CITY OF TRACY

SAN JOAQUIN COUNTY, CALIFORNIA

Think Inside the Triangle™

Public Works Department
Engineering Division
333 Civic Center Plaza,
Tracy, California 95376
Phone: (209) 831-6478
Fax: (209) 831-4430

CONTRACT DOCUMENTS

For the Construction
of the

Transit Station Emergency Backup Generator Project
CIP 77592

BID ACCEPTANCE UNTIL: WEDNESDAY, MAY 27, 2026

BID OPENING: WEDNESDAY, MAY 27, 2026, 3:00PM

TEAMS meeting call in number: +1 209-425-4338,,140666606# United States, Stockton
Meeting ID : Meeting ID: 229 762 062 486 484 , Phone Conference ID: : 140 666 606#

Approved for Construction:

EVEN G. MARCELO, PE — Date
CITY ENGINEER

4/30/26

Transit Station Emergency Backup Generator Project
CIP 77592

Design Certifications

The Plans and Technical Specifications contained herein have been prepared by, or under the responsible charge of, the following registered person(s):

The KPA Group
1840 Fourth St, Suite 200
Livermore, CA 94550

Paul Powers — Date 4/28/26
License # C-29713
Exp. Date: 2/28/2027

Pharis Engineering
7110 Austinwood Road
Louisville, KY 40214

Keith Pharis — Date 4/28/26
License # 17740
Exp. Date: 3/31/2028

Table of Contents

A. INTRODUCTORY PAGES
Cover Page i
Design Certifications ii
Table of Contents iii
Location Map vii
Notice Inviting Bids viii
Instructions to Bidders ix

B. BID PROPOSAL
Bid Proposal P-1
Bid Schedule P-3
Subcontractor List P-5
Non-Collusion Declaration P-6
Bid Bond P-7
Bidder's Questionnaire P-9

C. CONTRACT AND FORMS
Contract C-1
Payment Bond C-6
Performance Bond C-8
Warranty Bond C-10

D. GENERAL CONDITIONS
Article 1 - Definitions GC-1
Article 2 - Roles and Responsibilities GC-3
2.1 City GC-3
2.2 Contractor GC-3
2.3 Subcontractors GC-6
2.4 Coordination of Work GC-7
2.5 Submittals GC-7
2.6 Shop Drawings GC-8
Article 3 - Contract Documents GC-8
3.1 Interpretation of Contract Documents GC-8
3.2 Order of Precedence GC-9
3.3 Caltrans Standard Specifications GC-9
3.4 For Reference Only GC-10
3.5 Current Versions GC-10
Article 4 - Bonds, Indemnity, and Insurance GC-10
4.1 Payment and Performance Bonds GC-10
4.2 Indemnity GC-10
4.3 Insurance GC-11
4.4 Warranty Bond GC-13
Article 5 - Contract Time GC-13
5.1 Time is of the Essence GC-13
5.2 Schedule Requirements GC-13
5.3 Delay and Extensions of Contract Time GC-15
5.4 Liquidated Damages GC-18
Article 6 - Contract Modification GC-18
6.1 Contract Modification and Changes in Work GC-18
6.2 Contractor Change Order Requests GC-19
6.3 Adjustments to Contract Price GC-20
6.4 Unilateral Change Order GC-21

6.5 Non-Compliance Deemed Waiver GC-21
Article 7 - General Construction Provisions GC-21
7.1 Permits and Taxes GC-21
7.2 Temporary Facilities GC-21
7.3 Noninterference and Additional Work Areas GC-22
7.4 Signs GC-22
7.5 Worksite and Nearby Property Protections. GC-23
7.6 Materials and Equipment GC-24
7.7 Substitutions GC-25
7.8 Testing and Inspection GC-26
7.9 Worksite Conditions and Maintenance GC-28
7.10 Traffic Control and Parking Restrictions. GC-30
7.11 Instructions and Manuals GC-32
7.12 As-built Drawings GC-32
7.13 Utilities. GC-32
7.14 Notice of Excavation GC-33
7.15 Trenching and Excavations. GC-34
7.16 Trenching and Excavations of Four Feet or More GC-34
7.17 Trenching of Five Feet or More GC-34
7.18 New Utility Connections GC-35
7.19 Shut Down Notification. GC-35
7.20 Lines and Grades. GC-35
7.21 Historic or Archeological Items GC-35
7.22 Environmental Control GC-35
Article 8 - Payment GC-36
8.1 Schedule of Values GC-36
8.2 Progress Payments GC-37
8.3 Adjustment of Payment Application GC-37
8.4 Acceptance of Work. GC-38
8.5 Retention GC-38
8.6 Setoff GC-39
8.7 Payment to Subcontractors and Suppliers GC-39
8.8 Final Payment GC-39
8.9 Release of Claims GC-39
8.10 Warranty of Title GC-39
Article 9 - Labor Provisions GC-39
9.1 General. GC-39
9.2 Discrimination Prohibited GC-40
9.3 Labor Code Requirements GC-40
9.4 Prevailing Wages GC-40
9.5 Payroll Records GC-40
9.6 Labor Compliance GC-41
Article 10 - Safety Provisions GC-41
10.1 Safety Precautions and Programs GC-41
10.2 Hazardous Materials GC-42
10.3 Material Safety GC-42
10.4 Hazardous Condition GC-42
10.5 Confined Space Entry Program GC-42
Article 11 - Completion and Warranty Provisions GC-43
11.1 Final Completion GC-43
11.2 Warranty GC-43
11.3 Use Before Final Completion GC-44
11.4 Substantial Completion GC-45
Article 12 - Dispute Resolution GC-45
12.1 Claims GC-45
12.2 Claims Submission GC-45

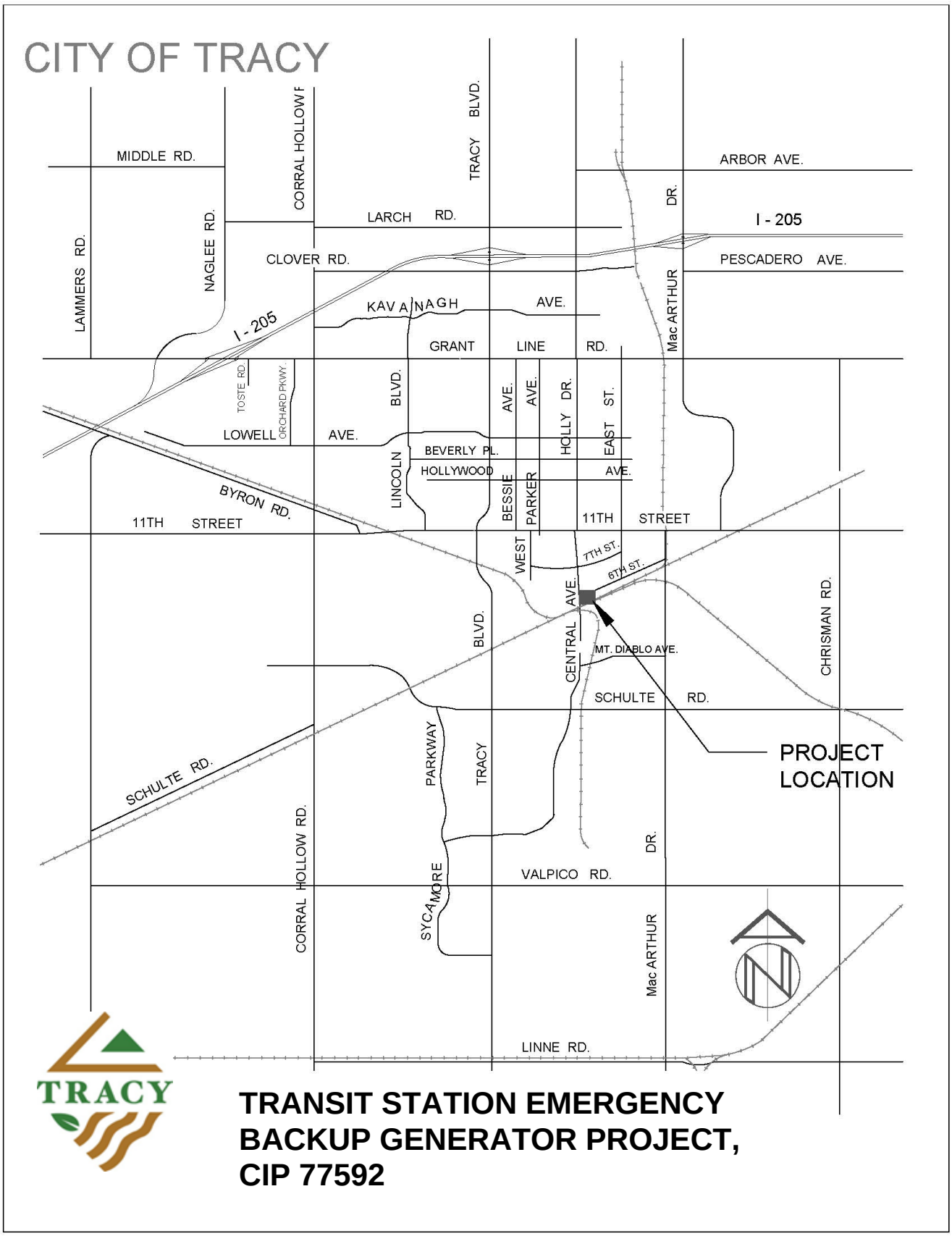
12.3 City's Response GC-47
12.4 Meet and Confer GC-47
12.5 Mediation and Government Code Claims GC-47
12.6 Tort Claims GC-48
12.7 Arbitration GC-48
12.8 Damages GC-48
12.9 Other Disputes GC-48
Article 13 - Suspension and Termination GC-48
13.1 Suspension for Cause GC-48
13.2 Suspension for Convenience GC-49
13.3 Termination for Default GC-49
13.4 Termination for Convenience GC-49
13.5 Effect of Any Contract Termination GC-50
Article 14 - Miscellaneous Provisions GC-50
14.1 Assignment of Unfair Business Practice Claims GC-50
14.2 Provisions Deemed Inserted GC-50
14.3 Waiver GC-50
14.4 Titles, Headings, and Groupings GC-50
14.5 Statutory and Regulatory References GC-51

E. TECHNICAL PROVISIONS

DIVISION 01 - GENERAL REQUIREMENTS
01 74 19 Construction Waste Management DIVISION 2 – EXISTING CONDITIONS
02 41 00 Demolition
DIVISION 3 – CONCRETE
03 05 00 Concrete Tests and Inspections
03 11 13 Concrete Formwork
03 20 00 Concrete Reinforcement
03 30 00 Cast-in-Place Concrete
DIVISION 5 – METALS
05 12 00 Structural Steel Framing
05 31 00 Steek Deck
05 50 00 Metal Fabrications
DIVISION 6 – WOOD AND PLASTICS
06 10 00 Rough & Finish Carpentry
DIVISION 7 – THERMAL AND MOISTURE PROTECTION
07 41 13 Standing Seam Metal Roof Panels
07 42 35 Metal Panels
07 84 00 Firestopping Systems
07 90 00 Joint Sealers
DIVISION 9 – FINISHES
09 24 00 Portland Cement Plastering
09 90 00 Painting
DIVISION 10 – SPECIALTIES
10 14 00 Signage
10 44 13 Fire Extinguisher Cabinets
DIVISION 26 – ELECTRICAL
26 05 00 Common Work Results for Electrical

26 05 19 Low-Voltage Electrical Power Conductors and Cables
26 05 26 Grounding and Bonding for Electrical Systems
26 05 29 Hangers and Supports for Electrical Systems
26 05 33 Raceway and Boxes for Electrical Systems
26 05 53 Identification for Electrical Systems
26 24 13 Switchboards
26 24 16 Panelboards
26 27 26 Wiring Devices
26 28 16 Enclosed Switches and Circuit Breakers
26 32 13 Engine Generators
26 36 00 Automatic Transfer Switches
DIVISION 31 – EARTHWORK
31 23 00 Excavating Backfilling and Compacting
DIVISION 32 – EXTERIOR IMPROVEMENTS
32 05 23 Cement and Concrete for Exterior Improvements
32 84 00 Planting Irrigation

F. APPENDICES
APPENDIX A – City Local Hiring Policy
APPENDIX B – City of Tracy Truck Route
APPENDIX C – PGE Construction Sketch



TRANSIT STATION EMERGENCY BACKUP GENERATOR PROJECT, CIP 77592

Location Map

Notice Inviting Bids

1. **Bid Acceptance and Opening.** The City of Tracy ("City"), will accept sealed bids for its **Transit Station Emergency Backup Generator Project, CIP 77592**, ("Project"), by or before May 27 2026, at 3:00p.m., at the City Clerk's Office, 2nd Floor, 333 Civic Center Plaza, Tracy, California, 95376. Bids will be publicly opened immediately thereafter.

2. **Location and Description.** The Project is located at 50 East 6th Street, Tracy, CA, 95376. Work includes: Installation of a diesel emergency generator, generator enclosure, trash enclosure improvements and all associated electrical and landscape improvements as shown on the contract plans.

3. **Time for Completion.** The planned timeframe for work is between August 2026 and August 2027. Contract time to be three hundred sixty-five (365) calendar days.

4. **License.** This Project requires a valid California contractor's license for the following classification(s): Class B, General Building Contractor's License.

5. **DIR Registration. Contractor must submit proof of DIR Registration with Bid Proposal.**

6. **Contract Documents.** Bids are required for the entire project work and shall be made upon the Bid Forms in accordance with the Instructions to Bidders.

   Bid Documents and Addenda can be viewed, downloaded and printed for submittal from QuestCDN - Construction DataNetwork: https://qcpi.questcdn.com/cdn/posting/?group=4201841&provider=4201841&projType=all

   Hard copies of the Contract Documents are not available for purchase. For technical questions, please contact D'Evelyn Spekner at develyn.spekner@cityoftracy.org or 209-831-6453.

7. **Prevailing Wage Requirements.** This Project is subject to the prevailing wage requirements, available at City Engineer's office or online at http://www.dir.ca.gov/DLSR, applicable to the locality in which the Work is to be performed.

8. **Bonds.** The successful bidder will be required to provide performance and payment bonds, each for 100% of the maximum Contract Price, and a warranty bond for 10% of the maximum Contract Price.

9. **Substitution of Securities.** Substitution of appropriate securities in lieu of retention amounts from progress payments is permitted under Public Contract Code section 22300.

10. **Subcontractor List.** A completed Subcontractor List form must be submitted with the Bid Proposal in accordance with the Instructions to Bidders.

11. **Pre-bid Job Walk.** An OPTIONAL Pre-bid Job Walk will be held at 50 East 6th Street, Tracy, CA 95376, on Tuesday, May 12, 2026, at 10:00 a.m. Attendance is OPTIONAL but highly recommended.

By: _____ Date: April 30, 2026
April B. A. Quintanilla, City Clerk

Publication Dates: 1) May 8, 2026 2) May 15, 2026

END OF NOTICE INVITING BIDS

Instructions to Bidders

Each Bid Proposal submitted to the City of Tracy ("City") for its **Transit Station Emergency Backup Generator Project, CIP 77592**, ("Project") must be submitted in accordance with the following instructions and requirements:

1. Bid Submission.

1.1 General. Each Bid Proposal must be signed, sealed and submitted to City, using the form provided in the Contract Documents, by or before the date and time set forth in the Notice Inviting Bids, or as amended by subsequent addendum. Faxed or emailed Bid Proposals will not be accepted, unless otherwise specified. Late submissions will be returned unopened to the bidder. City reserves the right to postpone the date and time for receiving or opening bids. Each bidder is solely responsible for all of its costs to prepare and submit its bid and by submitting a bid waives any right to recover those costs from City. The bid price(s) must include all costs to perform the Work as specified, including all labor, material, supplies, and equipment and all other direct or indirect costs such as applicable taxes, insurance and overhead.

1.2 Bid Envelope. The envelope containing the sealed Bid Proposal and required attachments must be clearly labeled and addressed as follows:

BID PROPOSAL:
Transit Station Emergency Backup Generator Project
CIP No. 77592

City Clerk
333 Civic Center Plaza
Tracy, CA 95376

The envelope must also be clearly labeled, as follows, with the bidder's name, address, and its registration number with the California Department of Industrial Relations ("DIR") for bidding on public works contracts (Labor Code sections 1725.5 and 1771.1):

[Contractor company name]
[street address]
[city, state, zip code]
DIR Registration No:_____

The bidder must also attach proof of current DIR registration to the **outside** of the sealed envelope.

1.3 DIR Registration. Subject to limited legal exceptions for joint venture bids and federally-funded projects, City may not accept a Bid Proposal from a bidder without proof that the bidder is registered with the DIR to perform public work under Labor Code section 1725.5. If City is unable to confirm that the bidder is currently registered with the DIR, City may disqualify the bidder and return its bid unopened. (Labor Code sections 1725.5 and 1771.1(a).)

2. Bid Proposal Form and Enclosures. Each Bid Proposal must be completed in ink using the Bid Proposal form included in the Contract Documents. The Bid Proposal form must be fully completed without interlineations, alterations, or erasures. Any necessary corrections must be clear and legible, and must be initialed by the bidder's authorized representative. A Bid Proposal submitted with terms such as "negotiable," "will negotiate," or similar terms,

will be considered nonresponsive. Each Bid Proposal must be accompanied by bid security, as set forth in Section 4 below, and by the completed Subcontractor List, and Non-Collusion Declaration using the forms included in the Contract Documents.

3. **Authorization and Execution.** Each Bid Proposal must be signed by the bidder's authorized representative. A Bid Proposal submitted by a partnership must be signed in the partnership name by a general partner with authority to bind the partnership. For a corporation, at least two signatures are required: (1) one from an officer on the operations side of the corporation (such as president, vice president, chief operating officer, etc.); and (2) one from the finance side of the corporation (such as the chief financial officer, treasurer, etc.) or from the corporate secretary. Alternatively, if only one signature will be obtained from a corporation, attach the corporate resolution authorizing that individual to bind the corporation to contracts.

4. **Bid Security.** Each Bid Proposal must be accompanied by bid security of ten percent (10%) of the maximum bid amount, in the form of a cashier's check, a certified check, or a bid bond using the form included in the Contract Documents and executed by a surety licensed to do business in the State of California, made payable to City. The bid security must guarantee that within ten days after issuance of the notice of award, the bidder will execute and submit the enclosed Contract for the bid price; submit payment and performance bonds for 100% of the maximum Contract Price; submit a warranty bond for 10% of the maximum Contract Price; and submit the insurance certificates and endorsements and other submittals, if any, required by the Contract Documents.

5. **Bidder's Questionnaire.** A completed, signed Bidder's Questionnaire using the form provided with the Contract Documents and including all required attachments must be submitted with the sealed bid. A bid that does not comply with this requirement may be rejected as nonresponsive. A bidder who submits a Bidder's Questionnaire which is subsequently determined to contain false or misleading information, or material omissions, may be disqualified as non-responsible.

6. **Pre-Bid Investigation.**

6.1 General. Each bidder is solely responsible at its sole expense for diligent and thorough review of the Contract Documents, examination of the Project site, and reasonable and prudent inquiry concerning known and potential site and area conditions before submitting a Bid Proposal. Each bidder is responsible for knowledge of conditions and requirements which reasonable review and investigation would have disclosed. However, except for any areas that are open to the public at large, bidders may not enter City's property or the Project site without prior written authorization from City. Bidders are responsible for reporting any errors or omissions in the Contract Documents to City before submitting a Bid Proposal, subject to the limitations of Public Contract Code section 1104. City expressly disclaims responsibility for assumptions a bidder might draw from the presence or absence of information provided by City.

6.2 Project Site. Soil and soil test data, water table elevations, and soil analyses for test holes may be provided "For Reference Only," as defined in Section 3.4 of the General Conditions. Any additional subsurface exploration at the Project site must be done at the bidder's expense, but only with prior written authorization from City. All soil data and analyses available for inspection or provided in the Contract Documents apply only to the test hole locations. The water table elevation indicated by a soil test report existed on the date the test hole was drilled. The bidder is responsible for determining and allowing for any differing soil or water table conditions during construction. Because groundwater levels may fluctuate, difference(s) in elevation between ground water shown in soil boring logs and ground water actually encountered during Project construction will not be considered changed Project site conditions. Actual locations and depths must be determined by

bidder's field investigation. The bidder may request access to underlying or background information on the Project site in City's possession that is necessary for the bidder to form its own conclusions, including, if available, record drawings or other documents indicating the location of subsurface lines, utilities, or other structures.

6.3 Utility Company Standards. The Project must be completed in a manner that satisfies the standards and requirements of the affected utility companies or agencies (collectively, the "utility owners"). The successful bidder may be required by the utility owners to provide detailed plans prepared by a California registered civil engineer showing the necessary temporary support of the utilities during coordinated construction work. Bidders are directed to contact the utility owners to learn about their requirements before submitting a Bid Proposal.

7. **Bidders Interested in More Than One Bid.** No person, firm, or corporation may submit or be a party to more than one Bid Proposal unless alternate bids are specifically called for. However, a person, firm, or corporation that has submitted a subcontract proposal or quote to a bidder may submit subcontract proposals or quotes to other bidders, and may also submit a Bid Proposal as a prime contractor.

8. **Requests for Information.** Questions or requests for clarifications regarding the Project, the bid procedures or any of the Contract Documents may only be submitted in writing by email to D'Evelyn Spekner, Associate Engineer, at develyn.spekner@cityoftracy.org .Oral responses are not authorized and are not binding on the City. Bidders are strongly encouraged to submit such inquiries at least five working days before the scheduled bid opening. For purposes of this Section 8, a "working day" means a day that City is open for normal business, and excludes weekends and holidays observed by City. Questions received any later might not be addressed before the bid deadline. An interpretation or clarification by City in response to a written inquiry will be issued in an addendum.

9. **Addenda.** Any addenda issued before the bid opening are part of the Contract Documents. Subject to the limitations of Public Contract Code section 4104.5, City reserves the right to issue addenda before bid time. Each bidder is responsible for ensuring it has received and reviewed all addenda submitting its bid. Bidders are strongly encouraged to check City's website periodically for any addenda or updates on the Project, as specified in Section 4 of the Notice Inviting Bids.

10. **Brand Designations and "Or Equal" Substitutions.** Any specification designating a material, product, thing, or service by specific brand or trade name, followed by the words "or equal," is intended only to indicate quality and type of item desired, and bidders may request use of any equal material, product, thing, or service. All data substantiating the proposed substitute as an "equal" item must be submitted with the written request for substitution. Any request for substitution must contain all information required by Section 7.7 of the General Conditions. This provision does not apply to materials, products, things, or services that may lawfully be designated by a specific brand or trade name under Public Contract Code section 3400(c).

11. **Withdrawal of Bid Proposals.** A Bid Proposal may not be withdrawn for a period of 90 days after the bid opening without forfeiture of the bid security, except as authorized for material error under Public Contract Code section 5100 et seq.

12. **License(s).** The successful bidder and its Subcontractor(s) must possess the California contractor's license(s) in the classification(s) required by law to perform the Work. The successful bidder must also obtain a City business license within ten days following City's issuance of the notice of award. Each Subcontractor must also obtain a City business license before beginning any Work.

13. Bid Protest. Any bid protest must be in writing and received by the City Clerk at 333 Civic Center Plaza, Tracy, CA 95376 or via email at CityClerk-acct@cityoftracy.org before 5:00 p.m. no later than five working days following bid opening (the "Bid Protest Deadline") and must comply with the following requirements:

13.1 General. Only a bidder who has actually submitted a Bid Proposal is eligible to submit a bid protest against another bidder. Subcontractors are not eligible to submit bid protests. A bidder may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest. If required by City, the protesting bidder must submit a non-refundable fee in the amount specified by City, based upon City's reasonable costs to administer the bid protest. Any such fee must be submitted to City no later than the Bid Protest Deadline, unless otherwise specified. For purposes of this Section 13, a "working day" means a day that City is open for normal business, and excludes weekends and holidays observed by City.

13.2 Protest Contents. The bid protest must contain a complete statement of the basis for the protest and all supporting documentation. Material submitted after the Bid Protest Deadline will not be considered. The protest must refer to the specific portion or portions of the Contract Documents upon which the protest is based. The protest must include the name, address, email address, and telephone number of the person representing the protesting bidder if different from the protesting bidder.

13.3 Copy to Protested Bidder. A copy of the protest and all supporting documents must be concurrently transmitted and received by email or hand delivery, by or before the Bid Protest Deadline, to the bidder whose bid is being protested ("protested bidder") and any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

13.4 Response to Protest. The protested bidder may submit a written response to the protest, provided the response is received by City before 5:00 p.m., within two working days after the Bid Protest Deadline or after actual receipt of the bid protest, whichever is sooner (the "Response Deadline"). The response must include all supporting documentation. Material submitted after the Response Deadline will not be considered. The response must include the name, address, email address, and telephone number of the person representing the protested bidder if different from the protested bidder.

13.5 Copy to Protesting Bidder. A copy of the response and all supporting documents must be concurrently transmitted by fax or by email, by or before the Response Deadline, to the bidder who has submitted the protest ("protesting bidder") and any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

13.6 Exclusive Remedy. The procedure and time limits set forth in this Section are mandatory and are the bidder's sole and exclusive remedy in the event of bid protest. A bidder's failure to comply with these procedures will constitute a waiver of any right to further pursue a bid protest, including filing a Government Code Claim or initiation of legal proceedings.

13.7 Right to Award. City reserves the right, acting in its sole discretion, to reject any bid protest that it determines lacks merit, to award the Contract to the bidder it has determined to be the responsible bidder submitting the lowest responsive bid, and to issue a notice to proceed with the Work notwithstanding any pending or continuing challenge to its determination.

14. Rejection of Bids; Award of Contract. City reserves the right, acting in its sole discretion, to waive immaterial bid irregularities, to accept or reject any and all bids, or to

abandon the Project entirely. The Contract will be awarded, if at all, within 90 days after opening of bids or as otherwise specified in the Special Conditions, to the responsible bidder that submitted the lowest responsive bid.

15. Bonds. The successful bidder is required to submit payment and performance bonds as specified in the Contract Documents using the bond forms included in the Contract Documents, within ten days following City's issuance of the notice of award. All required bonds must be calculated on the maximum total Contract Price as awarded, including additive alternates, if applicable. The payment and performance bonds must each be for 100% of the maximum Contract Price, and the warranty bond for 10% of the maximum Contract Price.

16. Ineligible Subcontractor. Any Subcontractor who is ineligible to perform work on a public works project under Labor Code sections 1777.1 or 1777.7 is prohibited from performing Work on this Project.

17. Engineer's Estimate. The Engineer's estimate prepared pursuant to Government Code section 4004 will not be available for public review until after the bids have been opened.

18. Bid Submittals. Each bid must include each of the following documents, completed and signed as directed, using the forms provided by City and including any required attachments:

18.1 Bid Proposal Form;
18.2 Bid Schedule;
18.3 Subcontractor List;
18.4 Noncollusion Declaration;
18.5 Bid Security or Bid Bond;
18.6 Bidder's Questionnaire; and
18.7 No other submittals are required

19. Safety Orders. If the Project includes construction of a pipeline, sewer, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, which are five feet or deeper, each bid must include a bid item for adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life or limb, which comply with safety orders as required by Labor Code section 6707.

20. Bid Schedule. Bidders are required to complete the Bid Schedule form accompanying the Bid Proposal form with unit prices as indicated, and to submit the completed Bid Schedule with their Bid Proposal.

20.1 Incorrect Totals. If a computational error for any bid item (base bid or alternate) results in an incorrect extended total for that item, the submitted base bid or bid alternate total will be adjusted to reflect the corrected amount (estimated quantity X unit cost), unless the cumulative amount of correction changes the total amount of the base bid or bid alternate by more than five percent (5%). If there is a discrepancy between the actual total of the itemized or unit prices shown on the Bid Schedule for the base bid, and the amount entered as the base bid on the Bid Proposal form, the actual total of the itemized or unit prices shown on the Bid Schedule for the base bid will be deemed the base bid price. Likewise, if there is a discrepancy between the actual total of the itemized or unit prices shown on the Bid Schedule for any bid alternate, and the amount entered for the alternate on the Bid Proposal form, the actual total of the itemized prices shown on the Bid Schedule for that alternate will be deemed the alternate price. Nothing in this provision is intended to prevent a bidder from requesting to withdraw its bid for material error under Public Contract Code section 5100 et seq.

20.2 Estimated Quantities. The quantities shown on the Bid Schedule are estimated and the actual quantities required to perform the Work may be greater or less than the estimated amount. The Contract Price will be adjusted to reflect the actual quantities required for the Work based on the itemized or unit prices provided in the Bid Schedule, with no allowance for anticipated profit for quantities that are deleted or decreased.

21. **For Reference Only.** The following documents are provided "For Reference Only," as defined in Section 3.4 of the General Conditions:
APPENDIX C – PGE Construction Sketch

22. **Subcontractor Work Limits.** The prime contractor must perform at least 20% of the Work on the Project, calculated as a percentage of the base bid price, with its own forces, except for any Work identified as "Specialty Work" in the Contract Documents. The total bid amount for any such Specialty Work, as shown on the Bid Schedule, may be deducted from the base bid price before computing the __% self-performance requirement. The remaining Work may be performed by qualified Subcontractor(s).

END OF INSTRUCTIONS FOR BIDDERS

Bid Proposal

Transit Station Emergency Backup Generator Project, CIP 77592

_____ ("Bidder") hereby submits this Bid Proposal to the City of Tracy ("City") for the above-referenced project ("Project") in response to the Notice Inviting Bids and in accordance with the Contract Documents referenced therein.

1. **Base Bid.** Bidder proposes to perform and complete the Work for the Project as specified in the Contract Documents, within the time required for full completion of the Work, including all labor, materials, supplies, and equipment and all other direct or indirect costs including, but not limited to, taxes, insurance and all overhead for the following price ("Base Bid"):
   $ _____.

2. **Addenda.** Bidder agrees that it has confirmed receipt of or access to, and review of all addenda issued for this Bid. Bidder specifically acknowledges receipt of the following addenda:

Addendum:	Date Issued:	Addendum:	Date Issued:
#01	_____	#05	_____
#02	_____	#06	_____
#03	_____	#07	_____
#04	_____	#08	_____

3. **Bidder's Warranties.** By signing and submitting this Bid Proposal, Bidder warrants the following:

   3.1 Examination of Contract Documents. Bidder has thoroughly examined the Contract Documents, and represents that, to the best of Bidder's knowledge there are no errors, omissions, or discrepancies in the Contract Documents subject to the limitations of Public Contract Code section 1104.

   3.2 Examination of Worksite. Bidder has had the opportunity to examine the Worksite and local conditions at the Project location.

   3.3 Bidder is Qualified. Bidder is qualified to perform the Work.

   3.4 Responsibility for Bid. Bidder has carefully reviewed this Bid Proposal and is solely responsible for any errors or omissions contained in its completed Bid.

4. **Award of Contract** . By signing and submitting this Bid Proposal, Bidder agrees that if Bidder is awarded the Contract for the Project, that within ten days following issuance of the notice of award to Bidder, Bidder will do all of the following:

   4.1 Execute Contract. Enter into the Contract with City in accordance with the terms of this Bid Proposal, by signing and submitting to City the Contract prepared by City using the form included with the Contract Documents;

   4.2 Submit Required Bonds. Submit to City a payment bond and a performance bond, each for 100% of the Contract Price, and a warranty bond for 10% of the Contract Price, using the bond forms provided and in accordance with the requirements of the Contract Documents; and

4.3 Insurance Requirements. Submit to City the insurance certificate(s) and endorsement(s) as required by the Contract Documents.

5. Bid Security. As a guarantee that, if awarded the Contract, Bidder will perform its obligations under Section 4, above, Bidder is enclosing bid security in the amount of ten percent of its maximum bid amount in one of the following forms:

____ A cashier's check or certified check payable to City and issued by _____ in the amount of $_____.

____ A bid bond, using the Bid Bond form included with the Contract Documents, payable to City and executed by a surety licensed to do business in the State of California.

This Bid Proposal is hereby submitted on _____, 20__:

s/ _____
_____
Name and Title [print]

s/ _____
_____
[See section 3 of Instructions to Bidders] Name and Title [print]

_____
_____
Company Name License # and Classification

_____
_____
Address DIR Registration #

_____
_____
City, State, Zip Phone

_____
_____
Contact Name Contact Email

END OF BID PROPOSAL

Bid Schedule

This Bid Schedule must be completed in ink and must be included with the sealed Bid Proposal. Pricing must be provided for each Bid Item as indicated. Items marked "(SW)" are Specialty Work that must be performed by a qualified Subcontractor. The lump sum or unit cost for each item must be inclusive of all costs, whether direct or indirect, including profit and overhead. The sum of all amounts entered in the "Extended Total Amount" column must be identical to the Base Bid price entered in Section 1 of the Bid Proposal Form.

AL = Allowance CF = Cubic Feet CY = Cubic Yard EA = Each LB = Pounds
LF = Linear Foot LS = Lump Sum SF = Square Feet TON = Ton (2000 lbs)

BID ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	EXTENDED TOTAL AMOUNT
1	General Conditions	**1**	**LS**	$	$
2	Mobilization & Demobilization	**1**	**LS**	$	$
3	Clearing, Grubbing & Demolition	**1**	**LS**	$	$
4	Furnish & Install HSS Steel Framing & Connections per Contract Documents, Complete in Place	**1**	**LS**	$	$
5	Construct Generator Enclosure – Reinforced Concrete Foundation & Walls, Complete in Place	**1**	**LS**	$	$
6	Construct Generator Enclosure – Furnish & Install Gates, Hardware & Wall Panels, Complete in Place (N)	**1**	**LS**	$	$
7	Furnish & Install Trash Enclosure Modifications, Reinforced Concrete, Roof, Gates, Hardware, Wall Panels, & Down Spout Complete in Place (N), etc.	**1**	**LS**	$	$
8	Furnish & Install 250kW New Diesel Generator w/Aftermarket Tier 4 Emissions System, 48-Hr Fuel Storage Tank and Custom Enclosure, Annunciator System, & Emergency Shut off, etc., Complete in Place	**1**	**LS**	$	$
9	Perform Directional Bore, Including Conduits and Handholes for Grounding & Communications Systems, Complete in Place	**1**	**LS**	$	$
10	Furnish & Install Electrical Work including all panelboards, switchboards, PG&E vault, raceways, conduits, conductors & all related items, Complete in Place	**1**	**LS**	$	$
11	Furnish & Install Landscaping and Irrigation, including Tree & Stump Removal, (N) Irrigation Meter, Backflow Relocation, Valves, Controls, & Fine Grading, etc., Complete in Place	**1**	**LS**	$	$

BID ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	EXTENDED TOTAL AMOUNT
12	Perform Miscellaneous Work – Pavement Striping, Signage, Bollards, Perimeter Fencing & Gate, Fire extinguisher & Cabinet, etc., Complete in Place per Contract Documents	**1**	**LS**	$	$

TOTAL BASE BID: Items 1 through _____inclusive: $_____

[Note: The amount entered as the "Total Base Bid" should be identical to the Base Bid amount entered in Section 1 of the Bid Proposal form.]

BIDDER NAME: _____

END OF BID SCHEDULE

Subcontractor List

For each Subcontractor who will perform a portion of the Work in an amount in excess of one-half of 1% of the Bidder's total Contract Price,[1] Bidder must list a description of the Work, the name of the Subcontractor, its California contractor license number, the location of its place of business, DIR registration number and percentage of Work to be performed, measured as a percentage of the Base Bid amount. **Bidders: Please print legibly. Illegible forms may be rejected.**

DESCRIPTION OF WORK	SUBCONTRACTOR NAME	CALIFORNIA CONTRACTOR LICENSE NO.	LOCATION OF BUSINESS	DIR REG. NO.	PERCENT OF WORK

END OF SUBCONTRACTOR LIST

[1] For street or highway construction this requirement applies to any subcontract of $10,000 or more.

Non-Collusion Declaration

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the _____ [title] of _____ [business name], the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. 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. All statements contained in the bid are true. 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, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid and will not pay, any person or entity for such purpose.

This declaration is intended to comply with California Public Contract Code section 7106 and Title 23 U.S.C section 112.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ [date], at _____ [city], _____ [state].

s/_____

_____
Name [print]

END OF NONCOLLUSION DECLARATION

Bid Bond

_____ ("Bidder") has submitted a bid, dated _____, 20_____ ("Bid"), to the City of Tracy ("City") for work on the ,**Transit Station Emergency Backup Generator Project, CIP 77592**, ("Project"). Under this duly executed bid bond ("Bid Bond"), Bidder as Principal and _____, its surety ("Surety"), are bound to City as obligee in the penal sum of ten percent of the maximum amount of the Bid (the "Bond Sum"). Bidder and Surety bind themselves and their respective heirs, executors, administrators, successors and assigns, jointly and severally, as follows:

1. **General.** If Bidder is awarded the Contract for the Project, Bidder will enter into the Contract with City in accordance with the terms of the Bid.

2. **Submittals.** Within ten days following issuance of the notice of award to Bidder, Bidder must submit to City the following:

   2.1 Contract. The executed Contract, using the form provided by City in the Project contract documents ("Contract Documents");

   2.2 Payment and Performance Bonds. A payment bond and a performance bond, each for 100% of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Payment Bond and Performance Bond forms included with the Contract Documents;

   2.3 Warranty Bond. A warranty bond for 10% of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Warranty Bond form included with the Contract Documents; and

   2.4 Insurance. The insurance certificate(s) and endorsement(s) required by the Contract Documents, and any other documents required under the Instructions for Bidders.

3. **Enforcement.** If Bidder fails to execute the Contract and to submit the bonds and insurance certificates as required by the Contract Documents, Surety guarantees that Bidder forfeits the Bond Sum to City. Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

   Attn: _____
   Address: _____
   City/State/Zip: _____
   Phone: _____
   Fax: _____
   Email: _____

4. **Duration; Waiver.** If Bidder fulfills its obligations under Section 2, above, then this obligation will be void; otherwise it will remain in effect for 90 days following award of the Contract or until this Bid Bond is returned to Bidder, whichever occurs first. Surety waives the provisions of Civil Code sections 2819 and 2845.

[Signatures are on the following page.]

This Bid Bond is entered into and effective on _____, 20_____.

SURETY: _____
Business name

s/ _____

_____
Name/Title

(Acknowledgement with Notary Seal for Surety, and Surety's Power of Attorney Certificate must be attached.)

CONTRACTOR: _____
Business name

s/ _____

_____
Name/Title

END OF BID BOND

Bidder's Questionnaire

TRANSIT STATION EMERGENCY BACKUP GENERATOR PROJECT, CIP 77592

Each Bid Proposal must be accompanied by a completed, signed Bidder's Questionnaire using this form, including all required attachments and clearly labeled additional sheets, if needed. The Questionnaire must be filled out completely, accurately, and legibly. Any errors, omissions, or misrepresentations in completion of the Questionnaire may be grounds for rejection of the bid or termination of a Contract awarded pursuant to the bid.

Part 1: General Information

Bidder Business Name: _____ ("Bidder")

Check One: ___ Corporation
___ Partnership
___ Sole Proprietorship
___ Joint Venture of: _____
___ Other:_____

Address: _____

_____

Phone: _____

Owner of Business: _____

Contact Person: _____

Email: _____

Bidder's California Contractor's License Number(s): _____

Part 2: Bidder Experience

1. How many years has Bidder been in business under its present business name? ____ years

2. Has Bidder completed projects similar in type and size to this Project as a general contractor?
_____ Yes _____ No

3. Has Bidder ever been disqualified on grounds that it is not responsible?
_____ Yes _____ No

If yes, provide additional information on a separate sheet of paper regarding the disqualification, including the name and address of the agency or owner of the subject project, the type and size of the project, the reasons that Bidder was disqualified as not responsible, and the month and year in which the disqualification occurred.

4. Has Bidder ever been terminated from a construction project, either as a general contractor or as a subcontractor?
_____ Yes _____ No

If yes, provide additional information on a separate sheet of paper regarding the termination, including the name and address of the agency or owner of the subject project, the type and size

of the project, whether Bidder was under contract as a general contractor or a subcontractor, the reasons that Bidder was terminated, and the month and year in which the termination occurred.

5. Provide information about Bidder's past projects performed as general contractor as follows:

5.1 Six most recently completed public works projects within the last three years;

5.2 Three largest completed projects within the last three years; and

5.3 Any project which is similar to this Project including magnitude and character of the work.

6. Use separate sheets of paper provide all of the following information for each project identified in response to the above three categories:

6.1 Project name
6.2 Location
6.3 Owner
6.4 Owner contact (name and current phone number)
6.5 Architect or engineer name
6.6 Architect or engineer contact (name and current phone number)
6.7 Project manager (name and current phone number)
6.8 Description of project and scope of work performed
6.9 Initial contract value (at time of bid award)
6.10 Final cost of construction (including change orders)
6.11 Original scheduled completion date
6.12 Time extensions granted (number of days)
6.13 Actual date of completion
6.14 Number and amount of stop notices or mechanic's liens filed
6.15 Amount of liquidated damages assessed against Bidder
6.16 Nature and resolution of any claim, lawsuit, and/or arbitration between Bidder and the owner.

Part 3: Verification

In signing this document, I, the undersigned, declare that I am duly authorized to sign and submit this Bidder's Questionnaire on behalf of the named Bidder, and that all responses and information set forth in this Bidder's Questionnaire and accompanying attachments are, to the best of my knowledge, true, accurate and complete as of the date of submission. **I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.**

Signature: _____ Date: _____

By: _____
Name and Title [print]

END OF BIDDER'S QUESTIONNAIRE

Contract

This public works contract ("Contract") is entered into by and between the City of Tracy ("City") and _____ ("Contractor") for work on the **Transit Station Emergency Backup Generator Project, CIP 77592**, ("Project").

The parties agree as follows:

1. **Award of Contract**. In response to the Notice Inviting Bids, Contractor has submitted a Bid Proposal to perform the Work to construct the Project. On _____, 20___, City authorized award of this Contract _____ to Contractor for the amount of Contractor's bid.

2. **Contract Documents**. The Contract Documents incorporated into this Contract include and are comprised of all of the following (subject to the order of precedence in Section 3.2 of the General Conditions):

   2.1 Notice Inviting Bids;
   2.2 Instructions to Bidders;
   2.3 Addenda, if any;
   2.4 Bid Proposal and attachments thereto;
   2.5 Contract;
   2.6 Payment, Performance and Warranty Bonds;
   2.7 General Conditions;
   2.8 Special Conditions;
   2.9 Project Drawings and Specifications;
   2.10 Change Orders and Contract amendments, if any;
   2.11 Notice of Award;
   2.12 Notice to Proceed; and
   2.13 The following: No other documents.

3. **Contractor's Obligations.** Contractor agrees to perform all of the Work required for the Project, as specified in the Contract Documents. Contractor must provide, furnish, and supply all things necessary and incidental for the timely performance and completion of the Work, including all necessary labor, materials, supplies, tools, equipment, transportation, and utilities, unless otherwise specified in the Contract Documents. Contractor must use its best efforts to complete the Work in a professional and expeditious manner and to meet or exceed the performance standards required by the Contract Documents.

4. **Payment.** As full and complete compensation for Contractor's timely performance and completion of the Work in strict accordance with the terms and conditions of the Contract Documents, City will pay Contractor _____Dollars ($_____) (the "Contract Price") for all of Contractor's direct and indirect costs to perform the Work, including all labor, materials, supplies, equipment, taxes, insurance, bonds and all overhead costs, in accordance with the payment provisions in the General Conditions.

5. **Time for Completion**. Contractor will complete the Work for the Project within three hundred sixty-five (365) calendar days from the commencement date given in the Notice to Proceed ("Contract Time"). By signing below, Contractor expressly waives any claim for delayed early completion.

6. **Liquidated Damages.** If Contractor fails to complete the Work within the Contract Time, City will assess liquidated damages in the amount of one thousand dollars ($1,000) for

each calendar day of unexcused delay in completion, and the Contract Price will be reduced accordingly.

7. Labor Code Compliance.

7.1 General. This Contract is subject to all applicable requirements of Chapter 1 of Part 7 of Division 2 of the Labor Code, including requirements pertaining to wages, working hours and workers' compensation insurance. Contractor shall comply with all other applicable federal, state, and local laws, regulations and policies pertaining to labor standards insofar as those laws, regulations and policies apply to the performance of this Contract, including any applicable City employment requirements, including but not limited to, the City's Local Hiring Policy (attached as Exhibit 1 to this Contract).

7.2 Prevailing Wages. This Project is subject to the prevailing wage requirements applicable to the locality in which the Work is to be performed for each craft, classification or type of worker needed to perform the Work, including employer payments for health and welfare, pension, vacation, apprenticeship and similar purposes. Copies of these prevailing rates are available online at http://www.dir.ca.gov/DLSR.

7.3 DIR Registration. City will not enter into the Contract with a bidder, without proof that the bidder and its Subcontractors are registered with the California Department of Industrial Relations ("DIR") to perform public work under Labor Code section 1725.5, subject to limited legal exceptions.

8. Workers' Compensation Certification. Under Labor Code section 1861, by signing this Contract, Contractor certifies as follows: "I am aware of the provisions of Labor Code section 3700 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 on this Contract."

9. Conflicts of Interest. Contractor, its employees, Subcontractors and agents, may not have, maintain or acquire a conflict of interest in relation to this Contract in violation of any City ordinance or policy or in violation of any California law, including under Government Code section 1090 et seq. and under the Political Reform Act as set forth in Government Code section 81000 et seq. and its accompanying regulations. Any violation of this Section constitutes a material breach of the Contract.

10. Independent Contractor. Contractor is an independent contractor under this Contract and will have control of the Work and the means and methods by which it is performed. Contractor and its Subcontractors are not employees of City and are not entitled to participate in any health, retirement, or any other employee benefits from City.

11. Notice. Any notice, billing, or payment required by or pursuant to the Contract Documents must be made in writing, signed, dated and sent to the other party by personal delivery, U.S. Mail, a reliable overnight delivery service, or by email as a PDF (or comparable) file. Notice is deemed effective upon delivery unless otherwise specified. Notice for each party must be given as follows:

City:

Public Works Department, Engineering Division
Attn: City Engineer / Even G. Marcelo / Miguel Hernandez, Construction Project Manager
Address: 333 Civic Center Plaza
City/State/Zip: Tracy, CA 95376
Email: miguel.hernandez@cityoftracy.org
Copy to: April B. A. Quintilla, City Clerk
Email: april.quintilla@cityoftracy.org

Contractor:

Name:_____
Address:_____
City/State/Zip:_____
Phone:_____
Attn:_____
Email:_____
Copy to:_____

12. General Provisions.

12.1 Assignment and Successors. Contractor may not assign its rights or obligations under this Contract, in part or in whole, without City's written consent. This Contract is binding on Contractor's and City's lawful heirs, successors and permitted assigns.

12.2 Third Party Beneficiaries. There are no intended third party beneficiaries to this Contract except as expressly provided in the General Conditions or Special Conditions.

12.3 Governing Law and Venue. This Contract will be governed by California law and venue will be in the Superior Court of San Joaquin County, and no other place.

12.4 Amendment. No amendment or modification of this Contract will be binding unless it is in a writing duly authorized and signed by the parties to this Contract.

12.5 Integration; Severability. This Contract and the Contract Documents incorporated herein, including authorized amendments or Change Orders thereto, constitute the final, complete, and exclusive terms of the agreement between City and Contractor. If any provision of the Contract Documents, or portion of a provision, is determined to be illegal, invalid, or unenforceable, the remaining provisions of the Contract Documents will remain in effect.

12.6 Authorization. Each individual signing below warrants that he or she is authorized to do so by the party that he or she represents, and that this Contract is legally binding on that party. If Contractor is a corporation, at least two signatures are required pursuant to California Corporation Code section 313: (1) one from an officer on the operations side of the corporation (such as president, vice president, chief operating officer, etc.); and (2) one from the finance side of the corporation

(such as the chief financial officer, treasurer, etc.) or from the corporate secretary. Alternatively, if only one signature will be obtained from a corporation, attach the corporate resolution authorizing that individual to bind the corporation to contracts.

[Signatures are on the following page.]

The parties agree to this Contract as witnessed by the signatures below:

CITY:

s/_____

_____
Name/Title [print]

Date: _____

Approved as to form:

s/_____

_____
Name/City Attorney

Date: _____

Attest:

s/_____, City Clerk
Name [print]

Date: _____

CONTRACTOR: _____
Business Name

s/_____

Seal:

_____
Name/Title [print]

Date: _____

Second Signature (See Section 12.6):

s/_____

_____
Name/Title [print]

Date: _____

_____
Contractor's California License Number(s) and Expiration Date(s)

END OF CONTRACT

Payment Bond

The City of Tracy ("City") and _____ ("Contractor") have entered into a contract, dated _____, 20___ ("Contract") for work on the **Transit Station Emergency Backup Generator Project, CIP 77592** ("Project"). The Contract is incorporated by reference into this Payment Bond ("Bond").

1. **General.** Under this Bond, Contractor as principal and _____ _____, its surety ("Surety"), are bound to City as obligee in an amount not less than $_____, under California Civil Code sections 9550, et seq.

2. **Surety's Obligation.** If Contractor or any of its Subcontractors fails to pay any of the persons named in California Civil Code section 9100 amounts due under the Unemployment Insurance Code with respect to work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of Contractor and its Subcontractors, under California Unemployment Insurance Code section 13020, with respect to the work and labor, then Surety will pay for the same.

3. **Beneficiaries.** This Bond inures to the benefit of any of the persons named in California Civil Code section 9100, so as to give a right of action to those persons or their assigns in any suit brought upon this Bond. Contractor must promptly provide a copy of this Bond upon request by any person with legal rights under this Bond.

4. **Duration.** If Contractor promptly makes payment of all sums for all labor, materials, and equipment furnished for use in the performance of the Work required by the Contract, in conformance with the time requirements set forth in the Contract and as required by California law, Surety's obligations under this Bond will be void. Otherwise, Surety's obligations will remain in effect.

5. **Waivers.** Surety waives any requirement to be notified of alterations to the Contract or extensions of time for performance of the Work under the Contract. Surety waives the provisions of Civil Code sections 2819 and 2845. City waives requirement of a new bond for any supplemental contract under Civil Code section 9550. Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

   Attn: _____
   Address: _____
   City/State/Zip: _____
   Phone: _____
   Fax: _____
   Email: _____

6. **Law and Venue.** This Bond will be governed by California law, and any dispute pursuant to this Bond will be venued in the Superior Court of the County in which the Project is located, and no other place. Surety will be responsible for City's attorneys' fees and costs in any action to enforce this Bond.

7. Effective Date; Execution. This Bond is entered into and is effective on _____, 20_____. Two identical counterparts of this Bond, each of which is deemed an original for all purposes, are hereby executed and submitted.

SURETY: _____
Business Name

s/ _____

_____
Name/Title [print]

(Acknowledgment with Surety's Notary Seal and Surety's Power of Attorney must be attached.)

CONTRACTOR: _____
Business Name

s/ _____

_____
Name/Title [print]

s/ _____

_____
Name/Title [print]

APPROVED BY CITY:

s/ _____

_____
Name/Title [print]

END OF PAYMENT BOND

Performance Bond

The City of Tracy ("City") and _____ ("Contractor") have entered into a contract, dated _____, 20____ ("Contract") for work on the **Transit Station Emergency Backup Generator Project, CIP 77592**, ("Project"). The Contract is incorporated by reference into this Performance Bond ("Bond").

1. **General.** Under this Bond, Contractor as Principal and _____ _____, its surety ("Surety"), are bound to City as obligee for an amount not less than $_____. By executing this Bond, Contractor and Surety bind themselves and their respective heirs, executors, administrators, successors and assigns, jointly and severally, to the provisions of this Bond.

2. **Surety's Obligations; Waiver.** If Contractor fully performs its obligations under the Contract, including its warranty obligations under the Contract, Surety's obligations under this Bond will become void upon recordation of the notice of completion, provided Contractor has timely provided a warranty bond as required under the Contract. Otherwise Surety's obligations will remain in effect until expiration of the one year warranty period under the Contract. Surety waives any requirement to be notified of and further consents to any alterations to the Contract made under the applicable provisions of the Contract Documents, including changes to the scope of Work or extensions of time for performance of Work under the Contract. Surety waives the provisions of Civil Code sections 2819 and 2845.

3. **Application of Contract Balance.** Upon making a demand on this Bond, City will make the Contract Balance available to Surety for completion of the Work under the Contract. For purposes of this provision, the Contract Balance is defined as the total amount payable by City to Contractor as the Contract Price minus amounts already paid to Contractor, and minus any liquidated damages, credits, or back charges to which City is entitled under the terms of the Contract.

4. **Contractor Default.** Upon written notification from City that Contractor is in default under Article 13 of the Contract General Conditions, time being of the essence, Surety must act within the time specified in Article 13 to remedy the default through one of the following courses of action:

   4.1 Arrange for completion of the Work under the Contract by Contractor, with City's consent, but only if Contractor is in default solely due to its financial inability to complete the Work;

   4.2 Arrange for completion of the Work under the Contract by a qualified contractor acceptable to City, and secured by performance and payment bonds issued by an admitted surety as required by the Contract Documents, at Surety's expense, or

   4.3 Waive its right to complete the Work under the Contract and reimburse City the amount of City's costs to have the remaining Work completed.

5. **Surety Default.** If Surety defaults on its obligations under the Bond, City will be entitled to recover all costs it incurs due to Surety's default, including legal, design professional, or delay costs.

6. **Notice.** Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

Attn: _____
Address: _____
City/State/Zip: _____
Phone: _____
Fax: _____
Email: _____

7. **Law and Venue.** This Bond will be governed by California law, and any dispute pursuant to this Bond will be venued in the Superior Court for the County in which the Project is located, and no other place. Surety will be responsible for City's attorneys' fees and costs in any action to enforce this Bond.

8. **Effective Date; Execution.** This Bond is entered into and effective on _____, 20___. Two identical counterparts of this Bond, each of which is deemed an original for all purposes, are hereby executed and submitted.

SURETY: _____
Business Name

s/ _____

_____
Name/Title [print]

(Acknowledgment with Surety's Notary Seal and Surety's Power of Attorney must be attached.)

CONTRACTOR: _____
Business Name

s/ _____

_____
Name/Title [print]

s/ _____

_____
Name/Title [print]

APPROVED BY CITY:

s/ _____

_____
Name/Title [print]

END OF PERFORMANCE BOND

Warranty Bond

The City of Tracy ("City") and _____ ("Contractor") have entered into a contract, dated _____, 20___ ("Contract") for work on the **Transit Station Emergency Backup Generator Project, CIP 77592**, ("Project"). The Contract is incorporated by reference into this Warranty Bond ("Bond").

1. **General.** Under this Bond, Contractor as principal and _____ _____, its surety ("Surety"), are bound to City as obligee in the maximum amount of 10% of the final Contract Price, unless otherwise specified in the Contract Documents.

2. **Warranty Period.** The Contract requires Contractor to guarantee its Work and that of its Subcontractors on the Project, against defects in materials or workmanship which are discovered during the one year period commencing with recordation of the notice of completion (the "Warranty Period").

3. **Surety's Obligations.** If Contractor faithfully carries out and performs its guarantee under the Contract, and, on due notice from City, repairs and make good at its sole expense any and all defects in materials and workmanship in the Project which are discovered during the Warranty Period, or if Contractor promptly reimburses City for all loss and damage that City sustains because of Contractor's failure to makes such repairs in accordance with the Contract requirements, then Surety's obligations under this Bond will be void. Otherwise, Surety's obligations will remain in effect.

4. **Waiver.** Surety waives the provisions of Civil Code sections 2819 and 2845.

5. **Notice.** Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

   Attn: _____
   Address: _____
   City/State/Zip: _____
   Phone: _____
   Fax: _____
   Email: _____

6. **Law and Venue.** This Bond will be governed by California law, and any dispute pursuant to this Bond will be venued in the Superior Court in which the Project is located, and no other place. Surety will be responsible for City's attorneys' fees and costs in any action to enforce this Bond.

7. **Effective Date; Execution.** This Bond is entered into and is effective on _____, 20__. Two identical counterparts of this Bond, each of which is deemed an original for all purposes, are hereby executed and submitted.

[Signatures are on the following page.]

SURETY: _____
Business Name

s/ _____

_____
Name/Title [print]

(Acknowledgment with Surety's Notary Seal and Surety's Power of Attorney must be attached.)

CONTRACTOR: _____
Business Name

s/ _____

_____
Name/Title [print]

s/ _____

_____
Name/Title [print]

APPROVED BY CITY:

s/ _____

_____
Name/Title [print]

END OF WARRANTY BOND

GENERAL CONDITIONS

General Conditions

Article 1 - Definitions

Definitions. The following definitions apply to all of the Contract Documents unless otherwise indicated. Defined terms and titles of documents are capitalized in the Contract Documents, with the exception of the following in any tense or form: “day,” “furnish,” “including,” “install,” “work day” or “working day.”

Allowance means a specific amount that must be included in the Bid Proposal for a specified purpose.

Article, as used in these General Conditions, means a numbered Article of the General Conditions, unless otherwise indicated by the context.

Change Order means a written document duly approved and executed by City, which changes the scope of Work, the Contract Price, or the Contract Time.

City means the City of Tracy, acting through its City Council, officers, employees, and authorized representatives.

City Engineer means the City Engineer for City and his or her authorized delegee(s).

Claim means a separate demand by Contractor for change in the Contract Time or Contract Price, that has previously been submitted to City in accordance with the requirements of the Contract Documents, and which has been rejected by City, in whole or in part; or a written demand by Contractor objecting to the amount of Final Payment.

Contract means the signed agreement between City and Contractor.

Contract Documents means, collectively, all of the documents listed as such in Section 2 of the Contract, including the Notice Inviting Bids; the Instructions to Bidders; addenda, if any; the Bid Proposal, and attachments thereto; the Contract; the notice of award and notice to proceed; the payment and performance bonds; the General Conditions; the Special Conditions; the Project Drawings and Specifications; any Change Orders and Contract amendments; and any other documents expressly made part of the Contract Documents.

Contract Price means the total compensation to be paid to Contractor for performance of the Work, as set forth in the Contract and as amended by Change Order or adjusted for an Allowance. The Contract Price is not subject to adjustment due to inflation or due to the increased cost of labor, material, supplies or equipment following submission of the Bid Proposal.

Contract Time means the time specified for complete performance of the Work, as set forth in the Contract and as may be amended by Change Order.

Contractor means the individual, partnership, corporation, or joint-venture who has signed the Contract with City to perform the Work.

Day means a calendar day unless otherwise specified.

Design Professional means the licensed individual(s) or firm(s) retained by City to provide architectural or engineering services for the Project. If no Design Professional has been retained for this Project, any reference to Design Professional is deemed to refer to the Engineer.

Drawings means the City-provided plans and graphical depictions of the Project requirements, and does not include Shop Drawings.

Engineer means the City Engineer for the City of Tracy and his or her authorized delegees.

Extra Work means new or unforeseen work added to the Project, as determined by the Engineer in his or her sole discretion, including Work that is not part of or incidental to the scope of the Work; is substantially different from the Work as described in the Contract Documents at bid time; or Work that results from a substantially differing and unforeseeable condition.

Final Completion means Contractor has fully completed all of the Work required by the Contract Documents, including all punch list items, any required commissioning or training, and has provided all required submittals, including instructions and manuals, product warranties, and as-built drawings, all to City's satisfaction.

Final Payment means payment to Contractor of the unpaid Contract Price, including release of undisputed retention, less amounts withheld pursuant to the Contract Documents, including liquidated damages, up to 125% of the amount of any unreleased stop notice, amounts subject to setoff, up to 150% of any unresolved third-party claim for which Contractor is required to indemnify City, and up to 150% of any amount in dispute as authorized by Public Contract Code section 7107.

Furnish means to purchase and deliver to the Worksite designated for installation.

Hazardous Materials means any substance or material identified now or in the future as hazardous under any federal, state, or local law or regulation, or any other substance or material that may be considered hazardous or otherwise subject to statutory or regulatory requirements governing handling, disposal, or cleanup.

Including, whether or not capitalized, means "including, but not limited to," unless the context clearly requires otherwise.

Inspector means the individual(s) or firm(s) retained or employed by City to inspect the workmanship, materials, and manner of construction of the Project and its components to ensure compliance with the Contract Documents and all applicable codes, regulations, and permits.

Install means to fix in place for materials, and to fix in place and connect for equipment.

Letter of Instruction means any writing issued by the Engineer, in his or her sole discretion, that interprets or clarifies the Contract Documents but does not modify the scope of the Work or change the Contract Price or the Contract Time. Letters of Instruction include written field orders, directives, general or specific clarifications, and responses to Requests for Information about the Contract Documents, the Work or the Project.

Plans has the same meaning as Drawings.

Project means the public works project referenced in the Contract.

Project Manager means the individual designated by City to oversee and manage the Project on City's behalf and may include his or her authorized delegee(s) when the Project Manager is unavailable. If no Project Manager has been designated for this Project, any reference to Project Manager is deemed to refer to the Engineer.

Request for Information or **RFI** means Contractor's written request for information submitted to the Engineer, in the manner and format specified by City, about the Contract Documents, the Work or the Project.

Section as used in these General Conditions, means a numbered Section of the General Conditions, unless otherwise indicated by the context, e.g., statutory references.

Shop Drawings means drawings, plan details or other graphical depictions prepared by or on behalf of Contractor, and subject to City acceptance, which are intended to provide details for fabrication, installation, and the like, of items required by or shown in the Drawings and Specifications.

Specialty Work means Work that must be performed by a specialized Subcontractor with the specified license or other special certification, and not by a the Contractor.

Specifications means the technical, text specifications describing the Project requirements, which are prepared for and incorporated into this Project by or on behalf of City, and does not include the Contract, General Conditions or Special Conditions.

Subcontractor means an individual, partnership, corporation, or joint-venture retained by Contractor directly or indirectly through a subcontract to perform a specific portion of the Work. The term Subcontractor applies to subcontractors, suppliers, fabricators, and equipment lessors of all tiers, unless otherwise indicated by the context.

Technical Specifications means Specifications.

Work means all of the construction and services necessary for or incidental to completing the Project in conformance with the requirements of the Contract Documents.

Work Day or **Working Day**, whether or not capitalized, means a weekday which is not a holiday observed by City.

Worksite means the place or places where the Work is performed, which includes, but may extend beyond the Project site, including separate locations for staging or fabrication.

Article 2 - Roles and Responsibilities

2.1 City.

(A) ***City Council.*** The City Council has final authority in all matters affecting the Project, except to the extent it has delegated such authority to the Engineer.

(B) ***Engineer.*** The Engineer, acting within the authority conferred by the City Council, has primary responsibility for administration of the Project on behalf of City, including authority to provide directions to the Design Professional and to Contractor to ensure proper and timely completion of the Project. The Engineer's decisions are final and conclusive within the scope of his or her authority, including interpretation of the Contract Documents.

(C) ***Design Professional.*** The Design Professional is responsible for the overall design of the Project and, to the extent authorized by City, may act on City's behalf to ensure performance of the Work in compliance with the Contract Documents. The Design Professional's interpretation of the Drawings or Specifications is final and conclusive.

2.2 Contractor.

(A) ***General.*** Contractor must provide all labor, materials, supplies, equipment and services and incidentals necessary to perform and timely complete the Work in strict

accordance with the Contract Documents, and in an economic and efficient manner in the best interests of City, and with minimal inconvenience to the public.

(B) ***Responsibility for the Work and Risk of Loss.*** Contractor is responsible for supervising and directing all aspects of the Work to facilitate the efficient and timely completion of the Work. Contractor is solely responsible for and required to exercise full control over the Project, including the construction means, methods, techniques, sequences, procedures, and coordination of all portions of the Work with that of all other contractors and Subcontractors, except to the extent that the Contract Documents provide other specific instructions. Contractor's responsibilities extend to any plan, method or sequence suggested, but not required by City or specified in the Contract Documents. From the date of commencement of the Work until either the date on which either City formally accepts the completed Project or the effective date of termination of the Contract, whichever is later, Contractor bears all risks of injury or damage to the Work and the materials and equipment delivered to the Work site, by any cause including fire, earthquake, wind, weather, vandalism or theft.

(C) ***Project Administration.*** Contractor must provide sufficient and competent administration, staff, and skilled workforce necessary to perform and timely complete the Work in accordance with the Contract Documents. Before starting the Work, Contractor must designate in writing and provide complete contact information, including telephone numbers and email address, for the officer or employee in Contractor's organization who is to serve as Contractor's primary representative for the Project, and who has authority to act on Contractor's behalf. A Subcontractor may not serve as Contractor's primary representative.

(D) ***On-Site Superintendent.*** Contractor must, at all times during performance of the Work, provide a qualified and competent full-time superintendent acceptable to City, and assistants as necessary, who must be physically present at the Project site while any aspect of the Work is being performed. City's approval of the superintendent is required before the Work commences. If City is not satisfied with the superintendent's performance, City may request a qualified replacement of the superintendent. Failure to comply may result in temporary suspension of the Work, at Contractor's sole expense and with no extension of Contract Time, until the approved superintendent is physically present to supervise the Work. Contractor must provide written notice to City, as soon as practicable, before replacing the superintendent.

(E) ***Pre-Construction Conference.*** City will designate a date and time for a pre-construction conference with Contractor following Contract execution. Project administration procedures and coordination between City and Contractor will be discussed, and Contractor must present City with the following information or documents at the meeting for the Engineer's review and approval before the Work commences:

(1) Name, 24-hour contact information, and qualifications of the proposed on-site superintendent;

(2) List of all key Project personnel and their complete contact information, including email addresses and telephone numbers during regular hours and after hours;

(3) Staging plans that identify the sequence of the Work, including any phases and alternative sequences or alternative phases, with the goal of minimizing the impacts on residents, businesses and other operations in the Project vicinity;

(4) Traffic control plan(s) associated with the staging plans that are signed and stamped by a licensed traffic engineer or licensed civil engineer;

(5) Draft baseline schedule for the Work as required under Section 5.2(A) below, to be finalized within 10 days after City issues the Notice to Proceed;

(6) Breakdown of lump sum bid items, to be used for determining the value of Work completed for future progress payments to Contractor;

(7) Schedule with list of Project submittals that require City review, and list of the proposed material suppliers;

(8) Plan for coordination with affected utility owner(s) and compliance with any related permit requirements;

(9) Videotape and photographs recording the conditions of the Project site before construction begins, showing every detail of the existing improvements including the current condition of the curbs, gutters, sidewalks, signs, landscaping, streetlights, structures near the Project such as building faces, canopies, shades and fences, and any other features within the Project area limits; and

(10) If requested by the Engineer, Contractor's cash flow projections.

(F) ***Standards; Compliance.*** Contractor must, at all times, ensure that the Work is performed in an efficient, skillful manner following best practices and in full compliance with the Contract Documents and all applicable laws, regulations, codes, standards, and permits, including City's municipal code, rules, and regulations, and any orders of the administrative or judicial bodies with jurisdiction over the Work.

(G) ***Progress Meetings.*** Contractor, its project manager and superintendent and the Subcontractors requested by City, must attend weekly Project progress meetings with City which the Engineer will schedule at mutually agreed on times and locations;

(H) ***Responsible Party.*** Contractor is solely responsible to City for the acts or omissions of any Subcontractor(s), or any other party or parties performing portions of the Work or providing equipment, materials or services for or on behalf of Contractor or the Subcontractors. Upon City's written request, Contractor must promptly and permanently remove from the Project, at no cost to City, any employee or Subcontractor or employee of a Subcontractor who the Engineer has determined be incompetent, intemperate or disorderly when performing Work on the Project, or who has refused to perform the Work in whole or in part as required under the Contract Documents.

(I) ***Correction of Defects.*** Contractor must promptly correct, at Contractor's sole expense, any Work that is determined by City to be deficient or defective in any way, including workmanship, materials, parts or equipment. Workmanship, materials or equipment that do not conform to the requirements under the Drawings, Specifications and every other Contract Document, as determined by City, may be rejected as defective. Contractor must also promptly correct, at Contractor's sole expense, any Work performed beyond the lines and grades shown on the Plans or established by the Engineer, and any Extra Work performed without City's prior written approval. However, City retains the right, but not the obligation, to retain defective Work, and deduct the difference in value, as determined by the Engineer, from payments otherwise due to Contractor.

(J) ***Contractor's Records.*** Contractor must maintain all of its records relating to the Project in any form, including paper documents, photos, videos and electronic records. Project records subject to this provision include, but are not limited to, Project cost records and records relating to preparation of Contractor's bid.

(1) Contractor's cost records must include all supporting documentation, including original receipts, invoices, and payroll records, evidencing its direct costs to perform the Work, including, but not limited to, costs for labor, materials and equipment. Each cost record should include, at a minimum, a description of the expenditure with references to the applicable requirements of the Contract Documents, the amount actually paid, the date of payment, and whether the expenditure is part of the original Contract Price, related to an executed Change Order, or otherwise categorized by Contractor as Extra Work. Contractor's failure to comply with this provision as to any claimed cost operates as a waiver of any rights to recover the claimed cost.

(2) Contractor must continue to maintain its Project records in an organized manner for a period of four years after City's acceptance of the Project or following termination, whichever occurs first. Subject to prior notice to Contractor, City is entitled to inspect or audit any of Contractor's Project records relating to the Project or to investigate Contractor's plant or equipment during Contractor's normal business hours.

(K) ***Copies of Project Documents.*** Contractor and its Subcontractors must keep copies of the Contract, permit(s), Drawings, Specifications, Addenda, Contract amendments, Change Orders, Letters of Instructions, Shop Drawings, and any related written interpretations, maintained at the Worksite. The Contract Documents, as-built drawings, and all Worksite copies must be available to the Engineer for reference at all times.

2.3 Subcontractors.

(A) ***General.*** All Work which is not performed by Contractor with its own forces must be performed by Subcontractors. City reserves the right to approve or reject any and all Subcontractors proposed to perform the Work. Each Subcontractor must obtain a City business license before beginning any Work.

(B) ***Contractual Obligations.*** Contractor must require every Subcontractor to be bound to the provisions of the Contract Documents as they apply to the Subcontractor's portion(s) of the Work, and to likewise bind their subcontractors or suppliers. Nothing in these Contract Documents creates a contractual relationship between a Subcontractor and City, but City is deemed to be a third-party beneficiary of the contract between Contractor and each Subcontractor.

(C) ***Termination.*** If the Contract is terminated, each Subcontractor's agreement must be assigned by Contractor to City, subject to the prior rights of any surety, provided that City accepts the assignment by written notification, and assumes all rights and obligations of Contractor pursuant to each such subcontract agreement.

(D) ***Substitution of Subcontractor.*** If Contractor requests substitution of a listed Subcontractor under Public Contract Code section 4107, Contractor is solely responsible for all costs City incurs in responding to the request, including legal fees and costs to conduct a hearing.

2.4 Coordination of Work.

(A) ***Concurrent Work.*** City reserves the right to perform or to have performed other work on or adjacent to the Project site while the Work is being performed. Contractor is responsible for coordinating its Work with other work being performed on or adjacent to the Project site, including by any utility companies or agencies, and must avoid hindering, delaying, or interfering with the work of other contractors and subcontractors. To the full extent permitted by law, Contractor must hold harmless and indemnify City against any and all claims arising from or related to Contractor's avoidable, negligent, or willful hindrance of, delay to, or interference with the work of a utility company or agency or another contractor or subcontractor.

(B) ***Defects.*** Before proceeding with any portion of the Work affected by the construction or operations of others, Contractor must give the Engineer prompt written notification of any defects Contractor discovers which will prevent the proper execution of the Work. Failure to give notice of any such known defects will be deemed acknowledgement by Contractor that the work of others is not defective and will not prevent the proper execution of the Work.

2.5 Submittals. Unless otherwise specified, Contractor must submit to Engineer for review and acceptance, all schedules, Shop Drawings, samples, product data and similar submittals required by the Contract Documents, or upon request by the Engineer. Unless otherwise specified, all submittals, including requests for information (RFIs), are subject to the general provisions of this Section, as well as specific submittal requirements that may be included elsewhere in the Contract Documents.

(A) ***General.*** Contractor is responsible for ensuring that its submittals are accurate and conform to the Contract Documents.

(B) ***Time and Manner of Submission.*** Contractor must ensure that its submittals are prepared and delivered in a manner consistent with the current accepted schedule for the Work and within the applicable time specified elsewhere in the Contract Documents, or if no time is specified, in such time and sequence so as not to delay the performance of the Work or completion of the Project.

(C) ***Required Contents.*** Each submittal must include the Project name and contract number, Contractor's name and address, the name and address of any Subcontractor or supplier involved with the submittal, the date, and references to applicable Specification section(s) and/or drawing and detail number(s).

(D) ***Required Corrections.*** If corrections are required, Contractor must promptly make and submit any required corrections in full conformance with the requirements of this Section, or other requirements that apply to that submittal.

(E) ***Effect of Review and Acceptance.*** Review and acceptance of a submittal by City will not relieve Contractor from complying with the requirements of the Contract Documents. Contractor is responsible for any errors in any submittal, and review or acceptance of a submittal by City is not an assumption of risk or liability by City.

(F) ***Enforcement.*** Any Work performed or any material furnished, installed, fabricated or used without the Engineer's prior acceptance of a required submittal is performed or provided at Contractor's risk, and Contractor may be required to bear the costs incident thereto, including the cost of removing and replacing such Work, repairs to other affected portions of the Work or material, and the cost of additional time or services required of the Design Professional, Project Manager, or Inspector.

(G) ***Excessive RFIs.*** RFIs will be considered excessive or unnecessary if the Engineer determines that the explanation or response to the RFI is clearly and unambiguously discernable in the Contract Documents. City's costs to review and respond to excessive or unnecessary RFIs may be deducted from payments otherwise due to Contractor.

2.6 Shop Drawings. When Shop Drawings are required by the Specifications or requested by the Engineer, they must be prepared according to best practices at Contractor's expense. The Shop Drawings must be of a size and scale to clearly show all necessary details. Unless otherwise specified by City, Shop Drawings must be provided to the Engineer for review and acceptance at least 30 days before the Work will be performed. If City requires changes, the corrected Shop Drawings must be resubmitted to the Engineer for review within the time specified by the Engineer. For all Project components requiring Shop Drawings, Contractor will not furnish materials or perform any Work until the Shop Drawings for those components are accepted by City. Contractor is responsible for any errors and omissions in the Shop Drawings, shop fits and field corrections, any deviations from the Contract Documents, and for the results obtained by the use of Shop Drawings. Acceptance of Shop Drawings by the Engineer does not relieve Contractor of such responsibility.

Article 3 - Contract Documents

3.1 Interpretation of Contract Documents.

(A) ***Drawings and Specifications.*** The Drawings and Specifications included in the Contract Documents are complementary. If Work is shown on one but not on the other, Contractor must perform the Work as though fully described on both, consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. The Drawings and Specifications are deemed to include and require everything necessary and reasonably incidental to completion of the Work, whether or not particularly mentioned or shown. Contractor must perform all Work and services and supply all things reasonably related to and inferable from the Contract Documents. If there is a conflict between the Drawings and Specifications, the Specifications will control. Any arrangement or division of the Drawings and Specifications into sections is for convenience only and is not intended to limit the Work required by separate trades. Any conclusion presented in the Drawings or Specifications is a recommendation only. Actual locations and depths must be determined by Contractor's field investigation. Contractor may request access to underlying or background information in City's possession that is necessary for Contractor to form its own conclusions. Subject to the limitations of Public Contract Code section 1104, it is Contractor's responsibility to ascertain the existence of any conditions affecting the cost of the Work.

(B) ***Figures and Dimensions.*** Figures control over scaled dimensions.

(C) ***Technical or Trade Terms.*** Any terms that have well-known technical or trade meanings will be interpreted in accordance with those meanings, unless otherwise specifically defined in the Contract Documents.

(D) ***Measurements.*** Contractor must verify all relevant measurements at the Worksite before ordering any material or performing any Work, and will be responsible for the correctness of those measurements.

(E) ***Duty to Notify and Seek Direction.*** If Contractor becomes aware of a changed condition in the Project, or of any ambiguity, conflict, inconsistency, discrepancy, omission, or error in the Contract Documents, including under the Drawings or

Specifications, Contractor must immediately submit a Request for Information to the Engineer and wait for a response from City before proceeding further with the related Work. The Request for Information must notify City of the issue and request clarification, interpretation or direction. The Engineer's clarification, interpretation or direction, which may be stated in a Letter of Instruction, will be final and binding on Contractor. If Contractor proceeds with the related Work before obtaining City's response, Contractor will be responsible for any resulting costs, including the cost of correcting any defective Work that results. City will not extend the Contract Time due to Contractor's failure to submit a timely Request for Information to the Engineer.

(F) ***Letters of Instruction.*** Any Letter of Instruction issued by the Engineer is binding on Contractor. Contractor must promptly comply with any directions included in a Letter of Instruction. If Contractor believes it is entitled to a change in the Contract Price or change in the Contract Time based on the directions provided in the Letter of Instruction, it may submit a Change Order request as specified in Articles 5 and 6.

3.2 Order of Precedence. Information included in one Contract Document but not in another will not be considered a conflict or inconsistency. Unless otherwise specified in the Special Conditions, in case of any conflict or inconsistency among the Contract Documents, the following order of precedence will apply, beginning from highest to lowest:

(A) Change Orders and Contract amendments;
(B) Addenda;
(C) Contract;
(D) Notice to Proceed;
(E) Notice of Award;
(F) Special Conditions;
(G) General Conditions;
(H) Payment, Performance and Warranty Bonds;
(I) Technical Provisions;
(J) City of Tracy Design Standards and Standard Specifications
(K) Drawings;
(L) City of Tracy Standard Plans & City Parks and Streetscape Standard Plans;
(M) Contractor's Bid Proposal and attachments;
(N) Notice Inviting Bids;
(0) Instructions to Bidders; and
(P) Any documents prepared by and on behalf of a third party, that were not prepared specifically for this Project, e.g., Caltrans Standard Specifications or Caltrans Special Provisions.

3.3 Caltrans Standard Specifications. Any reference to or incorporation of the Standard Specifications of the State of California, Department of Transportation ("Caltrans"), including "Standard Specifications," "Caltrans Specifications," "State Specifications," or "CSS," means the most current edition of Caltrans' Standard Specifications, unless otherwise specified ("Caltrans Standard Specifications"), including the most current amendments as of the date that Contractor's bid was submitted for this Project. The following provisions apply to use of or reference to the Standard Specifications:

(A) ***Limitations.*** The "General Provisions" of the Standard Specifications, i.e., sections 1 through 9, do not apply to these Contract Documents with the exception of any specific provisions, if any, which are expressly stated to apply to these Contract Documents.

(B) ***Conflicts or Inconsistencies.*** If there is a conflict or inconsistency between any provision in the Standard Specifications and a provision of these Contract Documents, as determined by City, the provision in the Contract Documents will govern.

(C) ***Meanings.*** Terms used in the Standard Specifications are to be interpreted as follows:

(1) Any reference to the "Engineer" is deemed to mean the City Engineer.

(2) Any reference to the "Special Provisions" is deemed to mean the Special Conditions.

(3) Any reference to the "Department" or "State" is deemed to mean City.

3.4 For Reference Only. Contractor is responsible for the careful review of any document, study, or report appended to the Contract Documents solely for informational purposes and identified as "For Reference Only." Nothing in any document, study, or report so appended and identified is intended to supplement, alter, or void any provision of the Contract Documents. However, Contractor is advised that City or its representatives may be guided by information or recommendations included in such reference documents, particularly when making determinations as to the acceptability of proposed materials, methods, or changes in the Work. Any "record drawings" or similar final or accepted drawings or maps that are not part of the Contract Documents are deemed For Reference Only. Contractor must promptly notify City of any perceived or actual conflict between the Contract Documents and any For Reference Only document.

3.5 Current Versions. Unless otherwise specified by City, any reference to standard specifications, technical specifications, manuals, handbooks and the like or any City or state codes or regulations means the latest specification, manual, handbook, code or regulation in effect at the time the Contract is signed.

Article 4 - Bonds, Indemnity, and Insurance

4.1 Payment and Performance Bonds. Within ten days following issuance of the notice of award, Contractor is required to provide a payment bond and a performance bond, each in the penal sum of not less than 100% of the Contract Price, using the bond forms included with the Contract Documents.

(A) Surety. Each bond must be issued by a surety admitted in California. If an issuing surety cancels the bond or becomes insolvent, within seven days following written notice from City, Contractor must substitute a surety acceptable to City. If Contractor fails to substitute an acceptable surety within the specified time, City may, at its sole discretion, withhold payment from Contractor until the surety is replaced to City's satisfaction, or terminate the Contract for default.

(B) Supplemental Bonds for Increase in Contract Price. If, during construction, the Contract Price increases by five percent or more over the original Contract Price, at City's request Contractor must provide supplemental or replacement bonds within ten days of written notice from City pursuant to this Section, covering 100% of the increased Contract Price and using the bond forms included with the Contract Documents.

4.2 Indemnity. To the fullest extent permitted by law, Contractor must indemnify, defend (with independent counsel approved by City), and hold harmless City, its elected and appointed officials, officers, agents, employees, volunteers, and consultants (individually, an "Indemnitee," and collectively the "Indemnitees") from and against any and all liability,

loss, damage, injuries, claims, actions, causes of action, demands, charges, costs, and expenses, whether direct or indirect (including, without limitation, attorney fees, expert witness fees, paralegal fees, and fees and costs of litigation or arbitration) (collectively, "Liability") of every nature arising out of, relating to, or in connection with the acts or omissions of Contractor, its employees, Subcontractors, representatives, or agents, in bidding or performing the Work, or in failing to comply with any of Contractor's obligations under the Contract, except such Liability caused by the active negligence, sole negligence, or willful misconduct of an Indemnitee. This indemnity requirement applies to any Liability arising from alleged defects in the content or manner of submission of Contractor's bid for the Contract. Contractor's failure or refusal to timely accept a tender of defense pursuant to this Contract will be deemed a material breach of the Contract. City will timely notify Contractor upon receipt of any third-party claim relating to the Contract, as required by Public Contract Code section 9201. Contractor's indemnity obligations under this Contract will survive the expiration or any early termination of the Contract.

4.3 Insurance. No later than ten days following issuance of the notice of award, Contractor must procure and provide proof of the insurance coverage required by this Section in the form of certificates of insurance and endorsements acceptable to the City Attorney. The required insurance must cover the activities of Contractor, its employees, Subcontractors, representatives and agents relating to or arising from the performance of the Work, and must remain in effect at all times during the period covered by the Contract, through the date of City's recordation of the notice of completion for the Project. All required insurance must be issued by a company licensed by the California Insurance Commissioner to do business in the State of California, and each such insurer must have an A.M. Best's financial strength rating of "A-" or better and a financial size rating of "VII" or better. If Contractor fails to provide any of the required coverage in full compliance with the requirements of the Contract Documents, City may, at its sole discretion, purchase such coverage at Contractor's expense and deduct the cost from payments due to Contractor, or terminate the Contract for default. Contractor's procurement of the required insurance will not be construed to limit Contractor's liability, relieve Contractor of any responsibility, or fulfill Contractor's indemnification obligations under this Contract.

(A) ***Policies and Limits.*** The following insurance policies and minimum limits are required for this Contract unless otherwise specified in the Special Conditions. Contractor may also carry such additional insurance as it deems necessary:

(1) *Commercial General Liability ("CGL") Insurance:* The CGL insurance policy (with coverage at least as broad as ISO form CG 00 01) must be issued on an occurrence basis, written on a comprehensive general liability form, and must include coverage for liability arising from Contractor's or its Subcontractor's acts or omissions in the performance of the Work, including contractor's protected coverage, blanket contractual, products and completed operations, broad form property damage, vehicle coverage and employer's non-ownership liability coverage, with limits of at least $2,000,000.00 per occurrence and $4,000,000.00 general aggregate. Contractor must also provide proof of products/completed operations coverage by renewing its CGL insurance coverage for at least three years after Final Completion of the Project. The CGL coverage may be arranged under a single policy for the full limits required or by a combination of underlying policies with the balance provided by excess or umbrella policies, provided each such policy complies with the requirements set forth herein.

(2) *Builder's Risk Insurance:* The builder's risk insurance policy must be issued on an occurrence basis, for all-risk or "all perils" coverage on a 100% completed value basis on the insurable portion of the Project for the benefit of City.

(3) Automobile Liability Insurance: The automobile liability insurance policy (with coverage at least as broad as ISO form CA 00 01 for "any auto") must provide coverage of at least $2,000,000 combined single-limit per accident for bodily or personal injury, death and property damage. The automobile liability policy must name City as an additional insured, and must include the first two endorsements required under subsection (D), below.

(4) *Workers' Compensation Insurance and Employer's Liability:* The workers' compensation and employers' liability insurance policy must comply with the requirements of the California Workers' Compensation Insurance and Safety Act, providing coverage of at least $1,000,000.00 or as otherwise required by the statute. If Contractor is self-insured, Contractor must provide its Certificate of Permission to Self-Insure, duly authorized by the California Department of Industrial Relations.

(5) *Professional Liability Insurance*: If engineering or design professionals will be used during this project, Contractor shall maintain or ensure subcontractors maintain professional liability insurance that insures against professional errors and omissions that may be made in performing the services to be rendered in connection with this Agreement, in the minimum amount of two million dollars ($2,000,000) per claim and in the aggregate. Any policy inception date, continuity date, or retroactive date must be before the effective date of this agreement, and Contractor agrees to maintain or cause to maintain continuous coverage through a period no less than three years after completion of the services required by this Agreement.

(B) ***Notices and Expiration.*** Each certificate of insurance must state that the coverage afforded by the policy or policies will not be reduced, cancelled or allowed to expire without at least 30 days written notice to City, unless due to non-payment of premiums, in which case ten days written notice must be made to City. If an insurance carrier will not guarantee the provision of such notice to City, Contractor must require its insurance agent or broker to provide such notice to City. For purposes of this subsection 4.3(B), any material change in a required policy will be considered a cancellation and Contractor must immediately obtain a replacement policy acceptable to City. No later than 30 days before the expiration date of any required policy, Contractor must provide a renewed or updated certificate of insurance and the related endorsements in a form acceptable to the City Attorney.

(C) ***Waiver of Subrogation.*** Each required policy must include an endorsement providing that the carrier agrees to waive any right of subrogation it may have against City.

(D) ***Required Endorsements.*** The CGL policy, the builder's risk policy and the automobile liability policy must include the following specific endorsements:

(1) The City, including its Council, officials, officers, employees, agents, volunteers and consultants (collectively, "Additional Insured") must be named as an additional insured for all liability arising out of the operations by or on behalf of the named insured, and the policy must protect the Additional Insured against any and all liability for personal injury, death or property damage or destruction arising directly or indirectly in the performance of the Contract.

(2) The inclusion of more than one insured will not operate to impair the rights of one insured against another, and the coverages afforded will apply as though separate policies have been issued to each insured.

(3) The insurance provided is primary and no insurance held or owned by City may be called upon to contribute to a loss.

(4) This policy does not exclude explosion, collapse, underground excavation hazard, or removal of lateral support.

(E) ***Subcontractors.*** Contractor must ensure that each Subcontractor is required to maintain the same insurance coverage required under this Section 4.3, with respect to its performance of Work on the Project, including those requirements related to the Additional Insureds and waiver of subrogation.

4.4 Warranty Bond. Within ten days following issuance of the notice of award, Contractor must submit a warranty bond, using the form included with the Contract Documents, to guarantee its Work as specified in Article 11, Completion and Warranty Procedures. The warranty bond must be issued by a surety admitted in California for 10% of the final Contract Price or as otherwise specified in the Contract Documents. If an issuing surety cancels the bond or becomes insolvent, within seven days following written notice from City, Contractor must substitute a surety acceptable to City.

Article 5 - Contract Time

5.1 Time is of the Essence. Time is of the essence in Contractor's performance and completion of the Work, and Contractor must diligently prosecute the Work and complete it within the Contract Time.

(A) ***General.*** Contractor must commence the Work on the date indicated in the Notice to Proceed, and must complete the Work in strict compliance with all requirements of the Contract Documents and within the Contract Time.

(B) ***Authorization.*** Contractor is not entitled to compensation or credit for any Work performed before the date specified in the Notice to Proceed, with the exception of any schedules, submittals, or other requirements, if any, that must be provided or performed before issuance of the Notice to Proceed.

(C) ***Rate of Progress.*** Contractor and its Subcontractors must, at all times, provide workers, materials, and equipment sufficient to maintain the rate of progress necessary to ensure full completion of the Work within the Contract Time. If City determines that Contractor is failing to prosecute the Work at a sufficient rate of progress, City may, in its sole discretion, direct Contractor to provide additional workers, materials, or equipment, or to work additional hours or days without additional cost to City, in order to achieve a rate of progress satisfactory to City. If Contractor fails to comply with City's directive in this regard, City may, at Contractor's expense, separately contract for additional workers, materials, or equipment or use City's own forces to achieve the necessary rate of progress. Alternatively, City may terminate the Contract based on Contractor's default.

5.2 Schedule Requirements. Contractor must prepare all schedules using standard scheduling software acceptable to the Engineer, and must provide the schedules in electronic and paper form as requested by the Engineer. In addition to the general scheduling requirements set forth below, Contractor must also comply with any scheduling requirements included in the Special Conditions or in the Technical Specifications.

(A) ***Baseline (As-Planned) Schedule.*** Within ten calendar days following City's issuance of the Notice of Award (or as otherwise specified in the Special Conditions), Contractor must submit to the Engineer for review and acceptance a baseline (as-planned) schedule showing in detail how Contractor plans to perform and complete the Work within the Contract Time, including labor, equipment, materials and fabricated items using critical path methodology. The baseline schedule must show the order of the major items of Work and the dates of start and completion of each item, including when the materials and equipment will be procured. The schedule must also include the work of all trades, reflecting anticipated labor or crew hours and equipment loading for the construction activities, and must be sufficiently comprehensive and detailed to enable progress to be monitored on a day-by-day basis. The schedule should take into account the likely number of rain days each for each calendar month based on monthly rainfall averages over the previous ten-year period using data from reliable meteorological records for the Project's location. For each activity, the baseline schedule must be dated, provided in the format specified in the Contract Documents or as required by City, and must include, at a minimum, a description of the activity, the start and completion dates of the activity, and the duration of the activity.

(1) *Specialized Materials Ordering*. Within five calendar days following issuance of the Notice to Proceed, Contractor must order any specialized material or equipment for the Work that is not readily available from material suppliers. Contractor must also retain documentation of the purchase orders date(s).

(B) ***City's Review of Schedules.*** City will review and may note exceptions to the baseline schedule, and to the progress schedules submitted as required under subsection 5.2(C) below, to assure completion of the Work within the Contract Time. Contractor is solely responsible for resolving any exceptions noted in a schedule and must, within five working days, correct the schedule to address them. For purposes of this Section 5, a "working day" means a day that City is open for normal business, and excludes weekends and holidays observed by City.

(C) ***Progress Schedules.*** After City accepts the final baseline schedule with no exceptions, Contractor must submit an updated progress schedule and three-week look-ahead schedule, in the format specified by City, for review and acceptance with each application for a progress payment, or when otherwise specified by City, until completion of the Work. The updated progress schedule must: show how the actual progress of the Work as constructed to date compares to the baseline schedule; reflect any proposed changes in the construction schedule or method of operations, including to achieve Project milestones within the Contract Time; and identify any actual or potential impacts to the critical path. Contractor must also submit periodic reports to the Engineer of any changes in the projected material or equipment delivery dates for the Project.

(1) ***Float***. The progress schedule must show early and late completion dates for each task. The number of days between those dates will be designated as the "float." Any float belongs to the Project and may be allocated by the Engineer to best serve timely completion of the Project.

(2) ***Failure to Submit Schedule***. Reliable, up-to-date schedules are essential to efficient and cost-effective administration of the Project. If Contractor fails to submit a schedule within the time periods specified in this Section, or submits a schedule to which City has noted exceptions that are not corrected, City may withhold ten percent from payment(s) otherwise due to Contractor until the exceptions are resolved, the schedule is corrected and resubmitted; and City has accepted the schedule.

(D) ***Recovery Schedule.*** If City determines that the Work is more than one week behind schedule, within seven days following written notice of such determination, Contractor must submit a recovery schedule, showing how Contractor intends to perform and complete the Work within the Contract Time, based on actual progress to date.

(E) ***Effect of Acceptance.*** Contractor and its Subcontractors must perform the Work in accordance with the most current approved schedule unless otherwise directed by City. City's acceptance of a schedule does not operate to extend the time for completion of the Work or any component of the Work, and will not affect City's right to assess liquidated damages for Contractor's unexcused delay in completing the Work within the Contract Time.

(F) ***Posting.*** Contractor must at all times maintain a copy of the most current City-accepted progress or recovery schedule posted prominently in its on-site office.

(G) ***Reservation of Rights.*** City reserves the right to direct the sequence in which the Work must be performed or to make changes in the sequence of the Work in order to facilitate the performance of work by City or others, or to facilitate City's use of its property. The Contract Time or Contract Price may be adjusted to the extent such changes in sequence actually increase or decrease Contractor's time or cost to perform the Work.

(H) ***Authorized Working Days and Times.*** Contractor is limited to working Monday through Friday, excluding holidays, during the hours of 7:00 AM to 4:00 PM, including any equipment operation, truck hauling or deliveries, except as expressly provided in the Special Conditions or as authorized in writing by City. Contractor must also consider and coordinate its working hours with time constraints for City and private special events and other City activities in the Project vicinity. City reserves the right to charge Contractor for additional costs incurred by City due to Work performed on days or during hours not expressly authorized in the Contract Documents, including reimbursement of costs incurred for inspection, testing, and construction management services.

5.3 Delay and Extensions of Contract Time.

(A) ***Notice of Delay.*** If Contractor becomes aware of any actual or potential delay affecting the critical path, Contractor must promptly notify the Engineer in writing, regardless of the nature or cause of the delay, so that City has a reasonable opportunity to mitigate or avoid the delay.

(B) ***Excusable Delay.*** The Contract Time may be extended if Contractor encounters "Excusable Delay," which is an unavoidable delay in completing the Work within the Contract Time due to causes completely beyond Contractor's control, and which Contractor could not have avoided or mitigated through reasonable care, planning, foresight, and diligence. Grounds for Excusable Delay may include fire, natural disasters including earthquake or unusually severe weather, acts of terror or vandalism, epidemic, unforeseeable adverse government actions, unforeseeable actions of third parties, encountering unforeseeable hazardous materials, unforeseeable site conditions, or suspension for convenience under Article 13.

(C) ***Non-Excusable Delay***. Delay which Contractor could have avoided or mitigated through reasonable care, planning, foresight and diligence is "Non-Excusable Delay." Contractor is not entitled to an extension of Contract Time or any compensation for Non-Excusable Delay, or for Excusable Delay that is concurrent with Non-Excusable Delay. Non-Excusable Delay includes delay caused by:

(1) weather conditions which are normal for the location of the Project, as determined by reliable records, including monthly rainfall averages, for the preceding ten years;

(2) Contractor's failure to order equipment and materials sufficiently in advance of the time needed for timely completion of the Work;

(3) Contractor's failure to provide adequate notification to utility companies or agencies for connections or services necessary for the timely performance and completion of the Work;

(4) foreseeable conditions which Contractor could have ascertained from reasonably diligent inspection of the Worksite or review of the Contract Documents; or

(5) Contractor's financial inability to perform the Work, including insufficient funds to pay its Subcontractors or suppliers.

(D) **"Weather Delay Day."** A "Weather Delay Day" is a Working Day during which Contractor and its forces, including Subcontractors, are unable to perform more than 40% of the critical path Work scheduled for that day due to adverse weather conditions which impair the ability to safely or effectively perform the scheduled critical path Work that day. Adverse weather conditions may include rain, saturated soil, and Worksite cleanup required due to adverse weather. Determination of what constitutes critical path Work scheduled for that day will be based on the most current, City-approved schedule. Contractor will be entitled to a non-compensable extension of the Contract Time for each Weather Delay Day caused by rain days in excess of the number of rain days for that month based on reliable records for the preceding ten years, subject to the following limitations:

(a) Contractor must comply with the applicable procedures in Article 5 and 6 of the General Conditions regarding requests to modify the Contract Time.

(b) Normal Weather Delay Days which do not occur during a given month do not carry over to another month.

(c) Contractor will not be entitled to an extension of time for a Weather Delay Day to the extent Contractor is responsible for concurrent delay on that day.

(E) ***Compensable Delay.*** Pursuant to Public Contract Code section 7102, in addition to entitlement to an extension of Contract Time, Contractor is entitled to compensation for costs incurred due to delay caused solely by City, when that delay is unreasonable under the circumstances involved and not within the contemplation of the parties ("Compensable Delay"). Contractor is not entitled to an extension of Contract Time or recovery of costs for Compensable Delay that is concurrent with Non-Excusable Delay.

(F) ***Recoverable Costs.*** Contractor is not entitled to compensation for Excusable Delay unless it is Compensable Delay, as defined above. Contractor is entitled to recover only the actual, direct, reasonable, and substantiated costs ("Recoverable Costs") for each working day that the Compensable Delay prevents Contractor from proceeding with more than 50% of the critical path Work scheduled for that day, based on the most recent

City-approved progress schedule. Recoverable Costs will not include home office overhead or markup for overhead or profit.

(G) ***Request for Extension of Contract Time or Recoverable Costs.*** A request for an extension of Contract Time or any associated Recoverable Costs must be submitted in writing to City within ten calendar days of the date the delay is first encountered, even if the duration of the delay is not yet known at that time, or any entitlement to the Contract Time extension or to the Recoverable Costs will be deemed waived. In addition to complying with the requirements of this Article 5, the request must be submitted in compliance with the Change Order request procedures in Article 6 below. Strict compliance with these requirements is necessary to ensure that any delay or consequences of delay may be mitigated as soon as possible, and to facilitate cost-efficient administration of the Project and timely performance of the Work. Any request for an extension of Contract Time or Recoverable Costs that does not strictly comply with all of the requirements of Article 5 and Article 6 will be deemed waived.

(1) *Required Contents.* The request must include a detailed description of the cause(s) of the delay, and must also describe the measures that Contractor has taken to mitigate the delay and/or its effects, including efforts to mitigate the cost impact of the delay, such as by workforce management or by a change in sequencing. If the delay is still ongoing at the time the request is submitted, the request should also include Contractor's plan for continued mitigation of the delay or its effects.

(2) *Delay Days and Costs.* The request must specify the number of days of Excusable Delay claimed, or provide a realistic estimate if the duration of the delay is not yet known. If Contractor believes it is entitled to Recoverable Costs for Compensable Delay, the request must specify the amount and basis for the Recoverable Costs that are claimed, or provide a realistic estimate if the amount is not yet known. Any estimate of delay duration or cost must be updated in writing and submitted with all required supporting documentation as soon as the actual time and cost is known. The maximum extension of Contract Time will be the number of calendar days, if any, by which an Excusable Delay or a Compensable Delay exceeds a concurrent Non-Excusable Delay. Contractor is entitled to an extension of Contract Time, or compensation for Recoverable Costs for Compensable Delay, only if, and only to the extent that, such delay will unavoidably delay Final Completion.

(3) *Supporting Documentation.* The request must also include any and all supporting documentation necessary to evidence the delay and its actual impacts, including scheduling and cost impacts with a time impact analysis using critical path methodology and demonstrating the unavoidable delay to Final Completion. The time impact analysis must be submitted in a form or format acceptable to City.

(4) *Burden of Proof.* Contractor has the burden of proving that: (a) the delay was an Excusable Delay or Compensable Delay, as defined above; (b) Contractor has made reasonable efforts to mitigate the delay and its schedule and cost impacts; (c) the delay will unavoidably result in delaying Final Completion; and (d) any Recoverable Costs claimed by Contractor were actually incurred and were reasonable under the circumstances.

(5) *Legal Compliance.* Nothing in this provision is intended to require the waiver, alteration, or limitation of the applicability of Public Contract Code section 7102.

(6) *No Waiver.* Any grant of an extension of Contract Time, or compensation for Recoverable Costs due to Compensable Delay, will not operate as a waiver of City's right to assess liquidated damages for Non-Excusable Delay.

(7) *Dispute Resolution.* If there is a dispute over entitlement to an extension of Contract Time or compensation for Recoverable Costs, Contractor may not stop working pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work. Contractor's sole recourse for an unresolved dispute based on City's rejection of a Change Order request for an extension of Contract Time or compensation for Recoverable Costs is to comply with the Dispute Resolution provisions set forth in Article 12 below.

5.4 Liquidated Damages. It is expressly understood that if Final Completion is not achieved within the Contract Time, City will suffer damages from the delay that are difficult to determine and accurately specify. Pursuant to Public Contract Code section 7203, if Contractor fails to achieve Final Completion within the Contract Time, City will charge Contractor in the amount specified in the Contract for each day that Final Completion is delayed beyond the Contract Time, as liquidated damages and not as a penalty.

(A) ***Liquidated Damages.*** Liquidated damages will not be assessed for any Excusable or Compensable Delay, as set forth above.

(B) ***Milestones.*** Liquidated damages will also be separately assessed for failure to meet milestones specified elsewhere in the Contract Documents.

(C) ***Setoff.*** City is entitled to set off the amount of liquidated damages assessed against any payments otherwise due to Contractor, including setoff against release of retention. If there are insufficient Contract funds remaining to cover the full amount of liquidated damages assessed, City is entitled to recover the balance from Contractor or its performance bond surety.

(D) ***Occupancy or Use.*** Occupancy or use of the Project in whole or in part before Final Completion does not constitute City's acceptance of the Project and will not operate as a waiver of City's right to assess liquidated damages for Contractor's unexcused delay in achieving Final Completion.

(E) ***No Limitation on Other Remedies.*** City's right to liquidated damages under this Section applies only to damages arising from Contractor's unexcused failure to complete the Work within the Contract Time. City retains its right to pursue all other remedies under the Contract for other types of damage, including damage to property or persons, or for defective materials or workmanship.

Article 6 - Contract Modification

6.1 Contract Modification and Changes in Work. Modifications to the Contract are valid and legally binding only pursuant to a written, duly authorized and signed Change Order or Contract amendment. City also reserves the right to make changes in the Work without invalidating the Contract including reducing or eliminating portions of the Work or otherwise modifying the Work. City may direct changes in the Work, which may include Extra Work as set forth in subsection (B) below. Any change in the Work, whether directed by City or pursuant to Contractor's request for a Change Order under Section 6.2 below, will not be a valid and binding change to the Contract unless it is formalized in a Change Order, which may include commensurate changes in the Contract Price or Contract Time as applicable. Contractor must promptly comply with City-directed

changes in the Work in accordance with the original Contract Documents, even if Contractor and City have not yet reached agreement as to adjustments to the Contract Price or Contract Time for the change in the Work or for the Extra Work.

(A) ***Disputes.*** If there is a dispute over entitlement to or the amount of a change in Contract Time or a change in Contract Price related to a City-directed change in the Work, Contractor must perform the Work as directed and may not delay its Work or cease Work pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work, including the Work in dispute. If City and Contractor dispute whether a portion or portions of the Work are already required by the Contract Documents or constitute Extra Work, dispute the value of added or eliminated Work, or otherwise dispute the interpretation of any portion(s) of the Contract Documents or entitlement to changes in the Contract Price or Contract Time, Contractor must perform the Work as directed and may not delay its Work or cease Work pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work, including the Work in dispute, as directed by City. Contractor's sole recourse for an unresolved dispute related to changes in the Work or performance of any Extra Work is to comply with the dispute resolution provisions set forth in Article 12, below.

(B) ***Extra Work.*** City may direct Contractor to perform Extra Work related to the Project. Contractor must promptly perform any Extra Work as directed or authorized by City in accordance with the original Contract Documents, even if Contractor and City have not yet reached agreement on adjustments to the Contract Price or Contract Time for such work. Contractor must maintain detailed daily records that itemize the cost of each element of Extra Work, and sufficiently distinguish the direct cost of the Extra Work from the cost of other Work performed. For each day that Contractor performs Extra Work, or Work that Contractor contends is Extra Work, Contractor must submit no later than the following Working Day, a daily report of the Extra Work performed that day and the related costs, together with copies of certified payroll, invoices, and other documentation substantiating the costs ("Extra Work Report"). The Engineer will make any adjustments to Contractor's Extra Work Report(s) based on the Engineer's records of such work. When an Extra Work Report(s) is agreed on and signed by both City and Contractor, the Extra Work Report(s) will become the basis for payment under a duly authorized and signed Change Order. Failure to submit the required documentation by close of business on the next Working Day is deemed a full and complete waiver for any change in the Contract Price or Contract Time for any Extra Work performed that day.

(C) ***Remedy for Non-Compliance.*** Contractor's failure to promptly comply with a City-directed change is deemed a material breach of the Contract, and in addition to all other remedies available to it, City may, at its sole discretion, hire another contractor or use its own forces to complete the disputed Work at Contractor's sole expense, and may deduct the cost from the Contract Price.

6.2 Contractor Change Order Requests. Contractor must submit a request or proposal for a change in the Work, compensation for Extra Work, or a change in the Contract Price or Contract Time as a written Change Order request or proposal.

(A) ***Time for Submission.*** Any request for a change in the Contract Price or the Contract Time must be submitted in writing to the Engineer within ten calendar days of the date that Contractor first encounters the circumstances, information or conditions giving rise to the Change Order request, even if the total amount of the requested change in the Contract Price or impact on the Contract Time is not yet known at that time. If City requests that Contractor propose the terms of a Change Order, unless otherwise specified in City's request, Contractor must provide the Engineer with a written proposal

for the change in the Contract Price or Contract Time within five working days of receiving City's request, in a form satisfactory to the Engineer.

(B) ***Required Contents.*** Any Change Order request or proposal submitted by Contractor must include a complete breakdown of actual or estimated costs and credits, and must itemize labor, materials, equipment, taxes, insurance, and subcontract amounts and if applicable, Extra Work Reports. Any estimated cost must be updated in writing as soon as the actual amount is known.

(C) ***Required Documentation.*** All claimed costs must be documented, and any related request for an extension of time or delay-related costs must be included at that time and in compliance with the requirements of Article 5 of the General Conditions.

(D) ***Required Form.*** Contractor must use City's form(s) for submitting all Change Order requests or proposals, unless otherwise specified by City.

(E) ***Certification.*** All Change Order requests must be signed by Contractor and must include the following certification:

> "The undersigned Contractor certifies under penalty of perjury that its statements and representations in this Change Order request are true and correct. Contractor warrants that this Change Order request is comprehensive and complete as to the Work or changes referenced herein, and agrees that any costs, expenses, or time extension request not included herein is deemed waived. Contractor understands that submission of claims which have no basis in fact or which Contractor knows to be false may violate the False Claims Act, as set forth in Government Code sections 12650 et seq."

6.3 Adjustments to Contract Price. The amount of any increase or decrease in the Contract Price will be determined based on one of the following methods, but in the order provided with unit pricing taking precedence over the other methods:

(A) ***Unit Pricing.*** Amounts previously provided by Contractor in the form of unit prices, either in a bid schedule or schedule of values, will apply if unit pricing has previously been provided in Contractor's accepted bid schedule or schedule of values for the affected Work. No additional markup for overhead or profit will be added to the calculation.

(B) ***Lump Sum.*** An all-inclusive mutually agreed upon lump sum for the affected Work with no additional markup.

(C) ***Time and Materials.*** On a time and materials basis, which may include a not-to-exceed limit:

> (1) All labor, materials and equipment used for Work paid on a time and materials basis is subject to approval by the Engineer, and compensation will be calculated as the total of the following sums:
>
> > (a) All direct labor costs, meaning costs actually paid to or on behalf of workers for hourly wages, health and welfare benefits, pensions, vacation, or training, plus 15% markup;
> >
> > (b) All direct material costs, including sales tax, plus15% markup;
> >
> > (c) All direct plant and equipment rental costs, plus 15% markup;

(d) All direct subcontract costs, plus 5% markup for first tier subcontract costs only; and

(e) Increased bond or insurance premium costs computed at 1.5% of total of the previous four sums.

(2) The markups stated above constitute full compensation for any and all costs associated with the Work performed on a time and materials basis, including overhead, profit, workers' compensation, social security, unemployment insurance, taxes, cost of delay or disruption, and any other costs.

6.4 Unilateral Change Order. If the parties dispute the terms of a proposed Change Order, including disputes over the amount of compensation or extension of time that Contractor has requested, disputes over the value of deleted or changed Work, disputes as to what constitutes Extra Work, or disputes as to quantities used, City may elect to issue a unilateral Change Order, directing performance of the Work, and authorizing a change in the Contract Price or Contract Time up to the amount City believes is merited. Contractor's sole recourse to dispute the terms of a unilateral Change Order is to submit a timely Claim pursuant to Article 12, below.

6.5 Non-Compliance Deemed Waiver. Contractor waives its entitlement to any increase in the Contract Price or Contract Time if Contractor fails to comply with the provisions of this Article. Contractor will not be paid for unauthorized Extra Work.

Article 7 - General Construction Provisions

7.1 Permits and Taxes.

(A) ***General.*** Unless otherwise specified in the Contract Documents, Contractor must obtain and pay for all permits, fees, or licenses required to perform the Work, including a City business license obtained within ten days following City's issuance of the Notice of Award. For City capital improvement projects, Contractor must obtain a "No Fee" encroachment and building permit from City's Development and Engineering Services Department. Contractor must also cooperate with and provide notifications to all government agencies with jurisdiction over the Project, as may be required. Contractor must provide City with copies of all notices, permits, licenses, and renewals required for the Work.

(B) ***Federal Excise Tax.*** Contractor must pay for all taxes on labor, material and equipment, except Federal Excise Tax to the extent that City is exempt from Federal Excise Tax.

(C) ***Local Tax Allocation.*** Contractor and each Subcontractor performing Work with a value over $5,000,000 must obtain a Board of Equalization sub-permit for the Project Site and allocate all eligible sale and use tax payments to the City. If applicable, before starting the Work, Contractor and Subcontractors will provide the City with a copy of its Board of Equalization account number and sub-permit.

7.2 Temporary Facilities. Contractor must provide, at Contractor's sole expense, any and all temporary facilities for the Project, including onsite staging area(s) for material and equipment, a field office, sanitary facilities including enclosed toilets for Contractor's employees and Subcontractors, light, power and water, storage, scaffolds, barricades, walkways, and any other temporary structure required to safely perform the Work along with any utility services incidental thereto.

(A) ***Standards.*** Temporary facilities must be safe and adequate for the intended use, and installed and maintained in accordance with all applicable federal, state, and local laws, codes, and regulations.

(B) ***Staging Area.*** Contractor must fence and screen the staging area(s), and its operation must minimize inconvenience to neighboring properties.

(C) ***Utilities.*** Contractor must install and maintain the light, power, water and all other utilities required for the Project site, including the piping, wiring, lamps and related equipment necessary to perform the Work. Contractor may not draw water from any City water source, except to extinguish a fire, without first obtaining a permit from City.

(D) ***Removal and Repair.*** Contractor must promptly remove all such temporary facilities when they are no longer needed or upon completion of the Work, whichever comes first. Contractor must promptly repair any damage to City's property or to other property caused by the installation, use, or removal of the temporary facilities, and must promptly restore the property to its original or intended condition.

(E) ***Additional Requirements.*** Additional provisions pertaining to temporary facilities may be included in the Specifications or Special Conditions.

7.3 Noninterference and Additional Work Areas. Contractor must avoid interfering with City's use of its property at or adjacent to the Project site, including use of roadways, entrances, parking areas, walkways, and structures. Contractor must also minimize disruption of access to private property in the Project vicinity. Contractor must coordinate with affected property owners, tenants, and businesses, and maintain some vehicle and pedestrian access to their residences or properties at all times. Temporary access ramps, fencing or other measures must be provided as needed. Before blocking access to a private driveway or parking lot, Contractor must notify the affected parties of the pending closure and allow them to remove vehicles. Private driveways, residences and parking lots must have access to a roadway during non-Work hours.

(A) ***Offsite Acquisition.*** Contractor must acquire, use and dispose of, at its sole expense unless otherwise provided by City, any additional Work areas, easements, and temporary facilities necessary to access and perform the Work. Contractor's indemnity obligations under Section 4.2 above apply to any such acquisition, use or disposal.

(B) ***Offsite Staging Area and Field Office.*** If additional space beyond the Project site is needed for the staging area(s) or the field office, Contractor must make advance arrangements with the nearby property owner(s) to secure the space. Contractor may negotiate a license agreement(s) or easement(s) with the property owner(s) before submitting the Bid Proposal and must also secure any required use permit from City's Planning Division. Before using or occupying the area, Contractor must provide the Engineer with a copy of the license agreement(s) or easement(s) and the use permit, together with a written release from the property owner(s) holding City harmless from any related liability, in a form acceptable to the City Attorney.

7.4 Signs. No signs may be displayed on or about City's property, except signage which is required by law or by the Contract Documents, without City's prior written approval as to content, size, design, and location.

7.5 Worksite and Nearby Property Protections.

(A) ***General.*** Contractor is responsible at all times, on a 24-hour basis and at its sole cost, for providing security for and protecting the Work, the Project site, and the materials and equipment to be incorporated into the Work, until the Project has been accepted by City. Except as specifically authorized by City, Contractor must confine its operations to the area of the Project site indicated in the Drawings. With the Engineer's advance approval and at his or her direction, Contractor may use adjacent City right-of-way for Work operations during Work hours. Contractor is liable for any damage caused to the Work, City's property, the property of adjacent or nearby property owners (including real property, improvements and utilities and personal property), and the work or personal property of other contractors working for City.

(1) Subject to the Engineer's approval, Contractor will provide and install safeguards to protect the Work, the Worksite, City's real or personal property, and the real or personal property of adjacent or nearby property owners.

(2) City's wastewater systems may not be interrupted. If the Work disrupts existing sewer facilities, Contractor must immediately notify the Engineer and establish a plan, subject to City's approval, to convey the sewage in closed conduits back into the sanitary sewer system. Sewage must not be permitted to flow in trenches or be covered by backfill.

(3) Contractor must remove with due care, and store at City's request, any objects or material from the Project site that City will salvage or reuse at another location(s). Contractor must deliver the objects or material to any other site(s) in City that the Engineer designates.

(4) If directed by Engineer, Contractor must promptly repair or replace any such property damage, as specified by the Engineer. However, acting in its sole discretion, City may elect to have the property damage remedied otherwise, and may deduct the cost to repair or replace the damaged property from payment otherwise due to Contractor.

(B) ***Securing Project Site.*** After completion of Work each day, Contractor must secure the Project site and, to the extent feasible, make the area reasonably accessible to the public unless the Engineer approves otherwise. All excess materials and equipment not protected by approved traffic control devices must be relocated to the staging area or demobilized. Trench spoils must be hauled off the Project site daily and open excavations must be protected with steel plates. Contractor and Subcontractor personnel may not occupy or use the Project site for any purpose during non-Work hours, except as may be provided in the Contract Documents to address issues such as site security.

(C) ***Unforeseen Conditions.*** If Contractor encounters facilities, utilities, or other unknown conditions not shown on or reasonably inferable from the Drawings or apparent from inspection of the Project site, Contractor must immediately submit a Request for Information to the Engineer and avoid taking any action which could cause damage to the facilities or utilities pending further direction from the Engineer. The Engineer's direction, which may be stated in a Letter of Instruction, will be final and binding on Contractor. If the Engineer's subsequent direction to Contractor affects Contractor's cost or time to perform the Work, Contractor may submit a Change Order request as set forth in Article 6 above. However, City will not extend the Contract Time due to Contractor's failure to submit a timely Request for Information.

(D) ***Support; Adjacent Properties.*** Contractor must provide, install, and maintain all shoring, bracing, and underpinning necessary to provide support to City's property and adjacent properties and improvements thereon. Contractor must provide notifications to adjacent property owners as may be required by law.

(E) ***Post-Construction Restoration.*** Contractor must ensure, as part of the Work, that all parts of the construction are properly joined with existing and adjacent improvements and conditions, and must provide all cutting, fitting and patching needed to accomplish that requirement. Contractor must repair or replace all existing improvements that are damaged or removed during the Work, both on and off the Project site, including curbs, sidewalks, driveways, fences, signs, utilities, street surfaces and structures. Repairs and replacements must be at least equal to the existing improvements, and the condition, finish and dimensions must match the existing improvements.

(1) Contractor must replace, with thermoplastic, any existing striping within and adjacent to the Project site that is damaged during the Work. Partially damaged striping must be replaced in its entirety.

(2) Contractor must replace any survey monuments that are damaged or removed during the Work, with a Record of Survey filed by a licensed Land Surveyor as required by State law.

(3) Before removing any traffic control or street signs on the Project site, Contractor must take photographs showing their original locations. Upon completion of each phase of construction, Contractor must temporarily reset the signs at those locations. Contractor must then replace the signs permanently upon completion of the Work and the cost of their removal and replacement must be included in the Bid Proposal.

(4) Contractor must maintain any rural mail boxes on the Project site and relocate them to their permanent locations as soon as possible in the course of the Work, to the satisfaction of the affected property owners and the postal service.

7.6 Materials and Equipment.

(A) ***General.*** Unless otherwise specified, all materials and equipment required for the Work must be new, free from defects, and of the best grade for the intended purpose, and furnished in sufficient quantities to ensure the proper and expeditious performance of the Work. Contractor must employ measures to preserve the specified quality and fitness of the materials and equipment.

(1) Unless otherwise specified, all materials and equipment required for the Work are deemed to include all components required for complete installation and intended operation, and must be installed in accordance with the manufacturer's recommendations or instructions.

(2) Contractor is responsible for all shipping, handling, and storage costs associated with the materials and equipment required for the Work, and is responsible for providing security and protecting the Work and all of the required materials, supplies, tools and equipment at Contractor's sole cost until City has recorded the notice of completion. Contractor will not assign, sell, mortgage, or hypothecate any materials or equipment for the Project, or remove any materials or equipment that have been installed or delivered.

(3) Within five calendar days following issuance of the Notice to Proceed, Contractor must order any specialized material or equipment for the Work that is not readily available from material suppliers. Contractor must also retain documentation of the purchase orders date(s).

(B) ***City-Provided.*** If the Work includes installation of materials or equipment to be provided by City, Contractor is solely responsible for the proper examination, handling, storage, and installation of such items in accordance with the Contract Documents. Contractor must promptly notify City of any defects discovered in City-provided materials or equipment. Contractor is solely responsible for any loss of or damage to such items which occurs while the items are in Contractor's custody and control, the cost of which may be offset from the Contract Price and deducted from any payment(s) due to Contractor.

(C) ***Intellectual Property Rights.*** Contractor must, at its sole expense, obtain any authorization or license required for use of patented or copyright protected materials, equipment, devices or processes that are incorporated into the Work. Contractor's indemnity obligations in Article 4 applies to any claimed violation of intellectual property rights in violation of this provision.

(D) ***Weighing and Metering Equipment.*** Contractor must ensure that all scales and metering equipment used for the Project are inspected for accuracy and certified, within the previous 12 months before each use, by the California Bureau of Weights and Measures, the San Joaquin County Director or Sealer of Weights and Measures, or a scale mechanic registered with or licensed by San Joaquin County. The scale service agency's accuracy must meet all State legal standards pertaining to weighing devices. Contractor must present a certificate of compliance to the Engineer for approval before the agency's operation, and the certificate must be renewed at the Engineer's request at no cost to City. All scales must be arranged so they can be easily read from the operator's area. They must indicate true net weight without applying any factor and the scale figures must be clearly legible. Scales must be accurate to within one percent when tested with the plant shut down. Weighing equipment must be insulated against vibration or moving of other operating equipment in the area such that the error in weighing with the entire plant running will not exceed two percent for any setting or one and one-half percent for any batch.

(E) ***Calibration of Testing Equipment***. Testing equipment, including pressure gauges, metering devices, hydraulic systems, force (load) measuring instruments and strain-measuring devices, must be calibrated by a testing agency acceptable to the Engineer at intervals not to exceed 12 months and also following repairs, modification or relocation of the equipment. Contractor must provide the calibration certificates at the Engineer's request.

7.7 Substitutions.

(A) ***"Or Equal."*** Any Specification designating a material, product, or thing (collectively, "item") or service by specific brand or trade name, followed by the words "or equal," is intended only to indicate the quality and type of item or service desired, and Contractor may request use of any equal item or service.

(B) ***Request for Substitution.*** A post-award request for substitution of an item or service must be submitted in writing to the Engineer for approval in advance, within the applicable time period provided in the Contract Documents. If no time period is specified, the substitution request may be submitted any time within 35 days after the date of award of the Contract, or sufficiently in advance of the time needed to avoid delay of the Work,

whichever is earlier. A request for substitution must contain a description of any proposed changes to the Work required to accommodate the substitution.

(C) ***Data Showing Equality*.**

(1) Contractor must, at its expense, have any proposed substituted item or service tested as required by the Engineer, to determine whether the physical, chemical or other characteristics, including quality, strength, durability, finish, efficiency, dimensions, service level and suitability, are such that the item or service will fulfill its intended function for the Project.

(2) The Engineer must approve the test method(s), in his or her sole discretion, in advance of any test. Contractor will report the test results promptly to the Engineer, who will determine if the item or service is "equal."

(D) ***Substantiation.*** Any available data substantiating the proposed substitute as an equal item or service must be submitted with the written request for substitution. Contractor's failure to timely provide all necessary substantiation, including any required test results as soon as they are available, is grounds for rejection of the proposed substitution, without further review.

(E) ***Burden of Proving Equality.*** Contractor has the burden of proving the equality of the proposed substitution. City has sole discretion to determine whether a proposed substitution is equal, and City's determination is final.

(F) ***Approval or Rejection.*** If the proposed substitution is approved, Contractor is solely responsible for any additional costs or time associated with the substituted item or service. If the proposed substitution is rejected, Contractor must, without delay, install the item or use the service as specified.

(G) ***Contractor's Obligations.*** City's review of a proposed substitution will not relieve Contractor from any of its obligations under the Contract Documents, including guarantee and warranty requirements. If Contractor makes an unauthorized substitution, Contractor will be solely responsible for all resulting cost impacts, including the cost of removal and replacement and the impact to other design elements.

7.8 Testing and Inspection.

(A) ***General.*** All materials, equipment, and workmanship used in the Work are subject to inspection and testing by the Inspector or the Engineer, at all times and locations during construction and/or fabrication and at any worksite, including at shops and yards as well as at the Project site. All manufacturers' application or installation instructions must be provided to the Inspector or the Engineer at least ten days before the first such application or installation. Contractor must, at all times, make the Work available for inspection.

(B) ***Scheduling and Notification.*** Contractor must cooperate with City in coordinating the inspections and testing. Contractor must submit samples of materials, and schedule all tests required by the Contract Documents in time to avoid any delay to the progress of the Work. Contractor must notify the Engineer no later than noon of the Working Day before any inspection or testing, and must provide timely notice to the other necessary parties as specified in the Contract Documents. If Contractor schedules an inspection or test beyond regular Work hours, or on a Saturday, Sunday, or recognized City holiday, Contractor must notify the Engineer at least 48 hours in advance for approval. If approved, Contractor must reimburse City for the cost of the overtime

inspection or testing. Such costs, including the City's hourly costs for required personnel, may be deducted from payments otherwise due to Contractor.

(1) *Materials Testing*. Contractor must submit samples of the Project materials to the Engineer, upon his or her request, before the materials are incorporated into the Work. Contractor will deliver the materials for any testing at the time and place designated by the Engineer, at no cost to City. Unless otherwise specified in the Special Conditions, the initial testing will be performed at City's cost. The Engineer will direct and supervise all testing, including the number and location of tests. Contractor must notify City in writing at least 15 days in advance of the use of any materials for the Project for which tests are required or requested, to allow sufficient time for City to perform the tests. Contractor's notice will name the proposed supplier and the source of the material(s).

(C) ***Responsibility for Costs.*** City will bear the initial cost of testing to be performed by independent testing consultants retained by City, subject to the following exceptions:

(1) Contractor will be responsible for the costs of any subsequent tests which are required to substantiate compliance with the Contract Documents, and any associated remediation costs.

(2) Contractor will be responsible for inspection costs, at City's established rates, for inspection time lost because the Work is not ready or Contractor fails to appear for a scheduled inspection.

(3) If any portion of the Work that is subject to inspection or testing is covered or concealed by Contractor before the inspection or testing, Contractor will bear the cost of making that portion of the Work available for the inspection or testing required by the Contract Documents, and any associated repair or remediation costs. If the Engineer requests to see a covered or concealed portion of the Work that was not subject to such testing or inspection, Contractor must promptly uncover the Work but may also submit a request for a Change Order for the cost of uncovering and then re-covering that portion of the Work. However, if the uncovered Work does not conform to the Contract Documents, Contractor must pay all such costs and will not be entitled to any adjustment to the Contract Time or Contract Price.

(4) Contractor is responsible for properly shoring all compaction test sites deeper than five feet below grade, as required under Section 7.17 below, to protect testing personnel.

(5) Any Work or material that is defective or fails to comply with the requirements of the Contract Documents must be promptly repaired, removed, replaced, or corrected by Contractor, at Contractor's sole expense, even if that Work or material was previously inspected or included in a progress payment.

(D) ***Contractor's Obligations.*** Contractor is solely responsible for any delay occasioned by remediation of defective or noncompliant Work or material. Inspection of the Work does not in any way relieve Contractor of its obligations to perform the Work as specified. Any Work done without the required inspection(s) will also be subject to rejection by City. If Contractor fails to remove defective, noncompliant or rejected Work or material from the Project site within 14 days after City's written notice thereof, City may, without foregoing any other remedies under the Contract, remove, sell or otherwise dispose of the Work or material. Contractor will be entitled to the proceeds of any sale, but only in excess of the costs and damages for which Contractor is liable to City for the

removal, including compensation for City's related services, expenses and any attorney's fees and costs incurred.

(E) ***Distant Locations.*** If required off-site testing or inspection must be conducted at a location more than 100 miles from the Project site, Contractor is solely responsible for the additional travel costs required for testing and/or inspection at such locations. Regardless of location, no materials or equipment for the Project will be shipped, and no processing, fabrication or treatment of the materials or equipment will be done, without passing inspection. The materials and equipment will also be subject to re-inspection at the Project site.

(F) ***Waiver of Testing Requirements.*** The Engineer, in his or her sole discretion, may waive material testing requirements under the Contract Documents and accept the manufacturer's written certificate of compliance or test data evidencing that the materials meet all requirements. A certificate of compliance is acceptable for authorizing the use of steel pipe in sizes less than 18 inches, and the use of vitrified clay, cast iron or ductile iron pipe in all sizes. However, City may sample or test, at any time, all materials used on the basis of a certificate of compliance. Any materials used for the Work on the basis of a certificate of compliance does not relieve Contractor of the responsibility to only use materials that conform to the requirements of the Contract Documents.

(G) ***Acceptance of Defective or Noncompliant Work.*** City retains the option, at its sole discretion and by written notice to Contractor, to accept defective or noncompliant Work instead of requiring its removal or correction as set forth above in this Section 7.8. In such event, the Contract Price will be reduced by an amount equal to the difference between: the value to City of the Work had it been performed in compliance with the Contract Documents; and the value to City of the defective or noncompliant Work. If the remaining payments due to Contractor and retention under the Contract are not sufficient to cover the amount of the Contract Price reduction, Contractor must promptly pay the amount of the deficiency to City.

(H) ***Final Inspection.*** The provisions of this Section 7.8 apply to final inspection under Article 11, Completion and Warranty Provisions.

7.9 Worksite Conditions and Maintenance. Contractor must, at all times on a 24-hour basis and at its sole cost, maintain the Project site and the staging and storage areas in clean and neat condition and in compliance with any regulatory requirements for air quality and noise control. Contractor must also, on a daily basis and at its sole cost, remove and properly dispose of the debris and waste materials from the Project site.

(A) ***Air Emissions and Noise Control***. Contractor must not discharge smoke, dust or any other air contaminants into the atmosphere in violation of any applicable law, regulation or rule. Contractor must also control the noise generated from construction to the Engineer's satisfaction and in compliance with any applicable law, regulation or rule. Use of an air compressor, jackhammer or other loud vibrating-sound device will be limited to operation on regular Work days between the hours of 8:00 AM to 4:30 PM.

(B) ***Dust and Debris***. Contractor must minimize and confine dust and debris resulting from the Work, including as required by Chapter 7.24 of City's Municipal Code. Contractor must abate dust nuisance by cleaning, sweeping, and immediately sprinkling with water excavated areas of dirt or other materials prone to cause dust, and within one hour after the Engineer notifies Contractor that an airborne nuisance exists. The Engineer may direct that Contractor provide an approved water- spraying truck for this purpose. If the Engineer determines that the dust control is not adequate, City may have the work done by others and deduct the cost from the Contract Price. Contractor will immediately remove any excess excavated material from the Worksite and any dirt deposited on

public streets. Contractor will also remove forms and form lumber as soon as practicable after stripping.

(1) *Construction Water.* Construction water from City hydrants will be available for the Project at no cost to Contractor. Before obtaining any water, Contractor must secure a permit from City and provide an approved water truck, installed with backflow prevention devices.

(C) ***Clean up.*** Before discontinuing Work in an area, Contractor must clean the area and remove all rubbish and debris along with the construction equipment, tools, machinery, waste and surplus materials. Except as otherwise specified, excess Project materials and the materials removed from existing improvements on the Project site with no salvage value or intended reuse by City will be Contractor's property.

(1) Hauling trucks and other vehicles leaving the Project site must be cleaned of exterior mud or dirt before traveling on City streets. Materials and loose debris must be delivered and loaded to prevent dropping materials or debris. Contractor must immediately remove spillage from hauling on any publicly traveled way.

(2) Contractor must handle and contain waste materials that are hazardous, dangerous or unsanitary separately from inert waste.

(3) Streets affected by Work on the Project must be kept clean by street sweeping.

(C) ***Disposal.*** Contractor must dispose of all Project debris and waste materials in a safe and legal manner. Contractor may not burn or bury waste materials on the Project site. Contractor will not allow any dirt, refuse, excavated material, surplus concrete or mortar, or any associated washings, to be disposed of onto streets or into manholes or City's storm drain system. If the Engineer determines that any objects or materials removed from the existing improvements will be reused by City or have salvage value, Contractor must deliver them to City's corporation yard or to any other site the Engineer designates within the City, at Contractor's sole cost.

(E) ***Completion.*** At the completion of the Work, Contractor must remove from the Project site all of its equipment, tools, surplus materials, waste materials and debris, presenting a clean and neat appearance. Before demobilizing from the Project site, Contractor must ensure that all surfaces are cleaned, sealed, waxed, or finished as applicable, and that all marks, stains, paint splatters, and the like have been properly removed from the completed Work and the surrounding areas.

(1) Structures constructed must be free of rodents, insects, vermin and pests. Contractor must arrange and pay for, as part of the Work and within the Contract Time, any necessary extermination work. A licensed exterminator must perform such work, in compliance with all regulatory requirements. Contractor will be responsible for any injury to persons or property, and for eliminating offensive odors resulting from, any extermination operations.

(F) ***Non-Compliance.*** If Contractor fails to comply with its maintenance and cleanup obligations or any City cleanup order, City may suspend the Work until the condition(s) is corrected with no increase in the Contract Time or Contract Price. Following written notification from City or its representative, City may also

undertake appropriate cleanup measures without further notice and the cost will be deducted from any amounts due or to become due to Contractor.

7.10 Traffic Control and Parking Restrictions. Contractor must, at its sole cost, provide for the safe movement of vehicular, bicycle and pedestrian traffic through and around the Work site at all times during the course of the Project. Contractor must use signs, flag persons, pavement markings, barricades, lights, cones, and delineators as necessary, with minimal delay and inconvenience to the public. Contractor must also use only individuals trained in traffic control and traffic control flagging for the Project.

(A) ***Traffic Control Plan***. Contractor must submit a traffic control plan(s) to City at the pre-construction conference, proposing Contractor's traffic control measures for the Project. The plan must conform with the *Manual of Uniform Traffic Control Devices* and the *Work Area Traffic Control Handbook* (Building News Incorporated P.O. Box 3031, Terminal Annex, Los Angeles, CA 90051). The plan must include scaled drawings for addressing traffic control at intersections and mid-blocks of the impacted streets during working and non-working hours, showing the proposed signs, traffic control devices and flag persons to be used. The plan must be directed equally to the regulation and protection at all times of non-vehicular traffic, including pedestrians, bicyclists, joggers, skaters, and skateboarders. No traffic control may commence until the Engineer has reviewed and accepted the plan(s). Contractor may implement any revised traffic control plan(s) only after the Engineer's advance review and acceptance of the revised plan(s).

(B) ***Traffic Control Devices***. Contractor must provide and maintain traffic control devices in sufficient quantities, types, and locations for safe and adequate traffic control and flow at all times. During hours of darkness, approved lights and flares must illuminate signs and hazards and alert approaching traffic. Barricades must be furnished and maintained along all open trenches. No Work may begin before the related traffic control devices have been placed, tested and, if required by City, adjusted and revised. Placement of all traffic control devices must conform with the *Manual of Uniform Traffic Control Devices* and the traffic control plan(s), and the device locations must be adjusted to suit the conditions of each detour and changing Project conditions. After any Work hazards have been removed, all traffic control devices and temporary signs must also be removed. Daily traffic control measures in the impacted areas must continue until Project cleanup activities have been completed and all of Contractor's equipment has been removed from the traveled way.

(C) ***Traffic Control Detours***. Contractor must direct, divert and detour traffic through, around and adjacent to Work operations in accordance with the traffic control plan(s) and as otherwise specified in the Contract Documents.

(1) *Field Review of Detours*. Each traffic detour must be test-driven by the Engineer and Contractor's onsite superintendent immediately after the related traffic control devices are placed. The test drive must include approaches to the detour from each possible direction, and traverse the full length of each detour route. Contractor must adjust and revise all traffic control devices as needed, and the test drive must be repeated if the Engineer determines it to be necessary.

(2) *Diverting Bicycle and Pedestrian Traffic.* Whenever Work operations obstruct the flow of bicycle or pedestrian traffic, or present a hazard to bicycles or pedestrians in the vicinity, Contractor must take action to protect and separate bicycles and pedestrians from the Work area. Such actions may include placement of barricades between bicycles and pedestrians and the Work areas, placement of warning signs, and using personnel to protect and maintain access for approaching bicycles and pedestrians as the conditions warrant.

(3) *Diverting Vehicular Traffic*. Whenever Work operations obstruct the flow of vehicular traffic, or present a hazard to vehicles operating in the vicinity, Contractor must take action to warn, detour and otherwise protect approaching drivers and vehicles as the conditions warrant.

(4) *Flaggers*. Contractor must employ flaggers as necessary for each detour and at all locations where barricades and warning signs alone cannot control traffic movement. A warning sign must be placed ahead of the flaggers reading: "Flagger Ahead." The distance between the sign and the flaggers must be based on the average traffic speed for the location, allowing at least 50 feet for each 10 miles per hour. During hours of darkness, flagger stations must be illuminated so the flaggers are clearly visible to approaching traffic. Each flagger must wear a red or orange warning garment when flagging. Flaggers must be provided with approved red flags or Stop/Slow hand paddles, and two-way radios for communication. When flagging during hours of darkness, the flagger must signal with a red light or flare and must have a belt and suspender harness outside his or her garment fitted with reflectors or made from reflectorized cloth.

(5) *Notice to Agencies*. Contractor must notify the Engineer and all agencies having jurisdiction over the Work, in writing, at least 96 hours in advance, excluding holidays and weekends, before instituting any street or lane closure or detour. At the end of each Workday, Contractor must inform the Engineer, the Police Department and the Fire Department of the status of all detours, lane restrictions, and road closures. Contractor must also cooperate and coordinate with the trash collection agencies, public transit providers, U.S. Postal Service, and any other third parties as necessary, to allow them to maintain their existing service schedules in City during the course of the Work.

(6) *Emergency Vehicle Access Through Detours.* Contractor must provide for and not impede the movement of emergency vehicles through the Work area while all detours and street closures remain in effect.

(7) *Night Detours*. Contractor may not maintain any lane or road closure during non-Working hours without obtaining the Engineer's advance written approval. Contractor must restore travel lanes to their original alignment and configuration during non-Working hours by placing temporary asphalt pavement or bridging with steel plates. Contractor must also place "Rough Road" signs conforming to the *Manual of Uniform Traffic Control Devices* at uneven temporary pavement or bridging locations.

(8) *Temporary Traffic Lanes*. Temporary traffic lanes must be at least ten feet wide, and 11 feet wide around curves, with an additional two feet of clearance from curbs. The length of temporary lanes must be limited to the Work area under construction and the distance necessary to safely divert traffic.

(D) ***Parking Restrictions***. Contractor must post no-parking signs at all locations necessary to establish Work areas and detour traffic. Signs must read "No Parking -- Construction Tow-away Zone" in all capital letters, state the day(s) and hours of the parking restrictions, and state the telephone number of the Police Department or other agency having jurisdiction over parking at that location. The Engineer must approve in advance the signs, their placement location, and the duration of the parking limits. The signs must be placed at least 72 hours before the parking restrictions take effect. The signs must be removed when no Work is under way and reposted at least 72 hours before the Work resumes. Contractor must contact and coordinate with the Police Department before removing any vehicles parked in violation of the signs. Contractor

must also coordinate with the Police Department for enforcement and towing of any illegally parked vehicles, in compliance with the California Vehicle Code.

7.11 Instructions and Manuals. Contractor must provide to City three copies each of all instructions and manuals required by the Contract Documents, unless otherwise specified. These must be complete as to drawings, details, parts lists, performance data, and other information that may be required for City to easily maintain and service the materials and equipment installed for this Project.

(A) ***Submittal Requirements.*** All manufacturers' application or installation instructions must be provided to the City at least ten days before the first such application. The instructions and manuals, along with any required guarantees, must be delivered to City for review.

(B) ***Training.*** Contractor or its Subcontractors must instruct City's personnel in the operation and maintenance of any complex equipment as a condition precedent to Final Completion, if required in the Contract Documents.

7.12 As-built Drawings. Contractor and its Subcontractors must prepare and maintain on the Worksite a detailed, complete and accurate as-built set of the Drawings which will be used solely for the purpose of recording changes made in any portion of the original Drawings in order to create accurate record drawings at the end of the Project.

(A) ***Duty to Update.*** The as-built drawings must be updated as changes occur, on a daily basis if necessary. Contractor must prepare and submit a set of red-lined as-built drawings for Engineer's review and approval at the end of each month. Progress payments may be delayed, in whole or in part, until the as-built drawings are brought up to date to the satisfaction of City. Actual locations to scale must be identified on the as-built drawings for all runs of mechanical and electrical work, including all site utilities, etc., installed underground, in walls, floors, or otherwise concealed. Deviations from the original Drawings must be shown in detail. The exact location of all main runs, whether piping, conduit, ductwork, drain lines, etc., must be shown by dimension and elevation. The location of all buried pipelines, appurtenances, or other improvements must be represented by coordinates and by the horizontal distance from visible above-ground improvements.

(B) ***Final Completion.*** Contractor must verify that all changes in the Work are depicted in the as-built drawings and must deliver the complete set of as-built drawings to the Engineer for review and approval as a condition precedent to Final Completion and Final Payment. Contractor must also deliver all Worksite copies to the Engineer upon completion of the Work.

7.13 Utilities.

(A) ***Subsurface Infrastructure.*** With reference to the requirements of Government Code sections 4216 through 4216.9, Contractor must identify, locate and protect subsurface infrastructure and installations, including service laterals, conduits, and appurtenances of any underground facility, the presence of which can be inferred from the Contract Documents or from visible facilities such as buildings, meters or junction boxes, before doing any Work that could damage such facilities or interfere with their service. Where underground main distribution conduits such as water, gas, sewer, electric power, telephone, or cable television are shown on the Drawings, Contractor must assume that every parcel will be served by a connection for each type of utility. Contractor must not interrupt the service function or disturb the supporting base of any utility without authority from the utility owner or a City order.

(B) ***Field Verification of Improvements and Utilities.*** Existing and proposed improvements and utilities are shown on the Drawings in their approximate locations. Locations may not have been field-verified and City does not guarantee the accuracy and completeness of the information shown. Contractor must field-adjust proposed improvements to avoid conflicts with existing improvements. Contractor must also take reasonable care to determine the existence, location and depth of any underground improvements, facilities or utilities that are indicated on the Drawings, or indicated by field-locating services, or evidenced by facilities visible in the field. The fact that a utility, facility or improvement is not shown on the Drawings does not relieve Contractor of its responsibilities under this subsection. Contractor must become familiar with the type, material, age and condition of any utility that may be affected by the Work and pothole the utilities before working in the area to avoid damage. The Contract Price will not be increased for delays that result from Contractor's failure to field-verify or pothole existing utilities before commencing the Work. Potholing is included in the Contract Price and is not considered Extra Work.

(C) ***Protection of Utilities.*** Contractor must furnish and install, at its expense, any protection necessary to ensure support of the existing underground, overhead or at-grade utilities shown on the Drawings, including their associated structures and service connections. Contractor must immediately notify the Engineer and the applicable utility owner if a utility is disturbed, disconnected or damaged during the Work. Contractor must also, without additional compensation, restore to its original condition any utility that is damaged. When placing concrete around or contiguous to a utility, Contractor must furnish and install, at its expense, a cushion of expansion joint material, clear opening, sleeve, or other suitable material approved by the Engineer, to prevent embedment or bonding of the utility with the concrete.

(D) ***Existing Utilities Not Identified by City.*** As required by Government Code section 4215, if, during the performance of the Work, Contractor discovers utility facilities not identified by City in the Contract Documents, Contractor must immediately provide written notice to City and the utility. City assumes responsibility for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the Project site, if those utilities are not identified in the Contract Documents. Contractor will be compensated in accordance with the provisions of the Contract Documents for the costs of locating, repairing damage not due to Contractor's failure to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Drawings or Specifications with reasonable accuracy, and for equipment on the Project necessarily idled during such work. Contractor will not be assessed liquidated damages for delay in completion of the Work, to the extent such delay was caused by City's failure to provide for removal or relocation of the utility facilities.

(E) ***Removal of Abandoned Utilities.*** Unless otherwise specified in the Contract Documents, Contractor must remove all portions of interfering utilities shown on the Drawings as "abandoned" or "to be abandoned in place." Before commencing removal operations, Contractor must confirm with the utility owner that the abandonment is complete. The removal and disposal of utilities to be abandoned is considered part of the Work included in the Contract Price and is not considered Extra Work.

7.14 Notice of Excavation. Contractor must comply with all applicable operator requirements in Government Code sections 4216 through 4216.5. Government Code section 4216.2 requires that, except in an emergency, Contractor must contact the appropriate regional notification center, or Underground Services Alert at 800-642-2444 (for Northern California), at least two working days but not more than 14 calendar days before starting any excavation if the excavation will be conducted in an area that is known, or reasonably should be known, to contain subsurface installations, and, if practical, Contractor must delineate with white paint or other suitable markings the area

to be excavated. Contractor may not begin excavation until it has obtained and submitted to Engineer an inquiry identification number from Underground Services Alert.

7.15 Trenching and Excavations. The maximum length of any open trench under the Project is 200 feet or the distance that pipe can be installed in a single day, unless the Engineer directs otherwise in writing. Backfill and resurfacing must comply with City of Tracy Standard Plan 501 for Trenching and Resurfacing, unless otherwise indicated in the Special Conditions. Trenches must be backfilled and covered with two inches of cutback in paved areas, or bridged with tack-welded steel plates at the end of each Work day. Cutback must be placed around plate edges to provide a smooth transition and to secure against displacement. As soon as possible following excavation, but no later than 14 Days, Contractor must backfill each excavation and restore the site and existing improvements to their pre-excavation condition, unless otherwise specified in the Contract Documents.

7.16 Trenching and Excavations of Four Feet or More. As required by Public Contract Code section 7104, if the Work includes digging trenches or other excavations that extend deeper than four feet below the surface, the following provisions in this Section apply to the Work and the Project.

(A) ***Duty to Notify.*** Contractor must promptly, and before the following conditions are disturbed, provide written notice to City if Contractor finds any of the following conditions:

(1) Material that Contractor believes may be a hazardous waste, as defined in section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law;

(2) Subsurface or latent physical conditions at the Worksite differing from those indicated by information about the Worksite made available to bidders before the deadline for submitting bids; or

(3) Unknown physical conditions at the Worksite of any unusual nature, materially different from those ordinarily encountered and generally recognized as inherent in work of the character required by the Contract Documents.

(B) ***City Investigation.*** City will promptly investigate the conditions and if City finds that the conditions do materially differ or do involve hazardous waste, and cause a decrease or increase in Contractor's cost of, or the time required for, performance of any part of the Work, City will issue a Change Order.

(C) ***Disputes.*** If a dispute arises between City and Contractor regarding any of the conditions specified in subsection (A) above, Contractor will not be excused from completing the Work within the Contract Time, but must proceed with all Work to be performed under the Contract. Contractor will retain any and all rights provided either by the Contract or by law which pertain to the resolution of disputes between Contractor and City.

7.17 Trenching of Five Feet or More. As required by Labor Code section 6705, if the Contract Price exceeds $25,000 and the Work includes the excavation of any trench or trenches of five feet or more in depth, a detailed plan must be submitted to City or its civil or structural engineer, for acceptance in advance of the excavation. The detailed plan must show the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation. If the plan varies from the shoring system standards, it must be prepared by a registered civil or

structural engineer. Use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders is prohibited.

7.18 New Utility Connections. City will pay connection charges and meter costs for new permanent utilities required by the Contract Documents, if any. Contractor must notify City sufficiently in advance of the time needed to request service from each utility provider so that connections and services are initiated in accordance with the Project schedule.

7.19 Shut Down Notification. Contractor must coordinate any shut down of water main, sewer main or lateral service with the Engineer, City's Public Works Maintenance Department, and the affected property owners. Contractor must notify the Engineer in writing at least 72 hours in advance of a shut down. Except for scheduled shutdowns and emergency situations, Contractor must notify all customers and affected parties of a shut down in writing at least 48 hours in advance, and in person at least four hours in advance, to allow adequate draw time. Contractor must follow all City requirements for exercising and shutting off water valves on main lines and any required materials will be at the Work site before the shutdown is requested. Contractor will expedite the Work until the affected water or sewer lines are back in service.

7.20 Lines and Grades. Contractor is required to use any benchmark provided by the Engineer. Unless otherwise specified in the Contract Documents, Contractor must provide all lines and grades required to execute the Work. Contractor must also provide, preserve, and replace if necessary, all construction stakes required for the Project. All stakes or marks must be set by a California Licensed Surveyor or a California Registered Civil Engineer. Contractor must notify the Engineer of any discrepancies found between Contractor's staking and grading and information provided by the Contract Documents. Contractor must provide horizontal control and cut sheets to Engineer immediately following the setting of construction or boundary markers. Contractor also must set the grades for underground conduits on the ground surface and transfer them to the bottom of the trenches. Upon completion, all Work must conform to the lines, elevations, and grades shown in the Plans.

7.21 Historic or Archeological Items.

(A) ***Contractor's Obligations.*** Contractor must ensure that all persons performing Work at the Project site are required to immediately notify the Project Manager, upon discovery of any potential historic or archeological items, including historic or prehistoric ruins, a burial ground, archaeological or vertebrate paleontological site, including fossilized footprints or other archeological, paleontological or historical feature on the Project site (collectively, "Historic or Archeological Items").

(B) ***Discovery; Cessation of Work.*** Upon discovery of any potential Historic or Archeological Items, Work must be stopped within an 100-foot radius of the find and may not resume until authorized in writing by City. If required by City, Contractor must assist in protecting or recovering the Historic or Archeological Items, any such assistance to be compensated as Extra Work on a time and materials basis under Article 6, Contract Modification. Any suspension of Work required due to discovery of Historic or Archeological Items will be treated as a suspension for convenience under Article 13.

7.22 Environmental Control. Contractor must not pollute any drainage course or its tributary inlets with fuels, oils, bitumens, acids, insecticides, herbicides or other harmful materials. Contractor must conduct the Work in a manner that prevents the release of hazardous material or hazardous waste into the soil or groundwater, and prevents the unlawful discharge of pollutants into City's storm drain system and watercourses as required below. Contractor and its Subcontractors must at all times in the performance of the Work

comply with all applicable federal, state, and local laws and regulations concerning pollution of waterways.

(A) ***Storm water Permit.*** Contractor must comply with all applicable conditions of the State Water Resources Control Board national Pollutant Discharge Elimination System General Permit for Waste Discharge Requirements for Discharges of Storm water Runoff Associated with Construction Activity ("Storm water Permit").

(B) ***Contractor's Obligations.*** If required for the Work, a copy of the Storm water Permit is on file in City's principal administrative offices, and Contractor must comply with the same without adjustment of the Contract Price or the Contract Time. Contractor must timely and completely submit required reports and monitoring information required by the conditions of the Storm water Permit, Contractor must comply with all other applicable state, municipal or regional laws, ordinances, rules or regulations governing discharge of storm water, including applicable municipal storm water management programs.

Article 8 - Payment

8.1 Schedule of Values. Before submitting its first application for payment, Contractor must prepare and submit to the Project Manager a schedule of values apportioned to the various divisions and phases of the Work. Each line item contained in the schedule of values must be assigned a value such that the total of all items equals the Contract Price. The items must be sufficiently detailed to enable accurate evaluation of the percentage of completion claimed in each application for payment, and the assigned value consistent with any itemized or unit pricing submitted with Contractor's bid.

(A) ***Measurements for Unit Price Work.*** Materials and items of Work to be paid for on the basis of unit pricing will be measured according to the methods stipulated in the Contract Documents. Unless otherwise specified, the following standards apply:

(1) Quantities of Work will be determined from measurements or dimensions in the horizontal planes. Stationing will be along the street centerline. Lengths of sanitary sewers, storm drains and water lines will measured as the horizontal distances from the center to center of structures, rounded to the nearest foot, and lengths of all return radii and curb data will be measured along the face of curb.

(2) Volumetric quantities will be the product of the mean area of vertical or horizontal sections and the intervening horizontal or vertical dimensions. Measurements will be according to U.S. Standard Measures. A pound will be an avoirdupois pound. A ton will be 2,000 pounds avoirdupois. The U.S. gallon is the unit of liquid measure.

(3) Weight quantities will be determined on certified platform scales or, when the Engineer approves, on an automated weighing and recording system. Contractor must furnish the Engineer with duplicate licensed weighmaster's certificates showing the actual net weights. City will accept the certificates as evidence of the weights delivered.

(B) ***Increases or Decreases in Unit Price Work***. If the actual quantity for a bid item is increased or decreased by more than 25 percent of the estimated quantity on the Bid Schedule, the City may, but is not obligated to, adjust the unit price pursuant to subsection (1) or (2), as applicable. The Engineer will determine whether a given increase or decrease in a quantity exceeds 25 percent, and the Engineer's determination

is final. No adjustment in unit pricing will be made until after all Work involving that bid item is completed, and the final quantity has been determined by the Engineer.

(1) For quantity increases of more than 25 percent, the unit price may be adjusted based on the difference between unit price and the actual unit cost for the additional quantity. The Engineer's determination will be based on time and materials only, and will not include fixed costs or markup for overhead, profit, or other indirect costs. For purposes of this Section 8.1, "fixed costs" means the Contractor's direct costs for labor, material, or equipment to perform or supply the bid item, which costs remain constant regardless of the item quantity.

(2) For quantity decreases of more than 25 percent, the unit price may be adjusted based on the difference between the unit price and the actual unit cost, inclusive of the item's fixed costs.

(C) ***Deleted or Reduced Work.*** Contractor will not be compensated for Work that City has deleted or reduced in scope, except for any labor, material or equipment costs for such Work that Contractor reasonably incurred before Contractor learned that the Work could be deleted or reduced. Contractor will only be compensated for those actual, direct and documented costs incurred, and will not be entitled to any mark up for lost profits.

8.2 Progress Payments. Following the last day of each month, or as otherwise required by the Special Conditions or Specifications, Contractor will submit to the Project Manager a monthly application for payment for Work performed during the preceding month based on the estimated value of the Work performed during that preceding month.

(A) ***Application for Payment.*** Each application for payment must be itemized to include labor, materials, and equipment incorporated into the Work, and materials and equipment delivered to the Worksite, as well as authorized and approved Change Orders. Each pay application must be supported by Contractor's schedule of values and any other substantiating data required by the Contract Documents. Contractor must also warrant, upon submitting each pay application, that all Work which City has previously paid for is free and clear of any claim, stop notice, security interest, or encumbrance in favor of Contractor, a Subcontractor, or any other person or entity making a claim(s) based on labor, materials or equipment related to the Work.

(B) ***Payment of Undisputed Amounts.*** City will pay the undisputed amount due within thirty (30) days after Contractor has submitted a complete and accurate payment application, subject to Public Contract Code section 20104.50. City will deduct a percentage from each progress payment as retention, as set forth in Section 8.5, below, and may deduct additional amounts as set forth in Section 8.3, below.

8.3 Adjustment of Payment Application. City may adjust, withhold from or reject a payment application, including application for Final Payment, in whole or in part, based upon any of the circumstances listed below. Contractor will be notified in writing of the basis for the adjustment, withholding, or rejection, and amounts withheld temporarily will be released once the basis for that withholding has been remedied and no longer exists.

(A) For Contractor's unexcused failure to perform the Work as required by the Contract Documents, including correction or completion of punch list items, City may withhold or deduct an amount based on the City's estimated cost to correct or complete the Work;

(B) For loss or damage caused by Contractor or its Subcontractor(s) arising out of or relating to performance of the Work or any failure to protect the Worksite, City may deduct an amount based on the estimated cost to repair or replace, including for any claim(s) filed or reasonable evidence indicating the likely filing of a claim(s);

(C) For Contractor's failure to pay its Subcontractors and suppliers when payment is due, City may withhold an amount sufficient to compensate unpaid subcontractors and suppliers;

(D) For Contractor's failure to timely correct rejected, nonconforming, or defective Work, City may withhold or deduct an amount based on the City's estimated cost to correct or complete the Work;

(E) For any unreleased stop notice, City may withhold 125% of the amount claimed;

(F) For Contractor's failure to submit any required schedule or schedule update in the manner and within the time specified in the Contract Documents, City may withhold or deduct an amount equal to five percent of the total amount requested;

(G) For Contractor's failure to maintain or submit as-built documents in the manner and within the time specified in the Contract Documents, City may withhold or deduct an amount based on the City's cost to prepare the as-builts;

(H) For Work performed without approved Shop Drawings, when approved Shop Drawings are required before proceeding with the Work, City may deduct an amount based on the estimated costs to correct unsatisfactory Work or diminution in value;

(I) Contractor's payroll records are delinquent or inadequate;

(J) Contractor's waste or disposal of materials in a manner not anticipated or required under the Contract Documents, including the cost of: rejected materials not unloaded from vehicles; rejected materials after placement; materials placed outside Plan lines; materials that were delivered but not incorporated into the Work; or disposal of rejected or excess materials;

(K) For fines assessed under the Labor Code, as required by law; or

(L) For any other costs or charges that may be offset against payments due, as provided in the Contract Documents, including liquidated damages.

8.4 Acceptance of Work. Neither City's payment of progress payments nor its partial or full use or occupancy of the Project constitutes acceptance of any part of the Work.

8.5 Retention. City will retain five percent (5%) of the amount due on each progress payment, or the percentage stated in the Notice Inviting Bids, whichever is greater, as retention to ensure full and satisfactory performance of the Work.

(A) ***Substitution of Securities.*** As provided by Public Contract Code section 22300, Contractor may request in writing that it be allowed, at its sole expense, to substitute securities for the retention withheld by City. Any escrow agreement entered into pursuant to this provision must comply with Public Contract Code section 22300, and will be subject to approval as to form by City's legal counsel.

(B) ***Release of Undisputed Retention.*** All undisputed retention, less any amounts that may be assessed as liquidated damages, retained for stop notices, or otherwise withheld under Section 8.3 or 8.6, will be released as Final Payment to Contractor no

sooner than 35 days following recordation of the notice of completion, and no later than 60 days following acceptance of the Project by City's governing body or authorized designee pursuant to Section 11.1(D) below, or, if the Project has not been accepted, no later than 60 days after the Project is otherwise considered complete under Public Contract Code section 7107(c).

8.6 Setoff. City is entitled to set off any amounts due from Contractor against any payments due to Contractor. City's entitlement to setoff includes progress payments as well as Final Payment and release of retention.

8.7 Payment to Subcontractors and Suppliers. Each month, Contractor must promptly pay each Subcontractor and supplier the value of the portion of labor, materials, and equipment incorporated into the Work or delivered to the Worksite by the Subcontractor or supplier during the preceding month. Such payments must be made in accordance with the requirements of the law, and those of the Contract Documents and applicable subcontract or supplier contract.

(A) ***Withholding for Stop Notice.*** City will withhold 125% of the amount claimed by an unreleased stop notice, a portion of which may be retained by City for the costs incurred in handling the stop notice claim, including attorneys' fees and costs, as authorized by law.

(B) ***Joint Checks.*** City reserves the right to issue joint checks made payable to Contractor and its Subcontractors or suppliers. As a condition to release of payment by a joint check, the joint check payees may be required to execute a joint check agreement in a form provided or approved by City. The joint check payees will be jointly and severally responsible for the allocation and disbursement of funds paid by joint check. Payment by joint check will not be construed to create a contractual relationship between City and a Subcontractor or supplier of any tier beyond the scope of the joint check agreement.

8.8 Final Payment. Contractor's application for Final Payment must comply with the requirements for submitting an application for a progress payment as stated in Section 8.2, above. Corrections to previous progress payments, including adjustments to estimated quantities for unit priced items, may be included in the Final Payment. The date of Final Payment is deemed to be effective on the date that City acts to release retention as final payment to Contractor, or otherwise provides written notice to Contractor of Final Payment. If the amount due from Contractor to City exceeds the amount of Final Payment, City retains the right to recover the balance from Contractor or its sureties.

8.9 Release of Claims. City may, at any time, require that payment of the undisputed portion of any progress payment or Final Payment be contingent upon Contractor furnishing City with a written waiver and release of all claims against City arising from or related to the portion of Work covered by those undisputed amounts subject to the limitations of Public Contract Code section 7100. Any disputed amounts may be specifically excluded from the release.

8.10 Warranty of Title. Contractor warrants that title to all work, materials, or equipment incorporated into the Work and included in a request for payment will pass over to City free of any claims, liens, or encumbrances upon payment to Contractor.

Article 9 - Labor Provisions

9.1 General. This Contract is subject to all applicable requirements of Chapter 1 of Part 7 of Division 2 of the Labor Code, including requirements pertaining to wages, working hours

and workers' compensation insurance, as further specified in Article 9 of the General Conditions. Contractor shall comply with all other applicable federal, state, and local laws, regulations and policies pertaining to labor standards insofar as those laws, regulations and policies apply to the performance of this Contract, including any applicable City employment requirements including but not limited to the City's Local Hiring Policy(attached as Exhibit 1 to this Contract).

9.2 **Discrimination Prohibited**. Discrimination against any prospective or present employee engaged in the Work on grounds of race, color, ancestry, national origin, ethnicity, religion, sex, sexual orientation, age, disability, or marital status is strictly prohibited. Contractor and its Subcontractors are required to comply with all applicable federal and California laws including the California Fair Employment and Housing Act (Government Code sections 12900 et seq.), Government Code section 11135, and Labor Code sections 1735, 1777.5, 1777.6, and 3077.5.

9.3 **Labor Code Requirements.**

(A) ***Eight Hour Day.*** Under Labor Code section 1810, eight hours of labor constitute a legal day's work under this Contract.

(B) ***Penalty.*** Under Labor Code section 1813, Contractor will forfeit to City as a penalty, the sum of $25.00 for each day during which a worker employed by Contractor or any Subcontractor is required or permitted to work more than eight hours in any one calendar day or more than 40 hours per calendar week, except if such workers are paid overtime under Labor Code section 1815.

(C) ***Apprentices.*** Contractor is responsible for compliance with the requirements governing employment and payment of apprentices, as set forth in Labor Code section 1777.5, which is incorporated by reference.

(D) ***Notices.*** Under Labor Code section 1771.4, Contractor is required to post all job site notices prescribed by law or regulation.

9.4 **Prevailing Wages.** Each worker performing Work under this Contract that is covered under Labor Code section 1720 or 1720.9, including cleanup at the Project site, must be paid at a rate not less than the prevailing wage as defined in sections 1771 and 1774 of the Labor Code. The prevailing wage rates are on file with the City and available online at http://www.dir.ca.gov/dlsr. Contractor must post a copy of the applicable prevailing rates at the Worksite.

(A) ***Penalties.*** Under Labor Code section 1775, Contractor and any Subcontractor will forfeit to City as a penalty up to $200.00 for each calendar day, or portion a day, for each worker paid less than the applicable prevailing wage rate. Contractor must also pay each worker the difference between the applicable prevailing wage rate and the amount actually paid to that worker.

(B) ***Federal Requirements.*** If this Project is subject to federal prevailing wage requirements in addition to California prevailing wage requirements, Contractor and its Subcontractors are required to pay the higher of the current applicable prevailing wage rates under federal law, available online at http://www.access.gpo.gov/davisbacon/ca.html.

9.5 **Payroll Records.** Contractor must comply with the provisions of Labor Code sections 1776 and 1812 and all implementing regulations, which are incorporated by this reference, including requirements for electronic submission of payroll records.

(A) ***Contractor and Subcontractor Obligations***. Contractor and each Subcontractor must keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed in connection with the Work. Each payroll record must contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

(1) The information contained in the payroll record is true and correct.

(2) Contractor or Subcontractor has complied with the requirements of Labor Code sections 1771, 1811, and 1815 for any Work performed by its employees on the Project.

(B) ***Certified Record.*** A certified copy of an employee's payroll record must be made available for inspection or furnished to the employee or his or her authorized representative on request, to City, or to the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations, and as further provided by the Labor Code.

(C) ***Enforcement.*** Upon notice of noncompliance with Labor Code section 1776, Contractor or Subcontractor has ten days in which to comply with requirements of this section. If Contractor or Subcontractor fails to do so within the ten day period, Contractor or Subcontractor will forfeit a penalty of $100.00 per day, or portion a day, for each worker for whom compliance is required, until strict compliance is achieved. Upon request by the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement, these penalties will be withheld from progress payments then due.

9.6 Labor Compliance. Under Labor Code section 1771.4, the Contract for this Project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations.

Article 10 - Safety Provisions

10.1 Safety Precautions and Programs. Contractor and its Subcontractors are responsible for safety precautions and programs, and for the safety of persons and property in the performance of the Work. Contractor and its Subcontractors must at all times comply with all applicable safety laws, rules and regulations and seek to avoid injury, loss, or damage to persons or property by taking reasonable steps to protect its employees and other persons at the Worksite, materials and equipment stored on or off site, and property at or adjacent to the Worksite.

(A) ***Reporting Requirements.*** Contractor must immediately provide a written report to City of all recordable accidents and injuries occurring at the Worksite. If Contractor is required to file an accident report with a government agency, Contractor will provide a copy of the report to City.

(B) ***Legal Compliance.*** Contractor's safety program must comply with the applicable legal and regulatory requirements. Contractor must provide City with copies of all notices required by law or regulation.

(C) ***Contractor's Obligations.*** Any damage or loss caused by Contractor arising from the Work which is not insured under property insurance must be promptly remedied by Contractor.

(D) ***Remedies.*** If City determines, in its sole discretion, that any part of the Work or Worksite is unsafe, City may, without assuming responsibility for Contractor's safety program, require Contractor or its Subcontractor to cease performance of the Work or to take corrective measures to City's satisfaction. If Contractor fails to promptly take the required corrective measures, City may perform them and deduct the cost from the Contract Price. Contractor agrees it is not entitled to submit a Claim for damages, for an increase in Contract Price, or for a change in Contract Time based on Contractor's compliance with City's request for corrective measures pursuant to this provision.

10.2 Hazardous Materials. Unless otherwise specified, this Contract does not include the removal, handling, or disturbance of any asbestos or other Hazardous Materials. If Contractor encounters materials on the Worksite that Contractor reasonably believes to be asbestos or other Hazardous Materials, and the asbestos or other Hazardous Materials have not been rendered harmless, Contractor may continue Work in unaffected areas reasonably believed to be safe, but must immediately cease Work on the area affected and report the condition to City. No asbestos, asbestos-containing products or other Hazardous Materials may be used in performance of the Work.

10.3 Material Safety. Contractor is solely responsible for complying with section 5194 of Title 8 of the California Code of Regulations, including by providing information to Contractor's employees about any hazardous chemicals to which they may be exposed in the course of the Work. A hazard communication program and other forms of warning and training about such exposure must be used. Contractor must also maintain Material Safety Data Sheets ("MSDS") at the Worksite, as required by law, for materials or substances used or consumed in the performance of the Work. The MSDS will be accessible and available to Contractor's employees, Subcontractors, and City.

(A) ***Contractor Obligations.*** Contractor is solely responsible for the proper delivery, handling, use, storage, removal, and disposal of all materials brought to the Worksite and/or used in the performance of the Work. Contractor must notify the Engineer if a specified product or material cannot be used safely.

(B) ***Labeling.*** Contractor must ensure proper labeling on any material brought onto the Worksite so that any persons working with or in the vicinity of the material may be informed as to the identity of the material, any potential hazards, and requirements for proper handling, protections, and disposal.

10.4 Hazardous Condition. Contractor is responsible for determining whether a hazardous condition exists or is created during the course of the Work, involving a risk of bodily harm to any person or risk of damage to any property. If a hazardous condition exists or is created, Contractor must take all precautions necessary to address the condition and ensure that the Work progresses safely under the circumstances. Such conditions may result from, but are not limited to, use of specified materials or equipment, the Work location, the Worksite condition, the method of construction, or the way any Work must be performed.

10.5 Confined Space Entry Program. If the Work requires entry into a "permit-required confined space," as defined under 29 CFR 1910.146(b) Contractor must implement, administer and maintain a confined space entry program ("CSEP") in full compliance with applicable law and related regulations before performing any Work in the space. A copy of the permit must be available at all times on the Work site for review by Contractor, Subcontractor and City personnel. All manholes, tanks, vaults, pipelines, excavations or other enclosed or partially enclosed spaces will be considered permit-required confined spaces until any pre-entry procedures demonstrate otherwise. Before starting the Work, Contractor must submit its CSEP to the Engineer for review and approval. The CSEP must address all potential physical and environmental hazards and contain procedures

for safe entry into the spaces. Contractor must consider all costs of the CSEP, including the associated equipment and personnel, as part of the bid items for which the CSEP is required. City will not pay additional compensation to Contractor for CSEP compliance.

Article 11 - Completion and Warranty Provisions

11.1 Final Completion.

(A) ***Final Inspection and Punch List.*** When the Work required by this Contract is performed, Contractor must provide written notification to the Project Manager requesting final inspection. The Engineer will schedule the date and time for final inspection, which must include Contractor's primary representative for this Project and its superintendent. Based on this inspection, City will prepare a punch list of items that are incomplete, incorrectly installed, or not operating as required by the Contract Documents. The punch list may include City's estimated cost to complete each punch list item if Contractor fails to do so within the specified time. The omission of any such item from this punch list will not relieve Contractor from fulfilling all requirements of the Contract Documents. City will deliver the punch list to Contractor and will specify the time by which all of the punch list items must be completed or corrected.

(B) ***Requirements for Final Completion.*** Final Completion will be achieved upon completion or correction of all punch list items, as verified by inspection, and upon satisfaction of all other Contract requirements, including any commissioning required under the Contract Documents, and submission of all final submittals, including a warranty bond as required under Section 4.4 and instructions and manuals as required under Article 7, all to City's satisfaction.

(C) ***Acceptance.*** Following Final Completion, the Project will be considered accepted upon City Council action during a public meeting to accept the Project or if the Engineer or other designee is authorized to accept the Project, the Project will be considered accepted upon the date of the Engineer's issuance of a written notice of acceptance. After the Engineer issues the notice of acceptance, City will file a notice of completion with the County Recorder.

(D) ***Final Payment.*** City will not make Final Payment and release of retention, less any sums withheld pursuant to the provisions of the Contract Documents, sooner than 35 days after recordation of the notice of completion. If Contractor fails to complete all of the punch list items within the specified time, City may elect to accept the Project and record the notice of completion, and withhold up to 150% of City's estimated cost to complete the remaining items from Final Payment.

11.2 Warranty.

(A) ***General.*** Contractor warrants that all materials and equipment will be new unless otherwise specified, of good quality, in conformance with the Contract Documents, and free from defective workmanship and materials. Contractor further warrants that the Work will be free from material defects not intrinsic in the design or materials required in the Contract Documents. At City's request, Contractor must furnish satisfactory evidence of the quality and type of materials and equipment furnished. Contractor's warranty does not extend to damage caused by normal wear and tear, or improper use or maintenance.

(B) ***Warranty Period.*** Contractor's warranty must guarantee its Work for a period of one year from the date of recordation of the notice of completion (the "Warranty Period"), except when a longer guarantee is provided by a supplier or manufacturer or is required by the Specifications or Special Conditions. Contractor must obtain from its

Subcontractors, suppliers and manufacturers any special or extended warranties required by the Contract Documents.

(C) ***Warranty Documents.*** As a condition precedent to acceptance, Contractor must supply City with all warranty and guarantee documents relevant to equipment and materials incorporated into the Work and guaranteed by their suppliers or manufacturers.

(D) ***Subcontractors.*** The warranty obligations in the Contract Documents apply to Work performed by Contractor and its Subcontractors, and Contractor expressly agrees to act as co-guarantor of such Work.

(E) ***Contractor's Obligations.*** Upon written notice from City to Contractor of any defect in the Work discovered during the Warranty Period, Contractor or its responsible Subcontractor must promptly correct the defective Work at its own cost. Contractor's obligation to correct defects discovered during the Warranty Period will continue past the expiration of the Warranty Period as to any defects in Work for which Contractor was notified before expiration of the Warranty Period.

(F) ***City's Remedies.*** If Contractor fails to correct defective Work within ten days following notice by City, or sooner if required by the circumstances, City may correct the defects to conform with the Contract Documents at Contractor's sole expense. Contractor must reimburse City for its costs in accordance with subsection H below.

(G) ***Emergency Repairs.*** In cases of emergency where any delay in correcting defective Work could cause harm, loss or damage, Contractor agrees that City may immediately correct the defects to conform with the Contract Documents at Contractor's sole expense. Contractor or its surety must reimburse City for its costs in accordance with subsection H below.

(H) ***Reimbursement.*** Contractor must reimburse City for its costs to repair under subsections (F) or (G), above, within 30 days following City's submission of a demand(s) for payment pursuant to this provision. Costs subject to such reimbursement include all of City's direct, indirect and consequential expenses incurred for correcting the defective Work, such as the fees and charges for labor, material, equipment, engineers, architects, attorneys and any other professionals needed. If City is required to initiate legal action to compel Contractor's compliance with this provision, and City is the prevailing party in such action, Contractor is solely responsible for all of City's attorney's fees and legal costs expended to enforce Contractor's warranty obligations herein in addition to any and all costs City incurs to correct the defective Work.

11.3 Use Before Final Completion. City reserves the right to occupy or make use of the Project, or any portions of the Project, before to Final Completion if City has determined that the Project or portion of it is in a condition suitable for the proposed occupation or use, and that it is in its best interest to occupy or make use of the Project, or any portions of it, before Final Completion. City will notify Contractor in writing of its intent to occupy or make use of the Project or any portions of the Project, pursuant to this provision.

(A) ***Non-Waiver.*** Occupation or use before Final Completion will not operate as acceptance of the Work or any portion of it, nor will it operate as a waiver of any of City's rights or Contractor's duties pursuant to these Contract Documents, and will not affect nor bear on the determination of the time of substantial completion with respect to any statute of repose pertaining to the time for filing an action for construction defect.

(B) ***City's Responsibility.*** City will be responsible for the cost of maintenance and repairs due to normal wear and tear with respect to those portions of the Project that are being occupied or used before Final Completion. The Contract Price or the Contract

Time may be adjusted pursuant to the applicable provisions of these Contract Documents if, and only to the extent that, any occupation or use under this Section actually adds to Contractor's cost or time to complete the Work within the Contract Time.

11.4 Substantial Completion. For purposes of determining "substantial completion" with respect to any statute of repose pertaining to the time for filing an action for construction defect, "substantial completion" is deemed to mean the last date that Contractor or any Subcontractor performs Work on the Project before recordation of the notice of completion, except for warranty work performed under this Article.

Article 12 - Dispute Resolution

12.1 Claims. This Article applies to and provides the exclusive procedures for any Claim arising from or related to the Contract or performance of the Work.

(A) ***Definition.*** "Claim" means a separate demand by Contractor, submitted in writing by registered or certified mail with return receipt requested, for change in the Contract Time, including a time extension or relief from liquidated damages, or a change in the Contract Price, that has previously been submitted to City in accordance with the requirements of the Contract Documents, and which has been rejected or disputed by City, in whole or in part.

(B) ***Limitations.*** A Claim may only include the portion of a previously rejected demand that remains in dispute between Contractor and City. With the exception of any dispute regarding the amount of money actually paid to Contractor as Final Payment, Contractor is not entitled to submit a Claim demanding a change in the Contract Time or the Contract Price, which has not previously been submitted to City in full compliance with Article 5 and Article 6, and subsequently rejected in whole or in part by City.

(C) ***Scope of Article.*** This Article is intended to provide the exclusive procedures for submission and resolution of Claims of any amount, and applies in addition to the provisions of Public Contract Code Section 9204 and Sections 20104 et seq., which are incorporated by reference herein.

(D) ***No Work Delay.*** Notwithstanding the submission of a Claim or any other dispute between the parties related to the Project or the Contract Documents, Contractor must perform the Work and may not delay or cease Work pending resolution of the Claim or other dispute, but must continue to diligently prosecute the performance and timely completion of the Work, including the Work pertaining to the Claim or other dispute.

12.2 Claims Submission. The following requirements apply to any Claim subject to this Article:

(A) ***Substantiation.*** The Claim must be submitted to City in writing, clearly identified as a "Claim" submitted pursuant to this Article 12, and must include all of the documents necessary to substantiate the Claim including the Change Order request that was rejected in whole or in part, and a copy of City's written rejection that is in dispute. The Claim must clearly identify and describe the dispute, including relevant references to applicable portions of the Contract Documents, and a chronology of relevant events. Any Claim for additional payment must include a complete, itemized breakdown of all labor, materials, taxes, insurance, and subcontract, or other costs. Substantiating documentation such as payroll records, receipts, invoices, or the like, must be submitted in support of each claimed cost. Any Claim for an extension of time or delay costs must

be substantiated with schedule analysis and narrative depicting and explaining claimed time impacts.

(B) ***Claim Format.*** A Claim must be submitted in the following format:

(1) General introduction, specifically identifying the submission as a "Claim" submitted under this Article 12.

(2) Relevant background information, including identification of the specific demand at issue, and the date of City's rejection of that demand.

(3) Detailed explanation of the issue(s) in dispute. For multiple issues, separately number and identify each issue and include the following for each separate issue:

(a) The background of the issue, including references to relevant provisions of the Contract Documents;

(b) A succinct statement of the matter in dispute, including Contractor's position and the basis for that position;

(c) A chronology of relevant events;

(d) The identification and attachment of all supporting documents (see subsection (A), above, on Substantiation); and

(e) Use of a separate page for each issue.

(4) Summary of issues and damages.

(5) The following certification, executed by Contractor's authorized representative:

"The undersigned Contractor certifies under penalty of perjury that its statements and representations in this Claim are true and correct. Contractor warrants that this Claim is comprehensive and complete as to the matters in dispute, and agrees that any costs, expenses, or delay claim not included herein are deemed waived. Contractor understands that submission of a Claim which has no basis in fact or which Contractor knows to be false may violate the False Claims Act (Government Code Section 12650 et seq.)."

(C) ***Submission Deadlines.***

(1) A Claim must be submitted within 15 days following the date that City notified Contractor in writing that a request for a change in the Contract Time or Contract Price, duly submitted in compliance with Article 5 and Article 6, has been rejected in whole or in part.

(2) With the exception of any dispute regarding the amount of Final Payment, any Claim must be filed on or before the date of Final Payment, or will be deemed waived.

(3) A Claim disputing the amount of Final Payment must be submitted within 15 days of the effective date of Final Payment, under Section 8.8, above.

(4) Strict compliance with these Claim submission deadlines is necessary to ensure that any dispute may be mitigated as soon as possible, and to facilitate cost-efficient administration of the Project. ***Any Claim that is not submitted within the specified deadlines will be deemed waived by Contractor.***

12.3 City's Response. City will respond within 45 days of receipt of the Claim with a written statement identifying which portion(s) of the Claim are disputed, unless the 45-day period is extended by mutual agreement of City and Contractor or as otherwise allowed under Public Contract Code section 9204. However, if City determines that the Claim is not adequately documented, City may first request in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim that City may have against the Claim. If Contractor fails to submit the additional documentation to City within 15 days of receipt of City's request, the Claim will be deemed waived.

(A) ***Additional Information.*** If additional information is thereafter required, it may be requested and provided upon mutual agreement of City and Contractor.

(B) ***Non-Waiver.*** Any failure by City to respond within the times specified above may not be construed as acceptance of the Claim in whole or in part, or as a waiver of any provision of these Contract Documents.

12.4 Meet and Confer. If Contractor disputes City's written response, or City fails to respond within the specified time, within 15 days of receipt of City's response, or within 15 days of City's failure to respond within the applicable 45-day time period under Section 12.3, respectively, Contractor may notify City of the dispute in writing of the sent by registered or certified mail, return receipt requested, and demand an informal conference to meet and confer for settlement of the issues in dispute. If Contractor fails to dispute City's response in writing within the specified time, Contractor's Claim will be deemed waived.

(A) ***Schedule Meet and Confer.*** Upon receipt of the demand to meet and confer, City will schedule the meet and confer conference to be held within 30 days, or later if needed to ensure the mutual availability of each of the individuals that each party requires to represent its interests at the meet and confer conference.

(B) ***Location for Meet and Confer.*** The meet and confer conference will be scheduled at a location at or near City's principal office.

(C) ***Written Statement After Meet and Confer.*** Within ten working days after the meet and confer has concluded, City will issue a written statement identifying which portion(s) of the Claim remain in dispute, if any.

(D) ***Submission to Mediation.*** If the Claim or any portion remains in dispute following the meet and confer conference, within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute, the disputed portion(s) will be submitted for mediation, as set forth below.

12.5 Mediation and Government Code Claims.

(A) ***Mediation.*** Within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute following the meet and confer, City and Contractor will mutually agree to a mediator, as provided under Public Contract Code section 9204. Mediation will be scheduled to ensure the mutual availability of the selected mediator and all of the individuals that each party requires to represent its interests. The parties will share the costs of mediation equally, except costs incurred by each party for its representation by legal counsel or any other consultants.

(B) ***Government Code Claims***.

(1) Timely presentment of a Government Code Claim is a condition precedent to filing any legal action based on or arising from the Contract.

(2) The time for filing a Government Code Claim will be tolled from the time Contractor submits its written Claim pursuant to Section 12.2, above, until the time that Claim is denied in whole or in part at the conclusion of the meet and confer process, including any period of time used by the meet and confer process. However, if the Claim is submitted to mediation, the time for filing a Government Code Claim will be tolled until conclusion of the mediation, including any continuations, if the Claim is not resolved by mutual agreement of the parties during the mediation or any continuation of the mediation.

12.6 Tort Claims. This Article does not apply to tort claims and nothing in this Article is intended nor will be construed to change the time periods for filing tort-based Government Code Claims.

12.7 Arbitration. It is expressly agreed, under California Code of Civil Procedure Section 1296, that in any arbitration to resolve a dispute relating to this Contract, the arbitrator's award must be supported by law and substantial evidence.

12.8 Damages. Contractor bears the burden of proving entitlement to and the amount of any claimed damages. Contractor is not entitled to damages calculated on a total cost basis, but must prove actual damages. Contractor is not entitled to recovery of any alleged home office overhead. The Eichleay Formula or similar formula may not be used for any recovery under the Contract. Contractor is not entitled to consequential damages, including home office overhead or any form of overhead not directly incurred at the Worksite; lost profits; loss of productivity; lost opportunity to work on other projects; diminished bonding capacity; increased cost of financing for the Project; extended capital costs; non-availability of labor, material or equipment due to delays; or any other indirect loss arising from the Contract.

12.9 Other Disputes. The procedures in this Article 12 will apply to any and all disputes or legal actions, in addition to Claims, arising from or related to this Contract, unless and only to the extent that compliance with a procedural requirement is expressly and specifically waived by City. Nothing in this Article is intended to delay suspension or termination under Article 13.

Article 13 - Suspension and Termination

13.1 Suspension for Cause. In addition to all other remedies available to City, if Contractor fails to perform or correct Work in accordance with the Contract Documents, City may immediately order the Work, or any portion of it, suspended until the cause for the suspension has been eliminated to City's satisfaction.

(A) ***Failure to Comply.*** Contractor will not be entitled to an increase in Contract Time or Contract Price for a suspension occasioned by Contractor's failure to comply with the Contract Documents.

(B) ***No Duty to Suspend.*** City's right to suspend the Work will not give rise to a duty to suspend the Work, and City's failure to suspend the Work will not constitute a defense to Contractor's failure to comply with the requirements of the Contract Documents.

13.2 Suspension for Convenience. City reserves the right to suspend, delay, or interrupt the performance of the Work in whole or in part, for a period of time determined to be appropriate for City's convenience, and not due to any act or omission by Contractor or its Subcontractors. Upon notice by City pursuant to this provision, Contractor must immediately suspend, delay, or interrupt the Work and secure the Project site as directed by City except for taking measures to protect completed or in progress Work as directed in the suspension notice. The Contract Price and the Contract Time will be equitably adjusted by Change Order to reflect the cost and delay impact occasioned by such suspension for convenience. However, the Contract Time will not be adjusted if the suspension will not delay Final Completion by the Contract Time.

13.3 Termination for Default. Contractor may be deemed in default for a material breach of or inability to perform the Contract, including Contractor's refusal or failure to supply sufficient skilled workers, proper materials, or equipment to perform the Work within the Contract Time; refusal or failure to make prompt payment to its employees, Subcontractors, or suppliers or to correct rejected Work; disregard of laws, regulations, ordinances, rules, or orders of any public agency with jurisdiction over the Project; lack of financial capacity to complete the Work within the Contract Time; or responsibility for any other material breach of the Contract requirements.

(A) ***Notice.*** Upon City's determination that Contractor is in default, City may provide Contractor and its surety written notice of default and intent to terminate the Contract.

(B) ***Termination.*** Within seven calendar days after notice of intent to terminate for default has been given, unless the default is cured or arrangements to cure the default have been made and memorialized in writing, to City's satisfaction, City may terminate the Contract by written notice to Contractor with a copy to Contractor's surety.

(C) ***Waiver.*** Time being of the essence in the performance of the Work, if Contractor's surety fails to arrange for completion of the Work in accordance with the Performance Bond, within seven calendar days from the date of the notice of termination, Contractor's surety will be deemed to have waived its right to complete the Work under the Contract, and City may immediately make arrangements for the completion of the Work through use of its own forces, by hiring a replacement contractor, or by any other means that City determines advisable under the circumstances. Contractor and its surety will be jointly and severally liable for any additional cost incurred by City to complete the Work following termination. In addition, City will have the right to use any materials, supplies, and equipment belonging to Contractor and located at the Worksite for the purposes of completing the remaining Work.

(D) ***Wrongful Termination.*** If a court of competent jurisdiction or an arbitrator later determines that the termination for default was wrongful, the termination will be deemed to be a termination for convenience, and Contractor's damages will be strictly limited to the compensation provided for termination for convenience, in Section 13.4, below. Contractor waives any claim for any other damages for wrongful termination including consequential damages, lost opportunity costs or lost profits.

13.4 Termination for Convenience. City reserves the right to terminate all or part of the Contract for convenience upon written notice to Contractor. Upon receipt of such notice, Contractor must: (A) immediately stop the Work, under any terms or conditions that may be specified in the notice; (B) comply with City's instructions to protect the completed Work and materials; and (C) use its best efforts to minimize further costs. Subject to City's directions in the notice, Contractor must not place further orders or enter into new subcontracts for materials, equipment, services or facilities, except as may be necessary to complete any portion of the Work that is not terminated. Contractor must also promptly cancel all existing subcontracts that relate to performance of the discontinued Work.

(A) ***Compensation to Contractor.*** In the event of City's termination for convenience, Contractor waives any claim for damages, including for loss of anticipated profits from the Project. The following will constitute full and fair compensation to Contractor, and Contractor will not be entitled to any additional claim or compensation:

(1) ***Completed Work.*** The value of its Work satisfactorily performed to date, including (a) Project overhead and profit based on Contractor's schedule of values, (b) unpaid costs for items delivered to the Project site that were fabricated for incorporation in the Work, and (c) any proven losses related to materials and equipment directly resulting from the termination;

(2) ***Demobilization.*** Actual and substantiated demobilization costs; and

(3) ***Markup.*** Five percent of the total value of the Work performed as of the date of notice of termination or five percent of the value of the Work yet to be completed, whichever is less.

13.5 Effect of Any Contract Termination. Upon any termination pursuant to this Article, City may enter upon and take possession of the Project and the Work. City may also take possession of, for the sole purpose of completing the Work, all of Contractor's tools, equipment and appliances, and all materials on the Work site or stored off the Work site that will be incorporated in the Work. Regardless of any Contract termination, Contractor's obligations for portions of the Work already performed will continue and the provisions of the Contract Documents will remain in effect as to any claim, indemnity obligation, warranties, guarantees, submittals of as-built drawings, instructions, or manuals, or other such rights and obligations arising before the termination date.

Article 14 - Miscellaneous Provisions

14.1 Assignment of Unfair Business Practice Claims. Under Public Contract Code section 7103.5, Contractor and its Subcontractors agree to assign to City all rights, title, and interest in and to all causes of action it may have under section 4 of the Clayton Act (15 U.S.C. section 15) or under the Cartwright Act (Chapter 2 (commencing with section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the Contract or subcontract. This assignment will be effective at the time City tenders Final Payment to Contractor, without further acknowledgement by the parties.

14.2 Provisions Deemed Inserted. Every provision of law required to be inserted in the Contract Documents is deemed to be inserted, and the Contract Documents will be construed and enforced as though such provision has been included. If it is discovered that through mistake or otherwise that any required provision was not inserted, or not correctly inserted, the Contract Documents will be amended accordingly.

14.3 Waiver. City's waiver of a breach, failure of any condition, or any right or remedy contained in or granted by the provisions of the Contract Documents will not be effective unless it is in writing and signed by City. City's waiver of any breach, failure, right, or remedy will not be deemed a waiver of any other breach, failure, right, or remedy, whether or not similar, nor will any waiver constitute a continuing waiver unless specified in writing by City.

14.4 Titles, Headings, and Groupings. The titles and headings used and the groupings of provisions in the Contract Documents are for convenience only and may not be used in

the construction or interpretation of the Contract Documents or relied upon for any other purpose.

14.5 Statutory and Regulatory References. With respect to any amendments to any statutes or regulations referenced in these Contract Documents, the reference is deemed to be the version in effect on the date that that bids were due.

END OF GENERAL CONDITIONS

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TECHNICAL PROVISIONS

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PART 1 - GENERAL

1.01 SUMMARY – WASTE MANAGEMENT GOALS

A. Section includes administrative and procedural requirements for salvaging, recycling and disposing of nonhazardous demolition and construction waste.

B. The Owner has established that this Project shall generate the least amount of waste possible and processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors shall be employed.

C. Of the inevitable waste that is generated, as many of the waste materials as economically feasible shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized.

1.02 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal of off-site waste and subsequent sale, recycling, reuse or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitability, corrosivity, toxicity or reactivity.

E. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

F. Recycle: Recovery of waste from the Project site to another site for subsequent processing in preparation for reuse

G. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of recycling. Recycling does not include burning, incinerating, or thermally destroying waste.

H. Salvage: To remove a waste material from the Project site for subsequent sale or reuse in another facility.

I. Salvage and Reuse: Recovery of waste and subsequent incorporation into the Work.

1.03 PERFORMANCE REQUIREMENTS

A. Develop and implement a waste management program resulting in an end-of-project rates for salvage/recycling of minimum 65 percent by weight or volume of the total waste generated by the project. Refer the San Joaquin County and/or City of Tracy Cal Green Construction and Demolition Debris Recovery Program and follow the Cal Green Application.

B. Regulations: The Contractor shall be responsible for knowing and complying with regulatory requirements, Federal, State, and Local, pertaining to legal disposal of all construction and demolition waste materials.

C. Coordination: Coordinate the recycling of materials with Owner and Subcontractors as required to conform to the Construction Waste Management Plan.

D. Site Access and Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Waste Management Meetings: Conduct on-site waste management meetings with all subcontractors. Review and discuss the waste management plan, methods, procedures and each party's roles and responsibilities.

C. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

D. Packing and Shipping

1. Shipping: Coordinate the schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

2. Packing: Arrange for the return of packing materials, such as wood pallets, where economically feasible.

E. Handling

1. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

2. Promptly inspect shipments to assure products comply with requirements, quantities are correct, and products are undamaged.

3. Promptly return damaged shipments or incorrect orders to manufacturer for credit or refund.

F. Storage: Store products in accordance with manufactures recommendations and periodically inspect to assure that stored products are undamaged and are maintained under required conditions.

G. Preparation

1. Storage and Protection:

a. Designate receiving/storage areas for incoming material to be delivered according to installation schedule and to be placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

b. Store and handle materials in a manner as to prevent loss from weather and other damage. Keep materials covered and off the ground, and store in a dry, secure area.

c. Prevent contact with material that may cause corrosion, discoloration, or staining.

d. Protect all materials and installations from damage by the activities of other trades.

H. Waste Management

1. Source separated waste: Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in order to prevent contamination of materials and to maximize recyclability and salvageability of identified materials.

2. Comingled Waste: Waste may be commingled at the site and separated at a recycling facility.

3. Return: Set aside and protect missed-delivered and substandard products and materials and return to supplier for credit.

4. Reuse and Salvage: Set aside, sort, and protect separated products and materials for collection, re-use on site by contractor, and salvage by other.

5. Recycling: Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

1.05 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to the requirements in this Section, as well as the requirements indicated in the LEED for Building Design and Construction New Construction Reference Guide, version 2019, under Materials and Resources Credit 2 – Construction Waste Management. Plan shall consist of the following sections: Waste Management Goals, Responsible Parties, Waste Identification, Waste Prevention and Diversion Measures, Contamination Prevention Measures, Communication and Education Measures, Onsite Recycling Operations, and Cost/Revenue Analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume but use same units of measure throughout waste management plan. The plan shall result in end-of-Project rates for salvage/recycling of minimum 65 percent by weight or volume of the total waste generated by the work. Refer the San Joaquin County and/or City of Tracy Cal Green Construction and Demolition Debris Recovery Program and follow the Cal Green Application.

B. Waste Identification: Indicate anticipated types and quantities of demolition, site- clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. The list of these materials is to include, at minimum, the following materials:

1. Cardboard.

2. Clean dimensional wood.

3. Beverage containers.

4. Land clearing debris.

5. Concrete.

6. Bricks.

7. Concrete Masonry Units (CMU).

8. Metals from banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.

9. Drywall.

10. Carpet and carpet pads.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: The Contractor shall designate an on-site party (or parties) responsible for instructing workers and overseeing and documenting results of the Waste Management Plan for the Project.

B. Distribution: The Contractor shall distribute copies of the Waste Management Plan to the Job Site Foreman, each Subcontractor, the Owner, and the Owner's Representative.

C. Instruction and Training: The Contractor shall provide on-site instruction and train workers, subcontractors and suppliers of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used.

D. Separation facilities: The Contractor shall layout and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials. Waste may be commingled at the site in a specific label area for pickup by the waste hauler and separated at a recycling facility.

E. Hazardous wastes: Hazardous wastes shall be separated, stored, and disposed of according to local regulations.

F. The amount (in tons or cubic yards) of material landfilled from the Project, the identity of the landfill, the total amount of tipping fees paid at the landfill, and the total disposal cost. Include manifests, weight tickets, receipt, and invoices.

G. For each material recycled, reused, or salvaged from the Project, the amount (in tons or

cubic yards), the date (removed from the jobsite, the receiving party, the transportation cost, the amount of any money paid or received for the recycled or salvaged material, and the net total cost or savings of salvage or recycling each material). Attach manifests, weight tickets, receipts, and invoices.

3.02 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Owner.

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan

E. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin. Regularly inspect bins for contamination.

F. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

G. Stockpile materials away from construction area. Do not store within drip line of remaining trees.

H. Store components off the ground and protect from the weather.

I. Remove recyclable waste from Owner's property per approved Waste Management Plan.

3.03 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

11. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site surfaces and areas.

3.04 INSTALLATION

A. Install product(s) per manufacturer's recommendations to reduce damage to or waste of materials by required replacement.

3.05 TRANSPORTATION

A. Transport materials in covered trucks to prevent contamination of product or littering of surrounding areas.

3.06 GENERAL CLEANING

A. Control accumulation of waste materials and trash. Recycle or dispose of off-site at intervals approved by the Owner and in compliance with waste management procedures.

B. Cleaning materials: Use cleaning materials that are non-hazardous.

3.07 FINAL CLEANING

A. Cleaning Materials: Only non-hazardous cleaning materials shall be used in the final cleanup.

B. Recycle, salvage, and return construction and demolition waste from Project.

C. Arrange for pick-up of salvageable materials in accordance with the Waste Management Plan.

D. Disposal Operations: Promptly and legally transport and dispose of any trash. Do not burn, bury, or otherwise dispose of trash on the Project site.

END OF SECTION

PART 1 GENERAL

1.01 DESCRIPTION

A. This section specifies demolition and removal of buildings, portions of buildings, utilities, other structures and debris arising from demolition work.

1.02 RELATED WORK

A. All sections listed in the Table of Contents are a Condition of this Section.

1.03 PROTECTION

A. Perform demolition in such a manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures.

B. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations.

C. Maintain fences, barricades, lights, and other similar items around exposed excavations until such excavations have been completely filled.

D. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable condition such as, but not limited to; ice, flooding, or pollution. Vacuum and dust the work area daily. Follow City, County and/or State requirements.

E. In addition to previously listed fire and safety rules to be observed in performance of work, include following:

1. No wall or part of wall shall be permitted to fall outwardly from structures.

2. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Instruct all possible users in use of fire extinguishers.

3. Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 15 feet of fire hydrants.

F. Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The contractor shall take necessary precautions to avoid damages to existing items to remain in place, to be reused, or to remain the property of the site; any damaged items shall be repaired or replaced. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal works.

1.04 UTILITY SERVICES

A. Demolish and remove outside utility service lines shown to be removed and as required to install new utility lines and building.

B. Remove abandoned outside utility lines that would interfere with installation of new utility lines and new construction.

C. Coordinate removal of utilities with utility companies.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 DEMOLITION

A. Completely demolish and remove buildings and structures, including all appurtenances related or connected thereto. Completely demolish pavements, curbs, walks, pads , irrigation systems, utility boxes, gutters, exterior signage, landscaping, landscape features wood deck, fencing and all other site features required to install new building and site elements.

1. As required for installation of new utility service lines.

2. To full depth within an area defined by hypothetical lines located 20 feet outside building lines of new structures.

3. As required to install new site/civil components.

B. Debris, including brick, concrete, stone, metals and similar materials shall become the property of Contractor and shall be disposed daily, off the property to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the City. Contractor shall dispose of debris in compliance with applicable federal, state or local permits, rules and/or regulations.

C. Remove and legally dispose of all materials, other than earth to remain as part of project work. Materials removed shall become the property of the contractor and shall be disposed of in compliance with applicable federal, state or local permits, rules and/or regulations. Materials that are located beneath the surface of the surrounding ground more than 5 feet except utilities.

D. Remove existing utilities as indicated or uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the City. When utility lines are encountered that are not indicated on the drawings, the City shall be notified prior to further work in that area.

3.02 CLEAN-UP

A. On completion of work of this section and after removal of all debris, leave site in clean condition satisfactory to City. Clean-up shall include off-site disposal of all items and materials not required to remain property of the City as well as all debris and rubbish resulting from demolition operations.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the requirements for tests and inspections for site concrete work specified in Sections 03 20 00 Concrete Reinforcement and 03 30 00 Cast in Place Concrete.

1.02 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 SUBMITTALS

A. Submit for review and approval.

1. Design Data: Certified copies of mix designers for each concrete class specified

2. Certifications that materials comply with requirements specified.

3. Samples: As requested by the Testing Laboratory and accompanied by certification from vendor that samples originate from and are representative of each lot proposed for use.

4. Test Reports

a. Mill test reports for reinforcement.

b. Reports from testing organization.

1.04 QUALITY ASSURANCE

A. Referenced Standards

1. California Building Code (CBC), 2016.

2. ACI 301 – Specifications for Structural Concrete for Buildings.

3. ACI 318 – Building Code Requirements for Structural Concrete.

4. ASTM C143 / C143M-15a – Standard Test Method for Slump of Hydraulic-Cement Concrete

1.05 DELIVERY, STORAGE AND HANDLING

A. Owner is responsible for all testing and inspection of concrete work. Owner shall retain the services of a certified testing laboratory to perform concrete testing.

PART 2 PRODUCTS

2.01 REINFORCEMNT

A. The Testing Laboratory

1. Take samples from bundles delivered to job site from the mill, unless bundles are identified by heat number and accompanied by mill certificates. When reinforced is not positively identified by heat numbers or when random sampling is intended two specimens will be taken from each 2 ½ tons or fraction thereof of each size and grade.

2. Test for tensile and bending strength in accordance with CBC Chapters 17 and 19.

2.02 CAST IN PLACE CONCRETE

A. The Testing Laboratory will:

1. Review mix designs, compliance certificates and samples of materials proposed for use.

2. Test and inspect materials according to CBC 1903 from compliance with requirements specified in Section 03 30 00 Cast-in-Place Concrete.

3. Inspect batch plant prior to concrete being furnished to verify that:

a. Plant is equipped with approved metering devices for determining moisture content of fine aggregate.

b. Other plant quality controls are satisfactory.

PART 3 EXECUTION

3.01 CAST-IN-PLACE CONCRETE

A. The Testing Laboratory will:

1. Perform testing in accordance with ACI 318

2. Test concrete slump in accordance with ASTM C143

3. Test concrete for required compressive strength in conformance with CBC Section 1905, as follows.

a. Make and cure a minimum of five specimen cylinders according to ASTM C31 for each 150 cubic yards, or fraction thereof, of each class of concrete placed each day.

b. As a minimum, one set of five specimen cylinders shall be made for each 5,000 square feet of slab or wall surface area or fraction thereof placed each day

c. Retain one cylinder for 7-day test, one for 14-day test, and two for 28-day test. Hold one or more cylinders for subsequent testing, in necessary.

d. Number each cylinder, date each set of cylinders and record placement represented by each set of cylinders.

e. Transport specimen cylinders from jobsite to laboratory.

f. Test specimen cylinders according to ASTM C30 from specified strength after cylinders have aged for 7 days, 14 days, and 28 days.

B. Furnish to the Testing Laboratory the ready-mix delivery tickets for each batch of concrete delivered to the jobsite, each ticket bearing the following:

1. Design mix number

2. Time of batching

3. Weight of cement, type and maximum size of aggregates, water, and admixtures in each batch.

4. Total volume of concrete in each batch.

C. When laboratory tests of specimen cylinders show compressive strengths below the minimum specified, the Contractor will be back charged for costs of the taking and testing core specimens of hardened concrete according to ASTM C42.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. This section includes the requirements for furnishing and placing concrete formwork.

1.02 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 QUALITY ASSURANCE

A. Referenced Standards

1. California Building Code (CBC), 2022
2. ACI 301 – Specifications for Structural Concrete for Buildings.
3. ACI 318 – Building Code Requirements for Reinforced Concrete
4. ACI 347R – Guide to Formwork for Concrete.
5. CRSI Manual of Standard Practice
6. PSI-95 US Product Standard for Construction and Industrial Plywood
7. West Coast Lumber Inspection Bureau (WCLB) Standard.
8. Western Wood Products Association (WWPA) Publication: Western Lumber Grading Rules.

B. Design Criteria: Unless otherwise shown, noted, or specified, formwork shall be in conformance with ACI 347

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle materials subject to damage from dirt and moisture maintaining them clean and dry, off the ground, and suitably protected.

PART 2 PRODUCTS

2.01 MATERIALS

A. General: Form materials shall be new at start of work.

B. Form Lumber: Douglas Fir, Construction Grade, S1S2E

C. Plywood Forms and Architectural Smooth Finish: Five-ply, 3/4-inch thick, APA A-A Plyform, Class I, Exterior Type, with mill-oiling treatment omitted for architecture smooth finish; or City approved equal.

D. Flexible spring steel forms or laminated boards for forming radius bends.

E. Form Accessories:

1. Accessories which will be entirely or partially embedded in concrete, such as ties and hangers, shall be of metal and of standard manufacture; wire ties are not acceptable.

2. The portion of embedded accessories remaining in concrete shall have no metal within one inch of face of concrete, and shall have no fractures, spalls, depressions, or other surface disfigurations exceeding 3/4 inch in diameter.

3. Spreader cones on ties shall not exceed one inch in diameter.

F. Form Sealer: Sealer shall eliminate grain raise as a result of moisture, and shall not interfere with color, bond, or subsequent treatment of or application of finishes to concrete surface; Sonneborn Building Products, Inc. "Form Saver," Grace Construction Materials "Form Film," Burke "Form Sealer," or approved equal.

G. Form Release Agents:

1. For Concrete Exposed to View in the Finished Work or to Receive Applied Finishes: Use chemically-active types producing water-insoluble soaps. Release agents shall contain no petroleum-based solvents such as creosote, paraffin, wax, or diesel oil.

2. For ABS form liners, use only form release agents recommended by form liner manufacturer.

3. For Unexposed Concrete: Any type that will not interfere with bond of finishes to be applied.

PART 3 EXECUTION

3.01 PREPARATION

A. Treat contact surface of plywood and board forms with a form sealer in accordance with the manufacturer's printed instructions.

B. Clean form surfaces and reseal before each use. The use of form oil will not be permitted.

3.02 CONSTRUCTION

A. Design, construct, and brace formwork and temporary falsework to safely support concrete and hold personnel during construction operations.

B. Coordinate design, construction, and installation of formwork to accommodate openings, sleeves, chases, pipes, nailers, anchors, ties, inserts, and other embedded items.

C. Construct forms of sufficient strength and rigidity to produce finished concrete of the size, shape, and location shown, without exceeding specified tolerances. Form assembly shall permit removal in proper sequence without damaging concrete.

D. Use only new plywood form material for creating smooth architectural finish where required; reuse of forms not permitted for creating smooth architectural finish.

E. Install form liners for architectural finishes in strict accordance with manufacturer's printed instructions and approved submittal.

F. Arrange forms to permit single pours of exposed areas and panels without joints between adjacent form materials in the same plane.

G. Construct forms for all exposed to view concrete full height and width between construction joints in surface of concrete. Do not break forms for pour or construction joints within such areas.

H. Forms shall not extend higher than 12 inches above the top of a pour or construction joint.

I. Form construction joints as specified in Section 03 30 00 – Cast-In-Place Concrete. Provide a surfaced pouring strip where construction joints intersect faces of surfaces to be exposed to view in the finished work; prior to subsequent pour, remove strip and tighten forms.

J. Construction joints shall show no overlapping or offsetting of concrete surfaces and shall as closely as possible have the same appearance as butted board joints. Joints in a continuous line shall be straight and true.

K. Provide cleanouts as required to permit inspection and thorough cleaning of loose dirt and debris. Cleanouts shall not be apparent on concrete surfaces exposed to view in finished work.

L. Arrange forms to permit proper erection sequence and subsequent form removal without damaging concrete.

M. Whenever concrete bases and foundations are required for equipment furnished as part of the work of other Sections, verify equipment dimensions prior to placing concrete.

N. Forms for concrete surfaces exposed to view in the finished work shall be constructed to match existing concrete finish.

O. Forms for unexposed concrete surfaces shall be undressed lumber, form plywood, or other suitable material.

P. Formwork shall be clean and free of foreign material when concrete is placed.

3.03 FORM REMOVAL

A. Do not remove forms until concrete has attained sufficient strength to support its own weight and anticipated construction live loads without damage, but in no case less than the following.

1. Walls: Four (4) days

2. Footings, Curbs, Walks, Paving: Side forms may be removed 24 hours after concrete placement.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. This section includes the requirements for furnishing and installing concrete reinforcement.

1.02 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 SUBMITTALS

A. Shop Drawings: Complete bending and placing details of reinforcement.

1. Details of reinforcement not shown on Drawings shall be in conformance with ACI 315 and ACI 318.

2. Detailing, fabricating and spacing of reinforcement shall be in conformance with ACI 315 unless otherwise shown or noted.

B. Test Reports: Certified copies of mill tests showing chemical and physical analyses of each heat or melt from which reinforcement was made.

1.04 QUALITY ASSURANCE

A. Referenced Standards

1. California Building Code (CBC), 2022

2. ACI 301 – Specifications for Structural Concrete for Buildings

3. ACI 318 – Building Code Requirements for Reinforced Concrete

4. ACI 347R – Guide to Formwork for Concrete

5. CRSI Manual of Standard Practice

B. Allowable Tolerances Fabricating/placing tolerances shall be in conformance with ACI 301.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver reinforcement from the mill in securely tied bundles, each bundle limited to one size and grade of reinforcement. Identify each bundle with readily visible metal or plastic tags identifying the reinforcement by the same item marking as on the approved shop drawings; tags shall also identify the mill, heat or melt number, and the grade and size of reinforcement.

B. After bundles are broken, identify by segregating reinforcement by sizes and grades.

C. Store reinforcement off the ground, protected from the elements and foreign material which could adversely affect its bond with concrete.

PART 2 PRODUCTS

2.01 MATERIALS

A. Reinforcing Bars: ASTM A625, Grade 60 for all bars except where noted otherwise on plans.

B. Wire for Ties, Stirrups, and Spiral Reinforcement: ASTM A82.

C. Spacers, Bar Supports, and Other Accessories: In conformance with ACI 315. Where portions of accessories will be within 1/2 inch of concrete surfaces which will be exposed to the elements in the finished work, such accessories shall be of non-corrosive material or shall be corrosion-resistant treated; aluminum products will not be acceptable.

2.02 FABRICATION

A. Fabricate reinforcement in accordance with the requirements of ACI 315, where specific details are not shown or where Contract Documents are not more restrictive.

B. Fabrication of reinforcement shall begin only after approval of bar lists and shop drawings, with each item of reinforcement fabricated in conformance with such approved documents.

C. Bend reinforcing steel cold; do not straighten/rebend, doing damage to the material.

PART 3 EXECUTION

3.01 INSTALLATION

A. At time of concrete placement, reinforcement shall be free of dirt, oil, scale, loose rust, and other foreign material that could adversely affect the bond with concrete.

B. Fasten reinforcement/support to prevent displacement beyond the tolerances specified in ACI 301, by construction loads and concrete placement. Sizes and dimensions of supports shall be as required to position the reinforcement as shown on the approved shop drawings and in conformance with the minimum concrete protective covering requirements of ACI 301.

C. Furnish reinforcing bars full length whenever possible; splices will be permitted only where shown or noted on the approved shop drawings, or as otherwise permitted by the City.

D. Splices may be made in horizontal reinforcement by lapping and placing ends of bars in contact and securely wiring; or bars may be separated sufficiently to permit the embedment of the entire surface of each bar in concrete.

1. Locate all splices as per drawings. Lap bars 48 diameters minimum.

2. Stagger splices in adjacent bars.

E. Obstructions: Should items to be embedded in concrete interfere with placement of reinforcements, notify the City to obtain written approval of procedure before starting.

F. Concrete Cover: Install reinforcement to achieve the minimum concrete coverage shown or noted on the Drawings, unless otherwise specified.

G. Welding: Reinforcing bars shall not have welded joints.

H. Misplaced Reinforcing Bars:

1. If reinforcing bars are found to be misplaced after concrete placement, immediately notify the City for recommendations for correcting the misplacement; perform no corrective measures without such prior recommendations.

2. Redesign, alterations, corrections, and replacement of concrete or reinforcing bars due to misplaced bars shall be performed at no additional expense to the City.

3.02 MAINTENANCE OF REINFORCEMENT

A. Continuously inspect/maintain reinforcement in proper position during concreting operations.

B. Where reinforcement cannot otherwise be kept properly aligned, provide additional bracing ties, stirrups, and other items as necessary.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the requirements for furnishing and placing cast-in-place concrete, including cast-in-place architectural finish concrete, curing and finishing.

B. All Sections listed in the Table of Contents are a Condition of this Section.

1.02 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 SUBMITTALS

A. Mix design for each class of concrete proposed for use. If concrete will be pneumatically placed, mixes shall be specifically so designed and designated.

B. Laboratory test reports for concrete mixes. Compression test data (field experience method) or results of testing (trial batch method) used to establish mix proportions.

C. Product Data: Manufacturers' and suppliers' proprietary information on materials.

D. Layout Drawings: Submit layout drawings showing proposed locations of construction joints, control joints, details of construction, and connections for approval prior to concrete placement.

E. Submit delivery ticket to City for each batch of concrete delivered.

1.04 QUALITY ASSURANCE

A. Reference Standards

1. California Building Code (CBC), 2022.

2. ACI 301 – Specifications for structural Concrete for Buildings.

3. ACI 318 – Building Code Requirements for Reinforced Concrete.

B. Quality Control: Owner to retain the services of a qualified testing organization

C. Quality Control Supervisor: Owner will retain the services of an independent concrete contractor that will observe Contractor’s work to achieve desired results.

D. Allowable Tolerances: Deviation from plumb and level shall not exceed 1/8 inch within ten feet in any direction, as determined with a ten-foot straightedge. Cumulative deviation over the length or height of the building shall not exceed 3/8 inch in any direction.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle packaged materials in the manufacturers' original, sealed packages, each clearly identified with the manufacturer's name, and name and type of material.

B. Deliver, store, and handle materials subject to damage from dirt and moisture maintaining them clean and dry, off the ground, and suitably protected.

C. Store coarse and fine aggregates in separate, covered bins to prevent them from mixing, and to preserve moisture content of aggregate at batch plant.

D. Store bulk cement in covered bins.

1.06 PROJECT CONDITIONS

A. Environmental Requirements for Concrete Placement:

1. Hot Weather: In conformance with ACI 305.

2. Cold Weather: In conformance with ACI 306.

3. During Precipitation: Do not place unless adequate protection is provided.

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete, ready-mixed, ASTM C94.

1. Cement: ASTM C150, Type II, Portland Cement.

2. Aggregate:

a. Fine Aggregate: ASTM C33

b. Coarse Aggregate: ASTM C33

c. Source of aggregate shall remain constant for the duration of the work.

3. Water: Clean, clear, and potable.

B. Curing materials:

1. Liquid Membrane: ASTM C308, Type I.

2. Sheet material: ASTM C171.

C. Admixtures

1. Water reducing Admixture: ASTM C494, only with prior review of mix design.

2. Air-Entraining Admixture: ASTM C260, for lightweight concrete only with prior review of mix design.

3. Unspecified Admixtures: Not Permitted.

4. Calcium Chloride: not Permitted.

5. Hydrogen Chloride: Not Permitted

D. Non-shrink Grout: Premixed, requiring only addition of specified water; Master Builders "Masterflow 928," or approved equal.

1. Flowable, low shrinkage, 5,000 psi at 7 days.

2. Non-metallic Type: For all uses.

3. Metalic Type: Will not be permitted.

E. Bonding Agent: Larsen Products Corp. "Weld-Crete," Sika Chemical Corp. "Sikastix 370" or "Sikadur Hi-Mod," or approved equal.

F. Hardener: Clear, dust-on type; Sonneborn-Contech "Harcol Standard Natural," Upco Co. "Hydroment," Lambert Corp. "Colorhard," or approved equal.

G. Sealer: Heavy penetrating type, from same manufacturer as hardener.

1. Without wax or other constituent that will impair application of finishes.

H. Epoxy Grout for Reinforcement and Bolt Installation: Hilti "HIT-RE 500-SD” Adhesive Anchor System", Simpson Strong-Tie “SET XP”, or equal.

I. Detectable Warning - Truncated Domes & Nosing:

1. Spacing, height and configuration of truncated domes shall meet CBC 11B-705. Base diameter of 0.9 inch min. and 0.92 inch max, a top diameter of 0.45 inch minimum and 0.47 inch maximum, and a height of 0.2 inch. Dome spacing shall have center to center 2.3 inch min. and 2.4 inch max., and a base-to-base spacing of 0.65 inch minimum.

2. Amstep Model 224A, 2-3/8 inches wide, and meets the California Title 24 code for the visually impaired. Tread 5/16 inch thick with continuous arrow profile anchor 5/8 inch deep. The abrasive filler shall consist of a mixture of aluminum oxide and silicon granules in an epoxy resin and hardener mixture and locked into an extruded base, alloy 6063-T6. Coefficient of friction 1.02 dry, 0.98 wet per ASTM F 609. Abrasive filler color as selected.

2.02 MIXES

A. Design Criteria

1. Concrete shall develop the minimum compressive strength noted on the Contract Documents at 28 days on cylinders made and tested in accordance with referenced ASTM standards.

2. The average of the sets of three consecutive strength tests shall be equal to or greater than the specified strength, and no individual strength test results shall fall below the specified strength by more than 500 psi.

B. General

1. Mix designs shall be in conformance with CBC Section 1905, based on materials tested and approved by the Testing Laboratory.

2. If concrete will be pneumatically placed, mixes shall be specifically so designed and designated.

3. If concrete is to be pumped, mixes shall be specifically so designed and designated.

C. Nonshrink Grout: Mix in accordance with the manufacturer's printed instructions.

D. Dry Pack: Mix, in proportions by volume, one-part cement to two-and-one-half parts fine aggregate, screening out materials retained on a No. 4 sieve. Mix with water to a consistency so that when a ball of mixture is compressed in the hand, it will show finger marks but maintain its shape and not show any surface water.

E. Patching Mortar: Mix in proportion by volume, one part cement to two parts fine aggregate.

2.03 MIXING

A. Batch Plant:

1. Equipment and plant shall be capable of weighing, segregating, and efficiently handling materials. Automatic metering capable of determining moisture content of sand shall be utilized.

2. Equipment and plant shall be subject to the approval of the Testing Laboratory; equipment and processes not so approved shall not be used for the work.

B. General:

1. Mixing shall be in conformance with ASTM C94 and CBC.

2. Mix cement, fine and coarse aggregate, admixtures, and water to exact proportions of approved mix designs.

3. Measure fine and coarse aggregates separately according to approved method which affords accurate control and checking.

4. Adjust grading to improve workability; do not add water unless otherwise recommended by the City.

C. Admixtures: use automatic metering dispenser to incorporate admixtures into mix

2.04 CONCRETE CLASSES

A. Definitions:

1. Strength: Minimum compressive strength after 28 days, when tested in accordance with ASTM C39.

2. Aggregate: Maximum size.

3. Weight: Pounds per cubic foot, air dry.

4. Slump: When tested in accordance with ASTM C143.

5. Maximum water/ cement ratio of 0.45

B. Concrete Classes and Uses:

Class	Weight (psf)	Strength (psi)	Aggregate (inches)	Use
A	145	4000	3/4	Cast-In-Place Concrete, Concrete Foundations, Concrete Slabs, etc.
B	110	3000	5/8	Sand Lightweight Concrete over metal deck

PART 3 EXECUTION

3.01 PREPARATION

A. Prior to concrete placement, determine finishes required to accommodate the work of other sections, and prepare for such finishes. Where determination for such finishes may be in question, refer to City for resolution.

B. Remove loose dirt/foreign material from excavations and forms and standing and saturated soil from excavations and cavities. Placing concrete in standing water is not permitted.

C. Thoroughly clean reinforcement and other items to be embedded in concrete of loose rust and other foreign matter which could inhibit bond with concrete.

D. Thoroughly wet wood forms, except coated plywood, and adjacent concrete a minimum of one hour prior to placing concrete; securely close cleanout and inspection ports; repeat wetting as required to keep forms damp.

E. Work form release agent into all areas of form liner as recommended by form manufacturer.

F. Apply form release agent to form liners before each use and within the same day that concrete is placed.

G. Subgrade and forms shall have been checked for line and grade, and work areas shall have been inspected by Engineer and observed by the City prior to starting concrete placement.

H. Roughen surfaces +/- ¼" amplitude at all joints and at all contact surfaces between new and existing concrete. Provide shear keys and prepare joints as per Drawings and Specifications. Apply bonding agent between existing and new concrete pours.

3.02 TRANSPORTING

A. Transport concrete from the mixer to the place of final deposit as quickly as possible, and by methods which prevent the separation and loss of ingredients. Concrete shall be of uniform density when placed.

B. Concrete shall not be freely dropped where reinforcement will cause segregation. Spouts, elephant trunks, or other approved means shall be utilized to prevent segregation.

C. In no case shall concrete be freely dropped more than six (6) feet. Provide formwork with pour ports at four (4) feet or closer horizontally so that concrete will be deposited freely such that no more than six (6) feet is dropped at any location.

D. Concrete may be pumped from the mixer to the place of deposit, provided that information on mix design adjustments, equipment, and procedures have received the City's written approval.

3.03 PLACING

A. General:

1. Notify City a minimum of 72 hours prior to each major concrete placement.

2. Place concrete in a continuous operation until a section of approved size and shape has been completed.

3. For horizontal surfaces, maintain a plastic surface essentially horizontal until completion of placement of the section.

4. Prevent displacement of reinforcement and other items to be embedded.

5. Before concrete sets, completely remove concrete spilled on forms and reinforcement in sections where concrete is not to be immediately installed.

6. An interruption of more than 60 minutes in concrete placement will be cause for shutting down the work and disposing of remaining mixed concrete. If such interruption occurs, provide construction joints where and as instructed, and cut concrete back to such line, cleaning forms and reinforcement as specified.

7. Record the date and time of concrete placement in each section. Retain records until completion of the work and make available at all times to the review of the City.

B. Consolidation:

1. Thoroughly consolidate concrete by puddling with suitable tools during placement, and by thoroughly working around reinforcement and other embedded items.

2. In addition to manual spading and tamping, internally vibrate concrete with high-speed mechanical vibrators of sufficient amplitude for thorough consolidation.

3. Prevent formation of shoulders and ledges.

4. Provide keys across vertical joints as shown on drawings. Place dowels across joints.

5. Joints for Slabs on Grade: Locate construction joints where approved and under partitions, whenever possible.

3.04 PROTECTION AND CURING

A. Protection:

1. Maintain concrete temperature above 50 degrees F during curing.

2. Protect concrete from sun and rain.

3. Do not subject concrete to loads until it has completely cured and attained minimum 28-day strength.

4. Water cure concrete continuously for minimum duration specified, including Saturdays, Sundays, and holidays; do not permit it to dry out until it has cured for the specified time.

5. Protect concrete during/after curing from damage from construction operations.

6. Cover traffic areas with kraft paper and plywood sheets; maintain protective covering in place and in good repair as long as necessary to protect concrete from damage.

7. Keep finished areas free from traffic for a minimum of four days, or as long as necessary for concrete to have set sufficiently to prevent its being damaged.

B. Curing: Curing shall immediately follow finishing and shall be performed as follows.

1. Flatwork Surfaces: Membrane cure for a minimum of seven days.

3.05 DEFECTIVE CONCRETE

A. Repair or replace defective concrete as instructed by City, and at no additional expense to City. Repair materials shall include, as necessary, cements, aggregates, admixtures, and epoxy.

B. With written approval of City, some minor defective work may be repaired by use of cement mortar; however, if the defects affect the strength of the structure, its appearance, or are otherwise detrimental, City may require the removal and replacement of that portion of the structure.

END OF SECTION

PART 1 GENERAL

1.01 DESCRIPTION:

A. This section specifies structural steel shown and classified by Section 2, Code of Standard Practice for Steel Buildings and Bridges.

1.02 RELATED WORK:

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 QUALITY ASSURANCE:

A. Fabricator and erector shall maintain a program of quality assurance in conformance with Section 8, Code of Standard Practice for Steel Buildings and Bridges. Work shall be fabricated in an AISC certified Category Std fabrication plant.

B. Before authorizing the commencement of steel erection, the controlling contractor shall ensure that the steel erector is provided with the written notification required by 29 CFR 1926.752. Provide copy of this notification to the Resident Engineer.

1.04 TOLERANCES:

A. Fabrication tolerances for structural steel shall be held within limits established by ASTM A6, by AISC 303, Sections 6 and 7, Code of Standard Practice for Buildings and Bridges, except as follows:

B. Elevation tolerance for closure plates at the building perimeter and at slab openings prior to concrete placement is 6 mm (1/4 inch).

1.05 REGULATORY REQUIREMENTS:

A. AISC 360: Specification for Structural Steel Buildings

B. AISC 303: Code of Standard Practice for Steel Buildings and Bridges.

1.06 SUBMITTALS:

A. Submit in accordance with Division 01, Submittals, Shop Drawings Product Data and Samples,

B. Shop and Erection Drawings: Complete

C. Certificates:

1. Structural steel.

2. Steel for all connections.

3. Welding materials.

D. Test Reports:

1. Welders' qualifying tests.

E. Design Calculations and Drawings:

1. Connection calculations, if required.

F. Record Surveys.

1.02 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Institute of Steel Construction (AISC):

1. AISC 360-10 Specification for Structural Steel Buildings

2. AISC 303-10 Code of Standard Practice for Steel Buildings and Bridges

C. American National Standards Institute (ANSI):

B18.22.1-65(R2008)..... Plain Washers

B18.22M-81(R2000)..... Metric Plain Washers

D. American Society for Testing and Materials (ASTM):

A6/A6M-11 ..... Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling

A36/A36M-08 ..... Standard Specification for Carbon Structural Steel

A53/A53M-10 ..... Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

A123/A123M-09 ..... Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A242/A242M-04(R2009)..... Standard Specification for High-Strength Low- Alloy Structural Steel

A283/A283M-03(R2007)..... Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates

A307-10..... Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength

A325-10.....Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

A490-12.....Standard Specification for Heat-Treated Steel Structural Bolts 150 ksi Minimum Tensile Strength

A500/A500M-10a. .....Standard Specification for Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

A501-07.....Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing

A572/A572M-07 .....Standard Specification for High-Strength

Low-Alloy Columbium-Vanadium Structural Steel A992/A992M-11……Standard Specification for Structural Steel Shapes

E. American Welding Society (AWS):

D1.1/D1.1M-10.....Structural Welding Code-Steel

F. Research Council on Structural Connections (RCSC) of The Engineering Foundation:

Specification for Structural Joints Using ASTM A325 or A490 Bolts

G. Military Specifications (Mil. Spec.):

MIL-P-21035 .....Paint, High Zinc Dust Content, Galvanizing, Repair

H. Occupational Safety and Health Administration (OSHA):

29 CFR Part 1926-2001.....Safety Standards for Steel Erection

PART 2 PRODUCTS

2.01 MATERIALS:

A. Structural Steel: ASTM A572 W Shapes, A36 misc. steel

B. Structural Tubing: ASTM A500, Grade B.

C. Steel Pipe: ASTM A53, Grade B.

D. Bolts, Nuts and Washers:

1. High-strength bolts, including nuts and washers: ASTM A325 or A490 as noted.

2. Bolts and nuts, other than high-strength or as shown on plans: ASTM A307, Grade A.

3. Plain washers, other than those in contact with high-strength bolt heads and nuts: ANSI Standard B18.22.1.

E. Zinc Coating: ASTM A123.

F. Galvanizing Repair Paint: Mil. Spec. MIL-P-21035.

PART 3 EXECUTION

3.01 CONNECTIONS (SHOP AND FIELD):

A. Welding: Welding in accordance with AWS D1.1. Welds shall be made only by welders and welding operators who have been previously qualified by tests as prescribed in AWS D1.1 to perform type of work required.

B. High-Strength Bolts: High-strength bolts tightened to a bolt tension not less than 70% of their minimum tensile strength. Tightening done with properly calibrated wrenches, by turn-of-nut method or by use of direct tension indicators (bolts or washers). Tighten bolts in connections identified as slip-critical using Direct Tension Indicators. Twist-off torque bolts are not an acceptable alternate fastener for slip critical connections.

3.02 FABRICATION:

A. Fabrication in accordance with Chapter M, AISC 360.

3.03 SHOP PAINTING:

A. General: Shop paint steel with primer in accordance with AISC 303, Section 6.

B. Do not apply paint to following:

1. Surfaces within 50 mm (2 inches) of joints to be welded in field.

2. Surfaces which will be encased in concrete.

3. Surfaces which will receive sprayed on fireproofing.

4. Top flange of members which will have shear connector studs applied.

C. Structural steel in the interstitial space that does not receive sprayed on fireproofing shall be painted with primer in accordance with general requirement of shop painting.

3.04 ERECTION:

A. General: Erection in accordance with AISC 303, Section 7B.

B. Temporary Supports: Temporary support of structural steel frames during erection in accordance with AISC 303, Section 7

3.05 FIELD PAINTING:

A. After erection, touch-up steel surfaces specified to be shop painted. After welding is completed, clean and prime areas not painted due to field welding.

B. Finish painting of steel surfaces is specified in Section 09 91 00, PAINTING.

3.06 SURVEY:

A. Upon completion of finish bolting or welding on any part of the work, and prior to start of work by other trades that may be supported, attached, or applied to the structural steel work, submit a certified report of survey to Resident Engineer for approval. Reports shall be prepared by Registered Land Surveyor or Registered Civil Engineer as specified in Section 01 00 00, GENERAL REQUIREMENTS. Report shall specify that location of structural steel is acceptable for plumbness, level and alignment within specified tolerances specified in the AISC Manual.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the following:

1. Roof deck.
2. Acoustical roof deck.
3. Cellular roof deck.
4. Acoustical cellular roof deck.
5. Composite floor deck.
6. Cellular deck floor systems with electrical distribution.
7. Noncomposite form deck.
8. Noncomposite vented form deck

1.02 RELATED WORK:

A. All Related Documents and Sections: Contractor to examine Contract Documents for requirements that directly affect or are affected by Work of this Section. Those Documents and Sections include, but is not limited to, the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 General Requirements, apply to this Section.
2. All Specification Sections listed in the Table of Contents.

1.03 SUBMITTALS

A. Comply with Submittal Procedures.

B. Product Data: Submit a minimum 2 weeks prior to product delivered to site. Incomplete forms will be rejected and returned to the Contractor for completions. No work can be done on-site until the form is completed and sub-mitted for review.

C. Product Data: For each type of deck, accessory, and product indicated.

D. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

E. Product Certificates: For each type of steel deck, signed by product manufacturer.

F. AWS Welding certificates for each welder.

G. Field quality-control test and inspection reports.

H. Research/Evaluation Reports: For steel deck and Mechanical Fasteners.

I. Submit material cost data for all materials required to construct the work in place. The cost data should be marked up to the General Contractor. If the work is self performed the material cost shall reflect the actual cost of the material without mark up.

J. Provide manufacturer's information/data sheet or a letter from the manufacturer indicated the location of manufacture, amount of recycled content (post consumer and post industrial percentage) in the product, and the location of raw material harvest if within 500 miles of the project site.

1.04 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated.

B. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."

C. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: Indicated by design designations of applicable testing and inspecting agency.

2. Steel deck units shall be identified with appropriate markings of applicable testing and inspecting agency.

D. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

E. Electrical-Raceway Units: Provide UL-labeled cellular floor deck units complying with UL 209 and listed in UL's "Electrical Construction Equipment Directory" for use with standard header ducts and outlets for electrical distribution systems.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packaging:

1. Avoid over packaging.

2. Packaging materials should be of recyclable materials such as cardboard.

B. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

C. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 PRODUCTS

2.01 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. Steel Deck:

a. ASC Profiles, Inc.

b. Epic Metals Corporation.

c. Nucor Corp.; Vulcraft Division.

d. United Steel Deck, Inc.

e. Verco Manufacturing Co.

f. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

2.02 ROOF DECK

A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 30, and with the following:

1. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G60 zinc coating.

2. Deck Profile: As indicated.

3. Profile Depth: As indicated.

4. Design Uncoated-Steel Thickness: As indicated.

5. Span Condition: Triple span or more, unless indicated otherwise on Contract Drawings.

6. Side Laps: Interlocking seam.

2.03 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application. Provide continuous bent bearing plates of same material and finish as deck, at least 0.0596-inch thickness, wherever slope of deck does not align with bearing surface below.

F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 30 for overhang and slab depth.

G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.

H. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck, with 3-inch- wide flanges and recessed pans of 1-1/2-inch minimum depth. For drains, cut holes in the field.

I. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.

J. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.

K. Repair Paint: Manufacturer’s standard rust-inhibitive primer of same color as primer.

L. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

3.02 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, and requirements in this Section.

B. Install temporary shoring before placing deck panels, if required to meet deflection limitations.

C. Locate deck bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

1. Align cellular deck panels for entire length of cell runs and align cells at ends of abutting panels.

E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

I. Mechanical fasteners to be used to fasten deck as indicated on Contract Drawings. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

J. Remove any lubricants or oils which would impair the adhesion of spray applied fireproofing on all deck surfaces receiving fireproofing.

3.03 ROOF-DECK INSTALLATION

A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:

1. Weld Diameter: 3/4 inch, nominal.

2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds as indicated.

3. Side-Lap and Perimeter Edge Fastening: Provide as indicated.

B. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints lapped 2 inches minimum.

C. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld flanges to top of deck. Space welds not more than 12 inches apart with at least one weld at each corner. Install reinforcing channels or zees in ribs to span between supports and weld.

D. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation. Weld cover plates at changes in direction of roof-deck panels, unless otherwise indicated. Install bearing plates as needed to provide full support of deck units.

E. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

3.04 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field welds will be subject to inspection.

C. Shear connector stud welds will be inspected and tested according to AWS D1.1 for stud welding and as follows:

1. Shear connector stud welds will be visually inspected.

2. Bend tests will be performed if visual inspections reveal less than a full 360-degree flash or welding repairs to any shear connector stud.

3. Tests will be conducted on additional shear connector studs if weld fracture occurs on shear connector studs already tested according to AWS D1.1.

D. Testing agency will report inspection results promptly and in writing to Contractor and Architect.

E. Remove and replace work that does not comply with specified requirements.

F. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.05 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. This section specifies items and assemblies fabricated from structural steel shapes and other materials as shown and specified.

B. Items specified.

1. Support for Wall Mounted Items

2. Gates, Hinges, Latch and Stop

3. Bollards

1.02 RELATED WORK

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 SUBMITTALS

A. Submit in accordance with Division 01, Submittals, Shop Drawings Product Data and Samples.

B. Shop Drawings:

1. Each item specified, showing complete detail, location in the project, material and size of components, method of joining various components and assemblies, finish, and location, size and type of anchors.

2. Mark items requiring field assembly for erection identification and furnish erection drawings and instructions.

3. Provide templates and rough-in measurements as required.

C. Furnish setting drawings and instructions for installation of anchors to be preset into concrete and masonry work, and for the positioning of items having anchors to be built into concrete or masonry construction.

1.04 QUALITY ASSURANCE

A. Each product type shall be the same and be made by the same manufacturer.

B. Assemble product to the greatest extent possible before delivery to the site.

C. Include additional features, which are not specifically prohibited by this specification, but which are a part of the manufacturer's standard commercial product.

1.05 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society of Mechanical Engineers (ASME):

B18.2.2-87(R2005).....Square and Hex Nuts

C. American Society for Testing and Materials (ASTM):

A36/A36M-08 .....Structural Steel

A47-99(R2009).....Malleable Iron Castings

A53-10.....Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

A123-09.....Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A307-10.....Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength

A653/A653M-10 .....Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process

A786/A786M-09 .....Rolled Steel Floor Plate

C1107-08 .....Packaged Dry, Hydraulic-Cement Grout (Non-shrink)

F436-10.....Hardened Steel Washers

F1667-11.....Driven Fasteners: Nails, Spikes and Staples

D. American Welding Society (AWS):

D1.1-10 .....Structural Welding Code Steel

D1.3-08 .....Structural Welding Code Sheet Steel

E. National Association of Architectural Metal Manufacturers (NAAMM)

AMP 521-01 .....Pipe Railing Manual

AMP 500-06 .....Metal Finishes Manual

Structural Steel Painting Council (SSPC)/Society of Protective Coatings:

SP 1-04 .....No. 1, Solvent Cleaning

SP 2-04 .....No. 2, Hand Tool Cleaning

SP 3-04 .....No. 3, Power Tool Cleaning

1.06 DESIGN CRITERIA

A. In addition to the dead loads, design fabrications to support the following live loads unless otherwise specified.

B. Ladders and Rungs: 120 kg (250 pounds) at any point.

C. Railings and Handrails: 900 N (200 pounds) in any direction at any point.

PART 2 PRODUCTS

2.01 MATERIALS

A. Structural Steel: ASTM A36.

B. Floor Plate:

1. Steel ASTM A786.

2. Aluminum: ASTM B632.

C. Steel Pipe: ASTM A53.

1. Galvanized for exterior locations.

2. Coated for interior locations

D. Cast-Iron: ASTM A48, Class 30, commercial pattern.

E. Grout: ASTM C1107, pourable type.

F. Steel Pipe (Bollard): ASTM A53.

1. Galvanized for exterior locations.

2. Type S, Grade A unless specified otherwise.

3. NPS (inside diameter) as shown.

2.02 HARDWARE

A. Rough Hardware:

1. Furnish rough hardware with a standard plating, applied after punching, forming and assembly of parts; galvanized, cadmium plated, or zinc-coated by electro-galvanizing process. Galvanized G-90 where specified.

2. Use G90 galvanized coating on ferrous metal for exterior work unless non-ferrous metal or stainless is used.

B. Fasteners:

1. Bolts with Nuts:

a. ASTM A307 for 415 MPa (60,000 psi) tensile strength bolts.

b. ASTM F593 for stainless steel.

c. Screws: ASME B18.6.1.

d. Washers: ASTM F436, type to suit material and anchorage.

e. Nails: ASTM F1667, Type I, style 6 or 14 for finish work.

2.03 FABRICATION GENERAL

A. Material

1. Use material as specified. Use material of commercial quality and suitable for intended purpose for material that is not named or its standard of quality not specified.

2. Use material free of defects which could affect the appearance or service ability of the finished product.

B. Size:

1. Size and thickness of members as shown.

2. When size and thickness is not specified or shown for an individual part, use size and thickness not less than that used for the same component on similar standard commercial items or in accordance with established shop methods.

C. Connections

1. Except as otherwise specified, connections may be made by welding, riveting or bolting.

2. Field riveting will not be approved.

3. Design size, number and placement of fasteners, to develop a joint strength of not less than the design value.

4. Holes, for rivets and bolts: Accurately punched or drilled and burrs removed.

5. Size and shape welds to develop the full design strength of the parts connected by welds and to transmit imposed stresses without permanent deformation or failure when subject to service loadings.

6. Use Rivets and bolts of material selected to prevent corrosion (electrolysis) at bimetallic contacts. Plated or coated material will not be approved.

7. Use stainless steel connectors for removable members machine screws or bolts.

D. Fasteners and Anchors

1. Use methods for fastening or anchoring metal fabrications to building construction as shown or specified.

2. Where fasteners and anchors are not shown, design the type, size, location and spacing to resist the loads imposed without deformation of the members or causing failure of the anchor or fastener, and suit the sequence of installation.

3. Use material and finish of the fasteners compatible with the kinds of materials which are fastened together and their location in the finished work.

4. Fasteners for securing metal fabrications to new construction only, may be by use of threaded or wedge type inserts or by anchors for welding to the metal fabrication for installation before the concrete is placed or as masonry is laid.

5. Fasteners for securing metal fabrication to existing construction or new construction may be expansion bolts, toggle bolts, power actuated drive pins, welding, self-drilling and tapping screws or bolts.

E. Workmanship

1. General:

a. Fabricate items to design shown.

b. Furnish members in longest lengths commercially available within the limits shown and specified.

c. Fabricate straight, true, free from warp and twist, and where applicable square and in same plane.

d. Provide holes, sinkages and reinforcement shown and required for fasteners and anchorage items.

e. Provide openings, cut-outs, and tapped holes for attachment and clearances required for work of other trades.

f. Prepare members for the installation and fitting of hardware.

g. Cut openings in gratings and floor plates for the passage of ducts, sumps, pipes, conduits and similar items. Provide reinforcement to support cut edges.

h. Fabricate surfaces and edges free from sharp edges, burrs and projections which may cause injury.

2. Welding:

a. Weld in accordance with AWS.

b. Welds shall show good fusion, be free from cracks and porosity and accomplish secure and rigid joints in proper alignment.

c. Where exposed in the finished work, continuous weld for the full length of the members joined and have depressed areas filled and protruding welds finished smooth and flush with adjacent surfaces.

d. Finish welded joints to match finish of adjacent surface.

3. Joining:

a. Miter or butt members at corners.

b. Where frames members are butted at corners, cut leg of frame member perpendicular to surface, as required for clearance.

4. Cutting and Fitting:

a. Accurately cut, machine and fit joints, corners, copes, and miters.

b. Fit removable members to be easily removed.

c. Design and construct field connections in the most practical place for appearance and ease of installation.

d. Fit pieces together as required.

e. Fabricate connections for ease of assembly and disassembly without use of special tools.

f. Joints firm when assembled.

g. Conceal joining, fitting and welding on exposed work as far as practical.

h. Do not show rivets and screws prominently on the exposed face.

i. The fit of components and the alignment of holes shall eliminate the need to modify component or to use exceptional force in the assembly of item and eliminate the need to use other than common tools.

F. Finish:

1. Finish exposed surfaces in accordance with NAAMM Metal Finishes Manual.

2. Aluminum: NAAMM AMP 501.

a. Mill finish, AA-M10, as fabricated, use unless specified otherwise.

b. Clear anodic coating, AA-C22A41, chemically etched medium matte, with Architectural Class 1, 0.7 mils or thicker.

c. Colored anodic coating, AA-C22A42, chemically etched medium matte with Architectural Class 1, 0.7 mils or thicker.

d. Painted: AA-C22R10.

3. Steel and Iron: NAAMM AMP 504.

a. Zinc coated (Galvanized): ASTM A123, G90 unless noted otherwise.

b. Surfaces exposed in the finished work:

1) Finish smooth rough surfaces and remove projections.

2) Fill holes, dents and similar voids and depressions with epoxy type patching compound.

c. Shop Prime Painting:

1) Surfaces of Ferrous metal:

a) Items not specified to have other coatings.

b) Galvanized surfaces specified to have prime paint.

c) Remove all loose mill scale, rust, and paint, by hand or power tool cleaning as defined in SSPC-SP2 and SP3.

d) Clean of oil, grease, soil and other detrimental matter by use of solvents or cleaning compounds as defined in SSPC-SP1.

e) After cleaning and finishing apply one coat of primer as specified in Section 09 90 00, PAINTING.

4. Stainless Steel: NAAMM AMP-504 Finish No. 4.

G. Protection:

1. Spot prime all abraded and damaged areas of zinc coating which expose the bare metal, using zinc rich paint on hot-dip zinc coat items and zinc dust primer on all other zinc coated items.

2.04 SUPPORTS

A. General:

1. Fabricate ASTM A36 structural steel shapes where shown.

2. Use clip angles or make provisions for welding hangers and braces to overhead construction.

3. Field connections may be welded or bolted.

B. For Wall Mounted Items:

1. For items supported by metal stud partitions.

2. Steel strip minimum of 150 mm (6 inches) wide, length extending one stud space beyond end of item supported.

2.05 GATES, HINGES, LATCH, AND STOP

A. Manufacturer: Ameristar Fence Products, Inc., Tulsa, Oklahoma or approved equal.

B. Material: Steel. Exterior grade, heavy duty hardware - Anti-sag design.

C. Finish: Powder Coated.

D. Door: Custom as shown in the Drawings.

E. Hinge: Piano, full height of gate.

F. Color: To match adjacent fence color.

G. See Drawings for hardware and gate information.

2.06 STEEL PIPE BOLLARD

A. Provide bollard in accordance with ASTM A53 with dimensions as shown in standard detail SD320523-04. Anchor posts in concrete and fill solidly with concrete with a minimum compressive strength of 17 MPa 2500psi.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

A. Set work accurately, in alignment and where shown, plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.

B. Set frames of access doors and similar items flush with finish floor and, where applicable, flush with side of opening.

C. Field weld in accordance with AWS.

1. Design and finish as specified for shop welding.

2. Use continuous weld unless specified otherwise.

D. Install anchoring devices and fasteners as shown and as necessary for securing metal fabrications to building construction as specified.

E. Spot prime all abraded and damaged areas of zinc coating as specified and all abraded and damaged areas of shop prime coat with same kind of paint used for shop priming.

3.02 INSTALLATION OF SUPPORTS

A. Anchorage to structure:

1. Secure angles or channels and clips to overhead structural steel by continuous welding unless bolting is shown.

2. Secure supports to concrete inserts by bolting as shown.

3. Secure steel plate to studs as detailed.

B. Supports for Wall Mounted items:

1. Locate center of support at anchorage point of supported item.

2. Locate support at top and bottom of wall hung cabinets.

3. Locate support at top of floor cabinets and shelving installed against walls.

4. Locate supports where required for items shown.

3.03 CLEAN AND ADJUSTING

A. Adjust movable parts including hardware to operate as designed without binding or deformation of the members centered in the opening or frame and, where applicable, contact surfaces fit tight and even without forcing or warping the components.

B. Clean after installation exposed prefinished and plated items and items fabricated from stainless steel, aluminum and copper alloys, as recommended by the metal manufacture and protected from damage until completion of the project.

3.04 INSTALLATION OF STEEL PIPE BOLLARD

A. Set bollards vertically in concrete piers. Compressive strength of concrete piers shall be 21MPa 3000psi. For dimensions of concrete piers

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. Provide labor, materials and equipment to complete all rough and finish carpentry work as indicated in the Contract Documents.

B. Work of this section include rough carpentry, plywood, composite lumber, finish carpentry and miscellaneous installed finished items.

1. Establish lines and levels for use of other trades.

1.02 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 REFERENCES

A. AHA A135.4 - Basic Hardboard; American Hardboard Association.

B. ANSI A208.1 - Wood Particleboard.

C. ASTM C1036 - Standard Specification for Flat Glass.

D. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

F. AWI P-200 - Architectural Woodwork Quality Standards; Architectural Woodwork Institute.

G. AWPA C2 - Lumber, Timbers, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes; American Wood Preservers Association.

H. NWWDA I.S.4 - Industry Standard for Water-Repellent Preservative Non-Pressure Treatment for Millwork; National Wood Window and Door Association.

I. NIST PS 1 - Construction and Industrial Plywood.

J. NIST PS 20 - American Softwood Lumber Standard.

K. WIC - Manual of Millwork; Woodwork Institute of California.

L. Forest Products Society (FPS): National Design Specification for Stress Grade Lumber and its Fastening.

1.04 SUBMITTALS

A. Submit in accordance with Division 01, Submittals, Shop Drawings Product Data and Samples.

B. Product Data: Submit wood treatment certifications and instructions for proper use of each type of treated material.

C. Wood Product Certifications:

1. FSC Certification: Furnish certification indicating wood products are from “well-managed” forests.

2. Toxicity Certification: Furnish certification plywood has no added formaldehyde and has no toxic materials as defined by LEED.

1.05 QUALITY ASSURANCE

M. Lumber Grades: Provide visible grade stamp of an agency certified by FPS.

N. Lumber Standard: Comply with US Product Standard PS20 for each indicated use, including moisture content and actual sizes related to indicated nominal sizes.

O. Plywood Standard: Comply with PS1 (ANSI A199.1).

P. FSC Certified Wood Products: Wood products to be from forests certified “well-managed” by an agency accredited by Forest Stewardship Council (FSC) including SmartWood Program and Forest Conservation Program.

PART 2 PRODUCTS

2.01 MATERIALS

A. Blocking: Provide dimensional lumber graded in accordance with FPS Grading Rules; Construction Grade, Douglas Fir; minimum S-Dry.

B. Plywood: Provide minimum APA C-D exterior (CDX) plywood; stress rated where spanning between supporting members; fire retardant treated; minimum 3/4" thick unless otherwise indicated. Where plywood will be exposed in finished work with painted finish provide A-C/EXT-APA plywood with Grade A face exposed and Grade C face concealed for exterior use: and A-C/INT-APA plywood with Grade A face exposed and Grade C face concealed for interior use.

1. General: Provide plywood certified with no added formaldehyde (NAF) and with no toxic materials as defined by LEED.

C. Nails, Spikes and Staples: Galvanized; size and type to suit application.

D. Bolts, Nuts, Washers, Lags, Pins and Screws: Medium carbon steel; galvanized; size and type to suit application.

E. Fasteners: Provide fasteners as required for complete, secure installation of miscellaneous rough carpentry.

1. Steel: Bolts or powder activated type.

F. Hardwood Lumber: Graded in accordance with WIC Custom; of quality suitable for transparent finish. Species as directed by architect. Exterior planter bench work shall include brackets and fasteners.

G. Primer: Alkyd primer sealer type.

H. Wood Filler: Solvent base, tinted to match surface finish color.

I. Wood Treatment: Water Repellant Preservative Treatment by Dipping Method: NWWDA I.S.4, with 0.25 percent retainage.

J. Building Paper

1. 15 Lb. asphalt impregnated felt paper.

K. Construction Adhesives

1. Products of Contech Division of Rexnord Chemical Corporation or equal as approved by Architect.

a. Interior work dry areas – PL200

b. Exterior work and wet areas – PL 400

c. Treated Wood – PL500

2.02 FABRICATION

A. Wood Preservation: Treat lumber and plywood to comply with applicable requirements of American Wood Preservers Association.

1. Decay Resistance Treatment: Pressure treat following items with water-borne preservatives for above ground use with AWPA C-2.

a. Treat wood members in connection with roofing, flashing, vapor barriers and waterproofing.

b. Treat wood members in contact with masonry, with concrete, and below grade.

c. Kiln-dry wood to a maximum moisture content of 19% after treatment with water-borne preservative.

2. Fire Retardant Treatment: Comply with AWPA standards for pressure impregnation with fire-retardant chemicals to achieve flame-spread rating of not more than 25 in accordance with ASTM E84 or UL Test 723.

a. Treat interior wood and plywood complying with AWPA C20 and C27, Interior Type A, and identify with FRTW.

b. Provide UL label on each piece of fire-retardant wood and plywood.

c. Kiln-dry treated items to maximum moisture content of 19%.

3. Complete fabrication of treated items prior to treatment, wherever possible; if cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment.

4. Inspect each piece after drying and discard damaged and defective pieces.

PART 3 EXECUTION

3.01 PLACEMENT

A. Place miscellaneous rough carpentry true to lines and levels.

B. Correlate location so attached work will comply with design requirements and be properly located. For equipment, accessory, part of other item intended to be installed.

C. Construct members of continuous pieces of longest possible lengths.

D. Fit carpentry work to other work; scribe and cope as required for accurate fit.

E. Shim with metal or slate for bearing on concrete and masonry.

F. Securely attach carpentry work to substrates by anchoring and fastening as required by recognized standards.

1. Provide washers under bolt heads and nuts in contact with wood.

G. Wood Blocking: Provide blocking of S4S lumber not less than 1-1/2" wide and of thickness required to provide adequate support or to properly locate attached material.

1. Provide attachment to other work; form to shapes shown.

2. Countersink bolts and nuts flush with surfaces.

3. Remove temporary blocking when no longer needed.

4. Anchor to formwork before concrete placement.

H. Plywood: Comply with recommendations of American Plywood Association (APA) for fabrication and installation of plywood work.

1. Provide attachment to other work; form to shapes shown.

2. Align fasteners for exposed view aesthetic as shown.

3. Fit carpentry work to other work.

4. Adjust, trim and level.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes (but Is Not Necessarily Limited to)

1. Standing Seam Metal Roofing

2. Self-adhesive underlayment.

B. The work of this Section is not limited to those items specifically mentioned herein but includes all items necessary to produce a properly executed and complete job.

1.02 RELATED SECTIONS

1. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 REFERENCES

A. Aluminum Association (AA)

1. "Aluminum Design Manual."

2. "Aluminum Structures: A Guide to their Specifications and Design."

3. "Aluminum Standards and Data."

B. American Society for Testing and Materials (ASTM)

1. A 167 “Standard Specification for Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.”

2. A 653 “Standard Specification for Steel Sheet, Zinc-Coating (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.”

3. A 792 “Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.”

4. A 924 “Standard Specification for General Requirements for Steel Sheet, Metallic- Coated by the Hot-Dip Process.”

5. D 523 “Standard Test Method for Specular Gloss.”

6. D 714 “Standard Test Method For Evaluating Degree of Blistering of Paints.”

7. D 822 “Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.”

8. D 968 “Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.”

9. D 1056 “Standard Specification for Flexible Cellular Materials.”

10. D 2244 “Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.”

11. D 3359 “Standard Test Methods for Measuring Adhesion by Tape Test.”

12. D 3361 “Standard Practice for Unfiltered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.”

13. D 3363 “Standard Test Method for Film Hardness by Pencil Test.”

14. D 4214 “Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.”

15. E 1592 “Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.”

16. E 1637 “Standard Specification for Structural Standing Seam Aluminum Roof Panel Systems.”

17. E 1646 “Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.”

18. E 1680 “Standard Test Method for Rate of Air Leakage through Exterior Metal Roof Panel Systems.”

C. National Roofing Contractors Association (NRCA): The NRCA Roofing and Waterproofing Manual.

D. Sheet Metal and Air Conditioning Contractors’ National Association (SMACNA): Architectural Sheet Metal Manual.

E. Underwriters Laboratories Inc.: UL 580, Tests for Uplift Resistance of Roof Assemblies.

1.04 PERFORMANCE REQUIREMENTS

A. General: Metal roof panels shall comply with performance requirements without failure due to defective manufacturer, fabrication, installation, or other defects in construction.

B. Material Compatibility: Provide materials that are compatible with one another under conditions of service and application required, as demonstrated by testing and field experience.

C. Delegated Design: Design metal roof panel assembly, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

D. Structural Performance: The wind uplift resistance of the roof assembly shall be established in accordance with ASTM E 1592.

E. Uplift Rating Testing: Roof panel system shall be successfully tested in accordance with UL 580 and maintain a Class 90 uplift rating.

F. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes. Calculations should be based on surface temperatures due to both solar heat gain and nighttime-sky heat loss.

G. System to be designed to allow for maintenance access.

1.05 QUALITY ASSURANCE

A. Field and office representatives responsible for work under this section shall attend a pre-roofing conference at the job site to discuss roofing and sheet metal practices applicable to this project.

B. The manufacturer shall have a minimum of 10 years experience supplying metal roofing to the region of the project.

C. The installer shall be authorized or certified by the panel manufacturer.

D. The installer shall have a minimum 2 years experience installing accepted roof panels on projects of similar scope.

1.06 SUBMITTALS

A. Do not order materials before receiving the Architect's written approval of the list of manufacturers, samples, and appropriate product data sheet.

B. Product Data: For each type of product indicated.

C. Samples: All materials specified unless otherwise noted in Part 2. Provide 12 in. x 12 in. samples of all sheet products, 12 inch long formed sheet profiles, one container of all sealants, and four of each type of fastener.

D. Shop Drawings: Shop drawings must be in scale large enough to clearly define all layers. Show dimensions of all typical and special conditions. Show details of waterproofing, terminations, and penetrations of metal work. Details referenced to manufacturer's literature shall show the specific dimensions for this project. Include material types and thickness, connections (fastener type, size and spacing), sealant or seal tape (brand, type, size, location), and provisions for thermal movement.

E. Calculations: Submit calculations with registered engineer seal verifying roof panel attachment method resists wind pressures imposed on it pursuant to applicable building codes. In addition to uplift load, consider the friction force of thermal movement on the fixed point connection to the structure below.

F. Written certification (in time to prevent delay of the work) by the manufacturers of the roofing materials that the materials supplied to this job are the same as covered by the submitted calculations, that they meet all requirements of the ASTM standards, and that all materials are suitable for the uses specified herein.

G. Maintenance Data: For metal roof panels to include in maintenance manuals.

H. Warranty: Sample copy of warranty.

I. Mock-up: One full length roofing section by minimum eight feet wide, prior to install of remaining system. Mock-up to include panels, clips and edge conditions.

1.07 PROJECT DELIVERY STORAGE & HANDLING

A. Deliver panels and other components so they will not be damaged or deformed. Package panels for protection against transportation damage.

B. Unload, store, and erect panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack materials on platforms or pallets, and cover with tarpaulins or other suitable weathertight and ventilated covering. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.

1.08 PROJECT CONDITIONS

A. Advise the General Contractor daily of the area where roofing work is to be performed so that he can protect the personnel, equipment and materials below. Provide 72 hour advance notice if roof mounted equipment, ductwork or conduits must be removed to permit roofing operations.

B. Dispose of all debris in a legal manner, off the site. Safely conduct debris to trucks or approved containers on the ground. Do not apply any roofing or flashing materials unless the exposed surface of the deck or finished membrane is clean and dry. If any unusual condition is discovered, stop work and promptly report this finding to the General Contractor and Architect.

C. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface and equipment movement. Protect surface with plywood runways where access is absolutely required, and insure full protection of roofing surface against mechanical damage. Notify the General Contractor and Architect in writing if any other contractor abuses or damages roofing or flashing components.

D. Proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed according to manufacturer's written instructions and warranty requirements.

E. Verify actual dimensions of construction contiguous with metal roof panels by field measurement before fabrication.

1.09 WARRANTY

A. Submit written warranty for the Metal Roofing and related work, signed by the roofing contractor, agreeing to repair or replace roof which leaks water, deteriorates, or otherwise fails to perform as required within warranty period as a result of failure of materials and/or workmanship at no expense to the City.

1. By terms of warranty, also agree to remove and replace other work, as required, which has been connected to or superimposed on substrate material to be replaced.

2. The guaranty period for the work shall be 5 years after date of Substantial Completion and shall include entire installation and waterproofing membrane assembly with no dollar limit.

3. Guarantees shall be signed by Roofing Contractor.

B. Manufacturer's Warranty

1. Special Warranty: In addition to Contractor's warranty, submit executed copy of manufacturer's standard form in which manufacturer agrees to repair or replace metal panel roof assemblies that fail in materials or workmanship within specified warranty period.

a. Warranty Period: 5 years from date of substantial completion.

2. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panel assemblies that show evidence of deterioration of factory-applied finishes within specified warranty period.

a. Warranty Period: 20 years from date of substantial completion.

PART 2 PRODUCTS

2.01 PANEL MATERIALS

A. General: The roof system is a standing seam metal roof attached to the building with concealed fasteners. Panels shall be in continuous lengths with no end laps. Exposed fasteners shall be restricted to perimeter conditions.

B. Acceptable manufacturers:

1. Berridge Manufacturing Company.

2. AEP Span, Inc.

3. Morin

4. ATLAS

5. Bridger Steel.

C. Panel Material: .040 Aluminum.

D. Panel System: Aluminum. System to be a 2" deep roll formed mechanically seamed (double lock standing seam) 16" O.C continuous lengths.

E. Panel Finish: Mill finish

F. Flashing and Trim: Manufacturer's standard flashing and trim profiles, factory formed, gauge as recommended by manufacturer, color and finish matching metal roofing panels. Edge of roof flashing shall be curved to follow roof. Pie cut curved parts are not acceptable.

G. Anchor Clips: Anchor clips and clip bases are fabricated from Series 300 stainless steel or nylon coated aluminum. Shape, size, and spacing as determined to meet the uplift requirements.

H. Closures: Fabricate closures of sheet metal matching the color and thickness of the roof panels using and closed cell foam inserts to seal against the panel profile. Use 3T minimum bend radii and open hems to stiffen all edges. Use cleats or clips to minimize the use of exposed fasteners. Flashing shall be installed in strict accordance with the recommended practice in the AA, NRCA and SMACNA architectural sheet metal manuals.

I. Fasteners:

1. Clip anchor screws are minimum #14 hex head stainless steel screws threaded to suit the support material.

2. Exposed fasteners that penetrate to the inside are minimum #14 painted stainless steel hex head sheet metal screws with neoprene washers.

3. Exposed fasteners that do not penetrate to the inside are minimum 3/16 in. painted aluminum pop rivets.

J. Accessories: Provide components approved by roof panel manufacturer and as required for a complete metal roof panel assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashing, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

K. Provide non skid surfaces where indicated on the drawings.

2.02 FABRICATION, GENERAL

A. Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

B. Unless otherwise shown on drawings, panels shall be full length. Flashings and accessories shall be fabricated in longest practical lengths.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

2.03 SELF-ADHESIVE UNDERLAYMENT MATERIALS

A. Self-adhesive Underlayment: 30 mil cold-applied, self-adhering membrane composed of a high density, cross laminated polyethylene film coated on one side with a layer of butyl rubber adhesive with embossed slip resistant surface provided on the polyethylene: Ultra by W.R. Grace.

B. Primer: Primer as recommended by self-adhesive underlayment manufacturer.

C. Mastic: Mastic as recommend by self-adhesive underlayment manufacturer.

D. Slip Sheet: Inorganic slip sheet: Tyvek or as recommended by metal roof panel manufacturer.

PART 3 EXECUTION

3.01 INSPECTION

A. Examine roof deck, blocking, and related substrates, and verify that they are uniform in plane and satisfactory for roofing application.

B. Notify the General Contractor and Architect of any discrepancies between drawings and field conditions, and of any elements that require repair.

C. Start of roofing application implies the Sheet Metal Roofing Contractor has verified that the deck and substrates are satisfactory for roofing application.

3.02 SELF-ADHESIVE UNDERLAYMENT INSTALLATION

A. Prime substrate to receive sheet membrane as required per manufacturer's written instructions.

B. Remove release liner and position membrane carefully before placing length against the surface.

C. Begin installation at the low point of the roof structure. Apply sheets so that direction of flow of water is over and not against laps.

D. Apply membrane firmly into place without wrinkles, buckles, or kinks.

E. When properly positioned, place against surface by pressing firmly into place. Roll membrane with extension-handled membrane roller immediately after placement.

F. Provide minimum 2-1/2 in. end side laps and 6 in. end laps.

G. Do not expose sheet membrane to sunlight for more than thirty days prior to enclosure.

H. Inspect installation prior to installation of metal roof panels and repair punctures, damaged areas and inadequately lapped seams with a patch of the membrane sized to extend 6 in. in all directions from the perimeter of the affected area, unless specifically detailed otherwise. Seal all reverse laps with manufacturer's recommended mastic.

I. Cover installed membrane with slip sheet.

3.03 METAL ROOF PANEL INSTALLATION

A. General: Comply with manufacturer's instructions and recommendations. Anchor panels and other components of the work securely in place, with provisions for thermal and structural movement.

B. Field cutting of panels by torch is not permitted.

C. Workmanship shall conform to standards specified in SMACNA "Architectural Sheet Metal Manual."

D. Remove any strippable protective film prior to panel installation.

E. Fasten metal roof panels to supports with concealed clips at each standing-seam joint location, spacing, and with fasteners recommended by manufacturer.

F. Install panels weathertight without waves, warps, buckles, or distortions and allow for expansion and contraction. Attachment and joints shall allow for expansion and contraction from temperature changes without distortion or elongation of fastener holes.

G. Install panels plumb, level, and straight with seams and ribs parallel, conforming to design as indicated.

H. Do not allow panels or trim to come into contact with dissimilar materials.

I. Install accessories required for a complete roof system, including trim, copings, fascias, gravel stops, ridge closures, clips, seam covers, battens, flashings, gutters, sealants, gaskets, fillers, closure strips, and similar items.

J. Hem raw edges on flashing and trim.

3.04 CLEANING AND PROTECTION

A. Replace panels and other components of the work that have been damaged or have deteriorated beyond successful repair by means of finish touch-up or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as soon as each panel is installed. Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer, and maintain in a clean condition during construction.

3.05 COMPLETION

A. Provide written punch list from manufacturer.

B. Provide installer and manufacturer’s warranty after punch list items have been corrected.

END OF SECTION 07 41 13

PART 1 GENERAL

1.01 SUMMARY

A. This section includes concealed fastener profiled lap-seam metal soffit panels and screen wall panels.

1.02 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 PERFORMANCE REQUIREMENTS

A. Structural performance: provide exterior wall and soffit panel assemblies capable of withstanding the effects of load and stresses from dead loads, wind loads, snow loads and normal thermal movement without evidence of permanent defects of assemblies or components.

1. Structural Design Criteria:
   a. Wind Loads – Structural Design Basis
      Importance Factor – See Structural Design Basis (Sheet S0.1.1)

   b. Seismic Design – Structural Design Basis
      Importance Factor – See Structural Design Basis (Sheet S0.1.1)

   c. Design Wind Loads: 65 psf positive and 35 psf negative.

2. Comply with ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads."

3. Thermal Movements: Provide assemblies that allow for thermal movements resulting from the following maximum changes (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components and other detrimental effects:

   a. Temperature Change (range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

B. Sealed joints shall allow free and silent movement of panels during expansion and contraction while preventing uncontrolled penetration of moisture.

C. Manufacturing and installation shall prevent deformation of exposed surfaces.

D. Design panel system to accommodate substructure tolerance of +0 to -1/8 inch.

E. Not Permitted: Vibration harmonics; wind whistles; noises caused by thermal movement; thermal movement transmitted to other building elements; loosening, weakening or fracturing of attachments or components of system.

F. Structural Performance / Uniform Load Deflection Test: Provide panel system which has been tested in accordance with both ASTM E330 and ASTM E1592 structural testing at a design pressure of at least 60 psf without deformation or failures of structural members. Maximum allowable deflection of span: L/180.

G. Air Infiltration: Panel system shall not have air infiltration rate more than 0.06 cfm per sq. ft. of fixed wall area when tested in accordance with both ASTM E283 and ASTM E1680 at static air pressure differential of 6.24 psf.

H. Static Water Penetration: Panel system shall have no water penetration as defined by in test method when tested in accordance with ASTM E331 and ASTM E1646. The ASTM E331 test shall be conducted at inward static pressure differential of not less than 15.0 psf. The ASTM E1646 test shall be conducted at inward static pressure differential of not less than 20.0 psf.

I. Dynamic Water Penetration: Panel system shall have been tested in accordance with AAMA 501 and shall have passed with no uncontrolled water leakage at 15.00 psf dynamic pressure differential, with water application rate of 5 gallons/hr/sqft.

1.04 SUBMITTALS

A. Product Data: Manufacturer's product literature for the concealed fastener profiled lap-seam metal soffit and wall panel system as specified.

B. Shop Drawings: For exterior concealed fastener profiled panels and accessories. Include plans; elevations; sections and details.

C. Quality Assurance Submittals: Submit the following:

1. Certificates: Product certificates signed by manufacturer certifying materials comply with the specified performance characteristics and criteria, and physical requirements.

D. Provide color samples of selected custom color. Samples shall involve normal color and texture variations, include sample sets showing the full range of variations expected.

E. Affidavit certifying that the material meets the requirements specified.

1.05 QUALITY ASSURANCE

A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where the project is located and who is experienced in providing engineering services of kind indicated.

B. Manufacturer Qualifications: Minimum of 5 years experience in manufacturing exposed fastener profiled (corrugated) lap-seam metal wall panel systems similar to those specified.

C. Installer Qualifications: Acceptable to manufacturer.

1.06 DELIVERY, STORAGE & HANDLING

A. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

B. Store materials in accordance with manufacturer’s recommendations.

C. Handle materials carefully to avoid damage to materials and finishes.

1.07 PROJECT CONDITIONS

A. Field Measurements: Verify actual supporting and adjoining construction by field measurements before fabrication, and indicate recorded measurements on final shop drawings. Coordinate construction to ensure that panels fit properly to supporting and

adjoining construction and coordinate schedule with construction progress to avoid delaying the work.

1. Established dimensions: Where field measurements cannot be made without delaying the work, guarantee dimensions and proceed with fabrication of panels corresponding to the established dimensions.

1.08 WARRANTY

A. Project warranty refers to Conditions of the Contract for project warranty provisions. Manufacturer's warranty: submit, for acceptance, manufacturer's standard warranty documents executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights the City may have under Contract Documents.

B. The Contractor shall warrant the materials to be free of faults and defects in accordance with the General Conditions, except that the warranty shall be extended by paint manufacturer's standard multi-year warranty. The warranty shall be in writing and shall be signed by the manufacturer.

C. Materials Manufacturers: Repair or replace defective materials for a period of two (2) years.

D. Panel System Manufacturer: Repair or replace fabricated products which fail due to faulty workmanship for a period of five (5) years.

E. Panel System Installer: Repair or replace products or components which fail due to faulty workmanship for a period of two (2) years.

F. Painted Finish: Coatings Manufacturer and applicator to warrant paint for a period of twenty (20) years after the Effective Date, the factory applied finish applied by the applicator.

1. Will not chip, crack or peel (lose adhesion) but does not include minute fracturing which may occur in proper fabrication of building parts.

2. Will not chalk in excess of ASTM D-4214-89 number eight (8) rating, determined by the procedure outlined in ASTM D-4214-89 specification test.

3. Will not change color more than five (5) Delta-E Hunter units (square roof/wall of the sum of square Delta L, Delta a, and Delta b) as determined by ASTM method D-2244. It is acknowledged that fading or color changes may not be uniform if the surfaces are not equally exposed to the sun and elements.

PART 2 PRODUCTS

2.01 CONCEALED FASTENER PROFILED LAP-SEAM PROFILED WALL PANELS

A. General: Provide factory-formed metal wall panels designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners inside laps. Include accessories required for weathertight installation.

2.02 MANUFACTURER

A. Basis of Design – Screen Wall Panels

1. Centria

a. Ecoscreen Perforated Screen Wall or approved equal.

B. Screen Wall Panels – 7/8 in Perforated Corrugated Metal Panel

1. Ecoscreen Perforated Screen Wall, CS-660, 36” (914.4mm) wide, and 7/8 in thickness

2. Panel orientation: Horizontal

3. Finish: 9922 Steel Grey

4. Perforation Pattern:

a. Open/Free Area Percentage: 40%

b. Pattern: Staggered

c. Diameter: 3/8 in

d. Spacing: 9/16 in

C. Screen Wall Panels – 3 in Perforated Corrugated Metal Panel

1. Ecoscreen Perforated Screen Wall, MR3-36, 36” (914.4mm) wide, and 3 in thickness

2. Panel orientation: Horizontal

3. Finish: 9922 Steel Grey

4. Perforation Pattern:

a. Open/Free Area Percentage: 40%

b. Pattern: Staggered

c. Diameter: 3/8 in

d. Spacing: 9/16 in

2.03 MATERIALS

A. Aluminum Face Sheet – Soffit Panels: ASTM B209, Aluminum Association specification sheet 3003-H14/3105-H14 for painted finish.

2.04 FABRICATION

A. Tolerances

1. Form panels in longest practical lengths, true to shape, accurate in size, square, and free from distribution or manufacturing defects.

2. Bend lines, breaks, and angles shall be sharp and true, and surfaces shall be free from warp or buckle.

B. Material surfaces shall be free of scratches or marks caused during fabrication.

C. Ensure that entire project is manufactured from single color coil paint run to ensure color uniformity.

D. Provide factory applied strippable plastic film for protection during fabrication and installation.

2.05 ACCESSORIES

A. All fasteners shall be non-corrosive type, as recommended by the panel manufacturer. Provide self-tapping screws and other suitable fasteners designed to withstand building design loads; exposed fasteners with heads matching color of metal wall panels by means of plastic caps or factory-applied coating. Provide EPDM, PVC or neoprene sealing washers.

B. Flashing: Shall be same material and gauge as for panel where exposed.

C. Panel Sealants:

1. Sealant Tape: Pressure-sensitive, gray isobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, non-toxic, non-staining tape 1/8” (3mm) thick and 1” (25mm) wide.

2. Joint Sealant: ASTM C90; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal wall panels and remain weathertight; and as recommended in writing by metal wall panel manufacture.

3. Non-Skinning Butyl Sealant: ASTM C734 Non-hardening, non-drying, non-oxidizing butyl rubber-based sealant.

D. Subgrits: Provide G90 galvanized steel of gauge and spacing required for panel structural requirements, as recommended by the panel manufacturer and in accordance with approved shop drawings. To avoid galvanic reaction, separate dissimilar metals.

E. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal wall panels.

F. Backing Plates: Provide metal backing plates at end splices, fabricated from material recommended by manufacture.

G. Closure Strips: Closed-cell, expanded, cellular, rubber or cross-linked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1 inch (25mm) thick, flexible closure strips; cut or pre-molded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

H. Ice & Water Shield: Grace, rubberized asphalt adhesive backed by a layer of high density cross laminated polyethylene.

2.06 FINISHES, GENERAL

A. Comply with NAAMM’s Metal Finishes Manual for architectural metal products for recommendations for applying and designating finishes.

2.07 FINISHES

A. Panel Finishes:

1. Coating shall be Spray-Applied Fluorocarbon Resin utilizing 70% Kynar 500 resins.

2. Number of Coats: Three (3) coats. Coating shall be factory applied on a continuous process paint line. Coating shall consist of a 0.2 mil prime coat, a 0.75 mil barrier coat, a 0.75 mil metallic/color coat containing 70% Kynar resins, and a 0.5 mil clear coat containing 70% Kynar resins.

3. Relevant to the color selected, material to be painted in accordance with either AAMA specification 2605 or 2604.

4. Provide factory applied strippable plastic film for protection during fabrication and installation

5. Custom color selected by Architect.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation. Panel substructure shall be level and plumb. Coordinate delivery of such items to project site.

3.02 INSTALLATION

A. General: Install meal wall panels according to manufacturer’s written instructions.

B. Erect panel level and plumb, in proper alignment in relation to substructure framing and established lines; follow SMACNA Architectural Sheet Metal manual and standard practices.

C. Panels shall be erected in accordance with approved shop drawings.

D. Panel anchorage shall be structurally sound and per engineering recommendations.

E. Where aluminum materials come in contact with dissimilar materials, an isolation shim or tape shall be installed at fastening locations.

F. Install weather resistant membrane in accordance with manufacturer's instructions.

G. Completed system shall be free from over bending, deforming, stretching, distortion, waves, and buckles.

H. Lap-Seam metal wall panels: Fasten metal wall panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacture.

1. Lap ribbed sheets on full rib corrugation. Apply panels and associated items for neat and weathertight enclosure. Avoid “panel creep” or application not true to line.

2. Locate and space concealed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.

3. At panel splices, nest panels with minimum 4-inch (100mm) end lap, sealed with butyl rubber sealant and fastened together as recommended by metal wall panel manufacture.

I. Install gaskets, joint fillers and sealants where indicated and where required for weathertight performance of metal wall panel assemblies. Provide types of gaskets, fillers and sealants indicated or if not indicated, types as recommended by metal wall panels manufacture.

1. Seal metal wall panel end laps with double beads of tape or sealant, full width of panels.

2. Seal side joints where recommended by metal wall panel manufacture.

3. Prepare joints and apply sealants to comply with the requirements in Division07 Section “Joint Sealants”.

3.03 CLEANING AND PROTECTING

A. Clean exposed surfaces of panels that are not protected by temporary covering to remove fingerprints and soil during construction period.

B. Clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

C. Protect panels from damage during construction. Use temporary protective coverings where needed as approved by the panel manufacturer.

D. Clean and touch up minor abrasions in finish with air-dried coating that matches color and gloss, and is compatible with, factory applied finish coating.

E. Remove panels damaged beyond repair and replace with new panels to match adjacent undamaged panels.

F. Remove protective film immediately after installation.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. Provide labor, material, equipment and services to furnish and install firestopping systems required for the work as shown on the drawings, as specified herein and as required for a complete and proper installation, including, but not limited to, the following:

1. Closures of openings in walls, floors, and roof decks against penetration of flame, heat, and smoke or gases in fire resistant rated construction.

2. Closures of openings in walls against penetration of gases or smoke in smoke partitions.

3. Sealants around penetrations in non-rated smoke barriers where indicated on Drawings.

4. Closures of floor openings in vertical mechanical shafts against penetration of flame, heat, smoke and gases.

5. Closures of openings in elevator shafts against penetration of flame, heat, smoke and gases.

B. Drawings and General Provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, apply to this Section.

1.02 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 SUBMITTALS

A. Submit in accordance with Division 01, Submittals, Shop Drawings Product Data and Samples.

B. Manufacturers' literature, data, and installation instructions for types of firestopping and smoke stopping used.

C. List of FM, UL, or WH classification number of systems installed.

D. Certified laboratory test reports for ASTM E814 tests for systems not listed by FM, UL, or WH proposed for use.

1.04 DELIVERY AND STORAGE

A. Deliver materials in their original unopened containers with manufacturer's name and product identification.

B. Store in a location providing protection from damage and exposure to the elements.

1.05 QUALITY ASSURANCE

A. FM, UL, or WH or other approved laboratory tested products will be acceptable.

1.06 APPLICABLE STANDARDS: The latest edition of publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

A. American Society for Testing and Materials (ASTM):

1. E84 Surface Burning Characteristics of Building Materials

2. E136 Behavior of Material in a Vertical Tube Furnace

3. E814 Fire Tests of Through-Penetration Fire Stops

B. Factory Mutual Engineering and Research Corporation (FM):

1. Annual Issue Approval Guide Building Materials

C. Underwriters Laboratories, Inc. (UL):

1. Annual Issue Building Materials Directory

2. Annual Issue Fire Resistance Directory

D. Warnock Hersey (WH):

1. Annual Issue Certification Listings

PART 2 PRODUCTS

2.01 FIRESTOP SYSTEMS

A. Metallic Pipe of Conduits: Firestop systems shall comply with the following:

1. Classified for use with the particular type of penetrating material used.

2. Use either factory built (Firestop Devices) or field erected (through-Penetration Firestop Systems) to form a specific building system maintaining required integrity of the fire barrier and stop the passage of gases or smoke.

3. Tested through-penetration firestop systems and firestop devices in accordance with ASTM E814 using the "T" rating to maintain the same rating and integrity as the fire barrier being sealed.

4. Products requiring heat activation to seal an opening by its intumescence shall exhibit a demonstrated ability to function as designed to maintain the fire barrier.

5. Firestop sealants used for firestopping or smoke sealing shall have following properties:

a. Contain no flammable or toxic solvents.

b. Have no dangerous or flammable outgassing during the drying or curing of products.

c. Water-resistant after drying or curing and unaffected by high humidity, condensation or transient water exposure.

d. When used in exposed areas, shall be capable of being sanded and finished with similar surface treatments as used on the surrounding wall or floor surface.

6. Maximum flame spread of 25 and smoke development of 50 when tested in accordance with ASTM E84.

7. FM, UL, or WH rated or tested by an approved laboratory in accordance with ASTM E814.

8. Materials to be asbestos free.

B. Glass pipe, plastic pipe or conduits, unenclosed cables, or other non-metallic materials: Comply to requirements for metallic pipe and as follows:

1. Penetrations containing loose electrical cables, computer data cables, and communications cables protected using firestopping systems that allow unrestricted cable changes without damage to the seal.

2. Intumescent products which expand to seal the opening and act as fire, smoke, toxic fumes, and, water sealant.

C. One-Hour Fire Barrier Sealant: One-component neutral-cure silicone rubber sealant.

1. Manufacturers:

a. 3M “Fire Barrier 2000 or 2003 Sealant, Caulk Type CP25 or No. 303 Putty”;

b. International Protective Coatings “Flame-Safe FS500 or FSP1000 Putty”;

c. Fipro “A/D Silicone Firebarrier Sealant-SL”;

d. Or equal.

2.02 SMOKE STOPPING IN SMOKE PARTITIONS

A. Non-Fire-rated Smoke Stop Partitions: Sealants around penetrations in smoke stop partitions or barriers not identified on the plans as part of a rated assembly shall comply as follows:

1. Use silicone sealant in smoke partitions as specified in Section 07 90 00, Joint Sealers.

2. Use mineral fiber filler and bond breaker behind sealant.

3. Sealants shall have a maximum flame spread of 25 and smoke developed of 50 when tested in accordance with E84.

4. When used in exposed areas capable of being sanded and finished with similar surface treatments as used on the surrounding wall or floor surface.

B. Fire-rated Smoke Stop Partitions: Sealants around penetrations in smoke stop partitions or barriers that are identified on the plans as part of a rated assembly shall comply as follows:

1. Use listed firestop system specified above.

2.03 ACCESSORIES

A. Stuffing Material: Mineral fiber matting, permanent.

B. Retainers: Clips to support mineral fiber matting.

PART 3 EXECUTION

3.01 EXAMINATION

A. Submit product data and installation instructions, as required by article, submittals, after an on-site examination of areas to receive firestopping.

B. Examine substrates and conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping.

3.02 PREPARATION

A. Remove dirt, grease, oil, loose materials, or other substances that prevent adherence and bonding or application of the firestopping or smoke stopping materials.

B. Remove insulation on insulated pipe for a distance of six inches (150 mm) on either side of the fire rated assembly prior to applying the firestopping materials unless the firestopping materials are tested and approved for use on insulated pipes.

C. Install backing materials to arrest liquid material leakage.

3.03 INSTALLATION

A. Do not begin work until the specified material data and installation instructions of the proposed firestopping systems have been submitted and approved.

B. Install firestopping systems with smoke stopping in accordance with FM, UL, WH, or other approved system details and installation instructions.

C. Install smoke stopping seals in smoke partitions.

3.04 FIELD QUALITY CONTROL

A. City’s Fire Marshal will examine completed firestopping to determine, in general, if it is being installed in compliance with requirements.

B. Do not proceed to enclose firestopping with other construction until reports of City Fire Marshal’s examinations are issued.

C. Where deficiencies are found, repair or replace firestopping so that it complies with requirements.

3.05 CLEANING

A. As work is completed, remove materials, litter, and debris.

B. Clean up spills of liquid type materials.

END OF SECTION 07 84 00

PART 1 GENERAL

1.01 SUMMARY

A. Provide joint sealers, for interior and exterior joints not specified elsewhere, with backing rods and accessories as required for complete installation. Joint sealers include sealants and caulking as indicated.

1.02 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 SUBMITTALS

A. Submit in accordance with Division 01, Submittals, Shop Drawings Product Data and Samples.

B. Product Data: Furnish manufacturer's descriptive literature.

C. Samples: Furnish samples of each type of exposed joint sealer in required colors.

D. Certifications:

1. Furnish manufacturer's certification joint sealers comply with Contract Documents and are suitable for Project applications.

2. Furnish certification indicating installers are trained in proper use of specified products, qualified, and familiar with proper installation techniques.

1.04 QUALITY ASSURANCE

A. Performance Requirements:

1. Select materials for compatibility with joint surfaces and indicated exposures.

2. Where not indicated, select modulus of elasticity and hardness or grade recommended by manufacturer for each application indicated.

3. Comply with applicable limitations on volatile organic compound (VOC) emissions.

B. Installer Qualifications: Firm with minimum five years successful experience on projects of similar type and size, using specified products.

1. Installers shall be familiar with proper application procedures to ensure maximum joint sealer expansion and contraction capabilities.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, cure time, and mixing instructions.

1.06 SITE CONDITIONS

A. Do not proceed with installation of joint sealers under unfavorable weather conditions.

B. Install elastomeric sealants when temperature is in lower third of temperature range recommended by manufacturer.

1.07 WARRANTY

A. Special Warranty: Repair or replace joint sealers which fail to perform as intended, because of leaking, crumbling, hardening, shrinkage, bleeding, sagging, staining and loss of adhesion.

PART 2 PRODUCTS

2.01 MATERIALS

A. Elastomeric Sealants:

1. Single-Component Low Modulus Silicone Sealant: ASTM C920 Type S, Class 25, Grade NS; minimum 50% expansion and compaction capability.

a. Provide at exterior locations not exposed to traffic.

b. Manufacturers:

1) General Electric Co./Silpruf, Silglaz or GESIL.

2) Dow Corning Corp./790 or 795.

3) Pecora Corp./864 Architectural Silicone.

4) Tremco/Spectrum 3.

2. Multi-Component Polyurethane Sealant: ASTM C920, Type M, Grade P, Class 25, self-leveling; minimum 25% expansion and compaction capability.

a. Provide following at traffic bearing locations.

b. Manufacturers:

1) Pecora Corp./NR-200 Urexpan.

2) Tremco/Vulkem 245.

3) Sonneborn Division of ChemRex /SL 2

3. Mildew-Resistant Silicone Rubber Sealant: ASTM C920, Type S, Grade NS, Class 25, compounded with fungicide, specifically for mildew resistance and recommended for interior joints in wet areas.

a. Provide at interior joints in wet areas.

b. Manufacturers:

1) General Electric Co./SCS 1702 Sanitary Sealant.

2) Dow Corning Corp./786 Bathtub Caulk.

3) Pecora Corp./863 #345 White.

4) Tremco/Tremsil 200.

B. Non-Elastomeric Sealants:

1. Acrylic-Emulsion Sealant: ASTM C834 acrylic or latex-rubber-modified acrylic sealant, permanently flexible, non-staining and non-bleeding; recommended for general interior exposure; compatible with paints specified in Section 09 90 00.

a. Provide at general interior applications.

b. Manufacturers:

1) Pecora Corp./AC-20.

2) Sonneborn Division of ChemRex/Sonolac.

3) Tremco/Ultrem 1500

C. Miscellaneous Materials:

1. Primers/Sealers: Non-staining types recommended by joint sealer manufacturer for joint surfaces to be primed or sealed.

2. Joint Cleaners: Non-corrosive types recommended by joint sealer manufacturer; compatible with joint forming materials.

3. Bond Breaker Tape: Polyethylene tape as recommended by joint sealer manufacturer where bond to substrate or joint filler must be avoided for proper performance of joint sealer.

4. Sealant Backer Rod: Compressible polyethylene foam rod or other flexible, permanent, durable non-absorptive material as recommended by joint sealer manufacturer for compatibility with joint sealer.

a. Oversize backer rod minimum 30% to 50% of joint opening.

D. Colors: Provide colors indicated or as selected by Architect from manufacturer's full range of colors.

PART 3 EXECUTION

3.01 PREPARATION

A. Prepare joint surfaces in accordance with ASTM C1193 and as recommended by joint sealer manufacturer.

B. Clean joint surfaces immediately before installation of joint sealer; remove dirt, insecure materials, moisture and other substances which could interfere with bond of joint sealer.

C. Prime or seal joint surfaces where recommended by joint sealer manufacturer; do not allow primer/sealer to spill or migrate onto adjoining surfaces.

D. Ensure protective coatings on surfaces in contact with joint sealers have been completely stripped.

3.02 INSTALLATION

A. Comply with manufacturer's printed instructions and ASTM C1193, except where more stringent requirements are shown or specified.

B. Set sealant backer rods at proper depth or position in joint to coordinate with other work, including installation of bond breakers and sealant; do not leave voids or gaps between ends of backer rods.

1. Do not stretch, twist, puncture or tear backer rods.

C. Install bond breaker tape where required by manufacturer's recommendations to ensure joint sealers will perform properly.

D. Size materials to achieve required width/depth ratios.

E. Employ installation techniques that will ensure joint sealers are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of bond surfaces equally on opposite sides.

F. Joint Configuration: Fill sealant joint to a slightly concave surface, slightly below adjoining surfaces, unless otherwise indicated.

G. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture or dirt.

H. Install joint sealers to depths recommended by joint sealer manufacturer but within the following general limitations, measured at center (thin) section of bead.

1. Horizontal Joints: 75% width with minimum depth of 3/8".

2. Elastomeric Joints: 50% width with minimum depth of 1/4".

3. Non-Elastomeric Joints: 75% to 125% of joint width.

I. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces.

1. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

J. Cure joint sealers in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability.

K. Maintain finished joints free of embedded matter, ridges and sags.

END OF SECTION

PART 1 GENERAL

1.01 DESCRIPTION

A. This section specifies lathing and Portland cement-based plaster (stucco) with acrylic-based finish coatings.

1.02 RELATED WORK

A. All Related Documents and Sections: Contractor to examine Contract Documents for requirements that directly affect or are affected by Work of this Section. Those Documents and Sections include, but is not limited to, the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 General Requirements, apply to this Section.

2. All Specification Sections listed in the Table of Contents.

1.03 TERMINOLOGY

A. Definitions and description of terms shall be in accordance with ASTM C11, C841, and C926 and as specified.

B. Self-furring Lath: Metal plastering bases having dimples or crimps designed to hold the plane of the back of the lath 6 to 10 mm (1/4 to 3/8 inch) away from the plane of the solid backing.

C. Solid Backing or Solid Bases: Sheathing with waterproofing membrane and similar materials to which plaster is directly applied.

1.04 SUBMITTALS

A. Submit in accordance with Division 01, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:

1. Accessories for plaster, each type.

2. Metal lath.

3. Fasteners.

4. Admixtures and Color, including mixing and application instructions.

C. Samples:

1. Panels for each texture and color, showing finish coat, 12 by 12 inches.

1.05 PROJECT CONDITIONS

A. Exterior plaster shall not be applied when the ambient temperature is less than 4° C (40° F).

B. Plaster shall not be applied to frozen surfaces or surfaces containing frost.

C. Frozen materials shall not be used in the mix.

D. Plaster coats shall be protected against freezing for a period of not less than 24 hours after application.

1.06 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

B. American Society for Testing And Materials (ASTM):

A653/A653M-10	Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
A641-09.....	.Zinc-Coated (Galvanized) Carbon Steel Wire
C150-09.....	.Portland Cement
C847-10.....	.Metal Lath
C897-05(R2009)...	.Aggregate for Job-Mixed Portland Cement Based Plasters
C926-06.....	.Application of Portland Cement-Based Plaster
C979-10.....	Pigments for Integrally Colored Concrete
C1002-07.....	Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs

Commercial Item Description (CID):

A-A-55615.....	Shield, Expansion (Wood Screw and Lag Bolt Self-Threading Anchors)

C. Federal Specifications (Fed Spec.):

UU-B-790A.....Building Paper, Vegetable Fiber(Kraft), Waterproofed, Water Repellent and Fire Resistant.

PART 2 PRODUCTS

2.01 METAL PLASTERING BASES

A. Expanded Metal Lath:

1. ASTM C847, zinc-coated (galvanized) except as modified by ASTM C841 and this specification. Self furring where applied over solid backing.

2. Diamond mesh weighing not less than 1.8 kg/m2 (3.4 pounds per square yard).

B. Building Paper Backing for Metal Plastering Bases:

1. Water Resistant Backing: Fed. Spec. UU-B-790, Type I, Grade B.

2.02 ACCESSORIES FOR CEMENT PLASTER (STUCCO)

A. ASTM C841, except fabricate from zinc alloy.

B. Control Joints: ASTM C841, zinc.

2.03 FASTENERS

A. Tie, wire, screws, clips, and other fasteners ASTM C841, except as otherwise specified.

B. Fasteners for securing metal plastering bases shall have heads, or be through washers large enough to engage two strands of the metal plastering base.

C. Screws: ASTM C1002.

D. E. Expansion Shields: CID A-A-55615, of the Type and Class applicable.

2.04 CEMENT

A. Portland: ASTM C150, Type I.

B. White where required for white finish coat.

2.05 LIME

A. ASTM C206, Type S.

B. ASTM C207, Type S.

2.06 AGGREGATES (SAND)

A. ASTM C897, graded as required to suit texture of finish specified.

B. White where white finish coat is specified.

2.07 BONDING AGENT

A. ASTM C932.

2.08 FACTORY PREPARED FINISH COAT FOR CEMENT PLASTER (STUCCO)

A. Acrylic-Based Finish Coatings: Factory-mixed acrylic-emulsion coating systems formulated with colorfast mineral pigments and fine aggregates; for use over

cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic-based finishes.

1. Color: Per Owner’s selection.

2. Factory-Prepared Finish-Coat Mixes: For acrylic-based finish coatings, comply with manufacturer's written instructions.

B. Pigments: ASTM C979, lime proof mineral oxide.

C. Not more than 35 percent, by weight of all ingredients (cement, aggregate, hydrated lime, admixture and coloring pigment) shall pass a number 100 sieve.

2.09 ADMIXTURES

A. Air Entrainment: ASTM C260.

PART 3 EXECUTION

3.01 METAL PLASTERING BASES (LATH) LOCATIONS

A. Where metal plastering bases are used as a base for exterior cement plaster over wall sheathing, use wire lath or stucco mesh with water resistant backing.

3.02 APPLYING METAL PLASTERING BASES

A. In accordance with ASTM C841, except as otherwise specified or shown.

B. Form true surfaces, straight or in fair curves where shown, without sags or buckles and with long dimension of lath at right angles to direction of supports

C. Lath for ceiling or soffit construction shall terminate at casing bead (floating angle construction) at perimeter angles between walls and ceilings or soffits.

D. Metal plastering bases shall not be continuous through expansion and control joints, but shall be stopped at each side.

E. Wood plugs are not acceptable.

3.03 INSTALLING PLASTERING ACCESSORIES

A. Install accessories in accordance with ASTM C841, except as otherwise specified.

1. Set plastering accessories plumb, level and true to line, neatly mitered at corners and intersections, and securely attach to supporting surfaces as specified for metal lath.

2. Install in one piece, within the limits of the longest commercially available lengths.

B. Corner Beads: Install at all vertical and horizontal external plaster corners, as required to establish grounds, and where shown.

C. Strip Lath:

1. Install metal lath strips centered over joints between dissimilar materials, such as hollow tile, brick, concrete masonry units, concrete, and joints with metal lath on framing or furring, where both such surfaces are required to be plastered and are in contact with each other in same plane, except where expansion joints and casing beads are required.

2. Wire tie or fasten strip lath to base along both edges at not over 150 mm (six inches) on centers.

D. Casing Beads:

1. Install casing beads where shown and at following locations where plaster terminates to provide finish trim.

2. Where plaster terminates against non-plastered surfaces such as masonry, concrete, and wood.

3. Where plaster terminates against trim of steel frames and trim of other materials and equipment, except where trim overlaps plaster.

4. Around perimeter of openings except where edge is covered by flanges. Locate to conform to dimensions shown on shop drawings.

5. Where plaster for new walls or furring (vertical or horizontal) terminates against existing construction.

6. Both sides of expansion and control joints unless shown otherwise.

7. Install casing bead at perimeter angles between walls and ceilings so as to provide floating angle (unrestrained) construction in accordance with ASTM C841.

E. Control Joints:

1. Install control joints as shown.

2. Install control joints only to the edges of abutting sheets of lath so that the lath is not continuous or tied across the joint.

3. Joints shall extend the full width and height of the wall or length of soffit/ceiling plaster membrane.

3.04 PORTLAND CEMENT BASED PLASTER

A. Provide portland cement based plaster where cement plaster (stucco) is shown and specified, and as follows:

1. Three coat work shall be used over all metal plastering bases, with or without solid backing.

B. Proportion, mix and apply plaster in accordance with ASTM C926, except as otherwise specified.

1. Use air entrained plaster for all exterior work.

2. Use coloring pigments for finish coat when integral color other than white is specified.

3. Use white cement with white sand when white finish coat is specified.

4. Factory prepared finish coat: Add water, mix, and apply as specified by manufacturer.

5. Color: match existing adjacent surface

6. Finish coat shall be smooth troweled, sand float, machine dash texture as chosen from standards.

END OF SECTION

PART 1 GENERAL

1.01 DESCRIPTION

A. Painting and finishing of exposed exterior and interior surfaces as required to complete finishing of the Work as indicated on the Drawings including the following items:

1. Electrical Sub-panels painted to match adjacent wall surface.

2. Visible piping and electrical components.

B. The Work includes painting and finishing of new and existing interior and exterior exposed items and surfaces throughout project, except as otherwise indicated.

1. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of work.

C. Surfaces Not to be Painted:

1. Factory pre-finished items as specified in various Sections.

2. Pre-finished wall, ceiling, and floor coverings.

3. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to, shop priming.

4. Code-Required Labels: Keep equipment identification and fire rating labels free of paint.

5. Surfaces concealed in walls and above ceilings except as specifically indicated otherwise.

6. Ducts, piping, conduit, and equipment concealed in walls and ceilings, unless specifically indicated otherwise.

D. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

E. Paint exposed surfaces whether or not colors are designated in "schedules", except where natural finish of material is specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint same as adjacent similar materials or areas. If color of finish is not designated, Architect will select these from standard colors available for materials systems specified.

1.02 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 SUBMITTALS

A. Submit in accordance with Division 01, Submittals, Shop Drawings Product Data and Samples.

B. Product Data:

1. Not less than 30 days before beginning work, submit a complete list of materials proposed for use, together with manufacturer's specifications.

2. Paint materials and products shall be subject to the Architect's acceptance.

C. Samples:

1. Custom and Stock Colors: Submit 8x8 inch brush-out samples for Architect's review of each color and texture. Provide a listing of material and application for each coat of each finish sample.

2. Samples shall be resubmitted as requested until required sheen, color, and texture is achieved.

3. Label and identify each sample as to location and application.

D. Field Samples: On actual wall surfaces and other exterior and interior building components in areas designated by Architect, duplicate painted finishes of prepared samples in 4 ft. sq. areas. Simulate finished lighting conditions for Architect's and City's review of in-place Work. Colors may require adjustment at no additional cost to the City.

1.04 QUALITY ASSURANCE

A. Include on label of containers:

1. Manufacturer's name

2. Type of paint

3. Manufacturer's stock number

4. Color

5. Instructions for reducing, where applicable

B. Field Quality Control:

1. Request review by the Architect of first finished room, space, or item of each color scheme required for color, texture, and workmanship.

2. Use first acceptable room, space, or item as the Project standard for each color scheme.

C. Regulatory Requirements:

1. Comply with the regulations of the Southern California Air Quality Management District (SCAQMD) for Volatile Organic Contents (VOC's).

2. Paint shall be certified by the manufacturer as "non-lead" (less than 0.06 percent lead by weight in the dried film) as defined in Part 1303 of the Consumer Product Safety Act.

3. Work to be painted may contain excessive levels of lead-based paint. Contractor shall retain and pay for the services of a Testing Agency to perform and report on tests for such suspected material

1.05 DELIVERY AND STORAGE

A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:

1. Name or title of material

2. Manufacturer's stock number and date of manufacturer

3. Manufacturer's name

4. Contents by volume, for major pigment and vehicle constituents

5. Thinning instructions

6. Application instructions

7. Color name and number

B. Storage of Materials:

1. Store only acceptable project materials on project site.

2. Store in a suitable location.

3. Restrict storage to paint materials and related equipment.

4. Comply with health and fire regulations.

1.06 PROJECT CONDITIONS

A. Environmental Requirements:

1. Comply with manufacturer’s recommendations as to environmental conditions under which coatings and coating systems can be stored and applied.

2. Do not apply paint in rain, fog or mist; or when relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by paint manufacturer's printed instructions.

3. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

1.07 WARRANTY

A. Color and Life of Film:

1. At the end of 1 year, colors of surfaces shall have remained free from serious fading, and variations (if any) shall be uniform.

2. Materials shall have their original adherence at end of 1 year and there shall be no evidence of blistering, running, peeling, scaling, chalking, streaking, or stains at end of this period.

1.08 MAINTENANCE

A. Extra Materials:

1. At completion of the Work, deliver to the City extra stock of paint equaling approximately 5 percent of each color used in each coating material used.

2. Stock shall be in tightly sealed and clearly labeled containers.

PART 2 PRODUCTS

2.01 MATERIALS

A. Product numbers specified in Article 3.06, “Paint Systems”, are as manufactured by Sherwin Williams, unless otherwise indicated. Equivalent products manufactured by Sinclair Paint Co., Benjamin Moore, Dunn-Edwards, ICI Paints, Fuller O’Brien or Glidden are acceptable.

B. Materials selected for coating system of each type of surface shall be the product of a single manufacturer.

C. Thinner: As recommended by each manufacturer for his respective product for use only within recommended limits.

D. Colors used shall be selected for their permanence and non-fading qualities. In addition, colors that are used over concrete and plaster surfaces shall be lime-proof.

E. Unsuitability of Specified Products: Claims concerning unsuitability of any materials specified will not be entertained, unless such claim is made in writing to the Architect before the Work is started.

F. Texturing: Match texture of adjacent textures when new materials abut textured areas.

2.02 MATERIAL QUALITY

A. Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

B. Proprietary names used to designate colors or materials are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.

2.03 COLORS

A. Colors: Colors to be selected by Architect from manufacturer’s color chart.

B. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

C. Paint Coordination: Provide finish coats which are compatible with prime paints used. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information on characteristics of finish material proposed for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.

2.04 MIXING AND TINTING

A. Deliver paints ready mixed to jobsite.

B. Accomplish job mixing and job tinting only when acceptable to the Architect.

C. Mix only in mixing pails placed in suitable sized nonferrous or oxide-resistant metal pans.

D. Use tinting colors recommended by manufacturer for specific type of finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Applicator.

B. Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.

C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

3.02 SURFACE PREPARATION

A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.

B. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.

C. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces. Do not paint until all interior gypsum board is installed, taped and sanded.

D. Gypsum Board:

1. Fill narrow, shallow cracks and small holes with spackling compound.

2. Rake deep, wide cracks and deep holes.

   a. Dampen with clear water.

   b. Fill with thin layers of drywall joint cement.

3. Allow to dry.

4. Sand smooth after drying; do not raise nap of paper on gypsum board.

5. See Section 09 25 00 for requirements for gypsum board finishing.

E. Ferrous Metals: Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.

1. Touch-up shop-applied prime coats wherever damaged or bare, where required by other sections of these specifications. Clean and touch-up with same type shop primer.

F. Galvanized Surfaces: Clean free of oil and surface contaminants with non-petroleum-based solvent.

G. Surfaces which cannot be prepared or painted as specified shall be immediately brought to the attention of the Architect in writing.

1. Starting of work without such notification will be considered acceptance by the Contractor of surface involved.

2. Contractor shall replace unsatisfactory work caused by improper or defective surfaces, as directed by the Architect, at no additional cost to the City.

3.03 MATERIALS PREPARATION

A. Mix and prepare painting materials in accordance with manufacturer's directions.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.

C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

3.04 APPLICATION

A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.

3. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.

4. Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.

B. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Allow sufficient time between successive coatings to permit proper drying. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.

C. Prime Coats: Apply prime coat of material which is required to be painted or finished, and which has not been prime coated by others.

1. Re-coat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn through or other defects due to insufficient sealing.

E. Stipple Eggshell Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.

F. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.

3.05 CLEAN-UP AND PROTECTION

A. Clean-up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day.

1. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

B. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

1. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.

2. At the completion of work of other trades, touch up and restore all damaged or defaced painted surfaces.

3.06 PAINT SYSTEMS

A. General:

1. Exterior paint systems are specified and identified by number and interior paint systems by letter.

2. Only major areas are scheduled, but miscellaneous and similar items and areas within room or space shall be treated with suitable system.

3. Number of coats scheduled is minimum.

a. Additional coats shall be applied at no additional cost if necessary to completely hide base material, produce uniform color, and provide satisfactory finish result.

4. This specification shall serve as a guide and is meant to establish procedure and quality.

B. Acceptance of Final Colors: Final coat of paint for both exterior and interior shall not be applied until colors have been accepted by the Architect based on Field Samples noted in 1.03.C above.

C. Interior Coating Systems: Provide the following finish coating systems for the various substrates, as shown on the Finish Plan. Provide coats as indicated and sufficient to cover.

1. Galvanized Metal (trim and access doors, except structural steel, etc.):

a. Semi-gloss:

1) Prime Coat (delete if shop primed): One coat 621-04 BLOX-RUST Alkyd Metal Primer.

2) Two coats 619-6X Ultra-Color Alkyd Semi-Gloss Enamel.

3. Ferrous Metal or Aluminum (miscellaneous)

a. Semi-gloss:

1) Prime Coat (delete if shop primed): 15 Red Oxide Primer

2) Second Coat: 1790 Latex Enamel Undercoater

3) Finish Coat: 4000 Acrylic Latex Enamel

D. Other Coating Systems:

1. Plaster

a. Semi-gloss:

1) Prime Coat: 18 Epoxy Water-Base Primer

2) Finish Coat: 4400 Acrylic Emulsion

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. This section specifies exterior regulatory signs.

1.04 SUBMITTALS

A. Submit in accordance with Division 01, Submittals, Shop Drawings Product Data and Samples.

B. Manufacturer's Literature:

1. Showing the methods and procedures proposed for the concealed anchorage of the signage system to each surface type.

2. Manufacturer’s printed specifications, anchorage details, installation and maintenance instructions.

C. Shop Drawings:

1. Sign location plan, showing location, type and total number of signs required.

2. Scaled drawings for manufacture and fabrication of sign types. Identify materials, show joints, welds, anchorage, accessory items, mounting and finishes.

D. Samples:

1. All sign colors.

1.05 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Deliver materials to job in manufacturer's original sealed containers with brand name marked thereon. Protect materials from damage.

B. Package to prevent damage or deterioration during shipment, handling, storage and installation. Maintain protective covering in place and in good repair until removal is necessary.

C. Deliver signs only when the site and mounting services are ready for installation work to proceed.

D. Store products in dry condition inside enclosed facilities.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Signs of type, size and design shown on the drawings and as specified.

B. Signs complete with lettering, framing and related components for a complete installation.

C. Provide graphics items as completed units produced by a single manufacturer, including necessary mounting accessories, fittings and fastenings.

D. Do not scale drawings for dimensions. Contractor to verify and be responsible for all dimensions and conditions shown by these drawings. City's Representative to be notified of any discrepancy in drawing, in field directions or conditions, and/or of any changes required for all such construction details.

E. The Sign Contractor, by commencing work of this section, assumes overall responsibility, as part of his warranty of work, to assure that assemblies, components and parts shown or required within the work of the section, comply with the Contract Documents. The Contractor shall further warrant: That all components, specified or required to satisfactorily complete the installation are compatible with each other and with conditions of installations.

2.02 SIGN MATERIALS

A. General: For items exposed to view on completion, provide materials having flat, smooth surfaces without blemishes. Do not use materials whose surfaces exhibit pitting, seam marks, roller marks, rolled trade names or roughness.

B. Aluminum:

1. Sheet and Plate: ASTM B209.

2. Extrusions and Tubing: ASTM B221.

3. Castings: ASTM B26.

C. Concrete Post Footings: See Section 03 30 00, CAST-IN-PLACE CONCRETE.

D. Steel:

1. Posts: ASTM A53 Grade B, Schedule 40 pipe, Galvanized G90.

2. Sheet: ASTM A1008, ASTM A591 electrolytic zinc coated.

E. Sign Face: High impact polyester acrylate resins, pressure molded into a single polymerized component, using manufacturer's co-molding process.

F. Colors: High contrast semi-matte integral colors for graphics. All integral resins are U.V. stabilized resins utilizing automotive grade pigments.

G. Traffic Regulatory Signs:

1. Steel Sheet: 0.0625 inch thick, painted.

H. Accessories:

1. Anchors and inserts: Provide hot-dipped galvanized anchors and inserts for exterior installations. Use toothed steel devices for drilled in anchors. Furnish inserts to be set into concrete or masonry work. Furnish galvanized through bolts for attachment to posts.

2.03 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Baked Enamel: Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating and painting.

D. Surface Texture: Matte Non-Glare.

E. Letter Style: Sans Serif.

2.04 FABRICATION

A. Design components to allow for expansion and contraction for a minimum material temperature range of 56 °C (100 °F), without causing buckling, excessive opening of joints or over stressing of adhesives, welds and fasteners.

B. Form work to required shapes and sizes, with true curve lines and angles. Provide necessary rebates, lugs and brackets for assembly of units. Use concealed fasteners whenever and wherever possible.

C. Shop fabricate so far as practicable. Joints fastened flush to conceal reinforcement, or welded where thickness or section permits.

D. Contact surfaces of connected members be true. Assembled so joints will be tight and practically unnoticeable, without use of filling compound.

E. Signs shall have fine, even texture and be flat and sound. Lines and miters sharp, arises unbroken, profiles accurate and ornament true to pattern. Plane surfaces be smooth flat and without oil-canning, free of rack and twist. Maximum variation from plane of surface plus or minus 0.3 mm (0.015 inches). Restore texture to filed or cut areas.

F. Level or straighten wrought work. Members shall have sharp lines and angles and smooth surfaces.

G. Extruded members to be free from extrusion marks. Square turns and corners sharp, curves true.

H. Drill holes for bolts and screws. Conceal fastenings where possible. Exposed ends and edges mill smooth, with corners slightly rounded. Form joints exposed to weather to exclude water.

I. Coat aluminum exterior signs with low VOC acrylic polyurethane. Paint coatings are to be UV and graffiti resistant and able to maintain a consistent color and durability.

J. All signs are to be constructed in a manner where front faces are free of exposed fasteners.

K. Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions: Verify installation conditions previously established under other sections are acceptable for product installation in accordance with manufacturer's instructions.

B. Scheduling of installation by the client implies that substrate and conditions are prepared and ready for product installation. Proceeding with installation implies installer’s acceptance of substrate and conditions.

3.02 INSTALLATION

A. Install product in accordance with supplier’s instructions.

B. Install product in locations indicated using mounting methods recommended by sign manufacturer and free from distortion, warp, or defect adversely affecting appearance.

C. Install product level, plumb, and at heights indicated.

3.03 CLEANING AND PROTECTION

A. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible to the unaided eye from a distance of 5 feet.

B. Remove temporary coverings and protection to adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to City’s acceptance. Remove construction debris from project in accordance with provisions in Division 1.

END OF SECTION

PART 1 GENERAL

1.01 DESCRIPTION

A. This section includes weathertight outdoor fire extinguisher cabinets.

1.02 RELATED WORK

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 SUBMITTALS

A. Submit in accordance with Division 01, Submittals, Shop Drawings Product Data and Samples.

B. Manufacturer's Literature and Data: Fire extinguisher cabinet including installation instruction and rough opening required.

1.04 APPLICATION PUBLICATIONS

The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

A. American Society of Testing and Materials (ASTM):

D4802-10.....Poly (Methyl Methacrylate) Acrylic Plastic Sheet

PART 2 PRODUCTS

2.01 FIRE EXTINGUISHER CABINET

A. Weathertight outdoor fire extinguisher cabinets.

1. Surface-mounted outdoor steel fire cabinet for 40-B:C extinguisher
2. 16-Gauge galvanized steel with weatherproof red acrylic finish
3. Steel door with all face joints fully welded and ground smooth. Design doors to open 180 degrees.
4. Provide continuous hinge, pull handle
5. Zinc-plate latch
6. Size:
   a. Interior: height 24 in, width 11 ¾ in and depth 7 ¾”in
   b. Exterior: height 24 ¾ in, width 12 ½ in and depth 8 ½ in

2.02 EXTINGUISHER

A. 40-B:C Extinguisher

2.03 FINISH

B. Finish interior, exterior and door cabinet with manufacturer's standard weatherproof red acrylic finish

PART 3 EXECUTION

A. Install fire extinguisher cabinets in prepared openings and secure in accordance with manufacturer's instructions.

B. Install cabinet so that bottom of cabinet is 975 mm (39 inches) above finished floor.

C. Install signage as required to indicate obscured extinguisher locations.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sleeves for raceways and cables.
2. Sleeve seals.
3. Grout.
4. Common electrical installation requirements.

1.2 SUBMITTALS

A. Product Data: For sleeve seals.

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

C. Sleeves for Rectangular Openings: Galvanized sheet steel.

1. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches and no side more than 16 inches, thickness shall be 0.052 inch.
b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches and 1 or more sides equal to, or more than, 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE SEALS

A. 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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Advance Products & Systems, Inc.
b. Calpico, Inc.

c. Metraflex Co.
d. Pipeline Seal and Insulator, Inc.

3. Sealing Elements: EPDM or NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
4. Pressure Plates: Stainless steel. Include two for each sealing element.
5. Connecting Bolts and Nuts: Stainless steel]of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

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

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Cut sleeves to length for mounting flush with both surfaces of walls.

F. Extend sleeves installed in floors 2 inches above finished floor level.

G. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.

H. Seal space outside of sleeves with grout for penetrations of concrete and masonry

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

I. Interior Penetrations of Non-Fire-Rated Walls and Floors: 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 "Joint Sealants.".

J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."

K. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use 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.

3.4 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

END OF SECTION 260500

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.
3. Sleeves and sleeve seals for cables.

1.2 SUBMITTALS

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

B. Field quality-control test reports.

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 CONDUCTORS AND CABLES

A. **Copper** Conductors: Comply with NEMA WC 70.

B. Conductor Insulation: Comply with NEMA WC 70 for Types **THW** and **THHN-THWN**.

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of 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.

C. 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** 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.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type THHN-THWN, single conductors in raceway.

B. Exposed Feeders: Type THHN-THWN, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: 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 Crawlspaces: Type THHN-THWN, single conductors in raceway.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway, OR Romex product NEC compliant for application and approved by AHJ. Contractor shall verify NEC and AHJ compliance prior to any rough-in.

G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.

H. Class 1 Control Circuits: Type THHN-THWN, in raceway.

I. Class 2 Control Circuits: Type THHN-THWN, in raceway.

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.

I. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.4 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

D. Cut sleeves to length for mounting flush with both wall surfaces.

E. Extend sleeves installed in floors 2 inches above finished floor level.

F. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and cable unless sleeve seal is to be installed.

G. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.

H. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and cable, using joint sealant appropriate for size, depth, and location of joint according to Division 07 Section "Joint Sealants."

I. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at cable penetrations. Install sleeves and seal with firestop materials according to Division 07 Section "Penetration Firestopping."

J. Aboveground Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeves to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

K. Underground Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inch annular clear space between cable and sleeve for installing mechanical sleeve seals.

3.5 SLEEVE-SEAL INSTALLATION

A. Install to seal underground exterior-wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for cable material and size. Position cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.6 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 07 Section "Penetration Firestopping."

3.7 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, and conductors feeding the following critical equipment and service 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 260519

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes methods and materials for grounding systems and equipment.

1.2 SUBMITTALS

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

B. Field quality-control test reports.

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 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 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 wide and 1/16 inch thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.2 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory 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, bolted 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, 3/4 inch diameter by 10 feet long.

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 copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches 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.

B. 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.

C. Ground Rods: Drive rods until tops are 2 inches 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.

D. 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 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.

E. 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 so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

F. 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, using a bolted clamp connector or by bolting 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.

G. 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.

3.3 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. 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.

    a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    b. Perform tests by fall-of-potential method according to IEEE 81.

B. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity 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 260526

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.

E. Comply with all Seismic Requirements.

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:
2. Manufacturers: Subject to compliance with requirements, provide products by one of 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.

3. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
4. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
5. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
6. 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. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where 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:
    b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Hilti Inc.
2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
3) MKT Fastening, LLC.
4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit

2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless 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:
b. Manufacturers: Subject to compliance with requirements, provide products by one of 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.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. 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 required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted [or other]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.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch 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.

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 thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts.
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.

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 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 , 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 03 Section Miscellaneous 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.

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 260529

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 BOXES, ENCLOSURES, AND CABINETS

A. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

B. Cast-Metal Outlet and Device Boxes: NEMA FB 1, aluminum, 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, cast aluminum 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.

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 or IMC.
2. Concealed Conduit, Aboveground: rigid steel conduit, IMC or EMT.

3. Underground Conduit: RNC, Type EPC-40PVC, direct buried.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFNC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

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 or IMC. 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 or IMC.
7. Raceways for Optical Fiber or Communications Cable: EMT.
8. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, stainless steel in damp or wet locations.

C. Minimum Raceway Size: 3/4-inch 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 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." Comply with all Seismic requirements.

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 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 tensile strength. Leave at least 12 inches of slack at each end of pull wire.

K. Raceways for Communications Cable: Install as follows:

1. 3/4-Inch Trade Size and Smaller: Install raceways in maximum lengths of 50 feet.
2. 1-Inch Trade Size and Larger: Install raceways in maximum lengths of 75 feet.
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 and that has straight-run length that exceeds 25 feet.

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 temperature change.
b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
c. Indoor Spaces: Connected with the Outdoors without Physical Separation: 125 deg F temperature change.
d. Attics: 135 deg F 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 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 of flexible conduit for 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 or LFNC 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 Division 31 Section "Earth Moving" for pipe less than 6 inches in nominal diameter.
2. Install backfill as specified in Division 31 Section "Earth Moving."
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 of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Division 31 Section "Earth Moving."
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 of concrete.
    b. For stub-ups at equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.

6. Warning Planks: Bury warning planks approximately 12 inches above direct-buried conduits, placing them 24 inches o.c. Align planks along the width and along the centerline of conduit.

3.4 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

END OF SECTION 260533

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 and system or service type.

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.

D. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

E. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

F. Write-On Tags: Polyester tag, 0.015 inch 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. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

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 and system or service type.

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.

D. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.

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, 0.015 inch 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. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

D. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

E. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.4 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches 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.

C. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

D. Write-On Tags: Polyester tag, 0.015 inch 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. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.5 FLOOR MARKING TAPE

A. 2-inch wide, 5-mil 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.

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 grommets in corners for mounting.
3. Nominal size, 7 by 10 inches.

D. Metal-Backed, Butyrate Warning Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 10 by 14 inches.

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.

2.8 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch 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.

C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

2.9 EQUIPMENT IDENTIFICATION LABELS

A. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

B. 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.

C. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

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 maximum intervals in straight runs, and at 25-foot 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 below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches 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 30-foot 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 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 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 marker tape 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: Baked-enamel warning sign.

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- high letters for emergency instructions at equipment used for.

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: Adhesive film label. Unless otherwise indicated, provide a single line of text with 1/2-inch high letters on 1-1/2-inch high label; where two lines of text are required, use labels 2 inches high.
        b. Outdoor Equipment: Engraved, laminated acrylic or melamine label Stenciled legend 4 inches 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 260553

SECTION 262413 - SWITCHBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Service and distribution switchboards rated 600 V and less.
2. Transient voltage suppression devices.
3. Disconnecting and overcurrent protective devices.
4. Instrumentation.
5. Control power.
6. Accessory components and features.
7. Identification.

1.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Switchboards 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.

1.3 SUBMITTALS

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

B. Shop Drawings: For each switchboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings.
2. Include time-current coordination curves for each type and rating of overcurrent protective device included in switchboards.
3. Include schematic and wiring diagrams for power, signal, and control wiring.

C. Seismic Qualification Certificates: Submit certification that switchboards, 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. 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 2.

C. Comply with NFPA 70.

D. Comply with UL 891.

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 MANUFACTURED UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product 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.

C. Front-Connected, Front-Accessible Switchboards:

1. Main Devices: Panel mounted.
2. Branch Devices: Panel mounted.
3. Sections front and rear aligned.

D. Nominal System Voltage: Per Drawings

E. Main-Bus Continuous: Per Drawings.

F. Seismic Requirements: Fabricate and test switchboards according to IEEE 344 to withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

G. Enclosure: Steel, NEMA 250, Type 1

1. Enclosure Finish: Factory-applied finish in manufacturer's standard gray finish over a rust-inhibiting primer on treated metal surface.
2. Enclosure: Flat roof; bolt-on rear covers for each section, with provisions for padlocking.

H. Utility Metering Compartment: Fabricated, barrier compartment and section complying with utility company's requirements. If separate vertical section is required for utility metering, match

and align with basic switchboard. Provide service entrance label and necessary applicable service entrance features.

I. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.

J. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.

K. Pull Box on Top of Switchboard:

1. Adequate ventilation to maintain temperature in pull box within same limits as switchboard.
2. Removable covers shall form top, front, and sides. Top covers at rear shall be easily removable for drilling and cutting.
3. Bottom shall be insulating, fire-resistive material with separate holes for cable drops into switchboard.
4. Cable supports shall be arranged to facilitate cabling and adequate to support cables indicated, including those for future installation.

L. Phase and Neutral Buses and Connections: Three phase, four wire unless otherwise indicated. Tin-plated, high-strength, electrical-grade aluminum alloy with tin-plated aluminum circuit-breaker line connections.

1. Ground Bus: 1/4-by-2-inch- minimum size, hard-drawn copper of 98 percent conductivity, equipped with pressure connectors for feeder and branch-circuit ground conductors.
2. Main Phase Buses and Equipment Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
3. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with pressure connectors for outgoing circuit neutral cables.

M. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.

2.2 TRANSIENT VOLTAGE SUPPRESSION DEVICES

A. Surge Protection Device Description: IEEE C62.41-compliant, integrally mounted, solid-state, parallel-connected, with sine-wave tracking suppression and filtering modules, UL 1449, second edition, short-circuit current rating matching or exceeding the switchboard short-circuit rating, and with the following features and accessories:

1. Fuses, rated at 200-kA interrupting capacity.
2. LED indicator lights for power and protection status.
3. Audible alarm, with silencing switch, to indicate when protection has failed.
4. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of system operation. Contacts shall reverse position on failure of any surge diversion module or on opening of any current-limiting device.
5. Transient-event counter set to totalize transient surges.

B. Peak Single-Impulse Surge Current Rating: 160 kA per mode/320 kA per phase

C. Withstand Capabilities: 5000 IEEE C62.41, Category C3 (10 kA), 8-by-20-mic.sec. surges with less than 5 percent change in clamping voltage.

D. Protection modes and UL 1449 SVR for grounded wye circuits with Voltage per drawing, three-phase, four-wire circuits shall be as follows:

1. Line to Neutral: 800 V for 480Y/277, 400 V for 208Y/120.
2. Line to Ground: 800 V for 480Y/277, 400 V for 208Y/120.
3. Neutral to Ground: 800 V for 480Y/277, 400 V for 208Y/120.

2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. 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. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
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 material.
    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. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
    f. Communication Capability: Circuit-breaker-mounted communication module with functions and features compatible with power monitoring and control system specified in Division 26 Section "Electrical Power Monitoring and Control."
    g. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at [**55**] [**75**] percent of rated voltage.
    h. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
    i. Auxiliary Contacts: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
    j. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.

2.4 INSTRUMENTATION

A. Instrument Transformers: IEEE C57.13, NEMA EI 21.1, and the following:

1. Current Transformers: IEEE C57.13; 5 A, 60 Hz, secondary and secondary shorting device. Burden and accuracy shall be consistent with connected metering and relay devices.
2. Control-Power Transformers: Dry type, mounted in separate compartments for units larger than 3 kVA.
3. Current Transformers for Neutral and Ground-Fault Current Sensing: Connect secondary wiring to ground overcurrent relays, via shorting terminals, to provide selective tripping of main and tie circuit breaker. Coordinate with feeder circuit-breaker, ground-fault protection.

B. Multifunction Digital-Metering Monitor: Microprocessor-based unit suitable for three- or four-wire systems and with the following features:

1. Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:

a. Phase Currents, Each Phase: Plus or minus 1 percent.
b. Phase-to-Phase Voltages, Three Phase: Plus or minus 1 percent.
c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 1 percent.
d. Megawatts: Plus or minus 2 percent.
e. Megavars: Plus or minus 2 percent.
f. Power Factor: Plus or minus 2 percent.
g. Frequency: Plus or minus 0.5 percent.
h. Accumulated Energy, Megawatt Hours: Plus or minus 2 percent; accumulated values unaffected by power outages up to 72 hours.
i. Megawatt Demand: Plus or minus 2 percent; demand interval programmable from five to 60 minutes.

2. Mounting: Display and control unit flush or semiflush mounted in instrument compartment door.

2.5 CONTROL POWER

A. Control Circuits: 120-V ac, supplied through secondary disconnecting devices from control-power transformer.

B. Electrically Interlocked Main and Tie Circuit Breakers: Two control-power transformers in separate compartments, with interlocking relays, connected to the primary side of each control-power transformer at the line side of the associated main circuit breaker. 120-V secondaries connected through automatic transfer relays to ensure a fail-safe automatic transfer scheme.

C. Control-Power Fuses: Primary and secondary fuses for current-limiting and overload protection of transformer and fuses for protection of control circuits.

D. Control Wiring: Factory installed, with bundling, lacing, and protection included. Provide flexible conductors for No. 8 AWG and smaller, for conductors across hinges, and for conductors for interconnections between shipping units.

2.6 ACCESSORY COMPONENTS AND FEATURES

A. Portable Test Set: For testing functions of solid-state trip devices without removing from switchboard. Include relay and meter test plugs suitable for testing switchboard meters and switchboard class relays.

B. Spare-Fuse Cabinet: Suitably identified, wall-mounted, lockable, compartmented steel box or cabinet. Arrange for wall mounting.

2.7 IDENTIFICATION

A. Service Equipment Label: NRTL labeled for use as service equipment for switchboards with one or more service disconnecting and overcurrent protective devices.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Receive, inspect, handle, store and install switchboards and accessories according to NECA 400 NEMA PB 2.1.

B. Equipment Mounting: Install switchboards on concrete base, 4-inch nominal thickness. Comply with requirements for concrete base specified in Division 03 Section "Cast-in-Place Concrete."

1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
2. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
4. Install anchor bolts to elevations required for proper attachment to switchboards.

C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from switchboard units and components.

D. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

E. Install filler plates in unused spaces of panel-mounted sections.

F. Install overcurrent protective devices, transient voltage suppression devices, and instrumentation.

1. Set field-adjustable switches and circuit-breaker trip ranges.

G. Install spare-fuse cabinet.

H. Comply with NECA 1.

I. Comply with requirements for terminating feeder bus specified in Division 26 Section "Enclosed Bus Assemblies." Drawings indicate general arrangement of bus, fittings, and specialties.

J. Comply with requirements for terminating cable trays specified in Division 26 Section "Cable Trays for Electrical Systems." Drawings indicate general arrangement of cable trays, fittings, and specialties.

3.2 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

B. Switchboard Nameplates: Label each switchboard compartment with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

C. Device Nameplates: Label each disconnecting and overcurrent protective device and each meter and control device mounted in compartment doors with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

A. Acceptance Testing Preparation:

1. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

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. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
3. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

C. Switchboard will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports, including a certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION 262413

SECTION 262416 - 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.

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 3R.

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: Hard-drawn copper, 98 percent conductivity.

E. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Hard-drawn copper, 98 percent conductivity.
2. Main and Neutral Lugs: Compression type.
3. Ground Lugs and Bus Configured Terminators: Compression type.
4. Feed-Through Lugs: Compression type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
5. Subfeed (Double) Lugs: Compression 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: Rated for series-connected system with integral or remote upstream overcurrent protective devices and labeled by an NRTL. Include size and type of allowable upstream and branch devices, and listed and labeled for series-connected short-circuit rating by an NRTL.

I. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.2 DISTRIBUTION PANELBOARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product 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. Panelboards: NEMA PB 1, power and feeder distribution type.

C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

D. Mains: Circuit breaker.

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; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

G. Branch Overcurrent Protective Devices: Fused switches.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Eaton Electrical Inc.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D;

B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

C. Mains: Circuit breaker or lug.

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:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product 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.

C. 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. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
5. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
6. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
7. Arc-Fault Circuit Interrupter (AFCI) Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.
8. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:

    a. Standard frame sizes, trip ratings, and number of poles.
    b. Lugs: Compression 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. Communication Capability: Circuit-breaker-mounted communication module with functions and features compatible with power monitoring and control system specified in Division 26 Section "Electrical Power Monitoring and Control."

f. Shunt Trip: 120V trip coil energized from separate circuit, set to trip at [55] [75] percent of rated voltage.
g. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.
h. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

D. Fused Switch: NEMA KS 1, Type HD; clips to accommodate specified fuses; lockable handle.

1. Fuses, and Spare-Fuse Cabinet: Comply with requirements specified in Division 26 Section "Fuses."

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.

B. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

C. Mount top of trim 90 inches above finished floor 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 empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch 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 262416

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Receptacles, receptacles with integral GFCI, and associated device plates.

B. See Division 27 Section "Communications Horizontal Cabling" for workstation outlets.

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, 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 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 0.035-inch.
3. Material for Unfinished Spaces: Smooth, high-impact thermoplastic.
4. Material for Damp Locations: Thermoplastic 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 with lockable cover.

2.5 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 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 left.

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. 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 white-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 262726

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."

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. Basis-of-Design Product: Subject to compliance with requirements, provide **product indicated on Drawings** or comparable product 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. Type GD, General Duty, Single Throw, 240-V ac, 800 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with cartridge fuse interiors to accommodate **indicated** fuses, lockable handle with capability to accept two 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. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
4. Lugs: Suitable for number, size, and conductor material.
5. Service-Rated Switches: Labeled for use as service equipment.

2.2 MOLDED-CASE CIRCUIT BREAKERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide **product indicated on Drawings** or comparable product 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. Electronic Trip Circuit Breakers: Field-replaceable rating plug, rms sensing, with the following field-adjustable settings:

1. Instantaneous trip.
2. Long- and short-time pickup levels.
3. Long- and short-time time adjustments.
4. Ground-fault pickup level, time delay, and I^2t response.

E. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.

F. 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.
4. Ground-Fault Protection: Comply with UL 1053; **integrally mounted, self-powered** type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
5. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
6. Auxiliary Contacts: **One SPDT switch** with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
7. Alarm Switch: One **NO** contact that operates only when circuit breaker has tripped.

2.3 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 3R**.

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 262816

PART 1 GENERAL

1.01 SUMMARY

A. This section specifies the furnishing, installation, connection, and testing of diesel-fueled generator sets that are rated at up to 2500kW on a standby basis, and operating at up to 15,000VAC.

1.02 SCOPE

A. Provide complete factory assembled generator set equipment with digital (microprocessor-based) electronic generator set controls, digital governor, and digital voltage regulator.

B. Provide factory test, startup by a supplier authorized by the equipment manufacturer(s), and on-site testing of the system.

C. The generator set manufacturer shall warrant all equipment provided under this section, whether or not is manufactured by the generator set manufacturer, so that there is one source for warranty and product service. Technicians specifically trained and certified by the manufacturer to support the product and employed by the generator set supplier shall service the generator sets.

D. The generator set supplier shall be responsible for complete compliance to all specification requirements for the entire on site power supply system, including generator set(s), power switching equipment, and paralleling equipment (when used).

E. Prototype testing, factory testing, site testing.

1.03 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.04 REFERENCES

A. The generator set installation and on-site testing shall conform to the requirements of the following codes and standards, as applicable. The generator set shall include necessary features to meet the requirements of these standards.

1. ANSI S1.13-1971—Measurement of Sound Pressure Levels in Air

2. CSA 282, 1989 Emergency Electrical Power Supply for Buildings

3. IEEE446 – Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications

4. NFPA 30 – Flammable and Combustible Liquids

5. NFPA 37 – Standard For the Installation and Use of Stationary Combustion Engines and Gas Turbines

6. NFPA 70 – National Electrical Code. Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.

7. NFPA 99 – Essential Electrical Systems for Health Care Facilities

8. NFPA 110 – Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems. Level 1prototype tests required by this standard shall have been performed on a complete and functional unit, component level type tests will not substitute for this requirement.

B. The generator set and supplied accessories shall meet the requirements of the following standards:

1. NEMA MG1-1998 part 32. Alternator shall comply with the requirements of this standard.

2. UL142 – Sub-base Tanks

3. UL1236 – Battery Chargers

4. UL2200. The generator set shall be listed to UL2200 or submit to an independent third party certification process to verify compliance as installed. The generator set and all accessories shall be CSA certified

C. The control system for the generator set shall comply with the following requirements.

1. CSA C22.2, No. 14 – M91 Industrial Control Equipment.

2. EN50082-2, Electromagnetic Compatibility – Generic Immunity Requirements, Part 2: Industrial.

3. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.

4. FCC Part 15, Subpart B.

5. IEC8528 part 4. Control Systems for Generator Sets

D. The generator set manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.

1.05 SUBMITTALS

A. Shop drawings:

1. Outline drawings of assembly.

2. One-line diagrams and wiring diagrams for assembly and components.

3. Interconnection wiring diagrams

4. Submit names, experience level, training certifications, and locations for technicians that will be responsible for servicing equipment at this site.

B. Product data:

1. Technical data on all major components. Technical data must include an alternator thermal damage curve, description and operating characteristics of the alternator protection device demonstrating alternator protection, and an alternator reactive capability curve.

2. Certification of the emissions performance of the generator set engine by the engine manufacturer.

3. Seismic certification, demonstrating compliance to local requirements.

C. Project information:

1. Test reports and certifications.

2. Factory test procedures.

D. Contract closeout information:

1. Operating and maintenance data.

1.06 QUALITY ASSURANCE

A. Acceptable Manufacturers

1. Only approved bidders shall supply equipment provided under this contract. Equipment specifications for this project are based on microprocessor-based generator sets. Equipment by other suppliers that meets the requirement of this specification are acceptable, if equal and approved.

B. Qualifications

1. The generation set manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.

2. The manufacturer of this equipment shall have produced similar equipment for a minimum period of ten years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

C. Regulatory Requirements

1. The generator set shall be UL2200 listed, CSA certified, and labeled

2. The generator set overcurrent protection shall be UL listed as a utility grade protective device under UL category NRGU or CSA equivalent.

3. The generator set engine shall comply will all applicable emissions standards at the date of installation.

D. Warranty

1. The manufacturer shall provide base warranty coverage on the material and workmanship of the generator set for a minimum of twenty-four (24) months for Standby product and twelve (12) months for Prime/Continuous product from registered commissioning and start-up.

2. The manufacturer of the generator set(s) shall offer extended coverages of 5 years.

3. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc. shall be allowed during the minimum noted warranty period described in paragraph A above.

PART 2 PRODUCTS

2.01 GENERATOR SET

A. Products

1. Manufacturer – Cummins Power Generation or approved equal.

B. Ratings

1. The generator set shall operate at 1800 rpm and at a voltage of: 120/208 Volts AC, Three phase, 4-wire, 60 hertz.

2. The complete generator set shall be rated per ISO8528 at 250 kW at 0.8 PF, Standby rating, based on site conditions of: Altitude 16 meters, ambient temperatures of 40 degrees C, based on temperature measured at the control for indoor installations, and measured at the air inlet closest to the alternator for outdoor equipment.

3. The generator set rating shall be based on emergency/standby service and marked as such per NFPA110.

C. Tier 4 Compliance Requirements

1. The engine generator set and exhaust aftertreatment system must meet EPA emissions regulations under the provisions of 40 CFR 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, and 40 CFR 1039, Control of Emissions from New and In-Use Nonroad Compression Ignition Engines.

2. System Requirements

a. For the purpose of this project a Tier 4 compliant solution complying with the emissions limits below is required. T4 Certified solutions with inducement shutdowns shall not be allowed.

Pollutant	System Output

Oxides of Nitrogen (NOx)	≤ 0.67g/KW-hr
Particulate Matters (PM)	≤ 0.02g/KW-hr
Hydrocarbons (HC)	≤ 0.19g/KW-hr
Carbon Monoxide (CO)	≤ 3.50g/KW-hr

b. In the event a Diesel Particulate Filter (DPF) is required to meet the emissions levels, the DPF system shall be capable of automatic regeneration across the entire operating range of engine-generator set, regardless of site loads.

c. The system shall incorporate a radiator cooled loadbank programed by the manufacture to with automatic controls to elevate the engine exhaust temperature and keep the DPF in optimal regeneration state/temperatures at all times so the backpressure of the DPF is kept at the lowest level at all times. That same load will also be sufficient for routine exercise load requirements by the Generator Mfg as well as meet code requirements.

d. The system shall include CTs to monitor building load requirements and shed any portion of the loadbank necessary to prioritize building loads up to 100% of the generator standby rating.

3. The control logic shall monitor back pressure upstream of aftertreatment system. In the event that the back pressure exceeds the engine manufacturer's specified back pressure limit, the aftertreatment control system shall send a fault code to the engine-generator set control. and to the remote annunciator panel indicating the high back pressure condition.

4. The aftertreatment system shall be able to operate at ambient temperatures noted in this specification.

5. The Diesel Exhaust Fluid (DEF) delivery system shall have a freeze protection mechanism automatically controlled for ambient temperature less than 15 deg. F.

6. The system shall reach NOx emissions compliance within 15 minutes from the time of emergency start. Evidence of this performance shall be provided with the submittal package and based on ISO conditions of 60 degrees Fahrenheit at sea level.

7. All components of aftertreatment system exposed to exhaust flow and DEF shall be fabricated from T-304/439 Stainless Steel. (this is optional for items upstream of the DEF injection point, but recommended)

8. The aftertreatment system shall be designed to account for thermal expansion within the temperature operating range of system.

9. The aftertreatment system must provide fault annunciation in case of:
   a. High NOx levels in both test and normal operating modes
   b. Back pressure exceeding the allowed manufacturer's limit
   c. Faulty or failed sensors
   d. Low DEF tank level
   e. Dosing system failure

f. Aftertreatment system control failures

10. The DPF elements must be of modular design, removable, replaceable, and serviceable by a single person.

11. The aftertreatment system shall attenuate the engine exhaust noise to critical sound attenuation levels by a minimum of 25 dBA in octave range between 63 to 8000 hertz.

12. The total back pressure on the engine caused by components including the aftertreatment system shall not exceed engine's corresponding limits.

13. The aftertreatment system should have self-check functionality for DEF flow and sensor capabilities.

14. Data from Aftertreatment control system shall be available for the BMS (Building Management System) through Modbus protocol.

15. The Aftertreatment should be insulated from the AT inlet to outlet with touch temperatures designed not greater than 140degF.

16. Scope of supply shall include the following:

a. All the wiring harnesses and associated sensors and plumbing

b. Dosing system including 48hr of operation at full load capacity

c. System shall be fully integrated within and on top of the Generator housing, no external support structures allowed.

D. Performance

1. Voltage regulation shall not exceed one percent for any constant load between no load and rated load for both parallel and non-parallel applications. Random voltage variation with any steady load from no load to full load shall not exceed plus or minus 0.5 percent.

2. Frequency regulation shall be isochronous from steady state no load to steady state rated load. Random frequency variation with any steady load from no load to full load shall not exceed plus or minus 0.25%.

3. Generator sets shall be designed to allow operation at full rated load in an ambient temperature under site conditions, based on highest ambient condition. Ambient temperature shall be as measured at the air inlet to the generator set for enclosed generator sets, and at the control of the generator set for machines installed in equipment rooms.

4. The engine-generator set shall be capable of single step load pick up of 100% nameplate kW and power factor, less applicable derating factors, with the engine-generator set at operating temperature.

5. Motor starting capability shall be a minimum of 937 kVA. The generator set shall be capable of sustaining a minimum of 90% of rated no load voltage with the specified kVA load at near zero power factor applied to the generator set.

6. The alternator shall produce a clean AC voltage waveform, with not more than 5% total harmonic distortion at full linear load, when measured from line to neutral, and with not more than 3% in any single harmonic, and no 3rd order harmonics or their multiples. Telephone influence factor shall be less than 40.

7. The generator set shall be certified by the engine manufacturer to be suitable for use at the installed location and rating, and shall meet all applicable exhaust emission requirements at the time of commissioning.

8. The time required to automatically start, accelerate to rated speed and voltage, synchronize and parallel all generator sets to the system bus on a normal power failure shall not exceed 15 seconds, assuming that the generator sets are in an ambient temperature of 15C or greater, and water jacket heaters are operating properly.

9. The generator set and complete sound attenuated enclosure sound levels shall be tested by the manufacturer per ANSI S1.13. Data documenting performance shall be provided with submittal documentation.

E. Construction

1. The engine-generator set shall be mounted on a heavy-duty steel base to maintain alignment between components. The base shall incorporate a battery tray with hold-down clamps within the rails.

2. All switches, lamps, and meters in the control system shall be oil-tight and dust-tight. There shall be no exposed points in the control (with the door open) that operate in excess of 50 volts.

3. All outdoor equipment shall be enclosed with corrosion-protected materials. Steel components used in enclosures shall be powder coated and baked, and shall provide fade and corrosion resistance in compliance to Dry film thickness shall be shd3363 of 2H+all a minimum of 1.8 Mils, gloss at 60degrees per ASTMD523 of 80+/- 10, pencil hardness per ASTM D3363

F. Connections

1. The generator set load connections shall be composed of silver or tin plated copper bus bars, drilled to accept mechanical or compression terminations of the number and type as shown on the drawings. Sufficient lug space shall be provided for use with cables of the number and size as shown on the drawings. Generator set feeder distribution shall be wall mounted and compliant to code requirements for conductor sizing, isolation of devices, and isolation of service types.

2. Power connections to auxiliary devices shall be made at the devices, with

required protection located at a wall-mounted common distribution panel.

3. Generator set control interfaces to other system components shall be made on a common, permanently labeled terminal block assembly.

2.02 ENGINE AND ENGINE EQUIPMENT

A. The engine shall be diesel, 4 cycle, radiator and fan cooled. Minimum displacement shall be 8.9 liters, with 6 cylinders. The horsepower rating of the engine at its minimum tolerance level shall be sufficient to drive the alternator and all connected accessories. Two cycle engines are not acceptable. Engine accessories and features shall include:

B. An electronic governor system shall provide automatic isochronous frequency regulation. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions. The control system shall actively control the fuel rate and excitation as appropriate to the state of the generator set. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed, accelerating to rated speed, and operating in various isochronous or parallel states.

C. Skid-mounted radiator and cooling system rated for full load operation in the ambient temperature called out in this specification as measured at the generator air inlet, based on 0.5 in H_2O external static head. Radiator shall be sized based on a core temperature which is 10C higher than the rated operation temperature, or prototype tested to verify cooling performance of the engine/radiator/fan operation in a controlled environment. Radiator shall be provided with a duct adapter flange. The cooling system shall be filled with a 50/50-ethylene glycol/water mixture by the equipment manufacturer. Rotating parts shall be guarded against accidental contact.

D. Electric starters capable of three complete cranking cycles without overheating.

E. Positive displacement, mechanical, full pressure, lubrication oil pump.

F. Full flow lubrication oil filters with replaceable spin-on canister elements and dipstick oil level indicator.

G. Diesel engines shall include an engine driven, mechanical, positive displacement fuel pump and fuel filter(s) with replaceable spin-on canister element(s). Fuel cooler, suitable for operation of the generator set at full rated load in the ambient temperature specified shall be provided if required for operation due to the design of the engine and the installation.

H. Replaceable dry element air cleaner with restriction indicator.

I. Flexible supply and return fuel lines.

J. Engine mounted battery charging alternator, 40-ampere minimum, and solid-state voltage regulator.

K. Coolant heater

1. Engine mounted, thermostatically controlled, coolant heater(s) for each engine. Heater voltage shall be as shown on the project drawings. The coolant heater shall be UL499 listed and labeled.

2. The coolant heater shall be installed on the engine with SAEJ20 compliant materials. Steel tubing shall be used for connections into the engine coolant system wherever the length of pipe run exceeds 12 inches. The coolant heater installation shall be specifically designed to provide proper venting of the system. The coolant heaters shall be installed using isolation valves to isolate the heater for replacement of the heater element. The design shall allow the heater element to be replaced without draining the engine cooling system or significant coolant loss.

3. The coolant heater shall be provided with a 24VDC thermostat, installed at the engine thermostat housing. An AC power connection shall be provided for a single AC power connection to the coolant heater system.

4. The coolant heater(s) shall be sized as recommended by the engine manufacturer to warm the engine to a minimum of 40C in a 15C ambient, as a minimum, or the temperature required for starting and load pickup requirements of this specification.

L. Provide vibration isolators, spring/pad type, quantity as recommended by the generator set manufacturer. Isolators shall include seismic restraints if required by site location.

M. Starting and Control Batteries shall be lead acid type, 24 volt DC, sized as recommended by the engine manufacturer for compliance to NFPA110 starting requirements, complete with battery cables and connectors.

N. Provide exhaust silencer(s) for each engine of size and type as recommended by the generator set manufacturer and approved by the engine manufacturer to meet sound attenuation requirements of the application. Exhaust system shall be installed according to the engine manufacturer's recommendations and applicable codes and standards.

O. Provide 1 fully regulated, constant voltage, current limited, battery charger for each battery bank, plus a parallel operating redundant charger for each required charger. The chargers shall be designed for heavy-duty industrial service, primarily to quickly recharge and maintain batteries that start internal combustion engines. Charger shall be rated a minimum of 10 amps, and be capable of operating in parallel with another like charger for reliability and added charging capacity.

1. Charger shall provide 4 distinct charge states: "dead battery", "bulk charge", "absorption", and "float". Charge rate shall be temperature compensated to provide proper charging in ambient conditions from –20 to +55C.

2. Provider LED indication of general charger condition, including charging, fault, and equalize. Provide a 2 line LCD display to indicate charge rate, battery voltage, faults, and provide for charger set up. Charger shall provide relay

contacts for fault conditions as required by NFPA110.

3. The charger shall operate properly during fault conditions, including battery disconnection while charging, reversed battery polarity connections, and shorted battery.

4. The charger shall be compliant to the same RFI/EMI and voltage surge performance as are specified for the genset control.

P. Provide a UL or CSA listed sub-base fuel tank suitable for full load operation of the generator set for up to 48 hours and complying to local requirements. For top-loaded tanks, a metallic fill pipe shall be designed and installed to minimize the generation of static electricity by terminating the pipe within 6 inches (152 mm) of the bottom of the tank, and it shall be installed in a manner that avoids excessive vibration. Revise plans to show (CFC, 5704.2.7.5.5).

Q. An approved means or method in accordance with Section 5704.2.9.7.5 shall be provided to prevent the overfill of all Class I, II and IIIA liquid storage tanks. Storage tanks in refineries, bulk plants or terminals regulated by Section 5706.4 or 5706.7 shall have overfill protection in accordance with API 2350. CFC 704.2.7.5.8.

R. An approved means or method in accordance with Section 5704.2.9.7.5 shall be provided to prevent the overfilling of Class IIIB liquid storage tanks connected to fuel-burning equipment inside buildings. Exception: Outside above-ground tanks with a capacity of 1,320 gallons (5000 L) or less.

S. Filling, withdrawal and vapor-recovery connections for Class I, II and IIIA liquids that are made and broken shall be located outside of buildings, not more than 5 feet (1524 mm) above the finished ground level, in an approved location in close proximity to the parked delivery vehicle. Such location shall be away from sources of ignition and not less than 5 feet (1524 mm) away from building openings. Such connections shall be closed and liquid tight when not in use and shall be properly identified. CFC 5704.2.7.5.6.

T. LOW VOLT Provide and install a 20-light LED type remote alarm annunciator with horn, located as shown on the drawings or in a location that can be conveniently monitored by facility personnel. The remote annunciator shall provide all the audible and visual alarms called for by NFPA Standard 110 for level 1 systems; and in addition shall provide indications for high battery voltage, low battery voltage, loss of normal power to the charger. Spare lamps shall be provided to allow future addition of other alarm and status functions to the annunciator. Provisions for labeling of the annunciator in a fashion consistent with the specified functions shall be provided. Alarm silence and lamp test switch(es) shall be provided. LED lamps shall be replaceable, and indicating lamp color shall be capable of changes needed for specific application requirements. Alarm horn shall be switchable for all annunciation points. Alarm horn (when switched on) shall sound for first fault, and all subsequent faults, regardless of whether first fault has been cleared, in compliance with NFPA110 3-5.6.2.

2.03 AGE AC ALTERNATOR

A. The AC alternator shall be; synchronous, four pole, 2/3 pitch, brushless, revolving field, drip-proof construction, single prelubricated sealed bearing, air cooled by a direct drive centrifugal blower fan, and directly connected to the engine with flexible drive disc. The alternator design shall prevent shaft current from flowing and eliminate the need for insulated bearings. All insulation system components shall meet NEMA MG1 requirements for Class H insulation systems. Actual temperature rise measured by resistance method at full load shall not exceed 105°C in a 40°C ambient. Alternator shall be provided with protection to prevent damage due to any external fault or overload

condition, including short circuit, ground fault, or overload.

B. The alternator shall be capable of delivering rated output (kVA) at rated frequency and power factor, at any voltage up to 5 percent above or below rated voltage.

C. The alternator shall be supplied with a dedicated, independent power source for the voltage regulation system, which provides sufficient excitation for the alternator to supply 300% of rated output current for 10 seconds.

D. The subtransient reactance of the alternator shall not exceed 12 percent, based on the standby rating of the generator set.

E. Provide an anti-condensation heater for the alternator for generator sets installed outdoors or in unheated environments.

F. The alternator shall be capable of delivering rated output (kVA) at rated frequency and power factor, at any voltage up to 5 percent above or below rated voltage.

G. The subtransient reactance of the alternator shall not exceed 12 percent, based on the standby rating of the generator set.

H. Provide an anti-condensation heater for the alternator.

I. Provide two embedded resistance temperature detectors per phase and temperature indication equipment. The control system shall annunciate high alternator temperature as a fault condition.

2.04 GENERATOR SET CONTROL AND PROTECTION

A. The generator set shall be provided with a microprocessor-based control system that is designed to provide automatic starting, monitoring, protection and control functions for the generator set. The control system shall also be designed to allow local monitoring and control of the generator set, and remote monitoring and control as described in this specification.

B. The control shall be mounted on the generator set. The control shall be vibration isolated and prototype tested to verify the durability of all components in the system under the vibration conditions encountered.

C. The generator set mounted control shall include the following features and functions:

1. Control Switches

a. Mode Select Switch. The mode select switch shall initiate the following control modes. When in the RUN or Manual position the generator set shall start, and accelerate to rated speed and voltage as directed by the operator. In the OFF position the generator set shall immediately stop, bypassing all time delays. In the AUTO position the generator set shall be ready to accept a signal from a remote device to start and accelerate to rated speed and voltage.

b. EMERGENCY STOP switch. Switch shall be Red "mushroom-head" push-button. Depressing the emergency stop switch shall cause the generator set to immediately shut down, and be locked out from automatic restarting. The switch shall include a lockout provision for use in safely disabling the generator set for necessary service.

c. RESET switch. The RESET switch shall be used to clear a fault and allow restarting the generator set after it has shut down for any fault condition.

d. PANEL LAMP switch. Operating the panel lamp switch shall cause the entire panel to be lighted with DC control power. The panel lamps shall automatically be switched off 10 minutes after the switch is operated, or after the switch is operated a second time.

e. Paralleling Breaker Control Switch. The control shall include breaker operation switches for manual paralleling of the generator set.

f. Voltage and Frequency Adjustment. The genset mounted control shall include digital raise/lower switches for adjustment of voltage and frequency. The control system shall lock out these adjustments when the paralleling breaker is closed. Operator adjustment of the voltage and frequency shall not impact on the load sharing function or settings for kW and kVAR load sharing.

2. Generator Set AC Output Metering. The generator set shall be provided with a metering set including the following features and functions:

a. Analog voltmeter, ammeter, frequency meter, and kilowatt (KW) meter. Voltmeter and ammeter shall display all three phases. Ammeter and KW meter scales shall be color coded in the following fashion: readings from 0-90% of generator set standby rating: green; readings from 90-100% of standby rating: amber; readings in excess of 100%: red.

b. Digital metering set, 0.5% accuracy, to indicate generator RMS voltage and current, frequency, output current, output KW, KW-hours, and power factor. Generator output voltage shall be available in line-to-line and line-to-neutral voltages, and shall display all three phase voltages (line to neutral or line to line) simultaneously.

3. Generator Set Alarm and Status Display.

a. The generator set shall be provided with alarm and status indicating lamps to indicate non-automatic generator status, and existing warning and shutdown conditions. The lamps shall be high-intensity LED type. The lamp condition shall be clearly apparent under bright room lighting conditions. The generator set control shall indicate the existence of all alarm, shutdown, and status conditions associated with the generator set, including all paralleling control functions and the engine ECM on an alphanumerical display on the genset. The following alarm, shutdown, and status conditions are required, as a minimum:

1) low oil pressure (alarm)

2) low oil pressure (shutdown)

3) oil pressure sender failure (alarm)

4) low coolant temperature (alarm)

5) high coolant temperature (alarm)

6) high coolant temperature (shutdown)

7) engine temperature sender failure (alarm)

8) low coolant level (alarm or shutdown--selectable)

9) fail to crank (shutdown)

10) fail to start/overcrank (shutdown)

11) overspeed (shutdown)

12) low DC voltage (alarm)

13) high DC voltage (alarm)

14) weak battery (alarm)

15) high AC voltage (shutdown)

16) low AC voltage (shutdown)

17) under frequency (shutdown)

18) over current (warning)

19) over current (shutdown)

20) short circuit (shutdown)

21) ground fault (alarm)

22) overload (alarm)

23) emergency stop (shutdown)

b. The generator set control shall annunciate all alarm and shutdown conditions from the engine electronic control.

c. Provisions shall be made for indication of four customer-specified alarm or shutdown conditions. Labeling of the customer-specified alarm or shutdown conditions shall be of the same type and quality as the above specified conditions. The non-automatic indicating lamp shall be red, and shall flash to indicate that the generator set is not able to automatically respond to a command to start from a remote location.

4. Engine Status Monitoring.

a. The following information shall be available from a digital status panel on the generator set control:

1) engine oil pressure (psi or kPA)

2) engine coolant temperature (degrees F or C)

3) engine oil temperature (degrees F or C)

4) engine speed (rpm)

5) number of hours of operation (hours)

6) number of start attempts

7) battery voltage (DC volts)

b. The control system shall also incorporate a data logging and display provision to allow logging of a minimum of the last 20 warning or shutdown indications on the generator set, the time of the last fault of each type, and the number of faults of each type, and total time of operation at various loads as a percent of the standby rating of the generator set.

5. Engine Control Functions.

a. The control system provided shall include a cycle cranking system, which allows for user selected crank time, rest time, and # of cycles. Initial settings shall be for 3 cranking periods of 15 seconds each, with 15-second rest period between cranking periods.

b. The control system shall include an engine governor control, which functions to provide steady state frequency regulation as noted elsewhere in this specification. The governor control shall include adjustments for gain, damping, and a ramping function to control engine speed and limit exhaust smoke while the unit is starting. The governor control shall be suitable for use in paralleling applications without component changes.

c. The control system shall include time delay start (adjustable 0-300 seconds) and time delay stop (adjustable 0-600 seconds) functions.

d. The control system shall include sender failure monitoring logic for oil pressure, and engine temperature which is capable of discriminating between failed sender or wiring components, and an actual failure conditions.

6. Alternator Control Functions:

a. The generator set shall include a full wave rectified automatic digital voltage regulation system that is matched and prototype tested by the engine manufacturer with the governing system provided. It shall be immune from misoperation due to load-induced voltage waveform distortion and provide a pulse width modulated output to the alternator exciter. The voltage regulation system shall be equipped with

three-phase line to neutral RMS sensing and shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. The system shall include a torque-matching characteristic, which shall reduce output voltage in proportion to frequency below an adjustable frequency threshold. Torque matching characteristic shall be adjustable for roll-off frequency and rate, and be capable of being curve-matched to the engine torque curve with adjustments in the field. The voltage regulator shall include adjustments for gain, damping, and frequency roll-off. Adjustments shall be broad range, and made via digital raise-lower switches, with an alphanumeric LED readout to indicate setting level. Rotary potentiometers for system adjustments are not acceptable.

b. Controls shall be provided to monitor the output current of the generator set and initiate an alarm (over current warning) when load current exceeds 110% of the rated current of the generator set on any phase for more than 60 seconds.

c. Controls shall be provided to individually monitor all three phases of the output current for 1, 2, or 3-phase short circuit conditions. The control/protection system shall monitor the current level and voltage. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator (short circuit shutdown). This function shall be provided by equipment which is listed under UL category NRGU, or equivalent equipment that is CSA listed for applications installed in Canada.

d. Controls shall be provided to monitor the KW load on the generator set, and initiate an alarm condition (over load) when total load on the generator set exceeds the generator set rating for in excess of 5 seconds. Controls shall include a load shed control, to operate a set of dry contacts (for use in shedding customer load devices) when the generator set is overloaded.

e. An AC over/under voltage monitoring system that responds only to true RMS voltage conditions shall be provided. The system shall initiate shutdown of the generator set when alternator output voltage exceeds 110% of the operator-set voltage level for more than 10 seconds, or with no intentional delay when voltage exceeds 130%. Under voltage shutdown shall occur when the output voltage of the alternator is less than 85% for more than 10 seconds.

f. A battery monitoring system shall be provided which initiates alarms when the DC control and starting voltage is less than 25VDC or more than 32 VDC (24VDC nominal) or less than 8VDC or more than 16 VDC (12VDC nominal). During engine cranking (starter engaged), the low voltage limit shall be disabled, and if DC voltage drops to less than 14.4 volts for more than two seconds a "weak battery" alarm shall be initiated.

7. The generator set shall be provided with a network communication module to allow real time communication with the generator set control by remote devices. The control shall communicate all engine and alternator data; alarm, shutdown and status conditions; and allow starting and stopping of the generator set via the network in both test and emergency modes.

8. Control Interfaces for Remote Monitoring:

a. No field connections for control devices shall be made in the AC power output enclosure. Provide the following features in the control system:

b. Form "C" dry contact set rated 2A @ 30VDC to indicate existence of any alarm or shutdown condition on the generator set.

c. One set of contacts rated 2A @ 30VDC to indicate generator set is ready to load. The contacts shall operate when voltage and frequency are greater than 90% of rated condition.

d. A fused 10 amp switched 24VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit whenever the generator set is running.

e. A fused 20 amp 24VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit at all times from the engine starting/control batteries.

f. The control shall be provided with a direct serial communication link for the communication network interface as described elsewhere in this specification and shown on the drawings.

2.06 OUTDOOR ENCLOSURE

J. The generator set shall be provided with an outdoor enclosure. The package shall comply with the requirements of the National Electrical Code for all wiring materials and component spacing. The total assembly of generator set, enclosure, and sub-base fuel tank (when used) shall be designed to be lifted into place using spreader bars.

1. Enclosure shall provide ample airflow for generator set operation at rated load in an ambient temperature of 100°F. The enclosure shall have hinged access doors as required to maintain easy access for all operating and service functions. All doors shall be lockable, and include retainers to hold the door open during service. Enclosure roof shall be designed to prevent rainwater accumulation. Openings shall be screened to limit access of rodents into the enclosure. All electrical power and control interconnections shall be made within the perimeter of the enclosure.

2. All sheet metal shall be primed for corrosion protection and finish painted with the manufacturer’s standard color using a powder coat paint process, or equal meeting the performance requirements specified below. All surfaces of all metal parts shall be primed and painted.

3. Enclosure material shall be either steel or aluminum. Steel enclosure shall be constructed of minimum 12 gauge steel for framework and 14 gauge steel for panels. Aluminum enclosure shall be wind rated for 150 mph conditions. All enclosure hardware and hinges shall be stainless steel.

4. Tier 4 Compliant solution fully integrated into the enclosure. Exhaust connections to the generator set shall be through seamless flexible connections.

5. Total sound pressure level to be less than or equal to 75 dB(A) at 23ft average of 8 point around the enclosure per ISO 3755 and ISO 8528-10

6. The enclosure shall include the following maintenance provisions:

a. Flexible coolant and lubricating oil drain lines, that extend to the exterior of the enclosure, with internal drain valves

b. External radiator fill provision.

7. Inlet ducts shall include rain hoods.

8. Provide mounted and wired electrical distribution to serve the generator set and enclosure. The provisions required include:

a. Pre-wired service to prewired junction boxes located interior to generator enclosure to be connected by installer to power service at exterior panelboard shown on drawings for following:

1) Two duplex GFI receptacles, one inside the enclosure, and a weatherproof receptacle on the outside of the enclosure.

2) Two three-way switches controlling AC lamps mounted in vapor tight and gasketed fixtures.

3) Normal AC service from the junction boxes to the engine coolant and alternator heaters, and battery charger.

PART 3 EXECUTION

3.01 PROTOTYPE TESTING

A. Submit evidence of prototype testing; manufacturer’s certificate etc.

3.02 SUBMITTALS

A. Provide the following information for review:

1. Manufacturer’s product literature and performance data, sufficient to verify compliance to specification requirements.

2. A paragraph-by-paragraph specification compliance statement, describing the differences between the specified and the proposed equipment.

3. Manufacturer's certification of prototype testing.

4. Manufacturer's published warranty documents.

5. Shop drawings showing plan and elevation views with certified overall dimensions, as well as wiring interconnection details.

6. Interconnection wiring diagrams showing all external connections required; with field wiring terminals marked in a consistent point-to-point manner

3.03 FACTORY TESTING

K. The generator set manufacturer shall perform a complete operational test on the generator set prior to shipping from the factory. A certified test report shall be provided. All testing shall be performed with calibrated metering.

L. Generator set factory tests on the equipment shall be performed at rated load and rated power factor, as well as 1.0 power factor. Generator sets that have not been factory

tested at rated power factor will not be acceptable. Tests shall include: run at full load, maximum power, voltage regulation, transient and steady-state governing, single step load pickup, and function of safety shutdowns.

M. A certified test report shall be provided documenting the results of these tests.

3.04 INSTALLATION

A. Equipment shall be installed by the contractor in accordance with final submittals and contract documents. Installation shall comply with applicable state and local codes as required by the authority having jurisdiction. Install equipment in accordance with manufacturer's instructions and instructions included in the listing or labeling of UL listed products.

B. Installation of equipment shall include furnishing and installing all interconnecting wiring between all major equipment provided for the on-site power system. The contractor shall also perform interconnecting wiring between equipment sections (when required), under the supervision of the equipment supplier.

C. Equipment shall be installed on concrete housekeeping pads. Equipment shall be permanently fastened to the pad in accordance with manufacturer’s instructions and seismic requirements of the site.

D. Equipment shall be initially started and operated by representatives of the manufacturer. All protective settings shall be adjusted as instructed by the consulting engineer.

E. All equipment shall be physically inspected for damage. Scratches and other installation damage shall be repaired prior to final system testing. Equipment shall be thoroughly cleaned to remove all dirt and construction debris prior to initial operation and final testing of the system.

F. On completion of the installation by the electrical contractor, the generator set supplier shall conduct a site evaluation to verify that the equipment is installed per manufacturer’s recommended practice.

3.05 ON-SITE ACCEPTANCE TEST:

A. The complete installation shall be tested to verify compliance with the performance requirements of this specification following completion of all site work. Testing shall be conducted by representatives of the manufacturer, with required fuel supplied by Contractor. The Engineer shall be notified in advance and shall have the option to witness the tests. The generator set manufacturer shall provide a site test specification covering the entire system. Tests shall include:

B. Prior to start of active testing, all field connections for wiring, power conductors, and bus bar connections shall be checked for proper tightening torque.

C. Installation acceptance tests to be conducted on-site shall include a "cold start" test, a two hour full load (resistive) test, and a one step rated load pickup test in accordance with NFPA 110. Provide a resistive load bank and make temporary connections for full load test, if necessary.

D. Perform a power failure test on the entire installed system. This test shall be conducted by opening the power supply from the utility service, and observing proper operation of the system for at least 2 hours. Coordinate timing and obtain approval for start of test with site personnel.

3.06 TRAINING

A. The equipment supplier shall provide training for the facility operating personnel covering operation and maintenance of the equipment provided. The training program shall be not less than 4 hours in duration and the class size shall be limited to 5 persons. Training date shall be coordinated with the facility owner.

3.07 SERVICE AND SUPPORT

A. The generator set supplier shall maintain service parts inventory for the entire power system at a central location which is accessible to the service location 24 hours per day, 365 days per year. The inventory shall have a commercial value of $3 million or more. The manufacturer of the generator set shall maintain a central parts inventory to support the supplier, covering all the major components of the power system, including engines, alternators, control systems, paralleling electronics, and power transfer equipment.

B. The generator set shall be serviced by a local service organization that is trained and factory certified in generator set service. The supplier shall maintain an inventory of critical power system replacement parts in the local service location. Service vehicles shall be stocked with critical replacement parts. The service organization shall be on call 24 hours per day, 365 days per year. The service organization shall be physically located within 100 miles of the site.

C. The manufacturer shall maintain model and serial number records of each generator set provided for at least 20 years.

END OF SECTION

SECTION 263600 – AUTOMATIC TRANSFER SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes automatic transfer switches rated 600 V and less.

1.2 SUBMITTALS

A. Product Data: Include rated capacities, weights, operating characteristics, furnished specialties, and accessories.

B. Shop Drawings: Dimensioned plans, elevations, sections, and details showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.

C. Manufacturer Seismic Qualification Certification: Submit certification that transfer switches accessories, and components will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems." Include the following:

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

    a. 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."

2. Dimensioned Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based.

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 NEMA ICS 1.

C. Comply with NFPA 70.

D. Comply with NFPA 99.

E. Comply with NFPA 110.

F. Comply with UL 1008 unless requirements of these Specifications are stricter.

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Contactor Transfer Switches:
   a. Caterpillar; Engine Div.
   b. ASCO Power Technologies
   c. Generac Power Systems, Inc.
   d. GE Zenith Controls.
   e. Kohler Power Systems; Generator Division.
   f. Cummins Power Generation

2.2 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

A. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.

B. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

1. Where transfer switch includes internal fault-current protection, rating of switch and trip unit combination shall exceed indicated fault-current value at installation location.

C. Solid-State Controls: Repetitive accuracy of all settings shall be plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.

D. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

E. Electrical Operation: Accomplish by a nonfused, momentarily energized solenoid or electric-motor-operated mechanism, mechanically and electrically interlocked in both directions.

F. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.

1. Limitation: Switches using molded-case switches or circuit breakers or insulated-case circuit-breaker components are not acceptable.
2. Switch Action: Double throw; mechanically held in both directions.
3. Contacts: Silver composition or silver alloy for load-current switching. Conventional automatic transfer-switch units, rated 225 A and higher, shall have separate arcing contacts.

G. Neutral Switching. Where four-pole switches are indicated, provide neutral pole switched simultaneously with phase poles.

H. Neutral Terminal: Solid and fully rated, unless otherwise indicated.

I. Oversize Neutral: Ampacity and switch rating of neutral path through units indicated for oversize neutral shall be double the nominal rating of circuit in which switch is installed.

J. Battery Charger: For generator starting batteries.

1. Float type rated 10 A.
2. Ammeter to display charging current.
3. Fused ac inputs and dc outputs.

K. Enclosures: General-purpose NEMA 250, Type 3R, complying with NEMA ICS 6 and UL 508, unless otherwise indicated.

2.3 AUTOMATIC TRANSFER SWITCHES

A. Comply with Level 1 equipment according to NFPA 110.

B. Switching Arrangement: Double-throw type, incapable of pauses or intermediate position stops during normal functioning, unless otherwise indicated.

C. Signal-Before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval is adjustable from 1 to 30 seconds.

D. Transfer Switches Based on Molded-Case-Switch Components: Comply with NEMA AB 1, UL 489, and UL 869A.

E. In-Phase Monitor: Factory-wired, internal relay controls transfer so it occurs only when the two sources are synchronized in phase.

F. Motor Disconnect and Timing Relay: Controls designate starters so they disconnect motors before transfer and reconnect them selectively at an adjustable time interval after transfer. Time delay for reconnecting individual motor loads is adjustable between 1 and 60 seconds, and settings are as indicated.

G. Programmed Neutral Switch Position: Switch operator has a programmed neutral position arranged to provide a midpoint between the two working switch positions, with an intentional, time-controlled pause at midpoint during transfer.

H. Automatic Transfer-Switch Features:

1. Undervoltage Sensing for Each Phase of Normal Source: Sense low phase-to-ground voltage on each phase. Pickup voltage shall be adjustable from 85 to 100 percent of nominal, and dropout voltage is adjustable from 75 to 98 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.
2. Adjustable Time Delay: For override of normal-source voltage sensing to delay transfer and engine start signals. Adjustable from zero to six seconds, and factory set for one second.
3. Voltage/Frequency Lockout Relay: Prevent premature transfer to generator. Pickup voltage shall be adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90

percent. Pickup frequency shall be adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.

4. Time Delay for Retransfer to Normal Source: Adjustable from 0 to 30 minutes, and factory set for 10 minutes to automatically defeat delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.
5. Test Switch: Simulate normal-source failure.
6. Switch-Position Pilot Lights: Indicate source to which load is connected.
7. Source-Available Indicating Lights: Supervise sources via transfer-switch normal- and emergency-source sensing circuits.

    a. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
    b. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."

8. Unassigned Auxiliary Contacts: Two normally open, single-pole, double-throw contacts for each switch position, rated 10 A at 240-V ac.
9. Transfer Override Switch: Overrides automatic retransfer control so automatic transfer switch will remain connected to emergency power source regardless of condition of normal source. Pilot light indicates override status.
10. Engine Starting Contacts: One isolated and normally closed, and one isolated and normally open; rated 10 A at 32-V dc minimum.
11. Engine Shutdown Contacts: Instantaneous; shall initiate shutdown sequence at remote engine-generator controls after retransfer of load to normal source.
12. Engine Shutdown Contacts: Time delay adjustable from zero to five minutes, and factory set for five minutes. Contacts shall initiate shutdown at remote engine-generator controls after retransfer of load to normal source.
13. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine generator and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods are adjustable from 10 to 30 minutes. Factory settings are for 7-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:

    a. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.
    b. Push-button programming control with digital display of settings.
    c. Integral battery operation of time switch when normal control power is not available.

2.4 SOURCE QUALITY CONTROL

A. Factory test and inspect components, assembled switches, and associated equipment. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Design each fastener and support to carry load indicated by seismic requirements and according to seismic-restraint details. See Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

B. Floor-Mounting Switch: Anchor to floor by bolting.

1. Concrete Bases: 4 inches (100 mm) high, reinforced, with chamfered edges. Extend base no more than 4 inches (100 mm) in all directions beyond the maximum dimensions of switch, unless otherwise indicated or unless required for seismic support or requirement per California Electrical Code or other California regulation. Provide per California regulation. Construct concrete bases per Civil requirements.

C. Identify components according to Division 26 Section "Identification for Electrical Systems."

D. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

3.2 CONNECTIONS

A. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

B. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.

B. Perform tests and inspections and prepare test reports.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installation, including connections, and to assist in testing.
2. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.
3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
4. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.

    a. Check for electrical continuity of circuits and for short circuits.
    b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
    c. Verify that manual transfer warnings are properly placed.
    d. Perform manual transfer operation.

5. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.

    a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
    b. Simulate loss of phase-to-ground voltage for each phase of normal source.
    c. Verify time-delay settings.
    d. Verify pickup and dropout voltages by data readout or inspection of control settings.
    e. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for 1 pole deviating by more than 50 percent from other poles.
    f. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.

6. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.

    a. Verify grounding connections and locations and ratings of sensors.

C. Coordinate tests with tests of generator and run them concurrently.

D. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

E. Remove and replace malfunctioning units and retest as specified above.

F. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switch. Remove all access panels so joints and connections are accessible to portable scanner.

1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.
2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
3. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment as specified below. Refer to Division 01 Section "Demonstration and Training."

B. Coordinate this training with that for generator equipment.

END OF SECTION 263600

PART 1 GENERAL

1.01 SUMMARY

A. Excavating for footings, slabs-on-grade, trenches, curbs, and paving; backfill and compaction of sub-grade, base and trenches.

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

1.02 RELATED SECTIONS

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 SUBMITTALS

A. Submit in accordance with Division 01, Submittals, Shop Drawings Product Data and Samples.

B. Submit list and source of materials to be used in the Work.

1.04 QUALITY ASSURANCE

A. Verify that survey benchmark and intended elevations for the Work are as indicated.

B. Comply with State of California Construction Safety Orders (CAL/OSHA)

1.05 UTILITY DISCONNECTS

A. Coordinate directly with the City for any utility disconnects.

B. Notify the City 72 hours prior to any excavation.

PART 2 PRODUCTS

2.01 MATERIALS

A. General: Fill material will be subject to approval of the Geotechnical Engineer.

B. Backfill and Fill Materials: Satisfactory soil materials free of clay, rock or gravel larger than 2 inches in any dimension, debris, waste, vegetation, and other unsuitable materials. Local and import fill should have less than 15% fines and a plasticity index (PI) of less than 20.

C. Aggregate Base: Class 2 conforming to Caltrans Specification Section 26, maximum size 3/4 inches; compact to minimum of 95 percent.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

B. Locate, identify, and protect utilities that remain from damage.

C. Notify utility company to remove and relocate utilities if required.

D. Protect plant life, lawns, and other features remaining as a portion of final landscaping.

E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.02 EXCAVATION AND COMPACTING

A. Saw cut all cuts into asphalt and/or concrete surfaces.

B. Excavate subsoil to accommodate building foundations, paving and site structures, construction operations, and as indicated on Drawings and in attached Project Geotechnical Report.

C. Compact disturbed load-bearing soil in direct contact with foundations to original bearing capacity; perform compaction as directed by Geotechnical Engineer.

D. Support trench excavations in compliance with local codes and safety regulations.

E. Sheet Pile or shore all excavations as required.

F. Do not interfere with 45 degree bearing splay under foundations except at pile foundations or where shoring is designed to resist earth and foundation pressures without permitting any settlements of foundations, slabs, or similar structures.

G. Grade top perimeter of excavation to prevent surface water from draining into excavation.

H. Hand trim excavation. Remove loose matter.

I. Remove lumped subsoil, boulders, and rock larger than 2 inches in diameter.

J. Correct areas over-excavated as directed by Geotechnical Engineer.

K. Do not backfill trenches until tests and inspections have been made.

L. Compact to minimum of 95 percent dry density (ASTM 1557) in planted areas and a minimum of 95 percent dry density (ASTM 1557) in paved areas.

M. Footing bottoms should be free of loose debris and should be firm and unyielding as approved by the project Geotechnical Engineer prior to placement of steel and concrete.

END OF SECTION

PART 1 GENERAL

1.01 DESCRIPTION

A. This section shall cover site work concrete constructed upon the prepared subgrade and in conformance with the lines, grades, thickness, and cross sections shown. Construction shall include the following:

1. Curb, gutter, and combination curb and gutter.

2. Pedestrian Pavement: Walks.

1.02 RELATED WORK

A. All Sections listed in the Table of Contents are a Condition of this Section.

1.03 DESIGN REQUIREMENTS

A. Design all elements with the latest published version of applicable codes.

1.04 WEATHER LIMITATIONS

A. Placement of concrete shall be in conformance with ACI as specified under Section 03 30 00, CAST-IN-PLACE CONCRETE.

1.05 SELECT SUBBASE MATERIAL JOB-MIX

A. The Contractor shall retain and reimburse a testing laboratory to design a select subbase material mixture and submit a job-mix formula to the City’s Representative, in writing, for approval. The formula shall include the source of materials, gradation, plasticity index, liquid limit, and laboratory compaction curves indicating maximum density at optimum moisture.

1.06 SUBMITTALS

A. Submit in accordance with Division 01, Submittals, Shop Drawings Product Data and Samples.

B. Manufacturers' Certificates and Data certifying that the following materials conform to the requirements specified.

1. Expansion joint filler

2. Hot poured sealing compound

3. Reinforcement

4. Curing materials

C. Data and Test Reports: Select subbase material.

1. Job-mix formula.

2. Source, gradation, liquid limit, plasticity index, percentage of wear, and other tests as specified and in referenced publications.

1.07 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. Refer to the latest edition of all referenced Standards and codes.

B. American Association of State Highway and Transportation Officials (AASHTO):

M031MM031-07-UL ..... Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement (ASTM A615/A615M-09)

M055MM055-09-UL ..... Steel Welded Wire Reinforcement, Plain, for Concrete (ASTM A185)

M147-65-UL ..... Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses (R 2004)

M148-05-UL ..... Liquid Membrane-Forming Compounds for Curing Concrete (ASTM C309)

M171-05-UL ..... Sheet Materials for Curing Concrete (ASTM C171)

M182-05-UL ..... Burlap Cloth Made from Jute or Kenaf and Cotton Mats

M213-01-UL ..... Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Type) (ASTM D1751)

M233-86-UL ..... Boiled Linseed Oil Mixer for Treatment of Portland Cement Concrete

T099-09-UL ..... Moisture-Density Relations of Soils Using a 2.5 kg. (5.5 lb) Rammer and a 305 mm (12 in.) Drop

T180-09-UL ..... Moisture-Density Relations of Soils Using a 4.54 kg (10 lb.) Rammer and a 457 mm (18 in.) Drop

C. American Society for Testing and Materials (ASTM):

C94/C94M-09 ..... Ready-Mixed Concrete

C143/C143M-09 ..... Slump of Hydraulic Cement Concrete

PART 2 PRODUCTS

2.01 GENERAL

A. Concrete shall be Type C, air-entrained as specified in Section 03 30 00, CAST-IN-PLACE CONCRETE, with the following exceptions:

TYPE	MAXIMUM SLUMP*
Curb & Gutter	75 mm (3")
Pedestrian Pavement	75 mm (3")
* For concrete to be vibrated: Slump as determined by ASTM C143. Tolerances as established by ASTM C94.	

2.02 REINFORCEMENT

A. The type, amount, and locations of steel reinforcement shall be as shown on the drawings and in the specifications.

B. Welded wire-fabric shall conform to AASHTO M55.

C. Dowels shall be plain steel bars conforming to AASHTO M31. Tie bars shall be deformed steel bars conforming to AASHTO M31.

2.03 SELECT SUBBASE (WHERE REQUIRED)

A. Subbase material shall conform to Section 31 23 00 “Excavating Backfilling and Compacting” and as shown on the Drawings.

B. Subbase material shall produce a compacted, dense-graded course, meeting the density requirement specified in these specifications and drawings.

2.04 FORMS

A. Use metal or wood forms that are straight and suitable in cross-section, depth, and strength to resist springing during depositing and consolidating the concrete, for the work involved.

B. Do not use forms if they vary from a straight line more than 3 mm (1/8 inch) in any 3000 mm (ten foot) long section, in either a horizontal or vertical direction.

C. Wood forms should be at least 50 mm (2 inches) thick (nominal). Wood forms shall also be free from warp, twist, loose knots, splits, or other defects. Use approved flexible or curved forms for forming radii.

2.05 CONCRETE CURING MATERIALS

A. Concrete curing materials shall conform to one of the following:

1. Burlap conforming to AASHTO M182 having a weight of 233 grams (seven ounces) or more per square meter (yard) when dry.

2. Impervious Sheeting conforming to AASHTO M171.

3. Liquid Membrane Curing Compound conforming to AASHTO M148 (ASTM C309), and shall be free of paraffin or petroleum.

2.06 EXPANSION JOINT FILLERS

A. Material shall conform to AASHTO M213.

PART 3 EXECUTION

3.01 SUBGRADE PENETRATION

A. Prepare, construct, and finish the subgrade as specified in Section 31 23 00, Excavating Backfilling and Compacting.

B. Maintain the subgrade in a smooth, compacted condition, in conformance with the required section and established grade until the succeeding operation has been accomplished.

3.02 SELECT SUBBASE (WHERE REQUIRED)

A. Mixing: Proportion the select subbase by weight or by volume in quantities so that the final approved job-mixed formula gradation, liquid limit, and plasticity index requirements will be met after subbase course has been placed and compacted. Add water in approved quantities, measured by weight or volume, in such a manner to produce a uniform blend.

B. Placing:

1. Place the mixed material on the prepared subgrade in a uniform layer to the required contour and grades, and to a loose depth not to exceed 200 mm (8 inches), and that when compacted, will produce a layer of the designated thickness.

2. When the designated compacted thickness exceeds 150 mm (6 inches), place the material in layers of equal thickness. Remove unsatisfactory areas and replace with satisfactory mixture, or mix the material in the area.

3. In no case will the addition of thin layers of material be added to the top layer in order to meet grade.

4. If the elevation of the top layer is 13 mm (1/2 inch) or more below the grade, excavate the top layer and replace with new material to a depth of at least 75 mm (3 inches) in compacted thickness.

C. Compaction:

1. Perform compaction with approved equipment (hand or mechanical) well suited to the material being compacted.

2. Moisten or aerate the material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used.

3. Compact each layer to at least 95 percent or 100 percent of maximum density as determined by AASHTO T180 or AASHTO T99 respectively.

D. Smoothness Test and Thickness Control:

Test the completed subbase for grade and cross section with a straight edge.

1. The surface of each layer shall not show any deviations in excess of 10 mm (3/8 inch).

2. The completed thickness shall be within 13 mm (1/2 inch) of the thickness as shown.

E. Protection:

1. Maintain the finished subbase in a smooth and compacted condition until the concrete has been placed.

2. When Contractor's subsequent operations or adverse weather disturbs the approved compacted subbase, excavate, and reconstruct it with new material meeting the requirements herein specified, at no additional cost to the City.

3.03 SETTING FORMS

A. Base Support:

1. Compact the base material under the forms true to grade so that, when set, they will be uniformly supported for their entire length at the grade as shown.

2. Correct imperfections or variations in the base material grade by cutting or filling and compacting.

B. Form Setting:

1. Set forms sufficiently in advance of the placing of the concrete to permit the performance and approval of all operations required with and adjacent to the form lines.

2. Set forms to true line and grade and use stakes, clamps, spreaders, and braces to hold them rigidly in place so that the forms and joints are free from play or movement in any direction.

3. Forms shall conform to line and grade with an allowable tolerance of 3 mm (1/8 inch) when checked with a straightedge and shall not deviate from true line by more than 6 mm (1/4 inch) at any point.

4. Do not remove forms until removal will not result in damaged concrete or at such time to facilitate finishing.

5. Clean and oil forms each time they are used.

C. The Contractor’s Registered Professional Land Surveyor shall establish and control the alignment and the grade elevations of the forms or concrete slipforming machine operations.

1. Make necessary corrections to forms immediately before placing concrete.

2. When any form has been disturbed or any subgrade or subbase has become unstable, reset and recheck the form before placing concrete.

3.04 EQUIPMENT

A. The City's Representative shall approve equipment and tools necessary for handling materials and performing all parts of the work prior to commencement of work.

B. Maintain equipment and tools in satisfactory working condition at all times.

3.05 PLACING REINFORCEMENT

A. Reinforcement shall be free from dirt, oil, rust, scale or other substances that prevent the bonding of the concrete to the reinforcement.

B. Before the concrete is placed, the City's Representative shall approve the reinforcement, which shall be accurately and securely fastened in place with suitable supports and ties. The type, amount, and position of the reinforcement shall be as shown.

3.06 PLACING CONCRETE - GENERAL

A. Obtain approval of the City's Representative before placing concrete.

B. Remove debris and other foreign material from between the forms before placing concrete. Obtain approval of the City's Representative before placing concrete.

C. Before the concrete is placed, uniformly moisten the subgrade, base, or subbase appropriately, avoiding puddles of water.

D. Convey concrete from mixer to final place of deposit by a method which will prevent segregation or loss of ingredients. Deposit concrete so that it requires as little handling as possible.

E. While being placed, spade or vibrate and compact the concrete with suitable tools to prevent the formation of voids or honeycomb pockets. Vibrate concrete well against forms and along joints. Over-vibration or manipulation causing segregation will not be permitted. Place concrete continuously between joints without bulkheads.

F. Install a construction joint whenever the placing of concrete is suspended for more than 30 minutes and at the end of each day's work.

G. Workmen or construction equipment coated with foreign material shall not be permitted to walk or operate in the concrete during placement and finishing operations.

3.07 PLACING CONCRETE FOR CURB AND GUTTER, PEDESTRIAN PAVEMENT, AND EQUIPMENT PADS

A. Place concrete in the forms in one layer of such thickness that, when compacted and finished, it will conform to the cross section as shown.

B. Deposit concrete as near to joints as possible without disturbing them but do not dump onto a joint assembly.

C. After the concrete has been placed in the forms, use a strike-off guided by the side forms to bring the surface to the proper section to be compacted.

D. Consolidate the concrete thoroughly by tamping and spading, or with approved mechanical finishing equipment.

E. Finish the surface to grade with a wood or metal float.

F. All Concrete pads and pavements shall be constructed with sufficient slope to drain properly.

3.08 PLACING CONCRETE FOR VEHICULAR PAVEMENT

A. Deposit concrete into the forms as close as possible to its final position.

B. Place concrete rapidly and continuously between construction joints.

C. Strike off concrete and thoroughly consolidate by a finishing machine, vibrating screed, or by hand-finishing.

D. Finish the surface to the elevation and crown as shown.

E. Deposit concrete as near the joints as possible without disturbing them but do not dump onto a joint assembly. Do not place adjacent lanes without approval by the City's Representative.

3.09 CONCRETE FINISHING - GENERAL

A. The sequence of operations, unless otherwise indicated, shall be as follows:

1. Consolidating, floating, straight-edging, troweling, texturing, and edging of joints.

2. Maintain finishing equipment and tools in a clean and approved condition.

3.10 CONCRETE FINISHING CURB AND GUTTER

A. Round the edges of the gutter and top of the curb with an edging tool to a radius of 1/4 inch or as otherwise detailed.

B. Float the surfaces and finish with a smooth wood or metal float until true to grade and section and uniform in textures.

C. Finish the surfaces, while still wet, with a bristle type brush with longitudinal strokes.

D. Immediately after removing the front curb form, rub the face of the curb with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. Brush the surface, while still wet, in the same manner as the gutter and curb top.

E. Except at grade changes or curves, finished surfaces shall not vary more than 1/8 inch for gutter and 1/4 inch for top and face of curb, when tested with a 10 foot straightedge.

F. Remove and reconstruct irregularities exceeding the above for the full length between regularly scheduled joints.

G. Correct any depressions which will not drain.

H. Visible surfaces and edges of finished curb, gutter, and combination curb and gutter shall be free of blemishes, form marks, and tool marks, and shall be uniform in color, shape, and appearance.

3.11 CONCRETE FINISHING PEDESTRIAN PAVEMENT

A. Walks, Wheelchair Curb Ramps:

1. Finish the surfaces to grade and cross section with a metal float, trowled smooth and finished with a broom moistened with clear water.

2. Medium brooming shall be transverse to the line of traffic.

3. Finish all slab edges, including those at formed joints, carefully with an edger having a radius as shown on the Drawings.

4. Unless otherwise indicated, edge the transverse joints before brooming. The brooming shall eliminate the flat surface left by the surface face of the edger. Execute the brooming so that the corrugation, thus produced, will be uniform in appearance and not more than 1/16 inch in depth.

5. The completed surface shall be uniform in color and free of surface blemishes, form marks, and tool marks. The finished surface of the pavement shall not vary more than 3/16 inch when tested with a 10 foot straightedge.

6. The thickness of the pavement shall not vary more than 1/4 inch.

7. Remove and reconstruct irregularities exceeding the above for the full length between regularly scheduled joints.

3.12 JOINTS - GENERAL

A. Place joints, where shown, conforming to the details as shown, and perpendicular to the finished grade of the concrete surface.

B. Joints shall be straight and continuous from edge to edge of the pavement.

3.13 EXPANSION JOINTS

A. Use a preformed expansion joint filler material of the thickness as shown to form expansion joints.

B. Material shall extend the full depth of concrete, cut and shaped to the cross section as shown, except that top edges of joint filler shall be below the finished concrete surface where shown to allow for sealing.

C. Anchor with approved devices to prevent displacing during placing and finishing operations.

D. Round the edges of joints with an edging tool.

E. Form expansion joints as follows:

1. Without dowels, about structures and features that project through, into, or against any site work concrete construction.

2. Using joint filler of the type, thickness, and width as shown.

3. Installed in such a manner as to form a complete, uniform separation between the structure and the site work concrete item.

3.14 CONSTRUCTION JOINTS

A. Locate longitudinal and transverse construction joints between slabs as shown.

B. Place transverse construction joints of the type shown, where indicated and whenever the placing of concrete is suspended for more than 30 minutes.

C. Use a butt-type joint with dowels in curb and gutter if the joint occurs at the location of a planned joint.

D. Use keyed joints with tiebars if the joint occurs in the middle third of the normal curb and gutter joint interval.

3.15 FORM REMOVAL

A. Forms shall remain in place at least 12 hours after the concrete has been placed. Remove forms without injuring the concrete.

B. Do not use bars or heavy tools against the concrete in removing the forms. Promptly repair any concrete found defective after form removal.

3.16 CURING OF CONCRETE

A. Cure concrete by one of the following methods appropriate to the weather conditions and local construction practices, against loss of moisture, and rapid temperature changes for at least seven days from the beginning of the curing operation. Protect unhardened concrete from rain and flowing water. All equipment needed for adequate curing and protection of the concrete shall be on hand and ready to install before actual concrete placement begins. Provide protection as necessary to prevent cracking of the pavement due to temperature changes during the curing period. If any selected method of curing does not afford the proper curing and protection against concrete cracking, remove and replace the damaged pavement and employ another method of curing as directed by the City’s Representative.

B. Burlap Mat: Provide a minimum of two layers kept saturated with water for the curing period. Mats shall overlap each other at least 150 mm (6 inches).

C. Impervious Sheeting: Use waterproof paper, polyethylene-coated burlap, or polyethylene sheeting. Polyethylene shall be at lease 0.1 mm (4 mils) in thickness. Wet the entire exposed concrete surface with a fine spray of water and then cover with the sheeting material. Sheets shall overlap each other at least 300 mm (12 inches). Securely anchor sheeting.

D. Liquid Membrane Curing:

1. Apply pigmented membrane-forming curing compound in two coats at right angles to each other at a rate of 5 m2/L (200 square feet per gallon) for both coats.

2. Do not allow the concrete to dry before the application of the membrane.

3. Cure joints designated to be sealed by inserting moistened paper or fiber rope or covering with waterproof paper prior to application of the curing compound, in a manner to prevent the curing compound entering the joint.

4. Immediately re-spray any area covered with curing compound and damaged during the curing period.

3.17 CLEANING

A. After completion of the curing period:

1. Remove the curing material (other than liquid membrane).

2. Sweep the concrete clean.

3. After removal of all foreign matter from the joints, seal joints as herein specified.

4. Clean the entire concrete of all debris and construction equipment as soon as curing and sealing of joints has been completed.

3.18 PROTECTION

A. The contractor shall protect the concrete against all damage prior to final acceptance by the City. Remove concrete containing excessive cracking, fractures, spalling, or other defects and reconstruct the entire section between regularly scheduled joints, when directed by the City's Representative, and at no additional cost to the City. Exclude traffic from vehicular pavement until the concrete is at least seven days old, or for a longer period of time if so directed by the City's Representative.

3.19 FINAL CLEAN-UP

A. Remove all debris, rubbish and excess material from the site.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Automatically-controlled lawn irrigation system, controllers and all other appurtenances.

1.02 RELATED REQUIREMENTS

A. All Related Documents and Sections: Contractor to examine Contract Documents for requirements that directly affect or are affected by Work of this Section. Those Documents and Sections include, but is not limited to, the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 General Requirements, apply to this Section.

2. All Specification Sections listed in the Table of Contents.

1.03 ABBREVIATIONS

A. HDPE: High-density polyethylene plastic.

B. NPT: National pipe thread.

C. PTFE: Polytetrafluoroethylene.

D. PVC: Polyvinyl chloride plastic.

1.04 DEFINITIONS

A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves.

B. Drain Piping: Downstream from circuit-piping drain valves.

C. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves.

D. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 Volts or for remote-control, signaling power-limited circuits.

1.05 APPLICABLE PUBLICATIONS

A. American Society Of Mechanical Engineers (ASME):

1. B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.

2. B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

3. B40.100 - Pressure Gauges and Gauge Attachments.

B. American Society of Sanitary Engineering (ASSE):

1. 1013 - Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers.

C. ASTM International (ASTM):

1. D1785-15 - Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80, and 120.

2. D2241-15 - Poly(Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR Series).

3. D2464-15 - Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.

4. D2466-15 - Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.

5. D2564-12 - Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.

6. D2683-14 - Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.

7. D2855-15 - Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.

8. F477-14 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

D. American Water Works Association (AWWA):

1. C504-15 - Rubber-Seated Butterfly Valves.

E. National Fire Protection Association (NFPA):

1. 70 - National Electrical Code.

1.06 SUBMITTALS

A. Manufacturer's Literature and Data:

1. Description of each product: Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

2. Installation instructions.

3. Warranty.

B. Extra Materials: Show labels describing contents.

1. Rotary and Spray Head Sprinkler: 5 percent of amount installed for each type and size indicated, but no fewer than 2 units.

C. Qualifications: Substantiate qualifications comply with specifications.

1. Irrigation Installer.

2. Service provider.

D. Operation and Maintenance Data:

1. Start-up, maintenance, troubleshooting, emergency, and shut-down instructions for each operational product.

1.07 QUALITY ASSURANCE

A. Installer Qualifications:

1. Regularly installs specified products.

2. Installed specified products with satisfactory service on five similar installations for minimum five years.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original sealed packaging.

B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, production run number, and manufacture date.

C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

D. Store plastic piping protected from direct sunlight. Support pipe to prevent sagging and bending.

1.09 WARRANTY

A. Construction Warranty: one year labor and material warranty

PART 2 PRODUCTS

2.01 SYSTEM DESCRIPTION

A. Provide system that compatible with existing irrigations system.

B. Irrigation Zone Control: Automatic operation with controller and automatic control valves.

2.02 MATERIALS

A. Polyvinyl Chloride (PVC) Pipe: ASTM D1785 PVC 1120, Schedule 40.

a. Fittings:

1) Socket Type: ASTM D2466, Schedule 40.

2) Threaded Type: ASTM D2464, Schedule 80.

3) Swing Joints: Threaded fittings with elastomeric seals and minimum 1380 kPa (200 psi) working pressure.

b. Solvent Cement: ASTM D2564.

c. Flange Gaskets, Bolts, and Nuts: Type as recommended by manufacturer.

B. Valves:

1. Swing Check Valves:

a. Valves Smaller than 100 mm (4 inches): ASTM B61 or ASTM B62, 850 kPa (125 psi) bronze body and bonnet.

b. Valves 100 mm (4 inches) and Larger: ASTM B61 or ASTM B62, 1380 kPa (200 psi), iron body, bronze trim, vertical or horizontal installation, flange connection.

2. Pressure Reducing Valve: Cast steel body with renewable seats and stainless steel trim. Design flow passages and all parts to withstand high velocity applications, flange connected.

3. Remote Control Valves: Solenoid actuated valves, 24 Volt AC, installed underground.

a. Globe Valves: Heavy duty construction with manual shut-off and flow control adjustment manual operation.

b. Straight or Angle Valve:

1) Cast iron valve body with brass bonnet, trim and renewable seat with two inlet taps.

2) Molded-plastic body, normally closed diaphragm type with manual shut off and flow control adjustment.

c. Provide valves with unions and housing with minimum working pressure, 1025 kPa (150 psi).

4. Quick Couplers: Brass parts, two-piece unit consisting of coupler water seal valve assembly and removable upper body to allow spring and key track to be serviced without shut down of main.

a. Lids: Lockable vinyl cover with springs for positive closure on key removal.

5. Reduced Pressure Principle Backflow Preventer: ASSE 1013. Provide for new connection to water distribution system.

C. Sleeve Material: ASTM D2241, Schedule 40.

2.03 AUTOMATIC CONTROL EQUIPMENT - ELECTRIC

A. Control Equipment: Match existing.

2.04 SPRINKLER HEADS

A. Sprinkler Heads: Manufacturer's standard unit designed to provide uniform coverage over entire area of spray. Internal assembly includes filter screen, capable of removal from top without removing sprinkler case from riser.

1. Rotary Pop-Up Sprinklers: Gear-driven, impact resistant heavy-duty ABS with gears and pinions assembled on stainless steel spindles.

a. Full circle sprinklers, dual or tri-nozzle combination type with positive water-driven gear assembly.

b. Part circle sprinklers, variable arc type.

2.05 LOW VOLTAGE CONTROL VALVE WIRE

A. Wire: NFPA 70, solid copper wire, minimum1.8 mm (14 gage), UL LLC approved for direct burial in ground.

2.06 LOW VOLTAGE CONTROLLER CABLE

A. Multi-strand cable, UL-approved for direct burial in ground, size and wire type according to manufacturer’s recommendations.

2.07 TRACER WIRES

A. Tracer Wires: Plastic-coated copper tracer wire, 1.8 mm (14 gage), green, Type TW, installed with non-metallic irrigation main lines.

2.08 SPLICING MATERIALS

A. Epoxy waterproof sealing packet.

2.09 ACCESSORIES

A. Valve Box: Precast concrete with compressive strength in excess of 30 MPa (4,000 psi). Provide valve boxes suitable and adjustable for valve used.

1. Cast word “Irrigation” on cover.

2. Provide "T" handle socket wrenches, 15 mm (5/8 inch) round stock with sufficient length to extend 600 mm (2 feet) above top of deepest valve box cover.

3. Stencil controller and circuit numbers with permanent white epoxy paint. Letters minimum 75 mm (3 inches) height.

4. Provide 760 mm (30 inches) long valve adjustment keys.

5. Valve Box in Plant Bed Areas: HDPE structural foam Type A, Class III.

c. Color: match existing.

d. Size: Minimum 480 (19 inches) long by 355 mm (14 inches) deep with key-lockable hinged cast iron cover.

B. Backflow Preventer: ASSE 1013.Provide reduced pressure principle backflow preventer at each new connection to water distribution system.

PART 3 EXECUTION

3.01 PREPARATION

A. Examine and verify substrate suitability for product installation.

B. Protect existing construction and completed work from damage.

C. Examine proposed irrigation areas for compliance with requirements and conditions affecting installation and performance.

D. Set stakes to identify locations of proposed irrigation system. Obtain Contracting Officer’s Representative's approval before excavation.

3.02 INSTALLATION - GENERAL

A. Install products according to manufacturer's instructions.

1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Owner’s Representative’s consideration.

3.03 PIPE INSTALLATION - GENERAL

A. Layout work as indicated on drawings. Lines are to be in common trench wherever possible.

B. Install sprinkler lines to avoid HVAC trenches, electric ducts, storm and sanitary sewer lines, and existing water and gas mains; all of which have right of way.

C. Cut existing sidewalks and curbs during trenching and installation of pipe. Install pipe under sidewalks and curbs by jacking, auger boring, or by tunneling. Repair or replace any cracked concrete, due to settling, during warranty period.

D. Do not lay pipe on unstable material, in wet trenches or, in opinion of Contracting Officer’s Representative, when trench or weather conditions are unsuitable for work.

E. Allow minimum of 75 mm (3 inches) between parallel pipes in same trench.

F. Clean interior portion of pipe and fittings of foreign matter before installation. Securely close open ends of pipe and fittings with caps or plugs to protect fixtures and equipment against dirt, water and chemical or mechanical injury. At completion of all work thoroughly clean fixtures, exposed materials and equipment.

G. Install full length of each section of pipe resting upon pipe bed with recesses excavated to accommodate bells or joints. Do not lay pipe on wood blocking.

H. Hold pipe securely in place while joint is being made.

I. Do not work over, or walk on, pipe in trenches until covered by layers of earth, well tamped, in place to depth of 300 mm (12 inches) over pipe.

J. Connect new system to existing mains.

K. Install concrete thrust blocks where irrigation main changes direction at “L” and “T” locations and where irrigation main terminates. Delay pressure tests until minimum 36 hours after completing thrust blocks. Size and place concrete thrust blocks for supply mains according to pipe manufacturer's instructions.

L. Minimum cover over water mains, 760 mm (30 inches). Cover laterals to minimum depth of 600 mm (24 inches).

M. Place warning tape 300 mm (12 inches) above sprinkler system water mains and laterals.

3.04 PLASTIC PIPE INSTALLATION

A. Install plastic pipe snaked in trench at least 1 m per 30 m (1 foot per 100 feet) to allow for thermal construction and expansion and to reduce strain on connections.

B. Joints:

1. Solvent Welded Socket Type: ASTM D2855.

2. Threaded Type: Apply liquid Polytetrafluoroethylene (PTFE) thread lubricant or PTFE thread tape. After joint is made hand tight (hard), strap wrench should be used to make up to two additional full turns.

3. Elastomeric Gasket: ASTM F477.

3.05 VALVE INSTALLATION

A. Group remote control valves wherever possible and aligned at set dimension back of curb along roads.

B. Do not install valves under roads, pavement or walks.

C. Clean interior of valves of foreign matter before installation.

D. House pressure control valves installed adjacent to remote control valve in same valve box.

E. Install valve box with cover flush with finished grade.

F. Install control valves minimum 75 mm (3 inches) below finished grade.

3.06 SLEEVE INSTALLATION

A. Install sleeves where pipe and control wires are installed under walks, paving, walls, and other similar areas.

B. Install sleeves twice line size or greater extend 300 mm (12 inches) beyond edges of paving or construction.

C. Bed sleeves with minimum 100 mm (4 inches) sand backfill above top of pipe in areas where pipe is placed before hardscape is installed.

3.07 SPRINKLER AND QUICK COUPLER INSTALLATION

A. Install sprinkler heads and quick couplers on temporary nipples extending at least 75 mm (3 inches) above finished grade. After turf is established, remove temporary nipples, install sprinkler heads and quick couplers at ground surface.

B. Locate part circle heads to maintain maximum distance of 150 mm (6 inches) from edges and other boundaries.

C. Provide swing joint assembly in all sprinklers, shrub sprays and quick couplers.

D. Set shrub spray heads 200 mm (8 inches) above grade and 300 mm (12 inches) from edge of curb or pavement. Place adjacent to walls. Stake heads before backfilling trenches. Support stakes parallel to riser.

E. Install entire system for manual and automatic draining. Equip low point of each underground line with drain valve draining into an excavation containing gravel. Backfill with excavated material and cover with 50 mm (2 inches) precast concrete cover.

F. recommendations for hose or distribution tubing size and length.

3.08 AUTOMATIC IRRIGATION - CONTROL SYSTEM INSTALLATION

A. Determine exact location of controllers in field before installation. Coordinate electrical service to these locations. Install according to manufacturer's instructions and NFPA 70.

3.09 CONTROL WIRE INSTALLATION

A. Install electric control cable in trenches with new mains or in separate trench at back of curb, unless cross-country route is indicated on Drawings. Locate in trench with mains when possible on cross-country routes.

B. Install wiring bundles located with piping 50 mm (2 inches) below bottom of pipe. Color code each wire in bundle differently. Bundle multiple wires and tape together at 4570 mm (15 foot) intervals. Tag wires at controllers and control valve location with plastic tie wire tags. Provide same number and color of wire at each ends.

C. Hold splicing to minimum. Provide pullbox at each splice. No splices will be allowed between field located controllers and remote control valves.

D. Provide 300 mm (12 inch) expansion loops in wiring at each wire connection or change in wire direction. Provide 600 mm (24 inches) loop at remote control valves.

E. Do not install power wires for operation of irrigation system in same conduit as irrigation control wires.

3.10 PROTECTION

A. Protect irrigation system from traffic and onstruction operations.

B. Remove protective materials immediately before acceptance.

C. Repair damage.

END OF SECTION

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APPENDICES

TABLE OF CONTENTS
FOR APPENDICES

APPENDIX A……..... City of Tracy Local Hire Policy

APPENDIX B……..... City of Tracy Truck Route

APPENDIX C…..... …… PGE Construction Sketch

APPENDIX A

City of Tracy
Local Hiring Policy

City of Tracy Local Hiring Policy

The City of Tracy's Local Hiring Policy for Capital Improvement Projects aims to target employment and training opportunities to Tracy residents.

The Prime Contractor and all subcontractors shall implement and comply with the Local Hiring Policy for this project.

I. Definitions (for purposes of Local Hiring Policy only)

Construction Trade	A construction trade classification as established for prevailing wage payment requirements by the California Department of Industrial Relations.
Contractor	A contractor of any tier that employs individuals to perform Project Work.
Tracy Resident	An individual domiciled within the City of Tracy. "Domiciled" has the meaning set forth in section 349(b) of the California Election Code.
New Local Apprentice	A Tracy Resident who at time of the individual's commencement of Project Work has completed less than 25% of the required apprentice work hours to attain journey-level status, in a state-registered apprenticeship program.
Percentage Goals	The goals indicated for employment of Tracy Residents and New Local Apprentices described in the "Percentage Goals" section below.
Project Work	Construction work performed pursuant to the prime contract.

II. Percentage Goals

The City establishes the following goals for each Contractor, for performance of Project Work in each Construction Trade:

a) For journey-level workers:

- at least 25% of Project Work hours shall be performed by Tracy Residents.

b) For apprentice-level workers:

- At least 25% of Project Work hours performed by apprentices shall be performed by New Local Apprentices.

III. Contractor Hiring Responsibilities

Each Contractor shall follow the following hiring processes, which constitute good faith efforts to satisfy each of the Percentage Goals.

Contractors Working Under a Collective Bargaining Agreement: Contractor shall assign any existing crew members that fit the Percentage Goal categories, if such crew members are not currently working on other projects, until Percentage Goals are satisfied. If Contractor cannot satisfy Percentage Goals through assignment of existing crew members not currently working other projects, then Contractor shall use union hiring hall referral systems for any workers needed to satisfy Percentage Goals, including name calls and any other available mechanisms. For journey-level workers: when a Contractor requests workers from the union hiring hall, it requests Tracy Residents if needed to satisfy the applicable Percentage Goal. For apprentice-level workers: same as journey-level process, except Contractors shall contact the relevant apprenticeship program or hiring hall, and request referral of New Local Apprentices as needed to satisfy the applicable Percentage Goal, and shall sponsor New Local Apprentices as needed. If necessary, Contractors shall contact other sources designated by the City to identify Tracy Residents and New Local Apprentices to employ as needed to satisfy Percentage Goals.

Contractors Not Working Under a Collective Bargaining Agreement: Contractor shall assign any existing crew members that fit the Percentage Goal categories, if such crew members are not currently working on other projects, until Percentage Goals are satisfied. If Contractor cannot satisfy Percentage Goals through assignment of existing crew members not currently working other projects, then Contractor shall contact other available sources of workers for Tracy Residents and New Local Apprentices. Contractors shall sponsor New Local Apprentices as needed, if such workers can be identified. If necessary, Contractors shall contact other sources designated by the City to identify Tracy Residents and New Local Apprentices to employ as needed to satisfy Percentage Goals.

IV. Miscellaneous

a. Monitoring. Contractors shall provide information as requested by the City, and access to job sites and employees as requested, to enable determination of compliance with requirements of the Local Hiring Policy.

b. Subcontracts. The Prime Contractor shall include compliance with the Local Hiring Policy as a material term of all subcontracts. The Prime Contractor is liable for any breach of this Policy by any subcontractor of any tier.

c. Assurance Regarding Preexisting Contracts. Each Contractor represents that as of the date that a contract incorporating this Policy became effective, it has executed no contract pertaining to the project that would have violated this Policy had it been executed after that date, or would interfere with fulfillment of or conflict with terms of this Policy. If, despite this representation, an entity that has agreed to comply with this Policy has entered into such contract, then upon request from the City it shall either amend that contract to include the provisions required by this Policy, or terminate that contract.

d. Liquidated Damages. If a Contractor fails to demonstrate that it made good faith efforts as described above and it fell short of the Percentage Goals, then the City may require prime contractor to pay City as liquidated damages an amount equal to the minimum journeyman level wage (or apprentice-level wage, as applicable) under the prevailing wage classification for the Construction Trade in question, for each hour short of the Percentage Goals by a Contractor. Compliance and liquidated damages will be assessed on an annual basis, or prior to final payment to the prime contractor for work under the subcontract in question. Liquidated damages may be withheld from progress payments or final payment from the City, upon compliance determination by the City, or during compliance review.

e. Out-of-State Workers. The Percentage Goals do not apply to Project Work hours performed by residents of states other than the State of California (and such hours shall not be considered Project Work Hours for purposes of determining satisfaction of Percentage Goals).

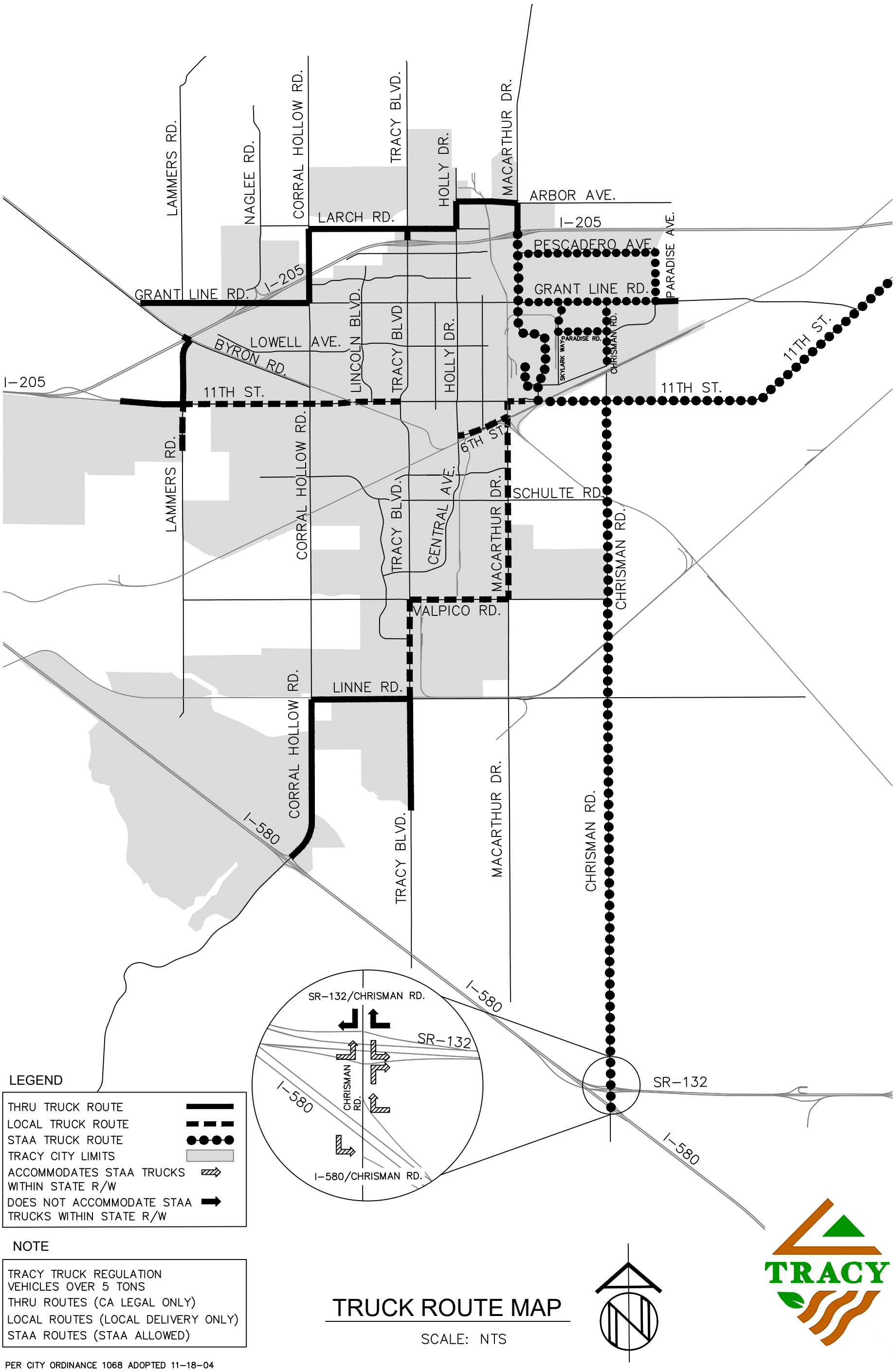
APPENDIX B

City of Tracy

Truck Route

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OCTOBER 2022



LEGEND

- THRU TRUCK ROUTE
- LOCAL TRUCK ROUTE
- STAA TRUCK ROUTE
- TRACY CITY LIMITS
- ACCOMMODATES STAA TRUCKS WITHIN STATE R/W
- DOES NOT ACCOMMODATE STAA TRUCKS WITHIN STATE R/W

NOTE

TRACY TRUCK REGULATION
VEHICLES OVER 5 TONS
THRU ROUTES (CA LEGAL ONLY)
LOCAL ROUTES (LOCAL DELIVERY ONLY)
STAA ROUTES (STAA ALLOWED)

PER CITY ORDINANCE 1068 ADOPTED 11–18–04

TRUCK ROUTE MAP

SCALE: NTS

TRACY

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APPENDIX C

PGE Construction Sketch

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CONSTRUCTION SKETCH

SEC, SVC AND METER INSTALL

50 EAST 6TH STREET, TRACY, CA

NO ENVIRONMENTAL ISSUES

Know what's below. Call before you dig.

811

PRIMARY VOLTAGE: 12	kV	VOLTAGE AREA: 2	
LATITUDE: 37.7343	LONGITUDE: -121.4252		
SOURCE SIDE DEVICE:FUSE 20529			
SUB & CIRCUIT: TRACY 1105			
DSGN SAG:SSU		RAPTOR ZONE:YES	
LOADING AREA:LIGHT		ARRESTER DIST:3	
CORROSION AREA:NON		INSULATION DIST:B	
EXEMPT EQUIP.INST.: NO		FIRE AREA: LRA-TIER 1	
NEAR LOC:N/A		GAS CONFLICT: NO	

EST: PAUL FULGENCIO	(707)750-6856	NOTIF: 132900606	JPA#: N/A
ADE: SAMIR FARAG	(540)359-9812	SCALE: 1"=50'	DATE: 3/4/2026
SUPV: KIMBERLY PAYNE	(661)524-1434	PM: 35714556	SHEET: 1 OF 1 REV. 0
REP: HASIB HABIBI	(209)401-9087		
PLNR: N/A			

N

LEGENDS

INSTALL	DESCRIPTION
	(XX'/XX'/XX') (FRANCHISE-3RD PARTY CONDUIT/PRIVATE PROPERTY/TOTAL CABLE LENGTH)
S	INSTALL 750A QPX (600V) SECONDARY CABLE BY PG&E IN EXISTING 4" DUCT
SV	INSTALL 750A QPX (600V) SERVICE CABLE BY PG&E IN 1 OF NEW 2-5" DUCT BY APPLICANT
[3]	INSTALL NEW 24"X36"X26" (IVT) SECONDARY ENCLOSURE (CODE M040942) BY APPLICANT
	PG&E TO INSTALL 800A METER

REMOVE	DESCRIPTION
	REMOVE 350A QPX (600V) SECONDARY CABLE IN EXISTING 4" DUCT BY PG&E
	REMOVE 1000A QPX (600V) SERVICE CABLE IN EXISTING 5" DUCT BY PG&E
	PG&E TO REMOVE METER(S)

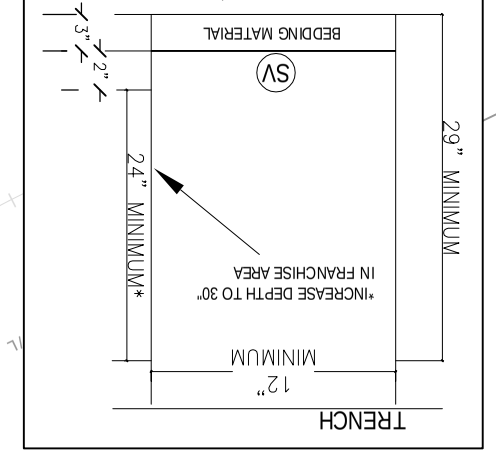
EXISTING	DESCRIPTION
	EXISTING 3Ø UG PRIMARY CABLE (SIZED AS SHOWN)
	EXISTING UG SECONDARY CABLE (SIZED AS SHOWN)
	EXISTING UG SERVICE CONDUCTOR (SIZE AS SHOWN)

LAND	DESCRIPTION
P/L	PROPERTY LINE
	RAILROAD LINE

NOTES

1. APPLICANT TO TRENCH ELECTRIC, PHONE & CABLE
2. APPLICANT TO PROVIDE ALL ELECTRIC SUBSTRUCTURES AS SHOWN
3. APPLICANT IS TO PROVIDE MANDREL AND PERFORM MANDREL TEST WITH PG&E INSPECTOR STANDBY.
4. THE TOTAL NUMBER OF BENDS INSTALLED IN ANY PRIMARY DUCT RUN SHALL NOT EXCEED 300 DEGREES. THE TOTAL NUMBER OF BENDS IN ANY SECONDARY DUCT RUN IN EXCESS OF 200 FEET SHALL NOT EXCEED 300 DEGREES. ANY SECONDARY DUCT RUN EQUAL TO OR LESS THAN 200 FEET IN LENGTH MAY CONTAIN UP TO A TOTAL OF 315 DEGREES IN BENDS.
5. APPLICANT IS RESPONSIBLE TO ENSURE TRENCHING AND SUBSTRUCTURE INSTALLATION MEET PG&E GREENBOOK STANDARDS. GREENBOOKS ARE AVAILABLE AT YOUR LOCAL PG&E HEADQUARTERS OR CAN BE FOUND ON THE INTERNET @ WWW.PGE.COM/GREENBOOK
6. 3' SEPARATION IS REQUIRED BETWEEN ELECTRIC TRENCH AND WET FACILITIES
7. FLAME RESISTANT (FR) CLOTHING IS REQUIRED WHEN WORKING ON OR AROUND PG&E FACILITIES AND EQUIPMENT. SEE PG&E GREENBOOK FOR ADDITIONAL DETAILS.

SECONDARY/SERVICE TRENCH DETAILS



CONSTRUCTION NOTES

- APPLICANT TO TRENCH/INSTALL SUBSTRUCTURE ONSITE AND OFFSITE

REQUIRED PERMITS

☐ COUNTY ☒ CITY ☐ TRAFFIC CONTROL

1-350A QPX 4" (0'/340'/350')

750A QPX (0'/45'/55')
REMOVE: 50' OF 350A QPX

750A QPX (0'/21'/36')

1-1000A QPX 5" (0'/210'/225')
ABANDON: 210' OF 5" CONDUIT

SUBJECT CUSTOMER (NON-RES)
800A METER PANEL 3Ø 120/208V
CSG: 63.2KVA
VD:3.61V
SCI:30,000A

MTR#100705231 8
WORST CASE
CSG: 3.8KVA
VD:3.98V

4/0A QPX (0'/35'/50')

MTR#100707082 1

4/0A QPX (0'/47'/97')

1-4/0A QPX 3" (115'/115'/245')

3-1/0 A EPR 12kV 4"

SSD: FUSE 20529

0.09 MILES

117734
75 3φ 120/208

E 6TH ST

D ST

P/L

1668
1667
1666
614
17
23
31
35
55
59
65
P112417
564P
1-6A OPX

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CONTRACT DRAWINGS

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CITY OF TRACY
SAN JOAQUIN COUNTY, CALIFORNIA
TRANSIT STATION EMERGENCY BACKUP GENERATOR

50 E. 6th Street, Tracy, CA 95376

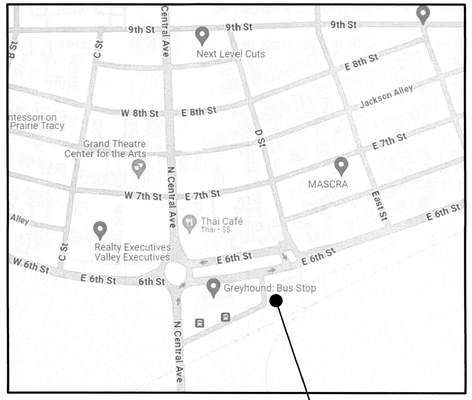
C.I.P. No. 77592

ABBREVIATIONS:

ADJ	ADJACENT
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AEG	ABOVE EXISTING GRADE
ALT	ALTERNATE
ARCH	ARCHITECT
ATS	AUTOMATIC TRANSFER SWITCH
BD	BOARD
BFP	BACK FLOW PREVENTER
BLDG	BUILDING
BLKG	BLOCKING
BO	BOTTOM OF
BOT	BOTTOM
BTWN	BETWEEN
BV	BALL VALVE
CBC	CALIFORNIA BUILDING CODE
C–C	CENTER TO CENTER
CHH	COMMUNICATIONS HANDHOLE
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CL	CENTER LINE
CLR	CLEAR
CONC	CONCRETE
CONT	CONTINUOUS
CSB	COMMUNICATION SERVICE BOX
CTR	CENTER
CW	COLD WATER
DEPT	DEPARTMENT
DET	DETAIL
DIA	DIAMETER
DIM(S)	DIMENSION(S)
DN	DOWN
D	DEEP
DWG(S)	DRAWING(S)
DW	DOMESTIC WATER
E	EAST
(E)	EXISTING
EA	EACH
EF	EACH FACE
EJ	EXPANSION JOINT
EHH	ELECTRICAL HANDHOLE
ELEC	ELECTRICAL
EL/ELEV	ELEVATION
ENG/ENGR	ENGINEER
EOR	ENGINEER OF RECORD
EQ	EQUAL
ES	EACH SIDE
EXP	EXPANSION
FDN	FOUNDATION
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FLOOR
FIN	FINISH
FLR	FLOOR
FOC	FACE OF CURB
FT	FOOT OR FEET
FTG	FOOTING
GA	GAUGE OR GAGE
GALV	GALVANIZED
GALV STL	GALVANIZED STEEL
GENR	GENERATOR
GC	GENERAL CONTRACTOR
GND	GROUND
GTW	GROUNDING TESTWELL
HH	HAND HOLE
HP	HIGH POINT
HSS	HOLLOW STRUCTURAL SECTIONS
HT	HEIGHT
ICB	IRRIGATION CONTROL BOX
ICV	IRRIGATION CONTROL VALVE
ID	INSIDE DIAMETER
IN	INCHES
INC	INCORPORATED
INFO	INFORMATION
INT	INTERIOR
INV	INVERT ELEVATION
IRR	IRRIGATION
LGTH	LENGTH
LBS	POUND (S)
LIN	LINEAR, LINEAL
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MISC	MISCELLANEOUS
MIN	MINIMUM
MSB	MAIN SWITCH BOARD
MS	MAIN SWITCH
MTL	METAL
MV	MAIN VALVE
(N)	NEW
N	NORTH
NA or N/A	NOT APPLICABLE/AVAILABLE
NEU	NEUTRAL
NIC	NOT IN CONTRACT
NO	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER (DIM.)
OPP	OPPOSITE HAND
OPNG	OPENING
OPTL	OPTIONAL
PART	PARTIAL OR PARTICLE
PERF	PERFORATED
PG&E	PACIFIC GAS AND ELECTRIC COMPANY
PL	PROPERTY LINE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE PIPE
PVMT	PAVEMENT
QTY	QUANTITY
QCV	QUICK COUPLING VALVE
R	RADIUS
RD	ROOF DRAIN
REINF	REINFORCING
REQ'D	REQUIRED
REV	REVISION
RP	RADIUS POINT
SEOR	STRUCTURAL ENGINEER OF RECORD
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SOG	SLAB ON GRADE
SP	SPACE
SPEC	SPECIFICATION
SQ	SQUARE
SSMR	STANDING SEAM METAL ROOF
STL	STEEL
SST	STAINLESS STEEL
STD	STANDARD
STRUCT	STRUCTURE/STRUCTURAL
SYM	SYMBOL
SW	SIDEWALK
T&B	TOP & BOTTOM
THK	THICKNESS
THRU	THROUGH
T.A.	TOP OF
TOW/TW	TOP OF WALL
TRSH	TRASH ENCLOSURE
TYP	TYPICAL
UG	UNDERGROUND
UON/UNO	UNLESS OTHERWISE NOTE UNLESS NOTED OTHERWISE
UP	UNDERGROUND POWER
UPRRE	UNION PACIFIC RAILROAD ELECTRIC
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WATER
W/	WITH
W/O	WITHOUT
WT	WEIGHT

MAPS:

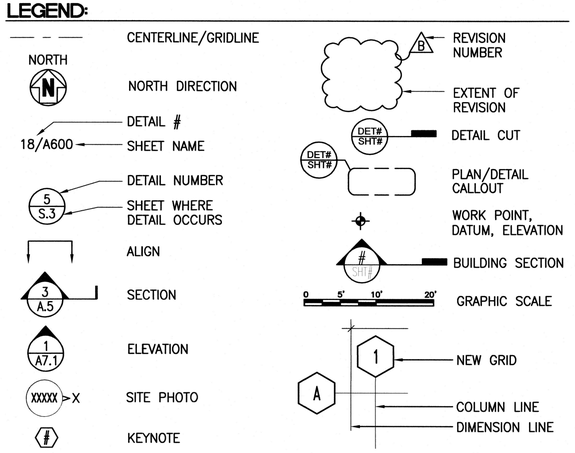
PROJECT SITE MAP:



SITE VICINITY MAP:



LEGEND:



PROJECT TEAM:

OWNER:
CITY OF TRACY
333 CIVIC CENTER PLAZA,
TRACY, CA 95376

ARCHITECT/STRUCTURE/CIVIL/LANDSCAPE:
THE KPA GROUP
6700 KOLL CENTER PARKWAY, STE. 125
PLEASANTON, CA 94566

STRUCTURAL:
TUAN and ROBINSON
STRUCTURAL ENGINEERS, INC.
444 SPEAR STREET, STE. 101
SAN FRANCISCO, CA 94105

ELECTRICAL/COMMUNICATIONS:
PHARIS ENGINEERING
7110 AUSTINWOOD ROAD
LOUISVILLE, KY 40214

DEFERRED SUBMITALS:

CONSTRUCTION WASTE MANAGEMENT FORM

PROJECT DESCRIPTION:

PROJECT IS TO INSTALL AN EMERGENCY BACKUP DIESEL GENERATOR AT THE TRACY TRANSIT STATION.

UTILITIES INCLUDE INSTALLATION OF A NEW MAIN SWITCH BOARD AT THE EXTERIOR GENERATOR LOCATION. EXISTING BUILDING MAIN SWITCH BOARD TO BECOME DISTRIBUTION PANEL WITH ALL BUILDING LOADS SERVED FROM NEW EXTERIOR SWITCHBOARD SITED AT THE NEW GENERATOR LOCATION.

SITE WORK INCLUDES DEMOLITION AND RECONSTRUCTION OF THE EXISTING UTILITIES INCLUDING DOMESTIC WATER AND BACKFLOW PREVENTOR, IRRIGATION SYSTEM AND IRRIGATION CONTROLLER. SITE ELECTRICAL HANDHOLES AND CONDUIT LOCATED AT NEW GENERATOR ENCLOSURE ARE SERVING RAILROAD METER EAST OF SITE AND ALSO REQUIRE RELOCATION AT AREA OF THE NEW GENERATOR.

STRUCTURES INCLUDE GENERATOR ENCLOSURE STRUCTURE AND ACCESS GATE. ALSO INCLUDED ARE NEW ROOF AND GATE IMPROVEMENTS AT THE ADJACENT TRASH ENCLOSURE.

GENERATOR DESCRIPTION:

GENERATOR CLASSIFICATION CEC 702 – OPTIONAL STANDBY SYSTEM

SHEET INDEX:

GENERAL	
G001	COVER SHEET, SHEET INDEX, ABBREVIATIONS AND LEGEND
G002	GENERAL NOTES
G003	GENERAL NOTES
G004	GENERAL NOTES
CIVIL	
C100	OVERALL SITE PLAN
C401	ENLARGED SITE PLANS–DEMO/NEW
C402	ENLARGED SITE UTILITY PLANS–DEMO/NEW
C501	ELEVATIONS AND SECTIONS
C502	DETAILS
C503	CITY STANDARD DETAILS
LANDSCAPING	
L101	ENLARGED LANDSCAPE AND IRRIGATION PLANS
STRUCTURAL	
S001	STRUCTURAL GENERAL NOTES
S101	STRUCTURAL ENLARGED PLANS AND DETAILS
S501	STRUCTURAL FOUNDATION/SLAB DETAILS
S541	STRUCTURAL FRAMING ELEVATIONS
S542	STRUCTURAL FRAMING DETAILS
ELECTRICAL	
E000	ELECTRICAL LEGEND, AND NOTES
ES100	ELECTRICAL SITE PLAN
E201	ELECTRICAL DETAILS
E202	ELECTRICAL SCHEDULES

CITY OF TRACY

APPROVAL OF THESE PLANS DOES NOT RELEASE THE DEVELOPER OF THE RESPONSIBILITY FOR THE CORRECTION OF ERRORS, OMISSIONS, OR CONFLICTS DISCOVERED DURING THE COURSE OF CONSTRUCTION OF THE IMPROVEMENTS PUBLIC INTEREST REQUIRES MODIFICATION OF OR A DEPARTURE FROM THE SPECIFICATIONS AND DETAILS OF THE CITY OF TRACY, THE CITY ENGINEER MAY AUTHORIZE SUCH MODIFICATIONS OR DEPARTURE. IF REQUIRE SUCH MODIFICATIONS OR DEPARTURE AND TO REFLECT THE MANNER IN WHICH THE WORK WAS ACTUALLY CONSTRUCTED, THE CONTRACTOR SHALL MAKE THE CHANGES ON THE INFORMATION SUBMITTED HEREON. APPROVED FOR THE CITY OF TRACY

EVEN G. MARCELO, P.E. CITY ENGINEER — DATE: 4/30/26

Think Inside the Triangle.

LICENSED ARCHITECT
PAUL W. POWERS
C-29713
3/31/2027
RENEWAL DATE
STATE OF CALIFORNIA

KPA ENGINEERS ARCHITECTS
THE KPA GROUP
1840 Fourth Street, Suite 200
Livermore, California 94550
Tel. 925.223.8217 www.thekpagroup.com
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REVISIONS			
SYMBOL	DATE	DESCRIPTION	APPROVED
1	10-11-24	PERMIT COMMENTS-REV 1	
2	10-12-25	PERMIT COMMENTS-REV 2	

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353
COVER SHEET, SHEET INDEX, ABBREVIATIONS AND LEGEND
TRANSIT STATION EMERGENCY BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

G001

CITY STANDARD NOTES

1. ALL WORK SHALL CONFORM TO CITY OF TRACY STANDARD SPECIFICATIONS AND STANDARD PLANS. THE WORK IS SUBJECT TO THE INSPECTION AND APPROVAL OF THE CITY ENGINEER, AND THE ENGINEERING DIVISION INSPECTORS. CONTACT ENGINEERING DIVISION CONSTRUCTION MANAGEMENT AT (209) 831-6400, TWO WORKING DAYS (48 HOURS) PRIOR TO THE START OF ANY WORK TO ARRANGE FOR INSPECTION.

2. TRAFFIC SIGNS SHALL BE INSTALLED IN CONFORMANCE WITH THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD) AT LOCATIONS SPECIFIED BY CITY DESIGN STANDARDS, STANDARD PLANS, AND STANDARD SPECIFICATIONS.

3. THESE PLANS HAVE BEEN CHECKED BY THE CITY OF TRACY FOR CONFORMANCE WITH THE CITY'S MINIMUM STANDARDS, BUT SUCH CHECKING BY THE CITY DOES NOT RELIEVE THE CONTRACTOR FROM THEIR RESPONSIBILITY TO FIND AND CORRECT ERRORS, OMISSIONS OR MAKE CHANGES REQUIRED BY CONDITIONS DISCOVERED IN THE FIELD DURING THE COURSE OF CONSTRUCTION. ANY REQUEST BY THE CONTRACTOR TO CHANGE THESE PLANS SHALL BE SUBMITTED IN WRITING TO THE CITY ENGINEER.

4. ALL REVISIONS TO THIS PLAN MUST BE REVIEWED BY THE CITY ENGINEER PRIOR TO CONSTRUCTION AND SHALL BE ACCURATELY SHOWN ON REVISED PLANS STAMPED AND SIGNED BY THE CITY ENGINEER PRIOR TO THE INSTALLATION OF THE IMPROVEMENTS.

5. ALL CONSTRUCTION STAKING FOR CURB, GUTTER, SIDEWALK, SANITARY SEWERS, STORM DRAINS, WATER LINES, FIRE HYDRANTS, AND ELECTROLIERS, ETC., SHALL BE DONE BY THE REGISTERED CIVIL ENGINEER OF RECORD OR LICENSED LAND SURVEYOR. HORIZONTAL CONTROL AND CUT SHEETS SHALL BE PROVIDED TO THE CITY PRIOR TO START OF WORK.

6. EXISTING UTILITIES ARE PLOTTED FROM AVAILABLE RECORDS. THE CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES TO PROTECT THESE UTILITIES. THE DEVELOPER SHALL PERFORM NO EXCAVATION UNTIL ALL UTILITY AGENCIES AND THE CITY OF TRACY HAVE BEEN NOTIFIED AND HAVE BEEN GIVEN THE OPPORTUNITY TO MARK THEIR FACILITIES IN THE FIELD. NOTIFY UNDERGROUND SERVICE ALERT AT (800) 227-2600 AT LEAST TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION. SOME AGENCIES SUCH AS IRRIGATION DISTRICTS MAY NOT BE PART OF UNDERGROUND SERVICE ALERT AND MUST BE CONTACTED SEPARATELY.

7. WATER MAINS AND SERVICES, SANITARY SEWER MAINS AND LATERALS, STORM DRAIN MAINS AND LATERALS, JOINT TRENCH UTILITIES, STREET LIGHT CONDUIT, AND ALL OTHER UNDERGROUND UTILITIES SHALL BE INSTALLED, TESTED, REPAIRED AND RETESTED IF NECESSARY PRIOR TO CURB, GUTTER, SIDEWALK AND STREET PAVING INSTALLATION.

8. ALL UNDERGROUND UTILITIES ABANDONED DURING CONSTRUCTION SHALL BE REMOVED.

9. TESTING
   - A) ALL SAMPLING AND TESTING CALLED FOR BY THE CITY ENGINEER SHALL BE PAID FOR BY THE CONTRACTOR.
   - B) ROADWAY SUBBASE, BASE, ASPHALT, AND TRENCH BACKFILL COMPACTION TESTING SHALL BE PERFORMED BY A SOILS LAB CONTRACTING WITH THE CITY OF TRACY.
   - C) TESTS FOR SUBGRADE R-VALUES ARE REQUIRED PRIOR TO THE INSTALLATION OF BASE ROCK WHEN R-VALUES ASSUMED IN DESIGN ARE GREATER THAN 5.
   - D) A MINIMUM OF 48 HOURS' NOTICE IS REQUIRED TO SCHEDULE ALL SOILS TESTING SERVICES.

10. ALL TRENCHES SHALL BE BACKFILLED IN ACCORDANCE WITH CITY DESIGN STANDARDS, STANDARD PLANS, AND STANDARD SPECIFICATIONS. COMPACTION SHALL BE ACHIEVED BY MECHANICAL MEANS. NO FLOODING, PONDING OR JETTING SHALL BE PERMITTED.

11. ASBESTOS CEMENT PIPE (ACP) OR FITTINGS SHALL NOT BE USED WITHIN THE CITY OF TRACY AND SHALL BE REMOVED IF FOUND.

12. CONTRACTOR SHALL NOTIFY THE CITY ENGINEER IMMEDIATELY UPON THE DISCOVERY OF A SURVEY MONUMENT WITHIN THE CONSTRUCTION LIMITS.

13. ALL STREET MONUMENTS, LOT CORNER, AND OTHER PERMANENT PIPE OR MONUMENTS WITHIN THE CONSTRUCTION LIMITS SHALL BE REFERENCED BY A REGISTERED LAND SURVEYOR BY MEANS OF A PRE-CONSTRUCTION CORNER RECORD. MONUMENTS DISTURBED DURING THE PROCESS OF CONSTRUCTION SHALL BE REPLACED PRIOR TO CITY ACCEPTANCE OF IMPROVEMENTS.

14. THE CONTRACTOR SHALL CONTROL DUST AT ALL TIMES DURING CONSTRUCTION AS REQUIRED BY THE CITY OF TRACY.

15. PRIOR TO TRENCHING FOR ANY SEWER, WATER, OR STORM DRAIN PIPE, THE DEVELOPER SHALL VERIFY, IN THE FIELD, THE SIZE AND LOCATION OF THE EXISTING PIPE AT THE POINT OF CONNECTION. ANY DEVIATION FROM THE PLANS SHALL BE RESOLVED BY THE DESIGN ENGINEER AND REVIEWED BY THE CITY ENGINEER PRIOR TO TRENCHING.

16. MANHOLES, VALVES, CLEANOUTS, ETC., SHALL BE BROUGHT TO FINISH GRADE BY THE DEVELOPER AFTER THE FINAL PAVING COURSE IS PLACED. EXISTING IRON SHALL BE LOWERED, THEN RAISED AFTER FINAL PAVING PER STANDARD PLAN 118. LOCKING GRADE RINGS OF ANY KIND ARE NOT ALLOWED. CITY OF TRACY DESIGN STANDARDS FEBRUARY 18, 2020 PAGE 92.

17. THE INSTALLATION OF EROSION AND SEDIMENT CONTROLS PER THE APPROVED SWPPP OR ESCP SHALL BE IMPLEMENTED PRIOR TO CONSTRUCTION AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. THE BMPS SHALL NOT ALLOW TURBID OR SEDIMENT-LADEN WATERS TO ENTER THE STORM DRAINAGE SYSTEM.

18. WORK SHALL BE RESTRICTED TO WEEKDAYS BETWEEN 7:30 AM AND 7:00 PM AND WEEKENDS BETWEEN 9:00 AM AND 5:00 PM. ALTERNATE HOURS MUST BE APPROVED BY THE CITY ENGINEER. WORK WHICH REQUIRES ANY TRAFFIC LANE CLOSURES OR RESTRICTION OF THE TRAVELED WAY SHALL BE LIMITED TO 9:00 AM TO 3:30 PM IN THE COMMUTE DIRECTION AND 8:00 AM TO 4:30 PM IN THE NON-COMMUTE DIRECTION. COMMUTE DIRECTIONS SHALL BE AS DETERMINED BY THE CITY ENGINEER.

19. THE OVERTIME COST FOR INSPECTING WORK REQUIRING CITY INSPECTION, PERFORMED BEFORE 7:00 AM AND AFTER 3:30 PM, SHALL BE PAID BY THE CONTRACTOR BEFORE THE WORK IS AUTHORIZED.

20. CONSTRUCTION EQUIPMENT WHICH OPERATES AT A NOISE LEVEL IN EXCESS OF 85 DECIBELS (MEASURED ON THE A-WEIGHTED SCALE DEFINED IN ANSI S-1.4) AT A DISTANCE OF 100 FEET FROM THE EQUIPMENT IS PROHIBITED.

21. THE CONTRACTOR SHALL KEEP EXCAVATIONS FREE FROM WATER DURING CONSTRUCTION. THE STATIC WATER LEVEL SHALL BE DRAWN DOWN A MINIMUM OF 2 FEET BELOW BOTTOM OF EXCAVATIONS TO MAINTAIN UNDISTURBED STATE OF NATURAL SOILS AND ALLOW PLACEMENT OF ANY FILL TO SPECIFIED DENSITY. DISPOSAL OF WATER SHALL NOT DAMAGE PROPERTY OR CREATE A PUBLIC NUISANCE.

22. DISPOSAL OF CONSTRUCTION DEWATER INTO THE CITY SANITARY SEWER OR STORM DRAIN SYSTEM MAY BE ALLOWED BY THE CITY WHEN JURISDICTIONAL WATER QUALITY STANDARDS ARE SATISFIED. CONTRACTOR SHALL SUBMIT A DEWATERING PLAN, OBTAIN ALL NECESSARY PERMITS, AND CONDUCT WATER QUALITY TESTING AS REQUIRED TO COMPLY WITH PERMIT REQUIREMENTS. THE DEWATERING PLAN MUST BE APPROVED BY THE UTILITIES DEPARTMENT PRIOR TO BEGINNING ANY DEWATERING ACTIVITIES.

23. CONTRACTOR SHALL MAINTAIN ALL STREETS, SIDEWALKS, AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION THROUGHOUT THE COURSE OF CONSTRUCTION. ALL SPILLS OF SOIL, ROCK, CONSTRUCTION DEBRIS, ETC., SHALL BE REMOVED IMMEDIATELY FROM PUBLICLY OWNED PROPERTY. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC, SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.

CONSTRUCTION NOTES

1. FOR HAUL ROUTE INFORMATION CALL THE CITY OR TRACY FOR THEIR REQUIREMENTS (209) 831-6400.

2. ALL TRENCHES SHALL BE BACKFILLED OR COVERED WITH TRENCH PLATES IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND THE CITY STANDARDS AT THE END OF EACH DAY. COMPACTION SHALL BE ACHIEVED BY MECHANICAL MEANS. NO FLOODING, PONDING OR JETTING SHALL BE PERMITTED.

3. ALL TRENCH EXCAVATION OVER FIVE FEET IN DEPTH SHALL BE SHORED IN ACCORDANCE WITH CAL-OSHA "CONSTRUCTION SAFETY ORDERS" CURRENT EDITION. CONTRACTOR MUST HAVE VALID TRENCH SHORING PERMIT ISSUED BY CAL-OSHA.

4. CONTRACTOR SHALL REMOVE DAILY, ALL WASTE MATERIALS FROM SITE RESULTING FROM CLEARING AND DEMOLITION OPERATIONS. ALL EXCESS MATERIAL SHALL BE DISPOSED OFF-SITE IN A SAFE AND LEGAL MANNER BY THE CONTRACTOR AT HIS OWN EXPENSE.

5. PORTLAND CEMENT CONCRETE PAVEMENT SHALL CONFORM TO THE MATERIAL REQUIREMENTS OF SECTION 90 CLASS B. AND PLACING REQUIREMENTS OF SECTION 40. TRANSVERSE WEAKENED PLANE JOINTS AND CONSTRUCTION JOINTS SHALL MATCH EXISTING JOINTS OR AS DIRECTED BY THE ENGINEER.

6. ALL WORK SHALL BE IN ACCORDANCE WITH THE PLANS, DETAILS AND SPECIFICATIONS PREPARED FOR THE PROJECT. ANY DEVIATION FROM APPROVED PLANS DURING CONSTRUCTION WILL REQUIRE 48 HOURS PRIOR WRITTEN NOTICE TO AND SUBJECT TO THE APPROVAL OF THE CITY.

7. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO INSTALL AND/OR ERECT THE CONSTRUCTION AS REQUIRED TO PROPERLY COMPLETE THE INTENDED WORK. MISCELLANEOUS ITEMS OF WORK, MATERIAL, EQUIPMENT, ETC. NECESSARY TO COMPLETE THE INSTALLATION SHALL BE PROVIDED BY THE CONTRACTOR WHETHER OR NOT MENTIONED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS.

8. REFER TO THE CIVIL UTILITY PLANS AND OTHER DOCUMENTS FOR ADDITIONAL REQUIREMENTS AND WORK. UTILITY AND SERVICE MODIFICATION AND ROUTING MAY EXTEND OUTSIDE THE BOUNDARY OF THE LIMIT OF PROJECT WORK. CONTRACTOR SHALL INCLUDE IN BID ALL COSTS AND MATERIALS ASSOCIATED WITH UTILITY AND SERVICE WORK OUTSIDE LIMIT OF PROJECT WORK BOUNDARY.

9. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE CITY OF ANY DIFFERENCES IN LOCATIONS OF EXISTING UTILITIES FROM THAT SHOWN, OR ANY CONFLICTS WITH THE WORK BEFORE CONTINUING WORK IN THAT AREA.

10. ALL REVISIONS TO THESE DOCUMENTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION AND SHALL BE ACCURATELY REPRESENTED IN REVISED PLANS PRIOR TO THE ACCEPTANCE OF THE WORK AS COMPLETE. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY FIELD CHANGES MADE WITHOUT WRITTEN AUTHORIZATION FROM THE CITY.

11. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF TRACY, CAL-OSHA, AND THE STATE WATER RESOURCES CONTROL BOARD. ALL CODES, STANDARDS, AND SPECIFICATIONS SHALL BE AS AMENDED TO DATE.

12. THE CONTRACTOR SHALL PROVIDE PROMPT, WRITTEN NOTIFICATION TO THE CITY OF TRACY AND ARCHITECT CONCERNING CONFLICTS WITH, OR RECOMMENDED DEVIATIONS FROM CODES, LAWS, REGULATIONS, STANDARDS, AND OPINIONS OF REVIEW OFFICIALS AS DESCRIBED HEREIN.

13. ALL MONUMENTS MUST BE PROTECTED PER STATE LAND SURVEYORS STANDARD SPECIFICATION SECTION. NOTIFY THE ARCHITECT TO REPORT ANY MONUMENTS IN DANGER OF DESTRUCTION OR REMOVAL.

14. CONTRACTOR SHALL NOTIFY THE CITY ENGINEER IMMEDIATELY UPON THE DISCOVERY OF A SURVEY MONUMENT WITHIN THE CONSTRUCTION LIMITS.

15. ALL STREET MONUMENTS, LOT CORNER, AND OTHER PERMANENT PIPE OR MONUMENTS WITHIN THE CONSTRUCTION LIMITS SHALL BE REFERENCED BY A REGISTERED LAND SURVEYOR BY MEANS OF A PRE-CONSTRUCTION CORNER RECORD. MONUMENTS DISTURBED DURING THE PROCESS OF CONSTRUCTION SHALL BE REPLACED PRIOR TO CITY ACCEPTANCE OF IMPROVEMENTS.

16. CONTRACTOR SHALL SATISFY HIM/HERSELF AS TO THE CORRECTNESS OF THE EXISTING TOPOGRAPHY AND OTHER SITE CONDITIONS PRIOR TO CONSTRUCTION. NOTIFY AND OBTAIN WRITTEN APPROVAL FROM THE CITY OF TRACY IF ANY DISCREPANCIES, REVISIONS, AND ADDITIONAL WORK THAT IS REQUIRED AS A RESULT OF SUCH FIELD INVESTIGATION PRIOR TO BEGINNING OF ANY WORK. FAILING TO DO SO SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CORRECT.

17. IT IS THE RESPONSIBILITY OF THE CITY TO OBTAIN PERMITS NECESSARY TO PERFORM THE WORK FROM THE APPROPRIATE AGENCIES.

18. SAFETY OF PERSONNEL AND PROPERTY DURING DEMOLITION AND EXCAVATION WORK IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. ONLY THE EXTENT OF THE WORK IS INDICATED; AND NOT THE METHOD, SEQUENCE, OR SAFETY PROCEDURES AND CONSIDERATIONS. REVIEW OF THE CONTRACTOR'S SUBMITTALS IS NOT INTENDED TO RELIEVE CONTRACTOR OF ANY OF THE ABOVE RESPONSIBILITY.

19. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FENCING, FLAGMEN OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY.

20. TRAFFIC CONTROL
   - A. PRIOR TO BEGINNING ANY WORK ON EXISTING STREETS, ADVANCE WARNING SIGNS SHALL BE INSTALLED.

21. CONTRACTOR SHALL PROVIDE BARRICADE AND WARNING LIGHTS FOR ALL OPEN EXCAVATION.

22. THE CONTRACTOR SHALL EMPLOY MEANS NECESSARY TO CONTROL DUST AT AND NEAR THE SITE OF WORK AND ALONG APPROACH ROUTES TO THE CONSTRUCTION SITE. ADJACENT STREETS ARE TO BE CLEANSED DAILY OF DIRT AND DEBRIS THAT ARE THE RESULT OF OPERATIONS.

23. DUST SHALL BE CONTROLLED BY WATERING OR OTHER APPROVED METHODS. AT ALL TIMES DURING CONSTRUCTION AND UNTIL FINAL COMPLETION, THE CONTRACTOR, OR SUBCONTRACTOR OPERATING EQUIPMENT ON THE SITE, SHALL PREVENT THE FORMATION OF ANY AIRBORNE NUISANCE BY WATERING AND/OR TREATING THE SITE OF THE WORK IN SUCH A MANNER THAT WILL CONFINE DUST PARTICLES TO THE IMMEDIATE SURFACE OF THE WORK. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY THE CONTRACTOR OR SUBCONTRACTOR ACTIVITIES IN PERFORMING THE WORK UNDER THIS CONTRACT AND SHALL BE RESPONSIBLE FOR ANY DAMAGE FROM DUST NUISANCE.

24. THE CONTRACTOR SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
   - A. WATERING OR COVERING OF STOCKPILES OF DEBRIS, SOIL, SAND OR OTHER MATERIALS THAT CAN BE BLOWN BY WIND
   - B. COVER ALL TRUCKS HAULING SOIL, SAND AND OTHER LOOSE, MATERIALS OR ALL TRUCKS SHALL MAINTAIN TWO FEET CLEAR, BETWEEN HAULED MATERIALS AND THE TOP OF THE TRUCK BED

26. IF ANY CULTURAL FEATURES OR ARCHEOLOGICAL MATERIALS ARE UNCOVERED DURING GRADING, TRENCHING OR OTHER EXCAVATION WORK ALL WORK WITHIN 100 FEET OF THESE MATERIALS SHALL BE STOPPED UNTIL A PROFESSIONAL ARCHEOLOGIST (SOPA) AND/OR THE SOCIETY OF CALIFORNIA ARCHEOLOGY (SCA) HAS HAD THE OPPORTUNITY TO EVALUATE THE SIGNIFICANCE OF THE FIND APPROPRIATE MITIGATION MEASURES HAVE BEEN DETERMINED AND IMPLEMENTED THE CONTRACTOR SHALL ALSO IMMEDIATELY NOTIFY THE CITY OF TRACY.

27. FOR PAVING AND STORM DRAIN IMPROVEMENTS, TEMPORARY SILT AND DRAINAGE CONTROL FACILITIES SHALL BE INSTALLED TO CONTROL AND CONTAIN EROSION CAUSED SILT DEPOSITS AND TO PROVIDE FOR THE SAFE DISCHARGE OF STORM WATERS INTO EXISTING STORMWATER FACILITIES. DESIGN OF THESE FACILITIES SHOULD BE IN ACCORDANCE TO THE LATEST CALIFORNIA STORM WATER BEST MANAGEMENT PRACTICE HANDBOOK.

28. THE CONTRACTOR SHALL PROVIDE PLANS TO MANAGE EROSION AND SEDIMENT CONTROL MEASURES, ALL SHALL CONFORM TO THE CALIFORNIA STORM WATER CONSTRUCTION BMP HANDBOOK.

29. THE CONTRACTOR SHALL PROVIDE A PLAN TO MEET AND FOLLOW ALL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM REQUIREMENTS IN EFFECT AT THE TIME OF CONSTRUCTION.

30. CONTRACTOR SHALL MAINTAIN GOOD HOUSEKEEPING PRACTICES AT THE JOB SITE. EXCESS BUILDING MATERIALS AND DEBRIS SHALL BE REMOVED PROMPTLY FROM THE JOB SITE AND DISPOSED OF AT AN APPROVED DUMPSITE. THE JOB SITE SHALL BE LEFT CLEAN AT THE END OF EACH WORKDAY.

31. THE CONTRACTOR MUST MAINTAIN THE STREETS, SIDEWALKS AND ANY OTHER PUBLIC & PRIVATE RIGHTS-OF-WAY IN A CLEAN, SAFE, AND USABLE CONDITION. ANY SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS MUST BE REMOVED AND SWEPT CLEAN FROM THE PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT.

32. CONSTRUCTION OPERATIONS – WASTEWATER GENERATED DURING CONSTRUCTION SHALL NOT BE DISCHARGED TO THE STORM DRAIN SYSTEM. THE CONTRACTOR SHALL MAKE ARRANGEMENTS TO ELIMINATE DISCHARGE TO THE STORM DRAIN SYSTEM AND, IF NECESSARY, PROVIDE AN AREA FOR ON-SITE WASHING ACTIVITIES DURING CONSTRUCTION. MATERIALS, WHICH COULD CONTAMINATE STORM RUNOFF, SHALL BE STORED IN AREAS WHICH ARE DESIGNED TO PREVENT EXPOSURE TO RAINFALL AND NOT ALLOW STORM WATER TO RUN ONTO THE AREA.

33. FLUSHING OF STREETS AND PARKING LOTS TO REMOVE DIRT AND CONSTRUCTION DEBRIS IS PROHIBITED UNLESS PROPER SEDIMENT CONTROLS ARE USED. PREFERABLY, AREAS REQUIRING CLEANING SHOULD BE SWEPT.

34. CONTRACTOR SHALL PROTECT EXISTING FACILITIES FROM DAMAGE. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE CITY OF TRACY. BARRICADES, SIGNS, LIGHTS, ETC., REQUIRED FOR THE PROTECTION OF PERSONNEL. THE PUBLIC PROPERTY AND MATERIAL SHALL BE PROVIDED FOR AND MAINTAINED DURING CONSTRUCTION BY THE CONTRACTOR, AND SHALL CONFORM TO ALL COVERING CODES, ORDINANCES AND REGULATIONS. THE CONTRACTOR IS RESPONSIBLE FOR THE REPAIR OF PUBLIC AND PRIVATE IMPROVEMENTS/FACILITIES DAMAGED BY OPERATIONS INCLUDING BUT NOT LIMITED TO MONUMENTS, BENCHMARKS, AC PAVEMENTS, PAVEMENT MARKINGS, TRAFFIC STRIPING AND SIGNAGE, TRAFFIC LOOPS, EXISTING FIBER OPTIC, EXISTING SEWER MAINS, ETC.

35. THE TYPES, LOCATIONS, SIZES AND/OR DEPTHS OF EXISTING UTILITIES AS SHOWN ON DRAWINGS ARE APPROXIMATE AND WERE OBTAINED FROM SOURCES OF VARYING RELIABILITY, ONLY ACTUAL DEMOLITION WILL REVEAL THE TYPES, EXTENT, SIZES AND LOCATIONS OF SUCH UTILITIES.

36. ALL UNDERGROUND UTILITIES SHALL BE COMPLETE BEFORE PLACEMENT OF BASE ROCK UNLESS OTHERWISE NOTED.

37. ALL KNOWN EXISTING UTILITY LINES ARE SHOWN FOR INFORMATION ONLY. CONTRACTOR SHALL EXERCISE ALL NECESSARY CAUTION TO AVOID DAMAGE TO ANY EXISTING UTILITY LINES OR FACILITIES TO REMAIN IN PLACE, WHETHER OR NOT SUCH LINES OR FACILITIES ARE SHOWN ON THESE PLANS, AND SHALL BEAR FULL RESPONSIBILITY FOR ANY DAMAGE THERETO. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION AND DEPTH. NEITHER THE CITY OF TRACY NOR THE DESIGN TEAM ASSUMES RESPONSIBILITIES THAT EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED WILL BE THOSE ENCOUNTERED. LOCATIONS MAY NOT HAVE BEEN VERIFIED IN THE FIELD AND NO GUARANTEE IS MADE AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL NOTIFY AN UNDERGROUND UTILITY LOCATING COMPANY HIRED BY THE CONTRACTOR FIVE (5) WORKING DAYS IN ADVANCE OF CONSTRUCTION TO FIELD LOCATE UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE EXISTENCE AND LOCATION OF THOSE UTILITIES SHOWN ON THESE PLANS OR INDICATED IN THE FIELD BY LOCATING SERVICES TO VERIFY LOCATIONS OF EXISTING UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION. ALL WORK SHALL BE BORNE BY THE CONTRACTOR.

38. CONTRACTOR IS RESPONSIBLE FOR COORDINATING HIS WORK TO AVOID CONFLICTS BETWEEN SEWER. STORM DRAINS, WATER, GAS, AND ELECTRICAL MAINS. THE GENERAL CONTRACTOR SHALL EMPLOY A UTILITY AND SERVICE LOCATOR IN LOCATING BURIED UTILITIES AND SERVICES AT (AND IN THE VICINITY OF) THE PROJECT.

39. CONTRACTOR IS RESPONSIBLE FOR HAVING EXISTING GAS LINES, POWER LINES, WATER LINES, SEWER LINES, COMMUNICATION LINES, CABLE, ELECTRICAL LINES, ETC. DISCONNECTED AND RELOCATED AS NECESSARY. CONTRACTOR SHALL COORDINATE WORK WITH UTILITY COMPANIES.

40. UTILITIES OR SERVICES TEMPORARILY REMOVED OR DISCONNECTED IN ORDER TO PERFORM THE WORK SHALL BE REBUILT OR REPLACED TO MATCH THE (E) CONDITION PRIOR TO THEIR REMOVAL AND REINSTALLATION. SUCH WORK SHALL BE SUBJECT TO THE APPROVAL OF THE CITY.

CITY OF TRACY

Think Inside the Triangle

LICENSED ARCHITECT
PAUL W. POWERS
C-29713
2/28/2027
RENEWAL DATE
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CHECKED BY: PWP
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PERMIT #: COM24-0353

GENERAL NOTES

TRANSIT STATION EMERGENCY BACKUP GENERATOR

50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

G002

CONSTRUCTION NOTES - CONTINUED

41. UTILITY CONNECTIONS AND DISCONNECTIONS NECESSARY TO COMPLETE THE WORK WILL BE PERFORMED IN SUCH A MANNER AS TO MINIMIZE UTILITY SERVICE INTERRUPTIONS TO FACILITY OPERATIONS IN THE VICINITY OF CONSTRUCTION. THE CONTRACTOR WILL COORDINATE ALL UTILITY INTERRUPTIONS DURING ALL PHASES OF CONSTRUCTION. COORDINATE ALL OWNER'S "DOWN TIME" WITH THE CITY OF TRACY.

42. ALL EXCAVATIONS SHOULD BE PERFORMED IN ACCORDANCE WITH CAL OSHA REQUIREMENTS.

43. WHERE UNSTABLE OR UNSUITABLE MATERIALS ARE ENCOUNTERED DURING SUBGRADE PREPARATION, THE AREA IN QUESTION SHALL BE OVER EXCAVATED AND REPLACED BY SELECTED BACKFILL MATERIAL AS DIRECTED BY THE CITY OF TRACY.

44. CONTRACTOR IS TO DELIVER TO THE CITY OF TRACY THE PROJECT IN A COMPLETE AND OPERATIONAL MANNER. THE CONTRACTOR IS RESPONSIBLE FOR ANY INVESTIGATION OR STUDIES THAT ARE REQUIRED BY THE CONTRACTOR TO SATISFY THIS REQUIREMENT. NO ADDITIONAL COMPENSATION SHALL BE PAID FOR SAW CUT/FILL AND/OR IMPORT/EXPORT.

45. LOCATE CONTRACTOR STAGING AND STORAGE AREA, PORTABLE TOILETS WITH LOCATION APPROVED BY THE CITY OF TRACY. PROVIDE BASE/PAVING IF REQUIRED BY GENERAL CONTRACTOR.

46. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN CONTROL OF THE ENTIRE CONSTRUCTION OPERATION AND TO KEEP THE ENTIRE SITE IN COMPLIANCE WITH STATE AND LOCAL LAWS AND MEASURES.

47. ADJUSTMENTS SHALL BE MADE TO THIS PLAN AS NECESSARY TO WORK WITH THE CONSTRUCTION PHASING OF THE PROJECT. CONTRACTOR SHALL SUBMIT PHASING PLAN TO THE CITY OF TRACY FOR APPROVAL.

48. HEREIN MAY NOT COVER ALL THE SITUATIONS THAT MAY ARISE DURING CONSTRUCTION DUE TO UNANTICIPATED FIELD CONDITIONS. VARIATIONS AND ADDITIONS MAY BE MADE BY THE CONTRACTOR TO THIS PLAN WITH THE APPROVAL BY THE CITY OF TRACY. COST REGARDING ADJUSTING EROSION CONTROL PLAN DUE TO UNANTICIPATED AND CHANGING FIELD CONDITIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

49. CONTRACTOR SHALL CARRY OUT CONSTRUCTION OPERATIONS IN SUCH A MANNER THAT EROSION AND WATER POLLUTION WILL BE MINIMIZED. EXERCISE REASONABLE CARE WHEN HAULING ANY CONSTRUCTION DEBRIS OVER EXISTING ROADWAYS, PARKING LOTS, AND BUS DRIVEWAYS. SHOULD ANY BLOW, SPILL OR TRACK OVER AND UPON SAID PUBLIC OR ADJACENT PRIVATE PROPERTY, IMMEDIATELY REMEDY THE SITUATION BY USING PROPER CLEANING PROCEDURES. CONTRACTOR SHALL KEEP ALL PAVED AREAS CLEAR OF EARTH, MATERIAL AND DEBRIS. PROVIDE STREET SWEEPING AS NECESSARY, PER BMP FACT SHEET SE-7 OF "THE HANDBOOK". MAINTAIN AN INSPECTION SCHEDULE FOR THE IMPLEMENTED SEDIMENT AND EROSION BMP MEASURES AT LEAST ONCE A WEEK AND/OR 24 HOURS BEFORE AND AFTER A FORECASTED RAIN EVENT.

50. VACUUM, DUST, SWEEP AND REMOVE DEBRIS DAILY.

51. COORDINATE ANY NECESSARY ELECTRICAL OR OTHER SYSTEM SHUTDOWN WITH THE CITY OF TRACY AT LEAST 30 DAYS IN ADVANCE. PROVIDE ALL NECESSARY LIFE SAFETY, SECURITY AND MONITORING DURING SHUTDOWN.

52. PROTECT ALL EXISTING ITEMS AND FINISHES TO PROTECT THEM FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION.

53. PROTECT EXISTING WATER VALVE, IRRIGATION WIRING, UTILITIES, COMMUNICATION AND OTHER SITE ATTRIBUTES AS REQUIRED DURING DEMOLITION AND NEW CONSTRUCTION.

54. REPLACE ALL (E) ITEMS TO REMAIN THAT ARE DAMAGED/REMOVED BY CONSTRUCTION ACTIVITIES, AT NO ADDITIONAL COST TO CITY OF TRACY.

55. PROVIDE ANY NECESSARY OFF-SITE STORAGE AND STAGING.

56. MAINTAIN HIGH VISIBILITY PLASTIC (ORANGE OR EQUAL) 4'-0" HIGH CONSTRUCTION BARRIER (FENCE WITH VISUAL CONTROLS) AT ALL TIMES AROUND ENTIRE PERIMETER OF SITE. ALL CONSTRUCTION BARRIERS ARE DIAGRAMMATIC. ADJUST LOCATION AND CONFIGURATION OF CONSTRUCTION BARRIERS DURING THE PROJECT AS NECESSARY. PROVIDE ADEQUATE SAFETY BARRICADES AT NO ADDITIONAL COST TO THE CITY OF TRACY. MAINTAIN SITE FREE OF GRAFFITI (TAGGING) AND BUILD UP OF DEBRIS ALONG FENCE PERIMETER, BOTH SIDES.

57. KEYED NOTES AND SCHEDULED MAINTENANCE CLEANUP PHASES OF START AND STOP DEPEND UPON ACTUAL CONSTRUCTION SEQUENCE BY CONTRACTOR.

58. DRAWINGS AND SPECIFICATIONS ARE COMPLIMENTARY TO EACH, NOT SELF-SUFFICIENT. ALL THAT IS MENTIONED IN SPECIFICATIONS AND NOT SHOWN ON DRAWINGS OR SHOWN ON DRAWINGS AND NOT MENTIONED IN SPECIFICATIONS SHALL BE AS IF SHOWN ON OR MENTIONED IN BOTH.

59. CONTRACTOR SHALL MEET APPLICABLE PROVISION OF CFC CHAPTER 33: FIRE SAFETY DURING CONSTRUCTION, ALTERATION AND DEMOLITION

60. ROCKS LARGER THAN 3 INCHES, DEBRIS, THRASH AND MATERIAL UNSUITABLE FOR RECOMPACTION ENCOUNTERED DURING TRENCHING AND EXCAVATIONS SHALL BE REMOVED FROM SITE AT NO ADDITIONAL COST TO CITY.

61. ALL ACCESSIBILITY FEATURES PROVIDED ON SITE AND AT OR IN BUILDINGS ARE TO COMPLY WITH THE APPLICABLE SECTIONS OF 2022 CALIFORNIA BUILDING CODE SECTION 11B, 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN, AND TITLE II OF THE ADA.

62. SEQUENCING OF CONCRETE SIDEWALK POURS AND OTHER ADJACENT ELEMENTS: NO CONCRETE SIDEWALKS ARE TO BE CONSTRUCTED PRIOR TO ADJOINING ELEMENTS (CURBING, FOUNDATIONS, ETC.) OR PRIOR TO THE CONSTRUCTION OR SETTING OF ANY BUILDING AND ITS ENTRANCE DOOR THRESHOLD(S).

63. PROVIDE A 3-A:40-B:C (10LB. CAPACITY) RATED FIRE EXTINGUISHER NEAR THE GENERATOR AT NO MORE THAN FIVE (5) FEET ABOVE FLOOR LEVEL. EXTINGUISHER SHALL BE COMMERCIAL GRADE, CURRENTLY TAGGED, OR HAVE MANUFACTURER DATE CLEARLY MARKED ON THE EXTINGUISHER. A WEATHER-PROOF CABINET SHALL BE PROVIDED FOR FOR EXTERIOR MOUNT INSTALLATIONS. (906.1) CFC

64. PROVIDE NFPA 704 PLACARDS ON THE EXTERIOR OF DOOR/GATES OF THE GENERATOR ENCLOSURES AS FOLLOWS:
HEALTH; (BLUE)-1, FIRE; (RED)-2, REACTIVITY; (YELLOW)-0



NFPA 704 PLACARDS SHALL BE VISIBLE FROM ALL ANGLES OF APPROACH. (5704.2.3.2) AND (5003.5) CFC

65. SIGNS PROHIBITING SMOKING AND OPEN FLAMES SHALL BE POSTED. (5704.2.3.2) CFC

66. THE VENT PIPE OUTLET SHALL BE LOCATED SUCH THAT THE VAPORS ARE RELEASED NOT LESS THAN TWELVE (12) FEET ABOVE FINISHED GROUND LEVEL. (5704.2.7.3.3) CFC

67. ENCLOSURES SUBJECT TO VEHICLE CONTACT SHALL HAVE VEHICLE IMPACT PROTECTION IN ACCORDANCE WITH SECTION 312 OF THE CALIFORNIA FIRE CODE. BOLLARDS SHALL NOT BE LESS THAN 4 INCH DIAMETER STEEL, CONCRETE FILLED, NOT LESS 3 FEET ABOVE GRADE AND NOT LESS THAN 3 FEET BELOW GRADE INTO A MINIMUM 15 INCH DIAMETER CONCRETE BASE. (5703.6.4) CFC

68. CONTACT THE SOUTH SAN JOAQUIN COUNTY FIRE AUTHORITY (MINIMUM 2 WORKING DAYS IN ADVANCE) TO SCHEDULE A FINAL FIRE INSPECTION. (209-831-6700)

69. APPROVED STAMPED PLANS SHALL BE ONSITE AT THE TIME OF THE INSPECTION. FAILURE TO HAVE APPROVED PLANS ON SITE MAY RESULT IN THE CANCELLATION OF THE INSPECTION, AND A REINSPECTION FEE BEING ASSESSED.

70. SJCFA APPROVAL DOES NOT RELIEVE THE DESIGNER/CONTRACTOR FROM FULLY COMPLYING WITH ALL APPLICABLE FIRE CODE REQUIREMENTS, NOR DOES IT ABROGATE THE REQUIREMENTS OF OTHER AUTHORITIES HAVING JURISDICTION.

GENERATOR CONSTRUCTION NOTES

1. CONTRACTOR SHALL PROVIDE ALL TEMPORARY FENCING, LIGHTING AND SIGNAGE FOR A SAFE AND SECURE WORK SITE.

2. EXCAVATION OF ANY DEPTH BELOW 3'-0" SHALL BE REQUIRED TO CONTACT THE CITY OF TRACY.

APPLICABLE BUILDING CODES AND STANDARDS:

- ADMINISTRATIVE: 2022 CALIFORNIA ADMINISTRATIVE CODE & SUPPLEMENT JULY 2021
- BUILDING CODE: 2022 CALIFORNIA BUILDING CODE (VOL. 1 & 2) & SUPPLEMENT JULY 2021
- STRUCTURAL CODE: 2022 CALIFORNIA BUILDING CODE
- PLUMBING CODE: 2022 CALIFORNIA PLUMBING CODE & SUPPLEMENT JULY 2021
- MECHANICAL CODE: 2022 CALIFORNIA MECHANICAL CODE & SUPPLEMENT JULY 2021
- ELECTRICAL CODE: 2022 CALIFORNIA ELECTRIC CODE
- NFPA 70: 2020 NATIONAL ELECTRICAL CODE
- FIRE PROTECTION: 2022 CALIFORNIA FIRE CODE & SUPPLEMENT JULY 2021
- NFPA 13: 2019 STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
- ENERGY CODE: 2022 CALIFORNIA ENERGY CODE
- SUSTAINABILITY: 2022 CALIFORNIA GREEN BUILDING STANDARDS
- ADA: 2010 ADA STANDARDS
- GREEN BUILDING: 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE & SUPPLEMENT JULY 2021
- REFERENCED: 2019 CALIFORNIA REFERENCED STANDARDS CODE
- NATIONAL FIRE ALARM AND SIGNALING CODE 2016 OF CALIFORNIA ADOPTS WITH AMENDMENTS: NFPA 72, 2016
- BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE OF CALIFORNIA ADOPTS WITH AMENDMENTS: ACI 318 2014
- TITLE 24: 2019 TITLE 24 CALIFORNIA CODE OF REGULATIONS, AS AMENDED PER THE CITY OF TRACY MUNICIPAL CODE

DRAWING CONVENTIONS AND DIMENSIONING:

1. CONSTRUCTION DRAWINGS MAY BE IN VARIANCE TO EXISTING AS-BUILT CONDITIONS IN THE FIELD. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND DIMENSIONS IN THE FIELD WHERE CONTRACT WORK OCCURS.

2. THE CONTRACTOR SHALL NOT SCALE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO THE START OF WORK AND SHALL NOTIFY THE OWNER OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

3. DIMENSIONS ARE NOT ADJUSTABLE WITHOUT REVIEW BY THE ARCHITECT. DIMENSIONS NOTED "CLR" OR "CLEAR" MUST BE STRICTLY MAINTAINED ALLOWING FOR THICKNESS OF ALL FINISHES INCLUDING BASE, TILE, GYPSUM BOARD, ETC. CHECK DIMENSIONS NOTED "VERIFY IN FIELD" OR "V.I.F." PRIOR TO CONSTRUCTION.

4. DIMENSIONS ARE INDICATED TO THE CENTERLINE OF THE STRUCTURAL GRID AND FACE OF FINISH WALL OR PARTITION TYPE AS SCHEDULED, UNLESS OTHERWISE NOTED.

5. VERTICAL DIMENSIONS ARE INDICATED FROM THE FLOOR ELEVATION TO FACE OF FINISHED MATERIAL AT THE DIMENSION POINT, UNLESS NOTED ABOVE FINISH FLOOR A.F.F.

6. DIMENSIONS SHOWN ON THE DRAWINGS SHALL INDICATE THE REQUIRED SIZE, CLEARANCE, AND DIMENSIONAL RELATIONSHIP BETWEEN PROJECT SYSTEMS AND COMPONENTS. DIMENSIONS SHALL NOT BE DETERMINED BY SCALING THE DRAWINGS.

7. "ALIGN" MEANS ACCURATELY LOCATE FINISH FACES IN THE SAME PLANE.

8. "TYPICAL" OR "TYP" MEANS IDENTICAL FOR ALL SIMILAR CONDITIONS U.O.N.

9. "SIMILAR" MEANS COMPARABLE CHARACTERISTICS FOR THE CONDITIONS NOTED. VERIFY DIMENSIONS AND ORIENTATION ON PLANS AND ELEVATIONS.

10. "PARTIAL" MEANS A LIMITED PORTION OF AN ELEMENT (I.E. WALL, BASE, FLOOR OR CEILING) AFFECTED BY THE ADJACENT REMOVAL AND/OR NEW CONSTRUCTION.

11. "AS REQUIRED" INDICATES COMPONENTS REQUIRED TO COMPLETE THE WORK AS INDICATED IN THE PROJECT DOCUMENTS.

12. ALIGNMENT OF PARTITIONS AND FINISHES AS SCHEDULED SHALL BE STRAIGHT, TRUE & PLUMB. THE PRIORITY FOR PROJECT DIMENSIONS SHALL BE IN THE FOLLOWING ORDER:

a. MINIMUM DIMENSIONS FOR ACCESSIBILITY CLEARANCE AND BUILDING CODE REQUIREMENTS
b. LARGE SCALE DETAILS
c. SMALL SCALE DETAILS
d. ENLARGED VIEWS
e. FLOOR PLANS AND ELEVATIONS

CITY OF TRACY

TRACY Think Inside the Triangle

LICENSED ARCHITECT
PAUL W. POWERS
C-29713
2/28/2027
RENEWAL DATE
STATE OF CALIFORNIA

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SYMBOL	DATE	DESCRIPTION	APPROVED
1	12-13-24	ROOF COMMENTS REV 1	

PREVISIONS

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353

GENERAL NOTES

TRANSIT STATION EMERGENCY BACKUP GENERATOR

50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

G003

SCOPE

1. THE FOLLOWING GENERAL NOTES APPLY TO THE ENTIRE SET OF DRAWINGS LISTED BY THE "INDEX OF DRAWINGS".

2. THE COMPLETE SET OF DRAWINGS CONSISTS OF ALL DRAWINGS LISTED BY THE "SHEET INDEX" ON SHEET G001. COMPLETION OF WORK DESCRIBED MAY BE AFFECTED BY THE DRAWINGS OF ANOTHER DISCIPLINE. PARTIAL SETS OF DRAWINGS ARE INCOMPLETE. DO NOT DISTRIBUTE OR UTILIZE PARTIAL SETS OF DRAWINGS FOR CONSTRUCTION.

3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW AND COORDINATE THE WORK OF ALL SUBCONTRACTORS, TRADES, AND SUPPLIERS WITH ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS BEFORE COMMENCING CONSTRUCTION AND TO ASSURE THAT ALL PARTIES ARE AWARE OF ALL REQUIREMENTS REGARDLESS OF WHERE THE REQUIREMENTS OCCUR IN THE CONTRACT DOCUMENTS WHICH MIGHT AFFECT THE WORK OF THAT PARTY.

4. ALL WORK SHOWN IS BY CONTRACTOR U.O.N. ALL DRAWINGS AND SPECIFICATIONS ARE CONSIDERED TO BE PART OF THE CONTRACT DOCUMENTS. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE COMPLEMENTARY. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

5. THE ARCHITECTURAL DRAWINGS SHOW PRINCIPAL AREAS WHERE WORK MUST BE ACCOMPLISHED UNDER THIS CONTRACT. INCIDENTAL WORK MAY ALSO BE NECESSARY IN AREAS NOT SHOWN ON THE ARCHITECTURAL DRAWINGS DUE TO WORK IMPACTS FROM THE MECHANICAL, PLUMBING AND ELECTRICAL RETROFIT. SUCH INCIDENTAL WORK IS ALSO PART OF THIS CONTRACT.

6. ALL WORK SHALL COMPLY WITH APPLICABLE CODES AMENDMENTS, RULES, REGULATIONS, ORDINANCES, LAWS, ORDERS, APPROVALS, ETC. THAT ARE REQUIRED BY THE AUTHORITY HAVING JURISDICTION OVER THE WORK. IN THE EVENT OF CONFLICT, THE MOST STRINGENT REQUIREMENTS SHALL APPLY. REQUIREMENTS INCLUDE, BUT ARE NOT LIMITED TO, THE CURRENT APPLICABLE EDITIONS OF PUBLICATIONS.

7. NO PART OF THE CONTRACT DOCUMENTS SHALL BE CONSTRUED TO REQUIRE OR PERMIT WORK CONTRARY TO AN APPLICABLE GOVERNING RULE, CODE, REGULATION, ORDINANCE, OR LAW.

8. APPLICABLE PORTIONS OF THE CODES, REGULATIONS, AND STANDARDS LISTED HERE ARE INCORPORATED BY REFERENCE INTO THE REQUIREMENTS OF THIS CONTRACT AND ESTABLISH MINIMUM REQUIREMENTS WITH WHICH THE WORK MUST COMPLY.

9. PROPRIETARY PRODUCTS OR ASSEMBLIES UTILIZED AS "BASIS OF DESIGN":

   A. ON OCCASION, THE DRAWINGS MAY REFER TO A SINGLE PROPRIETARY PRODUCT OR ASSEMBLY WHILE THE SPECIFICATIONS LIST TWO OR MORE ACCEPTABLE MANUFACTURES AND/OR PRODUCTS, WHEN THIS OCCURS, THE PRODUCT OR ASSEMBLY ILLUSTRATED BY THE DRAWINGS IS THE "BASIS OF DESIGN" PRODUCT OR ASSEMBLY.

   B. THE DIMENSIONS, MOUNTING HEIGHTS, CLEARANCES, AND ACCESS REQUIREMENTS OF SPECIFIED PRODUCTS AND ASSEMBLIES OTHER THAN THE "BASIS OF DESIGN" MAY VARY FROM THAT SHOWN BY THE DRAWINGS.

   C. THE CONTRACTOR MAY UTILIZE ANY OTHER SPECIFIC PRODUCT OR ASSEMBLY IN LIEU OF THE "BASIS OF DESIGN" PRODUCT OR ASSEMBLY, AS APPROVED BY ARCHITECT. HOWEVER, THE CONTRACTOR IS RESPONSIBLE (AT NO ADDITIONAL EXPENSE TO THE OWNER) FOR ALL COORDINATION AND REVISIONS TO DIMENSIONS AND/OR DETAILS NECESSARY TO ACHIEVE THE SAME FUNCTIONAL AND AESTHETIC DESIGN INTENT AS ILLUSTRATED BY THE "BASIS OF DESIGN" SHOWN BY THE CONTRACT DOCUMENTS.

10. THE CONTRACTOR SHALL VISIT THE PROJECT SITE AND VERIFY THAT ALL DEMOLITION AND RECONSTRUCTION WORK DESCRIBED BY THE CONTRACT DOCUMENTS IS SUBSTANTIALLY INDICATED AND CLEAR.

11. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS, BE RESPONSIBLE FOR THE REVIEW AND COORDINATION OF ALL DRAWINGS PRIOR TO SUBMITTING ANY BID. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER PRIOR TO CONSTRUCTION SO THAT A CLARIFICATION CAN BE ISSUED.

12. CONFLICTS BETWEEN VARIOUS ELEMENTS OF THE DRAWINGS, SPECIFICATIONS, NOTES AND DETAILS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND RESOLVED BEFORE PROCEEDING WITH WORK.

13. THE CONTRACTOR MUST SUBMIT IN WRITING ANY REQUESTS FOR MODIFICATIONS TO THE PLANS AND SPECIFICATIONS.

14. PERFORM THE WORK AT THE PROJECT SITE DURING NORMAL BUSINESS HOURS, UNLESS OTHERWISE NOTED.

15. PROVIDE ALL LABOR, MATERIALS, ARTICLES, SUPPLIES AND EQUIPMENT AS SPECIFIED, DESIGNATED, OR REQUIRED BY THE CONTRACT.

16. CONTRACTOR SHALL PROTECT FROM DAMAGE ALL ELEMENTS TO REMAIN, WHICH ARE IN THE VICINITY OF CONSTRUCTION ACTIVITIES.

17. ALL EXISTING UTILITIES ARE TO BE ABANDONED AND SHALL BE REMOVED AS SHOWN ON UTILITY DEMOLITION SHEET.

18. ERECT AND INSTALL ALL WORK LEVEL, PLUMB, SQUARE, TRUE, STRAIGHT AND IN PROPER ALIGNMENT.

19. INSTALL MANUFACTURED MATERIALS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS, UNLESS OTHERWISE NOTED.

20. APPLICATION OF FINISH: SURFACES PREVIOUSLY PREPARED OR INSTALLED BY ANOTHER TRADE SHALL BE INSPECTED CAREFULLY BY THE SUBCONTRACTOR BEFORE APPLYING SUBSEQUENT MATERIALS OR FINISHES. IF SURFACES ARE NOT ACCEPTABLE, THE GENERAL CONTRACTOR SHALL BE NOTIFIED IMMEDIATELY IN ORDER THAT CORRECTIONS MAY BE MADE. APPLICATION OF FINISHES WILL BE CONSTRUED AS ACCEPTANCE OF RESPONSIBILITY BY THE SUBCONTRACTOR FOR THE BASE UPON WHICH IT IS APPLIED.

21. SAFETY MEASURES: AT ALL TIMES THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONDITIONS AT THE JOB SITE, INCLUDING SAFETY OF PEOPLE AND PROTECTION OF PROPERTY. ARCHITECT'S SITE VISITS ARE NOT INTENDED TO REVIEW THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES.

22. ALL WASTE AND REFUSE GENERATED BY THE WORK OF THIS PROJECT SHALL BE REMOVED FROM PREMISES AND PROPERLY DISPOSED OF BY CONTRACTOR. CLEAN SITE AT REGULAR INTERVALS AND AT THE END OF PROJECT. THE PREMISES SHALL BE LEFT CLEAR AND CLEAN TO THE SATISFACTION OF THE CITY OF TRACY. REMOVE DUST, DEBRIS, OILS, STAINS, FINGERPRINTS AND LABELS FROM EXPOSED SURFACES, INCLUDING BOTH SIDES OF GLAZING.

23. NO FACTORY COMPLIANT TIER 4 DIESEL GENERATORS SHALL BE PROVIDED. AFTERMARKET TIER 4 EMISSIONS TREATMENT SYSTEM REQUIRED

24. WHEN PROJECT IS COMPLETE, CLEAN ENTIRE AREAS AFFECTED BY CONSTRUCTION, GENERATOR ENCLOSURE, AND SITEWORK.

COORDINATION

1. REVIEW ALL CONTRACT DOCUMENTS. VERIFY ALL FIELD DIMENSIONS AND CONDITIONS AND CONFIRM THAT WORK IS CONSTRUCTIBLE AS SHOWN. IMMEDIATELY REPORT ANY CONFLICTS OR OMISSIONS TO THE ARCHITECT FOR CLARIFICATION BEFORE THE PERFORMANCE OF ANY WORK IN QUESTION.

2. VERIFY THAT NO CONFLICTS EXIST IN LOCATIONS OF ANY AND ALL MECHANICAL, TELEPHONE, ELECTRICAL, LIGHTING, PLUMBING, AND SPRINKLER EQUIPMENT (INCLUDING ALL PIPING, DUCTS AND CONDUITS), AND THAT ALL REQUIRED CLEARANCES FOR INSTALLATION AND MAINTENANCE OF EQUIPMENT ARE PROVIDED.

3. DETAILS SHOWN IN DRAWINGS APPLY TO ALL APPLICABLE CONDITIONS WHETHER OR NOT SPECIFICALLY REFERENCED.

4. ANY CONFLICTS BETWEEN DRAWINGS AND SPECIFICATIONS SHALL BE REPORTED TO THE OWNER FOR WRITTEN INTERPRETATION BEFORE THE PERFORMANCE OF ANY WORK IN QUESTION.

5. PLANNING AND ACCOMMODATION FOR ADJACENT FACULTY USES AND PUBLIC ACCESS SHALL BE CONSIDERED AND SHOWN ON CONTRACTOR SUBMITTED DEMOLITION, OPERATIONAL AND COMPLIANCE PLANS.

6. CONTRACTOR SHALL ESTABLISH/VERIFY BENCHMARKS, AND THE LOCATION. ADD BEARING ON NEW STRUCTURES AND FENCING.

7. WORK SHOWN IS PRIMARILY SHOWN BY A SYSTEM OF ELEMENTS COMPRISED TO CREATE A FUNCTIONAL, USEABLE AND COMPLETE FACILITY AND SITE. VARIOUS MATERIALS AND PIECES OF EQUIPMENT ARE FITTED TO OTHERS, VARIOUS MATERIALS ARE APPLIED TO WHICH OTHER MATERIALS ATTACH AND SIMILAR INSTALLATION RELATIONSHIP. EACH MANUFACTURER, CONTRACTOR, AND SUBCONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTION TO INSURE THAT MATERIALS, DEVICES, ITEMS, EQUIPMENT OR OTHER PRODUCTS CAN BE SATISFACTORILY APPLIED OR INSTALLED TO EACH OTHER OR WORK OF OTHERS, AND SHALL MAKE NECESSARY ADJUSTMENT DURING PREPARATION OF SHOP DRAWINGS OR IN ADVANCE OF FIELD OR SHOP WORK TO ACCOMMODATE OTHER WORK TO PREVENT UNSATISFACTORY ITEMS OR INSTALLATION.

8. PROPER PERFORMANCE OF THE CONTRACT SHALL IMPLY, AMONG OTHER THINGS, CORRECT AND PROPER PLACEMENT, PROPER OR PUBLISHED RESULTS FOR PRODUCTS AND EQUIPMENT, FITTING AND OPERATIONS OF FIXED OR MOVABLE AND OPERATING PARTS OF THE WORK, INCLUDING DOORS, WINDOWS, HARDWARE AND ALL SYSTEMS AND EQUIPMENT. ALL MATERIALS AND EQUIPMENT SHALL BE COMPLETE IN EVERY RESPECT, WITH ALL PARTS, CONNECTIONS, ANCHORS, DEVICES, BACKING, FITTINGS, CONTROLS AND OTHER NECESSARY ITEMS, AND SHALL BE COMPLETELY INSTALLED, ANCHORED, FITTED, AND PLACED IN OPERATING CONDITION.

CITY OF TRACY

TRACY — Think Inside the Triangle

LICENSED ARCHITECT
PAUL W. POWERS
C-29713
2/28/2027
RENEWAL DATE
STATE OF CALIFORNIA

KPA ENGINEERS ARCHITECTS
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SYMBOL	DATE	REVISIONS	APPROVED
1	26-02-25	ROOK COMMENTS-REV 2	

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353

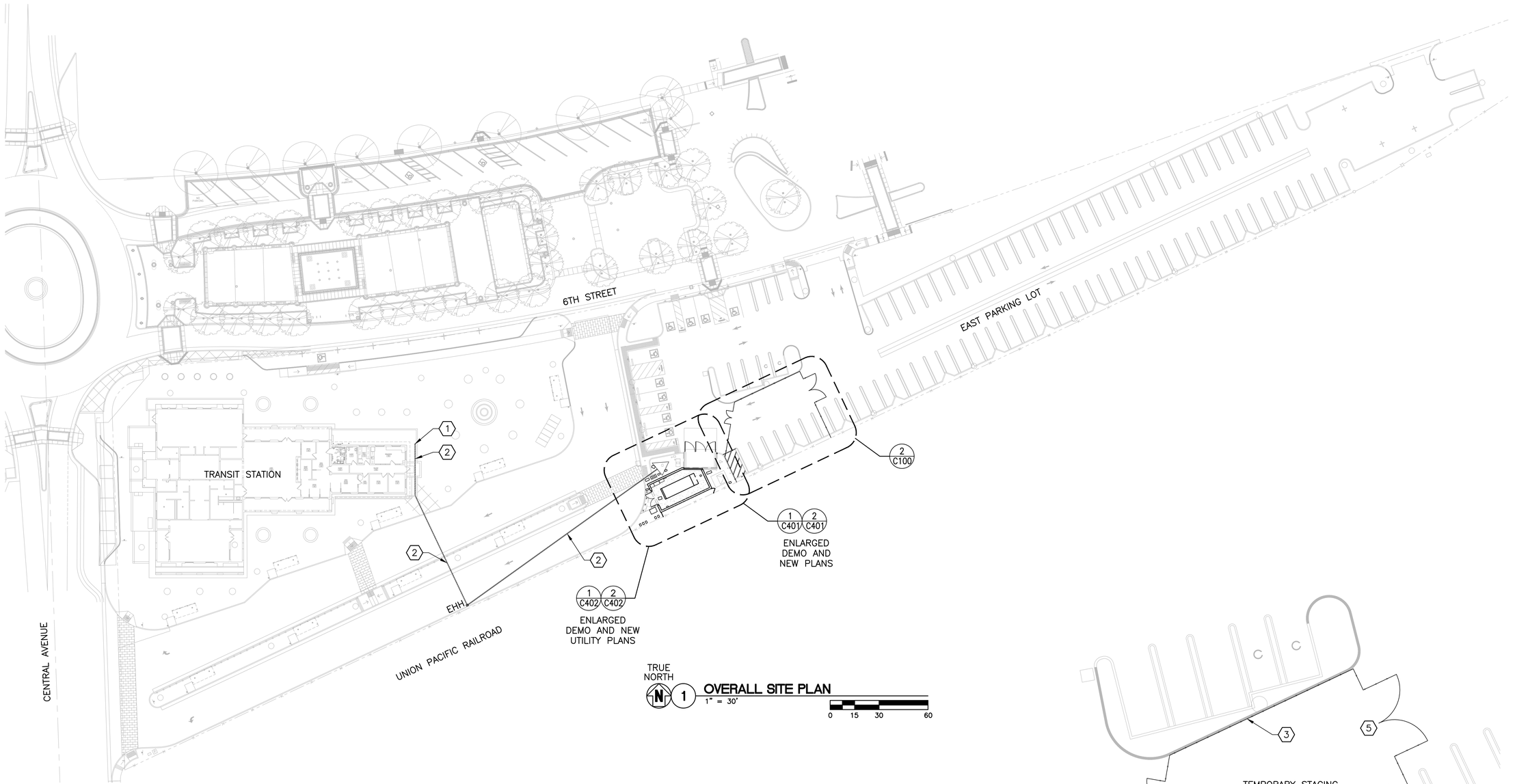
GENERAL NOTES

TRANSIT STATION EMERGENCY BACKUP GENERATOR

50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

G004

SHEET 4 OF 20

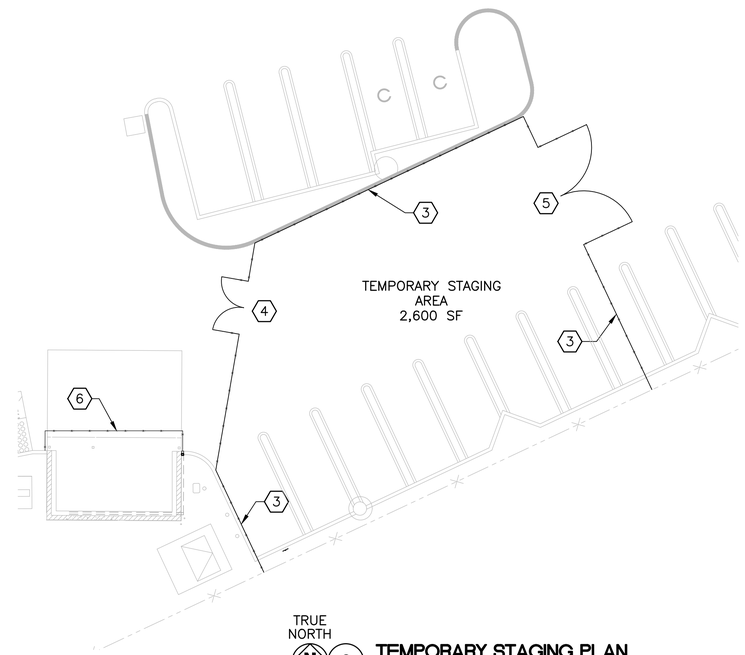


GENERAL NOTES:

1. FIELD VERIFY EXISTING CONDITIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR FINAL DECISION.
2. COORDINATE ALL DEMOLITION/NEW ELECTRICAL EQUIPMENT WITH ELECTRICAL DRAWINGS.
3. REPAIR/REFINISH ANY SURFACES DISTURBED BY DEMOLITION AND/OR NEW CONSTRUCTION. MATCH EXISTING MATERIALS.
4. CONTRACTOR MAY ALTER EXISTING FENCING AS NEEDED TO SECURE CONTRACTOR'S EQUIPMENT, TOOLS AND MATERIALS. SUBMIT TO CITY FOR REVIEW AND APPROVAL.
5. SEE ENLARGED PLAN SHEET C401 FOR DEMOLITION WORK AT LOCATION OF NEW GENERATOR.
6. COORDINATE ORDER OF WORK TO INSTALL NEW ELECTRICAL SERVICE PRIOR TO TRANSFER OF EXISTING BUILDING POWER TO NEW ELECTRICAL SERVICE. CONTRACTOR TO PROVIDE TEMPORARY POWER IF OVER 8 HOURS.

NEW WORK KEYED NOTES:

1. CONNECTION POINT FOR NEW ELECTRICAL GROUNDING CONDUCTOR TO EXISTING
2. BORE UNDERGROUND ELECTRICAL GROUNDING CONDUCTOR (MIN. 30" DEEP), SEE ELECTRICAL DRAWINGS
3. CONTRACTOR TO PROVIDE A TEMPORARY 8' HIGH CHAIN LINK FENCE. INSTALL PRIOR TO ANY CONSTRUCTION ACTIVITIES AND REMOVE UPON COMPLETION OF PROJECT.
4. PROVIDE (2) LOCKABLE 4'–0"W. MAN ACCESS GATES
5. PROVIDE (2) LOCKABLE 8'–0"W. VEHICLE ACCESS GATES
6. CONTRACTOR TO PROVIDE TEMPORARY MOVABLE 6'–8" HIGH CHAIN LINK FENCING AT TRASH ENCLOSURE UPON DEMOLITION OF (E) GATES



CITY OF TRACY

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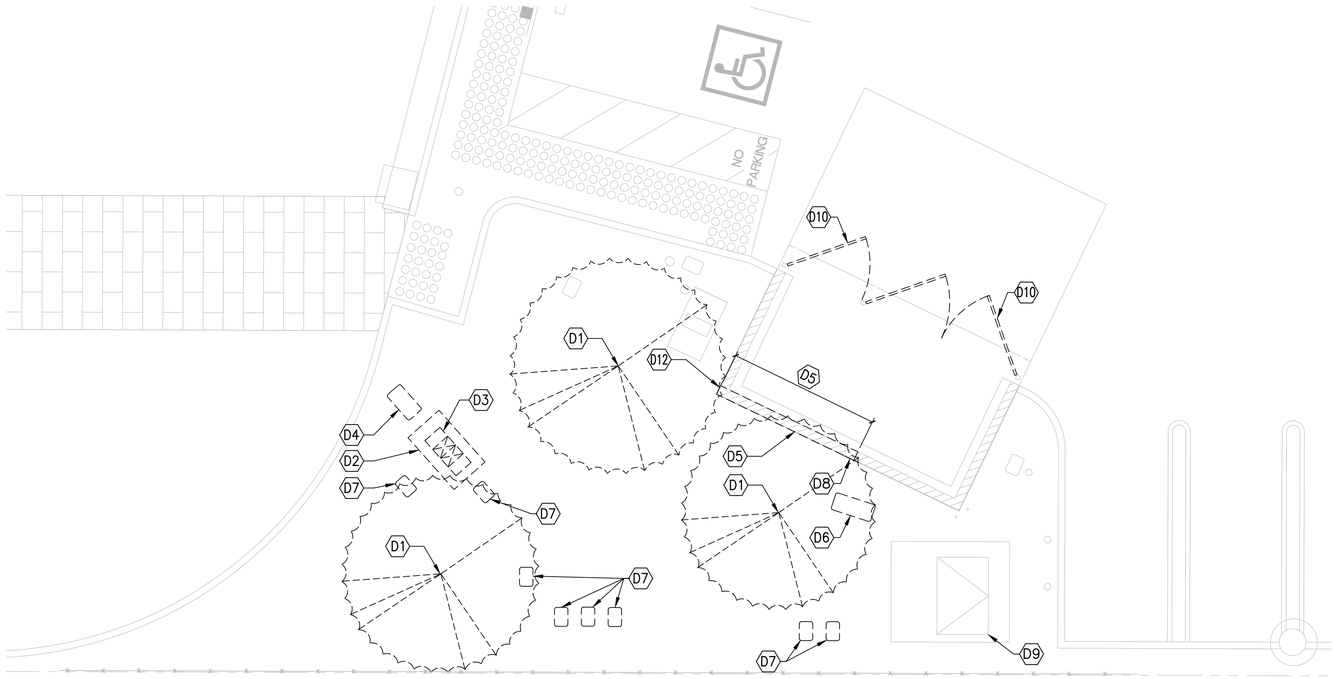
KPA ENGINEERS ARCHITECTS
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REVISIONS			
SYMBOL	DATE	DESCRIPTION	APPROVED
1	10-12-25	BCVE COMMENTS REV 2	

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
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SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353
OVERALL SITE PLAN
TRANSIT STATION EMERGENCY BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

C100

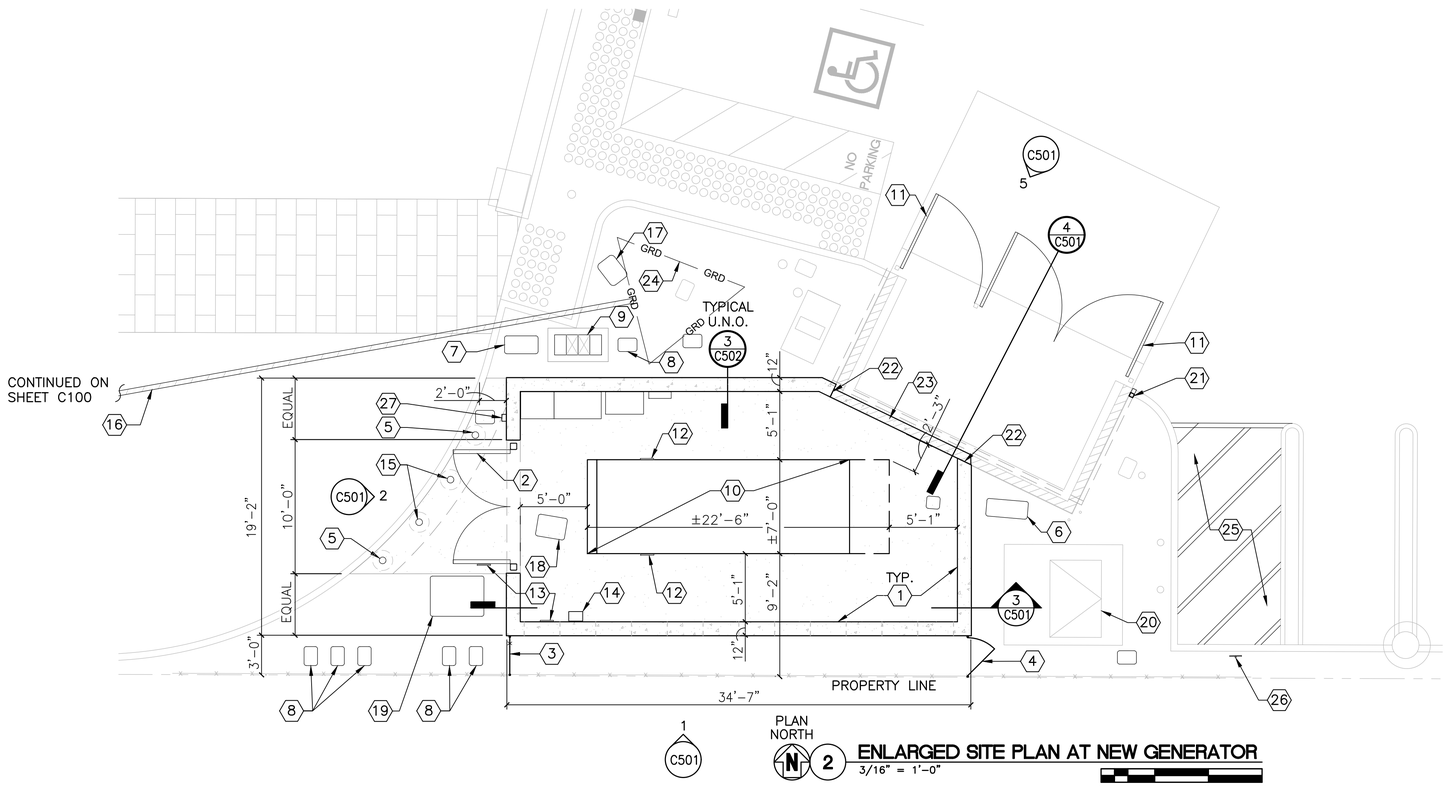


PLAN NORTH

N 1 **ENLARGED SITE DEMOLITION PLAN**

3/16" = 1'-0"

0 4' 8' 12'



1 C501

PLAN NORTH

N 2 **ENLARGED SITE PLAN AT NEW GENERATOR**

3/16" = 1'-0"

0 4' 8' 12'

GENERAL NOTES:

1. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR FINAL DECISION.
2. SEE SITE UTILITY PLAN FOR UNDERGROUND DEMOLITION, SEE C402.
3. TOTAL CAPACITY OF THE GENERATOR DIESEL SUB-BASE TANK IS 720 GALLONS.
4. THE GENERATOR INSTALLATION IS TO BE IN ACCORDANCE WITH 2021 NFPA 30 AS ADOPTED BY THE 2022 CFC.
5. METALLIC FILL PIPE TO COMPLY WITH CFC 5704.2.7.5.5 TO MINIMIZE THE GENERATION OF STATIC ELECTRICITY BY TERMINATING THE PIPE WITHIN 6" OF THE BOTTOM OF THE TANK.
6. SEE SHEET C502 FOR GENERATOR VENTING LOCATION

DEMOLITION KEYED NOTES:

D1 – REMOVE EXISTING TREE, GRIND STUMP TO 12" BELOW GRADE

D2 – REMOVE EXISTING CONCRETE SLAB

D3 – REMOVE EXISTING BACKFLOW PREVENTER AND BACKFLOW ENCLOSURE, SALVAGE FOR RE-USE, SEE 2/C401 FOR NEW LOCATION

D4 – REMOVE EXISTING WATER METER/HANDHOLE, SALVAGE AND RETURN OVER TO OWNER

D5 – REMOVE PORTION OF EXISTING PRECAST CONCRETE CAP AT LOCATION OF NEW CONCRETE WALL, SEE DETAIL 1/C502

D6 – REMOVE EXISTING COMMUNICATIONS SERVICE BOX, SALVAGE FOR RE-USE, SEE 2/C401 FOR NEW LOCATION. COORDINATE WITH COMCAST

D7 – REMOVE EXISTING IRRIGATION HANDHOLE, SALVAGE AND RETURN TO OWNER

D8 – REMOVE PORTION OF CEMENT PLASTER FINISH FOR NEW CONCRETE WALL TO BUTT INTO EXISTING MASONRY WALL

D9 – PROTECT EXISTING TRANSFORMER DURING DEMOLITION

D10 – DEMOLISH EXISTING GATES AND HARDWARE, EXISTING JAMB POSTS TO REMAIN, PREP POSTS TO RECEIVE NEW GATES

NEW WORK KEYED NOTES:

1 – 12" REINFORCED CONCRETE WALL WITH CORRUGATED METAL PANEL ABOVE, SEE EXTERIOR ELEVATIONS ON SHEET C501

2 – STEEL GATES, SEE EXTERIOR ELEVATION CALLOUT, SEE 2/C501

3 – PROVIDE NEW FENCE FROM NEW WALL TO EXISTING FENCE, HEIGHT, MATERIAL AND FINISH TO MATCH EXISTING

4 – PROVIDE NEW FENCE GATE WITH HASP AND PADLOCK, HEIGHT, MATERIAL AND FINISH TO MATCH EXISTING

5 – 6"ø STEEL PIPE BOLLARD, SEE DETAIL 6/C502, 4'-0" MAX. CENTER TO CENTER

6 – NEW LOCATION OF (E) COMMUNICATION SERVICES BOX

7 – NEW WATER METER/HANDHOLE

8 – NEW IRRIGATION HANDHOLE, SEE SHEET C402

9 – NEW LOCATION OF (E) BACKFLOW PREVENTER ON (N) CONCRETE EQUIPMENT SLAB, SEE DETAIL D8.2/C503 FOR EQUIPMENT SLAB

10 – NEW DEISEL BACK-UP GENERATOR w/ DOUBLE WALLED CONTAINMENT, CONTRACTOR TO COORDINATE LOCATION OF GENERATOR TO PROVIDE THE REQUIRED WORKING CLEARANCES. LEVEL FUEL BASE OF GENERATOR AS REQUIRED TO ACCOMMODATE SLOPED SLAB

11 – NEW TRASH ENCLOSURE GATES, SEE EXTERIOR ELEVATIONS ON SHEET C501

12 – PROVIDE NFPA 704 PLACARD AND A "NO SMOKING" SIGN MOUNTED ON GENERATOR HOUSING, SEE DETAILS 2/C502 & 8/C502

13 – PROVIDE A "NO SMOKING OR OPEN FLAME" SIGNAGE, SEE DETAIL 9/C502

14 – WEATHERTIGHT OUTDOOR FIRE EXTINGUISHER CABINET WITH 3-A:40-B:C RATED FIRE EXTINGUISHER, SURFACE MOUNTED TO CONCRETE WALL, TOP OF CABINET SHALL BE 60" MAX. ABOVE FLOOR SLAB,

15 – 6"ø REMOVABLE STEEL PIPE BOLLARD, SEE DETAIL 5/C502, 4'-0" MAX. CENTER TO CENTER

16 – BORE UNDERGROUND ELECTRICAL GROUNDING CONDUCTOR (MIN. 30" DEEP), SEE ELECTRICAL DRAWINGS

17 – NEW GROUNDING TEST WELL, SEE ELECTRICAL DRAWINGS

18 – NEW ELECTRICAL HANDHOLE, SEE ELECTRICAL DRAWINGS

19 – NEW PG&E VAULT, SEE ELECTRICAL DRAWINGS

20 – PROTECT EXISTING TRANSFORMER DURING NEW CONSTRUCTION

21 – ROOF DOWNSPOUT

22 – DOWEL (N) CONCRETE WALL TO (E) CMU TRASH ENCLOSURE WALL w/ #4'S @ 12" O.C., MIN. 6" EMBEDMENT

23 – BUILD UP (N) 8" CONCRETE WALL (E) CMU WALL, MATCH (N) CONCRETE WALL HEIGHT. SEE DETAIL 1/C502

24 – NEW ELECTRICAL COUNTERPOISE, SEE ELECTRICAL DRAWINGS

25 – PROVIDE 4"W. PAINTED STRIPING, MAX. SPACING AT 36" O.C., PAINT WHITE

26 – PROVIDE PARKING SIGNAGE, SEE DETAILS 12 & 13/C502

27 – SECURED KEY KNOX BOX LOCATION, SEE SHEET C501

CITY OF TRACY

TRACY Think Inside the Triangle

LICENSED ARCHITECT PAUL W. POWERS C-29713 2/28/2027 RENEWAL DATE STATE OF CALIFORNIA

KPA ENGINEERS ARCHITECTS
THE KPA GROUP
1840 FOURTH STREET, SUITE 200
LIVERMORE, CALIFORNIA 94550
TEL 925.223.8217 www.thekpagroup.com
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REVISIONS

SYMBOL	DATE	DESCRIPTION	APPROVED
1	12-12-24	RWQCB COMMENTS-RD 1	
2	03-13-25	RWQCB COMMENTS-RD 2	

DESIGNED BY: CDT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

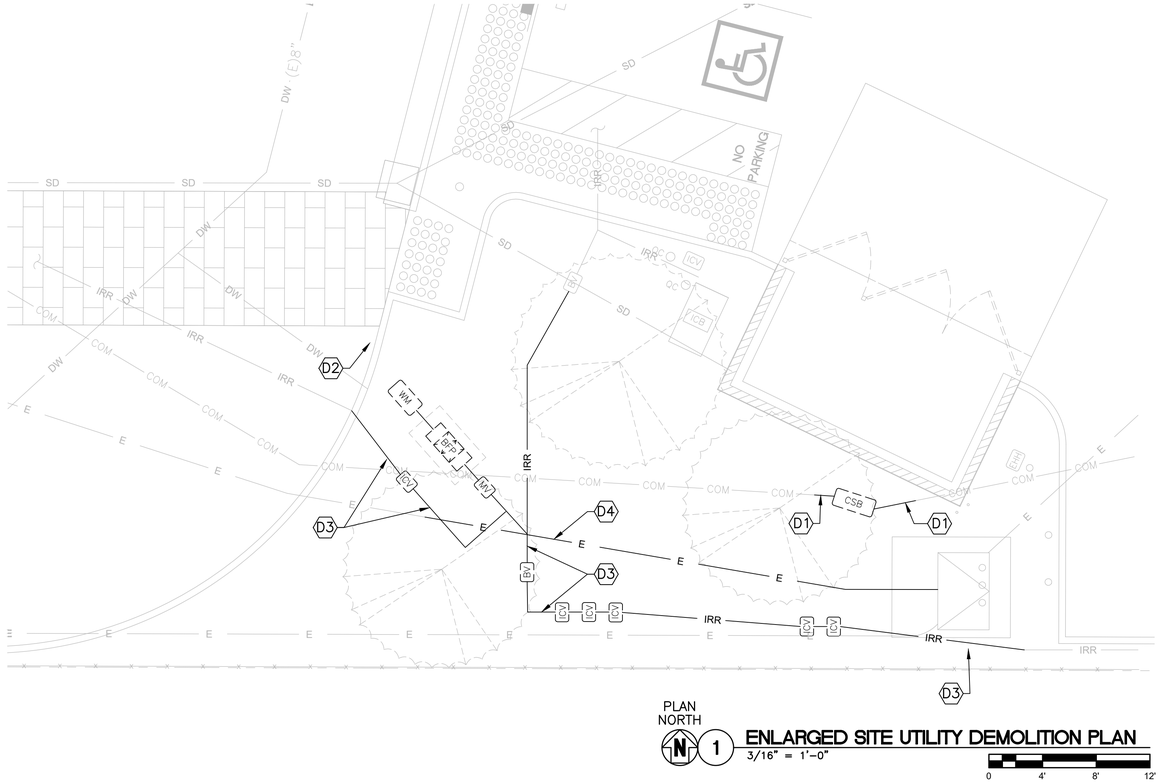
PERMIT #: COM24-0353

ENLARGED SITE PLANS - DEMO/NEW

TRANSIT STATION EMERGENCY BACKUP GENERATOR

50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

C401

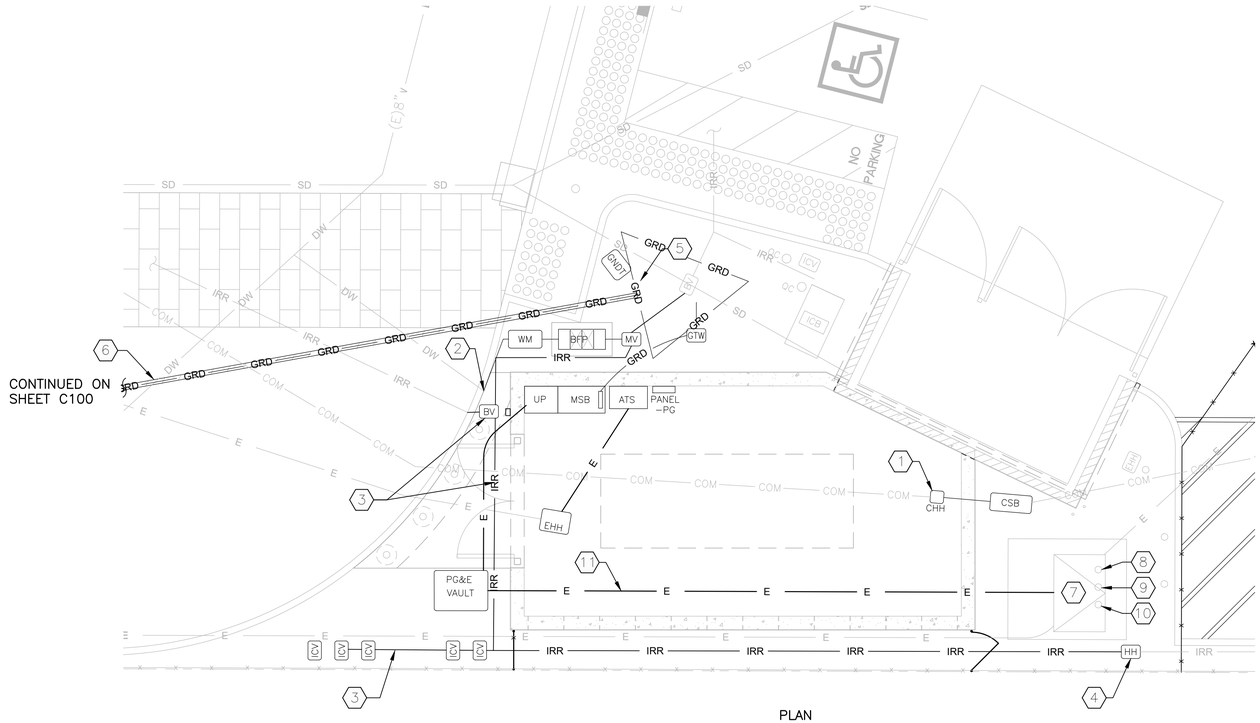


PLAN NORTH

1 ENLARGED SITE UTILITY DEMOLITION PLAN

3/16" = 1'-0"

0 4' 8' 12'



PLAN NORTH

2 ENLARGED SITE UTILITY PLAN AT NEW GENERATOR

3/16" = 1'-0"

0 4' 8' 12'

GENERAL NOTES:

1. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR FINAL DECISION.
2. VERIFY AND PROTECT ALL EXISTING UTILITY LINES THAT SHALL REMAIN.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR THE IRRIGATION OF THE AREA AFFECTED BY CONSTRUCTION, INCLUDING ALTERATION OF THE EXISTING SYSTEM TO FULLY SUPPLY LANDSCAPING THAT IS A RESULT OF ALL CONSTRUCTION AND TO ENSURE THE IRRIGATION SYSTEM WORKS AS IT DOES CURRENTLY. COORDINATE CHANGES TO IRRIGATION WITH CITY PARK MAINTENANCE.
4. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL UNDERGROUND CONDUIT FOR INSTALLATION OF THE NEW ELECTRICAL EQUIPMENT WITHIN THE GENERATOR ENCLOSURE.

DEMOLITION KEYED NOTES:

(D1) REMOVE PORTION OF COMMUNICATIONS CONDUIT FOR NEW GENERATOR ENCLOSURE

(D2) REMOVE PORTION OF WATER LINE, PROVIDE TEMPORARY WATER SERVICE "JUMPER" TO KEEP PLANTS ON SYSTEM ALIVE

(D3) REMOVE PORTION OF WATER LINE, PROVIDE TEMPORARY WATER SERVICE "JUMPER" TO KEEP PLANTS ON SYSTEM ALIVE

(D4) REMOVE PORTION OF (E) ELECTRICAL LINE FROM (E) TRANSFORMER TO NEW ELECTRICAL HANDHOLE LOCATION, SEE PLAN DETAIL 2/A402

NEW WORK KEYED NOTES:

(1) CONNECT NEW COMMUNICATIONS CONDUIT TO, (E) COMMUNICATION LINE, PROVIDE COMMUNICATIONS HANDHOLE AT NEW TO (E) SPLICE

(2) CONNECT NEW WATER METER PIPE TO EXISTING WATER LINE, PROVIDE SLEEVE FOR PIPE UNDER THE SLAB-ON-GRADE PORTION OF LINE

(3) NEW IRRIGATION WATER LINE, PLACE IN 2"ø PVC SLEEVE UNDER THE SLAB-ON-GRADE PORTION OF LINE

(4) CONNECT NEW IRRIGATION WATER LINE TO EXISTING AND CONTROL WIRE. ALL/ANY SPLICES MUST OCCUR IN BOX PER TRACY CITY STANDARDS

(5) NEW ELECTRICAL COUNTERPOISE SYSTEM, SEE ELECT. DRAWINGS

(6) BORE NEW GROUNDING CONDUCTOR AND GENERATOR COMMUNICATION FOR ANNUNCIATOR PANEL

(7) PG&E TRANSFORMER

(8) EMPTY TO BUILDING

(9) TO BUILDING "E"

(10) VPRRE

(11) NEW ELECTRICAL CONDUIT, SEE ELECTRICAL DRAWINGS

CITY OF TRACY

Think Inside the Triangle

LICENSED ARCHITECT
PAUL W. POWERS
C-29713
2/28/2027
RENEWAL DATE
STATE OF CALIFORNIA

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REVISIONS			
SYMBOL	DATE	DESCRIPTION	APPROVED
1	10-10-24	RDWR COMMENTS-REV 1	
2	10-10-25	RDWR COMMENTS-REV 2	

DESIGNED BY: CDT / KPA
DRAWN BY: THE KPA GROUP
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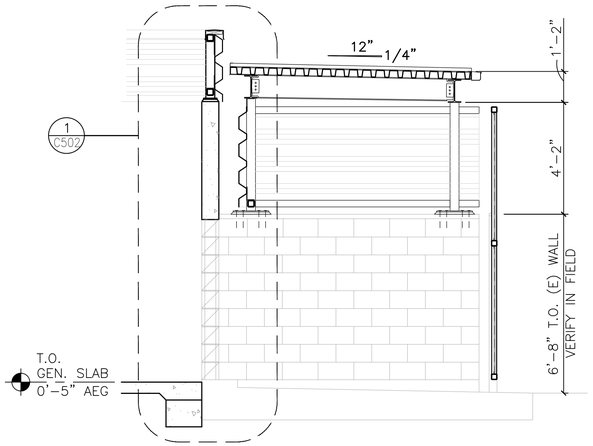
PERMIT #: COM24-0353

ENLARGED SITE UTILITY PLANS - DEMO/NEW

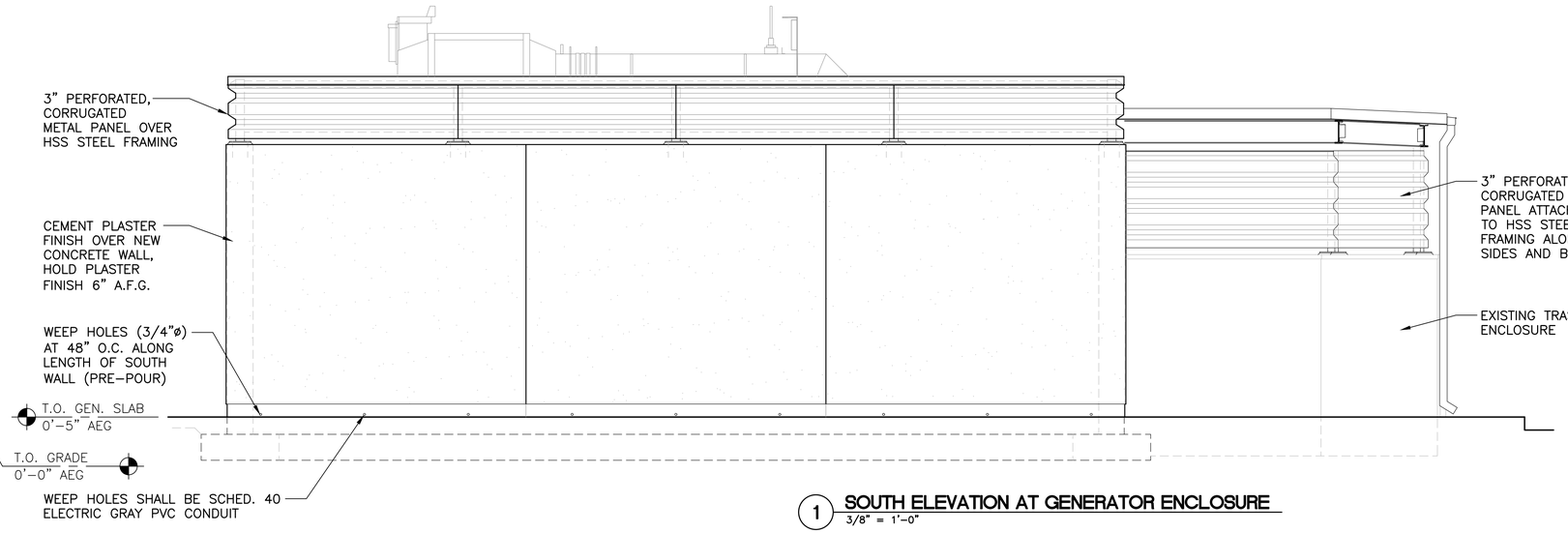
TRANSIT STATION EMERGENCY BACKUP GENERATOR

50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

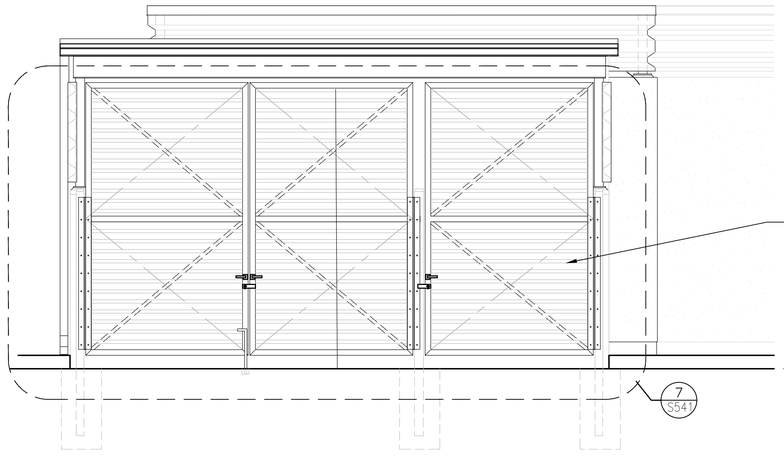
C402



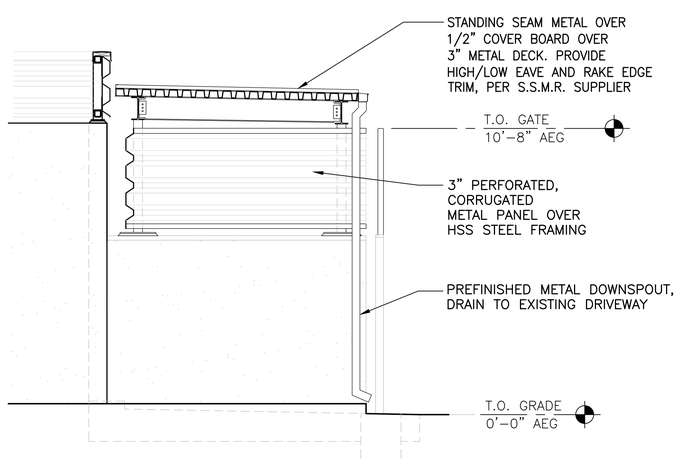
4 SECTION THRU (E) TRASH ENCLOSURE
3/8" = 1'-0"



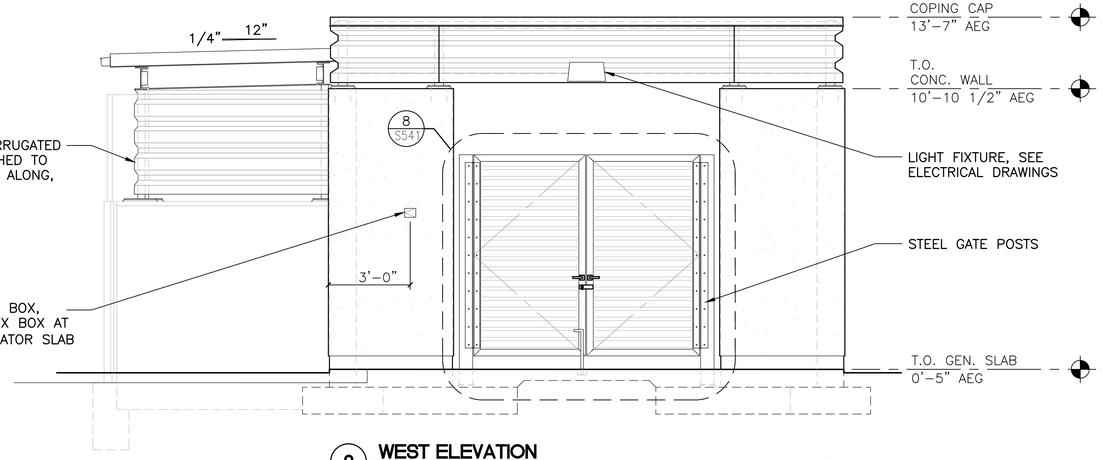
1 SOUTH ELEVATION AT GENERATOR ENCLOSURE
3/8" = 1'-0"



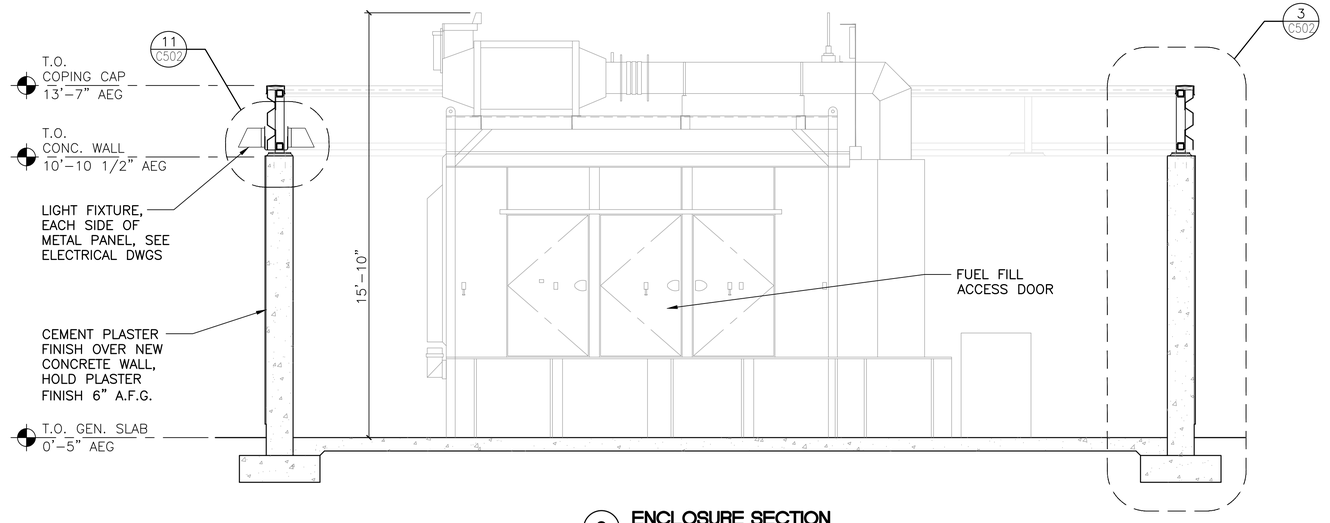
5 ELEVATION AT (E) TRASH ENCLOSURE
3/8" = 1'-0"



6 ELEVATION AT (E) TRASH ENCLOSURE
3/8" = 1'-0"



2 WEST ELEVATION
3/8" = 1'-0'



3 ENCLOSURE SECTION
3/8" = 1'-0'

CITY OF TRACY

Think Inside the Triangle

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C-29713
2/28/2027
RENEWAL DATE
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ENGINEERS
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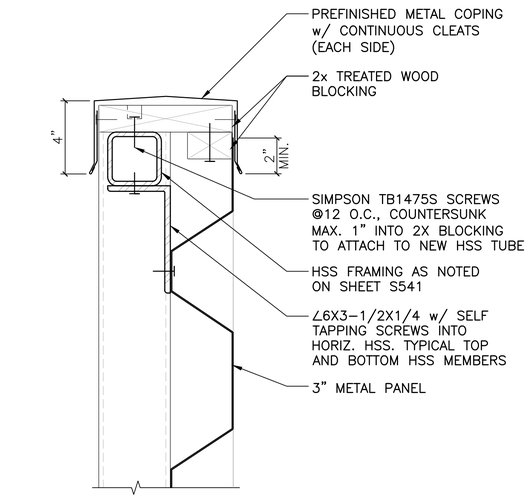
PERMIT #: COM24-0353

ELEVATIONS AND SECTION

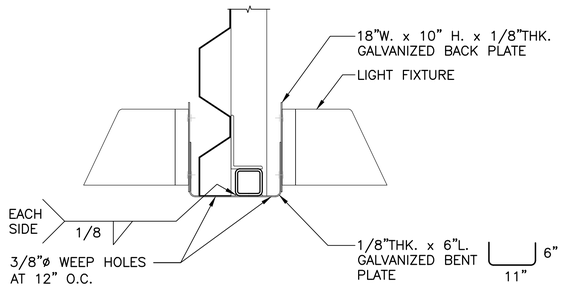
TRANSIT STATION EMERGENCY
BACKUP GENERATOR

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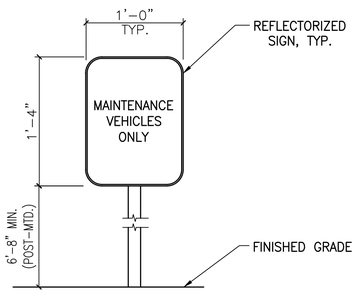
C501



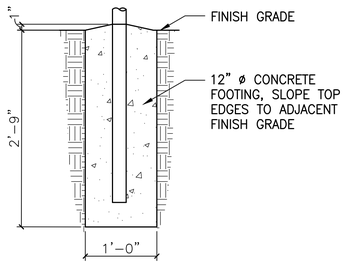
10 TOP OF PANEL/FRAME
3" = 1'-0"



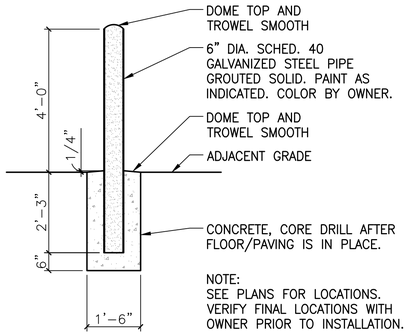
11 LIGHT FIXTURE MOUNTING
1 1/2" = 1'-0"



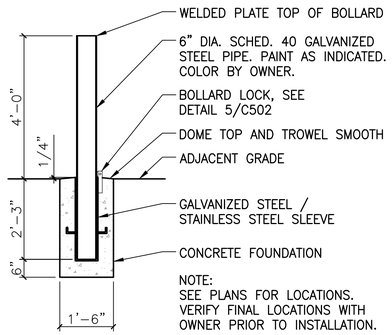
12 PARKING SPACE SIGNAGE
N.T.S.



13 SIGN FOUNDATION
N.T.S.



6 STEEL PIPE BOLLARD
1/2" = 1'-0"



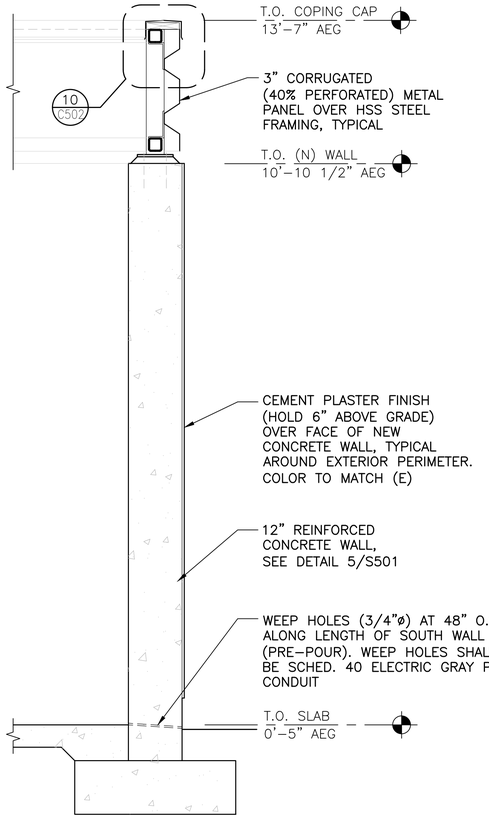
7 REMOVABLE STEEL PIPE BOLLARD
1/2" = 1'-0"



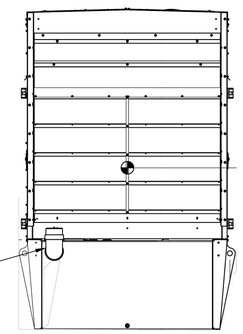
8 NO SMOKING SIGNAGE
NOT TO SCALE



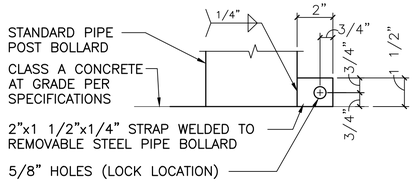
9 NO SMOKING/OPEN FLAME SIGNAGE
NOT TO SCALE



3 WALL SECTION
3/4" = 1'-0"

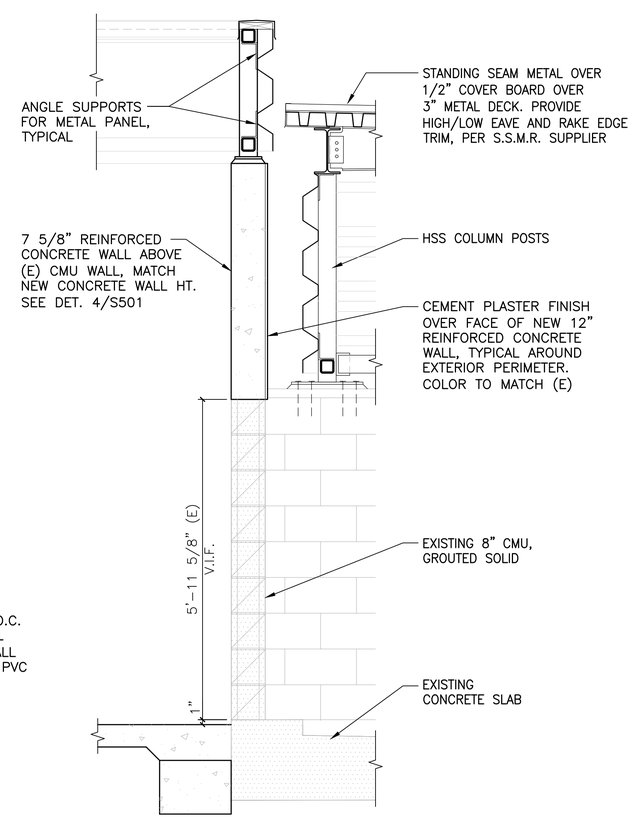


4 GENERATOR VENTING
NO SCALE

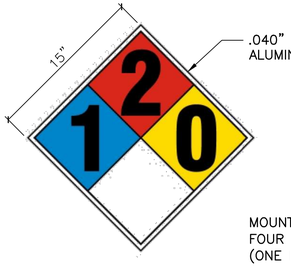


5A BOLLARD STRAP AT LOCK LOCATION

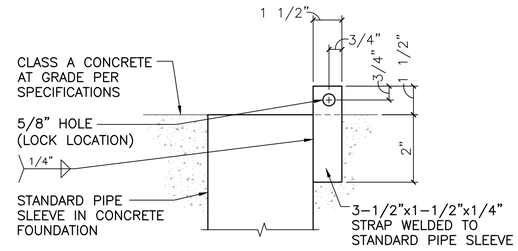
5 REMOVABLE BOLLARD LOCK DETAIL
NOT TO SCALE



1 WALL SECTION AT EXISTING TRASH ENCLOSURE
3/4" = 1'-0"



2 NFP 704 PLACARD SIGNAGE
NOT TO SCALE



5B SLEEVE STRAP AT LOCK LOCATION

CITY OF TRACY

TRACY Think Inside the Triangle

LICENSED ARCHITECT
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C-29713
2/28/2027
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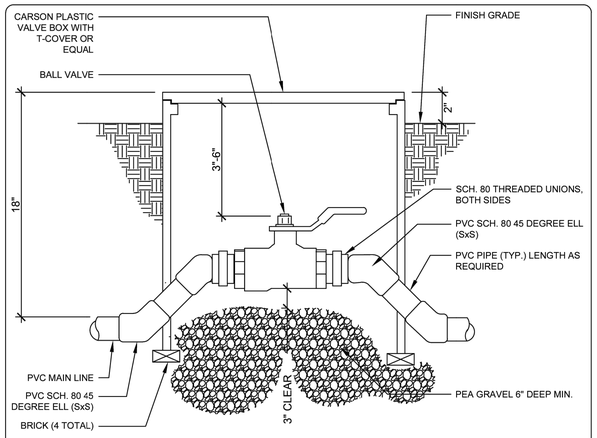
SYMBOL	DATE	REVISIONS DESCRIPTION	APPROVED
2	10-13-25	RWQB COMMENTS-RD 2	

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353
DETAILS
TRANSIT STATION EMERGENCY
BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

C502

SHEET 9 OF 20



NOTES

1. INSTALL BALL VALVE BEFORE EACH GROUP OF VALVES TO FACILITATE EASE OF MAINTENANCE TO VALVES.
2. INSTALL ALONG MAIN LINE FOR ISOLATION OF MAIN. USE NIBCO T-FP-0600A-LF VALVE OR APPROVED EQUAL FOR MAINLINES 3" & LARGER
3. BALL VALVE SHALL BE SIZE OF MAINLINE UNLESS NOTED.
4. BALL VALVE SHALL BE BRASS FULL PORT.
5. VALVE BOXES SHALL BE CARSON 1419 MODEL OR APPROVED EQUAL FOR 1 1/2" OR SMALLER AND SHALL HAVE T-COVER LIDS. USE CARSON 1324 MODEL OR APPROVED EQUAL FOR 2" VALVES.
6. ROTATE VALVE SO THAT HANDLE IS 90° OFF MAINLINE
7. FITTINGS SHALL BE SPEARS OR LASCO ONLY.
8. VALVE BOX LID TO FIT WITH VALVE IN OFF POSITION
9. HOT STAMP VALVE ON TOP OF VALVE BOX WITH 2" BLOCK LETTERS-BV
10. PURPLE COVER AND PURPLE BOX SHALL BE USED WITH RECLAIMED WATER SYSTEMS

CITY OF TRACY

TRACY Think Inside the Triangle™	REVIEWED BY: Robert Armijo CITY ENGINEER RCE 63173	DETAIL No. Sheet 1 of 1	D 8.3
	Res No. 2020-031 DATE:February 18, 2020	IRRIGATION Ball Valve	
	Rev: Lyle C. Rev:		
	Rev: Rev:		

GENERAL IRRIGATION GUIDELINES

32. A BOOSTER PUMP WILL BE REQUIRED FOR ALL PARKS BUT MAY NOT BE REQUIRED FOR STREETSCAPES. PLACEMENT SHALL BE WITHIN CITY'S RIGHT OF WAY. BOOSTER PUMP, BACKFLOW, FLOW METER AND CONTROLLER SHALL BE SECURED WITHIN A LOCKED CHAIN LINK OR OTHER ENCLOSURE WHERE AS DIRECTED BY THE CITY ENGINEER. AN EXTERNAL ROUTED BY-PASS SHALL BE INCLUDED WITH ALL INSTALLATIONS.
33. IRRIGATION SYSTEMS MUST BE TESTED BY A THIRD PARTY WATER AUDITOR, FOR THE PLANT ESTABLISHMENT PERIOD AND LONG TERM MAINTENANCE. AUDIT SHALL INCLUDE APPLIED WATER IRRIGATION, IRRIGATION DAYS PER WEEK, CYCLES PER DAY, MINUTES OF RUN TIME PER CYCLE. CONSIDERATION SHOULD BE GIVEN TO THE FLOW RATE, AREA COVERED BY VALVE, AND PRECIPITATION RATE. WATER AUDIT REPORT SHALL BE SUBMITTED TO THE CITY ALONG WITH LANDSCAPING AND IRRIGATION PLANS.
34. PRESSURE LOSS CALCULATIONS SHALL BE PROVIDED UPON FIRST IRRIGATION SUBMITTAL TO THE CITY. SHOW LOSSES BASED ON VALVE WITH POTENTIAL FOR GREATEST LOSS.
35. TO ENSURE THAT SYSTEMS DON'T FAIL UPON BUILD-OUT, WE REQUIRE A MINIMUM 5 PSI DYNAMIC RESIDUAL FOR TYPICAL SYSTEMS AND A MINIMUM 10 PSI DYNAMIC RESIDUAL PRESSURES FOR SYSTEMS WITH BOOSTER PUMPS. IF IRRIGATION CALCULATIONS FALL BELOW THESE PERIMETERS, ANOTHER SERVICE LINE / POINT OF CONNECTION WILL BE REQUIRED AND NO FUTURE TIE-INS WILL BE ALLOWED.
36. ALL WARRANTY REPAIRS ARE TO BE COMPLETED WITHIN 72 HOURS OF NOTIFICATION, OR CITY MAY MAKE REPAIRS AT CONTRACTOR'S EXPENSE.
37. A 4-INCH IRRIGATION SERVICE IS REQUIRED FOR ALL PARK SITES. A 2-INCH SERVICE IS REQUIRE FOR ALL STREETSCAPES WHICH MUST BE A SEPARATE SERVICE THAN THE ADJOINING PRIVATE PROPERTY.
38. WHEN SYSTEM USES RECLAIMED WATER, ADD ALL PERTINENT COMPONENTS, DETAILS AND NOTES.
39. IRRIGATION CONTROLLERS ARE TO BE MOTOROLA BY CENTRAL CONTROL SYSTEMS
    CONTACT: CENTRAL CONTROL SYSTEMS
    PHONE: 530-662-6841
    CCS@CCONTROLSYSTEMS.COM
40. IRRIGATION SHALL COMPLY WITH CALIFORNIA TITLE 23 CHAPTER 2.7 (MWELO) AND AB1881 INCLUDING ALL REQUIRED NOTES AND COMPLIANCE STATEMENT WITH SIGNATURE BLOCK.
41. RECYCLED WATER FOR IRRIGATION SHALL COMPLY WITH CALIFORNIA TITLE 22 CHAPTER 3
42. IDENTIFY AND LOCATE ON PLANS IRRIGATION POINT OF CONNECTION SHOWING SERVICE LINE, METER, BACKFLOW, AND FLOW METER LOCATION AND SIZES.
43. IDENTIFY AND LOCATE ON PLANS SECONDARY POWER SOURCE FOR IRRIGATION CONTROLLER. POWER SOURCE MUST BE A RIGHT-OF-WAY UTILITY.
44. PROVIDE ONE 6" SLEEVE AND TWO 4" SLEEVES FOR ALL CROSSINGS. SLEEVING TO BE SCHEDULE 40 PVC
45. PROVIDE AN ISOLATION VALVE AT EACH SIDE OF MAJOR CROSSINGS. REFER TO DETAILS FOR VALVE TYPE.
46. THE EVAPOTRANSPIRATION (ETO) RATE FOR THE CITY OF TRACY IS 48.5.
47. PROVIDE WRITTEN TECHNICAL SPECIFICATION FOR IRRIGATION.
48. PROVIDE SUBMITTALS AND / OR SAMPLES FOR APPROVAL PRIOR TO CONSTRUCTION.
49. FOR PROJECT WITH SPECIFIC PLANS AND/OR TO BE CONSTRUCTED IN PHASES, AN IRRIGATION MASTERPLAN WILL BE REQUIRED SHOWING POINTS OF CONNECTION (INCLUDING SERVICE LINE, METER, BACKFLOW SIZES), NOTE POTABLE OR RECYCLED, MAIN LINE ROUTING AND PROJECTED PEAK FLOW AND PRESSURE LOSS.

CITY OF TRACY

TRACY Think Inside the Triangle™	REVIEWED BY: Robert Armijo CITY ENGINEER RCE 63173	DETAIL No. Sheet 3 of 5	D 8.0
	Res No. 2020-031 DATE:February 18, 2020	IRRIGATION General Guidelines	
	Rev: Lyle C. Rev:		
	Rev: Rev:		

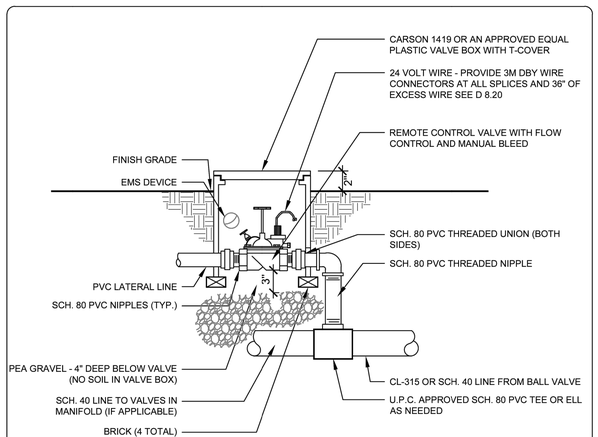
GENERAL IRRIGATION GUIDELINES

1. ALL PLANS ARE TO BE PREPARED AND UNDER THE DIRECTION OF A CALIFORNIA LICENSED LANDSCAPE ARCHITECT OR CERTIFIED IRRIGATION DESIGNER EXCEPT WHERE ALLOWED BY CALIFORNIA LANDSCAPE ARCHITECTS PRACTICE ACT, BUSINESS AND PROFESSION CODE.
2. ALL IRRIGATION SYSTEMS SHALL BE INSTALLED WITH A REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY AT POINT OF CONNECTION. D 8.2-D 8.2.2
3. BALL VALVES SHALL BE INSTALLED OFF MAINLINE BEFORE EACH VALVE TO FACILITATE EASE OF MAINTENANCE OF VALVES, BEFORE MAINLINE CROSSED UNDER STREET, AND ALSO AT LOCATIONS ALONG MAINLINE TO ALLOW SERVICE TO SYSTEM.
3. MAIN LINES (CONSTANT PRESSURE) SHALL BE SCHEDULE 40 SOLVENT WELD WITH SCHEDULE 40 FITTINGS FOR SIZES 2" AND LESS. FOR MAIN LINES 2 1/2" AND LARGER PVC CLASS 315 WITH SCHEDULE 80 SOLVENT WELD FITTINGS - 18" MINIMUM COVER, 36" UNDER PAVING. ALL MAINLINE SHALL HAVE DETECTABLE TAPE ALONG FULL LENGTH OF MAINLINE. ALL SOLVENT WELDING OF PIPE JOINTS PER MAIN INSTRUCTIONS. D 8.9
4. LATERAL LINES SHALL BE SCHEDULE 40 PVC PIPE WITH SOLVENT WELD FITTINGS - 12" MINIMUM COVER, 24" UNDER PAVING. D 8.9
5. THRUST BLOCKS SHALL BE PROVIDED TO RESIST SYSTEM PRESSURE ON RING-TITE PIPE AND FITTINGS, BASED ON AVERAGE SOIL SAFE BEARING LOAD OF 1000# PER SQUARE FOOT. D 8.10
6. QUICK COUPLERS SHALL BE PROVIDED AT INTERVALS OF 100 FEET AT PARKWAYS. AT PARKS, QUICK COUPLERS SHALL BE PLACED AT FUNCTIONAL USE ZONES, SUCH AS BUS STOPS, TRASH RECEPTACLES, PLAYGROUNDS, DRINKING FOUNTAINS, AND AT AREAS OTHERWISE DIRECTED BY THE CITY. PLACE IN VALVE BOX FOR PROTECTION AND EASE OF USE. INSTALL EMS DEVICE IN BOX. D 8.5
7. REMOTE CONTROL VALVES SHALL BE 200 PSI RATED PLASTIC BODY AND BONNET, ONE VALVE PER VALVE BOX. VALVE BOX SHALL BE AT GRADE AND HAVE AN EMS DEVICE PLACED IN THE BOX TO FACILITATE DETECTION MY METAL DETECTOR. D 8.6
9. CITY DOES NOT ALLOWS DRIP SYSTEMS FOR CITY MAINTAINED LANDSCAPES.
10. WIRE SPLICES SHALL BE MADE WITH 3M-DBY CONNECTORS OR APPROVED EQUAL FOR PROJECTS IN PUBLIC WORKS' JURISDICTION, AND DRI-SPLICE CONNECTORS OR EQ. FOR PROJECTS IN THE L.M.D. ALL SPLICES SHALL BE MADE IN VALVE BOX ONLY & SHOWN ON AS-BUILTS. D 8.11
11. THREADED PVC FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE, MINIMUM THREE WRAPS.
12. VALVE WIRE SHALL BE BURIED WITH MAIN LINE - 18" MINIMUM COVER. COMMON WIRE TO BE WHITE, CONTROL WIRES TO EACH VALVE COLOR CODED AS PER GROUPING BY AREA AS DESIGNATED BY CITY. MINIMUM SIZE TO BE 14 GAUGE. INSTALL 1 (ONE) EXTRA WIRE FOR EACH 3 VALVES WITH 2 (TWO) MAXIMUM PER EVERY 10 (TEN) VALVES. EXTRA WIRE SHALL BE A DIFFERENT COLOR FROM VALVE WIRES. D 8.9
13. ALL VALVE WIRES SHALL BE LABELED BY NUMBER WITH PERMANENT MARKING IN THE CONTROLLER. ALL VALVE BOXES SHALL BE HOT STAMPED WITH 2" TALL LETTERS/NUMBERS. MARK BOXES WITH THE CORRESPONDING VALVE NUMBER OR BOX IDENTIFICATION (QC, SV, GV etc.) AND BE PERMANENTLY MARKED.
14. LEAVE A 36" INCH COIL OF EXCESS WIRE AT EACH SPLICE ALONG THE MAINLINE RUN AND AT 100 FEET ON CENTER ALONG ANY WIRE RUN.
15. ALL POP-UP HEADS SHALL HAVE A CHECK VALVE TO PREVENT LOW HEAD DRAINAGE AND INTEGRAL PRESSURE REGULATING DEVICE.

CITY OF TRACY

TRACY Think Inside the Triangle™	REVIEWED BY: Robert Armijo CITY ENGINEER RCE 63173	DETAIL No. Sheet 1 of 5	D 8.0
	Res No. 2020-031 DATE:February 18, 2020	IRRIGATION General Guidelines	
	Rev: Lyle C. Rev:		
	Rev: Rev:		

PARKS AND STREETSCAPE STANDARD PLANS

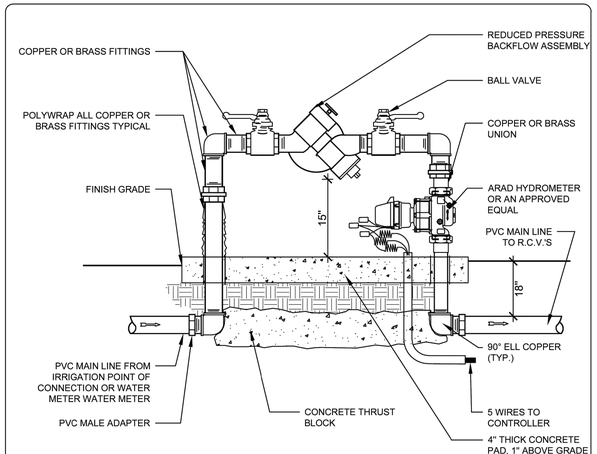


NOTES

1. INSTALL AN EMS DEVICE IN THE BOX TO FACILITATE DETECTION BY A METAL DETECTOR. ATTACH CHRISTY ID MARKER OR EQUAL TO VALVE IN BOX.
2. ONLY ONE (1) REMOTE CONTROL VALVE PER BOX - NO EXCEPTIONS.
3. MAINTAIN MIN. 1/2" CLEARANCE BETWEEN VALVE BOX AND PVC LINES.
4. PROVIDE WIRE SPLICE CONNECTIONS AT ALL SPLICES PER D 8.11.
5. THREADED UNIONS TO BE SPEARS, LASCO, OR APPROVED EQUAL ONLY.
6. CONTROL WIRE SHALL BE SIZED A MINIMUM OF #14 U.L. APPROVED.
7. VALVE BOXES FOR 1 1/2" SMALLER SHALL BE CARSON 1419 MODEL WITH T-COVER LIDS OR AN APPROVED EQUAL . FOR 2" VALVES, USE CARSON 1324 MODEL WITH T-COVER LID OR AN APPROVED EQUAL
8. HOT STAMP VALVE ON TOP OF VALVE BOX WITH 2" BLOCK LETTERS WITH VALVE NUMBER.
9. PURPLE COVER SHALL BE USED WITH RECLAIMED SYSTEMS.

CITY OF TRACY

TRACY Think Inside the Triangle™	REVIEWED BY: Robert Armijo CITY ENGINEER RCE 63173	DETAIL No. Sheet 1 of 1	D 8.5
	Res No. 2020-031 DATE:February 18, 2020	IRRIGATION Remote Control Valve	
	Rev: Lyle C. Rev:		
	Rev: Rev:		



NOTES

1. INSTALL REDUCED PRESSURE BACKFLOW PREVENTER DEVICE PER STANDARD PLAN 415.
2. BACKFLOW PREVENTER ENCLOSURE PER DETAIL D 8.2.1.
3. BACKFLOW PREVENTION DEVICE TO BE TESTED BY A CERTIFIED BACKFLOW
4. INSTALL WEATHERMATIC WEATHER BLANKET, OR AN APPROVED EQUAL, OVER BACKFLOW, SIZED TO FIT.
5. RUN 5 WIRES BACK TO CONTROLLER (1 EXTRA, 2 WHITE, 1 PURPLE, 1 YELLOW), BUNDLE, LABEL & TAPE TOGETHER.
6. CONNECT PER MANUFACTURERS INSTRUCTIONS.
7. MINIMUM FLOW THROUGH THE FLOW METER IS 6.6 GPM.

CITY OF TRACY

TRACY Think Inside the Triangle™	REVIEWED BY: Robert Armijo CITY ENGINEER RCE 63173	DETAIL No. Sheet 1 of 1	D 8.2
	Res No. 2020-031 DATE:February 18, 2020	IRRIGATION Reduced Pressure Backflow With Hydrometer	
	Rev: Lyle C. Rev:		
	Rev: Rev:		

GENERAL IRRIGATION GUIDELINES

16. ALL SHRUB SPRAYS AND SHRUB ROTORS WITHOUT INTERNAL CHECK VALVES SHALL HAVE A CHECK VALVE INSTALLED ON THE RISER IN PLACE OF THE SCHEDULE 80 COUPLING AND INTEGRAL PRESSURE REGULATING DEVICE IF AVAILABLE.
17. NOZZLES SHALL BE MATCHED PRECIPITATION RATE NOZZLES.
18. OVERHEAD IRRIGATION SHALL NOT BE PLACED WITHIN 24" OF ANY NON PERMEABLE SURFACE UNLESS THE ADJACENT NON PERMEABLE SURFACE DRAINS TO A LANDSCAPE AREA EFFORTS TO CONTROL OVER SPRAY SHALL BE MADE TO REDUCE SPRAY FROM HITTING TRUNKS OF TREES.
19. NO OVERHEAD IRRIGATION SHALL BE INSTALLED IN AREAS LESS THAN TEN (10) FEET IN ANY DIRECTION.
20. SOILS SHOULD BE INVESTIGATED AT EACH SITE FOR WATER RETENTION CAPABILITIES. SOILS REPORTS SUGGEST INFILTRATION RATES RANGE FROM .2 TO .6 INCHES/HOUR.
21. IRRIGATION SYSTEMS SHALL BE DESIGNED SO THAT THE APPLICATION RATE OF WATER DOES NOT EXCEED THE INFILTRATION RATE OF THE SOIL (SEE SOILS REPORT) AND WILL NOT ALLOW EXCESSIVE OVERSPRAY AND RUNOFF. IN GENERAL, LOW VOLUME SPRINKLER HEADS, AND PRESSURE COMPENSATION BUBBLERS SHALL BE USED THROUGHOUT THE SYSTEM.
22. CONTROLLERS SHALL HAVE MULTIPLE PROGRAMS AND WATER BUDGETING AVAILABLE. INSTALL CONTROLLERS INTO A VANDAL RESISTANT CONTROLLER ENCLOSURE. THE CITY WILL UTILIZE A MOTOROLA CENTRAL IRRIGATION CONTROL SYSTEM, AND SATELLITE FIELD CONTROLLERS, OR AN APPROVED EQUAL. D 8.1. CONTROLLER SHALL BE PROGRAMMED TO OPERATE BETWEEN THE HOURS OF 10:00 PM AND 7:00 AM. RESTRICTED WATERING TIMES MAY BE ESTABLISHED BASED UPON SITE CONDITIONS AS DETERMINED BY THE CITY. CONTROLLERS OPERATION STICKER SHALL BE APPLIED TO ALL CONTROLLERS PER CITY OF TRACY REQUIREMENTS.
23. ALL CONTROLLERS ARE TO BE METERED AND WITHIN AN PG&E APPROVED METERED CONTROLLER CABINET.
24. SPRINKLERS AT TOPS OF SLOPES SHALL BE VALVED SEPARATELY FROM SPRINKLERS AT BOTTOM OF SLOPES. PRECIPITATION RATES OF HEADS SHALL BE CONSIDERED.
25. FOR INSTALLATION, USE STRAP WRENCHES ONLY ON ALL EQUIPMENT WITH UNIONS, EXCEPT ON BACKFLOWS. NO PIPE WRENCHES SHALL BE USED.
26. MAIN LINE IRRIGATION NEEDS TO BE CENTER LOADED WITH VALVES INSTALLED AND FITTINGS COMPLETELY VISIBLE. A WATER PRESSURE OF 125 PSI SHALL BE APPLIED AND HELD FOR 2.5 HOURS. ALL LEAKS SHALL BE REPAIRED AND ALL LINES APPROVED BY THE CITY BEFORE ANY OF THE SYSTEM IS BACKFILLED.
27. CONTRACTOR SHALL KEEP AN AS-BUILT FIELD COPY OF IRRIGATION SYSTEM SHOWING ALL CHANGES. MAIN LINE SHALL NOT BE BACKFILLED UNTIL AS-BUILT DRAWINGS ARE APPROVED BY CITY ENGINEER. MARKED UP AS-BUILTS SHALL BE TURNED OVER TO CITY BEFORE MAINTENANCE BEGINS. LANDSCAPE ARCHITECT OF RECORD SHALL PREPARE RECORD DRAWINGS IN AUTOCAD FORMAT, AND PRINT AND SUBMIT NEW MYLARS.
28. IF EXPANDING EXISTING PARKWAY OR FACILITY, CONTRACTOR WILL UPDATE EXISTING CONTROLLER CHARTS, REFLECTING MODIFICATIONS TO THE EXISTING PROJECT AND PROVIDING A NEW CHART. UPON INSTALLATION OF A NEW PICCOLO UNIT, CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPROGRAMMING OF THE EXISTING OR NEW IRRINET FROM WHICH THE SCORPIO WILL COMMUNICATE.
29. FOR EACH IRRINET INSTALLED, PROVIDE CITY WITH TWO SETS OF LAMINATED REDUCED (11"x17") AS-BUILT IRRIGATION CHARTS. 10 ML. THICKNESS OF LAMINATION, SHOWING ZONES AND CORRESPONDING CORRESPONDING CONTROLLER STATIONS. FOR EACH SCORPIO CONTROLLER, PROVIDE THREE CHARTS.
30. ALL WATERING SHALL TAKE PLACE WITHIN THE CITY'S REQUIRED WATER WINDOW, OF 10PM TO 7AM. PROVIDE AN AUDIT TO SHOW WATERING SCHEDULE AND HOW IT MEETS REQUIREMENTS.
31. IRRIGATION SYSTEMS MUST BE COMPLETE AND FULLY OPERATIONAL BEFORE ANY PLANTING BEGINS.

CITY OF TRACY

TRACY Think Inside the Triangle™	REVIEWED BY: Robert Armijo CITY ENGINEER RCE 63173	DETAIL No. Sheet 2 of 5	D 8.0
	Res No. 2020-031 DATE:February 18, 2020	IRRIGATION General Guidelines	
	Rev: Lyle C. Rev:		
	Rev: Rev:		

CITY OF TRACY

Think Inside the Triangle™

LICENSED ARCHITECT PAUL W. POWERS C-29713 2/28/2027 RENEWAL DATE STATE OF CALIFORNIA

KPA ENGINEERS ARCHITECTS
THE KPA GROUP
1840 FOURTH STREET, SUITE 200
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TEL 925.223.8217 www.thekpagroup.com
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REVISIONS			
SYMBOL	DATE	DESCRIPTION	APPROVED
1	10-12-25	RIVER COMMENTS - REV 2	

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

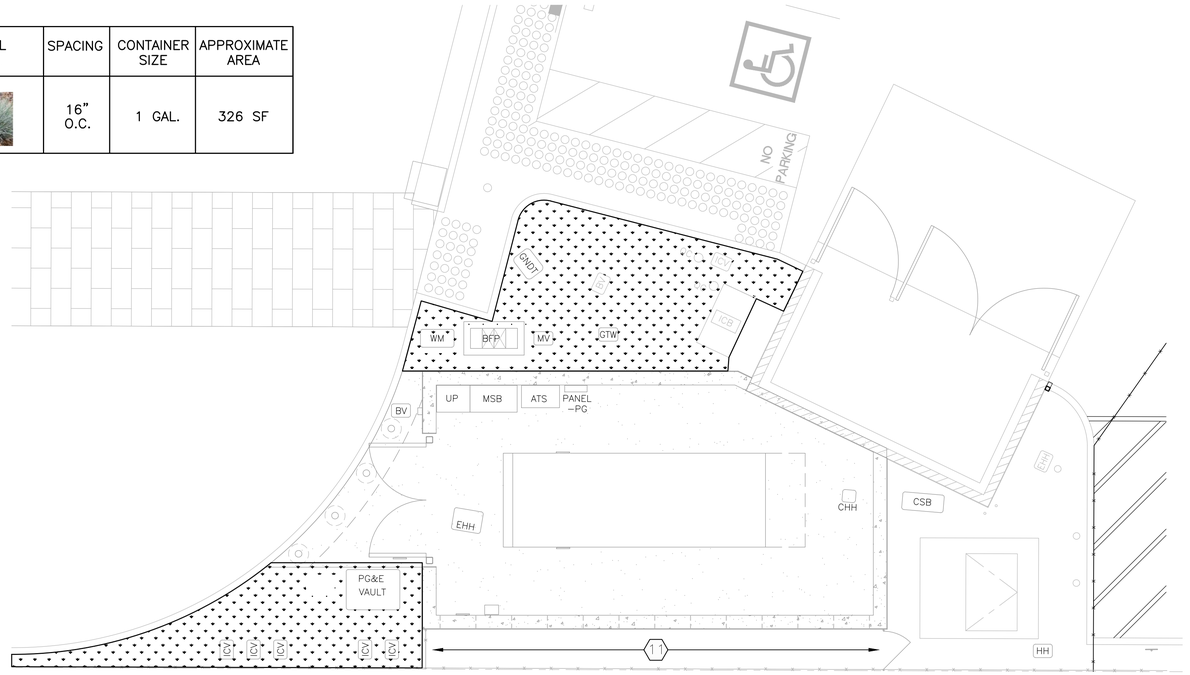
PERMIT #: COM24-0353
CITY STANDARD DETAILS
TRANSIT STATION EMERGENCY BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

C503

SHEET 10 OF 20

HATCH / SYMBOL	ABBREV/ USE	BOTANICAL NAME	COMMON NAME	TYPICAL IMAGE	SPACING	CONTAINER SIZE	APPROXIMATE AREA
	GC (GROUND COVER)	FESTUCA GLAUCA 'ELIJAHS BLUE'	COMMON BLUE FESCUE		16" O.C.	1 GAL.	326 SF

NOTE:
PROVIDE TANBARK BETWEEN APP PLANTS

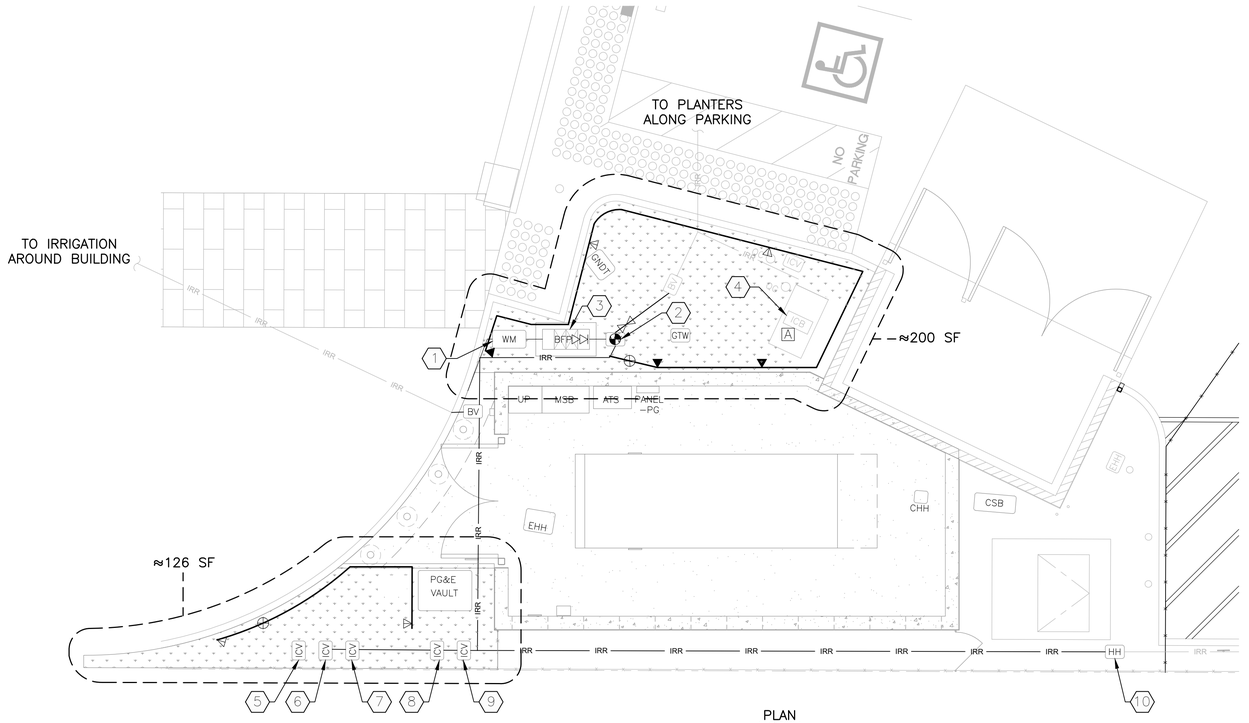


PLAN NORTH

1 ENLARGED NEW LANDSCAPE PLAN

3/16" = 1'-0"

0 4' 8' 12'



PLAN NORTH

2 ENLARGED NEW IRRIGATION PLAN

3/16" = 1'-0"

0 4' 8' 12'

GENERAL NOTES:

1. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR FINAL DECISION.
2. SEE SITE UTILITY PLAN C402 FOR UNDERGROUND DEMOLITION.
3. REMOVE ALL EXISTING VEGETATION WITHIN CONSTRUCTION AREA SHOWN ON C401.
4. ALL ROCK AND DEBRIS 1–1/2" AND LARGER SHALL BE REMOVED FROM THE TOP 6" OF PLANTING AREAS SCARIFIED SOIL AND THEN FROM THE SITE.
5. A DIAGRAM OF THE IRRIGATION PLAN SHOWING HYDROZONES SHALL BE KEPT WITH THE IRRIGATION CONTROLLER FOR SUBSEQUENT MANAGEMENT PURPOSES.
6. PRESSURE REGULATING DEVICES ARE REQUIRED IF WATER PRESSURE IS BELOW OR EXCEEDS THE RECOMMENDED PRESSURE OF THE SPECIFIED IRRIGATION DEVICES.
7. PROTECT AND REUSE EXISTING IRRIGATION SYSTEM TO REMAIN. RECONNECT EXISTING MAINLINE PIPE FOR PARKING AREA TO THE NEW BACKFLOW PREVENTOR.
8. ALL PIPES, FITTINGS, AND SPRAYS TO MATCH EXISTING.
9. SEE SITE UTILITY PLAN C402 FOR NEW CONCEPTUAL IRRIGATION WATER LINE.
10. IRRIGATION SYSTEM MUST REMAIN FUNCTIONAL THROUGHOUT THE PROJECT. IF MAINLINE MUST BE RECONFIGURED, TEMPORARY JUMPERS ARE REQUIRED. COORDINATE WITH PUBLIC WORKS.

IRRIGATION KEYED NOTES:

1. NEW WATER METER/HANDHOLE, CONNECT TO EXISTING UNDERGROUND WATER PIPE, SEE SHEET C402
2. NEW IRRIGATION (MAIN VALVE) HANDHOLE, CONNECT AS REQUIRED TO NEW IRRIGATION PIPING
3. RELOCATED BACKFLOW PREVENTER AND (N) CONCRETE SLAB
4. RECONNECT (E) CONTROLLER ASSEMBLY TO REVISED IRRIGATION SYSTEM, COORDINATE AS REQUIRED TO COMPLETE (E) IRRIGATION SYSTEM
5. SPARE ICV
6. ICV: A11–WEST STOP SIGN
7. ICV: A25–TREES EAST
8. ICV: A9–TO CHARGING STATION
9. ICV: A10–POP UPS AROUND GENERATOR
10. RECONNECT NEW IRRIGATION LINE TO (E) IRRIGATION MAIN ALONG FENCE
11. PROVIDE TAN BARK WITHIN FENCED IN AREA

IRRIGATION LEGEND:

- MAINLINE PIPE AND FITTING – 1120–SCHEDULE 40 PVC SOLVENT WELD, 18" COVER
- LATERAL LINE AND FITTING – 1120–SCHEDULE 40 PVC SOLVENT WELD, 12" COVER
- IRRIGATION ZONE (AREA OF ZONE)
- POINT OF CONNECTION
- IRRIGATION CONTROL ASSEMBLY
- REDUCED PRESSURE BACKFLOW PREVENTOR
- NIBCO THREADED FULL PORT BALL VALVE (LINE SIZE)
- REMOTELY CONTROL VALVE
- RAIN BIRD POP–UP SHRUB SPRAY, 1812–SAM–PRS–12
- RAIN BIRD POP–UP SHRUB SPAY, 1812–SAM–PRS–5

CITY OF TRACY

Think Inside the Triangle

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DESIGNED BY: COT / KPA
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SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353
ENLARGED LANDSCAPE AND IRRIGATION PLANS
TRANSIT STATION EMERGENCY BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

L101

SHEET 11 OF 20

GENERAL NOTES

A. DESIGN DATA

1. ALL WORK SHALL CONFORM TO MOST STRINGENT REQUIREMENTS OF:
   A. ALL APPLICABLE FEDERAL, STATE, AND LOCAL REQUIREMENTS AS WELL AS ALL REQUIREMENTS OF CONTRACT DOCUMENT.
   B. TO THE REQUIREMENTS OF THE CITY OF TRACY.
   C. CALIFORNIA BUILDING CODE, 2022 EDITION. TITLE 24, PART 2, ALL REFERENCES TO "TITLE 24" REFER TO THIS EDITION.

2. WIND LOADS:

BASIC WIND SPEED	93 MPH
IMPORTANCE FACTOR	1.00
EXPOSURE CATEGORY	B

3. SEISMIC LOADS: GENERATOR EQUIPMENT

S_s = 1.138
S_1 = 0.398
F_a = 1.2
F_v = N/A
A_p = 1
R_p = 2.5
Ip = 1.0
z/h = 0 (ANCHORED AT BASE)

$$Fp = \frac{0.4 * Ap * Sds * Wp * (1+2* z/h)}{(Rp / Ip)}$$

Fp = 0.15*Wp
Fpmin = 0.3 * Sds * Ip * Wp = 0.27 * Wp
Fp = 0.24 * Wp

B. STRUCTURAL STEEL, U.N.O.

1. ALL STEEL SHOWN ON STRUCTURAL DRAWINGS TO BE ASTM A992 FOR COLUMNS, BEAMS AND GIRDERS WITH Fy=50 KSI UNLESS OTHERWISE NOTED.
2. CONNECTING PLATES, BASE PLATES, STIFFENERS, DOUBLER PLATES, CONTINUITY PLATES, SHEAR TABS, ETC., TO BE SAME GRADE AS HIGHEST GRADE MEMBER AT CONNECTION, EXCEPT WHERE NOTED OTHERWISE.
3. ALL TUBES TO BE ASTM A500 GRADE B Fy=46 KSI, EXCEPT WHERE NOTED OTHERWISE.
4. ALL PIPES TO BE ASTM A53 GRADE B Fy=35 KSI, EXCEPT WHERE NOTED OTHERWISE.
5. ALL ANCHOR BOLTS TO BE ASTM F1554 GRADE 36 EMBEDDED AS SHOWN ON DRAWINGS, EXCEPT ANCHOR BOLTS AT COLUMNS WITH DIAGONAL BRACES TO BE A354 GRADE BD WITH MINIMUM TENSILE STRESS Fu=150 KSI.
6. ALL STEEL FABRICATION AND DETAILS TO COMPLY WITH MOST STRINGENT OF AISC CODE, THE AWS CODE, THE REFERENCED CODES AND STANDARDS, AND CONTRACT DOCUMENTS.
7. UNLESS OTHERWISE NOTED, ALL BOLTS TO BE ASTM A325X BEARING TYPE BOLTS WITH THREADS EXCLUDED FROM THE SHEAR PLANE. SIZES AS PER DRAWINGS. BOLT HOLES TO BE 1/16 INCH LARGER THAN BOLT DIAMETER UNLESS OTHERWISE NOTED. ALL BOLTS SHALL BE TIGHTENED AS PER MINIMUM TENSIONS NOTED ON THIS SHEET.
8. MINIMUM PLATE THICKNESS IS 3/8 INCH UNLESS OTHERWISE NOTED. MINIMUM WELD IS 5/16 INCH UNLESS OTHERWISE NOTED.
9. ALL WELDS SHALL BE E70XX UNLESS NOTED OTHERWISE.
10. ALL PENETRATION WELDS TO HAVE COMPLETE ULTRASONIC INSPECTIONS IN THE SHOP AND AFTER COMPLETION OF ASSEMBLY IN THE FIELD. ALL COMPLETE JOINT PENETRATION WELDS (CJP) SHALL HAVE ANY BACK-UP BARS REMOVED. WELDS TO BE BACK GOUGED AND MINIMUM 1/4" FILLET ADDED, UNLESS OTHERWISE NOTED.
11. INSPECTIONS AND ACCEPTANCE OF ALL WELDS, INCLUDING ALL PENETRATION WELDS, IS PER THE MOST STRINGENT OF THE CODE, AWS REQUIREMENTS, AND CONTRACT DOCUMENTS.
12. MATERIALS TO BE WELDED WITH COMPLETE JOINT PENETRATION WELDS SHALL BE FREE OF DELAMINATION AT WELD LOCATIONS AND FOR 6 INCHES ON EITHER SIDE OF THE WELD AND SHALL BE ULTRASONICALLY INSPECTED BEFORE WELDING AND AFTER WELDING AND COMPLETION OF ASSEMBLY.
13. FILLER METALS FOR ALL COMPLETE PENETRATION GROOVE WELDS SHALL HAVE A MINIMUM CHARPY V-NOTCH TOUGHNESS OF 20 FT-LBS AT -20°F AS DETERMINED BY AWS CLASSIFICATION.
14. ALL WELDING TO BE BY CERTIFIED WELDERS AND SHALL CONFORM TO ALL CODE AND AWS REQUIREMENTS.
15. ALL FIELD WELDING TO BE CONTINUOUSLY INSPECTED BY A SPECIAL INSPECTOR APPROVED BY THE BUILDING OFFICIAL.
16. PARTIAL PENETRATION GROOVE WELDS WHEN USED IN COLUMN SPLICES SHALL BE TESTED EITHER BY ULTRASONIC TESTING OR RADIOGRAPHY.
17. ALL STEEL WITH YIELD STRENGTHS OF 36000 PSI OR GREATER SHALL BE IDENTIFIED BY THE MILL AND FABRICATOR IN ACCORDANCE WITH THE DESIGN CODE.

STRUCTURAL STEEL, U.N.O. (CONTINUED)

12. "ALL THREAD" MATERIAL SHALL NOT BE SUBSTITUTED FOR BOLTS IN STEEL, CONCRETE, TIMBER, MASONRY, OR ANY OTHER STRUCTURAL APPLICATION, UNLESS NOTED OTHERWISE.
13. ALL INSPECTIONS AND TESTS BY AN INDEPENDENT TESTING AND INSPECTION AGENCY.
14. ALL STRUCTURAL STEEL, BOLTS, CONNECTING HARDWARE, AND WELDS SHALL BE PRIMED AND PAINTED OR GALVANIZED EXCEPT WHERE SPRAY ON FIRE PROOFING OR OTHER FINISHES COMPLETELY ENCASE AND PROTECT STEEL FROM ELEMENTS.

C. STRUCTURAL OBSERVATIONS

1. VISUAL OBSERVATIONS WILL BE PERFORMED AT THE DISCRETION OF THE OWNER, ARCHITECT, EOR, AND AS REQUIRED BY THE BUILDING OFFICIAL IN ACCORDANCE WITH THE BUILDING CODE. VISUAL OBSERVATIONS SHALL NOT BE CONSIDERED AS A SUBSTITUTE FOR THE SPECIAL INSPECTION REQUIREMENTS.
2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY THE EOR AS TO WHEN EACH MAJOR PHASE OF CONSTRUCTION IS READY FOR OBSERVATION A MINIMUM OF FIVE (5) WORKING DAYS IN ADVANCE.
3. THE FOLLOWING MAJOR PHASES OF CONSTRUCTION REQUIRE A SITE VISIT AND STRUCTURAL OBSERVATION REPORT FROM THE SEOR:
   -FOUNDATION REBAR AND ANCHORS – PRIOR TO FIRST POUR OF CONCRETE
   -STRUCTURAL FRAMING – AFTER ERECTION AND PRIOR TO CLOSING IN
   -COMPLETION OF THE STRUCTURAL SYSTEM
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT NAILING, REINFORCEMENT, WELDS, CONNECTIONS, ETC. ARE VISIBLE FOR OBSERVATION WHEN THE SEOR IS ON SITE AND FOR ANY SCHEDULING DELAYS DUE TO NONCOMPLIANT ITEMS FOUND DURING HT OBSERVATION.
5. AT THE CONCLUSION OF THE WORK INCLUDED IN THE PERMIT, THE STRUCTURAL OBSERVER SHALL SUBMIT TO THE BUILDING OFFICIAL A WRITTEN STATEMENT THAT THE SITE VISITS HAVE BEEN MADE AND IDENTIFY ANY REPORTED DEFICIENCIES THAT, TO THE BEST OF THE STRUCTURAL OBSERVER'S KNOWLEDGE, HAVE NOT BEEN RESOLVED.

D. SPECIAL INSPECTIONS

THE OWNER SHALL EMPLOY THE ENGINEER OR ARCHITECT RESPONSIBLE FOR THE STRUCTURAL DESIGN TO PERFORM STRUCTURAL OBSERVATION PER CBC SECTION 1702 & 1710.

1. THE OWNER SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS TO PROVIDE INSPECTIONS DURING CONSTRUCTION. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.
2. SPECIAL INSPECTIONS ARE NOT REQUIRED WHERE THE WORK IS DONE ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION. APPROVED FABRICATORS MUST SUBMIT A CERTIFICATE OF COMPLIANCE FOR OFFSITE FABRICATIONS SUCH AS STRUCTURAL STEEL, PRECAST CONCRETE, GLUED LAMINATED TIMBER, ETC.
3. ALL INSPECTIONS SHALL BE PERFORMED BY INDEPENDENT SPECIAL INSPECTORS. JOB SITE VISITS BY THE STRUCTURAL ENGINEER OR BUILDING OFFICIAL DO NOT CONSTITUTE AND ARE NOT A SUBSTITUTE FOR INSPECTIONS BY A SPECIAL INSPECTOR.
4. ALL INSPECTION REPORTS SHALL BE SUBMITTED TO THE BUILDING OFFICIAL AND EOR. THE FINAL REPORTS BY THE SPECIAL INSPECTOR(S) MUST CERTIFY THAT THE ENTIRE STRUCTURAL SYSTEM COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS.
5. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT THESE INSPECTIONS ARE PERFORMED.
6. WORK REQUIRING SPECIAL INSPECTION SHALL BE INSPECTED BY THE SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK IS PERFORMED AND AT THE COMPLETION OR WORK. CONTINUOUS (CONT.) INSPECTION CONSISTS OF A FULL-TIME INSPECTION; PERIODIC INSPECTION CONSISTS OF PART-TIME OR INTERMITTENT INSPECTION.
7. THE FOLLOWING SPECIAL INSPECTIONS ARE IN ADDITION TO INSPECTIONS BY THE BUILDING OFFICIAL. THIS SECTION IS NOT INTENDED TO BE ALL INCLUSIVE.
8. A SPECIAL INSPECTOR MEETING THE QUALIFICATION REQUIREMENTS DESCRIBED IN CHAPTER 17 OF TITLE 24 SHALL BE RETAINED FOR THIS PROJECT BY THE OWNER. THE FOLLOWING SPECIAL INSPECTIONS SHALL BE PROVIDED AS A MINIMUM:

STRUCTURAL WELDING –	VISUAL INSPECTION OF FILLET WELDS (UT INSPECTION OF PENETRATIONS WELDS)
STRUCTURAL BOLTING	
ANCHOR BOLTS	
HEADED STUDS AND ANCHORS	
CEMENT TREATMENT OF FILLS	(SEE SPECIFICATIONS
DECK ATTACHMENT	

9. STRUCTURAL OBSERVATION
   THE OWNER SHALL EMPLOY THE ENGINEER OR ARCHITECT RESPONSIBLE FOR THE STRUCTURAL DESIGN TO PERFORM STRUCTURAL OBSERVATION PER CBC SECTION 1702 & 1710.

E. DEFERRED APPROVALS

WHERE DEFERRED APPROVAL ITEMS ARE DESIGN-BUILD (OR BIDDER-DESIGNED), THE CONTRACTOR SHALL SUBMIT DRAWINGS AND CALCULATIONS STAMPED AND SIGNED BY A CIVIL ENGINEER LICENSED IN THE STATE OF CALIFORNIA. SUBMITTAL DOCUMENTS FOR THE FOLLOWING DEFERRED APPROVAL ITEMS SHALL BE REVIEWED BY THE ARCHITECT OR ENGINEER OF RECORD AND THEN SUBSEQUENTLY REVIEWED AND APPROVED BY THE BUILDING OFFICIAL PRIOR TO INSTALLATION.

F. BOLT TIGHTENING

ALL FRAMING BOLTS SHALL BE A325X BEARING TYPE WITH THREADS EXCLUDED FROM THE SHEAR PLANE. ALL BOLTS SHALL BE TIGHTENED TO SPECIFIED MINIMUM TENSILE STRENGTHS TABULATED BELOW. AVOID EXCESSIVE AND/OR UNCONTROLLED TIGHTENING.

1. THE REQUIRED MINIMUM TENSION FOR ALL A325 BOLTS IS:

MINIMUM TIGHTENING TENSION, KIPS	
DIA., IN.	A325
1/2	12
5/8	19
3/4	28
7/8	39
1	51
1 1/4	71
1 1/2	103

2. ALL BOLTS TO BE FURNISHED WITH LOAD INDICATING WASHERS OR TIGHTENED BY A CALIBRATED WRENCH WITH MEANS OF A POWERED WRENCH WITH AUTOMATIC CUTOFF AND CALIBRATION ON THE JOB. CONTROL AND TEST TO BE ACCOMPLISHED WITH A HYDRAULIC DEVICE EQUIPPED WITH A GAGE THAT REGISTERS THE TENSILE STRESS DEVELOPED AND WITNESSED BY PROJECT INSPECTOR.

G. CONCRETE, U.N.O.

1. ALL CONCRETE SHALL BE REINFORCED WITH REINFORCING BARS IN TWO DIRECTIONS, EXCEPT WHERE SPECIFICALLY NOTED "UNREINFORCED" ON THE STRUCTURAL DRAWINGS. MINIMUM REINFORCING SHALL BE #4 @ 12 INCHES EACH WAY; OR AN AREA OF UNIFORMLY DISPERSED REBAR EQUAL TO 0.0020 TIMES THE GROSS CONCRETE SECTION; WHICHEVER IS GREATER EXCEPT WHERE SHOWN OTHERWISE.
2. ALL CONCRETE MIXES SHALL BE DESIGNED BY AN INDEPENDENT TESTING LABORATORY. TEST CYLINDERS SHALL BE PREPARED AND TESTED AT 7 DAYS, 14 DAYS, & 28 DAYS, PRIOR TO SUBMITTALS OF DESIGN MIXES. SEE PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. ALL CONCRETE SHALL BE AS PER SPECIFICATIONS. WHERE NO SPECIFIC STRENGTH IS CALLED OUT, USE NORMAL WEIGHT CONCRETE WITH 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI, UNLESS NOTED OTHERWISE.
4. CONCRETE REINFORCING COVER AS FOLLOWS:

FOR BELOW GRADE SHOTCRETE:
EXTERIOR COVER MIN. 3 INCHES – MAX. 3-1/2 INCHES
INTERIOR COVER MIN. 3 INCHES – MAX. 3-1/2 INCHES

FOOTINGS AND SLABS CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3 INCHES
CONCRETE EXPOSED TO EARTH OR WEATHER	2 INCHES FOR #6 AND LARGER 1-1/2 INCHES FOR #5 AND SMALLER
CONCRETE NOT EXPOSED TO EARTH OR WEATHER	
WALLS AND SLABS, #11 OR SMALLER	3/4 INCHES
BEAM STIRRUPS	1-1/2 INCHES
COLUMN TIES	1-1/2 INCHES
PRECAST CONCRETE WALLS – EXTERIOR FACES	3/4 INCHES
PRECAST CONCRETE WALLS – INTERIOR FACES	5/8 INCHES

5. LIMIT POURS OF SLABS ON GRADE TO 900 SQ. FT. AND SUPPORTED SLABS TO 5000 SQ. FT. AREAS AND POUR IN ALTERNATE STRIPS FOR ALL SLABS OR SAWCUT AT 10'-0"x10'-0" PATTERN WITHIN 48 HOURS OF POUR UNLESS NOTED OTHERWISE. JOINTS AND SAWCUTS MAY BE OMITTED IN SLABS COVERED WITH TOPPING SLABS. LIMIT WALL POURS TO 20 LINEAR FEET FOR ANY WALL. SEE TYPICAL DETAILS FOR JOINT AND SPLICE LENGTH. MAXIMUM DISTANCE BETWEEN CONSTRUCTION JOINTS 20 FEET.
6. ROUGHEN SURFACES AT ALL JOINTS. PROVIDE SHEAR KEYS AND PREPARE JOINTS AS PER DRAWINGS AND SPECIFICATIONS.

G. CONCRETE U.O.N. (CONTINUED)

7. ALL CONCRETE DIMENSIONS SHOWN ARE MINIMUM DIMENSIONS. CONTRACTOR TO REVIEW FORMING, REINFORCING DETAILS, AND EMBEDDED ITEMS PLACEMENT REQUIREMENTS AND DETERMINE PRIOR TO FABRICATION OF ANY REINFORCING REQUIREMENTS AND CLEARANCES FOR PROPERLY PLACING AND CONSOLIDATING CONCRETE. CONTRACTOR MAY SUBMIT FOR ARCHITECT'S REVIEW LARGER DIMENSIONS FOR PARTICULAR CONDITIONS TO FACILITATE CONTRACTOR'S WORK AT NO ADDITIONAL COST TO OWNER.
8. ALL SLABS, UNLESS OTHERWISE NOTED, TO BE POURED AND FINISHED LEVEL WITHIN THE TOLERANCES INDICATED IN THE PROJECT SPECIFICATIONS. CONTRACTOR TO PROVIDE ADDITIONAL CONCRETE AS REQUIRED TO COMPENSATE FOR FORMWORK/METAL DECK DEFLECTION FROM THE WET WEIGHT OF CONCRETE. WHERE FINISHED TOP OF CONCRETE IS NOT WITHIN TOLERANCES, CONTRACTOR SHALL PROVIDE SUITABLE ADDITIONAL FLOOR LEVELING COMPOUND AT NO COST.
9. PROVIDE GROUT-CLEANED FINISH FOR ALL FORMED CONCRETE WALLS AND FLOOR EDGES EXPOSED TO VIEW.
10. "ALL THREAD" MATERIAL SHALL NOT BE SUBSTITUTED FOR BOLTS IN STEEL, CONCRETE, TIMBER, MASONRY, OR ANY OTHER STRUCTURAL APPLICATION, UNLESS NOTED OTHERWISE.

STRUCTURAL SUBMITTALS

1. REVIEW OF SHOP DRAWINGS AND SUBMITTALS BY THE EOR IS FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS.
2. SHOP DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR REVIEW PRIOR TO FABRICATION. CONTRACTOR WILL REMAIN RESPONSIBLE FOR ALL ERRORS OF DETAILING, FABRICATION, AND FOR CORRECT FITTING OF ALL STRUCTURAL MEMBERS INCLUDING COORDINATION WITH OTHER TRADES.
   A. SHOP DRAWINGS SHALL BE SUBMITTED TO THE EOR (ALLOW FOR A REVIEW DURATION OF 10 BUSINESS DAYS), AND SHALL CONSIST OF ELECTRONIC FILES.
   B. EOR WILL RETURN THE REPRODUCIBLE SET CLEARLY MARKED WITH COMMENTS. ANY REQUIRED RECORD SET COPIES SHALL BE MADE FROM THIS RETURNED SET.
   C. REPRODUCTION OF STRUCTURAL PLANS AND DETAILS FOR SHOP DRAWINGS IS PROHIBITED. SUBCONTRACTOR/FABRICATOR IS TO PROVIDE INDEPENDENTLY CREATED DRAWINGS BASED ON THE STRUCTURAL PLANS AND DETAILS. SHOP DRAWINGS THAT ARE REPRODUCTIONS OF STRUCTURAL DRAWINGS WILL NOT BE REVIEWED.
3. SHOP DRAWINGS AND SUBMITTALS DO NOT CONSTITUTE CHANGE ORDERS. ANY PROPOSED CHANGES TO THE STRUCTURAL DOCUMENTS MUST BE SUBMITTED IN WRITING AS A REQUEST FOR SUBSTITUTION TO THE ARCHITECT AND EOR FOR APPROVAL.
4. EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A MAIN WIND OR SEISMIC FORCE RESISTING SYSTEM, DESIGNATED SEISMIC SYSTEM OR A WIND OR SEISMIC RESISTING COMPONENT LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. THE CONTRACTORS STATEMENT OF RESPONSIBILITY SHALL CONTAIN ACKNOWLEDGEMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE STATEMENT OF SPECIAL INSPECTION.
5. THE FOLLOWING LIST SUMMARIZES REQUIRED STRUCTURAL SUBMITTALS FOR THIS PROJECT. REFER TO THE SPECIFICATIONS FOR A COMPLETE LIST AND ADDITIONAL REQUIREMENTS.

GENERAL
- QUALIFICATION DATA FOR APPROVED INSTALLERS AND FABRICATORS
- CERTIFICATES OF CONFORMANCE FOR PREFABRICATED MEMBERS
- SEISMIC JOINT AND EXPANSION JOINT COVER PRODUCT DATA

CONCRETE REINFORCEMENT
- MANUFACTURER'S PRODUCT DATA, SPECIFICATIONS AND INSTALLATION PROCEDURES FOR PROPRIETARY MATERIALS AND REINFORCEMENT
- STEEL PRODUCER'S CERTIFICATES OF MILL ANALYSIS, TENSILE AND BEND TESTS
- SHOP DRAWINGS FOR FABRICATION, BENDING AND PLACEMENT

CAST-IN-PLACE CONCRETE
- DESIGN MIX FOR EACH CONCRETE MIX
- MATERIAL TEST REPORTS
- MATERIAL CERTIFICATES FOR CEMENT, AGGREGATES AND ADMIXTURES
- SHOP DRAWINGS FOR PROPOSED LOCATIONS OF ADDITIONAL CONSTRUCTION OF CONTROL JOINTS NOT SHOWN ON THE STRUCTURAL PLANS
- MINUTES FROM PREINSTALLATION CONFERENCE

STRUCTURAL STEEL
- MANUFACTURER'S MILL CERTIFICATES
- MILL TEST REPORTS
- SHOP DRAWINGS FOR FABRICATION AND ASSEMBLY OF MEMBERS
- ERECTION PLAN SEQUENCE AND PROCEDURES
- WELDING PROCEDURE SPECIFICATIONS (WPS)
- CERTIFICATES FOR ALL WELDERS VERIFYING CURRENT AWS QUALIFICATIONS
- TEST REPORTS FOR SHOP AND FIELD WELDED BOLTED CONNECTIONS

STEEL DECK
- SHOP DRAWINGS INDICATING TYPE, LAYOUT, DETAILS, AND OPENINGS LARGER THAN 1'-0"

CITY OF TRACY

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LICENSED ARCHITECT PAUL W. POWERS C-29713 2/28/2027 RENEWAL DATE STATE OF CALIFORNIA

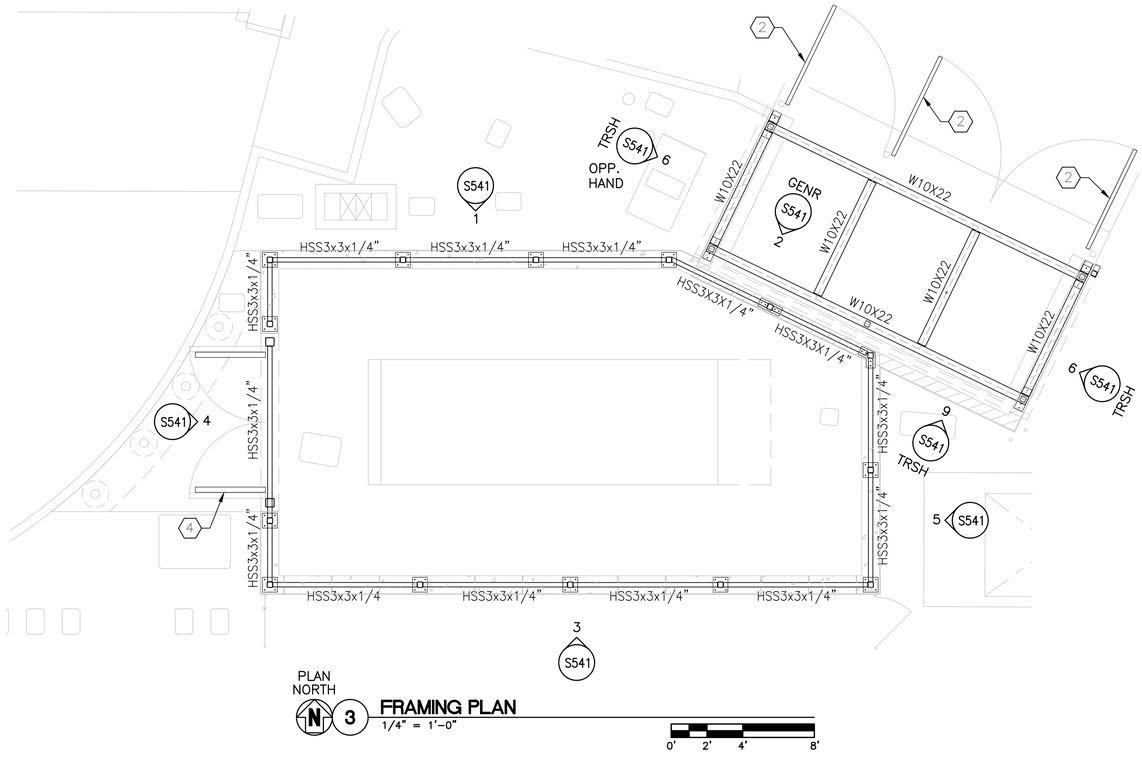
KPA ENGINEERS ARCHITECTS
THE KPA GROUP
1840 FOURTH STREET, SUITE 200
LIVERMORE, CALIFORNIA 94550
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REVISIONS			
SYMBOL	DATE	DESCRIPTION	APPROVED

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353
STRUCTURAL GENERAL NOTES
TRANSIT STATION EMERGENCY BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

S001

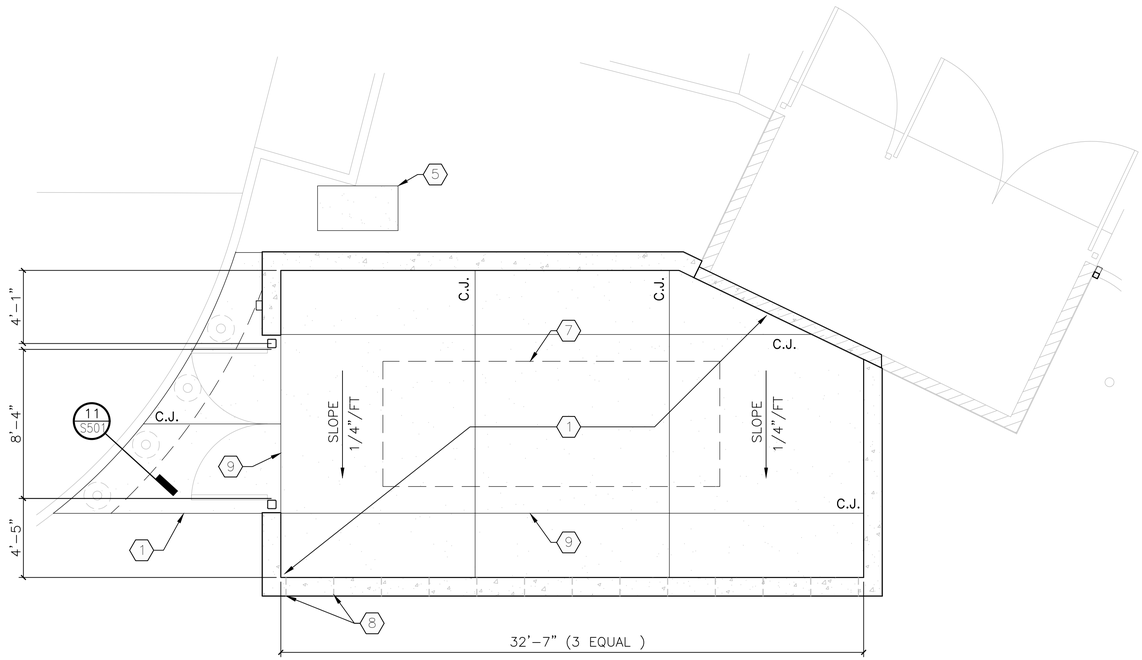


PLAN NORTH

3 FRAMING PLAN

1/4" = 1'-0"

0' 2' 4' 8'

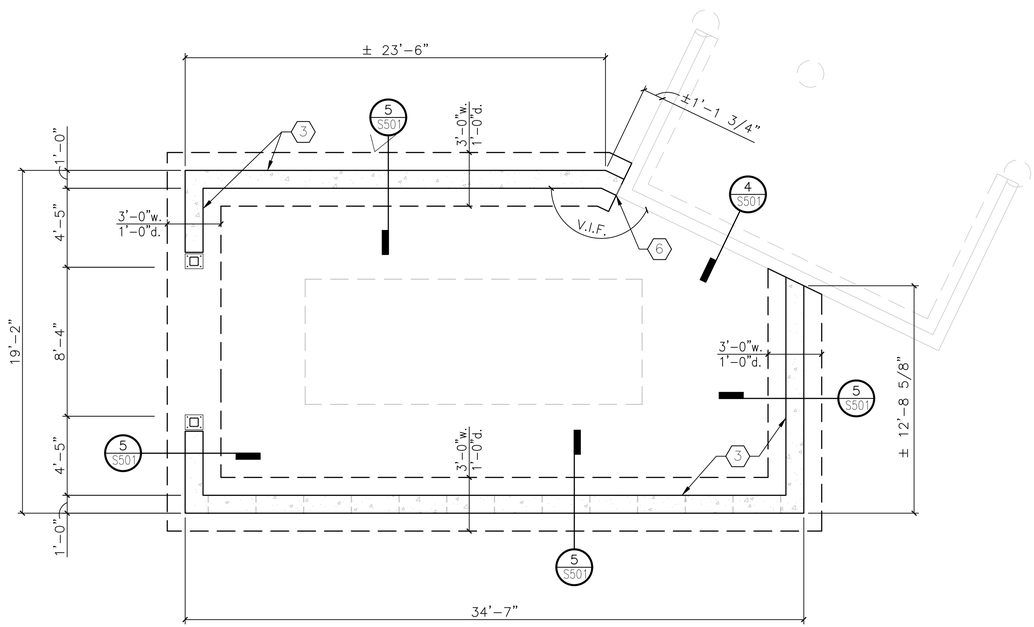


PLAN NORTH

2 FLATWORK PLAN

1/4" = 1'-0"

0' 2' 4' 8'



PLAN NORTH

1 FOUNDATION PLAN

1/4" = 1'-0"

0' 2' 4' 8'

GENERAL NOTES:

1. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR FINAL DECISION.
2. FIELD VERIFY ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION. CONTRACTOR TO COORDINATE ANY DISRUPTION OF SERVICES WITH OWNER PRIOR TO DISCONNECTING.
3. SEE SHEET S541 FOR ALL SPACING OF VERTICAL STEEL FRAMING PER ELEVATION CALLOUTS.

KEYED NOTES:

1. 6" CONC. SLAB-ON-GRADE w/ #4'S AT 12" O.C., EACH WAY, CENTERED IN SLAB, SEE DETAIL 2/S501
2. HSS STEEL GATE FRAME, SEE FRAME ELEVATION 7/S541
3. 12" REINFORCED CONCRETE WALL. TYPICAL ALL WALLS U.O.N.,
4. HSS STEEL GATE FRAME, SEE FRAME ELEVATION 8/S541
5. 54"x30" CONCRETE EQUIPMENT SLAB, SEE DETAIL D8.2/C503
6. ALIGN FACE OF NEW CONCRETE WALL WITH FACE OF EXISTING MASONRY WALL
7. PROVIDE (10) 1/2"ø SS TITEN-HD SCREWS w/ 3-1/4" EMBED, TYPICAL. COORDINATE w/ APPROVED GENERATOR SHOP DRAWINGS
8. WEEP HOLES (3/4"ø) AT 48" O.C. ALONG LENGTH OF SOUTH WALL (PRE-POUR)
9. CONSTRUCTION JOINT, SEE DETAIL 12/S501

CITY OF TRACY

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LICENSED ARCHITECT
PAUL W. POWERS
C-29713
2/28/2027
RENEWAL DATE
STATE OF CALIFORNIA

KPA ENGINEERS ARCHITECTS
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SYMBOL	DATE	DESCRIPTION	APPROVED
1	12-12-24	REVIEW COMMENTS - REV 1	
2	10-12-25	REVIEW COMMENTS - REV 2	

REVISIONS

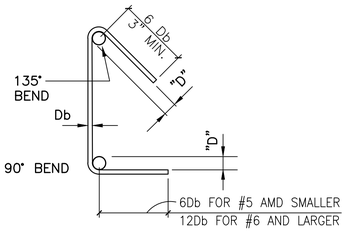
DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
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PERMIT #: COM24-0353
STRUCTURAL ENLARGED PLANS
TRANSIT STATION EMERGENCY BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
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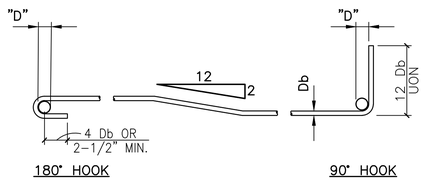
S101

SHEET 13 OF 20

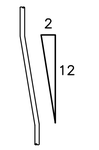
	BEND DIAMETER "D"	
BAR SIZE	STIRRUPS AND TIES	ALL OTHER BARS
#3 THRU #5	4 Db	6 Db
#6 THRU #8	4 Db	6 Db



STIRRUPS AND TIE HOOKS



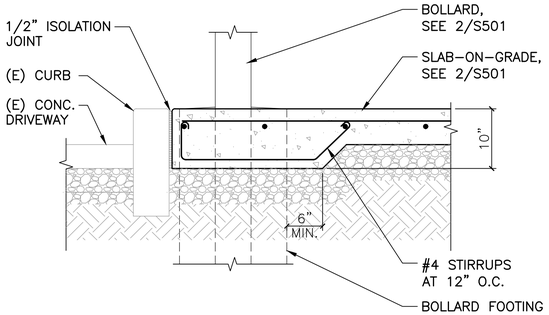
TYPICAL BAR OFFSET AND HOOKS



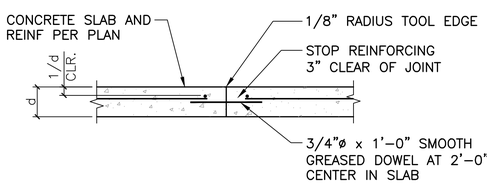
TYPICAL BAR COLUMN BAR OFFEST

NOTES:
1. "Db" IS THE NOMINAL DIAMETER OF THE BAR BEING BENT OR SPLICED

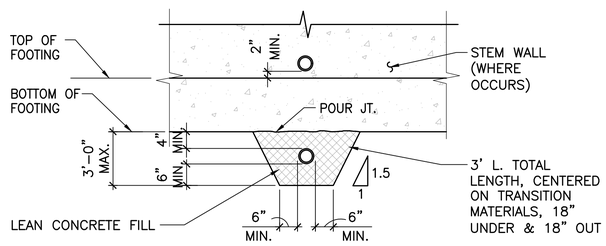
10 TYPICAL BAR BENDING DETAILS
N.T.S.

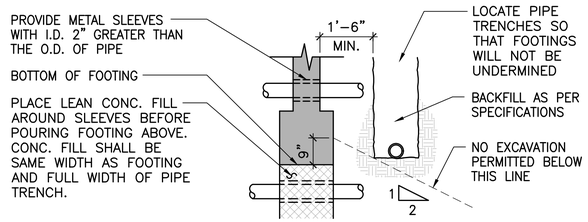


11 THICKENED SLAB EDGE DETAIL
1"=1'-0"

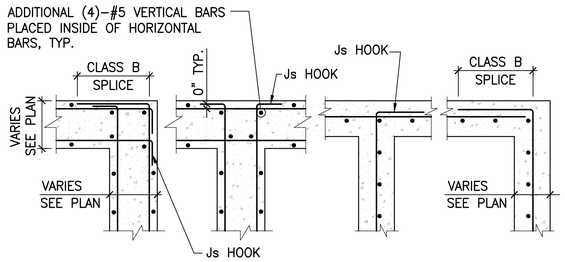


12 COLD DOWELED CONSTRUCTION JOINT
N.T.S

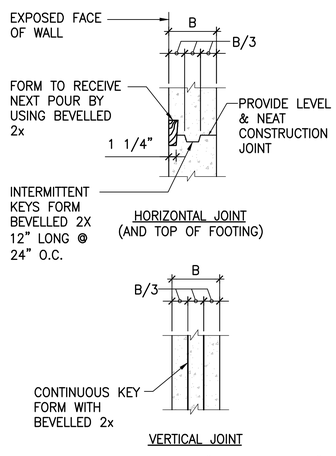




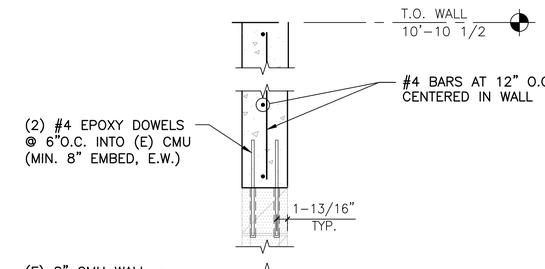
7 TYPICAL PIPE TRENCH DETAIL
NO SCALE



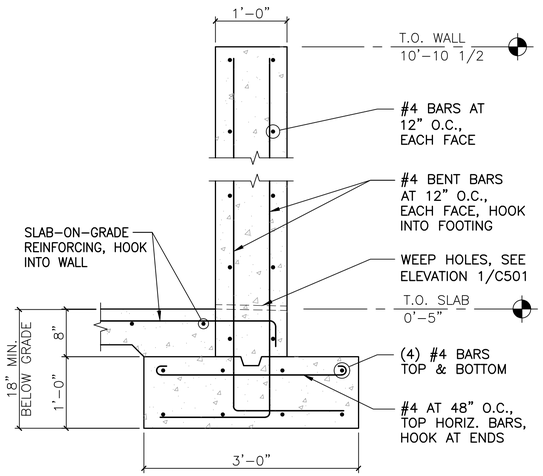
TYPICAL REINFORCING DETAILS AT WALL INTERSECTIONS
8
NO SCALE



9 CONSTRUCTION JOINTS
N.T.S.



4 FOUNDATION WALL AND FOOTING
1"=1'-0"



5 FOUNDATION WALL AND FOOTING
1"=1'-0"

BAR SIZE	CLASS B		CLASS A		ld	
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS
#3	2'-0"	1'-7"	1'-7"	1'-3"	1'-7"	1'-3"
#4	2'-8"	2'-1"	2'-1"	1'-7"	2'-1"	1'-7"
#5	3'-4"	2'-7"	2'-7"	2'-0"	2'-7"	2'-0"
#6	4'-0"	3'-1"	3'-1"	2'-5"	3'-1"	2'-5"
#7	5'-10"	4'-6"	4'-6"	3'-6"	4'-6"	3'-6"
#8	6'-8"	5'-2"	5'-2"	4'-0"	5'-2"	4'-0"
#9	7'-7"	5'-10"	5'-10"	4'-6"	5'-10"	4'-6"
#10	8'-6"	6'-7"	6'-7"	5'-1"	6'-7"	5'-1"
#11	9'-5"	7'-3"	7'-3"	5'-7"	7'-3"	5'-7"

NOTES:
1. SPLICE LENGTHS ARE TYPICAL UNLESS NOTED OTHERWISE.
2. USE CLASS A SPLICES ONLY WHERE SPECIFICALLY NOTED ON DRAWINGS. ALL CLASS A SPLICES SHALL BE STAGGERED SO THAT NO MORE THAN HALF OF THE TOTAL REINFORCEMENT IS SPLICED WITHIN THE REQUIRED LAP LENGTH.
3. USE CLASS B SPLICES AT ALL OTHER LOCATIONS, INCLUDING ALL BARS MARKED AS CONTINUOUS AND ALL COLUMN REINFORCING.
4. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 INCHES OF FRESH CONCRETE CAST BELOW THE BARS.

6 TYPICAL LAP SPLICE FOR SCHEDULE
N.T.S.

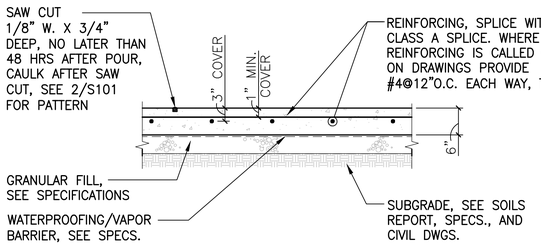
1. EPOXY ADHESIVE SHALL BE USED FOR ALL ALL-THREAD ROD (A.T.R.) ANCHORS AND REINFORCING STEEL (REBAR) DOWELS EMBEDDED IN EXISTING CONCRETE EXCEPT EPOXY SYSTEMS SHALL NOT BE USED TO SUPPORT GRAVITY LOADS EXPOSED TO FIRE AND NOT BURIED IN CONCRETE WITH A MINIMUM COVER OF 3 INCHES.
2. EPOXY ADHESIVE SYSTEMS SHALL BE SIMPSON "SET-XP" (ICC ESR-2508), HILTI "HIT-RE 500 V3" (ICC ER-3814), OR EQUIVALENT. ALTERNATIVE ANCHORING SYSTEMS MAY BE USED ONLY WITH PRIOR WRITTEN APPROVAL BY STRUCTURAL ENGINEER.
3. ALL THREADED RODS (ATR'S) AND ANCHOR BOLTS (A.B.'S) SHALL BE ASTM A307. MINIMUM DEPTH OF EMBEDMENT SHALL BE AS DETAILED ON THE DRAWINGS.
4. TEST 25% OF THE INSTALLED A.T.R. ANCHORS. TESTING OF REBAR DOWELS IS NOT REQUIRED.
5. PULL-OUT TEST LOAD VALUES:

A.T.R. OR REBAR DIAMETER	EMBEDMENT	PULL-OUT LOAD
3/8"	3 1/2"	2900 LBS.
1/2"	4 1/2"	4100 LBS.
5/8"	5 5/8"	6600 LBS.
3/4"	6 3/4"	7000 LBS.
7/8"	7 7/8"	11800 LBS.
1"	9"	12500 LBS.

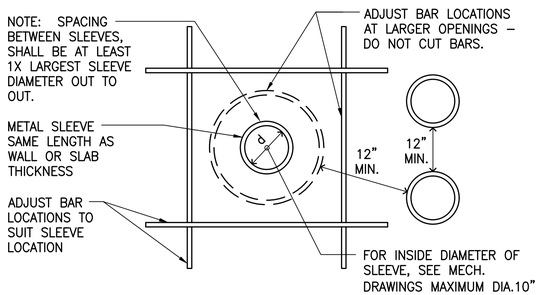
6. IF ANY ANCHOR SHOULD FAIL, IT SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

1 DRILLED ANCHORS - ANCHOR BOLTS, THREADED RODS OR REBAR SET IN EPOXY
NO SCALE

REINFORCING NOTES:
1. ALL CONCRETE REINFORCING IS ASTM A615, Fy=60 KSI, EXCEPT WHERE OTHERWISE NOTED.
2. REINFORCING SHALL BE CONTINUOUS U.N.O., STAGGER ALL SPLICES.
3. SPLICES IN REINFORCING AND SPLICE LENGTHS TO BE AS SHOWN ON TYPICAL DETAILS. LOCATE JOINTS AND SPLICES AS SHOWN ON DRAWINGS. SUBMIT FOR REVIEW ALL OTHER JOINT LOCATIONS AND SPLICE DETAILS. STAGGER ALL SPLICES WHERE POSSIBLE & PROVIDE SPLICES AS SHOWN ON CONTRACT DOCUMENTS. WHERE NO SPLICE IS SHOWN PROVIDE SPLICES AND DEVELOPMENT LENGTHS OF AT LEAST 48 BAR DIAMETERS. NO WELDING OF ANY REINFORCING IS PERMITTED EXCEPT HERE SPECIFICALLY SHOWN ON STRUCTURAL DOCUMENTS. REBAR SHOWN TO BE WELDED SHALL CONFORM TO ASTM A706.
4. LOCATE ALL REINFORCING AS SHOWN ON DRAWINGS AND FASTEN SECURELY.
5. ALL REINFORCING TO TERMINATE WITH STANDARD HOOKS AS SHOWN ON TYPICAL DETAILS. UNLESS NOTED OTHERWISE, ALL STIRRUPS AND TIES TO BE CLOSED WITH 135 DEGREE BENDS.



2 TYPICAL SLAB-ON-GRADE
3/4"=1'-0"



3 TYPICAL CONCRETE WALL SLEEVE DETAIL
NO SCALE

CITY OF TRACY

TRACY — Think Inside the Triangle

LICENSED ARCHITECT — PAUL W. POWERS — C-29713 — 2/28/2027 — RENEWAL DATE — STATE OF CALIFORNIA

KPA ENGINEERS ARCHITECTS
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TEL 925.223.8217 www.thekpagroup.com
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SYMBOL	DATE	DESCRIPTION	APPROVED
1	12-12-24	REVIEW COMMENTS REV 1	
2	10-13-25	REVIEW COMMENTS REV 2	

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353
STRUCTURAL FOUNDATION/SLAB DETAILS
TRANSIT STATION EMERGENCY BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

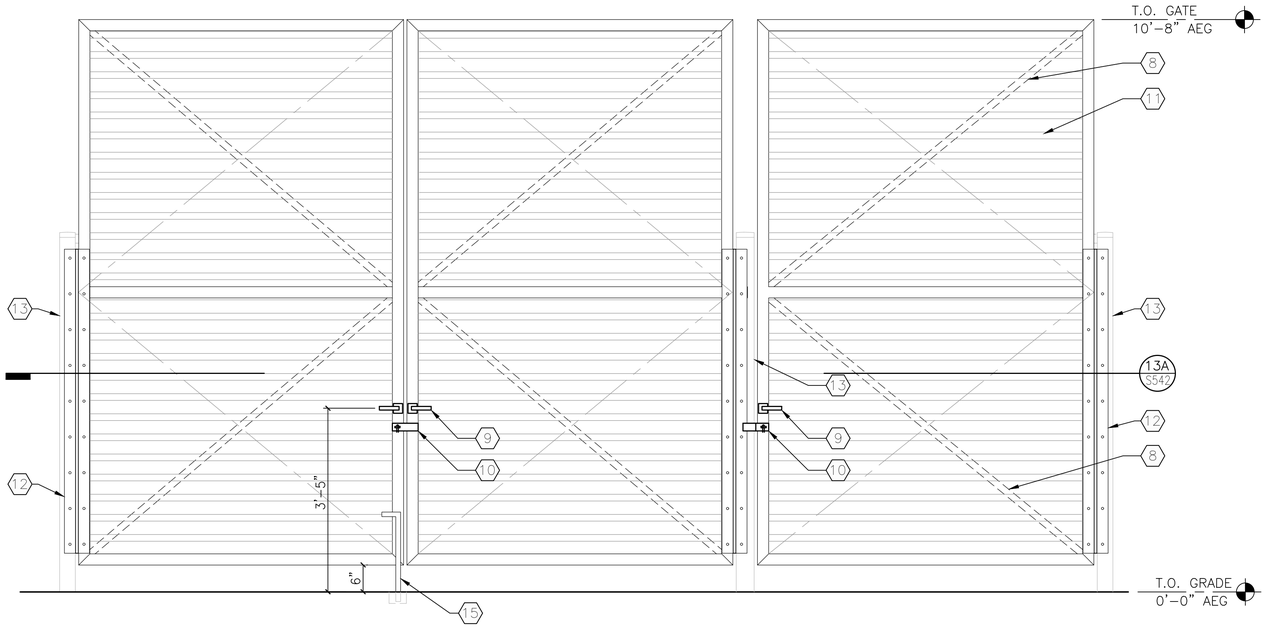
S501

GENERAL NOTES:

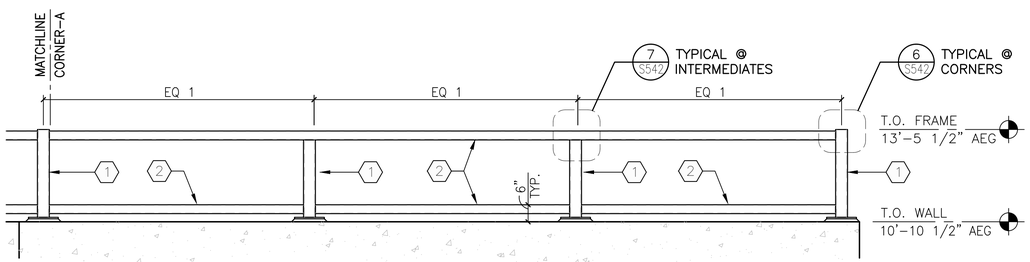
1. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR FINAL DECISION.
2. ALL EXPOSED STEEL SHALL BE GALVANIZED, PRIMED AND PAINTED. COLOR TO BE DETERMINED.

KEYED NOTES:

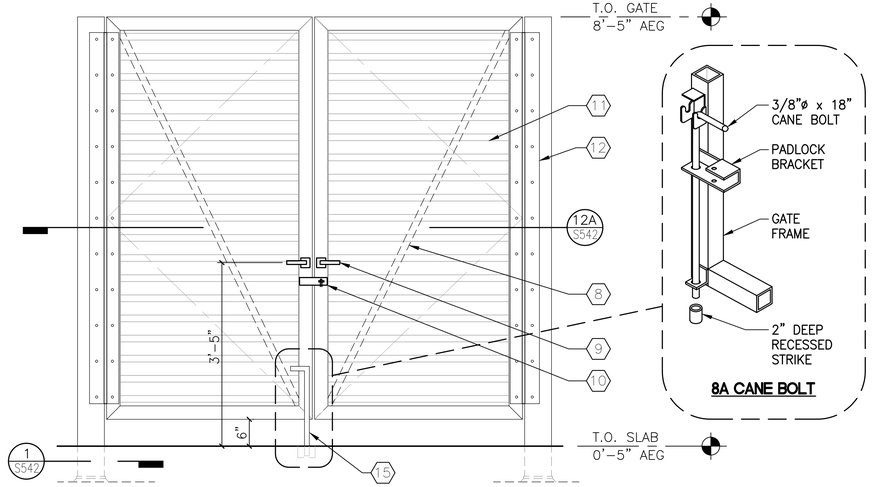
1. HSS4X4X3/8" COLUMN AND/OR BEAM
2. HSS3X3X1/4" BEAM
3. HSS2X2X13/16" BRACE
4. W6X12 COLUMN AND/OR BEAM
5. 1" SQ. STEEL BAR FRAMING
6. W10X22 BEAM
7. STIFFENER PLATE AT CROSS BEAM LOCATIONS
8. ∠1X1X1/8 DIAGONAL BRACING, TYPICAL EACH LEAF
9. FIXED GATE HANDLE, TYP. EACH LEAF
10. LOCK HASP AFFIXED TO HSS GATE FRAME
11. 7/8" CORRUGATED METAL PANEL (40% PERFORATED) ATTACHED TO STEEL ANGLE FRAMING
12. CONTINUOUS PIANO HINGE
13. EXISTING HSS JAMB POST
14. PROVIDE STEEL BENT PLATE FOR LIGHT FIXTURE MOUNT, SEE DETAIL 11/C502
15. HEAVY DUTY, SURFACE MOUNTED @ OUTSIDE OF GATE LEAF, LOCKABLE STAINLESS STEEL CANE BOLT. INSTALL HEAVY DUTY STAINLESS STEEL GROUND CATCHES WITH DRAIN HOLES IN BOTH THE OPEN AND CLOSED GATE LEAF POSITIONS, SEE DETAIL 8A/S542



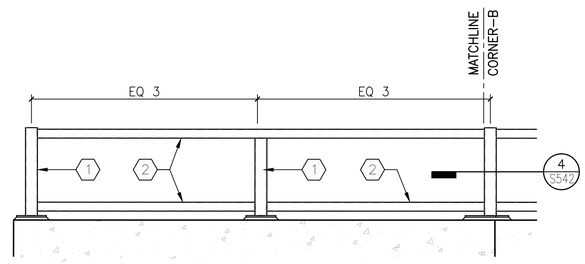
7 GATE FRAME ELEVATION AT TRASH ENCLOSURE
3/4" = 1'-0"



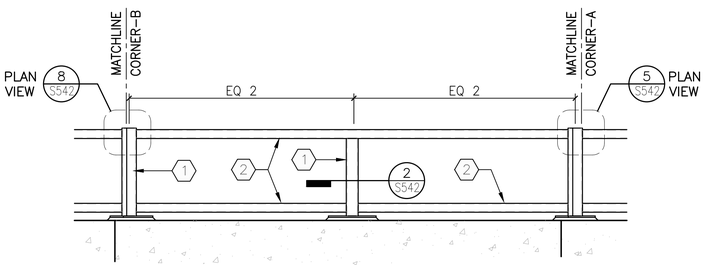
1 GENERATOR ENCLOSURE - NORTH ELEVATION
1/2" = 1'-0"



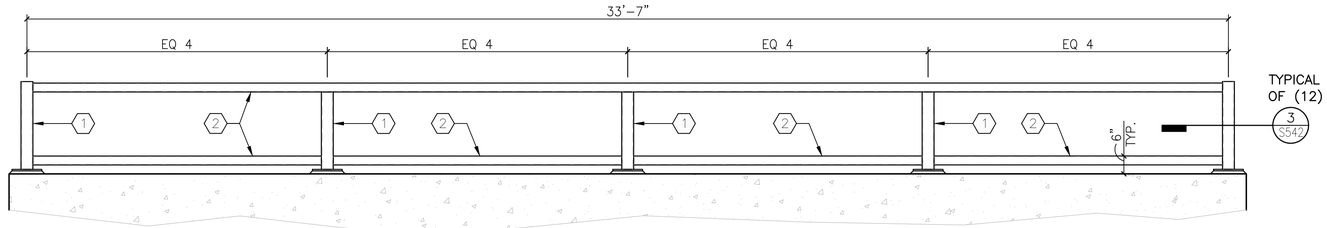
8 GATE FRAME ELEVATION AT GENERATOR
3/4" = 1'-0"



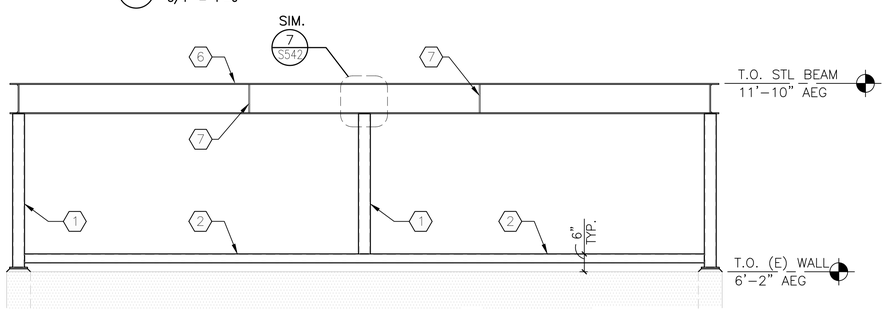
5 GENERATOR ENCLOSURE - EAST ELEVATION
1/2" = 1'-0"



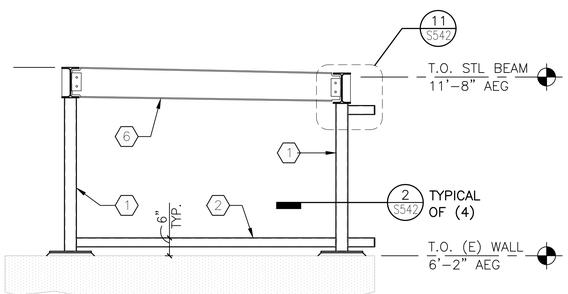
2 GENERATOR ENCLOSURE - NORTHEAST ELEVATION
1/2" = 1'-0"



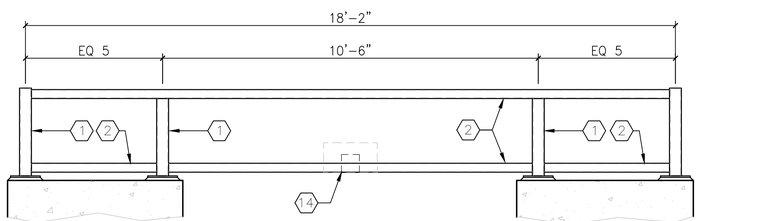
3 GENERATOR ENCLOSURE - SOUTH ELEVATION
1/2" = 1'-0"



9 TRASH ENCLOSURE - ELEVATION
1/2" = 1'-0"



6 TRASH ENCLOSURE - ELEVATION
1/2" = 1'-0"



4 GENERATOR ENCLOSURE - WEST ELEVATION
1/2" = 1'-0"

CITY OF TRACY

Think Inside the Triangle

LICENSED ARCHITECT
PAUL W. POWERS
C-29713
2/28/2027
RENEWAL DATE
STATE OF CALIFORNIA

KPA ENGINEERS ARCHITECTS
THE KPA GROUP
1840 FOURTH STREET, SUITE 200
LIVERMORE, CALIFORNIA 94550
TEL 925.223.8217 www.thekpagroup.com

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REVISIONS			
SYMBOL	DATE	DESCRIPTION	APPROVED
1	10-31-25	ROOF COMMENTS REV 2	

DESIGNED BY: CDT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

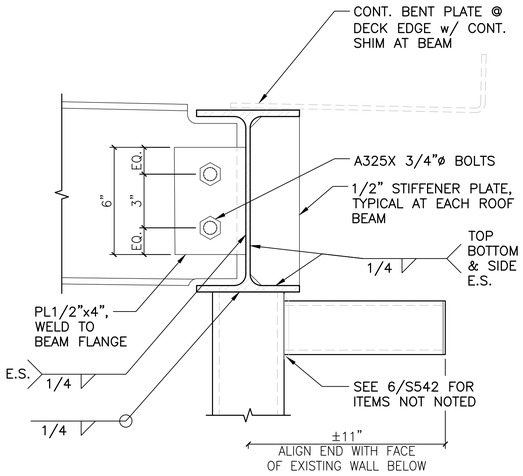
PERMIT #: COM24-0353
STRUCTURAL FRAMING ELEVATIONS
TRANSIT STATION EMERGENCY
BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

S541

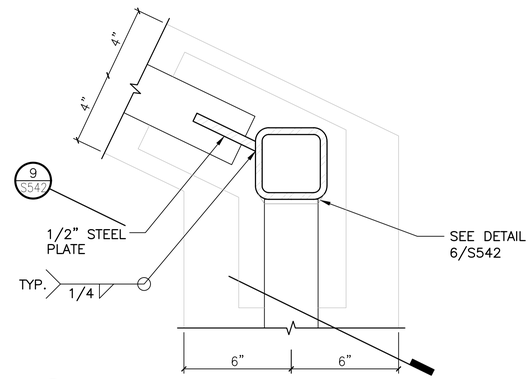
SHEET 15 OF 20

GENERAL NOTES:

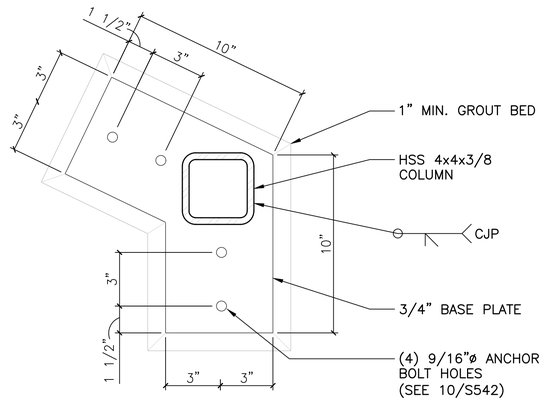
1. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR FINAL DECISION.
2. ALL BOLT HOLES ARE 1/16" LARGER THAN THE ANCHOR BOLTS.
3. ALL EXPOSED STEEL SHALL BE GALVANIZED, PRIMED AND PAINTED. COLOR TO BE DETERMINED,



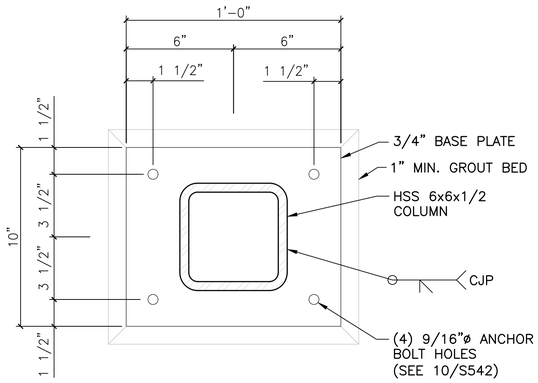
11 TOP OF COLUMN DETAIL
3" = 1'-0"



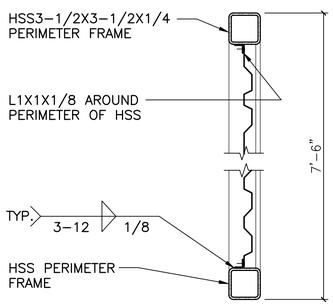
8 PLAN VIEW - BEAM TO COLUMN CONNECTION
3" = 1'-0"



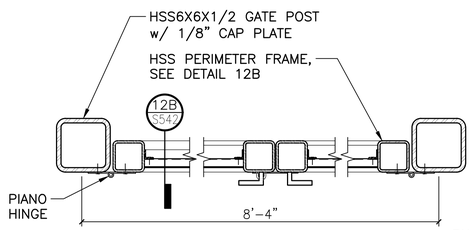
4 BASE PLATE DETAIL AT POST
3" = 1'-0" TYPICAL OF (2)



1 BASE PLATE DETAIL AT GATE JAMB POST
3" = 1'-0" TYPICAL OF (2)



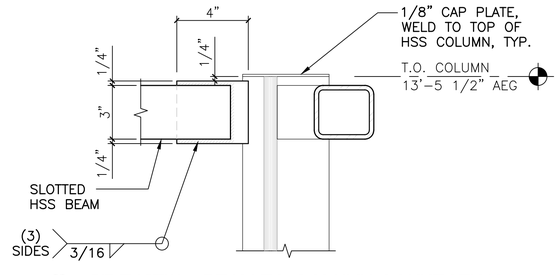
12B GATE LEAF VERTICAL SECTION



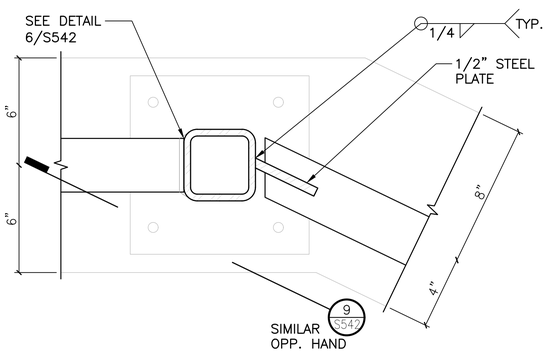
12A GATE LEAF PLAN VIEW SECTION

PIANO HINGE ATTACHMENT:
SIMPSON #10-16 x 3/4 STRONGDRIVE SELF-DRILLING METAL SCREW OR APPROVED EQUAL, MIN. 6 PER HSS POST

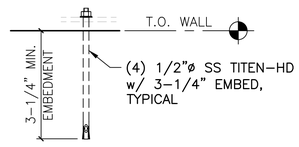
12 GATE LEAFS AT GENERATOR ENCLOSURE
1 1/2" = 1'-0"



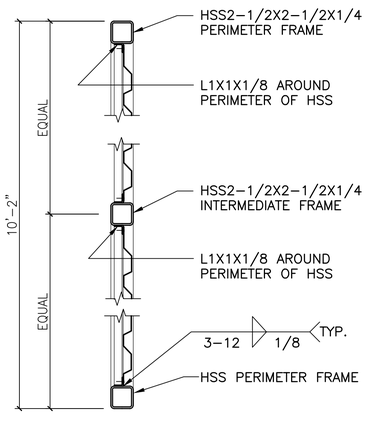
9 SIDE VIEW - BEAM TO COLUMN CONNECTION
3" = 1'-0"



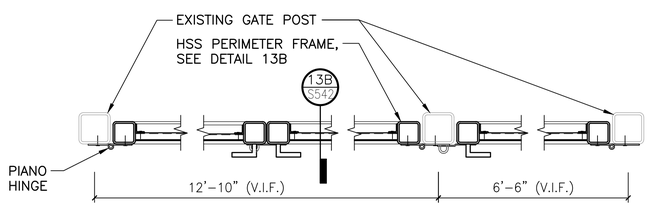
5 PLAN VIEW - BEAM TO COLUMN CONNECTION
3" = 1'-0"



10 ANCHOR BOLTS
NO SCALE

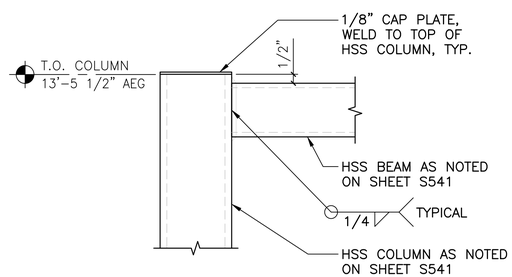


13B GATE LEAF VERTICAL SECTION

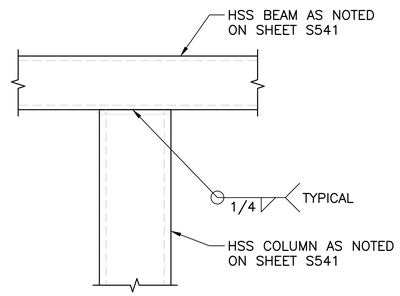


13A GATE LEAF PLAN VIEW SECTION

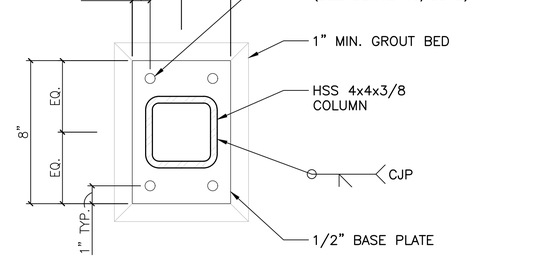
13 GATE LEAFS AT TRASH ENCLOSURE
1 1/2" = 1'-0"



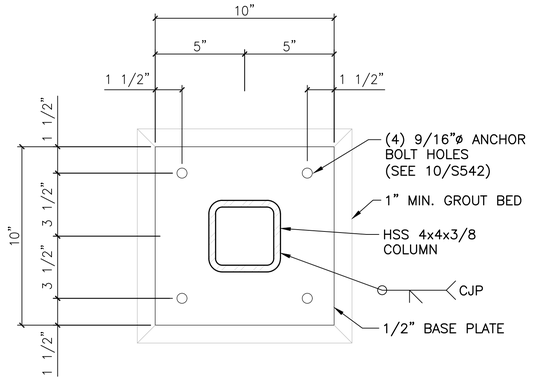
6 TOP OF COLUMN DETAIL
3" = 1'-0"



7 TOP OF COLUMN DETAIL
3" = 1'-0"



2 BASE PLATE DETAIL
3" = 1'-0" TYPICAL OF (5)



3 BASE PLATE DETAIL
3" = 1'-0" TYPICAL OF (12)

CITY OF TRACY

TRACY Think Inside the Triangle

LICENSED ARCHITECT PAUL W. POWERS C-29713 2/28/2027 RENEWAL DATE STATE OF CALIFORNIA

KPA ENGINEERS ARCHITECTS
THE KPA GROUP
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SYMBOL	DATE	REVISIONS DESCRIPTION	APPROVED
1	12-12-24	BIDS COMMENTS SET 1	

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353
STRUCTURAL FRAMING DETAILS
TRANSIT STATION EMERGENCY
BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

S542

GENERAL NOTES- ELECTRICAL:

A. CONTRACTOR SHALL FOLLOW SEISMIC RESTRAINT AND DESIGN REQUIREMENTS CONTAINED IN LATEST ADOPTED STATE AND INTERNATIONAL BUILDING CODES, WITH ALL AMENDMENTS AS ADOPTED BY THE CURRENT LEGISLATION.

B. THE TERM "PROVIDE" SHALL MEAN CONTRACTOR SHALL FURNISH AND INSTALL ITEMS AND CONNECT AS REQUIRED TO OBTAIN A COMPLETE WORKING SYSTEM.

C. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ALL LOCAL, STATE, AND NATIONAL CODES. INCLUDING BUT NOT LIMITED TO LATEST APPLICABLE CALIFORNIA ELECTRICAL CODE, NFPA 70 (NATIONAL ELECTRIC CODE), NFPA 72, INTERNATIONAL BUILDING CODE, CALIFORNIA TITLE 24, ETC.

D. ALL WORK SHALL BE COORDINATE WITH EXISTING CONDITIONS, NEW CONSTRUCTION, OWNER'S VENDORS, ALL TRADES, AND THEIR DOCUMENTS. THE CONTRACTOR SHALL VISIT THE SITE BEFORE SUBMITTING BID.

E. WHEN RUNNING MORE THAN 3 CURRENT CARRYING CONDUCTORS IN A SINGLE CONDUIT, DERATE AMPACITIES IN ACCORDANCE WITH NFPA 70.

F. A CODE SIZE INSULATED GROUND CONDUCTOR SHALL BE PROVIDED IN ALL FEEDER AND BRANCH CIRCUIT CONDUITS.

G. ALL THHN/THWN/THHW/THW/XHHW CONDUCTORS ARE SIZED BASED ON 75°C TEMPERATURE RATING. ALL TERMINATIONS FOR ALL EQUIPMENT AND DEVICES SHALL BE LISTED AND IDENTIFIED FOR USE WITH 75°C CONDUCTORS. IF CONTRACTOR PROVIDES TERMINATIONS OF LESS THAN 75°C, THE ASSOCIATED CONDUCTOR SIZES SHALL BE INCREASED DUE TO THE DERATING AMPACITY PER NEC TABLE 310-15(B)(16). CONTRACTOR SHALL MAKE ALL CHANGES (I.E. CONDUIT SIZES, ETC.) AS NECESSARY AND SHALL MAKE ALL REVISIONS ON "AS-BUILT" DRAWINGS.

H. MINIMUM CONDUIT SIZE IS 3/4 INCH, MINIMUM WIRE SIZE IS #12 AWG (COPPER CONDUCTOR THHN/THWN), UNLESS OTHERWISE NOTED ON PLANS OR IN CIRCUIT REVIEWS.

I. ALL CONDUIT SHALL BE RUN CONCEALED WHEREVER POSSIBLE ABOVE CEILINGS, INSIDE WALLS, OR UNDER FLOOR SLAB (ONLY WHERE SHOWN DASHED ON PLAN, OR NOTED/ALLOWED BY ENGINEER), UNLESS OTHERWISE NOTED ON PLAN. IN HIGH-BAY (NO CEILING) AREAS, RUN EXPOSED CONDUIT HIGH AS POSSIBLE. ALL CONDUIT SHALL BE RUN PARALLEL OR PERPENDICULAR TO NEARBY SURFACE OR STRUCTURAL MEMBERS AND FOLLOW THE SURFACE CONTOURS AS MUCH AS PRACTICAL. NO CONDUIT SHALL BE INSTALLED IN FLOOR SLAB UNLESS SPECIFICALLY NOTED OTHERWISE.

J. CONTRACTOR SHALL PROVIDE RIGID METAL SLEEVES TO FACILITATE PATHWAY (I.E. THRU BLOCK WALLS) FOR ELECTRICAL AND TELECOMMUNICATION DEVICES.

K. PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR CONDUITS. DO NOT LEAVE PIPING/ CONDUITS OPEN ENDED. PROVIDE END BUSHINGS FOR ALL STUB-OUTS AND SLEEVES DESIGNATED TO BE UTILIZED FOR THIS PROJECT. COORDINATE WITH OWNER'S REPRESENTATIVE FOR SYSTEMS NOT PROVIDED UNDER THIS CONTRACT.

L. PROVIDE FIRE STOP TO ALL CONDUITS AND DEVICES PENETRATING FIRE RATED WALLS, SMOKE WALLS AND FLOORS. ALL PENETRATIONS THROUGH FIRE WALLS SHALL BE BY UL LISTED FIRE PENETRATION METHODS/MATERIALS, ETC. SEE ARCHITECTURAL FOR RATED WALLS.

M. MOUNTING HEIGHTS ABOVE FINISHED FLOOR (AFF) ARE TO CENTER OF DEVICE UNLESS NOTED OTHERWISE.

N. DEVICES/OUTLETS SHALL BE COORDINATED WITH ASSOCIATED ARCHITECTURAL DRAWINGS (I.E. FLOOR PLANS, CASEWORK DETAILS/ELEVATIONS, ETC.) FOR EXACT LOCATIONS AND MOUNTING, PRIOR TO ROUGH-IN. IF EXACT LOCATIONS AND MOUNTING ARE NOT INDICATED ON ARCHITECTURAL DRAWINGS, FIELD VERIFY EXACT LOCATIONS AND MOUNTING WITH OWNER AND ALL TRADES. MOUNTING HEIGHTS SHALL MEET CBC ACCESSIBILITY.

O. RECEPTACLES SHALL BE CIRCUITED WITH A SEPARATE GROUND WIRE. RECEPTACLES PROTECTED BY A GROUND FAULT CIRCUIT INTERRUPTER CIRCUIT BREAKER SHALL HAVE A DEDICATED NEUTRAL WIRE PULLED FOR THAT CIRCUIT. S.

P. RECEPTACLES ARE TO BE INSTALLED WITH THE GROUND PIN IN THE TOP POSITION.

Q. FOR EACH RECEPTACLE SUPPLIED FROM A GROUND FAULT CIRCUIT INTERRUPTER BREAKER IN PANELBOARD, PROVIDE A COVER PLATE WITH THE FOLLOWING PERMANENTLY ETCHED OR ENGRAVED MARKING: "G.F.C.I. PROTECTED".

R. ELECTRICAL DRAWINGS SHALL BE COORDINATED WITH EXISTING CONDITIONS, ASSOCIATED MECHANICAL DRAWINGS AND MECHANICAL CONTRACTOR FOR MOTORS, DEVICES, FIXTURES, ETC. FOR EXACT LOCATIONS BEFORE ROUGH-IN OF CONDUIT SYSTEM

S. TURN OVER TO THE OWNER ALL MANUFACTURER'S WARRANTIES FOR EQUIPMENT AND MATERIALS PROVIDED.

T. PROVIDE NEW UPDATED TYPED PANEL LEDGER/CIRCUIT DIRECTORY FOR EACH NEW AND ALTERED PANELBOARD.

U. ALL NEW ELECTRICAL JUNCTION BOXES ABOVE CEILING IN AREAS RELATED TO CONSTRUCTION ARE TO BE IDENTIFIED AND LABELED WITH A PERMANENT MARKER. FIRE ALARM JUNCTION BOXES ARE TO BE PAINTED RED.

V. NO MC CABLE SHALL BE PERMITTED ON PROJECT.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	WALL OUTLET AND INCANDESCENT, FLUORESCENT, LED OR HID FIXTURE
	DUPLEX RECEPTACLE – 20 AMP,125V,2P.,3W,TYP.MTG. AT 18" A.F.F. TO BOTTOM UON WITH HEIGHT NOTED AFF
	CONDUIT CONCEALED WHERE POSSIBLE (NOTE NOT ALL CONDUIT IS INDICATED ON PLANS)
	CONDUIT CONCEALED IN FLOOR OR BELOW GRADE (NOTE NOT ALL CONDUIT IS INDICATED ON PLANS)
	RECESSED MOUNTED PANELBOARD PLANS/SINGLE-LINE FOR NAME, VOLTAGE AND SIZE
C	CONDUIT
PH	PHASE
NEU	NEUTRAL
WP	WEATHERPROOF (NEMA 3R). PROVIDE IN USE TYPE COVER WHERE NEC REQUIRED
GND	GROUND
SGB	MAIN SERVICE GROUND BAR WITHIN MAIN SWITCHBOARD, SEE DETAILS
GTW	GROUND TEST WELL
GFI GF	GROUND FAULT INTERRUPTER(RECEPTACLE)
UON	UNLESS OTHERWISE NOTED
	THIS IS A STANDARD LEGEND. ALL ITEMS MAY NOT APPEAR ON THIS JOB.

CITY OF TRACY

TRACY Think Inside the Triangle

REGISTERED PROFESSIONAL ENGINEER
KEITH A. PHARIS
No. 17740
Exp. 3/31/26
ELECTRICAL
STATE OF CALIFORNIA

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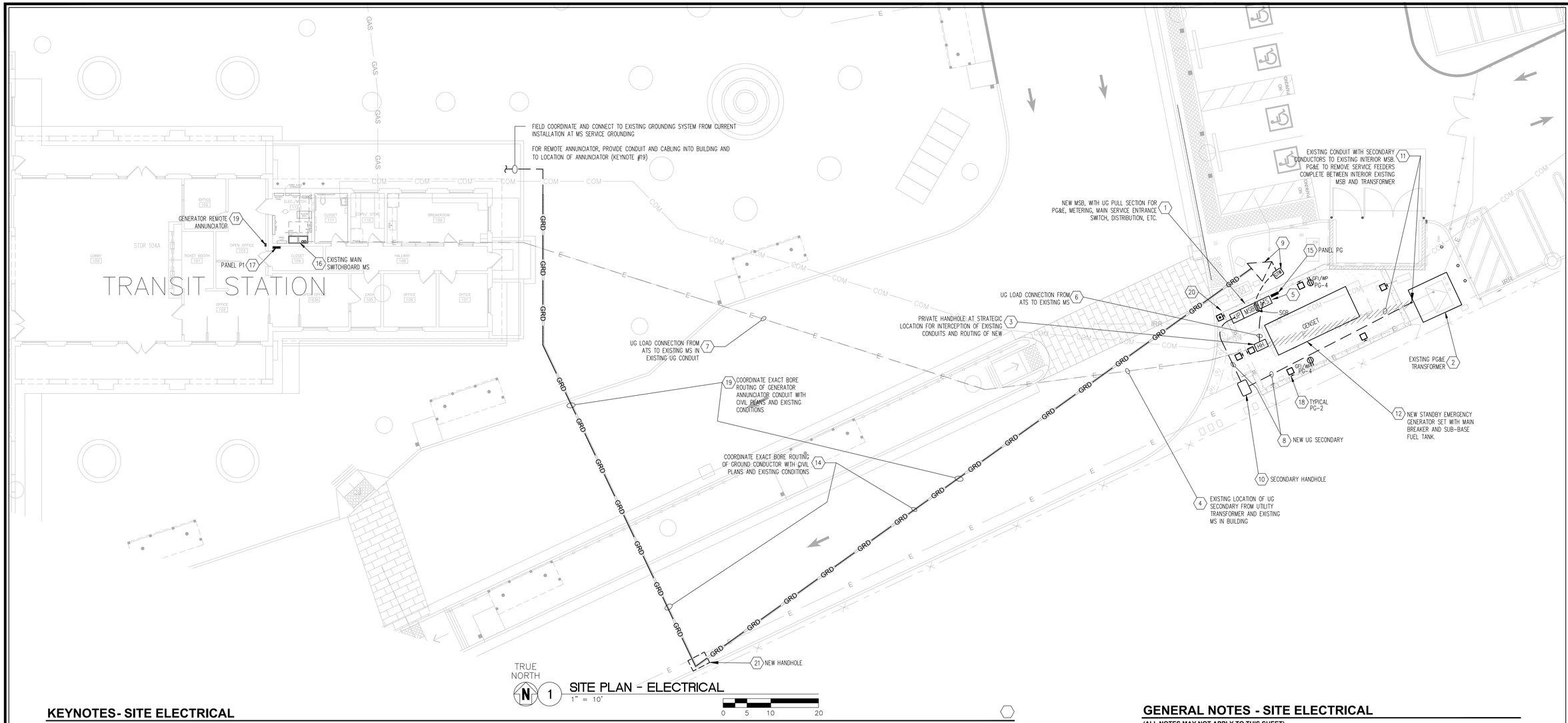
PHARIS ENGINEERING PLLC

SYMBOL	DATE	REVISIONS DESCRIPTION	APPROVED

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353
ELECTRICAL LEGEND
AND GENERAL NOTES
TRANSIT STATION EMERGENCY
BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

E000



KEYNOTES- SITE ELECTRICAL

(ALL NOTES MAY NOT APPLY TO THIS SHEET)

1. PROVIDE MAIN EXTERIOR ELECTRICAL GEAR COMPRISED OF PG&E COMPLIANT UG PULL SECTION AND MAIN SERVICE ENTRANCE SWITCHBOARD (MSB) WITH PG&E METERING IN NEMA 3R ENCLOSURE. COORDINATE WITH PG&E. FIELD COORDINATE EXACT LOCATIONS WITH OTHER TRADES, UTILITIES, ENGINEER, ETC..CONTRACTOR SHALL PROVIDE ALL IN COORDINATION WITH REQUIREMENT OF UTILITY FOR INSTALLATION PER UTILITY HANDBOOK AND ALL REQUIRED INSTALLATION DETAILS, ETC. PROVIDE UG SECONDARY FEEDER/CONDUIT, AS NECESSARY FROM NEW MAIN SWITCHBOARD MSB TO EXISTING UTILITY TRANSFORMER VIA NEW HANDHOLE, SEE KEYNOTE #3. SEE SINGLE-LINE DIAGRAM ON E201 FOR ADDITIONAL INFORMATION.
2. EXISTING PG&E UTILITY TRANSFORMER. PROVIDE ALL PER PG&E. EXISTING PRIMARY CONDUIT TO REMAIN. EXISTING SECONDARY CURRENTLY INTERCONNECTS EXISTING TRANSFORMER WITH EXISTING MS IN FACILITY. EXISTING CONDUIT CURRENTLY USED FOR SECONDARY FEEDER SHALL REMAIN FROM LOCATION OF NEW HANDHOLE (SEE KEYNOTE #3) TO EXISTING INTERIOR SWITCHBOARD MS TO BE USED AS LOAD FEEDER FROM ATS TO EXISTING MS (SEE KEYNOTE #7). NEW CONDUIT SHALL BE INSTALLED FROM TRANSFORMER VAULT TO NEW MSB TO CREATE NEW SERVICE ENTRANCE (SEE KEYNOTE #8). EXISTING CONDUIT FROM TRANSFORMER TO JUST OUTSIDE OF TRANSFORMER SHALL BE INTERCEPTED AND NEW CONDUIT SHALL BE PROVIDED TO NEW VAULT, SEE KEYNOTE #10. SEE CIVIL AND SEE SINGLE-LINE ON E201 FOR ADDITIONAL INFORMATION.
3. PROVIDE NEW HANDHOLE AT MOST STRATEGIC LOCATION IN FIELD, FIELD COORDINATE WITH EXISTING UTILITIES, CIVIL AND ALL TRADES. HANDHOLE PURPOSE IS TO INTERCEPT EXISTING CONDUIT FROM EXISTING MS AND PROVIDE NEW CONDUIT PATHWAY FOR NEW ELECTRICAL FROM ATS TO EXISTING MS. COORDINATE WITH OTHER KEYNOTES AND SINGLE-LINE ON E201.
4. THE EXISTING SECONDARY CONDUIT CURRENTLY SERVING DIRECTLY BETWEEN PG&E TRANSFORMER AND EXISTING INTERIOR MAIN SWITCHBOARD MS (KEYNOTE #16) SHALL HAVE SECONDARY FEEDER REMOVED COMPLETE. PROVIDE NEW 800A SECONDARY FEEDER PER KEYNOTES #10 AND #11, MEETING PG&E DESIGN AND DIRECTION, FROM EXISTING PG&E TRANSFORMER TO NEW EXTERIOR MAIN SWITCHBOARD MSB (KEYNOTE #1).
5. PROVIDE NEW ATS IN NEMA 3R ENCLOSURE WITH NORMAL CONNECTION TO NEW SWITCHBOARD MSB. EMERGENCY CONNECTION FROM NEW GENSET MAIN BREAKER. SEE SINGLE-LINE ON E201 FOR ADDITIONAL INFORMATION.
6. PROVIDE LOAD FEEDER IN NEW CONDUIT FROM NEW ATS LOAD VIA HANDHOLE TO EXISTING MS. SEE SINGLE-LINE ON E201 FOR ADDITIONAL INFORMATION.
7. PROVIDE DISTRIBUTION FEEDER IN EXISTING CONDUIT FROM NEW ATS LOAD SIDE VIA HANDHOLE TO EXISTING MS. CUT AND CONNECT EXISTING CONDUITS INTO NEW HANDHOLE "IN AND OUT"AS NECESSARY TO FACILITATE, SEE KEYNOTES #2 & #3 . SEE SINGLE-LINE ON E201 FOR ADDITIONAL INFORMATION.
8. PROVIDE NEW SECONDARY FEEDER FROM PG&E TRANSFORMER TO NEW MSB VIA NEW VAULT (SEE KEYNOTE #10), COORDINATE ALL WITH PG&E INCLUDING SIZE AND QTY OF SECONDARY CONDUCTORS PER GREEN BOOK. SEE KEYNOTE #2 AND SINGLE-LINE ON E201 FOR ADDITIONAL INFORMATION.
9. PROVIDE MAIN SERVICE GROUND COUNTERPOISE SYSTEM, FIELD COORDINATE EXACT LOCATION IN FIELD WITH ALL UTILITIES, TRADES, GRADE – FINAL SELECTION BY ENGINEER. PROVIDE CONNECTION FROM NEW COUNTERPOISE TO EXISTING GROUND SYSTEM CONNECTED TO EXISTING MS, PROVIDE GROUNDING TEST WELL, SEE DRAWING E201 FOR CONNECTIONS AND FURTHER DESCRIPTION/INFORMATION.
10. NEW UG SECONDARY HANDHOLE, PROVIDE PER PG&E AND ALL REQUIREMENTS. INTERCEPT EXISTING CONDUIT FROM PG&E TRANSFORMER JUST OUTSIDE OF EXISTING TRANSFORMER (SEE KEYNOTE #11) AND PROVDE NEW CONDUITS INTO NEW VAULT AND THEN PROVIDE NEW CONDUIT FROM VAULT TO NEW MSB IN GENERATOR ENCLOSURE FOR NEW SECONDARY FEEDER. SEE CIVIL AND SEE SINGLE-LINE ON E201 FOR ADDITIONAL INFORMATION.
11. REMOVE EXISTING CONDUIT BETWEEN NEW HANDHOLE (SEE KEYNOTE #3) AND LOCATION JUST OUTSIDE OF UTILITY TRANSFORMER AFTER PG&E REMOVES EXISTING SECONDARY FEEDER FROM TRANSFORMER TO EXISTING INTERIOR SWITCHBOARD MS. CONDUIT REMOVAL INDICATED AS HATCHED LINES. FIELD COORDINATE.
12. PROVIDE NEW 250KW, 208Y/120V, 3Ø, 4W STANDBY GENERATOR SET IN SOUND ATTENUATED, WEATHERPROOF ENCLOSURE, TIER 4 PER SPECIFICATIONS. SEE CIVIL DRAWINGS AND DETAILS FOR MORE INFORMATION. SEE SINGLE-LINE ON E201 FOR FURTHER DESCRIPTION.
13. PROVIDE DATA CABLE IN CONDUIT FROM GENERATOR CONNECTION POINT TO NETWORK LAN CONNECTION IN BUILDING. PROVIDE CABLING PER GENERATOR MANUFACTURER. MINIMUM (2) CAT 6A CABLES (IN 3/4"ONCE ENTERING BUILDING). CABLES MAY BE ROUTED IN SAME UG BORED CONDUIT AS GENERATOR ANNUNCIATOR WIRING – SEE KEYNOTE #19.
14. PROVIDE GROUND CONNECTION BETWEEN NEW GROUND SYSTEM AND EXISTING PER DETAILS ON E201. BORE PER CIVIL DRAWINGS. CONTRACTOR SHALL CONTINUE ROUTING OF CONDUIT TO GENERATOR AND ALSO TO FACILITY FOR FINAL CONNECTIONS OF GROUND.
15. PROVIDE NEMA 3R BRANCH PANELBOARD PG FOR PROVISIONS OF POWER TO ITEMS IN GENERATOR ENCLOSURE AND GENERATOR SURROUND PER PLANS.
16. EXISTING MAIN SERVICE SWITCHBOARD MS TO BE CONVERTED TO DISTRIBUTION BOARD ONLY, SEE SINGLE-LINE ON E201 FOR ADDITIONAL INFORMATION.
17. NEW BRANCH PANEL P1 IN BUILDING FOR FUTURE LOADS, SERVE FROM EXISTING MS PER SINGLE-LINE ON E201.
18. PROVIDE NEW EXTERIOR LIGHTING FIXTURE IN GENERATOR ENCLOSURE LIHTONIA WST-P2 40K VW MVOLT PBBWPIR E20WH OR ENGINEER REVIEWED EQUIVALENT.
19. PROVIDE NEW REMOTE ANNUNCIATOR TO MEET SPECIFICATION SECTION 26213. FIELD COORDINATE EXACT LOCATION AND ALL CABLING REQUIRED PER GENERATOR MANUFACTURER. ROUTE CABLING IN 1-/2" CONDUIT COMPLETE BETWEEN ANNUNCIATOR IN BUILDING AND GENERATOR CONTROL PANEL IN GENERATOR ENCLOSURE VIA BORING FROM GENSET TO NEW HANDHOLE (SEE KEYNOTE #21) AND FORM HANDHOLE INTO BUILDING. PROVIDE ADDITIONAL CABLING AND CONDUIT FROM END OF THIS BORING INTO BUILDING AND CONTINUED TO GENERATOR AS REQUIRED.
20. PROVIDE EMERGENCY STOP PUSHBUTTON TO SHUT DOWN PRIME MOVER MEETING REQUIREMENTS OF 445.18(B)(2). CED 445.18(C).
21. PROVIDE NEW HANDHOLE FOR BORED CONDUITS NOTED ABOVE (FOR GROUND CONDUCTOR NOTED AND FOR GENERATOR ANNUNCIATOR CONDUIT), SEE KEYNOTES #14 #19.

GENERAL NOTES - SITE ELECTRICAL

(ALL NOTES MAY NOT APPLY TO THIS SHEET)

A. GENERAL INTENT OF THIS DESIGN IS TO PROVIDE FULL STANDBY POWER TO TRANSIT BUILDING VIA NEW GENSET, MSB, ATS AND BACK FEED EXISTING FACILITY AT EXISTING MS. CONTRACTOR TO COORDINATE WITH GENERATOR VENDOR AND ALL TRADES FOR COMPLETE INSTALLATION. CONTRACTOR SHALL PROVIDE ALL NEW CONSTRUCTION TO GREATEST DEGREE POSSIBLE PRIOR TO DISCONNECTION, REMOVAL, DEMOLITION OF EXISTING POWER AND CONNECTION TO NEW. CONTRACTOR TO DISCONNECT AND REMOVE APPLICABLE PORTION OF FEEDERS AS DESCRIBED, PULL THESE FEEDERS BACK TO SOURCE, INSTALL NEW HANDHOLE, RECONNECT ALL CONNECT TO NEW, BACK FEED MS, ETC. SEE KEYNOTES AND SINGLE-LINE DIAGRAM ON E201. PROVIDE TEMPORARY PORTABLE GENERATOR TO BE CABLE CONNECTED TO EXISTING FACILITY SWITCHBOARD MS IN EVENT PHASING CANNOT BE DONE IN ACCEPTABLE DURATION OF OUTAGE FROM FACILITY MANAGER/CLIENT, COORDINATE WITH OWNER.

B. CONTRACTOR SHALL FOLLOW SEISMIC RESTRAINT AND DESIGN REQUIREMENTS CONTAINED IN LATEST ADOPTED STATE AND INTERNATIONAL BUILDING CODES, WITH ALL AMENDMENTS AS ADOPTED BY THE CURRENT LEGISLATION.

C. THE TERM "PROVIDE" SHALL MEAN CONTRACTOR SHALL FURNISH AND INSTALL ITEMS AND CONNECT AS REQUIRED TO OBTAIN A COMPLETE WORKING SYSTEM.

D. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ALL LOCAL, STATE, AND NATIONAL CODES. INCLUDING BUT NOT LIMITED TO LATEST APPLICABLE CALIFORNIA ELECTRICAL CODE, NFPA 70 (NATIONAL ELECTRIC CODE), NFPA 72, INTERNATIONAL BUILDING CODE, CALIFORNIA TITLE 24, ETC.

E. ALL WORK SHALL BE COORDINATED WITH EXISTING CONDITIONS, NEW CONSTRUCTION, OWNER'S VENDORS, ALL TRADES, AND THEIR DOCUMENTS. THE CONTRACTOR SHALL VISIT THE SITE BEFORE SUBMITTING BID.

F. PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR CONDUITS. DO NOT LEAVE PIPING/ CONDUITS OPEN ENDED. PROVIDE END BUSHINGS FOR ALL STUB-OUTS AND SLEEVES DESIGNATED TO BE UTILIZED FOR THIS PROJECT. COORDINATE WITH OWNER'S REPRESENTATIVE FOR SYSTEMS NOT PROVIDED UNDER THIS CONTRACT.

G. TURN OVER TO THE OWNER ALL MANUFACTURER'S WARRANTIES FOR EQUIPMENT AND MATERIALS PROVIDED.

H. INSTALLATION HANDBOOKS AND OTHER REQUIREMENTS.

I. ALL WORK SHALL BE DONE PER THE LATEST VERSION OF APPLICABLE CALIFORNIA ELECTRICAL CODES, REGULATIONS, STANDARDS, ORDINANCES, ETC.

J. ALL UNDERGROUND POWER CONDUIT SHALL BE MINIMUM 30" BELOW GRADE. CONDUIT SHALL BE PVC SCHEDULE 40 OR GREATER. ALL TRANSITIONS TO ABOVE GRADE SHALL BE MINIMUM SCHEDULE 80 PVC. COORDINATE ALL ROUTINGS WITH OTHER TRADES, SITE CONDITIONS, UTILITIES (NEW AND EXISTING), CIVIL ENGINEERING, ARCHITECT, ETC. ROUTINGS SHOWN ARE DIAGRAMMATIC, COORDINATION IS REQUIRED – PROVIDE ALL HANDHOLES NECESSARY FOR PROPER ROUTING OF CONDUIT DUE TO CONDITIONS IN FIELD. NOT ALL HANDHOLES/PULLBOXES ARE INDICATED. CONTRACTOR SHALL PROVIDE ALL FOR COMPLETE SYSTEM AS DETERMINED BY FIELD CONDITIONS, ETC.

CITY OF TRACY

TRACY Think Inside the Triangle

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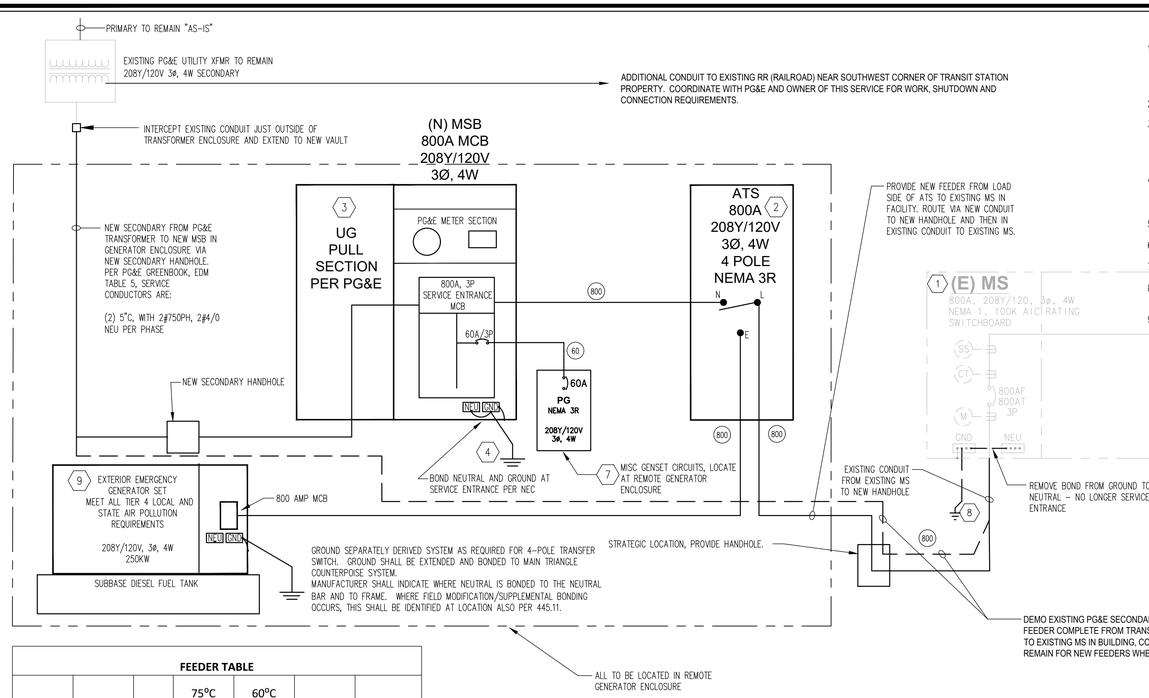
PHARIS ENGINEERING PLLC

SYMBOL	DATE	DESCRIPTION	APPROVED
1	12-12-24	REVIEW COMMENTS - REV 1	
2	10-13-25	REVIEW COMMENTS - REV 2	

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353
SITE PLAN -ELECTRICAL
TRANSIT STATION EMERGENCY BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

ES100



KEYNOTES - PANELBOARD AND RISER DIAGRAM:

1. EXISTING MS [(E)MSB] IN BUILDING TO REMAIN. REMOVE ALL PG&E SERVICE ENTRANCE DEVICES, METERING, ETC.. CONVERT TO DISTRIBUTION ONLY, DISCONNECT NEUTRAL TO GROUND BAR REQUIRED BY SERVICE ENTRANCE PER CODE. EXISTING LOADS TO REMAIN CONNECTED "AS-IS" (HVAC UNITS, PANEL LA). PROVIDE NEW BRANCH FEEDER CIRCUITS FOR NEW PANEL – PANEL P1 TO BE LOCATED IN BUILDING FOR ADDITIONAL SPARE CIRCUITS IN FUTURE.
2. NEW AUTOMATIC TRANSFER SWITCH, 800A, 3P NEMA 3R IN REMOTE GENERATOR ENCLOSURE. CONNECT AS INDICATED.
3. NEW MAIN SERVICE ENTRANCE SWITCHBOARD WITH UG PULL SECTION, PROVIDE ALL PER PG&E REQUIREMENTS. CONNECT TO EXISTING UTILITY TRANSFORMER BY INTERCEPTING EXISTING SERVICE CONDUIT CURRENTLY GOING TO (E) MSB IN BUILDING. ALL SERVICE CONDUCTORS TO BE REMOVED. NEW SERVICE CONDUCTORS TO BE PULLED FROM TRANSFORMER TO NEW MSB LOCATED IN GENERATOR ENCLOSURE. COORDINATE PHASING, HAVE NEW IN PLACE IN ORDER THAT POWER OUTAGE MITIGATED TO "SWITCHOVER" ONLY.
4. SERVICE GROUNDING COUNTERPOISE SYSTEM, COORDINATE AND PROVIDE PER LOCAL UTILITY, SEE DETAIL 02 FOR ADDITIONAL INFORMATION. CONNECT TO EXISTING GROUNDING SYSTEM AT EXISTING MS. CONNECTIONS SHOWN TO BUILDING STRUCTURE, WATER PIPING, ETC. IS EXISTING AT EXISTING MS.
5. EXISTING LOADS IN (E) MS TO REMAIN CONNECTED AS EXISTING – TYPICAL.
6. PROVIDE NEW BREAKER IN EXISTING SPACE IN (E) MS TO LOAD AS INDICATED.
7. CONNECT NEW PANEL PG AT REMOTE GENERATOR LOCATION TO (N) MSB DISTRIBUTION SECTION.
8. EXISTING GROUNDING AT (E) MS SHALL REMAIN. PROVIDE CONNECTION FROM EXISTING GROUNDING TO NEW GROUNDING COUNTERPOISE NOTED IN KEYNOTE #4.
9. NEW STANDBY GENERATOR IN WEATHERPROOF, SOUND ATTENUATED ENCLOSURE. SEE INFORMATION ON DIAGRAM.

GENERAL NOTES - PANELBOARD AND SINGLE-LINE DIAGRAM:

A. PROVIDE PANELBOARDS WITH TYPE WRITTEN SCHEDULES AND AS-BUILT DRAWINGS PER ACTUAL INSTALLATION.

B. FOR ALL PANELBOARD FEEDER SIZES REFER TO SAME PANELBOARD SCHEDULES, ON E300 SERIES DRAWINGS, IF NOT NOTED HERE.

C. ALL EQUIPMENT FEEDER SIZES INDICATED ON PANEL SCHEDULE, UON, OR PROVIDE PER NEC TO MATCH NAMEPLATE AND CORRESPONDING OVERCURRENT PROTECTION DEVICE.

D. REFER TO POWER PLAN(S) FOR DISTRIBUTION EQUIPMENT 'BASIS OF DESIGN' PHYSICAL SIZES AND LAYOUTS. CONTRACTOR SHALL PROVIDE AND INSTALL DISTRIBUTION EQUIPMENT TO MEET REQUIREMENTS OF ALL LOCAL, STATE, NATIONAL CODES AND AUTHORITY HAVING JURISDICTION. COORDINATE WITH EXISTING CONDITIONS, ALL NEW WORK, ACTUAL ROOM SIZE, ALL TRADES AND DISTRIBUTION EQUIPMENT SUPPLIER.

E. VERIFY EXACT A.I.C. RATING FOR ALL DISTRIBUTION EQUIPMENT WITH ACTUAL SITE AND EQUIPMENT CHARACTERISTICS OF AVAILABLE FAULT CURRENT PER LOCAL UTILITY AND PROPER SHORT CIRCUIT CALCULATIONS PER MANUFACTURER CALCULATION. SIZES INDICATED ARE A MINIMAL DESIGN SIZE BASED ON INFORMATION PROVIDED AT TIME OF DESIGN. CONTRACTOR TO VERIFY.

F. PROVIDE COMPLETE ARC-FLASH STUDY AND COMPLIANT LABELING OF ALL ELECTRICAL GEAR/PANELBOARDS/EQUIPMENT REQUIRED PER CEC 2022 110.16

G. ALL NEW BRANCH PANELBOARDS SHALL BE EATON POW-R-LINE PXBCM TYPE OR APPROVED EQUAL WITH BRANCH CIRCUIT MICROPROCESSOR-BASED MONITORING SYSTEM (PXBCM) FOR DISAGGREGATION OF ELECTRICAL CIRCUITS TO MEET CALIFORNIA TITLE 24 REQUIREMENTS (TABLE 130.5-B).

ELECTRICAL SINGLE-LINE DIAGRAM

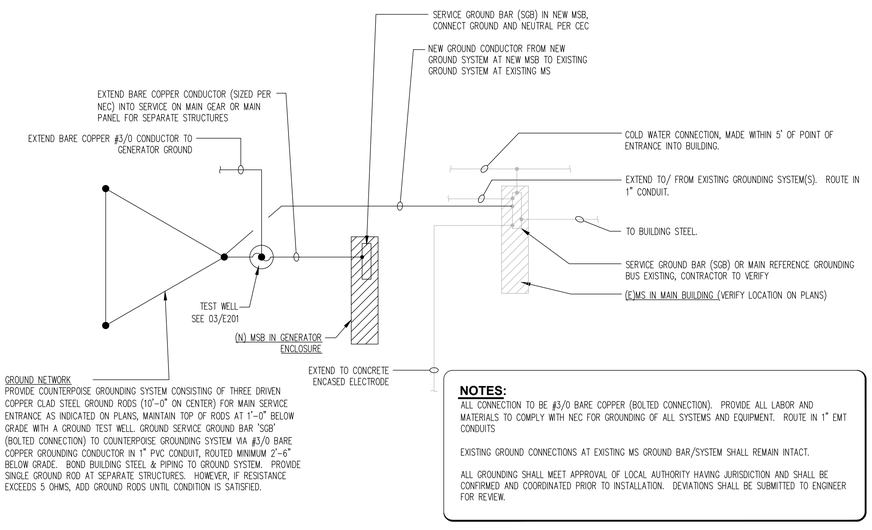
SCALE: NONE

01

FEEDER TABLE

IDEN	AMPS	SETS	75°C Cond Sz Phase	60°C Cond Sz Phase	250.122 ECG	CONDUIT SIZE
(20)	20	1	12	12	12	3/4"
(25)	25	1	10	10	10	3/4"
(30)	30	1	10	10	10	3/4"
(35)	35	1	10	8	10	3/4"
(40)	40	1	8	8	10	3/4"
(45)	45	1	8	6	10	3/4"
(50)	50	1	8	6	10	3/4"
(60)	60	1	6	4	10	1-1/4"
(65)	65	1	6	4	8	1-1/4"
(70)	70	1	4	4	8	1-1/4"
(80)	80	1	4	2	8	1-1/4"
(90)	90	1	3	2	8	1-1/4"
(100)	100	1	3	1	8	1-1/4"
(110)	110	1	2	1	6	1-1/4"
(125)	125	1	1	*	6	1-1/2"
(150)	150	1	1/0	*	6	1-1/2"
(175)	175	1	2/0	*	6	2"
(200)	200	1	3/0	*	6	2"
(225)	225	1	4/0	*	4	2"
(250)	250	1	250	*	4	2-1/2"
(300)	300	1	350	*	4	2-1/2"
(400)	400	2	3/0	*	3	3"
(400*)	400*	1	500	*	3	3"
(450)	450	2	4/0	*	2	2"
(500)	500	2	250	*	2	2-1/2"
(600)	600	2	350	*	1	3"
(700)	700	2	500	*	1/0	3-1/2"
(800)	800	3	350	*	1/0	3-1/2"

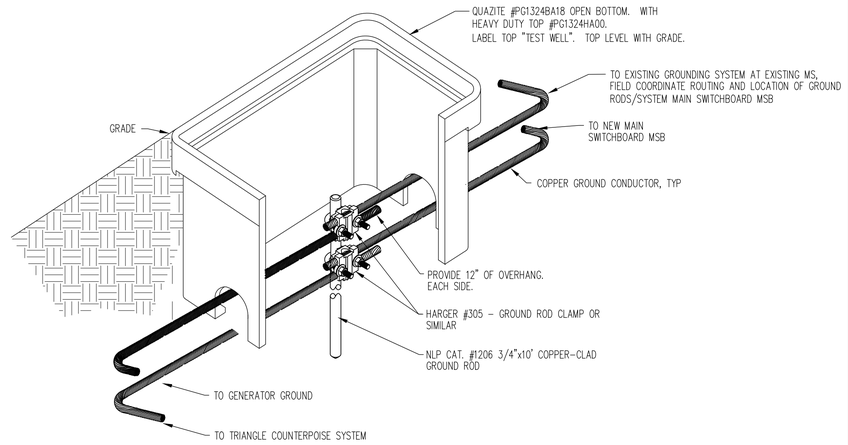
NOTES:
1. QUANTITY OF PHASE CONDUCTORS SHALL BE (2) FOR 2-POLE CIRCUITS AND (3) FOR 3-POLE CIRCUITS (PER "SET" OF CONDUCTORS)
2. A NEUTRAL OF SAME SIZE AS PHASE CONDUCTORS IS REQUIRED FOR 3Ø, 4W CIRCUITS
3. TABLE FOR CIRCUITS NOT INCLUDING VOLTAGE DROP, SEE VD TABLE ON EJ301 FOR ADJUSTMENTS. CONTRACTOR SHALL ADJUST CONDUIT SIZE APPROPRIATELY FOR CONDUCTOR SIZES.
4. FOR EQUIPMENT WITH 60° OR NO MARKINGS, THE 60° COLUMN SHALL BE USED.



GROUND NETWORK DETAIL

SCALE: NONE

02



GROUND INSPECTION WELL (TEST WELL)

SCALE: NONE

03

CITY OF TRACY

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SYMBOL	DATE	DESCRIPTION	APPROVED
1	10-15-24	REVIEW COMMENTS - REV 1	
2	10-15-25	REVIEW COMMENTS - REV 2	

PREVIOUS ISSUANCES

DESIGNED BY: COT / KPA
DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
SCALE: AS SHOWN
DATE: APRIL 27, 2026

PERMIT #: COM24-0353
ELECTRICAL DIAGRAM AND DETAILS
TRANSIT STATION EMERGENCY BACKUP GENERATOR
50 E. 6th St., Tracy, CA 95376
C.I.P. No. 77592

E201

SHEET 19 OF 20

P1

NEMA 1	BOLT-ON BREAKERS	3 PHASE / 4 WIRE	BRANCH PANELBOARD
SURFACE MOUNTED	22,000 AIC	208Y/120 VOLT	100 AMP BUS
			100A MLO

CKT	DESCRIPTION	BKR	LF	A	B	C	LF	BKR	DESCRIPTION	CKT
1	SPARE	20/1						20/1	SPARE	20/1
3	SPARE	20/1						20/1	SPARE	20/1
5	SPARE	20/1						20/1	SPARE	20/1
7	SPARE	20/1						20/1	SPARE	20/1
9	SPARE	20/1						20/1	SPARE	20/1
11	SPARE	20/1						20/1	SPARE	20/1
13	SPARE	20/1						20/1	SPACE	20/1
15	SPARE	20/1						20/1	SPACE	16
17	SPARE	20/1						20/1	SPACE	18
19	SPACE	20/1						20/1	SPACE	20
21	SPACE	20/1						20/1	SPACE	22
23	SPACE	20/1						20/1	SPACE	24
25	SPACE	20/1						20/1	SPACE	26
27	SPACE	20/1						20/1	SPACE	28
29	SPACE	20/1						20/1	SPACE	30
31	SPACE	20/1						20/1	SPACE	32
33	SPACE	20/1						20/1	SPACE	34
35	SPACE	20/1						20/1	SPACE	36
37	SPACE	20/1						20/1	SPACE	38
39	SPACE	20/1						20/1	SPACE	40
41	SPACE	20/1				0	0	20/1	SPACE	42
				0	0	0				

CONNECTED	0	VA	0	AMPS	
DEMAND	0	VA	0	AMPS	
LF = LOAD FACTOR		C = CONTINUOUS, L = LIGHTING, R = RECEPTACLE, H = HACR (PER NAMEPLATE)			
		S = SUB FEED, K = KITCHEN, N = NON-CONTINUOUS, U = USER			

NOTES:

1	SEE SINGLE-LINE FOR FEEDER SIZE

PG

NEMA 3R	BOLT-ON BREAKERS	3 PHASE / 4 WIRE	BRANCH PANELBOARD
SURFACE MOUNTED	22,000 AIC	208Y/120 VOLT	100 AMP BUS
			100A MLO

CKT	DESCRIPTION	BKR	LF	A	B	C	LF	BKR	DESCRIPTION	CKT
1	BATTERY CHARGER	20/1	N	1920	150		L	20/1	LIGHTING	2
3	BLOCK HEATER	20/2	N		1666	360	R	20/1	RECEPTACLE	4
5	*	-	H			1666		20/1	SPARE	6
7	ALTERNATOR STRIP HTR	20/1	H	1920				20/1	SPARE	8
9	SPARE	20/1						20/1	SPARE	10
11	SPARE	20/1						20/1	SPARE	12
13	SPARE	20/1							SPACE	14
15	SPARE	20/1							SPACE	16
17	SPARE	20/1							SPACE	18
19	SPACE								SPACE	20
21	SPACE								SPACE	22
23	SPACE								SPACE	24
25	SPACE								SPACE	26
27	SPACE								SPACE	28
29	SPACE								SPACE	30
31	SPACE								SPACE	32
33	SPACE								SPACE	34
35	SPACE								SPACE	36
37	SPACE								SPACE	38
39	SPACE								SPACE	40
41	SPACE					0	0		SPACE	42
				3990	2026	1666				

CONNECTED	7532	VA	21	AMPS	
DEMAND	7807	VA	22	AMPS	
LF = LOAD FACTOR		C = CONTINUOUS, L = LIGHTING, R = RECEPTACLE, H = HACR (PER NAMEPLATE)			
		S = SUB FEED, K = KITCHEN, N = NON-CONTINUOUS, U = USER			

NOTES:

1	SEE SINGLE-LINE FOR FEEDER SIZE

CITY OF TRACY

TRACY
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DRAWN BY: THE KPA GROUP
CHECKED BY: PWP
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E202