to trenching. Verify point of connection location prior to beginning of work.

Plans are diagrammatic and approximate. All piping, valve boxes, backflow preventers, etc., shall be located in planting areas if possible. No irrigation equipment except pipe crossings and electrical crossings shall be located in or under sidewalks and streets except where street crossings or trench rerouting is required to protect existing trees.

All irrigation equipment shall be installed, flushed out, pressure tested, and the coverage test approved prior to plant installation.

SECTION 1001 – CONSTRUCTION BEST MANAGEMENT PRACTICES (BMPs)

1001-1 GENERAL. To the "WHITEBOOK", ADD the following:

7. Based on a preliminary assessment by the City, this Contract is subject to WPCP.

TECHNICALS
FOR MBGC IRRIGATION & ELECTRICAL UPGRADES

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- 2.0 DRINKING FOUNTAIN**

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- 3.0 VAULT HATCH**

MBGC IRRIGATION & ELECTRICAL UPGRADES

ELECTRICAL BUILDING

1.0 PRE-MANUFACTURED BUILDING KIT for Electrical Building (Contractor to obtain Permit).
1.1 General.

Product: Model No. 'Premier Ranch Garage – 12x18' KIT, or approved equal.

Description: Basis of Design is a Tuff Shed. Kit to be provided and assembled by Contractor includes a Painted, gable-roofed building with standard wood construction per CBC code, 12x12 gable end vent, ridge vent, 12" overhang, 3-0x6-8 door, and 1' height addition for tall interior to accommodate electrical equipment mounting and clearances. Door shall be mounted at standard height from slab with outward opening bar hardware for electrical equipment buildings.

Services: Contractor to pay for delivery by TuffShed; Offloading, assembly, installation, and final painting by General Contractor.

Structural Drwgs: Shall be prepared and provided to Contractor by TuffShed for submittal to City of San Diego Development Services Department for 'Separate Permit under the Approved Project Number' and approval for the building permit.

Project Reference#: Mission Bay Golf Course, 7.10.2018

Manufacturer: Tuff Shed, or approved equal.

(760) 215-0978

www.tuffshed.com

2124 W. Mission Rd

Escondido, CA 92029

Paint Schedule:

Component	Exterior PPG (Pittsburgh Paint) Color
Trim	White
Exterior Walls	Tan

Roof Schedule: Asphalt Shingle, White Color for low Solar Reflectivity Index

Installation: Contractor shall unload delivery of kit and provide assembly/installation of kit on Contractor constructed building pad.

Door Exit Bar: Contractor shall install an ADA approved push exit bar and hardware onto the door to enable accessible exiting from Electrical Distribution Building. Installation shall be compliant with ADA codes. Product submittal is required for review prior to installation.

Global Door Controls, #TH1100EDTBARAL, 32" Aluminum Touch Bar Exit Device and associated latching hardware, or an approved equal.

Concrete Specified by Special Exposure. Based on the Soil Corrosivity Test Results presented in section 7.8 from the Geotechnical Investigation, the concrete foundations for the prefabricated electrical building shall be a Type V Moderate Exposure Mix 658-CME-4500P, 4 inch slump, certified ticket required

REINFORCEMENT FOR CONCRETE.

Tie Wire. Tie wire shall be 16 gauge, black annealed.

Reinforcing Supports. All horizontal reinforcing shall be supported on approved chairs or supports to the specified height and locations as indicated on the plans.

Dowel. Dowels shall be sections of deformed steel reinforcing rod in sizes and lengths as indicated on the plans. Dowels shall be provided in locations where resilient paving sub-slab abuts existing or new concrete curbs, where concrete curbs abut new concrete walkways, at expansion joints, and anywhere else as indicated on the plans. Provide dowels at the on-center spacing as indicated on the plan, centered vertically within the concrete slab section, with a minimum of two dowels abutting into any adjacent slab sections.

1.2 Contractor Responsibilities.

CONTRACTOR

The Contractor is responsible for the site survey and staking the building locations, finished slab survey elevations and marking on site, construction and compaction of the required building pads; access to the site delivering the prefabricated building kit; providing electrical power at a point of connection (POC) within the building slab and at the depth required by the local code; and the installation of any sidewalks outside the building footprint.

The Contractor is responsible for verification to the prefabricated building kit manufacturer that there are no unanticipated site delivery issues such as overhead wires, trees, tree roots, or existing grade changes and that prevent a clear path of travel between a roadway and the final site exists for a tractor trailer to expedite delivery.

PREFABRICATED BUILDING KIT MANUFACTURER

The prefabricated building kit manufacturer will provide to the General Contractor final building design architectural drawings and engineering calculations under the responsibility of a CA licensed professional engineer, in compliance with all local, state and federal codes. The Manufacturer, as a subcontractor to the General Contractor, shall construct the building kit offsite, transport it to the site, and have the General Contractor unload it and install the building turnkey, on a Contractor prepared building foundation / pad per the drawings.

1.3 Shipping Protection.

During transport to the project site the prefabricated building kit may encounter inclement weather or road grime that could require substantial cleaning if the building is insufficiently prepared for transport. The building shall be shrink-wrapped before transportation and sufficiently strong to arrive at the owner site intact for exterior finish protection. Materials removed on site shall be disposed of and recycled by building install staff.

1.4 SITE FURNISHINGS INSTALLATION

Deliver, store and handle all furnishing materials to prevent damage. Install all factory-fabricated site furnishings in conformance manufacturer's specifications, instructions and recommendations. Contractor shall provide the City with one copy of complete manufacturers installation instructions and maintenance kit.

All components shall be firmly and permanently affixed to concrete surfaces and/or footings to the satisfaction of the City.

Site furnishings shall be installed accurately in the correct orientation, location and relationship with other improvements shown on the plans. For surface mount and/or coil rod application, epoxy shall be placed between site furnishing and mounting surface. Epoxy shall be placed in marked out location prior to site furnishing being placed on top. No excess epoxy shall be visible (emerging) from the joint. All excess shall be cleaned from adjacent surface with no darkening and/or staining of finished surfaces.

Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair damage resulting from installation work. Protect site furnishings from damage throughout construction work.

See construction plans and details for location and layout.

1.5 Measurement and Payment.

Payment for Site Furnishings shall be included in the lump sum SCOPE OF WORK for MBGC Irrigation & Electrical Upgrades and in the Scope of Work for MBGC Clubhouse Demo/Prtbl Building Instl lump sum.

1.6 Building Pad/ Foundation Installation - General.

The Contractor shall prepare the pre-fabricated electrical enclosure building slab/footings/sub-grade to receive the pre-fabricated building in accordance with the bid sub-grade preparation drawings or foundation plan.

1.7 Electrical Conduit Installation.

The Contractor shall provide and install electrical conduits, junction boxes and sweeps for all incoming/outgoing electrical circuits and sources to within building slab to 6" above finished building slabs elevation per bid plans. The Contractor shall make all final connections to ALL the electrical POINTS OF CONNECTION for this project. Contractor to install all panels and provide a fully functional electrical system as described in the contract documents.

1.8 Concrete Building Foundation and Slab.

The Contractor shall construct the 12" perimeter foundation with 4" thick slab per the dimensions and layout indicated on the plans. Foundation shall be constructed with 'J' bolts for attachment of building to slab.

1.9 Exterior Walls.

The building shall have wood T-111 vertical slot plywood finish with 4" strip at corners and around door. Exterior walls and trim shall be painted by the Contractor/Manufacturer in the field after installation.

1.10 Roof System.

The roof structure shall be a gabled roof with a 5 to 12 pitch, constructed of 2" x 6" wood rafters at 24" on center with 5/8" plywood sheathing and waterproofing membrane and asphalt shingle roofing material.

1.11 Interior Walls.

Interior walls shall be faced with ½" smooth plywood for mounting of electrical equipment per the Electrical Drawings. Plywood shall be mounted to wall studs with 2" wood screws. Plywood shall be mounted to walls from floor to ceiling with no gaps between plywood sheets. Plywood shall be cut to center of stud spacing for attachment.

1.12 Gable Ventilation System.

Shall be included with the building as a standard feature.

1.13 Doors

The building shall be provided with one standard 3' wide x 7'-0" tall entry door with locking hardware, push bar exit device, deadbolt lock and associated hardware.

1.14 Electrical.

Interior electrical systems for general wall outlets and lighting shall be provided per Electrical drawings. Work shall be coordinated and with plywood installation and all other work required with this contact. Start-up of this facility will be fully coordinated with the City for no disruption to the Golf Course operations. It is the responsibility of the Contractor to coordinate with SDG&E for energizing the system.

1.15 Certifications and Warranty

Building shall be certified in compliance with the plan approval by the State of California, Department of Housing and Community Development. The building shall be delivered with an applied insignia; in compliance with all State regulations. The local building authority shall provide site inspections for the underground mechanical piping and final connections, footings, and access issues outside the building footprint. Electrical building subcontractor shall also furnish 5-year warranty, certifications for the concrete slab specification compliance, and maintenance manuals for the building and components.

MBGC IRRIGATION & ELECTRICAL UPGRADES

DRINKING FOUNTAIN

2.0

Drinking Fountain shall conform to the following specifications:

Model#Model 3500 (Drinking Fountain), or approved equal.

Description: Barrier-Free Stainless-Steel Pedestal

Fountain Manufacturer: Haws Corporation, or approved equal

(775) 359-4712
hawesco.com

Type: Superior-duty "Hi-lo"

Pedestal: 11-gauge, stainless steel

Basins: 3/8" Thick Stainless Steel

Finish: Pedestal and Basins, Powder-coated green, Glossy

Operation: Push-button with stainless steel valves with operating pressure from 30 to 90 psi, front-accessible cartridge and low adjustment.

Waterways: 100% lead free

Bubbler Heads: Polished chrome-plated brass with integral basin shank, vandal-resistant waste strainers with top-down clean-out access.

GPM: 0.45

Access: Access door with heavy duty hinges and square key locks

Mounting: Integral bottom plate and stainless-steel mounting plate with integral 6" zinc plated anchors.

Contractor shall provide and install an extension of the supply line, from potable water line to new drinking fountain location. Contractor shall provide all supply line piping and fittings, drainage line piping and fittings, drain rock, soil separation fabric and other materials as listed on the drawing in locations indicated. Provide Type K copper piping and fittings from existing supply line to new drinking fountain. All work shall be installed in compliance with the local plumbing codes and 801-5.3.4. Turf repair shall be provided per TECHNICALS- Irrigation System installation requirements for turf cutting and reinstallation within same day.

Contractor shall provide a drainage sump consisting of a perforated drain line wrapped in a filter fabric sock and surrounded with a 3/4" crushed rock bed, graded away from the potable lines at locations and to the size indicated on the plans. Soil or media coverage above the sump drain line shall be 6" minimum unless otherwise specified.

MBGC IRRIGATION & ELECTRICAL UPGRADES

VAULT HATCH

3.0 Product: Custom double-door access hatch 70x70 Frame and Door Manufacturer: USF Fabrication or approved equal.

Description: Double door access hatch with frame; Pedestrian rated with galvanized diamond plate finish.

Material: 3/16-inch galvanized steel for frame and covers

Hardware: 316 SS nuts, bolts and washers

Hold open device: Galvanized steel one piece hold open arm with removable pin to release door full 180-degree open position.

Lift assist: SS compression springs; no more than 35 lbs. of lift is required.

Lock device: 316 SS slam lock with special ¼-turn tamper resistant penta head release

Lift handles: Two galvanized steel lift handles flush with top cover.

Cathodic Protection: Provide cathodic protection between dissimilar metal contact.

Warranty: 5-year warranty.

MBGC IRRIGATION & ELECTRICAL UPGRADES

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MBGC IRRIGATION & ELECTRICAL UPGRADES
SPECIFICATIONS FOR IRRIGATION SYSTEM IMPROVEMENTS

SECTION 1 - PROJECT REQUIREMENTS.

1.01 Golf Course Irrigation System Project Requirements.

- A. The project includes the installation of a new irrigation system on an existing golf course, including all components as illustrated in the construction drawings, details, and technical specifications.
- B. Extreme consideration must be given to maintaining acceptable playing conditions throughout duration of project. All excavations and disturbance must be returned to original conditions within same day in active play areas. All open excavations must be protected, barricaded, shored, or covered as required, to safely allow play to occur in vicinity of construction.
- C. Contractor will be provided with a location to store project materials and equipment. Contractor to erect security fencing around perimeter of storage yard with lockable gate. All non-pipe materials to be stored inside a lockable trailer within the fence perimeter. All stored pipe materials must remain covered at all times. All stored pipe material left uncovered longer than seven (7) days must be removed from site and replaced with new by Contractor. Keep all material stored withing staging area unless being used that day.
- D. Irrigation Consultant to field locate all irrigation heads in advance of Contractor excavation. Contractor to cup all flagged locations with greens cup cutter and remove excavated soil and grass. Paint inside of cup with bright colored paint, and install plastic feathered stake chaser (color to match staked flag).

Prior to excavating at a staked head location, paint a straight line (min. 48" long) centered over cup and perpendicular to pipe routing, to mark specific location of head and insure final installation is +/- 6".
- E. Contractor is responsible for removal of all existing heads, and controllers as individual fairways are completed. Items are to be turned over to superintendent following removal.
- F. Contractor must maintain the existing irrigation system as required by golf course superintendent, throughout the installation of the irrigation improvements. Existing distribution piping and electrical wiring must be immediately repaired or replaced if damaged during construction. Existing lateral piping and low voltage wiring must also be repaired during installation of distribution piping.
- G. Contractor will be responsible for making temporary connections to existing distribution piping system throughout installation process. Owner or Consultant can direct locations for connections.

- H. The following requirements govern the construction activities if rock is encountered on site.
 - a) Main Line

Piping Rocky material that can be excavated utilizing a Vermeer T655 or equivalent size machine shall be the responsibility of the Contractor. Material that cannot be removed by a similar size machine may be removed by any method approved by the Resident Engineer. Owner, Consultant, and Contractor will negotiate payment due the Contractor for additional equipment and excavation requirements. Contract price increases issued by Change Order for such work must be agreed to Resident Engineer prior of any activities initiated by Contractor that exceed the use of a Vermeer T655 or equivalent size machine. Following agreement of price for this work, Contractor may proceed with approved method of excavation. Contractor will be required to track this additional work for approval of change order by Resident Engineer.
 - b) Lateral

Piping Rocky material that can be trenched utilizing a Vermeer V-8050 Trencher with Rock-wheel or equivalent size machine shall be the responsibility of the contractor. Material that cannot be removed by a similar size machine may be removed by any method approved by the Resident Engineer. Owner, Consultant, and Contractor will negotiate payment due the Contractor for additional equipment and excavation requirements. Contract price increases issued by Change Order for such work must be approved by the Resident Engineer prior of any activities initiated by Contractor that exceed the use of a Vermeer V-8050 Trencher with Rock-wheel. Following agreement of price, this work may proceed with approved method of excavation. Contractor will be required to track this additional work for approval of change order by the Resident Engineer.
 - c) Contractor is responsible for producing 1/2" minus screened excavated material from excavation for bedding. Should pipe bedding material requirements exceed that available from screened excavated material, contractor to supply additional bedding material approved by the Resident Engineer.
- I. Owner shall make available to Contractor one or more on-site locations acceptable for stockpiling excavated rock debris. Contractor is responsible for stockpiling debris at approved location as identified by the Owner. Contractor shall be responsible for any final removal of material from approved stockpile location(s).
- J. Tree Protection– All trees identified on drawing are shown in approximate location, as mapped through aerial photography. Contractor shall minimize all trenching activities under tree drip zones.
- K. Contractor As-Built drawings will be required for all previously installed irrigation equipment prior to delivery of As-Staked drawings from Consultant to Contractor. Additionally, copies of all Contractor As-Built drawings prepared during each month of irrigation installation must be submitted with each

payment request. Any payment request made without attached current Contractor As-Built drawings may be refused by the Owner, until such time that As-Built drawings are submitted and approved by the Resident Engineer.

- L. At time of walk-through, Contractor shall make available to Consultant two (2) English speaking representatives for facilitation of walk-through activities.
- M. The Contractor shall complete the Work in its entirety in 100 working days from the date of the Notice to Proceed.
- N. The Contractor will utilize an approved Project Superintendent for this project. This Superintendent shall remain the key on-site representative of the Contractor throughout the duration of the project. If this Superintendent leaves the employment of the Contractor, the Owner shall approve his replacement.

SECTION 02815 GOLF COURSE IRRIGATION SYSTEM

1.0 GENERAL.

1.01 WORK INCLUDED. - Work of this Section generally includes provision of an underground irrigation system including the following; in conformance with the 2018 Greenbook and with City of San Diego 2018 Whitebook.

- A. Trenching, stockpiling excavation materials, and refilling trenches.
- B. Complete system including but not limited to piping, valves, fittings, heads, control system, wiring and final adjustments to insure efficient and uniform coverage as determined by Consultant.
- C. Water Connections.
- D. Replacement of unsatisfactory materials.
- E. Clean-up, inspection, and approval.
- F. Tests.

1.02 REFERENCES

- A. Perform Work in accordance with requirements of Conditions of the Contract and General Requirements as well as provisions of all applicable laws, codes, ordinances, rules, and regulations.
- B. Conform to requirements of reference information listed below except where more stringent requirements are shown or specified in Contract Documents.
 - (1) American Society for Testing and Materials (ASTM)-Specifications and Test Methods specifically referenced in this Section.
 - (2) Underwriters Laboratories (UL) - UL Wires and Cables.

1.03 QUALITY ASSURANCE.

- A. Special Requirements:
 - 1. Tolerances - Specified depths of pressure supply lines and laterals and pitch of pipes are minimums. Settlement of trenches is cause for removal of finish grade treatment, refilling, recompaction, and repair of finish grade treatment to satisfaction on owner.
 - 2. Electrical Power – Work involving connection to 120 volt or greater

electrical service shall be executed by a licensed and bonded electrician and performed in accordance with prevailing codes and regulations.

1.04 SUBMITTALS.

Prepare and make submittals in accordance with conditions of the Contract.

- A. Shop Drawings - Submit Shop Drawings if noted on construction drawings. Include a complete materials list indicating manufacturer, model number, and description of all materials and equipment to be used. Show appropriate dimensions and adequate detail to accurately portray intent of construction.
- B. Manufacturer's Literature - Submit three (3) sets of manufacturer cut sheets for all material components required for installation of irrigation system as indicated herein or on construction drawings, for approval by Consultant prior to installation.
 - 1. Provide an index sheet for each set of material cut sheets outlining item, manufacturer, and model number in order of cut sheets.
 - 2. Highlight or circle specific model or item to be approved on cut sheets that feature more than one model or item.
 - 3. Each cut sheet submittal shall be bound in binder with cover or cover sheet indicating project name, contractor name, address, phone number, and contact person.
 - 4. Material submittals to be provided:
 - a) All Heads
 - b) Remote Control Valves
 - c) Quick Coupler Valves
 - d) Satellites and Pedestals
 - e) Pressure Regulating Valves
 - f) Gate Valves
 - g) Valve Boxes
 - h) Ductile Iron Fittings
 - i) Air Relief Valves
 - j) All Wire and Connectors
 - k) All Pipe
- C. Record Drawings (As-Builts):
 - 1. During field location of irrigation rotor heads and field satellite units, Contractor will be provided with "As-Staked" drawings by Consultant reflecting modifications to any head locations or stationing. Contractor to maintain a record copy of as-staked plans, and redline changes in all piping, valves, satellite locations, spice boxes and station changes.

2. Contractor to bring record drawings up-to-date following installation of each hole, and make available to Consultant if requested.
 3. Prior to scheduling staking activities, Contractor to submit all as-built information to date.
 4. The Contractor's As-Built drawings shall include redline changes in all heads, remote control valves, quick coupler valves, satellites and pedestals, satellite locations, pressure regulating valves, gate valves, valve boxes, spliced boxes, air relief valves, all wire and connectors, station changes, communication cable, power wire and all pipe of each kind and any other items to be provided in this contract.
- D. Operation Manual:
- Submit 3 sets of operations manual to Consultant for approval prior to scheduling final completion walk-through. Manual to include the following in 1" - 3 ring binder:
1. Index sheet stating project name, and listing contractor name, address, phone number and contact person including Primary Sub-Contractors.
 2. Manufacturer cut sheets for all material components of irrigation system and literature from pumping facility.

1.05 DELIVERY, STORAGE, and HANDLING.

Deliver, unload, store, and handle materials, packaging, bundling, and products, in dry, weatherproof, waterproof condition in manner to prevent damage, breakage, deterioration, intrusion, ignition, and vandalism. Deliver in original unopened packaging containers prominently displaying manufacturer name, volume, quantity, contents, instructions, and conformance to local, state, and federal law. Remove and replace cracked, broken, or contaminated items or elements prematurely exposed to moisture, inclement weather, snow, ice, temperature extremes, fire, or job site damage.

- A. Handling of PVC and HDPE Pipe - Exercise care in handling, loading and storing of PVC and HDPE pipe. All PVC and HDPE pipe shall be transported in a vehicle that allows length of pipe to lie flat so as not to subject it to undue bending or concentrated external loads. No transporting of pipe will be allowed using a forklift or forks attached to a loader bucket. Pipe that is being loaded and unloaded with a forklift shall have carpet wrapped around forks. All sections of

pipe that have been dented or damaged shall be discarded, and if installed, shall be removed and replaced with new piping.

1.06 JOBSITE CONDITIONS

Construction drawing pipe routing is schematic and does not indicate all fittings, joints, and angles necessary to properly install piping in and around trees, shrubs, structures, and golf course elements.

- A. Protection of Property:
 - 1. Preserve and protect all trees, shrubs, all golf areas and elements, structures, and paved areas from damage due to Work of this Section. In the event damage does occur, all damage to inanimate items shall be completely repaired or replaced to satisfaction of Owner. Owner shall repair all injury to living plants, and all costs of such repairs shall be charged to and paid by Contractor.
 - 2. Protect buildings, walks, walls, and other property from damage. Flare and barricade open ditches. Damage caused to asphalt, concrete, or other building material surfaces shall be repaired or replaced at no cost to Owner. Restore disturbed areas to original condition.
- B. Protection and Repair of Underground Lines
 - 1. Request proper utility company to stake exact location (including depth) of all underground electric, gas, or telephone lines. Take whatever precautions are necessary to protect these underground lines from damage. In the event damage does occur, Contractor shall repair all damage. Contractor shall pay all costs of such repairs unless other arrangements have been made.
- C. Existing Cart Paths
 - 1. Piping 3" and larger which crosses existing cart paths to be installed by removing complete panels. All lateral piping crossing cart paths to be bored. Dispose of demolished concrete off-site.
- D. Existing Roadways
 - 1. All existing roadways have been sleeved in accordance with irrigation construction drawings. Coordinate installation with Owner and governing agency (Association, City, County, and State Highway Department) including compliance with all requirements thereof or not specifically called out in construction documents. Curb and gutter crossings to be bored or jacked. Asphalt or concrete roadway surface to be saw cut and removed material disposed offsite. Replace roadway material to match existing in compliance with governing agency requirements.
- E. Protection and Repair of Underground Lines
 - 1. Request proper utility company to stake exact location (including depth) of all underground electric, gas, or telephone lines. Take whatever precautions are necessary to protect these underground lines from damage. In the event damage does occur, Contractor shall repair all damage, and Contractor shall pay all costs of such repairs unless

other arrangements have been made.

- F. Replacement of Paving and Curbs - Where trenches and lines cross existing roadways, curbing, etc., damage to these shall be kept to a minimum and shall be restored to original condition.

1.07 WARRANTY/GUARANTEE

Contractor shall warrant materials against defects for a period of two years from date of Substantial Completion. Contractor shall guarantee workmanship for same period. Contractor shall be responsible for coordinating material warranty items with manufacturer/distributor.

- A. Contractor shall repair settling of backfilled trenches that may occur during guarantee period within 48 hours of verbal contact by Owner at no expense to Owner, including complete restoration of damaged property.
- B. Expenses due to vandalism before substantial completion shall be borne by Contractor.
- C. Owner will maintain turf and planting areas during warranty period, so as not to hamper proper operation of irrigation system.

1.08 MAINTENANCE

- A. Furnish the following maintenance items to Owner prior to final Acceptance:
 - 1. 3 Sets of tools required for removing, disassembling, and adjusting each type of sprinkler head and valve supplied on this Project.
 - 2. Two 6 foot valve keys for operation of gate valves.
 - 3. 5 quick coupler keys and matching hose swivels.
 - 4. 2 aluminum keys of sufficient length for operation of blow-off valves.
 - 5. 10 of each type of sprinkler head installed.
 - 6. 1 complete irrigation satellite controller.
 - 7. 2 remote control valves of each type installed.

2.01 MATERIALS:

- A. General Piping:
 - 1. Distribution Piping – PE4710 DR11 HDPE ANSI/AWWA C906 Polyethylene (PE) Pressure Pipe and Fittings, 4 in. and larger.
 - 2. Lateral Lines (3" and smaller) – PE4710 DR11 HDPE ANSI/AWWA C901 Polyethylene (PE) Pressure Pipe and Tubing.
- B. HDPE Piping:
 - 1. All Fused PE4710 material (compound) shall conform to material

requirements specified in pipe standard: ASTM D3035 or ASTM F714 or AWWA C901 or AWWA C906, fitting standard: AWWA C906 or ASTM D3261 or ASTM F2206 or ASTM F1055 as applicable for the pipe or fitting. PE4710 material (compound) shall meet the requirements of ASTM D3350 and shall meet or exceed Cell Classification 445574C and 445576C and shall have a PENT value at 2.4 MPa and 80 °C of >10,000 hours per ASTM F 1473.as it is listed by the Plastics Pipe Institute.

- i. Butt Fusion Fittings - Fittings shall be made of HDPE material with a minimum material designation code of PE4710 and with a minimum Cell Classification as noted in 2B.01A. Butt Fusion Fittings shall meet the requirements of ASTM D3261. Molded and fabricated fittings shall have a pressure rating equal to the pipe unless otherwise specified on the Construction Drawings. All fittings shall meet the requirements of AWWA C906.
- ii. Markings for molded fittings shall comply with the requirements of ASTM D 3261. Fabricated fittings shall be marked in accordance with ASTM F 2206.

C. Electrofusion Fittings:

- i. Fittings shall be made of HDPE material with a minimum material designation code of PE 4710 and with a minimum Cell Classification as noted in 2B.01A. Electrofusion Fittings shall have a manufacturing standard of ASTM F1055. Fittings shall have a pressure rating equal to the pipe unless otherwise specified on the construction drawings. All electrofusion fittings shall be suitable for use as pressure conduits and have nominal burst values of four times the Working Pressure Rating (WPR) of the fitting. Markings shall be according to ASTM F 1055.

D. Flange and Mechanical Joint Adapters (MJ Adapters)

- i. Flange and Mechanical Joint Adapters shall have a material designation code of PE4710 or higher and a minimum Cell Classification as noted in 2B.01A. Flange and Mechanical Joint Adapters can be made to ASTM D 3261 or if machined, must meet the requirements of ASTM F 2206. Flange and MJ Adapters shall have a pressure rating equal to the pipe unless otherwise specified on the construction drawings. Markings for molded or machined flange adapters or MJ Adapters shall be per ASTM D 3261. Fabricated (including machined) flange adapters shall be per ASTM F 2206.
- ii. Back up rings shall be ductile iron per ASTM A536 and DR11 or stronger. Flange Backup Rings shall be Designed Specifically for use with HDPE Flange Adapters and have the following approvals: ASME/ANSI B16.5, ANSI B16.47 SERIES A, CL150, B16.1, CL125, AWWA C207 (B/D/E). All Backup Rings shall be IPS Convuluted Type and have a minimum working pressure of 200 PSI. Ductile Iron Epoxy coated back up rings shall be FM Approved FM 1613, ASTM A536, and GR 65/45/12.

E. Electrofusion Saddles:

1. Electrofusion Transition Saddle shall comply with ASTM D2513, ASTM F1055, AWWA C906, ANSI B1.20.1, ANSI/NSF Standard 61, and shall be Brass 360 Alloy with 1" or 2" FPT or Corp outlet.

2. All fittings, including bolts, nuts, back-up rings, retainer glands, gaskets and other accessories, shall be of domestic manufacture.
- F. Pipe and Fittings Identification:
- i. The pipe shall be marked in accordance with the standards to which it is manufactured.
 - ii. Color identification by the use of stripes on pipe to identify pipe service shall be required. Stripes or colored exterior pipe product shall be purple for non-potable water and blue for potable water.
- G. Gate Valves:
1. 2" lateral isolation gate valve – AquaFuse AFBV-0200Y-MFNO-360 full turn HDPE isolation valve.
 2. Gate valves for 4 inch and larger pipe – Clow F-6100 mechanical joint gate valve or accepted equivalent AFC 2500 mechanical joint gate valve. Iron body, brass or bronze mounted AWWA gate valves with a clear waterway equal to full nominal diameter of valve; mechanical joint-type valves only. Valves shall be able to withstand a continuous working pressure of 150 PSI and be equipped with a square operating nut.
- H. Quick Coupling Valves - Brass 1 ½" body designed for working pressure of 150 PSI; operable with quick coupler. Lavender in color for recycled water and yellow in color for potable water.
- I. Valve Boxes:
- i. Ground Rods - Old Castle Fibrelyte FL08-9" Round Box #2006000 with Lid #2500120, green.
 - ii. Lateral Isolation and Gate Valves - Old Castle Fibrelyte Round Box #2006000 with Lid #2500120, green.
 - iii. Control Wiring Splices - Old Castle Fibrelyte Round Box #2006005 with Lid #2006125, gray.
 - iv. Remote Control Valves – Old Castle Fibrelyte Rectangular Box #2001045 with Lid #SPECIAL, green.
 - v. 120/220 Volt Wiring Splices- Old Castle Fibrelyte Rectangular Box #2001029 with Lid #2006209, gray.
 - vi. Air Relief Valve and Blow-off Valve Assemblies - Old Castle Fibrelyte Rectangular Box #2006042 with Lid #SPECIAL, green.
 - vii. Quick Coupling Valves – Carson #0809 Round Box, green.
- J. Electrical Control Wiring (Regency or Paige Only):
- K. Low Voltage:
1. Electrical Control Wire –Regency or Paige 14PE65 (signal wire) and 12PE45 (common wire) and 14PEXX (spare signal wire), Polyethylene with soft drawn bare copper conductor meeting the requirements of ASTM specifications B-3 Or B-8, and insulation thickness of 0.045". All cables shall be tested physically and electrically in accordance with UL Standard 493, and 83 (paragraphs 28.1,29.1 and 29.2). All reels and

cartons bear UL labels.

2. Wire Colors:
 - a. Control Wires - Yellow.
 - b. Common Wires - Blue.
 - c. Spare Wires – Different color control and same color common wire (labeled at terminations).
3. Where wire paths of different field satellite units or control system hubs cross each other, both common and control wires from each satellite units shall be different colors approved by Consultant (black, red, white and green not allowed).
4. Connections and Splices - 3M or equivalent epoxy type compounds, Paige Electric DBM, or 3M DBY/DBR/DBY-6/DBR-6 connectors. PVC adhesives or sealing compounds are not allowed.
 - i. Communication Wire – Regency 1602THDS5 or accepted equivalent (Paige).
 - ii. High Voltage – Type require by local codes and ordinances. (220 v)
1. Regency or Paige THWN-THHN, 600 Volt with 75 degree heat, moisture and flame retardant PVC.
2. Wire Colors (220 v.)
 - a. Ground - Green
 - b. Power – Black
 - c. Common - Red
- i. Weather Station Cable – Regency DBS203P1 or accepted equivalent (Paige).
- ii. Locating Tape - Magnetic backed, 6” wide, manufactured by Markline or accepted equivalent.
- L. Sprinkler Heads - As indicated on drawings. Fabricate riser units in accordance with details on Drawings.
- M. Pipe bedding material – Screened excavated material or SE30 sand. If sand is required, contractor to provide.
- N. Air release valves – Crispin PL10A 2”
- O. Field Satellite Unit - As indicated on drawings and construction details.
- P. Central Control Computer – Existing.
- Q. Weather Station – As indicated on drawings and construction details.

3.01

PREPARATION

- A. Staking shall occur as follows:
1. Consultant will coordinate with Contractor to layout irrigation equipment prior to installation. Contractor to also make available two individuals to assist in layout operation, if requested by Consultant. Following each day staking, Consultant will provide Contractor within 48 hours an "As-Staked" drawing reflecting any field changes to original design and layout.
- B. Coordinate with Owner and locate existing distribution and lateral piping that may conflict with installation of irrigation improvement. Expose existing piping/wiring by hand digging prior to trenching or vibratory plow installation of new piping/wiring to avoid damage. If any existing piping/wiring is damaged, repair immediately to satisfaction of Owner.
- C. Sod Removal shall occur as follows:
1. All excavated areas are to have grass and top 1 1/2" – 2" of soil removed prior to excavating. Remove all existing turfgrass using approved mechanical sod cutter over trench routing to width of trench excavation. Store removed sod in shaded area. Re-lay sod same day following completion of backfill and compaction of that days excavation. Sod not re-laid within same day shall be covered with wetted burlap or canvas tarp.
 2. Sodded area must be compacted to match surrounding grade, and top dressed with native soil to fill in any depressions or gaps in sod. Compaction and top dressing must occur on same day as sod re-laying.
- D. Trenching - Trench excavation shall follow, as much as possible, layout shown on Drawing. Dig trenches straight and support pipe continuously on bottom of trench. Trench bottom shall be clean and smooth with all rock and organic debris removed. Distribution piping trenches shall be over-excavated as required to allow for bedding material. Trench depth shall be uniform as required to meet minimum depth requirements for type of piping.
1. Clearances:
 - a) Piping 3 Inches and Larger - Make trenches of sufficient width (14 inches minimum) to properly assemble and position pipe in trench. Minimum clearance of piping 3 inches and larger shall be 5 inches horizontally on both sides of the trench.
 - b) Piping smaller than 3" - If installed through use of mechanical trencher, trenches shall have a minimum width of 7 inches.
 - c) Line Clearance - Provide not less than 6 inches of clearance between each line, and not less than 12 "of clearance between lines of other trades.
 - d) Distribution Piping Clearance – Provide not less than 10' of clearance between distribution piping and dedicated greens distribution piping.
 2. Pipe and Wire Depth:
-

- a) Distribution Piping – 30" from top of pipe. (See detail)
 - b) Distribution Piping Bedding - 4" above and 4" below piping and to width of trench.
 - c) Lateral Piping – 18" from top of pipe.
 - d) Control Wiring - Side and 2" below top of distribution piping.
 - e) Communication Cable - Side and 2" below top of distribution piping, opposite 120 volt wiring.
3. Boring:
- a) Boring will be permitted only where pipe must pass under obstruction(s), which cannot be removed, and must be approved by Owner if not specifically indicated on construction drawings. Final density of backfill shall match that of surrounding soil. Use of sleeves of suitable diameter is acceptable if installed first by jacking or boring, and pipe laid through sleeves. Observe same precautions as though pipe were installed in open trench.
 - b) Piping 2 1/2" and smaller that crosses cart paths shall be installed by boring or jacking.
- E. Vibratory Plow - All piping 2 1/2" and smaller shall be installed through use of vibratory plow method.
- 1. Bullet size no smaller than one (1) nominal size larger than pipe.
 - 2. All wiring to be laid through plow cut with adequately sized wire chute.
 - 3. All fitting and head excavations shall conform to trenching method of turfgrass removal, excavation, backfill, compaction, and relaying of sod.
 - 4. Equipment must be adequately weighted to prevent damage to existing turfgrass.
 - 5. Plowing may be discontinued by Owner after inclement weather, or if course conditions are damaged unacceptably by plowing operation.
- F. Excavation of Rock - Refer to Special Provisions for activities required if rock is encountered.

3.02

INSTALLATION - Locate equipment as near as possible to locations designated on construction drawings. Consultant shall approve deviations prior to installation.

- A. Piping
- 1. Snake lateral pipe in trench as much as possible to allow for expansion and contraction.
 - 2. When pipe laying is not in progress, or at end of each day, close pipe ends with tight plug or cap. Perform work in accordance with good practices prevailing in piping trades.
 - 3. Coordinate distribution piping installation with required bedding operations.

4. Lay pipe and make all plastic-to-plastic joints in accordance with manufacturer's recommendations.
- B. Control Wiring (if utilized).
1. Low Voltage Wiring:
 - a) Bury control wiring between field satellite unit and head valves in distribution piping trenches, with wires consistently located 2" below top and to one side of pipe.
 - b) Install control wiring with lateral piping to service each head valve.
 - c) Install control wiring not with distribution piping or lateral piping in 24" trench with magnetic backed locating (warning) tape at 6" depth.
 - d) Bundle all 24-volt wires at 10-foot intervals with electrical tape.
 - e) Provide an expansion loop at distribution piping angle fittings, and at minimum 500 feet intervals. Form expansion loop by wrapping wire at least 8 times around a 3/4-inch pipe and withdrawing pipe.
 - f) Make splices and electric control valve connections using 3M-DBY connectors or similar dry splice method.
 - g) Install control wire splices in a separate splice valve box.
 - h) Install one control wire for each Valve-In-Head and Remote Control Valve.
 - i) Run all future wires to point indicated on drawings. Coil a minimum of ten (10) feet at termination and install in 10" round valve box (separate from isolation valve box). Label all wires at termination.
 2. High Voltage Wiring for Automatic Controller (if utilized).
 - a) Provide 220-volt power connection to field satellite units as indicated on construction drawings, in accordance with local codes and ordinances.
 3. Communication Cable: Installed as per control system manufacturer's specifications.
 - a) Install cable consistently located 2" below top and to one side of pipe, opposite control wiring and/or high voltage wiring.
 - b) Splices to occur only at field satellite unit pedestal unless approved by Consultant prior to installation
 - c) Install communication cable not with pressure supply line in 24" trench with magnetic backed locating tape at 6" depth.
- C. Field Satellite Unit
1. Install field satellite unit in accordance with manufacturer's instructions and as detailed.

2. Connect head valves to field satellite unit in numerical sequence as shown on As-Staked Drawings.
 3. Consultant/Owner shall approve final location of field satellite unit prior to installation.
 4. Each field satellite unit shall have dedicated separate ground wires per detail #10, Sheet I-6 including grounding rod and plate.
 5. Above ground conduit shall be rigid galvanized with appropriate fittings.
 6. Below ground conduit shall be grey PVC SCH 40 UL651/NEMA TC2. See Sheet I-4 for conduit schedule.
 7. Label each field satellite unit with letter designation (indicated on As-Staked Drawings) with 2" high vinyl adhesive letters on inside of front panel cover. Lettering material to be approved by Consultant prior to installation.
- D. Quick Coupling Valves - Install quick couplers on double swing-joint assemblies. Angled nipple relative to pressure supply line shall be no more than 45 degrees and no less than 10 degrees. Install quick coupling valves as detailed.
- E. Blow-Off Valves - Install where shown on drawings or where located as detailed.
- F. Valve Boxes:
1. Install one valve box for each type of valve installed as detailed flush with grade.
 2. Valve box to rest on gravel sump. Place final portion of gravel inside valve box after valve box is backfilled and compacted.
- G. Gate Valves - Install where shown on Drawings or where located as detailed.
- H. Sprinkler Heads
1. Install sprinkler heads where surveyed by Consultant as detailed.
 2. Set plumb to finish grade as detailed. Install heads on double swing-joint risers as detailed.
 3. Adjust part circle heads for proper coverage. Consultant may request nozzle changes or adjustments without additional cost to the Owner.
 4. Part circle sprinklers along cart paths, streets, greens, tees or other edge lines are to be no further than twelve inches away from the surface edge (greens edge are defined by the outside edge of green collar. If the sprinklers are installed farther than 12" from this edge, the contractor shall be responsible for the relocation of the sprinkler head at no additional cost to the owner.
- I. Backfilling - All excavations are to be backfilled and compacted on same day. In areas of fitting installation on distribution piping, excavation may be left open for maximum seven (7) calendar days provided it is properly barricaded and marked in accordance with OSHA standards. Under no circumstances can excavations inside

fairway limit or around greens, tees, or bunkers be left open for more than 8 hours.

1. All distribution piping lines shall be bedded with ½" minus material screened by Contractor from trench excavation or SE30 sand. Bedding to be 4" below invert of pipe, to 4" above top of pipe and width of trench.
2. Materials - Excavated material is generally considered satisfactory for backfill purposes after completing bedding requirements. Backfill material shall be free of rubbish, vegetable matter, frozen materials, and stones larger than 2 inches in maximum dimension. Do not mix subsoil with topsoil. Material not suitable for backfill shall be hauled away. Contractor shall be responsible for providing and Contractor shall be responsible for installing suitable backfill if excavated material is unacceptable or not sufficient to meet backfill, compaction, and final grade requirements.
3. Compact backfill to 90% maximum density in 6" lifts, determined in accordance with ASTM D155-7 utilizing the following methods:
 - a) Mechanical tamping.
 - b) Puddling or ponding. Puddling or ponding and/or jetting are prohibited within 10'- 0" of building or foundation walls.

J. Piping Under Paving:

1. Provide for a minimum cover of 30 inches between the top of the pipe and the bottom of the aggregate base for all distribution piping installed under asphaltic concrete or concrete paving, and 18 inches for lateral piping.
2. Piping shall be bedded with construction grade sand or squeegee - 4 inches below pipe to 4 inches above pipe and width of excavation.
3. Compact backfill material in 6 inch lifts at 95% maximum density determined in accordance with ASTM D155-7 using manual or mechanical tamping devices.

3.03

FIELD QUALITY CONTROL

- A. Flushing - After piping, risers, and lateral isolation, air relief, and blow-off valves are in place and connected, but prior to installation of sprinkler heads and quick coupling valves, thoroughly flush piping system under full head of water pressure from dead end fittings. Maintain flushing for 5 minutes through furthest valves. Close lateral isolation valves after flushing.
- B. Walk-Through for Final Completion:
 1. Arrange for Consultant's presence a minimum of 48 hours in advance of walk through.
 2. Show evidence to Consultant that Owner has received all accessories, charts, and equipment as required before Final Completion walk-through is scheduled.
 3. Operate each station, or show equipment assembly identified as deficient at substantial completion walk through for Consultant at time

of final completion walk through to insure correction of all incomplete items.

4. Items deemed not acceptable by Consultant shall be reworked to complete satisfaction of Consultant.
5. If after request to Consultant for walk-through for Final Completion of irrigation system, Consultant finds items during walk through which have not been properly adjusted, reworked, or replaced as indicated on list of incomplete items from substantial completion walk-through, Contractor shall be charged for all subsequent walkthroughs. Funds will be withheld from final payment and/or retainage to Contractor, in amount equal to additional time and expenses required by Consultant to conduct and document further walk-throughs as deemed necessary to insure compliance with Contract Documents.

3.04

ADJUSTING - Upon substantial completion of installation, "fine-tune" entire system by setting regulating valves, adjusting patterns, changing nozzles and setting pressure reducing valves controls at proper pressure to provide optimum and efficient coverage. Flush and adjust all heads for optimum performance and to prevent over spray onto roadways, and buildings as much as possible.

- A. If it is determined that irrigation adjustments will provide proper and more adequate coverage, make such adjustments prior to Final Acceptance, as directed, at no additional cost to Owner. Adjustments may also include changes in nozzle sizes, and degrees of arc.
- B. All sprinkler heads shall be set perpendicular to finish grade unless otherwise designated.
- C. Areas that do not conform to designated operation requirements due to unauthorized changes or poor installation practices shall be immediately corrected at no additional cost to the Owner.

END OF SECTION

**Specification for
MCI Endurance Irrigation Prefabricated Pumping System**

1.00 General. To provide a single source responsibility for the manufacture, warranty, service, and operation of a prefabricated, skid mounted, fully automatic pumping system for non-potable water. The pumping system shall automatically maintain a constant discharge pressure regardless of varying flow demands within the station rating. Pumping system shall conform to the following specifications in all respects. This specification covers minimum requirements; however, it should not be construed as all inclusive. It is the successful vendor's responsibility to include all necessary appurtenances to provide for a complete, automatic, smooth operating, and reliable pumping system. The manufacturer shall supply a complete set of general arrangement drawings, electrical power schematics, and control schematics in the operations & service manual.

1.10 Manufacturer.

A. The pumping system shall be as manufactured by MCI Pumping Systems, Dallas, Texas, U.S.A., as basis of design. For consideration of a proposed alternate deduct system, the contractor shall furnish the following data to the engineer:

1. A complete specification for the pumping system proposed as an equal.
2. A statement of full conformance to the following specifications signed by an officer of the manufacturer.
3. A general arrangement drawing showing overall dimensions and all piping layouts.
4. Complete submittal data for all components.
5. An electrical schematic showing power and control wiring and panel layout drawing.
6. Installation list of 200 similar pumping systems which have been in operation for a minimum of 3 years.
7. Location of closest factory owned or trained service centers.
8. Manufacturer's UL electrical industrial control panel file number UL508A and CSA-C22.2 No. 14.
9. Manufacturer's complete packaged pump system UL category QCZJ and QCZJ7 file number.
10. Voided
11. A complete list of all field service offices, complete with phone numbers and contact information, having the fields service office closest to the site clearly indicated.
12. ISO9001 Certification - 2015.

B. Voided

C. All bids shall be submitted using the MCI system as basis of design. Alternate manufacturer's shall comply with quality standards as MCI.

1.20 REFERENCES

A. American Water Works Association (AWWA)

- B. American National Standards (ANSI)
 - C. American Standards for Testing Materials (ASTM)
 - D. Hydraulic Institute
 - E. American Society of Mechanical Engineers (ASME)
- 1.30 Submittal Data Required.** Upon City acceptance of contractor's low bid, provide three copies of the submittal for approval, properly dated, sectioned, bound, titled, with a table of contents, including no less than the following:
- A. Full set of mechanical drawings including skid framing, connection dimensions, and equipment layout, all to scale.
 - B. Full electrical schematic, including three-line power schematic, ladder logic, PLC, and system interface.
 - C. Properly indicated pump curves which include pumping system internal losses, manufacturer's name (other than pumping system manufacturer), pump model number, motor type, RPM, and horsepower
 - D. Properly marked cut sheets for each component of the pumping system, both mechanical and electrical
 - E. Copies of UL authorizations under categories and QCZJ/QCZJ7 and UL508A and CSA-C22.2 No. 14.
 - F. Complete description of the system including operation sequence, alarm sequence, receiving instructions, storage instructions and control feature description
 - G. Operation and Maintenance Manuals shall be submitted at the time the pumping system is shipped to the site by the manufacturer. Manual shall have been prepared for this specific project and shall not be a general manual applicable to many systems. Manual shall bear the same format as the submittal and shall contain full submittal information. In addition, technical manuals shall be included for each piece of equipment that is field serviceable.

1.40 Sequence of Operation (PLC):

- A. General Items applying to each alarm circuit shall include a display of condition on the system display, the illumination of a red indicating light, and manual reset of a persistent condition.
- B. Alarm sequence
 - 1. Low Discharge Pressure alarm circuit shall stop pumping system in the event discharge pressure drops below normal level. Operator interface device, mounted in enclosure door, shall signal low discharge pressure. Pumping system shall not operate until safety has been manually reset.
 - 2. High Discharge Pressure alarm circuit shall shut down pumping system if discharge pressure reaches a predetermined high level. Operator interface device, mounted in enclosure door, shall signal high discharge pressure. Pumping system shall not operate until pressure is reduced and alarm has been reset.

3. Low Inlet Pressure alarm shall protect the pumps from operating without adequate inlet pressure, which could cause damage to pumps. A pressure sensor shall be installed on the suction manifold to monitor the suction pressure. This feature shall include a short time delay to handle transient conditions which can occur during the starting of a pump. Operator interface device (OID), mounted in enclosure door, shall signal low suction pressure. Pump system shall not start until low suction pressure is corrected and circuit has been reset. Low suction pressure alarm shall pertain to flooded suction and booster applications.
4. Main phase failure and low voltage safety circuit shall retire the pumping system if it experiences low voltage, phase failure or phase reversal as monitored at line-side of control enclosure. Phase monitor shall have a time delay to allow for transient low voltage during motor starting and to allow maximum motor protection. Operator interface device, mounted in enclosure door, shall signal phase failure for any affected pump.
5. Individual Phase Failure and Low Voltage alarm circuitry, as part of the overload relay circuit, shall retire any pump that experiences low voltage, phase failure or phase unbalance as monitored at the load-side of each pump motor contactor by the overload relay. Each pump motor shall have its individual protective device and time delay to allow for transient low voltage during motor starting to allow maximum motor protection. The individual pumps or pumping system shall not operate until the voltage problem has been corrected and safety has been manually reset. Incoming phase monitor safety circuit as the only phase failure sensing device is not acceptable.

C. Functional Sequence, Pressure and Flow Sequencing.

1. Lead irrigation pump shall start immediately on a drop in system pressure (Adjustable).
2. PLC shall control the speed of the pump to produce constant pressure regardless of demand within the pump's capacity. The PLC shall not allow both pumps to operate at the same time.
3. On failure of lead pump to start or to continue running, the next pump in sequence shall start in its place. Alarm light shall be illuminated, and individual pump fault shall be displayed.
4. Equal sized pumps shall be alternated based on accumulated motor run time after the running pump is retired. The pump with the least run time shall be started first.
5. All data accessible on control panel HMI shall also be available remotely.

1.50 Codes.

- A. Without exception, pumping system shall be UL listed as finally assembled under UL category QCZJ/QCZJ7.
- B. Control panel with controls shall be built in accordance with NEC, and U.L. standards. Without exception, the electrical components and enclosure shall be labeled as a complete U.L. listed industrial control panel assembly, with manufacturer's U.L. label applied to the door, under UL category UL508A, control panels.

2.0 PUMPS and MOTORS:

- A. This specification includes the supply of centrifugal pump(s).

2.10 QUALITY ASSURANCE

- a. All pumping equipment furnished under this Section shall be of a design and manufacture that has been used in similar applications, and it shall be demonstrated to the satisfaction of the Owner that the quality is equal to equipment made by that manufacturer specifically named herein.
- b. Unit responsibility. Pump(s), complete with motor, necessary guards and all other specified accessories and appurtenances shall be furnished by the pump station manufacturer to ensure compatibility and integrity of the individual components and provide the specified warranty for all components.
- c. The centrifugal pump(s) specified in this section shall be furnished by and be the product of one manufacturer.
- d. Pumps are to be engineered and manufactured under a written Quality Assurance program. The Quality Assurance program is to be in effect for at least ten years, to include a written record of periodic internal and external audits to confirm compliance with such program.
- e. Pump(s) are to be engineered and manufactured under the certification of ISO-9001:2015.

2.20 PERFORMANCE

- A. The pump(s) shall be designed for continuous operation and will be operated continuously under normal service.

OPERATION CRITERIA

- a) Total dynamic head shall be as measured at the discharge of the pump and shall include velocity head and vertical static head from the minimum water level to the centerline of the pump discharge.
- b) Maximum pump speed shall not exceed 1800 RPM.
- c) Driver size shall be limited to 10HP maximum.
- d) Driver must be TEFC.
- e) Liquid pumped is reuse water with a maximum temperature of 80 deg. F.

2.30 PUMPS

2.30 End Suction Centrifugal Pumps.

- A. The main pumps shall be horizontal close coupled end suction centrifugal pumps with flow and head as defined below. The pumps shall be manufactured according to the standards of the Hydraulic Institute and to ANSI specification No. B58.1. The pump casing shall be ASTM 48, class 20B, cast-iron capable of hydrostatic test @ 150% of maximum discharge pressure and have both suction and hub replaceable wear ring. All mating parts shall have a register fit to ensure alignment.
- B. The impeller shall be an enclosed, single piece bronze or cast-iron casting completely machined on all outside surfaces or be fabricated from stainless steel, and dynamically balanced at time of pump assembly. The impeller shall be keyed to the shaft and securely fastened with a vibration resistant lock screw and washer.
- C. The packing box shall contain a mechanical seal for the specific application.
- D. The impeller shall not contact the suction or hub wear ring under any operating load condition.
- E. The pump and motor shall be connected by an ASTM 48, class 30, cast-iron bracket incorporating a full isolating shield with dual slinger rings to prevent moisture from entering the front motor bearing. The pumping systems manufacturer shall have a network of service centers which shall have available spare parts and trained pump technicians to handle service, repair, and warranty procedures. The pump shall be as manufactured by Goulds or Cornell.

- 2.40 **Totally Enclosed Fan Cooled Motors.** Motors for the pumps shall be of United States manufacture, and be TEFC, 1.15 service factor, and class F insulation. Motors shall be wound for the starting

configuration as called out in the schedule. Design pump brake horsepower shall not exceed 98% of motor horsepower exclusive of service factor. Maximum pump run out horsepower shall not be greater than motor rating inclusive of service factor. The motor bearings shall be selected to have a minimum life of 5 years continuous operation. The motor shaft shall be high-strength steel protected by a bronze or stainless-steel shaft sleeve secured to the shaft. Motors shall be as manufactured by U.S. Electric, or Baldor.

- 2.50 Motor Space Heater.** The pumping system manufacturer shall provide on each pump motor a 120-volt, single phase space heater of ample size to prevent condensation from occurring within the motor during non-operating periods. The space heater shall be de-energized when the motor is running.

VALVES:

- 3.10 Lug Butterfly Pump Isolation Valves:** Valve shall be of the lug style butterfly type. Valve shall have one-piece body cast from Ductile Iron. Stem shall be stainless steel. Disc shall be 316SS. Seat shall be EPDM elastomer, one-piece construction, and shall also form the flange sealing gaskets. Valves 6" and smaller shall have a lever operator. Valves 8" and larger shall have a gear operator with hand wheel. Valve shall be rated at 200 PSI bubble shutoff. Pump Isolation isolation valve shall be as manufactured by Smith Cooper or equal.
- 3.20 Pump Check Valve.** Pump check valves shall be provided on the discharge of each pump and sized per the pump schedule. Check valves shall be of the silent type. Check valves shall begin to close as forward velocity diminishes and shall be fully closed at zero velocity preventing flow reversal. Valve bodies shall be cast from Ductile Iron and shall be coated internally and externally with NSF/ANSI 61 certified fusion bonded epoxy. The valve design shall incorporate a center guided, spring loaded poppet, guided at opposite ends and having a short linear stroke that generates a flow area equal to the pipe diameter. Internals shall be machined 316SS disc, seat, and stem guide. Disc shall incorporate an EPDM insert to provide resilient sealing. **Dual disc style or swing check valves shall not be accepted.** Valves shall be sized to permit full pump capacity to discharge through them without exceeding a pressure drop of 2.5 PSI. Check valves through 8" shall be model 888 rated at 400 psi working pressure as manufactured by Flomatic or Apco.
- 3.30 Lug Pattern Butterfly Station Isolation Valve.** Valve shall be of the lug style butterfly type. Valve shall have one-piece body cast from Ductile Iron. Stem shall be stainless steel. Disc shall be 316SS. Seat shall be EPDM elastomer, one-piece construction, and shall also form the flange sealing gaskets. Valves 6" and smaller shall have a lever operator. Valves 8" and larger shall have a gear operator with hand wheel. Valve shall be rated at 200 PSI bubble shutoff. Station isolation valve shall be as manufactured by Smith Cooper or equal.

FABRICATION:

- 4.00 Aluminum Pump System Base and Shelter.**
- A. The pumping system shelter shall be a durable, corrosion-resistant, fabricated aluminum structure comprised of formed wall and roof panels and doors. The inside height shall not be less than five and a half feet near the walls. The sloped maximum height at the front shall determine the overall exterior height of approximately 7'-0".

- B. Building walls and roof shall be manufactured from marine grade aluminum, 1/8" thick, and formed for rigidity. Panels shall be riveted or bolted together. Doors shall be provided front and rear, providing complete access to the controls and the pumps for adjustment and maintenance.
- C. The roof shall include a gabled design.
- D. Building shall include dual full opening doors front and rear, providing full access to the mechanical and electrical components for adjustment and maintenance. Doors shall include latches, lockable by padlock.
- E. Door jams shall be molded as an integral part of the wall.
- G. Environmental Control Systems
 - 1. Exhaust fan and inlet louver - Exhaust fan shall be a high capacity direct drive propeller wall mounted fan. Fan shall be 12" in diameter and shall come complete with a wall collar and exhaust damper. Inlet louver shall be a fixed damper. Assembly shall include fan filter. Fan capacity shall be at least 360CFM with filter in place.
- H. All conduit and wiring shall be installed in accordance with the latest edition of the National Electric Code.
- I. Pump station skid shall be constructed of a durable, corrosion-resistant, fabricated marine grade aluminum.

4.10 FDA Lined Piping, Fusion Bonding. All piping inclusive of manifolds shall be constructed from ASTM A105 schedule 40 pipe or heavier as required to maintain a 3 to 1 pressure safety factor. **(Sch10 piping shall not be allowed)** All piping shall be hydrostatically tested to 500 psi. All steel piping shall be blasted internal to SSPC-SP10 Zinc based primer coated and lined with an FDA approved fusion bonded epoxy. Epoxy shall be applied according to manufacturer's requirements, thickness shall be tested throughout and found to be without holidays. **Proposed alternate systems utilizing non-internally coated piping or coated piping less than standard weight or Sch40 shall not be allowed.**

4.20 Piping Support. All piping supports shall cover 120 degrees of arc under the piping and support the weight of the piping and the water it contains. Thrust shall be resisted by proper thrust blocking of the supply and distribution system piping which shall be connected to the pumping system in the field, and through proper anchoring of the pump station to the slab according to manufacturer's recommendations. **Piping supports not occupying at least 120 degrees of arc shall not be accepted.**

SENSORS:

5.00 Pressure Gauge. A pressure gauge shall be mounted on each header, complete with isolation ball valves. All gauges shall be silicone oil filled to reduce wear due to vibration. Accuracy shall be within 1.5%. Gauge diameter shall be 3.5" minimum. Range shall be at least 30% higher than the highest pressure attainable from the pumps at shutoff head conditions and shall include bronze internals. Pressure gauge shall be as manufactured by Wika.

5.10 Pressure Transducer. Pressure transducers shall be mounted on the suction and discharge manifolds and shall provide all pressure signals for the control logic. Pressure transducers shall be a solid-state bonded strain gage type with an accuracy of at least plus/minus 0.25% and constructed

of 316L stainless steel. Resolution of the transducer shall be greater than the resolution of the analog to digital conversion for PLC operation. Transducer shall be rated for pressures greater than station discharge pressure, and shall provide gauge pressure output, rather than absolute pressure. Pressure transducer must be programmable and have a 4-digit LED display.

5.20 Magnetic Flowmeter. This section describes the requirements for an electromagnetic flow meter and microprocessor-based signal converter. Under this item, the pump station manufacturer shall furnish and install the magmeter equipment and accessories as indicated on the plans and as herein specified. The electromagnetic flow meter shall consist of a flow sensor based on Faraday's Law of Electromagnetic Induction and microprocessor-based signal converter, type MAG 5000.

The sensor flow tube and liner material shall be constructed of a composite elastomer (Ebonite) surrounded by two integral coils. Measurement and grounding electrodes shall be 316 stainless steel. Connecting flanges shall be carbon steel. (12" – 48") *The sensor flow tube shall be 304 stainless steel surrounded by two coils. Liner material shall be hard rubber.* Installation: A minimum of 5 pipe diameters up stream and 3 pipe diameters downstream are recommended.

- Operating Temp: -20 to +160° F.
- Submergence: The sensor shall be pedestal sealed against accidental submersion to 3 feet for 30 minutes standard, or permanently submerged to 30 feet when the terminal box is backfilled with a non-setting, transparent potting material.
- Signal converter: Type MAG 5000.
- Enclosure: NEMA 4X enclosure
- Display: Background illumination with alphanumeric 3-line, 20-character display to indicate flow rate, totalized values, settings, and faults (a blind version of the MAG 5000 signal converter is available).
- Power supply: 115/230 VAC or 11-24VDC.
- Operating temperature: -5 to +120 degrees F.
- Outputs: 0-20 mA or 4-20 mA into 800 ohms max. One relay rated at 42 VAC/2 A, 24 DC/1 A. Digital (frequency or pulse) for external display of flow rate or totalizer.
- Communications: Optional HART available.
- Sensor and signal converter performance:
- Flow Range: 1.5 fps to 33 fps for accuracies stated below.
- Accuracy: 0.5% of actual flow.
- Separation: Maximum distance of 900 feet between signal converter and sensor without the use of any additional equipment.
- Bi-directional flow capabilities shall be standard
- Totalizer: Two eight-digit counters for forward, net, or reverse flow
- The electromagnetic flow meter shall be a Siemens Model MAG 5100 W flow sensor with a Siemens Model MAG 5000 signal converter. Insertion type flow meters will not be accepted.

Calibration: Each flow sensor shall be wet calibrated and all the calibration information and factory settings matching the sensor shall be stored in an integrally mounted SENSORPROM® memory unit. The SENSORPROM® shall store sensor calibration data and signal converter settings for the lifetime of the product. At initial commissioning, the flowmeter commences measurement without any initial programming. Any customer specified settings are downloaded to the SENSORPROM®. Should the signal converter need to be replaced, the new signal converter will upload all previous settings and resume measurement without any need for reprogramming or rewiring. A certificate of calibration shall accompany each flow sensor.

Signal Converter Function Details

The following functions shall be provided:

- All programming shall be accomplished through an integral keypad and all programming shall be protected by a user-defined password.
- The signal converter shall be integrally mounted or remotely mounted using a remote-mount kit provided by the manufacturer.
- The signal converter shall provide a 0/4-20 mA DC signal proportional to flow rate into 800 ohms max. Output selectable as unidirectional or bi-directional.
- The relay shall be programmable as error indicator, limit alarm or pulsed output.
- The signal converter system shall be equipped with an error and status log with 4 groups of information.
 1. Information without a functional error involved.
 2. Warnings which may cause malfunction in the application
 3. Permanent errors, which may cause malfunction in the application.
 4. Fatal error, which is essential for the operation of the flowmeter.
- A system error shall be indicated by a flashing icon on the display or activation of the relay when set as an error alarm.
- The first nine standing errors shall be stored in the error pending log. A corrected error is removed from the error pending log. A status log shall be provided to store the last 9 error messages received for 180 days regardless of correction.

ARCHITECTURAL and PROTECTIVE COATINGS:

- 6.10 Paint.** Cleaned aluminum skid and shelter surfaces shall be coated with electrostatically applied polyester TGIC to a thickness of no less than 3.5 mils and baked to 450 degrees F. Impact resistance shall be to 80 in-lbs per ASTM D-2794 with no appearance of cracks down to the substrate. The coating shall pass a 1000-hour salt spray test per ASTM B117 and Humidity resistance test of 1000 hours with a maximum undercutting of 1/8" and no blistering.
- 6.11 Bolts.** All bolts, nuts, washers, and lock washers used in the assembly of the pumping system shall be 316SS to retard corrosion.

7.00 CONTROLS:

- 7.10 Scope:** Furnish UL Listed 508a complete control panel that will provide the necessary controls to efficiently control the irrigation pumping system. The system shall be comprised of the components described in this section and specified in the technical datasheet. The system will provide all of the required components including but not limited to main disconnect, surge protection, phase monitor, fuses/blocks, Variable Speed Drive, high speed drive fuse protection, dual interlocked contactors, solid state overloads, door devices, color HMI touch screen and plc.
- 7.20** Control system shall be a standard product with a configurable program. The system shall not use a custom program or one that requires modification to provide the specified system control. The HMI must use a manufacturer's standard offering without requiring screen or database changes.

Supply power is as called out on the technical datasheet.

Ratings/Listings

- a) All products shall be UL labeled and meet the requirements of UL508a and maintain cUL.
- b) 100 ka Short Circuit Current Rating of the panel
- c) Service Entrance Rated
- d) Manufactured by an ISO9001:2015 facility

Environmental requirements

- e) Temperature 14 to 122 Deg F.
- f) Relative Humidity 98% maximum

Construction

- 7.30** Enclosure shall be a UL Listed Type 4X 316SS Enclosure with a powder coat finish. All penetrations in the panel shall be made prior to the application of the powder coat finish. Powder coat finish shall be a polyester Textured RAL 7035 heat guard finish. The powder coat process shall be a minimum 5 stage process. The enclosure shall contain a pour in place two-part urethane gasket. **Adhesive strip gaskets shall not be allowed.** The enclosure door shall use a 3 Point latch system.
- 7.40** **Surge Arrestor** - Incoming Power shall be a UL Type 1 with bicolor led status indicators. 120 Vac shall be SQD with replaceable modules.
- 7.50** **Main Service Disconnect:** Main service disconnect shall be a rotary fusible disconnect with J Class fuses. Handle shall be padlock able and interlock with main panel door to prevent opening the door without first turning the disconnect to the off position. See through covers shall be provided to cover line and load side lug connections.
- 7.60** **Phase Monitor:** Phase monitor shall be an 8 Pin replaceable type unit with line side fuse protection. Provides protection from low/high voltage, phase loss, reverse phase, and voltage unbalance. Unit shall be provided Diagnostic LED with adjustable trip delays.
- 7.70** **Short Circuit protection:** Control Panel shall be protected by J Type fuses. XL Motor shall be protected by J Type fuses. Fuse blocks shall be finger safe and provided with covers. High clarity see-through covers allow for inspecting wire terminations or to take thermography measurements without removing cover. Probe holes included for easy, safer testing and troubleshooting. Built-in lockout/tag out feature improves safety. VSD shall be protected by high speed J type fuses such as the Bussman DFJ.

Panel will require a set of mechanically interlocked contactors with one solid state overload per pump. Contactors shall be Allen Bradley C series contactors. Coils shall be 110 Vac control and include varistor protection. Solid state overload shall be E1 Plus as manufactured by Allen-Bradley. Overload shall provide phase loss protection, ambient compensated and wide current adjustment range of 5:1.

- 7.80** **Variable Speed Drive:** One variable speed drive will be provided sized of the appropriate horsepower per equal size of main pumps. Furnish complete VFD as specified herein or in the equipment schedule for loads designated to be variable speed. VFD's shall be user-selectable for either constant or variable torque loads.

The VFD shall be a six-pulse input design. The VFD shall be of a PWM output design utilizing current IGBT inverter technology and voltage vector control of the output PWM waveform and shall output a waveform that closely approximates a sine wave.

The manufacturer of the VFD shall demonstrate a continuous period of manufacturing and development of VFD's for a minimum of 40 years. VFD's that are brand-labeled are not acceptable. The VFD shall produce an output waveform capable of handling maximum motor cable distances of up to 1,000 ft. (unshielded) without tripping or de-rating.

VFD shall automatically boost power factor at lower speeds. In variable torque applications, the VFD shall provide a CT-start feature and be able to provide full torque at any speed up to the base speed of

the motor. In either CT or VT mode, the VFD shall be able to provide its full rated output current continuously and 110% of rated current for 60 seconds.

Switching of the input power to the VFD shall be possible without interlocks or damage to the VFD at a minimum interval of 2 minutes. Switching of power on the output side between the VFD and the motor shall be possible with no limitation or damage to the VFD and shall require no additional interlocks.

The VFD shall include an integral RFI filter conforming to the A2 standard as a minimum. VFD shall provide full galvanic isolation with suitable potential separation from the power sources (control, signal, and power circuitry within the drive) to ensure compliance with PELV requirements and to protect PLC's and other connected equipment from power surges and spikes. All inputs and outputs shall be optically isolated. Isolation boards between the VFD and external control devices shall not be required.

The VFD shall provide internal DC link reactors to minimize power line harmonics and to provide near unity power factor. DC Link reactor shall be installed so that power fluctuations to the DC Capacitors shall be reduced to increase Capacitor life. VFD's without a DC link reactor shall provide a 5% impedance line side reactor and provide spare capacitors.

VFD shall have input surge protection utilizing MOV's, spark gaps, and Zener diodes to withstand surges of 2.3 times line voltage for 1.5 msec. Printed Circuit boards shall be conformal coated to reduce the corrosion effect from environmental gases and other conditions. The conformal coating must meet IEC 61721-3-3, Class 3C2. VFD shall include circuitry to detect phase imbalance and phase loss on the input side of the VFD.

VFD shall include current sensors to monitor all three-output phases to detect and report phase loss or unbalance or other power issues to the motor. The VFD will identify which of the output phases is low or lost.

VFD shall provide an alphanumeric backlit display keypad (LCP) which may be remotely mounted using a standard 9-pin cable. VFD may be operated with keypad disconnected or removed entirely. The remote mount must meet N4X rating. Keypad may be disconnected during normal operation without the need to stop the motor or disconnect power to the VFD

All VFD's shall be of the same series and shall utilize a common control card and LCP (keypad/display unit) throughout the rating range. The control cards and keypads shall be interchangeable through the entire range of drives used on the project.

A battery back-up shall be provided to maintain internal clock operation during power interruptions. Battery life shall be no less than 10 years of normal operation.

The VFD shall have an adjustable output switching frequency.

Four complete programming parameter setups shall be provided, which can be locally selected through the keypad or remotely selected via digital input(s), allowing the VFD to be programmed for up to four alternate control scenarios without requiring parameter changes.

In each programming set up, independent acceleration and deceleration ramps shall be provided. Acceleration and deceleration time shall be adjustable over the range from 0 to 3,600 seconds to base speed.

The VFD shall have four programmable "Bypass frequencies" with adjustable bandwidths to prevent the driven equipment from running at a mechanically resonant frequency. The feature shall offer a Semi-Automatic program to simplify the set-up. ***The pump station manufacture shall identify and record the 1st and 2nd critical frequencies on any pump operating on a VFD and shall lock out these***

frequencies. The pump/s may pass through these frequencies on ramp-up and ramp-down but shall not be allowed to reside within these identified frequencies.

In each programming setup, independent current limit settings, programmable between 50% and 110% of the drives output current rating, shall be provided.

The VFD will include a "loss of follower" function to detect the loss of process feedback or reference signals with a live-zero value and a user-selectable choice of responses (go to set speed, min speed, max speed, stop, stop, and trip).

An initial ramp function shall be available to provide a user-selectable ramp, up to 60 seconds, for applications requiring a faster or slower ramp than the normal ramp.

A Dual Ramp feature shall include a Check Valve Ramp and a final Ramp feature. The Check Valve Ramp shall be programmable to gently seat a check valve and reduce the potential of damage from excess pressure while shutting-down the system. Both time and end speed shall be programmable. On the Final Ramp, the VFD shall be programmable to quickly stop the motor after seating of a check valve or for a more rapid stopping than the normal ramp down setting.

The ambient operating temperature of the VFD shall be -10°C to 50°C (14 to 122°F), with a 24-hour average not to exceed 45°C. Elevation to 3,300 feet (1000 meters) without de-rating. VFD shall provide full torque to the motor, given input voltage fluctuations of up to +10% to -15% of the rated input voltage (525 to 690VAC, 380 to 480VAC, or 200 to 240VAC). Line frequency variation of ± 2% shall be acceptable.

The VFD shall be equipped with a standard RS-485 serial communications port and front-of-drive accessible USB port. Danfoss FC or ModBus RTU communications shall be integrally mounted.

VFD Keypad shall be mounted and accessible from the exterior of the control panel door in a NEMA 4 configuration. . Keypads mounted internally shall not be allowed.

*The utilization of an electrically actuated valve as a variable speed drive backup device shall be permitted by other manufacturers providing only that the unit is a valve providing linear proportional control and surge protection. Valve shall be either ball valve or eccentric plug valve. **Non-Linear lug or wafer butterfly valves shall not be allowed as the design does not provide for efficient proportional and linear control nor provide surge protection.** Actuator shall provide modulating service utilizing PID loop. Actuator shall be a totally enclosed and sealed worm gear actuator and position indicator with externally adjustable open/close stops. The worm gear segment shall be ASTM A536 grade 65-45-12 ductile iron with a precision bore and keyway for connection to the valve shaft. Bronze radial bearings shall be provided for the segment gear and worm shaft. Alloy steel roller thrust bearings shall be provided for the hardened worm. All gear actuators shall be designed to withstand, without damage, a rim pull of 200 lbs on the handwheel and an input torque of 300 ft-lbs for nuts.*

The VSD shall be provided with a six-year warranty. This warranty includes coverage's for momentary line or load anomalies such as lightning strikes. This includes the cost for travel for one visit to the customer site for repair or replacement of the VFD

7.90 Control Power Transformer: Control power transformer shall be a minimum of 350 VA and include primary and secondary fuse protection.

7.100 Programmable Logic Controller: Programmable logic controller shall be an SCU as manufactured by Schneider with built in Ethernet and one USB port. Processor utilizing battery for program storage

will not be acceptable. Unit shall operate on 24 Vdc and shall include 750 KB user memory. The operating range of the processor shall be 32 to 140 degrees Fahrenheit. PLC shall be provided with capability of using SD memory card for data logging. I/O shall be 24 VDC. Processor shall be capable of expanding the I/O with the addition of up to 4 expansion modules. The processor shall be provided with the following on board I/O:

- a) 6 DC Inputs
- b) 6 DC Outputs
- c) 2 Analog Inputs current and voltage
- d) 2 analog Outputs current and voltage
- e) 2 High Speed Counters

7.110 Color Touchscreen: HMI Color Touch Screen interface shall be an integral to the SCU control and include a 3" color touch screen. Recipe management, machine setup, and data-tracking through .csv files. HMI shall include;

- a) Built-in full Unicode font to support multiple languages with a single run-time application.
- b) Base-configured terminal available with display and logic modules.
- c) Supports real-time monitoring of your terminals through a web browser.
- d) RS-232 and Ethernet networks available through built-in communication ports.
- e) Built-in USB ports and SD card slot
- f) Allen Bradley 24 DC Power Supply: 5 Amp DC power supply with built in status indicators.
- g) Allen Bradley 5 Port Ethernet Switch with 24 Vdc supply power.
- h) Panel devices shall be Allen Bradley NEMA 4 30 mm heavy duty devices. Panel indicator lamps shall be 24 VDC LED types.
- i) Level sensing relays shall be Crozet PNR utilizing 3W2 SS probe tips.
- j) HMI shall contain job specific drawings and data which shall be user accessible within PDF format.

7.120 Control System Configuration: The control system configuration and operation parameters shall be configurable through the HMI touch screen and shall be available remotely. (The station manufacturer shall be capable of remote programming of PLC and HMI). No laptops or programming devices shall be required to configure the system for operation. The system configurable parameters are protected by password levels to ensure correct personnel are making system configuration changes. Manufacturer shall be capable of remote access to the actual PLC and HMI programs for upgrades and modifications. The following are parameters that are required but not limited to be configurable through the touch screen.

- a) File Set up System; Allow changes to be saved to a SD memory card. Existing parameters may be uploaded from the SD memory card. This shall allow the system to be returned to last state, factory default or new configuration.
- b) Pump System: The quantity, type and operational parameters are assignable through the touch screen.
- c) Pump Control Assignable safeties, lockouts, limits, anti-cycle, and faults shall be assignable to each pump.
- d) Auxiliary pumps: Quantity and mode of operation shall be configurable.
- e) Lake Level Controls: Enable/disable of lake level controls. Selectable operation from probes or analog level transmitter. Delay times, and analog set points if analog mode is chosen.
- f) Inlet Screen: Enable/disable with flow and flush parameters.
- g) Chemical Injection: Enable/disable with flow set point and scaling parameters.

- h) Station Filter: Enable/disable with flow and flush parameters.
- i) Station Safeties: Enable type of safety and associated time parameters and operational set points. System should contain the following type of safeties
 - a. Pump Protection: Consist of low inlet pressure, loss of prime, and high pump temperature safety.
 - b. Station Safeties: Low/high Discharge pressure set points, phase failure, and VSD fault.
- j) Analog Scaling: Analog inputs shall be able to be scaled for min/max for raw and scaled values.
- k) I/O Mapping: All PLC inputs/outputs regardless of type can be assigned from the HMI.
- l) All data accessible through HMI shall be available with remote access.

7.130 Operation Setup: the operation parameters are configurable and settable based on the operating needs of the site system;

- a) Pump Sequence: Settable parameters to set the start/stop for the sequence of pumps that includes pressure/flow set points and timers to verify required operation. This includes transition speeds and timing when starting/stopping lag pumps. Includes configuration of flow stop parameters.
- b) Variable Speed Bypass: Start/stop set points which include delay timer settings for configuration when the variable speed drive is in bypass mode.
- c) PID Turning: Includes tuning parameters for different PID loop requirements and advanced PID tuning of a minimum of 3 pressure ranges. Includes status indications and trend graphing to assist in the tuning process.
- d) VSD Controlled Shutdown: Configurable parameters to add in smoothly transition to an off state.
- e) High Pressure Check: System parameters to verify if flow demand exist and at what point to shut the system down to no flow demand.
- f) Line Fill: Configurable set points to allow slow filling of the distribution system during the initial startup or recovery after power failure.
- g) Lockouts: Time and day of the week settings to restrict the number of pumps that may operate during the restrictive times. Maximum pressure and VSD speed are configurable set points. The lockouts can be enable/disable.
- h) Time/Date Configuration: Allows sync of real time clock of PLC with HMI and allows manual setting of the time and date.

7.140 Maintenance: Settings to assist in troubleshooting and repairing of the control system.

- a) Project Documentation: HMI must include the ability to store and view PDFs from the touch screen display. This includes manuals, bill of materials and drawings. It shall be a requirement that manufacturer provide these deliverables within the HMI.
- b) Pump Sequence Logic: Provides status indications of what current step the program is in and the amount of the high-pressure accumulator. This screen also provides for temporally overriding the amount of pump run time. The alternation of pumps is based on least run time and this provides a method to either have a pump run more or lease often.
- c) Email Setup: When connected to the internet the system shall provide the ability to send email and text messages due to an assignable fault occurrence. It also provides the ability to attach the event log for review. A configuration screen is provided for input of the required parameters.

7.150 Operation: Screens to provide indication of the system operation, events, alarms, trends, and

totalizes.

- a) Dashboard: Screen will provide indication of the systems current state. Display shall provide current flow, pressure, set point, VSD speed, pump status, pump run time, and status indicators for auxiliary controls.
- b) Current Alarms: Displays any current alarms with time/date stamp of occurrence.
- c) Historical Alarms: Displays historical alarms with time/date stamp of occurrence. Additional information that is captured with each alarm is flow rate, pressure, status and operational method of each pump, and speed of the VFD. The last 100 alarms are stored on PLC memory and are viewable thru the HMI.
- d) Trends: Trend screen provides trending information of pressure set point, PID set point, Pressure, VSD speed & flow rate. The status of each pump is trended that will provide indication of pump is running or off and if the pump is operating across the line or on the VSD. HMI must be able to store 300,000 Points of trend data for trend view.
- e) Historical Events: Displays historical event occurrence and the status of the system at the time of the event. The event is time/date stamped. System conditions such as flow, pressure, set point, VSD speed and pump status is reordered with each event. The last 200 events shall be stored on the PLC memory and shall be accessible for view thru the HMI. All historical events are logged to an HMI data log CSV file. A new data log file shall be created weekly. The data log file shall be capable of being extracted to be viewed on a PC with excel viewer program.
- f) Totalizers: Provides current and two previous years cumulative totals for system flow and for each pump run times and number of starts. This is displayed in daily, monthly, and yearly totals.
- g) Auxiliary Pumps: Enable time clock-controlled pumps or auxiliary devices. Start start/stop time per day. Day of week operation is selectable.
- h) Dashboard shall also be configured to provide each pumps status.
- i) Help Screen: Provides contact information for MCI Pump Service Group to provide 24/7 phone support and field support.

7.160 Remote Cellular Connection

- a) Unit shall be provided with a cellular modem to provide a remote connection via the internet utilizing any smart phone, tablet or PC that is capable of connection to the WEB.
- b) This system shall not require any modification to the pump station control system to install and operate this feature.
- c) The cellular option shall be an XPC-RCM as provided by Motor Controls, Inc. of Dallas, TX.
- d) The XPC-RCM will provide a cellular modem, antenna and first year of service included with station. No additional software changes shall be allowed.

7.170 Inlet Transition Piping - Station inlet transition piping shall be constructed from ASTM A105 schedule 40 pipe or heavier as required to maintain a 3 to 1 pressure safety factor (including 1/16" corrosion allowance). After fabrication and before coating, piping shall be hydrostatically tested to 150% of maximum shutoff pressure. Transition piping shall be designed for 90 degree turn down and shall be equipped with a rigid coupling to facilitate alignment variances in the field. The pipe shall be equipped with thread-o-lets for customers use. Transition pipe shall connect to an 8"

suction line. All thread-o-lets included on transition pipe shall be 316SS.

7.180 Discharge Transition Piping - Station discharge transition piping shall be constructed from ASTM A105 schedule 40 pipe or heavier as required to maintain a 3 to 1 pressure safety factor (including 1/16" corrosion allowance). After fabrication and before coating, piping shall be hydrostatically tested to 150% of maximum shutoff pressure. Transition piping shall be designed for 90 degree turn down and shall be equipped with a rigid coupling to facilitate alignment variances in the field. The pipe shall be equipped with thread-o-lets for customers use. Transition pipe shall connect to 8" main irrigation line. Three ¾" thread-o-lets and one 2" thread-o-let shall be included on the transition pipe. All thread-o-lets included on transition pipe shall be 316SS.

7.190 Station Heater - Station heater shall be mounted inside station shelter. Heater shall be controlled by control panel and help keep station at optimal and adjustable ambient temperature.

POSTPRODUCTION:

8.10 General. Installing contractor shall be responsible for providing all materials, equipment, and labor necessary to install and connect the pumping system.

8.20 Unloading and Setting Supervision. Setting of the pumping system and connection to suction, discharge and power, anchoring of the pumping system, and thrust blocking of the suction and discharge piping that is connected to the pumping system shall be the responsibility of the installing contractor and not the manufacturer. Crane to off-load and set the pumping system onto the concrete slab shall be provided by installing contractor. Pumping system manufacturer shall supply a technician for one day to meet the shipment and advise the contractor on unloading and setting the pumping system. Technician's job shall be supervisory only, in the role of an advisor.

8.30 Start Up. When discharge piping, electrical connections, and electrical inspection have been completed, the pumping system manufacturer shall be contacted for startup. A minimum one-week notice shall be given to manufacturer prior to scheduled startup date. During start up, the complete pumping system shall be inspected for proper installation and shall be given a running test of normal start and stop, and fully loaded operating conditions. During this test, each pump shall demonstrate its ability to operate without undue vibration or overheating and shall demonstrate its general fitness for service. All defects shall be corrected, and adjustments made at the expense of the pumping system manufacturer. Test shall be repeated until satisfactory results are obtained. Startup assistance shall be provided but shall be limited to one 8-hour day.

After the station startup has been completed, but before the technician leaves the job site, a training session shall be given to the owner or the owner's representative to familiarize them with the pumping system operation, maintenance and adjustments.

8.40 Warranty.

A. The manufacturer shall warrant that the water pumping system shall be free of defects in workmanship for a period of two years from date of authorized start-up but not to exceed thirty months from date of manufacturer's invoice. Variable frequency drive shall be provided with a 6-year warranty as described in the VFD section above and shall include protection against lightning strikes and electrical surges. All components in the electrical panel shall be covered by a 6-year warranty inclusive of power related damages such as lightning. This includes parts only.

- B. Provided that all installation and operation responsibilities have been properly performed, manufacturer shall provide a replacement part or component during the warranty life. Any repairs to be accomplished at manufacturer's expense must be pre-authorized. The start-up certificate must be on file with manufacturer to activate warranty. Upon request, manufacturer shall provide advice for trouble shooting of a defect during the warranty period.
- C. Manufacturer shall use only first quality material. As with any mechanical or electrical device, some preventive maintenance efforts are required to assure an adequate service life. A periodic preventive maintenance program recommendation shall be included in the owner's manual. Manufacturer shall support a large national network of technical service technicians. Manufacturer's field service technicians shall be contacted for service. Because of varied conditions beyond the control of manufacturer, this warranty may not be valid or may not cover damage as follows:
1. Default of any agreement with manufacturer.
 2. Misuse, abuse, or failure to conduct routine maintenance.
 3. Handling any liquid other than clean water.
 4. Exposure to electrolysis, erosion, or abrasion.
 5. Presence of destructive gaseous or chemical solutions.
 6. Over voltage or unprotected low voltage.
 7. Unprotected electrical phase loss or phase reversal.

MCI TECHNICAL SPECIFICATIONS

Prefabricated Endurascap Pumping System

System Model No:	PPS-N-ES2-400-20-SV-P-48-3-6
Project Name	Mission Bay
Project Location	CA
Consultant	VSS
Station Type	MCI Endurascap System
QTY of Pumps	2

Third Party Listing

Pump Station	UL Category QCZJ and QCZJ7 as a packaged pump system
Controls & VFD	UL508A and CSA-C22.2 No.14

VARIABLE FREQUENCY DRIVES

OPERATING TEMP	-10C to 50C (14F to 122F)
HUMIDITY	95% non-condensing
OUTPUT VOLTAGE	0-100% of supply voltage
MINIMUM EFFICIENCY	98%
HARMONIC MITIGATION	Dual 3.5% DC Link Reactors
FREQUENCY RATING	100% continuous drive rating - 110% max for 60 seconds

System Hydraulic and PSI Requirements

Zone	Flow (GPM)	Pressure (PSI)	Total HP	EFF
1	400	20	20	74.24%

Station Power Requirements

Equipment	HP	KVA	AMPS	CFM	Voltage	Phase	HZ
Main Pump 1	10	12	14	160	460	3	60
Main Pump 2	10	12	14	160	460	3	60
TOTALS	20	24	28	320	460	3	60

SAFETIES						
Safety				Setting		
Incoming Phase Failure/ Low Voltage/Phase reversal				10% +/-		
Individual power phase failure and low voltage				10% +/-		
Low Discharge pressure shutdown				25 PSI below SP - Manual reset		
High Discharge pressure shutdown				15 PSI above SP - Auto reset		
Low Inlet PressureShutdown				10 PSI below SP - Auto reset		

FOR MBGC CLUBHOUSE DEMO/PRTBL BLDG INSTL

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SECTION 02 41 00

DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Building demolition excluding removal of hazardous materials and toxic substances.
- B. Selective demolition of built site elements.
- C. Abandonment and removal of existing utilities and utility structures.

1.2 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

1.3 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.

PART 3 EXECUTION

2.1 SCOPE

- A. Remove the entire building including minor structures, enclosures, and sheds in their entirety..
- B. Remove paving and curbs as required to accomplish new work.
- C. Within area of new construction, remove foundation walls and footings to a minimum of 2 feet (600 mm) below finished grade.
- D. Remove other items indicated, for salvage, relocation, recycling, and demolition.
- E. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill Geotechnical report.

2.2 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Use of explosives is not permitted.
 - 2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 3. Provide, erect, and maintain temporary barriers and security devices.
 - 4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 5. Do not close or obstruct roadways or sidewalks without permit.
 - 6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Protect existing structures and other elements that are not to be removed.
 1. Provide bracing and shoring.
 2. Prevent movement or settlement of adjacent structures.
 3. Stop work immediately if adjacent structures appear to be in danger.
- D. When hazardous materials are discovered during removal operations as noted in previous sections, abate work .
- E. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.
- F. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

2.3 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

2.4 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02 41 00

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Curing compounds.
 - 6. Bonding agents.
 - 7. Adhesives.
 - 8. Joint-filler strips.

- B. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Aggregates.
- C. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1.8 FIELD CONDITIONS

- A. Hot-Weather Placement: Comply with ACI 301 and as follows:
 - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301 (ACI 301M).
 - 2. ACI 117 (ACI 117M).

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.
- D. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- E. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
 - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain-Steel Wire: ASTM A 1064/A 1064M.

2.4 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:
 - 1. Portland Cement: ASTM C 150/C 150M, Type II.
 - 2. Fly Ash: ASTM C 618, [Class F or C].
- C. Normal-Weight Aggregates: ASTM C 33/C 33M, coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- E. Water: ASTM C 94/C 94M.

2.6 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.

2.7 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.
- B. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

2.8 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301 (ACI 301M).
 - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - 1. Fly Ash: 20 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 - 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.
 - 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.9 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Normal-weight concrete.
 - 1. Minimum Compressive Strength: As indicated.
 - 2. Maximum W/C Ratio: 0.50.
 - 3. Slump Limit: 8 inches (200 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).

2.10 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.11 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 - 1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 - 2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
 - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M), to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M).
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 - 1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
 - 2. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.

- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.

- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer

and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

3.7 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces exposed to public view.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.9 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 (ACI 301M) for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.

- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

3.10 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- E. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.11 FIELD QUALITY CONTROL

- A. Special Inspections: Contractor will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
1. Steel reinforcement placement.
 2. Verification of use of required design mixture.
 3. Concrete placement, including conveying and depositing.
 4. Curing procedures and maintenance of curing temperature.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:
1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 3. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below or 80 deg F (27 deg C) and above, and one test for each composite sample.
 4. Unit Weight: ASTM C 567/C 567M, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 5. Compression Test Specimens: ASTM C 31/C 31M.

- a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
 - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
 9. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
 12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 03 30 00

SECTION 04 22 00
CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Mortar and grout.
 - 3. Steel reinforcing bars.
 - 4. Miscellaneous masonry accessories.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Material Certificates: For each type and size of the following:
 - 1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements].
 - b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
 - 2. Cementitious materials. Include name of manufacturer, brand name, and type.
 - 3. Mortar admixtures.
 - 4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 - 5. Grout mixes. Include description of type and proportions of ingredients.

6. Reinforcing bars.
- C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
 - D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 2. Protect sills, ledges, and projections from mortar droppings.
 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 PERFORMANCE REQUIREMENTS

- A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.
 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.
 2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

2.3 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6 except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

2.4 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. CMUs: ASTM C 90.
1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi.
 2. Density Classification: Medium weight.
 3. Size (Width): Manufactured to dimensions 3/8 inch (10 mm) less-than-nominal dimensions.
 4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
 5. Faces To Receive Plaster: Where units are indicated to receive a direct application of plaster, provide textured-face units made with gap-graded aggregates.

2.5 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91/C 91M.
- E. Mortar Cement: ASTM C 1329/C 1329M.
- F. Aggregate for Mortar: ASTM C 144.
1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- G. Aggregate for Grout: ASTM C 404.
- H. Water: Potable.

2.6 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).

2.7 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Use masonry cement or mortar cement mortar unless otherwise indicated.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated.
 - 1. For reinforced masonry, use Type S.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
 - 2. Proportion grout in accordance with ASTM C 476, Table 1, but not less than 2000 psi.
 - 3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
 - 2. Verify that foundations are within tolerances specified.
 - 3. Verify that reinforcing dowels are properly placed.
 - 4. Verify that substrates are free of substances that would impair mortar bond.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.3 TOLERANCES

- A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

- B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm).

- C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm).

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 - 1. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- C. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.
- D. Cut joints flush where indicated to receive waterproofing unless otherwise indicated.

3.6 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 60 inches.

3.7 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Contractor will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Special inspections according to Level B in TMS 402/ACI 530/ASCE 5.
 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- F. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for compressive strength.
- G. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.8 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.9 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 1. Crush masonry waste to less than 4 inches (100 mm) in each dimension.
 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."
 3. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.
- C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 22 00

SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Structural steel.

1.3 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.
- C. Demand Critical Welds: Those welds, the failure of which would result in significant degradation of the strength and stiffness of the Seismic-Load-Resisting System and which are indicated as "Demand Critical" or "Seismic Critical" on Drawings.

1.4 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication of structural-steel components.
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.

2. Include embedment Drawings.
 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
 5. Identify members and connections of the Seismic-Load-Resisting System.
 6. Identify demand critical welds.
- C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing, including the following:
1. Power source (constant current or constant voltage).
 2. Electrode manufacturer and trade name, for demand critical welds.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Mill test reports for structural steel, including chemical and physical properties.
- E. Product Test Reports: For the following:
 1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 2. Shop primers.
 3. Nonshrink grout.
- F. Source quality-control reports.
- G. Field quality-control and special inspection reports.

1.7 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
- B. Comply with applicable provisions of the following specifications and documents:
 1. AISC 303.
 2. AISC 341 and AISC 341s1.

3. AISC 360.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. Plate and Bar: ASTM A 36/A 36M.
- B. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.
- C. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.
 1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
 2. Plate Washers: ASTM A 36/A 36M carbon steel.
 3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
 4. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

2.3 PRIMER

- A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
- B. Galvanizing Repair Paint: ASTM A 780/A 780M.

2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.
 - 1. Camber structural-steel members where indicated.
 - 2. Fabricate beams with rolling camber up.
 - 3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
 - 4. Mark and match-mark materials for field assembly.
 - 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
 - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

2.6 SHOP CONNECTIONS

- A. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.
 - 2. Fire-Resistance Rating: **[4 hours] [3 hours] [2 hours] [As indicated]**.

2.7 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
 - 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
 - 2. Galvanize all steel.

2.8 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.
 - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - 1. Liquid Penetrant Inspection: ASTM E 165.
 - 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - 3. Ultrasonic Inspection: ASTM E 164.
 - 4. Radiographic Inspection: ASTM E 94.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
 - 1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
 - 1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
 2. Weld plate washers to top of baseplate.
 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
1. Level and plumb individual members of structure.
 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

- A. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
 3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Contractor will engage a qualified special inspector to perform the following special inspections:
1. Verify structural-steel materials and inspect steel frame joint details.
 2. Verify weld materials and inspect welds.
- B. Testing Agency: Contractor will engage a qualified testing agency to perform tests and inspections.

- C. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
 - 1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.

3.6 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 05 12 00

SECTION 05 50 00

METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated steel and aluminum items.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 05 12 00 - Structural Steel Framing: Structural steel column anchor bolts.
- C. Section 09 91 13 - Exterior Painting: Paint finish.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014.
- F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- H. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- I. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.
- J. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- K. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.
- L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
- M. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2008.

- N. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2015.
- O. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).
- P. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

1.04 SUBMITTALS

- A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
- B. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- D. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.
- E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
- F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- G. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
- B. Sheet Aluminum: ASTM B209 (ASTM B209M), 5052 alloy, H32 or H22 temper.
- C. Bolts, Nuts, and Washers: Stainless steel.
- D. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.03 FABRICATED ITEMS

- A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.

2.04 FINISHES - STEEL

- A. Prime paint steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete, items to be embedded in masonry, and all exterior items.

- B. Prime Painting: One coat.
- C. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft (530 g/sq m) galvanized coating.
- D. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.05 FINISHES - ALUMINUM

- A. Exterior Aluminum Surfaces: Class I color anodized.

2.06 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).
- C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).
- D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).
- E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Obtain approval prior to site cutting or making adjustments not scheduled.

3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch (6 mm).
- C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION 05 50 00

SECTION 07 92 00

JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Joint backings and accessories.

1.02 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015.
- B. ASTM C834 - Standard Specification for Latex Sealants; 2014.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014a.
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
- E. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).

1.03 SUBMITTALS

- A. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 4. Substrates the product should not be used on.
- B. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

- A. Scope:
 - 1. Exterior Joints: Seal open joints, whether or not the joint is indicated on the drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
 - a. Wall expansion and control joints.
 - b. Joints between door, window, and other frames and adjacent construction.
 - c. Joints between different exposed materials.
 - d. Openings below ledge angles in masonry.
 - e. Other joints indicated below.
 - 2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.

- a. Joints between door, window, and other frames and adjacent construction.
- b. Other joints indicated below.
- 3. Do not seal the following types of joints.
 - a. Intentional weepholes in masonry.
 - b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
 - c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
 - d. Joints where installation of sealant is specified in another section.
 - e. Joints between suspended panel ceilings/grid and walls.
- B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
- C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
 - 1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.

2.02 NONSAG JOINT SEALANTS

- A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 50 percent, minimum.
 - 2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
 - 3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
- B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 25 percent, minimum.
- C. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.

2.03 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Install bond breaker backing tape where backer rod cannot be used.
- D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

END OF SECTION 07 92 00

SECTION 08 63 00

SUSPENDED SKYLIGHTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Skylight glazing.
- B. Fasteners, anchors, reinforcement, and flashings.

1.02 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications: Fabricated steel attachment devices.
- B. Section 07 92 00 - Joint Sealants: Sealing joints between skylight frames and adjacent construction.

1.03 REFERENCE STANDARDS

- A. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure; 2005.
- B. ASTM C1184 - Standard Specification for Structural Silicone Sealants; 2014.

1.04 SUBMITTALS

- A. Product Data: Provide manufacturer's specifications, standard details, and installation requirements.
- B. Shop Drawings: Indicate framed opening requirements and tolerances, spacing of members, anticipated deflection under load, affected related work, expansion and contraction joint locations and details, and sizes and locations for field welding.
 - 1. Show field measurements on shop drawings.
- C. Selection Samples: Submit full range of aluminum finish samples for Architect's color selection.
- D. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- E. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations.
- F. Manufacturer's Installation Instructions: Indicate special procedures, safety precautions, and perimeter conditions requiring special attention.
- G. Field Quality Control Submittals: Report of field testing for water leakage.

1.05 QUALITY ASSURANCE

- A. Designer Qualifications: Design skylight system under direct supervision of a professional engineer licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section.

- C. Verify that each component is appropriate for use in structural sealant glazing (SSG) application in regards to at least the following properties; size, shape, dimensions, material, shelf-life, storage conditions, and color.
- D. Installer Qualifications: Company specializing in performing the type of work specified in this section.

1.06 MOCK-UP

- A. Construct mock-up that includes examples of materials and conditions required in finished skylight installation. Size mock-up 3 feet by 3 feet.
- B. Locate where directed by Architect.
- C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Provide wrapping to protect prefinished aluminum surfaces. Do not use adhesive papers or spray coatings that bond when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

- A. Correct defective work, including leaks, discoloration, failure of seal at insulated glazing units, and excessive thermal or structural movement, within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 SKYLIGHTS

- A. Skylights: glazed.
 - 1. Support system - Stand-off suspension system. Studs welded to the steel frame with gasketed base connectors.
 - 2. Glazing System: Pressure glazing bar system for sloped joints and two (2)-sided structural sealant glazing (SSG) for horizontal joints.
 - 3. Glazing: Translucent Plastic Panels - Design Composites distributed by Moxie Panels or Approved Equal.
 - a. Basis of design: Moxie surfaces Clear-PEP UV Satin
 - b. Translucent Glazing Panels:
 - 1) Design Composite: Clear-PEP UV Satin panels
 - 2) UV satin clear clear-PEP with satin finish on the top layer and satin clear finish on the bottom layer.
 - 3) 1" thick panels at trellis canopies to span up to 6'-0".
 - 4) C1/CC1 rating
 - 5) Edge Finish: EXT-2
 - c. Silicone or neoprene setting blocks shall be used for the support of the glazing and shall be sized and located in accordance with the manufacturer's

recommendations. At no point shall the glazing come into contact with metal parts of the skylight.

2.03 PERFORMANCE REQUIREMENTS

- A. Provide skylights that comply with the following:
 - 1. Structural Design: Design and size components to withstand dead loads and specified live loads without damage or permanent set.
 - 2. Wind Loads: Test in accordance with ASTM E330/E330M, using loads 1.5 times the specified design pressures and 10 second duration of maximum load.
 - 3. Design Pressure (DP): In accordance with applicable codes.
 - 4. Glazing Support Member Deflection Under Wind Load: $1/180$ of span, maximum.
 - 5. Thermal Movement: Design system to accommodate thermal expansion and contraction over ambient temperature range of 100 degrees F (38 degrees C), dynamic loading and release of loads, creep of concrete structural members and deflection of structural support framing without damage to skylight system components or loss of weathertightness.
 - 6. Structural Sealant Glazing (SSG) System: For individual panels, design framing members to not exceed a deflection normal to the wall of $L/175$ between supports with $3/4$ inch (19 mm) maximum, and a deflection parallel to the wall of $L/360$ with $1/8$ inch (3.2 mm) maximum, whichever is less.

2.04 MATERIALS

- A. Glazing Accessories: As recommended by manufacturer of skylight system.
- B. Structural Sealant Glazing (SSG) Adhesive: Neutral curing, silicone sealant formulated for SSG applications in compliance with ASTM C1184 and structural glazing industry guidelines, ASTM C1401.
 - 1. Sealant Design Tensile Strength: 20 psi (139 kPa), maximum.
 - 2. Hardness: 20 to 60 with Type A-2 durometer in compliance with test method ASTM C661.
 - 3. SSG sealant tested for compatibility with glazing accessories in compliance with ASTM C1087, tested for accelerated weathering in compliance with ASTM C793, and in compliance with insulating glass secondary sealant design standards of ASTM C1249.
- C. Weatherseal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories.
- D. Fasteners: Stainless steel.
- E. Anchorage Devices: Threaded suspended standoff type recommended by manufacturer, exposed to view.

2.05 FABRICATION

- A. Rigidly fit and secure joints and corners with stainless steel fasteners; fabricate rigid joints with connections that are flush, hairline, and weatherproof.
- B. Fabricate components to allow for expansion and contraction with minimum clearance and shim spacing around perimeter of assembly.
- C. Drain to exterior any water entering exterior joints, condensation occurring in glazing channels, or migrating moisture occurring within system.

- D. Prepare components to receive concealed anchorage devices, and ensure that fasteners will be concealed upon completion of installation.

2.06 FINISHES

- A. Color: To be selected by Architect from manufacturer's standard range.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that structural curb is ready to receive skylight system. Coordinate installation of roofing and other adjacent work to ensure weathertight construction.

3.02 PREPARATION

3.03 INSTALLATION

- A. Install skylights plumb, true without warping or racking of panels. Slope system minimum of 2% to drain.
- B. Anchor system in strict accordance with approved shop drawings
- C. Set skylight structure plumb, level, and true to line, without warp or rack of frames or glazing panels. Anchor securely in place in accordance with approved shop drawings.
- D. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Structural Sealant Glazing (SSG) Adhesive: Install structural sealant glazing adhesive and weather-tight sealant in accordance with manufacturer's instructions.
- F. Panel butt joints are to be tongue and groove joints with 1/2" joints filled with rod and sealant on top.
- G. Touch up damaged finishes so repair is imperceptible from 6 feet (1.8 m) distance, and remove and replace components that cannot be acceptably touched up.

3.04 CLEANING

- A. Upon completion of installation, thoroughly clean skylight aluminum surfaces in accordance with AAMA 609 & 610.
- B. Remove protective material from prefinished aluminum surfaces.
- C. Wash down exposed surfaces; wipe surfaces clean.
- D. Remove excess sealant by methods recommended by skylight manufacturer.

END OF SECTION 08 63 00

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
- C. Related Sections:
 - 1. Division 08 Section 08 63 00 - Suspended Skylights
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- D. Informational Submittals:
 - 1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: A qualified installer with experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
- E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Five years for exit hardware.
 - 3. Twenty five years for manual surface door closer bodies.
 - 4. Ten years for heavy duty floor closers.
 - 5. Two years for shallow depth floor closers.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

- a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
- 4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
- 5. Manufacturers:
 - a. Bommer Industries (BO).
 - b. Hager Companies (HA).
 - c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
- B. Floor Closers: ANSI/BHMA A156.4 certified floor closers. Provide independent and adjustable valves for closing speed, latch speed, and backcheck with built-in dead stop and hold open features as specified. Provide finished cover plates or thresholds as indicated in door Hardware Sets.
 - 1. Manufacturers:
 - a. Rixson Door Controls (RF).
- C. Pivots: ANSI/BHMA A156.4, Grade 1, certified. Space intermediate pivots equally not less than 25 inches on center apart or not more than 35 inches on center for doors over 121 inches high. Pivot hinges to have oil impregnated bronze bearing in the top pivot and a radial roller and thrust bearing in the bottom pivot with the bottom pivot designed to carry the full weight of the door. Pivots to be UL listed for windstorm where applicable.
 - 1. Manufacturers:
 - a. Architectural Builders Hardware (AH).
 - b. Rixson Door Controls (RF).

2.3 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.
 - 1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
 - 2. Furnish dust proof strikes for bottom bolts.
 - 3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
 - 4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
 - 5. Manufacturers:

- a. Burns Manufacturing (BU).
 - b. Door Controls International (DC).
 - c. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

- B. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Model as indicated in hardware sets.
 - 1. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Door Controls International (DC).
 - c. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

- C. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 - 1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 - 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 - 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 - 4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 - 5. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Hiawatha, Inc. (HI).
 - c. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.4 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have on record a published security keying system policy.

- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

- C. Cylinders: Original manufacturer cylinders complying with the following:
 - 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 - 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 - 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 - 5. Keyway: Match Facility Standard.

- D. Keying System: Each type of lock and cylinders to be factory keyed.
 - 1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
 - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 - 3. Existing System: Key locks to Owner's existing system.

- E. Key Quantity: Provide the following minimum number of keys:
 - 1. Change Keys per Cylinder: Two (2)
 - 2. Master Keys (per Master Key Level/Group): Five (5).
 - 3. Construction Keys (where required): Ten (10).
 - 4. Construction Control Keys (where required): Two (2).
 - 5. Permanent Control Keys (where required): Two (2).

- F. Construction Keying: Provide temporary keyed construction cores.

- G. Key Registration List (Bitting List):
 - 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 - 2. Provide transcript list in writing or electronic file as directed by the Owner.

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.
 - 1. Manufacturers:
 - a. Sargent Manufacturing (SA) – 8200 Series.
 - b. Stanley Best (BE) – 40H-UN Series.

2.6 AUXILIARY LOCKS

2.7 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 - 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 - 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

- B. Standards: Comply with the following:
1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 4. Dustproof Strikes: BHMA A156.16.

2.8 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
 4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
 5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
 - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
 7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 9. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.
 - 1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.

2.9 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
 - 1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 - 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 - 3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
 - 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
 - 5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 - 6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
 - 7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.
 - 1. Manufacturers:
 - a. LCN – 4040XP or equal

2.10 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Hiawatha, Inc. (HI).
 - c. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.11 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 1. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Hiawatha, Inc. (HI).
 - c. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring

of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:
 - a. Rixson Door Controls (RF).
 - b. Sargent Manufacturing (SA).

2.12 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
 1. National Guard Products (NG).
 2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
 3. Reese Enterprises, Inc. (RE).

2.13 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.14 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
 - E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. The supplier is responsible for handing and sizing all products as listed in the door hardware sets. Quantities listed are for each pair of doors, or for each single door.

Hardware Sets

Set: 1.0

2 Floor Closer	PH SC 27-180N	626
2 Intermediate Pivot	M19	626
1 Header Bolt	4016	
1 Threshold Bolt	4015-18-IB	
1 Header Bolt	4085-IB	603
1 Mortise Deadlock	MS1850S	628
1 Cylinder	1E-74 C181 RP3	626
1 Thumb Turn Cylinder	4066-01	130
4 Door Pull	BF157 BTB	US32D
2 Door Stop	466-RKW	Black
1 Threshold	Per Detail	
1 Rain Guard	346C (Omit at Overhang)	
2 Sweep (w/drip edge)	3452CNB	
1 Gasketing	by Door Manufacturer	

Set: 2.0

1	Floor Closer	PH SC 27-180N	626
1	Intermediate Pivot	M19	626
1	Mortise Deadlock	MS1850S	628
1	Cylinder	1E-74 C181 RP3	626
1	Thumb Turn Cylinder	4066-01	130
2	Door Pull	BF157 BTB	US32D
1	Door Stop	466-RKW	Black
1	Threshold	Per Detail	
1	Rain Guard	346C (Omit at Overhang)	
1	Sweep (w/drip edge)	3452CNB	
1	Gasketing	by Door Manufacturer	

Set: 3.0

3	Hinge (heavy weight)	T4A3386 (NRP at Outswinging)	US32D
1	Rim Exit Device	LC 43 8813 ETL	US32D
1	Cylinder	12E-72 S2 RP	626
1	Door Closer	351 P10	EN
1	Kick Plate	K1050 16" HVBEV CSK	US32D
1	Door Stop	466-RKW	Black
1	Threshold	Per Detail	
1	Perimeter Gasketing	285CR	
1	Rain Guard	346C (Omit at Overhang)	
1	Sweep (w/drip edge)	3452CNB	

Set: 4.0

6 Hinge	TA2314 (NRP at Outswinging)	US32D
1 Dust Proof Strike	570	US26D
1 Flush Bolt (self latching)	2845	US26D
1 Storeroom Lock	45H7D 15H	630
1 Coordinator	2600 Series	US28
1 Conc Overhead Stop	1-X36	630
2 Door Closer	351 P10	EN
2 Kick Plate	K1050 16" HVBEV CSK	US32D
1 Door Stop	466-RKW	Black
1 Threshold	Per Detail	
1 Perimeter Gasketing	285CR	
1 Rain Guard	346C (Omit at Overhang)	
2 Sweep (w/drip edge)	3452CNB	
1 Astragal	357SP	

Set: 5.0

3 Hinge	TA2314 (NRP at Outswinging)	US32D
1 Storeroom Lock	45H7D 15H	630
1 Door Closer	351 P10	EN
1 Kick Plate	K1050 16" HVBEV CSK	US32D
1 Door Stop	466-RKW	Black
1 Threshold	Per Detail	
1 Perimeter Gasketing	285CR	
1 Rain Guard	346C (Omit at Overhang)	
1 Sweep (w/drip edge)	3452CNB	

Set: 6.0

3 Hinge	TA2314 (NRP at Outswinging)	US32D
1 Classroom Deadbolt	8T37S STK	630
1 Pull Plate	BF 106x70C	US32D
1 Push Plate	70C (4 X 16)	US32D
1 Door Closer	351 O	EN
1 Kick Plate	K1050 16" HVBEV CSK	US32D
1 Mop Plate	K1050 4" HVBEV	US32D
1 Wall Stop	409	US26D
1 Threshold	Per Detail	
1 Perimeter Gasketing	285CR	
1 Rain Guard	346C (Omit at Overhang)	
1 Sweep (w/drip edge)	3452CNB	

Set: 7.0

3 Hinge	TA2714 (NRP at Outswinging)	US26D
1 Storeroom Lock	45H7D 15H	630
1 Door Closer	351 P9	EN
1 Kick Plate	K1050 16" HVBEV CSK	US32D
1 Wall Stop	409	US26D
3 Silencer	608-RKW	

Set: 8.0

1	Pivot Set	147	626
1	Intermediate Pivot	M19	626
1	Mortise Deadlock	MS1850S	628
1	Cylinder	1E-74 C181 RP3	626
1	Thumb Turn Cylinder	4066-01	130
2	Door Pull	BF157 BTB	US32D
1	Door Closer	351 (Brackets & Drop Plates as Required)	EN
1	Wall Stop	409	US26D
1	Gasketing	by Door Manufacturer	

Set: 9.0

1	Hardware	by Door Supplier	
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END OF SECTION 08 71 00

Five Knuckle Standard Weight Series

Recommended for standard weight, medium frequency doors, or doors with closing devices.

- Use for common flush door/frame/wall applications
- For Beveled Edge, where doors are beveled on hinge side, specify TA4314 or TA4714
- For available finishes see page 29

TA2314
TA2714

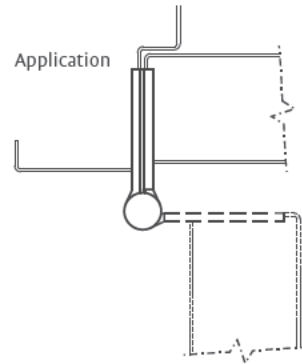


No.	ANSI Cross Reference	Base Material	Weight
TA2314	A5112	Stainless	STD
TA2314	A2112	Brass	STD
TA2714	A8112	Steel	STD

Specifications

Inches	mm	Gauge	No. of Holes	Fasteners	
				Machine	Wood
3 1/2" x 3 1/2"*	88.9 x 88.9	.123	6	1/2 x 10-24	1 x 10
4" x 4"*	101.6 x 101.6	.130	8	1/2 x 12-24	1 1/4 x 12
4 1/2" x 4"	114.3 x 101.6	.134	8	1/2 x 12-24	1 1/4 x 12
4 1/2" x 4 1/2"	114.3 x 114.3	.134	8	1/2 x 12-24	1 1/4 x 12
5" x 4 1/2"*	127 x 114.3	.146	8	1/2 x 12-24	1 1/4 x 12
5" x 5"*	127 x 127	.146	8	1/2 x 12-24	1 1/4 x 12
6" x 6"*	152.4 x 152.4	.160	10	1/2 x 1/4-20	1 1/2 x 14

* Not available in Brass base material.



Options:

Code	Description
NRP	Non-Removable Pin
TB	Ball Bearing
TCA	Concealed Bearing
RC	Round Corner – 1/4" radius furnished unless specified otherwise
HT	Hospital Tip
BT	Ball Tip
ST	Steeple Tip
SSF	Safety Stud Feature
QC	ElectroLynx® Hinge – 2, 4, 6, 8, 10 or 12 wire available
CC	Concealed Circuit – 2, 4, 6, 8, 10 or 12 wire available
CC-18	Concealed Circuit – 2, 4, 6, 8 or 10 wire available (2-18AWG wires and the remainder 28AWG wires)
MM	Magnetic Monitoring

ASSA ABLOY

The global leader in
door opening solutions

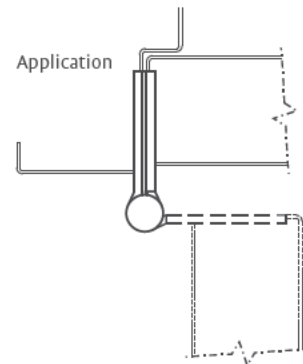
Five Knuckle Heavy Weight Full Mortise Series

Recommended for use on high frequency and/or heavy wood or metal doors in schools, hospitals or other public buildings where heavy traffic is experienced.

- Heavy weight hinges should be used on all extra heavy doors or those exposed to high frequency use
- T4A3386- Stainless steel base or available in brass base material polished
- T4A3786- Steel base material
- For Beveled Edge, where doors are beveled on hinge side, specify T4A4386 or T4A4786
- For available finishes see page 29

Note: 8" x 6" and 8" x 8" have six bearings. Specify T6B3386 or T6B3786.

T4A3386
T4A3786



No.	ANSI Cross Reference	Base Material	Weight
T4A3386	A5111	Stainless	HVY
T4A3386	A2111	Brass	HVY
T4A3786	A8111	Steel	HVY

Specifications

Inches	mm	Gauge	No. of Holes	Fasteners	
				Machine	Wood
4 1/2" x 4"	114.3 x 101.6	.180	8	1/2 x 12-24	1 1/4 x 12
4 1/2" x 4 1/2"	114.3 x 114.3	.180	8	1/2 x 12-24	1 1/4 x 12
5" x 4 1/2"	127 x 114.3	.190	8	1/2 x 12-24	1 1/4 x 12
5" x 5"	127 x 127	.190	8	1/2 x 12-24	1 1/4 x 12
6" x 5"	152.4 x 127	.203	8	1/2 x 1/4-24	1 1/4 x 14
6" x 6"	152.4 x 152.4	.203	10	1/2 x 1/4-20	1 1/2 x 14
8" x 6"	203.2 x 125.4	.203	16	1/2 x 1/4-20	1 1/2 x 14
8" x 8"	203.2 x 203.2	.203	16	1/2 x 1/4-20	1 1/2 x 14

* Not available in brass base material.

** Available in steel only.

***Available in stainless steel only.

Options:

Code	Description
NRP	Non-Removable Pin
T4B	Ball Bearing
TCA	Concealed Bearing
RC	Round Corner – 1/4" radius furnished unless specified otherwise
HT	Hospital Tip
BT	Ball Tip
ST	Steeple Tip
SSF	Safety Stud Feature
RB	Raised Barrel*
QC	ElectroLynx® Hinge – 2, 4, 6, 8, 10 or 12 wire available
CC	Concealed Circuit – 2, 4, 6, 8, 10 or 12 wire available
CC-18	Concealed Circuit – 2, 4, 6, 8 or 10 wire available (2-18AWG wires and the remainder 28AWG wires)
MM	Magnetic Monitoring

* Refer to page SP-3 for Raised Barrel.

ASSA ABLOY

The global leader in door opening solutions FM-13
193 | Page

Model 27-180 3/4" Offset

Application

- Single Acting, Handed
- Exterior or Interior Doors
- Weight to 450 lbs.*
- Door Width up to 4'0" (1219mm)



ANSI/C06041/C06051

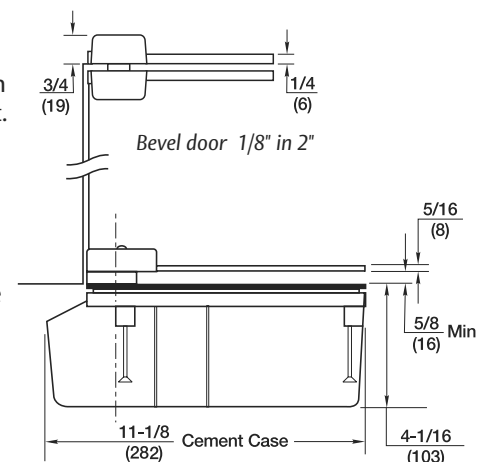
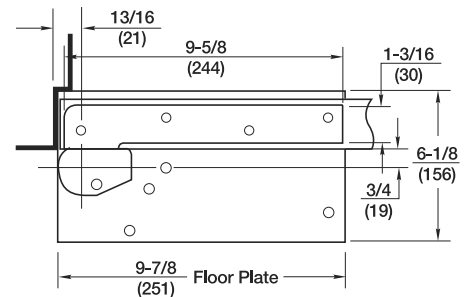
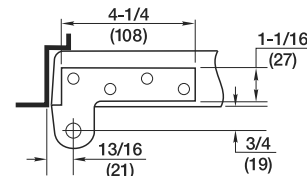
* Door size & weight guidelines are determined using the appropriate number of intermediate pivots

Product Description & Features

- Maximum opening 180°, auxiliary floor or wall stop recommended
- Separate and independent valves for closing speed and latch speed
- Adjustable hydraulic backcheck
- Available non-hold open (N) or automatic hold open (A)
- Not available with delayed action (DA)
- Models available to meet ICC/ANSI 117.1 low opening force requirements, prefix "PH". (For 8-1/2 lbs. of opening force prefix "PH" and suffix "8-1/2 lbs.")
- Cold weather option – specify "CWF"
- Sealed closer option – specify "SC"
- Available with floor plate or threshold installation (floor plate shown)
- Available 1-1/2" offset, for doors with cladding or frames with applied molding, maximum door weight 250 lbs.
- Cylolac, rustproof cement case
- Vertical door adjustment
- Standard top pivot: #180 included
- Intermediate pivot(s) required: M19 (order separately), see page 17
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) warrants another intermediate pivot
- For fire rated openings (up to 3 hour assemblies) prefix "F". This package will be supplied with a steel top pivot (F180) and a non-hold open closer. Intermediate pivot required: FM19 (order separately), see page 17
- Fire rated closers cannot have PH option
- For 20-minute labeled doors suffix "-20" to the part number
- Furnished with wood and machine screws
- Extended spindles available in 1/2" increments up to 2" longer than standard

Technical Information

Frame stop required



Options


Sealed Closer – Prefix SC

This option for exterior doors or interior doors with heavy exposure to water or cleaning solvents, protects the body. The closer body is placed in the cement case. A stainless steel cover plate is then gasketed and fastened to the cement case. This must be ordered with closer and cannot be ordered less the cement case.

Delayed Action – Prefix DA

After full open permits door to remain ajar (*at 70 degrees*) for up to 40 seconds. Operates by separate valve and can be shut off if not needed. Not available on closers with hold open feature.


Physically Handicapped – Prefix PH

To comply with ICC/ANSI 117.1 established by the Americans with Disabilities Act. PH prefix indicates 5 pounds of opening force, based at 30" from centerline of pivot. PH closers may not be used on labeled fire doors or exterior doors. Rixson accepts no responsibility for PH closers and door latching. Also, be advised that ADA guidelines DO NOT apply to fire rated openings or exterior doors. 


Wood Door – Prefix W

When using a center hung product with the centering arm (*i.e. 28, 30 or 40*) a special plate and less obtrusive adjusting screws are needed for wood doors. This plate is reinforcement to the deep mortise required for that arm, protecting veneer.

Fire Rated – Prefix F

Closer packages for fire rated doors (*up to 3 hours*) include a steel top pivot and must have additional steel intermediate pivots. These closers are non-hold open. 

Twenty Minute Label – Suffix -20

This UL rating is for 20 minute doors. Pivots are brass base material and include a visible label. 

8-1/2 # Opening Force – Prefix PH Suffix 8-1/2

This is a lighter than normal opening force. Be aware that this may not be strong enough to close fire rated or exterior doors. Rixson accepts no responsibility for PH closers and door latching. Also, be advised that ADA guidelines DO NOT apply to fire rated openings or exterior doors.

Less All Parts – Suffix LAP

If a closer is needed for replacement, the arm, cover, cement case, top pivot and floor plate are omitted.

Less Floor Plate – Suffix LFP

When thresholds or cover pans are being used the closer doesn't need the decorative floor plate.

Less Cement Case – Suffix LCC

For existing installations or when cement case has been sent earlier in construction. Closer will be packaged without the cement case.

Less Top Pivot – Suffix LTP

For unusual head conditions, where the top pivot cannot be used, the closer is shipped without the top pivot. For offset installations, an additional load bearing intermediate (*side jamb*) M190 pivot is required. All intermediate pivots for that opening should be M190's, not M19's.

Heavy-Duty Floor Closers Options, Certifications, Limited Warranty, Specifications

Options Continued

Degree of Swing – Follows Model Number

Single acting heavy-duty floor closers have a deadstop. This means that the door cannot go past a certain point. If ordered as a hold open closer, the hold open position is exactly the same as the deadstop. The degrees available are 85°, 90°, 95° or 105° (180° for model 27 only). It is recommended that the maximum degree of swing be ordered.

Double acting closers have a deadstop at 103° and are available with hold open options at 90 or 100°.

Non Hold Open – Suffix N

These closers do not hold the door open. This feature cannot be changed in the field.

Automatic Hold Open – Suffix A

These closers hold the door open. This feature cannot be changed in the field.

Selective Hold Open – Suffix S

These closers can be set to hold open or non-hold open. This is done via a screw control on the top of the closer. Available on Models 27 and 28 only.

Hand- Suffix RH or LH

All single acting floor closers are handed. All double acting floor closers (30, 40, H40) are non-handed.

Door Thickness – Suffix 1-3/4, 2, 2-1/4, 2-1/2 or 3

When ordering L product for lead lined doors, the thickness of the door must be given. The purpose of the L product is to have screws spaced so that they straddle the lead in the center of the door. Also used when lead lining is under the skins of the door. Recommended for use on extra heavy or high traffic doors.

Cold Weather Fluid – Suffix CWF

Cold weather fluid should be specified for exterior doors in consistently cold climates under 32° F for weeks at a time. The hydraulic fluid is of a lower viscosity to prevent sluggish closing. Cannot be used with the delayed action feature.

Extended Spindle – Suffix Extra Length

Any special floor coverings or severe door undercuts will affect the spindle height. In these applications an extended spindle may be required. See product template to determine if an extended spindle is needed. Extended spindles available in 1/2" increments up to 2" longer than standard.

1-1/2" Offset – Suffix 1-1/2

Offset is the distance from the face of the door to the pivot point. Extended offsets should not be used unless there is cladding on the face of the door or there is trim to clear on the frame. 1-1/2" offset arms and pivots are for doors with cladding or trim that project 3/4" from the face of the door.

Cover Pan (Terrazzo) – Suffix Part Number

Closers should always be accessible. They should never be buried beneath flooring materials. A cover pan sits on top of the closer and has the flooring material set in it. This way the sight line for the floor is consistent. Cover pans may require closers with longer spindles. See cover pan template to determine spindle length needed.

Special Layouts – Suffix SPLO#

Unique installations or specially engineered products are called special layouts. These numbers must be assigned by the technical support department and they must be called out specifically by their number when ordered.

Certifications

All Rixson® heavy-duty floor closers are in compliance with ANSI/BHMA 156.4 Standards. See individual products for sub sections.



Limited Warranty

Rixson heavy-duty floor closers models 27/28 and 30/40 are warranted for 10 years against defect. The model 20 closer carries a 2 year warranty. See Rixson Price Book for specific details of the limited warranty.

Specification

Floor closers shall be heavy-duty model 27 (*offset*) or model 28 (*center hung*). All closers shall be handed. Choose appropriate functions and strengths to accommodate lead lining, extra high traffic, fire rating, independently hung or quick install models. These closers shall have separate and independent checking valves, to control latch speed, closing speed and adjustable hydraulic backcheck. All single acting closers shall have a built in dead stop feature. All closers have one piece spindle assembly. Extra heavy-duty closers shall have minimum of two thrust bearings and one needle bearing. Closers shall not have compression spring.

Model 173

Application

Interior Doors

Weight 150 lbs

Door Sizes up to 3'0" x 8'0" x 1-3/4"

Handed



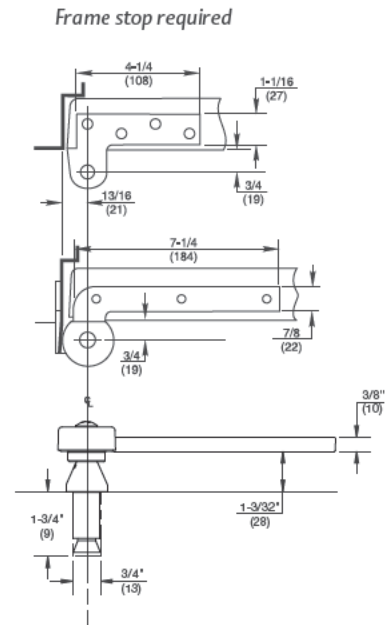
C07202

BHMA/
ANSI :
C07162\

Product Description & Features

- Standard top pivot 180 included
- 119 intermediate pivot recommended for all doors over 6'8" (order separately) see page 136
- Bottom pivot mounts directly to concrete floor
- Uses same arm and cap as 117 pivot set
- Non-ferrous base metal
- 3/4" offset only (*measured from centerline of pivot to face of door*)
- Available for 1-1/2" (38mm) offset (*door weight 100 lbs*) for doors with cladding or frame molding
- Door edges must be beveled 1/8" in 2"
- Furnished with wood and metal screws
- 3/8" vertical adjustment
- No spindle extensions available
- Door will swing 180°, trim permitting

Technical Information



Model 147

Application

Exterior or Interior Doors

Weight to 600 lbs.*

Door Width up to 4'0" (1219mm)

Handed



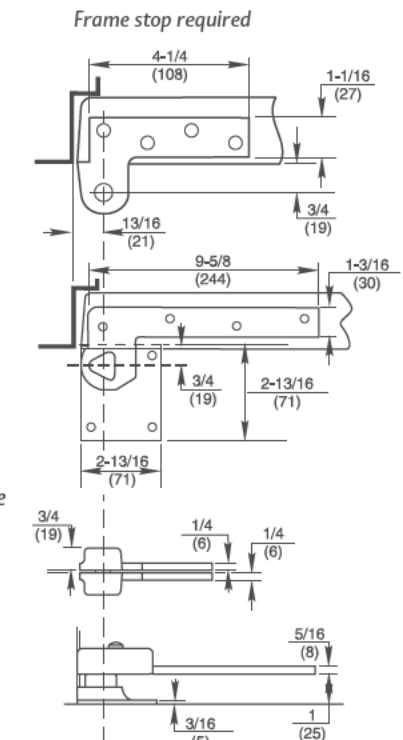
ANSI NO: C07162
C07202

BHMA/

Product Description & Features

- Standard top pivot 180 included
- M19 intermediate pivot required (*order separately*); see page 136
- Bottom pivot mounts directly to floor
- Uses same arm and cap as 27 floor closer
- Available for fire door assemblies up to three hours (*ferrous material*) – specify F147. Intermediate pivot required by UL. Specify FM19 (*order separately*), see page 136
- For 20-minute label suffix "-20" to the part number
- Non-ferrous base material
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) of door height warrants another intermediate pivot
- 3/4" (19mm) offset (*measured from centerline of pivot to face of door*)
- Available for 1-1/2" (38mm) offset (*door weight 350lbs.*) for doors with cladding or frame molding
- Door edges must be beveled 1/8" in 2"
- Furnished with wood and machine screws
- Extended spindles available in 1/2" (13mm) increments up to 2" (51mm) longer than standard
- Doors will swing 180°, trim permitting

Technical Information



* Door size & weight guidelines are determined using the appropriate number of intermediate pivots

Options

Fire Rated – Prefix F

Pivots for fire rated doors (up to 3 hours) include a steel top pivot and must have additional steel intermediate pivots. For F519 pocket pivot, door assemblies must have been tested with pocket pivots.



Twenty-minute label – Suffix - 20

This UL rating is for 20-minute assemblies.

Product with this rating has an authorized label.

Handing

All offset pivots and pivot sets are handed. Suffix RH or LH.

Extended Spindle – Suffix extra length needed

Any special coverings or severe door undercuts will affect the spindle height. In these applications, an extended spindle may be required. Most standard spindle heights accommodate door undercuts up to 1/2". Extended spindles available in 1/2" increments up to 2" longer than standard. See template.

1-1/2" Offset – Suffix 1-1/2

Offset is the distance from the face of the door to the pivot point. Extended offsets should not be used unless there is cladding on the face of the door or there is trim to clear on the frame. 1-1/2" offset arms and pivots are for doors with cladding or trim that project 3/4" from the face of the door. The greater the offset the less weight can be carried by the pivot.

Less Top Pivot – Suffix LTP

For conditions requiring special top pivots or for arch top doors, the pivot set should be ordered less top pivot – LTP. For offset installations an additional load bearing intermediate (side jamb) M190 pivot is required. All intermediate pivots for that opening should be M190's, not M19's.

Special Layouts – Suffix SPLO#

Unique installations or specially engineered products are called special layouts. These numbers must be assigned by the technical support department and they must be called out specifically by their number when ordering.

Door Thickness – Suffix 1-3/4", 2", 2-1/4", 2-1/2" or 3"

When ordering L series pivot for lead-lined doors, the thickness of the door must be given. The purpose of the L product is to have screws spaced so they straddle the lead in the center of the door. Also used when lead lining is under the skins of the door. Recommended for use on extra heavy or high traffic doors.

ElectroLynx® Connectors – Suffix QC – Number of Wires

The plug-in connectors with easy color coded wire system eliminate matching wires. Must be used with ASSA ABLOY doors, frames and hardware. Available 4, 6, 8 or 12 wires for most products.

Hardwiring Made Easy®



Certifications

All Rixson® pivots and pivot sets are in compliance with ANSI/ BHMA 156.4 Standards. See individual products for sub sections.

Limited Warranty

Rixson Pivot sets are warranted for 2 years for defect. See Rixson Price Book for specific details of the limited warranty.

Specifications

All pivots and pivot sets shall be of one manufacturer. All heavy-duty pivots shall have a minimum of 2 bearings internal to the bottom pivot. One shall be a thrust bearing and the other a needle bearing. Separate bearing surfaces shall be in the top pivot. Lead-lined door units and high traffic pivots shall have additional thrust bearing. Fire rated pivot sets shall have steel top pivots. Fire rated doors require steel intermediate pivots.

Model 119

Application

- Full Mortise
- Handed

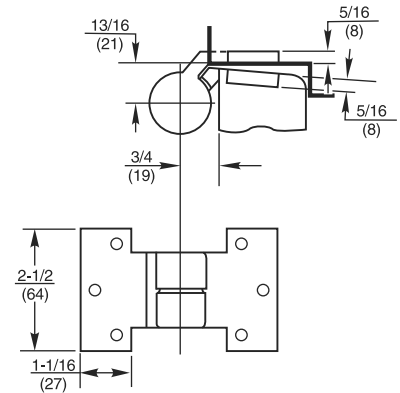
BHMA/ANSI NO: C07382



Product Description & Features

- Not load-bearing
- Maintains door alignment
- Available 3/4" offset only
- Non-ferrous base material
- Recommended for use with Model 127 and 427 Floor Closers
- Furnished with wood and machine screws

Technical Information



Model M19/M190

Application

- Full Mortise
- Handed

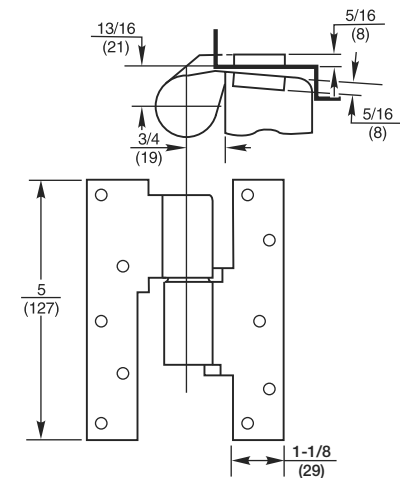
BHMA/ANSI NO: C07321/C07371



Product Description & Features

- M19, bushing, not load-bearing
- M190, bearing, load-bearing
- Maintains door alignment
- Aids in installing floor closers and bottom pivots
- Non-ferrous base material
- 3/4" offset standard
- Available 1-1/2 (38mm) offset
- Available for fire door assemblies (*ferrous material*) specify FM19 or FM190
- On labeled for fire doors NFPA80 requires an intermediate pivot for every additional 30" (762mm) of door height over 60" (1542mm)
- For 20-minute label suffix "-20" to the part number
- Furnished with wood and machine screws

Technical Information



Options


Sealed Closer – Prefix SC

This option for exterior doors or interior doors with heavy exposure to water or cleaning solvents, protects the body. The closer body is placed in the cement case. A stainless steel cover plate is then gasketed and fastened to the cement case. This must be ordered with closer and cannot be ordered less the cement case.

Delayed Action – Prefix DA

After full open permits door to remain ajar (*at 70 degrees*) for up to 40 seconds. Operates by separate valve and can be shut off if not needed. Not available on closers with hold open feature.


Physically Handicapped – Prefix PH

To comply with ICC/ANSI 117.1 established by the Americans with Disabilities Act. PH prefix indicates 5 pounds of opening force, based at 30" from centerline of pivot. PH closers may not be used on labeled fire doors or exterior doors. Rixson accepts no responsibility for PH closers and door latching. Also, be advised that ADA guidelines DO NOT apply to fire rated openings or exterior doors. 


Wood Door – Prefix W

When using a center hung product with the centering arm (*i.e. 28, 30 or 40*) a special plate and less obtrusive adjusting screws are needed for wood doors. This plate is reinforcement to the deep mortise required for that arm, protecting veneer.

Fire Rated – Prefix F

Closer packages for fire rated doors (*up to 3 hours*) include a steel top pivot and must have additional steel intermediate pivots. These closers are non-hold open. 

Twenty Minute Label – Suffix -20

This UL rating is for 20 minute doors. Pivots are brass base material and include a visible label. 

8-1/2 # Opening Force – Prefix PH Suffix 8-1/2

This is a lighter than normal opening force. Be aware that this may not be strong enough to close fire rated or exterior doors. Rixson accepts no responsibility for PH closers and door latching. Also, be advised that ADA guidelines DO NOT apply to fire rated openings or exterior doors.

Less All Parts – Suffix LAP

If a closer is needed for replacement, the arm, cover, cement case, top pivot and floor plate are omitted.

Less Floor Plate – Suffix LFP

When thresholds or cover pans are being used the closer doesn't need the decorative floor plate.

Less Cement Case – Suffix LCC

For existing installations or when cement case has been sent earlier in construction. Closer will be packaged without the cement case.

Less Top Pivot – Suffix LTP

For unusual head conditions, where the top pivot cannot be used, the closer is shipped without the top pivot. For offset installations, an additional load bearing intermediate (*side jamb*) M190 pivot is required. All intermediate pivots for that opening should be M190's, not M19's.

Heavy-Duty Floor Closers Options, Certifications, Limited Warranty, Specifications

Options Continued

Degree of Swing – Follows Model Number

Single acting heavy-duty floor closers have a deadstop. This means that the door cannot go past a certain point. If ordered as a hold open closer, the hold open position is exactly the same as the deadstop. The degrees available are 85°, 90°, 95° or 105° (180° for model 27 only). It is recommended that the maximum degree of swing be ordered.

Double acting closers have a deadstop at 103° and are available with hold open options at 90 or 100°.

Non Hold Open – Suffix N

These closers do not hold the door open. This feature cannot be changed in the field.

Automatic Hold Open – Suffix A

These closers hold the door open. This feature cannot be changed in the field.

Selective Hold Open – Suffix S

These closers can be set to hold open or non-hold open. This is done via a screw control on the top of the closer. Available on Models 27 and 28 only.

Hand- Suffix RH or LH

All single acting floor closers are handed. All double acting floor closers (30, 40, H40) are non-handed.

Door Thickness – Suffix 1-3/4, 2, 2-1/4, 2-1/2 or 3

When ordering L product for lead lined doors, the thickness of the door must be given. The purpose of the L product is to have screws spaced so that they straddle the lead in the center of the door. Also used when lead lining is under the skins of the door. Recommended for use on extra heavy or high traffic doors.

Cold Weather Fluid – Suffix CWF

Cold weather fluid should be specified for exterior doors in consistently cold climates under 32° F for weeks at a time. The hydraulic fluid is of a lower viscosity to prevent sluggish closing. Cannot be used with the delayed action feature.

Extended Spindle – Suffix Extra Length

Any special floor coverings or severe door undercuts will affect the spindle height. In these applications an extended spindle may be required. See product template to determine if an extended spindle is needed. Extended spindles available in 1/2" increments up to 2" longer than standard.

1-1/2" Offset – Suffix 1-1/2

Offset is the distance from the face of the door to the pivot point. Extended offsets should not be used unless there is cladding on the face of the door or there is trim to clear on the frame. 1-1/2" offset arms and pivots are for doors with cladding or trim that project 3/4" from the face of the door.

Cover Pan (Terrazzo) – Suffix Part Number

Closers should always be accessible. They should never be buried beneath flooring materials. A cover pan sits on top of the closer and has the flooring material set in it. This way the sight line for the floor is consistent. Cover pans may require closers with longer spindles. See cover pan template to determine spindle length needed.

Special Layouts – Suffix SPLO#

Unique installations or specially engineered products are called special layouts. These numbers must be assigned by the technical support department and they must be called out specifically by their number when ordered.

Certifications

All Rixson® heavy-duty floor closers are in compliance with ANSI/BHMA 156.4 Standards. See individual products for sub sections.



Limited Warranty

Rixson heavy-duty floor closers models 27/28 and 30/40 are warranted for 10 years against defect. The model 20 closer carries a 2 year warranty. See Rixson Price Book for specific details of the limited warranty.

Specification

Floor closers shall be heavy-duty model 27 (*offset*) or model 28 (*center hung*). All closers shall be handed. Choose appropriate functions and strengths to accommodate lead lining, extra high traffic, fire rating, independently hung or quick install models. These closers shall have separate and independent checking valves, to control latch speed, closing speed and adjustable hydraulic backcheck. All single acting closers shall have a built in dead stop feature. All closers have one piece spindle assembly. Extra heavy-duty closers shall have minimum of two thrust bearings and one needle bearing. Closers shall not have compression spring.



Lever Extension Flush Bolt With Bottom Fire Bolt No. 557 x 19BFB

- Material:** Flush bolt – brass
Bottom fire bolt – stainless steel
- Finishes:** Available in standard architectural finishes (see page 9)
- Fastener:** 7 ea. #8 x 3/4" FH combo screws
4 ea. #8 - 32 x 1/2" FH MS
4 ea. #8 counter sunk washer
- Features:**
- For Fire Rated Plastic & Wood Covered Fire Doors measuring up to 4'w x 9'h rated up to 20 minutes
 - 3/4" bolt throw, 3/4" backset; door strength maintained by corner reinforcing plate
 - When door is subjected to 230°F the plug and black plastic cover will melt allowing the bolt to project, locking the leaves together
 - Bottom fire bolt eliminates need for floor prep
 - Oversize fire bolt strike hole allows for slight door misalignment

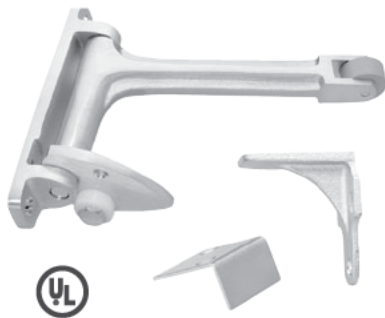
No.	Size	Weight
557 x 19BFB	Top bolt: 1" x 6 3/4" Bottom bolt: 1 3/16" dia.	0.9 lbs.



Dust Proof Strike No. 570

- Material:** Brass
- Finishes:** Available in standard architectural finishes (see page 9)
- Fastener:** Adjustment nut
Spanner wrench
2 ea. #8 x 1 OH SMS, 2 ea. plastic anchors
2 ea. #8 - 32 x 3/4" OH MS, 2 ea. lead anchors
- Features:**
- Works with all Rockwood manual and automatic flush bolts
 - Removable face plate for use with thresholds
 - Adjustable height for carpeted areas

No.	Size	Weight	ANSI A156.16
570	Face plate: 1 3/8" x 2 7/8" Barrel: 7/8" dia. x 2" depth	0.4 lbs.	L04021



Gravity Door Coordinator No. 576

- Material:** Cast brass
- Finishes:** Available in standard architectural finishes (see page 9).
- Fastener:** Body: 2 ea. #10 x 1" FH SMS, 2 ea. #10 - 24 x 1" FH MS
Strike: 5 ea. #8 x 1" FH SMS
- Other:**
- For use on door sizes:
 - with Astragal on active door – 18" to 48"
 - with Astragal on inactive door – 18" to 34"
 - with Astragal on both doors – 18" to 30"
 - The overlap of the astragal is maximum 7/8" with door hung on standard hinges. Customer must contact the factory for all other astragal situations
- Features:** Non-handed reversible. Prevents the active door from closing until the inactive door is closed

No.	Size	Projection	Weight	ANSI A156.3
576	1" x 5 7/16"	7"	2.2 lbs.	Type 21

ASSA ABLOY

The global leader in
door opening solutions
Attachment E – Technicals



Automatic Flush Bolts No. 2840 (Automatic Top Bolt Only) No. 2842 (Set) (replaces the No. 1840 and No. 1842)

- Material:** Brass, stainless steel
- Finishes:** US3, US4, US10, US10B, US26, US26D, US32D
- Fastener:** No. 2842: 20 ea. #8 x 3/4" FH combo screws, 2 ea. #6-8 plastic anchors
No. 2840: 10 ea. #8 x 3/4" FH combo screws. NOTE: No plastic anchor required for top only
- Features:**
- For Fire Rated Metal Doors labeled A, B, C, D & E up to 4'w x 8'h
 - Non-handed
 - Fully automatic— opening active door retracts top and bottom bolts
 - Override feature prevents damage to doors or bolts if bolt heads are blocked from entering strikes
 - Bolt head rods are adjustable up to 1 1/2"
 - Thermal lock automatically locks the inactive door under high heat conditions due to fire
- Options:** No. 2842 can be used with the No. 570 Dust Proof Strike (shown on page E4).

No.	Size	Weight	ANSI A156.3
2840	1" x 6 3/4"	1.2 lbs.	Type 25
2842	1" x 6 3/4"	2.4 lbs.	Type 25



Combination Flush Bolts No. 2805 (Self Latching Top Bolt Only) No. 2845 (Set) (replaces No. 1805 and No. 1845)

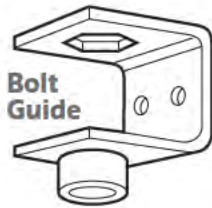
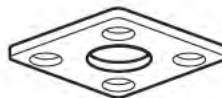
- Material:** Brass, stainless steel
- Finishes:** US3, US4, US10, US10B, US26, US26D, US32D
- Fastener:** Top: 8 ea. #8 x 3/4" FH combo screws. NOTE: No plastic anchor required for top only.
Bottom (No. 2845 only) 18 ea. #8 x 3/4" FH combo screws, 2 ea. #6-8 plastic anchors.
- Features:**
- For Fire Rated Metal Doors labeled A, B, C, D & E up to 4'w x 8'h
- Top Bolt**
- Automatically engages when the inactive door closes. When the active door is opened, the inactive door stays latched at the top until the top bolt is released by pressing the plunger button on the bolt face
- Bottom Bolt (No. 2845 only)**
- Non-handed
 - Fully automatic — opening active door retracts bottom bolt
 - Override feature prevents damage to door or bolt if bolt head is blocked from entering strike
 - Bolt head rod is adjustable up to 1 1/2"
 - Thermal lock automatically locks the inactive door under high heat conditions due to fire
- Options:** No. 2845 can be used with the No. 570 Dust Proof Strike (shown on page E4)

No.	Size	Weight	ANSI A156.3
2805	1" x 6 3/4"	1.2 lbs.	Type 27
2845	1" x 6 3/4"	2.4 lbs.	Type 27

ASSA ABLOY

The global leader in
door opening solutions

Attachment E – Technicals


Bolt Guide

4005 Strike

Header Bolt

For Aluminum Stile Doors

4016

ANSI/BHMA Type E82111 (Grade 1)

▼ Strike

For header bolt, a 1/2" diameter hole in metal frame is suitable or, for non-metal installations, 4005 strike is available.

Not applicable to wood doors.

▼ Adjustment

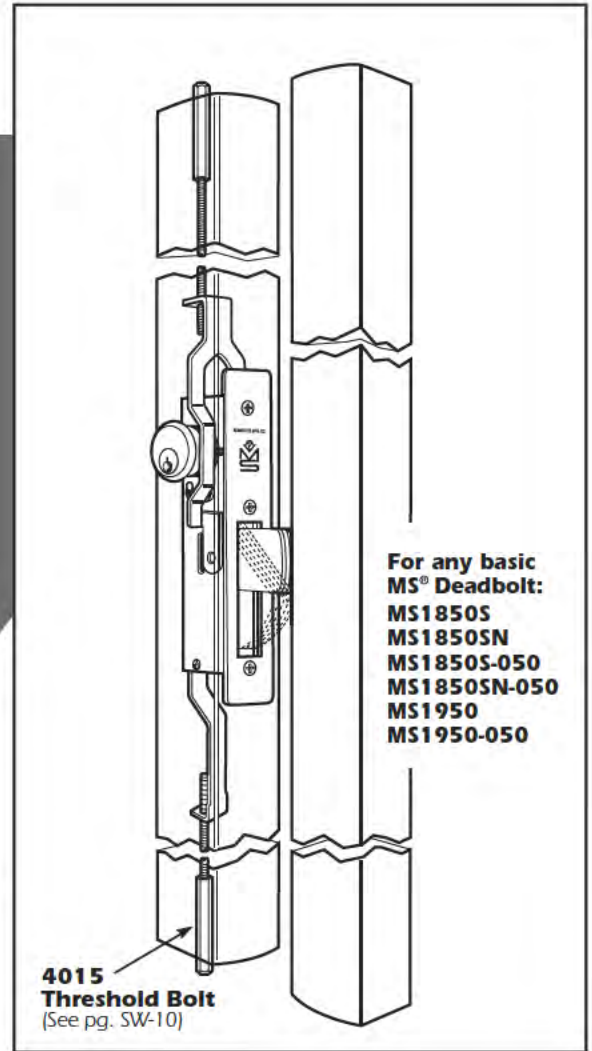
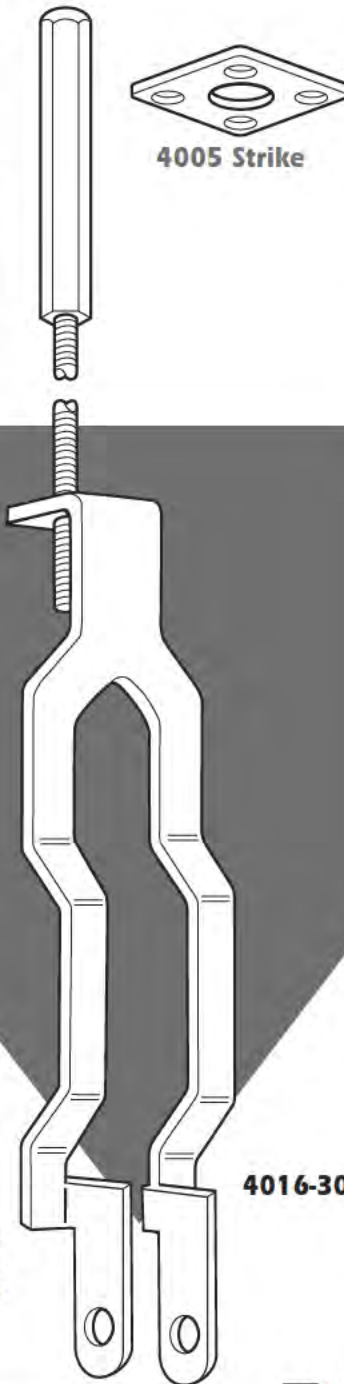
Exact adjustment of threaded rod to door height is locked in place by hexagonal header bolt.

▼ Door/Cylinder Height

The standard version is designed for a 7' door height with cylinder height as low as 35". Can also be ordered for up to 10' door with additional extension.

▼ Function

Adding the 4016 Header Bolt and the 4015 Threshold Bolt to a pivoted MS® deadbolt allows for Maximum Security for pairs of doors by the turn of a single key. Simultaneously extending the stainless steel hexbolts top and bottom and pivoting the massive MS® deadbolt into the mating stile, the three-point lock secures the entire double door entrance. The 4016 can be added to any basic MS1850S, MS1850SN or for two-points top and bottom use with 1870/1870HM Cylinder-Operated Flushbolt. Not applicable to 7/8" backset locks.



For any basic MS® Deadbolt:
 MS1850S
 MS1850SN
 MS1850S-050
 MS1850SN-050
 MS1950
 MS1950-050

4015 Threshold Bolt
 (See pg. SW-10)

▼ Header Bolt

Hexagonal 3/8" flat to flat. Made of stainless steel.

▼ Operation

360° turn of key or thumbturn in basic MS® lock throws counterbalanced bolt into opposite door and hexagonal bolt into header strike. Key can be removed only when bolts are in a positively locked or unlocked position.

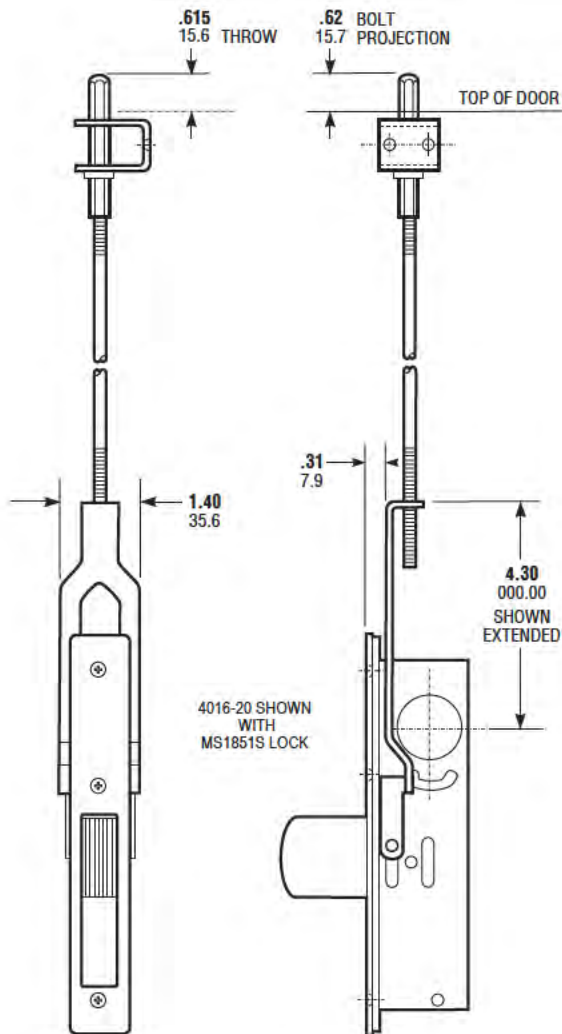


4016 Header Bolt

DIMENSIONS

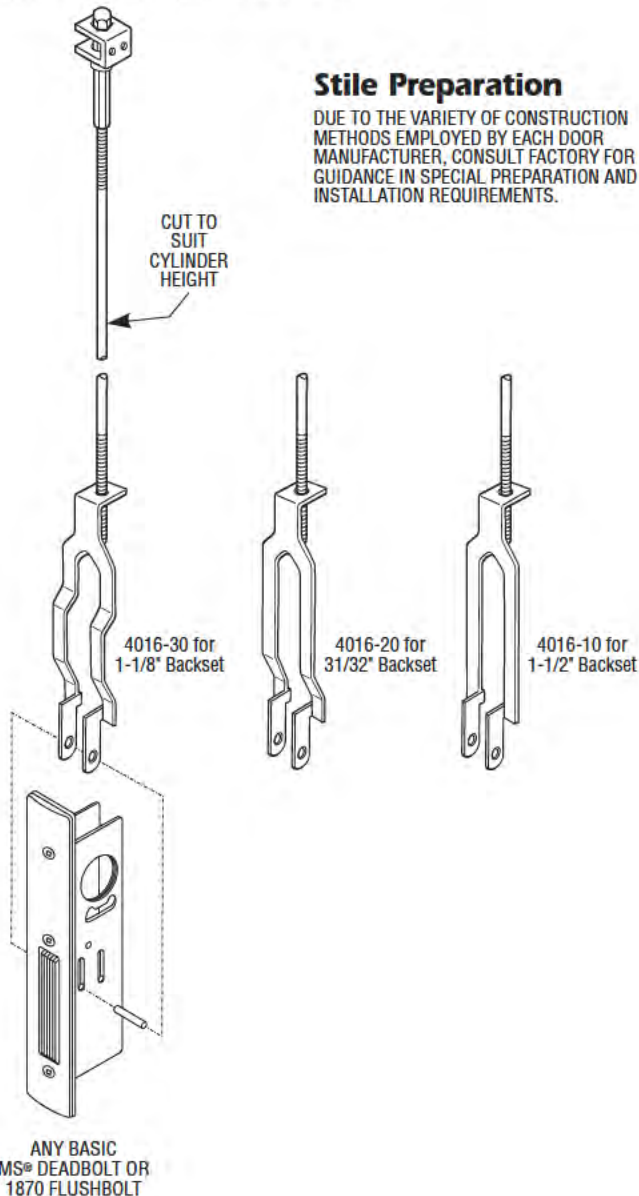
INCHES
MILLIMETERS

Nominal, subject to tolerance extremes.



INSTALLATION

INSTALL ADAPTOR ARM TO LOCK FROM TOP WITH BOLT RETRACTED AS SHOWN. INSTALL PIN THROUGH SLOTS IN LOCK SIDE PLATES, PASSING THROUGH HOLES IN BOTH SIDES OF THE ADAPTOR ARM.



Stile Preparation

DUE TO THE VARIETY OF CONSTRUCTION METHODS EMPLOYED BY EACH DOOR MANUFACTURER, CONSULT FACTORY FOR GUIDANCE IN SPECIAL PREPARATION AND INSTALLATION REQUIREMENTS.

HOW TO ORDER

*Specify quantity and the following information.
Order related hardware separately.*

Lock Backset

10 1-1/2"
20 31/32"
30 1-1/8"

Door Height

01 7' Door
02 10' Door

4016 - 30 - 01

STANDARD PACKAGE

Packed separately with bolt guide, screws and attachment pin. Shipping weight: 1 lb. Order MS Deadbolt and 4015 Threshold Bolt separately.

Threshold Bolt

For Aluminum Stile Doors

4015

ANSI/BHMA Type E824.1 (Grade 1)

▼ Cylinder Height

Standard threshold bolt rod is sufficient for cylinder height up to 53-7/16". It is fully threaded and can be cut off for low cylinder heights. Also available to volume users, cut and threaded only for specific cylinder heights.

▼ Adjustment

Exact adjustment of threaded rod to cylinder height is locked in place by hexagonal threshold bolt.

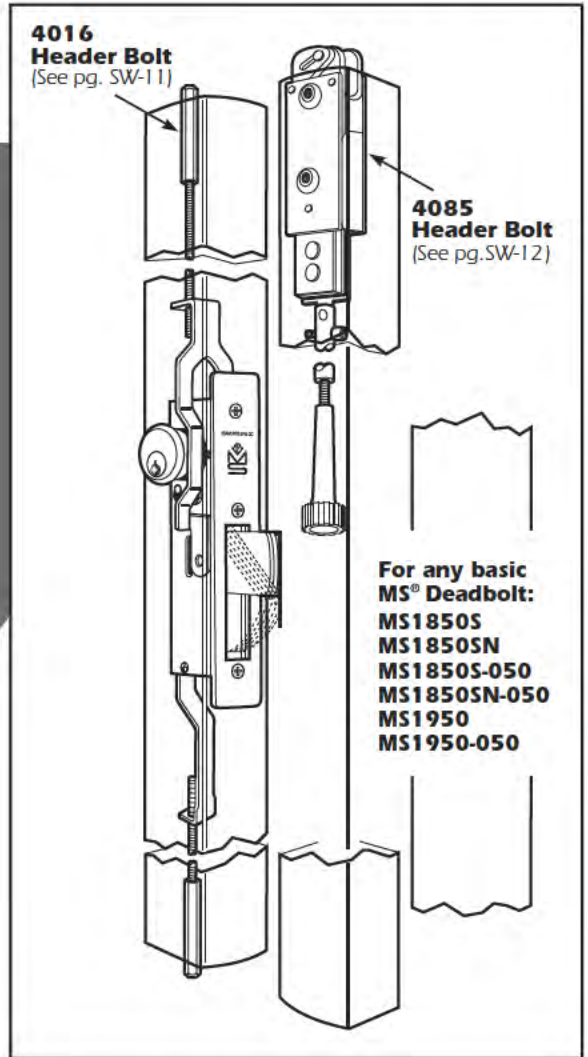
▼ Strike

For drop-bolt, a 1/2" diameter hole in metal threshold is suitable or, for non-metal installations, 4005 strike is available.



▼ Function

Adding the 4015 bolt to a pivoted bolt MS® deadbolt allows Maximum Security for pairs of doors by the turn of a single key. Simultaneously dropping a stainless steel hexbolt into the threshold and pivoting the massive MS® bolt into the mating door's stile, the two-point lock secures the entire double door entrance. The 4015 threshold bolt is harnessed to the rear of the pivoted bolt. It may be added to any basic MS1850S or MS1850SN deadbolt.



▼ Threshold Bolt

Hexagonal 3/8" flat to flat. Made of stainless steel.

▼ Operation

360° turn of key or thumbturn in basic MS® lock throws counterbalanced bolt into opposite door and drop-bolt into threshold. Key can be removed only when bolts are in a positively locked or unlocked position.

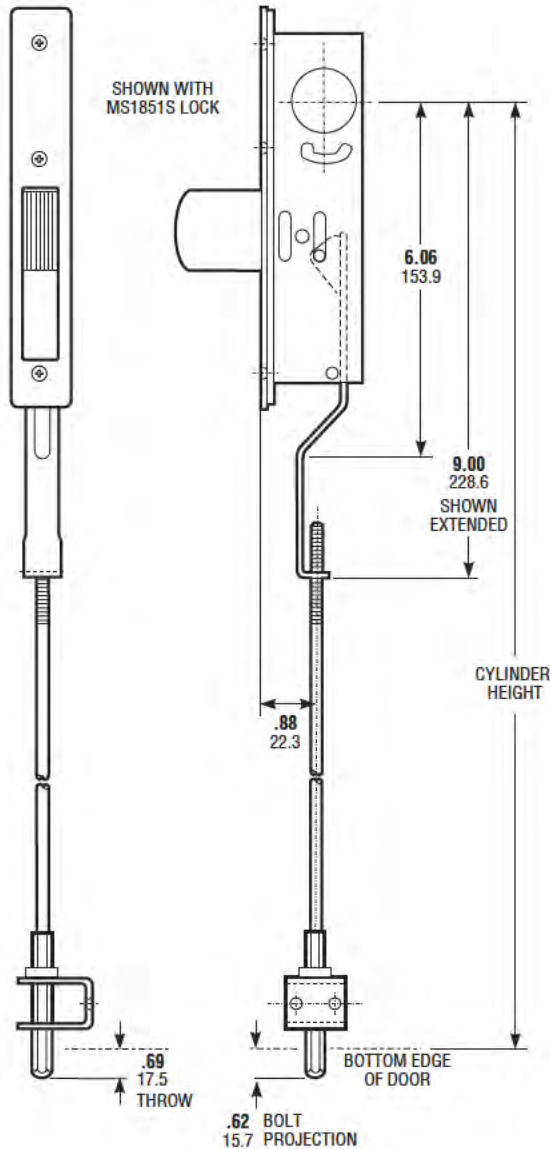


4015 Threshold Bolt

DIMENSIONS

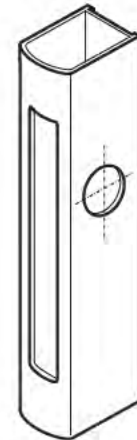
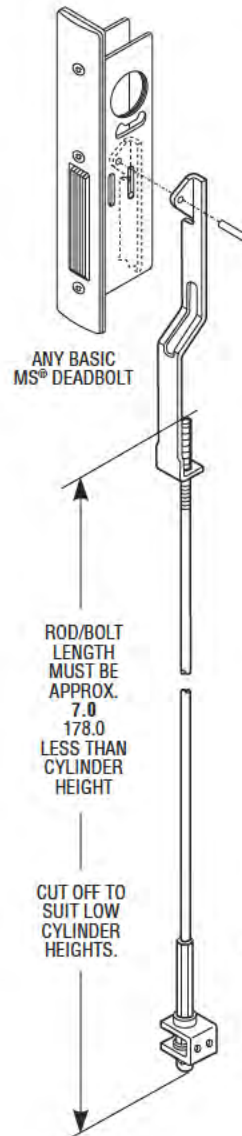
INCHES
MILLIMETERS

Nominal, subject to tolerance extremes.



INSTALLATION

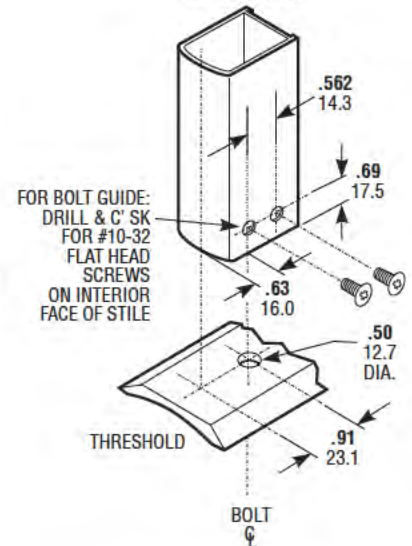
INSTALL ADAPTOR ARM IN LOCK FROM REAR WITH BOLT RETRACTED AS SHOWN. DRIVE PIN THROUGH SLOTS IN LOCK SIDE PLATES PASSING THROUGH HOLE IN THE ADAPTOR ARM.



Stile Preparation

See basic MS® Deadlocks:

- MS1850S
- MS1850SN
- MS1950
- MS1950-050



HOW TO ORDER

Specify quantity and the following information.
Order related hardware separately.

Add Dash Number
for "universal" size

4015 -18-IB

If ordering in volume quantity for specific cylinder height,
specify CYLINDER HEIGHT.

OPTIONS

For "universal" application, specify 4015-18 with fully threaded rod for cut off to any cylinder height below 53". For greater height or precut rod for high volume use, specify exact cylinder height. Order 4085 Header Bolt and 4016 Header Bolt separately (Page SW-11.)

STANDARD PACKAGE

Packed separately with bolt guide, screws and attachment pin.
Shipping weight: 1 lb.



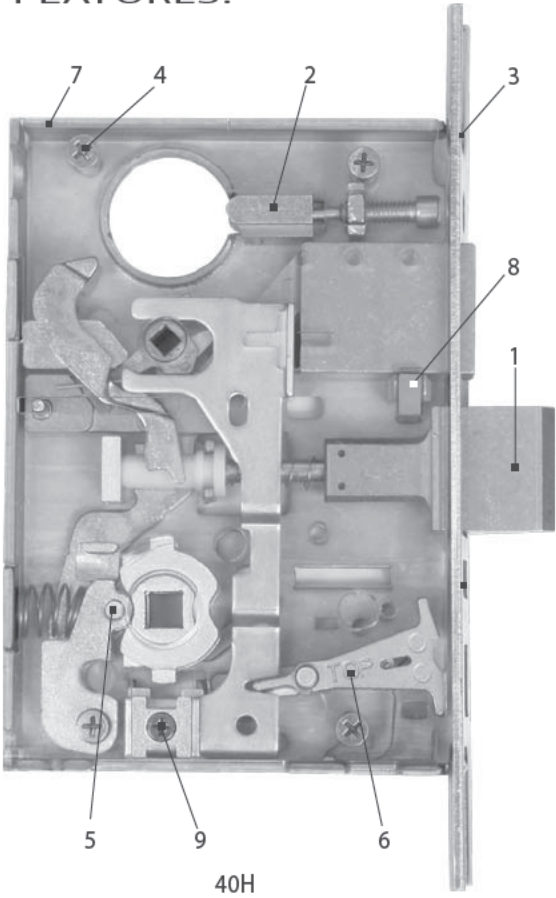
40H SERIES

Heavy Duty Mortise Locks

STANLEY[®]
Security Solutions

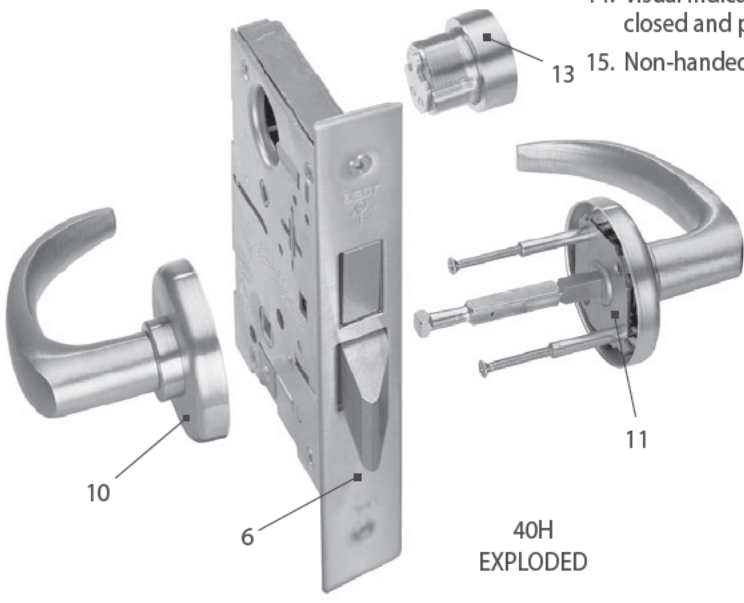
TABLE OF CONTENTS	Page	Page	
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Universal Lock Concept.....	4-5	Functions.....	10-13
How To Order	6-7	48H & 49H High Security Specification	14
Special Features	8	48H & 49H Function & How To Order.....	14
Service Equipment.....	8	Standard & High Security Cylinders.....	15

FEATURES.



40H CUTAWAY

1. Solid one-piece stainless steel anti-friction latch provides 50% more surface contact with strike for superior strength and security. Reversible latch rotates 180 degrees for easy handing change without opening case. Precision-engineered curve provides enhanced cycle life with reduced wear to the strike.
2. Non-handed cylinder retainer.
3. Armored front completely surrounds latch and deadbolt providing increased lateral strength. Staked assembly design allows the armored front to self-align with the door bevel during installation.
4. Enhanced case integrity achieved through four case cover screws (one at each corner), plus interlocking armored front and cover design at the latch.
5. Roller bearing hub mechanism provides smooth, wear resistant operation.
6. Locking toggle includes clear indication of "locked" and "unlocked" states.
7. 40H case, cover, and armored front manufactured from 0.095" cold rolled steel for strength and durability.
8. Fusible link.
9. Four position hub toggle design determines whether each hub is always locked, always unlocked, or locked by key for easy handing change without opening case.
10. Lever return spring mechanism located in trim for enhanced protection against lever droop, providing a firm, positive return of the lever to the horizontal position.
11. Self-aligning trim mechanism for fast, easy, and accurate installation.
12. Curved lip strike and strike box assembly provides an aesthetic, non-handed solution to complement field reversible case.
13. Solid machined cylinder rings with wavy washer provides resistance to wrenching of cylinder. Cylinder security screw prevents removal of cylinder without first removing interchangeable core.
14. Visual indicator shows a padlock icon open for unlocked and padlock icon closed and painted red for locked, as well as the visual indicator thumb-turn.
15. Non-handed stainless steel auxiliary bolt for ease of changing hand. (not shown)



40H EXPLODED



Strike box & strike



14 Visual Indicators



ADA-Americans With Disabilities Act:
45H Series - The design and operation of the BEST® mortise lock meets the intent of the standard for ANSI A117.1 section 404.2.6.

Builders Hardware Manufacturers Association:
45H Series - ANSI A156.13, Series 1000, Grade 1 Operation and Strength, Grade 2 Security. To meet Grade 1 Security, a drill resistant core (1CD, 1CDP, 1CDF, or 1CDX) must be used with escutcheon trims, and 1E7K4 high security cylinder must be used with sectional trims.

47H Series - ANSI A156.13, Series 1000, Grade 1 Operational, Strength, and Security.

Underwriters Laboratories®
The 40H series is listed by Underwriters Laboratories for use on a 3 hour A label doors. These locks also carry the C-UL mark which is officially accepted in all of Canada, indicating compliance with appropriate Canadian standards and codes. The 47H series locks conform to UL437 standard for key locks, referencing door locks. The 1E7J4 cylinder used in the 47H series also conforms to UL437 standard for key locks, referencing high security cylinders, and is listed for Canada as well as the United States.

Florida Building Code (FBC) Listed and Miami-Dade County Code Compliance Office

See certification listing for all 40H series lock functions that are certified for use in applications requiring a design pressure rating as specified.

Description	Model	Single Door	Double Door
PSF w/o DeadBolt	45H and 47H	+60	+35
PSF w/ DeadBolt	45H and 47H	+100	+50
PSF w/ DeadBolt	48H and 49H	+50	+50

The 40H series lock has received a notice of acceptance from Miami-Dade County and is considered Miami-Dade County product. "WS" option must be ordered for the lock to include a "Miami-Dade County Product Control Approved" label for inspection purposes.

Auxiliary bolt: Stainless steel, non-handed.

Backset: 2 3/4"

Case: 0.095" cold rolled steel, 5 7/8" H x 7/8" D x 4 1/16" W. Steel is zinc dichromate plated for corrosion protection.

Deadbolt: Stainless steel, 1" throw.

Latchbolt: Solid stainless steel, 3/4" throw. Latch is oil-impregnated for anti-friction operation. Reversible without opening case.

Strike: For complete strike package spec's see page 5.

Door Thickness: Standard lock configuration designed for doors 1 3/4" thick. Thick door configuration available for doors up to 5" thick (specify thickness when ordering).

Faceplate: Stainless steel, brass or bronze material, 8" H x 1 1/4" W x 1/16" T. Lock face automatically adjusts to proper bevel during

Finishes:

- 605 – bright brass, clear coated
- 606 – satin brass, clear coated
- 611 – bright bronze, clear coated
- 612 – satin bronze, clear coated
- 613* – oxidized satin bronze, oil rubbed
- 618 – bright nickel plated, clear coated (brass base material)
- 619 – satin nickel plated, clear coated (brass base material)
- 622 – flat black coated (brass base material)
- 625 – bright chromium plated (brass base material)
- 626 – satin chromium plated (brass base material)
- 629 – bright stainless steel
- 630 – satin stainless steel
- 690* – dark bronze coated (brass base material)

*613 finish is designed to wear over time, providing an "antique" appearance. 690 finish will continue as a dark brown appearance over time.

Antimicrobial Finish

- 626AM – satin chrome plated with UltraShield™ antimicrobial protected coating
- 630AM – satin stainless steel with UltraShield™ antimicrobial protected coating



The Stanley Security Solutions UltraShield™ finish inhibits the growth of bacteria and other microbes on the surface of the hardware.

NOTE: Stanley's UltraShield™ option is recommended for use on any hardware application where product cleanliness is a high priority. i.e.: Hospital/Healthcare, Elderly Care, Education, Transportation, Food-Service, Hospitality.

#4 Knob: Diameter – 2 1/8"; Projection on door – 2 7/8" Material machined from solid brass or bronze.

Decorative and Special Order Lever Handles: Stainless steel base material with applied finish.

Standard Lever Handles: Brass, bronze, or stainless steel base material for standard lever designs. Lever styles #3, #14, and #15 return to a minimum of 1/2" of door surface. Lever styles #3 and #14 conform to California Titles 19 and 24. Lever styles 12, 16 and 17 do not return. Levers project 2 15/16" from door surface with H, J, R and S trim. Levers project 3 1/64" with M and N trim.

Roses: Wrought brass, bronze, or stainless steel base material.

H – Flat w/ round edge, 2 3/4" diameter.

R – Contoured w/ round edge, 2 3/4" diameter.

S – Flat w/ beveled edge, 3 1/2" diameter.

Escutcheons: J – Wrought brass, bronze, or stainless steel base material, 7 1/2" H x 2 9/32" W x 17/32" T. M & N – Forged brass or bronze, 8" H x 2 1/8" W x 37/64" T, through bolt mounted (no exposed screws outside). M – Standard cylinder; N – Concealed cylinder.

Vandal Trim: VT-Vandal trim is available in standard finish for H, J, M, N, R, and S trims in either #14 or #15 levers.

NOTE: Not available in single or dummy trim functions. If compliance to California Building Code Title 19 & 24 is required, the #14 lever design must be specified.

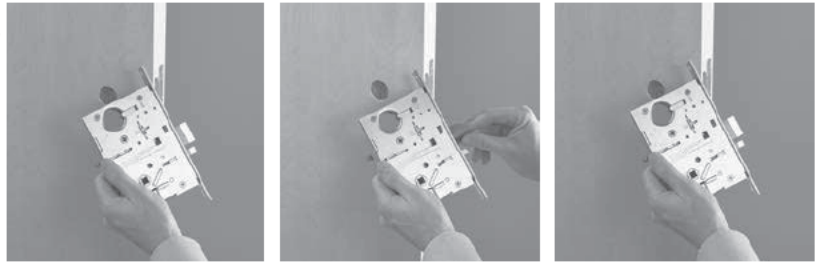
Visual Indicators:

VIN-Visual indication uses an unlocked padlock or locked padlock image with red background to indicate lock state.

VIT-Visual indication uses a thumb-turn with color coded locked and unlocked icons – red indicates door is secure and green indicates door is unsecure.

UNIVERSAL LOCK DESIGN CONCEPT

Strength, Durability...and now Flexibility. Sure, a mortise lock is one of the strongest and longest lasting locks available. But who says it has to be the most complex to order and install? When designing the 40H mortise lock, BEST[®] decided to focus on things that would make the lock easier to use, while at the same time maintaining the strength, durability, and dependability you would expect in a BEST[®] mortise lock.



In addition to the ability to quickly change the lock handing, the universal case design of the 40H provides the ability to reconfigure a lock into many different functions easily and quickly, often by rearranging existing parts without disassembling the lock case. The efficiency of the design enables over 12 of the most commonly used lock functions to be included in just 3 case configurations.

The 40H provides the ability to postpone decisions on how the lock will be configured all the way up to the point of installation, making it one of the most flexible and user-friendly mortise locks available. This translates into value for anyone involved in the process, whether they're an architect, specification writer, distributor, or end-user.

FLEXIBILITY IN ORDERING

Stanley/BEST offers three ways in which to order the 40H mortise lock. YOU get to choose which method meets your needs.

Function Specific Lock

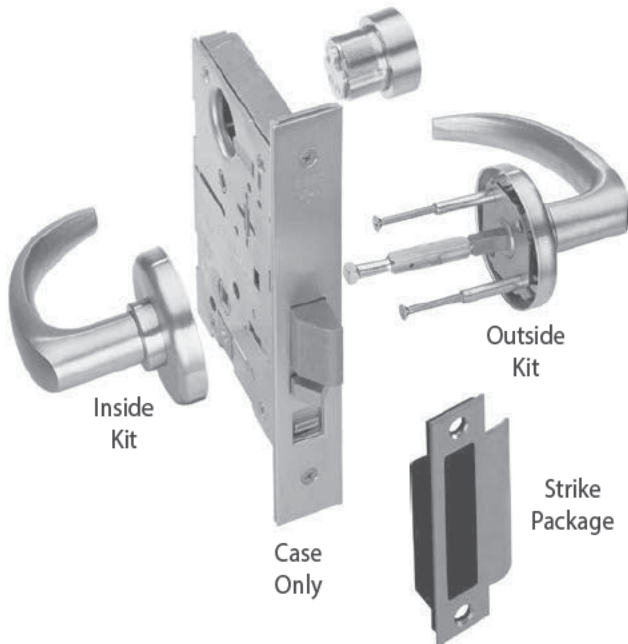
If you know exactly what you need in a mortise lock, and are confident that your needs won't change, then order your 40H locks in the traditional way by specifying the exact function, trim, finish, and handing. BEST[®] will build the locks to work exactly as specified, so they may or may not have the ability to be converted to another function in the future.

Universal Lock

If you want to keep your options open, this method of ordering the 40H is for you. BEST[®] has developed three "universal" functions that can be configured to a variety of common functions, all without opening the lock case. When any of the universal functions are ordered as a complete lock, all the necessary parts (including trim) are provided to configure any of the functions in that group.

UNR	ANSI	UNT	ANSI	UNAB	ANSI
A - office	F04	L - privacy	F19	AB - office	F20
AT - office	F04	T - dormitory	F13	TA - dormitory	F12
D - storeroom	F07			TD - dormitory	
N - passage	F01				
NX - exit	F31				
R - classroom	F05				

FOUR-PART LOCK



For the maximum flexibility in ordering a mortise lock, BEST[®] provides a way to order your 40H lock in four parts: Inside Trim, Case Only, Outside Trim and Strike Packages. The kits that make up these four parts have been carefully designed so that when all three are combined you have everything found in a complete 40H lock. This order method is ideal for customers wanting to stock a variety of trim designs with a minimal number of lock cases.

HOW TO ORDER: 45H

45H	7	R	14	H	626	RH	
Series	Core Housing	Function Code	Lever Style	Trim Style	Finish	Door Hand	Options
45H- standard mortise lock	0- non keyed or dummy trim 7- 7 pin housing accepts all BEST cores	A- office D- storeroom L- privacy N- passage R- classroom T- dormitory etc. pages 14-17	Standard Levers: ⊗ 3- solid tube/return ⊗ 12- solid tube/no return ⊗ 14- curved return ⊗ 15- contour/angle return ⊗ 16- curved/no return ⊗ 17- gull wing Knobs: 4- round	H- 2 3/4" dia. R- 2 3/4" dia. S- 3 1/2" dia. J- wrought M- forged N- forged (concealed cyl.)	618 626 630 690 Satin 606 612 613 619 Bright 605 611 622 625 629 Antimicrobial 626AM 630AM page 3	RH RHRB LH LHRB page 8	LL- lead lined SH- security head screws Thick Door- (specify thickness if other than 1 3/4") TAC- tactile lever/knob 7/8 LTC- 7/8" lip-to-center strike VIN*- visual indicator S1- standard strike S5- latchbolt-only strike S6- latchbolt/deadbolt strike VT- vandal trim VIT- visual indicator thumb- turn

STANDARD MORTISE CYLINDER

Standard 1E74 Mortise Cylinder

Designed for standard security applications, BEST® offers the 45H/48H mortise locksets, utilizing the 1E74 mortise cylinder and special interchangeable core. Special cylinder variations are available for most applications. Stanley/Best cylinders are machined from solid brass or bronze bar stock. Additional security is provided by a set screw that mounts diagonally into the cylinder wall. This set screw prevents unauthorized removal of the cylinder without use of the control key.



1E74
Standard Mortise Cylinder

1E74 Cylinder Specifications

Diameter: 1 5/32". 1.150-32 (NS-2A) threaded mortise cylinder.

Length: 1 1/4"

Material: Brass or bronze.

Finish: Supplied to match mortise lockset trim (see specifications, page 3).

Cylinder Ring: Wrench resistant ring with tension spring, machined from all brass or bronze.

Proper length automatically provided with lockset. For more ring information see cylinder catalog.

Cam: Proper cam provided for cylinder as required by designated function on order. Special cams available; see cylinder catalog section.



Standard C258 Cam



C293 Cam

All functions except O/S C and CHB O/S c and CHB Functions only

HIGH SECURITY CYLINDER

1E7J4 High Security Cylinder

Designed for high security applications, BEST® offers the 47H/49H mortise locksets, utilizing the 1E7J4 high security cylinder and special 5C interchangeable core. This special cylinder is listed by Underwriters Laboratories as conforming to Standard UL437 for high security cylinders. The patented cylinder provides additional strength through a hardened stainless steel alloy ring, face and keyway disc. It is available in most keyed functions (All functions are certified to ANSI A156.13 Security Grade 1.) and is supplied only with "M" trim. Cylinder also conforms to ANSI A156.5 Mortise Cylinder, Grade 1A.

NOTE: 1E7J4 must be combined at factory to comply to UL437. 1E7K4 is combined in the field and may be ordered less core.



1E7J4
High Security Cylinder

1E7J4 Cylinder Specifications

Diameter: 1 5/32". 1.150-32 (NS-2A) threaded mortise cylinder.

Length: 1 1/16"

Materials: Brass and stainless steel.

Finish: Stainless steel base plated to match 626 finish.

Cylinder Ring: High security wrench resistant, machined from stainless steel, hardened. Proper length automatically provided with lockset. Special door preparation required. Diameter of hole 1 3/4".

Cylinder Face,

Keyway Disc: Stainless steel, hardened.

Cam: Proper cam provided for cylinder as required by designated function order.

NOTE: 1E7J4 requires long blade key for operation.

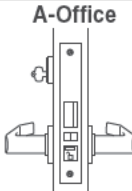
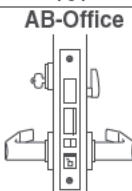




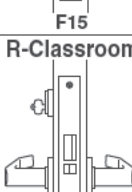
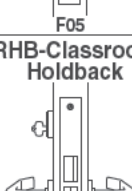


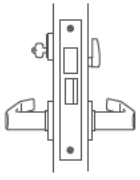
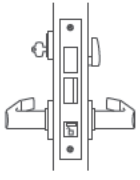
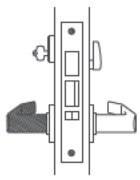
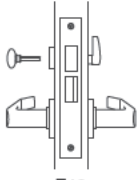
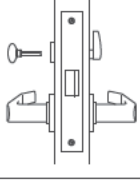
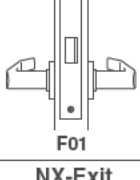
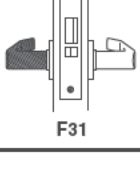
47H Mortise Lock
with #4 knob



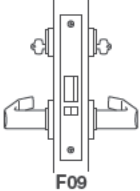
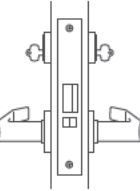
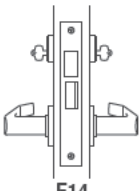
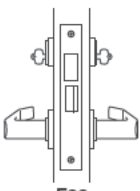
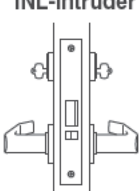
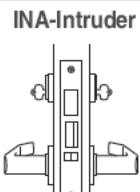

47H Mortise Lock
with #14 lever

FUNCTIONS

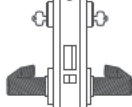


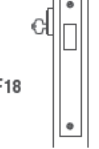
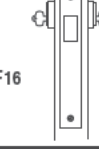
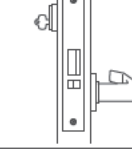
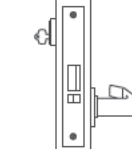
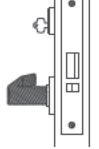
Function & Diag. ANSI No.	Description Latch operated by	Outside Lever or Knob			Inside Lever or Knob	
		Deadbolt operated by	Locked by	Unlocked by	Locked by	Unlocked by
Single Keyed						
 A-Office F04	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever—only when locking toggle is in unlocked position, Turning key in outside cylinder. 	N/A	Placing locking toggle in locked position	Placing locking toggle in unlocked position	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
 AB-Office F20	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever—only when locking toggle is in unlocked position, Turning key in outside cylinder. 	<ul style="list-style-type: none"> Turning key in outside cylinder, Inside turn lever, Inside lever retracts deadbolt and latch simultaneously. 	<ul style="list-style-type: none"> Placing locking toggle in locked position, Projecting deadbolt by key or turn lever. 	Turning key in outside cylinder and placing locking toggle in unlocked position	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
 AT-Office F04	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever only when unlocked by key or turn lever, Turning key in outside cylinder. 	N/A	<ul style="list-style-type: none"> Turning inside turn lever, Turn key in outside cylinder. 	<ul style="list-style-type: none"> Turning inside turn lever, Turning key in outside cylinder. 	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
 D-Storeroom F07	<ul style="list-style-type: none"> Rotating inside lever, Turning key in outside cylinder. 	N/A	Always locked	Cannot be unlocked	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
 H-Hotel F15	<ul style="list-style-type: none"> Rotating inside lever, Turning key in outside cylinder. 	<ul style="list-style-type: none"> Turning inside turn knob Turning key in O/S cylinder. (Rotating inside lever retracts deadbolt and latch simultaneously). 	Always locked	Cannot be unlocked	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch. Throwing deadbolt blocks out all keys except "ER" key.						
 HJ-Hotel F15	<ul style="list-style-type: none"> Rotating inside lever, Turning key in outside cylinder. 	<ul style="list-style-type: none"> Turning inside turn lever, Turning emergency key in O/S cylinder. (Rotating inside lever retracts deadbolt and latch simultaneously.) 	Always locked	Cannot be unlocked	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch. Throwing deadbolt blocks out all keys except "ER" key.						
 R-Classroom F05	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever only when unlocked by key, Turning key in outside cylinder. 	N/A	Turning key in outside cylinder	Turning key in outside cylinder	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
 RHB-Classroom Holdback F06	<ul style="list-style-type: none"> Rotating inside lever, Turning key in outside cylinder, O/S lever except when locked by outside key, Latchbolt held retracted by turning O/S key while holding up I/S lever. 	N/A	Turning key in outside cylinder	Turning key in outside cylinder	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						

Function & Diag. ANSI No.	Description	Outside Lever or Knob		Inside Lever or Knob		
		Latch operated by	Deadbolt operated by	Locked by	Unlocked by	Locked by
Single Keyed (continued)						
T-Dormitory  F13	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever—only when deadbolt is retracted Turning key in outside cylinder. 	<ul style="list-style-type: none"> Turning key in outside cylinder, Inside turn lever, Inside lever retracts deadbolt and latch simultaneously. 	<ul style="list-style-type: none"> Turning key in outside cylinder, Turning inside turn lever. 	<ul style="list-style-type: none"> Turning key in outside cylinder, Turning inside turn lever, Rotating inside lever. 	Cannot be locked	Always unlocked
TA-Dormitory  F12	<ul style="list-style-type: none"> Rotating inside lever, Rotating O/S lever only when locking toggle is in unlocked position and deadbolt is retracted, Turning key in outside cylinder. 	<ul style="list-style-type: none"> Turning key in outside cylinder, Turning inside turn lever. (Rotating inside lever retracts deadbolt and latch simultaneously.) 	<ul style="list-style-type: none"> Placing locking toggle in locked position, Projecting deadbolt by key or turn lever. 	Turning key in outside cylinder and placing locking toggle in unlocked position	Cannot be locked	Always unlocked
TD-Dormitory  F12	<ul style="list-style-type: none"> Rotating inside lever, Turning key in outside cylinder. 	<ul style="list-style-type: none"> Turning inside turn lever, Rotating inside lever retracts deadbolt and latch simultaneously.), Turning key in outside cylinder. 	Always locked	Cannot be unlocked	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
Non-Keyed						
L-Privacy  F19	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever only when deadbolt is retracted. 	<ul style="list-style-type: none"> Turning the emergency key, Turning inside turn lever. (Rotating inside knob/lever retracts deadbolt and latch simultaneously.) 	<ul style="list-style-type: none"> Turning inside turn lever, Turning the emergency key. 	<ul style="list-style-type: none"> Turning inside turn lever, Rotating inside lever retracts latch and deadbolt simultaneously, Turning the emergency key. 	Cannot be locked	Always unlocked
LT-Privacy  F19	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever only when turn knob is unlocked. 	N/A	<ul style="list-style-type: none"> Turning inside turn lever, Turning the emergency key. 	<ul style="list-style-type: none"> Turning inside turn lever, Rotating inside lever, Turning the emergency key. 	Cannot be locked	Always unlocked
N-Passage  F01	Rotating inside or outside lever	N/A	Cannot be locked	Always unlocked	Cannot be locked	Always unlocked
NX-Exit  F31	Rotating inside lever	N/A	Always locked	Cannot be unlocked	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						

FUNCTIONS

Function & Diag. ANSI No.	Description	Outside Lever or Knob			Inside Lever or Knob	
		Latch operated by	Deadbolt operated by	Locked by	Unlocked by	Locked by
Double Keyed*						
 <p>*C-Public Entrance F09</p>	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever only when unlocked by key in inside cylinder, Turning key in outside cylinder only. 	N/A	Turning key in inside cylinder	Turning key in inside cylinder	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch. When required, inside cylinder may be combined to operate by master key only.						
 <p>CHB-Holdback</p>	<ul style="list-style-type: none"> Turning outside key, Rotating outside lever only when unlocked by key in inside cylinder, Inside lever, Latchbolt held retracted by turning inside key while holding up on inside lever. 	N/A	Turning key in inside cylinder	Turning key in inside cylinder	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch.						
 <p>G-Communicating F14</p>	Rotating inside or outside lever— only when deadbolt is retracted	Turning key in inside or outside cylinder	Turning key in inside or outside cylinder	Turning key in inside or outside cylinder	Turning key in inside or outside cylinder	Turning key in inside or outside cylinder
 <p>IND-Intruder F33</p>	<ul style="list-style-type: none"> Turning key in inside or outside cylinder, Rotating outside lever when deadbolt is retracted, Rotating inside lever. 	<ul style="list-style-type: none"> Turning key in outside or inside cylinder, Rotating inside lever (Retracts the deadbolt and latch simultaneously). 	Extending the deadbolt by turning key in inside or outside cylinder	<ul style="list-style-type: none"> Retracting the deadbolt by turning key in inside or outside cylinder, Rotating inside lever (Retracts the deadbolt and latch simultaneously). 	Cannot be locked	Always unlocked
 <p>INL-Intruder F32</p>	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever only when unlocked by inside or outside key, Turning key in inside or outside cylinder. 	N/A	Turning key in inside or outside cylinder	Turning key in inside or outside cylinder	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch. When required, inside cylinder may be combined to operate by master key only.						
 <p>INA-Intruder F34</p>	<ul style="list-style-type: none"> Turning key in inside or outside cylinder, Rotating outside lever when deadbolt is retracted, Rotating inside lever. 	<ul style="list-style-type: none"> Turning key in outside or inside cylinder, Rotating inside lever (Retracts the deadbolt and latch simultaneously). 	Extending the deadbolt by turning key in inside or outside cylinder	<ul style="list-style-type: none"> Retracting the deadbolt by turning key in inside or outside cylinder, Rotating inside lever (Retracts the deadbolt and latch simultaneously). 	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch. When required, inside cylinder may be combined to operate by master key only.						
 <p>*S-Storeroom F35</p>	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever only when locking toggle is in unlocked position and deadbolt is retracted, Turning key in inside or outside cylinder. 	Turning key in inside or outside cylinder	Placing locking toggle in locked position	Turning key in outside cylinder or inside cylinder and placing locking toggle in unlocked position	Extending the deadbolt	Retracting the deadbolt

***ATTENTION:** Locksets that secure both sides of the door are controlled by building codes and the Life Safety Code®. In an emergency exit situation, failure to quickly unlock the inside lever could be hazardous or even fatal.

Function & Diag. ANSI No.	Description Latch operated by	Outside Lever or Knob			Inside Lever or Knob	
		Deadbolt operated by	Locked by	Unlocked by	Locked by	Unlocked by
Double Keyed* (continued)						
*W-Storeroom  F30	Turning key in inside or outside cylinder	N/A	Always locked	Cannot be unlocked	Always locked	Cannot be unlocked
The latchbolt is deadlocked with an auxiliary deadlatch. When required, inside cylinder may be combined to operate by master key only.						
Deadlocks						
AD-Deadlock  F17	N/A	<ul style="list-style-type: none"> Turning key in outside cylinder Turning inside turn lever. 	N/A	N/A	N/A	N/A
RD-Classroom Deadlock  F29	N/A	<ul style="list-style-type: none"> Turning key in outside cylinder Turning inside turn lever.* 	N/A	N/A	N/A	N/A
*Function RD—the inside turn knob retracts deadbolt but will not project it. (Specify hand of door.)						
YD-Deadlock  F18	N/A	Turning key in outside cylinder only	N/A	N/A	N/A	N/A
WD-Deadlock  F16	N/A	Turning key in outside or inside cylinder	N/A	N/A	N/A	N/A
Special						
XR-Classroom 	<ul style="list-style-type: none"> Rotating inside lever, Turning key in outside cylinder. 	N/A	N/A	N/A	Cannot be locked	Always unlocked
XRHB-Classroom Holdback 	<ul style="list-style-type: none"> Rotating inside lever, Turning key in outside cylinder. Latchbolt held retracted by turning O/S key while holding up I/S lever 	N/A	N/A	N/A	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
*ZD-Storeroom 	Turning key in outside cylinder	N/A	Always locked	Cannot be unlocked	N/A	N/A
The latchbolt is deadlocked with an auxiliary deadlatch						

***ATTENTION:** Locksets that secure both sides of the door are controlled by building codes and the Life Safety Code®. In an emergency exit situation, failure to quickly unlock the inside lever could be hazardous or even fatal.

40H SERIES - STANDARD LEVERS, KNOB & TRIMS



Knob- 4
Rose - H



Knob- 4
Rose - R



Knob- 4
Rose - S



Knob- 4
Escutcheon - J



Knob- 4
Escutcheon - N



Lever- 3
Rose - H



Lever- 12
Rose - H



Lever- 14
Rose - H



Lever- 15
Rose - H



Lever- 16
Rose - H



Lever- 17
Rose - H



Lever- 3
Rose - R



Lever- 12
Rose - R



Lever- 14
Rose - R



Lever- 15
Rose - R



Lever- 16
Rose - R



Lever- 17
Rose - R

40H SERIES - STANDARD LEVERS, KNOB & TRIMS



**Lever-3
Rose - S**



**Lever-12
Rose - S**



**Lever-14
Rose - S**



**Lever-15
Rose - S**



**Lever-16
Rose - S**



**Lever-17
Rose - S**



**Lever-3
Escutcheon - J**



**Lever-12
Escutcheon - J**



**Lever-14
Escutcheon - J**



**Lever-15
Escutcheon - J**



**Lever-16
Escutcheon - J**



**Lever-17
Escutcheon - J**



**Lever-3
Escutcheon - M**



**Lever-12
Escutcheon - M**



**Lever-14
Escutcheon - M**



**Lever-15
Escutcheon - M**



**Lever-16
Escutcheon - N**



**Lever-17
Escutcheon - N**

40H SERIES - DECORATIVE LEVERS



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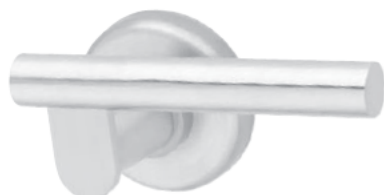
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40H SERIES - DECORATIVE LEVERS



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#76



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#85



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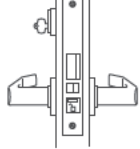
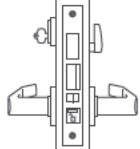
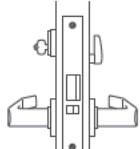
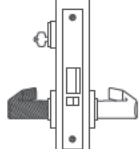
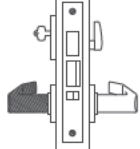
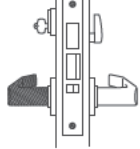
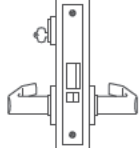
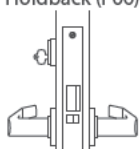


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FUNCTIONS

Function & Diag.	Description	Outside Lever or Knob			Inside Knob/Lever	
ANSI No.	Latch operated by	Deadbolt operated by	Locked by	Unlocked by	Locked by	Unlocked by
Single Keyed						
A-Office (F04) 	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever—only when locking toggle is in unlocked position, Turning key in outside cylinder. 	N/A	Placing locking toggle in locked position	Placing locking toggle in unlocked position	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
AB-Office (F20) 	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever—only when locking toggle is in unlocked position, Turning key in outside cylinder. 	<ul style="list-style-type: none"> Turning key in outside cylinder, Inside turn lever, Inside lever retracts deadbolt and latch simultaneously. 	<ul style="list-style-type: none"> Placing locking toggle in locked position, Projecting dead-bolt by key or turn lever. 	Turning key in outside cylinder and placing locking toggle in unlocked position	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
AT-Office (F04) 	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever only when unlocked by key or turn lever, Turning key in outside cylinder. 	N/A	<ul style="list-style-type: none"> Turning inside lever, Turn key in outside cylinder. 	<ul style="list-style-type: none"> Turning inside turn lever, Turning key in outside cylinder. 	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
D-Storeroom (F07) 	<ul style="list-style-type: none"> Rotating inside lever, Turning key in outside cylinder. 	N/A	Always locked	Cannot be unlocked	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
H-Hotel (F15) 	<ul style="list-style-type: none"> Rotating inside lever, Turning key in outside cylinder. 	<ul style="list-style-type: none"> Turning inside turn lever, Turning emergency key in O/S cylinder. (Rotating inside lever retracts deadbolt and latch simultaneously.) 	Always locked	Cannot be unlocked	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch. Throwing deadbolt blocks out all keys except "ER" key.						
HJ-Hotel (F15) 	<ul style="list-style-type: none"> Rotating inside lever, Turning key in outside cylinder. 	<ul style="list-style-type: none"> Turning inside turn lever, Turning emergency key in O/S cylinder. (Rotating inside lever retracts deadbolt and latch simultaneously.) 	Always locked	Cannot be unlocked	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch. Throwing deadbolt blocks out all keys except "ER" key.						
R-Classroom (F05) 	<ul style="list-style-type: none"> Rotating inside lever, Rotating outside lever only when unlocked by key, Turning key in outside cylinder. 	N/A	Turning key in outside cylinder	Turning key in outside cylinder	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						
RHB-Classroom Holdback (F06) 	<ul style="list-style-type: none"> Rotating inside lever, Turning key in outside cylinder, O/S lever except when locked by outside key, Latchbolt held retracted by turning O/S key while holding up I/S lever. 	N/A	Turning key in outside cylinder	Turning key in outside cylinder	Cannot be locked	Always unlocked
The latchbolt is deadlocked with an auxiliary deadlatch						

40H SERIES - STANDARD LEVERS, KNOB & TRIMS



Knob-4
Rose - H



Knob-4
Rose - R



Knob-4
Rose - S



Knob-4
Escutcheon - J



Knob-4
Escutcheon - N



Lever-3
Rose - H



Lever-12
Rose - H



Lever-14
Rose - H



Lever-15
Rose - H



Lever-16
Rose - H



Lever-17
Rose - H



Lever-3
Rose - R



Lever-12
Rose - R



Lever-14
Rose - R



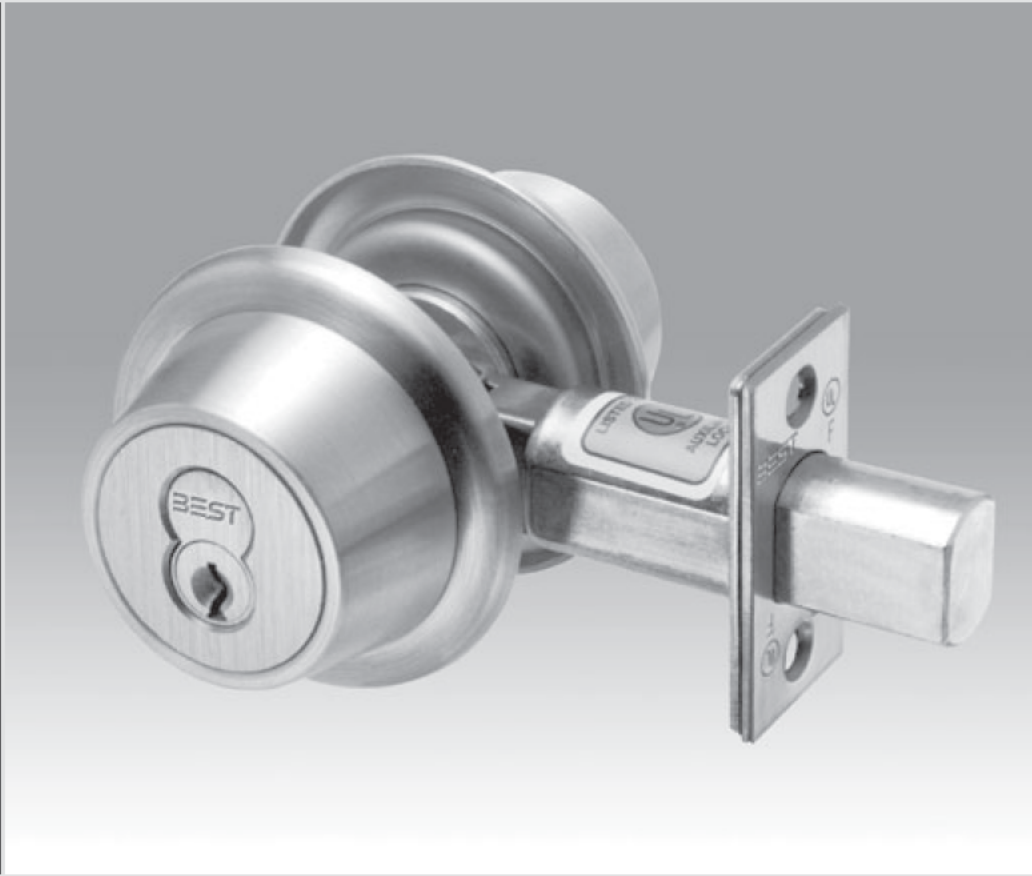
Lever-15
Rose - R



Lever-16
Rose - R



Lever-17
Rose - R



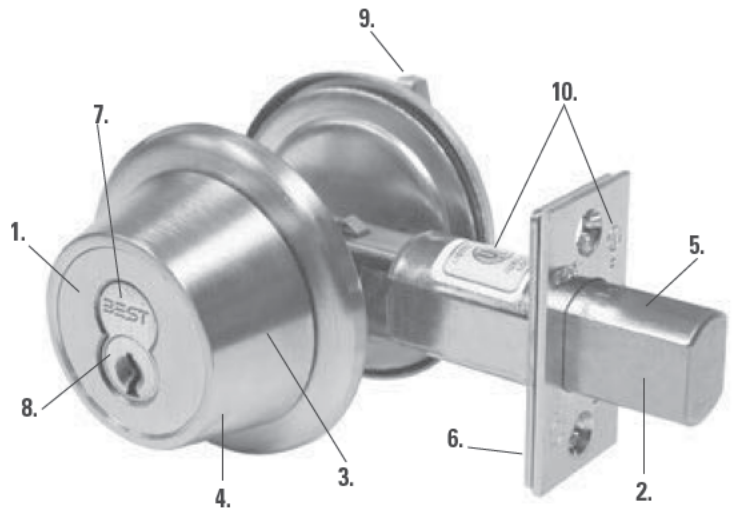
T SERIES

Tubular Deadbolts



DEADBOLT FEATURES

1. No exposed mounting screws standard on 8T2/8T3 double cylinder M function only (available as an option on 8T2/8T3 K, L, and S function)
2. Full 1" stainless steel throw deadbolt
3. Free-turning, wrench-resistant, tapered cylinder ring
4. 8T2/8T3-solid extruded brass or bronze cylinder
7T2/7T3-solid cast zinc with brass or bronze shell
5. Stainless steel for strength and corrosion resistance
6. Simple installation; self-aligning and reversible strike
7. May be keyed into existing BEST® masterkeyed system
8. The original interchangeable core permits instant, economical rekeying
9. ADA turn lever
10. Deadbolt UL listed for use as auxiliary lock type on 3 hr. fire doors (GWXT). These locks also carry the C-UL mark which is officially accepted in all of Canada, indicating compliance with appropriate Canadian standards and codes.



8T3 Deadbolt

Products protected by one or more of the following patents:
 4,301,667 D290,085 4,843,852 5,590,555 5,794,472
 Other Patents Pending



SPECIFICATIONS

Backset: 7T2/8T2- 2 3/8", 7T3/8T3- 2 3/4"

Cylinders:

8T2/8T3- ANSI A156.36-2010 Auxiliary Locks, **Grade 1**
 Operational, **BHMA, Strength and Security** with drill-resistant core
 (1CD/1CDP.1CDB/1CDF/1CDM/1CDX)

7T2/7T3- ANSI A156.36-2010 Auxiliary Locks, **Grade 2**
 Operational, **BHMA, Strength and Security** with drill-resistant core
 (1CD/1CDP.1CDB/1CDF/1CDM/1CDX)

Deadbolt: 7T2/7T3- 1" throw, 5/8" x 7/8" bolt. Brass nickel plated, with
 concealed hardened steel free-turning pin. Housing fits 1" bore.
 8T2/8T3- 1" throw, 5/8" x 7/8" solid stainless steel bolt. Housing fits 1"
 bore.

Door thickness: Fits 1 3/4" doors (standard)

7T2/7T3: fits doors - from 1 3/8" to 2 1/8"

8T2/8T3: fits doors - from 1 3/8" to 3". Specify if other than 1 3/4"

Faceplate: brass or bronze base material.

7T2/8T2 - 1" x 2 1/4", 7T3/8T3 - 1 1/8" x 2 1/4"

Finishes:

7T2/7T3: 612 - satin bronze, 626 - satin chromium,

8T2/8T3: 605 - bright brass, 606 - satin brass,

611 - bright bronze, 612 - satin bronze,

613 - dark oxidized satin, 625 - bright chromium,

626 - satin chromium

Strikes:

8TSTK - rectangular 1 1/8" x 2 3/4" (ANSI A156.36-2010)

8TS1 - curved lip 1 1/4" x 4 7/8" (ANSI A156.36-2010)

8TS4 - curved lip 1 1/8" x 2 3/4" (ANSI A156.36-2010)

8TS5 - high security rectangular 1 1/4" x 4 7/8"
 (ANSI A156.36-2010)

Trim: wrought brass or bronze cylinder rose or turn lever
 rose, 2 3/4" dia. to cover 2 1/2" bore. Machined brass or
 bronze cylinder ring.

STRIKES



8TSTK Standard Strike

Dimensions- 1 1/8" x 2 3/4"
 (Supplied with box and screws)
To order with unit- STK
To order without unit-
 8TSTK and finish



8TS4 Strike

Dimensions- 1 1/8" x 2 3/4"
 with curved lip. (Supplied
 with box and screws).
To order with unit- S4
To order without unit-
 8TS4 and finish.



8TS1 Strike

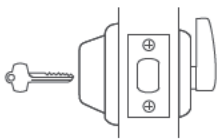
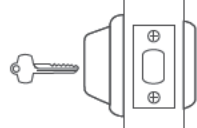
Dimensions- 1 1/4" x 4 7/8"
 (ANSI 115.1) (Supplied with
 box and screws).
To order with unit- S1
To order without unit-
 8TS1 and finish.




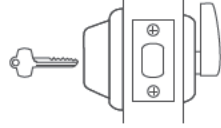
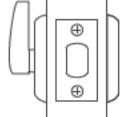
8TS5 High Security Strike

Dimensions- 1 1/4" x 4 7/8"
 (Supplied with box and long
 screws).
To order with unit- S5
To order without unit- 8TS5
 and 630 finish ONLY.

FUNCTIONS

Function & Diag. ANSI (Fed. No.)	Deadbolt Operated by
K-Turnknob E2151, E2152 (181K) 	<ul style="list-style-type: none"> Turning the key in the outside cylinder Turning the inside turn lever.
L-One-Way Deadbolt E2161, E2162 (181L) 	Turning the key in the outside cylinder; the inside cylinder is blank

***ATTENTION:** Locksets that secure both sides of the door are controlled by building codes and the Life Safety Code. In an emergency exit situation, failure to quickly unlock the deadbolt could be hazardous or even fatal.

Function & Diag. ANSI (Fed. No.)	Deadbolt Operated by
*M-Double-Cylinder E2141, E2142 (181M) 	<ul style="list-style-type: none"> Turning the key in the inside or outside cylinder. The inside mounting screws are concealed.
S-Classroom-One-Way Deadbolt E2171 (181S) 	<ul style="list-style-type: none"> Turning the key in the outside cylinder Turning the inside turn lever only retracts the deadbolt (available ONLY in 82T/83T) <p>NOTE: Can't throw the deadbolt.</p>
KL-Closet (available ONLY in 82T/83T) 	Turning the turn lever only.

8T2/8T3 TUBE ASSEMBLIES

8TD2B Deadbolt Tube Assembly

Bolt throw – 1"

Backset – 2 3/4"

Faceplate – brass or bronze, 1" x 2 1/4", self-adjusting and reversible for either door hand.

Tube – steel, fits 1" diameter bore

To order without trim: 82TDB and finish



8TD2B

8TD3B Deadbolt Tube Assembly

Bolt throw – 1"

Backset – 2 3/4"

Faceplate – brass or bronze, 1 1/8" x 2 1/4", self-adjusting and reversible for either door hand.

Tube – steel, fits 1" diameter bore.

To order without trim: 83TDB and finish



8TD3B

8TD25 Drive-in Bolt Tube Assembly

Bolt throw – 1"

Backset – 2 3/4"

Faceplate – brass or bronze, circular

Tube – steel, fits 1" diameter bore

To order without trim: 82TD5 and finish



8TD25

8TD35 Drive-in Bolt Tube Assembly

Bolt throw – 1"

Backset – 2 3/4"

Faceplate – brass or bronze, circular.

Tube – steel, fits 1" diameter bore.

To order without trim: 83TD5 and 626 finish



8TD35

HOW TO ORDER

8T3	7	K	STK	606	**
Backset	Core Housing	Function Code	Strike	Standard Finishes	Options
7T2– 2 3/4" 7T3– 2 3/4" 8T2– 2 3/4" 8T3– 2 3/4"	7– 7 pin housing accepts all Best cores	see above	STK– standard deadbolt 8T2/8T3 only S1– high security S4– curved lip S5– high security deadbolt (630 finish only)	72T/73T: 612 626 8T2/8T3: 605 606 611 612 613 625 626 690	CS– concealed screws (8T2/8T3 only) D5– drive-in bolt (8T2/8T3 only) LL– lead lined (83T only) NF– narrow face 1" (std. 8T2)SH– security head screws (8T2/8T3 only) WF– wide face 1 1/8" (std. 8T3) Door thickness– specify if other than 1 3/4" 8T2/8T3 only)

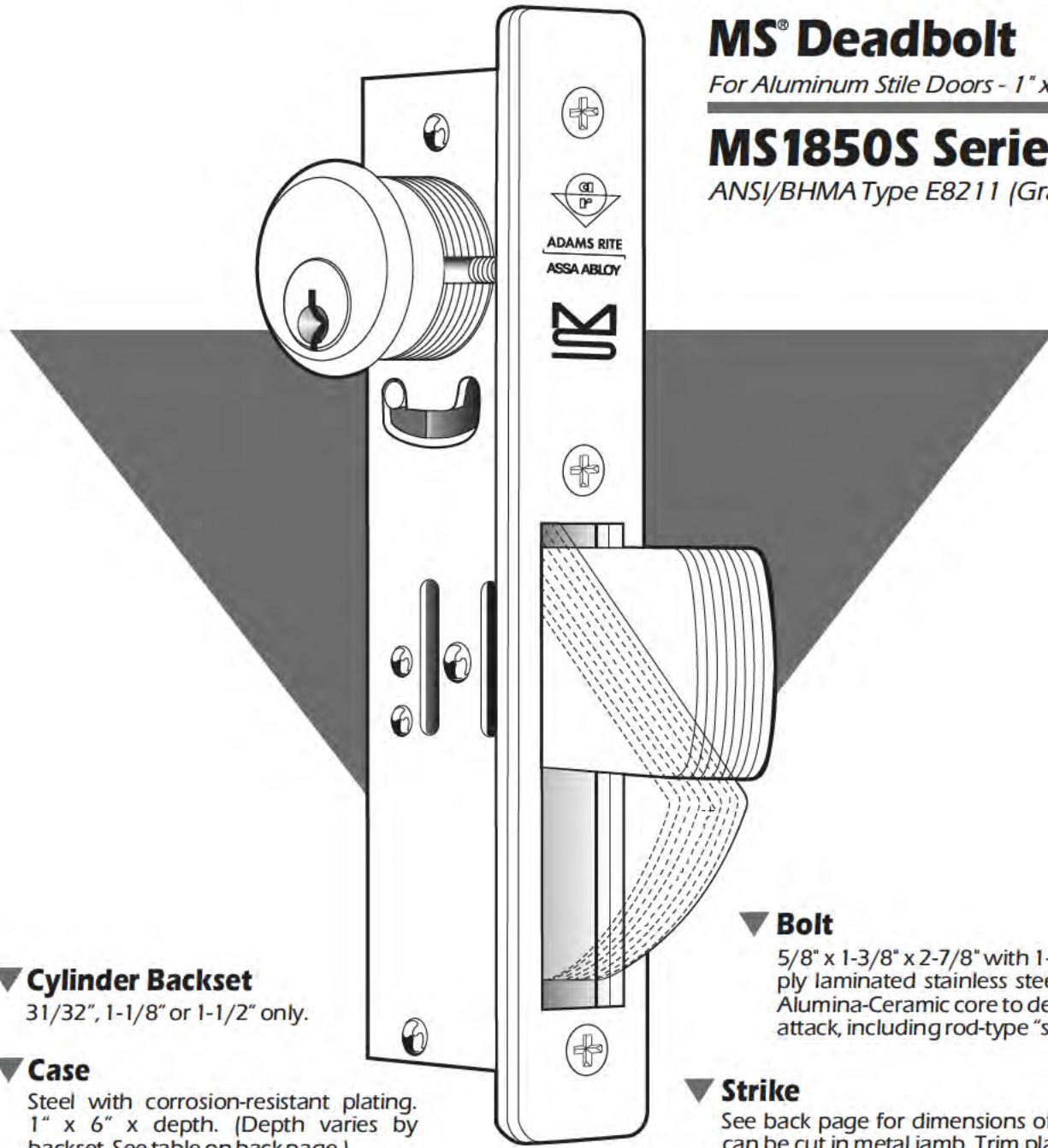
**Must specify key mark and number of keys or designate L/C for less core.

MS® Deadbolt

For Aluminum Stile Doors - 1" x 6-7/8" Faceplate

MS1850S Series

ANSI/BHMA Type E8211 (Grade 1)



▼ **Cylinder Backset**
31/32", 1-1/8" or 1-1/2" only.

▼ **Case**
Steel with corrosion-resistant plating. 1" x 6" x depth. (Depth varies by backset. See table on back page.)

▼ **Function**
A huge bolt of laminated stainless steel, nearly three inches long, activated by an uncomplicated pivot mechanism, has made this basic MS® Deadbolt the standard of the narrow stile door industry. The length of this bolt provides maximum security for a single leaf door, even a very tall and flexible one or an installation where the gap between door and jamb is greater than it should be.

▼ **Bolt**
5/8" x 1-3/8" x 2-7/8" with 1-3/8" throw. Eight ply laminated stainless steel. Center ply has Alumina-Ceramic core to defeat any hacksaw attack, including rod-type "super" hacksaws.

▼ **Strike**
See back page for dimensions of strike slot which can be cut in metal jamb. Trim plate, box strike and armored strike are also available. (See page SW-17.)

▼ **Operation**
360° turn of key or thumbturn throws or retracts the counterbalanced bolt. Key can be removed only when bolt is in a positively locked or unlocked position. Lock accepts any standard 1-5/32" diameter mortise cylinder or thumbturn from either or both sides. Cylinder must have MS® dimensioned cam. (See page SW-36.)



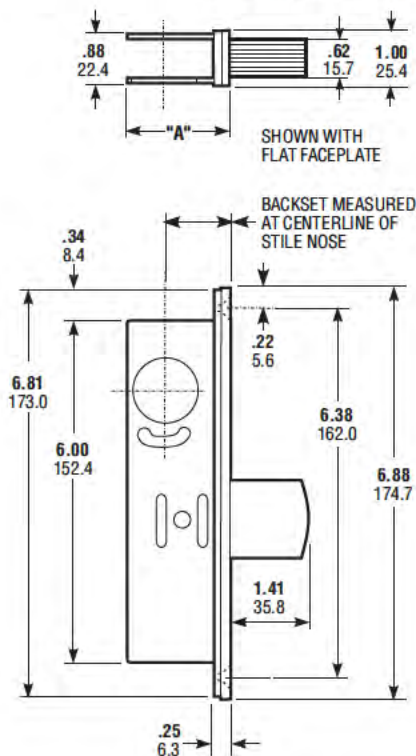
260 Santa Fe Street
Pomona, California 91767
(800) 872-3267 Fax:(800) 232-7329
www.adamsrite.com



MS 1850S Deadbolt

DIMENSIONS

INCHES
MILLIMETERS
Nominal, subject to tolerance extremes.

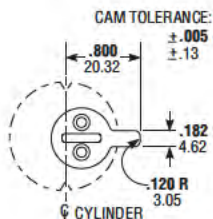


BACKSET	"A"
31/32" 24.6	1.63 41.4
1-1/8" 28.6	1.78 45.2
1-1/2" 38.1	2.25 57.1

ARMORED FACEPLATE 1" x 6 7/8"	
FLAT	MS1850S
RADIUS	MS1851S
RADIUS w/WEATHERSTRIP	MS1851SW
LH BEVEL	MS1852S 015
RH BEVEL	MS1852S 016

Cylinder Cam

MS1850S Series locks are operable by any standard 1-5/32" diameter mortise cylinder with special MS® cam dimensioned as shown. Cylinders with MS® cams can be readily obtained from most cylinder manufacturers. See page SW-36 for cylinder make and trim ring information.



HOW TO ORDER

Specify quantity and the following information.
Order related hardware separately.

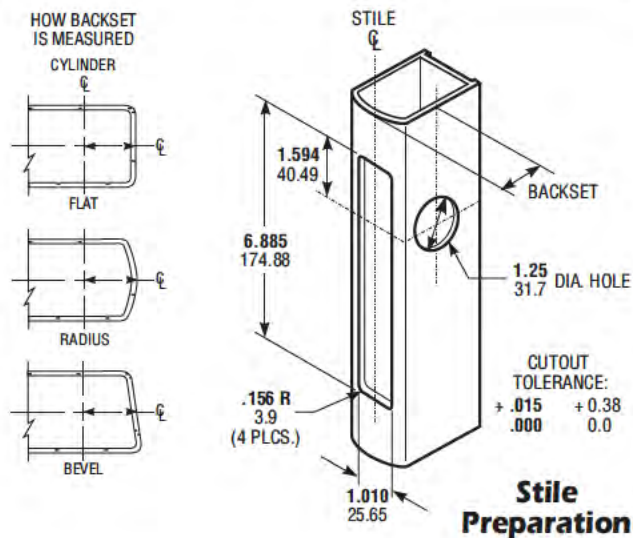
Faceplate Shape	Backset	Handing
1850S Flat	2 31/32"	15 LH or RHR
1851S Radius	3 1 1/8"	16 RH or LHR
1851SW Radius w/w/strip	4 1 1/2"	10 Non Handed*
1852S Bevel		

MS 1850S - 215 - 628

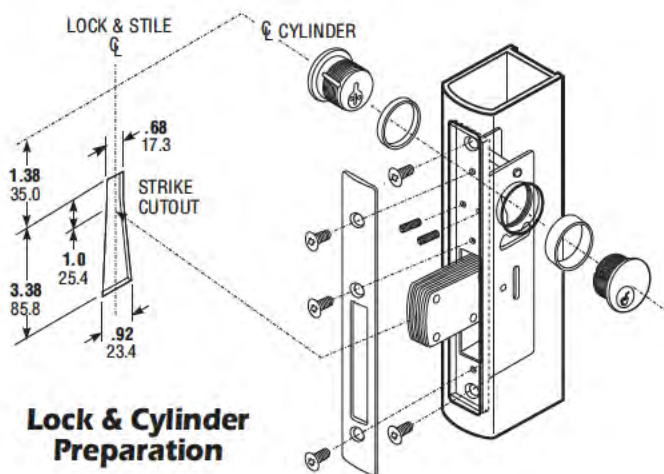
Finish
628 Clear Anodized
313 Dark Bronze Anodized
335 Black Anodized

*Any flat or radius face, except Schoolhouse.

INSTALLATION



Stile Preparation



Lock & Cylinder Preparation

OPTIONS

For jambs too narrow to accept the long bolt, the MS1850S-050 offers a shorter bolt with hook shape to provide equal security against door-prying attempts. (See catalog page SL-1.) 1850S-020 short throw without hook also available. Second and third point locking bolts are available for pairs of doors. (See pages SW-11 and SW-12.) All use any make standard mortise cylinder and thus can be keyed into systems with other types of doors. "SCHOOLHOUSE" version, also available, is modified so that operation from inside is "unlock only." This lock is handed and must be specified LH or RH. Specify Series SCH 1850S. Same faceplate and backset options as Series MS1850S. Operation from inside, with standard Adams Rite 4066 Turn seen on page SW-36 or with 4550 Deadbolt Lever (page SW-16). For wood or hollow metal, see MS1850SN.

STANDARD PACKAGE

Individually boxed with machine screws for mounting. Cylinders and/or thumbturn available at extra cost. Shipping weight: 1-1/2 lbs.

80 Series

80 Series Exit Devices Features

SARGENT
ASSA ABLOY

SARGENT manufactures a full line of exit devices including vertical rod, rim and mortise devices for both standard and narrow stile doors. These devices provide the best combination of simplicity, strength, durability, aesthetics and innovation and are perfect for applications in commercial office buildings, medical and educational institutions.

Simplicity

- Easy installation!
- Maintenance-free design
- Few moving parts – less wear
- Modular construction
- Rekeying is accomplished without removing device from door

Aesthetics

- Clean, simple, aesthetically pleasing design
- “True” architectural hardware finishes consistent with BHMA/ANSI standards
- Coastal Series and Studio Collection Levers adds a touch of elegance

Security

- Double cylinder functions available
- Torx® and spanner screws
- Anti-vandal trim options
- Master keying with SARGENT Security Key systems available (V-10, Signature, Keso F1, Keso and XC)

Strength & Durability

- Made of finest component materials
- Heavy duty mounting construction
- Built to withstand abusive conditions
- Available options to meet Dade County Protocols and other local hurricane code requirements for high wind load and missile impact*
- 5 Year warranty
- * Consult factory

Innovation

- SARGENT introduces Beacon™, a next generation exit device that creates a clearer pathway to safety during an emergency. The combination of audible and visible alerts built into the exit device makes Beacon unique – and effective.
- Broad offering of electro-mechanical solutions for the most demanding access/egress control applications
- MicroShield™ anti-microbial finish coating offers a new level of protection
- SARGuide™ exit device contains an electroluminescent touchpad to enhance the visibility of exit locations in dark or smoke-filled passages and effectively improve the safety of any public building
- CTL (Center and Top Latching) Vertical Rod Devices offer less bottom rod convenience with true center latching for added security



MicroShield™ Microshield™ Coating

- This revolutionary finish coating available on all SARGENT product lines, utilizes a silver-based antimicrobial compound from Agion® Technologies
- The MicroShield protection is now available integrated within the 80 Series touch pad as well as the finish coating. MicroShield lasts for the life of the finish
- MicroShield coating permanently suppresses the growth of bacteria, algae, fungus, mold and mildew. It is effective against a broad spectrum of bacteria
- Non-toxic and completely safe. The Agion antimicrobial compound is EPA and NSF approved and FDA listed for use in medical and food preparation equipment
- Applications: Anywhere there is need for a clean environment (hospitals, laboratories, schools, medical centers, daycare, food processing etc.)

MicroShield™

As part of their promise to provide innovative solutions to their customers, ASSA ABLOY Group companies offer the MicroShield™ technology, a silver-based antimicrobial coating designed to stem the spread of germs and bacteria. MicroShield™ is a trademark of Yale Security Inc., an ASSA ABLOY Group company



The Agion antimicrobial is not intended as a substitute for good hygiene. Coated products must still be cleaned to insure the surfaces will be free of destructive microbes. ASSA ABLOY makes no representations or warranties, express or implied, as to the efficacy of the Agion antimicrobial. A copy of the Agion warranty is available upon request. Agion is a registered trademark of Agion Technologies, Inc., Wakefield, MA, USA



- The SARGuide illuminated exit device increases visibility of exit locations in dark or smoke-filled passages, supplementing existing codes for egress lighting
- SARGuide utilizes state-of-the-art FLATLITE electroluminescent lighting from E-Lite Technologies Inc.
- Green-blue electroluminescent light provides 3 to 5 times the visibility of other lights

- Can be wired for continuous operation or activation by fire alarm system
- Exit devices are placed low enough on a door to provide an extended window of opportunity for safe emergency egress
- Supplements building exit signs required by code
- Intuitive operation. Integral “EXIT” signage guides users directly to the means of egress
- UL Listed for use on panic (UL 305) and fire-rated (UL10C) exit devices
- Available with mechanical, and many electro-mechanical, exit devices
- See pages 56 & 57 for information on the TL- & PL- offerings



80 Series

80 Series Exit Devices
UL Fire Door Ratings and
Openings Sizes

SARGENT®
ASSA ABLOY

Maximum Door Opening-Fire Doors

Type	Exit Device	Door Material	Single Door	Double Door Applications						
				with 12-HC980 or 12-980 or 12-L980 or 12-HCL980 Mullion	with 12-HD980 Mullion	VR/VR Doors Swing Same Direction	SVR/Mortise Doors Swing Same Direction	CVR/Mortise MD Doors Swing Same Direction	CVR/Mortise WD Doors Swing Same Direction	VR/VR Double Egress
Rim	12-8800	Metal	3 Hour 4' x 10'	3 Hour 8' x 8'	3 Hour 8' x 10'	—	—	—	—	—
	12-8800	Wood	3 Hour 4' x 10'	3 Hour 8' x 8'	3 Hour 8' x 10'	—	—	—	—	—
Mortise Lock	12-8900	Metal	3 Hour 4' x 10'	—	—	—	3 Hour 8' x 8'	3 Hour 8' x 10'	—	—
	12-8900	Wood	3 Hour 4' x 10'	—	—	—	3 Hour 8' x 8'	—	3 Hour 8' x 9'	—
	12-8300	Metal	3 Hour 4' x 10'	—	—	—	—	3 Hour 8' x 10'	—	—
	12-8300	Wood	3 Hour 4' x 10'	—	—	—	—	—	3 Hour 8' x 9'	—
SVR	12-FM8700	Metal	3 Hour 4' x 7'	—	—	3 Hour 6' x 7'	—	—	—	—
	12-8700	Metal	—	—	—	3 Hour 8' x 8'	3 Hour 8' x 8'	—	—	3 Hour 8' x 8'
	12-8700	Wood	—	—	—	3 Hour 8' x 8'	3 Hour 8' x 8'	—	—	3 Hour 8' x 8'
	12-NB8700	Metal	—	—	—	3 Hour 8' x 8'	—	—	—	3 Hour 8' x 8'
	12-NB8700	Wood	—	—	—	3 Hour 8' x 8'	—	—	—	3 Hour 8' x 8'
SVR/Mortise	12-SP8700	Metal	90 Min 4' x 10'	—	—	—	—	—	—	—
	12-SP8700	Wood	90 Min 4' x 9'	—	—	—	—	—	—	—
	12-PP8700 & 12-PR8700	Metal	—	—	—	3 Hour 8' x 10'	—	—	—	3 Hour 8' x 10'
	12-PP8700 & 12-PR8700	Wood	—	—	—	3 Hour 8' x 8'	—	—	—	3 Hour 8' x 8'
CVR	12-MD8600	Metal	—	—	—	3 Hour 8' x 10'	—	3 Hour 8' x 10'	—	3 Hour 8' x 10'
	12-NB-MD8600	Metal	—	—	—	3 Hour 8' x 10'	—	—	—	3 Hour 8' x 10'
	12-WD8600	Wood	—	—	—	90 Min 8' x 9'	—	—	3 Hour 8' x 9'	3 Hour 8' x 9'
	12-NB-WD8600	Wood	—	—	—	90 Min 8' x 9'	—	—	—	3 Hour 8' x 9'
	12-MD8400	Metal	—	—	—	3 Hour 8' x 10'	—	3 Hour 8' x 10'	—	3 Hour 8' x 10'
	12-NB-MD8400	Metal	—	—	—	3 Hour 8' x 10'	—	—	—	3 Hour 8' x 10'
CVR/Mortise	12-SP8600	Metal	3 Hour 4' x 10'	—	—	—	—	—	—	—
	12-SP8600	Wood	45 Min 4' x 9'	—	—	—	—	—	—	—
	12-PP8600 & 12-PR8600	Metal	—	—	—	3 Hour 8' x 10'	—	—	—	3 Hour 8' x 10'
	12-PP8600 & 12-PR8600	Wood	—	—	—	90 Min 8' x 8'	—	—	—	45 Min 8' x 8'
	12-LS8600	Metal	3 Hour 4' x 10'	—	—	—	—	—	—	—
	12-LP8600 & 12-LR8600	Metal	—	—	—	3 Hour 8' x 10'	—	—	—	3 Hour 8' x 10'

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80 Series

8800 Rim Exit Device

SARGENT®
ASSA ABLOY

8800 Series Rim Exit Device



8800 Features

- Designed for standard width stile applications on wood and metal doors
- Most functions are non-handed
- Single point rim latching device
- Single door & double door applications with mullions
- Quiet operation and solid security
- Devices are ANSI A156.3 – 2001 Grade 1
- UL Fire and Panic listed

Specifications

8800 Series Rim Exit Device

Door Types	Wood or metal 1 3/4" (44 mm) minimum thickness. For doors over 1-3/4" to 2-1/4" thick, specify thickness and order as 31- prefix
Door Widths	E Rail - 24" to 32" (61cm to 81cm) No cutting required for 32" door F Rail - 33" to 36" (84cm to 91cm) No cutting required for 36" door J Rail - 37" to 42" (94cm to 107cm) No cutting required for 42" door G Rail - 43" to 48" (110cm to 122cm) No cutting required for 48" door
Strike	649 Standard Black Nylon Coated
Optional Strikes	642, 644 and 613
Dogging Feature	Hex key dogging standard; Cylinder dogging available (16-)
Electric Options	AL- Alarmed Exit Device - Page 56 BT- Beacon™ Exit Device - Page 55 PL- SARGuide Photoluminescent Coated Push Rail - Page 56 TL- SARGuide Illuminated Touchpad - Page 57 53- LX Latchbolt Monitor Switch - Page 57 54- Outside Lever Monitoring - Page 62 55- Request-to-Exit Signal - Rail Monitoring - Page 57 56- ELR Remote Latch Retraction - Page 58 57- Delay Egress Exit to be used in conjunction with Electromagnet - Page 60 58- Electric Dogging - Page 61 59- Electroguard – Self Contained Delayed Egress Device - Page 61
Mounting Fasteners	Supplied standard with wood and machine screws Available with through-bolts and mortise (sex) nuts
Latch Bolt	Stainless steel, 3/4" (19mm) throw
Device Centerline from Finished Floor	41" (1041 mm) for Standard Applications
Center Case Dimensions	8-3/8" (213mm) x 2-5/8" (67mm)
Projection	Pushbar Neutral – 3" (76 mm) Pushbar Depressed – 2-1/8" (54 mm)
Fire Exit Hardware	See Chart – Page 3

649 Strike



- Surface applied
- Panic & Fire Rated
- Black nylon coated

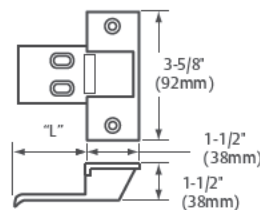
688 Trim Retrofit Kit



- A SARGENT 8800/8888 Rim Exit x ET with a 688 Trim Retrofit Kit will easily replace Von Duprin's 98/99 Series Exit with no additional door prep. Note: 688 Trim Kit only required when replacing Von Duprin trim.

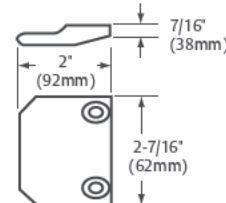
Alternate Strikes For 8800 Rim Devices

642 Strike



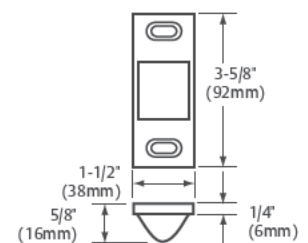
- Mortised. Dimension "L" equals door thickness plus 1/2" (13mm). Black nylon coated on lip only.

644 Strike



- Surface applied. For use on pairs of doors without mullion. Ductile Iron. Black nylon coated.

613 Strike



- Half mortised. Black nylon coated.

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09/05/08

6

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Attachment E – Technicals

ASSA ABLOY, the global leader in door opening solutions

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80 Series

Prefixes, Descriptions and Rail Sizes

Cylinder Notes:

- 16- Cylinder Dogging uses a 41 inside cylinder with 97 ring
- Removable core and 70 prefix cylinders require a 97-0351 cylinder rings for 700 Series ET Controls and 94-0153 ring for 100 & 300 Series Aux controls
- Less cylinder - SARGENT supplies standard blocking rings. Specify if using competitor cylinders
- When ordering BEST cylinders for use in SARGENT Exit Devices, use the following BEST product numbers:
Mortise cylinder: 1-E74XC208
Rim cylinder: 1ESPL-7-AO5994

Notes For Prefixes

- 31- Specify door thickness and specify panel thickness and location, if used
- 31- prefix not available, HC8700, FM8700, PP, PR & SP8700, PP, PR & SP8600, LP, LR & LP8700,
- 31- Prefix requires extended lip strike for 8300 & 8900 Series (supplied).
- SC- Prefix not available in 57- Prefix, (SC- Cylinders are only available in 41 length cylinders and Rim cylinders)
- SC-, SE- & VC- Prefixes not available with the following: 8904, 8916, 8944, 8975, 8976, 8866, 8304, 8344, 8375 & 8376 (SC- & SE- #41 cylinders only & VC- #42 cylinders only)
- + 11- Prefix not available with 10-, 10-UL-, 22-, 60-, 63-, 64- SE, SC, 82-, F1-82-, 82-, F1-83- & 84- prefixes.
- +116- Prefix not available with 12-, 57, 59- or AL- prefix
- * 53- Not available on PP/PR/SP8600 & LP/LR/LS8600 Exit Devices
- ** 59- & BC59- are not available with 16-, 55-, 56-, 57-, 58- prefixes and on NB8700, PP/PR/SP8600 & LP/LR/LS8600 Exit Devices
- *** BT- Not available FM8700 Devices & theses prefixes 16-, 56-, 57-, 59-, BC59- and AL

Suffix

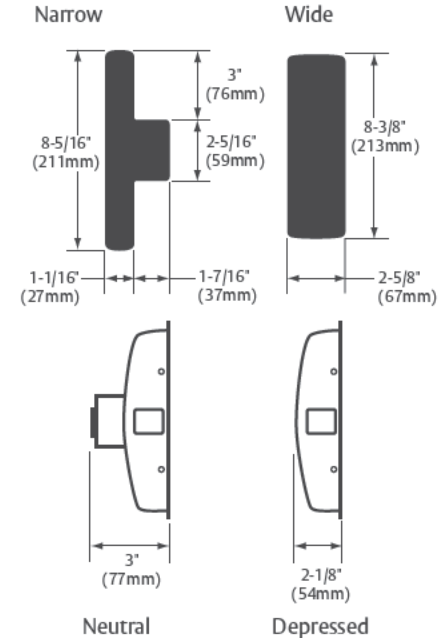
CPC Clear Powder Coat – Recommended for exit devices used in full exterior application and highly corrosive areas with 32 and 32D finishes.

How to order: 8313F x ETL x 32D x CPC

Prefixes Available

10	Signature System
10-UL	Signature, meets UL437 cylinder
+11	SARGENT XC Key System
12	UL Fire Label Exit Devices
14	Sliding bolt bottom case for 8700
+16	Cylinder lockdown feature
19	Pushbar without Lexan touchpad
21	Construction Keying Conventional, XC and Signature Series
22	Construction Keying Conventional Cylinders (Existing Systems Only)
23	ANSI flat lip strike (8300, 8900, including 12- Prefix)
*31	Doors over 1-3/4" and/or Panels
36	6 Lobe security head screws
37	Spanner head screws
43	Flush End Cap
*53	Latchbolt monitoring switch
54	Internal micro switch in ET Control
55	Signal Switch in Rail (Request to Exit)
56	Remote Dogging/Latch Retraction
56-HK	Remote Latch Retraction with manual Hex Key dogging
57	Delayed Egress (Magnet ordered separately)
58	Electric Dogging
**59	Electroguard® Self Contained Delayed Egress Device
**BC59	Electroguard Boca Code (Door Status Switch required)
60	Disposable Construction Core
63	SARGENT Removable Core cyl. Includes masterkeying, grand masterkeying
64	SARGENT Removable Construction Core cylinder
65-73	6 Pin Uncombined Small Format Interchangeable Cores
65-73-7P	7 Pin Uncombined Small Format Interchangeable Type Cores
70	Exit device to accept Small Format Interchangeable Cores - no core provided
72	Exit device to accept Small Format Interchangeable Cores with Construction Core provided
73	Small Format 6-Pin interchangeable core (refer to CK-8 for available keyways)
73-7P	Small Format 7-pin interchangeable core, (refer to CK-8 for available keyways)
75	Warning inside, Abrasive strip on rail
76	Knurled Outside Lever
77	Warning inside and outside, abrasive strip on rail, abrasive coating on Lever
81	Cylinder to accept Keso (83) and Keso F1 (F183) removable core – no core provided
F1-82	Keso Security Cylinder with Front Profile (Patent Pending)
82	Keso Security Cylinder
F1-83	Keso Security Removable Core Cylinder with Front Profile (Patent Pending)
83	Keso Security Removable Core Cylinder
84	Keso Security Removable Construction Core Cylinder
AL	Alarmed Exit
BR	Bump Resistant Cylinder (Available with Conventional & XC Cylinders Only)
***BT	Beacon- Emergency Audio & Visual egress system with a self contained Laser, Flashing LEDs & Audio alert
GL	Guarded Latchbolt for 8800
NB	No Bottom Rod (Not available with 59- & BC59-)
PL	SARGuide™ PL – Photoluminescent Coated Push Rail – (Touchpad eliminated)
SC, SE	Exit Device furnished in Schlage C or E Keyway (specify)
SG	MicroShield - Antimicrobial clear powder coat
TL	SARGuide Illuminated touchpad
VA, VC, VS, VC, VS	SARGENT V-10 Cylinders See V-10 Cylinder Section

Cover Dimensions and Touchbar Projections



Rail Sizes

SARGENT offers four sizes of rails to accommodate 32", 36", 42" and 48" doors. These rails can be cut for smaller doors as specified in the chart below.

SARGENT will cut all rails to size if door width is specified when the hardware is ordered.

Stock Size	Door Widths	Remarks
E	24" to 32" (61cm to 81cm)	No cutting required for 32" (81cm) door
F	33" to 36" (84cm to 91cm)	No cutting required for 36" (91cm) door
J	37" to 42" (94cm to 107cm)	No cutting required for 42" (107cm) door
G	43" to 48" (110cm to 122cm)	No cutting required for 48" (122cm) door

LP, LR & LS8600 Rail Sizes

L Rail	36" (91cm)	No cutting required
M Rail	42" to 44" (107cm to 112cm)	No cutting required
N Rail	46" to 48" (117cm to 122cm)	No cutting required

Note: For additional information on Electrified Exit Devices, see the Electrified Exit Device catalog at www.sargentlock.com

How to Order Exit Devices

12-	89	75	F	ETMR	12VDV	RHR	32D	36"	84"	41"
Prefixes	Device Type	Function	Rail Size	Trim	Voltage	Hand Finish	Finish	Door Width	Opening Height	AFF
Available Prefixes Listing Page 63	89 - Mortise	04 - Night Latch	E 24"-32"	For ET trim specify ET followed by Lever design, See pages 46-48	12VDC	RHR	Available Finishes page 65	If door width is supplied rails will be cut to size	Required for Vertical Rod Exit Devices	Center Line of Rail Above Finish Floor 41" Standard
	WS89 - Mortise	06 - Night latch	F 33"-36"		24VDC	LHR				
	88 - Rim	10 - Dummy	J 37"-42"							
	HC88 - Rim	13 - Classroom	G 43"-48"	Rail Sizes Listed Below are for LP, LR & LS Devices Only For Thumb Piece Trims and Pulls specify Trim Designation as specified by Device Type	Voltage required for Solenoid Controlled Functions - 70, 71, 73, 74, 75 & 76					
	WS88 - Rim	15 - Passage								
	87 - SVR	16 - Entrance								
	NB87 - SVR	28 - TP Passage	L 36" Door							
	HC87 - SVR	40 - FW Dummy								
	FM87 - SVR	43 - FW Classroom								
	MD86 - CVR	44 - FW Night Latch	M 42"-44"							
	NB-MD86 - CVR	46 - FW Night Latch	N 46"-48"							
	WD86 - CVR	62 - TP Night Latch								
	NB-WD86 - CVR	63 - TP Classroom								
	85 - Rim Narrow	66 - TP Entrance								
	84 - CVR Narrow	70 - Solenoid Fail Safe w/Cyl								
NB-84 - CVR Narrow	71 - Solenoid Fail Secure w/Cyl									
83 - Mortise Narrow	73 - Solenoid Fail Safe									
PP87 - CTL SVR	74 - Solenoid Fail Secure									
PR87 - CTL SVR	75 - Solenoid Fail Safe w/Cyl									
SP87 - CTL SVR	76 - Solenoid Fail Secure w/Cyl									
PP86 - CTL CVR										
PR86 - CTL CVR										
SP86 - CTL CVR										
LP86 - CTL CVR										
LR86 - CTL CVR										
LS86 - CTL CVR										

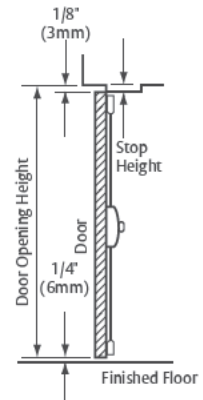
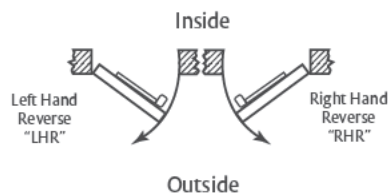
Legend

- AFF - Above Finish Floor
- CTL - Center & Top Latching Exit
- CVR - Concealed Vertical Rod
- ET - SARGENT External Lever Trim
- FM - FEMA
- FW - Freewheeling Trim
- HC - Hurricane Code
- MD - Metal Door
- NB - No Bottom Rod
- SVR - Surface Vertical Rod
- TP - Thumb Piece Trim
- WD - Wood Door
- WS - Windstorm

Mounting Heights

- 41" (1041mm) from finished floor for standard application
- 38" (965mm) from finished floor for elementary schools and to meet local accessibility standards when a 100 or 300 Series Auxiliary Control is used (38" AFF must be specified)

Hand



How to order 700 Series ET Trim

Specify Function, Suffix, Lever, Finish and Handing (e.g., 713-8 ETL x 26D x RHR)

Note: Suffix requirements are based on the type of exit device being used:

- 700-8 is for 8800, 8500, NB8700, PP, PR & SP8700 devices, except with these functions: 04, 10, 16, 40 & 44
- 700-6 is for all PP, PR, SP, LP, LR & LS8600 devices
- 700-4 is for all WD & MD 8600 and 8400 devices
- 700 with No Suffix for all 8900, 8300, 8700 with bottom rod and also for 8800, 8500, NB8700, PP, PR & SP8700 devices with 04, 10, 16, 40 & 44 functions

80 Series

Architectural Specifications,
Finishes and Finish Care



2.01 EXIT DEVICES

- A. Exit devices shall be 80 Series push rail devices as manufactured by SARGENT Manufacturing Company, New Haven, CT.
 - B. Exit devices shall be certified to meet or exceed the requirements of ANSI/BHMA A156.3 Grade 1.
 - C. Exit devices shall be listed by Underwriters Laboratories for panic and bear the UL label for life safety in full compliance with NFPA 80 and NFPA 101. Exit devices for fire labeled doors shall be UL listed as "Fire Exit Hardware".
 - D. Provide standard hex key dogging on non fire-rated exit devices, with cylinder dogging (i.e., SARGENT 16- prefix) as an option.
 - E. Exit devices shall comply with UL10C and UBC 7-2 positive pressure requirements.
 - F. Construction:
 - 1. Chassis shall be of heavy duty cast design with one piece drawn nonferrous removable covers matching the material of the push and mounting rails.
 - 2. Stamped steel chassis are not acceptable.
 - 3. Mounting rails shall be formed from a solid single piece of stainless steel, brass or bronze no less than 0.072 inches thick.
 - 4. Push rails shall be constructed of 0.062 inch thick material in the same manner as the mounting rail. Painted or anodized aluminum shall not be considered heavy duty and are not acceptable.
 - 5. Provide protective Lexan touchpad on the exit device push rail to prevent scratches and serve as a visible guide to the user.
 - 6. Metal end caps shall be formed from the same base metal as the push and mounting rails.
 - G. Exit devices shall have a maximum of 3 inches projection from the face of the door in the non-dogged position. When in the dogged position, the device shall have no more than a 2-1/8 inch projection from the door face.
 - H. The design of the exit device shall eliminate the necessity of removing the device from the door for standard maintenance or keying changes.
 - I. The device chassis shall be mounted and operable without the need of the rail or the chassis cover.
 - J. Trim shall be through-bolted.
 - K. Devices shall be available with matching trim for both wide and narrow stile doors, including electrified functions when required.
 - L. Exit device operating lever trim shall withstand 1000 inch pounds of torque without allowing access.
 - M. Lever trim shall be available in architectural finishes and designs to match that of the locksets specified.
 - N. Exit devices shall have a five year limited warranty.
- The following guidelines should be referenced regularly and as required for proper appearance and longevity of finish.

Finish

SARGENT#	BHMA#	Description	How to clean	Avoid these cleaners
3	605	Bright brass, clear powder coat	Mild non-abrasive detergent with damp cloth or sponge	Abrasives cleaners, bleach solvents, steel or bronze wool
4	606	Dull brass, clear powder coat		
9	611	Bright bronze		
10	612	Dull bronze, clear powder coat		
10B	613	Antique bronze, oiled	Lemon oil polished with dry cloth	Abrasives cleaners, bleach solvents, steel or bronze wool
10BL	-	Oxidized satin bronze-lacquered	Mild non-abrasive detergent with damp cloth or sponge	Abrasives cleaners, bleach solvents, steel or bronze wool
15	619	Satin nickel plate		
20D	-	Statuary bronze, dark		
26	625	Bright chrome		
26D	626	Dull chrome		
32	628	Bright stainless steel		
32D	630	*Dull stainless steel	Plastic pad or bronze wool	Cleaners, solvents, bleach, steel wool

*To avoid discoloration and pitting:

- Keep stainless steel away from contact with other metals
- Avoid cleaning with mineral acids or chlorine products
- Avoid cleaning with abrasive products like sandpaper or steel wool

To maintain the finish:

- Remove any contamination before damage occurs
- Protect with a metal polish or car wax

CPC – Clear Powder Coat

For use in pool areas, offshore applications and highly corrosive applications, the clear powder coat eliminates need for cleaning and maintenance of finish. Applied over 32D only.

8888/8810 Multi-Function Rim Exit Device & Trim

80 Series

SARGENT®

ASSA ABLOY



The 8888/8810 Rim Exit Device

- Devices are ANSI A156.3 – 2008 Grade 1
- UL Fire and Panic listed
- Device is non-handed
- ANSI/BHMA architectural finishes
- Four standard sizes available

To Order: Specify options, 8888 or 8810, Rail Size and Finish
Example: 12-19-8888F x 32D

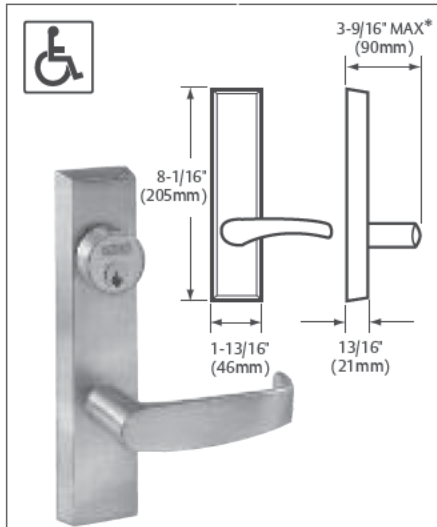
8888/8810 Multi-Function exit device and trim

- Device & trim sold separately; easy to mix and match
- Designed for standard width stile applications on wood and metal doors
- 7 functions available as determined by the trim function
- 3 trim designs available:
 - 700 ET Controls
 - 88 Lever & Rose trim
 - Pull trims
- Single and double door applications with a mullion

Specifications

For Doors	Wood or metal. 1-3/4" (44 mm) minimum thickness. For doors over 1-3/4" to 2-1/4" thick, specify thickness and order as 31- option
Mounting	Supplied standard with wood and machine screws Available with through-bolts and mortise nuts
Chassis Cover	Cold drawn stainless steel, brass or bronze with ANSI/BHMA Finishes
Chassis	Nonferrous alloy (Panic) Ferrous alloy (Fire Rated)
Rails	Roll Formed Stainless Steel, Brass or Bronze with ANSI/BHMA Finishes
Hand	Non-handed
Dogging Feature (Non 12- only)	Hex key dogging standard on non fired rated devices; specify 16- for cylinder dogging (#41 cylinder supplied)
Latchbolt	Stainless steel, 3/4" (19mm) throw
Strike	649 Strike supplied standard for panic & fire rated openings
Fire Exit Hardware	See chart - Page 3

700 Series ET Control



The 700 Series ET Control is sold separately from the exit device and can be used with 8888 & 8810 Exit Device. The trim is non handed and is through-bolted to the chassis for greater security and durability. Available in 7 functions and SARGENT Studio, Coastal and standard lever designs to accommodate most requirements.

- ANSI/BHMA Finishes
- Easy operating lever handle allows convenient one hand operation
- ET trim is not available in 32 or 32D
- Stainless steel levers are available

Rail Chart

- Rails are available in 4 sizes, use door width to determine size needed.
- Rails will be factory cut to size if door width is supplied or can be cut in the field

Stock Size	Door Widths	Remarks
E	24" to 32" (61cm to 81cm)	No cutting required for 32" (81cm) door
F	33" to 36" (84cm to 91cm)	No cutting required for 36" (91cm) door
J	37" to 42" (94cm to 107cm)	No cutting required for 42" (107cm) door
G	43" to 48" (110cm to 122cm)	No cutting required for 48" (122cm) door

88 Lever and Rose Trim



LB
ROSE: L
LEVER: B



- The 88 Lever and Rose Trim is sold separately from the exit device and can be used with 8888 & 8810 Exit Device.
- The trim is non handed and is through-bolted to the chassis for greater security and durability. Available in 4 functions and 4 lever designs to accommodate most requirements.

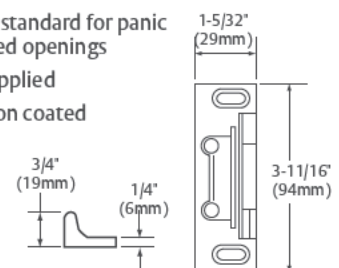
688 Trim Retrofit Kit

- 688 Trim Retrofit kit allows an 8810/8888 rim exit with an ET to replace Von Duprin's 98/99 series exit with minimal door prep.
- Order as: 688 Kit



649 Strike

- Supplied standard for panic & fire rated openings
- Surface applied
- Black nylon coated



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90641: D 8/30/10

8888/8810 Multi-Function Rim Exit Device & Trim

80 Series



How to order 8888/8810 Multi-Function Exit Devices:

Specify the following:

Options	Series	Rail	Finish
16-	8888 or 8810	F	32D

- All trims and functions listed on this page, work with 8888 & 8810 Exit Devices
- Available options listed at the right
- 8888 & 8810 are identical products and are non-handed
- Exit devices are not available in 14, 15, 26 and 26D finishes

How to order trim for 8888 & 8810 Exit Devices:

Specify the following:

Options	Trim Designation	Hand	Finish
10-	713-8 ET_*	RHR	26D
10-	88-CL_*	Non-Handed	10B
60-	814-MSL	RHR	04

*Specify lever design
Available Options listed at the right

700 Series ET Trim



SARGENT Function Numbers	ANSI Function Numbers	Description & Cylinder Info (1-3/4" Door)	Trim Designations
04	03	Night Latch Key Retracts Latch #34 Cylinder Supplied	704 ET_ x Hand & Finish
10	02	No outside operation (No Cylinder) ET Control is used as Pull Only	710 ET_ x Hand & Finish
13	08	Key Outside Unlocks/Locks Trim #41 Cylinder Supplied	713-8 ET_ x Hand & Finish
15	14	Passage Only (No cylinder)	715-8 ET_ x Hand & Finish
40	02	Freewheeling Trim - No outside operation (No Cylinder) Dummy Trim	740 ET_ x Hand & Finish
43	08	Key Outside Unlocks/Locks Trim #41 Cylinder Supplied	743-8 ET_ x Hand & Finish
44	03	Freewheeling Trim - Key Retracts Latch #34 Cylinder Supplied	744 ET_ x Hand & Finish

700 Series ET Controls

To order: Specify options followed by trim designation, lever design, hand and finish (as shown to the right).
Example: 11-SG-713-8 x RHR x 10B

Freewheeling Trim

The lever rotates when the door is locked preventing excessive force from being applied to the horizontal lever

Note: ET trim is not available in 32(629) or 32D(630)

88 Lever and Rose Trim

To order: Specify options followed by trim designation, lever design and finish (as shown to the right).
Example: 10-SG-88-CLP x 26D



ANSI Function Numbers	Description	Trim Designations
03	Key Retracts Latch Cylinder Supplied	88-KL_ x Finish
02	No outside Operation (No Cylinder) Dummy Trim	88-DL_ x Finish
08	Key Outside Unlocks/locks Trim Cylinder Supplied	88-CL_ x Finish
14	Passage Only (No cylinder)	88-LL_ x Finish

Lever Designs available for 88 Lever & Rose Trim are L, B, J & P

Note: For 88 Lever & Rose trim, the 1st letter is the function, the 2nd is the "L" Rose Design & the 3rd is the lever design specified

Keyed & Non Keyed Pull Trim for 8888 & 8810 Devices

Use the six digit designation (Ex "866-MAL") when ordering trim without an Exit Device, always specify options, designation, finish & hand

Example: 10-SG-814-FSW x 04 x RHR

SARGENT Function #'s	ANSI	Description & Cylinder Info. (1-3/4" Door)	Trim Designations				
04	03	Key Retracts Latch #34 Cylinder Supplied	814-FSL*	814-FSW*	814-MSL*	814-PSB*	814-ST5
10	02	No O/S Operation or Cylinder (Pull Only)	810-FLL	810-FLW	810-MAL	810-PTB	810-ST5

Note: FSW, FLW, 88 Lever & Rose trim & ET's are not available in 32(629) or 32D(630)

* FSL, FSW, MSL and PSB trims are used with (HC- & 12-) 8888 and 8804 only and are the same as FLL, FLW, MAL and PTB pulls, except for cylinder hole located 3/8" (9mm) lower

Options	
Exit	Trim
12-	10-
*16-	**10-UL-
19-	11-
43-	11-70-
GL-	11-72-7P-
CPC-	11-73-7P-
LC-	21-
LD-	22-
PL-	60-
	63-
	64-
	+70-
	+72-
	+73-
	+73-7P-
	+65-73-
	+65-73-7P-
	BR-
	LC-
	SC-
	SE-
	++SF-
	SG-

* Supplied with standard 41 cylinder, for cylinder options, see trim options

** Double asterisk options are not available with 88 Lever & Rose Trim

+ Single crossed options are not available with 88 Lever & Rose Trim with J Lever

++ Double Cross options are only available with 88 Lever & Rose Trim

Available Finishes

SARGENT Finishes	ANSI Finishes
03	605
04	606
09	611
10	612
10B	613
10BL	614
14	618
15	619
20D	624
26	625
26D	626
32	629
32D	630

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8800 Functions & Trims

80 Series



Options	Series	Function	Rail Lgth	Trim	Hand	Outside Finish	Inside Finish	Door Width	Options
F1-83-56	88	13	F	ETL	RHR	26D	32D	36"	8800

700 Series ET Trim



Exits with ET Trim, specify lever design after the ET designation (e.g., ETL)

Lever Designs for ET Controls

A, B, E, F, J, L, P, W

Also available with Coastal Series & Studio Collection Levers

ET Designation with Suffix (Used to order ET without device)

8800 Series: 704, 706-8, 710, 713-8, 715-8, 716, 740, 743-8, 744, 746-8, 773-8, 774-8, 775-8 & 776-8

Freewheeling Trim

The lever rotates when the door is locked preventing excessive force from being applied to the horizontal lever

Electrified ET Trim

Voltage must be specified for the following functions: 73, 74, 75 and 76. Specify: 12VDC or 24VDC

SARGENT Function Numbers	ANSI Function Numbers	Description & Cylinder Info (1-3/4" Door)	ANSI Type 1 8800 Panic & Fire
04	03	Night Latch Key Retracts Latch #34 Cylinder Supplied	8804 x ET_
06	09	Key unlocks Trim, Trim retracts latch/ Trim relocks when key is removed #41 Cylinder Supplied	8806 x ET_
10	01	No outside operation (No Cylinder)	8810
10	02	No outside operation (No Cylinder) ET Control is used as Pull Only	8810 x ET_
13	08	Key Outside Unlocks/locks Trim #41 Cylinder Supplied	8813 x ET_
15	14	Passage Only (No cylinder)	8815 x ET_
16	10	Key Outside Retracts Latch; Key Inside Unlocks/Locks O/S Trim O/S #34 Cylinder & I/S #44 Cylinder Supplied	8816 x ET_
40	02	Freewheeling Trim - No outside operation (No Cylinder) Dummy Trim	8840 x ET_
43	08	Freewheeling Trim - Key Outside Unlocks/locks Trim #41 Cylinder Supplied	8843 x ET_
44	03	Freewheeling Trim - Key Retracts Latch #34 Cylinder Supplied	8844 x ET_
46	09	Freewheeling Trim - Key unlocks Trim, Trim retracts latch/ Trim relocks when key is removed #41 Cylinder Supplied	8846 x ET_
73		Electrified ET Trim - Fail Safe Power Off, Unlocks Lever (No Cylinder)	8873 x ET_
74		Electrified ET Trim - Fail Secure Power Off, Locks Lever (No Cylinder)	8874 x ET_
75		Electrified ET Trim - Fail Safe Power Off, Unlocks Lever, Key Retracts Latch #34 Cylinder Supplied	8875 x ET_
76		Electrified ET Trim - Fail Secure Power Off, Locks Lever, Key Retracts Latch #34 Cylinder Supplied	8876 x ET_

Note: Exit devices are available in all standard finishes, except 14, 15, 26 & 26D. With these finishes, exit devices are supplied in 32 or 32D to match accordingly. 26 or 26D is automatically supplied when 32 or 32D is specified. For nickel finishes, specify 14/32 or 15/32D to receive nickel finished trims and stainless exit devices.

Pull & Thumb Piece Trim Section

Trim Designations

- Use three letter designations (Ex "PTB") when ordering the Exit Device with trim
- Use the six digit designation (Ex "866-MAL") when ordering trim without an Exit Device, always specify finish

Series



8800
Panic & Fire

SARGENT Function Numbers	ANSI Function Numbers	Description & Cylinder Info. (1-3/4" Door)	814-FSL*	814-FSW*	814-MSL*	814-PSB*	814-ST5	862 Pull	8800 Panic & Fire
04	03	Night Latch Key Retracts Latch #34 Cylinder Supplied	814-FSL*	814-FSW*	814-MSL*	814-PSB*	814-ST5	862 Pull	8804 x Trim Designation
10	02	No O/S Operation or Cylinder (Pull Only)	810-FLL	810-FLW	810-MAL	810-PTB	810-ST5	862 Pull	8810 x Trim Designation
28	15	Passage Only (No cylinder)	828-FLL	828-FLW	828-MAL	828-PTB	828-ST5	N/A	8828 x Trim Designation
63	05	Key Outside Unlocks/ Locks Trim #34 Cylinder Supplied	866-FLL	866-FLW	866-MAL	866-PTB	866-ST5	N/A	8863 x Trim Designation
66	07	Key Outside Retracts Latch; Key Inside Unlocks/Locks O/S Trim O/S #34 & I/S #44	866-FLL	866-FLW	866-MAL	866-PTB	866-ST5	N/A	8866 x Trim Designation

* FSL, FSW, MSL and PSB trims are used with (HC- & 12-) 8888 and 8804 only and are the same as FLL, FLW, MAL and PTB pulls except for cylinder hole located 3/8" (9mm) lower
Note: Thumb piece trims for 63 and 66 function devices are identical and are identified as 66 function when trim is ordered separately
Note: FLW & FSW trims are not available in 32(629) or 32D(630)

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7

Mechanical Options:
12-
16-
19-
31-
36-
37-
43-
53-
54-
55-
56-
56-HK-
57-
58-
59-
BC-59-
76-
85-
86-
87-
AL-
BT-
CPC-
GL-
LD-
PL-
SG-
TB-
TL-
Cylinder Options:
10-
10-21-
10UL-
10-63-
11-
11-21-
11-60-
11-63-
11-64-
11-70-7P-
11-72-7P-
11-73-7P-
11-65-73-7P-
21-
22-
51-
52-
60-
63-
64-
70-
72-
73-
65-73-
65-73-7P-
73-7P-
81-
82-
F1-82-
83-
F1-83-
84-
BR-
LC-
*5C-
*5E-

* Options are not available with 8816

Available Finishes

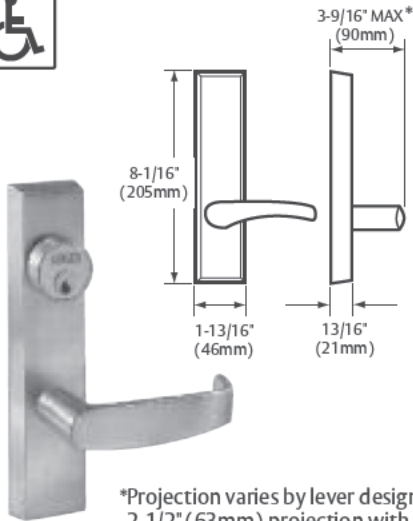
SARGENT Finishes	ANSI Finishes
03	605
04	606
09	611
10	612
10B	613
10BL	614
14	618
15	619
20D	624
26	625
26D	626
32	629
32D	630

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ET Trim, Levers and Pulls

80 Series

ET Lever Controls

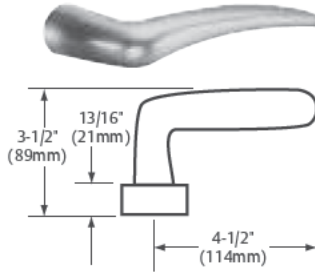


*Projection varies by lever design.
2-1/2" (63mm) projection with L Lever

Note: ET suffixes required when ordering ET trim without an exit device, see page 71 for complete details

A Lever

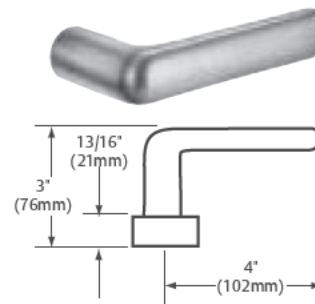
• Handed



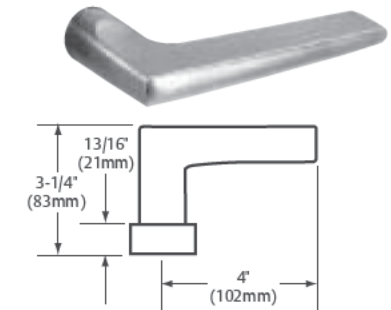
B Lever



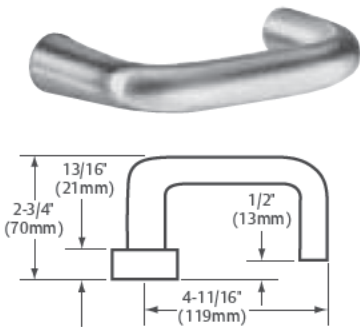
E Lever



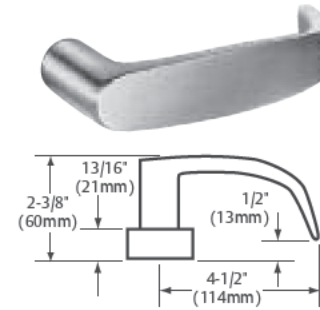
F Lever



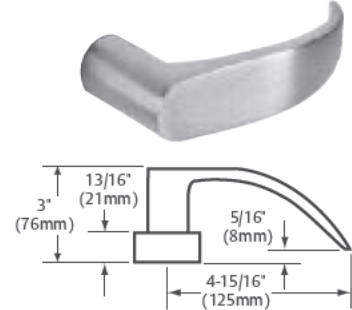
J Lever*



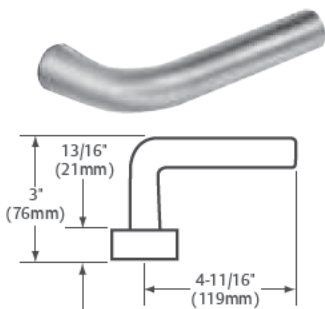
L Lever*



P Lever*

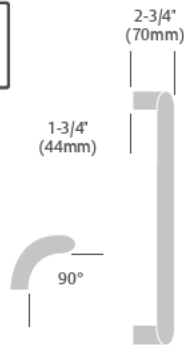


W Lever

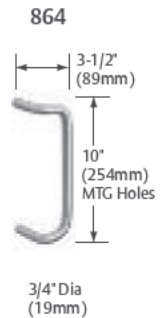
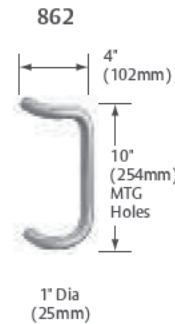


*Lever returns within 1/2" (13mm) of door face

Pulls



SIDE PROFILE



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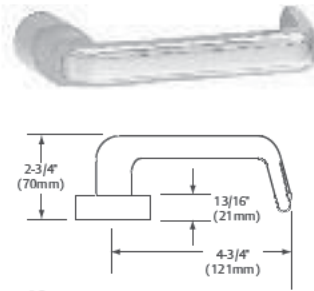
Coastal Series Levers & Thumb Piece Pulls

80 Series

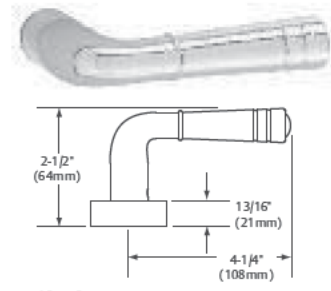


- Coastal Series™ levers can be used with all SARGENT 80 Series exit devices with ET trim
- All levers – solid cast brass
- All standard functions available
- Finishes available: 03, 04, 09, 10, 10B, 10BL, 14, 15, 20D, 26, 26D
- * Lever returns within 1/2" (13mm) of door face

C* - Coronado™



R - Rockport™



Y - Yarmouth™



G - Gulfport™



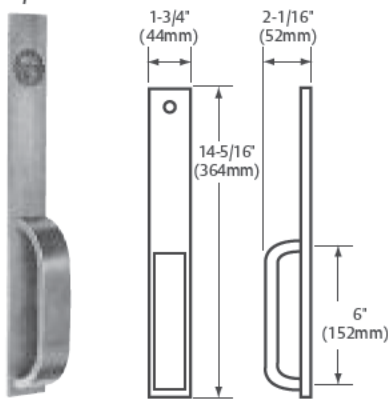
S - Sanibel™



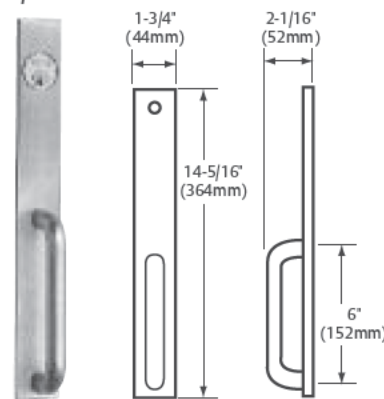
Pulls and Thumb Pieces Trims

These trims are through-bolted, creating perfect alignment of center case, thumb piece and cylinder, as required. Through-bolts pass through the chassis of the devices and are bolted directly to the trim. FSL, FSW, MSL and PSB pulls are used with 12- 8804 and 8804 only, they are identical to FLL, FLW, MAL and PTB pulls except the cylinder hole is located 3/8" (9mm) lower. The 802-PTB plate is a flat plate which can be used to cover existing door preps and is as ANSI/BHMA function 01.

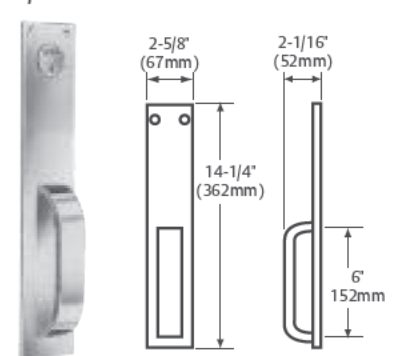
FLL/FSL



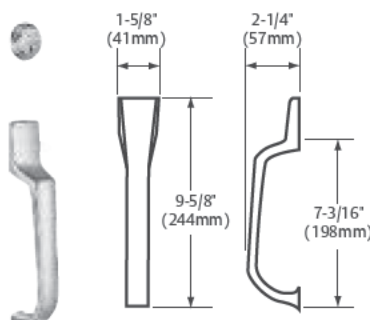
FLW/FSW



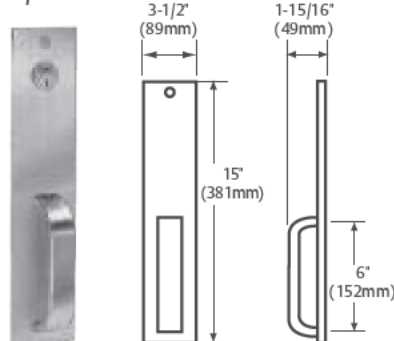
MAL/MSL



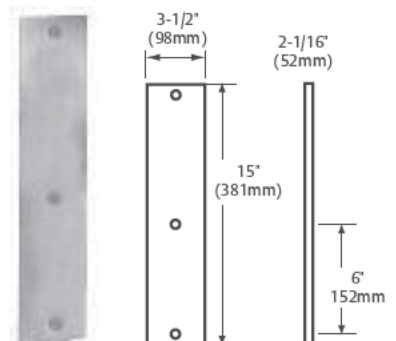
STS



PTB/PSB



802-PTB



Studio Collection Levers

80 Series

SARGENT®

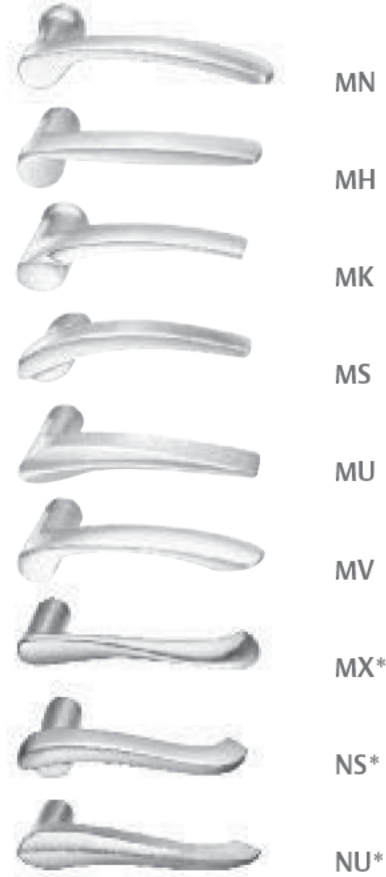
ASSA ABLOY

Studio^{collection}

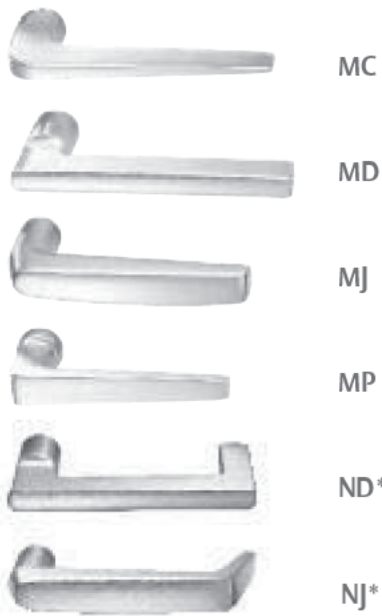
Features

- Studio Collection levers can be used with all SARGENT 80 Series exit devices with ET trim
- All levers - solid brass or stainless steel
- Available with all lever functions
- Lever finishes available: 03, 04, 09, 10, 10B, 10BL, 14, 15, 20D, 26, 26D, 32 & 32D
- Always specify hand

Odéon Series



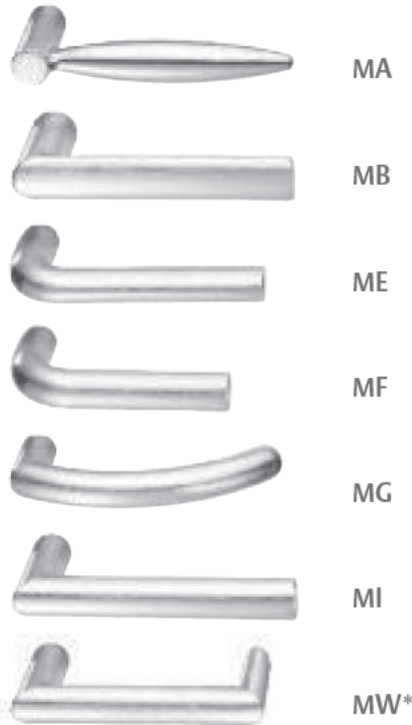
Centro Series



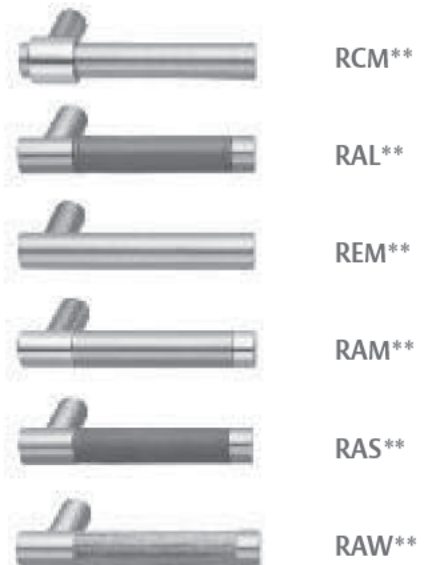
Rialto Series



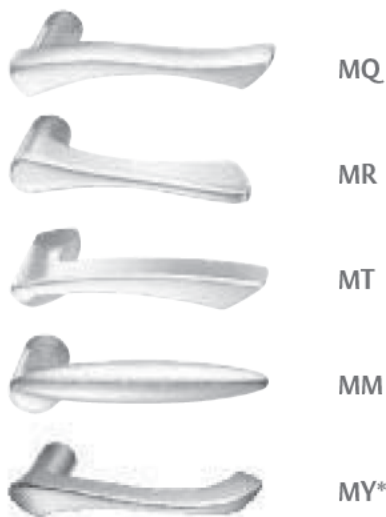
Aventura Series



Gramercy Series



Notting Hill Series



* Lever returns within 1/2" (13mm) of door face

** The Gramercy Levers are customized. Refer to page 65 on how to order

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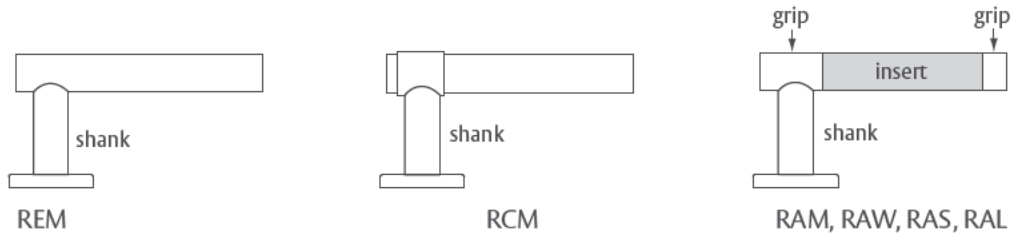
90641; D 8/30/10

Ordering Gramercy Series Levers

80 Series



Elements of Gramercy Series Levers



Lever	Part Number	Shank Finish*	Insert	Grip Finish
Plain†	REM	Polish Stainless (629) or Satin Stainless (630)	n/a	Polish Stainless (629) or Satin Stainless (630)
With Raised Band	RCM	Polished Stainless (629)	n/a	Polish Stainless (629) or Satin Stainless (630)
With Metallic Insert	RAM	Polished Stainless (629)	Satin Stainless (630)	Polished Stainless (629)
With Wood Insert†	RAW	Polished Stainless (629) or Satin Stainless (630)	Birch (BH)	Polish Stainless (629) or Satin Stainless (630)
With Santoprene Insert†	RAS	Polished Stainless (629) or Satin Stainless (630)	Black (BK)	Polish Stainless (629) or Satin Stainless (630)
With Leather Insert†	RAL	Polished Stainless (629) or Satin Stainless (630)	Black (BK) or Brown (BN)	Polish Stainless (629) or Satin Stainless (630)

*Rose and escutcheon finish is designated by shank finish selected

† Grip finish must match shank finish

To order Gramercy Series levers with 80 Series products, see the example below. When specifying finish, use the last two digits of the BHMA standard finish code, i.e. use "29" for polished stainless, BHMA finish 629.

Sample order on how to specify an Exit Device with Gramercy levers

							Gramercy Lever information							
Options	Series	Function	Rail Size	Voltage	Trim	Lever	Shank Finish*	Insert Finish	Grip Finish	Hand	Inside Finish	Door Width	Opening Height	AFF
Select from 80 Series catalog				Specified for electrical functions	Select from 80 Series catalog	Leather insert	Polished or satin stainless	Black or brown	Polished or satin stainless	RHR, RH, LHR, or LH	Select from 80 Series catalog		For vertical rod devices	Above Finished Floor
10-	87	73	F	12VDC	F	RAL	29	BN	29	RH	32D	36"	84"	41"

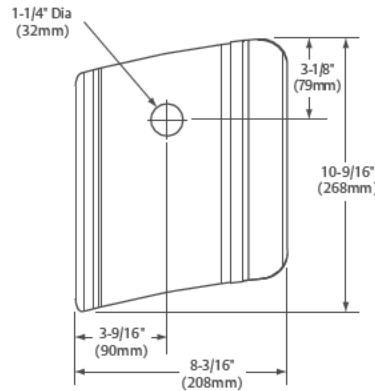
* Escutcheon finish is designated by shank finish selected

Anti-Vandal Trim, 988 Surface Bolt, ET Plates & Dummy Rails

80 Series

SARGENT®
ASSA ABLOY

Anti-Vandal Trim



Designed for exterior doors that require extra security or resistance to vandalism, anti-vandal trim (AVT) plates have an extended lip on the active side of the door to provide extra protection for the latchbolt. A matte plastic coated grip provides a comfortable pull over wide temperature ranges. Fully through-bolted with no exposed exterior fasteners for a cleaner look and increased security.

Features

- Heavy duty 12 gauge stainless steel in 32D finish
- Through-bolted for added strength
- Handed – Specify RHR or LHR
- ADA Compliant
- #34 Rim Cylinder supplied for 8804
- #41 Mortise Cylinder supplied for 8904
- Night Latch and Dummy Functions available
- Available for MD & WD8610, 8710, 8804, 8810, 8904 & 8910 Devices
- Without protective lip for inactive door
- AVT Retrofit Kit works easily with existing product with minor prep modification
- Order by part number (826, 824, 821 or 827) as determined by product & function below

Part Number	Description	Application
826	Cylinder, but No Protective Lip	8804 Mfg after 02-2001
824	Protective Lip & Cylinder	8904; also 8804 Mfg before 02-2001
821	No Protective Lip & No Cylinder	MD & WD8610, 8710 and 8810
827	Protective Lip & No Cylinder	8910

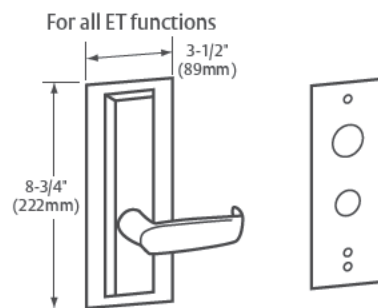
821 for use on all inactive leaves

988 Surface Bolt Kit



- Designed for severe windload (Hurricane Code) environments where surface bolts are required (e.g., on inactive doors)
- Tested to Dade County protocols
- Listed to UL 10C for use on fire rated door assemblies. Refer to codes for locations where surface bolts are allowed on fire doors
- All steel construction for maximum strength and heavy duty use
 - Full 3/4" (19mm) square, 12" (305mm) bolt with 1-1/4" (32mm) throw
 - Bright zinc-plated finish
 - Jimmy-resistant design locks bolt automatically when thrown; released by pressing knob toward door while retracting
 - Bolt can be locked in retracted or thrown position
- Angle (L shaped) and mortise strike with mounting hardware supplied standard
- Order as a: 988 Surface Bolt

ET Cover Plate



This plate is designed to be mounted behind the ET control to cover a stock hollow metal cutout

- Order as a: 68-0657 x finish

809 Touchpad Kit

- Lexan touchpad replacement kit for all 80 Series push rails
- Direct replacement – uses existing mounting holes
- Order as a: 809 Touch Pad

8893 Dummy Rail



A decorative push bar for vestibule door applications where continuity of design is desired, but no exit device is required. Outside dummy trim available on order.

- Order as a: 8893 x finish; Specify door width and door stile width when ordering.

8895 Active Dummy Rail



Push rail operates on this rail to simulate active doors. Can be used with dummy trim.

- Order as a: 8885 x Finish; specify door width and door stile width when ordering.
- Available with Request-to-Exit (REX) signaling switch; specify 55-8895 x Finish

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Attachment E – Technicals

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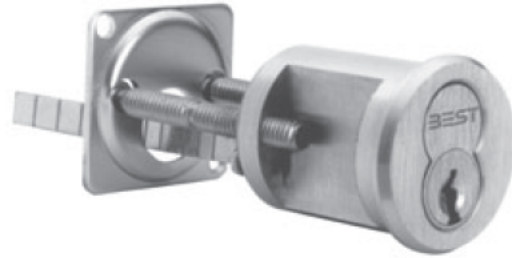
242 | Page

TABLE OF CONTENTS		Page	Page
1E Series features.....	2	Eurocylinders.....	7
1E Series specs/how to order.....	2	Cylinders and cams.....	8
1E Series rings/spindles/mortise/service equipment.....	3	1E Cylinder special rings.....	9
1E Series special cylinders.....	4, 5	5E Series specs/accessories.....	10
1EJ7J4/1EK7K4 high security cylinders.....	6	5E Series how to order.....	11
Patented keying system.....	6	1E Series how to order (continued).....	12

1E SERIES – FEATURES

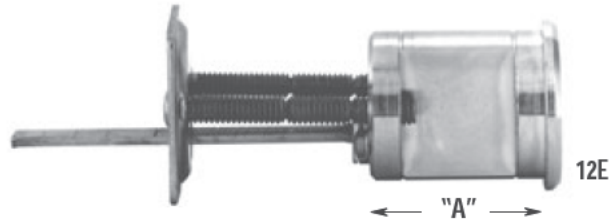
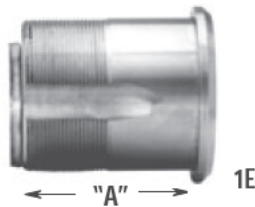
1E Mortise Cylinder

Standard mortise applications require use of BEST's 1E series cylinders with standard 1E-C4 cam. BEST cylinders may be altered to function with other manufacturers' locks by use of different cams (see page 8) and different cylinder rings (see page 9). Special cylinder variations are available for most applications (see pages 4 & 5). BEST cylinders are machined from brass or bronze bar stock and are available in a variety of finishes. Additional security is provided by a set screw that mounts diagonally in the cylinder wall and when tightened, holds the cylinder securely in the housing. BEST mortise cylinders feature the BEST interchangeable core and may be master-keyed into any existing BEST system. Contact your local Stanley Security Solutions sales office for information on special cylinder applications not listed in this catalog.



12E Rim Cylinder

Standard rim cylinder applications require the use of BEST's 1E rim cylinder series. BEST rim cylinders are interchangeable with other manufacturers' rim cylinders. BEST rim cylinders are machined from solid bar stock and are available in a variety of finishes. The standard package for the BEST rim cylinder includes cylinder, RP3 ring package, 1E-S2 spindle, clamp plate and clamp plate screws. BEST rim cylinders feature the BEST interchangeable core and may be masterkeyed into any existing Best system.



Specifications

Cylinder Nomenclature	Dimension "A"	Door Thickness
1E-64	1 1/8"	1 5/8" to 2 1/4"
1E-74	1 1/4"	1 7/8" to 2 1/2"

Cylinder diameter– 1 5/32"

To order: example: 1E74-C4-RP3-626

Products covered by on or more of the following patents:
5,590,555 5,794,472

Specifications

Cylinder Nomenclature	Dimension "A"	Door Thickness
12E62	1 3/16"	1" to 2 3/4"
12E72	1 11/32"	1 1/4" to 3"

Cylinder diameter– 1 5/32"

To order: example: 12E72-S2-RP3-626

1E SERIES HOW TO ORDER

1E	7	4		C4	RP3	626	**
Series	Core Housing	Function Code	Length Code	Cam or Spindle	Rings	Finish	
See p. 12	0– dummy 6 – 6-pin 7– 7 pin housing accepts all Best cores	See p. 12	Blank– Standard 22– 1 3/8" 24– 1 1/2" up to 6" (See page 4-5) (See code below)	C4– Standard cam C181– Adams Rite MS cam S2– Standard spindle (For special cams see page 8)	RP– Rim cylinder RP1– Tapered cylinder RP2– 6 pin mortise RP3– 7 pin mortise RP4– 3E mortise (For special rings see page 9)	626 690 Satin* 606 612 613 619 Bright* 605 611 625	

*Indicates extra cost

** Must specify keymark and number of keys or designate L/C for less core.

SPECIAL CYLINDERS

Special Length Mortise Cylinders Specifications

Diameter: 1 5/32"

Uses: Special thickness doors

Length: See chart

Material: Solid brass or bronze

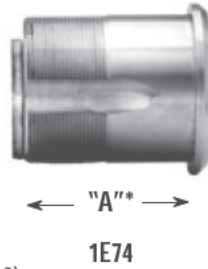
Cam: Standard 1E-C4 cam (see page 2)

supplied unless otherwise specified.

Rings: The RP2 (for 6 pin) and RP3 (for 7 pin) package are supplied standard (page 2) unless otherwise specified.

To order: Designate desired length from chart under length code step "D" as shown (page 2).

Example: 1E-74-32



Mortise Cylinder Length Chart		Riveted cams
Length "A"	Designate this number on step "D" of order procedure (page 2)	
1 3/8"	22	Riveted cams
1 1/2"	24	
1 5/8"	26	
1 3/4"	28	
1 7/8"	30	
2"	32	
2 1/8"	34	Screw-on cams
2 1/4"	36	
2 1/2"	40	
2 3/4"	44	
3"	48	
3 1/2"	56	
4"	64	
4 1/2"	72	
5"	80	
5 1/4"	88	
6"	96	

*ONLY AP TO 1E74

1 1/2" Diameter Mortise Cylinder Specifications

Diameter: 1 1/2"

Length: 6 pin-1 1/8"; 7 pin-1 1/4"

Door thickness:

6 pin-1 1/8" to 2 1/4" (includes trim)

7 pin-1 1/8" to 2 1/2"

Material: Solid brass or bronze

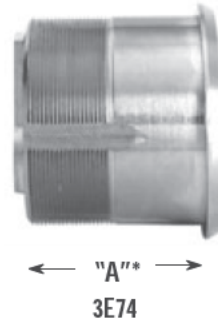
Cam: Standard 3E-C3 cam supplied unless otherwise specified.

Rings: The RP4 ring package is supplied with 3E cylinders. This package includes a 3E-R2 (1/8") and a 3E-R4 (1/4") ring.

To order: Designate "3E" on step "A" of order procedure (page 2) **Example:** 3E-74-C3-RP4-626

Options: 3E-04-Dummy, 3E-7A4-Turn knob, 3E-7B4-Dust Cover.

Adaptor ring to allow 1E74 cylinders to fit a 3E tapped hole - A26139.



Taper Head Mortise Cylinder Specifications

Diameter: 1 5/32"

Length: 6 pin - 23/32"; 7 pin - 3/4"

Door thickness: 6 pin- 1 3/8" to 1 3/4" (including trim)

7 pin- 1 3/8" (including trim)

7 pin- 1 3/4" (without trim)

Material: Solid brass or bronze

Cam: Standard 1E-C4 cam supplied unless otherwise specified.

Rings: The RP1 ring package (page 2) is supplied standard with all 1E taper cylinders (page 2).

To order: See page 2. **Example:** 1E-76-C181-626



Dummy Mortise and Rim Cylinders Specifications

Diameter: 1 5/32"

Length: Mortise -1 1/8"; Rim -1 1/8"

Material: Solid brass or bronze

Rings: Ring packages are supplied standard as follows:

Mortise: RP2 ring package(see page 2)

Rim: RP3 ring package (see page 3)

To order: Designate "0" on step "B" of order procedure (page 2)

Example: 1E-02

E04-slot in back-1ESPL-6-B4619

1E04-slot in back-1ESPL-7-B4620

1E02-slot in face-1ESPL-6-A5035

Special 1E04 with slot on back- 1ESPL-7-B4620

Special length 1E04 cylinders:

1 1/2" - 1ESPL-7-A9619

1 3/4" - 1ESPL-7-A20331



1E04



12E02

Turn Knob Cylinders Specifications

Diameter: 1 3/32"

Length: Mortise- 6 pin-1 1/8"; 1EA6A4

Rim- 6 pin-1 1/16" - 1EA6A2

Material: Solid brass or bronze

Cam: Standard 1E-C140 cam supplied unless otherwise specified (see page 2).

Rings: Ring packages are supplied standard as follows (unless otherwise specified):

Mortise 6 pin: RP2 ring package

(see page 2)

To order: Designate "A4" on step "C" of order procedure (page 2).

Example: 1EA-6A4-C140-RP3-626

R-function turn knob cylinders

RH-1ESPL-6-B35401

LH-1ESPL-6-B35405

Special length cylinders

1.5" -1ESPL-6-A20336

1.75" -1ESPL-6- A20337

2" - 1ESPL-6-B23409



1EA6A

*ADA Turn Knob Shown

NOTE: These should not be used in conjunction with deadbolt function BEST mortise locks. To order the old style "UP" thumb turn contact your local BEST dealer.

* Reference to Length "A" on Mortise Cylinder Length Chart.

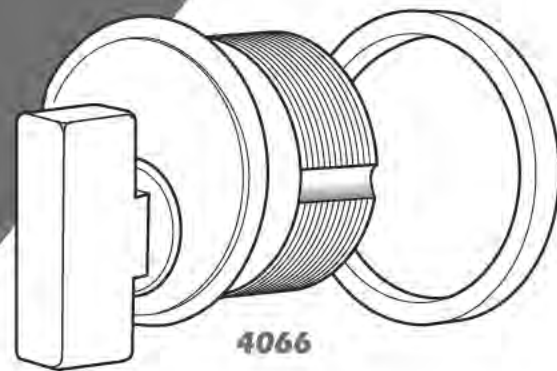
Mortise Cylinder & Thumbturn

4036 - Cylinder 4066 - Thumbturn

ANSI/BHMA Type E19211 (Grade 1)



4036



4066

▼ Shell, Cylinder

Brass, Aluminum scalp with US28 Clear Anodized (628) or 313 (Dark Bronze Anod.) or 335 (Black Anod.). Plug is US26 Chrome (625).

▼ Keying

Available in keyed-alike pairs (KA2), keyed-different (KD) and keyed-alike sets of 50 (KA50). All cylinders furnished with two keys per cylinder.

▼ Trim Ring

Furnished. 1/4" thick, suitable for 1-3/4" thick doors. Available on special order for other door thicknesses.

▼ Function

A standard 1-5/32" diameter cylinder with 5-pin tumbler security. Designed to operate any Adams Rite lock or latch requiring a mortise cylinder. Close-tolerance manufacture and inspection achieve setscrew grooves and cam that are true on their respective centerlines. This ensures proper mating and operation with the lock or latch mechanism.

▼ Shell, Turn

Brass. Choice of three finishes: 130 to match Clear Anodized, 313 (Dark Bronze Anodized) or 335 (Black Anodized).

▼ Trim Ring

Furnished. 1/4" thick, suitable for 1-3/4" thick doors. Available on special order for other door thicknesses.

▼ Function

To operate lock or latch without key. Interchanges with standard 1-5/32" diameter mortise cylinder. Cams are available to suit the particular Adams Rite lock or latch. (See back for cam specifications.)

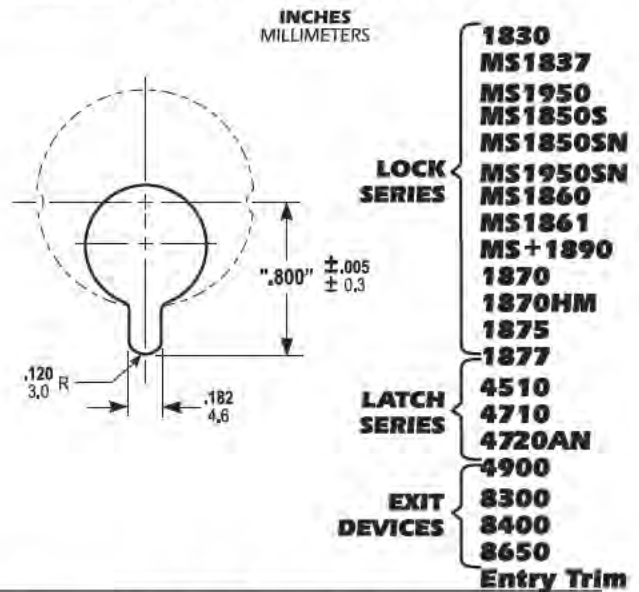


4036 Mortise Cylinder/4066 Thumbturn

CYLINDERS "BY OTHERS"

Adams Rite metal stile glass door deadbolts and latches are designed to accept standard 1-5/32" mortise cylinders of all popular makes. This means that the entrance can be keyed to match the system used throughout the building on other types of doors. Care must be taken, however, to specify the proper cam for each type of lock, as these are not generally interchangeable. The cam shapes shown below are available from the listed cylinder manufacturers and will be supplied by them with the cylinder when specified or available separately. Because of variations in attachment of cams to cylinders and other construction differences, it is advisable NOT to attempt using one manufacturer's cylinder with another's cam.

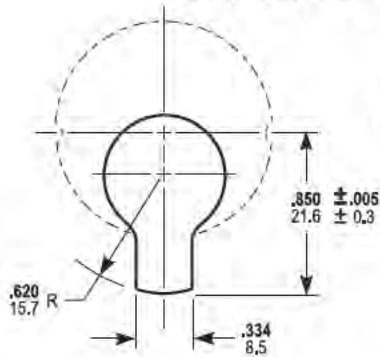
Dimensions of Cam to Operate:



MS[®] CAM

Manufacturer	Standard	High Security	IC/Removable Core
Arrow	AR18	18A	18C/18A
Best	N/A	N/A	C181
Corbin-Russ.	111F55	111F55	362F42
Falcon	9899	9899	A12667-001
ILCO	863A	863A	863A
Medeco	Z02	Z02	Z02
Sargent	13-0512	18-0076	13-0832
Schlage	B502-292	B502-944	K510-711
Yale	1161L	1161L	1160L

Dimensions of Cam to Operate: 4070 Series Deadlock

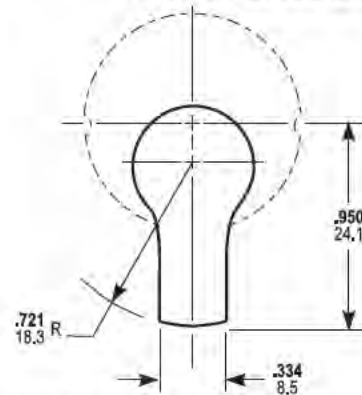


This cam available from above cylinder manufacturers on special order (or make from standard cam)

4070 CAM

Manufacturer	Standard	High Security	IC/Removable Core
Arrow	N/A	N/A	N/A
Best	N/A	N/A	A-4445
Corbin-Russ.	105F70	105F70	423F49
Falcon	A09898-000	A09898-000	A12667-002
ILCO	863H	863H	863H
Medeco	Z06	Z06	Z06
Sargent	13-0513	N/A	N/A
Schlage	B502-380	B502-945	B520-378
Yale	N/A	N/A	N/A

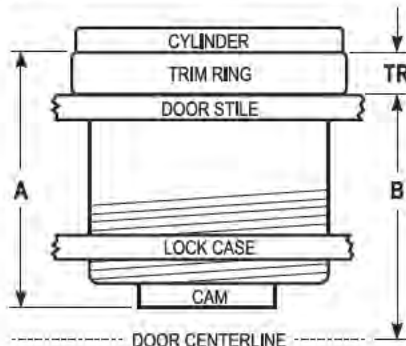
Dimensions of Cam to Operate: 2331 Series Deadlock



This cam available from all cylinder manufacturers (standard cam)

2331 CAM

Manufacturer	Standard	High Security	IC/Removable Core
Arrow	001	1A	1C
Best	N/A	N/A	A-1248
Corbin-Russ.	65F36	N/A	N/A
Falcon	9897-000-30	9897-000-30	12667-003-50
ILCO	863G	863G	863G
Medeco	Z01	Z01	Z01
Sargent	13-0097	18-0080	X1-3000
Schlage	B502-191	B502-948	K510-730
Yale	1161	1161	1160E



"TR" is trim ring length.
"A" is cylinder height (less shoulder but including cam).
"B" is one-half of door thickness.

Cylinder Trim Ring for Narrow Stiles

Narrow stile doors require a trim ring to fill the gap remaining between the cylinder shoulder and stile when a standard mortise cylinder is used. If the security of the hardened steel Adams Rite MS4043 Cylinder Guard is not required, this ring may be simply a length of 1.171 I.D. tubing. Its length varies depending on door thickness or cylinder make and number of pins. The specific length required can be quickly determined by the following formula:

FOR MS[®] LOCKS:

$$TR = A + .125 - B$$

FOR 2190

$$TR = A - B$$

FOR 4500 SERIES LATCHES:

$$TR = A + .0312 - B$$

*TOLERANCE: ±.060

4036/4066 OPTIONS

Dash number specifies type of cam:
-01 for MS lock, 4900 Deadlatches, etc.
-02 for 4070 Deadbolt
-03 for 2331 Deadbolt

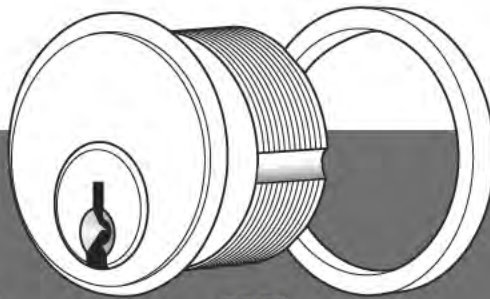
STANDARD PACKAGE

Individually packed with trim ring.
4036 also furnished with key.

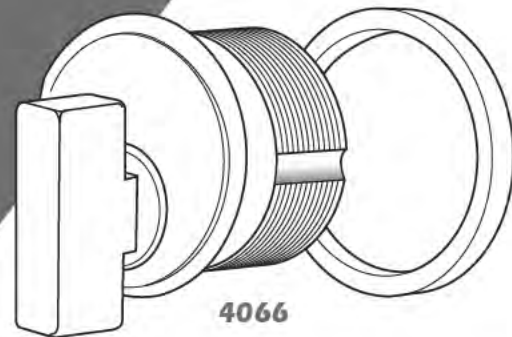
Mortise Cylinder & Thumbturn

4036 - Cylinder 4066 - Thumbturn

ANSI/BHMA Type E19211 (Grade 1)



4036



4066

▼ Shell, Cylinder

Brass, Aluminum scalp with US28 Clear Anodized (628) or 313 (Dark Bronze Anod.) or 335 (Black Anod.). Plug is US26 Chrome (625).

▼ Keying

Available in keyed-alike pairs (KA2), keyed-different (KD) and keyed-alike sets of 50 (KA50). All cylinders furnished with two keys per cylinder.

▼ Trim Ring

Furnished. 1/4" thick, suitable for 1-3/4" thick doors. Available on special order for other door thicknesses.

▼ Function

A standard 1-5/32" diameter cylinder with 5-pin tumbler security. Designed to operate any Adams Rite lock or latch requiring a mortise cylinder. Close-tolerance manufacture and inspection achieve setscrew grooves and cam that are true on their respective centerlines. This ensures proper mating and operation with the lock or latch mechanism.

▼ Shell, Turn

Brass. Choice of three finishes: 130 to match Clear Anodized, 313 (Dark Bronze Anodized) or 335 (Black

▼ Trim Ring

Furnished. 1/4" thick, suitable for 1-3/4" thick doors. Available on special order for other door thicknesses.

▼ Function

To operate lock or latch without key. Interchanges with standard 1-5/32" diameter mortise cylinder. Cams are available to suit the particular Adams Rite lock or latch. (See back for cam specifications.)



4036 Mortise Cylinder/4066 Thumbturn

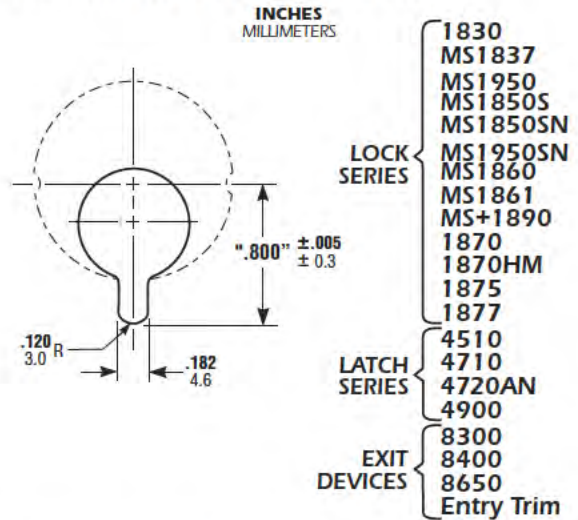
CYLINDERS "BY OTHERS"

Adams Rite metal stile glass door deadbolts and latches are designed to accept standard 1-5/32" mortise cylinders of all popular makes. This means that the entrance can be keyed to match the system used throughout the building on other types of doors. Care must be taken, however, to specify the proper cam for each type of lock, as these are not generally interchangeable. The cam shapes shown below are available from the listed cylinder manufacturers and will be supplied by them with the cylinder when specified or available separately. Because of variations in attachment of cams to cylinders and other construction differences, it is advisable NOT to attempt using one manufacturer's cylinder with another's cam.

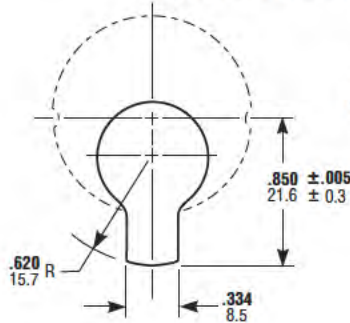
MS® CAM

Manufacturer	Standard	High Security	IC/Removable Core
Arrow	AR18	18A	18C/18A
Best	N/A	N/A	C181
Corbin-Russ.	111F55	111F55	362F42
Falcon	9899	9899	A12667-001
ILCO	863A	863A	863A
Medeco	Z02	Z02	Z02
Sargent	13-0512	18-0076	13-0832
Schlage	B502-292	B502-944	K510-711
Yale	1161L	1161L	1160L

Dimensions of Cam to Operate:



Dimensions of Cam to Operate: 4070 Series Deadlock

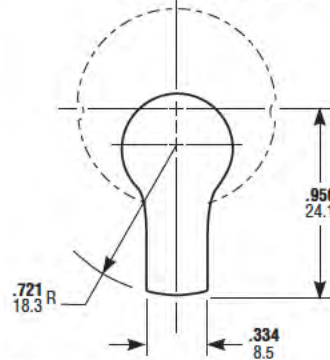


This cam available from above cylinder manufacturers on special order (or make from standard cam)

4070 CAM

Manufacturer	Standard	High Security	IC/Removable Core
Arrow	N/A	N/A	N/A
Best	N/A	N/A	A-4445
Corbin-Russ.	105F70	105F70	423F49
Falcon	A09898-000	A09898-000	A12667-002
ILCO	863H	863H	863H
Medeco	Z06	Z06	Z06
Sargent	13-0513	N/A	N/A
Schlage	B502-380	B502-945	B520-378
Yale	N/A	N/A	N/A

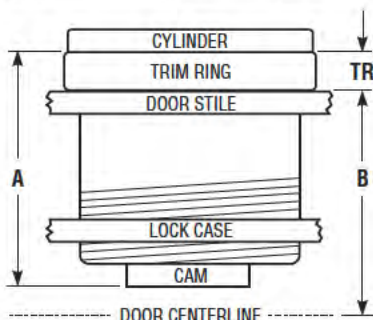
Dimensions of Cam to Operate: 2331 Series Deadlock



This cam available from all cylinder manufacturers (standard cam)

2331 CAM

Manufacturer	Standard	High Security	IC/Removable Core
Arrow	001	1A	1C
Best	N/A	N/A	A-1248
Corbin-Russ.	65F36	N/A	N/A
Falcon	9897-000-30	9897-000-30	12667-003-50
ILCO	863G	863G	863G
Medeco	Z01	Z01	Z01
Sargent	13-0097	18-0080	X1-3000
Schlage	B502-191	B502-948	K510-730
Yale	1161	1161	1160E



Cylinder Trim Ring for Narrow Stiles

Narrow stile doors require a trim ring to fill the gap remaining between the cylinder shoulder and stile when a standard mortise cylinder is used. If the security of the hardened steel Adams Rite MS4043 Cylinder Guard is not required, this ring may be simply a length of 1.171 I.D. tubing. Its length varies depending on door thickness or cylinder make and number of pins. The specific length required can be quickly determined by the following formula:

FOR MS® LOCKS:

$$TR^* = A + .125 - B$$

FOR 4500 SERIES LATCHES:

$$TR^* = A + .0312 - B$$

*TOLERANCE: $\pm .060$

"TR" is trim ring length.
"A" is cylinder height (less shoulder but including cam).
"B" is one-half of door thickness.

4036/4066 OPTIONS

Dash number specifies type of cam:
-01 for MS® lock, 4900 Deadlatches, etc.
-02 for 4070 Deadbolt
-03 for 2331 Deadbolt

STANDARD PACKAGE

Individually packed with trim ring. 4036 also furnished with key.



Pull Plates No. 102 x 70, 105 x 70, 106 x 70, 107 x 70

- Material:** Aluminum, brass, bronze, stainless steel
- Finishes:** Stocked in standard architectural finishes but available in any finish, US32DMS, US32D316, and US32316 (see page 9). *US3LIFETIME available on select product below
- Fastener:** #6 x 5/8" OH SMS; 1/4-20 x 2 1/4" thru bolt & finish washer (standard 1 3/4" door)
- Options:**
- Barrier Free available in 2 1/2" clearance — use BF prefix when ordering (BF102 x 70C)
 - Advise if door thickness is other than 1 3/4"
 - See page B13 for mounting selection (standard duty 1/4 - 20)

No.	Pull	CTC	Plate	Size	Weight	ANSI A156.6
102 x 70B	5/8" dia.	5 1/2"	70	3 1/2" x 15"	1.8 lbs.	J405
102 x 70C	5/8" dia.	5 1/2"	70	4" x 16"	1.9 lbs.	J405
105 x 70B	3/4" dia.	5 1/2"	70	3 1/2" x 15"	2.1 lbs.	J405
105 x 70C	3/4" dia.	5 1/2"	70	4" x 16"	2.2 lbs.	J405
106 x 70B	3/4" dia.	6"	70	3 1/2" x 15"	2.2 lbs.	J405
106 x 70C	3/4" dia.	6"	70	4" x 16"	2.3 lbs.	J405
107 x 70B*	3/4" dia.	8"	70	3 1/2" x 15"	2.4 lbs.	J405
107 x 70C*	3/4" dia.	8"	70	4" x 16"	2.5 lbs.	J405



Pull Plates No. 110 x 70, 111 x 70

- Material:** Aluminum, brass, bronze, stainless steel
- Finishes:** Stocked in standard architectural finishes but available in any finish, US32DMS, US32D316, and US32316 (see page 9). *US3LIFETIME available on select product below
- Fastener:** #6 x 5/8" OH SMS; 1/4-20 x 2 1/4" thru bolt & finish washer (standard 1 3/4" door)
- Options:**
- Barrier Free available in 2 1/2" clearance — use BF prefix when ordering (BF110 x 70C)
 - Advise if door thickness is other than 1 3/4"
 - See page B13 for mounting selection (standard duty 1/4 - 20)
 - Heavy bevel available, specify HVBEV

No.	Pull	CTC	Plate	Size	Weight	ANSI A156.6
110 x 70B	1" dia.	8"	70	3 1/2" x 15"	3.8 lbs.	J405
110 x 70C	1" dia.	8"	70	4" x 16"	3.9 lbs.	J405
111 x 70B*	1" dia.	10"	70	3 1/2" x 15"	4.3 lbs.	J405
111 x 70C*	1" dia.	10"	70	4" x 16"	4.4 lbs.	J405

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Push Plates – .050" Thick

- Material:** Aluminum, brass, bronze, stainless steel
- Finishes:** Available in standard architectural finishes, US32DMS, US32D316, US32316, and US3LIFETIME (see page 9)
- Fastener:** #6 x 5/8" OH SMS
- Features:** Four beveled edges
- Ordering:** Specify plate number followed by size designation and finish (70B US32D) or for non-standard size 70 Specify width x height and finish. Specify any additional options
- Options:**
- Custom sizes available upon request
 - TEK – self-drilling screws
 - TORX – security Torx screws
 - SA – self-adhesive mounting: 1/16" double face foam tape (no screw holes on plate)
 - Engraving on plates 4" wide or wider. Specify copy. See page B1 for standard engraving locations
 - Cylinder cutouts (CFC) and turn knob cutouts (CFTT). See page B1 for standard locations and sizes
 - Heavy bevel available on 70A to 70G, specify HVBEV



No. 70

No.	Standard Size	Weight	ANSI A156.6
70A	3" x 12"	0.7 lbs.	J301
70B	3 1/2" x 15"	0.9 lbs.	J301
70C	4" x 16"	1.0 lbs.	J301
70E	6" x 16"	1.5 lbs.	J301
70F	8" x 16"	2.0 lbs.	J301
70G	4" x 20"	1.3 lbs.	J301



No. 70RC

No.	Standard Size	Weight	ANSI A156.6
70RCA	3" x 12"	0.7 lbs.	J301
70RCB	3 1/2" x 15"	0.9 lbs.	J301
70RCC	4" x 16"	1.0 lbs.	J301
70RCE	6" x 16"	1.5 lbs.	J301
70RCF	8" x 16"	2.0 lbs.	J301
70RCG	4" x 20"	1.3 lbs.	J301



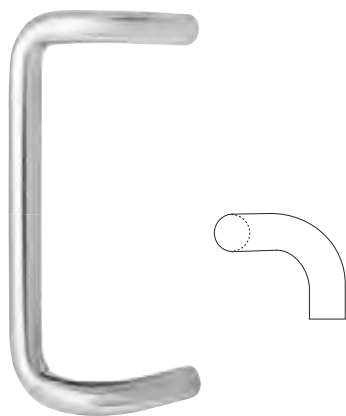
No. 70RE

No.	Standard Size	Weight	ANSI A156.6
70REA	3" x 12"	0.7 lbs.	J301
70REB	3 1/2" x 15"	0.9 lbs.	J301
70REC	4" x 16"	1.0 lbs.	J301

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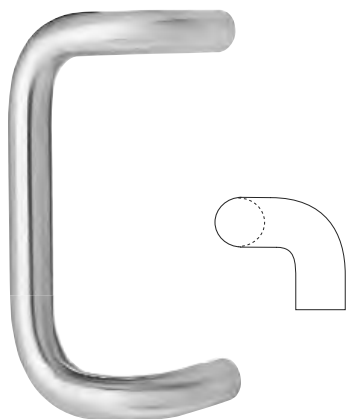
Attachment E – Technicals



90° Offset Door Pulls No. BF150, BF151, BF152

- Material:** Aluminum, brass, bronze, stainless steel
- Finishes:** Available in standard architectural finishes, US32DMS, US32D316, US32316, white (WPC), red (RPC), and black (BPC) powder coat finishes (see page 9)
- Fastener:** 1/4-20 x 2 1/4" thru bolt & finish washer (standard 1 3/4" door)
- Options:**
- Back to back mounting in pairs — use BTB suffix and mounting type number (BF150BTB16)
 - Concealed mounting single pulls — use C suffix and mounting type number (BF150C17)
 - Advise if door thickness is other than 1 3/4"
 - See page B27 for mounting selection (standard duty 1/4 - 20)

No.	Material Size	CTC	Overall	Base	Projection	Clearance	Offset	Weight	ANSI A156.6
BF150	3/4" dia.	8"	8 3/4"	3/4"	3 1/4"	2 1/2"	4"	2.3 lbs.	J402
BF151	3/4" dia.	10"	10 3/4"	3/4"	3 1/4"	2 1/2"	4"	2.5 lbs.	J402
BF152	3/4" dia.	12"	12 3/4"	3/4"	3 1/4"	2 1/2"	4"	2.7 lbs	J402



90° Offset Door Pulls No. BF156, BF157A, BF157, BF158, BF159

- Material:** Aluminum, brass, bronze, stainless steel
- Finishes:** Available in standard architectural finishes, US32DMS, US32D316, US32316, white (WPC), red (RPC), and black (BPC) powder coat finishes (see page 9).
*US3LIFETIME available on select product below
- Fastener:** 1/4-20 x 2 1/4" thru bolt & finish washer (standard 1 3/4" door)
- Features:** Recommended for ADA openings
- Options:**
- Back to back mounting in pairs — use BTB suffix and mounting type number (BF156BTB16)
 - Concealed mounting single pulls — use C suffix and mounting type number (BF156C17)
 - Advise if door thickness is other than 1 3/4"
 - Heavy duty versions of most fastening types available — use suffix HD to fastening type number (BF156BTB16HD)
 - See page B27 for mounting selection (standard duty 1/4 - 20)

No.	Material Size	CTC	Overall	Base	Projection	Clearance	Offset	Weight	ANSI A156.6
BF156	1" dia.	8"	9"	1"	3 1/2"	2 1/2"	4"	3.9 lbs.	J402
BF157A	1" dia.	9"	10"	1"	3 1/2"	2 1/2"	4"	4.1 lbs.	J402
BF157*	1" dia.	10"	11"	1"	3 1/2"	2 1/2"	4"	4.3 lbs.	J402
BF158	1" dia.	12"	13"	1"	3 1/2"	2 1/2"	4"	4.8 lbs.	J402
BF159	1" dia.	18"	19"	1"	3 1/2"	2 1/2"	4"	6.5 lbs.	J402

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Attachment E – Technicals

Door Coordinators No. 2600 Series

- Material:** Steel
- Finishes:** Black prime coat, silver powder coat
- Fastener:** 7 ea. #12 - 24x 1¹/₄ TH type C tapping screws
- Size:** Standard device size 5⁵/₈" x 1⁵/₈" x 52"
- Features:** Non-handed. Override protection to prevent damage in case of abnormal force on door Mechanism and filler bar completely fill width of opening and when painted to match frame it becomes virtually invisible
- Options:** Specify make and model of exit device for vertical rod preparation
- Ordering:** Stock Sizes



No.	Opening	Weight	ANSI A156.3
2660	60"	7.0 lbs.	Type 21A
2672	72"	8.0 lbs.	Type 21A
2696	96"	9.75 lbs.	Type 21A

Custom Sizes — The 2600 Series coordinators are manufactured in different housing lengths to coordinate the full range of door sizes:

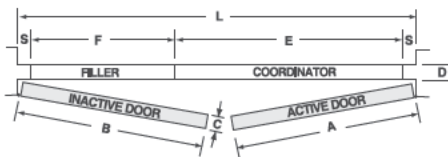
- NX2600 Series: For jamb opening widths (A + B dimension) from 48" - 54". E dimension, 42"
- 2600 Series: For jamb opening widths (A + B dimension) from 54" - 96". E dimension, 52"

Determining Coordinator Item Number

- Active door widths A plus inactive door width B equals the last two or three digits of all 2600 Series coordinator item numbers (2680 is for 80" door opening)
- Less than 48" jamb widths = N2600 Series (N2644 = 44" opening).
- Larger sizes are available (XL, XXL). Contact the factory

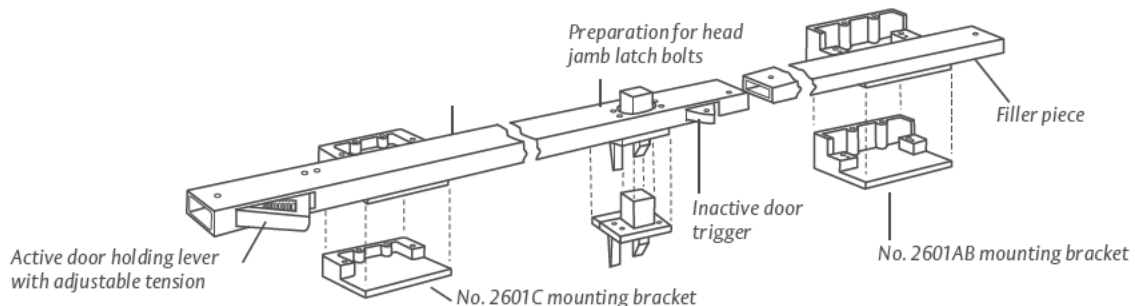
NOTE: Some panic hardware requires the coordinator to be factory prepped. Contact factory.

No.	Jamb Widths	Coordinator Length	ANSI A156.3
NX2648- NX2654	48"-54"	42"	Type 21A
2655 - 2660	55" - 60"	52"	Type 21A
2661 - 2672	61" - 72"	52"	Type 21A
2673 - 2696	73" - 96"	52"	Type 21A



Fillers are usually supplied precut from the factory (filler bars shown on page E14).

NOTE: If "S" dimension is other than 5⁵/₈" advise the factory.



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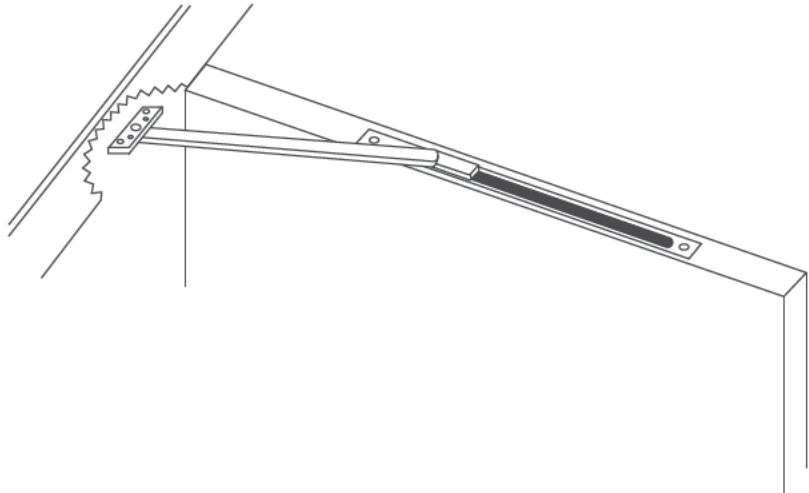
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Attachment E – Technicals

Concealed Mount – Interior or Exterior – High Traffic Doors

Product Description & Features

- Doors may be single or double acting
- Non-handed
- Slide track design
- Recommended for high traffic, heavy abuse installations
- Heavy shock absorber spring provides 5 -7° compression before dead stop
- LS option omits spring for special applications
- Surface on/off knob on hold open models
- Stop, friction stay or hold open functions
- Complete screw packet for installation in wood and machine screws for door and frame.
- For security areas, Torx® screws available for exposed fasteners
- Standard architectural finishes
- Durable slider cam and shock block
- 110° maximum opening
- 1-3/4" minimum door thickness, for thicker doors, note thickness when ordering
- 1-3/16" square channel
- Stop function UL listed for fire door assemblies
- Hanging means other than standard butts or offset pivots require special templating and pricing. Consult factory



Checkmate®
Stops & Holders

Door Opening Chart (in inches)

Butts Offset Pivots	Center Hung Pivots	Model Number		
		Friction	H.O.	Stop
*24 - 28	—	1-116	1-126	1-136
28-1/16 - 33	30 - 36	1-216	1-226	1-236
33-1/16 - 38	36-1/16 - 41	1-316	1-326	1-336
38-1/16 - 43	41-1/16 - 46	1-416	1-426	1-436
43-1/16 - 48	46-1/16 - 50	1-516	1-526	1-536

ANSI No.			
Shipping Weight 4.5 lbs.	Friction	H.O.	Stop
	C01531	C01511	C01541

*Butt hung only on this size door. No swing clear hinges.

Options

Less Spring – Suffix LS

Heavy duty slide track type stops have a spring in the end of the channel that keeps the slider from deadstopping. If these units are being used with electromechanical closer, where the door must deadstop, the LS option is needed. For non-adjustable models 1 and 9 only.

Angle Jamb Bracket Adapter – Standard-duty models suffix 5258 (non-handed) Heavy-duty models suffix 5458 (LH) or 5459 (RH)

When surface mounted units are mounted on a rabbeted door on the push side, flush door and transom on the push side, or in a reverse installation on the pull side of the door a special bracket is needed. Note that not all models can be mounted on the pull side of the door (See specific model numbers in catalog.)

Security Screws – Suffix Torx

Security screws can be supplied for exposed fasteners.



5258



5458

Certifications

All Rixson Checkmate® overhead stops and holders are in compliance with ANSI/BHMA 156.8, Grade 1 and 2 Standards. See individual products for sub sections. See individual models for UL Listing.



Limited Warranty

Rixson Checkmate® stops and holders are warranted for 2 years for defect. See Rixson price book for specific details of the limited warranty

Specifications

All overhead stops and holders shall be from a single manufacturer.

Standard-duty models used for interior or low to medium traffic doors.

Heavy-duty models used for exterior or high traffic doors or doors subject to abuse.

For extremely abusive areas or high winds use double lever arm type.

Coordinate deadstop and/or hold open location with concealed floor closers.

Checkmate products provide hold open and/or deadstop.

351 Series

Powerglide® Door Closer
Door Control

SARGENT®
ASSA ABLOY

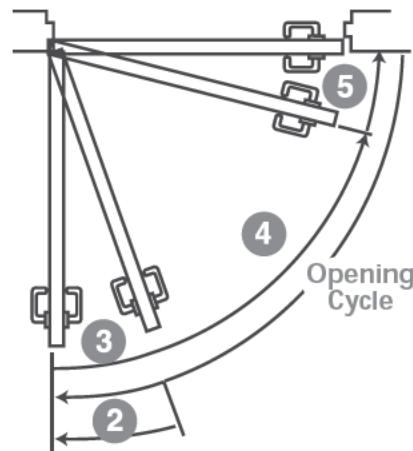
1 Closer Spring Adjustment

- Not Shown in Door Closer Cycle Diagram
- Effects the entire cycle of the door closer movement
- Used to size closer for application requirements
- Determines the amount of force with which the door closes and the amount of force required to open the door
- Adjustable to compensate for door size and draft conditions

2 Backcheck valve

- At approximately 70° of the open cycle, the Backcheck Valve begins to slow the door's motion
- Prevents the door from slamming into the door's stop
- Valve is used to control the intensity of the Backcheck
- Note: A Positive stop is required; Backcheck cannot be used as a stop

Door Closer Cycle



3 Delayed action valve (Optional)

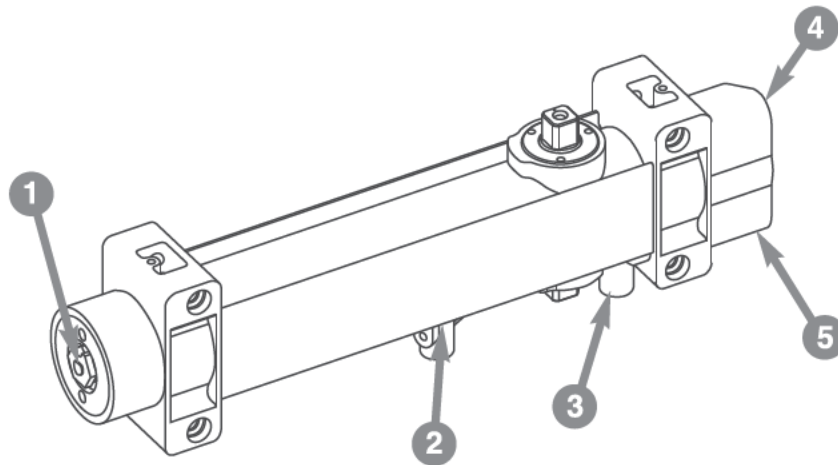
- Holds the door in the open position momentarily
- 20 second minimum hold open delay
- The feature is available for all applications and arms
- Beneficial when moving carts or objects through door opening or ADA applications

4 Closing speed valve

- Controls how fast the door closes to approximately 8" from the closed position, along with the closer spring

5 Latching speed valve

- Controls the speed of the door during the final 8" of door swing
- The force the door closes with is controlled by the closer spring
- Note: This adjustment is critical for door latching



ANSI Standards

ARM	TYPE	ARM	TYPE
O	CO2011	PF9	CO2101
P9	CO2021	P10	CO2021
H	CO2051	PS/CPS	CO2021
PH9	CO2061	CPSH/PSH	CO2061
F	CO2091		

All are certified ANSI types including options PT4 A, B, D, E, F, G, H

How to Select the Proper Closer

Things to Consider

1. Size and Weight of Door

The 351 Door Closers is non-sized so that closing force can be adjusted in the field to accommodate various door sizes and weights.

2. Interior Application

The standard application is the most efficient in terms of power and control.

3. Exterior Application

The top jamb, corner bracket or parallel arm application should be used. Exterior doors require greater closing forces because of draft conditions. Always place the closers out of the weather.

4. Degree of Opening

Proper arm and position on the door is most important to permit the door to open far enough to allow adequate traffic flow.

5. Function

Closers are available with hold-open, positive stop or fusible link hold-open arms.

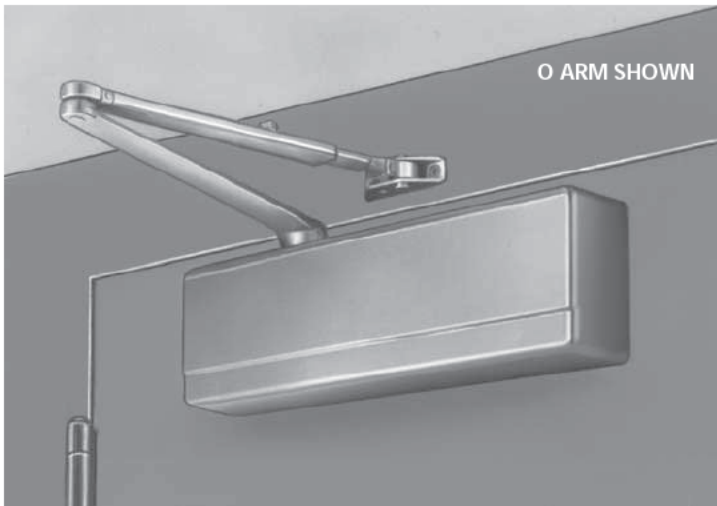
6. Special Condition

Consult factory when special hinges, overhead holders or other specialized hardware is used.

351 Series

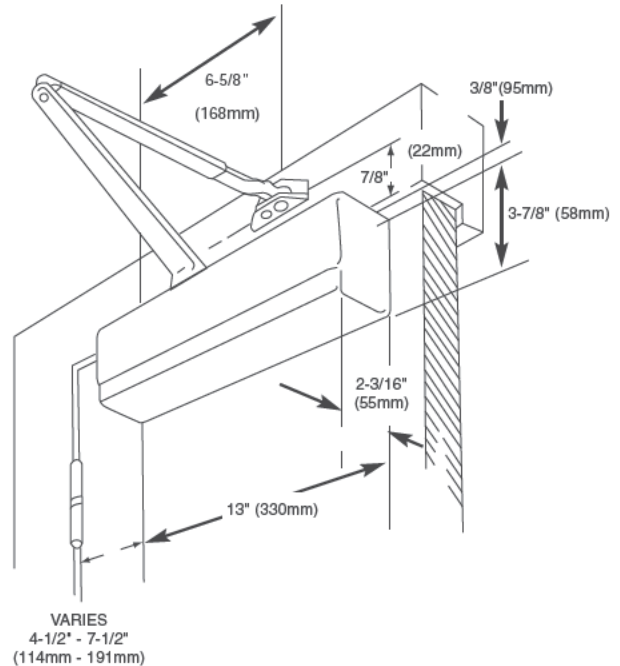
Powerglide® Door Closer
Standard Application

SARGENT®
ASSA ABLOY



The standard application of the 351 door closer is the most common and the most desirable. The closer mounts on the hinge (pull) side of door (except when the W Corner Bracket is used). Note: This application is not recommended on exterior doors (the closer is not protected from weather). The cover projection normally limits the door opening to a maximum of 160°.

351-0 Standard Application



351 Standard Application for:

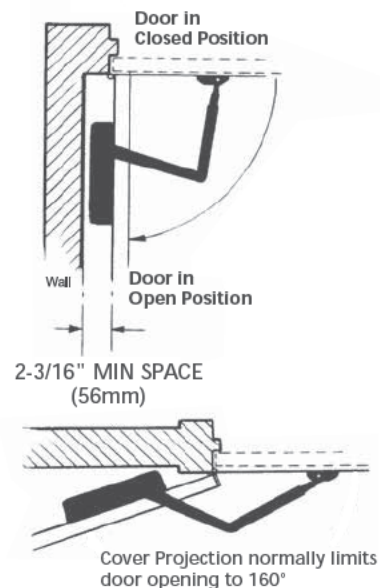
- Interior Doors Opening In or Out
- Exterior Doors Opening In
- Maximum Reveal 7/16"
- Non-hand universal body

351 Standard Application Door Opening Range

(Range based on Mounting Position)

- O- Standard Arm: 120° - 180°
- H- Hold Open Arm: 90° - 160°
- F- Fusible Link Hold Open Arm: 75°-135°

Wall Clearance Requirement



Adjustable Closing Force

- Interior doors to 5'0" wide
- Exterior doors to 4'0" wide
- Shipped factory preset for 3'0" door
- Factory pre-sized upon request

Arm Leverage Adjustment

Closers using "O" or "F" arms have the provision to increase closing power by 15% by adjusting foot pivot



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351 Series

Powerglide® Door Closer
Arms and Accessories
for Standard Application

SARGENT®
ASSA ABLOY

O - Standard Arm

- Forged Steel Main Arm
- Non-handed
- Permits 120° door opening with standard mounting
- Permits 180° door opening with alternate mounting or corner bracket



Order as 25-O x finish for arm only
Includes: 63-2607 - Main arm
63-2216 - Foot assembly
63-3684 - Screw pack

H - Hold Open Arm

- Forged Steel Main Arm
- Non-handed
- Hand is changed by inverting the foot assembly
- Friction type holder easily adjusted by a wrench
- Permits 180° door opening
- Holds open from 80° to 180°



Order as 25-H x finish for arm only
Includes: 63-2229 - Main arm
61-2303 - Foot assembly
63-3684 - Screw pack

F - Fusible Link Hold Open Arm

- Forged Steel Main Arm
- Handed same as door
- Friction type holder easily adjusted by a wrench
- Holds open from 80° to 140°
- 160° F Link Standard
- Specify 125°F Link when required



Order as 25-F x hand x finish for arm only
Includes: 63-2240 - Left hand main arm
63-2241 - Right hand main arm
63-2468 - Foot assembly
63-3684 - Screw pack

O8 - Mortise Foot Arm

- Forged Steel Main Arm
- Non-handed
- Permits 120° door opening
- Commonly used with bull nose frames



Order as 25-O8 x finish for arm only
Includes: 63-2607 - Main arm and link assembly
63-2273 - Foot assembly
63-2391 & 63-3684 - Screw packs

H8 - Mortise Foot Hold Open Arm

- Forged Steel Main Arm
- Handed same as door
- Friction type holder easily adjusted by a wrench
- Holds open from 80° to 180°



Order 25 R-H8 for right hand and 25 L-H8 for left hand x finish for arm only
Includes: 63-2289 - Left hand foot assembly
63-2290 - Right hand foot assembly
63-2229 - Main Arm and Link Assembly
63-2391 & 63-3684 - Screw packs

F8 - Mortise Foot Fusible Link Hold Open Arm

- Forged Steel Main Arm
- Handed same as door
- Friction type holder easily adjusted by a wrench
- Permits 140° door opening
- Holds open to 140°
- 160° F Link Standard
- Specify 125° F Link when required



Order as 25-F x hand x finish for arm only
Includes: 63-2240 - Left hand main arm assembly
63-2241 - Right hand main arm assembly
61-2273 - Foot assembly
63-3684 - Screw packs

OLC - Standard Arm for Low Ceiling

- Forged Steel Main Arm
- Non-handed
- Must be used when the distance between the top of door to ceiling is less than 1-1/4" (32mm)
- Permits 120° door opening with standard mounting



Order as 25-OLC x finish for arm only
Includes: 63-2549 - Main arm and link assembly
63-2216 - Foot assembly
63-3684 - Screw pack

UH Package

- Universal hold open arm package provides brackets and arms to install closer in top jamb, standard or parallel applications
- Order closer as 351-UH x finish
- 351-UH not available with (MC) metal cover or plated finishes



Screw packs
63-3684

125-PH9



UO Package

- Universal arm package provides brackets and arms to install closer in standard top jamb or parallel applications
- Order closer as 351-UO x finish
- 351-UO not available with (MC) metal cover or plated finishes



Screw packs
63-3684 &
63-2391

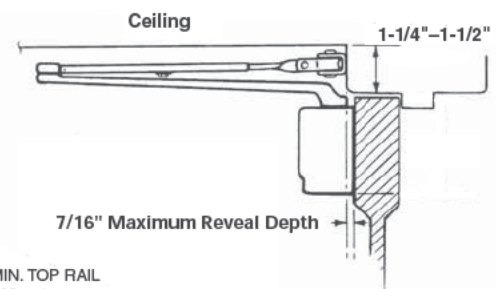
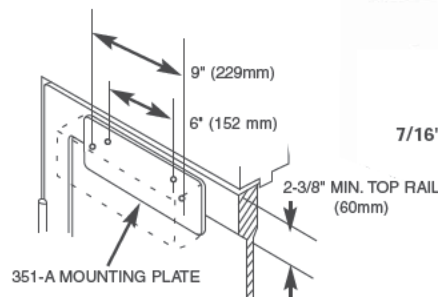
125-P9



OLC - Low Ceiling Application Arm for Ceiling to Doors Clearance 1-1/4" - 1-1/2"

Door Top Rail Requirement

- 4-1/4" min. rail (108mm)
- 351 closer can be mounted on top rails 2-3/8" through 4-1/4" using a 351-A mounting plate



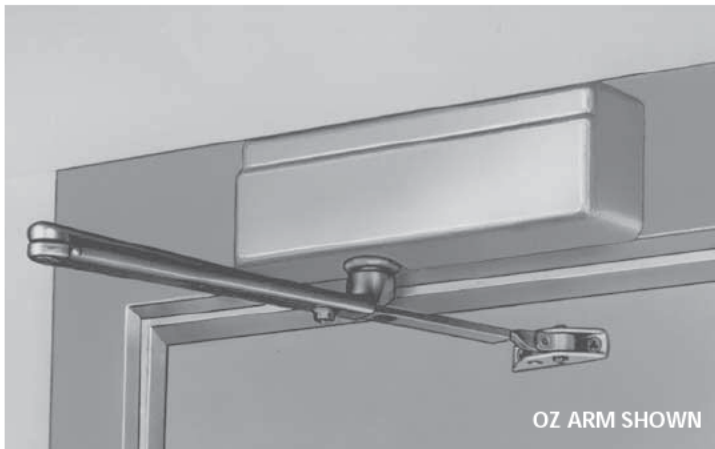
351L - LCN retro plate

Designed to replace an LCN 4040 closer body with a SARGENT 351 without drilling new holes in door (NOTE: New mounting holes required for arm bracket only)
Order as: 351L x finish

351 Series

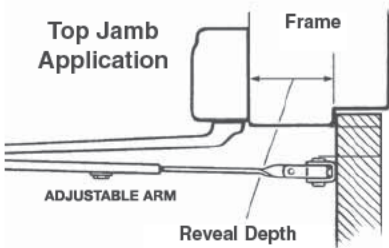
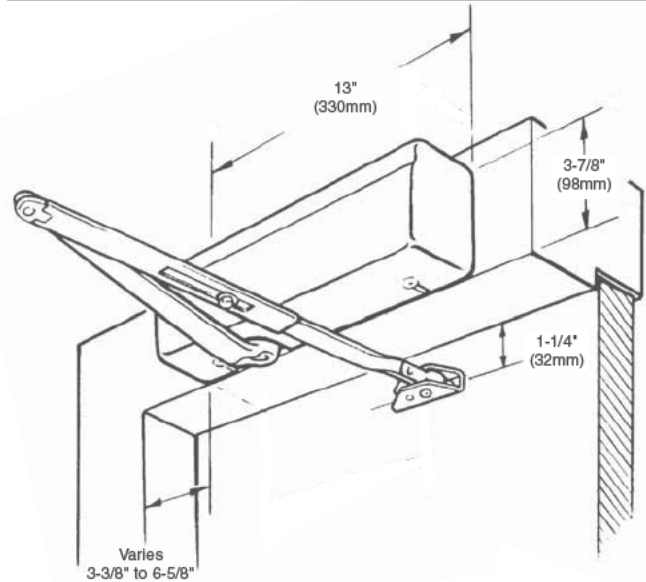
Powerglide® Door Closer
Top Jamb Application

SARGENT®
ASSA ABLOY



Top Jamb applications - The 351 closer is mounted on the frame face above the door. The foot is mounted on the push side of door. This application is for use on exterior doors opening out to protect the closer from the weather.

351-0 Top Jamb Mounting Position



351 Typical Reveal Top Jamb Applications

For reveals up to 2" (51mm) maximum

- O Arm - Max. Door Opening: 180°
- H Arm - Hold Open Range: 80°-180°
- F Arm - Fusible Link Hold Open Arm Hold Open Range: 80°-130°

351 Deep Reveal Top Jamb Applications

For reveals from 2-1/8" (54mm) to 5" (127mm)

- OZ Arm - Max. Door Opening: 140°
- HZ Arm - Hold Open Range: 80°-140°
- FZ Arm - Fusible Link Hold Open Arm Hold Open Range: 80°-130°

351 Extra Deep Reveal Top Jamb Applications

For reveals from 5-1/8" (130mm) to 8" (203mm)

- OZA Arm - Max. Door Opening: 140°
- HZA Arm - Hold Open Range: 80°-130°
- FZA Arm - Fusible Link Hold Open Arm Hold Open Range: 80°-130°

Minimum Frame Face Required

- 1-3/4" minimum required for 351A plate and 1-15/16" minimum required 351B plate for both single and double rabbeted frames

Minimum Door Top Rail Required to Mount Closer Foot

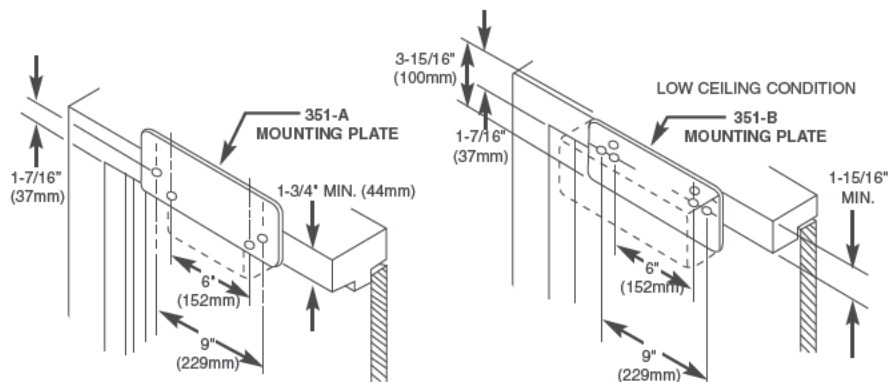
- 2" (51mm) minimum
- Rail height used will vary depending on type and make of auxiliary holder

Adjustable Closing Force

- Interior doors to 5'0" wide
- Exterior doors to 4'0" wide
- Shipped factory preset for 3'0" door
- Factory pre-sized upon request

351 Top Jamb Mounting Plates

- Permits closers to be mounted for special applications when overhead auxiliary door holders are used or in low ceiling applications
- Plates are painted or plated steel to match closer
- Plates are non-handed
- Order as 351-A or B x finish



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351 Series

Powerglide® Door Closer Arms
for Top Jamb Application

SARGENT®
ASSA ABLOY

Narrow Reveal

O - Standard Arm

- Forged Steel Main Arm
- For reveals up to 2" (51mm)
- Non-handed
- Permits 180° door opening



Order as 25-O x finish for arm only
Includes: 63-2607 - Main arm assembly
63-2216 - Foot assembly
63-3684 - Screw pack

H - Hold Open Arm

- Forged Steel Main Arm
- For reveals up to 2" (51mm)
- Adjustable friction holder
- Non-handed
- Permits 180° door opening



Order as 25-H x finish for arm only
Includes: 63-2229 - Main arm assembly
61-2303 - Foot assembly
63-3684 - Screw pack

F- Fusible Link Hold Open Arm

- Forged Steel Main Arm
- For reveals up to 2" (51mm)
- Adjustable friction holder
- Handed same as door
- Permits 140° door opening
- 160° F link standard
- Specify 125° F link when required



Order as 25-F x hand x finish for arm only
Includes: 63-2240 - Left hand main arm assembly
63-2241 - Right hand main arm assembly
63-2468 - Foot assembly
63-3684 - Screw pack

Deep Reveal Arms

OZ - Standard Arm for Deep Reveals

- Forged Steel Main Arm
- For reveals from 2-1/8" (54mm) to 5" (127mm)
- Non-handed
- Permits 140° door opening



Order as 25-OZ x finish for arm only
Includes: 63-2607 - Main arm assembly
63-2217 - Foot assembly
63-3684 - Screw pack

HZ - Hold Open Arm for Deep Reveals

- Forged Steel Main Arm
- For reveals from 2-1/8" (54mm) to 5" (127mm)
- Adjustable friction holder
- Non-handed
- Permits 140° door opening



Order as 25-HZ x finish for arm only
Includes: 63-2230 - Main arm assembly
61-2303 - Foot assembly
63-3684 - Screw pack

FZ - Fusible Link Hold Open Arm for Deep Reveals

- Forged Steel Main Arm
- For reveals 2-1/8" (54mm) to 5" (127mm)
- Adjustable friction holder
- Handed same as door
- Permits 140° door opening
- 160° F link standard
- Specify 125° F link when required



Order as 25-FZ x hand x finish for arm only
Includes: 63-2240 - Left hand main arm
63-2241 - Right hand main arm
63-2217 - Foot assembly
63-3684 - Screw pack

Extra Deep Reveal Arms

OZA - Standard Arm for Extra Deep Reveal

- Forged Steel Main Arm
- For reveals 5-1/8" (130mm) to 8" (203mm)
- Non-handed
- Permits 140° door opening



Order as 25-OZA x finish for arm only
Includes: 63-2607 - Main arm assembly
63-2218 - Foot assembly
63-3684 - Screw pack

HZA - Hold Open Arm for Extra Deep Reveal

- Forged Steel Main Arm
- For reveals 5-1/8" (130mm) to 8" (203mm)
- Adjustable friction holder
- Non-handed
- Permits 140° door opening



Order as 25-HZA x finish for arm only
Includes: 63-2231 - Main arm assembly
61-2303 - Foot assembly
63-3684 - Screw pack

FZA - Fusible Link Hold Open Arm for Extra Deep Reveal

- Forged Steel Main Arm
- For reveals 5-1/8" (130mm) to 8" (203mm)
- Adjustable friction holder
- Handed same as the door
- Permits 140° door opening
- 160° F link standard
- Specify 125° F link when required

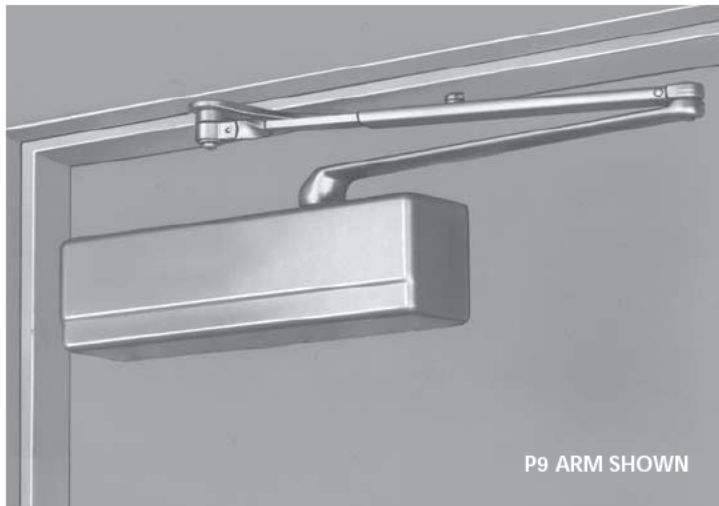


Order as 25-FZA x hand x finish for arm only
Includes: 63-2240 - Left hand main arm assembly
63-2241 - Right hand main arm assembly
63-2218 - Foot assembly
63-3684 - Screw pack

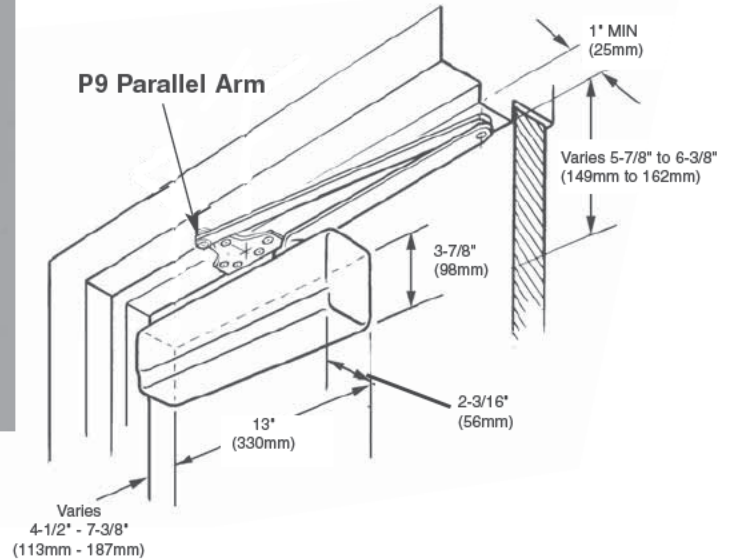
351 Series

Powerglide® Door Closer
Parallel Arm Application

SARGENT®
ASSA ABLOY



351-P9 Regular Duty Parallel Arm



Parallel Arm Applications - The 351 closer is mounted on the push side of the door. As the door opens, the closer swings with the door and gives full headroom in the door opening. Other advantages: the closer arm does not project into the room; the frame can be quite narrow and the door can be swung open much farther than in Top Jamb Applications.

Heavy Duty Parallel Arms

For use in high traffic and abusive environments

- Forged steel arm and cast iron foot bracket for strength and durability
- Oiled bronze bearings for superior wear resistance
- 2 piece rigid arms for ease of installation
- Friction and positive hold open arms available
- Use friction hold open arms for doors subject to moderate hold open use
- Dead stop and compression stop arms available
- Security non-hold open arms available

Non hold-open arms

- Two mounting positions for 120° and 180° maximum door openings

Stop arms

- 6 mounting positions allow stop from 85°-110°

Regular Duty Parallel Arms

Available Arms for institutional installations:

- Regular duty parallel arms
- Offset bracket arms for use with Auxiliary Holders & Stops
- Parallel flush frame arms
- Flush frame arms for use with Auxiliary Holders & Stops
- Flush frame, friction Hold Open Arms

NON HOLD OPEN ARMS

- Two mounting positions for 120° and 180° maximum door opening

HOLD OPEN ARMS

- Friction hold open arms available for doors subject to moderate hold open use
- UL Listed fusible hold open arms available

351 Series

Powerglide® Door Closer
Heavy Duty Parallel Arms

SARGENT®
ASSA ABLOY

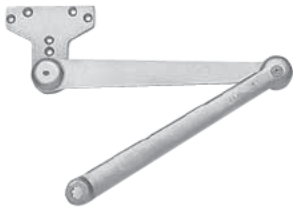
P10 - Heavy Duty Parallel Arm



- Forged Steel Constructions
- Non-Handed
- Easily installed
- Permits 120° opening at standard mounting
- Permits 180° opening at alternate mounting

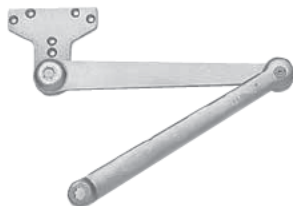
Order as 25-P10 x finish for arm only
25-P10 Includes: 63-0641 - Main arm
63-3727 - P10 foot assembly
63-3684 & 63-2392 - Screw packs

SP10 Heavy Duty Security Arm



- Same as P10, except factory assembled at arm joint (elbow) to prevent disassembly in SSP package along with metal cover

PH10 - Heavy Duty Friction Hold Open Parallel Arm



- Forged Steel Constructions
- Adjustable hold open from 75° to 180°
- Forged steel arm 11-1/4" (286mm) long
- Handed same as door
- Use friction hold open arms for doors subject to moderate hold open use

Order as 25-PH10 x finish for arm only
25-PH10 Includes:
63-0641 - Main arm
63-3839 - Left hand PH10 foot assembly
63-3840 - Right hand PH10 foot assembly
63-3684 & 63-2392 - Screw packs

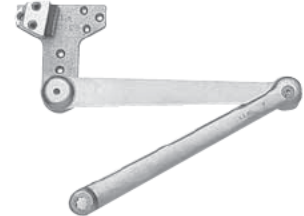
PS - Heavy Duty Parallel Arm with Positive Stop



- Forged Steel Constructions
- Handed arm is field-reversible
- Provides built in stop from 85° to 110°
- Permits 110° opening maximum
- Easily installed
- Permits 85° to 110° door opening

Order as 25-PS x finish for arm only
Includes: 63-0641 - Main arm
63-3837 - PS foot assembly
63-3684 & 63-2398 - Screw packs

CPS - Heavy Duty Parallel Arm with Compression Stop



- Forged Steel Constructions
- Provides built in compression stop from 85° to 105°
- Permits 105° opening maximum
- Easily installed
- Handed arm is field-reversible
- Dead stop within 3°

Order as 25-CPS x finish for arm only
Includes: 63-0641 - Main arm
63-3830 - CPS foot assembly
63-0516 - Bumper holder
63-3493 - Bumper
63-3684 & 63-2398 - Screw packs

PSH - Heavy Duty Parallel Hold Open Arm with Positive Stop



- Forged Steel Constructions
- Provides holder and stop features
- Handed arm is field-reversible
- Easily installed/adjusted
- Permits 85° to 110° door opening

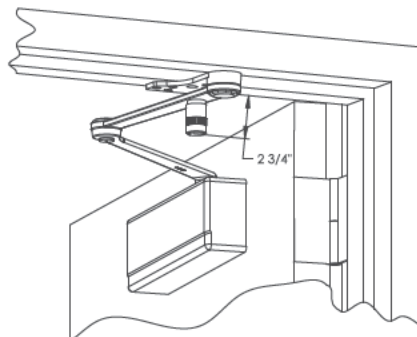
Order as 25-PSH x finish for arm only
Includes: 63-0641 - Main arm
63-3833 - PSH foot assembly
63-3684, 63-2392 & 63-2398 - Screw packs

CPSH - Heavy Duty Hold Open Parallel Arm with Compression Stop



- Forged Steel Constructions
- Handed arm is field-reversible
- Provides built in compression stop and holder mechanism from 85° to 105°
- Easily installed/adjusted
- Permits 105° opening maximum
- Dead stop within 3°

Order as 25-CPSH x finish for arm only
Includes: 63-0641 - Main arm
63-3836 - CPSH foot assembly
63-0516 - Bumper holder
63-3493 - Bumper
63-3684, 63-2392 & 63-3487 - Screw packs



The PSH and CPSH arms project 2 3/4" below the head stop

Positive Stop Hold Open Arms (PSH & CPSH ARMS)

- Use on doors subject to repetitive hold open use
- 6 hold open positions from 85° to 110° determined by mounting position
- Hold open function may be disengaged
- Hold open tension is easily adjustable

351 Series

Powerglide® Door Closer
Regular Duty Parallel Arms

SARGENT®
ASSA ABLOY

Regular Duty Hold Open Arms

P4H - Flush Frame, Friction Hold Open Arm

- Forged Steel Main Arm
- Holds open from 75° to 180°
- Easily adjusted by wrench
- Non-handed
- Use on frames where stop or soffit is too narrow to mount the standard hold open foot bracket



Order as 25-P4H x finish for arm only
Includes: 63-2229 - Main arm
61-2303 - Foot assembly
64-0050 - Foot bracket
63-3684 & 63-2391 - Screw packs

PH9 - Friction Hold Open Arm

- Forged Steel Main Arm
- Holds open from 75° to 180°
- Easily adjusted by wrench
- Non-handed



Order as 25-PH9 x finish for arm only
Includes: 63-2229 - Main arm
61-2303 - Foot assembly
64-0039 - Foot bracket (125 PH9)
63-3684 & 63-2391 - Screw packs

PF9 - Fusible Link Hold Open Arm

- Forged Steel Main Arm
- Fusible link melts and releases hold mechanism allowing door to close
- 160°F fusible link standard; 125°F link optional
- Equipped with adjustable friction holder
- Holds door open from 75° to 180°
- Easily adjusted by wrench
- Handed same as door



Order as 25-PF9 x hand x fusible link degree x finish for arm only
Includes: 63-2229 - Main arm
63-2245 - Left hand foot assembly
63-2246 - Right hand foot assembly
63-3684 & 63-2391 - Screw packs

Regular Duty Offset Bracket Arms

P3 - 1" Offset Bracket for use with Auxiliary Holder/Stop

- Forged Steel Main Arm
- For use with auxiliary surface overhead stops and holders
- Foot bracket is offset 1" more than P-9, allowing door closer to be lowered on door face
- Non-handed



Order as 25-P3 x finish for arm only
Includes: 63-2607 - Main arm
63-2270 - Foot assembly
63-3684 & 63-2391 - Screw packs

P3A - 1-3/4" Offset Bracket for use with Auxiliary Holder/Stop

- Forged Steel Main Arm
- For use with auxiliary surface overhead stops and holders and door coordinators
- Foot bracket lowers door closer an additional 3/4" below P3 bracket
- Non-handed



Order as 25-P3A x finish for arm only
Includes: 63-2607 - Main arm
63-2274 - Foot assembly
63-3684 & 63-2391 - Screw packs

P4 - Parallel Flush frame Arm

- Forged Steel Main Arm
- Foot bracket is attached to frame or transom face
- For use where stop or soffit is too narrow for the standard P9
- Permits 120° opening with standard mounting
- Permits 180° opening with alternate mounting
- Non-handed



Order as 25-P4 x finish for arm only
Includes: 63-2607 - Main arm
63-2295 - Foot assembly
63-3684 & 63-2391 - Screw pack

P4A - Flush Frame Arm for use with Auxiliary Holder/Stop

- Forged Steel Main Arm
- For use with auxiliary surface overhead stops and holders
- Foot bracket is attached to frame or transom face
- Foot bracket lowers door closer an additional 3/4" below P4 bracket
- Non-handed



Order as 25-P4A x finish for arm only
Includes: 63-2607 - Main arm
63-2272 - Foot assembly
63-3684 & 63-2391 - Screw packs

P9 - Standard Parallel Arm

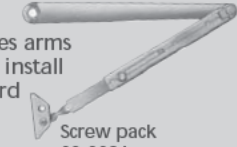
- Forged Steel Main Arm
- Non-handed



Order as 25-P9 x finish for arm only
Includes: 63-2607 - Main arm
63-2271 - Foot assembly
63-3684 & 63-2391 - Screw packs

UO Package

- Universal arm package provides arms and brackets to install closer in standard top jamb or parallel application



Screw pack
63-3684

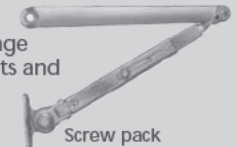
351-UO not available with (MC) metal cover or plated finishes



125-P9

UH Package

- Universal hold open arm package provides brackets and arms to install closer in top jamb, standard or parallel applications



Screw pack
63-3684

351-UH not available with (MC) metal cover or plated finishes



125-PH9

351 Series

Powerglide® Door Closer
Accessories For Parallel Applications

SARGENT®
ASSA ABLOY

Heavy Duty Parallel Arm Accessories

581-2 Blade Stop Spacer Kit



- For frames with 1/2" blade stops
 - For use with P10, PH10, PS, PSH, CPS and CPSH arms
 - 125-V bracket included
 - Packed with 1-1/4" long screws
- Use P/N 63-0756 to order blade stop only

125-V/125-VF Brackets



125-V

- For use with all heavy duty parallel arms
- Use 125-V for narrow stop and frame conditions
- Use 125-VF for flush door and frame conditions



125-VF

Spacer 63-0191

- Included with all heavy duty arms



Regular Duty Parallel Arm Accessories

125-P3 Arm Conversion Unit

- Converts O-P9 arm to P3 Parallel Arm



125-P3A Arm Conversion Unit

- Converts O or P9 Arm to P3A Parallel Arm



125-PH9 Parallel Arm Foot

- Converts standard hold open (H) arm to PH9 Parallel Hold Open Arm



125-P4 Conversion Unit

- Converts O or P9 Arm to P4A Arm



125-P4A Arm Conversion Unit

- Converts O or P9 arm to P4A Arm



581-1 Blade Stop Spacer Kit

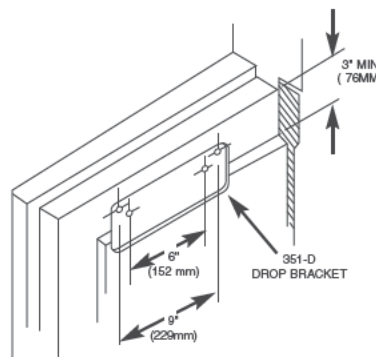


- For frames with 1/2" blade stops
- For use with P9, PH9 and PF9 arms only
- Packed with 1-1/4" long screws

Parallel Arm Mounting Plates

351-D Drop Plate

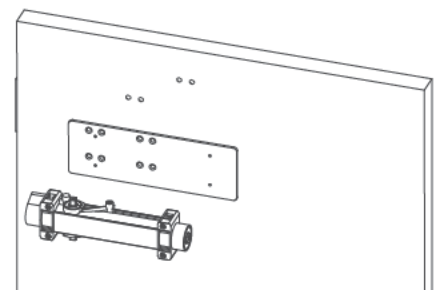
- Permits mounting parallel arm 351 Series Closer applications on doors with narrow top rails
- Requires 3" (76mm) minimum top rail
- For closers used with overhead stops and holders, top rail requirements will vary depending upon type and make of holder
- Available with powder coat and plated finishes to match door closer
- Plates are not handed
- Plate mounting screws included
- Order as 351-D x finish



- Plates are non-handed
- Available in powder coat and plated finishes
- Order as: 351L x finish
- Consult factory when replacing LCN stop arm

351L - LCN RETROFIT Plate

Designed to replace a LCN 4040 closer body with a SARGENT 351 without drilling new holes in door (NOTE: new mounting holes required for arm bracket only)

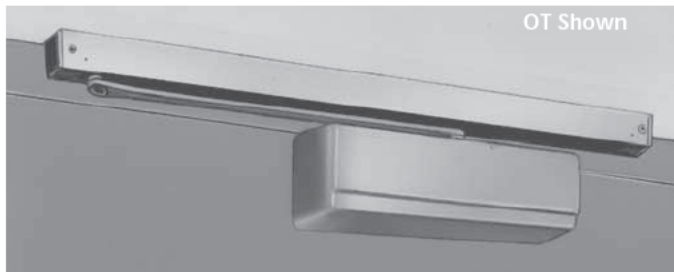


351 Series

Powerglide® Door Closer
Track Type Applications

SARGENT®
ASSA ABLOY

Pull Side Mounting (Hinge Side)

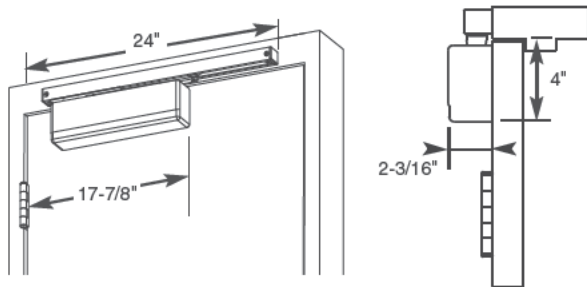


The closer is for use on interior doors opening in or out. As the door opens, the closer swings with the door. This affords a variable hold-open feature option.

Pull Side Track Application

Arm & Track	Description
OT	Pull Standard pull side
OTB	Pull Track with bumper
HT	Pull Holder
HBT	Pull Holder with bumper

Track Arm Applications



Pull Hinge Side Mounting (Track mounts on frame face)

- Minimum top rail required with a 351-A plate = 2-1/4" (57mm)
- Minimum top rail required without mounting plate = 4" (102mm)

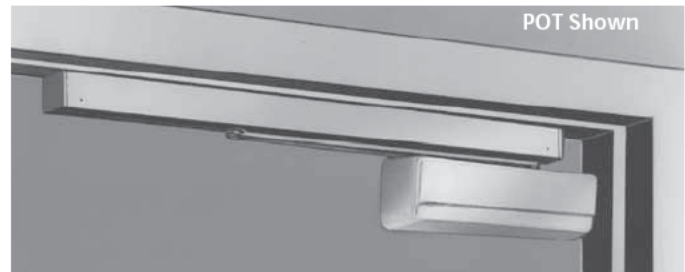
Maximum Door Opening

- 160° with standard track
- 120° with optional bumper track
- 180° with standard track if frame conditions permit

Hold Open Range

- 85° to 120°

Push Side Mounting (Stop Side)

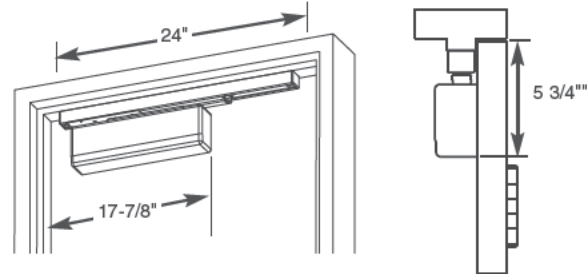


The closer is for use on interior doors opening in or out. As the door opens, the closer swings with the door. This affords a variable hold-open feature option.

Push Side Track Application

Arm & Track	Description
POT	Push Standard
POTB	Push Bumper
PHT	Push Holder
PHTB	Push Holder and bumper

Track Arm Applications



Push Stop Side Mounting (Track mounts on frame stop)

- Minimum top rail required without drop plate = 5-3/4" (146mm)
- 3" (76mm) minimum top rail required with 351-D Drop Plate

Minimum Stop Required

- 1-9/16" (40mm) wide

Maximum Door Opening

- 100° with standard track
- 95° with optional bumper track

Hold Open Range

- 85° to 95°

Common Features

Standard Finishes

- EAB, EB, ED, EN, EP, powder coated on all exposed surfaces
- Architectural plated arms and covers optional

Track

- Extruded aluminum track

Arm

- Forged steel

Bumper (optional)

- Mounts in track to assist backcheck
- Not designed to be used as a stop
- Auxiliary stop is required
- Available for both regular or hold open tracks

Holder (optional)

- Mounts within the track (adjustable)

Non Sized-Adjustable

- Interior doors to 5'0" wide
- Shipped factory preset for 3'0" door
- Factory pre-sized upon request

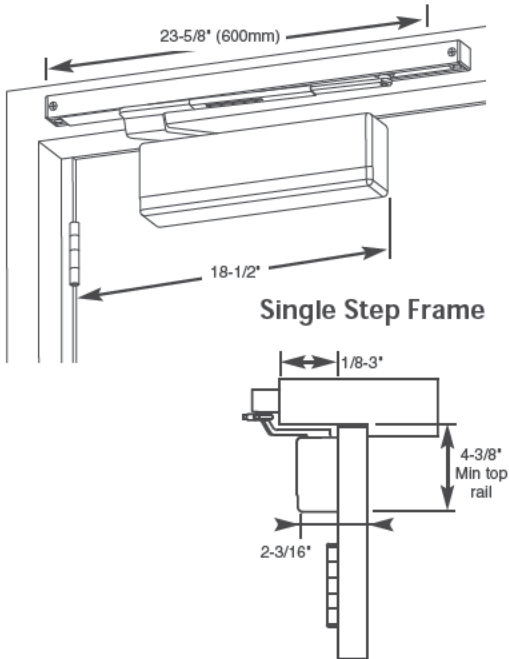
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351 Series

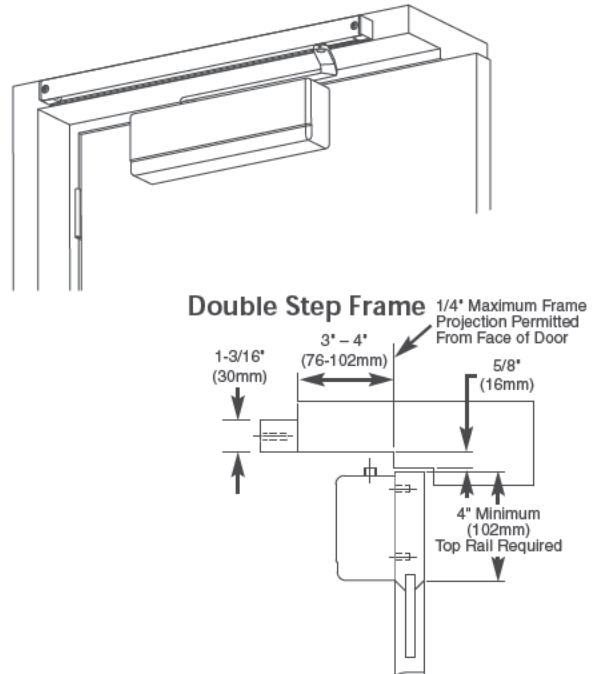
Powerglide® Door Closer
Double Egress Application

SARGENT®
ASSA ABLOY

ODS - Single Step Double Egress Arm



OD - Double Step Double Egress Arm



ODS Applications

- 160° maximum door opening
- 120° opening with bumper option
- Range of hold open 85°-120°
- Used with reveals 1/8" to 3" (3mm-76mm)

Track

- Extruded aluminum track
- End caps finished to match track

Arm

- Forged steel
- Bearing roller
- Arm handed same as door

Non Handed

- Universal body

Finishes (Powder Coat)

- EAB, EB, ED, EN, EP (standard for all exposed surfaces)

Bumper (optional)

- Mounts in track to assist backcheck
- Not designed to be used as a stop
- Auxiliary stop is required
- Available for both regular or hold open tracks

Holder (optional)

- Mounts within the track (adjustable)

Non Sized-Adjustable

- Interior doors to 5'0" wide
- Shipped factory preset for 3'0" door
- Factory pre-sized upon request

Double egress track arms are used when the aesthetics of a track application is required on the pull side of a deep reveal frame.

This application is commonly used on cross corridor openings.

Double Egress Track Applications

OD	Double step double egress
ODB	Double step double egress with bumper
HD	Double step double egress with holder
HDB	Double step double egress with bumper and holder
ODS	Single step double egress
ODSB	Single step double egress with bumper
HDS	Single step double egress with holder
HDSB	Single step double egress with bumper and holder

OD Applications

- 160° maximum door opening
- 120° opening with bumper option
- Range of hold open: 85°-120°
- Used with reveals 3" to 4" (76mm-101mm)

Track

- Extruded aluminum track
- End caps finished to match track

Arm

- Forged steel
- Bearing roller
- Arm is handed same as door

Non Handed

- Universal Body

Finishes (Powder Coat)

- EAB, EB, ED, EN, EP (standard for all exposed surfaces)

Bumper (optional)

- Mounts in track to assist backcheck
- Not designed to be used as a stop
- Auxiliary stop is required
- Available for both regular or hold open tracks

Holder (optional)

- Mounts within the track (adjustable)

Non Sized-Adjustable

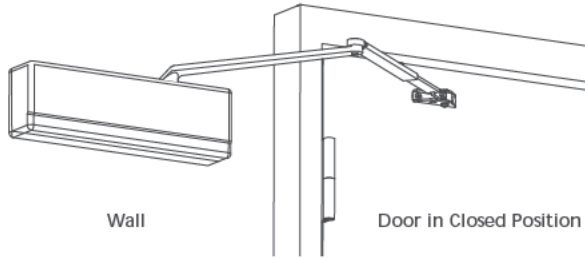
- Interior doors to 5'0" wide
- Shipped factory preset for 3'0" door
- Factory pre-sized upon request

351 Series

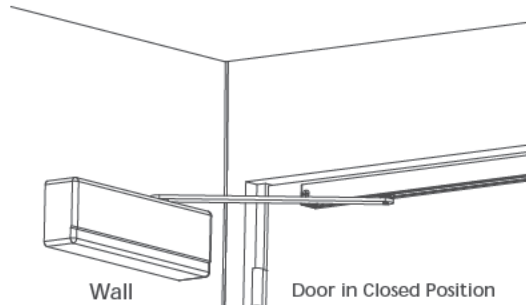
Powerglide® Door Closer
Pocket Door Application

SARGENT®
ASSA ABLOY

OP - Double Lever Arm Application



OTP - Track Type Application



Pocket Door Applications

The 351 Series Powerglide Door Closer body is mounted on the wall and installed so that it pushes the door closed. This application is typically used with fire doors that are held open. In this application when the door is open, the closer and arms are completely hidden from view.

OP - Pocket Arm Application

- 180° Maximum Opening
- Non handed

Arm

- Forged steel

Non Handed

- Universal Body

Finishes (Powder Coat)

- EAB, EB, ED, EN, EP (standard for all exposed surfaces)
- Plated Covers and arms available

OTP - Track Type Application

- 90° Maximum Opening
- Extruded Aluminum Track
- Non handed

Arm

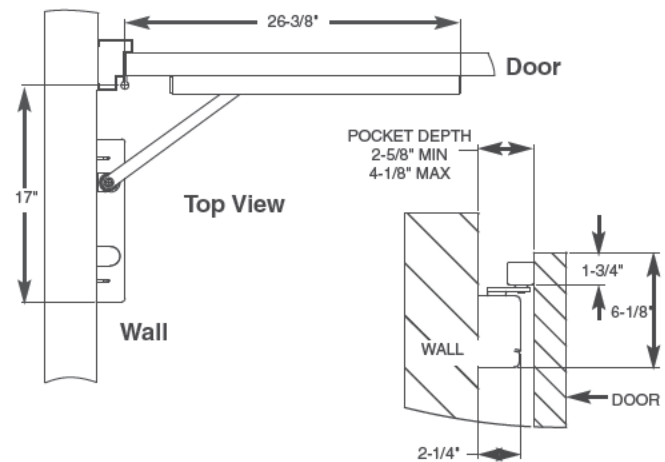
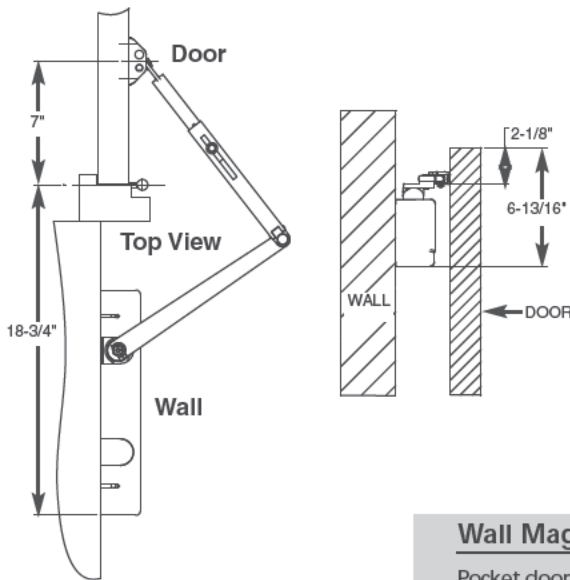
- Forged steel
- Bearing roller

Non Handed

- Universal Body

Finishes (Powder Coat)

- EAB, EB, ED, EN, EP (standard for all exposed surfaces)
- Plated Covers and arms available



Wall Magnets - see SARGENT holders and stops catalog

Pocket door applications commonly use wall mounts (wall magnets).



1560 Surface Mount



1561 Flush Mount



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351 Series

Powerglide® Door Closer
Overhead Stop/Holder Compatibility

SARGENT®
ASSA ABLOY

When a floor or wall stop cannot be used the highest level of door control is provided with the use of a SARGENT door closer and a SARGENT overhead stop or holder. While door closer arms are available with stop and holder options, they are limited in their ability to withstand extreme abuse. Overhead stops absorb abusive loads using a heavy compression spring that distributes the load to the frame. SARGENT overhead stops and holders are designed for years of abuse and come with a 5 year warranty

Frequently Used Overhead Stops used with the 281 Series

• Standard Door Closer Applications (PULL SIDE MOUNT) Not Shown

- 590 Series Holder/Stop with 351-O
- 690 Series Holder/Stop with 351-O
- 1530 Series Holder/Stop with 351-O
- 1540 Series Holder/Stop with 351-O

• Parallel Arm Door Closer Applications (PUSH SIDE MOUNT)

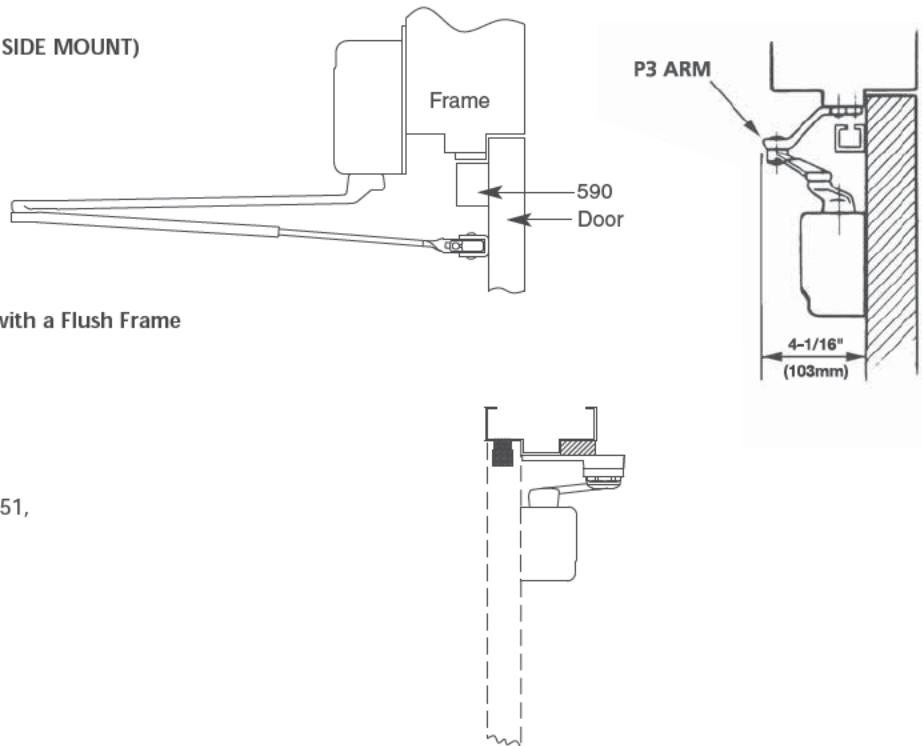
- 590 Series Holder/Stop with 351-P3
- 590 Series Holder/Stop with 351-PD10
- 690 Series Holder/Stop with 351-P9
- 690 Series Holder/Stop with 351-P10
- 1530 Series Holder/Stop with 351-P9
- 1530 Series Holder/Stop with 351-P10
- 1540 Series Holder/Stop with 351-P3
- 1540 Series Holder/Stop with 351-PD10

• Parallel Arm Door Closer Applications Used with a Flush Frame

- 590 Series Holder/Stop with 351-P4
- 690 Series Holder/Stop with 351-P4
- 1530 Series Holder/Stop with 351-P4
- 1540 Series Holder/Stop with 351-P4

• Inverted Top Jamb Applications

- 590, 690, 1530, 1540 Series with either 281, 351, 1431 Series and "O" OZ, OZA Arm



Special Conditions

The SARGENT Website (www.sargentlock.com) contains templates for all common applications of SARGENT Door Closers with SARGENT overhead door holders. To ensure a satisfactory installation for other holders, it is recommended that complete details be submitted as follows:

- Type, size and make of holder
- Closer application being used
- Holding position (maximum door opening)
- Size and type of hinge
- Submit holder template being used

In the case of unusual door, frame and hinge conditions where regular products do not meet requirements, submit drawings and complete details specifying the degree of door openings required, the type and size of hinge and the maximum door opening angle.

Through-bolts and Mortise Nuts

- When through-bolting is ordered, factory will furnish mortise nuts for use with the machine screws furnished with the closer
- Nuts are sized to accommodate 1-3/4" (44mm) standard or 1-3/8" (35mm) thick doors when specified on order
- For 2-1/4" (57mm) thick doors, through-bolts will be furnished with mortise nuts
- A bridge type reinforcement is required to prevent collapse of top rails when through-bolts are tightened (required on hollow metal doors).

351 Series

Powerglide® Door Closer
How to Order

SARGENT®
ASSA ABLOY

Packing

All closer assemblies are packaged 4 per carton. On request, door closers will be be packed 2 per carton.

Series

Number per Carton

Approx. wt per Carton

351	4-Standard (2 upon request)	19 lbs. per 4
Screw	Prefix 36 — 6 lobe screws	

How To Order Complete Door Closer

		Example
Series	351	351
Delayed Action	When delayed action is required specify suffix DA	351 DA
Arm with Closer	See applicable catalog section for arms available	351 DA P10
Finish, powder coated on all exposed surfaces	EB — Bronze Enamel to match 10B ED — Bronze Enamel to match 20D EN — Aluminum Enamel EP — Bronze Enamel to match US10 EAB — Brass Enamel to be used with brass finishes	351 DA P10 EB
Optional Plated Finishes (Handed metal cover required)		
	Symbol	BHMA
	3	605
	4	606
	9	637
	10	612
	10B	613
	26	625
	26D	626
		Description
		Polished Brass
		Dull Brass
		Bright Bronze, Clear Coated
		Dull Bronze
		Oxidized Dull Bronze, Oil Rubbed
		Chrome
		Dull Chrome

Hand (Applies to F, PH and DE arms and metal covers only)	Non-handed	351 DA P10 EB
Through Bolts and Mortise Nuts	When ordering mortise nuts, use suffix TB 1-3/4" (44.5mm) std door thickness. For all others, specify	351 DA P10 EB TB
Corrosion Protection	Special rust inhibitor process (arm only) suffix SRI for additional protection in corrosive environments	351 DA P10 EB TB SRI

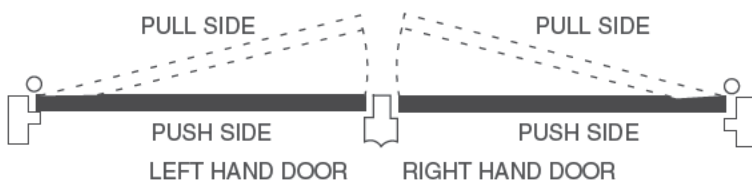
Note: MicroShield™ can be added to your door closer. Specify prefix SG when ordering.

How To Order Accessories

Example

Arm Only	Specify arm required and finish	25-PSH EN
Arm conversion Units	Specify unit and finish	125-P4 EB
Cover Only (Standard)	351-C x finish	351-C EN
Cover Only (Metal)	351-MC x finish and hand and arm type	351-MC + 26D + LH
Accessories	Specify accessory and finish - See applicable catalog section	351-D EB

When complete closer assembly is ordered with an accessory, order accessory as a separate item

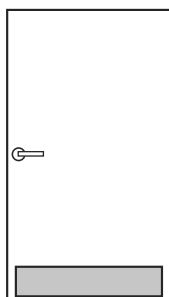


Special Rust Inhibitor Process (SRI)

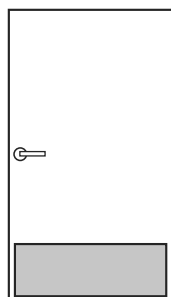
Additional process available for bracket and arms provides an extra layer of protection for extreme corrosive environments. Specify SRI as suffix when ordering

Plated Finish Notes

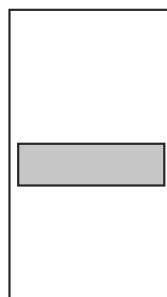
- A metal cover is automatically provided with plated finishes
- The MC suffix is also used when a metal cover is desired with a painted finish
- When added to a plated finish, the MC suffix indicates that only the cover is to be plated, the arms will be powder coated to match
- Do not specify the MC suffix if both the cover and arms are to be plated



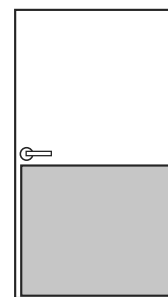
Mop Plate
Up to 6" h x 48" w



Kick Plate
6" to 12" h x 48" w



Stretcher Plate
6" to 12" h and up to 48" w



Armor Plate
Up to 48" h x 48" w and available in most finishes



Width of Plates:

Push Side: 2" less than door width. Pull Side: 1 1/2" less than door width.

NFPA 80 STANDARDS — 2-4.5 Protection Plates: Factory-installed protection plates shall be installed in accordance with the listing of the door. Field-installed protection plates shall be labeled and installed in accordance with their listing.

Exception: Labeling is not required where the top of the protection plate is not more than 16" (406 mm) above the bottom of the door.

OPTIONAL
Self-Drilling TEK
Screws
Cuts door plate
installation time in half.

Metal Door Plate – Economy Duty No. K1038

Material: .038" aluminum, stainless steel

Finishes: Brass look aluminum (BRS LK), US32D, and US3LIFETIME

Fastener: #6 x 5/8" OH SMS

Ordering: Specify height x width x finish code. Add any options

Weight: 8" x 34" = 3.2 lbs

- Options:**
- SA – self-adhesive mounting
 - TORX – security Torx screws
 - TEK – self-drilling screws
 - Cutouts for locks, louvers, or windows (see worksheets on pages C14-C15 for details on how to order)

Metal Door Plate – Standard Duty No. K1050, K1050F

Material: .050" aluminum, brass, bronze, stainless steel

Finishes: Available in standard architectural finishes, US32DMS, US32D316, and US32316 (see page 9)

Fastener: #6 x 5/8" OH SMS

Ordering: Specify height x width x finish code. Add any options

Weight: 8" x 34" = 4.0 lbs

ANSI: J101 - metal armor plate, J102 - metal kick plate, J103 - metal stretcher & mop plate

- Options:**
- SA – self-adhesive mounting
 - TEK – self-drilling screws
 - Beveled 3 or 4 edges, specify B3E or B4E
 - Cutouts for locks, louvers, or windows (see worksheets on pages C14-C15 for details on how to order)
 - Heavy bevel available, specify HVBEV
 - Screw mounting (K1050F) and UL listed for use on 90-minute label wood doors and 3-hour label metal doors (UL)
 - CSK – countersunk holes
 - TORX – security Torx screws

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Solid Cast Wall Stops No. 400, 401, 402

- Material:** Cast brass with DuraFlex bumper
Finishes: Available in standard architectural finishes (see page 9)
Features: Concealed mounting, convex bumper. Back plate prevents damage to wall

No.	Bumper	Fastener	Size	Projection	Weight	ANSI A156.16
400	Convex	#6 x 1 1/2" FH SMS, plastic toggle	2 7/16" dia.	1"	3.3 lbs./10	L02101
401	Convex	#8 x 1" RH WS, plastic anchor	2 7/16" dia.	1"	3.3 lbs./10	L02101
402	Convex	#8 - 32 x 1" TH MS, lead anchor	2 7/16" dia.	1"	3.3 lbs./10	L02101



Solid Cast Wall Stops No. 403, 404, 405

- Material:** Cast brass with DuraFlex bumper
Finishes: Available in standard architectural finishes (see page 9)
Features: Concealed mounting, concave bumper. Back plate prevents damage to wall

No.	Bumper	Fastener	Size	Projection	Weight	ANSI A156.16
403	Concave	#6 - 1 1/2" FH SMS, plastic toggle	2 7/16" dia.	1"	3.3 lbs./10	L02251
404	Concave	#8 x 1" RH WS, plastic anchor	2 7/16" dia.	1"	3.3 lbs./10	L02251
405	Concave	#8 - 32 x 1" TH MS, lead anchor	2 7/16" dia.	1"	3.3 lbs./10	L02251



Wrought Wall Stops No. 406

- Material:** Wrought brass, bronze, and stainless steel with DuraFlex bumper
Finishes: Available in standard architectural finishes (see page 9)
Features:
 - Concealed mounting, convex bumper. Back plate prevents damage to wall
 - Accepted by the New York State Office of Mental Health (OMH) for use in high risk areas

No.	Bumper	Fastener	Size	Projection	Weight	ANSI A156.16
406	Convex	#8 x 1 1/4" TH SMS, plastic toggle	2 1/2" dia.	3/4"	1.8 lbs./10	L02101



Wrought Wall Stops No. 409

- Material:** Wrought brass, bronze, and stainless steel with DuraFlex bumper
Finishes: Available in standard architectural finishes (see page 9)
Features:
 - Concealed mounting, concave bumper. Back plate prevents damage to wall
 - Accepted by the New York State Office of Mental Health (OMH) for use in high risk area**Options:** DuraFlex bumper available in standard gray or optional black

No.	Bumper	Fastener	Size	Projection	Weight	ANSI A156.16
409	Concave	#8 x 1 1/4" TH SMS, plastic toggle	2 1/2" dia.	3/4"	1.8 lbs./10	L02251

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Heavy Duty Door Stop No. 466

- Material:** Flame resistant molded rubber bumper
- Finishes:** Black
- Mounting:** Drill 1" dia. x 2 1/2" deep hole, fill with anchoring grout
- Features:**
- Ideal for use in high vandalism or security areas
 - No exposed fasteners

No.	Diameter	Height	Mounting Bolt	Weight
466	2" dia.	x 1 1/2" h	5/8" x 2 1/2"	0.6 lbs.



Heavy Duty Door Stop No. 467

- Material:** Flame resistant molded rubber bumper
- Finishes:** Black
- Mounting:** Drill 1" dia. x 2 1/2" deep hole, fill with anchoring grout
- Features:**
- Suitable for concrete floor or wall mounting
 - Ideal for use in high vandalism or security areas
 - No exposed fasteners
 - Accepted by the New York State Office of Mental Health (OMH) for use in high risk areas

No.	Diameter	Height	Mounting Bolt	Weight
467	2" dia.	x 3 1/2" h	5/8" x 2 1/2"	0.9 lbs.



Heavy Duty Door Stop No. 468

- Material:** Wrought stainless steel and black rubber bumper
- Finishes:** US32D
- Mounting:** Drill 1 1/2" dia. x 7" deep hole, fill with anchoring grout
- Features:**
- Ideal for use in high vandalism or security area
 - No exposed fasteners
 - Accepted by the New York State Office of Mental Health (OMH) for use in high risk areas

No.	Diameter	Height	Mounting Bolt	Weight
468	2" dia.	x 3" h	1" x 7"	2.6 lbs.

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Offset Saddles (Cont.)

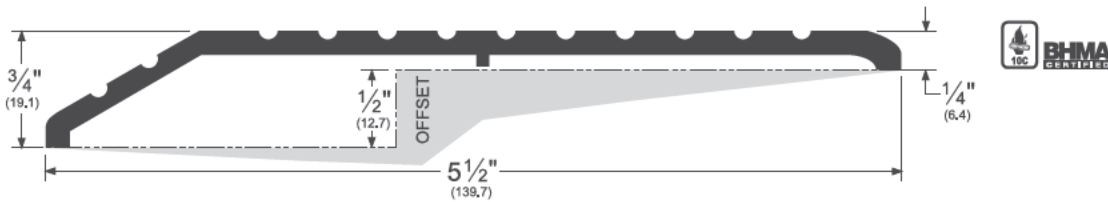
2727_

AVAILABLE FINISHES: A, D, G
ANSI (aluminum): J32100, J32130, J32138, J32180



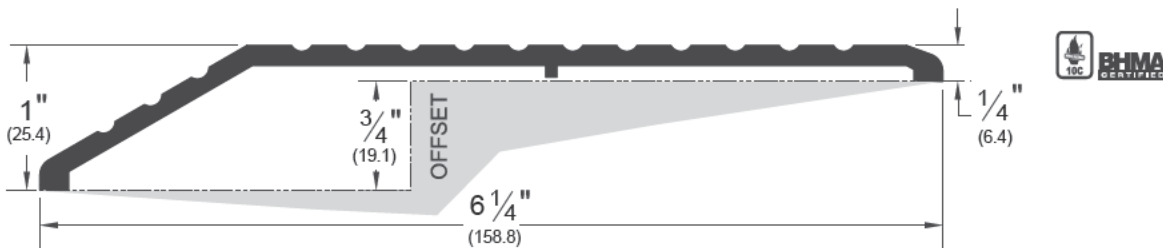
157_

AVAILABLE FINISHES: A, D, G
ANSI (aluminum): J32100, J32180, J33100



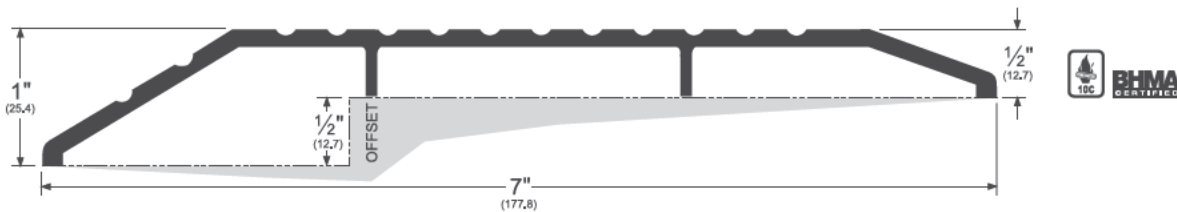
1571_

AVAILABLE FINISHES: A, D
ANSI (aluminum): J32100, J32180, J33100



182_

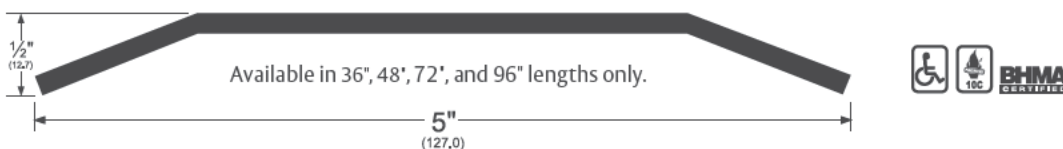
AVAILABLE FINISHES: A, D, G
ANSI (aluminum): J32100, J32180, J33100



Stainless Steel Saddles

154SS_

AVAILABLE FINISH: SS (#4, Brushed Finish)
ANSI: J52300, J52330



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Attachment E – Technicals

NOTE: Products shown in this section may not be drawn to scale.

AVAILABLE FINISHES FOR PRODUCTS SHOWN ON THIS PAGE (see General Information section for finish chart)
A (Mill Finish Aluminum) D (Dark Bronze Anodized) G (Gold Anodized) SS (See Individual Part)

NOTE: G is available with limited inventory

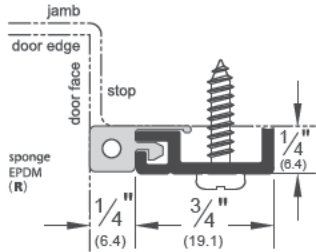
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Standard Perimeter Gasketing (Cont.)

312_R

AVAILABLE FINISHES: B, C, D, G
 REPLACEMENT INSERT: ER9BL (BL)
 ANSI (alum): R3G164, R3G165

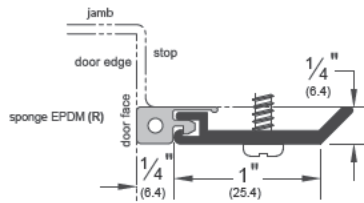
• 312BR is being redesigned. Consult website for current profile.



315_R

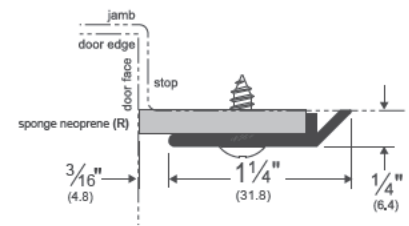
AVAILABLE FINISHES: B, C, D, G
 REPLACEMENT INSERT: ER9BL (BL)
 ANSI (alum): R3G164, R3G165

• 315BR is being redesigned. Consult website for current profile.



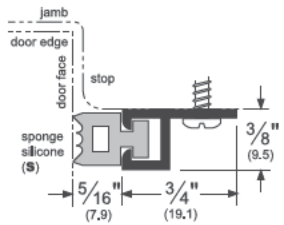
3151_R

AVAILABLE FINISHES: C, D, G
 REPLACEMENT INSERT: ER2 (BL)
 ANSI (alum): R3G164



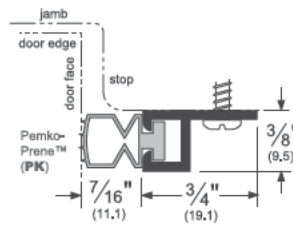
296_S

AVAILABLE FINISHES: C, D, G
 REPLACEMENT INSERT: SR6 (BL)
 ANSI (alum): R3E164, R3E165



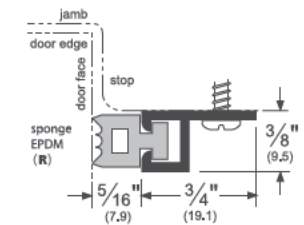
296_PK

AVAILABLE FINISHES: C, D, G
 REPLACEMENT INSERT: PK4132 (BL)
 ANSI (alum): R3G164, R3G165



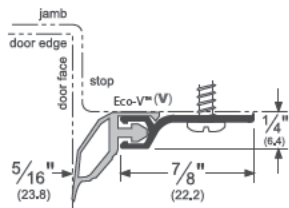
296_R

AVAILABLE FINISHES: C, D, G
 REPLACEMENT INSERT: E7 (BL)
 ANSI (alum): R3G164, R3G165



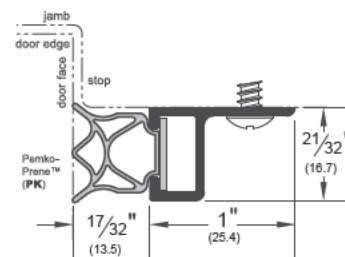
330_V

AVAILABLE FINISHES: A, BDG, D, G, PW, SN
 REPLACEMENT INSERT: EV61 (BL, GR)



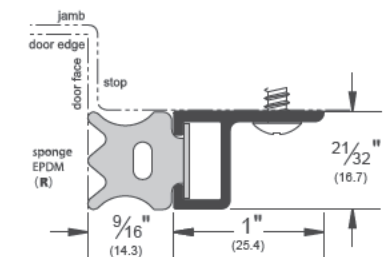
285_PK

AVAILABLE FINISHES: C, D, G
 REPLACEMENT INSERT: PK4304 (BL)
 ANSI (alum): R3G164, R3G165



285_R

AVAILABLE FINISHES: C, D, G
 REPLACEMENT INSERT: E4303 (BL)
 ANSI (alum): R3G166



NOTE: Products shown in this section may not be drawn to scale.

AVAILABLE FINISHES FOR PRODUCTS SHOWN ON THIS PAGE (see General Information section for finish chart)
 A (Mill Finish Aluminum) B (Mill Finish Extruded Bronze [Brass]) BDG (Bright Dip Gold Anodized)
 C (Clear Anodized) D (Dark Bronze Anodized) G (Gold Anodized) PW (Painted White) SN (Satin Nickel Anodized)

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ASSA ABLOY

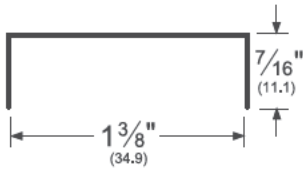
The global leader in
 door opening solutions

Door Top Weatherstrip

_343

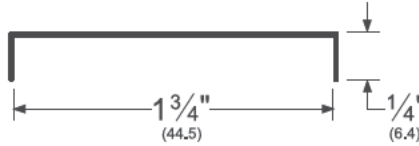
AVAILABLE FINISHES: PA
AVAILABLE LENGTHS: 36", 48"

- For top of 1 3/8" wood doors



_344

AVAILABLE FINISHES: PA
AVAILABLE LENGTHS: 36", 48"



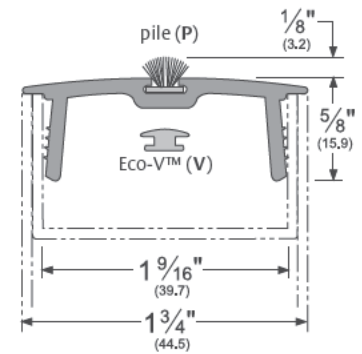
377VP_

REPLACEMENT INSERT: P2 (BL, GR)

377V_

REPLACEMENT INSERT: EV38 (Tan)

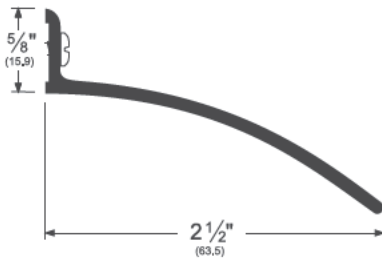
Rigid tan colored Eco-V™ with Eco-V™ (V) insert or pile (P) insert used as a door top (or bottom) filler strip for hollow metal doors



346_

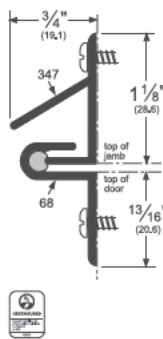
AVAILABLE FINISHES: C, D, G, PW

- Overhead rain drip with slotted holes
- Should be ordered a minimum of 4" longer than the door width



347_

AVAILABLE FINISHES: A, D, G



Heavy Duty Door Bumper

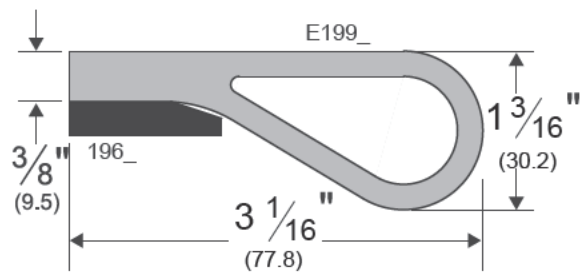
- Heavy duty door bumper extruded from black EPDM (E)
- Order 196_ separately; furnished undrilled unless requested otherwise

E199_

AVAILABLE COLOR: BL

196_

AVAILABLE COLOR: A



NOTE: Products shown in this section may not be drawn to scale.

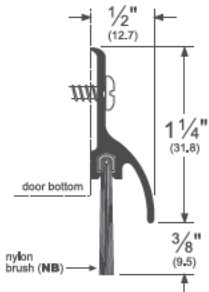
AVAILABLE FINISHES FOR PRODUCTS SHOWN ON THIS PAGE (see General Information section for finish chart)
A (Mill Finish Aluminum) C (Clear Anodized) D (Dark Bronze Anodized) G (Gold Anodized) PA (Painted Aluminum)
PW (Painted White)
Non-Metal Finish: BL (Black)

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Door Bottom Sweeps (Cont.)

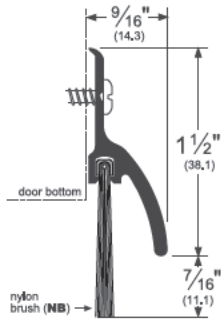
3452_NB

AVAILABLE FINISHES:
BDG, C, D, G, PW, SN
REPLACEMENT INSERT:
P14075 (BL, GR)
ANSI: R3A534



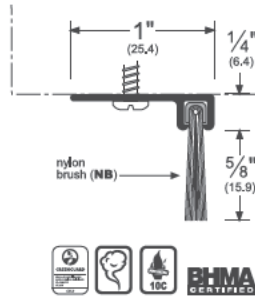
345_NB

AVAILABLE FINISHES:
A, BDG, D, G, PW
REPLACEMENT INSERT:
P14100 (BL, GR)
ANSI: R3A534



90062_NB

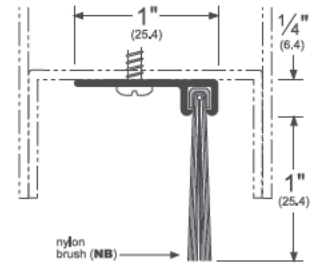
AVAILABLE FINISHES:
C, D, G
REPLACEMENT INSERT:
P516062 (BL, GR, W)
ANSI: R3A414



90100_NB

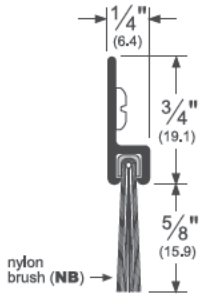
AVAILABLE FINISHES:
C, D, G
REPLACEMENT INSERT:
P516100 (BL, GR, W)
ANSI: R3A414

For hollow metal doors
with inverted channel



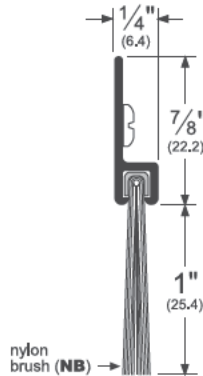
18061_NB

AVAILABLE FINISHES:
C, D, G, SN
REPLACEMENT INSERT:
P51062 (BL, GR, W)
ANSI: R3A434



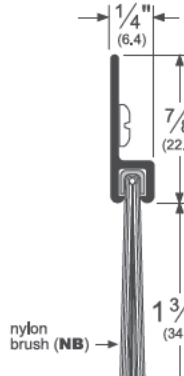
18100_NB

AVAILABLE FINISHES:
C, D, G, PW
REPLACEMENT INSERT:
P38100 (BL, GR)
ANSI: R3A434



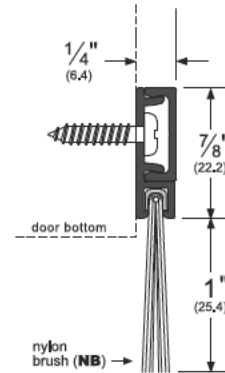
18137_NB

AVAILABLE FINISHES:
C, D, G, PW
REPLACEMENT INSERT:
P38137 (BL, GR)
ANSI: R3A434



293100_NB

AVAILABLE FINISHES:
C, D, G
REPLACEMENT INSERT:
P516100 (BL, GR)



NOTE: Products shown in this section may not be drawn to scale.

AVAILABLE FINISHES FOR PRODUCTS SHOWN ON THIS PAGE (see General Information section for finish chart)
A (Mill Finish Aluminum) BDG (Bright Dip Gold Anodized) C (Clear Anodized) D (Dark Bronze Anodized)
G (Gold Anodized) PD (Painted Dark Bronze) SN (Satin Nickel Anodized)

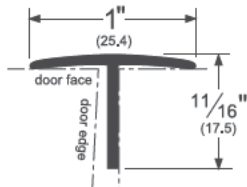
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"T" and Overlapping Astragals

359_

AVAILABLE FINISHES:
A, BDG, D

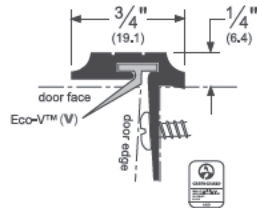
- Supplied with weatherstrip nails for installation



356_V

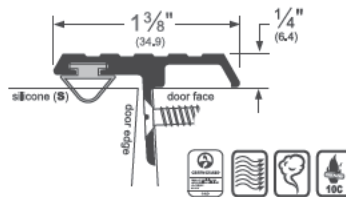
AVAILABLE FINISHES:
A, BDG, D, PW, SN
REPLACEMENT INSERT:
EV17 (BL, GR, W)

- Countersink drilling with countersunk flathead screws also available upon request at no extra charge



355_S

AVAILABLE FINISHES:
B, BDG, C, D, G, PW, SN
REPLACEMENT INSERT:
S4 (BL, GR)



Alternate Inserts For 355

355_V

AVAILABLE FINISHES:
B, BDG, C, D, G, PW, SN
REPLACEMENT INSERT:
EV7 (BL, GR, W)



355_P

AVAILABLE FINISHES:
B, BDG, C, D, G, PW, SN
REPLACEMENT INSERT:
P2 (BL, GR)



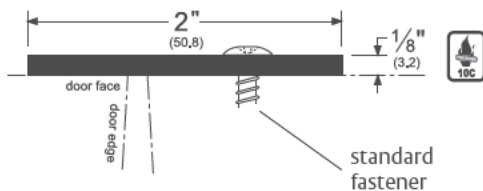
357_

357_ND

AVAILABLE FINISHES:
C, D, G, SP, SS (#4 Finish & #4 Edge)

11 GAUGE

- "ND" denotes "no drill" (unless specified "ND", astragals are drilled)
- Standard fastener is #10 x 1" Truss Head SMS
- Lead-line option available

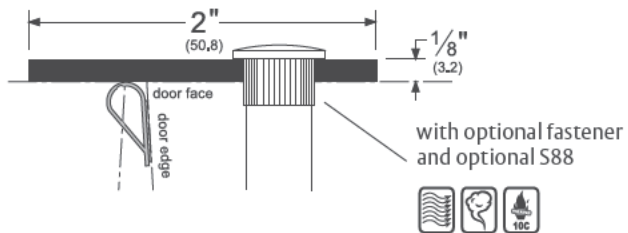


357_ with S88

AVAILABLE FINISHES:
SP, SS (#4 Finish & #4 Edge)

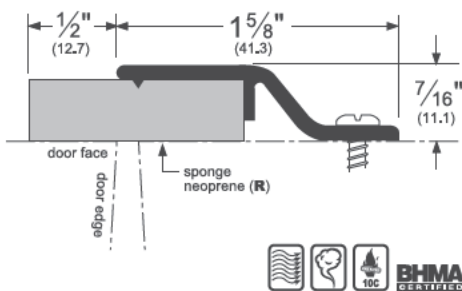
11 GAUGE

- Standard fastener is #10 x 1" Truss Head SMS
- 1/4" - 20 machine screws and thru-bolts must be ordered separately at additional cost
- S88 seal must be ordered separately at an additional cost, if required
- If specifications state that an astragal is required to satisfy a fire and / or smoke opening, then a thru-bolted 357SP or SS in conjunction with S88 seal is the only configuration that can be used.



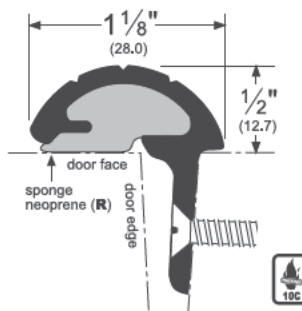
375_R

AVAILABLE FINISHES: B, C, D, G
REPLACEMENT INSERT: R4 (BL)
ANSI: R3C634, R3C635



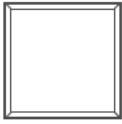
352_R

AVAILABLE FINISHES: C, D, G
REPLACEMENT INSERT: R8 (BL)
For reverse bevel doors



AVAILABLE FINISHES FOR PRODUCTS SHOWN ON THIS PAGE (see General Information section for finish chart)
A (Mill Finish Aluminum) B (Mill Finish Extruded Bronze [Brass]) BDG (Bright Dip Gold Anodized) C (Clear Anodized)
D (Dark Bronze Anodized) G (Gold Anodized) PW (Painted White) SN (Satin Nickel Anodized) SP (Galvannealed Steel)
SS (See Individual Part) Special finishes available upon request

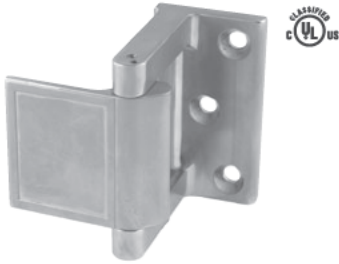
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Wall Guard No. 606

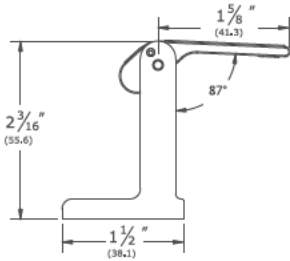
- Material:** Clear rubber
Other: Sold in sheets of 55
Features: Self-adhesive mounting

No.	Fastener	Size	Weight
606	Self-adhesive back	1"x1"	0.4 lbs./55



Privacy Door Latch No. PDL (formerly 607)

- Material:** Zinc die cast
Finishes: BRS, DBRS, STNN, CRM, DCRM, ORB
Features:
- ADA compliant
 - Enhanced in room privacy
 - Easy to install
 - For use with UL Classified fire doors for use with hollow metal steel composite type fire doors rated up to and including 3 hrs Wood composite type fire doors rated up to and including 1½ hrs and 20 minutes without hose stream



No.	Fastener	Size	Weight
PDL	#12 x 1¼" FH SMS	1½" x 2 ¹³ / ₁₆ "	0.75 lbs.



Door Silencer No. 608CA

- Material:** Clear rubber
Other: Sold in packages of 300
Features: Self-adhesive mounting

No.	Fastener	Size	Weight
608CA	¾" dia. x 1/8"	Metal or wood	0.2 lbs./300



Door Silencers No. 608, 609

- Material:** DuraFlex gray rubber
Other: Sold in packages of 100

No.	Size	Frame Type	Weight	ANSI A156.16
608	½" dia. x 5/8"	Metal	1.3 lbs./500	L03011
609	¾" x ¾"	Wood	1.3 lbs./500	L03021

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 door opening solutions
 Attachment E – Technicals

SECTION 09 00 00

FINISHES

INTERIOR – FOOD SERVICE AND GOLF OPERATIONS

ACT	Acoustic Ceiling Tile:	Armstrong Color: White Grid: 9/16" Suprafine XL, trim to be along entire perimeter of each room Panel: 24" x 24" Ultima, 1912
CMB	Cement Board Panel:	American Fiber Cement Corporation Color: Patina, Granite P020 Size: 48" x 96"
CPT	Carpet Tile:	Milliken Color: Install:
DR	Sliding, Folding Doors	La Cantina Standard Threshold Aluminum Frame - COLOR
LVT	Luxury Vinyl Tile	MANF Color: Install
M1	Metal (Doors + Frames)	Aluminum Color:
PT1	Paint (Field + Ceiling)	Sherwin Williams Color: Sheen:
PT2	Paint (Accent)	Sherwin Williams Color: Sheen: Accent wall(s) to be selected by owner, if requested
PT3	Paint (HM Doors + Frames)	Sherwin Williams To match Aluminum Storefront system
RB	Rubber Base	Roppe Color: Size: Standard Cove, 4"
SS	Solid Surface	Corian Color: Edge:

INTERIOR- RESTROOMS

PT1	Paint (Field + Ceiling)	Sherwin Williams Color: Sheen:
T2	Porcelain Tile	Daltile Santino, Chiaro SN07, 12x24 (running bond pattern) Santino, Chiaro SN07, Cove Base 6x12
TG2	Tile Grout	Laticrete 1/8", Natural Gray 24
TP	Toilet Partitions (HDPE)	Scranton Products, Hiny Hider Color: Concrete Texture: Orange Peel

EXTERIOR

C1	Concrete	Integral Color Concrete Color:
C2	Concrete	Integral Color Concrete with Aggregate Color:
CMU	Concrete Masonry Unit	RCP Block and Brick Match existing wall
M3	Metal (Perforated Panel)	McNicols Color: Pattern
TSP1	Translucent Panel Skylight Attachments	Moxie Clear - PEP UV, 1" Color: Clear Safin Edge: Ext 2 Finish Edge Manf. Stainless Steel Standoffs

END OF SECTION 09 00 00

SECTION 09 91 13

EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints, stains, and varnishes.
- C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, zinc, and lead.
 - 6. Floors, unless specifically indicated.
 - 7. Glass.

1.02 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications: Shop-primed items.

1.03 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

- A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.
- B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition, www.paintinfo.com.
- C. SSPC-SP 1 - Solvent Cleaning; 2015.

1.05 SUBMITTALS

- A. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

- B. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
- C. Manufacturer's Instructions: Indicate special surface preparation procedures.
- D. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Colors: To be selected from manufacturer's full range of available colors.

1. Selection to be made by Architect after award of contract.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Paint MgE-OP-3A - Galvanized Metals, Alkyd, 3 Coat:
 1. One coat galvanize primer.
 2. Semi-gloss: Two coats of alkyd enamel.

2.04 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Galvanized Surfaces:
 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- G. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance.

- D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

END OF SECTION 09 91 13

SECTION 10 14 00

SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Room and door signs.
- B. Building identification signs.

1.02 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- B. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - 1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule.
 - 2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
 - 3. Submit for approval by Owner through Architect prior to fabrication.
- C. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

1.04 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

- B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
 - 1. Sign Type: Flat signs with engraved panel media as specified.
 - 2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
 - 3. Character Height: 1 inch.
 - 4. Sign Height: 2 inches, unless otherwise indicated.
 - 5. Office Doors: Identify with room numbers to be determined later, not the numbers shown on the drawings; in addition, provide "window" section for replaceable occupant name.
 - 6. Conference and Meeting Rooms: Identify with room numbers to be determined later, not the numbers shown on the drawings; in addition, provide "window" section with sliding "In Use/Vacant" indicator.
 - 7. Service Rooms: Identify with room names and numbers to be determined later, not those shown on the drawings.
 - 8. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.
- C. Building Identification Signs:
 - 1. Use individual metal letters.
 - 2. Mount on outside wall in location shown on drawings.

2.02 SIGN TYPES

- A. Flat Signs: Signage media without frame.
 - 1. Edges: Square.
 - 2. Corners: Square.
 - 3. Wall Mounting of One-Sided Signs: Tape adhesive.
- B. Color and Font: Unless otherwise indicated:
 - 1. Character Font: Helvetica, Arial, or other sans serif font.
 - 2. Character Case: Upper case only.
 - 3. Background Color: to be selected from Manufacturer's full range.
 - 4. Character Color: Contrasting color.

2.03 TACTILE SIGNAGE MEDIA

- A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
 - 1. Total Thickness: 1/16 inch.

2.04 DIMENSIONAL LETTERS

- A. Metal Letters:
 - 1. Metal: Aluminum casting.
 - 2. Finish: Brushed, satin.
 - 3. Mounting: Concealed screws.

2.05 ACCESSORIES

- A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
- B. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Protect from damage until Substantial Completion; repair or replace damaged items.

END OF SECTION 10 14 00

SECTION 13 34 19

MANUFACTURED BUILDING SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufacturer and engineer a shop-fabricated modular building with structural steel building frame. Building shall be complete with all components.
- B. Insulated wall and roof panels including roof mounted equipment curbs and interior partitions, doors, canopy overhang structure and panels, HVAC, plumbing, electrical data/phone, lighting fixtures, interior finishes, toilet accessories, skylights, and other accessories .
- C. Exterior envelope including doors, windows, skylights, and exterior finishes, folding glass doors, sliding metal panels system, roofing and moisture protection.

1.02 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications.
- B. Section 07 92 00 - Joint Sealants: Sealing joints between accessory components and wall system.

1.03 REFERENCE STANDARDS

- A. AISC 360 - Specification for Structural Steel Buildings; 2010.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- C. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- D. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; 2012.

1.04 SUBMITTALS

- A. Product Data: Provide data on profiles, component dimensions, fasteners.
- B. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections; wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, installation, and building trellis, folding doors, sliding panels, and other systems; framing anchor bolt settings, sizes, and locations from datum, foundation loads; indicate welded connections with AWS A2.4 welding symbols; indicate net weld lengths; provide professional seal and signature.
- C. Samples: Submit two samples of all finishes for each color selected, 8 by 8 inch in size illustrating color and texture of finish.
- D. Manufacturer's Instructions: Indicate preparation requirements, anchor bolt placement.

- E. Manufacturer Qualification Statement: Provide documentation showing metal building manufacturer is accredited under IAS AC472.
 - 1. Include statement that manufacturer designs and fabricates manufactured building system as integrated components and assemblies, including but not limited to primary structural members, secondary members, joints, roof, and wall cladding components specifically designed to support and transfer loads and properly assembled components form a complete or partial building shell.
- F. Project Record Documents: Record actual locations of concealed components and utilities.

1.05 QUALITY ASSURANCE

- A. Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this Work.
 - 1. Design Engineer Qualifications: Licensed in the State in which the Project is located.
 - 2. Conform to applicable code for submission of design calculations as required for acquiring permits.
 - 3. As a separate permit, submit and obtain permits for the building, cooperate with regulatory agency or authority and provide data as requested.

1.06 WARRANTY

- A. Provide five year manufacturer warranty for building structure.
 - 1. Include coverage for exterior pre-finished surfaces to cover pre-finished color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading. Include coverage for weather tightness of building enclosure elements after installation.

PART 2 PRODUCTS

2.01 MANUFACTURED BUILDING

- A. Manufactured building is to be a factory manufactured building, designed by manufacturer to meet applicable codes with walls, roof and floors as a modular assembly with all the components shown in the drawings and as required for weathertightness and functioning.
 - 1. Modules to be 12' - 0" wide.
 - 2. Components are to include steel frame system, wood framing for walls, floor and roof.
 - 3. Framing to include support for the building trellis.
 - 4. Mounting to be set on site built foundation.
 - 5. All details and interface to be coordinated between site built and factory built components.
 - 6. Building is to be processed by manufacturer as a deferred submittal through the City of San Diego for building and installation permits.
- B. Floor System
 - 1. Joist: Wood framing at 16" O.C. as required for loading.
 - 2. Deck: 3/4" Tongue and Groove plywood.
 - 3. Insulation: R30 unfaced batt.
 - 4. Bottom: Reinforced plastic bottom board rodent barrier.

- C. Exterior Wall System
 - 1. Framing: Wood frame at 16" O.C.
 - 2. Insulation: R-19 kraft faced batt
 - 3. Interior face: 5/8" gypsum board, water resistant at future kitchen, and tile backer board at the restrooms.
 - 4. Exterior cladding: Large format exterior cement board, dimensions as indicated in drawings.
 - a. Panel: James Hardie, HardiePanel smooth vertical siding or approved equal.
 - b. Edges and corners to be preformed aluminum trim.
 - c. Panels over house wrap building paper.
 - d. Sheathing: 1/2" OSB.

- D. Interior Wall System
 - 1. Framing: Wood frame at 16" O.C. Walls to extend up to bottom of rafters.
 - 2. Sheathing: 5/8" gypsum board, water resistant at future kitchen, and tile backer board at the restrooms.
 - 3. Insulation: Full depth batt insulation at restroom walls.

- E. Roof System
 - 1. Rafters: Wood framing at 16" O.C. as required for loading.
 - 2. Roof Slope: 1/4 inches in 12 inches to roof drain above outlet point.
 - 3. Sheathing: OSB 15/32".
 - 4. Roofing Material: Manufacturers standard single ply 50 mil PVC or TPO cool roof in white with cover board as required by manufacturer.
 - 5. Insulation: R-30 kraft faced batt.
 - 6. Flashings: Prefinished galvanized steel.
 - 7. Roof curbs: Premanufactured for equipment and equipment screen support.

- F. Doors and Frames
 - 1. Hollow Metal Doors
 - a. Exterior Doors: Thermally insulated.
 - 1) Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - (a) Level 2 - Heavy-duty.
 - (b) Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4
 - (c) Model 1 - Full Flush.
 - (d) Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 - 2) Core Material: Manufacturers standard core material/construction and in compliance with requirements.
 - 3) Door Thickness: 1-3/4 inch, nominal.
 - 4) Door Finish: Factory primed and field finished.
 - 5) Zinc Coating for Typical Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
 - 6) Includes restroom doors
 - b. Wood Interior Doors
 - 1) Flush solid core wood doors
 - 2) wood veneer for painted finish.
 - c. Hollow Metal Frames
 - 1) Exterior Door Frames: Full profile/continuously welded type.

- (a) Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
 - (b) Frame Metal Thickness: 18 gage, 0.042 inch, minimum.
 - (c) Frame Finish: Factory primed and field finished.
 - 2) Interior Door Frames, Non-Fire Rated: Knock-down type
 - (a) Frame Metal Thickness: 18 gage, 0.042 inch, minimum.
 - (b) Frame Finish: Factory primed and finished.
- G. Folding Glass Doors:
1. Aluminum Thermally Controlled Folding Doors: Aluminum Thermally Controlled Outswing Bi-Fold Doors.
 - a. Frame and Panels: Complete folding door system including head, side jambs, threshold and aluminum thermally controlled panels to sizes indicated on the Drawings. Provided with thermal struts that create a non-conductive bridge between the outside and the inside of the door.
 - 1) Panel: Thermally broken, extruded aluminum stile and rail panels with standard one life.
 - (a) Thickness 2-1/4 inches.
 - (b) Stile and Rail 2-15/16 inches.
 - (c) Bottom Rail 2-15/16 inches.
 - 2) Frame and Sill: Thermally broken, extruded aluminum.
 - (a) Jamb thickness: 1-1/4 inches.
 - (b) Frame width: 5-5/8 inches.
 - 3) Weatherstripping: Weather seal inserted in frame and sill to provide perimeter seal, as well as between door panels. Color is dark bronze.
 - b. Glass: All glass to comply with safety glazing requirements of ANSI Z97.1 and CPSC 16CFR 1201.
 - 1) Type: Triple glazed insulated glass with a 1-1/4 inch overall thickness.
 - 2) Glass:
 - (a) Low-E 272 (for standard sizes, argon filled).
 - (b) Clear insulated.
 - 3) Glazing: Silicone bedding on exterior surfaces and glazing seal on the interior of the panel.
 - c. Locking Hardware and Handles: Manufacturer's standard handle and concealed two point locking hardware operated by 90 degree turn of handle between each pair of folding panels and on any secondary swing panel.
 - 1) Locking/handle operation from inside only (for even/even panel configurations or window applications where manufacturer's standard lever handle and lockset is not provided), on all swing panels or pair of folding panels to be opened first, provide manufacturer's standard handle and concealed two point locking hardware operated by 90 degree turn of handle.
 - 2) Cap concealed aluminum locking rods with solid stainless steel tips that lock into the frame's top and bottom locking channels.
 - 3) Handle Finish:
 - (a) Brushed Satin Bronze color.
 - d. Folding Hardware: Manufacturer's standard folding hardware integrated with engineered head track, side jambs and threshold frame system. Systems where weight of panels is borne by the bottom of the track will not be allowed. Hardware systems carrying capacity is a minimum of 220 lbs (99.79 Kg) per panel.

- 1) System operates with an upper wheel carrier that rolls on the aluminum head track. Lower track is incorporated into the threshold to guide door panels. Upper carrier and lower guide attached to door panel hinges. Jamb panels attached with top and bottom pivots. Panels connected with hinges including top and bottom hinges attached to top carrier and lower guide. Handles to open and close door is included. Carrier pins at top pivots, and intermediate and end carriers support the full door weight and provides panel adjustment. A pin locking system is used to lock vertical adjustment once heights are set. Pivots at jamb allow screwdriver adjustment of the system horizontally up to 3/8 inch (10 mm). All screws fully concealed for external security. Architectural grade stainless steel used for hinge pins, carrier pins and carrier bogeys.
 - 2) Hardware Sets:
 - (a) Hinges: Provide 3 hinges on panels 96 inches (2438 mm) or less and 4 hinges on panels taller than 96 inches (2438 mm).
 - (b) Wall Pivots: Provide wall pivots for jamb side pivot panels for taller doors or high-wind environments.
 - 3) Hardware finish:
 - (a) Brushed Satin Bronze color.
 - 4) Threshold:
 - (a) ADA Compliant ramp sill.
 - 5) Adjustment: System to be capable of adjustments without removing panels from tracks, up to 3/8 inch both vertically and horizontally with flathead and Phillip's head screwdriver.
 - 6) Gaps between folding panels that accommodate weather stripping and hinges to be 3/16 inch or less when panels are closed.
- e. Aluminum Finish:
- 1) Provide same finishes on inside and outside.
 - (a) Two coat 70 percent Kynar finish with color as selected from manufacturer range of finishes.
- f. Threshold Finish:
- 1) Bronze anodized.
- H. Storefront and Windows:
1. Storefront and windows
 - a. Center-Set Style, Thermally-Broken
 - b. Basis of Design: Kawneer Trifab 451 Series or approved equal.
 - c. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
 - d. Glazing: 1" insulated clear with low e coating to meet thermal performance. Tempered where required.
 2. Swinging Doors
 - a. Medium Stile, Insulating Glazing, Thermally-Broken:
 - 1) Basis of Design: Kawneer 19350 Series or approved equal.
 - 2) Thickness: 1-3/4 inches.
 - 3) Glazing: 1" insulated clear tempered with low e coating to meet thermal performance.
 - 4) Bottom rail 10"
 - 5) Include all weatherstripping, thresholds and hardware.
- I. Building trellis system:
1. Structure to be galvanized steel tube sections cantilevered from the building.

2. Structure to be capable of supporting the sliding panels or folding glass wall where they occur.
 3. Structure to be field painted to match the free standing trellis.
 4. Panels and suspension per section 086300
- J. Perforated Metal Panels:
1. For use with roof equipment screens, window screen panel and sliding metal panels
 2. 11 gauge aluminum sheet perforated with 1/4" diameter holes at 3/8" staggered centers, 40% open area.
 3. All elements to be finished with flouropolymer finish.
- K. Sliding Metal Panel System:
1. Perforated panels in 48" x 120" panels.
 2. Mounted on an tubular aluminum frame.
 3. Suspended with stainless steel rolling (barndoor) track hardware and bottom keepers.
 4. All elements to be finished with flouropolymer finish.
- L. Toilet accessories;
1. Commercial Toilet and Shower Accessories:
 - a. AJW Architectural Products: www.ajw.com.
 - b. American Specialties, Inc: www.americanspecialties.com.
 - c. Bradley Corporation: www.bradleycorp.com.
 - d. Substitutions: Or Approved Equal.
 2. Stainless Steel: Satin finish, unless otherwise noted.
 3. COMMERCIAL TOILET ACCESSORIES
 - a. Toilet Paper Dispenser: Double roll, surface-mounted, stainless steel unit with pivot hinge, tumbler lock.
 - 1) a. Horizontal orientation; tamper-proof; Bobrick B-2740
 - 2) b. Vertical orientation; ADA accessible; Bobrick B-2888
 - 3) Soap Dispenser: Liquid soap dispenser, wall-mounted, with stainless steel cover and window to gage soap level, tumbler lock.
 - (a) Minimum Capacity: 48 ounces.
 - 4) Grab Bars: Stainless steel, nonslip grasping surface finish.
 - (a) Standard Duty Grab Bars:
 - (1) Push/Pull Point Load: 250 pound-force, minimum.
 - (2) Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
 - (3) Length and Configuration: As indicated on drawings.
- M. Toilet partitions;
1. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), tested in accordance with NFPA 286, floor-mounted headrail-braced.
 2. Doors:
 - a. Thickness: 1 inch.
 - b. Width: 24 inch.
 - c. Width for Handicapped Use: 36 inch, out-swinging.
 - d. Height: 55 inch.
 3. Panels:
 - a. Thickness: 1 inch.

- b. Height: 55 inch.
- 4. Pilasters:
 - a. Thickness: 1 inch.
 - b. Width: As required to fit space; minimum 3 inch.
- 5. Accessories
 - a. Pilaster Shoes: Formed chromed steel with polished finish, 3 inch high, concealing floor fastenings.
 - b. Head Rails: Hollow anodized aluminum, 1 inch by 1-1/2 inch size, with anti-grip profile and cast socket wall brackets.
 - c. Pilaster Brackets: Polished stainless steel.
 - d. Wall Brackets: Continuous type, polished stainless steel.
 - e. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
 - f. Hardware: Polished stainless steel:
 - 1) Pivot hinges, gravity type, adjustable for door close positioning; two per door.
 - 2) Door Latch: Slide type with exterior emergency access feature.
 - 3) Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
 - 4) Coat hook with rubber bumper; one per compartment, mounted on door.
 - 5) Provide door pull for outswinging doors.

N. Tubular skylights -

- 1. Roof Assemblies: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
 - a. Glazing: Acrylic plastic, 1/8 inch minimum thickness.
 - b. Dome Ring: Attached to top of base section; 0.090 inch nominal thickness injection molded high impact ABS; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing; weather seal of medium density pile weather stripping.
- 2. Reflective Tube: ASTM B209 (ASTM B209M) aluminum sheet, thickness between 0.015 inch and 0.020 inch.
- 3. Diffuser Assemblies: Supporting light transmitting surface at bottom termination of tube, with compression seal to minimize condensation and bug or dirt infiltration.
 - a. Ceiling Ring: Edge trim for ceiling opening; injection molded high impact ABS.
 - b. Diffuser Trim: Edge and attachment trim for diffuser lens; injection molded high impact ABS.
 - c. Lens: Flush frosted lens.
 - d. Lens Material: Acrylic plastic.
 - e. Visible Light Transmission (VLT): 90 percent, minimum.
 - f. Seal: Closed cell EPDM foam rubber.

O. Finishes are per Finish Schedule.

P. Door hardware is to be per City of San Diego Standards, keyway by Best Hardware.

2.02 MATERIALS -

- A. Roof Curbs: Insulated metal same as roofing, ___ inch thick, designed for imposed equipment loads, anchor fasteners to equipment, counterflashed to metal roof system.

- B. Trim, Closure Pieces, Caps, Flashings, Fascias, Infills, and roof drain and connections to storm water system.: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

2.03 DESIGN CRITERIA

- A. Design members to withstand dead load, and design loads due to pressure and suction of wind calculated in accordance with applicable code.
- B. Exterior wall and roof system shall withstand imposed loads with maximum allowable deflection of 1/90 of span.
- C. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of ____ degrees F.
- D. Size and fabricate wall and roof systems free of distortion or defects detrimental to appearance or performance.
- E. Electrical systems are to be designed and installed to applicable code requirements.
- F. Roof top mounted HVAC systems are to be designed and installed to applicable code requirements.
- G. Plumbing systems are to designed and installed to applicable code requirements.
 - 1. roof drains are to be internal and connect to exterior storm drain system.

2.04 FABRICATION - FRAMING

- A. Fabricate members in accordance with AISC 360 for plate, bar, tube, or rolled structural shapes.
- B. Anchor Bolts: Formed with bent shank, assembled with template for casting into concrete.
- C. Provide framing for skylight openings.
- D. Provide wall opening framing for doors, windows, and other accessory components.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that foundation, mechanical and electrical utilities, and placed anchors are in correct position

3.02 ERECTION - FRAMING

- A. Erect framing in accordance with AISC 360.
- B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.
- C. Set column base plates with non-shrink grout to achieve full plate bearing.
- D. Do not field cut or alter structural members without approval.
- E. After erection, prime welds, abrasions, and surfaces not shop primed.

3.03 ERECTION - WALL AND ROOF PANELS

- A. Install in accordance with manufacturer's instructions.
- B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.
- C. Fasten cladding system to structural supports, aligned level and plumb.
- D. Locate end laps over supports. End laps minimum 4 inches. Place side laps over bearing.
- E. Provide expansion joints where indicated.
- F. Use concealed fasteners.
- G. Install sealant and gaskets, providing weather tight installation.

3.04 ERECTION - SKYLIGHTS

- A. Install in accordance with manufacturer's instructions.
- B. Coordinate with installation of roofing system and related flashings.
- C. Seal between skylight units and roof system, providing weather tight installation.

3.05 INSTALLATION - ACCESSORY COMPONENTS IN WALL SYSTEM

- A. Install door frames, doors, windows and glass, and folding glass door, storefront system. in accordance with manufacturer's instructions.

3.06 TOLERANCES

- A. Framing Members: 1/4 inch from level; 1/8 inch from plumb.
- B. Siding and Roofing: 1/8 inch from true position.

END OF SECTION 13 34 19

SECTION 22 05 00

COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions, Supplementary Conditions, and Division 01, are a part of this section and the contract for this work and apply to this section as fully as if repeated herein.

1.02 SUBMITTALS

- A. Submit a minimum of six copies of shop drawings for all products. All submittal sheets shall be clearly marked or highlighted showing conformance to specifications and schedule. All submittals shall be cross referenced to the requirements of each specification paragraph pertaining to the item being submitted. All requirements must be shown on manufacturer's literature. Manufacturer's representative's letterhead, or super-imposed notations, are not acceptable. This requirement pertains to all sections of Division 22. No exceptions. Submittals not so marked will be subject to rejection.

1.03 CODES AND STANDARDS

- A. All work and materials shall be in full accordance with the latest rules and regulations of the State Fire Marshal, the Safety Orders of the Division of Industrial Safety, the California Building Code, the California Mechanical Code, the California Plumbing Code the California Electrical Code, Local Building Codes, and other applicable codes, laws or regulations of bodies lawfully empowered and having jurisdiction over this project. Nothing in the plans or specifications is to be construed to permit work not conforming to these codes.

1.04 SEISMIC ANCHORAGE AND BRACING

- A. All equipment and piping shall be anchored or braced in accordance with the California Building Code. The contractor is responsible for providing anchorage or bracing for all equipment regardless of whether detailed or shown on the plans. All equipment and ductwork supports not detailed as shown on the plans, requires approval of a registered structural engineer.
- B. All piping shall be supported or braced in accordance with the SHL-A "Seismic Restraint Manual: Guideline for Mechanical Systems" latest approved edition, Superstrut "Seismic Restraint System", Unistrut Corp. "Seismic Bracing For Ductwork, Conduit, and Cable Tray Supports", or B-Line "Seismic Restraints." If the pipe size exceeds the size included in these manuals, custom designed supports are required. All custom supports require the approval of a registered Structural Engineer. All shop drawings and calculations shall be submitted prior to fabrication.
- C. All flexibly mounted equipment shall be provided with seismic vibration isolation devices designed in accordance with the California Building Code. All anchors and equipment connections shall be submitted. All seismic vibration isolation devices shall be

submitted with structural calculations signed by a Registered Structural Engineer in the State of California.

1.05 PERMITS

- A. The Contractor shall obtain all permits, patent rights, and licenses that are required for the performance of his work by all laws, ordinances, rules and regulations or orders of any officer and/or body, shall give all notices necessary in connection therewith, and pay all fees relating thereto and all costs and expenses incurred on account thereof. No work shall be covered before inspection by the jurisdictional inspector and the Architect.
- B. Contractor shall apply for and pay for all cost for the installation of water and gas meters, and for connection to gas, water, and sewer mains.

1.06 CUTTING AND PATCHING

- A. Perform all cutting and fitting required for work of this section in rough construction of the building.
- B. All patching of finished construction of building shall be performed under the sections of specifications covering these materials.
- C. All cutting of concrete work by this Contractor shall be by core drilling or concrete saw. No cutting or coring shall be done without first obtaining the permission of the Architect.

1.07 GENERAL

- A. Unless otherwise specified herein, all equipment and fixtures shall be installed in accordance with the manufacturer's recommendations.
- B. Before submitting his bid, the Contractor for the work under this section shall carefully study all drawings, and shall make a careful examination of the premises. He shall definitely determine in advance, the methods of installing and connecting the apparatus, the means to be provided for getting any equipment into place, and shall make himself thoroughly familiar with all the requirements of the contract. After award of the contract, no subsequent allowances will be made to the Contractor due to his failure to comply with the above requirements and any other conditions affecting the installation and completion of all work.
- C. Workmanship: All labor shall be carefully skilled for this kind of work, thorough and first class in all respects and under the direction of a competent foreman.
- D. Special Note: Any work called for on plans shall be installed whether or not mentioned in these specifications.

1.08 VERIFICATION OF LEAD CONTENT IN PLUMBING PRODUCTS

- A. Comply with California Health and Safety Code 116875 (AB 1953-2006) Lead Content in Plumbing Products for valves and fittings. All valves 2" and smaller and all fittings 2" and smaller for installation in the domestic water system, whether serving a fixture providing domestic water for human consumption or serving a fixture providing domestic water to a fixture not normally considered as for use for human consumption shall be provided with valve and fittings that have been verified by an independent evaluation service as meeting the requirements of the California Health and Safety Code 116875 (AB 1953-

2006). When valves or fittings larger than 2" are required and verified products are available from the specified manufacturer(s), verified valves and fittings shall be submitted for approval and provided, as approved.

- B. Comply with California Health and Safety Code 116875 (AB 1953-2006) Lead Content in Plumbing Products for piping specialties installed in the domestic water system whether serving a fixture providing domestic water for human consumption or serving a fixture providing domestic water to a fixture not normally considered as for use for human consumption shall have been verified by an independent evaluation service as meeting the requirements of the California Health and Safety Code 116875 (AB 1953-2006). When piping specialty item larger than 2" is required, and a verified product is available from the specified manufacturer(s), the verified plumbing specialty item shall be submitted for approval and provided, as approved.

1.09 DAMAGE BY LEAKS

- A. This Contractor shall be responsible for damage to the grounds, walks, roads, buildings, piping systems, electrical systems and their equipment and contents, caused by leaks in the piping systems being installed or having been installed herein. He shall repair at his expense all damage so caused. All repair work shall be done as directed by the Architect.

1.10 EMERGENCY REPAIRS

- A. The Owner reserves the right to make emergency repairs as required to keep equipment in operation without voiding the Contractor's guarantee bond nor relieving the Contractor of his responsibilities.

1.11 EXPLANATION AND PRECEDENCE OF DRAWINGS

- A. For purposes of clearness and legibility, drawings are essentially diagrammatic, and, although size and location of equipment are drawn to scale wherever possible, Contractor shall make use of all data in all the contract documents and shall verify this information at building site.
- B. The drawings indicate required size and points of termination of pipes, and suggest proper routes to conform to structure, avoid obstructions and preserve clearances. However, it is not intended that drawings indicate all necessary offsets, and it shall be the work of the Contractor to make the installation in such a manner as to conform to structure, avoid obstructions, preserve headroom and keep openings and passageways clear, without further instructions or cost to the Owner.
- C. It is intended that all apparatus be located symmetrical with architectural elements. Refer to architectural details in completing the correlating work.
- D. The contractor shall be fully informed regarding any and all peculiarities and limitations of the spaces available for the installation of all work and materials furnished and installed under the contract. The contractor shall exercise due and particular caution to determine that all parts of his work are made quickly and easily accessible.
- E. The Contractor shall study all drawings and specifications to determine any conflict with ordinances and statutes. Any errors or omissions shall be reported, and any changes shall be shown in the as-built drawings and the additional work performed at no cost to the Owner.

- F. Submittal of bid shall indicate the Contractor has examined the site and drawings and has included all required allowances in his bid. No allowance shall be made for any error resulting from Contractor's failure to visit job site and to review drawings, and bid shall include costs for all required drawings and changes as outlined above, all at no cost to Owner.

1.12 EXCAVATION AND BACKFILL

- A. See other Divisions for excavation and backfill requirements.
- B. Underground piping shall be installed with a minimum of 24" cover from finish grade and deeper as noted on drawings. Excavation depths shall be coordinated with other trades.
- C. Excavation for pipes shall be cut a minimum of 6" below the required grade. A 6" bed of sand or other approved material shall be then placed and properly compacted to provide an accurate grade and uniform bearing throughout the length of the pipe.
- D. Sand used shall be certified to a resistance of not less than the surrounding soil when wet with distilled water and shall consist of clean, natural, washed sand. The particles size shall pass through a 3/8" screen, 90% of them will pass through a 1/4" screen and not more than 25% will pass through a No. 50 screen.
- E. Backfilling will not be placed until the work has been inspected, tested and approved.
- F. Clods or lumps 2" in size or larger will not be permitted in the backfill. If the excavated material is not suitable, adequate material shall be provided by hauling from other locations.
- G. Surplus earth or material remaining after backfilling shall be removed from the site as indicated in "Earthwork" section.

1.13 SUPERVISION AND COOPERATION

- A. This Contractor shall include the services of experienced superintendents for each sub-section who shall be constantly in charge of the work, together with the qualified journeymen, helpers and laborers, required to properly unload, install, connect, adjust, start, operate and test the work involved, including equipment and materials furnished by others and by the Owner.
- B. The work under this section shall be executed in cooperation with the work of other trades to prevent conflict or interference and to aid rapid completion of the overall project.

1.14 OPERATION

- A. The Owner may require operation of parts or all of the installation for beneficial occupancy prior to final acceptance. Refer to General Conditions of the Contract.
- B. Cost of utilities for such operation shall be paid by the Owner. Said operation shall not be construed as acceptance of the work.

1.15 UTILITY SERVICES DURING CONSTRUCTION

- A. All water and electric power used for construction shall be paid for by the Contractor.

1.16 COORDINATION

- A. Coordinate layout and installation of piping and suspension system components with other construction, including light fixtures, HVAC ductwork / equipment, electrical conduit, fire suppression system components, and partition assemblies.
- B. Coordinate pipe sleeve installations for foundations wall penetrations.
- C. Coordinate installation of pipe sleeves for penetrations through exterior walls and floor assemblies.

PART 2 - PRODUCTS

2.01 ACCESS DOORS AND PANELS:

- A. Wherever valves, air vents, or other items or parts of the installation which require periodic inspection or adjustment are concealed by permanent non-removable construction, an access door or panel shall be provided. Installation of access doors to be coordinated by general contractor. Types to be submitted and approved for the surface, and construction in which it is installed. Access door to be manufactured by Mifab, Inc., or approved equal, and be Series CAD or UA, or series MFRU for fire rated walls.

2.02 ROOF FLASHING

- A. Furnish and install on each pipe passing through the roof, a "Stoneman" No. 1100-7, or approved equal, six pound, seamless lead flashing assembly. Flashing shall have reinforced boot and be complete with cast iron counter flashing sleeve and Permaseal waterproofing compound. All vent pipes shall be terminated 7" above the roof.

PART 3 - EXECUTION

3.01 INSTALLATION OF PLUMBING SYSTEMS

- A. No holes for pipe or equipment will be allowed in any structural members without written consent of the Architect. Where pipes are to pass through or interfere with any member, or where notching, boring or cutting of the structure is necessary, the work shall be done by the Contractor as directed by the Architect.
- B. The Contractor shall, at a time in advance of the work, coordinate with other disciplines as to his requirements for openings, recesses, and chases in the walls, partitions, or framing. Should furnishing this information be neglected, delayed, or incorrect and additional cutting is found to be required, the costs of same shall be charged to the Contractor.
- C. Sleeves through foundation walls shall be standard weight black steel pipe, flush with walls and two pipe sizes larger than the pipe passing through. Sleeves shall be caulked with oakum to within 1" of the wall lines and then completely filled with an approved bitumastic compound. Sleeves for piping through masonry wall above grade or floor or through floors shall be #10 gauge galvanized sheet steel and shall extend completely through the walls, or floor finishing flush on both sides. Sleeves shall be 1/2" larger than the pipe passing through with oakum caulking to make opening airtight. Sleeves through concrete firewalls or floors shall be packed with suitable non-combustible

material. Provide and install polished chromium plate brass floor ceiling on wall plates for all pipes, exposed in finished portions of the buildings.

- D. All scaled and figured dimensions are approximate and are given for estimate purposes only. Before proceeding with any work, this Contractor shall carefully check and verify all dimensions, sizes, etc., and shall assume full responsibility for the installation with respect to other parts of the equipment, and to the structure.
- E. Any minor changes in work, which has not been installed, shall be made by this Contractor without additional compensation, except changes that are caused by architectural revisions that increase or decrease the size of the materials specified or indicated on the drawings.
- F. This Contractor shall submit an estimate of the cost of or credit for such changes he does not consider of a minor nature and shall proceed only upon the written authority of the Architect.
- G. Coordinate all sanitary vents through roof with HVAC equipment. Terminate all vents at least 10'-0" from any outside air intakes.
- H. Pipes Over Electrical Equipment: Where pipe joints or valves in pipes conveying water occur within 3' in a horizontal direction, of electrical panels and electronic equipment, provide a drip pan of galvanized steel construction of a size which will afford maximum protection.
 - 1. Pans: 24 gauge, edges turned up 2-1/2" all sides, reinforced with galvanized steel angles or by rolling edge over 1/4" diameter steel rod.
 - 2. Provide drain with 3/4" brass flange and copper pipe to floor.
 - 3. Support the pan with bars or angles, brace to prevent sagging or swaying.
- I. Install chrome plated split escutcheons around all pipes passing through finished walls, floors and ceilings.

3.02 TESTS AND ADJUSTMENTS

- A. No piping work, fixtures, or equipment shall be concealed or covered until inspected and approved by the Engineer, who shall be notified when the work is ready for inspection. All work shall be completely installed, tested as required by this section and the State Ordinances and State Safety Orders, and shall be leak-tight before inspection is requested. All tests shall be repeated upon request to the satisfaction of those making the inspection.
- B. Disinfection of the potable water system prior to use shall meet the requirements of the California Plumbing Code section 609.9. The method to be followed shall be that prescribed by the Health Authority or, in case no method is prescribed by it, the following:
 - 1. *The piping system shall be flushed with clean, potable water until only potable water appears at the points of outlet.*
 - 2. *The system or parts thereof shall be filled with a water-chlorine solution containing at least fifty (50) parts per million of chlorine, and the system or part thereof shall be valved-off and allowed to stand for twenty four (24) hours; or, the system or part*

thereof shall be filled with a water-chlorine solution containing at least two hundred (200) parts per million of chlorine and allowed to stand for three (3) hours.

3. Following the allowed standing time, the system shall be flushed with clean, potable water until the chlorine residual in the water coming from the system does not exceed the chlorine residual in the flushing water.
4. The procedure shall be repeated if it is shown by bacteriological examination made by an approved agency that contamination persists in the system.

- C. Piping tests shall be made with the medium and under pressure listed below. Use a calibrated Bristol Pressure Recorder on all tests. Recorder range shall be 0 - 300 pounds or required range for specific test.

Type of System	Gauge Pressure (Lbs. per sq. inch, gauge)	Test Medium
Soil, Waste, Vent Piping Within Building	Minimum of 5 psi for each joint, for duration of test with no loss in pressure.	Water
Domestic Water	150 PSI	Water

- D. Test pressure in pounds per square inch, gauge, are given as initial pressure to be applied to lines being tested, together with test medium.
- E. Tests are to be applied for a minimum period of twenty-four (24) hours and until tests are complete.
- F. Final pressures at the end of test period shall be no more nor less than that caused by expansion or contraction of the test medium due to temperature changes.

3.03 DRAWINGS OF RECORD

- A. Provide reproducible "as-builts" for the purpose of showing a complete picture of the work as actually installed. Copies of the contract drawings can be made available upon request at cost to the contractor.
- B. These drawings shall serve as work progress report sheets and the Contractor shall make all notations, neat and legible, thereon daily as the work proceeds. The drawings shall be available for inspection at all times and shall be kept at the job at a location designated by the Architect.
- C. At completion of the work, these as-built drawings shall be signed by the Contractor indicating his approval, dated and returned to the Architect.
- D. Invert elevations for buried piping and conduit. The dimensions location of all concealed raceway shall be accurately recorded on the "as-built" drawings. Elevation, on Mean Sea Level base, of all piping and conduit runs outside the building shall be recorded.

3.04 FINAL INSPECTION

- A. If upon final completion of the final inspection and review of the maintenance manuals and "as-built" drawings, the list of required corrections is such that a re-inspection is

required, the contractor will be subject to a charge of Ninety Dollars (\$90.00) per hour for any additional time required.

3.05 GUARANTEE

- A. All work under this section shall be guaranteed in writing in accordance with the General Provisions.
- B. All material except as otherwise noted shall be new, free from defect and of the quality and rating shown or specified.
- C. Any defect due to missing or improper material or faulty workmanship existing or developing during the warranty period shall be corrected and the resulting damage repaired without additional cost to the Owner.
- D. The warranty period shall be one year from date of acceptance of the project.

END OF SECTION 22 05 00

SECTION 22 05 13

COMMON MOTOR REQUIREMENTS FOR PLUMBING EQUIPMENT

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions, Supplementary Conditions, and Division 01, are a part of this section and the contract for this work and apply to this section as fully as if repeated herein. The system shall be complete in all respects including all labor, materials, equipment and services necessary, and shall be installed by personnel specifically experienced in plumbing systems.

1.02 ELECTRICAL

- A. Before order is placed for motors or other electrical devices, the Contractor shall check with Division 26 plans and specifications, and verify requirements as to type, mounting and current characteristics as well as to any special delivery instructions.
- B. All motors less than 1/2 HP shall have built-in running thermal overload protection. Motors 1/2 HP and larger, shall be rated for 3-phase service unless otherwise noted.
- C. All motors installed exposed to the weather, shall be totally enclosed and weatherproof.
- D. Starters: All individual motor starters will be furnished under the Electrical Section of the specifications, unless noted otherwise. For starters to be furnished under this section, see Control Diagram on the drawings and Equipment Section of the specifications.

PART 2 - PRODUCTS

2.01 Electric Motors

- A. Motors shall be designed to operate at full load continuously without exceeding a temperature rise of 40°C.
- B. Each motor for a belt drive shall be fitted with adjustable "V" belt sheaves. These shall be key seated and set screwed to the motor shafts and the combined motor and sheave shall run in perfect balance.
- C. All motors between greater than 1 HP and less than 3 HP shall have a nominal full-load efficiency level based on NEMA Premium efficiency as shown in NEMA MG 1, Table 12-12 (EISA-2007).
- D. All motors 3 horsepower and larger, shall be premium efficiency type in compliance with NEMA Energy Efficiency Standards, and qualify for local utility rebates, Centry E, or approved equal. Submittals shall show efficiency and power factor at 100% load.

PART 3 - EXECUTION

3.01 INSTALLATION OF MOTORS

- A. This Contractor shall furnish, install and/or align all motors for driving the equipment furnished and installed by this contract. The size of all motors shall be the size required by equipment it drives. Each belt connected motor shall be fitted with base and slide rails. Motors shall be Westinghouse, General Electric, Fairbanks Morse, Wagner, Allis Chalmers, or Sterling. Each motor shall have a sufficient starting torque to start the apparatus drive. All motors shall be wound for the voltage shown in the schedule on the drawings.

END OF SECTION 22 05 13

SECTION 22 05 19

METERS AND GAUGES FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions, Supplementary Conditions, and Division 01, are a part of this section and the contract for this work and apply to this section as fully as if repeated herein. The system shall be complete in all respects including all labor, materials, equipment and services necessary, and shall be installed by personnel specifically experienced in plumbing systems.

1.02 WORK INCLUDED

- A. Work included shall be as indicated on the drawings, including but not limited to the following:
 - 1. Thermometers
 - 2. Test Wells
 - 3. Pressure Gauges

PART 2 - PRODUCTS

2.01 THERMOMETERS:

- A. Stem type, cast aluminum case, 9" scale, clear acrylic window. Adjustable angle brass stem with stem of sufficient length so the end of the stem is near the middle of a pipe without reducing the thickness of any insulation, red indicating fluid, black lettering against a white background, with scale ranges as follows:

Service:	Hot Water
Scale Range, °F	30 – 180
Increment, °F:	2

- B. Manufactured by Weiss, or Weksler.
- C. Thermometer Sockets: Brass with threaded connections suitable for thermometer stems and temperature control sensing elements in pipeline. Furnish with extension necks for insulated piping systems.

2.02 TEST WELLS:

- A. Similar to thermometer sockets except with a brass cap that threads into the inside of the test well to prevent dirt from accumulating. Secure cap to body with a short chain. Furnish with extension necks, where appropriate, to accommodate the pipeline insulation.
- B. Test Plugs: Brass threaded pressure and temperature test plug with neoprene self-closing valve, valve retainer, brass threaded cap, rated for 150 psi and 0°F – 200°F.

2.03 PRESSURE GAUGES:

- A. Cast aluminum case of not less than 4.5" in diameter, double strength glass window, black lettering on a white background, phosphor bronze bourdon tube with bronze bushings, recalibration from the front of the dial, 99% accuracy over the middle half of the scale, 98.5% accuracy over the remainder of the scale, with scale range as follows:

Service:	Hot Water	Cold Water
Scale Range, psig	0 – 100	0 – 100
Increment, psig	1	1

- B. Manufactured by Weiss, or Weksler.
- C. Pressure Snubbers: Bronze construction, 300 psig working pressure, 1/4" size.

PART 3 - EXECUTION

3.01 PIPE INSTALLATION

- A. Pipe and plumbing products shall be carefully cleaned before installation. The ends of threaded pipe shall be reamed out full size with a long taper reamer so as to be partially bell-mouthed and perfectly smooth.
- B. Openings in pipes, drains, fittings, apparatus and equipment shall be kept covered or plugged to prevent foreign substance from entering.
- C. Install gauges, thermometers, etc per manufacturer's recommendations including required straight pipe before and after each unit.

END OF SECTION 22 05 19

SECTION 22 05 29

HANGERS AND SUPPORTS FOR PLUMBING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions, Supplementary Conditions, and Division 01, are a part of this section and the contract for this work and apply to this section as fully as if repeated herein. The system shall be complete in all respects including all labor, materials, equipment and services necessary, and shall be installed by personnel specifically experienced in plumbing systems.

1.02 WORK INCLUDED

- A. Work included shall be as indicated on the drawings, including but not limited to the following:
 - 1. Pipe Hangers
 - 2. Supports

PART 2 - PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

- A. All pipe hangers and supports installed in exterior location shall be galvanized.
- B. Split ring hangers with swivel adjuster, solid rods and rod sockets: Steel pipe Fee and Mason Fig. 212, or Super-Strut M-718T.
- C. Adjustable Beam Clamps: Fee and Mason Fig. 246 or Super-Strut Fig. CM-754 (where this type is not adaptable, an approved top beam, side beam, or channel clamp by Fee and Mason or Super-Strut, will be acceptable).
- D. Trapeze Hangers: Super-Strut A-1200 or Unistrut P-1000 channel with pipe clamps and guides as required (include type to be used in submittal).
- E. Riser Clamps (4" Pipe and Less): Fee and Mason Fig. 241 or Super-Strut C-720.
- F. Offset Pipe Clamps: Fee and Mason Fig. 366, or Super-Strut C-720L.
- G. Pipe Isolation: All piping shall be isolated from dissimilar metals, other piping, any part of the building, framing, conduit, supports etc., with Elmdor/Stoneman Series 500 trisolator or approved equal.

PART 3 - EXECUTION

3.01 PIPE HANGERS AND SUPPORTS

- A. Horizontal piping shall be supported as follows: Use beam clamps for attachment to structural steel surfaces and expansion type inserts for attachment to concrete surfaces. Clamps and inserts shall be sized for the required hanger rod and comply with all applicable codes and safety regulations. The use of "C" clamps designed to attach

threaded rod to one side of a steel beam flange shall not be used unless they are provided with a restraining strap, or hook to the opposite beam flange.

- B. Piping shall be firmly held in place by adjustable split ring malleable iron hangers, supports and pipe rests, located adjacent to fittings at each offset or change of direction, at the ends of branches over 5' long, at riser pipes and along piping where necessary to prevent sags, bends, or vibration. All hangers and supports shall be of a design that will support the combined weight of pipe, fluid and insulation.
- C. Pipe straps shall be heavy gauge galvanized iron factory fabricated to fit against supporting surface when installed. Makeshift devices will not be acceptable. No plumbing tape is allowed.
- D. Lateral bracing shall be provided at every fourth hanger where hanger rods are more than 18" in length.
- E. Hangers supported by concrete structure shall be attached by cast iron manufactured concrete inserts installed at the time concrete is poured and each insert shall be provided with through rods lapped over structural reinforcing.
- F. Hangers supported by structural steel shapes shall be attached by cast-iron clamps designed for use on the specific steel shape and equipped with retainers.
- G. All hangers shall be attached to halter rod by means of adjustable swivel, turnbuckle or double nut to allow height adjustment.
- H. Vertical piping shall be suitably supported from the building structure where required by means of malleable iron or steel pipe clamps of ample size, either bolted or welded to the pipe and supported at the floor slab. Supports where indicated on the drawings shall also act as anchors to allow for expansion and contraction of the piping. Provide rubber isolators for clamps where required for elimination of vibration and sound to the structure.
- I. Miscellaneous Supports: Wall brackets, etc., shall be provided where required in accordance with the best standard practice of the trade in a manner as approved by the Architect.
- J. In the event additional structural steel is required to transmit loads to main structure, it shall be provided at no additional cost to the Owner.
- K. Soil, Waste, Vent and Down Spouts: Hanger rod sizes shall be as follows:

1-1/2" to 2" Pipe	3/8" Rod
2-1/2" to 3-1/2" Pipe	1/2" Rod
4" to 5" Pipe	5/8" Rod

L. Domestic Water:

- 1. Hanger Spacing shall be as Follows for Copper Tubing:

1/2" to 3/4" Pipe	5'-0"
1" Pipe	6'-0"

1-1/4" Pipe 7'-0"

1-1/2" to 2" Pipe 8'-0"

2. Hanger Rod Sizes shall be as Follows:

3/4" to 2" Pipe 3/8" Rod

2-1/2" to 3-1/2" Pipe 1/2" Rod

M. For horizontal installations, hangers or supports shall be provided for at least every other joint except when the developed length between supports exceeds 4'. If the developed length exceeds 4', hangers or supports shall be provided at each joint. Supports shall also be provided at each horizontal branch connection. Hangers, supports, or blocks shall be adequate to maintain alignment and prevent sagging or joint separation. Hangers, supports or blocks shall be placed on, or immediately adjacent to, the coupling, not to exceed 18". Adequate provisions shall be made to prevent "shear."

N. Vertical "no-hub" components shall be secured at each stack base, and at sufficiently close intervals to keep system in alignment and to adequately support the weight of the pipe and its contents.

O. Trap arms and similar branches must be firmly secured against movement in any direction. Closet bends shall be stabilized by firmly strapping and blocking. Where vertical closet stubs are used, they must be completely stabilized against all horizontal movement.

END OF SECTION 22 05 29

SECTION 22 05 33

PLUMBING IDENTIFICATION

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions, Supplementary Conditions, and Division 01, are a part of this section and the contract for this work and apply to this section as fully as if repeated herein. Furnish design, construct and install a complete plumbing piping system. The system shall be complete in all respects including all labor, materials, equipment and services necessary, and shall be installed by personnel specifically experienced in plumbing systems.

1.02 WORK INCLUDED

- A. Work included shall be as indicated on the drawings, including but not limited to the following:
 - 1. Equipment Labels
 - 2. Warning Signs and Labels
 - 3. Pipe Labels
 - 4. Stencils
 - 5. Valve Tags
 - 6. Warning Tags

1.03 SUBMITTALS

- A. Product Data: For each type of product indicated submit list of wording, symbols, letter size, and color coding for identification of plumbing.
- B. Samples: Included with the above submittals, shall be samples of each identification material and device used.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
- D. Valve numbering scheme.

1.04 COORDINATION

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.01 EQUIPMENT LABELS

- A. Manufacturers:
 - 1. Seton Name Plate Corp
 - 2. Craftmark Identification Systems
 - 3. Bunting Mechanical Identification Systems
 - 4. Or Approved Equal
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8" thickness minimum, and having predrilled holes for attachment hardware.
- C. Letter Color: White
- D. Background Color: Black
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2 1/2" x 3/4".
- G. Minimum Letter Size: 1/2" for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- H. Fasteners: Stainless Steel
- I. Adhesive: Contact type permanent adhesive, compatible with label and with substrate.
- J. Label Content: Include equipment's drawing designation or unique equipment number.
- K. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify drawing numbers where equipment is indicated (plans, details, and schedules), plus the specification section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.02 WARNING SIGNS AND LABELS

- A. Manufacturers:
 - 1. Seton Name Plate Corp
 - 2. Craftmark Identification Systems
 - 3. Bunting Mechanical Identification Systems
 - 4. Or Approved Equal
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8" thickness minimum, and having predrilled holes for attachment hardware.
- C. Letter Color: Red
- D. Background Color: White
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

- F. Minimum Label Size: Length and width vary for required label content, but not less than 2 ½" x ¾".
- G. Minimum Letter Size: ½" for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- H. Fasteners: Stainless Steel
- I. Adhesive: Contact type permanent adhesive, compatible with label and with substrate.
- J. Label Content: Include caution and warning information, plus emergency notification instructions.

2.03 PIPE LABELS

- A. Manufacturers:
 - 1. Seton Name Plate Corp
 - 2. Craftmark Identification Systems
 - 3. Bunting Mechanical Identification Systems
 - 4. Or Approved Equal
- B. General Requirements: Preprinted, color-coded with lettering indicating service, and showing flow direction.
- C. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.
- D. Self-Adhesive Pipe Labels: Printed plastic with contact type permanent adhesive backing.
- E. Pipe Label Contents: Including identification of piping service using same designations or abbreviates as used on drawings, pipe size, and an arrow indicating flow direction.
 - 1. Flow Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
 - 2. Lettering Size: At least 1-1/2" high.
- F. Letter Color: See section 3.B.4 below.
- G. Background Color: See section 3.B.4 below.

2.04 STENCILS

- A. Manufacturers:
 - 1. Seton Name Plate Corp
 - 2. Craftmark Identification Systems
 - 3. Bunting Mechanical Identification Systems
 - 4. Or Approved Equal
- B. General Requirements: Prepared with letter sizes according to ASME A13.1 for piping and minimum letter height of ¾" for access panel and door labels, equipment labels, and similar operational instructions.

- C. Material: Metal
- D. Stencil Paint Color: Exterior, gloss, black unless otherwise indicated. Paint me be in pressurized spray-can form.
- E. Identification Paint: Exterior in colors according to ASME A13.1 unless otherwise indicated.
- F. Letter Color: See section 3.B.4 below.
- G. Background Color: See section 3.B.4 below.

2.05 VALVE TAGS

- A. Manufacturers:
 - 1. Seton Name Plate Corp
 - 2. Craftmark Identification Systems
 - 3. Bunting Mechanical Identification Systems
 - 4. Or Approved Equal
- B. General Requirements: Stamped or engraved with ¼" letters for piping system abbreviation and ½" numbers.
- C. Material: Aluminum, 0.032" minimum thickness, and having predrilled or stamped holes for attachment hardware.
- D. Fasteners: Brass beaded chain.
- E. Valve Schedule: For each piping system to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate valve identification number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed or modulating) and variations for identification. Mark valves for emergency shutoff and similar special uses. Valve schedule shall be included in operation and maintenance data.
- F. Valve Tag Color: See section 3.C.2 below.
- G. Valve Letter Color: See section 3.C.2 below
- H. Valve Size and Shape: See section 3.C.2 below.

2.06 WARNING TAGS

- A. Manufacturers:
 - 1. Seton Name Plate Corp
 - 2. Craftmark Identification Systems
 - 3. Bunting Mechanical Identification Systems
 - 4. Or Approved Equal
- B. General Requirements: Preprinted or partially printed accident prevention tags.
- C. Material: Plasticized card stock with matte finish suitable for writing.
- D. Size: 3"x5-1/4" minimum

- E. Color: Yellow background with black lettering.
- F. Fasteners: Brass grommet and wire.
- G. Nomenclature: Large size primary caption such as "DANGER", "CAUTION", or "DO NO OPERATE".

PART 3 - EXECUTION

3.01 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulates.

3.02 INSTALLATION

A. EQUIPMENT LABELS

1. Install or permanently fasten labels on each major item of plumbing equipment.
2. Locate equipment labels where accessible and visible.

B. PIPE LABELS

1. Pipe color coding/painting per specification per the Whitebook/Greenbook 2018 Edition.
2. Stenciled Pipe Label Option: Stencil labels may be provided instead of manufactured pipe labels, at installer's option. Install stenciled pipe, complying with ASME A13.1, on each piping system.
 - Identification Paint: Use for contrasting background.
 - Stencil Paint: Use for pipe marking
3. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums, and exterior exposed locations as follows:
 - Near each valve and control device.
 - Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 - Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
 - At access doors, manholes, and similar access points that permit view of concealed piping.
 - Near major equipment items and other points of origination and termination.
 - Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 - On piping above removable acoustical ceilings. Omit intermediately spaced labels.

4. Pipe Label Color Schedule:

Domestic Water Piping

Background Color: Blue
Letter Color: White

Sanitary Waste Piping

Background Color: White
Letter Color: Green

C. VALVE LABELS

1. Install tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and hose bibb connections; and similar roughing-in connections of end use fixtures and units. List tagged valves in a valve schedule.
2. Valve Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:

Valve-Tag Size and Shape

Cold Water: 2" Round
Hot Water: 2" Round

Valve-Tag Color

Cold Water: Green
Hot Water: Green

Letter Color

Cold Water: Black
Hot Water: Black

D. WARNING TAGS

1. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 22 05 33

SECTION 22 07 00

PLUMBING INSULATION

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions, Supplementary Conditions, and Division 01, are a part of this section and the contract for this work and apply to this section as fully as if repeated herein. Furnish design, construct and install a complete insulated plumbing piping system. The system shall be complete in all respects including all labor, materials, equipment and services necessary, and shall be installed by personnel specifically experienced in insulation systems.

1.02 WORK INCLUDED

- A. The work covered by this specification consists of furnishing all labor, equipment, materials and accessories, and performing all operations required, for the correct installation of insulation on all piping, fittings, valves, controls and all other necessary items connected into the system subject to condensation or loss of heat.

1.03 SUBMITTALS

- A. Product Data: Provide product description, list of materials and thickness for each service or equipment scheduled, locations, and manufacturer's installation instructions.
- B. Shop Drawings: Submit list of insulation to be used for each service. Include installation details for valves, fittings, pipe and all other items to be insulated.
- C. Samples: Included with the above submittals, shall be samples of each insulation to be used.

1.04 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics and insulating cements.

1.05 QUALITY ASSURANCE

- A. Insulation Materials: Insulation materials must be manufactured at facilities certified and registered with an approved registrar to conform to ISO 9001 Quality Standard.
 - 1. Pipe insulation shall be preformed and furnished in standard lengths with ends cut square, conforming to the dimensional requirements of ASTM C 585.
 - 2. Insulation materials shall be asbestos free.
 - 3. All insulating products shall have a 25/50 flame spread/smoke developed rating as tested in accordance with ASTM E 84.
- B. Workmanship: All insulation to be installed by a licensed applicator and applied in accordance with the manufacturer's recommendations.

1. All work shall conform to accepted industry and trade standards for commercial and industrial insulations.
2. Surfaces to be insulated shall be clean and free of dirt, scale, moisture, oil and grease.

1.06 DELIVERY AND STORAGE OF MATERIALS

- A. Deliver all materials to the jobsite and protect the insulation against dirt, water, chemical and mechanical damage before, during and after installation. Do not install damaged insulation and remove it from the project site.
- B. Deliver insulation, coverings, cements, adhesives coatings etc. to the site in factory-fabricated containers with the manufacturer's stamp or label affixed showing fire hazard ratings of the products.
- C. Installed insulation which has not been weatherproofed shall be protected from inclement weather by approved waterproof sheeting installed by the contractor. Any wet or damaged insulation shall be removed and replaced by the contractor at no additional cost.

PART 2 - PRODUCTS

2.01 INSULATION

- A. All domestic hot water supply piping shall be insulated with Johns Manville, or approved equal, Micro-Loc HP preformed fiber glass pipe insulation, complying with ASTM C 547, Class 13 (to 850°F), rigid, molded pipe insulation, noncombustible.
 1. Thermal Conductivity ("k"): 0.23 Btu•in/(hr•ft²•°F) at 75°F mean temperature per ASTM C 518.
 2. Maximum Service Temperature: 850°F.
 3. Rated 25/50 per ASTM E 84, UL 723 and NFPA 255.
 4. When being used over stainless steel, product must comply with the requirements of ASTM C 795.
 5. All-Service (ASJ) Vapor-Retarder Jacket: A white, kraft paper, reinforced with a glass fiber yarn and bonded to an aluminum foil, with selfsealing longitudinal closure laps (SSL) and butt strips.
- B. Field-Applied Jackets:
 1. PVC Plastic: Zeston 2000 Series. One piece, molded type fitting covers and jacketing material, gloss white.
 2. Connections: Tacks, pressure sensitive, color matching, vinyl tape.
 3. Aluminum Jacket: 0.016" thick sheet, (smooth/ embossed) finish, with longitudinal slip joints and 2" laps, die-shaped fitting covers with factory-attached protective liner.
 4. Stainless Steel Jacket: Type 304 stainless steel, 0.10", (smooth/ corrugated) finish.

2.02 FITTINGS, VALVES, TEES, ETC.

- A. All fittings, valves, tees, flanges, connections, etc. shall be insulated and covered with the appropriate Zeston 2000 PVC or metal insulated fitting cover.
 - 1. Fittings shall be manufactured from ultraviolet resistant PVC.
 - 2. Connections: Tacks, pressure sensitive, color matching, vinyl tape, Perma-Weld Adhesive.

2.03 EXPOSED DRAIN AND SUPPLY PIPES BELOW LAVATORIES

- A. Insulate all drainage piping including all hot and cold water valve and supplies under lavatories. PVC Insulators to comply with CBC (California Building Code) shall meet Testing Standard ASTM E 84-07 with a 25 flame spread/50 smoke. Insulators to meet and be listed with IPC/IAPMO Property and Material Standard PS 94-2008. With a one-piece design, fusion molded fabrication and pliable for high flexibility requirements. PVC insulators material to be 1/8" thick. Surfaces to be soft, smooth, nonabsorbent, easy to clean U/V inhibited, antimicrobial, antifungal properties. Insulator shall have a dual fastening system which consists of fusion bonded Velcro fastener strips for full slit enclosure and tamper resistant, smooth, non-abrasive snap-locking fasteners. Surfaces to be soft, smooth, non-absorbent, easy to clean U/V inhibited, antimicrobial, antifungal properties. Insulators shall have a dual fastening system which consists of fusion bonded Velcro fastener strips for full slit enclosure and tamper resistant, smooth, non-abrasive snap-locking fasteners. Manufacturer: Plumberex or approved equal Brand: Handy-Shield Maxx

PART 3 - EXECUTION

3.01 PREPARATION

- A. Verify that the fiber glass pipe insulation may be installed in accordance with project drawings, operation performance parameters and limitations of the specification.
- B. Tests of the piping system shall be completed prior to insulation application.
- C. All piping shall be cleaned of foreign substances and free of surface moisture prior to insulation application.

3.02 INSTALLATION

- A. Pipe insulation thickness:
 - 1. Runouts to individual fixtures that are no more than 12 feet long and smaller than 2" shall be insulated with 0.5" insulation.
 - 2. Pipe sizes up to 4" shall be insulated with 1.0" insulation.
- B. General:
 - 1. All pipe insulation shall be continuous through wall and ceiling openings and sleeves, except where fire stop materials are required.
 - 2. All surface finishes are to be extended to protect all surfaces, ends and raw edges of insulation.

3. Rigid insulation inserts shall be installed on pipe sizes 1½" or larger under outside hangers. Inserts shall be of equal thickness to the adjoining insulation and shall be provided with vapor retarder seals where required.
4. Insulation inserts shall not be less than the following lengths:

Pipe Size, In.	Length, In.
1½ – 2½	10

5. Galvanized metal shields shall be applied between hangers or supports and the pipe insulation. Shields shall be formed to fit the insulation and shall extend up to the centerline of the pipe and the length specified for the insulation hanger inserts less 4" to allow for vapor retarding butt joints on each side of the shields.
 6. Specified adhesives, mastics and coatings shall be applied at the manufacturer's recommended minimum coverage per gallon.
 7. When Zeston 2000 PVC Insulated Fitting Covers are used, care shall be taken to ensure that the surface temperature of the fitting will be kept below 150°F by the use of a proper thickness of insulation and by keeping the PVC cover away from contact with, or exposure to, sources of direct or radiant heat.
- C. Indoor piping: This portion of the installation procedure is applicable for piping in all indoor areas, including concealed spaces, mechanical rooms and inhabited areas.
1. Preformed fiber glass pipe insulation with all service jacket shall be applied to piping with all joints tightly fitted to eliminate voids.
 2. Longitudinal jacket laps and butt strips shall be smoothly secured according to manufacturer's recommendations.
 3. When adhered, the lap and butt strips must be pressurized by rubbing firmly with a plastic squeegee or the back of a knife blade to ensure positive closure.
 4. The installed thickness shall be enough that the surface temperature shall be kept below 150°F.
 5. For pipe exposed in mechanical equipment rooms or in finished spaces less than 10' above finished floor, finish with aluminum jacket.
 6. Fittings, valves and flanges shall be insulated with PVC insulated fitting covers and Hi-Lo Temp insulation inserts per manufacturer's recommendations.

END OF SECTION 22 07 00

SECTION 22 11 00

DOMESTIC WATER PIPING AND SPECIALTIES

PART 4 - GENERAL

4.01 GENERAL CONDITIONS

- A. The General Conditions, Supplementary Conditions, and Division 01, are a part of this section and the contract for this work and apply to this section as fully as if repeated herein. Furnish design, construct and install a complete domestic water piping system. The system shall be complete in all respects including all labor, materials, equipment and services necessary, and shall be installed by personnel specifically experienced in plumbing installation.

4.02 WORK INCLUDED

- A. Work included shall be as indicated on the drawings, including but not limited to the following:
 - 1. Copper Pipe
 - 2. Valves and Fittings
 - 3. Piping Specialties

4.03 Quality assurance

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of plumbing specialties and are based on the specific system indicated. Refer to Division 01 Section 016000 "Product Requirements."
- B. Plumbing specialties shall bear label, stamp, or other markings of specified testing agency.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for piping materials and installation.
- E. NSF Compliance:
 - 1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components. Include marking "NSF-PW" on plastic potable-water piping and "NSF-DWV" on plastic drain, waste, and vent piping.
 - 2. Comply with NSF 61, "Drinking Water System Components--Health Effects, Sections 1 through 9," for potable domestic water plumbing specialties.

PART 5 - PRODUCTS

5.01 All Domestic Water Piping:

- A. Above grade shall be type "K" copper tubing hard drawn with wrought copper solder sweat fittings. Where below grade and within 5' of building line, shall be type "K" copper tubing in single continuous length with polyethylene outer tubing.

5.02 VALVES AND FITTINGS

- A. Ball valves 2" and smaller (Lead Free): Two-piece alloy C69300 (copper-zinc-silicon) body; sweat or threaded ends, alloy C69300 ball; virgin PTFE seat ring; brass alloy C36000 packing gland, O-Ring EPDM, alloy 69300 blowout-proof stem; 600 psig CWP. Nibco T/S 685-80-LF or approved equal.
- B. Spring loaded check valves 2" and smaller (Lead Free): Alloy C87850 body, sweat or threaded ends, stainless steel spring, stainless steel stem, stainless steel disc holder, PTFE disc; 250 PSI CWP. Nibco S/T 480-Y-LF or approved equal.
- C. Swing check valves 2" and smaller (Lead Free): Alloy C87850 body, sweat or threaded ends, Y-pattern, renewable PTFE seat disc, 200 PSI CWP, suitable for installation in a horizontal or vertical line with flow upward. Nibco S/T 413-Y-LF or approved equal.
- D. Balance valves 2" and smaller (Lead Free): Brass body, stainless steel ball, sweat or threaded ends, glass and carbon filled TFE seat, brass readout valves with EPT check valves, EPDM stem "O" ring, , suitable for 400 PSIG water working pressure at 250°F for NPT models and 200 PSIG water working pressure at 250 °F for sweat models. Bell & Gossett CB-LF or approved equal.
- E. Stops (Lead Free): Heavy pattern brass chrome plated with 3/8" O.D. compression outlet, 1/2" I.P.S. inlet and riser to match application. Provide stuffing box lock-shield with loose key and shallow stainless steel escutcheon in all exposed public applications. Note: Valve must weigh no less than 6.5 ounces. Dual outlet stops shall be provided with optional brass stem. Stops shall be Brass Craft Compliant KT or approved equal.
- F. Combination Pressure and Temperature Relief Valve (Lead Free): Lead free brass body, temperature and pressure actuated, stainless steel stem and spring, thermostat with non-metallic coating, test lever, suitable for 125 psig water working pressure at 240°F, sized for full BTUH input and operating pressure of equipment, with valve capacity on metal label. For equipment less than or equal to 200,000 BTUH input, provide AGA, U.L. or ASME listed and labeled valve. Provide ASME listed and labeled valve for larger equipment. Temperature and pressure relief valve shall be sized per AGA rating for BTUH input. Watts LF40XL.

5.03 PIPING SPECIALTIES

- A. Unions in Copper Tubing 2" and Smaller: ANSI B16.18 cast bronze union coupling or ANSI B15.24 class 150 bronze flanges. Nibco 733.
- B. Dielectric Fittings:
- C. Provide fittings and unions to install between pipes made of dissimilar metals. Unions shall be factory certified to withstand a minimum of 600 volts on a dry line with no flash over and shall be rated to 180°F at 250 PSI. Flanged fittings shall have a bolt isolator to insulate each bolt in the flange and shall be rated at 175 PSI. Bolts shall be constructed of

durable, corrosion resistant polysulfone. Flanged fittings shall have a Standard Gasket "A" (GA) suitable for water, air, oil, natural gas, propane, gasoline, kerosene, mineral oil, vegetable oil and alkalines in 210°F at 250 PSI. Threaded end connections shall meet ANSI B2.1 and flanged fittings shall meet ANSI B16.42 (iron) and ANSI B16.24 Bronze. Unions shall conform to ANSI B16.39, including hydrostatic strength and air pressure testing. Dielectric fittings and unions shall be constructed of the following materials:

- | | | |
|----|----------------------|---------------|
| 1. | Gray Iron | ASTM A48-83 |
| 2. | Malleable iron parts | ASTM A-197-79 |
| 3. | Steel parts | ASTM A108 |
| 4. | Bronze parts | ASTM B-16 |
| 5. | Zinc parts | ASTM B633-85 |

- D. Dielectric fittings shall be WATTS Series 3000.
- E. Water hammer arrestors: ANSI A112.26.1, ASSE 1010, sized in accordance with PDI WH-201, precharged piston type constructed entirely of stainless steel, threaded brass adapter, brass piston with O-ring seals, FDA approved silicone lubricant, suitable for operation in temperature range 35°F to 150°F maximum 150 psig working pressure, 1500 psig surge pressure. J. R. Smith Series 5000.

PART 6 - EXECUTION

6.01 pipe installation

- A. Joints in copper tubing shall be made by first thoroughly cleaning the surface of the pipe and fittings, applying flux and sweating with 95-5 tin Antimony "soft-solder."
- B. Pipe shall be carefully cleaned before installation. The ends of threaded pipe shall be reamed out full size with a long taper reamer so as to be partially bell-mouthed and perfectly smooth.
- C. Flush out all water mains with water so as to obtain free flow. Remove all obstructions and defects discovered. Remove and re-lay any sections and pipe already laid and found to be defective or which has had grade or joints disturbed.
- D. Openings in pipes, drains, fittings, apparatus and equipment shall be kept covered or plugged to prevent foreign substance from entering.
- E. Run piping free of traps, sags, or bends. Grade and valve for complete drainage and control of the system.
- F. All piping to be run to maintain headroom and keep passageways and openings clear. Run parallel and straight with adjacent walls or ceilings to present a uniform appearance.
- G. All piping, except where noted otherwise on plans, shall be concealed in walls or above ceilings.
- H. Bending or forcing of pipe will not be allowed. Use fittings for all offsets or changes in alignment of piping.

- I. Proper provision shall be made for expansion and contraction by means of fittings and anchors and supports of all piping.
- J. Street elbows, bushings and long screw fittings will not be allowed.
- K. All piping shall be isolated from dissimilar metals, other piping, any part of the building, framing, conduit, supports etc., with Elmdor/Stoneman Series 500 trisolator or approved equal.
- L. PDI sized water hammer arresters shall be installed at the end of the branch line between the last two self-closing water faucet / flush valve fixtures served. When the branch line exceeds 20'-0" in length, an additional water hammer arrester shall be installed.
- M. Unions shall be installed after each screw-type valve, connections for all equipment, appliances and as required for erection and maintenance. No unions shall be installed in a concealed location.
- N. Install isolation unions on all connections between dissimilar metals (galvanized steel, black steel to copper).

END OF SECTION 22 11 00

SECTION 22 13 00

SANITARY WASTE, VENT, AND SPECIALTIES

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions, Supplementary Conditions, and Division 01, are a part of this section and the contract for this work and apply to this section as fully as if repeated herein. Furnish design, construct and install a complete sanitary waste system. The system shall be complete in all respects including all labor, materials, equipment and services necessary, and shall be installed by personnel specifically experienced in plumbing systems.

1.02 WORK INCLUDED

- A. Work included shall be as indicated on the drawings, including but not limited to the following:
 - 1. Sanitary Waste Piping
 - 2. Pipe Fittings

PART 2 - PRODUCTS

2.01 FITTINGS AND PIPING

- A. Soil, Waste, and Vent Above and Below Grade Within 5' of Building Line: No hub service weight cast iron soil pipe and fittings conforming to the latest issue of CISPI 301, ASTM A-888. Pipe and fittings shall be GreenSpec listed. Manufacturer shall be Charlotte, Tyler, AB&I, or approved equal.
- B. Joints: Joints for hubless pipe and fittings shall conform to the manufacturer's installation instructions and local code requirements. Hubless couplings shall be composed of a heavy duty four or six band coupling, stainless steel shield / clamp assembly and a fire resistant neoprene gasket conforming to ASTM C1540, CISPI 310, Factory Mutual 1680 Class 1, and bear the NSF trademark, manufactured by Anaco Husky SD4000, Fernco, MiFab or approved equal. Joints for hub and spigot shall be installed with compression gaskets conforming to the requirements of ASTM C-564, or shall be installed with lead and oakum.
- C. Sewer from 5' outside building except as otherwise noted on plans; Schedule 40 PVC piping conforming to ASTM D 2665, fittings conforming to ASTM D 2466 with solvent welded joints conforming to ASTM D2564.
- D. Vent Piping: Service weight cast-iron with same joint as used for soil and waste above grade.

2.02 CLEANOUTS

- A. Wall Cleanouts: J.R. Smith Fig. 4472, or approved equal, series countersunk plug with chrome plated cover and screws.

2.03 ROOF FLASHING

- A. Furnish and install on each pipe passing through the roof, a "Stoneman" No. 1100-7, or approved equal, six pound, seamless lead flashing assembly. Flashing shall have reinforced boot and be complete with cast iron counter flashing sleeve and Permaseal waterproofing compound. All vent pipes shall be terminated 7" above the roof.

PART 3 - EXECUTION

3.01 PIPE INSTALLATION

- A. No-Hub cast-iron Soil Pipe Institute Pamphlet #100 and the I.A.P.M.O. IS-6-75.
- B. All sanitary sewers and waste lines shall grade as indicated on drawings. The sections of the pipe shall be laid and fitted so that when completed the pipe will have smooth and uniform invert. Water shall not be allowed in the trenches while the pipes are being laid. Dirt, cement, or any other superfluous material of any description shall be carefully removed from the interior of the piping system as the work progresses. Constant inspection shall be made in pipe and fittings during and after all installation for possible fractures and failures caused by installation. Backfill so as not to disturb pipe or jointing.
- C. Flush out all sanitary drains with water so as to obtain free flow. Remove all obstructions and defects discovered. Remove and re-lay any sections and pipe already laid and found to be defective or which has had grade or joints disturbed.
- D. Openings in pipes, drains, fittings, apparatus and equipment shall be kept covered or plugged to prevent foreign substance from entering.
- E. Run piping free of traps, sags, or bends. Grade and valve for complete drainage and control of the system.
- F. All piping to be run to maintain headroom and keep passageways and openings clear. Run parallel and straight with adjacent walls or ceilings to present a uniform appearance.
- G. All piping, except where noted otherwise on plans, shall be concealed in walls or above ceilings.
- H. Bending or forcing of pipe will not be allowed. Use fittings for all offsets or changes in alignment of piping.
- I. Vents shall penetrate through the roof with water-tight flashing and shall terminate no less than 7" above the roof and at least 1'-6" from vertical walk and parapets. Coordinate with ventilation plans. Locate all terminations at least 10'-0" from air intakes or windows.

3.02 CLEANOUTS

- A. As specified (see plans for size), cleanouts shall be caulked into pipe where shown on plans under countertops where they occur in walls to avoid their being too conspicuous. Cleanouts shall be accessible in all cases and shall be brought to surface on "Y" branches. All cleanouts shall be provided with removable floor or wall plate as herein specified.
- B. In addition to the cleanouts shown on the plans, install cleanouts in all horizontal lines at each aggregate change of direction exceeding 135°, and at the base of any vertical riser longer than 8'-0". Install cleanout outside the building at the lower end of the building drain and extend to grade.

END OF SECTION 22 13 00

SECTION 22 14 00

FACILITY STORM DRAINAGE PIPING AND SPECIALTIES

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions, Supplementary Conditions, and Division 01, are a part of this section and the contract for this work and apply to this section as fully as if repeated herein. Furnish design, construct and install a complete storm drain system. The system shall be complete in all respects including all labor, materials, equipment and services necessary, and shall be installed by personnel specifically experienced in storm drain systems.

1.02 WORK INCLUDED

- A. Work included shall be as indicated on the drawings, including but not limited to the following:
 - 1. Storm Drainage Piping
 - 2. Pipe Fittings
 - 3. Piping Specialties

PART 2 - PRODUCTS

2.01 FITTINGS AND PIPING

- A. Downspouts Above and Below Grade Within 5' of Building Line: No hub service weight cast iron soil pipe and fittings conforming to the latest issue of CISPI 301, ASTM A-888. Pipe and fittings shall be GreenSpec listed. Manufacturer shall be Charlotte, Tyler, AB&I, or approved equal.
- B. Joints: Joints for hubless pipe and fittings shall conform to the manufacturer's installation instructions and local code requirements. Hubless couplings shall be composed of a stainless steel shield, clamp assembly and an elastomeric sealing sleeve conforming to CISPI 310. Joints for hub and spigot shall be installed with compression gaskets conforming to the requirements of ASTM C-564, or shall be installed with lead and oakum.
- C. Storm Drainage and Downspouts from 5' outside building except as otherwise noted on plans; Schedule 40 PVC piping conforming to ASTM D 2665, fittings conforming to ASTM D 2466 with solvent welded joints conforming to ASTM D2564.

2.02 PIPING SPECIALTIES

- A. Tracer Wire: Provide on all plastic pipe No. 10 AWG, TW insulated copper wire. Spiral wrap around complete length of all plastic piping at approximately 2' intervals, terminate above grade or in yard box with a 24" pipe.

2.03 BOXES

- A. "Brooks Products" 3, or approved equal, L concrete with self-closing cast-iron cover 10 x 20 or smaller, and concrete lid for larger boxes. Cover to be marked with name of service.

PART 3 - EXECUTION

3.01 PIPE INSTALLATION

- A. No-Hub cast-iron Soil Pipe Institute Pamphlet #100 and the I.A.P.M.O. IS-6-75.
- B. All storm drains shall grade as indicated on drawings. The sections of the pipe shall be laid and fitted so that when completed the pipe will have smooth and uniform invert. Water shall not be allowed in the trenches while the pipes are being laid. Dirt, cement, or any other superfluous material of any description shall be carefully removed from the interior of the piping system as the work progresses. Constant inspection shall be made in pipe and fittings during and after all installation for possible fractures and failures caused by installation. Backfill so as not to disturb pipe or jointing.
- C. Flush out all drains with water so as to obtain free flow. Remove all obstructions and defects discovered. Remove and re-lay any sections and pipe already laid and found to be defective or which has had grade or joints disturbed.
- D. Openings in pipes, drains, fittings, apparatus and equipment shall be kept covered or plugged to prevent foreign substance from entering.
- E. Run piping free of traps, sags, or bends. Grade and valve for complete drainage and control of the system.
- F. All piping to be run to maintain headroom and keep passageways and openings clear. Run parallel and straight with adjacent walls or ceilings to present a uniform appearance.
- G. All piping, except where noted otherwise on plans, shall be concealed in walls or above ceilings.
- H. Bending or forcing of pipe will not be allowed. Use fittings for all offsets or changes in alignment of piping.

END OF SECTION 22 14 00

SECTION 22 40 00

PLUMBING FIXTURES

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions, Supplementary Conditions, and Division 01, are a part of this section and the contract for this work and apply to this section as fully as if repeated herein. The system shall be complete in all respects including all labor, materials, equipment and services necessary, and shall be installed by personnel specifically experienced in plumbing systems.

1.02 WORK INCLUDED

- A. Work included shall be as indicated on the drawings, including but not limited to the following:
 - 1. Plumbing Fixtures
 - 2. Fixture Supports

PART 2 - PRODUCTS

2.01 PLUMBING FIXTURES

- A. Plumbing fixtures shall be as shown in equipment schedule.
- B. Reference is made to Crane Company, it is understood to mean that equivalent fixtures as manufactured by Elkay, American Standard, Kohler, Eljer, or approved equal, are acceptable if used throughout. Faucets by Symmons, equivalents by Zurn, T & S, Bradley, or approved equal, are acceptable. Equivalent toilet seats by Beneke, Olsonite, or approved equal, are acceptable. Equivalent carrier, floor drains, etc. by J.R. Smith, Josam, Wade, Zurn, or approved equal, are acceptable.
- C. All sinks shall have a clean-out.

PART 3 - EXECUTION

3.01 FIXTURE INSTALLATION

- A. All plumbing fixtures shall be bedded and caulked along joint at walls, countertops, and other intersecting surfaces with Vulkem white silicone, use clear at stainless steel fixtures.
- B. Plumbing fixture trim and exposed supplies and waste shall be brass with polished chrome plated finish. Individual loose key stops, or, so specified, screw driver stops, shall be provided for all supplies, and unless integral with valves or faucets, unless otherwise approved by Architect, shall be mounted under the fixture. Exposed supplies and wastes through walls shall be provided with polished chrome plated cast brass wall escutcheons.
- C. Fixtures with hangers or supporting arms shall have hangers or arms securely mounted on a 1/4" thick x 6" wide steel wall plate which shall extend at least one stud beyond the first

and last fixture mounting points. Concealed arm assemblies shall be attached to plates by four 3/8" x 1-1/4" steel bolts and nuts, and hangers and exposed arms by 5/16" minimum full thread steel studs and jamb nuts. Plates shall be drilled and tapped at the time of fixture installation.

- D. Wall plates shall be recessed flush with studs and shall be securely attached to each stud crossed. In steel stud construction, a 1-1/2" x 18" long furring channel shall be attached to each notched stud with fillet welds 1" long on 6" centers front and back. Plates shall be continuous fillet welded at both top and bottom to each furring channel.

END OF SECTION 22 40 00

SECTION 22 63 13

NATURAL GAS PIPING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions, Supplementary Conditions, and Division 01, are a part of this section and the contract for this work and apply to this section as fully as if repeated herein. The system shall be complete in all respects including all labor, materials, equipment and services necessary, and shall be installed by personnel specifically experienced in plumbing systems.

1.02 WORK INCLUDED

- A. Work included shall be as indicated on the drawings, including but not limited to the following:
 - 1. Steel Pipe
 - 2. Pipe Fittings

1.03 EXCAVATION AND BACKFILL

- A. See other Divisions for excavation and backfill requirements.
- B. Underground piping shall be installed with a minimum of 24" cover from finish grade and deeper as noted on drawings. Excavation depths shall be coordinated with other trades.
- C. Excavation for pipes shall be cut a minimum of 6" below the required grade. A 6" bed of sand or other approved material shall be then placed and properly compacted to provide an accurate grade and uniform bearing throughout the length of the pipe.
- D. Sand used shall be certified to a resistance of not less than the surrounding soil when wet with distilled water and shall consist of clean, natural, washed sand. The particles size shall pass through a 3/8" screen, 90% of them will pass through a 1/4" screen and not more than 25% will pass through a No. 50 screen.
- E. Backfilling will not be placed until the work has been inspected, tested and approved.
- F. Clods or lumps 2" in size or larger will not be permitted in the backfill. If the excavated material is not suitable, adequate material shall be provided by hauling from other locations.
- G. Surplus earth or material remaining after backfilling shall be removed from the site as indicated in "Earthwork" section.

PART 2 - PRODUCTS

2.01 NATURAL GAS PIPING AND ACCESSORIES:

- A. Gas Piping Above Grade: ASTM A53 or A106 Schedule 40 ASTM black steel screwed pipe with black banded 150 lb. malleable iron fittings ASTM B16.3. All gas piping and fittings exterior to the building shall be galvanized.
- B. Gas Piping Above Grade: 3" and larger shall ASTM A53 or A106 Schedule 40 ASTM black steel be butt welded with factory-made wrought steel butt welding fittings ASTM 16.9. All gas piping and fittings exterior to the building shall be galvanized.
- C. Gas Piping Below Grade: Polyethelene (PE) to conform to ASTM D 2513 with heat fusion fittings to conform to ASTM D 2683/3261, or ASTM D2513.
- D. Gas Shut-Off Valves 2" and smaller: Ball valve, bronze body, threaded ends, brass stem and ball, epoxy coated aluminum handle, PTFE seals, listed for use as natural gas shut-off. Valve shall meet CGA CR91.002, AGA 3-88, CAN 1-9.1, CAN/CGA 9.2 and ANSI Z21.15 standards and codes.
- E. Gas Shut-Off Valves 2-1/2" and larger: Lubricated plug valve, flanged ends, nickel plated cast iron plug, lever handle, 200 psi W.O.G., AGA listed for use as natural gas shut-off. Homestead 612.
- F. Gas Pressure Regulating Valve: Die cast aluminum body, galvanized valve head and aluminum orifice. Manufactured by American Meter Company.
- G. Earthquake Actuated Gas Valve: Valve shall meet, or exceed California Standard No. 12-23-1. Valve shall be fabricated from aluminum, and actuated by a stainless steel ball and have a single step manual reset lever. Manufactured by Safe-T-Quake.
- H. Tracer Wire: Provide on all plastic pipe No. 10 AWG, TW insulated copper wire. Spiral wrap around complete length of all plastic piping at approximately 2' intervals, terminate above grade or in yard box with a 24" pipe.

PART 3 - EXECUTION

3.01 PIPE INSTALLATION

- A. Pipe shall be carefully cleaned before installation. The ends of threaded pipe shall be reamed out full size with a long taper reamer so as to be partially bell-mouthed and perfectly smooth.
- B. Openings in pipes, drains, fittings, apparatus and equipment shall be kept covered or plugged to prevent foreign substance from entering.
- C. Run piping free of traps, sags, or bends.

- D. All piping to be run to maintain headroom and keep passageways and openings clear. Run parallel and straight with adjacent walls or ceilings to present a uniform appearance.
- E. All piping, except where noted otherwise on plans, shall be concealed in walls or above ceilings.
- F. Bending or forcing of pipe will not be allowed. Use fittings for all offsets or changes in alignment of piping.
- G. Proper provision shall be made for expansion and contraction by means of fittings and anchors and supports of all piping.
- H. Street elbows, bushings and long screw fittings will not be allowed.
- I. All piping shall be isolated from dissimilar metals, other piping, any part of the building, framing, conduit, supports etc., with Elmdor/Stoneman Series 500 trisolator or approved equal.

3.02 TESTS AND ADJUSTMENTS

- A. No piping work, fixtures, or equipment shall be concealed or covered until inspected and approved by the Engineer, who shall be notified when the work is ready for inspection. All work shall be completely installed, tested as required by this section and the State Ordinances and State Safety Orders, and shall be leak-tight before inspection is requested. All tests shall be repeated upon request to the satisfaction of those making the inspection.
- B. Piping tests shall be made with the pressure listed below. Use a calibrated Bristol Pressure Recorder on all tests. Recorder range shall be 0 - 300 pounds or required range for specific test.

Gauge Pressure		
<u>Type of System</u>	<u>(Lbs. per sq. inch, gauge)</u>	<u>Test Medium</u>
Fuel Gas	50 PSI	Compressed Air

- C. Test pressure in pounds per square inch, gauge, are given as initial pressure to be applied to lines being tested, together with test medium.
- D. Tests are to be applied for a minimum period of twenty-four (24) hours and until tests are complete.
- E. Final pressures at the end of test period shall be no more nor less than that caused by expansion or contraction of the test medium due to temperature changes.

END OF SECTION 22 63 13

SECTION 26 05 10

GENERAL ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections.
- B. All Specification Sections under Division 26.

1.02 SUMMARY

- A. This Section includes:
 - 1. Definitions.
 - 2. Excavation.
 - 3. Coordination of work.
 - 4. Cleaning, patching repairing and painting.
 - 5. Guarantees.
 - 6. Field test.

1.03 REFERENCES

- A. American National Standards Institute, Inc. (ANSI) Publications:
 - 1. C2 - National Electrical Safety Code.
- B. California Code of Regulations (CCR) Publications:
 - 1. Title 8, Industrial Relations.
 - 2. Title 19, State Fire Marshal Regulations.
 - 3. Title 24, Part 2, Energy Conservation Standards.
 - 4. Title 24, Part 3, CCR, Latest Edition California Electrical Code.
 - 5. Title 24, Part 9, CCR, Latest Edition California Fire Code.
- C. National Electrical Manufacturers Association (NEMA) Publication: ICS6-93 Enclosures for Industrial Controls and Systems.
- D. National Fire Protection Association (NFPA) Publications:
 - 1. 70 National Electrical Code (NEC).
 - 2. 70B Recommended Practice for Electrical Equipment Maintenance.
- E. State of California Public Utilities Commission (Cal. P.U.C.) Publications:
 - 1. G.O. 95 Rules for Overhead Electric Line Construction.
 - 2. G.O. 128 Rules for Construction of Underground Electrical Supply and Communications Systems.

1.04 DEFINITIONS

The following definitions apply to terms used in these standards.

- A. The words "work" or "electrical work" include products, labor, equipment, tools, appliances, transportation, and all related items directly or indirectly required to complete the specified and indicated electrical installation.

- B. The word "concealed" shall mean that the installation will not be visible when all permanent or removable elements of the construction are in place. The word "exposed" shall mean that the installation is visible when all permanent or removable elements of the construction are in place.
- C. The word "code" shall mean any and all regulations and requirements of regulatory bodies, public and private, having jurisdiction over the work involved.
- D. The word "product" used in Division 26 means all material, equipment, machinery, and/or appliances directly or indirectly required to complete the specified and/or indicated electrical work.
- E. The words "standard product" shall mean a manufactured product, illustrated and/or described in catalogs or brochures that is in general distribution prior to the date of issue of construction documents. Products will generally be identified by means of a specific catalog number and manufacturer's name.
- F. "Provide" means furnish, install, connect and test unless otherwise noted.
- G. The words "conduit" and "duct" are used interchangeably, and have the same meaning.
- H. "UFER" Ground: See Section 26 0526, "Grounding and Bonding for Electrical Systems".

1.05 DRAWINGS AND SPECIFICATIONS

- A. Electrical drawings are diagrammatic but shall be followed as closely as actual construction and work of the other sections shall permit. Size and location of equipment is drawn to scale wherever possible.
- B. Drawings and specifications are for the assistance and guidance of the Contractor. Exact locations, distances, and levels will be governed by the building. The Contractor shall make use of data in all the contract documents to verify information at the building site.
- C. In any case where there appears to be a conflict or ambiguity between that which is shown on the electrical drawings or in the electrical specifications and any other part of the Contract Documents, the Contractor shall notify and secure directions from the Architect.
- D. Drawings and specifications are intended to complement each other. Where a conflict or ambiguity exists between the requirements of the drawings and the specifications, request clarification. Do not proceed with work without direction.
- E. The Architect shall interpret the drawings and the specifications. The interpretation by the Architect as to the true intent and meaning thereof and the quality, quantity, and sufficiency of the materials and workmanship furnished there under shall be accepted as final and conclusive.
- F. In the case of conflicts or ambiguities not clarified prior to the bidding deadline, use the most costly alternative (better quality, greater quantity, and larger size) in preparing the bid. A clarification will be issued to the successful bidder as soon as feasible after the award and, if appropriate, a deductive change order will be issued.
- G. Where items are specified in the singular, this division shall provide the quantity as shown on drawings plus any spares or extras indicated on the drawings or in the specifications.

H. RECORD DRAWINGS

1. On one (1) set of contract drawings, kept at the site during construction, mark all work that is installed differently from that shown on plans, including revised circuitry, material or equipment. Sufficient dimensions shall be provided to locate all materials installed beneath and outside the building including, but not limited to, underground conduits, cabling, ground rods, and stubouts.
2. All changes or revisions to the contract drawings including, but not limited to, those indicate by amendment, change order, field order, written response to RFI/RFC or other contractual means shall be kept current as the work progresses and shall be incorporated onto the final record drawings.
3. Accurately locate and dimension all underground and embedded conduit runs on the record drawings.
4. The marked drawings shall be kept current as the work progresses and shall be available for inspection upon request. At the close of construction, prepare a set of accurate reproducible record drawings and turn them over to the Architect. The correct and completed record drawings are a prerequisite to final contract payment.
 - a. As part of the reproducible record drawings, the Contractor shall produce full size reproducible drawings with the: Final panelboard schedules as modified during construction and final light fixture schedule as modified during construction.
 - b. These drawings shall be on Architectural base sheets and numerically sequenced to follow the last "E" sheet.
5. As part of the reproducible record drawings, the Contractor shall produce full size reproducible drawings for all signal systems which shall include exact "As-Built" device locations, "As-Built" interconnection drawings, and "As-Built" riser diagrams, and provide one set in the panel board, motor control center, or main distribution panel.

1.06 EXAMINATION OF SITE

- A. Examination of the building site shall be made by the Contractor. The Contractor shall compare it with the drawings and specification and satisfy himself as to the conditions under which work is to be performed. The Contractor shall, at such time, ascertain and check the locations of existing structures or equipment which may affect his work.

1.07 EXCAVATION

- A. Prior to starting excavation or trenching, the Contractor shall perform an underground Site Survey utilizing an electronic locator to verify the exact location of all existing underground utility piping, conduits and conductors. The Contractor shall submit for approval a site survey report to the Engineer within five (5) working days after the survey is performed. The Site Survey Report shall show the horizontal location for existing utilities and identify any possible conflicts between the new work and existing utilities.

1.08 PERMITS, FEES AND INSPECTIONS

- A. Permits, fees, and inspections shall be arranged for and paid by the Contractor.

- B. The Contractor shall present to the Engineer, properly signed certificates of the final inspection before work will be accepted.

1.09 ELECTRO-MECHANICAL REQUIREMENTS

- A. The power wiring, safety switches, combination controllers (indicated on electrical plans), circuit breakers, and motor control equipment forming a part of motor-control centers or switchgear assemblies, and the electrical connection of the mechanical equipment to the electrical power source shall be included under Division 26.
- B. The electrical components of mechanical equipment including, but not limited to, motors, motor-starters, control or pushbutton stations, float-pressure switches, solenoid valves, thermostats, junction boxes, and other devices functioning to control mechanical equipment shall be provided under Division 15. Interconnecting wiring for packaged equipment shall be provided as an integral part of the equipment.
- C. Control Wiring: Installation of line and low voltage conduit, wiring and junction/outlet boxes not shown on the electrical drawings but required for controlling or monitoring mechanical equipment systems shall be furnished and installed under Division 15. Installation of these shall comply with the requirements of Division 26.
- D. If substitution of controls or mechanical equipment other than that specified requires any changes in the electrical work from that shown on the plans or specified in Division 26, any additional cost of the equipment or electrical work shall be the responsibility of Division 15.

1.10 SUBMITTALS

- A. Submittal requirements for Division 26 shall be in accordance with Division 1 except as modified herein. All time requirements shall be based on the notice to proceed date of the General Contract. All materials and equipment furnished under Division 26 shall be submitted to the Engineer for approval. Such approval shall be in writing from the Engineer including that which is exactly as specified. Any materials or equipment installed without written approval shall be subject to immediate removal. Approval of material or equipment shall in no way obviate compliance with the contract documents.
- B. Submittals shall be packaged separately for each system or major piece of equipment and reviewed by the Contractor for verification of compliance with the contract documents prior to submitting to the Engineer. Separate, bound submittals shall be provided for each specification section to the Architect. Authorization to combine equipment or systems must be in writing from the Engineer. All interface between specification sections shall be indicated in each submittal.
- C. All materials and equipment shall be new and shall bear the inspection label of the Underwriters Laboratories (UL) where applicable. Materials and equipment shall be the latest standard product and shall be of the grade indicated by the trade names given.
- D. The work shown on the contract drawings is engineered and designed to accommodate the equipment described hereinafter in these specifications.
- E. Equipment submittal shall include manufacturer's name, model, type, number, finish, size and capacity of the equipment at the given conditions. This information shall be provided in bound submittals, each containing an index and all submittals. Provide

[seven (7)] copies of each submittal. The title shall provide the project name, system identity, the specification number, and the Contractor's name and address. This submittal shall be in addition to the shop drawings hereinafter specified. Partial submittals of material submitted from time to time are not acceptable and may be returned without review.

- F. Submittals shall be reviewed by the Architect for compliance with the contract documents. Submittals found to be incomplete or not in compliance with the contract documents shall be returned for resubmittal. The Architect shall review the original submittal and one (1) resubmittal per section (if required). The Contractor shall reimburse the Architect for all subsequent submittal review.
- G. Equipment Layout Drawings: "Equipment Layout Drawings" shall be provided for each equipment room, yard or area containing equipment items furnished under Division 26. Layout drawings shall consist of a plan view of the room or area (to a ¼ inch = 1 foot – 0 inch minimum scale) showing projected outlines of all equipment, complete with dotted lines indicating all required clearances, including all clearances needed for removal or service. Location of all conduit and pull boxes shall be indicated. Drawings shall indicate any and all conflicts with other trades.

1.11 SUBSTITUTIONS

- A. Equipment submitted for substitution must fit the space conditions shown on the drawings, leaving adequate room for maintenance around all equipment. A minimum of 48 inches (or more if required by Code) must be maintained clear in front of all electrical panels, starters, gutters or other electrical apparatus. Submit drawings showing the layout, size, and exact method of interconnection of conduit, wiring and controls, which shall conform to the manufacturer's recommendations and these specifications. The scale of these drawings shall be the scale of the contract drawings. The Contractor shall bear the excess costs, by any and all crafts, for fitting the equipment into the space and the system designated. Where additional labor or material is required to permit equipment submitted for substitution to function in an approved manner, this shall be furnished and installed by the Contractor without additional cost to the Owner.
- B. NOT USED
- C. An item submitted for substitution does not constitute an "equal" unless approval by the Engineer has been given in writing.
- D. Equipment submitted for substitution shall be approved in writing by the Engineer and shall be accompanied by the following:
 - 1. A sample of each item submitted for substitution shall accompany the submittal if requested by the Engineer.
 - 2. A unit price quotation shall be provided with each item intended for substitution. This quote shall include a unit price for the specified item and a unit price for the intended substitute item. The Contractor shall also provide a total (per item) of the differential payback to the Owner should the intended substitute item be approved as equivalent to that which is specified.
- E. Substitutions shall be approved in writing by the Engineer. The determination of the Engineer shall be final.

1.12 WARRANTY

- A. Warranty requirements for Division 26 shall be in accordance with Division 1 except as modified herein.
- B. All materials and equipment provided shall be warranted for a minimum period of one (1)-year from the official date of completion. In addition, provide two (2)-year extended warranty, for a total of three (3)-years, for the following items:
 - 1. Disconnect Switches.
 - 2. Panelboards.
 - 3. Circuit Breakers.
- C. The Contractor shall provide all labor and materials required to correct problems which develop during the warranty period due to defective materials or faulty workmanship. The labor and materials to do this work shall be provided at no additional cost to the Owner.
- D. Within one (1)-month prior to the expiration of the warranty period, the Contractor shall correct any and all defects covered by the warranty. This shall include tightening to original specifications of all bolted connections.
- E. Warranty certificates shall be made out to City of San Diego and shall be delivered to the Engineer at the completion of the installation.
- F. All equipment shall be guaranteed to be supported in such a way as to be free from objectionable vibration and noise.
- G. Additional warranty requirement shall be as indicated in the following sections of Division 26.

1.13 OPERATION AND MAINTENANCE MANUALS

- A. The Contractor shall furnish operation and maintenance manuals for each electrical system and for each piece of equipment. The complete manual, bound in hardback binders, or an approved equivalent, shall be provided to the Engineer. Provide three (3) copies of each manual. One (1) manual shall be furnished prior to the time that system or equipment tests are performed, and the remaining manuals shall be furnished one (1) week before the final job visit is made. The following identification shall be inscribed on the cover; the words "OPERATION AND MAINTENANCE MANUAL", the name and location of the building, the name of the Contractor, and the contract number.
- B. The manual shall include the names, address, and the telephone numbers of each Subcontractor installing equipment and systems, and of the local representatives for each item of equipment and each system. The manual shall have a table of contents and be assembled to conform to the table of contents with tab sheets placed before instructions covering each subject. The instruction sheet shall be legible with large sheets of drawings folded in. The Manual shall include, but not limited to , the following:
 - 1. System layout showing components.
 - 2. Devices and controls.
 - 3. Wiring and control diagrams showing operation and control of each component.
 - 4. Sequence of operation describing start-up, operation, and shutdown.
 - 5. Functional description of the principal system components.
 - 6. Installation instructions.
 - 7. Maintenance and overhaul instructions.

8. Lubrication schedule including type, grade, temperature, range, and frequency.
 9. Safety precautions, diagrams and illustrations.
 10. Test procedures.
 11. Performance data.
 12. Parts list.
- C. The parts list for equipment shall indicate the sources of supply, recommended spare parts, and the service organization which is reasonably convenient to the building sit. The manual shall be complete in all respects for all equipment, controls, and accessories provided.

1.14 COORDINATION OF ALL WORK

- A. Job Visits by the Architect:
1. Periodic visits to the job by the Architect are for the express purpose of verifying compliance with the contract documents.
 2. Such visits shall not be construed as construction supervision. Neither shall such visits be construed as making the Architect responsible for providing a safe place for the performance of the work by the Contractor or the Contractor's employees or the safety of the supplies of the Contractor or his Subcontractors.
- B. Temporary Electrical Service:
1. The Contractor shall provide labor and materials required for the installation and maintenance of temporary lighting and required power sources for the Contractor's equipment inside the building or construction site and for pedestrian walkways during the period of construction.
 2. The building or construction site shall be sufficiently illuminated so that construction work can be safely performed. Special attention shall be given to adequately lighting stairs, ladders, pedestrian walkways, floor openings, etc. Walkway lights shall be controlled by a switch within the building or construction site.
 3. Power shall be on and all lighting shall be in operation before painting work commences.
- C. Electrical Service Outages:
1. There shall be no interruption of existing electrical service without prior approval by the Engineer. Written notice of proposed utility outages shall be delivered to the Engineer at least fourteen (14)-days prior to the start of the proposed outage. The interruption of electrical service shall be scheduled outside the normal working hours. The maximum outage time shall be four (4)-hours, otherwise, the Contractor shall be responsible for all related work including, but not limited to, installation of new electrical lines, abandonment of existing electrical lines, and interfacing between new and existing lines to ensure uninterrupted service. Additional requirements are listed in Division 1 of this specification.
 2. The installation shall be closely coordinated with the utility provider and all other site utilities.
 - a. Electrical
- D. Posted Operating Instructions:
1. Operating instructions shall be provided by the Contractor at the conclusion of the project for each system and each principal piece of equipment for the use of operating and maintenance personnel. The operating instructions shall include wiring and control diagrams showing the entire system, including, but not limited

to, equipment, devices, and control sequences. All operating instruction shall be approved by the Engineer.

2. Operating instructions shall be typewritten or engraved and shall be framed under glass or in approved laminated plastic and posted adjacent to each principal piece of equipment and shall include such instructions as start up, proper adjustment, operation, lubrication, shutdown, safety-precautions, procedure in the event of equipment failure, and any other necessary items of instructions as recommended by the manufacturer of unit.
3. Operating instructions exposed to the weather shall be made of weather-resisting materials or shall be suitably enclosed to be weather protected. Operating instructions shall not face when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.15 TRAINING

- A. User staff and maintenance personnel shall be thoroughly trained (minimum four (4)-hours) in the use of each system or major piece of equipment installed. This training shall be provided a part of the Contractors bid to supply the system or equipment. Additional training requirements, shall be as specified in the subsequent sections of Division 26.

1.16 DELIVERY AND STORAGE

- A. Equipment and materials shall be properly stored, adequately protected, and carefully handled to prevent damage before and during installation. Equipment and materials shall be handled, stored, and protected in accordance with the manufacturer's recommendations and as approved by the Engineer. Electrical conduit shall be stored to provide protection from the weather and accidental damage. Plastic conduit shall be stored on even supports and in locations not subject to direct sunrays or excessive heat. Cables shall be sealed, stored, and handled carefully to avoid damage to the outer covering or insulation and damage from moisture and weather. Damaged or defective items shall be replaced with new items a no cost to the Owner. The Engineer shall determine if a damaged or defective item is to be replaced with a new item. The decisions by the Engineer in these matters shall be final.

1.17 FIELD TESTS

- A. As an exception to requirements that may be stated elsewhere in the contract, the Architect shall be given five (5) working days notice prior to each test. The Contractor shall provide all test equipment, personnel and incidentals including, but not limited to, water, fuel, and lubricants necessary to perform the required tests. The Owner shall provide electrical power required for all tests. The Contractor shall submit five (5) typewritten copies of all test results to the Engineer within five (5) working days after each test.
 1. The information submitted shall include, but not limited to, the following:
 - a. Scope of the test.
 2. Name and type of instrument used.
 3. Calibration date of instrument and name of calibration firm.
 4. Name and signature of testing personnel.
 5. Name of signature of Architect.
 6. Analysis of test results.
 7. The Contractor shall demonstrate to the Engineer the operation of all equipment and systems. All tests shall be completed to the satisfaction of the Architect. Each

test shall be performed the number of time indicated in the individual specification section. In the event the number of times the tests are to be completed is omitted, the Architect shall determine the number.

END OF SECTION 26 05 10

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control test reports.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Aluminum and Copper Conductors: Comply with NEMA WC 70.
- B. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN, XHHW.
- C. Multiconductor Cable: Comply with NEMA WC 70 for armored cable, Type AC or metal-clad cable, Type MC with ground wire.

2.2 CONNECTORS AND SPLICES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Hubbell Power Systems, Inc.
 - 3. O-Z/Gedney; EGS Electrical Group LLC.
 - 4. 3M; Electrical Products Division.
 - 5. Tyco Electronics Corp.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper for feeders smaller than No. 1/0 AWG; aluminum for feeders No. 1/0 AWG and larger. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- C. Use copper feeders and branch circuit conductors serving motor loads.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type XHHW, single conductors in raceway.
- B. Exposed Feeders: Type THHN-THWN, single conductors in raceway.
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-THWN, single conductors in raceway.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.
- E. Exposed Branch Circuits, Including in Crawlspace: Type THHN-THWN, single conductors in raceway, Armored cable, Type AC or Metal-clad cable, Type MC.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway, Armored cable, Type AC or Metal-clad cable, Type MC.
- G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.
- H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- I. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- J. Class 2 Control Circuits: Type THHN-THWN, in raceway or Power-limited cable, concealed in building finishes.
- K. NM cable allowed where permissible by code and local authority having jurisdiction.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Division 26 Sections "Hangers and Supports for Electrical Systems."
- F. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."
- G. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- H. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - 1. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.
- I. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

3.4 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Division 26 Section "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
- B. Tests and Inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in cables and conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner.
 - a. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.
 - b. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - c. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of

deficiencies detected, remedial action taken, and observations after remedial action.

- C. Test Reports: Prepare a written report to record the following:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 26 05 19

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Grounding systems and equipment.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
 - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - 6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
 - 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

2.2 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two bolts.
 - 1. Pipe Connectors: Clamp type, sized for pipe.

- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, 5/8 by 96 inches (16 by 2400 mm) in diameter.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 3/0 AWG minimum or as indicated on plans. Bury at least 24 inches (600 mm) below grade.
- C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
- D. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
 - 3. Connections to Ground Rods at Test Wells: Bolted connectors.
 - 4. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1. Feeders and branch circuits.
 - 2. Lighting circuits.
 - 3. Receptacle circuits.
 - 4. Single-phase motor and appliance branch circuits.
 - 5. Three-phase motor and appliance branch circuits.
 - 6. Flexible raceway runs.
 - 7. Armored and metal-clad cable runs.
 - 8. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
 - 9. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.
- B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

- C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- D. Signal and Communication Equipment: In addition to grounding and bonding required by NFPA 70, provide a separate grounding system complying with requirements in TIA/ATIS J-STD-607-A.
 - 1. For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
 - 2. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-4-by-12-inch (6.3-by-100-by-300-mm) grounding bus.
 - 3. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
- E. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Division 26 Section "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches (300 mm) deep, with cover.
 - 1. Test Wells: Install at least one test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.
- D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

- E. Grounding and Bonding for Piping:
 - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
 - 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 - 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- F. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.

3.4 LABELING

- A. Comply with requirements in Division 26 Section "Identification for Electrical Systems" Article for instruction signs. The label or its text shall be green.
- B. Install labels at the telecommunications bonding conductor and grounding equalizer and at the grounding electrode conductor where exposed.
 - 1. Label Text: "If this connector or cable is loose or if it must be removed for any reason, notify the facility manager."

3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections and prepare test reports:
 - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 - 3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Make tests at ground rods before any conductors are connected.
- B. Report measured ground resistances that exceed the following values:
 - 1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
 - 2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
 - 3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
 - 4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).

- C. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Hangers and supports for electrical equipment and systems.
 - 2. Construction requirements for concrete bases.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.3 SUBMITTALS

- A. Product Data: For steel slotted support systems.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
 - 1. Trapeze hangers. Include Product Data for components.
 - 2. Steel slotted channel systems. Include Product Data for components.
 - 3. Equipment supports.
- C. Welding certificates.

1.4 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation.
 - f. Unistrut; Tyco International, Ltd.
 - g. Wesanco, Inc.
 - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 - 4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti Inc.
 - 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.

2. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
3. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
5. Toggle Bolts: All-steel springhead type.
6. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Division 05 Section "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as scheduled in NECA 1, where its Table 1 lists maximum spacings less than stated in NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 1. Secure raceways and cables to these supports with two-bolt conduit clamps or single-bolt conduit clamps.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified

loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
1. To Wood: Fasten with lag screws or through bolts.
 2. To New Concrete: Bolt to concrete inserts.
 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 4. To Existing Concrete: Expansion anchor fasteners.
 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
 6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69 or Spring-tension clamps.
 7. To Light Steel: Sheet metal screws.
 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Division 05 Section "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 03 Section 03 30 00 "Cast-in-Place Concrete."
- C. Anchor equipment to concrete base.
1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).
- B. Touchup: Comply with requirements in Division 09 painting Sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 05 29

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.
- B. See Division 26 Section "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks and manholes, and underground handholes, boxes, and utility construction.

1.2 SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, details, and attachments to other work.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

- A. Rigid Steel Conduit: ANSI C80.1.
- B. IMC: ANSI C80.6.
- C. EMT: ANSI C80.3.
- D. FMC: Zinc-coated steel.
- E. LFMC: Flexible steel conduit with PVC jacket.
- F. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
 - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886.
 - 2. Fittings for EMT: Steel or die-cast, compression type.

2.2 NONMETALLIC CONDUIT AND TUBING

- A. ENT: NEMA TC 13.
- B. RNC: NEMA TC 2, Type EPC-40-PVC, unless otherwise indicated.

- C. LFNC: UL 1660.
- D. Fittings for ENT and RNC: NEMA TC 3; match to conduit or tubing type and material.
- E. Fittings for LFNC: UL 514B.

2.3 METAL WIREWAYS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cooper B-Line, Inc.
 - 2. Hoffman.
 - 3. Square D; Schneider Electric.
- B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1, 12, 3R or 4X stainless steel, unless otherwise indicated.
- C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: As indicated.
- E. Finish: Manufacturer's standard enamel finish.

2.4 NONMETALLIC WIREWAYS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Hoffman.
 - 2. Lamson & Sessions; Carlon Electrical Products.
- B. Description: PVC plastic, extruded and fabricated to size and shape indicated, with snap-on cover and mechanically coupled connections with plastic fasteners.
- C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

2.5 SURFACE RACEWAYS

- A. Surface Metal Raceways: Galvanized steel with snap-on covers. Manufacturer's standard enamel finish in color selected by Architect.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Thomas & Betts Corporation.
 - b. Walker Systems, Inc.; Wiremold Company (The).
 - c. Wiremold Company (The); Electrical Sales Division.
- B. Surface Nonmetallic Raceways: Two-piece construction, manufactured of rigid PVC with texture and color selected by Architect.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Butler Manufacturing Company; Walker Division.
 - b. Enduro Systems, Inc.; Composite Products Division.
 - c. Hubbell Incorporated; Wiring Device-Kellems Division.
 - d. Lamson & Sessions; Carlon Electrical Products.
 - e. Panduit Corp.
 - f. Walker Systems, Inc.; Wiremold Company (The).
 - g. Wiremold Company (The); Electrical Sales Division.

2.6 BOXES, ENCLOSURES, AND CABINETS

- A. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
- B. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- C. Nonmetallic Outlet and Device Boxes: NEMA OS 2.
- D. Metal Floor Boxes: Cast metal, fully adjustable, rectangular.
- E. Nonmetallic Floor Boxes: Nonadjustable, round.
- F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- G. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, galvanized, cast iron with gasketed cover.
- H. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch, unless otherwise indicated.
 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 2. Nonmetallic Enclosures: Plastic, finished inside with radio-frequency-resistant paint.
- I. Cabinets:
 1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 2. Hinged door in front cover with flush latch and concealed hinge.
 3. Key latch to match panelboards.
 4. Metal barriers to separate wiring of different systems and voltage.
 5. Accessory feet where required for freestanding equipment.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
 1. Exposed Conduit: Rigid steel conduit.
 2. Concealed Conduit, Aboveground: Rigid steel conduit, IMC, EMT.
 3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.
 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 4X Stainless steel.

- B. Comply with the following indoor applications, unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 - 3. Exposed and Subject to Severe Physical Damage: Rigid steel conduit. Includes raceways in the following locations:
 - a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 - 6. Damp or Wet Locations: Rigid steel conduit.
 - 7. Raceways for Optical Fiber or Communications Cable: EMT.
 - 8. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4X, stainless steel in damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch (21-mm) trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

3.2 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."
- E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
- H. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch (27-mm) trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Change from ENT to RNC, Type EPC-40-PVC, rigid steel conduit, or IMC before rising above the floor.

- I. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
- J. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.
- K. Raceways for Optical Fiber and Communications Cable: Install as follows:
 - 1. 3/4-Inch (19-mm) Trade Size and Smaller: Install raceways in maximum lengths of 50 feet (15 m).
 - 2. 1-Inch (25-mm) Trade Size and Larger: Install raceways in maximum lengths of 75 feet (23 m).
 - 3. Install with a maximum of two 90-degree bends or equivalent for each length of raceway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.
- L. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where otherwise required by NFPA 70.
- M. Expansion-Joint Fittings for RNC: Install in each run of aboveground conduit that is located where environmental temperature change may exceed 30 deg F (17 deg C), and that has straight-run length that exceeds 25 feet (7.6 m).
 - 1. Install expansion-joint fittings for each of the following locations, and provide type and quantity of fittings that accommodate temperature change listed for location:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C) temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C) temperature change.
 - c. Indoor Spaces: Connected with the Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
 - d. Attics: 135 deg F (75 deg C) temperature change.
 - 2. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change.
 - 3. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.
- N. Flexible Conduit Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semirecessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.
 - 2. Use LFMC in damp or wet locations not subject to severe physical damage.

- O. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.
- P. Set metal floor boxes level and flush with finished floor surface.
- Q. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in the Whitebook/Greenbook 2018 Edition for pipe less than 6 inches (150 mm) in nominal diameter.
2. Install backfill as specified in the Whitebook/Greenbook 2018 Edition.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in the Whitebook/Greenbook 2018 Edition.
4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of the elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.
 - b. For stub-ups at equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.
6. Warning Planks: Bury warning planks approximately 12 inches (300 mm) above direct-buried conduits, placing them 24 inches (600 mm) o.c. Align planks along the width and along the centerline of conduit.

END OF SECTION 26 05 33

SECTION 26 05 43

UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Conduit, ducts, and duct accessories for duct banks and in single duct runs.
 - 2. Handholes and pull boxes.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings for Precast or Factory-Fabricated Underground Utility Structures: Include plans, elevations, sections, details, attachments to other work, and accessories, including the following:
 - 1. Duct entry provisions, including locations and duct sizes.
 - 2. Cover design.
 - 3. Grounding details.
 - 4. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.
- C. Field quality-control reports.

1.3 QUALITY ASSURANCE

- A. Comply with IEEE C2.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUIT

- A. Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1.
- B. RNC: NEMA TC 2, Type EPC-40-PVC, UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B.

2.2 NONMETALLIC DUCTS AND DUCT ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following:
 - 1. AFC Cable Systems.
 - 2. ARNCO Corporation.
 - 3. Beck Manufacturing.
 - 4. Cantex, Inc.
 - 5. CertainTeed Corp.

6. Condux International, Inc.
 7. DCX-CHOL Enterprises, Inc.; ELECSYS Division.
 8. Electri-Flex Company.
 9. IPEX Inc.
 10. Lamson & Sessions; Carlon Electrical Products.
 11. Manhattan Wire Products; a Belden company.
- C. Underground Plastic Utilities Duct: NEMA TC 6 & 8, Type EB-20-PVC, ASTM F 512, UL 651A, with matching fittings by the same manufacturer as the duct, complying with NEMA TC 9.
- D. Duct Accessories:
1. Duct Separators: Factory-fabricated rigid PVC interlocking spacers, sized for type and sizes of ducts with which used, and retained to provide minimum duct spacings indicated while supporting ducts during concreting or backfilling.
 2. Warning Tape: Underground-line warning tape specified in Division 26 Section "Identification for Electrical Systems."
 3. Concrete Warning Planks: Nominal 12 by 24 by 3 inches (300 by 600 by 76 mm) in size, manufactured from 6000-psi (41-MPa) concrete.
 - a. Color: Red dye added to concrete during batching.
 - b. Mark each plank with "ELECTRIC" in 2-inch- (50-mm-) high, 3/8-inch- (10-mm-) deep letters.

2.3 HANDHOLES AND PULL BOXES

- A. Description: Comply with SCTE 77.
1. Color: Green.
 2. Configuration: Units shall be designed for flush burial and have open bottom unless otherwise indicated.
 3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
 4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 5. Cover Legend: Molded lettering,
 - a. "ELECTRIC." Or "TELEPHONE." As indicated for each service.
 - b. Tier level number, indicating that the unit complies with the structural load test for that tier according to SCTE 77.
 6. Duct Entrance Provisions: Duct-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
 7. Handholes 12 inches wide by 24 inches long and larger shall have factory-installed inserts for cable racks and pulling-in irons.
- B. Fiberglass Handholes and Pull Boxes with Polymer Concrete Frame and Cover: Complying with SCTE 77 Tier 5 loading. Sheet-molded, fiberglass-reinforced, polyester resin enclosure joined to polymer concrete top ring or frame.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 2. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following:
 - a. Armorcast Products Company.
 - b. Carson Industries LLC.
 - c. Christy Concrete Products.

- d. Synertech Moulded Products, Inc.; a division of Oldcastle Precast.

PART 3 - EXECUTION

3.1 CORROSION PROTECTION

- A. Aluminum shall not be installed in contact with earth or concrete.

3.2 EARTHWORK

- A. Excavation and Backfill: Comply with the Whitebook/Greenbook 2018 Edition, but do not use heavy-duty, hydraulic-operated, compaction equipment.
- B. Restore surface features at areas disturbed by excavation and reestablish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
- C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with the Whitebook/Greenbook 2018 Edition.
- D. Cut and patch existing pavement in the path of underground ducts and utility structures according to the Whitebook/Greenbook 2018 Edition.

3.3 DUCT INSTALLATION

- A. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches both horizontally and vertically, at other locations unless otherwise indicated.
- B. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.
- C. Building Wall Penetrations: Make a transition from underground duct to rigid steel conduit at least 10 ft. (3 m) outside the building wall without reducing duct line slope away from the building and without forming a trap in the line. Use fittings manufactured for duct-to-conduit transition.
- D. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig (1.03-MPa) hydrostatic pressure.
- E. Pulling Cord: Install 100-lbf- (445-N-) test nylon cord in ducts, including spares.
- F. Concrete-Encased Ducts: Support ducts on duct separators.
 - 1. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, with not less than 4 spacers per 20 ft. (6 m) of duct. Secure separators to earth and to ducts to prevent floating during concreting. Stagger separators approximately 6 inches (150 mm) between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
 - 2. Pouring Concrete: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Use a plank to direct concrete down sides of bank assembly to trench bottom. Allow concrete to flow to center of

- bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.
3. Reinforcement: Reinforce concrete-encased duct banks where they cross disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.
 4. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
 5. Minimum Space between Ducts: 3 inches (75 mm) between ducts and exterior envelope wall, 2 inches (50 mm) between ducts for like services, and 4 inches (100 mm) between power and signal ducts.
 6. Depth: Install top of duct bank at least 24 inches (600 mm) below finished grade in areas not subject to deliberate traffic, and at least 30 inches (750 mm) below finished grade in deliberate traffic paths for vehicles unless otherwise indicated.
 7. Stub-Ups: Use manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor unless otherwise indicated. Extend concrete encasement throughout the length of the elbow.
 8. Stub-Ups: Use manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.
 - b. Stub-Ups to Equipment: For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of base. Install insulated grounding bushings on terminations at equipment.
 9. Warning Tape: Bury warning tape approximately 12 inches (300 mm) above all concrete-encased ducts and duct banks. Align tape parallel to and within 3 inches (75 mm) of the centerline of duct bank. Provide an additional warning tape for each 12-inch (300-mm) increment of duct-bank width over a nominal 18 inches (450 mm). Space additional tapes 12 inches (300 mm) apart, horizontally.
- G. Direct-Buried Duct Banks:
1. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
 2. Space separators close enough to prevent sagging and deforming of ducts, with not less than 5 spacers per 20 ft. (6 m) of duct. Secure separators to earth and to ducts to prevent displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger spacers approximately 6 inches (150 mm) between tiers.
 3. Excavate trench bottom to provide firm and uniform support for duct bank. Prepare trench bottoms as specified in the Whitebook/Greenbook 2018 Edition for pipes less than 6 inches (150 mm) in nominal diameter.
 4. Install backfill as specified in the Whitebook/Greenbook 2018 Edition.
 5. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand-place backfill to 4 inches (100 mm) over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing

controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction as specified in the Whitebook/Greenbook 2018 Edition.

6. Install ducts with a minimum of 3 inches (75 mm) between ducts for like services and 6 inches (150 mm) between power and signal ducts.
7. Depth: Install top of duct bank at least 36 inches (900 mm) below finished grade unless otherwise indicated.
8. Set elevation of bottom of duct bank below the frost line.
9. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of the elbow.
10. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.
 - b. For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.
11. Warning Planks: Bury warning planks approximately 12 inches (300 mm) above direct-buried ducts and duct banks, placing them 24 inches (600 mm) o.c. Align planks along the width and along the centerline of duct bank. Provide an additional plank for each 12-inch (300-mm) increment of duct-bank width over a nominal 18 inches (450 mm). Space additional planks 12 inches (300 mm) apart, horizontally.

3.4 INSTALLATION OF HANDHOLES AND PULL BOXES

- A. Install handholes and pull boxes level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances. Use pull box extension if required to match depths of ducts, and seal joint between box and extension as recommended by the manufacturer.
- B. Unless otherwise indicated, support units on a level 6-inch- (15-cm-) thick bed of crushed stone or gravel, graded from 1/2-inch (12.7-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: Set so cover surface will be flush with finished grade.
- D. Install handholes and pull boxes with bottom below the frost line, below grade.
- E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Retain arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.
- F. Field-cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

- G. For enclosures installed in asphalt paving and subject to occasional, nondeliberate, heavy-vehicle loading, form and pour a concrete ring encircling, and in contact with, enclosure and with top surface screeded to top of box cover frame. Bottom of ring shall rest on compacted earth.
 - 1. Concrete: 3000 psi (20 kPa), 28-day strength, complying with Division 03 Section "Cast-in-Place Concrete," with a troweled finish.
 - 2. Dimensions: 10 inches wide by 12 inches deep (250 mm wide by 300 mm deep)

3.5 GROUNDING

- A. Ground underground ducts and utility structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

3.6 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
 - 2. Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
 - 3. Test handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Division 26 Section "Grounding and Bonding for Electrical Systems."
- B. Correct deficiencies and retest as specified above to demonstrate compliance.
- C. Prepare test and inspection reports.

3.7 CLEANING

- A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

END OF SECTION 26 05 43

SECTION 26 05 44

SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
 2. Sleeve-seal systems.
 3. Sleeve-seal fittings.
 4. Grout.
 5. Silicone sealants.

ACTION SUBMITTALS

- B. Product Data: For each type of product.

PRODUCTS

SLEEVES

- C. Wall Sleeves:
1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
 2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.
- E. Sleeves for Rectangular Openings:
1. Material: Galvanized sheet steel.
 2. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
 - b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

SLEEVE-SEAL SYSTEMS

- F. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advance Products & Systems, Inc.
 - b. CALPICO, Inc.
 - c. Metraflex Company (The).
 - d. Pipeline Seal and Insulator, Inc.
 - e. Proco Products, Inc.
2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel.
4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

SLEEVE-SEAL FITTINGS

- G. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Presealed Systems.

GROUT

- H. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- I. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- J. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
- K. Packaging: Premixed and factory packaged.

SILICONE SEALANTS

- L. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
 2. Sealant shall have VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 3. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- M. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

EXECUTION

SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- N. Comply with NECA 1.
- O. Comply with NEMA VE 2 for cable tray and cable penetrations.
- P. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section 07 92 00 "Joint Sealants."
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
 - 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
 - 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Install sleeves during erection of floors.
- Q. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
 - 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- R. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- S. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- T. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

SLEEVE-SEAL-SYSTEM INSTALLATION

- U. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- V. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway

or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

SLEEVE-SEAL-FITTING INSTALLATION

- W. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- X. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- Y. Secure nailing flanges to concrete forms.
- Z. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 26 05 44

SECTION 26 05 48

VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Isolation pads.
 - 2. Spring isolators.
 - 3. Restrained spring isolators.
 - 4. Channel support systems.
 - 5. Restraint cables.
 - 6. Hanger rod stiffeners.
 - 7. Anchorage bushings and washers.

1.2 PERFORMANCE REQUIREMENTS

- A. Seismic-Restraint Loading:
 - 1. Site Class as Defined in the IBC: D.
 - 2. Assigned Seismic Use Group or Building Category as Defined in the IBC: II.
 - a. Component Importance Factor: 1.0.
 - b. Component Response Modification Factor: 1.5.
 - c. Component Amplification Factor: 1.0.

1.3 SUBMITTALS

- A. Product Data: For the following:
 - 1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
 - 2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
 - a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an agency acceptable to authorities having jurisdiction.
 - b. Annotate to indicate application of each product submitted and compliance with requirements.
 - 3. Restrained-Isolation Devices: Include ratings for horizontal, vertical, and combined loads.
- B. Delegated-Design Submittal: For vibration isolation and seismic-restraint details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Design Calculations: Calculate static and dynamic loading due to equipment weight and operation, seismic forces required to select vibration isolators and seismic restraints.
 - a. Coordinate design calculations with wind-load calculations required for equipment mounted outdoors. Comply with requirements in other Division 26 Sections for equipment mounted outdoors.

2. Indicate materials and dimensions and identify hardware, including attachment and anchorage devices.
 3. Field-fabricated supports.
 4. Seismic-Restraint Details:
 - a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
 - b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events.
 - c. Preapproval and Evaluation Documentation: By an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).
- C. Welding certificates.
- D. Field quality-control test reports.

1.4 QUALITY ASSURANCE

- A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- C. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.
- D. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATORS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Ace Mountings Co., Inc.
 2. Amber/Booth Company, Inc.
 3. California Dynamics Corporation.
 4. Isolation Technology, Inc.
 5. Kinetics Noise Control.
 6. Mason Industries.
 7. Vibration Eliminator Co., Inc.
 8. Vibration Isolation.

9. Vibration Mountings & Controls, Inc.
- B. Pads: Arrange in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
 1. Resilient Material: Oil- and water-resistant neoprene.
- C. Spring Isolators: Freestanding, laterally stable, open-spring isolators.
 1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 2. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 3. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
 5. Baseplates: Factory drilled for bolting to structure and bonded to 1/4-inch- (6-mm-) thick, rubber isolator pad attached to baseplate underside. Baseplates shall limit floor load to 500 psig (3447 kPa).
 6. Top Plate and Adjustment Bolt: Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.
- D. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic or limit-stop restraint.
 1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to weight being removed; factory-drilled baseplate bonded to 1/4-inch- (6-mm-) thick, neoprene or rubber isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
 2. Restraint: Seismic or limit-stop as required for equipment and authorities having jurisdiction.
 3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

2.2 SEISMIC-RESTRAINT DEVICES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Amber/Booth Company, Inc.
 2. California Dynamics Corporation.
 3. Cooper B-Line, Inc.; a division of Cooper Industries.
 4. Hilti Inc.
 5. Loos & Co.; Seismic Earthquake Division.
 6. Mason Industries.
 7. TOLCO Incorporated; a brand of NIBCO INC.
 8. Unistrut; Tyco International, Ltd.

- B. General Requirements for Restraint Components: Rated strengths, features, and application requirements shall be as defined in reports by an agency acceptable to authorities having jurisdiction.
 - 1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.
- C. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.
- D. Restraint Cables: ASTM A 603 galvanized-steel cables with end connections made of steel assemblies with thimbles, brackets, swivels, and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.
- E. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod. Do not weld stiffeners to rods.
- F. Bushings for Floor-Mounted Equipment Anchor: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchors and studs.
- G. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices.
- H. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.
- I. Mechanical Anchor: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchors with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.
- J. Adhesive Anchor: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.
- B. Hanger Rod Stiffeners: Install hanger rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.

- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.2 SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Equipment and Hanger Restraints:
 - 1. Install restrained isolators on electrical equipment.
 - 2. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch (3.2 mm).
 - 3. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction providing required submittals for component.
- B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- C. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- D. Drilled-in Anchors:
 - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 - 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 - 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 - 4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
 - 5. Set anchors to manufacturer's recommended torque, using a torque wrench.
 - 6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.3 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where they terminate with connection to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

3.4 FIELD QUALITY CONTROL

- A. Tests and Inspections:

1. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
 2. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
 3. Test to 90 percent of rated proof load of device.
 4. Measure isolator restraint clearance.
 5. Measure isolator deflection.
 6. Verify snubber minimum clearances.
 7. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.
- B. Remove and replace malfunctioning units and retest as specified above.
- C. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Adjust isolators after isolated equipment is at operating weight.
- B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.
- C. Adjust active height of spring isolators.
- D. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION 26 05 48

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Identification for raceways.
 - 2. Identification of power and control cables.
 - 3. Identification for conductors.
 - 4. Underground-line warning tape.
 - 5. Warning labels and signs.
 - 6. Instruction signs.
 - 7. Equipment identification labels.
 - 8. Miscellaneous identification products.

1.2 SUBMITTALS

- A. Product Data: For each electrical identification product indicated.

1.3 QUALITY ASSURANCE

- A. Comply with ANSI A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

PART 2 - PRODUCTS

2.1 POWER RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage.
- C. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.2 ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

- B. Colors for Raceways Carrying Circuits at 600 V and Less:
 1. Black letters on an orange field.
 2. Legend: Indicate voltage.
- C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.3 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Write-On Tags: Polyester tag, 0.010 inch (0.25 mm) thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2.4 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.5 FLOOR MARKING TAPE

- A. 2-inch- (50-mm-) wide, 5-mil (0.125-mm) pressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.

2.6 UNDERGROUND-LINE WARNING TAPE

- A. Tape:
 1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 2. Printing on tape shall be permanent and shall not be damaged by burial operations.
 3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.
- B. Color and Printing:
 1. Comply with ANSI Z535.1 through ANSI Z535.5.
 2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE.
 3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.
- C. Tag:

1. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core, bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
2. Overall Thickness: 5 mils (0.125 mm).
3. Foil Core Thickness: 0.35 mil (0.00889 mm).
4. Weight: 28 lb/1000 sq. ft. (13.7 kg/100 sq. m).
5. 3-Inch (75-mm) Tensile According to ASTM D 882: 70 lbf (311.3 N), and 4600 psi (31.7 MPa).

2.7 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
- C. Baked-Enamel Warning Signs:
 1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
 2. 1/4-inch (6.4-mm) grommets in corners for mounting.
 3. Nominal size, 7 by 10 inches (180 by 250 mm).
- D. Metal-Backed, Butyrate Warning Signs:
 1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm) galvanized-steel backing; and with colors, legend, and size required for application.
 2. 1/4-inch (6.4-mm) grommets in corners for mounting.
 3. Nominal size, 10 by 14 inches (250 by 360 mm).
- E. Warning label and sign shall include, but are not limited to, the following legends:
 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

2.8 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. inches (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.
 1. Engraved legend with black letters on white face.
 2. Punched or drilled for mechanical fasteners.
 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
- B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch (10 mm).

2.9 EQUIPMENT IDENTIFICATION LABELS

- A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).

2.10 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in Division 09 painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Apply identification devices to surfaces that require finish after completing finish work.
- C. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- D. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- E. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.
- F. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches (400 mm) overall.
- G. Painted Identification: Comply with requirements in Division 09 painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30A, and 120V to ground: Install labels at 10-foot (3-m) maximum intervals.
- B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:

1. Emergency Power.
 2. Power.
 3. UPS.
- C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder and branch-circuit conductors.
 - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - c. Colors for 480/277-V Circuits:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- D. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- E. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source.
- F. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- G. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
1. Limit use of underground-line warning tape to direct-buried cables.
 2. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- H. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- I. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.

1. Comply with 29 CFR 1910.145.
 2. Identify system voltage with black letters on an orange background.
 3. Apply to exterior of door, cover, or other access.
 4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - a. Power transfer switches.
 - b. Controls with external control power connections.
- J. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- K. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- (10-mm-) high letters for emergency instructions at equipment used for power transfer.
- L. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
1. Labeling Instructions:
 - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label, Stenciled legend 4 inches (100 mm) high.
 - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
 - d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

END OF SECTION 26 05 53

SECTION 26 22 00

LOW-VOLTAGE TRANSFORMERS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the following types of dry-type transformers rated 600 V and less, with capacities up to 1000 kVA:
1. Distribution transformers.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Indicate dimensions and weights.
1. Wiring Diagrams: Power, signal, and control wiring.
- C. Manufacturer Seismic Qualification Certification: Submit certification that transformers, accessories, and components will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."
- D. Field quality-control test reports.
- E. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with IEEE C57.12.91, "Test Code for Dry-Type Distribution and Power Transformers."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. ACME Electric Corporation; Power Distribution Products Division.
 2. Challenger Electrical Equipment Corp.; a division of Eaton Corp.
 3. Controlled Power Company.
 4. Eaton Electrical Inc.; Cutler-Hammer Products.
 5. Federal Pacific Transformer Company; Division of Electro-Mechanical Corp.
 6. General Electric Company.
 7. Hammond Co.; Matra Electric, Inc.
 8. Magnetek Power Electronics Group.
 9. Micron Industries Corp.
 10. Myers Power Products, Inc.
 11. Siemens Energy & Automation, Inc.

12. Sola/Hevi-Duty.
13. Square D; Schneider Electric.

2.2 GENERAL TRANSFORMER REQUIREMENTS

- A. Description: Factory-assembled and -tested, air-cooled units for 60-Hz service.
- B. Cores: Grain-oriented, non-aging silicon steel.
- C. Coils: Continuous windings without splices except for taps.
 1. Internal Coil Connections: Brazed or pressure type.
 2. Coil Material: Aluminum.

2.3 DISTRIBUTION TRANSFORMERS

- A. Comply with NEMA ST 20, and list and label as complying with UL 1561.
- B. Provide transformers that are constructed to withstand seismic forces specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."
- C. Cores: One leg per phase.
- D. Enclosure: Ventilated, NEMA 250, Type 2.
 1. Core and coil shall be encapsulated within resin compound, sealing out moisture and air.
 2. Core and coil shall be encapsulated within resin compound, sealing out moisture and air.
- E. Transformer Enclosure Finish: Comply with NEMA 250.
 1. Finish Color: Gray.
- F. Taps for Transformers Smaller Than 3 kVA: One 5 percent tap above normal full capacity.
- G. Taps for Transformers 7.5 to 24 kVA: Two 5 percent taps below rated voltage.
- H. Taps for Transformers 25 kVA and Larger: Two 2.5 percent taps above and four 2.5 percent taps below normal full capacity.
- I. Insulation Class: 220 deg C, UL-component-recognized insulation system with a maximum of 150 deg C rise above 40 deg C ambient temperature.
- J. Energy Efficiency for Transformers Rated 15 kVA and Larger:
 1. Complying with NEMA TP 1, Class 1 efficiency levels.
 2. Tested according to NEMA TP 2.
 3. Transformer shall be "Energy-Star" compliant per EPACK 2007.
- K. Wall Brackets: Manufacturer's standard brackets.

2.4 IDENTIFICATION DEVICES

- A. Nameplates: Engraved, laminated-plastic or metal nameplate. Nameplates are specified in Division 26 Section "Identification for Electrical Systems."

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install wall-mounting transformers level and plumb with wall brackets fabricated by transformer manufacturer.
 - 1. Brace wall-mounting transformers as specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."
- B. Construct concrete bases and anchor floor-mounting transformers according to manufacturer's written instructions, seismic codes applicable to Project, and requirements in Division 26 Section "Hangers and Supports for Electrical Systems."

3.2 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Infrared Scanning: Two months after Substantial Completion, perform an infrared scan of transformer connections.
 - a. Use an infrared-scanning device designed to measure temperature or detect significant deviations from normal values. Provide documentation of device calibration.
 - b. Perform 2 follow-up infrared scans of transformers, one at 4 months and the other at 11 months after Substantial Completion.
 - c. Prepare a certified report identifying transformer checked and describing results of scanning. Include notation of deficiencies detected, remedial action taken, and scanning observations after remedial action.

3.3 ADJUSTING

- A. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus 10 percent and not being lower than nameplate voltage minus 3 percent at maximum load conditions. Submit recording and tap settings as test results.
- B. Output Settings Report: Prepare a written report recording output voltages and tap settings.

END OF SECTION 26 22 00

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes distribution panelboards and lighting and appliance branch-circuit panelboards.

1.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Panelboards shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
 - 2. Detail enclosure types and details for types other than NEMA 250, Type 1.
 - 3. Detail bus configuration, current, and voltage ratings.
 - 4. Short-circuit current rating of panelboards and overcurrent protective devices.
 - 5. Include evidence of NRTL listing for series rating of installed devices.
 - 6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 - 7. Include wiring diagrams for power, signal, and control wiring.
 - 8. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards.
- C. Seismic Qualification Certificates: Submit certification that panelboards, overcurrent protective devices, accessories, and components will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."
- D. Field quality-control reports.
- E. Panelboard schedules for installation in panelboards.
- F. Operation and maintenance data.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NEMA PB 1.

- C. Comply with NFPA 70.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PANELBOARDS

- A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."
- B. Enclosures: Flush- and surface-mounted cabinets.
 - 1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - b. Outdoor Locations: NEMA 250, Type 4X stainless steels.
 - c. Kitchen and Wash-Down Areas: NEMA 250, Type 4X stainless steel.
 - d. Other Wet or Damp Indoor Locations: NEMA 250, Type 4X stainless steel.
 - 2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
 - 3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
 - 4. Directory Card: Inside panelboard door, mounted in transparent card holder.
- C. Incoming Mains Location: Top and bottom.
- D. Phase, Neutral, and Ground Buses: Tin-plated aluminum.
- E. Conductor Connectors: Suitable for use with conductor material and sizes.
 - 1. Material: Tin-plated aluminum.
 - 2. Main and Neutral Lugs: Mechanical type.
 - 3. Ground Lugs and Bus Configured Terminators: Mechanical type.
 - 4. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
 - 5. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
- F. Service Equipment Label: NRTL labeled for use as service equipment for panelboards with one or more main service disconnecting and overcurrent protective devices.
- G. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- H. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.2 DISTRIBUTION PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. Panelboards: NEMA PB 1, power and feeder distribution type.
- C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
- D. Mains: Lugs only.
- E. Branch Overcurrent Protective Devices: For Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
- F. Branch Overcurrent Protective Devices: For Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Mains: Circuit breaker or lugs only, as indicated on panel schedules.
- D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.
- F. Column-Type Panelboards: Narrow gutter extension, with cover, to overhead junction box equipped with ground and neutral terminal buses.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
 - a. Instantaneous trip.
 - b. Long- and short-time pickup levels.
 - c. Long- and short-time time adjustments.
 - d. Ground-fault pickup level, time delay, and I^2t response.
4. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
5. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
 - c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
 - d. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
 - e. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.
 - f. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.
 - g. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

2.5 ACCESSORY COMPONENTS AND FEATURES

- A. Portable Test Set: For testing functions of solid-state trip devices without removing from panelboard. Include relay and meter test plugs suitable for testing panelboard meters and switchboard class relays.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Receive, inspect, handle, store and install panelboards and accessories according to NECA 407 and NEMA PB 1.1.
- B. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."
- C. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches above the floor or working platform, unless otherwise indicated.

- D. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- E. Install overcurrent protective devices and controllers not already factory installed.
 - 1. Set field-adjustable, circuit-breaker trip ranges.
- F. Install filler plates in unused spaces.
- G. Stub four 1-inch (27-GRC) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch (27-GRC) empty conduits into raised floor space or below slab not on grade.
- H. Arrange conductors in gutters into groups and bundle and wrap with wire ties.
- I. Comply with NECA 1.

3.2 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Division 26 Section "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads and incorporating Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
- C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
- D. Device Nameplates: Label each branch circuit device in distribution panelboards with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Panelboards will be considered defective if they do not pass tests and inspections.

- E. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION 26 24 16

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. Snap switches and wall-box dimmers.
 - 3. Solid-state fan speed controls.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Samples: One for each type of device and wall plate specified, in each color specified.
- D. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - 1. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).
 - 2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
 - 3. Leviton Mfg. Company Inc. (Leviton).
 - 4. Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour).

2.2 STRAIGHT BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 5351 (single), 5352 (duplex).
 - b. Hubbell; HBL5351 (single), CR5352 (duplex).
 - c. Leviton; 5891 (single), 5352 (duplex).
 - d. Pass & Seymour; 5381 (single), 5352 (duplex).

2.3 GFCI RECEPTACLES

- A. General Description: Straight blade, non-feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.
- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; GF20.
 - b. Pass & Seymour; 2084.

2.4 SNAP SWITCHES (Non Public Areas ONLY)

- A. Comply with NEMA WD 1 and UL 20.
- B. Switches, 120/277 V, 20 A:
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 2221 (single pole), 2222 (two pole), 2223 (three way), 2224 (four way).
 - b. Hubbell; CS1221 (single pole), CS1222 (two pole), CS1223 (three way), CS1224 (four way).
 - c. Leviton; 1221-2 (single pole), 1222-2 (two pole), 1223-2 (three way), 1224-2 (four way).
 - d. Pass & Seymour; 20AC1 (single pole), 20AC2 (two pole), 20AC3 (three way), 20AC4 (four way).
- C. Pilot Light Switches, 20 A:
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 2221PL for 120 V and 277 V.
 - b. Hubbell; HPL1221PL for 120 V and 277 V.
 - c. Leviton; 1221-PLR for 120 V, 1221-7PLR for 277 V.
 - d. Pass & Seymour; PS20AC1-PLR for 120 V.
 3. Description: Single pole, with neon-lighted handle, illuminated when switch is "ON."

- D. Key-Operated Switches, 120/277 V, 20 A:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 2221L.
 - b. Hubbell; HBL1221L.
 - c. Leviton; 1221-2L.
 - d. Pass & Seymour; PS20AC1-L.
 - 3. Description: Single pole, with factory-supplied key in lieu of switch handle.
- E. Single-Pole, Double-Throw, Momentary Contact, Center-Off Switches, 120/277 V, 20 A; for use with mechanically held lighting contactors.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 1995.
 - b. Hubbell; HBL1557.
 - c. Leviton; 1257.
 - d. Pass & Seymour; 1251.
- F. Key-Operated, Single-Pole, Double-Throw, Momentary Contact, Center-Off Switches, 120/277 V, 20 A; for use with mechanically held lighting contactors, with factory-supplied key in lieu of switch handle.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 1995L.
 - b. Hubbell; HBL1557L.
 - c. Leviton; 1257L.
 - d. Pass & Seymour; 1251L.

2.5 ROCKER SWITCHES DECORA STYLE (ALL Public Areas, Including Guestrooms, Front Desk and Admin Offices)

- A. Rocker Switches by Cooper, Hubbell, Leviton or Pass & Seymour, Mfg. Co's, Grounding: UL Listed, CSA Certified, colors as selected from manufacturer's standard colors.
 - 1. Commercial Spec Grade, Back and Side Wired.
 - a. 20 amp, 120/277 volt single-pole, double-pole, 3-way and 4-way.
 - b. 20 amp, Illuminated ON, single-pole 120 volt and 277 volt, 3-way 120 volt and 277 volt.
 - c. 20 amp, Illuminated OFF, single-pole 120 volt and 277 volt, 3-way 120 volt and 277 volt.
 - d. 20 amp, 120/277 volt, antimicrobial, single-pole and 3-way.

2.6 WALL-BOX DIMMERS

- A. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
- B. Control: Continuously adjustable slider; with single-pole or three-way switching. Comply with UL 1472.
- C. Incandescent Lamp Dimmers: 120 V; control shall follow square-law dimming curve. On-off switch positions shall bypass dimmer module.
 - 1. 600 W; dimmers shall require no derating when ganged with other devices. Illuminated when "OFF."
- D. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.

2.7 FAN SPEED CONTROLS

- A. Modular, 120-V, full-wave, solid-state units with integral, quiet on-off switches and audible frequency and EMI/RFI filters. Comply with UL 1917.
 - 1. Continuously adjustable slider.

2.8 WALL PLATES

- A. Single and combination types to match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
 - 3. Material for Kitchen and Unfinished Spaces: Stainless steel.
 - 4. Material for Damp Locations: Stainless steel with spring-loaded lift cover, and listed and labeled for use in "wet locations."
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant thermoplastic "while in use" with lockable cover.

2.9 FLOOR SERVICE FITTINGS

- A. Type: Modular, flush-type, dual-service units suitable for wiring method used.
- B. Compartments: Barrier separates power from voice and data communication cabling.
- C. Service Plate: Rectangular die-cast aluminum with satin finish.
- D. Power Receptacle: NEMA WD 6 configuration 5-20R, gray finish, unless otherwise indicated.
- E. Voice and Data Communication Outlet: Blank cover with bushed cable opening.

2.10 FINISHES

- A. Color: Wiring device catalog numbers in Section Text do not designate device color.
 - 1. Wiring Devices Connected to Normal Power System: As selected by Architect, unless otherwise indicated or required by NFPA 70 or device listing.
 - 2. Wiring Devices Connected to Emergency Power System: Red.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
- B. Coordination with Other Trades:
 - 1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
 - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 - 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
 - 1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
 - 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 - 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
 - 4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailing existing conductors is permitted provided the outlet box is large enough.
- D. Device Installation:
 - 1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
 - 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 - 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 - 4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
 - 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
 - 6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
 - 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
 - 8. Tighten unused terminal screws on the device.

9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.
- E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- G. Dimmers:
1. Install dimmers within terms of their listing.
 2. Verify that dimmers used for fan speed control are listed for that application.
 3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.
- H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

3.2 IDENTIFICATION

- A. Comply with Division 26 Section "Identification for Electrical Systems."
1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
1. Test Instruments: Use instruments that comply with UL 1436.
 2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.
- B. Tests for Convenience Receptacles:
1. Line Voltage: Acceptable range is 105 to 132 V.
 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new, and retest as specified above.

END OF SECTION 26 27 26

SECTION 26 28 13

FUSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Cartridge fuses rated 600-V ac and less for use in enclosed switches and enclosed controllers.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NEMA FU 1 for cartridge fuses.
- C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cooper Bussmann, Inc.
 - 2. Edison Fuse, Inc.
 - 3. Ferraz Shawmut, Inc.
 - 4. Littelfuse, Inc.

2.2 CARTRIDGE FUSES

- A. Characteristics: NEMA FU 1, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

PART 3 - EXECUTION

3.1 FUSE APPLICATIONS

- A. Motor Branch Circuits: Class RK1, time delay.
- B. Other Branch Circuits: Class RK1, time delay.

3.2 INSTALLATION

- A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.3 IDENTIFICATION

- A. Install labels complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems" and indicating fuse replacement information on inside door of each fused switch and adjacent to each fuse block and holder.

END OF SECTION 26 28 13

SECTION 26 28 16

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fusible switches.
 - 2. Nonfusible switches.
 - 3. Receptacle switches.
 - 4. Shunt trip switches.
 - 5. Molded-case circuit breakers (MCCBs).
 - 6. Enclosures.

1.2 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Enclosed switches and circuit breakers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.4 SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated.
- B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Wiring Diagrams: For power, signal, and control wiring.
- C. Seismic Qualification Certificates: For enclosed switches and circuit breakers, accessories, and components, from manufacturer.
- D. Field quality-control reports.
- E. Operation and maintenance data.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. Type HD, Heavy Duty, Single Throw, 240 or 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 - 2. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
 - 3. Lugs: Suitable for number, size, and conductor material.

2.2 NONFUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. Type HD, Heavy Duty, Single Throw, 240 or 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 - 2. Lugs: Suitable for number, size, and conductor material.

2.3 RECEPTACLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.

- B. Type HD, Heavy-Duty, Single-Throw Fusible Switch: 240 or 600-V ac, 30, 60, 100 A; UL 98 and NEMA KS 1; horsepower rated, with clips or bolt pads to accommodate specified fuses; lockable handle with capability to accept three padlocks; interlocked with cover in closed position.
- C. Interlocking Linkage: Provided between the receptacle and switch mechanism to prevent inserting or removing plug while switch is in the on position, inserting any plug other than specified, and turning switch on if an incorrect plug is inserted or correct plug has not been fully inserted into the receptacle.
- D. Receptacle: Polarized, three-phase, four-wire receptacle (fourth wire connected to enclosure ground lug).

2.4 SHUNT TRIP SWITCHES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Cooper Bussmann, Inc.
 2. Ferraz Shawmut, Inc.
 3. Littelfuse, Inc.
- B. General Requirements: Comply with ASME A17.1, UL 50, and UL 98, with 200-kA interrupting and short-circuit current rating when fitted with Class J fuses.
- C. Switches: Three-pole, horsepower rated, with integral shunt trip mechanism and Class J fuse block; lockable handle with capability to accept three padlocks; interlocked with cover in closed position.
- D. Control Circuit: 120-V ac; obtained from integral control power transformer, with primary and secondary fuses, with a control power transformer of enough capacity to operate shunt trip, connected pilot, and indicating and control devices.
- E. Accessories:
 1. Oiltight key switch for key-to-test function.
 2. Oiltight ON pilot light.
 3. Isolated neutral lug.
 4. Mechanically interlocked auxiliary contacts that change state when switch is opened and closed.
 5. Form C alarm contacts that change state when switch is tripped.
 6. Three-pole, double-throw, fire-safety and alarm relay; 120-V ac coil voltage.
 7. Three-pole, double-throw, fire-alarm voltage monitoring relay complying with NFPA 72.

2.5 MOLDED-CASE CIRCUIT BREAKERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 3. Siemens Energy & Automation, Inc.
 4. Square D; a brand of Schneider Electric.

- B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.
- C. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
- D. Features and Accessories:
 - 1. Standard frame sizes, trip ratings, and number of poles.
 - 2. Lugs: Suitable for number, size, trip ratings, and conductor material.
 - 3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.

2.6 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
 - 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 - 2. Outdoor Locations: NEMA 250, Type 4X stainless steel.
 - 3. Kitchen and Wash-Down Areas: NEMA 250, Type 4X stainless steel.
 - 4. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4X, stainless steel.
 - 5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- B. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- D. Install fuses in fusible devices.
- E. Comply with NECA 1.

3.2 IDENTIFICATION

- A. Comply with requirements in Division 26 Section "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:

1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
 2. Test continuity of each circuit.
- C. Tests and Inspections:
1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION 26 28 16

SECTION 26 56 00

EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Exterior luminaires.

1.2 SUBMITTALS

- A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, and finishes.
- B. Shop Drawings: Anchor-bolt templates keyed to specific and certified by manufacturer.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with IEEE C2, "National Electrical Safety Code."
- C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide product indicated on Drawings.

2.2 GENERAL REQUIREMENTS FOR LUMINAIRES

- A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.
- B. Lateral Light Distribution Patterns: Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.
- C. Metal Parts: Free of burrs and sharp corners and edges.
- D. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.
- E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.
- F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

- G. Exposed Hardware Material: Stainless steel.
- H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
- I. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.
- J. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
 - 1. White Surfaces: 85 percent.
 - 2. Specular Surfaces: 83 percent.
 - 3. Diffusing Specular Surfaces: 75 percent.
- K. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.
- L. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.
- M. Factory-Applied Finish for Steel luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
 - 2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
 - a. Color: As selected by Architect from manufacturer's full range.
- N. Factory-Applied Finish for Aluminum luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
 - 2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20; and seal aluminum surfaces with clear, hard-coat wax.
 - 3. Class I, Clear Anodic Finish: AA-M32C22A41 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
 - 4. Class I, Color Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.
 - a. Color: Per architect.

- O. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
 - 1. Label shall include the following lamp and ballast characteristics:
 - a. "USES ONLY" and include specific lamp type.
 - b. Lamp tube configuration (twin, quad, triple), base type, and nominal wattage for compact fluorescent luminaires.
 - c. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.
 - d. Start type (preheat, rapid start, instant start) compact fluorescent luminaires.
 - e. ANSI ballast type (M98, M57, etc.) for HID luminaires.
 - f. CCT and CRI for all luminaires.

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

- A. Fasten luminaire to indicated structural supports.
 - 1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.
- B. Adjust luminaires that require field adjustment or aiming.

3.2 INSTALLATION OF INDIVIDUAL GROUND-MOUNTING LUMINAIRES

- A. Install on concrete base with top 4 inches (100 mm) above finished grade or surface at luminaire location. Cast conduit into base, and finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Division 03 Section "Cast-in-Place Concrete."

3.3 CORROSION PREVENTION

- A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.
- B. Steel Conduits: Comply with Division 26 Section "Raceway and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch- (0.254-mm-) thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

END OF SECTION 26 56 00

Hazardous Building Materials Abatement Specifications

REVISED

Mission Bay Golf Course
2702 N. Mission Bay Drive

San Diego, California
Architects Mosher Drew
4206 W. Point Loma Blvd. | San Diego, California 92110

June 17, 2020 | Project No. 108265001



Geotechnical | Environmental | Construction Inspection & Testing | Forensic Engineering & Expert Witness

Geophysics | Engineering Geology | Laboratory Testing | Industrial Hygiene | Occupational Safety | Air Quality | GIS

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

Hazardous Building Materials Abatement Specifications **REVISED**

Mission Bay Golf Course
Clubhouse and Range Building Demolition Project
2702 N. Mission Bay Drive
San Diego, California

Mr. Bill Magnusson, Principal
Architects Mosher Drew
4206 W. Point Loma Blvd. | San Diego, California 92101

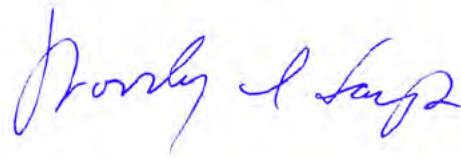
Dear Mr. Magnusson:

In accordance with your request and our proposal dated April 26, 2016, Ninyo & Moore has prepared Hazardous Building Material Abatement Specifications for the above-referenced site. These specifications will serve as guidance documents to contractors for the removal and abatement of asbestos-containing materials and universal hazardous waste. Ninyo & Moore is pleased to be of continued service to you on this important project.

June 17, 2020 | Project No. 108265001



Nicolas J. Carpenter, CAC #12-4867
Senior Project Environmental Scientist



C. Wood Hays
Principal Environmental Manager

NJC/CWH

Distribution: (1)

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SECTION 1

Asbestos Abatement and Removal Specifications

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Table 1 – Description and Location of Asbestos-Containing Material 1

1 SCOPE OF WORK

The scope of work for the abatement project will involve the abatement of asbestos-containing materials (ACMs) and asbestos-containing construction materials (ACCMs) prior to building demolition, as outlined in the construction contract documents. ACMs and ACCMs have been identified at the following locations at the Clubhouse and Range buildings (subject buildings).

Table 1 – Description and Location of Asbestos-Containing Materials

ACM Location ⁽¹⁾	ACM Description
CLUBHOUSE	
Roof throughout	Gray roof penetration mastic
Heater Room and Janitor Closet	White wall plaster
RANGE BUILDING	
Roof throughout	Roof assembly – rolled roofing ⁽²⁾
Roof throughout	Roof penetration mastic
Closet floor	Sheet vinyl
Storage room floor	12"x12" vinyl floor tile ⁽²⁾
NOTES:	
⁽¹⁾ = ACM locations are based upon Ninyo & Moore's visual observations during survey activities. Materials that are uniform in color, texture, construction or application date, and/or general appearance to materials found to be asbestos-containing, should be presumed to be asbestos-containing.	
⁽²⁾ = Material is an ACCM.	

The ACMs and ACCMs were identified during a hazardous building material survey conducted in April 2013. Tables summarizing the type of material sampled and results are included in the Asbestos-Lead-hazardous Materials Inspection Report (Section 4). It is the Contractor's responsibility to locate and quantify materials that are to be impacted by the scheduled demolition activities, as outlined in the construction contract documents prior to bid submittals, as part of the Contractor's due diligence, and prior to initiating demolition activities at the subject buildings.

Our understanding is that the buildings have been scheduled for demolition activities. Specific Contractor responsibilities include, but are not limited to, the following activities listed below, which will be performed as part of the scope of work.

- The Contractor is responsible for the protection and decontamination of fixtures and equipment remaining in the work area, prior to, and after abatement.
- The Contractor shall furnish all labor, materials, services, insurance, equipment, and decontamination facilities to carry out the complete removal and disposal of all ACMs and ACCMs identified in these specifications that are part of the demolition project.
- Work shall be performed in accordance with all applicable regulations, codes, ordinances, and standards of governing authorities having jurisdiction and the requirements specified herein.

Where applicable state or local standards are more stringent than federal standards, the Contractor shall adhere to the most stringent standards.

In addition, the Contractor shall furnish all labor, material, supervision, construction tools, and equipment necessary to perform the following work:

- Removal of all identified ACMs and ACCMs, as found in Table 1, prior to building demolition. The Contractor shall verify quantities and locations as part of the Contractor's due diligence.
- Provision and maintenance of environmental and occupational safety protective measures, equipment, and procedures at the work site, including appropriate engineering controls.
- Cleaning of the work site to completely remove all visually apparent asbestos and reduce airborne asbestos fiber concentrations.
- If, in the course of removal of ACMs and ACCMs from the site, the Contractor discovers any other ACMs and ACCMs other than those described in plans, reports, and/or specifications, the Contractor shall notify the Owner and/or Consultant in writing, and after receiving the Owner's approval, the Contractor will remove and dispose of such item(s) at the contract unit price identified by the Contractor in its bid.
- With respect to available utilities, the Contractor shall coordinate access and use of all utilities as needed for the duration of the project with the Owner. If utilities are unavailable, the Contractor will be required to provide the utilities at the Contractor's own cost.
- The Contractor shall obtain all necessary permits from the owner, the City of San Diego, San Diego Air Pollution Control District (SDAPCD), and any other authorities having jurisdiction.
- Packaging, transport, and disposal of all asbestos to a disposal site approved by the applicable federal, state, and local authorities shall be the sole responsibility of the Contractor, including any certifications or statements of non-friability required by the landfill.
- Cooperation with the Consultant with regards to air monitoring and observation of procedures.

1.1 Definitions

- "Aggressive method" means removal or disturbance of building material by sampling, abrading, grinding, or method that breaks, crumbles, or disintegrates intact ACM.
- "Amended water" means water to which surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.
- "Area sampling" means sampling of asbestos fiber concentrations which approximates the concentrations of asbestos in the theoretical breathing zone but is not actually collected in the breathing zone of an employee.
- "Asbestos" includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, actinolite, and any of these materials that has been chemically treated and/or altered.
- "ACM" means asbestos containing material; any material containing more than 1% asbestos (>1.0%).
- "ACCM" means asbestos-containing construction material; any material containing between 0.1% and 1% (0.1% to 1%) asbestos.

- “Authorized person” means any person authorized by the employer and required by work duties to be present in regulated areas.
- “Class I asbestos work” means activities involving the removal of thermal system insulation (TSI) and surfacing ACM and PACM.
- “Class II asbestos work” means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile, and sheeting, roofing and siding shingles, and construction mastics.
- “Class III asbestos work” means repair and maintenance operations where ACM, including TSI and surfacing ACM and PACM, is likely to be disturbed.
- “Clean room” means an uncontaminated room having facilities for the storage of employees’ street clothing and uncontaminated materials and equipment.
- “Closely resemble” means the major workplace conditions, which have contributed to the levels of historic asbestos exposure, are no more protective than the conditions of the current workplace.
- “Competent person” means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions, which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. In addition, for Class I and Class II work, one who is specially trained in a training course, which meets the criteria of the Environmental Protection Agency (EPA) model accreditation Plan (40 Code of Federal Regulations [CFR] 763) for project designer or supervisor, or its equivalent.
- “Consultant” shall be the independent party retained by the Owner to provide consultation and supervision services for asbestos abatement activities.
- “Critical barrier” means one or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.
- “Decontamination area” means an enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.
- “Demolition” means the wrecking or taking out of load-supporting structural member and any related razing, removing, or stripping of building materials.
- “Disturbance” means contact that releases fibers from ACM or ACCM or debris containing ACM or ACCM. This term includes activities that disrupt the matrix of ACM or ACCM, render ACM or ACCM friable, or generate visible debris. Disturbance includes cutting away small amounts of ACM and ACCM, no greater than the amount that can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM or ACCM so disturbed exceed the amount that can be contained in one glove bag or waste bag, which shall not exceed 60 inches in length and width.
- “Employee exposure” means that exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.
- “Encapsulants” means specific materials in various forms used to chemically or physically entrap asbestos fibers in various configurations to prevent these fibers from becoming airborne. There

are four types of encapsulants as follows which must comply with performance requirements as specified herein.

- Removal Encapsulant (can be used as a wetting agent).
 - Bridging Encapsulant (used to provide a tough, durable surface coating to ACM).
 - Penetrating Encapsulant (used to penetrate the ACM encapsulating all asbestos fibers and prevent fiber release due to routine mechanical damage).
 - Lock-Down Encapsulant (used to seal off or “lock-down” minute asbestos fibers left on surfaces from which ACM has been removed).
- “Equipment room (change room)” means a contaminated room located within the decontaminated area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.
 - “Fiber” means a particulate form of asbestos, 5 micrometers or longer, with a length to diameter ratio of at least 3 to 1.
 - “Glovebag” means an impervious plastic bag-like enclosure that can be affixed around ACM, with glove-like appendages through which materials and tools can be handled.
 - “High-efficiency particulate air (HEPA) filter” means a filter capable of trapping and retaining at least 99.97% of all mono-dispersed particles of 0.3 micrometer in diameter.
 - “Homogenous area” means an area of surfacing material or TSI that is uniform in color, texture, and date of installation.
 - “Industrial hygienist” means a professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.
 - “Intact” means that ACM has not crumbled, been pulverized, or otherwise deteriorated so that it is no longer likely to be bound with its matrix.
 - “Modification” means a changed or altered procedure, material, or component of a control system that replaces a procedure, material or component of a required system. Omitting a procedure or component, or reducing or diminishing the stringency or strength of a material or component of the control system is not a “modification.”
 - “Negative initial exposure assessment” means a demonstration by the employer that complies with the criteria in Title 8 California Code of Regulations (CCR) 1529, subsection (f)(2)(c), that employee exposure during an operation is expected to be consistently below the Permissible Exposure Limit (PEL).
 - “Owner” shall refer to the City of San Diego.
 - “Presumed ACM” means thermal system insulation and surfacing material found in buildings constructed no later than 1980. The designation of material as “PACM” may be rebutted pursuant to Title 8 CCR 1529, subsection (k)(4).
 - “Project Designer” means a person who has successfully completed the initial training requirements and maintained annual refreshers for the abatement project designer established by 40 U.S.C. Sec. 763.90(g).

- “Regulated area” means an area established by the employer to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limit.
- “Removal” means all operations where ACM and/or ACCM are taken out or stripped from structures or substrates, and includes demolition operations.
- “Renovation” means the modifying of an existing structure, or portion thereof.
- “Repair” means overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or ACCM attached to structures or substrates.
- “Surfacing material” means material that is sprayed, troweled-on, or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).
- “Surfacing ACM” means surfacing material, which contains more than 1% (>1.0%) asbestos.
- “Surfactant” means a chemical wetting agent added to water to improve penetration, thus reducing the amount of water required for a given operation or area, and enhancing the effect of the water in reducing fiber release.
- “TSI” means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

1.2 Notifications

Notification of asbestos abatement activities shall be provided by the Contractor as required and in accordance to all applicable federal, state, and local agencies prior to the start of abatement activities.

1.3 Quantity Takeoff

All ACM and ACCM quantities shall be determined by the bidder and no claim for additional cost will be accepted by the Owner as a result of quantities of ACMs and ACCMs to be removed.

1.4 Regulatory Compliance

All work shall be performed in compliance with pertinent laws, rules, and regulations existing at the time of the work, including but not limited to:

- General Industry Safety and Health Standards, 29 CFR Part 1910.
- Safety and Health Standards for the Construction Industry, 29 CFR Part 1926.
- The Occupational Safety and Health Standards for Asbestos, 29 CFR Parts 1910.1001 and 1926.1101.
- The EPA National Emission Standard for Hazard Air Pollutants, National Emission Standard for Asbestos, Title 40 CFR Part 61(a) and (m).

- The Occupational Safety and Health Administration (OSHA) Standards, for respiratory protection, 29 CFR Part 1910.134.
- CCR, Title 8, Section 1529, Asbestos in Construction.
- The Transportation Safety Act, Hazardous Material Transportation Act, Title 49 CFR Parts 106, 107, 171 to 179.
- The Asbestos Hazard Emergency Response Act, 40 CFR, Part 763.
- All applicable state, local regulations, and ordinances, including any regulations regarding State and/or local licenses or certificates.

Where applicable state or local regulations are more stringent than OSHA requirements or the requirements referenced herein, the Contractor shall adhere to the more stringent regulations. In addition, the Contractor warrants that he is familiar with the codes and requirements applicable to asbestos abatement work and shall give all notices and comply with all laws, ordinances, rules, and regulations applicable to the work. If the Contractor observes that the Specifications or plans at variance therewith, he shall give written notice to the Owner and/or Consultant describing such variances. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules, and regulations, and without written notice to the Owner and/or Consultant, the Contractor shall bear all costs arising there from. The Contractor's particular attention is directed to the applicable California Occupational Safety and Health Administration (Cal-OSHA) regulations found in CCR Title 8, Section 1529 and the necessity of complying with the regulations in the progress of his work. Failure or omission on the part of the Contractor, or any of its representatives, either to discover or to bring to the attention of the Owner and/or Consultant any deviation from, omission from, or noncompliance with the requirements for asbestos abatement shall not be used by the Contractor as defense for failure on its part to fulfill such requirements.

2 CONTRACTOR SUBMITTALS

2.1 Manufacturer's Product Data

- HEPA-Filtered Vacuum Equipment
- Respirators
- Surfactants
- Encapsulants

2.2 Plan for Removal and Demolition of Asbestos

The Contractor shall prepare and submit a detailed job specific plan of the work procedures to be used in the removal and demolition of materials containing asbestos at least **two weeks prior** to the start of work.

- The plan shall be prepared and signed by the Contractor and Contractor's Competent Person.
- Such plan shall include a sketch showing the location, size, and details of asbestos control areas, location and details of the change rooms, layout of change rooms, layout and location of waste container pass out airlock system, and locations of HEPA-filtered negative air equipment, if applicable.
- The plan shall also include interface of trades involved in the construction, sequencing of asbestos-related work, disposal plan, type of wetting agent and removal encapsulants to be used, respirators, protective equipment, pressure differential monitoring devices, and a detailed description of the method to be employed in order to control pollution.
- The plan shall include copies of emergency, security, and contingency plans as follows:
 - A plan to provide emergency and fire evacuation for removing workers from the work zone. A copy of this plan shall be filed with the local fire and/or ambulance unit.
 - A plan for maintaining the security of the work zone. The security plan shall provide a means of preventing accidental or unauthorized entry.
 - A contingency plan addressing emergencies, equipment failures, and barrier failure. This plan shall include telephone numbers of representatives of the Contractor to be contacted in emergencies.
- The plan shall be approved by the Owner and/or Consultant prior to the start of asbestos abatement work.
- Prior to beginning work, the Owner and/or Consultant and Contractor shall meet to discuss in detail the asbestos plan, including work procedures and safety precautions.

2.3 Administrative and Contractor Closeout Submittals

2.3.1 Notification of Equipment Rental

If rental equipment is to be used during asbestos handling and disposal, written notification concerning the intended use of the equipment will be furnished to the rental agency, with a copy to the Owner and/or Consultant.

2.3.2 Landfill Delivery Records

Within three days after delivery of ACM to the landfill, submit detailed delivery tickets and hazardous waste manifests, prepared, signed, and dated by an agent of the landfill, certifying the amount of materials delivered to the landfill.

2.3.3 Waste Disposal Site Approval

Submit the recommended waste disposal site to the Owner and/or Consultant for approval prior to the start of the project. Submit written evidence to the Owner and/or Consultant prior to disposal, that the waste disposal site is approved for asbestos disposal by the EPA and other applicable authorities. At job completion, these records shall be inserted into the job binder and transmitted to the Owner and/or Consultant.

2.3.4 Personnel Training Certificates

Prior to the Notice-to-Proceed, the Contractor shall submit to the Owner and/or Consultant a declaration certifying that all of the Contractor's employees have been adequately trained in accordance with CCR Title 8, Section 1529. The Contractor shall also submit proof that all personnel who will be permitted to enter contaminated work areas have been adequately trained in accordance with CCR Title 8, Section 1529 for certification as an Asbestos Worker or Supervisor for Class I and II asbestos abatement projects.

2.3.5 Medical Examination and Certification

Prior to the Notice-to-Proceed, the Contractor shall submit proof that all personnel who will be permitted to enter contaminated work areas have had medical examinations in accordance with CCR Title 8, Section 1529 and 29 CFR 1910.134. In addition, the Contractor shall provide a written certification signed by a licensed physician that all workers and supervisors have met or exceeded all of the medical prerequisites listed herein and in CCR Title 8, Section 1529 and 29 CFR 1910.134.

2.3.6 Testing Laboratory

The Contractor shall submit:

- The name, address, and telephone number of each testing laboratory selected for the sampling, analysis, and reporting of airborne concentrations of asbestos fibers along with evidence that each laboratory selected holds the appropriate state license and/or permits;
- Certification that each laboratory is American Industrial Hygiene Association (AIHA) accredited; and
- Persons counting the samples have been judged proficient by current inclusion on the AIHA Asbestos Analysis Registry and have successfully participated in the laboratory in the Proficiency Analytical Testing Program.

2.3.7 Personal Air Sampling Results

The Contractor shall have complete fiber counting for personal air sampling and provide results to the Owner and/or Consultant for review ***within 24 hours of sample collection***. The Contractor will notify the Owner and/or Consultant immediately of any airborne levels of asbestos fibers in excess of the PEL.

2.3.8 Asbestos Disposal Quantity Report

The Contractor shall review and report to the Owner and/or Consultant, within 24 hours from the end of each work day, the amount of asbestos containing material removed during the previous day.

2.3.9 Contractor Licensing Board Asbestos Certification

Submit a copy of the Contractor's California State Contractor's Licensing Board Asbestos Certification in accordance with the California Business and Professional Code, Section 7058.5, to the Owner and/or Consultant.

2.3.10 Contractor Class C Asbestos Removal License

The contractor removing the asbestos shall submit proof that possesses a current California Class C Asbestos Removal License to the Owner and/or Consultant.

2.3.11 Hazardous Waste Hauler License and EPA Transporter's Number

Submit proof that the Contractor's Hazardous Waste Hauler possesses a current Hazardous Waste Hauler License and EPA Transporter's Number to the Owner and/or Consultant.

2.3.12 At Job Completion

Contractor shall transmit the job binder to Owner and/or Consultant. Contents shall be as described in this section plus any additional items as designated by the Owner and/or Consultant.

2.4 Quality Assurance

- Where the methods or procedures are specified, they shall constitute the minimum measures and shall in no way relieve the Contractor of sole responsibility for the means, measures, methods, techniques, sequences, or safety measures in connection with the work.
- The removal of asbestos shall be supervised by a licensed supervisor who has experience in this field of construction and can furnish a record of satisfactory performance on at least three projects for work of comparable type and size.
- Subcontractor qualifications shall be the same in form and quantity as required for the Contractor.

3 PRODUCTS

Products to be supplied by the Contractor, include, but are not limited to, the following.

- **Polyethylene:** Polyethylene sheeting in various sizes to minimize the frequency of joints.
- **Tape:** Glass fiber or other tape capable of sealing joints of adjacent plastic sheets and for attachment of plastic sheeting to finished or unfinished surfaces of dissimilar materials under both dry and wet conditions.

- **Surfactant (Wetting Agent):** Shall consist of materials that are non-toxic and non-irritating to skin and eye, and non-carcinogenic. The wetting agent shall consist of 50% polyoxyethylene or polyglycolester and 50% polyoxyethylene ether, or the equivalent. Wetting agents shall be applied by means of an airless sprayer or equivalent.
- **Encapsulant:** Shall conform to EPA requirements, and shall contain no toxic or hazardous substances and no solvents.
- **Impermeable Containers:** Air- and water-tight, suitable to receive and retain any asbestos-containing or contaminated materials until disposal time at an approved site and labeled in accordance with applicable Cal-OSHA regulations (CCR Title 8, Section 1529). Two types of impermeable containers shall be used:
 - 6-millimeter (mil) plastic bags.
 - Metal or fiber drums with tightly fitting lids.
- **Warning Labels and Signs:** In conformance with applicable Cal-OSHA regulations (CCR Title 8, Section 1529).
- **Other Materials:** Provide all other materials, such as lumber, nails, and hardware that may be required to construct and dismantle the decontamination area and the barriers that isolate the work area.

4 EXECUTION

4.1 Material Handling

- Deliver materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.
- Store materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damages or contamination.
- Removal of all ACMs from the premises. Dispose of materials that become contaminated with asbestos in accordance with applicable regulatory standards.

4.2 Equipment

4.2.1 Respirators

The Contractor shall provide workers with personally issued and marked respiratory equipment approved by National Institute for Occupational Safety and Health and meeting the specifications of Cal-OSHA. This respiratory equipment shall be suitable for the asbestos exposure level in the work area according to CCR Title 8, Section 1529(i). The Contractor shall provide disposable HEPA (P100) cartridges as required, with sufficient replacement cartridges.

4.2.2 Personal Protective Equipment

The Contractor shall provide workers, the Owner and/or Consultant, and authorized visitors with sets of protective disposable clothing, head covers, gloves, eye protection, and foot covers of sizes to properly fit individual workers and visitors whenever they are required to enter the work area. Provide access and use of the Contractor's change room. Provide a minimum of four sets per day for visitors and sufficient sets as required for workers and the Owner and/or Consultant. The personal protective equipment, both new and used, shall remain the property of the Contractor.

4.2.3 Change Rooms

Provide a temporary unit with a separate equipment room, decontamination locker room, and a clean locker room for personnel required to wear whole body protective clothing.

- Separate each room from the others and from the control area by airlocks.
- Provide two separate lockers for each asbestos worker, one in each locker room.
- Keep street clothing and street shoes in the clean locker.
- Vacuum and remove asbestos contaminated disposable protective clothing while still wearing respirators in the equipment room. Seal clothing in impermeable bags or containers for disposal.
- Do not remove disposable protective clothing in the decontamination locker room.
- Remove work clothing in the decontamination locker room.
- Tag and bag cloth work clothes for laundering and keep work shoes in the decontamination locker room.
- Do not wear work clothing between home and work.
- Provide showers with hot and cold running water.
- Locate showers between the decontamination locker room and the clean locker room, and require employees to shower before changing into street clothes.
- Shower wastewater shall be handled and disposed as asbestos-containing material or shall be filtered through a final filter of at least 0.5 micron particle size collection capability before disposal into the sanitary sewer system.
- Handle and dispose of wastewater filters as asbestos containing material.
- Clean asbestos-contaminated work clothing in accordance with CCR Title 8, Section 1529 or use disposable clothing.
- Change rooms shall be physically attached to the work area wherever feasible and required.

4.2.4 Eye Protection

Furnish goggles for personnel engaged in asbestos operation when a full-face respirator is not being used.

4.2.5 Caution Signs and Labels

Provide caution signs printed in English and Spanish at approaches to asbestos work areas. Locate signs at such distance that personnel may read the sign and take the necessary precautions before entering the work area. Provide caution labels printed in English and Spanish. Affix labels to friable asbestos materials, scrap, waste, debris, sealed impermeable bags, asbestos waste drums, and other asbestos containing products. Caution signs and labels shall conform to the requirements defined in CCR Title 8, Section 1529.

4.2.6 Fire Extinguisher

A minimum of one 4A/60BC dry chemical extinguisher shall be maintained at each of the following locations:

- At each electrical panel.
- At each corner of the work area.
- Within 5 feet of the external entry to the shower room from the work area.
- Within 5 feet of the external entry to the shower room from the "clean room."

4.3 Worker Protection

4.3.1 Contractor Responsibility

Prior to commencement of work, all workers shall be instructed and shall be knowledgeable in the appropriate procedures of personal protection and asbestos removal.

The Contractor shall be solely responsible for enforcing worker protection requirements.

4.3.2 Reporting Unusual Events

When an event of unusual and significant nature occurs at the site, Contractor shall prepare and submit a special report listing chain of events, persons participating, responses, and similar pertinent information. When such events are known or predictable in advance, advise the Owner and/or Consultant at the earliest possible date. Unusual events would include breaches of containment.

4.3.3 Reporting Accidents

If a significant accident occurs at the site or anywhere else work is in progress, the Contractor shall prepare and submit appropriate reports to the Owner. For this purpose, a

significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained.

4.4 General Work Area Requirements

4.4.1 Respirators

- Workers shall always wear a respirator properly fitted on the face while in the work area.
- Workers wearing tight-fitting face pieces shall be clean-shaven to the extent that the hair does not interfere with the sealing surface of the respirator. This must be documented by a standard respirator fit test.
- The Contractor shall instruct and train workers in proper respirator use.

4.4.2 Clothing

Workers shall wear disposable, full-body coveralls and disposable head covers and footwear suitable for asbestos work in the work area.

4.5 Decontamination Unit Requirements

At all work areas, the Contractor shall set up a change room, shower, and equipment room outside the work area. Where feasible and required, the change room, shower, and equipment room will be attached to the work area. All workers without exception shall:

- Remove and properly store street clothes in the change room and put on new disposable coveralls, head covers, footwear, and cleaned respirator before entering the work area.
- Remove the disposable coveralls, head covers, and footwear in the equipment room and dispose them in an appropriate asbestos waste container. Still wearing their respirators, workers shall proceed to the showers and remove their respirators while showering with soap and tempered water. Wetted HEPA respirator cartridges shall be disposed of in appropriate asbestos containers.
- This procedure shall be followed each time a worker leaves the work area.
- Workers shall not eat, drink, smoke, or chew gum or tobacco in the work area.
- The Contractor shall provide disposable coveralls, head covering, and footwear to any official representative of the Owner who inspects the project.
- All persons entering the work area shall wear an approved respirator and disposable coveralls, head covering, and footwear.

4.6 Personal Air Monitoring

Daily personal air monitoring shall be conducted by the Contractor in order to determine the airborne concentrations of asbestos to which workers may be exposed.

4.7 Sign-In/Sign-Out Log & Daily Activity Report

- Contractor shall maintain a sign-in/sign-out log in the immediate vicinity of the change room of any decontamination area. This log shall be maintained from the time the first activity is performed involving the disturbance of asbestos-containing material until acceptance of the final air test results. All persons entering the work area, including the Contractor's workers, Owner, Consultant, and Government officials, shall be required to sign in and out each time upon entering and leaving the work area. All persons shall indicate name, time, company or agency represented, and reason for entering the work area.
- Contractor shall maintain a daily activity report describing work performed, materials and methods used, inspection(s) made, test(s) taken, and any unusual conditions or problems.
- Except for governmental inspectors having jurisdiction, no visitors shall be allowed in any work area, except as authorized by the Owner.

4.8 Housekeeping

The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by their employees. Bags of asbestos material and other waste material shall be removed immediately at the completion of work. Maintain surfaces of the work area free of debris and keep waste from being distributed outside of the immediate work area.

4.8.1 Removal of Asbestos Waste Containers

The Contractor shall provide a waste container removal system. Asbestos waste containers shall not be removed through the change rooms. The waste container removal system shall consist of a wash-down station inside the work area, a washroom, and a waste container holding area. Provide airlocks between each area and an airlock with access to outside the work area from the holding areas. Provide caution signs as specified herein for asbestos work areas. The waste container removal system shall be a temporary unit constructed to prevent the escape of asbestos fibers from the area. The system shall be physically attached to the work area. Personnel entering the waste container removal system shall wear personal protective equipment. The system shall not be used to enter or exit the work area. Access to outside the waste container removal system shall be sealed except during the removal of asbestos waste containers. Perform cleanup of the waste container removal system as specified herein for enclosed work areas. Do not remove the waste container removal system enclosure and caution signs prior to receipt of the Consultant's clearance certification. All asbestos waste containers shall be removed from the work area daily.

4.8.2 Procedure for Disposal of Asbestos

Do not remove any asbestos-containing materials from the site without approval from the Owner. Procedure for hauling and disposal of asbestos waste shall comply with 40 CFR 61, Subpart M and CCR Title 22.

4.9 Work Area Preparation

4.9.1 Warning Signs

The Contractor will provide Warning Signs meeting regulatory requirements at each visual and physical barrier.

4.9.2 Critical Barriers

Where appropriate, the Contractor shall seal all openings with two layers of 6-mil minimum polyethylene as a containment barrier to prevent leakage of air into the outside environment or other portions of the building. Individually seal ventilation openings in walls (supply and exhaust), wall-mounted fixtures, doorways, windows, convectors, and other wall and floor openings into the work area with adhesive tape alone or with two layers of polyethylene sheeting at least 6-mil (true), taped securely in place with adhesive tape.

4.9.3 Pre-Cleaning

1. The Contractor shall pre-clean movable objects to be salvaged for the Owner within the proposed work areas using HEPA vacuum equipment or wet cleaning methods as appropriate. The Contractor shall move such items to storage or other area as directed by the Owner.
2. The Contractor shall pre-clean immovable objects such as mechanical and electrical equipment and fixtures within the proposed work area using HEPA vacuuming equipment or wet cleaning methods as appropriate.
3. Prior to placing plastic sheeting, clean the work area(s) and immediately adjacent areas physically connected to abatement areas using HEPA vacuum equipment or wet-cleaning methods as appropriate. Do not use methods that raise dust such as broom sweeping or vacuuming with non-HEPA equipped vacuum cleaners.

4.9.4 Impermeable Drop Cloths

The contractor shall place impermeable drop cloths around the perimeters of the buildings in preparation for the removal of ACMs from the exterior walls. The drop cloths will extend a minimum of 10-feet from the base of the buildings walls. If the abatement project extends beyond one day, the drop cloths will be picked up at the end of each work day and packaged for disposal, after being cleaned of debris.

4.9.5 Containment

If necessary, the Contractor will contain work areas with two layers of 4-mil plastic sheeting on walls and ceilings, and two layers of 6-mil plastic sheeting on floors, or as otherwise directed in writing by the Consultant.

4.9.6 Decontamination Unit

The Contractor shall construct worker and waste container/equipment decontamination units in compliance with the EPA guidelines. Provide sufficient numbers of lockers in

change or "clean" rooms or worker's clothing with one locker reserved for Owner and/or Consultant personnel.

4.9.7 Emergency Exits

The Contractor shall establish emergency exits and procedures for the work area, satisfactory to fire officials and provide fire extinguishers as required.

4.9.8 Work Area Maintenance

The Contractor shall ensure that impermeable drop cloths remain around the perimeter of the building and interior containment walls remain intact. Inadvertent tears in plastic shall be repaired with fiber tape and the tear covered by plastic applied with spray adhesive, overlapping the tear by 6 inches on all sides.

If, during performance of abatement work, ACM or suspect ACM is observed outside the work area perimeter, work shall stop immediately upon discovery, appropriate repairs will be made (by Contractor), and all such debris will be collected using appropriate vacuums and wet methods.

5 ASBESTOS REMOVAL

5.1 General Work Area Requirements

In a work area, the Contractor shall:

- Remove and dispose of all ACMs in accordance with the methods and procedures outlined in CCR Title 8, Section 1529.
- All asbestos removal shall be supervised by a competent person.
- Where appropriate, enclose work areas under differential air pressure for the duration of the asbestos removal and subsequent cleaning phases and until all removal areas have been air-tested and found to be in compliance with the specified final air quality clearance level as determined by the Owner and/or Consultant.
- Perform appropriate cleaning using HEPA vacuum or wet cleaning methods of all areas physically connected to areas receiving asbestos removal.
- Dispose of all contaminated or otherwise removed materials and wastes in sealed and labeled containers in an approved sanitary landfill.
- Never use high-pressure water streams to remove any type of ACM.
- After removal, all surfaces shall be wet-cleaned and HEPA vacuumed to remove residual accumulated material. After cleaning, surfaces shall appear free of visible material.

- Prior to the removal of the plastic sheeting from the wall, apply approved sealant on all concrete or wood substrates, structural steel, and piping surfaces from which the material was removed and to plastic sheeting prior to its removal.
- Following related repair work remove any remaining floor and wall plastic, including seals on openings, and dismantle worker waste container/equipment decontamination areas and leave all areas clean.
- Eating, smoking, or applying cosmetics shall not be permitted in the work areas.

5.2 Removal of OSHA Class II Materials

5.2.1 Flooring Materials and/or Mastic

The Contractor is responsible for the removal/abatement of any of the identified flooring materials (linoleum), per the construction bid documents. The Contractor shall demonstrate to either the Owner or the Consultant that the flooring materials do not extend underneath any of the fixtures, cabinets, or other permanent items, in each room, where removal/abatement of asbestos-containing flooring materials is scheduled to occur.

The Contractor shall adhere to the following additional work practices regarding the removal of vinyl flooring tile and/or mastic:

- Flooring materials in the subject building include linoleum.
- Flooring materials and/or mastic shall be removed with hand tools and, to the extent feasible, substantially intact.
- Flooring materials and/or mastic removal operations involving the use of mechanized work methods, including motorized floor buffers and mechanical chipping, shall be conducted utilizing Class I work methods.
- Low-odor, solvent-based mastic removers may be used to remove ACM mastics, provided the waste generated is managed in accordance with applicable state and federal regulations. Use of solvent-based mastic removers will be followed by a suitable rinse (as per manufacturer's recommendations) to remove any residual mastic remover.

5.2.2 Roofing Materials

The Contractor shall adhere to the following additional work practices regarding the removal of roofing materials:

- Roofing materials shall be removed with hand tools, and to the extent feasible, substantially intact.
- Roofing materials shall not be dropped or thrown to the ground. The materials shall be carried or passed down by hand, or the materials will be lowered to the ground via covered, dust-tight chute, crane, or hoist.
- The Contractor will spray large areas of roofing material thoroughly with amend water, using spray equipment recommended by the surfactant manufacturer and capable of providing a "mist" application to reduce the chance of release of fibers. Spray the roofing material

repeatedly during the abatement work process to maintain wet conditions, but do not use excessive amounts of water that results in ponding or leakage into the building.

- While materials that have been removed remain on the roof, the materials shall either be kept wet, placed in an impermeable waste container, or wrapped in plastic sheeting.

5.3 Removal of Asbestos-Containing Construction Material

The Contractor shall adhere to the following additional work practices during the removal of ACCMs, in accordance with CCR, Title 8, Section 1529, Asbestos in Construction.

- ACCMs in the subject building include leveling compound and stucco.
- The Contractor shall constantly apply amended water or equivalent to the ACCM, for the duration of removal.
- No visible dust or other airborne particulate matter will be generated during removal activities.
- The Contractor will place the removed ACCMs in the waste disposal container(s) as soon as practicable, but no later than the end of the work shift.
- The Worker Protection measures and General Work Area Requirements described in Sections 4.4 and 4.5 will apply during the removal of ACCMs.
- The Work Area Preparation measures, as described in Section 4.9.1 - Warning Signs, are required during the removal of ACCMs. It is recommended that a disposable drop cloth be utilized during removal activities. If a drop cloth is utilized, the drop cloth will be disposed of with the removed materials as soon as practicable, but no later than the end of the work shift.

6 CLOSURE

6.1 Waste Labeling

- ACM should be placed in labeled, leak-tight containers and/or wrapping. The labels for friable ACMs shall contain all information as specified by the Occupational Safety and Health Standards of the Department of Labor, under 1926.1101(k)(2)(iii) and Title 8, Section 5229, and any local regulations.
- For temporary storage on site, ACMs shall be stored in a secured area. The area shall be demarcated with Asbestos Warning Signs.

6.2 Clearance

- Work areas and all other decontaminated areas and cleaned areas shall be considered clean when:
 - The work area passes a visual inspection by the Consultant,
 - Air testing performed by the Consultant and analyzed by Phase Contrast Microscopy (PCM) are found to be less than 0.01 fibers per cubic centimeter (f/cc) or background (to be determined by the Consultant, prior to abatement activities). PCM air samples will be analyzed in general accordance with NIOSH Method 7400.

- Areas that do not comply with the standard of cleaning for final clearance shall continue to be cleaned by and at the Contractor's expense until the specified standard is achieved as evidenced by results of air sampling tests by the Consultant. The costs of all follow-up tests necessitated by the failure of the air tests to meet the cleaning criteria, listed above, shall be borne by the Contractor; the Owner will deduct the cost of such follow-up tests from whatever moneys remain due to the Contractor. Follow-up testing shall occur within the time allotted for gross removal or all costs to the Owner of the building attributable to delayed occupancy or usage shall be borne by the Contractor.
- When the clearance is achieved, as listed above, and an inspection determines that the area has been visually decontaminated, the decontamination enclosure systems shall be removed, the area thoroughly wet cleaned, and materials from the equipment room and shower disposed of as contaminated waste. The remaining barriers between contaminated and clean areas and all seals on openings into the work area and fixtures shall be removed and disposed of as contaminated waste.

6.3 Tear Down

All plastic sheeting, tape, cleaning material, clothing, and all other disposable material used in the asbestos removal operation or items used in the work area shall be packed into sealable 6-mil plastic bags. These bags must be marked with labels as required by Cal-OSHA in CCR Title 8, Section 1529.



SECTION 2

Universal Waste Rule Removal Specifications

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1 SCOPE OF WORK

The scope of work for the abatement project will involve the removal, transport, and disposal of any items and/or materials falling under the Resource Conservation and Recovery Act (RCRA) Universal Hazardous Waste Rule (UWR) and materials potentially containing polychlorinated biphenyls (PCBs), which are to be removed prior to building demolition, as outlined in the construction contract documents.

1.1 Overview

- All work shall be supervised by experienced persons trained, knowledgeable, and qualified in the techniques of UWR/PCB abatement, handling of UWR/PCB waste and UWR/PCB-contaminated materials, and cleaning of UWR/PCB-contaminated areas.
- The Contractor shall provide and maintain environmental and occupational safety protective measures, equipment, and procedures at the work site.
- With respect to available utilities, the Contractor shall coordinate access and use of all utilities as needed for the duration of the project with the Owner. If utilities are unavailable, the Contractor will be required to provide the utilities at the Contractor's own cost.
- The Contractor shall furnish all labor, materials, services, insurance, equipment, decontamination facilities, and waste characterization of all potential UWR/PCB materials in order to carry out the complete removal, transport, and disposal of all UWR/PCB identified in these specifications that are part of the demolition project.
- The Contractor shall furnish all labor, materials, services, insurance, equipment, decontamination facilities, and waste characterization of all potentially hazardous PCB-containing materials in order to carry out the complete removal, transport, and disposal of all potentially PCB-containing materials identified in these specifications that are part of the demolition project.
- Work shall be performed in accordance with all applicable regulations, codes, ordinances, and standards of governing authorities having jurisdiction and the requirements specified herein. Where applicable state or local standards are more stringent than federal standards, the Contractor shall adhere to the most stringent standards.

1.2 Universal Hazardous Waste Rule (UWR) Scope of Work

The Contractor's Scope of Work for UWR includes, but is not limited to, the following:

- Removal and disposal/recycling of potentially mercury-containing fluorescent light tubes from light fixtures;
- Removal and disposal/recycling of potentially mercury-containing switches from thermostats;
- Removal and disposal/recycling of potentially tritium-containing exit signs;
- Removal and disposal/recycling of potentially Freon™-containing air conditioning units and refrigeration systems;

- Removal and disposal/recycling of lead/acid batteries;
- Removal and disposal/recycling of any building material falling under the UWR as described in the City of San Diego – Environmental Services Department’s Asbestos-Lead-Hazardous Materials Inspection Report (Section 3 of these Project Specifications);
- Placement of all contaminated items generated as a result of work activities and clean up in approved storage containers;
- Marking and labeling of all UWR materials and items for storage and disposal/recycling purposes;
- Transport of all UWR, items, and containers to a disposal facility and/or to an approved and off-site processing site for recycling;
- Preparing manifests, bills of lading, and all other required documentation for transportation, processing, and disposal of UWR for signature by the Owner.

1.3 Polychlorinated Biphenyls (PCB) Waste Scope of Work

The Contractor’s Scope of Work for PCBs includes, but is not limited to, the following:

- Removal of all potentially PCB-containing ballasts from light fixtures. All light fixtures are to be visually inspected, prior to removal or retrofitting, to determine if they contain PCBs. Those ballasts marked as “No PCBs” or “PCB Free” shall be considered as such. Those ballasts that are unmarked shall be considered PCB-containing and properly handled.
- Removal of all potentially PCB-oils, residues, and rinsates from pad-mounted electrical transformers.
- Proper cleanup and disposal of light fixtures if ballast oils have breached its container;
- Placement and proper packaging of all PCB or PCB-contaminated items generated as a result of work activities and clean up in approved storage containers;
- Proper packaging includes the use of an approved absorbent to contain any leaks that may occur during transportation to the disposal facility;
- Marking and labeling of all PCB materials and/or PCB-contaminated items for storage and disposal purposes;
- Transportation of all PCB materials, PCB-contaminated items, and disposal containers to an on-site storage facility, a disposal facility, and to an approved and permitted off-site processing site for draining and/or flushing prior to disposal and recycling;
- Labeling and record keeping in accordance with all applicable local, state, and federal regulations;
- Incineration or recycling of PCB and PCB-contaminated fluids (and solids, if preferred by the Contractor) and land filling of contaminated solids only as authorized by 40 Code of Federal Regulations (CFR) 761 and facilities approved by the United States Environmental Protection Agency (USEPA) and all other applicable regulatory agencies for such purposes;
- Prepare manifests and all other documentation for transportation, processing, and disposal of PCB wastes for signature by the Owner.

1.4 Quality Assurance

Since the work described herein includes the handling and disposal of highly toxic substances and materials requiring special expertise, the Contractor shall meet the following specific qualifications:

- **Single Party Responsibility:** The Contractor performing the work shall be responsible for, and accomplish, all UWR and PCB-related work activities.
- **License Requirements:** The Contractor or agent performing work for the Contractor must be currently licensed by the State of California Department of Public Health for the transporting, handling, and hauling of extremely hazardous wastes, including UWRs and PCB-related wastes.
- **Qualifications Statement:** The Contractor shall provide a Statement of Qualifications for review by the Owner or the Owner's Representative. The statement will provide sufficient data and information to prove to the satisfaction of the Owner that the Contractor performing the work described herein is fully experienced in the handling, storage, and transport of UWR, UWR-contaminated articles, and PCB-related wastes.

1.5 Submittals

The Contractor performing the work described herein will develop, together with applicable subcontractors, a site specific work plan. This work plan, at a minimum, will specify procedures, products and materials for the containment of the regulated work area (where appropriate), removal of UWR and PCB-containing/contaminated liquids and solids, decontamination of equipment and disposal of equipment that contained UWR and PCBs, waste storage containers, spill clean up, personnel decontamination, emergency contact numbers and procedures, first aid treatment, and temporary on-site storage procedures. This work plan will include the names and day-time phone numbers of all key personnel, the location of all required on-site documentation and emergency equipment, and delineation of the work area. A generalized, "boiler-plate" type of plan will not be accepted.

- Prior to the start of work, the Contractor will submit a complete list of all the materials and equipment proposed for use in the work. The list shall include such items as protective clothing, respiratory protection, absorbents, solvents, waste storage containers, item containers, and all appurtenances. A current Material Safety Data Sheet (MSDS) will be submitted for each item for which a MSDS is available. For items which a MSDS is not available, the Contractor will submit the name of the manufacturer, brand name, and catalog/serial number for each item.
- Prior to the start of work, the Contractor will submit the Work Plan, Hazardous Waste Permits (where applicable), Qualifications Statement, Hazardous Waste Haulers License Number, USEPA Identification Number, Certification of Disposal (where applicable), Accidental Spills Contingency Plan, and Routing of Equipment to be removed.

1.6 Regulatory Compliance

All work shall be performed in compliance with pertinent laws, rules, and regulations existing at the time of the work, including but not limited to:

- Standards for UWR, 40 CFR Part 273.
- California Code of Regulations (CRR), Title 8, Division 1, Chapter 4.
- CCR, Title 22, Division 4.5.
- California Health and Safety Code, Division 20.
- The Occupational Safety and Health Administration (OSHA) Standards, for respiratory protection, 29 CFR Part 1910.134.
- The Transportation Safety Act, Hazardous Material Transportation Act, Title 49 CFR Parts 106, 107, 171-179.
- All applicable state, local regulations, and ordinances, including any regulations regarding State and/or local licenses or certificates.
- Where applicable state or local regulations are more stringent than OSHA requirements or the requirements referenced herein, the Contractor shall adhere to the more stringent regulations.
- The Contractor warrants that he is familiar with the codes and requirements applicable to UWR and PCB work and shall give all notices and comply with all laws, ordinances, rules, and regulations applicable to the work. If the Contractor observes that the Specifications or plans at variance therewith, he shall give written notice to the Owner and/or Consultant describing such variances. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules, and regulations, and without written notice to the Owner and/or Consultant, the Contractor shall bear all costs arising there from. Failure or omission on the part of the Contractor, or any of its representatives, either to discover or to bring to the attention of the Owner and/or Consultant any deviation from, omission from, or noncompliance with the requirements for asbestos abatement shall not be used by the Contractor as defense for failure on its part to fulfill such requirements.

2 PRODUCTS

2.1 Storage Containers

- All UWR/PCB fluids and UWR/PCB-contaminated fluids, including flush and cleaning solvents and mixtures, shall be stored in sealed Department of Transportation (DOT) 17E closed top drums or other waste container approved for the storage of these materials.
- For the purposes of these specifications, PCB-contaminated fluids are defined as containing more than 5 but less than 500 parts per million (ppm). PCB fluids are defined as containing PCBs in concentration of 500 ppm or greater. Flush solvents shall be assumed to contain more than 500 ppm PCBs.
- All UWR/PCB soil wastes and items used in the course of work, such as rags, absorbents, and protective clothing, shall be stored in sealed DOT 17C open type drums or other waster container approved for the storage of these materials.
- Any UWR/PCB article container, other than approved DOT drums described above, that is intended for the storage, shall be submitted to the Owner or Owner's Representative for approval.

2.2 Solvents, Cleaning Agents, and Absorbents

- An appropriate solvent in which UWR are shown to be soluble in will be selected. An appropriate solvent in which PCBs are shown to be at least 5% soluble, by weight, will be selected. Solvents specified by the USEPA include: kerosene, diesel fuel, terpene hydrocarbons, and a mixture of terpene hydrocarbons and terpene alcohols. Care should be taken to limit the complexity of the waste stream. In all cases where solvents are used in the course of work, proper ventilation shall be provided by the Contractor to insure that the resulting fumes/vapors are not dispersed to occupied building areas either as a result of natural convection or via air intakes for building ventilation systems. The manufacturer's recommendations for applications and requirements for California Occupational Safety and Health Administration (Cal-OSHA) shall be strictly observed.
- An appropriate cleaning agent in which UWR are shown to be soluble in will be selected. An appropriate cleaning agent in which PCBs are shown to be at least 5% soluble, by weight, will be selected. Care should be taken to limit the complexity of the waste stream. Numerous non-toxic cleaning agents, shown to meet or exceed the solubility standard, are commercially available. In all cases where cleaning agents are used in the course of work, proper ventilation shall be provided by the Contractor to ensure that the resulting fumes/vapors are not dispersed to occupied building areas either as a result of natural convection or via air intakes for building ventilation systems. The manufacturer's recommendations for applications and requirements for Cal-OSHA shall be strictly observed.
- Safestep, as manufactured by Andesite of California, Inc. or functional equivalent, approved by the Owner's Representative, will be used as an absorbent.

3 SAFETY PROCEDURES AND WORKER PROTECTION

3.1 General Precautions

- The Contractor shall take all precautions and measures required to protect employees, inspection personnel, the Owner's Representative, and the general public from exposure to UWR/PCB solids, liquids, and vapors.
- All personnel authorized for entry into the work areas shall be instructed in the proper procedures for working with or around electrical hazards and UWR/PCB-containing/ contaminated materials.
- All electrical equipment, upon which UWR/PCB-related activities are to be performed, shall be de-energized, locked out/tagged out, and permanently disconnected from any power source prior to the commencement of work.
- Consumption of food or tobacco products shall not be permitted in any of the work areas where UWR/PCB materials, volatile solvents, or other hazardous materials are present. In addition, no open flames shall be permitted in these areas. Signage to this effect will be posted at each entry and exit from the work areas.

3.2 Work Area Protection and Demarcation

- Prior to commencing any UWR/PCB-related work activities, the Contractor will provide barricades, roping, and warning signs to clearly identify and effectively guard against unauthorized entry into the work area.
 - At a minimum, barricades may consist of yellow sawhorses, set end-to-end.

- Ropes are to be yellow in color and supported by the use of weighted bottom pipe type supports.
- Warning signs shall be suspended from the rope and placed at intervals of approximately 10 feet. Warning signs for the work area shall be approximately 18 inches square, with a yellow background and black lettering. Signs shall read “DANGER - KEEP OUT - TOXIC CHEMICAL WORK AREA”.
- The Contractor will place barricades in order to maintain a minimum of 25 feet from all perimeters of the work being conducted to the barricades, where feasible.
- All equipment, such as tools and containers, shall be confined to the work area until the work is complete, containers are sealed, and equipment has been properly decontaminated and safely stored for transport.

3.3 Personal Protective Clothing, Equipment, and Personal Protective Procedures

- At all times when UWR/PCB fluids or mixtures in any volume are not sealed in drums, containers, or electrical equipment, workers shall wear the following:
 - Gloves impermeable to both UWR/PCB and the clean-up agent in use.
 - Disposable coverall, impermeable to both UWR/PCB and the clean-up agent in use.
 - Appropriate eye protection to ensure that eyes are protected from liquid splatter or exposure to concentrated vapors or fumes.
 - If appropriate, respiratory protection appropriate for the concentration of the hazardous material(s) present and atmosphere present. If utilized, supplied air must meet the requirements for Grade D air, at a minimum.
- The Contractor shall provide protective clothing, eye protection, and breathing apparatus, as required for authorized inspection personnel, the Owner, and/or the Owner’s Representative upon request.
- The UWR/PCB work area shall not be left unattended from the start of work activities until all UWR/PCB and incidentals have been sealed in approved containers. If immediate transportation to a UWR/PCB storage facility or disposal facility is not feasible, the work area must be secured in a manner approved by the Owner or Owner’s Representative.
- During work procedures and at all times when UWR/PCB-containing/contaminated fluids in any volume are not sealed in drums, containers, or electrical equipment, all personnel entering the work area must don protective clothing and equipment. Upon exiting the work area, all disposable protective clothing shall be stored in appropriate waste storage drums and sealed, for subsequent transportation to the on-site storage facility or disposal facility.
- Workers with cuts or scratches shall cover these wounds sufficiently to prevent accidental contact with hazardous materials with the regulated work area, prior to entering the regulated work area. Similarly, workers who incur accidental minor cuts or scratches in the course of work activities will immediately leave the work area, cleanse the wound with a medical grade soap, and seal the wound before returning to the work area.

4 EXECUTION

4.1 Spill Clean up, Containerization, and Marking

4.1.1 Clean up of Work Area, UWR/PCB, and Spills

- After the last UWR/PCB-containing light ballast has been removed and all fluids and solids have been cleaned from the fixture, all tools and equipment used in the work shall be decontaminated and properly stored for future use.
- All tools that have come into contact with UWR/PCBs at any concentration will be thoroughly double washed/rinsed with an appropriate cleaning agent, wiped clean, and properly stored.
- At a minimum, all exterior surfaces of equipment that may have come into contact with UWR/PCBs or contaminated solids or fluids either during the course of work activities or due to past leaks will be double washed/rinsed with an appropriate cleaning agent and wiped clean.
- All metal surfaces and surfaces with impermeable liners which have come into contact with UWR/PCBs or UWR/PCB mixtures in the course of work or as a result of past leaks shall be thoroughly cleaned using a combination of absorbents and solvents or cleaning agents. Minimum cleaning requirements for these surfaces will include the removal of bulk material and two rinses with the cleaning agent for the affected surfaces. The work area shall be effectively ventilated during operations such that vapors used during decontamination and cleaning are not vented to occupied building areas. Upon completion of UWR/PCB-related activities, if fumes or vapors are still present in levels that could impede breathing or be considered toxic under state and/or National Institute of Occupational Safety and Health (NIOSH) standards, the Contractor will provide additional ventilation to accelerate drying. If needed, auxiliary breathing apparatus may only be used by personnel trained in the use of this equipment and experienced in conducting UWR/PCB-related work while wearing such apparatus, which can impede safe work practices.
- The USEPA, Region IX, regards soil, asphalt, wood, cement, and concrete as porous materials that absorb UWR/PCBs. Where practical, these materials must be removed when they are within the spill or contamination boundary.
- Completion of decontamination activities shall be inspected by the Contractor's Environmental Monitor, by collecting an appropriate number and type of samples for the specific UWR and/or PCBs and surfaces. The Contractor is responsible for all cost associated with spill clean up and oversight.

4.1.2 Containerization and Marking

- All liquids generated as a result of work activities and clean-up operation shall be placed in appropriate work containers and the containers sealed.
- All solids, such as absorbents, rags, disposable clothing, soil, and other incidentals, shall be placed in appropriate work containers and the containers sealed.
- All drums and items containers utilized shall be permanently marked as to the specific contents and dated. In addition, each drum and container shall be marked with the standard Environmental Protection Agency (EPA), UWR or PCB label, as appropriate (40 CFR 273) and Hazardous Waste label (40 CFR 262).

4.2 Handling and Transportation to Storage Facilities

- All closed and open top drums must be permanently sealed and marked prior to loading on the transport vehicle. Filled drums shall be loaded onto the transport vehicle by the following methods:
 - By a hoist or lift truck capable of utilizing a two-point drum lifter,
 - By a hoist or lift truck provided with a band-around type drum lifter, or
 - By a lift truck lifting the drums from underneath by a pallet attached to the drum by a banding arrangement.
- The drums shall not be lifted by:
 - Any rope, chain, or cloth slings tied about the drum,
 - Placement of drums on bare fork lift trucks,
 - Forcing drums between the forks of a lift truck, or
 - Any commercial drum lifter exerting force on the sides of the drums.
- All drums and containers shall be secured to the transport vehicle to prevent movement while in transit.

4.3 Transportation to the Storage Facility

4.3.1 General

- All UWR/PCB items and all drums containing liquids, solids, and incidentals shall be transported to an off-site UWR/PCB-approved and permitted recycling/disposal facility.
- The Contractor performing this section of the work shall be licensed for the transport and hauling of extremely hazardous waste. The Contractor shall provide a route plan, which clearly identifies the routes that he proposes to follow while transporting UWR/PCB items from the various work sites to off-site facilities.
- A minimum of two operators shall be in attendance at all times with UWR/PCB items are being transported, loaded, and unloaded.

4.3.2 General Provisions

- The specifications in the following sections apply to each motor carrier engaged in the transportation of hazardous materials by a motor vehicle that must be marked or placarded in accordance with DOT 177.
- These specifications include each officer or employee of the carrier who performs supervisory duties related to the transportation of UWR, PCBs, or hazardous materials and each person who operates and who is in charge of motor vehicle(s) transporting UWR, PCBs, or hazardous materials.

4.3.3 Compliance with Federal Motor Carrier Safety Rules

A motor carrier driver or other person must comply with the rules when he/she is transporting UWR, PCBs, or other hazardous materials by a motor vehicle, which must be marked or placarded in accordance with DOT 177.

4.3.4 State and Local Laws, Ordinances, and Regulations

Every motor vehicle transporting or storing items containing UWR, PCBs, or other hazardous materials must be operated and parked in compliance with the law, ordinances, and regulations of the state jurisdiction of which it is being operated in, unless they are at variance with specific regulations of the DOT, which are applicable to the operation of that vehicle and impose a more stringent obligation or restraint.

4.3.5 Attendance and Surveillance of Motor Vehicles

- A motor vehicle, which contains UWR, PCBs, or other hazardous materials and is located on a public street, highway, or shoulder of a public highway, must be attended by its driver. However, the vehicle need not be attended while its driver is performing other duties, which are necessary to his/her duties as operator of that vehicle.
- A motor vehicle is attended when the person in charge of the vehicle is on the vehicle, awake, or within 100 feet of the vehicle and has it within his/her unobstructed field of view.
- A qualified representative of a motor carrier is a person who
 - Has been designated by the carrier to attend the vehicle;
 - Is aware of the nature of the UWR, PCBs, or other hazardous material contained in the vehicle he/she attends;
 - Has been instructed in the procedures he/she must follow in the case of an emergency; and
 - Is authorized to move the vehicle and has the means and ability to do so.
- A motor vehicle that contains UWR, PCBs, or other hazardous materials must not be parked on or within 5 feet of the traveled portion of a public street or highway except for brief periods when the necessities of operation require the vehicle to be parked and make it impractical to stop the vehicle in any other place.

4.3.6 Routes

Unless there is no practical alternative, a motor vehicle that contains UWR, PCBs, or other hazardous materials must be operated over routes which do not go through or near heavily populated areas, places where crowds are assembled, tunnels, narrow streets, or alleys. Operating convenience is not a basis for determining whether it is practical to operate a motor vehicle in a certain area.

4.3.7 Fire/Open Flames/Smoking

- A motor vehicle containing hazardous materials must not be operated near an open flame, unless its driver has first taken precautions to ascertain that the vehicle can safely pass the fire without stopping.
- A motor vehicle containing hazardous materials must not be parked within 300 feet of an open fire.
- No person may smoke or carry a lighted cigarette, cigar, or pipe, on or within 25 feet of any Contractor's vehicle that contains flammable materials (flushing solvents), or an empty tank motor vehicle that has been used to transport flammable materials.

4.3.8 Fueling

When a motor vehicle containing hazardous materials is being fueled, its engine must not be operating and a person must be in control of the fueling process at the point where the fuel tank is filled.

4.3.9 Tires

- If a motor vehicle containing UWR, PCBs, or other hazardous materials is equipped with dual tires on any axle, its driver must stop the vehicle in a safe location at least once every two hours or every 100 miles of travel, whichever is less, and must examine the tires. The driver is also required to check the tires at the beginning of each trip and each time the vehicle is parked.
- If, as a result of the examination described above or otherwise, a tire is found to be flat, leaking, or improperly inflated, the driver must cause the tire to be repaired, replaced, or properly inflated before the vehicle is driven. However, the vehicle can be driven to the nearest safe place to perform the required repair, replacement, or inflation. If, as a result of an examination a tire is found to be overheated, the tire will be removed and placed a safe distance from the vehicle. The driver shall not operate the vehicle until the cause of the overheating is corrected.

4.3.10 Binding and Tie-down

- If a motor vehicle transports UWR, PCBs, or other hazardous materials, all containers must be properly secured in place to ensure that no equipment items or containers can come loose or unsafely placed into the transport vehicle. This may include chaining, roping, strapping, or winching. The driver of the vehicle must stop the vehicle in a safe location at least once during each two hours or 100 miles traveled, whichever is less, and inspect the contents of the shipment. At the time of inspection, if any form of binding is found to be loose, the driver shall immediately take action to remedy the situation for safe transportation.
- An equipment, drums, or other items carried in an open, flatbed, or stake type truck shall be covered with a tarp to protect it from the elements.

4.3.11 Hazardous Waste Instruction and Documentation

A motor carrier that transports "Hazardous Waste" must furnish the driver of each motor vehicle the following documents:

- A copy of these specifications.

- A document containing instructions on procedures to followed in the case of an accident or delay. The documents must include the names and telephone numbers of the people to be contacted, the types of hazardous wastes being transported, and the precautions taken in emergencies, such as fires, accidents, or leakages.
- Manifest and permit documents described in these specifications and required for waste transport.

4.3.12 Marking of Vehicles

A motor vehicle being operated must be marked if that vehicle is:

- Transporting UWR, PCBs, or hazardous materials of a kind that require the vehicle be marked or placarded in accordance with DOT 177 and;
- Commercial vehicles must display the name or trade name of the carrier operating the vehicle. These vehicles must display markings that designate the carrier as being a commercial vehicle “for hire”.

4.4 UWR/PCB Disposal

The contractor shall treat and dispose of all collected UWR/PCB wastes collected and generated during the execution of the scope of work described in Section 1 of these specifications.

- Except as may be otherwise specifically directed by the Owner or Owner’s Representative, the Contractor shall treat and dispose of all waste UWR/PCB materials as governed by 40 CFR 273, California State Regulations, local regulations, and subsequent amendments.
 - All UWR fluids, flushing fluids, and other UWR contaminants shall be disposed of by incineration or recycling at a facility approved for such use by the USEPA, and all other controlling regulatory agencies and bodies of the state, county, and municipality of that’s facility’s location. If the Contractor so elects, solid UWR wastes may also be incinerated, as suitable and allowed for this type of disposal.
 - All PCB fluids, flushing fluids, waste oils, and other fluid contaminants whose total PCB content is equal to or greater than 5 ppm (and are therefore restricted to this mode of thermal destruction) shall be disposed of by incineration or recycling at a facility approved for such use by the USEPA, and all other controlling regulatory agencies and bodies of the state, county, and municipality of that’s facility’s location. If the Contractor so elects, solid PCB wastes may also be incinerated, as suitable and allowed for this type of disposal.
- All UWR/PCB wastes generated as part of these operations will likewise be disposed of by the Contractor in a legal manner and the disposal will be included as part of the Contractor’s bid.
- The Contractor shall not sell, transfer, or recover any material from the wastes received from the Owner with their prior written consent.

4.5 Manifests and Records

- The Contractor shall provide the Owner with a compliance certificate verifying that all wastes received by it have been properly treated and disposed.

- The Contractor shall provide the Owner with copies of all manifests, permits, or other documents currently in effect relating to the specific UWR/PCB wastes to be transported, treated, and disposed of herein, except as otherwise stated in this section. The Contractor shall also promptly furnish the Owner copies of all new or renewal permits or other documents applicable to this project as soon as the Contractor receives them.
- As the waste generator, the Owner will sign the complete waste manifests, upon approval, for all UWR/PCB items/wastes generated during the course of this project. These manifests will accompany the waste loads to disposal and be properly completed by the hauler and disposal agent, as required under federal and state hazardous waste management statutes. The final manifest shall be returned to the Owner by registered mail within the designated time period under federal statutes.
- The project shall not be considered complete nor will the Owner issue final payment until the Owner receives certifications of incineration (for fluids) and/or recycling.

4.6 Placement in Storage and Records

4.6.1 Unloading and Placement in Storage

- Transport vehicles will be unloaded utilizing the same equipment and methods as for loading (Section 4.2).
- Drums and other storage containers will be placed in storage facilities in locations designated by the Owner or Owner's Representative.
- Drums shall be placed on pallets of sufficient strength to withstand double stacking. Drums shall not be stacked at the time of storage, unless space is limited as determined by the Owner or Owner's Representative. Where stacking of drums is necessary, pallets shall be placed between the drum layers.
- Ample clearance space will be provided around other storage containers in order to facilitate future inspections.
- Immediately following the unloading of the UWR/PCB transport vehicle, the cargo area shall be inspected to check for any fluid leaks. If any fluids are found, the source of the leaking drum or other storage container shall be identified and sealed.
- The contaminated cargo area shall be thoroughly washed/rinsed clean with absorbents, solvents, and liquid cleaners. Cleaning agents, solvents, and solids shall be placed in proper drums for disposal.

4.6.2 Records

Upon completion of all UWR/PCB-related work activities, the Contractor shall provide a complete record of all activities and storage data to the Owner or Owner's Representative for the UWR/PCBs removed during the course of the project. The record shall include the following:

- Name of the firm performing the work of this section and technician in charge.
- Number and size of drums and other storage containers.
- Weight in kilograms or gallons of content for each drum or other storage container.

- Date placed in storage.



SECTION 3

Asbestos-Lead-Hazardous Materials Inspection Report

6845

4491

CITY OF SAN DIEGO WORK REQUEST FOR ASBESTOS & LEAD MANAGEMENT PROGRAM

Department: Public Works Department Dept#: 2112 Division: Architectural Engineering & Parks Division

Work Requested By: Todd R. Schmit, Park Designer MS#: 908A Phone: 619-533-4620

Facility Name/Address: Mission Bay Golf Course - Clubhouse & Course Range Building: 2702 North Mission Bay Drive, San Diego, CA 92109.

Facility #'s: 010364 & 010363. Age of Facility: Built in 1960, approximately. Plans Attached? YES NO Target Start: ASAP

Description of Proposed Work (explain detail of work as well as where in facility): Please research any and all work completed by Environmental Services on Facility #'s 010364 and 010363, the existing course range building and existing clubhouse at Mission Bay Golf Course, respectively. I have a memo (dated July 3, 2012) regarding a mold evaluation for the course range building. I will include that memo as attached. This memo references a future memo which was to have the mold results from the clubhouse. I do not have the second memo. In addition to mold, I would like to obtain any reports or memos prepared (recently or in the past) on the referenced facility #'s regarding lead and asbestos testing. If these facilities have not been tested for lead and asbestos (Golf Division thinks they have), I will need a cost estimate for your group to evaluate the two buildings for lead and asbestos. Once all testing is complete, I will need an estimate for your group to remediate the mold, lead and asbestos prior to the buildings being demolished under a separate contract. Thanks so much for your help. Please call with questions.

S-01090.02.06 has been opened to Environmental Services (Business Area 2115).

Accounting Numbers: 1 7 1 4 1 6 1 3 1 5 700046 OTHR- 00000000-CL S-01090.02.06
G/L Number: 512029 Funds Center Fund Functional Area Internal Order/WBS

I have the authority to authorize ALMP to bill hourly inspection labor and laboratory expenses to the accounting numbers above for work related to this project.

Signature: Todd R. Schmit 4/21/13 Title: Todd R. Schmit, Park Designer & Project Manager Date: 2/21/2013
Print Name: Todd R. Schmit Div. Analyst Name: Leita Ross @ 619-533-4298

Send completed form to: ASBESTOS & LEAD MANAGEMENT PROGRAM - 9601 Ridgehaven Court, Suite 320, San Diego, CA 92123, MS 1103-B.

FOR OFFICE USE ONLY

Date Received _____ Inspector Wm. Brad Blundet

Records/Inspection Information _____

Impact on Project ALMP will provide an estimate for the necessary abatement for this project. Please see the attached inspection report and specification insert.

William B. Blundet
ASBESTOS & LEAD PROGRAM INSPECTOR

4-19-13
DATE

[Signature]
ASBESTOS & LEAD PROGRAM MANAGER

4/19/13
DATE

Asbestos & Lead Management Program -- (858) 573-1262 (FAX) (858) 492-5089



ASBESTOS & LEAD MANGEMENT PROGRAM
ASBESTOS-LEAD-HAZARDOUS MATERIALS
INSPECTION REPORT

for the

Demolition of Buildings at Mission Bay Golf Course

Golf Clubhouse & Golf Range Building

Facility 10363 & 10364

April 19, 2013

Prepared by:

A handwritten signature in blue ink, reading "Wm. Brad Blondet", positioned above a horizontal line.

Wm. Brad Blondet
Asbestos & Lead Program Inspector
CA Asbestos Site Surveillance
Technician # 99-2689
CDPH I/A # 5464

Reviewed by:

A handwritten signature in blue ink, reading "Alan J. Johanns", positioned above a horizontal line.

Alan J. Johanns
Asbestos & Lead Program Manager
CA Asbestos Consultant # 92-0842
CDPH I/A & PD # 7770

City of San Diego
Environmental Services Department
Office of Energy, Sustainability and Environmental Protection
Asbestos & Lead Management Program
9601 Ridgehaven Court, Ste 310
San Diego, CA 92123
Tel: (858) 492-5086
Fax: (858) 492-5089

1. Overview

The City of San Diego's Asbestos and Lead Management Program (ALMP) was requested to provide inspection services for asbestos, lead, and other hazardous materials for buildings to be demolished at the Mission Bay Golf Course Clubhouse (Facility #10363) & Golf Range Building (Facility #10364) in San Diego located 2702 North Mission Bay Drive, San Diego CA 92109. The inspection was performed March 12, 2013.

2. Summary of Asbestos Containing Materials

Friable asbestos containing material and Category II asbestos containing materials must always be removed by an asbestos abatement contractor prior to demolition. ALMP recommends removal of all asbestos containing materials prior to any disturbance created by demolition activities.

This survey may not have included all materials concealed behind walls and hard ceilings. If suspect materials are found during demolition/renovation activities that are not mentioned in this report then work must stop and ALMP must be notified.

The summary below lists materials sampled for asbestos. Materials that were found positive for asbestos are shaded in bold font.

Clubhouse Asbestos Sample Results				
SAMPLE #	TYPE OF MATERIAL	LOCATION	CONDITION	ASBESTOS
6845-01	Gray Roof penetration mastic	Roof seams and penetrations	Good	3%
6845-02	Gray Roof penetration mastic	Roof seams and penetrations	Good	3%
6845-03	Gray Roof penetration mastic	Roof seams and penetrations	Good	3%
6845-04	White Acoustic Plaster	Kitchen area	Good	ND
6845-05	White Acoustic Plaster	Kitchen area	Good	ND
6845-06	White Acoustic Plaster	Kitchen area	Good	ND
6845-07	White Acoustic Plaster	Kitchen area	Good	ND
6845-08	White Acoustic Plaster	Kitchen area	Good	ND
6845-09	White drywall, tape, mud	Kitchen area	Good	ND
6845-10	White drywall, tape, mud	Kitchen area	Good	ND
6845-11	White drywall, tape, mud	Kitchen area	Good	ND
6845-12	Yellow Carpet Glue	Kitchen area	Good	ND
6845-13	Yellow Carpet Glue	Kitchen area	Good	ND
6845-14	Yellow Carpet Glue	Kitchen area	Good	ND
6845-15	White Wall plaster	Heater Closet	Good	1-2%

6845-16	White Wall plaster	Heater Closet	Good	1-2%
6845-17	White Wall plaster	Janitorial Closet	Good	1-2%
6845-18	Beige Linoleum, Glue	Kitchen area	Good	ND
6845-19	Beige Linoleum, Glue	Kitchen area	Good	ND
6845-20	Beige Linoleum, Glue	Kitchen area	Good	ND
6845-21	Yellow Carpet Glue	Restroom, various areas	Good	ND
6845-22	Yellow Carpet Glue	Restroom, various areas	Good	ND
6845-23	Yellow Carpet Glue	Restroom, various areas	Good	ND
6845-24	Yellow insulation	Attic	Good	ND
6845-25	Yellow insulation	Attic	Good	ND
6845-26	Yellow insulation	Attic	Good	ND
6382-1A/B	Interior Plaster	Clubhouse Restrooms	Good	ND
6382-2A/B	Exterior Plaster	Clubhouse Restrooms	Good	ND

Range Building Asbestos Sample Results

SAMPLE #	TYPE OF MATERIAL	LOCATION	CONDITION	ASBESTOS
6784-1	Roofing Paper	Roof	Good	ND
6784-2	Roofing Paper	Roof	Good	ND
6784-3	Roofing Paper	Roof	Good	ND
6784-4	Rolled Roofing	Flat Roof	Good	ND
6784-5	Rolled Roofing	Flat Roof	Good	< 1%
6784-6	Rolled Roofing	Flat Roof	Good	ND
6784-7	Drywall, tape, mud	Storage room	Good	ND
6784-8	Drywall, tape, mud	Storage room	Good	ND
6784-9	Drywall, tape, mud	Storage room	Good	ND
6784-10	Drywall white/brown	Storage room	Good	ND
6784-11	Drywall white/brown	Storage room	Good	ND
6784-12	Drywall white/brown	Storage room	Good	ND
6784-13	Sheet Vinyl	Closet wall	Good	3%
6784-14	Roof sealant mastic	Roof penetrations	Good	2%
6784-15	Window Putty	Exterior windows	Good	ND
6784-16	Floor mastic	Storage room	Good	ND
6784-17	12" x 12" Floor Tile remnants	Storage room	Good	< 1%
6784-18	Floor Tile mastic	Storage room	Good	ND

3. Summary of Lead Paint

An inspection was performed using an XRF analyzer to determine which deteriorated painted surfaces had levels of lead that may pose a lead exposure risk during demolition. The painted exterior surfaces of the Clubhouse and Range Building were tested for lead-based paint which is defined as paint containing lead in concentrations greater than 5,000 ppm, 5,000 mg/kg, or 1.0 mg/cm². The painted surfaces for both facilities tested below this threshold and are not classified as lead-based paint or lead-containing paint. All painted surfaces have intact paint coatings. A printout of the entire XRF report is attached.

4. Universal Waste

Possible mercury containing fluorescent light bulbs, PCB containing light ballasts, mercury containing thermostat switches, and paint and household cleaners were found within the structures. The follow is a summary of the universal waste found in both structures.

Clubhouse and Range Building Universal Waste		
TYPE OF MATERIAL	LOCATION	APPROX. QUANTITY
Fluorescent Light Tubes	Throughout Both Facilities	160
PCB Containing Light Ballasts	Throughout Both Facilities	32
Mercury Thermostat Switch	Stage area in Clubhouse	1
Various Paints and Cleaners	Throughout Both Facilities	10 gallons
Mold on wood	Range Building	Unknown
Freon and Oils	HVAC Equipment on Clubhouse roof	Unknown

Note: This survey report did not include materials concealed behind walls and hard ceilings or below grade. If suspected materials are found during demolition/deconstruction activities that are not mentioned in this report work must stop immediately so additional testing can take place.

Attachment # 1

ASBESTOS LABORATORY REPORTS



CITY OF SAN DIEGO
Environmental Services Department
ALMP/LSHHP - Laboratory Submittal

126905



Project # 6845 Submitted by: Wm. Brad Blondet Date: 3/12/2013 Page 1 of 1

LAB SUBMITTED TO: H.M. Pitt Labs

TURNAROUND TIME:
 2 HOUR 24 HOUR 48 HOUR 72 HOUR 5 DAY OTHER:

The receiving Laboratory is required to complete the following:

1. All Invoices are to be sent to: Attn. Alan Johans- City of San Diego – Environmental Services Department, 9601 Ridgehaven Court, Suite 310 San Diego, CA 92123
2. Lab reports/invoices are to contain the Project Number listed above. Do not include Purchase Order Numbers on Invoices
3. Email report to: WBlondet@sandiego.gov

Lab Number	Sample No.	Location	Media	Time On/Off	Flow	Volume	Analyses Requested
Sample # Prefix: <u>6845</u>	-01	Gray Penetration Mastix	Bulk	- / -		Pos stop	PLM
	-02	↓	↓	- / -			↓
	-03	↓	↓	- / -			↓
	-04	White Acoustic Plaster	Bulk	- / -		Pos-stop	PLM
	-05	↓	↓	- / -			↓
	-06	↓	↓	- / -			↓
	-07	↓	↓	- / -			↓
	-08	↓	↓	- / -			↓
	-09	White Drywall, tape, mud	Bulk	- / -		Pos-stop	PLM
	-10	↓	↓	- / -			↓

NOTES:

Relinquished by: <u>William B. Blondet</u> Wm. Brad Blondet Date/Time: <u>3/14/13 0900</u>	Relinquished by: _____ Date/Time: _____
Received by: <u>Mona Broussard</u> Date/Time: <u>3-14-13 3:57</u>	Received by: _____ Date/Time: _____



CITY OF SAN DIEGO
Environmental Services Department
ALMP/LSHHP - Laboratory Submittal

126905



Project # 6845 Submitted by: Wm. Brad Blondet Date: 3/12/2013 Page 1 of 1

LAB SUBMITTED TO: H.M. Pitt Labs

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- Email report to: WBlondet@sandiego.gov

Lab Number	Sample No.	Location	Media	Time On/Off	Flow	Volume	Analyses Requested
Sample # Prefix: <u>6845</u>	-11	white Drywall, tape, mud	Bulk	- / -		Pos-stop	PLM
	-12	Yellow Carpet Glue	Bulk	- / -		Pos-stop	PLM
	-13	↓	↓	- / -		↓	↓
	-14	↓	↓	- / -		↓	↓
	-15	White Plaster, Scratchcoat, Drywall	Bulk	- / -		Pos-stop	PLM
	-16	↓	↓	- / -		↓	↓
	-17	↓	↓	- / -		↓	↓
	-18	Beige Limestone, glue	Bulk	- / -		Pos-stop	PLM
	-19	↓	↓	- / -		↓	↓
	-20	↓	↓	- / -		↓	↓

NOTES:

Relinquished by: <u>William B. Blondet</u> Wm. Brad Blondet Date/Time: <u>3/14/13 0900</u>	Relinquished by: _____ Date/Time: _____
Received by: <u>Mona B. Broussard</u> Date/Time: <u>3-14-13 3:57</u>	Received by: _____ Date/Time: _____



CITY OF SAN DIEGO
Environmental Services Department
ALMP/LSHHP - Laboratory Submittal

126905



Project # 6845 Submitted by: Wm. Brad Blondet Date: 3/12/2013 Page 1 of 1

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- Email report to: WBlondet@sandiego.gov

Lab Number	Sample No.	Location	Media	Time On/Off	Flow	Volume	Analyses Requested
Sample # Prefix: <u>6845</u>	-21	Yellow Carpet Glue, level compound	Bulk	-	-	Pos stop	PLM
	-22	↓	↓	-	-	↓	↓
	-23	↓	↓	-	-	↓	↓
	-24	Yellow insulation in attic	Bulk	-	-	Pos stop	PLM
	-25	↓	↓	-	-	↓	↓
	-26	↓	↓	-	-	↓	↓

NOTES:

Relinquished by: <u>Wm. Brad Blondet</u> Date/Time: <u>3-14-13 0900</u>	Relinquished by: _____ Date/Time: _____
Received by: <u>Mona Bransford</u> Date/Time: <u>3-14-13 3:57</u>	Received by: _____ Date/Time: _____

ASBESTOS & LEAD MANAGEMENT PROGRAM

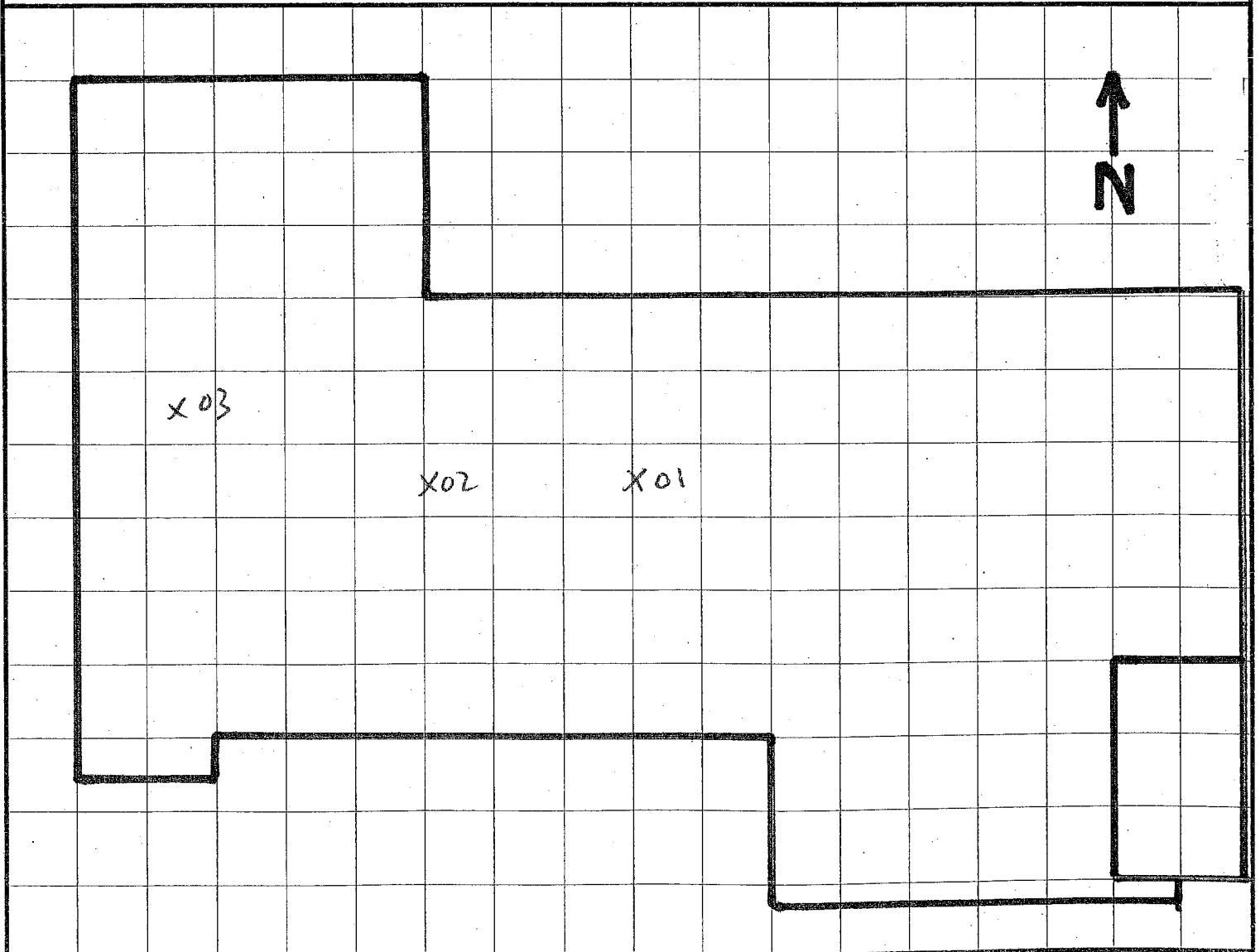
HOMOGENEOUS MATERIALS FORM

HOMOGENEOUS MATERIAL NO. H-

PROJECT# 6845	FACILITY# 10363	FACILITY NAME Mission Bay Golf Club House	
INSPECTOR Wm. Brad Blonder	DATE 3/12/2013	QUANTITY 130 sq. ft.	FRIABLE? No
MATERIAL DESCRIPTION & CONDITION Gray Penetration Mastics / Good			
ASSESSMENT NUMBERS		SAMPLE NUMBERS 6845-01 thru -03	

LOCATION DESCRIPTION

Gray Penetration Mastics on vents, gutter seams,
and HVAC unit at NW end of building.
Roof shingles are new



FORM #: ASB - 39 (10/12/2005)

ASBESTOS & LEAD MANAGEMENT PROGRAM

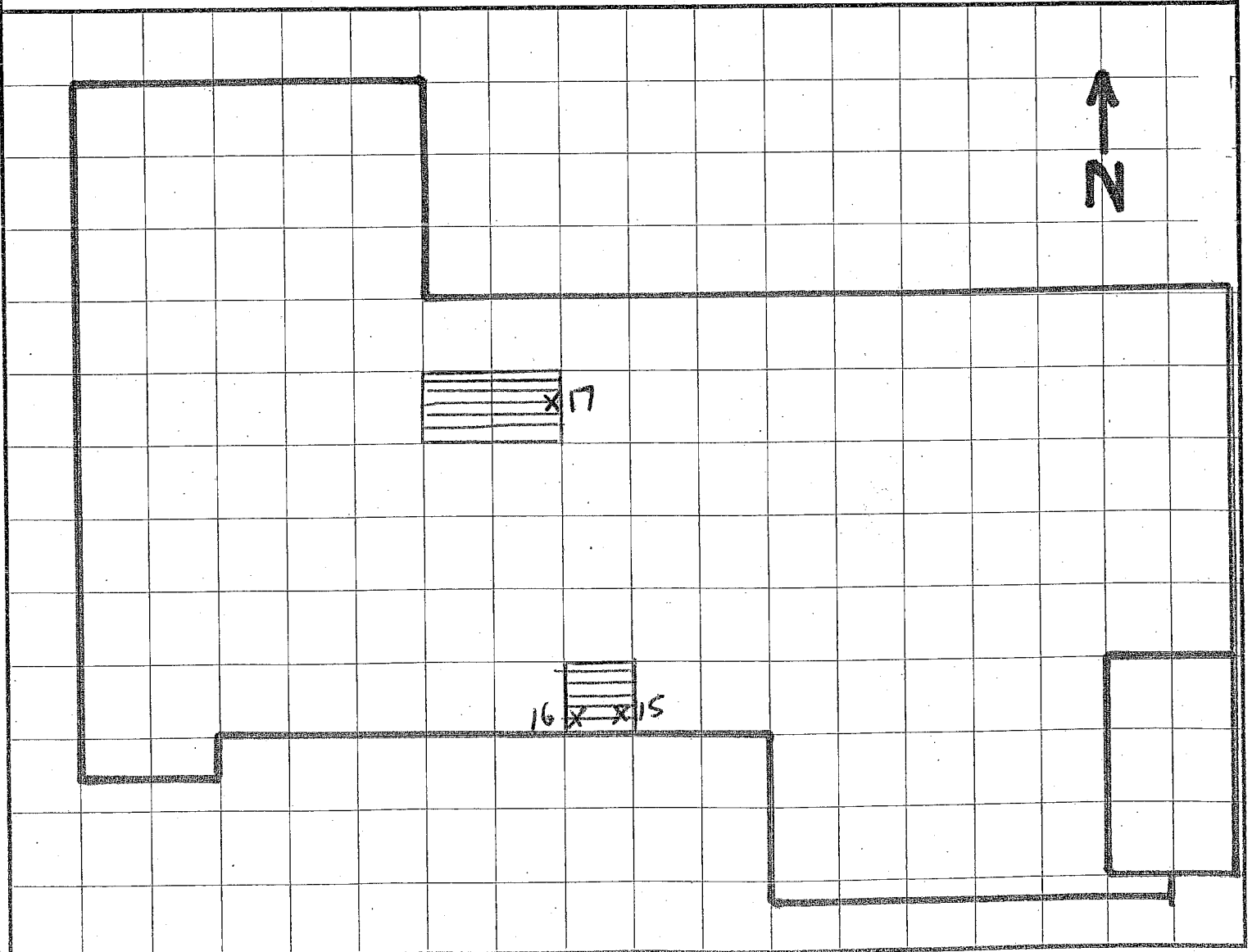
HOMOGENEOUS MATERIALS FORM

HOMOGENEOUS MATERIAL NO. H-

PROJECT# 6845	FACILITY# 10363	FACILITY NAME Mission Bay Golf Club House	
INSPECTOR Wm. Brad Blonder	DATE 3/12/2013	QUANTITY 700 sq. ft.	FRIABLE? Yes
MATERIAL DESCRIPTION & CONDITION Old Plaster walls			
ASSESSMENT NUMBERS		SAMPLE NUMBERS 6845-15 thru 17	

LOCATION DESCRIPTION

white plaster, white scratch coat, Dry wall "button board" backing



FORM #: ASB - 39 (10/12/2005)



H.M. Pitt Labs, Inc.

2434 Southport Way · Suite L · National City, CA 91950

Lab Number: 126905-160553

Tel: 619-474-8548 · Fax: 619-474-6128

Company:

City of San Diego Environmental Services
Department
9601 Ridgehaven Court, Suite 310
San Diego, CA 92123

Date Entered: 03/14/2013

Analyzed By: Katherine Graves

Date Analyzed: 03/15/13

Customer PO / Claim#:

Contract Number:

Job Site: Project No. 6845

Date Sampled

Who Sampled

03/12/2013

Wm. Brad Blondet

Lab Notes: 72 hrs. TAT

POLARIZED LIGHT MICROSCOPY (PLM) ANALYSIS REPORT - EPA-600/M4-82-020

Analysis Number: 126905-1

Customer Number: 01

Classification:

Description: Gray Penetration Mastic

Results: Asbestos: 3% Chrysotile in Black Non-Friable Penetration Mastic (1% Cellulose Fibers also present)
Note: Client requests analysis to stop at first positive

Analysis Number: 126905-4

Customer Number: 04

Classification:

Description: White Acoustic Plaster

Results: a. Non-Asbestos: 1% Cellulose Fibers in White Plaster
Note: Sample ground to powder in mortar and pestle.
b. Non-Asbestos: Non-Fibrous White Acoustic Ceiling
Note: Sample ground to powder in mortar and pestle.

Analysis Number: 126905-5

Customer Number: 05

Classification:

Description: White Acoustic Plaster

Results: a. Non-Asbestos: 1% Cellulose Fibers in White Plaster
Note: Sample ground to powder in mortar and pestle.
b. Non-Asbestos: Non-Fibrous White Acoustic Ceiling
Note: Sample ground to powder in mortar and pestle.

- All samples tested as submitted to the lab. H.M. PITT LABS, INC. does not assume responsibility for the accuracy of the information submitted with the samples unless done by an employee of H.M. PITT LABS, INC.
- These test results relate only to the sample(s) identified above.
- This report may not be used to claim endorsement by NVLAP or any agency of the Federal Government.
- This report shall not be reproduced, except in full, without written approval of H.M. Pitt Labs, Inc.
- Samples are archived for 2 years from date of receipt and will be disposed of properly following this period.
- Quantitative value is based on PLM CVES (Calibrated Visual Estimates) with a detection limit of 1%.

APPROVED BY: LELAND S. PITT
LELAND S. PITT, CIH

Dated: 03/15/2013

REVIEWED BY: JANET CHASE
Janet Chase



H.M. Pitt Labs, Inc.

2434 Southport Way · Suite L · National City, CA 91950

Lab Number: 126905-160553

Tel: 619-474-8548 · Fax: 619-474-6128

Company:

City of San Diego Environmental Services
Department
9601 Ridgehaven Court, Suite 310
San Diego, CA 92123

Date Entered: 03/14/2013**Analyzed By:** Katherine Graves**Date Analyzed:** 03/15/13**Customer PO / Claim#:****Contract Number:****Job Site:** Project No. 6845**Date Sampled****Who Sampled**

03/12/2013

Wm. Brad Blondet

Lab Notes: 72 hrs. TAT

POLARIZED LIGHT MICROSCOPY (PLM) ANALYSIS REPORT - EPA-600/M4-82-020

Analysis Number: 126905-6**Customer Number:** 06**Classification:****Description:** White Acoustic Plaster**Results:**

- a. Non-Asbestos: 1% Cellulose Fibers in White Plaster
Note: Sample ground to powder in mortar and pestle.
- b. Non-Asbestos: Non-Fibrous White Acoustic Ceiling
Note: Sample ground to powder in mortar and pestle.

Analysis Number: 126905-7**Customer Number:** 07**Classification:****Description:** White Acoustic Plaster**Results:**

- a. Non-Asbestos: 1% Cellulose Fibers in White Plaster
Note: Sample ground to powder in mortar and pestle.
- b. Non-Asbestos: Non-Fibrous White Acoustic Ceiling
Note: Sample ground to powder in mortar and pestle.

Analysis Number: 126905-8**Customer Number:** 08**Classification:****Description:** White Acoustic Plaster**Results:**

- a. Non-Asbestos: 1% Cellulose Fibers in White Plaster
Note: Sample ground to powder in mortar and pestle.
- b. Non-Asbestos: Non-Fibrous White Acoustic Ceiling
Note: Sample ground to powder in mortar and pestle.

- All samples tested as submitted to the lab. H.M. PITT LABS, INC. does not assume responsibility for the accuracy of the information submitted with the samples unless done by an employee of H.M. PITT LABS, INC.
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- Samples are archived for 2 years from date of receipt and will be disposed of properly following this period.
- Quantitative value is based on PLM CVES (Calibrated Visual Estimates) with a detection limit of 1%.

APPROVED BY:

LELAND S. PITT, CIH

Dated: 03/15/2013**REVIEWED BY:**

Janet Chase

Page 2 of 6



H.M. Pitt Labs, Inc.

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Tel: 619-474-8548 · Fax: 619-474-6128

Company:

City of San Diego Environmental Services
Department
9601 Ridgehaven Court, Suite 310
San Diego, CA 92123

Date Entered: 03/14/2013**Analyzed By:** Katherine Graves**Date Analyzed:** 03/15/13**Customer PO / Claim#:****Contract Number:****Job Site:** Project No. 6845**Date Sampled****Who Sampled**

03/12/2013

Wm. Brad Blondet

Lab Notes: 72 hrs. TAT

POLARIZED LIGHT MICROSCOPY (PLM) ANALYSIS REPORT - EPA-600/M4-82-020

Analysis Number: 126905-9**Customer Number:** 09**Classification:****Description:** White Drywall, Tape, Mud**Results:**

- a. Non-Asbestos: 4% Cellulose Fibers in White Drywall
- b. Non-Asbestos: 1% Cellulose Fibers in White Joint Compound

Analysis Number: 126905-10**Customer Number:** 10**Classification:****Description:** White Drywall, Tape, Mud**Results:**

- a. Non-Asbestos: 4% Cellulose Fibers in White Drywall
- b. Non-Asbestos: 1% Cellulose Fibers in White Joint Compound

Analysis Number: 126905-11**Customer Number:** 11**Classification:****Description:** White Drywall, Tape, Mud**Results:**

- a. Non-Asbestos: 4% Cellulose Fibers in White Drywall
- b. Non-Asbestos: 1% Cellulose Fibers in White Joint Compound

Analysis Number: 126905-12**Customer Number:** 12**Classification:****Description:** Yellow Carpet Glue**Results:**

Non-Asbestos: 3% Synthetic Fibers in Yellow Glue

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- Samples are archived for 2 years from date of receipt and will be disposed of properly following this period.
- Quantitative value is based on PLM CVES (Calibrated Visual Estimates) with a detection limit of 1%.

APPROVED BY:

LELAND S. PITT, CIH

Dated: 03/15/2013

REVIEWED BY:

Janet Chase



H.M. Pitt Labs, Inc.

2434 Southport Way · Suite L · National City, CA 91950

Lab Number: 126905-160553

Tel: 619-474-8548 · Fax: 619-474-6128

Company:

City of San Diego Environmental Services
Department
9601 Ridgehaven Court, Suite 310
San Diego, CA 92123

Date Entered: 03/14/2013

Analyzed By: Katherine Graves

Date Analyzed: 03/15/13

Customer PO / Claim#:

Contract Number:

Job Site: Project No. 6845

Date Sampled

Who Sampled

03/12/2013

Wm. Brad Blondet

Lab Notes: 72 hrs. TAT

POLARIZED LIGHT MICROSCOPY (PLM) ANALYSIS REPORT - EPA-600/M4-82-020

Analysis Number: 126905-13

Customer Number: 13

Classification:

Description: Yellow Carpet Glue

Results: Non-Asbestos: 3% Synthetic Fibers in Yellow Glue

Analysis Number: 126905-14

Customer Number: 14

Classification:

Description: Yellow Carpet Glue

Results: Non-Asbestos: 3% Synthetic Fibers in Yellow Glue

Analysis Number: 126905-15

Customer Number: 15

Classification:

Description: White Plaster, Scratch coat, Drywall

Results:
a. Non-Asbestos: 3% Glass Fibers in White Drywall
b. Non-Asbestos: 2% Cellulose Fibers in White Plaster
c. Asbestos: 1-2% Chrysotile in White Non-Friable Skim Coat
Note: Client requests analysis to stop at first positive.

Analysis Number: 126905-18

Customer Number: 18

Classification:

Description: Beige Linoleum, Glue

Results: Non-Asbestos: 7% Synthetic Fibers and 3% Glass Fibers in Beige Sheet Vinyl
Note: Adhesive and sheet vinyl were analyzed together and reported as one result.

- All samples tested as submitted to the lab. H.M. PITT LABS, INC. does not assume responsibility for the accuracy of the information submitted with the samples unless done by an employee of H.M. PITT LABS, INC.
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- Samples are archived for 2 years from date of receipt and will be disposed of properly following this period.
- Quantitative value is based on PLM CVES (Calibrated Visual Estimates) with a detection limit of 1%.

APPROVED BY: Leland S. Pitt
LELAND S. PITT, CIH

Dated: 03/15/2013

REVIEWED BY: Janet Chase
Janet Chase



H.M. Pitt Labs, Inc.

2434 Southport Way · Suite L · National City, CA 91950

Lab Number: 126905-160553

Tel: 619-474-8548 · Fax: 619-474-6128

Company:

City of San Diego Environmental Services
Department
9601 Ridgehaven Court, Suite 310
San Diego, CA 92123

Date Entered: 03/14/2013

Analyzed By: Katherine Graves

Date Analyzed: 03/15/13

Customer PO / Claim#:

Contract Number:

Job Site: Project No. 6845

Date Sampled

Who Sampled

03/12/2013

Wm. Brad Blondet

Lab Notes: 72 hrs. TAT

POLARIZED LIGHT MICROSCOPY (PLM) ANALYSIS REPORT - EPA-600/M4-82-020

Analysis Number: 126905-19

Customer Number: 19

Classification:

Description: Beige Linoleum, Glue

Results:

Non-Asbestos: 7% Synthetic Fibers and 3% Glass Fibers in Beige Sheet Vinyl
Note: Adhesive and sheet vinyl were analyzed together and reported as one result.

Analysis Number: 126905-20

Customer Number: 20

Classification:

Description: Beige Linoleum, Glue

Results:

Non-Asbestos: 7% Synthetic Fibers and 3% Glass Fibers in Beige Sheet Vinyl
Note: Adhesive and sheet vinyl were analyzed together and reported as one result.

Analysis Number: 126905-21

Customer Number: 21

Classification:

Description: Yellow Carpet Glue, Level Compound

Results:

Non-Asbestos: 1% Cellulose Fibers in Yellow / White Glue / Underlayment
Note: Homogenous, inseparable layers.

Analysis Number: 126905-22

Customer Number: 22

Classification:

Description: Yellow Carpet Glue, Level Compound

Results:

Non-Asbestos: 1% Cellulose Fibers in Yellow / White Glue / Underlayment
Note: Homogenous, inseparable layers.

- All samples tested as submitted to the lab. H.M. PITT LABS, INC. does not assume responsibility for the accuracy of the information submitted with the samples unless done by an employee of H.M. PITT LABS, INC.
- These test results relate only to the sample(s) identified above.
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- Samples are archived for 2 years from date of receipt and will be disposed of properly following this period.
- Quantitative value is based on PLM CVES (Calibrated Visual Estimates) with a detection limit of 1%.

APPROVED BY: Leland S. Pitt
LELAND S. PITT, CIH

Dated: 03/15/2013

REVIEWED BY: Janet Chase
Janet Chase



H.M. Pitt Labs, Inc.

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Lab Number: 126905-160553

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Company:

City of San Diego Environmental Services
Department
9601 Ridgehaven Court, Suite 310
San Diego, CA 92123

Date Entered: 03/14/2013

Analyzed By: Katherine Graves

Date Analyzed: 03/15/13

Customer PO / Claim#:

Contract Number:

Job Site: Project No. 6845

Date Sampled

Who Sampled

Lab Notes: 72 hrs. TAT

03/12/2013

Wm. Brad Blondet

POLARIZED LIGHT MICROSCOPY (PLM) ANALYSIS REPORT - EPA-600/M4-82-020

Analysis Number: 126905-23

Customer Number: 23

Classification:

Description: Yellow Carpet Glue, Level Compound

Results: Non-Asbestos: 1% Cellulose Fibers in Yellow / White Glue / Underlayment
Note: Homogenous, inseparable layers.

Analysis Number: 126905-24

Customer Number: 24

Classification:

Description: Yellow Insulation in Attic

Results: Non-Asbestos: 70% Glass Fibers and 15% Mineral Wool in Yellow Insulation

Analysis Number: 126905-25

Customer Number: 25

Classification:

Description: Yellow Insulation in Attic

Results: Non-Asbestos: 70% Glass Fibers and 15% Mineral Wool in Yellow Insulation

Analysis Number: 126905-26

Customer Number: 26

Classification:

Description: Yellow Insulation in Attic

Results: Non-Asbestos: 70% Glass Fibers and 15% Mineral Wool in Yellow Insulation

- All samples tested as submitted to the lab. H.M. PITT LABS, INC. does not assume responsibility for the accuracy of the information submitted with the samples unless done by an employee of H.M. PITT LABS, INC.
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- Quantitative value is based on PLM CVES (Calibrated Visual Estimates) with a detection limit of 1%.

APPROVED BY: Leland S. Pitt
LELAND S. PITT, CIH

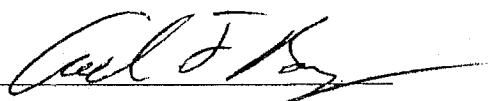
Dated: 03/15/2013

REVIEWED BY: Janet Chase
Janet Chase

Report No: 134372 Customer: City of San Diego
 Date: December 14, 2009 9601 Ridgehaven Ct. #320
 Date Received: December 14, 2009 San Diego, CA 92123
 Date Analyzed: December 14, 2009 Attention: Jeff Jones
 Date/Time Collected: by Jeff Jones Reference: 1078974, 6382
 Subject: Polarized Light Microscopy Analysis for Asbestos 4 Samples
 Methodology: "Method for Determination of Asbestos in Bulk Building Materials." EPA 600/R-93/116
 Accredited: NVLAP Lab Code 101218-0
 Certified: California Department of Health Services Environmental Testing Laboratory ELAP 1119
 County Sanitation Districts of Los Angeles County, Lab ID No. 10120

Quality Control Sample (SRM 1866 Glass Fibers as the blank): None Detected

Sample ID	Location / Description	Visual Description	Asbestiform Minerals	Other Fibrous Materials	Non-fibrous Materials
6382-1A	NON-FRIABLE	WHITE GRANULAR	NONE DETECTED	CELLULOSE 2%	GRANULAR MINERALS, OPAQUES
6382-1B	NON-FRIABLE	WHITE GRANULAR	NONE DETECTED	CELLULOSE 2%	GRANULAR MINERALS, OPAQUES
6382-2A	NON-FRIABLE	BEIGE GRANULAR	NONE DETECTED	CELLULOSE - LESS THAN 1%	GRANULAR MINERALS, OPAQUES
6382-2B	NON-FRIABLE	BEIGE GRANULAR	NONE DETECTED	CELLULOSE - LESS THAN 1%	GRANULAR MINERALS, OPAQUES



Carl Bergman, Optical Microscopist
 BMK/mt

B.M. Kolk, Laboratory Director

The EPA method is a semi-quantitative procedure. The detection limit is between 0.1 - 1% by area and is dependent upon the size of the asbestos fibers, the means of sampling and the matrix of the sampled material.

The test results reported are for the sample(s) delivered to us and may not represent the entire material from which the samples was taken. The EPA recommends three samples or more be taken from a "homogenous sampling area" before friable material is considered non-asbestos-containing.

** Negative floor tile samples may contain significant amounts (>1%) of very thin asbestos fibers which cannot be detected by PLM. Confirmation by XRD or TEM is recommended by the EPA (Federal Register Vol. 59, No. 146).

This report, from a NIST-accredited laboratory through NVLAP, must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. government. This report shall not be reproduced, except in full, without the written approval of EMS Laboratories.

ASBESTOS & LEAD MANAGEMENT PROGRAM

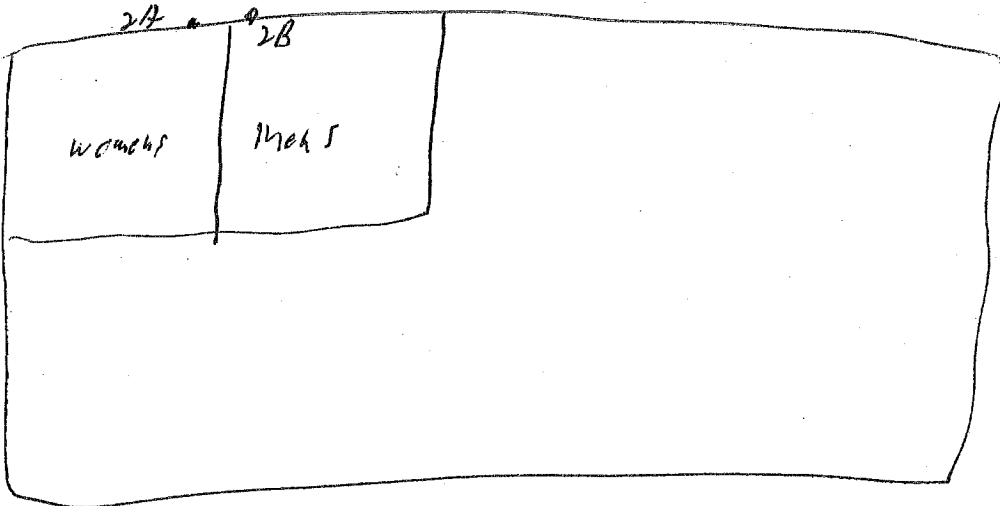
HOMOGENEOUS MATERIALS FORM

HOMOGENEOUS MATERIAL NO. H-

PROJECT# 6382	FACILITY# 10363	FACILITY NAME Mission Bay Golf Course	
INSPECTOR John S	DATE 12/10/09	QUANTITY	FRIABLE? N
MATERIAL DESCRIPTION Exterior Stucco			
ASSESSMENT NUMBERS Good		SAMPLE NUMBERS 6382-2A, 2B	

LOCATION DESCRIPTION

DRAWING (SHOW SAMPLE LOCATIONS)



COMMENTS

ASBESTOS & LEAD MANAGEMENT PROGRAM

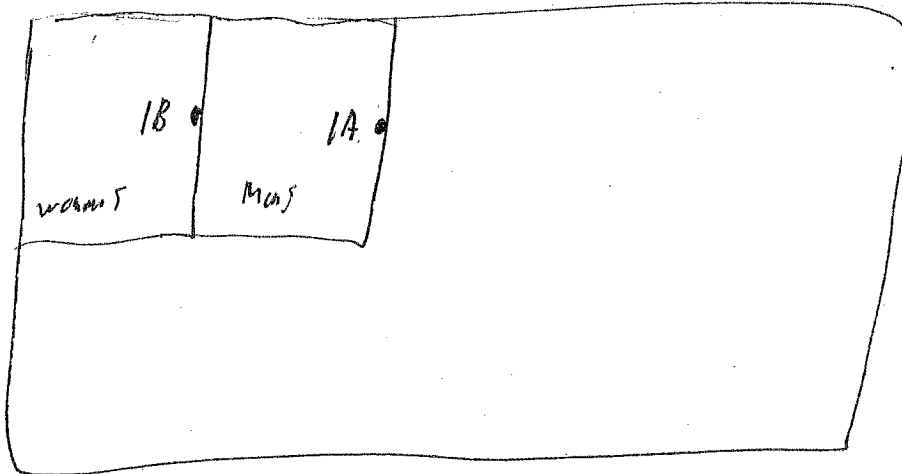
HOMOGENEOUS MATERIALS FORM

HOMOGENEOUS MATERIAL NO. H-

PROJECT# 6382	FACILITY# 10363	FACILITY NAME Mission Bay Golf Course	
INSPECTOR Jones	DATE 12/10/09	QUANTITY	FRIABLE? N
MATERIAL DESCRIPTION Interior Plaster			
ASSESSMENT NUMBERS Good		SAMPLE NUMBERS 6382-1A, 1B	

LOCATION DESCRIPTION

DRAWING (SHOW SAMPLE LOCATIONS)



COMMENTS

152211

SUBMITTAL FORM/Laboratory Services

Rush T/A

PAGE 1 OF 2

TURNAROUND TIME: STD 48 HR. 24 HR. <B HR. WKND OTHER:

RELINQUISHED BY Robert Cox TIME / DATE

CLIENT The City of San Diego ADDRESS 9601 Ridgeway Ct, Suite 310 San Diego, CA 92123 TELEPHONE (858) 573-1264 CONTACT Robert Cox

DATE OF SHIPMENT CARRIER Fed Ex CLIENT P.O. NO. CLIENT JOB/PROJECT ID NO(S) 6784 PACKAGE SHIPPED FROM

RESULTS REQUESTED VIA VERBAL FAX CLIENT FAX NO. EMAIL: Rcox@sandiego.gov (NOTE: Complete written reports will follow all analyses, in addition to any prior transmitted verbal or fax results.)

DATE/TIME OF SAMPLE COLLECTION SAMPLE PRESERVATIVES NO. OF SAMPLES SENT SAMPLER'S NAME SIGNATURE Robert Cox PRINTED TYPE: WATER WASTE WATER SOIL FILTER SORBENT TUBE IMPINGER OTHER PLM

(FOR EMS ONLY) EMS Sample No. 152211-1 15

Table with columns: CLIENT SAMPLE NO., DESCRIPTION/LOCATION/ANALYSIS, VOLUME/TIME/WEIGHT (IF APPLICABLE). Rows 6784-1 to 6784-15.

(SF 5/00)

FOR EMS ONLY

Laboratory No. 152211 Received By [Signature] Time 1107 Date of Package Delivery 07.26.12 Shipping Bill Retained: YES NONE Condition of Package on Receipt OK Condition of Custody Seal NONE No. of Samples 18 Chain-of-Custody Signature Date of Acceptance into Sample Bank 07.26.12 Misc. Info. Disposition of Samples EMS

EMS LABORATORIES 117 West Bellevue Drive / Pasadena CA 91105-2503 / 626-568-4065

CUSTOMER: City of San Diego
 9601 Ridgehaven Court Ste. 310
 San Diego CA 92123

PAGE #: 2 of 4
 REPORT #: 0152211
 PROJECT: PLM Analysis

BULK SAMPLE ANALYSIS FOR ASBESTOS CONTENT BY POLARIZED LIGHT MICROSCOPY

Laboratory ID - Sample No.	Sample Location Description	Layer No. Layer %	Asbestos Type (%)	Non-Asbestos Components (%)
0152211-005 6784-5	LAYER 1 Rolled roofing flat, Black, Homogeneous, Fibrous, non-friable, tease, melt, 26°C	LAYER 1 80%	None Detected	Cellulose Fiber 30% Non-Fibrous Material 70%
	LAYER 2 Black, Homogeneous, Fibrous, non-friable, tease, melt, 26°C	LAYER 2 10%	None Detected	Cellulose Fiber 45% Organic Matrix 55%
	LAYER 3 Black/white/brown, Non-homogeneous, tar/rubbery/fibrous, non-friable, ash, tease, 26°C	LAYER 3 10%	Chrysotile <1%	Fibrous Glass 10% Organic Matrix 90%
0152211-006 6784-6	Rolled roofing flat, black/white/black, Non-homogeneous, fibrous/rubbery/tar, non-friable, ash, melt, 26°C	LAYER 1 100%	None Detected	Cellulose Fiber 40% Non-Fibrous Material 60%
0152211-007 6784-7	drywall tape and mud, White, Non-homogeneous, granular/fibrous, non-friable, tease, acid, 26°C	LAYER 1 100%	None Detected	Cellulose Fiber 20% Non-Fibrous Material 80%
0152211-008 6784-8	drywall tape and mud, White, Non-homogeneous, fibrous/granular, non-friable, tease, acid, 27°C	LAYER 1 100%	None Detected	Cellulose Fiber 15% Non-Fibrous Material 75%
0152211-009 6784-9	drywall tape and mud, White, Non-homogeneous, fibrous/granular, non-friable, tease, acid, 27°C	LAYER 1 100%	None Detected	Cellulose Fiber 10% Non-Fibrous Material 90%
0152211-010 6784-10	Drywall, white/brown, Non-homogeneous, Granular/Fibrous, non-friable, crush, tease, 27°C	LAYER 1 100%	None Detected	Cellulose Fiber 10% Non-Fibrous Material 90%



EMS LABORATORIES INC.

117 W. Bellevue Drive, Pasadena, CA 91105-2548 626-568-4065

National Institute of Standards and Technology (NIST) NVLAP Lab Code 101218-0
 California Department of Health Services Environmental Testing Laboratory ELAP 1119
 County Sanitation Districts of Los Angeles County ID No. 10120
 Nevada Environmental Laboratory Certification CA00245

CUSTOMER: City of San Diego
 9601 Ridgehaven Court Ste. 310
 San Diego CA 92123
 CONTACT: George Katsikaris
 REFERENCE: 6784
 METHOD: EPA 600/R-93/116

PAGE #: 1 of 4
 REPORT #: 0152211
 PROJECT: PLM Analysis
 DATE COLLECTED:
 COLLECTED BY:
 DATE RECEIVED: 07/26/2012
 ANALYSIS DATE: 07/31/2012

BULK SAMPLE ANALYSIS FOR ASBESTOS CONTENT BY POLARIZED LIGHT MICROSCOPY

Laboratory ID - Sample No.	Sample Location Description	Layer No. Layer %	Asbestos Type (%)	Non-Asbestos Components (%)
0152211-001 6784-1	LAYER 1 Roofing Paper, Black, Homogeneous, Fibrous, non-friable, tease, melt, 25°C	LAYER 1 50%	None Detected	Cellulose Fiber 40% Organic Matrix 60%
	LAYER 2 Black, Homogeneous, Fibrous, non-friable, tease, melt, 25°C	LAYER 2 50%	None Detected	Cellulose Fiber 50% Organic Matrix 50%
0152211-002 6784-2	Roofing Paper, Black, Homogeneous, Fibrous, non-friable, tease, melt, 25°C	LAYER 1 100%	None Detected	Cellulose Fiber 50% Synthetic Fiber 3% Organic Matrix 47%
0152211-003 6784-3	Roofing Paper, Black, Homogeneous, Fibrous, non-friable, tease, melt, 29°C	LAYER 1 100%	None Detected	Cellulose Fiber 50% Organic Matrix 50%
0152211-004 6784-4	LAYER 1 Roofing flat, Black, Homogeneous, Fibrous, non-friable, tease, melt, 25°C Note: gray top	LAYER 1 50%	None Detected	Cellulose Fiber 5% Non-Fibrous Material 95%
	LAYER 2 Black, Homogeneous, Fibrous, non-friable, tease, melt, 25°C	LAYER 2 100%	None Detected	Cellulose Fiber 45% Organic Matrix 55%

CUSTOMER: City of San Diego
 9601 Ridgehaven Court Ste. 310
 San Diego CA 92123

PAGE #: 3 of 4
 REPORT #: 0152211
 PROJECT: PLM Analysis

BULK SAMPLE ANALYSIS FOR ASBESTOS CONTENT BY POLARIZED LIGHT MICROSCOPY

Laboratory ID - Sample No.	Sample Location Description	Layer No. Layer %	Asbestos Type (%)	Non-Asbestos Components (%)
0152211-011 6784-11	Drywall, white/brown, Non-homogeneous, granular/fibrous, non-friable, crush, tease, 27°C	LAYER 1 100%	None Detected	Cellulose Fiber 10% Non-Fibrous Material 90%
0152211-012 6784-12	White, Homogeneous, Granular, non-friable, crush, 27°C	LAYER 1 100%	None Detected	Cellulose Fiber 1% Non-Fibrous Material 99%
0152211-013 6784-13	LAYER 1 SVF, Gray, Homogeneous, Fibrous, Non-friable, tease, 27°C	LAYER 1 90%	Chrysotile 40%	Non-Fibrous Material 60%
	LAYER 2 Mastic, Yellow, Homogeneous, Rubbery, non-friable, melt, 27°C	LAYER 2 10%	None Detected	Cellulose Fiber 1% Non-Fibrous Material 99%
0152211-014 6784-14	Roof sealant mastic, Black/white, non-homogeneous, tar/fibrous, non-friable, melt, 27°C	LAYER 1 100%	Chrysotile 2%	Organic Matrix 98%
0152211-015 6784-15	Window Putty, white/green, Non-homogeneous, granular/paint, non-friable, ash, acid, 27°C	LAYER 1 100%	None Detected	Non-Fibrous Material 100%
0152211-016 6784-16	Floor mastic, Gray, Homogeneous, Rubbery, non-friable, ash, 27°C	LAYER 1 100%	None Detected	Non-Fibrous Material 100%
0152211-017 6784-17	Floor Tile, Gray, Homogeneous, Granular, non-friable, melt, 27°C	LAYER 1 100%	Chrysotile <1%	Non-Fibrous Material 100%

CUSTOMER: City of San Diego
 9601 Ridgehaven Court Ste. 310
 San Diego CA 92123

PAGE #: 4 of 4
 REPORT #: 0152211
 PROJECT: PLM Analysis

BULK SAMPLE ANALYSIS FOR ASBESTOS CONTENT BY POLARIZED LIGHT MICROSCOPY

Laboratory ID - Sample No.	Sample Location Description	Layer No. Layer %	Asbestos Type (%)	Non-Asbestos Components (%)
0152211-018 6784-18	Floor tile mastic, Yellow, Homogeneous, solid, non-friable, melt, 27°C	LAYER 1 100%	None Detected	Non-Fibrous Material 100%


 Analyst - JEFF IVAN

Approved Signatory Laboratory Director

The EPA method is a semi-quantitative procedure. The detection limit is between 0.1-1% by area and dependent upon the size of the asbestos fibers, the means of sampling and the matrix of the sampled material. The test results reported are for the sample(s) delivered to us and may not represent the entire material from which the sample was taken. The EPA recommends three samples or more be taken from a "homogeneous sampling area" before friable material is considered non-asbestos-containing. Negative floor tile samples may contain significant amounts (>1%) of very thin fibers which cannot be detected by PLM. Confirmation by TEM is recommended by the EPA (Federal Register Vol.59, No.146). Asbestos fibers bound in a non-friable organic matrix may not be detected by PLM. Alternative preparation methods are recommended. This report, from a NIST-accredited laboratory through NVLAP, must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. government. This report shall not be reproduced, except in full, without the written approval of EMS Laboratories, Inc. Samples were received in good condition unless otherwise noted.



NVLAP Lab Code: 101218-0

Attachment # 2

LEAD XRF REPORTS



City of San Diego
Asbestos Lead Management Program



Mission Bay Clubhouse, 2702 North Mission Bay Drive

XRF Assay Results

Reading No	Time	Type	Duration	Units	MODE	LOCAT.	ROOM	SIDE	COMPONENT	COND.	SUBST.	COLOR	Results	PbC
1	3/12/13 11:58	SHUTTER CAL	308.66	cps										1.5
2	3/12/13 12:00	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED	Negative	0.8
3	3/12/13 12:04	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED	Negative	0.8
4	3/12/13 12:06	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED	Negative	0.8
5	3/12/13 12:28	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	A	WALL	INTACT	WOOD	GRAY	Negative	0.06
6	3/12/13 12:29	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	B	WALL	INTACT	WOOD	GRAY	Negative	0.16
7	3/12/13 12:30	PAINT	1.03	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	WALL	INTACT	WOOD	GRAY	Negative	0.11
8	3/12/13 12:30	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	D	WALL	INTACT	WOOD	GRAY	Negative	0.06
9	3/12/13 12:31	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	A	TRIM FASCIA	INTACT	WOOD	GREEN	Negative	0.15
10	3/12/13 12:32	PAINT	1.03	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	A	TRIM BEAM	INTACT	WOOD	GREEN	Negative	0
11	3/12/13 12:32	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	A	TRIM COLUMN	INTACT	WOOD	GREEN	Negative	0.03
12	3/12/13 12:33	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	A	TRIM WINDOW	INTACT	WOOD	GREEN	Negative	0.17
13	3/12/13 12:33	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	A	TRIM FASCIA	INTACT	WOOD	GREEN	Negative	0
14	3/12/13 12:34	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	A	TRIM BEAM	INTACT	WOOD	GREEN	Negative	0.12
15	3/12/13 12:35	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	D	TRIM FASCIA	INTACT	WOOD	GREEN	Negative	0
16	3/12/13 12:35	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	D	TRIM BEAM	INTACT	WOOD	GREEN	Negative	0.27
17	3/12/13 12:36	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	TRIM FASCIA	INTACT	WOOD	GREEN	Negative	0
18	3/12/13 12:36	PAINT	1.17	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	OVERHANG	INTACT	WOOD	WHITE	Negative	0
19	3/12/13 12:36	PAINT	1.03	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	OVERHANG	INTACT	WOOD	WHITE	Negative	0
20	3/12/13 12:37	PAINT	1.03	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	OVERHANG	INTACT	WOOD	WHITE	Negative	0
21	3/12/13 12:37	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	GUTTER	INTACT	METAL	WHITE	Negative	0
22	3/12/13 12:37	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	GUTTER	INTACT	METAL	WHITE	Negative	0
23	3/12/13 12:38	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	GUTTER	INTACT	METAL	WHITE	Negative	0
24	3/12/13 12:38	PAINT	1.01	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	HANDRAIL	INTACT	METAL	WHITE	Negative	0
25	3/12/13 12:38	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	HANDRAIL	INTACT	METAL	WHITE	Negative	0
26	3/12/13 12:40	PAINT	1.01	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	BRIDGE	INTACT	WOOD	GREEN	Negative	0.01
27	3/12/13 12:41	PAINT	1.31	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	BRIDGE	INTACT	WOOD	GRAY	Negative	0.01
28	3/12/13 12:42	PAINT	1.03	mg / cm ^2	Std.	MB CLUBHOUSE	EXTERIOR	C	DOOR	INTACT	WOOD	GRAY	Negative	0
29	3/12/13 12:44	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	RESTUARANT	C	DOOR	INTACT	WOOD	WHITE	Negative	0
30	3/12/13 12:44	PAINT	3.07	mg / cm ^2	Std.	MB CLUBHOUSE	RESTUARANT	A	WALL	INTACT	WOOD	WHITE	Negative	0
31	3/12/13 12:45	PAINT	2.18	mg / cm ^2	Std.	MB CLUBHOUSE	RESTUARANT	B	WALL	INTACT	WOOD	WHITE	Negative	0
32	3/12/13 12:45	PAINT	1.6	mg / cm ^2	Std.	MB CLUBHOUSE	RESTUARANT	C	WALL	INTACT	WOOD	WHITE	Negative	0
33	3/12/13 12:45	PAINT	2.63	mg / cm ^2	Std.	MB CLUBHOUSE	RESTUARANT	D	WALL	INTACT	WOOD	WHITE	Negative	0
34	3/12/13 12:46	PAINT	1.01	mg / cm ^2	Std.	MB CLUBHOUSE	RESTUARANT	B	POST	INTACT	WOOD	WHITE	Negative	0
35	3/12/13 12:46	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	RESTUARANT	B	BEAM	INTACT	WOOD	WHITE	Negative	0
36	3/12/13 12:51	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	RESTAURANT RR	A	WALL TILE	INTACT	CERAMIC	BEIGE	Negative	0.01
37	3/12/13 12:51	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	RESTAURANT RR	A	WALL TILE	INTACT	CERAMIC	WHITE	Negative	0.01
38	3/12/13 12:52	PAINT	1.31	mg / cm ^2	Std.	MB CLUBHOUSE	RESTAURANT RR	A	FLOOR	INTACT	CERAMIC	WHITE	Negative	0.07
39	3/12/13 12:54	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	KITCHEN	A	DOOR	INTACT	METAL	WHITE	Negative	0
40	3/12/13 12:55	PAINT	1.31	mg / cm ^2	Std.	MB CLUBHOUSE	KITCHEN	A	DOOR FRAME	INTACT	METAL	WHITE	Negative	0



City of San Diego
Asbestos Lead Management Program

Mission Bay Clubhouse, 2702 North Mission Bay Drive



XRF Assay Results

Reading No	Time	Type	Duration	Units	MODE	LOCAT.	ROOM	SIDE	COMPONENT	COND.	SUBST.	COLOR	Results	PbC
41	3/12/13 12:59	PAINT	2.34	mg / cm ^2	Std.	MB CLUBHOUSE	SNACK BAR	A	FLOOR TILE	INTACT	CERAMIC	BEIGE	Negative	0
42	3/12/13 13:01	PAINT	2.48	mg / cm ^2	Std.	MB CLUBHOUSE	MEETING RM	A	WALL	INTACT	DRYWALL	WHITE	Negative	0
43	3/12/13 13:02	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	MEETING RM	B	DOOR	INTACT	WOO	WHITE	Negative	0.05
44	3/12/13 13:03	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	STAGE	B	STAGE	INTACT	WOOD	BEIGE	Negative	0.09
45	3/12/13 13:03	PAINT	1.03	mg / cm ^2	Std.	MB CLUBHOUSE	STAGE	A	WALL	INTACT	WOOD	BEIGE	Negative	0.2
46	3/12/13 13:04	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	STAGE	C	WALL	INTACT	WOOD	BEIGE	Negative	0.4
47	3/12/13 13:05	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	LOBBY	C	WALL	INTACT	WOOD	BEIGE	Negative	0
48	3/12/13 13:12	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	OFFICE	A	WALL	INTACT	WOOD	BEIGE	Negative	0
49	3/12/13 13:12	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	OFFICE	B	WALL	INTACT	WOOD	WHITE	Negative	0.2
50	3/12/13 13:14	PAINT	1.89	mg / cm ^2	Std.	MB CLUBHOUSE	PHONE RM	B	WALL	INTACT	DRYWALL	BEIGE	Negative	0
51	3/12/13 13:15	PAINT	1.45	mg / cm ^2	Std.	MB CLUBHOUSE	HALL	B	WALL	INTACT	DRYWALL	BEIGE	Negative	0
52	3/12/13 13:16	PAINT	1.31	mg / cm ^2	Std.	MB CLUBHOUSE	HALL	B	DOOR	INTACT	WOOD	TAN	Negative	< LOD
53	3/12/13 13:17	PAINT	1.02	mg / cm ^2	Std.	MB CLUBHOUSE	OFFICE	C	DOOR	INTACT	WOOD	BEIGE	Negative	0
54	3/12/13 13:17	PAINT	1.03	mg / cm ^2	Std.	MB CLUBHOUSE	OFFICE	B	WALL	INTACT	WOOD	BEIGE	Negative	0
55	3/12/13 13:21	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED	Negative	0.8
56	3/12/13 13:22	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED	Negative	0.8
57	3/12/13 13:31	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED	Negative	0.8



City of San Diego/Asbestos and Lead Management Program

Project 6382



XRF Assay Results

Reading No	Inspector	Time	Duration	Units	Site	Room	Side	Component	Substrate	Color	Condition	Results	PbC	PbC Error
38	JJ	12/10/2009 11:09	20.08	mg / cm ^2	6382	calibration				Red		Positive	1	0.1
39	JJ	12/10/2009 11:11	20.02	mg / cm ^2	6382	calibration				Red		Positive	1	0.1
40	JJ	12/10/2009 11:12	20.03	mg / cm ^2	6382	calibration				Red		Positive	1	0.1
41	JJ	12/10/2009 11:15	3.57	mg / cm ^2	6382	Mens	E	WALL	Plaster	White	Intact	Negative	0.03	0.02
42	JJ	12/10/2009 11:15	2.99	mg / cm ^2	6382	Mens	E	Cer Tile	Masonry	Brown	Intact	Negative	0	0.02
43	JJ	12/10/2009 11:16	3.58	mg / cm ^2	6382	Mens	E	Stall	Metal	Brown	Intact	Negative	0	0.02
44	JJ	12/10/2009 11:16	1.79	mg / cm ^2	6382	Ext	N	WALL	Plaster	Gray	Intact	Negative	0.04	0.03
45	JJ	12/10/2009 11:17	3.59	mg / cm ^2	6382	Ext	N	WALL	Wood	Gray	Intact	Negative	0	0.02
46	JJ	12/10/2009 11:18	1.81	mg / cm ^2	6382	Womens	W	Wall	Plaster	White	Intact	Negative	0.04	0.02
47	JJ	12/10/2009 11:18	3	mg / cm ^2	6382	Womens	W	Cer Tile	Masonry	Brown	Intact	Negative	0	0.02
48	JJ	12/10/2009 11:19	20.02	mg / cm ^2	6382	calibration				Red		Positive	1	0.1
49	JJ	12/10/2009 11:21	20.04	mg / cm ^2	6382	calibration				Red		Positive	1	0.1
50	JJ	12/10/2009 11:22	20.03	mg / cm ^2	6382	calibration				Red		Positive	1	0.1



City of San Diego/Lead Safe Neighborhoods Program

Mission Bay Golf Course- Course Range Building



XRF Assay Results

Reading No	Time	Type	Duration	Units	MODE	LOCAT.	ROOM	SIDE	COMPONENT	COND.	SUBST.	COLOR	MISC 1	Results	Action	PbC
1	7/25/2012 8:48	SHUTTER_CAL	222.47	cps												2.07
2	7/25/2012 8:50	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED		Negative	1	0.9
3	7/25/2012 8:51	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED		Positive	1	1
4	7/25/2012 8:52	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED		Negative	1	0.9
5	7/25/2012 8:55	PAINT	1.03	mg / cm ^2	Std.	Exterior		A	WALL	POOR	WOOD	GRAY	rc	Negative	1	0.02
6	7/25/2012 8:55	PAINT	1.02	mg / cm ^2	Std.	Exterior		A	WALL	POOR	WOOD	GRAY	rc	Negative	1	0
7	7/25/2012 8:55	PAINT	1.02	mg / cm ^2	Std.	Exterior		A	WALL	POOR	WOOD	GRAY	rc	Negative	1	0.01
8	7/25/2012 8:55	PAINT	1.02	mg / cm ^2	Std.	Exterior		A	WALL	POOR	WOOD	GRAY	rc	Negative	1	0.01
9	7/25/2012 8:56	PAINT	1.02	mg / cm ^2	Std.	Exterior		A	WALL	POOR	WOOD	GRAY	rc	Negative	1	0
10	7/25/2012 8:57	PAINT	1.02	mg / cm ^2	Std.	Exterior		A	WINDOW	POOR	WOOD	GREEN	rc	Negative	1	0
11	7/25/2012 8:57	PAINT	1.02	mg / cm ^2	Std.	Exterior		B	WINDOW	POOR	WOOD	GREEN	rc	Negative	1	0
12	7/25/2012 8:58	PAINT	1.02	mg / cm ^2	Std.	Exterior		B	WALL	POOR	WOOD	GRAY	rc	Negative	1	0
13	7/25/2012 8:58	PAINT	1.02	mg / cm ^2	Std.	Exterior		B	WALL	POOR	WOOD	GRAY	rc	Negative	1	0
14	7/25/2012 8:59	PAINT	1.02	mg / cm ^2	Std.	Exterior		B	DOOR JAMB	POOR	WOOD	GREEN	rc	Negative	1	0
15	7/25/2012 8:59	PAINT	1.02	mg / cm ^2	Std.	Exterior		B	DOOR	POOR	WOOD	BLUE	rc	Negative	1	0
16	7/25/2012 9:00	PAINT	1.02	mg / cm ^2	Std.	Exterior		A	RAFTER	POOR	WOOD	GREEN	rc	Negative	1	0
17	7/25/2012 9:00	PAINT	1.02	mg / cm ^2	Std.	Exterior		A	RAFTER	POOR	WOOD	GREEN	rc	Negative	1	0
18	7/25/2012 9:00	PAINT	1.22	mg / cm ^2	Std.	Exterior		B	RAFTER	POOR	WOOD	GREEN	rc	Negative	1	0.01
19	7/25/2012 9:00	PAINT	1.02	mg / cm ^2	Std.	Exterior		B	RAFTER	POOR	WOOD	GREEN	rc	Negative	1	0
20	7/25/2012 9:00	PAINT	1.03	mg / cm ^2	Std.	Exterior		C	RAFTER	POOR	WOOD	GREEN	rc	Negative	1	0
21	7/25/2012 9:03	PAINT	1.02	mg / cm ^2	Std.	Exterior		A	eaves	POOR	WOOD	WHITE	rc	Negative	1	0
22	7/25/2012 9:03	PAINT	0.82	mg / cm ^2	Std.	Exterior		B	eaves	POOR	WOOD	WHITE	rc	Null	1	0
23	7/25/2012 9:04	PAINT	1.02	mg / cm ^2	Std.	Exterior		C	eaves	POOR	WOOD	WHITE	rc	Negative	1	0
24	7/25/2012 9:09	PAINT	1.03	mg / cm ^2	Std.	Exterior		B	WALL	POOR	WOOD	GRAY	rc	Negative	1	0
25	7/25/2012 9:09	PAINT	1.02	mg / cm ^2	Std.	Exterior		B	WALL	POOR	WOOD	GRAY	rc	Negative	1	0.03
26	7/25/2012 9:09	PAINT	1.02	mg / cm ^2	Std.	Exterior		C	WALL	POOR	WOOD	GRAY	rc	Negative	1	0
27	7/25/2012 9:10	PAINT	1.02	mg / cm ^2	Std.	Exterior		C	WALL	POOR	WOOD	GRAY	rc	Negative	1	0
28	7/25/2012 9:10	PAINT	1.02	mg / cm ^2	Std.	Exterior		D	WALL	POOR	WOOD	GRAY	rc	Negative	1	0
29	7/25/2012 9:11	PAINT	1.24	mg / cm ^2	Std.	Interior	Storage	A	WALL	POOR	WOOD	WHITE	rc	Negative	1	0
30	7/25/2012 9:11	PAINT	1.43	mg / cm ^2	Std.	Interior	Storage	B	WALL	POOR	WOOD	WHITE	rc	Negative	1	0
31	7/25/2012 9:12	PAINT	3.27	mg / cm ^2	Std.	Interior	Storage	C	WALL	POOR	WOOD	WHITE	rc	Negative	1	0
32	7/25/2012 9:12	PAINT	2.88	mg / cm ^2	Std.	Interior	Storage	D	WALL	POOR	WOOD	WHITE	rc	Negative	1	0
33	7/25/2012 9:13	PAINT	1.23	mg / cm ^2	Std.	Interior	black	A	WALL	POOR	WOOD	BLACK	rc	Negative	1	0
34	7/25/2012 9:13	PAINT	3.28	mg / cm ^2	Std.	Interior	black	B	WALL	POOR	WOOD	BLACK	rc	Negative	1	0
35	7/25/2012 9:14	PAINT	1.02	mg / cm ^2	Std.	Interior	black	C	WALL	POOR	WOOD	BLACK	rc	Negative	1	0



XRF Assay Results

Reading No	Time	Type	Duration	Units	MODE	LOCAT.	ROOM	SIDE	COMPONENT	COND.	SUBST.	COLOR	MISC 1	Results	Action	PbC
36	7/25/2012 9:14	PAINT	2.87	mg / cm ^2	Std.	Interior	black	D	WALL	POOR	WOOD	BLACK	rc	Negative	1	0
37	7/25/2012 9:15	PAINT	1.02	mg / cm ^2	Std.	Interior	black	A	DOOR	POOR	WOOD	BLACK	rc	Negative	1	0
38	7/25/2012 9:15	PAINT	1.02	mg / cm ^2	Std.	Interior	black	A	DOOR CASING	POOR	WOOD	BLACK	rc	Negative	1	0.02
39	7/25/2012 9:15	PAINT	1.02	mg / cm ^2	Std.	Interior	black	A	DOOR CASING	POOR	WOOD	BLACK	rc	Negative	1	0.02
40	7/25/2012 9:21	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED	rc	Positive	1	1
41	7/25/2012 9:22	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED	rc	Negative	1	0.9
42	7/25/2012 9:23	PAINT	20	mg / cm ^2	K & L				CALIB. CHECK			RED	rc	Positive	1	1

Attachment # 3

INSPECTOR CERTIFICATIONS

State of California
 Division of Occupational Safety and Health
Certified Site Surveillance Technician

William Bradley Blondet



Name
 Certification No. 99-2689
 Expires on 12/10/13

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

State of California Department of Public Health

Lead-Related
 Construction
 Certificate

Certificate Type	Expiration Date
------------------	-----------------



Inspector/Assessor	07/01/2013
Supervisor	07/01/2013
Project Monitor	07/01/2013



William B. Blondet ID# **5464**

State of California Department of Public Health

Lead-Related
Construction
Certificate

Certificate
Type

Expiration
Date



Inspector/Assessor	02/15/2014
Project Designer	02/15/2014
Project Monitor	02/15/2014



Alan J. Johanns

ID #: 7770

State of California
Division of Occupational Safety and Health
Certified Asbestos Consultant

Alan James Johanns



Name

Certification No. 92-0842

Expires on 03/11/14

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

ASBESTOS, LEAD & HAZARDOUS MATERIALS

General

- A. The City of San Diego's Asbestos and Lead Management Program (ALMP) has performed an asbestos, lead and hazardous materials inspection for the Mission Bay Golf Course Clubhouse & Course Range Building demolition involved with this contract. Attached is the associated report. The Contractor that is awarded this contract shall not include any costs associated with mitigation of the asbestos and lead as it will be performed by a separate City contract with the abatement work being performed at the beginning of the project.
- B. The inspection and sampling performed by the ALMP was conducted without using destructive methods. Therefore, it is possible for the Contractor to encounter additional suspected hazardous materials as the walls are opened during demolition. The Contractor and his staff shall continue looking for suspected materials throughout this process.
 1. If additional suspected asbestos materials are identified, stop work in that area and immediately notify the Resident Engineer.
 2. As soon as possible, the City will undertake confirmation of the materials and determine if abatement is required. If abatement is required, the City will conduct such abatement at no cost to the Contractor.
 3. The Contractor shall remain out of that work area if abatement is required. There will be no additional financial compensation to the Contractor during the removal of this ACM.
- C. The painted surfaces of the Mission Bay Golf Course Clubhouse & Course Range Buildings were tested for lead-based paint which is defined as paint containing lead in concentrations greater than 5,000 ppm, 5,000 mg/kg, or 1.0 mg/cm². The painted surfaces tested below this threshold and are not defined as lead-based or lead-containing paint.
- D. The Hazardous materials such as Freon or hydraulic oils that are part of the mechanical systems to be demolished by the Contractor shall be disposed of properly, and the workers handling such items shall be OSHA 40 hour "Hazwoper" trained in accordance with the Whitebook.



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Mission Bay Golf Course Temporary Trailer and Restrooms

- A. Approximate dimensions of the following, if applicable (See Golf Op. Temporary Trailer floor plan):
 - 1. Counter
 - 2. Lobby
 - 3. Offices for Staff
 - 4. Office for Supervisors
 - 5. Storage
 - 6. Slat wall
 - 7. Bathrooms (See Bathrooms floor plan)

- B. Specific locations of the temporary trailers:
 - a. See Location Map

- C. Desired interior and exterior finishes:
 - a. Durable carpet in the offices and lobby
 - b. VCT flooring in storage areas
 - c. Slat wall

- D. List of Furniture in addition from the existing building:
 - a. Contractor provided:
 - i. Retail Counter
 - ii. Shelving system in storage area

 - b. CITY provided:
 - i. 3 Desks
 - ii. 1 File Cabinet

- E. List of Fixtures:
 - a. LED lighting in all spaces
 - b. AC throughout

- F. List of Equipment:
 - a. Contractor in coordination with the City IT Department or the appropriate City department will provide:
 - i. Power
 - ii. Data connections
 - iii. Analog phone lines

b. These items will be provided by the City and will need to be coordinated with the City IT Department:

- i. 5 Computers
- ii. 1 Receipt Printer
- iii. 2 Credit Card Terminals
- iv. 1 Back Up Credit Card Terminal
- v. 4 Phone lines
- vi. 1 PA System
- vii. 1 Large Copy Printer
- viii. 1 Clock

G. Bathroom Trailer

a. Contractor in coordination with the appropriate City department will provide:

- i. Power
- ii. Electricity
- iii. Sewer hookup or cleaning service

b. Portable/temporary restrooms

c. Space for 2 male and 2 female restrooms

d. Space for all gender ADA or 1 ADA on male restroom and 1 ADA on female restroom

e. Located next to temporary golf shop

f. Ability for sewer hookup

g. ADA ramp

h. Male restroom

- i. 1 toilets
- ii. 2 industrial size toilet paper holders
- iii. 2 urinals
- iv. 1 sinks
- v. 1 soap dispensers
- vi. 1 towel dispensers
- vii. Mirrors
- viii. Lights
- ix. A/C

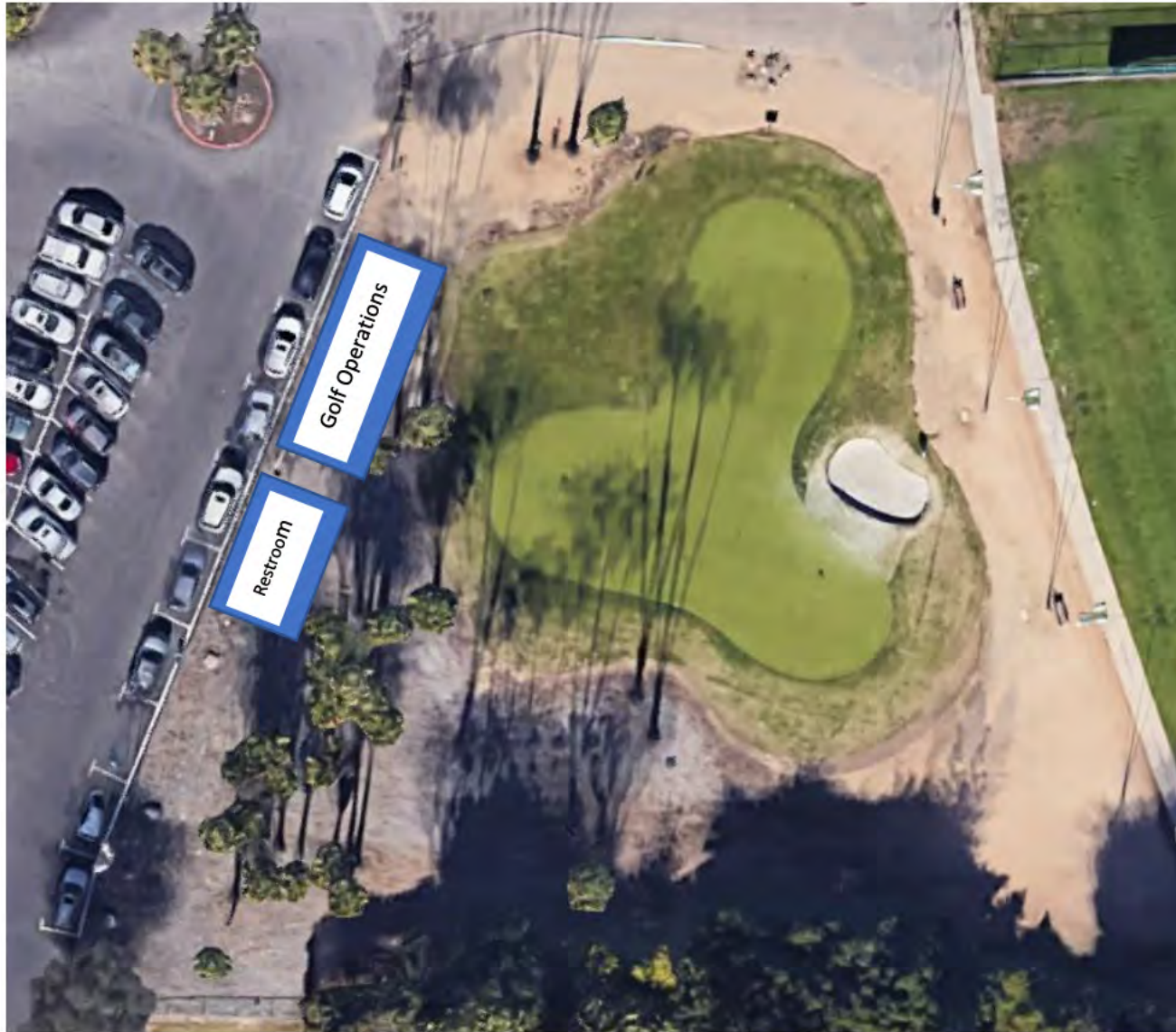
i. Female restroom

- i. 2 toilets
- ii. 2 industrial size toilet paper holders
- iii. 1 sinks
- iv. 1 soap dispensers
- v. 1 towel dispensers
- vi. Mirrors
- vii. Lights
- viii. A/C

- j. ADA accessible restroom
 - i. 1 toilets
 - ii. 1 industrial size toilet paper holders
 - iii. 1 sinks
 - iv. 1 soap dispensers
 - v. 1 towel dispensers
 - vi. Mirrors
 - vii. Lights
 - viii. A/C

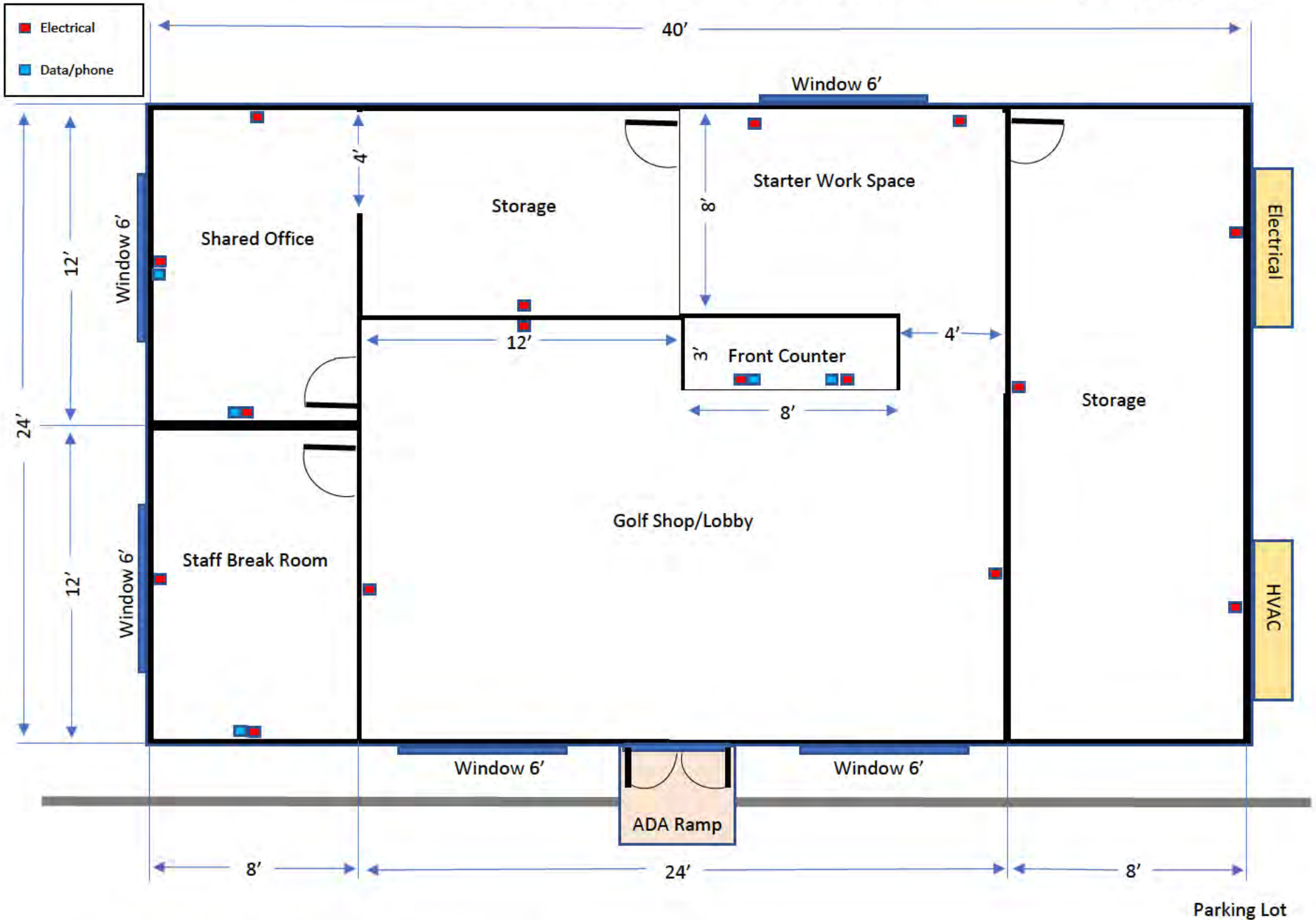
- k. Recommended manufacturer: Williams Scotsman or approved equal.

Temporary Trailer Location

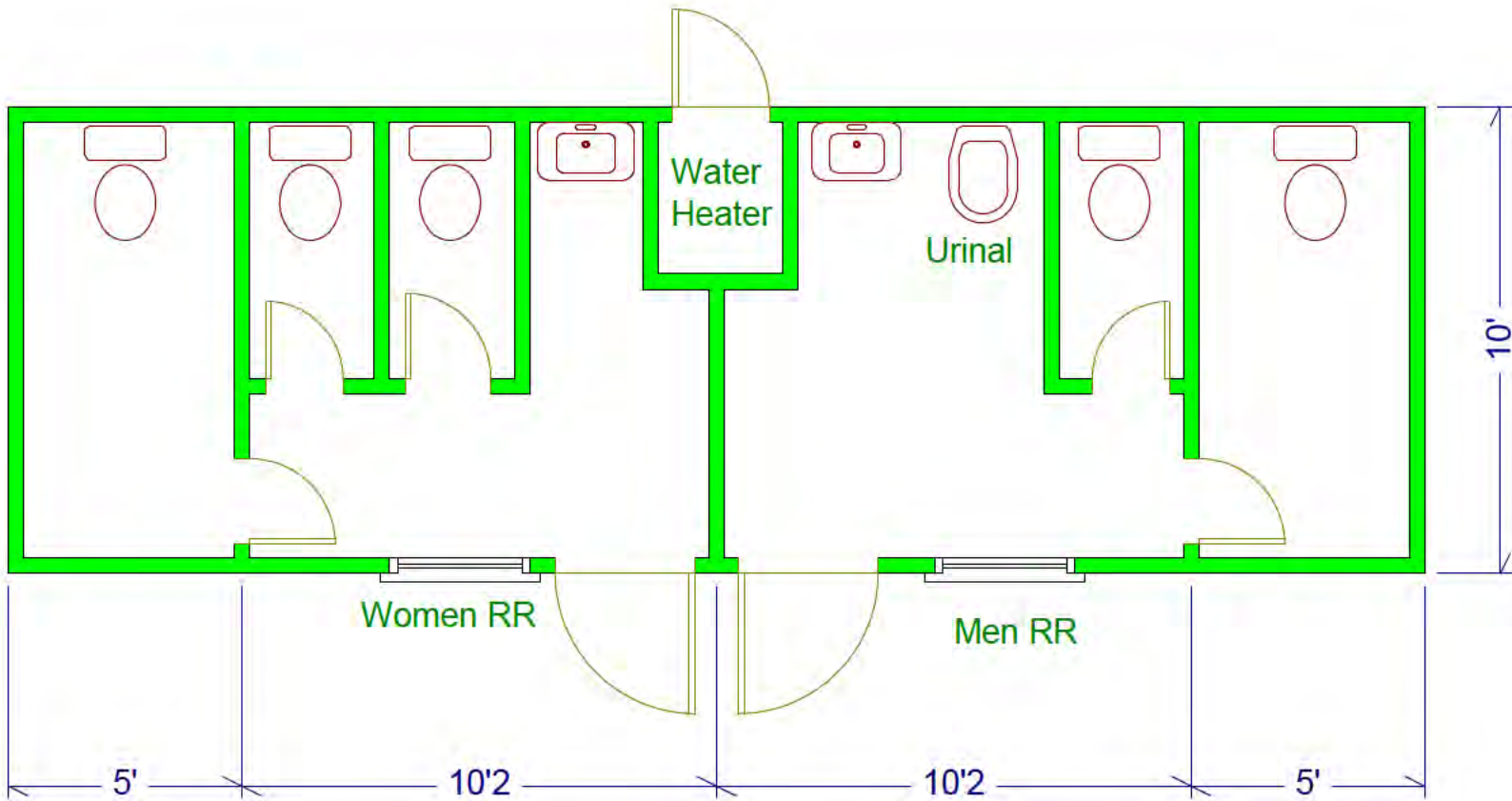


Mission Bay Golf Operations Temporary Trailer

Practice Putting Green



UM2-00011
STD/VCT/2HCRR/3 TT/1URINAL/2SINKS
MODEL: UNITED MODULAR, YEAR 2000



SUPPLEMENTARY SPECIAL PROVISIONS
APPENDICES

APPENDIX A

**NOTICE OF EXEMPTION, MITIGATED NEGATIVE DECLARATION AND
COASTAL DEVELOPMENT WAIVER**

NOTICE OF EXEMPTION

(Check one or both)

TO: Recorder/County Clerk
P.O. Box 1750, MS A-33
1600 Pacific Hwy, Room 260
San Diego, CA 92101-2400

FROM: City of San Diego
Public Works Department
525 B Street, Suite 750, MS 908A
San Diego, CA 92101

Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

Project Name: Mission Bay Golf Course Building Improvements

Project WBS No.: S-11010.02.06

Project Location-Specific: 2702 North Mission Bay Drive (Mission Bay Park Community Plan; Council District 2)

Project Location-City/County: San Diego/San Diego

Description of nature and purpose of the Project: This project consists of demolition of the existing clubhouse and related buildings at the Mission Bay Golf Course and replacement with modular buildings, including utility and landscaping improvements, located in the southern-central portion of the golf course. Maximum depth of excavation is approximately 7 feet belowground.

Name of Public Agency Approving Project: City of San Diego

Name of Person or Agency Carrying Out Project: City of San Diego Public Works Department
Contact: Gretchen Eichar, Senior Planner
PH: 619-533-4110
525 B Street, Suite 750, San Diego, CA 92101

Exempt Status: (CHECK ONE)

- Ministerial (Sec. 21080(b)(1); 15268);
- Declared Emergency (Sec. 21080(b)(3); 15269(a));
- Emergency Project (Sec. 21080(b)(4); 15269(b)(c))
- Categorical Exemption: Sec. 15302(c) [Replacement or Reconstruction]; Sec. 15304(b) [Minor Alterations to Land]
- Statutory Exemption

Reasons why project is exempt: The City of San Diego conducted an environmental review which determined that the project meets the categorical exemption criteria set forth in CEQA State Guidelines, Section 15302(c), Replacement or Reconstruction, which allows for replacement of a commercial structure with a new structure of substantially the same size, purpose, and capacity and where the exceptions listed in Section 15300.2 would not apply. The project also meets the categorical exemption criteria set forth in CEQA State Guidelines, Section 15304(b), Minor Alterations to Land, which allows for minor public alterations in the conditions of land including new gardening or landscaping, and where the exceptions listed in Section 15300.2 would not apply. The project site is underlain by fill material and native soils with little to no potential for archaeological resources; therefore, the project will have no impact on archaeological resources.

Lead Agency Contact Person: Gretchen Eichar

Telephone: (619) 533-4110

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a notice of exemption been filed by the public agency approving the project? () Yes () No

It is hereby certified that the City of San Diego has determined the above activity to be exempt from CEQA



Carrie Purcell, Assistant Deputy Director

5/17/18

Date

Check One:

- (X) Signed By Lead Agency
() Signed by Applicant

Date Received for Filing with County Clerk or OPR:



THE CITY OF SAN DIEGO

MITIGATED NEGATIVE DECLARATION

Project No. 607150
SCH No. N/A

SUBJECT: MBGC IRRIGATION & ELECTRICAL UPGRADES PROJECT: Mayoral approval of lighting and irrigation improvements to the existing Mission Bay Golf Course (MBGC). The project includes demolition and minor grading for installation of new drinking fountains, turf, irrigation systems, and lighting systems. The project site is located within the Mission Bay Park Area and City Council District 2. Applicant: City of San Diego Public Works Department.

- I. PROJECT DESCRIPTION: See attached Initial Study.
- II. ENVIRONMENTAL SETTING: See attached Initial Study.
- III. DETERMINATION:

The City of San Diego conducted an Initial Study which determined that the proposed project could have a significant environmental effect in the following area(s): **Archaeological Resources**. Subsequent revisions in the project proposal create the specific mitigation identified in Section V of this Mitigated Negative Declaration. The project as revised now avoids or mitigates the potentially significant environmental effects previously identified, and the preparation of an Environmental Impact Report will not be required.

- IV. DOCUMENTATION: The attached Initial Study documents the reasons to support the above Determination.
- V. MITIGATION, MONITORING AND REPORTING PROGRAM:
 - A. **GENERAL REQUIREMENTS – PART I**
Plan Check Phase (prior to permit issuance)

1. Prior to the issuance of a Notice To Proceed (NTP) for a subdivision, or any construction permits, such as Demolition, Grading or Building, or beginning any construction related activity on-site, the Development Services Department (DSD) Director's Environmental Designee (ED) shall review and approve all Construction Documents (CD), (plans, specification, details, etc.) to ensure the MMRP requirements are incorporated into the design.

2. In addition, the ED shall verify that the MMRP Conditions/Notes that apply ONLY to the construction phases of this project are included VERBATIM, under the heading, **"ENVIRONMENTAL/MITIGATION REQUIREMENTS."**

3. These notes must be shown within the first three (3) sheets of the construction documents in the format specified for engineering construction document templates as shown on the City website:

<http://www.sandiego.gov/development-services/industry/standtemp.shtml>

4. The **TITLE INDEX SHEET** must also show on which pages the "Environmental/Mitigation Requirements" notes are provided.

5. **SURETY AND COST RECOVERY** – The Development Services Director or City Manager may require appropriate surety instruments or bonds from private Permit Holders to ensure the long term performance or implementation of required mitigation measures or programs. The City is authorized to recover its cost to offset the salary, overhead, and expenses for City personnel and programs to monitor qualifying projects.

B. GENERAL REQUIREMENTS – PART II

Post Plan Check (After permit issuance/Prior to start of construction)

1. PRE CONSTRUCTION MEETING IS REQUIRED TEN (10) WORKING DAYS PRIOR TO BEGINNING ANY WORK ON THIS PROJECT. The PERMIT HOLDER/OWNER is responsible to arrange and perform this meeting by contacting the CITY RESIDENT ENGINEER (RE) of the Field Engineering Division and City staff from MITIGATION MONITORING COORDINATION (MMC). Attendees must also include the Permit holder's Representative(s), Job Site Superintendent and the following consultants:

Qualified Archaeologist

Qualified Native American Monitor

Note:

Failure of all responsible Permit Holder's representatives and consultants to attend shall require an additional meeting with all parties present.

CONTACT INFORMATION:

a) The PRIMARY POINT OF CONTACT is the **RE** at the **Field Engineering Division – 858-627-3200**

b) For Clarification of ENVIRONMENTAL REQUIREMENTS, it is also required to call **RE and MMC at 858-627-3360**

2. MMRP COMPLIANCE: This Project, Project Tracking System (PTS) #607150 and /or Environmental Document # 607150, shall conform to the mitigation requirements contained in the associated Environmental Document and implemented to the satisfaction of the DSD's Environmental Designee (MMC) and the City Engineer (RE). The requirements may not be reduced or changed but may be annotated (i.e. to explain when and how compliance is being met and location of verifying proof,

etc.). Additional clarifying information may also be added to other relevant plan sheets and/or specifications as appropriate (i.e., specific locations, times of monitoring, methodology, etc.

Note:

Permit Holder’s Representatives must alert RE and MMC if there are any discrepancies in the plans or notes, or any changes due to field conditions. All conflicts must be approved by RE and MMC BEFORE the work is performed.

3. OTHER AGENCY REQUIREMENTS: Evidence of compliance with all other agency requirements or permits shall be submitted to the RE and MMC for review and acceptance prior to the beginning of work or within one week of the Permit Holder obtaining documentation of those permits or requirements. Evidence shall include copies of permits, letters of resolution or other documentation issued by the responsible agency.

None

4. MONITORING EXHIBITS

All consultants are required to submit , to RE and MMC, a monitoring exhibit on a 11x17 reduction of the appropriate construction plan, such as site plan, grading, landscape, etc., marked to clearly show the specific areas including the **LIMIT OF WORK**, scope of that discipline’s work, and notes indicating when in the construction schedule that work will be performed. When necessary for clarification, a detailed methodology of how the work will be performed shall be included.

5. OTHER SUBMITTALS AND INSPECTIONS:

The Permit Holder/Owner’s representative shall submit all required documentation, verification letters, and requests for all associated inspections to the RE and MMC for approval per the following schedule:

Document Submittal/Inspection Checklist

DOCUMENT SUBMITTAL/INSPECTION CHECKLIST		
Issue Area	Document Submittal	Associated Inspection/Approvals/Notes
General	Consultant Qualification Letters	Prior to Preconstruction Meeting
General	Consultant Construction Monitoring Exhibits	Prior to or at Preconstruction Meeting
Archaeology	Archaeology Reports	Archaeology/Historic Site Observation

B. SPECIFIC MMRP ISSUE AREA CONDITIONS/REQUIREMENTS

ARCHAEOLOGICAL RESOURCES

Note: Archaeological and Native American monitoring is only required for ground disturbance associated with the installation of light poles DR1, DR2, and DR 12 through DR15 as shown on Sheet 39986-17-D of the Review Cycle 1 Mission Bay Golf Course Development Plans on file with the Development Services Department (See MND Figure 3).

I. Prior to Permit Issuance or Bid Opening/Bid Award

A. Entitlements Plan Check

1. Prior to permit issuance or Bid Opening/Bid Award, whichever is applicable, the Assistant Deputy Director (ADD) Environmental designee shall verify that the requirements for Archaeological Monitoring and Native American monitoring have been noted on the applicable construction documents through the plan check process.

B. Letters of Qualification have been submitted to ADD

1. Prior to Bid Award, the applicant shall submit a letter of verification to Mitigation Monitoring Coordination (MMC) identifying the Principal Investigator (PI) for the project and the names of all persons involved in the archaeological monitoring program, as defined in the City of San Diego Historical Resources Guidelines (HRG). If applicable, individuals involved in the archaeological monitoring program must have completed the 40-hour HAZWOPER training with certification documentation.
2. MMC will provide a letter to the applicant confirming the qualifications of the PI and all persons involved in the archaeological monitoring of the project meet the qualifications established in the HRG.
3. Prior to the start of work, the applicant must obtain written approval from MMC for any personnel changes associated with the monitoring program.

II. Prior to Start of Construction

A. Verification of Records Search

1. The PI shall provide verification to MMC that a site specific records search (1/4 mile radius) has been completed. Verification includes, but is not limited to a copy of a confirmation letter from South Coastal Information Center, or, if the search was in-house, a letter of verification from the PI stating that the search was completed.
2. The letter shall introduce any pertinent information concerning expectations and probabilities of discovery during trenching and/or grading activities.
3. The PI may submit a detailed letter to MMC requesting a reduction to the ¼ mile radius.

B. PI Shall Attend Precon Meetings

1. Prior to beginning any work that requires monitoring; the Applicant shall arrange a Precon Meeting that shall include the PI, Native American consultant/monitor (where Native American resources may be impacted), Construction Manager (CM) and/or Grading Contractor, Resident Engineer (RE), Building Inspector (BI), if appropriate, and MMC. The qualified Archaeologist and Native American Monitor shall attend any grading/excavation related Precon Meetings to make comments and/or suggestions concerning the Archaeological Monitoring program with the Construction Manager and/or Grading Contractor.
 - a. If the PI is unable to attend the Precon Meeting, the Applicant shall schedule a focused Precon Meeting with MMC, the PI, RE, CM or BI, if appropriate, prior to the start of any work that requires monitoring.

2. Acknowledgement of Responsibility for Curation (CIP or Other Public Projects)
The applicant shall submit a letter to MMC acknowledging their responsibility for the cost of curation associated with all phases of the archaeological monitoring program.
3. Identify Areas to be Monitored
 - a. Prior to the start of any work that requires monitoring, the PI shall submit an Archaeological Monitoring Exhibit (AME) (with verification that the AME has been reviewed and approved by the Native American consultant/monitor when Native American resources may be impacted) based on the appropriate construction documents (reduced to 11x17) to MMC identifying the areas to be monitored including the delineation of grading/excavation limits.
 - b. The AME shall be based on the results of a site specific records search as well as information regarding the age of existing pipelines, laterals and associated appurtenances and/or any known soil conditions (native or formation).
 - c. MMC shall notify the PI that the AME has been approved.
4. When Monitoring Will Occur
 - a. Prior to the start of any work, the PI shall also submit a construction schedule to MMC through the RE indicating when and where monitoring will occur.
 - b. The PI may submit a detailed letter to MMC prior to the start of work or during construction requesting a modification to the monitoring program. This request shall be based on relevant information such as review of final construction documents which indicate conditions such as age of existing pipe to be replaced, depth of excavation and/or site graded to bedrock, etc., which may reduce or increase the potential for resources to be present.
5. Approval of AME and Construction Schedule
After approval of the AME by MMC, the PI shall submit to MMC written authorization of the AME and Construction Schedule from the CM.

III. During Construction

- A. Monitor Shall be Present During Grading/Excavation/Trenching
 1. The Archaeological Monitor shall be present full-time during all soil disturbing and grading/excavation/trenching activities which could result in impacts to archaeological resources as identified on the AME. **The Construction Manager is responsible for notifying the RE, PI, and MMC of changes to any construction activities such as in the case of a potential safety concern within the area being monitored. In certain circumstances OSHA safety requirements may necessitate modification of the AME.**
 2. The Native American consultant/monitor shall determine the extent of their presence during soil disturbing and grading/excavation/trenching activities based on the AME and provide that information to the PI and MMC. If prehistoric resources are encountered during the Native American consultant/monitor's absence, work shall stop and the Discovery Notification Process detailed in Section III.B-C and IV.A-D shall commence.
 3. The PI may submit a detailed letter to MMC during construction requesting a modification to the monitoring program when a field condition such as modern disturbance post-dating the previous grading/trenching activities, presence of fossil

formations, or when native soils are encountered that may reduce or increase the potential for resources to be present.

4. The archaeological and Native American consultant/monitor shall document field activity via the Consultant Site Visit Record (CSVSR). The CSVSR's shall be faxed by the CM to the RE the first day of monitoring, the last day of monitoring, monthly (**Notification of Monitoring Completion**), and in the case of ANY discoveries. The RE shall forward copies to MMC.

B. Discovery Notification Process

1. In the event of a discovery, the Archaeological Monitor shall direct the contractor to temporarily divert all soil disturbing activities, including but not limited to digging, trenching, excavating or grading activities in the area of discovery and in the area reasonably suspected to overlay adjacent resources and immediately notify the RE or BI, as appropriate.
2. The Monitor shall immediately notify the PI (unless Monitor is the PI) of the discovery.
3. The PI shall immediately notify MMC by phone of the discovery, and shall also submit written documentation to MMC within 24 hours by fax or email with photos of the resource in context, if possible.
4. No soil shall be exported off-site until a determination can be made regarding the significance of the resource specifically if Native American resources are encountered.

C. Determination of Significance

1. The PI and Native American consultant/monitor, where Native American resources are discovered shall evaluate the significance of the resource. If Human Remains are involved, follow protocol in Section IV below.

- a. The PI shall immediately notify MMC by phone to discuss significance determination and shall also submit a letter to MMC indicating whether additional mitigation is required.
- b. If the resource is significant, the PI shall submit an Archaeological Data Recovery Program (ADRP) and obtain written approval of the program from MMC, CM and RE. ADRP and any mitigation must be approved by MMC, RE and/or CM before ground disturbing activities in the area of discovery will be allowed to resume.
Note: If a unique archaeological site is also an historical resource as defined in CEQA Section 15064.5, then the limits on the amount(s) that a project applicant may be required to pay to cover mitigation costs as indicated in CEQA Section 21083.2 shall not apply.

(1). Note: For pipeline trenching and other linear projects in the public Right-of-Way, the PI shall implement the Discovery Process for Pipeline Trenching projects identified below under "D."

- c. If the resource is not significant, the PI shall submit a letter to MMC indicating that artifacts will be collected, curated, and documented in the Final Monitoring Report. The letter shall also indicate that that no further work is required.

(1). Note: For Pipeline Trenching and other linear projects in the public Right-of-Way, if the deposit is limited in size, both in length and depth; the information value is limited and is not associated with any other resource; and there are no unique features/artifacts associated with the deposit, the discovery should be considered not significant.

- (2). Note, for Pipeline Trenching and other linear projects in the public Right-of-Way, if significance cannot be determined, the Final Monitoring Report and Site Record (DPR Form 523A/B) shall identify the discovery as Potentially Significant.

D. Discovery Process for Significant Resources - Pipeline Trenching and other Linear Projects in the Public Right-of-Way

The following procedure constitutes adequate mitigation of a significant discovery encountered during pipeline trenching activities or for other linear project types within the Public Right-of-Way including but not limited to excavation for jacking pits, receiving pits, laterals, and manholes, to reduce impacts to below a level of significance:

1. Procedures for documentation, curation and reporting
 - a. One hundred percent of the artifacts within the trench alignment and width shall be documented in-situ, to include photographic records, plan view of the trench and profiles of side walls, recovered, photographed after cleaning and analyzed and curated. The remainder of the deposit within the limits of excavation (trench walls) shall be left intact.
 - b. The PI shall prepare a Draft Monitoring Report and submit to MMC via the RE as indicated in Section VI-A.
 - c. The PI shall be responsible for recording (on the appropriate State of California Department of Park and Recreation forms-DPR 523 A/B) the resource(s) encountered during the Archaeological Monitoring Program in accordance with the City's Historical Resources Guidelines. The DPR forms shall be submitted to the South Coastal Information Center for either a Primary Record or SDI Number and included in the Final Monitoring Report.
 - d. The Final Monitoring Report shall include a recommendation for monitoring of any future work in the vicinity of the resource.

IV. Discovery of Human Remains

If human remains are discovered, work shall halt in that area and no soil shall be exported off-site until a determination can be made regarding the provenance of the human remains; and the following procedures as set forth in CEQA Section 15064.5(e), the California Public Resources Code (Sec. 5097.98) and State Health and Safety Code (Sec. 7050.5) shall be undertaken:

A. Notification

1. Archaeological Monitor shall notify the RE or BI as appropriate, MMC, and the PI, if the Monitor is not qualified as a PI. MMC will notify the appropriate Senior Planner in the Environmental Analysis Section (EAS) of the Development Services Department to assist with the discovery notification process.
2. The PI shall notify the Medical Examiner after consultation with the RE, either in person or via telephone.

B. Isolate discovery site

1. Work shall be directed away from the location of the discovery and any nearby area reasonably suspected to overlay adjacent human remains until a determination can be made by the Medical Examiner in consultation with the PI concerning the provenience of the remains.
2. The Medical Examiner, in consultation with the PI, will determine the need for a field examination to determine the provenience.

3. If a field examination is not warranted, the Medical Examiner will determine with input from the PI, if the remains are or are most likely to be of Native American origin.
- C. If Human Remains **ARE** determined to be Native American
1. The Medical Examiner will notify the Native American Heritage Commission (NAHC) within 24 hours. By law, **ONLY** the Medical Examiner can make this call.
 2. NAHC will immediately identify the person or persons determined to be the Most Likely Descendent (MLD) and provide contact information.
 3. The MLD will contact the PI within 24 hours or sooner after the Medical Examiner has completed coordination, to begin the consultation process in accordance with CEQA Section 15064.5(e), the California Public Resources and Health & Safety Codes.
 4. The MLD will have 48 hours to make recommendations to the property owner or representative, for the treatment or disposition with proper dignity, of the human remains and associated grave goods.
 5. Disposition of Native American Human Remains will be determined between the MLD and the PI, and, if:
 - a. The NAHC is unable to identify the MLD, OR the MLD failed to make a recommendation within 48 hours after being granted access to the site, OR;
 - b. The landowner or authorized representative rejects the recommendation of the MLD and mediation in accordance with PRC 5097.94 (k) by the NAHC fails to provide measures acceptable to the landowner, the landowner shall reinter the human remains, and items associated with Native American human remains with appropriate dignity on the property in a location not subject to further and future subsurface disturbance, THEN
 - c. To protect these sites, the landowner shall do one or more of the following:
 - (1) Record the site with the NAHC;
 - (2) Record an open space or conservation easement; or
 - (3) Record a document with the County. The document shall be titled "Notice of Reinterment of Native American Remains" and shall include a legal description of the property, the name of the property owner, and the owner's acknowledged signature, in addition to any other information required by PRC 5097.98. The document shall be indexed as a notice under the name of the owner.
 - d. Upon the discovery of multiple Native American human remains during a ground disturbing land development activity, the landowner may agree that additional conferral with descendants is necessary to consider culturally appropriate treatment of multiple Native American human remains. Culturally appropriate treatment of such a discovery may be ascertained from review of the site utilizing cultural and archaeological standards. Where the parties are unable to agree on the appropriate treatment measures the human remains and items associated and buried with Native American human remains shall be reinterred with appropriate dignity, pursuant to Section 5.c., above.
- D. If Human Remains are **NOT** Native American
1. The PI shall contact the Medical Examiner and notify them of the historic era context of the burial.
 2. The Medical Examiner will determine the appropriate course of action with the PI and City staff (PRC 5097.98).

3. If the remains are of historic origin, they shall be appropriately removed and conveyed to the San Diego Museum of Man for analysis. The decision for internment of the human remains shall be made in consultation with MMC, EAS, the applicant/landowner, any known descendant group, and the San Diego Museum of Man.

V. Night and/or Weekend Work

- A. If night and/or weekend work is included in the contract
 1. When night and/or weekend work is included in the contract package, the extent and timing shall be presented and discussed at the precon meeting.
 2. The following procedures shall be followed.
 - a. No Discoveries
In the event that no discoveries were encountered during night and/or weekend work, the PI shall record the information on the CSV and submit to MMC via fax by 8AM of the next business day.
 - b. Discoveries
All discoveries shall be processed and documented using the existing procedures detailed in Sections III - During Construction, and IV - Discovery of Human Remains. Discovery of human remains shall always be treated as a significant discovery.
 - c. Potentially Significant Discoveries
If the PI determines that a potentially significant discovery has been made, the procedures detailed under Section III - During Construction and IV-Discovery of Human Remains shall be followed.
 - d. The PI shall immediately contact the RE and MMC, or by 8AM of the next business day to report and discuss the findings as indicated in Section III-B, unless other specific arrangements have been made.
- B. If night and/or weekend work becomes necessary during the course of construction
 1. The Construction Manager shall notify the RE, or BI, as appropriate, a minimum of 24 hours before the work is to begin.
 2. The RE, or BI, as appropriate, shall notify MMC immediately.
- C. All other procedures described above shall apply, as appropriate.

VI. Post Construction

- A. Submittal of Draft Monitoring Report
 1. The PI shall submit two copies of the Draft Monitoring Report (even if negative), prepared in accordance with the Historical Resources Guidelines (Appendix C/D) which describes the results, analysis, and conclusions of all phases of the Archaeological Monitoring Program (with appropriate graphics) to MMC via the RE for review and approval within 90 days following the completion of monitoring. **It should be noted that if the PI is unable to submit the Draft Monitoring Report within the allotted 90-day timeframe as a result of delays with analysis, special study results or other complex issues, a schedule shall be submitted to MMC establishing agreed due dates and the provision for submittal of monthly status reports until this measure can be met.**
 - a. For significant archaeological resources encountered during monitoring, the Archaeological Data Recovery Program or Pipeline Trenching Discovery Process shall be included in the Draft Monitoring Report.

VI. PUBLIC REVIEW DISTRIBUTION:

Draft copies or notice of this Mitigated Negative Declaration were distributed to:

City of San Diego

Councilmember Zapf - District 2
Mayor's Office
City Attorney's Office (MS 59)
Development Services (501)
Mark Brunette, EAS/Planning
Peter Kann, Project Management
Engineering and Capital Projects (908A)
Juliana Grotzinger
Gretchen Eichar
Mark Berlin
Park and Recreation (413)
Bethany Windle
Library Dept. – Government Documents (81)
San Diego Central Library (81A)
Pacific Beach/Taylor Branch Library (81X)

State of California

California Coastal Commission, San Diego District (47)

Archaeology

Historical Resources Board (87)
Carmen Lucas (206)
South Coastal Information Center (210)
San Diego Archaeological Center (212)
Save Our Heritage Organisation (214)
Ron Christman (215)
Clint Linton (215B)
Frank Brown – Inter-Tribal Cultural Resources Council (216)
Campo Band of Mission Indians (217)
San Diego County Archaeological Society, Inc. (218)
Kumeyaay Cultural Heritage Preservation (223)
Kumeyaay Cultural Repatriation Committee (225)
Native American Distribution (225 A-S)

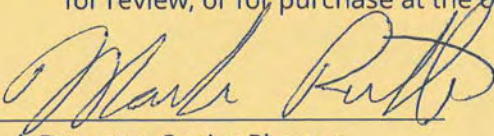
Other Interested Parties:

Beach and Bay Press (372)
Pacific Beach Town Council (374)
Pacific Beach Planning Group (375)
Pacific Beach Historical Society (377)
Mission Bay Park Committee (318A)
Mission Bay Lessees (323)
Carolyn Chase

VII. RESULTS OF PUBLIC REVIEW:

- () No comments were received during the public input period.
- () Comments were received but did not address the accuracy or completeness of the draft environmental document. No response is necessary and the letters are incorporated herein.
- (X) Comments addressing the accuracy or completeness of the draft environmental document were received during the public input period. The letters and responses are incorporated herein.

Copies of the draft Mitigated Negative Declaration, the Mitigation, Monitoring and Reporting Program and any Initial Study material are available in the office of the Entitlements Division for review, or for purchase at the cost of reproduction.



Mark Brunette, Senior Planner
Development Services Department

August 14, 2018
Date of Draft Report

December 6, 2018
Date of Final Report

Analyst: Mark Brunette

Attachments: Figure 1 – Location Map
Figure 2 – Site Map
Figure 3 – Driving Range Lighting Site Plan
Initial Study Checklist

From: Friends of Rose Creek
To: DSD FAS
Subject: Comments on Project MBGC IRRIGATION AND ELECTRICAL UPGRADES Project No. 607150 / SCH No. N/A
Date: Tuesday, September 04, 2018 2:45:01 PM

September 4, 2018
Via Email Transmission
Mark Brunette
City of San Diego Development Services Center
1722 First Avenue, MS 501
San Diego CA 92101

RE: Project Name: MBGC IRRIGATION AND ELECTRICAL UPGRADES
Project No. 607150 / SCH No. N/A
Community Plan Area: Mission Bay Park Plan
Council District: 2 Thank you for the opportunity to comment on this project.

Dear Mr. Brunette,
Thank you for providing this opportunity to comment on the proposed mitigated negative declaration on the proposed improvements to Mission Bay Golf Course.
While we understand the rationale for making improvements to the golf course, we feel that the City of San Diego is deliberately piece-mealing work in the De Anza area of Mission Bay Park. Currently the City of San Diego is undertaking a Draft PEIR for the De Anza area of Mission Bay Park, which according to the City's Notice of Preparation on the following project includes the Mission Bay Golf Course:

A-1

General Project Information:
PROJECT NAME: De Anza Cove Amendment to the Mission Bay Park Master Plan
COMMUNITY PLAN AREA: Mission Bay Park
COUNCIL DISTRICT: 2
Project No. 6112018

We believe this amounts to piece-mealing especially given that this area is overlapped by the De Anza Cove Amendment to the Mission Bay Park Master Plan. Moving ahead with project 607150, prior to the full completion of the CEQA process currently underway for the De Anza Amendment undermines the De Anza amendment. We find it highly unlikely that the City will undertake any changes to the Mission Bay Golf Course as part of the De Anza Amendment if a significant amount of money has just been spent. Furthermore, making turf and irrigation changes separately from undertaking the habitat restoration alternatives being studied may preclude multiple restoration alternatives in this area including but not limited to incorporating native plants into the landscape palette.

A-1

We have concerns on how the same project can be part of a programmatic EIR (PEIR) and a Mitigated Neg Dec simultaneously under CEQA processes especially when the findings of the PEIR may recommend alterations to the golf course. Furthermore, without the public's ability to have the full picture of all the proposed changes, we feel that the City is deliberately trying to circumvent public process.

A-1

On October 30, 2008, the California Supreme Court in *Save Tara v. City of West Hollywood* (2008) 45 Cal.4th 116 ("*Save Tara*") raised critical issues of pre-commitment in that pre-committing to a course of action before a CEQA EIR has been completed could potentially render the EIR mute. Specifically, the court ruled that the city should have done an

A-2

Letter A - Response

A-1: The proposed MBGC Irrigation and Electrical Upgrades project proposes improvements to the existing lighting and irrigation systems related to the ongoing operations of an existing public golf course. The De Anza Cove Amendment to the Mission Bay Park Master Plan project is an amendment to a master plan policy document. The amendment does not propose development at this time and if the amendment is adopted, future projects will be subject to subsequent discretionary project specific environmental review. The De Anza project is a long-range plan with implementation that would occur over time and does not preclude the City from maintaining the golf course and continuing operations. Therefore, the proposed MBGC Irrigation and Electrical Upgrades project has separate and independent utility from the De Anza Cove Amendment to the Mission Bay Park Master Plan. As such, the preparation of a Mitigated Negative Declaration for the MBGC project does not constitute "piecemealing" under CEQA.

A-2: See response to A-1. Furthermore, approval of the MBGC project would not preclude implementation of the Master Plan Amendment and will not render the CEQA document for this amendment moot because future projects including those that may affect the golf course property would be subject to future environmental review and disclosure under CEQA. If the Amendment is adopted and calls for different land uses of the golf course property, future development of the golf course would be required to conform to the adopted Master Plan Amendment and associated CEQA document.

environmental impact report on the proposal prior to entering into agreements for work to be completed. Since the City has a PEIR underway for the Mission Bay Golf Course as part of the De Anza amendment to the Mission Bay Park Master Plan and because the changes to be made at the golf course could discourage the City of San Diego from making any of the recommendations identified in the PEIR, we strongly urge the City of San Diego to hold off on proceeding with any work at this time.

A-3

Furthermore, we have concerns on how the irrigation systems changes will improve or degrade water quality in Rose Creek. We feel very strongly that this impact or lack thereof should be studied prior to making any changes to the golf course irrigation system.
Regards,

Karin Zirk
Executive Director
Friends of Rose Creek
*** Connecting Our Communities ***
<http://www.saverosecreek.org>

Letter A - Response (Continued)

A-3: Please refer to Initial Study pages 15 and 16, IX. Hydrology and Water Quality, responses to questions a, c, and d through f. Please also see responses to comments B-1 through B-5 for Letter B from Carolyn Chase. The proposed improvements to the irrigation system would not increase runoff into Rose Creek beyond the runoff generated by the existing golf course because the new irrigation system would be more efficient in terms of water usage than the existing system and would irrigate only those areas that are currently being irrigated. No expansion of the golf course or irrigated area is proposed. Furthermore, the project is required to comply with the City's storm water standards and the Regional Water Quality Board Municipal Storm Water (MS4) Permit for the City of San Diego which prohibits projects from degrading the water quality of waterways or tributaries like Rose Creek.

From: Carolyn Chase
To: DSD_EAS
Subject: Comments on Draft MNO
Date: Tuesday, September 04, 2018 8:47:02 AM

General Project Information:

- Project Name: MBGC IRRIGATION AND ELECTRICAL UPGRADES • Project No. 607150 / SCH No. N/A
- Community Plan Area: Mission Bay Park Plan
- Council District: 2

Please consider these comments in improving this proposal as well as increasing the disclosure of information to the public.

- B-1** The project description is inadequate to determine: the extent of impacts of the irrigation system and related trenching or the amount and kind of lighting.
- B-2** The project site was dredged and filled in this area of Rose Creek and its related estuary. What are the impacts of the projects on the remaining creek/drainage ditch?
Any work on the irrigation should analyze impacts on the existing remaining creek. The creek appears to be unmaintained, is impacted by invasive species (arundo to name one) and receives an unknown amount of runoff from the existing irrigation system.
- B-3** How much irrigation is used on the area? How much has been used in the past and when? What kind of water conservation efforts are being made?
- B-4** How much runoff is there now? Will the new irrigation increase or decrease or have no impact on the existing conditions?
- B-5** Is irrigation really needed on a driving range? Why not use artificial turf?
- B-6** Are they replacing all the irrigation on the entire golf course site? From the Archeo study it appears they are doing the entire course.
- B-7** The impacts of the irrigation system should be analyzed and discussed on the creek/drainage ditch and restoration and mainenance should be a priority in doing any project on this site.
- B-8** Again, how much existing runoff comes from the irrigation system? What kind of pesticides or other potential pollutants are applied to the golf course currently? Or may be applied in the future? Is there contamination in the existing runoff?
- B-9** There is also no information on the lighting other than the statement that it has "been designed with energy conservation sustainability goals of the City's Enviromental Services Division." Does the implementation comply with these goals? What kind of lights will be used? Will they be directed away from residences and wildlife? What are the impacts on wildlife? The driving range has not been used or lighted for many years now - how many years? How many lights are being installed? Is there more or less than in the past at this site? Are they replacing ALL the lighting or just redoing the driving range?
- B-10**
- B-11**

Letter B - Response

B-1: Comment noted. Please refer to the following pages of the Draft Mitigated Negative Declaration:

- Pages 4 through 9 discusses mitigation measures related to reducing impacts of construction activities, including trenching, to less than significant levels. For example, "the Archaeological Monitor shall be present full-time during all soil disturbing and grading/excavation/trenching activities which could result in impacts to archeological resources."

Please refer to the following pages of the Initial Study Checklist:

- Pages 1-2 gives a summary of the project scope, including relevant irrigation and lighting details necessary to analyze the propose project under CEQA.
- Page 5, I. Aesthetics, responses to questions a and d, discusses lighting in relation to scenic vistas and day/nighttime views.
- Page 11, VI. Geology and Soils, response to question b, discusses trenching in relation to soil erosion.
- Page 12, VII. Greenhouse Gas Emissions, response to question a, states that the proposed project includes replacement of existing lighting, irrigation, and power supply at an existing golf course and no expansion or intensification of the golf course would occur.
- Page 14, VIII. Hazards and Hazardous Materials, response to question c, discusses protocols to avoid hazardous emissions during trenching and excavation.
- Pages 15 and 16, IX. Hydrology and Water Quality, responses to a through f, discusses irrigation and trenching as it relates to water quality, ground water supplies, existing drainage patterns.
- Page 23, XVIII. Utilities and Service Systems. responses c through f, discusses irrigation in relates to wastewater treatment, water systems, drainage systems, and demand for water supply.

The above references are some examples that are most relevant to irrigation, trenching, and lighting. However, these features along with the rest of the proposed project were analyzed in relation to 18 environmental factors, as listed on page 2 and 3 of the Initial Study Checklist.

Responses to comments B-2 through B-14 below provide further amplification and clarification of the extent of impacts of the irrigation system and related trenching or the amount and kind of lighting.

From: Carolyn Chase
 To: DSD EAS
 Subject: Comments on Draft MND
 Date: Tuesday, September 04, 2018 8:47:02 AM

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- B-10**
- B-11**

Letter B – Response (Continued)

B-2: Comment noted. Please refer to the following pages and sections of Initial Study Checklist that would address potential impacts to Rose Creek:

- Page 8, IV. Biological Resources, responses to questions a and e.
- Pages 15 and 16, IX. Hydrology and Water Quality, responses to questions a, c, and d through f.
- Page 23, XVIII. Utilities and Service Systems, response to question e.

Additionally, please note the following regarding existing conditions, including existing drainage patterns:

- The golf course is located more than 300 feet away from the Rose Canyon Stream.
- There is an existing drainage ditch to the east of the golf course adjacent to the 7th and 8th holes and runs along Grand Avenue. This ditch conveys stormwater originating from outside the site (i.e., the surrounding urbanized areas).
- The golf course is in the general shape of a shallow bowl and does not directly drain to this ditch. During some storm events, a small amount of runoff originating from the golf course reaches this ditch.
- The drainage ditch to the east of the project site is intended to accept this volume and rate of storm water runoff.
- Occasionally, the golf course receives overflow from the adjacent drainage ditch during some storm events.
- There are two artificial ponds near the clubhouse. If these ponds were to overflow (i.e., in the event of unusually heavy rainfall), the runoff would flow into the surrounding turf areas.
- In the vicinity of the parking lot, runoff occasionally flows toward North Mission Bay Drive. However, this happens during infrequent large rainfall events.

Finally, please note the following proposed conditions, including future drainage patterns:

- The driving range would become a leach field to further capture runoff during particularly heavy rainfall events.
- A low-flow outfall storm drain would connect the two existing artificial ponds to the driving range. Therefore, during some storm events, overflow from the ponds would be directed towards the driving range.
- All other conditions and drainage patterns would be the same as existing.

B-3: Comment noted. Please see response to comment B-2.

Additionally, please note the following:

- All construction activities and proposed project features are within the limits of the existing golf course.
- Maintenance of Rose Canyon stream and drainage ditch is outside the scope of this project.
- Golf course staff do not conduct any maintenance in the ditch, with the exception of clearing the metal grates of vegetation and debris as well as clearing vegetation at the top of slopes to maintain clear cart paths and sidewalks.

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To: OSD EAS
Subject: Comments on Draft MND
Date: Tuesday, September 04, 2018 8:47:02 AM

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- B-11**

Letter B - Response (Continued)

B-4: Please refer to page 23, XVII. Utilities and Service Systems, response to question f, which states that construction of the proposed project would not increase the demand for water within the project area.

Please note the following key features of the existing irrigation system:

- The current annual water budget for Fiscal Year 2018-19 is 43,500 hundred cubic feet (which is 80% of the evapotranspiration estimated for turf in this region).
- The existing system is not set up to have perimeter sprinklers and is inefficient along the edges of the property.
- The existing system has roughly 40 valves that are considered a block system. Each valve controls 10 to 14 sprinklers (roughly 425 to 450 sprinklers on site). Sprinklers are controlled in groups and there is no control over individual sprinklers. There is also no remote access.

Please note the following key improvements and features of the proposed irrigation system:

- The project scope proposes to replace the irrigation system and does not expand capacity.
- The proposed system is anticipated to result in a reduction in water use as well as a decrease in the annual water budget.
- The proposed system would be connected to a weather station and shut off water distribution during periods of rain.
- The proposed system would be internet accessible and could be accessed and controlled remotely by golf course staff.
- The proposed system would allow customized control, including individual sprinklers. The system allows for adjustment of cycles to allow irrigation cycles (i.e. periods of watering) to alternate with soak cycles (i.e. periods of no watering) to avoid irrigation during periods of soil saturation. Thus, the potential for additional stormwater runoff from irrigation is reduced.
- The proposed system would include perimeter sprinklers and would apply an even distribution of water over landscaped areas.

B-5: Please refer to Initial Study pages 15 and 16, IX. Hydrology and Water Quality, responses to questions a, c, and d through f. Please also see responses to comments B-1 through B-5.

B-6: The driving range is not currently watered and will continue to not be watered with the installation of the proposed improvements. The driving range currently has grass and will remain in that condition.

B-7: The irrigation system for the entire golf course would be replaced.

B-8: Please see responses to comments B-1 through B-5.

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Date: Tuesday, September 04, 2018 8:47:02 AM

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- B-11**

Letter B - Response (Continued)

B-9: Please see responses to comments B-1 through B-5.

Various chemicals and fertilizers are used, and the golf course follows similar practices to other golf courses. Pesticides, fungicides, insecticides are used as needed to prevent and cure disease. The application of these chemicals and fertilizer is not anticipated to change with the proposed improvements. Any application of these materials is performed according to manufacturer's instructions for application rates and frequency. Additionally, all applications are monitored by the San Diego County Department of Agriculture. No changes are anticipated for the foreseeable future.

B-10: Comment noted. Please see response to Comment B-1. Please also refer to Figure No. 3, which depicts the lighting site plan.

Yes, the proposed project was evaluated by the Environmental Services Division, Office of Sustainability via a plan check process to ensure compliance with the Division's energy conservation sustainability goals.

Light Emitting Diode (LED) fixtures will be installed and replace the existing high-pressure sodium fixtures.

Lights will be directed downwards and contain shielding. Please refer to page 5, I. Aesthetics, responses to question d, of the Initial Study Checklist.

Please refer to pages 7 and 8, IV. Biological Resources, response to question a. Also, please refer to page 24 and 25, XIX. Mandatory Findings of Significance, responses to questions a through c. In summary, the project would not result in any impacts to wildlife because all proposed project features are within an existing public golf course and there are no sensitive habitats present on the project site.

The driving range and night lighting are currently in use and will continue to be in use. Lights are currently turned off at 10 PM each day and this is not anticipated to change with the installation of the proposed improvements. However, the proposed LED lights may occasionally be turned on in the mornings to aid in faster completion of maintenance activities.

B-11: There are 18 existing pole-mounted lights and zero existing ground-level lights at the driving range. 18 existing pole mounted lights are proposed to be removed and 15 new light poles with new lights are proposed to be installed adjacent to the driving range, in approximately the same location and height as the existing pole-mounted lights. Six new ground-level lights (mounted on retaining walls) are proposed to be installed within the driving range (See Draft MND Figure 3). Please note that the number of individual fixtures per light pole would vary from 1 to 3 fixtures. There are two fixtures per ground level light location. In summary, there would be a net increase of 3 lights as a result of the proposed project (6 new ground level lights and a reduction in the number of pole mounted lights from 18 to 15). Please also refer to page 5, I. Aesthetics, response to question d, of the Initial Study Checklist. Proposed replacement lighting and new lighting are limited to the driving range.

LETTER B - Carolyn Chase (Pg. 2)

- B-12** I have a view of the area from my home. What kind of increase or decrease in lighting is being done? What kind of increase or decrease can be expected in energy use from the change?
- B-13** What is the existing energy usage for the course? What is the expected energy usage? Is that an increase or a decrease and usage and related impacts?

- B-14** What will be increases in noise over existing conditions? Are there speakers on the driving range now? Are any sound amplification devices going to be installed at the driving range or elsewhere?

Thanks for your consideration of these comments and I look forward to receiving responses to my questions.

Carolyn Chase
2511 Loring St
San Diego CA 92109

Letter B - Response (Continued)

B-12: Please refer to page 5, I. Aesthetics, response to question d of the Initial Study Checklist. Of further note, the proposed LED lights are expected to produce less light trespass (pollution) than the existing high-pressure sodium lights. Also, the configuration of the LED lights would allow golf course staff to control the direction of light with more precision than existing conditions.

Energy consumption associated with lighting is expected to substantially decrease with the proposed improvements. Energy consumption associated with irrigation is expected to increase due to the addition of a new booster pump system. However, total energy costs and use would be anticipated to remain approximately the same or decrease slightly.

B-13: Please see response to Comment B-12. From July 2017 to July 2018, the golf course's total energy consumption was approximately 324,195 kilowatt hours (kwh).

B-14: There will be a temporary increase in noise levels associated with construction. However, the proposed project is not anticipated to result in any changes to existing noise levels. Additionally, the golf course maintenance industry is trending towards using more electrical motors as opposed to combustion engine motors for their maintenance equipment. Furthermore, the golf course participates in a program that tests new maintenance equipment technologies, such as electronic fairway grass cutters. Therefore, noise levels may be reduced in the future.

The existing sound system will remain in place.

No sound amplification devices are proposed.



PO Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 6194453810
Fax: 6194455337
viejas.com

Letter C - Response

September 10, 2018

Mark Burnette
City of San Diego Development Services Center
1222 First Avenue, MS 501
San Diego, CA 92101

RE: MBGC Irrigation and Electrical Upgrades

Dear Mr. Burnette,

In reviewing the above referenced project the Viejas Band of Kumeyaay Indians ("Viejas") would like to comment at this time.

C-1 The project area may contain many sacred sites to the Kumeyaay people. We request that these sacred sites be avoided with adequate buffer zones.

Additionally, Viejas is requesting, as appropriate, the following:

- C-2**
 - All NEPA/CEQA/NAGPRA laws be followed
 - Immediately contact Viejas on any changes or inadvertent discoveries.

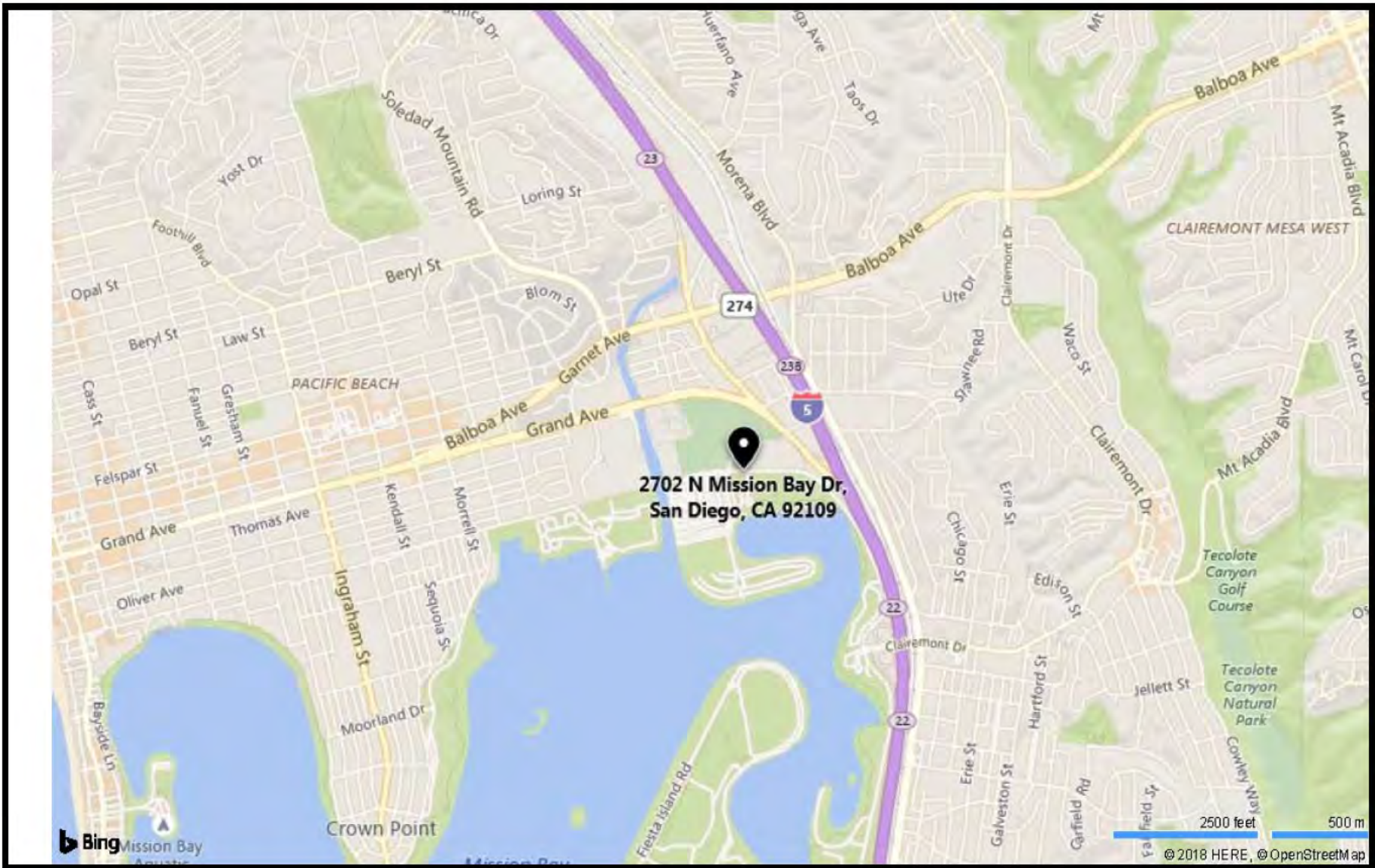
Thank you for your collaboration and support in preserving our Tribal cultural resources. I look forward to hearing from you. Please call me at 619-659-2312 or Ernest Pingleton at 619-659-2314, or email, rteran@viejas-nsn.gov or epingleton@viejas-nsn.gov, for scheduling. Thank you.

Sincerely,

Ray Teran, Resource Management
VIEJAS BAND OF KUMEYAAY INDIANS

C-1: As described in Section V of the MND, City of San Diego standard mitigation and monitoring measures for archaeological resources will be implemented for the proposed project which would reduce potentially significant impacts to archaeological resources to below a level of significance.

C-2: The project will comply with all applicable NEPA/CEQA/NAGRA laws. Notification will occur in accordance with the City of San Diego standard mitigation and monitoring measures for archaeological resources as described in Section V of the MND.



Vicinity Map

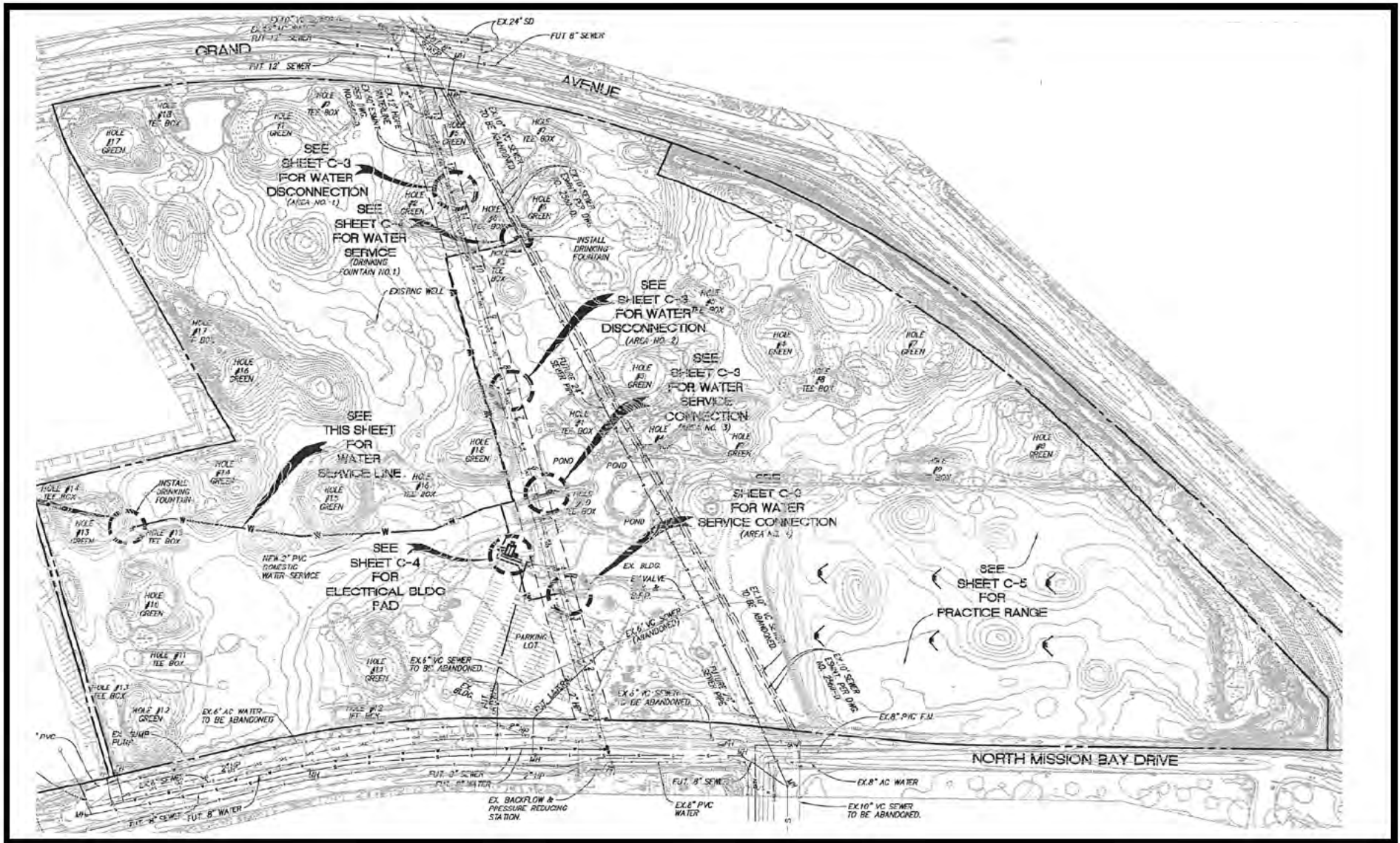
MBGC Irrigation & Electrical Upgrades/Project No. 607150

Address: 2702 N. Mission Bay Drive, San Diego, CA 92109 (APN: 424-460-05-00)

City of San Diego – Development Services Department

FIGURE

No. 1



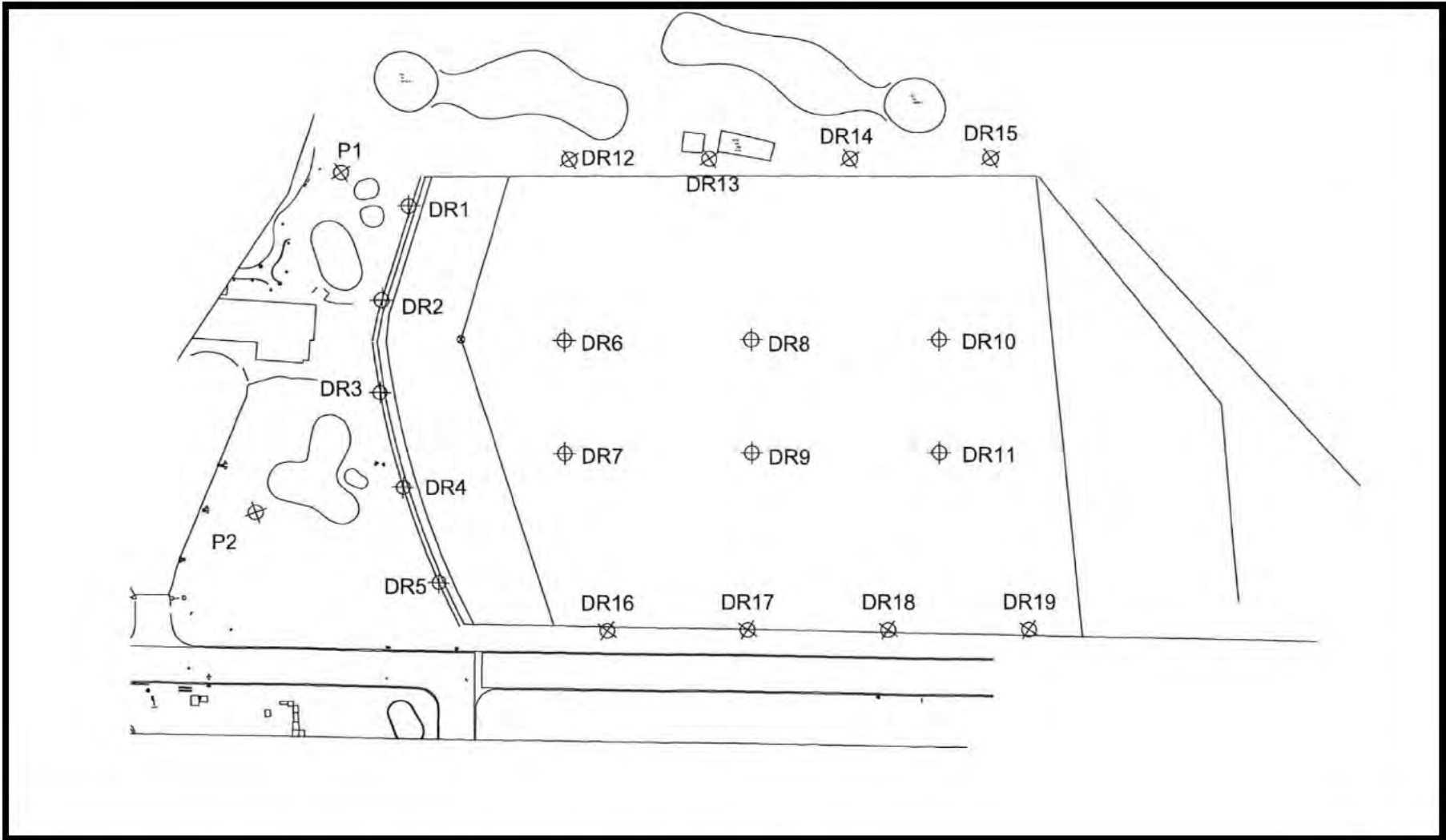
Site Plan

MBGC Irrigation & Electrical Upgrades/Project No. 607150

Address: 2702 N. Mission Bay Drive, San Diego, CA 92109 (APN: 424-460-05-00)

City of San Diego – Development Services Department

**FIGURE
No. 2**



Driving Range Lighting Site Plan

MBGC Irrigation & Electrical Upgrades/Project No. 607150

Address: 2702 N. Mission Bay Drive, San Diego, CA 92109 (APN: 424-460-05-00)

City of San Diego – Development Services Department

**FIGURE
No. 3**

INITIAL STUDY CHECKLIST

1. Project Title/Project Number: **MBGC IRRIGATION & ELECTRICAL UPGRADES PROJECT/607150**

2. Lead agency name and address:

City of San Diego
Department of Development Services
1222 First Avenue, MS 501
San Diego, CA 92101

3. Contact person and phone number: Mark Brunette/ (619) 446-5379

4. Project location:

The project is located within the Mission Bay Golf Course, at 2702 North Mission Bay Drive, in the Mission Bay Park Community Planning Area (Council District 2). (See attached vicinity and location maps).

5. Project Applicant/Sponsor's name and address:

City of San Diego Public Works Department – Engineering and Capital Projects, Right of Way Design Division

6. General Plan designation:

Park, Open Space and Recreation

7. Zoning:

The proposed project is within the RS-1-7 (Residential-Single Unit) zone.

8. Description of project (Describe the whole action involved, including but not limited to, later phases of the project, and any secondary, support, or off-site features necessary for its implementation.):

The project includes demolition and minor grading for installation of new drinking fountains, fencing, turf, irrigation systems, and lighting systems for the existing driving range and practice green. Electrical service and distribution equipment and other minor course amenities at the southeastern portion of the golf course will also be provided. The lighting has been designed in compliance with the energy conservation sustainability goals of the City's Environmental Services Division.

The light footings will be three feet in diameter and reach a maximum excavation depth of 12 feet. Perimeter light poles will be 18 inches in diameter and reach a maximum height of 50 feet. These lights will be installed at 100-foot intervals around the driving range and golf course. The new

irrigation systems will require trenching to a maximum depth of 36 inches. **The project site is not included on any Government Code listing of hazardous waste sites.**

9: Surrounding land uses and setting: Briefly describe the project's surroundings:

The project site is an existing public golf course and driving range at the northeastern edge of Mission Bay Park. The golf course has relatively flat topography and contains ornamental vegetation consisting of turf grass, trees and shrubs. It is bordered to the north and east by Grand Avenue and by multi-family and commercial uses on the opposite side of Grand Avenue in the community of Pacific Beach. North Mission Bay Drive, the unoccupied De Anza mobile home park, and De Anza Cove Park (Within Mission Bay Park) are situated adjacent to the southern edge of the golf course. The Mission Bay Little League facility and Pacific Beach Tennis Club are situated west of the golf course, consisting of four sports fields, eight tennis courts, and a parking lot.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.):

None

11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun?

Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21083.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

The Lipay Nation of Santa Ysabel and Jamul Indian Village of Kumeyaay Nation Native American tribes, which are traditionally and culturally affiliated with the project area, have requested consultation with the City of San Diego pursuant to Public Resources Code section 21082.3 (c). However, these tribes were notified of the opportunity to consult with the City of San Diego on the proposed project and they responded that they do not require consultation for this project.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- | | | | | | |
|-------------------------------------|------------------------------------|--------------------------|-------------------------------|--------------------------|---------------------------|
| <input type="checkbox"/> | Aesthetics | <input type="checkbox"/> | Greenhouse Gas Emissions | <input type="checkbox"/> | Population/Housing |
| <input type="checkbox"/> | Agriculture and Forestry Resources | <input type="checkbox"/> | Hazards & Hazardous Materials | <input type="checkbox"/> | Public Services |
| <input type="checkbox"/> | Air Quality | <input type="checkbox"/> | Hydrology/Water Quality | <input type="checkbox"/> | Recreation |
| <input type="checkbox"/> | Biological Resources | <input type="checkbox"/> | Land Use/Planning | <input type="checkbox"/> | Transportation/Traffic |
| <input checked="" type="checkbox"/> | Cultural Resources | <input type="checkbox"/> | Mineral Resources | <input type="checkbox"/> | Tribal Cultural Resources |

- 5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or (mitigated) negative declaration. *Section 15063(c)(3)(D)*. In this case, a brief discussion should identify the following:
 - a. Earlier Analysis Used. Identify and state where they are available for review.
 - b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c. Mitigation Measures. For effects that are “Less Than Significant With Mitigation Measures Incorporated”, describe the mitigation measures that were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion. Please note, all reports and documents mentioned in this document are available for public review in the Entitlements Division on the Fifth Floor of 1222 First Avenue, San Diego.
- 8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project’s environmental effects in whatever format is selected.
- 9) The explanation of each issue should identify:
 - a. The significance criteria or threshold, if any, used to evaluate each question; and
 - b. The mitigation measure identified, if any, to reduce the impact to less than significant.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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I) AESTHETICS – Would the project:

- a) Have a substantial adverse effect on a scenic vista?

There is no designated public scenic vista across the existing golf course or on properties adjacent to the golf course that would be affected by the project. The project involves the installation of irrigation and power utility lines below grade, the construction of an 11-foot high utility building, installation of drinking fountains, and the replacement of existing driving range lighting in the approximately the same location and height as existing lighting. New low-level lighting (7 feet high maximum) would also be installed near the center of the driving range. Therefore, the proposed project would not substantially alter the visual appearance of the existing golf course. As such, it would have no impact to public scenic vistas and no mitigation would be required.

- b) Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

See answer to I.a. above. In addition, the project would not damage any existing scenic rock outcroppings, or historic buildings (Refer to V.a.) as none of these features are located within the boundaries of the proposed project. Furthermore, the project site is not located near a state scenic highway.

- c) Substantially degrade the existing visual character or quality of the site and its surroundings?

See answer to I.a and I.b. above.

- d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

The project would replace existing lighting on the perimeter of the existing driving range, but the new lighting will be placed in the approximately the same location and pole height, and there will be a reduction in the number of light poles. All new light fixtures will be directed downward and will contain shielding to prevent light trespass on adjacent properties or public streets. Proposed new low-level lighting within the interior of the driving range would not exceed 7 feet above grade so lighting would not be directed off-site. In addition, no substantial sources of light would be generated during project construction, as construction activities would occur during daylight hours. The project would also be subject to the City's Outdoor Lighting Regulations per Municipal Code Section 142.0740. Therefore, there would be a less than significant impact and no mitigation is required.

II) AGRICULTURAL AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. - Would the project:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Converts Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

The project would occur at an existing public golf course which is not designated for agricultural use or farmland. In addition, agricultural land is not present in the vicinity of the project.

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|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| b) Conflict with existing zoning for agricultural use, or a Williamson Act Contract? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to II.a.

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|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 1220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

The project would occur at an existing public golf course which is not designated as forest land. In addition, forest land is not present in the vicinity of the project.

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|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| d) Result in the loss of forest land or conversion of forest land to non-forest use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to II.c.

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|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

The project does not propose a change in land use and would not result in the conversion of Farmland since no Farmland exists within, or in the vicinity, of the project boundaries.

III. AIR QUALITY - Where available, the significance criteria

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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established by the applicable air quality management or air pollution control district may be relied on to make the following determinations - Would the project:

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|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a) Conflict with or obstruct implementation of the applicable air quality plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

The proposed project involves improvements to utilities and lighting of an existing golf course that would not involve any future actions that would generate air quality emissions because of the proposed use (e.g. vehicle miles traveled). However, emissions would occur during the construction phase of the project and could increase the amount of harmful pollutants entering the air basin. The emissions would be minimal and would only occur temporarily during construction. When appropriate, dust suppression methods would be included as project components. As such, the project would not conflict with the region's air quality plan.

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|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
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Refer to III.b

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|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

As described above, construction operations could temporarily increase the emissions of dust and other pollutants. However, construction emissions would be temporary and implementation of Best Management Practices would reduce potential impacts related to construction activities to below a level of significance. Therefore, the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under applicable federal or state ambient air quality standards.

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|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| d) Create objectionable odors affecting a substantial number of people? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

Operation of construction equipment and vehicles could generate odors associated with fuel combustion. However, these odors would dissipate into the atmosphere upon release and would only remain temporarily in proximity to the construction equipment and vehicles. Therefore, the project would not create odors affecting a substantial number of people.

IV. BIOLOGICAL RESOURCES - Would the project:

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|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Have substantial adverse effects, either directly or through habitat modifications, on any species | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

The project site is an existing public golf course which contains ornamental vegetation and man-made water features. There is no sensitive upland or wetland habitat present on the project site. Therefore, the proposed project would not adversely affect any sensitive habitat, plant or animal species. There would be no impact and no mitigation is required.

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|--|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| b) Have a substantial adverse effect on any riparian habitat or other community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|-------------------------------------|

Refer to IV.a

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|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to IV.a.

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|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to IV.a

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|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to IV.a. The project is not located within or adjacent to the Multi-Habitat Planning Area (MHPA) and is therefore not subject to the MSCP City of San Diego Subarea Plan MHPA land use agency guidelines.

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|--|--------------------------|-------------------------------------|--------------------------|--------------------------|
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|-------------------------------------|--------------------------|--------------------------|

Refer to IV.a and e. The project would not conflict with any local conservation plans including the MSCP City of San Diego Subarea Plan.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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V. CULTURAL RESOURCES – Would the project:

- a) Cause a substantial adverse change in the significance of an historical resource as defined in §15064.5?

An existing shed would be demolished as part of the proposed project. However, this structure was reviewed by qualified City historic review staff who determined that the structure is not a designated historical structure, nor is it eligible for historic designation. No other existing structures would be impacted by the project. Therefore, the project would have no impact on a historical resource as defined in 15064.5 and no mitigation is required.

- b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

A geoarchaeological assessment (GA) was prepared for the entire Mission Bay Golf Course property (Geoarchaeological Assessment for Sewer & Water GJ 827 dated June 2015 by LSA), which found no cultural resource material at the golf course. Figure 9 of the GA shows a recorded archaeological site on the northeast portion of the golf course. However, the GA concludes that any cultural resources that may be present are covered with artificial fill material ranging in depth from 5 to 10 feet. The GA recommends archaeological monitoring only for excavation that may extend below the fill and would be located near the recorded site.

The GA was reviewed by Myra Herrmann, qualified archaeologist with the City of San Diego Planning Department, to determine monitoring requirements for the proposed lighting, new electrical building, new drinking fountains, and underground irrigation and power supply lines included within the scope of the proposed golf course improvement project. Ms. Herrmann determined that archaeological monitoring would be necessary for new light installation along the northerly edge of the driving range because it would require deep foundations that may extend below the artificial fill. She determined that monitoring would not be necessary for the remainder of the project due to shallower excavation requirements and/or a greater distance from the recorded archaeological site.

As recommended by Ms. Herrmann, archaeological and Native American monitoring will be required during ground disturbing activities associated with the installation of new golf course driving range poles DR1, DR2, and DR12 through DR15 as shown on Sheet 39986-17-D of the DSD review cycle 1 Development Plans (see attached Figure 3). The remainder of the project does not require monitoring. The required Native American and archaeological monitoring would reduce potentially significant impacts to archaeological resources to below a level of significance. This monitoring is included in Mitigation Monitoring and Reporting Program (MMRP) for this project, which is described in detail under Section V of the MND.

- c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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The project site is underlain by artificial fill material as indicated by the project's geoenvironmental assessment (GA) and the Development Services Department La Jolla Quadrangle geologic map. Since artificial fill is not a type of sedimentary material (which has the potential to contain paleontological resources) and has been imported from other locations, the fill material is unlikely to contain paleontological resources. Therefore, the project would have a less than significant impact on paleontological resources and no mitigation is required.

- d) Disturb any human remains, including those interred outside of formal cemeteries?

No cemeteries, formal or informal, have been identified on or adjacent to the project site. While there is a possibility of encountering human remains during subsequent project construction activities, if remains are found monitoring would be required. In addition, per CEQA Section 15064.5(e), the California Public Resources Code (Sec. 5097.98) and State Health and Safety Code (Sec. 7050.5), if human remains are discovered during construction, work would be required to halt in that area and no soil would be exported off-site until a determination could be made regarding the provenance of the human remains via the County Coroner and other authorities as required.

VI. GEOLOGY AND SOILS – Would the project:

- a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
- i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

According to City of San Diego Seismic Safety Study Maps the project site is in Geologic Hazard Zone 31 – Liquefaction; High Potential but is not located on or near an earthquake fault. Therefore, the potential for fault ground rupture at the site is would be unlikely. In addition, the project would utilize proper engineering design and standard construction practices in order to ensure that potential impacts in this category based on regional geologic hazards would remain less than significant. Therefore risks from rupture of a known earthquake fault would be below a level of significance.

- ii) Strong seismic ground shaking?

See VI.a.i. above. The project would also be required to utilize proper engineering design and standard construction practices to ensure that the potential for impacts from ground shaking would be below a level of significance.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
iii) Seismic-related ground failure, including liquefaction? See VI.a above. The project does not propose any new structures that would be occupied (an unmanned electrical utility building is proposed) so the risk to people would be less than significant. In addition, grading and construction associated with the utility building and light poles would be required to comply with the municipal code grading and building regulations which would ensure that any potential ground failure impacts from liquefaction would be less than significant and no mitigation is required.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides? See VI.a. above. The topography of the project site and surrounding properties is relatively flat. Therefore, there are no nearby slopes that would be subject to landslides and potential impacts would be less than significant.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil? Refer to VI.a. All trenching for irrigation and utility line installation would be backfilled and all disturbed areas would be revegetated with appropriate non-invasive, low water use container plants, hydroseed mix, or turf grass to control erosion. Additionally, appropriate Best Management Practices would be utilized during project construction to prevent soil erosion. As such, the project would not result in a substantial amount of soil erosion or loss of topsoil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? Refer to VI.a. In addition, proper engineering design and utilization of standard construction practices would ensure that the potential impacts would be less than significant.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? Refer to VI.a.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? Refer to VI.a. In addition, no septic or alternative wastewater systems are proposed since the scope of the project is to construct lighting, drinking fountain, irrigation and power supply line replacement improvements to an existing golf course which is connected to a public storm drain system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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VII. GREENHOUSE GAS EMISSIONS – Would the project:

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|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

In December 2015, the City adopted a Climate Action Plan (CAP) that outlines the actions that City will undertake to achieve its proportional share of State greenhouse gas (GHG) emission reductions. The purpose of the Climate Action Plan Consistency Checklist (Checklist) is to, in conjunction with the CAP, provide a streamlined review process for proposed new development projects that are subject to discretionary review and trigger environmental review pursuant to the California Environmental Quality Act (CEQA).

Analysis of GHG emissions and potential climate change impacts from new development is required under CEQA. The CAP is a plan for the reduction of GHG emissions in accordance with CEQA Guidelines Section 15183.5. Pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b), a project’s incremental contribution to a cumulative GHG emissions effect may be determined not to be cumulatively considerable if it complies with the requirements of the CAP.

This Checklist is part of the CAP and contains measures that are required to be implemented on a project-by-project basis to ensure that the specified emissions targets identified in the CAP are achieved. Implementation of these measures would ensure that new development is consistent with the CAP’s assumptions for relevant CAP strategies toward achieving the identified GHG reduction targets. Projects that are consistent with the CAP as determined through the use of this Checklist may rely on the CAP for the cumulative impacts analysis of GHG emissions. Projects that are not consistent with the CAP must prepare a comprehensive project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions and incorporation of the measures in this Checklist to the extent feasible. Cumulative GHG impacts would be significant for any project that is not consistent with the CAP.

The project would not result in additional operational greenhouse gas emissions since it includes replacement of existing lighting, irrigation, and power supply at an existing golf course and no expansion or intensification of the golf course would occur. Under Step 1 of the CAP Checklist the proposed project is consistent with the existing General Plan and Community Plan land use designations, and zoning designations for the project site because these designations allow for improvements to an existing public golf course which is a permitted active recreation use in the underlying land use designation of Park Open Space land use designation and underlying zone. Therefore, the proposed project is consistent with the growth projections and land use assumptions used in the CAP.

Furthermore, completion of the Step 2 of the CAP Checklist for the project demonstrates that the applicable CAP strategies for reduction in GHG emissions would be implemented for the one building within the project scope that would require a building permit or certificate

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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of occupancy (new electrical utility building).

Therefore, the project has been determined to be consistent with the City of San Diego Climate Action Plan, would result in a less than significant impact on the environment with respect to Greenhouse Gas Emissions, and further GHG emissions analysis and mitigation would not be required.

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|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

Refer to VII.a.

VIII. HAZARDS AND HAZARDOUS MATERIALS - Would the project:

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|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a) Create a significant hazard to the public or the environment through routine transport, use, or disposal of hazardous materials? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

Construction of the project may require the use of hazardous materials (e.g. fuels, lubricants, solvents, etc.) which would require proper storage, handling, use and disposal; however, these conditions would not occur during routine construction of the project. Construction specifications would include requirements for the contractor regarding where routine handling or disposal of hazardous materials could occur and what measures to implement in the event of a spill from equipment. Compliance with contract specifications would ensure that potential hazards are minimized to below a level of significance.

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|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

Construction of the project may have the potential to traverse properties which could contain Leaking Underground Storage Tank (LUST) cleanup sites, permitted UST's, or contaminated sites located within 1,000 feet of the project alignments; however, in the event that construction activities encounter underground contamination, the contractor would be required to implement section 803 of the City's "WHITEBOOK" for "Encountering or Releasing Hazardous Substances or Petroleum Products" of the City of San Diego Standard Specifications for Public Works Construction which is included in all construction documents and would ensure the proper handling and disposal of any contaminated soils in accordance with all applicable local, state, and federal regulations. Compliance with these requirements would minimize the risk to the public and the environment; therefore, impacts would remain less than significant.

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|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
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Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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Portions of the project are within one-quarter mile of existing schools and would involve trenching or excavation activities that could result in the release of hazardous emissions if unanticipated contamination is encountered within the PROW. However, section 803 of the City's "WHITEBOOK" to ensure that appropriate protocols are followed pursuant to County DEH requirements should any hazardous conditions be encountered. As such, impacts regarding the handling or discovery of hazardous materials, substances or waste within close proximity of a school would be below a level of significance with implementation of the measures required pursuant to the contract specifications and County DEH oversight.

- d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

See VIIIa-c above. In addition, the project is not included on a list of hazardous materials locations according to a review of the State Water Resources Control Board GeoTracker website (<http://geotracker.waterboards.ca.gov/>).

- e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two mile of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

The project is not located within an airport land use plan therefore there would be no impacts.

- f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

The project site is not within proximity of a private airstrip.

- g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Construction of the proposed project may temporarily affect traffic circulation within the project Area of Potential Effect (APE) and its adjoining roads. However, an approved Traffic Control Plan would be implemented during construction which would allow emergency plans to be employed. Therefore, the project would not physically interfere with an adopted emergency response plan or emergency evacuation plan.

- h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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The proposed project would be located within an existing irrigated and ornamentally landscaped golf course and there are no wildlands near the project site. Therefore, there would be no impacts from wildland fires.

IX. HYDROLOGY AND WATER QUALITY - Would the project:

- a) Violate any water quality standards or waste discharge requirements?

The project involves improvements to an existing public golf course to include replacement irrigation lines and emitters, replacement underground power lines, replacement lights, new drinking fountains, and the construction of a replacement electrical utility building. The scope of work is not anticipated to generate storm water runoff that is greater than existing conditions. In addition, the project does not involve any grading that would alter the existing drainage patterns of the golf course.

Furthermore, potential impacts to existing water quality standards associated with the proposed project would include minimal short-term construction-related erosion sedimentation but would not include any long term operational storm water impacts. The project would be required to comply with the City's Storm Water Standards Manual and would have to comply with either a Water Pollution Control Plan or Storm Water Pollution Prevention Plan. These plans would prevent or effectively minimize short-term water quality impacts during construction activities. In addition, the project will comply with all requirements of the most current Regional Water Quality Control Board municipal storm water (MS4) permit requirements. Therefore, the proposed project would not violate any water quality standards or discharge requirements.

- b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

The project does not use groundwater, nor would it create new impervious surfaces that would interfere with groundwater recharge.

- c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site?

Refer to IX.a. In addition, all areas that are trenched would be backfilled to match adjacent natural grade and all disturbed areas would be re-vegetated with a non-irrigated native hydroseed mix, turf grass, and/or low water use container plants to minimize soil erosion.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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Thus, the project would result in no siltation or erosion related impacts and no mitigation is required.

- d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?

Refer to IX.c.

- e) Create or contribute runoff water, which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Refer to IX.a and c. In addition, the project would be required to comply with all local and regional storm water quality standards during construction using approved Best Management Practices (BMPs), which would ensure that water quality is not degraded.

- f) Otherwise substantially degrade water quality?

Refer to IX.a and c. The project would be required to comply with all local and regional storm water quality standards during construction using approved Best Management Practices (BMPs), which would ensure that water quality is not degraded.

- g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

The project does not propose any housing.

- h) Place within a 100-year flood hazard area, structures that would impede or redirect flood flows?

The project does not propose any structures that would impede flood flows as the project is not located within a 100-year flood hazard area.

- i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

The proposed project does not include any features that would increase the risk associated with flooding beyond those of existing conditions.

- j) Inundation by seiche, tsunami, or mudflow?

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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The proposed project does not include any features that would increase the risk associated with inundation by seiche, tsunami, or mudflow beyond those of existing conditions.

X. LAND USE AND PLANNING – Would the project:

- a) Physically divide an established community?

The project would involve lighting, irrigation and power supply replacement improvements to an existing public golf course and would not introduce new features that could divide an established community.

- b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

The project would involve lighting, irrigation and power supply replacement improvements to an existing public golf course and would be consistent with all applicable land use plans, policies, or regulations of an agency with jurisdiction over the project and would not conflict with any land use plans.

- c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

Refer to IV. The project site is not within or adjacent to the MHPA preserve area of the City of San Diego Multiple Species Conservation Program (MSCP). No sensitive habitat, plants or animals are present on site because it is an ornamentally landscaped public golf course. Therefore, the proposed project would not conflict with the MSCP and no mitigation is required.

XI. MINERAL RESOURCES – Would the project:

- a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

The areas around the proposed project are not being used for the recovery of mineral resources and are not designed by the General Plan or other local, state or federal land use plan for mineral resources recovery; therefore, the project would not result in the loss of mineral resources and no mitigation is required.

- b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Refer to X.e.

XII. NOISE – Would the project result in:

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>a) Generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?</p> <p>The project would not result in the generation of operational noise levels in excess of existing standards or existing ambient noise levels in the vicinity of the project.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>b) Generation of excessive ground borne vibration or ground borne noise levels?</p> <p>The project would not result in the generation of operational ground borne vibration or noise levels in excess of existing standards or ambient levels.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?</p> <p>Refer to XII.a-b</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing without the project?</p> <p>The proposed golf course lighting, irrigation, and power supply replacement project would result in construction noise, but would be temporary in nature; in addition, the project is required to comply with the San Diego Municipal Code, Chapter 5, Article 9.5, (§59.5.0404 Construction Noise). This section specifies that it is unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays (with exception of Columbus Day and Washington’s Birthday), or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise. In addition, the project would be required to conduct any construction activity so as to not cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>e) For a project located within an airport land use plan, or, where such a plan has not been adopted, within two miles of a public airport or public use airport would the project expose people residing or working in the area to excessive noise levels?</p> <p>The project site is not located within an airport land use plan and is not within two miles of a public airport. The project would not generate operational noise. Therefore, the project would not expose people residing or working in the area to excessive noise levels and no mitigation is required.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>f) For a project within the vicinity of a private airstrip, would the project expose people residing or working</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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in the project area to excessive noise levels?

The project site is not located within the vicinity of a private airstrip.

XIII. POPULATION AND HOUSING – Would the project:

- a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?
- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

The project scope does not include the construction of new or extended roads or infrastructure, or new homes and businesses. The project would replace lighting and irrigation and power supply lines at an existing public golf course. Therefore, the project would not induce population growth nor require the construction of new infrastructure.

- b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?
- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

No such displacement would result. There is no existing housing within the boundaries of the proposed project.

- c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?
- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

No such displacement would result. There is no existing housing or residents within the boundaries of the project.

XIV. PUBLIC SERVICES

- a) Would the project result in substantial adverse physical impacts associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service rations, response times or other performance objectives for any of the public services:
- i) Fire Protection
- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

The project would not result in adverse physical impacts of fire facilities or adversely affect existing levels of fire services.

- ii) Police Protection
- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

The project would not affect existing levels of police protection service and would not

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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require the construction or expansion of a police facility.

iii) Schools

The project would not affect existing levels of public services and would not require the construction or expansion of a school facility.

v) Parks

The project would not affect existing levels of public services and would not require the construction or expansion of a park facility.

vi) Other public facilities

The project would not affect existing levels of public services; therefore, no new or altered government facilities would be required.

XV. RECREATION -

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The project would not adversely affect the availability of and/or need for new or expanded recreational resources.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

Refer to XV.a. The project does not propose recreation facilities or require the construction or expansion of any such facilities.

XVI. TRANSPORTATION/TRAFFIC - Would the project?

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

The proposed project would not generate additional vehicle trips or vehicle miles traveled since it would not expand or intensify the existing golf course use. Construction of the proposed project may temporarily affect traffic circulation within the project Area of Potential Effect (APE) and its adjoining roads. However, an approved Traffic Control Plan

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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would be implemented during construction such that traffic circulation would not be substantially impacted. Therefore, the project would not result in any significant permanent increase in traffic generation or level of service.

- b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

The proposed project would not generate additional vehicle trips or vehicle miles traveled since it would not expand or intensify the existing golf course use. Construction of the proposed project may temporarily affect traffic circulation within the project Area of Potential Effect (APE) and its adjoining roads. However, an approved Traffic Control Plan would be implemented during construction so that existing cumulative or individual levels of service are minimally impacted. Therefore, the project would not result in any significant permanent increase in traffic generation or permanent reduction in level of service.

- c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

The project would not result in safety risks or a change to air traffic patterns, increase in traffic, or a location change, in that all work would occur within the limits of the existing golf course and would not substantially increase the height of the golf course lighting or intensify the existing use. Furthermore, the project site is not located near an airport nor is it at a high grade elevation above sea level. As such, the project would not affect air traffic patterns or result in a substantial safety risk.

- d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The project would not create a permanent increase in hazards resulting from design features and would reduce temporary hazards due to construction to a less than significant level through a Traffic Control Plan. The project does not propose any expansions or change in the golf course that would affect existing land uses or public or private roads in the area.

- e) Result in inadequate emergency access?

Construction of the proposed project would temporarily affect traffic circulation within the project Area of Potential Effect (APE) and its adjoining roads. However, an approved Traffic Control Plan would be implemented during construction such that emergency access would not be substantially impacted. Therefore, the project would not result in inadequate emergency access.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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- | | | | | |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

The project may temporarily impact circulation during construction activities relative to traffic, pedestrians, public transit and bicycles. However, the preparation of a Traffic Control Plan would ensure that any disruption to these services would not be significant.

XVII. TRIBAL CULTURAL RESOURCES- Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to Section V.a and b. No tribal cultural resources as defined by Public Resources Code section 21074 have been identified on the project site. Furthermore, the project site was not determined to be eligible for listing on either the State or local register of historical resources. Notification, as required by Public Resources Code section 21074 was provided to the Lipay Nation of Santa Ysabel and the Jamul Indian Village of Kumeyaay Nation on June 1, 2018. On June 4 and 5, 2018, the Native American communities responded to the City that they do not require consultation for this project. Therefore, the project will not impact Tribal Cultural Resources and no mitigation is required.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

No significant resources pursuant to subdivision (c) of Public Resources Code Section 5024.1 have been identified on the project site. Please see discussion in Section V and XVII.a above.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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XVIII. UTILITIES AND SERVICE SYSTEMS – Would the project:

- c) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Construction of the proposed golf course lighting, irrigation and power supply replacement improvements would not expand the irrigation system and thus, would not generate runoff that is greater than existing golf course runoff. Therefore, the project would not exceed the requirements of the Regional Quality Control Board.

- d) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Construction of the proposed project would replace existing irrigation lines in an existing golf course and construct three drinking fountains. Therefore, it would not generate additional runoff and would not affect the capacity of existing water or wastewater systems. As such, the project would result in no impact on the environment.

- e) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Construction of the proposed project would replace existing irrigation lines in an existing golf course and construct three drinking fountains and does not propose or require the construction substantial new drainage facilities. Therefore, the project would not require the construction of new storm water drainage facilities or expansion of existing facilities.

- f) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Construction of the proposed project would not increase the demand for water within the project area.

- g) Result in a determination by the wastewater treatment provided which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Refer to XVII.c

- h) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Construction of the project would result in the removal of the existing lighting and irrigation

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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and underground power supply lines, but otherwise would likely generate minimal waste. Project waste would be disposed of in accordance with all applicable local and state regulations pertaining to solid waste including the permitted capacity of the landfill serving the project area. Demolition or construction materials which can be recycled shall comply with the City's Construction and Demolition Debris Ordinance. Operation of the project would not generate waste and, therefore, would not affect the permitted capacity of the landfill serving the project area.

- i) Comply with federal, state, and local statutes and regulation related to solid waste?

Refer to XVII.f. Any solid waste generated during construction related activities would be recycled or disposed of in accordance with all applicable local, state and federal regulations.

XIX. MANDATORY FINDINGS OF SIGNIFICANCE -

- a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

As stated in the Initial Study Checklist the project would not result in impacts to sensitive habitat, plant or animal species because none are present on the project site or immediately adjacent to the boundaries of the project. Furthermore, the project would result in less than significant impacts on tribal cultural and paleontological resources. Historical built environmental resources would not be significantly impacted by the project as stated in the Initial Study. Required archaeological and Native American monitoring would reduce potentially significant impacts to archaeological resources to below a level of significance.

- b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable futures projects)?

As stated in the Initial Study Checklist, the golf course is not located within or adjacent to the MHPA. There is no sensitive habitat or MSCP listed species on the project site, therefore, the project would be consistent with the Subarea Plan. As a result, project implementation would not result in any individually limited, but cumulatively significant impacts to biological resources. Based on the project's consistency with the Climate Action Plan it would not result in cumulatively considerable environmental impacts relative to greenhouse gas

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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emissions.

Furthermore, when considering all potential environmental impacts of the proposed project, including impacts identified as less than significant in the Initial Study Checklist, together with the impacts of other present, past and reasonably foreseeable future projects, there would not be a cumulatively considerable impact on the environment.

- c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

As evidenced by the Initial Study Checklist, no other substantial adverse effects on human beings, either indirectly or directly, would occur as a result of project implementation.

INITIAL STUDY CHECKLIST

REFERENCES

I. AESTHETICS / NEIGHBORHOOD CHARACTER

- City of San Diego General Plan; City of San Diego Land Development Municipal Code
- Community Plan.
- Local Coastal Plan.

II. AGRICULTURAL RESOURCES & FOREST RESOURCES

- City of San Diego General Plan.
- U.S. Department of Agriculture, Soil Survey - San Diego Area, California, Part I and II, 1973.
- California Agricultural Land Evaluation and Site Assessment Model (1997)
- Site Specific Report:

III. AIR QUALITY

- California Clean Air Act Guidelines (Indirect Source Control Programs) 1990.
- Regional Air Quality Strategies (RAQS) - APCD.
- Site Specific Report:

IV. BIOLOGY

- City of San Diego, Multiple Species Conservation Program (MSCP), Subarea Plan, 1997
- City of San Diego, MSCP, "Vegetation Communities with Sensitive Species and Vernal Pools" Maps, 1996.
- City of San Diego, MSCP, "Multiple Habitat Planning Area" maps, 1997.
- Community Plan - Resource Element.
- California Department of Fish and Game, California Natural Diversity Database, "State and Federally-listed Endangered, Threatened, and Rare Plants of California," January 2001.
- California Department of Fish & Game, California Natural Diversity Database, "State and Federally-listed Endangered and Threatened Animals of California," January 2001.
- City of San Diego Land Development Code Biology Guidelines.
- Site Specific Reports:

V. CULTURAL RESOURCES (INCLUDES HISTORICAL RESOURCES)

- City of San Diego Historical Resources Guidelines.
- City of San Diego Archaeology Library.
- Historical Resources Board List.
- Community Historical Survey:
- Site Specific Reports: Geoarchaeological Assessment for Sewer & Water GJ 827 by LSA, dated June 2015.

VI. GEOLOGY/SOILS

- City of San Diego Seismic Safety Study.
- U.S. Department of Agriculture Soil Survey - San Diego Area, California, Part I and II, December 1973 and Part III, 1975.
- Site Specific Report(s):

VII. GREENHOUSE GAS EMISSIONS

- City of San Diego Climate Action Plan, Adopted 2015
- Project Specific: Climate Action Plan Consistency Checklist for the Mission Bay Golf Course Lighting and Irrigation Project (PTS No. 607150), prepared by David Preciado, Estrada Land Planning.

VIII. HAZARDS AND HAZARDOUS MATERIALS

- San Diego County Hazardous Materials Environmental Assessment Listing,
- San Diego County Hazardous Materials Management Division
- FAA Determination
- State Assessment and Mitigation, Unauthorized Release Listing, Public Use Authorized.
- Airport Land Use Compatibility Plan.
- Site Specific Report:

IX. HYDROLOGY/WATER QUALITY

- Flood Insurance Rate Map (FIRM).
- Federal Emergency Management Agency (FEMA), National Flood Insurance Program - Flood Boundary and Floodway Map.
- Clean Water Act Section 303(b) list, http://www.swrcb.ca.gov/tmdl/303d_lists.html).
- Site Specific Reports:

X. LAND USE AND PLANNING

- City of San Diego General Plan.
- Community Plan.
- Airport Land Use Compatibility Plan
- City of San Diego Zoning Maps
- FAA Determination

XI. MINERAL RESOURCES

- California Department of Conservation - Division of Mines and Geology, Mineral Land Classification.
- Division of Mines and Geology, Special Report 153 - Significant Resources Maps.
- Site Specific Report:

XII. NOISE

- Community Plan
- San Diego International Airport - Lindbergh Field CNEL Maps.
- Brown Field Airport Master Plan CNEL Maps.
- Montgomery Field CNEL Maps.
- San Diego Association of Governments - San Diego Regional Average Weekday Traffic Volumes.
- San Diego Metropolitan Area Average Weekday Traffic Volume Maps, SANDAG.
- City of San Diego General Plan.
- Site Specific Report:

XIII. PALEONTOLOGICAL RESOURCES

- City of San Diego Paleontological Guidelines.
- Deméré, Thomas A., and Stephen L. Walsh, "Paleontological Resources City of San Diego," Department of Paleontology San Diego Natural History Museum, 1996.
- Kennedy, Michael P., and Gary L. Peterson, "Geology of the San Diego Metropolitan Area, California. Del Mar, La Jolla, Point Loma, La Mesa, Poway, and SW 1/4 Escondido 7 1/2 Minute Quadrangles," California Division of Mines and Geology Bulletin 200, Sacramento, 1975.

___ Kennedy, Michael P., and Siang S. Tan, "Geology of National City, Imperial Beach and Otay Mesa Quadrangles, Southern San Diego Metropolitan Area, California," Map Sheet 29, 1977.

___ Site Specific Report:

XIV. POPULATION / HOUSING

X City of San Diego General Plan.

X Community Plan.

___ Series 11 Population Forecasts, SANDAG.

___ Other:

XV. PUBLIC SERVICES

X City of San Diego General Plan.

X Community Plan.

XVI. RECREATIONAL RESOURCES

X City of San Diego General Plan.

___ Community Plan.

___ Department of Park and Recreation

___ City of San Diego - San Diego Regional Bicycling Map

___ Additional Resources:

XVII. TRANSPORTATION / CIRCULATION

X City of San Diego General Plan.

X Community Plan.

___ San Diego Metropolitan Area Average Weekday Traffic Volume Maps, SANDAG.

___ San Diego Region Weekday Traffic Volumes, SANDAG.

___ Site Specific Report:

XVIII. UTILITIES

X City of San Diego General Plan.

X Community Plan.

XIX. WATER CONSERVATION

X City of San Diego General Plan.

X Community Plan.

___ Sunset Magazine, New Western Garden Book. Rev. ed. Menlo Park, CA: Sunset Magazine.

APPENDIX B
FIRE HYDRANT METER PROGRAM

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 1 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

1. **PURPOSE**

1.1 To establish a Departmental policy and procedure for issuance, proper usage and charges for fire hydrant meters.

2. **AUTHORITY**

2.1 All authorities and references shall be current versions and revisions.

2.2 San Diego Municipal Code (NC) Chapter VI, Article 7, Sections 67.14 and 67.15

2.3 Code of Federal Regulations, Safe Drinking Water Act of 1986

2.4 California Code of Regulations, Titles 17 and 22

2.5 California State Penal Code, Section 498B.0

2.6 State of California Water Code, Section 110, 500-6, and 520-23

2.7 Water Department Director

Reference

2.8 State of California Guidance Manual for Cross Connection Programs

2.9 American Water Works Association Manual M-14, Recommended Practice for Backflow Prevention

2.10 American Water Works Association Standards for Water Meters

2.11 U.S.C. Foundation for Cross Connection Control and Hydraulic Research Manual

3. **DEFINITIONS**

3.1 **Fire Hydrant Meter:** A portable water meter which is connected to a fire hydrant for the purpose of temporary use. (These meters are sometimes referred to as Construction Meters.)

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SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 2 OF 10	EFFECTIVE DATE October 15, 2002
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- 3.2 **Temporary Water Use:** Water provided to the customer for no longer than twelve (12) months.
- 3.3 **Backflow Preventor:** A Reduced Pressure Principal Assembly connected to the outlet side of a Fire Hydrant Meter.

4. **POLICY**

- 4.1 The Water Department shall collect a deposit from every customer requiring a fire hydrant meter and appurtenances prior to providing the meter and appurtenances (see Section 7.1 regarding the Fees and Deposit Schedule). The deposit is refundable upon the termination of use and return of equipment and appurtenances in good working condition.
- 4.2 Fire hydrant meters will have a 2 ½" swivel connection between the meter and fire hydrant. The meter shall not be connected to the 4" port on the hydrant. All Fire Hydrant Meters issued shall have a Reduced Pressure Principle Assembly (RP) as part of the installation. Spanner wrenches are the only tool allowed to turn on water at the fire hydrant.
- 4.3 The use of private hydrant meters on City hydrants is prohibited, with exceptions as noted below. All private fire hydrant meters are to be phased out of the City of San Diego. All customers who wish to continue to use their own fire hydrant meters must adhere to the following conditions:
 - a. Meters shall meet all City specifications and American Water Works Association (AWWA) standards.
 - b. Customers currently using private fire hydrant meters in the City of San Diego water system will be allowed to continue using the meter under the following conditions:
 - 1. The customer must submit a current certificate of accuracy and calibration results for private meters and private backflows annually to the City of San Diego, Water Department, Meter Shop.

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2. The meter must be properly identifiable with a clearly labeled serial number on the body of the fire hydrant meter. The serial number shall be plainly stamped on the register lid and the main casing. Serial numbers shall be visible from the top of the meter casing and the numbers shall be stamped on the top of the inlet casing flange.
3. All meters shall be locked to the fire hydrant by the Water Department, Meter Section (see Section 4.7).
4. All meters shall be read by the Water Department, Meter Section (see Section 4.7).
5. All meters shall be relocated by the Water Department, Meter Section (see Section 4.7).
6. These meters shall be tested on the anniversary of the original test date and proof of testing will be submitted to the Water Department, Meter Shop, on a yearly basis. If not tested, the meter will not be allowed for use in the City of San Diego.
7. All private fire hydrant meters shall have backflow devices attached when installed.
8. The customer must maintain and repair their own private meters and private backflows.
9. The customer must provide current test and calibration results to the Water Department, Meter Shop after any repairs.
10. When private meters are damaged beyond repair, these private meters will be replaced by City owned fire hydrant meters.

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SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 4 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

11. When a private meter malfunctions, the customer will be notified and the meter will be removed by the City and returned to the customer for repairs. Testing and calibration results shall be given to the City prior to any re-installation.
 12. The register shall be hermetically sealed straight reading and shall be readable from the inlet side. Registration shall be in hundred cubic feet.
 13. The outlet shall have a 2 ½ “National Standards Tested (NST) fire hydrant male coupling.
 14. Private fire hydrant meters shall not be transferable from one contracting company to another (i.e. if a company goes out of business or is bought out by another company).
- 4.4 All fire hydrant meters and appurtenances shall be installed, relocated and removed by the City of San Diego, Water Department. All City owned fire hydrant meters and appurtenances shall be maintained by the City of San Diego, Water Department, Meter Services.
- 4.5 If any fire hydrant meter is used in violation of this Department Instruction, the violation will be reported to the Code Compliance Section for investigation and appropriate action. Any customer using a fire hydrant meter in violation of the requirements set forth above is subject to fines or penalties pursuant to the Municipal Code, Section 67.15 and Section 67.37.
- 4.6 Conditions and Processes for Issuance of a Fire Hydrant Meter**
- Process for Issuance
- a. Fire hydrant meters shall only be used for the following purposes:
 1. Temporary irrigation purposes not to exceed one year.

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2. Construction and maintenance related activities (see Tab 2).
 - b. No customer inside or outside the boundaries of the City of San Diego Water Department shall resell any portion of the water delivered through a fire hydrant by the City of San Diego Water Department.
 - c. The City of San Diego allows for the issuance of a temporary fire hydrant meter for a period not to exceed 12 months (365 days). An extension can only be granted in writing from the Water Department Director for up to 90 additional days. A written request for an extension by the consumer must be submitted at least 30 days prior to the 12 month period ending. No extension shall be granted to any customer with a delinquent account with the Water Department. No further extensions shall be granted.
 - d. Any customer requesting the issuance of a fire hydrant meter shall file an application with the Meter Section. The customer must complete a "Fire Hydrant Meter Application" (Tab 1) which includes the name of the company, the party responsible for payment, Social Security number and/or California ID, requested location of the meter (a detailed map signifying an exact location), local contact person, local phone number, a contractor's license (or a business license), description of specific water use, duration of use at the site and full name and address of the person responsible for payment.
 - e. At the time of the application the customer will pay their fees according to the schedule set forth in the Rate Book of Fees and Charges, located in the City Clerk's Office. All fees must be paid by check, money order or cashiers check, made payable to the City Treasurer. Cash will not be accepted.
 - f. No fire hydrant meters shall be furnished or relocated for any customer with a delinquent account with the Water Department.
 - g. After the fees have been paid and an account has been created, the

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meter shall be installed within 48 hours (by the second business day). For an additional fee, at overtime rates, meters can be installed within 24 hours (within one business day).

4.7 Relocation of Existing Fire Hydrant Meters

- a. The customer shall call the Fire Hydrant Meter Hotline (herein referred to as “Hotline”), a minimum of 24 hours in advance, to request the relocation of a meter. A fee will be charged to the existing account, which must be current before a work order is generated for the meter’s relocation.
- b. The customer will supply in writing the address where the meter is to be relocated (map page, cross street, etc). The customer must update the original Fire Hydrant Meter Application with any changes as it applies to the new location.
- c. Fire hydrant meters shall be read on a monthly basis. While fire hydrant meters and backflow devices are in service, commodity, base fee and damage charges, if applicable, will be billed to the customer on a monthly basis. If the account becomes delinquent, the meter will be removed.

4.8 Disconnection of Fire Hydrant Meter

- a. After ten (10) months a “Notice of Discontinuation of Service” (Tab 3) will be issued to the site and the address of record to notify the customer of the date of discontinuance of service. An extension can only be granted in writing from the Water Department Director for up to 90 additional days (as stated in Section 4.6C) and a copy of the extension shall be forwarded to the Meter Shop Supervisor. If an extension has not been approved, the meter will be removed after twelve (12) months of use.
- b. Upon completion of the project the customer will notify the Meter Services office via the Hotline to request the removal of the fire hydrant meter and appurtenances. A work order will be generated

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for removal of the meter.

- c. Meter Section staff will remove the meter and backflow prevention assembly and return it to the Meter Shop. Once returned to the Meter Shop the meter and backflow will be tested for accuracy and functionality.
- d. Meter Section Staff will contact and notify Customer Services of the final read and any charges resulting from damages to the meter and backflow or its appurtenance. These charges will be added on the customer's final bill and will be sent to the address of record. Any customer who has an outstanding balance will not receive additional meters.
- e. Outstanding balances due may be deducted from deposits and any balances refunded to the customer. Any outstanding balances will be turned over to the City Treasurer for collection. Outstanding balances may also be transferred to any other existing accounts.

5. **EXCEPTIONS**

- 5.1 Any request for exceptions to this policy shall be presented, in writing, to the Customer Support Deputy Director, or his/her designee for consideration.

6. **MOBILE METER**

- 6.1 Mobile meters will be allowed on a case by case basis. All mobile meters will be protected by an approved backflow assembly and the minimum requirement will be a Reduced Pressure Principal Assembly. The two types of Mobile Meters are vehicle mounted and floating meters. Each style of meters has separate guidelines that shall be followed for the customer to retain service and are described below:

- a) **Vehicle Mounted Meters:** Customer applies for and receives a City owned Fire Hydrant Meter from the Meter Shop. The customer mounts the meter on the vehicle and brings it to the Meter Shop for

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inspection. After installation is approved by the Meter Shop the vehicle and meter shall be brought to the Meter Shop on a monthly basis for meter reading and on a quarterly basis for testing of the backflow assembly. Meters mounted at the owner's expense shall have the one year contract expiration waived and shall have meter or backflow changed if either fails.

b) **Floating Meters:** Floating Meters are meters that are not mounted to a vehicle. **(Note: All floating meters shall have an approved backflow assembly attached.)** The customer shall submit an application and a letter explaining the need for a floating meter to the Meter Shop. The Fire Hydrant Meter Administrator, after a thorough review of the needs of the customer, (i.e. number of jobsites per day, City contract work, lack of mounting area on work vehicle, etc.), may issue a floating meter. At the time of issue, it will be necessary for the customer to complete and sign the "Floating Fire Hydrant Meter Agreement" which states the following:

- 1) The meter will be brought to the Meter Shop at 2797 Caminito Chollas, San Diego on the third week of each month for the monthly read by Meter Shop personnel.
- 2) Every other month the meter will be read and the backflow will be tested. This date will be determined by the start date of the agreement.

If any of the conditions stated above are not met the Meter Shop has the right to cancel the contract for floating meter use and close the account associated with the meter. The Meter Shop will also exercise the right to refuse the issuance of another floating meter to the company in question.

Any Fire Hydrant Meter using reclaimed water shall not be allowed use again with any potable water supply. The customer shall incur the cost of replacing the meter and backflow device in this instance.

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7. **FEE AND DEPOSIT SCHEDULES**

- 7.1 **Fees and Deposit Schedules:** The fees and deposits, as listed in the Rate Book of Fees and Charges, on file with the Office of the City Clerk, are based on actual reimbursement of costs of services performed, equipment and materials. These deposits and fees will be amended, as needed, based on actual costs. Deposits, will be refunded at the end of the use of the fire hydrant meter, upon return of equipment in good working condition and all outstanding balances on account are paid. Deposits can also be used to cover outstanding balances.

All fees for equipment, installation, testing, relocation and other costs related to this program are subject to change without prior notification. The Mayor and Council will be notified of any future changes.

8. **UNAUTHORIZED USE OF WATER FROM A HYDRANT**

- 8.1 Use of water from any fire hydrant without a properly issued and installed fire hydrant meter is theft of City property. Customers who use water for unauthorized purposes or without a City of San Diego issued meter will be prosecuted.
- 8.2 If any unauthorized connection, disconnection or relocation of a fire hydrant meter, or other connection device is made by anyone other than authorized Water Department personnel, the person making the connection will be prosecuted for a violation of San Diego Municipal Code, Section 67.15. In the case of a second offense, the customer's fire hydrant meter shall be confiscated and/or the deposit will be forfeited.
- 8.3 Unauthorized water use shall be billed to the responsible party. Water use charges shall be based on meter readings, or estimates when meter readings are not available.
- 8.4 In case of unauthorized water use, the customer shall be billed for all applicable charges as if proper authorization for the water use had been obtained, including but not limited to bi-monthly service charges, installation charges and removal charges.

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- 8.5 If damage occurs to Water Department property (i.e. fire hydrant meter, backflow, various appurtenances), the cost of repairs or replacements will be charged to the customer of record (applicant).

Water Department Director

- Tabs: 1. Fire Hydrant Meter Application
2. Construction & Maintenance Related Activities With No Return To Sewer
3. Notice of Discontinuation of Service

APPENDIX

Administering Division: Customer Support Division

Subject Index: Construction Meters
Fire Hydrant
Fire Hydrant Meter Program
Meters, Floating or Vehicle Mounted
Mobile Meter
Program, Fire Hydrant Meter

Distribution: DI Manual Holders



Application for Fire Hydrant Meter (EXHIBIT A)

(For Office Use Only)

NS REQ	FAC#
DATE	BY

METER SHOP (619) 527-7449

Meter Information

Application Date	Requested Install Date:
------------------	-------------------------

Fire Hydrant Location: (Attach Detailed Map//Thomas Bros. Map Location or Construction drawing.) <u>Zip:</u>	T.B.	G.B. (CITY USE)
Specific Use of Water:		
Any Return to Sewer or Storm Drain, if so, explain:		
Estimated Duration of Meter Use: <input type="text"/>	<input type="checkbox"/>	Check Box if Reclaimed Water

Company Information

Company Name:			
Mailing Address:			
City:	State:	Zip:	Phone: ()
*Business license#		*Contractor license#	
A Copy of the Contractor's license OR Business License is required at the time of meter issuance.			
Name and Title of Billing Agent: <small>(PERSON IN ACCOUNTS PAYABLE)</small>			Phone: ()
Site Contact Name and Title:			Phone: ()
Responsible Party Name:			Title:
Cal ID#			Phone: ()
Signature:		Date:	
<small>Guarantees Payment of all Charges Resulting from the use of this Meter. Insures that employees of this Organization understand the proper use of Fire Hydrant Meter</small>			

Fire Hydrant Meter Removal Request	Requested Removal Date:
Provide Current Meter Location if Different from Above:	
Signature:	Title: Date:
Phone: ()	Pager: ()

<input type="checkbox"/> City Meter	<input type="checkbox"/> Private Meter
Contract Acct #:	Deposit Amount: \$ 936.00 Fees Amount: \$ 62.00
Meter Serial #	Meter Size: 05 Meter Make and Style: 6-7
Backflow #	Backflow Size: Backflow Make and Style:
Name:	Signature: Date:

WATER USES WITHOUT ANTICIPATED CHARGES FOR RETURN TO SEWER

Auto Detailing
Backfilling
Combination Cleaners (Vactors)
Compaction
Concrete Cutters
Construction Trailers
Cross Connection Testing
Dust Control
Flushing Water Mains
Hydro Blasting
Hydro Seeing
Irrigation (for establishing irrigation only; not continuing irrigation)
Mixing Concrete
Mobile Car Washing
Special Events
Street Sweeping
Water Tanks
Water Trucks
Window Washing

Note:

1. If there is any return to sewer or storm drain, then sewer and/or storm drain fees will be charges.

Date

Name of Responsible Party
Company Name and Address
Account Number: _____

Subject: Discontinuation of Fire Hydrant Meter Service

Dear Water Department Customer:

The authorization for use of Fire Hydrant Meter # _____, located at *(Meter Location Address)* ends in 60 days and will be removed on or after *(Date Authorization Expires)*. Extension requests for an additional 90 days must be submitted in writing for consideration 30 days prior to the discontinuation date. If you require an extension, please contact the Water Department, or mail your request for an extension to:

City of San Diego
Water Department
Attention: Meter Services
2797 Caminito Chollas
San Diego, CA 92105-5097

Should you have any questions regarding this matter, please call the Fire Hydrant Hotline at (619) _____ - _____.

Sincerely,

Water Department

APPENDIX C

MATERIALS TYPICALLY ACCEPTED BY CERTIFICATE OF COMPLIANCE

MATERIALS TYPICALLY ACCEPTED BY CERTIFICATE OF COMPLIANCE

1. Soil amendment
2. Fiber mulch
3. PVC or PE pipe up to 16 inch diameter
4. Stabilizing emulsion
5. Lime
6. Preformed elastomeric joint seal
7. Plain and fabric reinforced elastomeric bearing pads
8. Steel reinforced elastomeric bearing pads
9. Waterstops (Special Condition)
10. Epoxy coated bar reinforcement
11. Plain and reinforcing steel
12. Structural steel
13. Structural timber and lumber
14. Treated timber and lumber
15. Lumber and timber
16. Aluminum pipe and aluminum pipe arch
17. Corrugated steel pipe and corrugated steel pipe arch
18. Structural metal plate pipe arches and pipe arches
19. Perforated steel pipe
20. Aluminum underdrain pipe
21. Aluminum or steel entrance tapers, pipe downdrains, reducers, coupling bands and slip joints
22. Metal target plates
23. Paint (traffic striping)
24. Conductors
25. Painting of electrical equipment
26. Electrical components
27. Engineering fabric
28. Portland Cement
29. PCC admixtures
30. Minor concrete, asphalt
31. Asphalt (oil)
32. Liquid asphalt emulsion
33. Epoxy

APPENDIX D

SAMPLE CITY INVOICE WITH CASH FLOW FORECAST

WBS #:	B18108
Date Submitted:	10/10/2018
NTP Date:	3/23/2018
Final Statement of WD Date:	5/23/2020
Contract #:	K-XX-XXXX-XXX-X
Contract Amount:	\$5,617,000

Construction Cash Flow Forecast
 "Sewer and Water Group Job 965 (W)"

Year	January	February	March	April	May	June	July	August	September	October	November	December
2018				15,000	25,000	52,000	52,000	100,000	10,000	100,000	100,000	100,000
2019	10,000	10,000	85,000	58,000	100,000	100,000	100,000	100,000	100,000	100,000	1,000,000	1,000,000
2020	100,000	100,000	100,000	1,000,000	1,000,000							
2021												
2022												
2023												
2024												
2025												

SAMPLE REFERENCE

APPENDIX E
LOCATION MAP



APPENDIX F
HAZARDOUS WASTE LABEL/FORMS

HAZARDOUS WASTE

STATE AND FEDERAL LAW PROHIBITS IMPROPER DISPOSAL
IF FOUND, CONTACT THE NEAREST POLICE, OR PUBLIC SAFETY
AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY
OR THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES

GENERATOR NAME _____
ADDRESS _____ 24 HR. PHONE () _____
CITY _____ STATE _____ ZIP _____
EPA ID NO. _____ MANIFEST DOCUMENT NO. _____
EPA WASTE NO. _____ CA WASTE NO. _____ ACCUMULATION START DATE _____ / /

CONTENTS, COMPOSITION _____
PROPER DOT SHIPPING NAME _____
TECHNICAL NAME (S) _____
UNNA NO. WITH PREFIX _____

PHYSICAL STATE | HAZARDOUS PROPERTIES FLAMMABLE TOXIC
 SOLID LIQUID CORROSIVE REACTIVE OTHER _____

HANDLE WITH CARE!
CONTAINS HAZARDOUS OR TOXIC WASTES

INCIDENT/RELEASE ASSESSMENT FORM ¹

If you have an emergency, Call 911

Handlers of hazardous materials are required to report releases. The following is a tool to be used for assessing if a release is reportable. Additionally, a non-reportable release incident form is provided to document why a release is not reported (see back).

Questions for Incident Assessment:

YES NO

- | | | |
|---|--------------------------|--------------------------|
| 1. Was anyone killed or injured, or did they require medical care or admitted to a hospital for observation? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Did anyone, other than employees in the immediate area of the release, evacuate? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Did the release cause off-site damage to public or private property? | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Is the release greater than or equal to a reportable quantity (RQ)? | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Was there an uncontrolled or unpermitted release to the air? | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Did an uncontrolled or unpermitted release escape secondary containment, or extend into any sewers, storm water conveyance systems, utility vaults and conduits, wetlands, waterways, public roads, or off site? | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Will control, containment, decontamination, and/or clean up require the assistance of federal, state, county, or municipal response elements? | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Was the release or threatened release involving an unknown material or contains an unknown hazardous constituent? | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Is the incident a threatened release (a condition creating a substantial probability of harm that requires immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment)? | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Is there an increased potential for secondary effects including fire, explosion, line rupture, equipment failure, or other outcomes that may endanger or cause exposure to employees, the general public, or the environment? | <input type="checkbox"/> | <input type="checkbox"/> |

If the answer is YES to any of the above questions – report the release to the California Office of Emergency Services at 800-852-7550 and the local CUPA daytime: (619) 338-2284, after hours: (858) 565-5255. Note: other state and federal agencies may require notification depending on the circumstances.

Call 911 in an emergency

If all answers are NO, complete a Non Reportable Release Incident Form (page 2 of 2) and keep readily available. Documenting why a “no” response was made to each question will serve useful in the event questions are asked in the future, and to justify not reporting to an outside regulatory agency.

If in doubt, report the release.

¹ This document is a guide for accessing when hazardous materials release reporting is required by Chapter 6.95 of the California Health and Safety Code. It does not replace good judgment, Chapter 6.95, or other state or federal release reporting requirements.

NON REPORTABLE RELEASE INCIDENT FORM

1. RELEASE AND RESPONSE DESCRIPTION

Incident # _____

Date/Time Discovered	Date/Time Discharge	Discharge Stopped <input type="checkbox"/> Yes <input type="checkbox"/> No
Incident Date / Time:		
Incident Business / Site Name:		
Incident Address:		
Other Locators (Bldg, Room, Oil Field, Lease, Well #, GIS)		
Please describe the incident and indicate specific causes and area affected. Photos Attached?: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Indicate actions to be taken to prevent similar releases from occurring in the future.		

2. ADMINISTRATIVE INFORMATION

Supervisor in charge at time of incident:	Phone:
Contact Person:	Phone:

3. CHEMICAL INFORMATION

Chemical	Quantity <input type="checkbox"/> GAL <input type="checkbox"/> LBS <input type="checkbox"/> FT ³
Chemical	Quantity <input type="checkbox"/> GAL <input type="checkbox"/> LBS <input type="checkbox"/> FT ³
Chemical	Quantity <input type="checkbox"/> GAL <input type="checkbox"/> LBS <input type="checkbox"/> FT ³
Clean-Up Procedures & Timeline:	
Completed By:	Phone:
Print Name:	Title:

EMERGENCY RELEASE FOLLOW - UP NOTICE REPORTING FORM

A	BUSINESS NAME	FACILITY EMERGENCY CONTACT & PHONE NUMBER () -	
B	INCIDENT DATE MO DAY YR	TIME OES NOTIFIED (use 24 hr time)	OES CONTROL NO.
C	INCIDENT ADDRESS LOCATION	CITY / COMMUNITY	COUNTY ZIP
D	CHEMICAL OR TRADE NAME (print or type)		CAS Number
D	CHECK IF CHEMICAL IS LISTED IN 40 CFR 355, APPENDIX A <input type="checkbox"/>	CHECK IF RELEASE REQUIRES NOTIFICATION UNDER 42 U.S.C. Section 9603 (a) <input type="checkbox"/>	
D	PHYSICAL STATE CONTAINED <input type="checkbox"/> SOLID <input type="checkbox"/> LIQUID <input type="checkbox"/> GAS	PHYSICAL STATE RELEASED <input type="checkbox"/> SOLID <input type="checkbox"/> LIQUID <input type="checkbox"/> GAS	QUANTITY RELEASED
D	ENVIRONMENTAL CONTAMINATION <input type="checkbox"/> AIR <input type="checkbox"/> WATER <input type="checkbox"/> GROUND <input type="checkbox"/> OTHER	TIME OF RELEASE	DURATION OF RELEASE — DAYS — HOURS — MINUTES
E	ACTIONS TAKEN		
F	KNOWN OR ANTICIPATED HEALTH EFFECTS (Use the comments section for addition information)		
F	<input type="checkbox"/> ACUTE OR IMMEDIATE (explain) _____		
F	<input type="checkbox"/> CHRONIC OR DELAYED (explain) _____		
F	<input type="checkbox"/> NOTKNOWN (explain) _____		
G	ADVICE REGARDING MEDICAL ATTENTION NECESSARY FOR EXPOSED INDIVIDUALS		
H	COMMENTS (INDICATE SECTION (A - G) AND ITEM WITH COMMENTS OR ADDITIONAL INFORMATION)		
I	CERTIFICATION: I certify under penalty of law that I have personally examined and I am familiar with the information submitted and believe the submitted information is true, accurate, and complete.		
I	REPORTING FACILITY REPRESENTATIVE (print or type) _____		
I	SIGNATURE OF REPORTING FACILITY REPRESENTATIVE _____ DATE: _____		

EMERGENCY RELEASE FOLLOW-UP NOTICE REPORTING FORM INSTRUCTIONS

GENERAL INFORMATION:

Chapter 6.95 of Division 20 of the California Health and Safety Code requires that written emergency release follow-up notices prepared pursuant to 42 U.S.C. § 11004, be submitted using this reporting form. Non-permitted releases of reportable quantities of Extremely Hazardous Substances (listed in 40 CFR 355, appendix A) or of chemicals that require release reporting under section 103(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 [42 U.S.C. § 9603(a)] must be reported on the form, as soon as practicable, but no later than 30 days, following a release. The written follow-up report is required in addition to the verbal notification.

BASIC INSTRUCTIONS:

- The form, when filled out, reports follow-up information required by 42 U.S.C § 11004. Ensure that all information requested by the form is provided as completely as possible.
- If the incident involves reportable releases of more than one chemical, prepare one report form for each chemical released.
- If the incident involves a series of separate releases of chemical(s) at different times, the releases should be reported on separate reporting forms.

SPECIFIC INSTRUCTIONS:

Block A: Enter the name of the business and the name and phone number of a contact person who can provide detailed facility information concerning the release.

Block B: Enter the date of the incident and the time that verbal notification was made to OES. The OES control number is provided to the caller by OES at the time verbal notification is made. Enter this control number in the space provided.

Block C: Provide information pertaining to the location where the release occurred. Include the street address, the city or community, the county and the zip code.

Block D: Provide information concerning the specific chemical that was released. Include the chemical or trade name and the Chemical Abstract Service (CAS) number. Check all categories that apply. Provide best available information on quantity, time and duration of the release.

Block E: Indicate all actions taken to respond to and contain the release as specified in 42 U.S.C. § 11004(c).

Block F: Check the categories that apply to the health effects that occurred or could result from the release. Provide an explanation or description of the effects in the space provided. Use Block H for additional comments/information if necessary to meet requirements specified in 42 U.S.C. § 11004(c).

Block G: Include information on the type of medical attention required for exposure to the chemical released. Indicate when and how this information was made available to individuals exposed and to medical personnel, if appropriate for the incident, as specified in 42 U.S.C. § 11004(c).

Block H: List any additional pertinent information.

Block I: Print or type the name of the facility representative submitting the report. Include the official signature and the date that the form was prepared.

MAIL THE COMPLETED REPORT TO:

**State Emergency Response Commission (SERC)
Attn: Section 304 Reports
Hazardous Materials Unit
3650 Schriever Avenue
Mather, CA 95655**

NOTE: Authority cited: Sections 25503, 25503.1 and 25507.1, Health and Safety Code. Reference: Sections 25503(b)(4), 25503.1, 25507.1, 25518 and 25520, Health and Safety Code.

APPENDIX G
SAMPLE ARCHAEOLOGY INVOICE

(FOR ARCHAEOLOGY ONLY)

Company Name
Address, telephone, fax

Date: Insert Date

To: Name of Resident Engineer
City of San Diego
Construction Management and
Field Services Division
9573 Chesapeake Drive
San Diego, CA 92123-1304

Project Name: Insert Project Name

SAP Number (WBS/IO/CC): Insert SAP Number

Drawing Number: Insert Drawing Number

Invoice period: Insert Date to Insert Date

Work Completed: Bid item Number – Description of Bid Item – Quantity – Unit Price– Amount

Detailed summary of work completed under this bid item: Insert detailed description of Work related to Archaeology Monitoring Bid item. See Note 1 below.

Summary of charges:

Description of Services	Name	Start Date	End Date	Total Hours	Hourly Rate	Amount
Field Archaeologist	Joe Smith	8/29/2011	9/2/2011	40	\$84	\$3,360
Laboratory Assistant	Jane Doe	8/29/2011	9/2/2011	2	\$30	\$60
Subtotal						\$3,420

Work Completed: Bid item Number – Description of Bid Item – Quantity – Unit Price– Amount

Detailed summary of work completed under this bid item: Insert detailed description of Work related to Archaeology Curation/Discovery Bid item. See Note 2 below.

Summary of charges:

Description of Services	Where work occurred (onsite vs offsite/lab)	Name	Start Date	End Date	Total Hours	Hourly Rate	Amount
Field Archaeologist		Joe Smith	8/29/2011	9/2/2011	40	\$84	\$3,360
Laboratory Assistant		Jane Doe	8/29/2011	9/2/2011	2	\$30	\$60
Subtotal							\$3,420

Total this invoice: \$ _____

Total invoiced to date: \$ _____

Note 1:

For monitoring related bid items or work please include summary of construction work that was monitored from Station to Station, Native American monitors present, MMC coordination, status and nature of monitoring and if any discoveries were made.

Note 2:

For curation/discovery related bid items or work completed as part of a discovery and curation process, the PI must provide a response to the following questions along with the invoice:

1. Preliminary results of testing including tentative recommendations regarding eligibility for listing in the California Register of Historical Resources (California Register).
 - a. Please briefly describe your application (consideration) of all four California Register criteria.
 - b. If the resource is eligible under Criterion D, please define the important information that may be present.
 - c. Were specialized studies performed? How many personnel were required? How many Native American monitors were present?
 - d. What is the age of the resource?
 - e. Please define types of artifacts to be collected and curated, including quantity of boxes to be submitted to the San Diego Archaeological Center (SDAC). How many personnel were required? How many Native American monitors were present?
2. Preliminary results of data recovery and a definition of the size of the representative sample.
 - a. Were specialized studies performed? Please define types of artifacts to be collected and curated, including quantity of boxes to be submitted to the SDAC. How many personnel were required? How many Native American monitors were present?
3. What resources were discovered during monitoring?
4. What is the landform context and what is the integrity of the resources?
5. What additional studies are necessary?
6. Based on application of the California Register criteria, what is the significance of the resources?
 - a. If the resource is eligible for the California Register, can the resource be avoided by construction?
 - b. If not, what treatment (mitigation) measures are proposed? Please define data to be recovered (if necessary) and what material will be submitted to the SDAC for curation. Are any specialized studies proposed?

(After the first invoice, not all the above information needs to be re-stated, just revise as applicable).

APPENDIX H
SAMPLE OF PUBLIC NOTICE



CONSTRUCTION NOTICE

PROJECT TITLE

Work on your street will begin within one week to replace the existing water mains servicing your community.

The work will consist of:

- Saw-cutting and trench work on Ingulf Street from Morena Boulevard to Galveston Street to install new water mains, water laterals and fire hydrants.
• Streets where trenching takes place will be resurfaced and curb ramps will be upgraded to facilitate access for persons with disabilities where required.
• This work is anticipated to be complete in your community by December 2016.

How your neighborhood may be impacted:

- Water service to some properties during construction will be provided by a two-inch highline pipe that will run along the curb. To report a highline leak call 619-515-3525.
• Temporary water service disruptions are planned. If planned disruptions impact your property, you will receive advance notice.
• Parking restrictions will exist because of the presence of construction equipment and materials.
• "No Parking" signs will be displayed 72 hours in advance of the work.
• Cars parked in violation of signs will be TOWED.

Hours and Days of Operation:

Monday through Friday X:XX AM to X:XX PM.

City of San Diego Contractor:

Company Name, XXX-XXX-XXXX



CONSTRUCTION NOTICE

PROJECT TITLE

Work on your street will begin within one week to replace the existing water mains servicing your community.

The work will consist of:

- Saw-cutting and trench work on Ingulf Street from Morena Boulevard to Galveston Street to install new water mains, water laterals and fire hydrants.
• Streets where trenching takes place will be resurfaced and curb ramps will be upgraded to facilitate access for persons with disabilities where required.
• This work is anticipated to be complete in your community by December 2016.

How your neighborhood may be impacted:

- Water service to some properties during construction will be provided by a two-inch highline pipe that will run along the curb. To report a highline leak call 619-515-3525.
• Temporary water service disruptions are planned. If planned disruptions impact your property, you will receive advance notice.
• Parking restrictions will exist because of the presence of construction equipment and materials.
• "No Parking" signs will be displayed 72 hours in advance of the work.
• Cars parked in violation of signs will be TOWED.

Hours and Days of Operation:

Monday through Friday X:XX AM to X:XX PM.

City of San Diego Contractor:

Company Name, XXX-XXX-XXXX

To contact the City of San Diego: SD Public Works 619-533-4207 | engineering@sandiego.gov | sandiego.gov/CIP

To contact the City of San Diego: SD Public Works 619-533-4207 | engineering@sandiego.gov | sandiego.gov/CIP

APPENDIX I

ADVANCED METERING INFRASTRUCTURE (AMI) DEVICE PROTECTION

Protecting AMI Devices in Meter Boxes and on Street Lights

The Public Utilities Department (PUD) has begun the installation of the Advanced Metering Infrastructure (AMI) technology as a new tool to enhance water meter reading accuracy and efficiency, customer service and billing, and to be used by individual accounts to better manage the efficient use of water. **All AMI devices shall be protected per Section 402-2, "Protection", of the 2018 Whitebook.**

AMI technology allows water meters to be read electronically rather than through direct visual inspection by PUD field staff. This will assist PUD staff and customers in managing unusual consumption patterns which could indicate leaks or meter tampering on a customer's property.

Three of the main components of an AMI system are the:

- A. Endpoints, see Photo 1:

Photo 1



- B. AMI Antenna attached to Endpoint (antenna not always required), see Photo 2:



Network Devices, see Photo 3:

Photo 3



AMI endpoints transmit meter information to the AMI system and will soon be on the vast majority of meters in San Diego. These AMI devices provide interval consumption data to the PUD's Customer Support Division. If these devices are damaged or communication is interrupted, this Division will be alerted of the situation. The endpoints are installed in water meter boxes, coffins, and vaults adjacent to the meter. A separate flat round antenna may also be installed through the meter box lid. This antenna is connected to the endpoint via cable. The following proper installation shall be implemented when removing the lid to avoid damaging the antenna, cable, and/or endpoint. Photo 4 below demonstrates a diagram of the connection:

Photo 4



The AMI device ERT/Endpoint/Transmitter shall be positioned and installed as discussed in this Appendix. If the ERT/Endpoint/Transmitter is disturbed, it shall be re-installed and returned to its original installation with the end points pointed upwards as shown below in Photo 5.

The PUD's code compliance staff will issue citations and invoices to you for any damaged AMI devices that are not re-installed as discussed in the Contract Document

Photo 5 below shows a typical installation of an AMI endpoint on a water meter.

Photo 5



Photo 6 below is an example of disturbance that shall be avoided:

Photo 6



You are responsible when working in and around meter boxes. If you encounter these endpoints, use proper care and do not disconnect them from the registers on top of the water meter. If the lid has an antenna drilled through, do not change or tamper with the lid and inform the Resident Engineer immediately about the location of that lid. Refer to Photo 7 below:

Photo 7



Another component of the AMI system are the Network Devices. The Network Devices are strategically placed units (mainly on street light poles) that collect interval meter reading data from multiple meters for transmission to the Department Control Computer. **If you come across any of these devices on street lights that will be removed or replaced (refer to Photos 8 and 9 below), notify AMI Project Manager Arwa Sayed at (619) 362-0121 immediately.**

Photo 8 shows an installed network device on a street light. On the back of each Network Device is a sticker with contact information. See Photo 9. **Call PUD Water Emergency Repairs at 619-515-3525 if your work will impact these street lights.** These are assets that belong to the City of San Diego and you shall be responsible for any costs of disruption of this network.

Photo 8



Network Device

Photo 9



If you encounter any bad installations, disconnected/broken/buried endpoints, or inadvertently damage any AMI devices or cables, notify the Resident Engineer immediately. The Resident Engineer will then immediately contact the AMI Project Manager, Arwa Sayed, at (619) 362-0121.

ATTACHMENT F
RESERVED

ATTACHMENT G
CONTRACT AGREEMENT

**ATTACHMENT G
CONTRACT AGREEMENT**

CONSTRUCTION CONTRACT

This Phase-Funded contract is made and entered into between THE CITY OF SAN DIEGO, a municipal corporation, herein called "City", and 3-D Enterprises, Inc., herein called "Contractor" for construction of MBGC Irrigation & Electrical Upgrades + MBGC Clubhouse Demo/Prtbl Building Instl; Bid No. K-21-1919-DBB-3; in the total amount of **Nine Million One Hundred Ninety Nine Thousand Seven Hundred Dollars (\$9,199,700)**, which is comprised of the Base Bid plus Additive Alternate A, consisting of an amount not to exceed **\$6,149,700** for Phase I and **\$3,050,000** for Phase II.

IN CONSIDERATION of the payments to be made hereunder and the mutual undertakings of the parties hereto, City and Contractor agree as follows:

1. The following are incorporated into this contract as though fully set forth herein:
 - (a) The attached Faithful Performance and Payment Bonds.
 - (b) The attached Proposal included in the Bid documents by the Contractor.
 - (c) Reference Standards listed in the Instruction to Bidders and the Supplementary Special Provisions (SSP).
 - (d) Phase Funding Schedule Agreement.
 - (e) That certain documents entitled MBGC Irrigation & Electrical Upgrades + MBGC Clubhouse Demo/Prtbl Building Instl, on file in the office of the Engineering & Capital Projects Department as Document No. S-11010, S-01090, as well as all matters referenced therein.
2. The City wishes to construct this Project on a Phase- Funded basis. In accordance with Whitebook section 7-3.10, the City is only obligated to pay for Phase I; Contractor cannot begin, nor is the City financially liable for any additional Phases, unless and until Contractor is issued a Notice to Proceed for each additional Phase by the City.
3. The Contractor shall perform and be bound by all the terms and conditions of this contract and in strict conformity therewith shall perform and complete in a good and workmanlike manner MBGC Irrigation & Electrical Upgrades + MBGC Clubhouse Demo/Prtbl Building Instl; Bid No. K-21-1919-DBB-3, San Diego, California.
4. For such performances, the City shall pay to Contractor the amounts set forth at the times and in the manner and with such additions or deductions as are provided for in this contract, and the Contractor shall accept such payment in full satisfaction of all claims incident to such performances (See WHITEBOOK, Section 7-3.10, Phased Funding Compensation).
5. No claim or suit whatsoever shall be made or brought by Contractor against any officer, agent, or employee of the City for or on account of anything done or omitted to be done in

CONTRACT AGREEMENT (continued)

connection with this contract, nor shall any such officer, agent, or employee be liable hereunder.

6. This contract is effective as of the date that the Mayor or designee signs the agreement and is approved by the City Attorney in accordance with San Diego Charter Section 40.


IN WITNESS WHEREOF, this Agreement is signed by the City of San Diego, acting by and through its Mayor or designee, pursuant to Municipal Code §22.3102, authorizing such execution.

THE CITY OF SAN DIEGO

APPROVED AS TO FORM

Mara W. Elliott, City Attorney

By 

By 

Print Name: Cindy Crocker
Acting Deputy Director
Purchasing & Contracting Dept.
Public Works Division

Print Name: Dana Fairchild
Deputy City Attorney

Date: 11/15/2021

Date: 11/15/2021

CONTRACTOR

By 

Print Name: Shahrokh Elihu

Title: Vice President

Date: 11/03/2021

City of San Diego License No.: B1994008349

State Contractor's License No.: 621125

DEPARTMENT OF INDUSTRIAL RELATIONS (DIR) REGISTRATION NUMBER: 1000003754

CERTIFICATIONS AND FORMS

The Bidder, by submitting its electronic bid, agrees to and certifies under penalty of perjury under the laws of the State of California, that the certifications, forms and affidavits submitted as part of this bid are true and correct.

BIDDER'S GENERAL INFORMATION

To the City of San Diego:

Pursuant to "Notice Inviting Bids", specifications, and requirements on file with the City Clerk, and subject to all provisions of the Charter and Ordinances of the City of San Diego and applicable laws and regulations of the United States and the State of California, the undersigned hereby proposes to furnish to the City of San Diego, complete at the prices stated herein, the items or services hereinafter mentioned. The undersigned further warrants that this bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

The undersigned bidder(s) further warrants that bidder(s) has thoroughly examined and understands the entire Contract Documents (plans and specifications) and the Bidding Documents therefore, and that by submitting said Bidding Documents as its bid proposal, bidder(s) acknowledges and is bound by the entire Contract Documents, including any addenda issued thereto, as such Contract Documents incorporated by reference in the Bidding Documents.

**NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID UNDER 23
UNITED STATES CODE 112 AND PUBLIC CONTRACT CODE 7106**

State of California

County of San Diego

The bidder, being first duly sworn, deposes and says that he or she is authorized by the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

CONTRACTOR CERTIFICATION

DRUG-FREE WORKPLACE

I hereby certify that I am familiar with the requirements of San Diego City Council Policy No. 100-17 regarding Drug-Free Workplace as outlined in the WHITEBOOK, Section 5-1.3, "Drug-Free Workplace", of the project specifications, and that;

This company has in place a drug-free workplace program that complies with said policy. I further certify that each subcontract agreement for this project contains language which indicates the subcontractor's agreement to abide by the provisions of subdivisions a) through c) of the policy as outlined.

CONTRACTOR CERTIFICATION

AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANCE CERTIFICATION

I hereby certify that I am familiar with the requirements of San Diego City Council Policy No. 100-4 regarding the Americans With Disabilities Act (ADA) outlined in the WHITEBOOK, Section 5-1.2, "California Building Code, California Code of Regulations Title 24 and Americans with Disabilities Act", of the project specifications, and that:

This company has in place workplace program that complies with said policy. I further certify that each subcontract agreement for this project contains language which indicates the subcontractor's agreement to abide by the provisions of the policy as outlined.

CONTRACTOR CERTIFICATION

CONTRACTOR STANDARDS – PLEDGE OF COMPLIANCE

I declare under penalty of perjury that I am authorized to make this certification on behalf of the company submitting this bid/proposal, that as Contractor, I am familiar with the requirements of City of San Diego Municipal Code § 22.3004 regarding Contractor Standards as outlined in the WHITEBOOK, Section 5-1.4, ("Contractor Standards and Pledge of Compliance"), of the project specifications, and that Contractor has complied with those requirements.

I further certify that each of the Contractor's subcontractors has completed a Pledge of Compliance attesting under penalty of perjury of having complied with City of San Diego Municipal Code § 22.3004.

CONTRACTOR CERTIFICATION

EQUAL BENEFITS ORDINANCE CERTIFICATION

I declare under penalty of perjury that I am familiar with the requirements of and in compliance with the City of San Diego Municipal Code § 22.4300 regarding Equal Benefits Ordinance.

CONTRACTOR CERTIFICATION

EQUAL PAY ORDINANCE CERTIFICATION

Contractor shall comply with the Equal Pay Ordinance (EPO) codified in the San Diego Municipal Code (SDMC) at section 22.4801 through 22.4809, unless compliance is not required based on an exception listed in SDMC section 22.4804.

Contractor shall require all of its subcontractors to certify compliance with the EPO in their written subcontracts.

Contractor must post a notice informing its employees of their rights under the EPO in the workplace or job site.

By signing this Contract with the City of San Diego, Contractor acknowledges the EPO requirements and pledges ongoing compliance with the requirements of SDMC Division 48, section 22.4801 et seq., throughout the duration of this Contract.

AFFIDAVIT OF DISPOSAL

(To be submitted upon completion of Construction pursuant to the contracts Certificate of Completion)

WHEREAS, on the _____ DAY OF _____, 2____ the undersigned entered into and executed a contract with the City of San Diego, a municipal corporation, for:

MBGC Irrigation & Electrical Upgrades + MBGC Clubhouse Demo/Prtbl Building Instl
(Project Title)

as particularly described in said contract and identified as Bid No. **K-21-1919-DBB-3**; SAP No. (WBS/IO/CC) **S-11010, S-01090**; and **WHEREAS**, the specification of said contract requires the Contractor to affirm that all brush, trash, debris, and surplus materials resulting from this project have been disposed of in a legal manner ; and **WHEREAS**, said contract has been completed and all surplus materials disposed of:

NOW, THEREFORE, in consideration of the final payment by the City of San Diego to said Contractor under the terms of said contract, the undersigned Contractor, does hereby affirm that all surplus materials as described in said contract have been disposed of at the following location(s)

and that they have been disposed of according to all applicable laws and regulations.

Dated this _____ DAY OF _____, _____.

By: _____
Contractor

ATTEST:

State of _____ County of _____

On this _____ DAY OF _____ 2____, before the undersigned, a Notary Public in and for said County and State, duly commissioned and sworn, personally appeared _____ known to me to be the _____ Contractor named in the foregoing Release, and whose name is subscribed thereto, and acknowledged to me that said Contractor executed the said Release.

Notary Public in and for said County and State

LIST OF SUBCONTRACTORS

***** PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY *** TO BE SUBMITTED IN ELECTRONIC FORMAT ONLY *** SEE INSTRUCTIONS TO BIDDERS, FOR FURTHER INFORMATION**

In accordance with the requirements of the "Subletting and Subcontracting Fair Practices Act", Section 4100, of the California Public Contract Code (PCC), the Bidder is to list below the name, address and license number of each Subcontractor who will perform work, labor, render services or specially fabricate and install a portion [type] of the work or improvement, in an amount of or in excess of 0.5% of the Contractor's total Bid. Failure to comply with this requirement may result in the Bid being rejected as non-responsive. The Contractor is to list only one Subcontractor for each portion of the Work. The Bidder's attention is directed to the Special Provisions - Section 3-2, "SELF-PERFORMANCE", which stipulates the percentage of the Work to be performed with the Bidder's own forces. The Bidder is to also list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors for which the Bidders are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	SUBCONTRACTOR LICENSE NUMBER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB®	WHERE CERTIFIED®	CHECK IF JOINT VENTURE PARTNERSHIP
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____							
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____							

- ① As appropriate, Bidder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):
- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |
- ② As appropriate, Bidder shall indicate if Subcontractor is certified by:
- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | | |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

NAMED EQUIPMENT/MATERIAL SUPPLIER LIST

***** PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY *** TO BE SUBMITTED IN ELECTRONIC FORMAT ONLY *** SEE INSTRUCTIONS TO BIDDERS FOR FURTHER INFORMATION**

NAME, ADDRESS AND TELEPHONE NUMBER OF VENDOR/SUPPLIER	MATERIALS OR SUPPLIES	DOLLAR VALUE OF MATERIAL OR SUPPLIES	SUPPLIER (Yes/No)	MANUFACTURER (Yes/No)	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB ^①	WHERE CERTIFIED ^②
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____						
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____						

- ① As appropriate, Bidder shall identify Vendor/Supplier as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):
- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |
- ② As appropriate, Bidder shall indicate if Vendor/Supplier is certified by:
- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | | |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

ELECTRONICALLY SUBMITTED FORMS

FAILURE TO FULLY COMPLETE AND SUBMIT ANY OF THE FOLLOWING FORMS WILL DEEM YOUR BID NON-RESPONSIVE.

PLANETBIDS WILL NOT ALLOW FOR BID SUBMISSIONS WITHOUT THE ATTACHMENT OF THESE FORMS

The following forms are to be completed by the bidder and submitted (uploaded) electronically with the bid in PlanetBids.

- A. BID BOND – See Instructions to Bidders, Bidders Guarantee of Good Faith (Bid Security) for further instructions**
- B. CONTRACTOR’S CERTIFICATION OF PENDING ACTIONS**
- C. LIST OF SUBCONTRACTORS FOR ALTERNATE ITEMS**
- D. MANDATORY DISCLOSURE OF BUSINESS INTERESTS FORM**
- E. DEBARMENT AND SUSPENSION CERTIFICATION PRIME CONTRACTOR**
- F. DEBARMENT AND SUSPENSION CERTIFICATION, SUBCONTRACTORS, SUPPLIERS AND MANUFACTURERS**
- G. MISSION BAY GOLF COURSES PROJECTS CONSTRUCTION PRE-QUALIFICATION STATEMENT**

BID BOND

**See Instructions to Bidders, Bidder Guarantee of Good Faith
(Bid Security)**

KNOW ALL MEN BY THESE PRESENTS,

That 3-D Enterprises, Incorporated as Principal,
and The Hanover Insurance Company as Surety, are held
and firmly bound unto The City of San Diego hereinafter called "OWNER," in the sum
of **10% OF THE TOTAL BID AMOUNT** for the payment of which sum, well and truly to be made, we
bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally,
firmly by these presents.

WHEREAS, said Principal has submitted a Bid to said OWNER to perform the WORK required under
the bidding schedule(s) of the OWNER's Contract Documents entitled

MBGC Irrigation & Electrical Upgrades + MBGC Clubhouse Demo/Prtbl Building Install
K-21-1919-DBB-3; Bid Date: June 16, 2021

NOW THEREFORE, if said Principal is awarded a contract by said OWNER and, within the time and in
the manner required in the "Notice Inviting Bids" enters into a written Agreement on the form of
agreement bound with said Contract Documents, furnishes the required certificates of insurance, and
furnishes the required Performance Bond and Payment Bond, then this obligation shall be null and
void, otherwise it shall remain in full force and effect. In the event suit is brought upon this bond by
said OWNER and OWNER prevails, said Surety shall pay all costs incurred by said OWNER in such suit,
including a reasonable attorney's fee to be fixed by the court.

SIGNED AND SEALED, this 14th day of June, 2021

3-D Enterprises, Incorporated (SEAL)

(Principal)

By: _____

(Signature)

The Hanover Insurance Company (SEAL)

(Surety)

By: _____

(Signature)

Audrey Rodriguez, Attorney-In-Fact

(SEAL AND NOTARIAL ACKNOWLEDGEMENT OF SURETY)

ALL- PURPOSE CERTIFICATE OF ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California }

County of San Diego }

On June 14, 2021 before me, B. Lafrenz, Notary Public
(Here insert name and title of the officer)

personally appeared Audrey Rodriguez,
 who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

B. Lafrenz
 Notary Public Signature (Notary Public Seal)



ADDITIONAL OPTIONAL INFORMATION

DESCRIPTION OF THE ATTACHED DOCUMENT

(Title or description of attached document)

(Title or description of attached document continued)

Number of Pages _____ Document Date _____

CAPACITY CLAIMED BY THE SIGNER

- Individual (s)
- Corporate Officer
- _____ (Title)
- Partner(s)
- Attorney-in-Fact
- Trustee(s)
- Other _____

INSTRUCTIONS FOR COMPLETING THIS FORM

This form complies with current California statutes regarding notary wording and, if needed, should be completed and attached to the document. Acknowledgments from other states may be completed for documents being sent to that state so long as the wording does not require the California notary to violate California notary law.

- State and County information must be the State and County where the document signer(s) personally appeared before the notary public for acknowledgment.
- Date of notarization must be the date that the signer(s) personally appeared which must also be the same date the acknowledgment is completed.
- The notary public must print his or her name as it appears within his or her commission followed by a comma and then your title (notary public).
- Print the name(s) of document signer(s) who personally appear at the time of notarization.
- Indicate the correct singular or plural forms by crossing off incorrect forms (i.e. ~~he/she/they~~, is /are) or circling the correct forms. Failure to correctly indicate this information may lead to rejection of document recording.
- The notary seal impression must be clear and photographically reproducible. Impression must not cover text or lines. If seal impression smudges, re-seal if a sufficient area permits, otherwise complete a different acknowledgment form.
- Signature of the notary public must match the signature on file with the office of the county clerk.
 - ❖ Additional information is not required but could help to ensure this acknowledgment is not misused or attached to a different document.
 - ❖ Indicate title or type of attached document, number of pages and date.
 - ❖ Indicate the capacity claimed by the signer. If the claimed capacity is a corporate officer, indicate the title (i.e. CEO, CFO, Secretary).
- Securely attach this document to the signed document with a staple.

**THE HANOVER INSURANCE COMPANY
MASSACHUSETTS BAY INSURANCE COMPANY
CITIZENS INSURANCE COMPANY OF AMERICA**

POWER OF ATTORNEY

THIS Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

KNOW ALL PERSONS BY THESE PRESENTS:

That THE HANOVER INSURANCE COMPANY and MASSACHUSETTS BAY INSURANCE COMPANY, both being corporations organized and existing under the laws of the State of New Hampshire, and CITIZENS INSURANCE COMPANY OF AMERICA, a corporation organized and existing under the laws of the State of Michigan, (hereinafter individually and collectively the "Company") does hereby constitute and appoint,

Brooke Lafrenz, Larry D. Cogdill, Michael Thomas, and /or Audrey Rodriguez

Of **Venbrook Insurance Services of Del Mar, CA** each individually, if there be more than one named, as its true and lawful attorney(s)-in-fact to sign, execute, seal, acknowledge and deliver for, and on its behalf, and as its act and deed any place within the United States, any and all surety bonds, recognizances, undertakings, or other surety obligations. The execution of such surety bonds, recognizances, undertakings or surety obligations, in pursuance of these presents, shall be as binding upon the Company as if they had been duly signed by the president and attested by the secretary of the Company, in their own proper persons. Provided however, that this power of attorney limits the acts of those named herein; and they have no authority to bind the Company except in the manner stated and to the extent of any limitation stated below:

Any such obligations in the United States, not to exceed Thirty Million and No/100 (\$30,000,000) in any single instance

That this power is made and executed pursuant to the authority of the following Resolutions passed by the Board of Directors of said Company, and said Resolutions remain in full force and effect:

RESOLVED: That the President or any Vice President, in conjunction with any Vice President, be and they hereby are authorized and empowered to appoint Attorneys-in-fact of the Company, in its name and as it acts, to execute and acknowledge for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, waivers of citation and all other writings obligatory in the nature thereof, with power to attach thereto the seal of the Company. Any such writings so executed by such Attorneys-in-fact shall be binding upon the Company as if they had been duly executed and acknowledged by the regularly elected officers of the Company in their own proper persons.

RESOLVED: That any and all Powers of Attorney and Certified Copies of such Powers of Attorney and certification in respect thereto, granted and executed by the President or Vice President in conjunction with any Vice President of the Company, shall be binding on the Company to the same extent as if all signatures therein were manually affixed, even though one or more of any such signatures thereon may be facsimile. (Adopted October 7, 1981 – The Hanover Insurance Company; Adopted April 14, 1982 – Massachusetts Bay Insurance Company; Adopted September 7, 2001 – Citizens Insurance Company of America)

IN WITNESS WHEREOF, THE HANOVER INSURANCE COMPANY, MASSACHUSETTS BAY INSURANCE COMPANY and CITIZENS INSURANCE COMPANY OF AMERICA have caused these presents to be sealed with their respective corporate seals, duly attested by two Vice Presidents, this 11th day of March, 2020.



THE HANOVER INSURANCE COMPANY
MASSACHUSETTS BAY INSURANCE COMPANY
CITIZENS INSURANCE COMPANY OF AMERICA


Robert Thomas, Vice President

THE HANOVER INSURANCE COMPANY
MASSACHUSETTS BAY INSURANCE COMPANY
CITIZENS INSURANCE COMPANY OF AMERICA


J. Michael Fete, Vice President

THE COMMONWEALTH OF MASSACHUSETTS)
COUNTY OF WORCESTER) ss.

On this 11th day of **March 2020** before me came the above named Vice Presidents of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, to me personally known to be the individuals and officers described herein, and acknowledged that the seals affixed to the preceding instrument are the corporate seals of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, respectively, and that the said corporate seals and their signatures as officers were duly affixed and subscribed to said instrument by the authority and direction of said Corporations.





Diane J. Marino, Notary Public
My Commission Expires March 4, 2022

I, the undersigned Vice President of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, hereby certify that the above and foregoing is a full, true and correct copy of the Original Power of Attorney issued by said Companies, and do hereby further certify that the said Powers of Attorney are still in force and effect.

GIVEN under my hand and the seals of said Companies, at Worcester, Massachusetts, this 14th day of June, 2021

CERTIFIED COPY


Theodore G. Martinez, Vice President

CONTRACTOR'S CERTIFICATION OF PENDING ACTIONS

As part of its bid or proposal (Non-Price Proposal in the case of Design-Build contracts), the Bidder shall provide to the City a list of all instances within the past 10 years where a complaint was filed or pending against the Bidder in a legal or administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers, and a description of the status or resolution of that complaint, including any remedial action taken.

CHECK ONE BOX ONLY.

- The undersigned certifies that within the past 10 years the Bidder has NOT been the subject of a complaint or pending action in a legal administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers.
- The undersigned certifies that within the past 10 years the Bidder has been the subject of a complaint or pending action in a legal administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers. A description of the status or resolution of that complaint, including any remedial action taken and the applicable dates is as follows:

DATE OF CLAIM	LOCATION	DESCRIPTION OF CLAIM	LITIGATION (Y/N)	STATUS	RESOLUTION/REMEDIAL ACTION TAKEN

Contractor Name: 3-D Enterprises, Incorporated

Certified By S. Etlhu Title Vice President
Name
[Signature] Date 06/16/21
Signature

USE ADDITIONAL FORMS AS NECESSARY

SUBCONTRACTORS ADDITIVE/DEDUCTIVE ALTERNATE
***** FOR USE WHEN LISTING SUBCONTRACTORS ON ALTERNATES *****
(Use Additional Sheets As Needed)

ADDITIVE/DEDUCTIVE ALTERNATE	SUBCONTRACTOR NAME, LOCATION, PHONE & EMAIL	CONSTRUCTOR OR DESIGNER	DIR REGISTRATION NUMBER	SUBCONTRACTOR LICENSE NUMBER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB	WHERE CERTIFIED	CHECK IF JOINT VENTURE PARTNERSHIP
	Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____		NONE						
	Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____								
	Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____								

- ① As appropriate, Bidder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):
- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |
- ② As appropriate, Bidder shall indicate if Subcontractor is certified by:
- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | | |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

Mandatory Disclosure of Business Interests Form

BIDDER/PROPOSER INFORMATION

Legal Name		DBA	
3-D Enterprises, Incorporated			
Street Address	City	State	Zip
3165 Ruffin Rd, Ste. 103	San Diego	CA	92123
Contact Person, Title		Phone	Fax
S. Elihu, Vice President		858 530 2202	844 318 2832

Provide the name, identity, and precise nature of the interest* of all persons who are directly or indirectly involved** in this proposed transaction (SDMC § 21.0103).

* The precise nature of the interest includes:

- the percentage ownership interest in a party to the transaction,
- the percentage ownership interest in any firm, corporation, or partnership that will receive funds from the transaction, the value of any financial interest in the transaction,
- any contingent interest in the transaction and the value of such interest should the contingency be satisfied, and any
- philanthropic, scientific, artistic, or property interest in the transaction.

** Directly or indirectly involved means pursuing the transaction by:

- communicating or negotiating with City officers or employees,
- submitting or preparing applications, bids, proposals or other documents for purposes of contracting with the City,
- or directing or supervising the actions of persons engaged in the above activity.

Name	Title/Position
Doris Elghanayan	President
City and State of Residence	Employer (if different than Bidder/Proposer)
Del Mar, CA	
Interest in the transaction	
70% ownership	

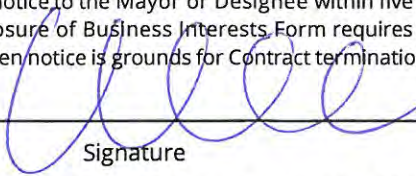
Name	Title/Position
Shahrokh Elihu	Vice President
City and State of Residence	Employer (if different than Bidder/Proposer)
Del Mar, CA	
Interest in the transaction	
30% ownership	

*** Use Additional Pages if Necessary ***

Under penalty of perjury under the laws of the State of California, I certify that I am responsible for the completeness and accuracy of the responses contained herein, and that all information provided is true, full and complete to the best of my knowledge and belief. I agree to provide written notice to the Mayor or Designee within five (5) business days if, at any time, I learn that any portion of this Mandatory Disclosure of Business Interests Form requires an updated response. Failure to timely provide the Mayor or Designee with written notice is grounds for Contract termination.

S. Elihu, Vice President

Print Name, Title



Signature

06/15/21

Date

Failure to sign and submit this form with the bid/proposal shall make the bid/proposal non-responsive. In the case of an informal solicitation, the contract will not be awarded unless a signed and completed Mandatory Disclosure of Business Interests Form is submitted.

Mandatory Disclosure of Business Interests Form

BIDDER/PROPOSER INFORMATION

Legal Name		DBA	
3-D Enterprises, Incorporated			
Street Address	City	State	Zip
3105 Puffin Rd, Ste. 103, San Diego		CA	92123
Contact Person, Title		Phone	Fax
S. Elihu, Vice President		858 530 2202	844 318 2832

Provide the name, identity, and precise nature of the interest* of all persons who are directly or indirectly involved** in this proposed transaction (SDMC § 21.0103).

* The precise nature of the interest includes:

- the percentage ownership interest in a party to the transaction,
- the percentage ownership interest in any firm, corporation, or partnership that will receive funds from the transaction, the value of any financial interest in the transaction,
- any contingent interest in the transaction and the value of such interest should the contingency be satisfied, and any
- philanthropic, scientific, artistic, or property interest in the transaction.

** Directly or indirectly involved means pursuing the transaction by:

- communicating or negotiating with City officers or employees,
- submitting or preparing applications, bids, proposals or other documents for purposes of contracting with the City,
- or directing or supervising the actions of persons engaged in the above activity.

Name	Title/Position
Cecilia Galvan	Office Mgr.
City and State of Residence	Employer (if different than Bidder/Proposer)
Chula Vista, CA	
Interest in the transaction	
Submitting/preparing applications, bids, proposals for purposes contracting w/ city officials	

Name	Title/Position
Daniel Silvestre	Project Engineer
City and State of Residence	Employer (if different than Bidder/Proposer)
San Diego, CA	
Interest in the transaction	
Communicating with city officers/employees	

*** Use Additional Pages if Necessary ***

Under penalty of perjury under the laws of the State of California, I certify that I am responsible for the completeness and accuracy of the responses contained herein, and that all information provided is true, full and complete to the best of my knowledge and belief. I agree to provide written notice to the Mayor or Designee within five (5) business days if, at any time, I learn that any portion of this Mandatory Disclosure of Business Interests Form requires an updated response. Failure to timely provide the Mayor or Designee with written notice is grounds for Contract termination.

S. Elihu, Vice President
[Signature]
06/16/21

Print Name, Title
Signature
Date

Failure to sign and submit this form with the bid/proposal shall make the bid/proposal non-responsive. In the case of an informal solicitation, the contract will not be awarded unless a signed and completed Mandatory Disclosure of Business Interests Form is submitted.

DEBARMENT AND SUSPENSION CERTIFICATION
PRIME CONTRACTOR
FAILURE TO COMPLETE AND SUBMIT AT TIME OF BID SHALL RENDER BID NON-RESPONSIVE

EFFECT OF DEBARMENT OR SUSPENSION

To promote integrity in the City's contracting processes and to protect the public interest, the City shall only enter into contracts with responsible bidders and contractors. In accordance with San Diego Municipal Code §22.0814 (a): *Bidders and contractors who have been debarred or suspended are excluded from submitting bids, submitting responses to requests for proposal or qualifications, receiving contract awards, executing contracts, participating as a subcontractor, employee, agent or representative of another person contracting with the City.*

As part of its bid or proposal (Non-Price Proposal in the case of Design-Build contracts), the Bidder shall provide to the City a list of Names of the Principal Individual owner(s).

The names of all persons interested in the foregoing proposal as Principals are as follows:

NAME	TITLE
Doris Elghanayan	President
Shahrokh Eliko	VP, Secretary

IMPORTANT NOTICE: If Bidder or other interested person is a corporation, state secretary, treasurer, and manager thereof; if a co-partnership, state true name of firm, also names of all individual co-partners composing firm; if Bidder or other interested person is an individual, state first and last names in full.

The Bidder, under penalty of perjury, certifies that, except as noted below, he/she or any person associated therewith in the capacity of owner, partner, director, officer, manager:

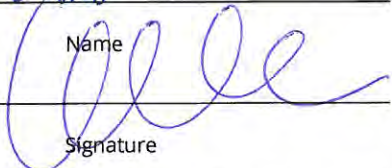
- Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal, State or local agency;
- has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal, State or local agency within the past 3 years;
- does not have a proposed debarment pending; and
- has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Contractor Name: 3-D Enterprises, Incorporated

Certified By: S. Eliko Title Vice President


 Name _____ Date 06/16/21
 Signature _____

NOTE: Providing false information may result in criminal prosecution or administrative sanctions

DEBARMENT AND SUSPENSION CERTIFICATION
SUBCONTRACTORS, SUPPLIERS AND MANUFACTURERS
TO BE COMPLETED BY BIDDER
FAILURE TO COMPLETE AND SUBMIT AT TIME OF BID SHALL RENDER BID NON-RESPONSIVE

Names of the Principal individual owner(s)

As part of its bid or proposal (Non-Price Proposal in the case of Design-Build contracts), the Bidder shall provide to the City a list of Names of the Principal Individual owner(s) for their subcontractor/supplier/manufacturers.

Please indicate if principal owner is serving in the capacity of **subcontractor**, **supplier**, and/or **manufacturer**:

SUBCONTRACTOR SUPPLIER MANUFACTURER

NAME	TITLE
Precision Striping	
SA Timothy Michael Martin	President / CEO

SUBCONTRACTOR SUPPLIER MANUFACTURER

NAME	TITLE
Central Valley Environmental	
Glenn John Accornero	President

SUBCONTRACTOR SUPPLIER MANUFACTURER

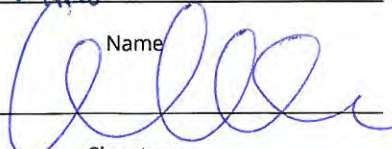
NAME	TITLE
A.B. Hashmi	
Ahmad Bilal Hashmi	President

SUBCONTRACTOR SUPPLIER MANUFACTURER

NAME	TITLE
Landscapes Unlimited, LLC	
William Martin Ruby	RMG

Contractor Name: 3-D Enterprises, Incorporated

Certified By S. E. Ihu Title Vice President


 Name _____ Date 06/16/21
 Signature _____

USE ADDITIONAL FORMS AS NECESSARY

**DEBARMENT AND SUSPENSION CERTIFICATION
 SUBCONTRACTORS, SUPPLIERS AND MANUFACTURERS
 TO BE COMPLETED BY BIDDER
 FAILURE TO COMPLETE AND SUBMIT AT TIME OF BID SHALL RENDER BID NON-RESPONSIVE**

Names of the Principal individual owner(s)

As part of its bid or proposal (Non-Price Proposal in the case of Design-Build contracts), the Bidder shall provide to the City a list of Names of the Principal Individual owner(s) for their subcontractor/supplier/manufacturers.

Please indicate if principal owner is serving in the capacity of **subcontractor**, **supplier**, and/or **manufacturer**:

SUBCONTRACTOR SUPPLIER MANUFACTURER

NAME	TITLE
Landscapes Unlimited, LLC	William Kubly - Manager

SUBCONTRACTOR SUPPLIER MANUFACTURER

NAME	TITLE
N/A	

SUBCONTRACTOR SUPPLIER MANUFACTURER

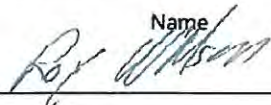
NAME	TITLE
N/A	

SUBCONTRACTOR SUPPLIER MANUFACTURER

NAME	TITLE
N/A	

Contractor Name: **Landscapes Unlimited, LLC**

Certified By **Roy Wilson** Title **Asst Manager**



 Signature

Date **06/15/2021**

USE ADDITIONAL FORMS AS NECESSARY

MISSION BAY GOLF COURSES PROJECTS
CONSTRUCTION PRE-QUALIFICATION STATEMENT

SPECIALTY CONTRACTOR

The intent of City of San Diego is to pre-qualify golf course builders (PRIME SUBMITTING FIRM OR SPECIALTY CONTRACTOR) for this project who must have prior specialty golf course construction experience, having worked on a golf course facility while maintaining its ability to be open during construction. This statement will determine the specialty contractor's qualification for this project. In addition to golf course construction experience, firms must also demonstrate an ability to work with two different design teams, coordinating two sets of drawings, implementing both projects to meet the clients objectives and to meet minimum guidelines as set in the SPECIAL PROVISIONS of the Contract Documents. Submission of this questionnaire does not constitute qualification. Qualification may be denied for any reason the City of San Diego deems necessary for the successful completion of the project.

~~GENERAL~~ SPECIALTY CONTRACTOR INFORMATION

Landscapes Unlimited, LLC (acting as a subcontracted specialty contractor)

COMPANY NAME (Full Legal Name)

1201 Aries Dr

STREET ADDRESS

N/A

MAILING ADDRESS (If Different Than Above)

Lincoln, NE 68512 402-423-6653

CITY STATE ZIP PHONE #

Roy Wilson **Roy@landscapesunlimited.com** **402-423-4487**

CONTACT PERSON

E-MAIL

FAX #



FEDERAL TAX ID NO.

Roy Wilson

A handwritten signature in cursive script that reads "Roy Wilson".

Assistant Manager

APPLICATION SUBMITTED BY

TITLE

SPECIALTY CONTRACTOR INFORMATION

If the Specialty Contractor is a corporation, please provide the following:

- State & Date of Incorporation N/A
- Contractor License # _____
- Secretary / Treasurer's Name _____

If the Specialty Contractor is a partnership, please provide the following: **(Limited Liability Company)**

- State & Date of Partnership Nebraska - July 2, 1999
- Contractor License # 973614 - A, B, C-27
- **Members** Names William Kubly - Manager; Roy Wilson, Kurt Huseman, John Pugliese, Bryce Juedes - Asst Managers

If the Specialty Contractor is sole proprietor, or individually owned, please provide the following:

- State, & Date of Ownership N/A
- Primary Owner's Name & License # _____

Please Check

YES NO

1. How many years has your organization been in business under your present name? 21 yrs.

Has your firm, its leadership/officers, and any of your management team ever operated under any other names in the past?

If so, name of organization Landscapes Unlimited, Inc. prior to 1999

2. Has any owner, officer or partner of your organization ever been an owner, officer or partner of this or any other organization that failed to complete a construction contract or been charged liquidated damages or received poor performance ratings? If yes, please provide additional information on a separate sheet.

3. Has your organization ever been denied, debarred, or suspended by a government agency with regard to licensing or award of contracts? If yes, please provide additional information on a separate sheet.

4. Has your organization ever failed to qualify as a Specialty Contractor of any project? If yes, please provide additional information on a separate sheet.

5. Does your organization meet the following minimum requirements:

- The successful Specialty Contractor must be able to provide valid and in good standing the following insurance coverage for the entire duration of the project, naming your firm and the Owner as additionally insured. A sample certificate with the following minimum coverage's must be submitted with this statement:

- ❖ Commercial General Liability \$1,000,000 Each Occurrence / \$2,000,000 General Aggregate
- ❖ Automobile Liability Insurance \$1,000,000 Minimum
- ❖ Workman's Compensation Insurance State Minimum Coverage as Required By Law

- The ability to provide a Bid Bond at the time of the project submission. Also, Performance Material & Payments Bonds in the total amount of the project at the award of contract. Please provide a letter of reference from your surety company (not an agent or broker) stating your good standing ability to bond a project of this scope. **We are able to provide bid, performance, and payment bonds but are acting as a subcontractor for this bid, so this will be provided by the prime.**
- Attach 3 Letters of Reference from a past public agency giving recommendation of your organization's ability to perform quality golf course construction.

- The selected firm shall be required to pay at a minimum Local Prevailing Wage rates as determined by the Department of Industrial Relations. Certified payrolls will be required. Can your organization comply with these requirements?

PAST COMPLETED GOLF COURSE PROJECT EXPERIENCE

The prime submitting firm or its specialty contractor, in order to be pre-qualified for this project must have completed **(1)** public or private golf course facility while maintaining its ability to be open during construction. The ideal project has a scope of work that demonstrates contractor's experience working with demolition, building, and irrigation systems using HDPE pipe with electrofusion welds in the last **(5)** years. Golf course must be open and in good operating condition for at least **1 year**. Only those projects where the complete construction of the facility has been the sole responsibility of your firm can be included. Please provide detailed project information and verifiable references for each of the qualifying golf course facility. No exceptions will be made to these requirements.

PROJECT INFORMATION / PHOTO REQUIRED – Please provide all information requested and utilize additional sheets as necessary. Also provide at least one (1) photo of the completed construction.

Name and Location of Project **Torrey Pines South Golf Course**
Owner's Name **City of San Diego** Address **11480 N Torrey Pine Rd, La Jolla, CA 92037**
Phone Number **Rich McIntosh 330-241-9858** Email **rmcintosh@sandiego.gov**
Project Size (skating area only) **N/A** sq ft / Construction Value **\$7.1M irrig / \$14M overall** / % Complete **100** / Completion Date **09/30/19**
Designer and Architect **Brent Harvey Consulting - Irrigation Designer, Rees Jones, Inc - Architect**
Project Description and Scope of Work **Design/build 18 hole irrigation renovation & golf course renovation**

This project included the installation of 3,400 Toro Infinity and Flex sprinklers and 62 satellites utilizing a Toro Lynx central. We installed approximately 44,000 lf of HDPE mainline pipe and 158,000 lf of HDPE lateral pipe for the potable and non-potable system. We created temporary tees and greens to allow play of 18 holes during the entire project and completed the project within schedule and budget.



ADDITIONAL QUESTIONNAIRE & REQUIREMENTS

Please accurately answer & provide for all the information requested utilizing a separate sheet as necessary.

Please Check

YES NO

- A. Has your firm worked with two different design teams, coordinating two sets of drawings, implementing both projects to meet the client's objectives?
- B. Does your firm possess experience working with HDPE pipe with electrofusion welds?
- C. Does your firm possess experience working with Toro Links Central Irrigation System installation and programming?
- D. Does your firm possess experience working with individual head control systems via GPS location?
- E. Does your firm possess experience working with Toro weather station installation and programming?
- F. Does your firm possess all the necessary equipment, labor forces, and material suppliers to complete this project per plans and specifications within the given schedule?
- N/A** G. Does your firm possess experience in construction of portable prefabricated buildings? **scope by others**
- N/A** H. Does your firm possess experience in demolition of buildings that has asbestos, lead? **scope by others**
- I. Has your firm completed a complex construction project, over \$10 million dollars in value, for a public agency while the facility was open for daily play by the public?
- J. Was the project completed on time?
- K. Did the project come in on budget?
- L. Were there any claims filed on the project? **Claim filed against fence subcontractor that damaged drainage pipe adjacent to course.**

SCHEDULE & GOLF COURSE MANAGEMENT EXPERIENCE

-
- Please provide a schedule identifying key tasks and milestones your project team has identified to demonstrate your ability to coordinate the entire job. This will be for evaluation purposes only and is not intended to be submitted as a working schedule.
 - Please provide a detailed list identifying your firm's key personnel and management team that is responsible for the aforementioned golf course experience. Please include any owners, officers, managers, construction supervisors, or any other employee with the identified experience for the listed qualifying projects. Show that the individual directly responsible for the construction management of these projects will be the same individual utilized on this project.
-

This document must be notarized. This pre-qualification statement will not be considered responsive or valid unless it is completed in its entirety and signed, dated, and notarized. The City reserve the right to disqualify any firm for any reason deemed necessary for the successful completion of this project.

The SPECIALTY CONTRACTOR (undersigned) hereby certifies and that all of the information contained in this document is true and correct to the best of their knowledge. I declare under penalty of perjury under the laws of the State of California, that the foregoing is correct.

Landscapes Unlimited, LLC - Contractor License #973614 - A, B, C-27

Legal Business Name of Submitting Individual, Partnership, Limited Liability Company,
or Corporation & Contractor License Number

Roy Wilson - Assistant Manager

Printed Name of Specialty contractor or Authorized Agent



Signature of Specialty contractor or Authorized Agent

**ALL SIGNATURES MUST BE
WITNESSED BY NOTARY
(ATTACH JURAT)**

Description of Document Construction Pre-Qualification Statement

Acknowledgement

State of Nebraska

S.S.

County of Lancaster)

The foregoing instrument was acknowledged before me this

3rd day of June, 2021
(month)

by Roy Wilson,
(printed name of acknowledging member or agent)

member (or agent) on behalf of

Landscapes Unlimited, LLC, a limited liability company.
(printed name of limited liability company)



↑ Affix Official Notary seal here ↑


Signature of Notary Public



CERTIFICATE OF LIABILITY INSURANCE

1/1/2022

DATE (MM/DD/YYYY)

12/3/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an **ADDITIONAL INSURED**, the policy(ies) must have **ADDITIONAL INSURED** provisions or be endorsed. If **SUBROGATION IS WAIVED**, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER LOCKTON COMPANIES 13710 FNB Pkwy, Suite 400 Omaha NE 68154 402-970-6100	CONTACT NAME: PHONE (A/C No. Ext): E-MAIL ADDRESS:		FAX (A/C No.):
	INSURER(S) AFFORDING COVERAGE		NAIC #
INSURED 1344770 LANDSCAPES UNLIMITED, LLC 1201 ARIES DRIVE LINCOLN NE 68512	INSURER A: Zurich American Insurance Company		16535
	INSURER B: Travelers Property Casualty Co of America		25674
	INSURER C:		
	INSURER D:		
	INSURER E:		
	INSURER F:		

COVERAGES LANHO03 **CERTIFICATE NUMBER:** 11567481 **REVISION NUMBER:** XXXXXXXX

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> DEDUCTIBLE \$5,000 GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:	N	N	GLO3503817	1/1/2021	1/1/2022	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 300,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 \$
A	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY	N	N	BAP3503816	1/1/2021	1/1/2022	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ XXXXXXXX BODILY INJURY (Per accident) \$ XXXXXXXX PROPERTY DAMAGE (Per accident) \$ XXXXXXXX \$ XXXXXXXX
B	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$ 10,000	N	N	ZUP14N9220A	1/1/2021	1/1/2022	EACH OCCURRENCE \$ 5,000,000 AGGREGATE \$ 5,000,000 \$ XXXXXXXX
A	<input checked="" type="checkbox"/> WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) <input checked="" type="checkbox"/> If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	N	WC3503818	1/1/2021	1/1/2022	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
A	<input checked="" type="checkbox"/> CONT. EQUIP INSTALLATION <input checked="" type="checkbox"/> FLTR/BUILDERS RISK	N	N	CPP5542918 MBR5542919	1/1/2021 1/1/2021	1/1/2022 1/1/2022	\$2,072,500 LMT; LEASED/RENTED: \$750,000 EACH ITEM MAX IF: \$5,000,000 LMT EACH ITEM

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

11567481
FOR INFORMATION ONLY

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Joseph M. Amello

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June 3, 2021

To Whom It May Concern,

Landscapes Unlimited completed an 18-hole irrigation remodel at Lake Arbor Golf Course and an 18-hole irrigation remodel at West Woods Golf Course, both for the City of Arvada. I was the Manager of Golf and involved with both projects before retiring from the City.

Landscapes Unlimited has some of the best, most experienced people in the industry who bring a wealth of knowledge to the project. LU's main focus is their attention to detail, ensuring a quality installation. The crews work very efficiently to keep the project on schedule, and if challenges arise, they communicate with all the stakeholders to determine the best solution.

It was my pleasure to work with Landscapes Unlimited on both projects, and I would highly recommend them for any golf course irrigation renovation you are considering.

Please feel free to contact me if I can provide any additional information or answer any questions.

Sincerely,

Jim Wilkins
Retired – City of Arvada
720-490-5220

June 2, 2021

To Whom it May Concern:

I am providing this letter of recommendation for Landscapes Unlimited, LLC irrigation division. It has been my pleasure to have worked with Landscapes for several years as it relates to golf course irrigation system installations.

Their field crews were knowledgeable about their required scope of work and were very professional and diligent in completing each task. More importantly, they were conscientious about ongoing operations and left the golf course clean and free of debris. It is incredibly impressive how they manage to install irrigation systems; within a very short time the golf property looks as it did before construction occurred.

I highly recommend Landscapes Unlimited LLC for your upcoming irrigation project needs.

Casey Crittenden CGCS

Golf Course Maintenance Coordinator

City of Lincoln, Nebraska 68510

402-440-5489

ccrittenden@lincoln.ne.gov



August 6, 2015

To Whom It May Concern:

Since April of 2015 the Bonneville Golf Course and Staff have been working closely with Joel Acosta and Landscapes Unlimited. It has been a wonderful working experience with Joel and his team.

Landscapes Unlimited has been the contractor for the installation of our much needed irrigation system at one of the most popular golf courses in Utah. Joel and his crew have been excellent in coordinating the entire project from following design to especially dealing with re-routing the golf course. They have been a step ahead in bridging trenches to accommodate the needs of our busy course, expectations of the golfers and working hand in hand with our maintenance staff.

He and his staff have been very professional in communicating with us and cooperating in operating our old antiquated system while installing our new modern system, this includes shutting off water at times and having it back on almost every evening.

The Landscapes Unlimited Crew has maintained an extremely safe work environment throughout this project. They have been visible with safety vests and equipment warning lights and beeps. They have kept all open holes fenced off and indentified with orange lattice; paths in fairways were sometimes directed with safety cones. They have done an excellent job in locating all utility lines and in dealing with local regulations and laws.

Our golf course is separated by Wasatch Drive a busy Salt Lake street. Joel and the Landscapes Unlimited were very observant of City regulations and crossings they utilized flagmen and safety cones while accessing this road.

As a staff at Bonneville we feel that Mr. Acosta, Gregg Sorensen and Landscapes Unlimited have exceeded our expectations of this project. Their work speed and the return to playability of our course after installation have been remarkable.

Respectfully,

Steve Campbell GCSSA

Jampe Martinsson GCSSA

Steve Elliott PGA

BONNEVILLE GOLF COURSE 954 CONNOR STREET SALT LAKE CITY, UTAH 84108

MISSION BAY GOLF COURSE IRRIGATION SCHEDULE			
Front 9 Mainline Pipe, Lateral Pipe, Sprinkler and Controller Installation	45.88 days	Thu 1/13/22	Mon 3/7/22
Point of Connection on Existing near #8 Green	1 day	Thu 1/13/22	Thu 1/13/22
Start Mainline Pipe Installation (#8 Green to #2 Tees (1,500'), #1 Green to #7 Green (1,300'), Mainline to Practice Area (500') followed by Main from #1 Tees to Pump Station (260'))	13 days	Mon 1/17/22	Mon 1/31/22
Lateral Piping, Sprinkler and Satellite Installation (463 Units = Valve in Head Sprinklers, Block Zone Sprinklers and Quick Couplers) Proposed Sequence #8, #9, #7, #4, #5, #6, #3, #2, #1	30 days	Mon 1/24/22	Mon 2/28/22
Front 9 Substantial Completion Notification Given to Brent Harvey Consulting and City of San Diego	1 day	Mon 2/28/22	Tue 3/1/22
Inspection / Punch List by Brent Harvey Consulting and City of San Diego	2 days	Tue 3/1/22	Thu 3/3/22
Notification That All Punch Lists Items Have Been Completed by Landscapes Unlimited	2 days	Fri 3/4/22	Mon 3/7/22
Final Inspection for Front 9 Completed	1 day	Tue 3/8/22	Tue 3/8/22
Open Front 9 for Golf	1 day	Wed 3/9/22	Wed 3/9/22
Back 9 Mainline Pipe, Lateral Pipe, Sprinkler and Controller Installation	40 days	Mon 3/7/22	Thu 4/21/22
Connect of Pump Station	1 day	Mon 3/7/22	Mon 3/7/22
Start Mainline Pipe Installation - #18 Green to #18 tees (1,100'), loop from #11 Tees to #16 Tees (1,600')	7 days	Mon 3/7/22	Mon 3/14/22
Lateral Piping, Sprinkler and Satellite Installation - (391 Units = Valve in Head Sprinklers, Block Zone Sprinklers and Quick Couplers) Proposed Sequence #18, #17, #16, #15, #14, #13, #12, #11, #10	25 days	Tue 3/15/22	Tue 4/12/22
Back 9 Substantial Completion Notification Given to Brent Harvey Consulting and City of San Diego	1 day	Wed 4/13/22	Wed 4/13/22
Inspection / Punch List by Brent Harvey Consulting and City of San Diego	2 days	Thu 4/14/22	Fri 4/15/22
Notification That All Punch Lists Items Have Been Completed by Landscapes Unlimited	2 days	Mon 4/18/22	Tue 4/19/22
Final Inspection for Back 9 Completed	1 day	Wed 4/20/22	Wed 4/20/22
Open Back 9 for Golf	1 day	Thu 4/21/22	Thu 4/21/22

This is a preliminary schedule, which will be further explored with the prime contractor and Resident Engineer to refine and adjust as needed but gives you a guideline for our approach to the installation.

IRRIGATION PROJECT MANAGEMENT

Listed below is the team who was involved with the irrigation and renovation project management at Torrey Pines South Course in 2019. This team will also be responsible for the irrigation project management of Mission Bay, although roles will change slightly as the specialty subcontractor.

Dave Linngren – Regional Manager – With more than 22 years of experience with Landscapes Unlimited (LU), Dave has been the Western Regional Manager for the last 13 years. He has been responsible for overseeing all LU projects completed in California and has coordinated and managed the construction and renovation of over 100 golf courses, both public and private facilities. Dave has been involved with all the renovations we have completed for the City of San Diego at Torrey Pines over the last 20 years.

Tom Works – Vice President – Irrigation – With over 30 years of irrigation experience, Tom will provide management oversight for the irrigation installation from pre-construction to job close out. Tom's experience with the Torrey Pines South Course in 2005 and 2019 makes him extremely familiar with the local environment and logistics for projects for the City of San Diego.

Eric Wolfert – Construction Manager – Eric has been in the golf industry for over 17 years and has worked the past seven years for LU. Eric's duties will focus on assisting the irrigation superintendents with the daily data collection, reporting, tracking, schedule management and updates, verification, testing, and as-builts, as well as serving as our safety representative. Additionally, he will communicate with the prime contractor, the Resident Engineer for the City, and the golf operations staff making sure that all goals are met, schedules are communicated, and any concerns are addressed. His experience at Torrey Pines South will be a huge asset.

Gabriel San Juan – Irrigation Project Manager - Gabriel has more than 17 years of experience working for LU and coordinates all irrigation projects in the Southwest Region. Gabriel has a thorough knowledge of Toro irrigation systems and products, as well as HDPE and PVC products and installation techniques. He has also managed irrigation installations on both public and private facilities. Gabriel's hands-on experience and irrigation installation expertise are an important part of the overall success of LU's irrigation division.

Joel Acosta – Irrigation Superintendent - Joel has over 30 years of experience with irrigation installations, and he will be responsible for the day-to-day on-site management at Mission Bay. Joel's focused assistance on the Torrey Pines South irrigation installation was key to the success and quality of this challenging project. His innate ability to sort through existing infrastructure will be a great benefit for this installation. Joel is certified as a fusion operator by CMF AquaFuse and ISCO on HDPE applications. He is also a certified Paige Application Specialist, OSHA 10 Hour certified, CPR/First Responder trained, a heavy equipment operator, and is bi-lingual.

Cheryl Halvorsen – Irrigation Estimating and Administration – Cheryl has 26 years of experience as a senior irrigation estimator working for LU and will be responsible for estimates, submittals, and purchase order creation.

Paige Pruitt – Project Administrator – Paige has been with LU for 22 years and will be responsible for contract and subcontract administration, billings and change orders, PRISM input, lien waivers, and communication with the prime contractor and the City as needed.

City of San Diego

CITY CONTACT: Brittany Friedenreich Senior Contract Specialist Email: BFriedenreic@sandiego.gov
Phone No. (619) 533-3104

ADDENDUM A



FOR

MBGC IRRIGATION & ELECTRICAL UPGRADES + MBGC CLUBHOUSE DEMO/PRTBL BUILDING INSTL

BID NO.: _____ **K-21-1919-DBB-3**

SAP NO. (WBS/IO/CC): _____ **S-11010, S-01090**

CLIENT DEPARTMENT: _____ **1714**

COUNCIL DISTRICT: _____ **2**

PROJECT TYPE: _____ **EA**

BID DUE DATE:


2:00 PM
JUNE 16, 2021

CITY OF SAN DIEGO'S ELECTRONIC BIDDING SITE, PLANETBIDS

<http://www.sandiego.gov/cip/bidopps/index.shtml>

DEPUTY CITY ENGINEER

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:



For City Engineer

6/4/21
Date

Seal:



A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN **EXTENDED AS STATED ON THE COVER PAGE.**

B. BIDDER'S QUESTIONS

- Q1. On sheet C-1 under water notes; Do we include the water connection fees in our bid?
- A1. No. Water and sewer capacity fees and the wet tap fees will be prepaid by the City for the City contracts.
- Q2. Bid Item #9 – A \$200,000 allowance is shown by the City. Will the City have separate contract with the temporary trailer company? The installation & rental costs will be paid from this item?
- A2. No, the City will not have a separate contract with the temporary trailer company. All costs and contracts related to the temporary trailers are the responsibility of the contractor. Please refer to attachment A, scope of work items 1.1.11 and 1.1.12. For the temporary trailer's specifications, location, and desired floor plan, please refer to attachment E, Technicals, right after the Hazardous Building Materials Abatement Specifications.
- Q3. The Engineer estimate is \$6.6 Mil. Is that for the base bid only?
- A3. No. It is for base bid + additive alternate A - Island Patio Remodel.
- Q4. Will Fire Sprinklers be required for the two Modular Buildings?
- A4. Fire sprinklers will not be required for the two modular buildings.
- Q5. Will Fire Alarms be required for the two Modular Buildings? If required, will they be stand alone or will they connect to a site CUP?
- A5. Would be stand-alone if required.

- Q6. A gas line is shown for the Food Service Building only. Will this be to supply future kitchen equipment?
- A6. Yes.
- Q7. Will gas piping in the building be connected to appliances or just be capped stub outs from interior walls for this project pricing?
- A7. Capped stub outs.
- Q8. Do we know how many connections will be required to provide correct pipe sizes?
- A8. No, we do not.
- Q9. Please confirm the gas piping is not for any building components such as Water Heaters, HVAC Units, etc.
- A9. Correct, gas piping is not for building components.
- Q10. How quickly does the City of San Diego anticipate the contract will be signed so that work can commence?
- A10. At least 4 months (1 month for the contract group to prepare the contract and about 3 months to route 2625).
- Q11. Does the \$25/day per employee fee apply to this project if we are working more than 10 hours per day or 40 hours per week as long as we are paying 1 ½ times the pay rate?
- A11. The \$25 per day/per employee is the penalty that would be imposed on a contractor or subcontractor by the DIR (on top of the overtime underpayment) if it was determined that an employee working on a public works project was not paid the time and a half for each hour worked over 8 hours in a day.
- Q12. Is the City paying the Irrigation Designer to do the staking and final as-builts for the project or are we to include those services in our bid?
- A12. Refer sheet number 39986-14-D, General Notes, Item 3. The Irrigation Designer (Harvey) will provide the staking as noted. The Irrigation

Designer (Harvey) will provide the irrigation record drawings (as-builts) as it pertains to irrigation only. Note that the Contractor is to provide all other as-builts pertaining to the work.

Q13. It is possible that the golf course irrigation scope could be more than 50% of the overall bid total. As a specialty golf course irrigation constructor, would we still be able to be considered a subcontractor for this project?

A13. The prime contractor shall perform at least 50% of the base Bid.

Q14. With the volatility and availability issues of irrigation materials, how will material escalation be addressed for this project?

A14. Prime contractors should secure prices and/or bids for materials and/or services that reflect the time period for the construction and the amount of their respective bids and the conditions of the contract documents.

Q15. Does a one year or two-year warranty apply to the irrigation system?

A15. 2 years.

Q16. The model numbers for the Toro sprinklers in the legend are no longer valid. Are the sprinklers to be standard solenoid (1) or Spike Guard solenoid (2)?

A16. Spike Guard solenoid for all VIH sprinklers and RCVs.

Q17. If this is an effluent system:

- a. Should all sprinklers have be effluent (E)?
- b. Should the quick couplers be 476-04 instead?
- c. Should remote control valves be effluent (E)?

A17. It isn't.

Q18. If the quick coupler is not for an effluent system, should it be the 476-00 as shown on the legend or they 476-01 with yellow vinyl cover as mentioned in the specs?

A18. 476-01.

Q19. The remote-control valve model number is for an LSM system. Please confirm that the correct model number would be P220G-27-04 and P220G-27-06.

A19. Correct.

Q20. The Toro satellite model number listed in the legend is no longer valid. Please confirm that the 300-064P6M4A would be the correct model number.

A20. Correct.

Q21. Please confirm that the central is existing. If a new one is required, please provide the model number.

A21. LX-04-5-07, Lynx CE, LSS, Premium, 5-year.

Q22. Will a site survey and FCC license be required?

A22. Yes.

Q23. How many iPads are we to include for the central?

A23. Two (2).

Q24. Will pipe require 6" warning tape for mainline and 3" warning tape for lateral piping?

A24. No warning tape required.

Q25. Please confirm the Crispin PL10A valve is correct for the air relief, as it is a 1" valve.

A25. This is correct.

Q26. Are Toro valve boxes acceptable in lieu of the Old Castle and Carson valve boxes specified?

A26. No.

- Q27. Could you please go to sheet I-2. For all the irrigation line it states 6" and 8". Is this actually 6" and 8" schedule 40 Irrigation Pipe?
- A27. It's 6" and 8" HDPE pipe, as it is called out for in the equipment legend and construction details.
- Q28. Is the irrigation main line required to be sleeved.
- A28. It is not sleeved.
- Q29. Under page 1 of 65 "Code Compliance" for Manufactured Building System, can we provide a building that complies with "Housing Community Development (HCD) Title 25"?
- A29. Yes, you may provide a building that complies with "Housing Community Development (HCD) Title 25".
- Q30. Specification section 13 34 19 part 1.04 E; Manufacturer Qualification statement: Provide documentation showing metal building manufacturer is accredited under IAS AC472. Can we provide Modular building that is approved by State of California Housing Community Development (2019 CBC, CEC, CMC, CPC and California Energy Code, Title 25, Article 3 Section 4369B compliance) in lieu of the accreditation IAS AC472?
- A30. Yes, you may provide a modular building that is approved by State of California Housing Community Development (2019 CBC, CEC, CMC, CPC and California Energy Code, Title 25, Article 3 Section 4369B compliance) in lieu of the accreditation IAS AC472.

C. CLARIFICATIONS

1. To the Bidding Documents, Cover Page, **DELETE** in its entirety and **SUBSTITUTE** with page 13 of this Addendum.
2. To Required Documents Schedule, page 4, **DELETE** in its entirety and **SUBSTITUTE** with pages 14 through 15 of this Addendum.

D. NOTICE INVITING BIDS

1. To page 8, **ADD** the following:
14. PHASED FUNDING: For Phased Funding Conditions, see Attachment B.

E. ATTACHMENTS

1. To Attachment B, Reserved, page 26, **DELETE** in their entirety and **SUBSTITUTE** with pages 16 through 19 of this Addendum.
2. To Attachment G, Contract Agreement, pages 596 through 597, **DELETE** in its entirety and **SUBSTITUTE** with pages 20 through 21 of this Addendum.

F. SUPPLEMENTARY SPECIAL PROVISIONS

1. To Section 3 – Control of the Work, Subsection 3-13.1.2, Walk-through and Punchlist Procedure, pages 40 through 41, **DELETE** in their entirety and **SUBSTITUTE** with the following:

3-13.1.2 Walk-through and Punchlist Procedure. To the “WHITEBOOK”, **DELETE** in its entirety and **SUBSTITUTE** with the following:

1. You shall notify the Engineer 15 Working Days in advance of date of anticipated Substantial Completion to allow time for Engineer to schedule a Walk-through.
2. After you complete the requirements in 3-13.1.1, “Requirements Before Requesting Substantial Completion” and when you consider that the Work is Substantially Complete, you will notify the Engineer in writing that the Project is Substantially Complete and request a Walk-through. The Engineer will review your request and determine if the Project is ready for a Walk-through, by verifying whether you have completed all items as required by 3-13.1.1, “Requirements Before Requesting Substantial Completion”. Within 7 Working Days, the City will either reject your request for a Walk-through in writing or schedule and conduct a Walk-through inspection. The Engineer shall facilitate the Walk-through.
3. The following documents shall be provided at the time of your Walk-through request: As-Built markup,

Plans, specifications, technical data such as submittals and equipment manuals, draft final payment, warranties, material certifications, bonds, guarantees, maintenance service agreements, and maintenance and operating manuals.

4. Written warranties, except manufacturer's standard printed warranties, shall be on a letterhead addressed to you. Warranties shall be submitted in the format described in this section, modified as approved by the City, to suit the conditions pertaining to the warranty. Lack of submitting these items will delay start of Walk-through.
5. The Engineer will provide you with the Punchlist within 15 Working Days after the date of the Walk-through. The City shall not provide a preliminary Punchlist.
6. If the Engineer finds that the Project is not Substantially Complete as defined herein, the Engineer will terminate the Walk-through and notify you in writing.
7. If, at any time during the Engineer's evaluation of the corrective Work required by the Punchlist, the Engineer discovers that additional corrective Work is required, the Engineer may include that corrective Work in the Punchlist.
8. You shall remain solely responsible for the Project Site until the Project is completely operational, all Punchlist items have been corrected, all operation and maintenance manuals have been approved, all necessary warranty letters have been received, and the work is formally accepted by the City.
9. The Engineer shall meet with you within 5 Working Days of notification that all Punchlist items are corrected. You shall complete the Punchlist within

30 Working Days, and Working Days will continue to be counted until Acceptance of the Project.

2. To Section 6 – Prosecution and Progress of the Work, Subsection 6-1.1, Construction Schedule, page 55, **DELETE** in its entirety and **SUBSTITUTE** with the following:

6-1.1 Construction Schedule. To the “GREENBOOK”, paragraph (1), sentence (1), **DELETE** in its entirety and **SUBSTITUTE** with the following:

After notification of award of the Contract and prior to the start of any Work, you shall submit your proposed Cost Loaded Construction Schedule to the Engineer at the pre-construction meeting.

To the “WHITEBOOK”, item 1, subsection “e”, “s” and “h”, **DELETE** in their entirety and **SUBSTITUTE** with the following:

- e) Monthly progress payments are contingent upon the submittal of an updated Schedule to the Engineer. The Engineer may refuse to process the whole or part of any monthly payment if you refuse or fail to provide an acceptable schedule.
- s) Submit an updated cash flow forecast with every pay request (for each Project ID or WBS number provided in the Contract) showing periodic and cumulative construction billing amounts for the duration of the Contract Time. If there has been any Extra Work since the last update, include only the approved amounts.
 - i. Refer to the Sample City Invoice materials in **Appendix D – Sample City Invoice with Cash Flow Forecast** and use the format shown.
 - ii. See also the “Cash Flow Forecast Example” at the location below:

<https://www.sandiego.gov/ecp/edocref/>

- h) Your Schedule shall include 7 Working Days for the Engineer to schedule and conduct a Walk-through inspection and 15 Working Days for the generation of the Punchlist. You shall Work diligently to complete all Punchlist items within 30 Working Days after the Engineer provides the Punchlist.

To the "WHITEBOOK", ADD the following:

- 3. The **90 Calendar Day** Plant Establishment Period is included in the stipulated Contract Time and shall begin with the acceptance of installation of the vegetation plan in accordance with Section 801-6, "MAINTENANCE AND PLANT ESTABLISHMENT".
- 4. Contractor shall complete all work outlined in the contract documents, with the following additional stipulations:
 - a) The Contractor shall keep nine holes open for public play during construction and ensure operations allow for access in a reasonable flow from one hole to another. Contractor shall put safety measures in place for the public.
 - b) Contractor shall provide a clear access from the parking lot to the temporary amenities provided for golf use.
 - c) Contractor shall provide a clear access and maintain the golf range open for use during construction.
 - d) Contractor shall keep parking lot for public use.
- 5. Contractor to contact SDG&E immediately upon award of contract to coordinate all energy needs for the project as they have strict timelines and longer leadtimes for scheduling their work.
 - a. SDG&E has informed the City that there is no mechanism in the street for temporary power and

that temporary power for all project requirements needs to come from the existing on site electrical building. So, the new electrical building needs to be installed, and transfer of power between the two facilities has to be done prior to demolition of the existing electrical building. No services can be interrupted during this transfer of power, so contractor shall assume to make this transfer at off-hours.

G. PLANS

1. To Drawing Sheet 39986-03-D, WATER NOTES – **DELETE** Note 2 in its entirety.

James Nagelvoort, Director
Engineering & Capital Projects Department

Dated: *June 4, 2021*
San Diego, California

JN/MJN/mlw

City of San Diego

CONTRACTOR'S NAME: _____
ADDRESS: _____
TELEPHONE NO.: _____ FAX NO.: _____
CITY CONTACT: Brittany Friedenreich Senior Contract Specialist Email: BFriedenreic@sandiego.gov
Phone No. (619) 533-3140
M. Calleran / M. Jirjis Nakasha / M. L. Wenceslao

BIDDING DOCUMENTS



FOR

MBGC IRRIGATION & ELECTRICAL UPGRADES + MBGC CLUBHOUSE DEMO/PRTBL BUILDING INSTL

BID NO.: _____ **K-21-1919-DBB-3**
SAP NO. (WBS/IO/CC): _____ **S-11010, S-01090**
CLIENT DEPARTMENT: _____ **1714**
COUNCIL DISTRICT: _____ **2**
PROJECT TYPE: _____ **EA**

THIS CONTRACT WILL BE SUBJECT TO THE FOLLOWING:

- PHASED-FUNDING
- THE CITY'S SUBCONTRACTING PARTICIPATION REQUIREMENTS FOR SLBE PROGRAM
- PREVAILING WAGE RATES: STATE FEDERAL
- APPRENTICESHIP

BID DUE DATE:

**2:00 PM
JUNE 16, 2021**

CITY OF SAN DIEGO'S ELECTRONIC BIDDING SITE, PLANETBIDS

<http://www.sandiego.gov/cip/bidopps/index.shtml>

REQUIRED DOCUMENTS SCHEDULE DURING BIDDING AND AWARDING

The Bidder's attention is directed to the City's Municipal Code §22.0807(e), (3)-(5) for important information regarding grounds for debarment for failure to submit required documentation.

The specified Equal Opportunity Contracting Program (EOCP) forms are available for download from the City's web site at:

<http://www.sandiego.gov/eoc/forms/index.shtml>

ITEM	DOCUMENT TO BE SUBMITTED	WHEN DUE	FROM
1.	Tier II Prequal Submittal	At Time of Bid	ALL BIDDERS
2.	Bid Bond (PDF via PlanetBids)	<u>At Time of Bid</u>	ALL BIDDERS
3.	Contractors Certification of Pending Actions	At Time of Bid	ALL BIDDERS
4.	List of Subcontractors for Alternate Items	At Time of Bid	ALL BIDDERS
5.	Mandatory Disclosure of Business Interests	At Time of Bid	ALL BIDDERS
6.	Debarment and Suspension Certification for Prime Contractors	At Time of Bid	ALL BIDDERS
7.	Debarment and Suspension Certification for Subcontractors, Suppliers & Mfgs	At Time of Bid	ALL BIDDERS
8.	Bid Bond (Original)	By 5PM 3 working days after bid opening	ALL BIDDERS
9.	SLBE Good Faith Effort Documentation	By 5 PM 3 working days after bid opening	ALL BIDDERS
10.	Form AA60 – List of Work Made Available	By 5 PM 3 working days after bid opening with Good Faith Effort (GFE) documentation	ALL BIDDERS
11.	Phased Funding Schedule Agreement (when required)	Within 10 working days of receipt by the bidder of the Notice of Intent to Award	AWARDED BIDDER
12.	If the Contractor is a Joint Venture: <ul style="list-style-type: none"> • Joint Venture Agreement • Joint Venture License 	Within 10 working days of receipt by bidder of contract forms	AWARDED BIDDER
13.	Payment & Performance Bond: Certificates of Insurance & Endorsements	Within 10 working days of receipt by bidder of contract forms and NOI	AWARDED BIDDER

<u>ITEM</u>	<u>DOCUMENT TO BE SUBMITTED</u>	<u>WHEN DUE</u>	<u>FROM</u>
14.	Signed Contract Agreement Page	Within 3 working days of receipt by bidder of Contract Agreement	AWARDED BIDDER
15.	Listing of "Other Than First Tier" Subcontractors	Within 10 working days of receipt by bidder of contract forms	AWARDED BIDDER

ATTACHMENT B
PHASED FUNDING PROVISIONS

PHASED FUNDING SCHEDULE AGREEMENT

The particulars left blank below, such as the total number of phases and the amounts assigned to each phase, will be completed with funding specific information from the Pre-Award Schedule and Construction Cost Loaded Schedule submitted to and approved by the City.

BID NUMBER: K-21-1919-DBB-3

CONTRACT OR TASK TITLE: MBGC IRRIGATION & ELECTRICAL UPGRADES + MBGC CLUBHOUSE DEMO/PRTL BUILDING INSTL

CONTRACTOR: 3-D Enterprises, Inc.

Funding Phase	Phase Description	Phase Start	Phase Finish	Not-to-Exceed Amount
1	All work associated with MBGC Clubhouse Demo/Prtl Building Instl in accordance with Plans 40268-01-D through 40268-65-D , inclusive and all work associated with MBGC Irrigation & Electrical Upgrades in accordance with Plans 39986-01-D through 39986-08-D, inclusive, and in accordance with Plans 39986-16-D through 39986-29-D.	10/18/21	10/27/22	\$6,149,700
2	All work associated with the MBGC Irrigation & Electrical Upgrades in accordance with Plans 39986-09-D through 39986-15-D, inclusive,	03/01/22	10/27/22	\$3,050,000
3				\$
Contract Total				\$9,199,700

Notes:

- 1) WHITEBOOK section 7-3.10, "Phased Funding Compensation" applies.
- 2) The total of all funding phases shall be equal to the TOTAL BID PRICE as shown on BID SCHEDULE 1 - PRICES.
- 3) This PHASED FUNDING SCHEDULE AGREEMENT will be incorporated into the CONTRACT and shall only be revised by written modifications to the CONTRACT.

CITY OF SAN DIEGO

PRINT NAME: Tony Perez
Construction Senior Engineer
Signature: Tony Perez
Date: 9/16/21

CONTRACTOR

PRINT NAME: Shahrokh Elihu
Title: Vice President
Signature: [Signature]
Date: 09/15/21

PRINT NAME: Kevin Oliver
Design Senior Engineer

Signature: [Signature]
Date: 9.13.21

CONTRACT AGREEMENT

CONSTRUCTION CONTRACT

This Phase-Funded contract is made and entered into between THE CITY OF SAN DIEGO, a municipal corporation, herein called "City", and _____, herein called "Contractor" for construction of **MBGC Irrigation & Electrical Upgrades + MBGC Clubhouse Demo/Portbl Building Instl**; Bid No. **K-21-1919-DBB-3**; in the total amount _____ (\$ _____), which is comprised of the Base Bid plus/ Additive Alternates _____, consisting of an amount not to exceed \$ _____ for Phase I and \$ _____ for Phase II (**add additional phases as needed**).

IN CONSIDERATION of the payments to be made hereunder and the mutual undertakings of the parties hereto, City and Contractor agree as follows:

1. The following are incorporated into this contract as though fully set forth herein:
 - (a) The attached Faithful Performance and Payment Bonds.
 - (b) The attached Proposal included in the Bid documents by the Contractor.
 - (c) Reference Standards listed in the Instruction to Bidders and the Supplementary Special Provisions (SSP).
 - (d) Phased Funding Schedule Agreement.
 - (e) That certain documents entitled **MBGC Irrigation & Electrical Upgrades + MBGC Clubhouse Demo/Prtbl Building Instl**, on file in the office of Engineering & Capital Projects Department as Document No. **S-11010, S-01090**, as well as all matters referenced therein.
2. The Contractor shall perform and be bound by all the terms and conditions of this contract and in strict conformity therewith shall perform and complete in a good and workmanlike manner **MBGC Irrigation & Electrical Upgrades + MBGC Clubhouse Demo/Prtbl Building Instl**, Bid Number **K-21-1919-DBB-3**, San Diego, California.
3. For such performances, the City shall pay to Contractor the amounts set forth at the times and in the manner and with such additions or deductions as are provided for in this contract, and the Contractor shall accept such payment in full satisfaction of all claims incident to such performances (See WHITEBOOK, Section 7-3.10, Phased Funding Compensation).
4. No claim or suit whatsoever shall be made or brought by Contractor against any officer, agent, or employee of the City for or on account of anything done or omitted to be done in connection with this contract, nor shall any such officer, agent, or employee be liable hereunder.
5. This contract is effective as of the date that the Mayor or designee signs the agreement and is approved by the City Attorney in accordance with San Diego Charter Section 40.

CONTRACT AGREEMENT (continued)

IN WITNESS WHEREOF, this Agreement is signed by the City of San Diego, acting by and through its Mayor or designee, pursuant to Resolution No. R - _____ or Municipal Code _____ authorizing such execution.

THE CITY OF SAN DIEGO

APPROVED AS TO FORM

Mara W. Elliott, City Attorney

By _____

By _____

Print Name: _____
Mayor or designee

Print Name: _____
Deputy City Attorney

Date: _____

Date: _____

CONTRACTOR

By _____

Print Name: _____

Title: _____

Date: _____

City of San Diego License No.: _____

State Contractor's License No.: _____

DEPARTMENT OF INDUSTRIAL RELATIONS (DIR) REGISTRATION NUMBER: _____

City of San Diego

CITY CONTACT: Brittany Friedenreich Senior Contract Specialist Email: BFriedenreic@sandiego.gov
Phone No. (619) 533-3104

ADDENDUM B



FOR

MBGC IRRIGATION & ELECTRICAL UPGRADES + MBGC CLUBHOUSE DEMO/PRTBL BUILDING INSTL

BID NO.: _____ **K-21-1919-DBB-3** _____
SAP NO. (WBS/IO/CC): _____ **S-11010, S-01090** _____
CLIENT DEPARTMENT: _____ **1714** _____
COUNCIL DISTRICT: _____ **2** _____
PROJECT TYPE: _____ **EA** _____

BID DUE DATE:

2:00 PM
JUNE 16, 2021

CITY OF SAN DIEGO'S ELECTRONIC BIDDING SITE, PLANETBIDS

<http://www.sandiego.gov/cip/bidopps/index.shtml>

A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

B. ADDENDUM

1. To Addendum A, Section B, Page 6, Bidder's Questions, A24, **DELETE** in its entirety and **SUBSTITUTE** with the following:

A24. Contractor shall bid the project per the irrigation details shown on Sheet 14, I-6 of the MBGC Irrigation and Electrical Upgrades plans.

James Nagelvoort, Director
Engineering & Capital Projects Department

Dated: *June 10, 2021*
San Diego, California

JN/MJN/mlw

Bid Results

Bidder Details

Vendor Name 3-D Enterprises, Inc.
Address 3665 Ruffin Road Suite 103
 San Diego, California 92123
 United States
Respondee Shawn Elihu
Respondee Title Vice President
Phone 858-530-2202
Email office@3d-nt.com
Vendor Type PQUAL, CADIR
License # 621125
CADIR 1000003754

Bid Detail

Bid Format Electronic
Submitted 06/16/2021 1:49 PM (PDT)
Delivery Method
Bid Responsive
Bid Status Submitted
Confirmation # 257870

Respondee Comment

Buyer Comment

Attachments

File Title	File Name	File Type
MBGC Construction Pre-qualification Statement.pdf	MBGC Construction Pre-qualification Statement.pdf	Pre-Qualification Statement
Contractor's Cert Pending Actions.pdf	Contractor's Cert Pending Actions.pdf	Contractor's Certification of Pending Actions
Disclosure of Business Interests Form.pdf	Disclosure of Business Interests Form.pdf	Mandatory Disclosure of Business Interests Form
Debarment Subs.pdf	Debarment Subs.pdf	Debarment & Suspension Certification - Subs, Suppliers, Manuf.
Bid Bond.pdf	Bid Bond.pdf	Bid Bond
Debarment Prime.pdf	Debarment Prime.pdf	Debarment & Suspension Certification - Prime
Subcontractor Additive Alternate.pdf	Subcontractor Additive Alternate.pdf	List of Subcontractors for Alternate Items

Subcontractors

Showing 4 Subcontractors

Name & Address	Desc	License Num	CADIR	Amount	Type
A. B. Hashmi, Inc. 13066 Deer Canyon Court San Diego, California 92131	Constructor - Demolition, Concrete Bldg. Foundation	798383	1000002125	\$842,386.00	ELBE, DBE, CADIR, PQUAL
CVE San Diego 135 Utility Court Suite A Rohnert Park, California 94928	Construction - Asbestos Waste Abatement	974852	1000001557	\$14,580.00	
Landscapes Unlimited, LLC 1201 Aries Drive Lincoln, Nebraska 68513	Constructor - Golf Course Irrigation System	973614	1000007260	\$2,849,400.00	PQUAL
Precision Striping Inc 545 W Bradley Ave El Cajon, California 92020	Constructor Striping	1026547	1000051515	\$3,800.00	

Line Items

Discount Terms No Discount

Item #	Item Code	Type	Item Description	UOM	QTY	Unit Price	Line Total	Response	Comment
Main Bid (MBGC Irrigation & Electrical Upgrades)							\$4,038,000.00		
1	524126		Bonds (Payment and Performance)	LS	1	\$40,000.00	\$40,000.00	Yes	
2	238990		SCOPE OF WORK for MBGC Irrigation & Electrical Upgrades includes demolition, grading, installation of new golf course irrigation, electrical service and distribution equipment, electrical equipment pre-manufactured building, water service lines and drinking fountains, fencing, turf repair, potholing, if applicable, all necessary special inspections, permits and fees and all other incidental work and appurtenances in accordance with Plans 39986-01-D through 39986-29-D, inclusive and these specifications.	LS	1	\$3,670,000.00	\$3,670,000.00	Yes	
3	561730		Mobilization	LS	1	\$100,000.00	\$100,000.00	Yes	
4			Field Orders (EOC - Type II)	AL	1	\$173,000.00	\$173,000.00	Yes	
5	541330		WPCP Development	LS	1	\$5,000.00	\$5,000.00	Yes	
6	237310		WPCP Implementation	LS	1	\$50,000.00	\$50,000.00	Yes	
Main Bid (MBGC Clubhouse Demo/Prtbl Building Instl)							\$4,843,500.00		
7	524126		Bonds (Payment and Performance)	LS	1	\$50,000.00	\$50,000.00	Yes	
8	238990		SCOPE OF WORK for MBGC Clubhouse Demo/Prtbl Building Instl provides for the Demolition of the existing clubhouse building including Hazardous Waste Abatement, construction of two separate pre-manufactured buildings; one for golf operations and one for food service, turf repair, drainage, shade trellises, landscaping, irrigation, hardscape, parking lot and path of travel accessibility upgrade?s, potholing, all necessary special inspections, permits and fees and all other incidental work and appurtenances in accordance with Plans 40268-01-D through 40268-65-D, inclusive, and these specifications, except work related to Alternate Additive A.	LS	1	\$4,126,000.00	\$4,126,000.00	Yes	
9	238990		"Temporary Trailers". One (1) temporary trailer for Golf Operations and one (1) temporary trailer for bathrooms throughout construction, provided and installed by the contractor according to the list of requirements, floor plan and location map provided on Attachment E-Technical, inclusive, and these specifications. (EOC - Type I)	AL	1	\$200,000.00	\$200,000.00	Yes	
10	236220		Mobilization	LS	1	\$120,000.00	\$120,000.00	Yes	
11			Field Orders (EOC - Type II)	AL	1	\$312,500.00	\$312,500.00	Yes	
12	541330		WPCP Development	LS	1	\$5,000.00	\$5,000.00	Yes	
13	237310		WPCP Implementation	LS	1	\$30,000.00	\$30,000.00	Yes	
Additive Alternate A							\$318,200.00		
14	238990		"Island Patio Remodel": All Work on Island including flatwork, landscaping, trellis, electrical and pre-manufactured bridges, potholing, if applicable, all necessary special inspections, permits and fees and all other incidental work and appurtenances for Additive Alternate A as shown in accordance with Plans 40268-01-D through 40268-65-D, inclusive, and these specifications.	LS	1	\$240,000.00	\$240,000.00	Yes	
15	524126		Bonds (Payment and Performance)	LS	1	\$8,000.00	\$8,000.00	Yes	
16	236220		Mobilization	LS	1	\$12,000.00	\$12,000.00	Yes	
17			Field Orders (EOC - Type II)	AL	1	\$58,200.00	\$58,200.00	Yes	

Line Item Subtotals

Section Title	Line Total
Main Bid (MBGC Irrigation & Electrical Upgrades)	\$4,038,000.00
Main Bid (MBGC Clubhouse Demo/Prtbl Building Instl)	\$4,843,500.00
Additive Alternate A	\$318,200.00
Grand Total	\$9,199,700.00

Line Totals (Unit Price * Quantity)								
Item Num	Section	Item Code	Description	Reference	Unit of Measure	Quantity	3-D Enterprises, Inc. - Unit Price	3-D Enterprises, Inc. - Line Total
1	Main Bid (MBGC Irrigation & Electrical Upgrades)	524126	Bonds (Payment and Performance)	1-7.2.1	LS	1	\$40,000.00	\$40,000.00

2	Main Bid (MBGC Irrigation & Electrical Upgrades)	238990	SCOPE OF WORK for MBGC Irrigation & Electrical Upgrades includes demolition, grading, installation of new golf course irrigation, electrical service and distribution equipment, electrical equipment pre- manufactured building, water service lines and drinking fountains, fencing, turf repair, potholing, if applicable, all necessary special inspections, permits and fees and all other incidental work and appurtenances in accordance with Plans 39986-01-D through 39986-29-D, inclusive and these specifications.	7-3.1	LS	1	\$3,670,000.00	\$3,670,000.00
3	Main Bid (MBGC Irrigation & Electrical Upgrades)	561730	Mobilization	7-3.4.1	LS	1	\$100,000.00	\$100,000.00

4	Main Bid (MBGC Irrigation & Electrical Upgrades)		Field Orders (EOC - Type II)	7-3.9	AL	1	\$173,000.00	\$173,000.00
5	Main Bid (MBGC Irrigation & Electrical Upgrades)	541330	WPCP Development	1001-4.2	LS	1	\$5,000.00	\$5,000.00
6	Main Bid (MBGC Irrigation & Electrical Upgrades)	237310	WPCP Implementation	1001-4.2	LS	1	\$50,000.00	\$50,000.00
								\$4,038,000.00
7	Main Bid (MBGC Clubhouse Demo/Prtbl Building Instl)	524126	Bonds (Payment and Performance)	1-7.2.1	LS	1	\$50,000.00	\$50,000.00

8	Main Bid (MBGC Clubhouse Demo/Prtbl Building Instl)	238990	<p>A SCOPE OF WORK FOR MBGC Clubhouse Demo/Prtbl Building Instl provides for the Demolition of the existing clubhouse building including Hazardous Waste Abatement, construction of two separate pre- manufactured buildings; one for golf operations and one for food service, turf repair, drainage, shade trellises, landscaping, irrigation, hardscape, parking lot and path of travel accessibility upgrades, potholing, all necessary special inspections, permits and fees and all other incidental work and appurtenances in accordance with Plans 40268-01-D through 40268-65-D, inclusive, and these specifications</p>	7-3.1	LS	1	\$4,126,000.00	\$4,126,000.00
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9	Main Bid (MBGC Clubhouse Demo/Prtbl Building Instl)	238990	Temporary Trailers. One (1) temporary trailer for Golf Operations and one (1) temporary trailer for bathrooms throughout construction, provided and installed by the contractor according to the list of requirements, floor plan and location map provided on Attachment E-Technical, inclusive, and these specifications. (EOC - Type I)	7-3.1	AL	1	\$200,000.00	\$200,000.00
10	Main Bid (MBGC Clubhouse Demo/Prtbl Building Instl)	236220	Mobilization	7-3.4.1	LS	1	\$120,000.00	\$120,000.00
11	Main Bid (MBGC Clubhouse Demo/Prtbl Building Instl)		Field Orders (EOC - Type II)	7-3.9	AL	1	\$312,500.00	\$312,500.00

12	Main Bid (MBGC Clubhouse Demo/Prtbl Building Instl)	541330	WPCP Development	1001-4.2	LS	1	\$5,000.00	\$5,000.00
13	Main Bid (MBGC Clubhouse Demo/Prtbl Building Instl)	237310	WPCP Implementation	1001-4.2	LS	1	\$30,000.00	\$30,000.00
								\$4,843,500.00
14	Additive Alternate A	238990	Island Patio Remodel: All Work on Island including flatwork, landscaping, trellis, electrical and pre-manufactured bridges, potholing, if applicable, all necessary special inspections, permits and fees and all other incidental work and appurtenances for Additive Alternate A as shown in accordance with Plans 40268-01-D through 40268-65-D, inclusive, and these specifications.	7-3.1	LS	1	\$240,000.00	\$240,000.00

15	Additive Alternate A	524126	Bonds (Payment and Performance)	1-7.2.1	LS	1	\$8,000.00	\$8,000.00
16	Additive Alternate A	236220	Mobilization	7-3.4.1	LS	1	\$12,000.00	\$12,000.00
17	Additive Alternate A		Field Orders (EOC - Type II)	7-3.9	AL	1	\$58,200.00	\$58,200.00
							Subtotal	\$318,200.00
							Total	\$9,199,700.00