

METROPOLITAN EXPOSITION RECREATION COMMISSION

RESOLUTION NO. 14-17

For the purpose of selecting Colton Construction Company for the Portland Expo Center - "Greenwall Stormwater Improvements" and authorizing the Metro Deputy Chief Operating Officer to execute a contract with Colton Construction Company.

WHEREAS, the Portland Expo Center's (Expo) has entered into an agreement with the City of Portland Bureau of Environmental Services (BES) to construct a greenwall stormwater structure to capture and treat roof run-off from Hall E; and

WHEREAS, the greenwall stormwater improvements have been designed to accept approximately 10,000 square feet of run-off; and

WHEREAS, Expo staff has worked with the Bureau of Environmental Services (BES) to implement construction of this project as a demonstration project through the City of Portland's Innovative Wet Weather Program (IWWP) which has provided \$100,000 of funding for this project; and

WHEREAS, Expo anticipates receiving additional funding of \$56,000 from BES toward the project for approximately 93% of the total project cost including, a 10% contingency on the base bid amount; and

WHEREAS, Section 7(B) of the Metropolitan Exposition Recreation Commission's ("the Commission") Contracting and Purchasing Rules, requires competitive sealed bids under ORS Chapter 279C for public improvements such as this project; and


WHEREAS, Staff has evaluated the bids, and Colton Construction Company is the lowest responsive and responsible bidder with a bid amount of one hundred forty eight thousand, six hundred and 00/100 (\$148,600.00)

BE IT THEREFORE RESOLVED as follows:


1. The Commission selects Colton Construction Company as the lowest responsive and responsible bidder in response to the Request for Bids for the Portland Expo Center – Greenwall Stormwater Improvements – Hall E.
2. The Commission approves the contract with Colton Construction Company in the form substantially similar to the attached Exhibit A and authorizes the Metro Deputy Chief Operating Officer to execute the contract on behalf of the Commission.

Passed by the Commission on June 4, 2014.


Chair


Secretary/Treasurer

Approved As to Form:
Alison R. Kean, Metro Attorney

By: 
Nathan A. S. Sykes
Deputy Metro Attorney

MERC STAFF REPORT

Agenda Item/Issue: For the purpose of selecting Colton Construction Company for the Portland Expo Center - "Greenwall Stormwater Improvements – Hall E" and authorizing the General Manager of Visitor Venues to execute a contract with Colton Construction Company.

Resolution No: 14-17

Presented by: Matthew Rotchford

Date: June 4, 2014

Background and Analysis: The Portland Expo Center (Expo) desires to construct a greenwall to collect and treat stormwater from the roof of Hall E to minimize offsite impacts from this runoff. The Expo has partnered with the Bureau of Environmental Services (BES) to obtain funding for this project through the City of Portland's Innovative Wet Weather Program (IWWP) which has provided \$100,000 for this project. This capital improvement project is in the public's best interest by decreasing the stormwater from the impervious surface of the roof of Hall E. This project will also serve as a demonstration project for future greenwall construction and provide educational opportunities related to monitoring stormwater impacts.

The scope of work for this project includes all materials and labor required to complete the final design dated February 24, 2014 which has been bid and approved for construction by the City of Portland. MERC Staff prepared and issued Bid Documents and a Request for Bids in accordance with MERC's Procurement Policies for a Request for Bid-Greenwall Construction, Expo Center. MERC staff included in the bid documents language requiring good faith efforts for outreach to the MWESB and FOTA communities.

On March 27, 2014, MERC Staff conducted a site walk for potential bidders in which nine general contractors attended: none were ESB, WBE or FOTA firms. Four bids were received on April 16, 2014 and ranged from \$148,600.00 to \$186,750.00. One bid was received from a MWESB firm. The lowest responsive and responsible bidder was Colton Construction Company, in the amount of One hundred, forty eight thousand, six hundred, and 00/100 dollars (\$148,600.00) an emerging small business firm (ESB). The lowest responsive and responsible bidder, Colton Construction Company did not include any first-tier sub-contractor with their bid proposal because they indicated that they will self perform all work in the contract. This project will achieve 100% MWESB participation.

FISCAL IMPACT: The Project is in the 2013-2014 adopted budget. The total budget for this project includes the bid amount of \$148,600 and an additional \$6,000 that is required for additional plumbing work for an anticipated total of \$154,600. The total expenses of \$154,600.00 will be offset by \$100,000 from the City of Portland's IWWP program and an additional \$56,000 from BES. The Metro Sustainability Center has allocated \$10,000.00 that was dedicated to developing bioswales on the Expo property to this project. The total capital outlay required to fund this project is \$6,000.00. The total includes a 10% contingency on the base bid amount of approximately \$14,000. Upon completion of the contract and associated work, MERC will be required to pay the Contractor the full amount of the contract of \$148,600.00 in order to receive the financial offset incentives as referenced above.

RECOMMENDATION: Staff recommends that the Metropolitan Exposition-Recreation Commission, by Resolution No. 14-17 approve the contract award and written contract (attached hereto) with Colton Construction Company, for the amount of One hundred, forty eight thousand, six hundred and 00/100 dollars (\$148,600.00) for construction of greenwall stormwater improvements – Hall E at the Portland Expo Center.

Construction Agreement

MERC CONTRACT NO. 304037

THIS CONSTRUCTION AGREEMENT is between Metropolitan Exposition Recreation Commission, an appointed commission of Metro, located at 600 N.E. Grand Avenue, Portland, OR 97232-2736, referred to herein as "MERC" or "Metro," and Colton Construction Company, referred to herein as "Contractor," located at PO Box 1168, Oregon City, OR 97045.

THE PARTIES AGREE AS FOLLOWS:

ARTICLE I

SCOPE OF WORK AND CONTRACT TERMS

CONTRACTOR shall perform the work and/or deliver to MERC the goods described in the Scope of Work attached hereto and incorporated herein as Attachment A. All services and goods shall be of good quality and otherwise in accordance with the Scope of Work. CONTRACTOR shall perform the work and/or deliver to MERC the goods described in the Scope of Work strictly in accord with the terms of this Construction Agreement and the General Conditions attached hereto and incorporated herein as Attachment B.

ARTICLE II

TERM OF CONTRACT

The term of this Contract shall be for the period commencing June 5, 2014 through and including November 1, 2014. Substantial completion per Section 9.4 of the General Conditions is August 30, 2014.

ARTICLE III

CONTRACT SUM AND TERMS OF PAYMENT

MERC shall pay the CONTRACTOR for work performed and/or goods supplied as described in the Scope of Work, in the maximum amount of ONE HUNDRED FORTY EIGHT SIX HUNDRED AND 00/100THS DOLLARS (\$148,600.00) (the "Maximum Price"). MERC shall not be responsible for payment of any materials, expenses or costs other than those which are specifically included in the Scope of Work. The Maximum Price includes all fees, costs and expenses of whatever nature. Each of MERC's payments to Contractor shall equal the percentage of the work Contractor accomplished during the billing period. Contractor's billing invoices shall include the MERC contract number, Contractor name, remittance address, invoice date, invoice number, invoice amount, tax amount (if applicable), and an itemized statement of work performed and expenses incurred during the billing period, and will not be submitted more frequently than once a month.

Contractor's billing invoices shall be sent to Metro Accounts Payable, 600 NE Grand Avenue, Portland, OR 97232-2736 or metroaccountspayable@oregonmetro.gov. The MERC contract number shall be referenced in the email subject line. Contractor's billing invoices for services through June 30 shall be submitted to Metro by July 15. Payment shall be made by MERC on a Net 30 day basis upon approval of CONTRACTOR invoice.

ARTICLE IV

BONDS

In addition, for public works subject to ORS 279C.800 to 279C.870, CONTRACTOR and every subcontractor shall have a public works bond required by 2005 Oregon Laws Chapter 360 filed with the Construction Contractors Board before starting work on the project, unless exempt under Section 2 of 2005 Oregon Laws Chapter 360.

ARTICLE V

PUBLIC CONTRACTS

All applicable provisions of ORS chapters 187 and 279A, 279B, and 279C and all other terms and conditions necessary to be inserted into public contracts in the State of Oregon, are hereby incorporated as if such provision were a part of this Agreement. Specifically, it is a condition of this contract that CONTRACTOR and all employers working under this Agreement are subject employers that will comply with ORS 656.017 as required by 1989 Oregon Laws, Chapter 684.

For public work subject to ORS 279C.800 to 279C.870, the CONTRACTOR shall pay prevailing wages. If such public work is subject both to ORS 279C.800 to 279C.870 and to 40 U.S.C. 276a, the CONTRACTOR and every



Construction Agreement

MERC CONTRACT NO. 304037

subcontractor on such public work shall pay at least the higher prevailing wage. The CONTRACTOR and each subcontractor shall pay workers not less than the specified minimum hourly rate of wage in accordance with Section 7 of 2005 Oregon Laws Chapter 360. MERC shall pay an administrative fee as provided in ORS 279C.825(1) to the Bureau of Labor and Industries pursuant to the administrative rules established by the Commissioner of Labor and Industries. CONTRACTORS must promptly pay, as due, all persons supplying to such contractor labor or material used in this contract. If the CONTRACTOR or first-tier subcontractor fails, neglects, or refuses to make payment to a person furnishing labor or materials in connection with the public contract for a public improvement within 30 days after receipt of payment from the public contracting agency or a contractor, the CONTRACTOR or first-tier subcontractor shall owe the person the amount due plus shall pay interest in accordance with ORS 279C.515. If the CONTRACTOR or first-tier subcontractor fails, neglects, or refuses to make payment, to a person furnishing labor or materials in connection with the public contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580. CONTRACTOR must pay any and all contributions and amounts due to the Industrial Accident Fund from contractor or subcontractor and incurred in the performance of the contract. No liens or claims are permitted to be filed against MERC on account of any labor or material furnished. CONTRACTORS are required to pay the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

For public improvement work all CONTRACTORS must demonstrate that an employee drug-testing program is in place.

ARTICLE VI COUNTERPARTS

This Contract may be executed in counterparts or multiples, any one of which will have the full force of an original.

ARTICLE VII DELIVERY OF NOTICES

Any notice, request, demand, instruction, or any other communications to be given to any party hereunder shall be in writing, sent by registered or certified mail or fax as follows:

To Contractor: Jared Colton
Colton Construction Company
PO Box 1168
Oregon City, OR 97045
503-631-4318 fax

To Metro: Metro Procurement Services
600 NE Grand Ave
Portland, Oregon 97232
503-797-1791 fax

With Copy to: Lydia Neill
600 NE Grand Ave
Portland, OR 97232
503-797-1795 fax

CONTRACTOR

METROPOLITAN EXPOSITION RECREATION
COMMISSION

By_____

By_____

Print Name_____

Print Name_____

Date_____

Date_____

Construction Agreement

MERC CONTRACT NO. 304037

ATTACHMENT A TO CONSTRUCTION AGREEMENT – SCOPE OF WORK

1. Purpose and Goal of Work

MERC is contracting for construction of a stormwater greenwall structure on the north façade of the Hall E building at the Portland Expo Center to provide storage and treatment of roof surface drainage and mitigate stormwater run-off from this building.

The stormwater greenwall is a metal structure and screen that is designed to hold metal stormwater channels containing plant material to slow and treat the run-off from the roof of Hall E. The screen is mounted on the north wall of Hall E and anchored to a concrete footing and planter box. An overflow has been incorporated into the design in the event the volume of run-off exceeds the storage capacity in the stormwater channels. Irrigation will be installed to ensure that the plant material in the stormwater channels and planter box is viable in months where little rainwater is available. The structure itself incorporates architectural elements called expogons. The expogon metal features may be repeated on other structures located throughout the site. The greenwall structure is intended to also become an architectural greenwall feature of this building and the plaza between Hall E and Hall D. The Portland Expo Center is located at 2060 N Marine Drive, Portland, OR 97217.

2. Scope of Work

Description of Work

Contractor is to provide all labor, materials, tools, equipment, and services necessary for the construction of a stormwater greenwall as described below and per the attached Plans, Specifications and Structural Calculations included as Attachments C, D and E respectively.

Work includes but is not limited to:

- Site prep and demolition
- Metal fabrication
- Asphaltic concrete paving
- Cast in place concrete
- Storm drains
- Plumbing
- Landscape and irrigation
- Expogon fabrication and installation

Clarifications

- Soil mix specified 329300-Plants 2.1.C.1 for use in stormwater channels: Intensive B4 Mix, Phillips' Soil Products, Inc., Canby, OR; 503-266-4700, Saturated Density = 73 lbs per cubic foot.
- Soil mix specified 329300-Plants 2.2.C.1 for use in planter: Intensive B4 Mix, Phillips' Soil Products, Inc., Canby, OR; 503-266-4700.
- The specified aluminum grade shall be 5052.
- Powder coating for the steel frame and screen shall be RAL 7043, DryLac Powder Coat.
- Aluminum could be obtained in 20 foot lengths to limit seaming issues.
- Detail 2/L5.1 Perforated plate shall be to be 9/32" Hex on 13/32" centers staggered. 10 GA T304 stainless steel.
- Perforations shall be 1/4" dia. and 3/8" O.C. for the aluminum pattern for detail 1/L4.1, for the perforated aluminum "B" and "C" channel weirs.
- Details 2/L4.2 (for the screen covering the box to be 1/2" 11 GA Aluminum woven wire. Mesh's intent is to keep birds and animals out of the boxes.
- Use stainless steel for all 'separation panel' and angles associated with this assembly.
- 2/L5.1 - Use Self tapping screws only.

Construction Agreement

MERC CONTRACT NO. 304037

- Anchor bolt installation will require special inspection. Metro will contract with Carlton Testing for this service.

Deliverables and Outcomes

- Expo desires construction of a functioning stormwater facility to treat the run-off from a portion of Hall E and an aesthetically pleasing addition to the courtyard between Halls D and E.
- Substantial completion must be completed by August 30, 2014 with final billing to Metro by September 30, 2014.

Material submittals are required before materials are ordered and must be approved by Expo.

Contractor is responsible for cleanliness of work areas and should plan to pick up debris created during construction. Contractor is responsible for protection of work area from pedestrian traffic. Contractor is responsible for cover up and protection of existing equipment and building. Contractor is to maintain a worksite free of hazardous work conditions and construction debris. Dust control is the responsibility of the Contractor.

Contractor shall not interfere with scheduled events or prohibit any tenants or clients from accessing other spaces in the building. Loud noise can be an issue in the facility; therefore any work that may be louder than a hand drill or similar will need to be coordinated with Expo, so as to not disturb events/clients. Although work is expected to be in areas without impact on events, work will need to be done around building schedule. Schedule will need to be coordinated with Expo project manager. Contractor shall work with Expo provided schedule. This project may require Contractor to work "off hours" in order to complete the project in a timely manner as agreed upon with the Expo. Contractor must coordinate work with building staff so as not to disrupt events in facility, which may include nights or weekend work.

The Scope of Work includes the Plan Set, Specifications, any Addenda attached hereto, and any Change Orders entered into in accord with the terms of the Contract.

ATTACHMENT C: Specifications, titled "Technical Specifications – Expo Center Stormwater Wall – Permit Set" and dated February 21, 2014;

ATTACHMENT D: Plan Set, titled "Expo Center Stormwater Wall – Permit Set, dated February 24, 2014;

ATTACHMENT E: Structural Calculations, titled "Calculations – Greenwall Structure", dated February 25, 2014;

ATTACHMENT F: EPA Contract Specifications

ATTACHMENT G: Davis Bacon Wage Rates, titled "OR140029" and dated January 24, 2014

And any modifications of any of the foregoing in the form of Addenda or Change Orders entered into in accordance with the terms of the Contract. Where applicable, reference to this Contract herein shall be deemed to refer to all of the Contract Documents.

Contractor shall provide all labor, tools, equipment, machinery, supervision, transportation, and every other item and service necessary to perform the Work described in the Contract Documents. Contractor shall fully comply with each and every term, condition and provision of the Contract Documents.

Construction Agreement

MERC CONTRACT NO. 304037

Attachment B - SECTION 007200 METRO GENERAL CONDITIONS

TABLE OF CONTENTS

ARTICLE 1 GENERAL PROVISIONS.....	8-13
1.1 DEFINITIONS	
1.2 INTERPRETATION AND USE OF CONTRACT DOCUMENTS.	
1.3 SUPPLY OF CONTRACT DOCUMENTS.	
1.4 USE OF CONTRACT DOCUMENTS.	
1.5 COPYRIGHT.	
1.6 CONTRACTOR'S STATUS AS INDEPENDENT CONTRACTOR.	
1.7 NO THIRD-PARTY BENEFICIARY TO THE CONTRACT.	
1.8 SEVERABILITY CLAUSE.	
1.9 NOTICE OR SERVICE.	
ARTICLE 2 CONTRACTOR	13-17
2.1 RESPONSIBILITIES OF THE CONTRACTOR.	
2.2 DOCUMENTS.	
2.3 CONTRACTOR'S AUTHORIZED REPRESENTATIVE.	
2.4 ON-SITE REPRESENTATION REQUIRED.	
2.5 CONTRACTOR'S OFFICE AT THE SITE.	
2.6 USE OF THE SITE BY CONTRACTOR.	
2.7 REVIEW OF PROJECT CONDITIONS.	
2.8 CONSTRUCTION STAKING.	
2.9 CONSTRUCTION STAGING AREA.	
2.10 KEY PERSONNEL.	
2.11 CONTRACTOR'S EMPLOYEES AND SUBCONTRACTORS.	
2.12 CONTRACTOR TO SUPPLY SUFFICIENT MATERIAL AND WORKERS.	
2.13 CONSTRUCTION PLANT, EQUIPMENT, AND METHODS.	
2.14 PERMITS.	
2.15 CONTRACTOR'S TEMPORARY STRUCTURES.	
2.16 COMPLIANCE WITH PRODUCT MANUFACTURER'S RECOMMENDATIONS.	
2.17 ACCOUNTING RECORDS	
ARTICLE 3 ADMINISTRATION OF THE CONTRACT	17-22
3.1 AUTHORITY AND RELATIONSHIPS OF METRO AND ARCHITECT.	
3.2 AUTHORITY OF METRO.	
3.3 REQUEST FOR INFORMATION.	
3.4 CONTRACTOR'S CLAIMS.	
3.5 METRO'S RIGHT TO STOP, PERFORM, OR DELETE WORK.	
3.6 METRO'S RIGHT TO ADJUST PAYMENTS.	
3.7 MEDIATION.	
3.8 LITIGATION.	
3.9 WORK TO CONTINUE NOTWITHSTANDING DISPUTE.	
ARTICLE 4 SUBCONTRACTING AND ASSIGNMENT OF THE CONTRACT	22-23
4.1 SUBCONTRACTING.	
4.2 OBJECTION TO SUBCONTRACTORS OR SUPPLIERS.	
4.3 SUBSTITUTION, CHANGE, OR ADDITION OF SUBCONTRACTORS OR SUPPLIERS.	
4.4 REMOVAL OF SUBCONTRACTORS AT REQUEST OF METRO.	
4.5 METRO NOT OBLIGATED TO DETECT UNSATISFACTORY WORK.	
4.6 NO CONTRACTUAL RELATIONSHIPS BETWEEN METRO AND CONTRACTOR'S SUBCONTRACTORS AND SUPPLIERS.	
4.7 CONTRACTOR'S AGREEMENTS WITH SUBCONTRACTORS.	
4.8 ASSIGNMENT.	
ARTICLE 5 TIME OF COMPLETION AND SCHEDULE FOR THE WORK.....	23-24
5.1 PROSECUTION OF WORK GENERALLY.	
5.2 TIME OF COMPLETION.	



Construction Agreement

MERC CONTRACT NO. 304037

5.3	EXTENSIONS OF TIME.	
5.4	PROJECT SCHEDULING.	
5.5	USE OF COMPLETED PARTS OF THE WORK BEFORE ACCEPTANCE.	
ARTICLE 6 COORDINATION WITH OTHER METRO CONTRACTORS		24-26
6.1	OTHER METRO CONTRACTORS GENERALLY.	
6.2	DUTY TO INSPECT OTHER METRO CONTRACTORS' WORK.	
6.3	LATENT DEFECTS IN OTHER CONTRACTOR'S WORK.	
6.4	DUTY TO MAINTAIN SCHEDULE.	
6.5	FAILURE TO MAINTAIN SCHEDULE.	
6.6	FAILURE TO COORDINATE WORK.	
6.7	OTHER METRO CONTRACTORS' FAILURE TO COORDINATE.	
6.8	CONFLICTS AMONG CONTRACTORS.	
6.9	COORDINATION DRAWINGS.	
6.10	FURNISHED BY OWNER, INSTALLED BY CONTRACTOR ("FOIC") ITEMS.	
6.11	CONFERENCES.	
ARTICLE 7 CONTROL AND QUALITY OF WORK AND MATERIAL		26-30
7.1	QUALITY CONTROL.	
7.2	INSPECTION.	
7.3	UNSATISFACTORY MATERIALS AND WORKMANSHIP.	
7.4	GENERAL WARRANTY OF CONTRACTOR.	
7.5	THIRD-PARTY WARRANTIES.	
7.6	SUBCONTRACTOR WARRANTIES.	
7.7	CORRECTION OF WORK BY CONTRACTOR.	
7.8	WARRANTY AND CORRECTION AGREEMENTS BY SUBCONTRACTORS.	
7.9	REMEDIES NOT EXCLUSIVE.	
7.10	PROOF OF COMPLIANCE WITH CONTRACT PROVISIONS.	
7.11	PATENTS, COPYRIGHTS, TRADEMARKS.	
7.12	ANTI-TRUST CLAIMS.	
ARTICLE 8 CHANGES IN THE WORK.....		30-33
8.1	CHANGE ORDERS GENERALLY.	
8.2	PROCEDURE FOR DETERMINING IMPACT OF CHANGE ORDERS ON CONTRACT AMOUNT.	
8.3	LIMITATIONS WHEN CHANGE ORDERS IMPACT CONTRACT AMOUNT.	
8.4	FORCE ACCOUNT WORK.	
8.5	CONTRACTOR PROPOSALS FOR CHANGES IN WORK.	
8.6	IMPACT OF AUTHORIZED CHANGES IN THE CONTRACT.	
ARTICLE 9 PAYMENTS AND COMPLETION		33-38
9.1	SCOPE OF PAYMENT.	
9.2	SCHEDULE OF VALUES.	
9.3	PROGRESS PAYMENT PROCEDURE.	
9.4	SUBSTANTIAL COMPLETION.	
9.5	FINAL COMPLETION AND ACCEPTANCE.	
9.6	CLOSEOUT SUBMITTALS.	
9.7	RELEASES.	
9.8	FINAL PAYMENT.	
9.9	NO WAIVER OF RIGHTS.	
ARTICLE 10 SAFETY, USE OF SITE, AND PROTECTION OF THE WORK.....		39-42
10.1	LAWS AND REGULATIONS.	
10.2	SAFETY REQUIREMENTS.	
10.3	FIRST AID.	
10.4	USE OF SITE.	
10.5	PROTECTION OF WORK, PERSONS, AND PROPERTY AGAINST DAMAGE.	
10.6	UTILITIES.	
10.7	HAZARDOUS SUBSTANCES ENCOUNTERED DURING CONSTRUCTION AND OTHER ENVIRONMENTAL LAWS.	
10.8	ADDITIONAL REQUIREMENTS FOR WORK.	
ARTICLE 11 INDEMNIFICATION		42
11.1	INDEMNIFICATION.	

Construction Agreement

MERC CONTRACT NO. 304037

ARTICLE 12 INSURANCE	43-45
12.1 GENERAL INSURANCE REQUIREMENT	
12.2 REQUIRED COVERAGE	
12.3 LIMITS	
12.4 ADDITIONAL INSURED	
12.5 JOINT VENTURE	
12.6 PRIMARY COVERAGE	
12.7 CONTRACTOR'S FAILURE TO MAINTAIN INSURANCE	
12.8 CERTIFICATES OF INSURANCE	
12.9 SUBCONTRACTOR INSURANCE	
12.10 LIMITATIONS ON COVERAGE	
12.11 PROPERTY INSURANCE	
ARTICLE 13 MINORITY/WOMEN/EMERGING SMALL BUSINESS PROGRAM	45-46
ARTICLE 14 MISCELLANEOUS STATUTORY RESPONSIBILITIES OF THE CONTRACTOR	46
ARTICLE 15 TERMINATION OR SUSPENSION OF THE WORK	46-49
15.1 DEFAULT OF CONTRACTOR.	
15.2 TERMINATION IN THE PUBLIC INTEREST.	
EXHIBIT 1 WARRANTY FORM	
EXHIBIT 2 SUBCONTRACTOR ASSIGNMENT OF ANTITRUST CLAIMS	
EXHIBIT 3 AFFIDAVIT, AGREEMENT FOR INDEMNITY, LIEN WAIVER AND RELEASE (PROGRESS PAYMENT)	
EXHIBIT 4 AFFIDAVIT, AGREEMENT FOR INDEMNITY, LIEN WAIVER AND RELEASE (FINAL CLOSEOUT)	
EXHIBIT 5 AFFIDAVIT, LIEN WAIVER AND RELEASE – CONDITIONAL FINAL (SUBCONTRACTOR CLOSEOUT)	

Construction Agreement

MERC CONTRACT NO. 304037

METRO GENERAL CONDITIONS

ARTICLE 1 GENERAL PROVISIONS

1.1 Definitions. Unless otherwise defined or specified in the Contract Documents, the following terms shall have the meanings indicated:

1.1.1 Act of God: An earthquake, flood, typhoon, cyclone, or other natural phenomenon of catastrophic proportions or intensity.

1.1.2 Addendum: A document issued by Metro during the solicitation period clarifying, adding, deleting, or materially changing Metro's solicitation documents.

1.1.3 Alternate Bids: Portions of the Work for which a Bidder must submit a separate Bid amount. Alternate Bid items may or may not be awarded at Metro's discretion.

1.1.4 Architect: A person retained by Metro as its design professional for the Work and authorized to practice architecture in the State of Oregon. The term "Architect" refers to the Architect or the Architect's authorized representative.

1.1.5 "As-Builts" or Record Documents: Those drawings made, revised, or annotated by Contractor and approved by Metro during the performance of the Contract, fully illustrating how all elements of the Work were actually installed and completed.

1.1.6 Aspirational Target: Target of intended utilization of MBE, WBE, and ESB firms that a contractor has no contractual obligation to meet.

1.1.7 Authorized Representative: A person acting on behalf of another through expressly delegated authority as specified in these Contract Documents.

1.1.8 Bid: The written offer of a Bidder to perform the Work as defined in these Contract Documents submitted in compliance with Metro's Bid Documents and Public Contracting Rules.

1.1.9 Bidder: A person acting directly or through a duly and legally authorized representative who submits or intends to submit a Bid for the Work as described in these Contract Documents.

1.1.10 Bid Documents: Those documents upon which a Bidder bases its bid to Metro.

1.1.11 Business Day: Calendar day excluding Saturdays, Sundays, and legal holidays.

1.1.12 Bid Forms: Forms required by Metro to be submitted with a Bid.

1.1.13 City or County: The city or county in which the Work is located.

1.1.14 Change Order: A written document signed by Metro and Contractor stating their agreement upon all of the following:

1.1.14.1 The change in the Work;

1.1.14.2 The amount of any adjustment in the Contract Amount; and

1.1.14.3 The extent of any adjustment to the Contract Time.

1.1.15 Clarification: A written document consisting of supplementary details, instruction or information issued by Metro after the award of Contract that clarifies or supplements the Contract Documents and becomes a part of the Contract Documents. A Clarification may or may not affect the scope of Work.

1.1.16 Completion: See "Substantial Completion" and "Final Completion and Acceptance."

1.1.17 Construction Schedule or Schedule: The timeline described in Article 5.

1.1.18 Contract: The Contract Documents.

1.1.19 Contract Amount: The total amount shown in the Construction Agreement as modified by any Change Orders.

1.1.20 Contract Documents or Contract or Bidding Documents: All of the following documents: the Advertisement for Bids, the Invitation to Bid, the Instructions to Bidders, the Bid Forms, the Construction Agreement, the Performance Bond, the Labor and Materials Payment Bond, the General Conditions, the Supplementary Conditions, the Specifications, the drawings, the approved and updated Construction Schedule, and any modifications of any of the foregoing in the form of Addenda, Clarifications, Change Orders, or Force Account Work.

1.1.21 Contractor: The person having entered into this Contract with Metro and who is responsible for the complete performance of the Work contemplated by the Contract Documents and for the payment of all legal debts pertaining to the Work, including its officers, agents, employees, and representatives.

1.1.22 Contract Time: The amount of time stated in the Contract Documents for the performance of all or a specified portion of the Work, as modified by any Change Orders.

1.1.23 Critical Path Method or CPM: The critical path method of scheduling as understood and interpreted by standard industry practice.

Construction Agreement

MERC CONTRACT NO. 304037

1.1.24 Day: Calendar day including Saturdays, Sundays, and legal holidays.

1.1.25 Defective Work: Work that (a) is performed in an unsatisfactory, faulty, or deficient manner; (b) does not conform to the Contract Documents; (c) does not meet the requirements of any reference standard, test, or approval referred to or incorporated by the Contract Documents; or (d) has been damaged by anyone other than Metro prior to Acceptance of the Work, whether or not such Work is in Metro's possession or use.

1.1.26 Direct Costs: The costs of labor (including benefits), materials, and equipment incurred by the person performing the Work or part of the Work.

1.1.27 Drawings: The graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location, and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

1.1.28 Engineer: A person lawfully practicing engineering. The term "Engineer" refers to the Engineer or the Engineer's authorized representative.

1.1.29 Environmental Laws: Any applicable statute, law, ordinance, order, consent decree, judgment, permit, license, code provision, covenant deed, common law, treaty, convention, or other requirement pertaining to protection of the environment, health or safety, natural resources, conservation, wildlife, waste management, or disposal of hazardous substances or pollution, including but not limited to regulation of releases to air, land, water, and groundwater.

1.1.30 Equal, Approved, Approved Equal: The material or product to be supplied or installed is equal to or better than that specified in function, performance, reliability, quality, and general configuration and is approved by Architect. Equality in reference to the Project design requirements shall be determined by Architect prior to installation of any material or product in the Project. Where the term "or equal" is not used and a sole product is specified, the term "or equal" is implied.

1.1.31 Final Completion: Full performance of all of the Work and acceptance of the Project by Metro.

1.1.32 Final Payment: The balance of the Contract Amount to be paid to the Contractor upon Final Completion and Acceptance of the Work. "Final Payment" includes payment of any withheld Retainage less deductions permitted or required by the Contract.

1.1.33 First Opportunity Target Area or FOTA: FOTA is the economically distressed area located in the immediate vicinity of the Oregon Convention Center as authorized by Section 2, Chapter 909, Oregon Laws 1989.

1.1.34 Force Account Work: Work, ordered in writing by Metro, for which Contractor must report its actual costs in accordance with Section 8.4 of the General Conditions.

1.1.35 General Conditions: The Metro General Conditions of the Contract for Construction set forth in this document.

1.1.36 General Manager of Visitor Venues or GM: The GM oversees the Portland's 5 Centers for the Performing Arts, the Oregon Convention Center, the Portland Expo Center and the Oregon Zoo.

1.1.37 Hazardous Materials: Any substance defined or designated as being radioactive, infectious, hazardous, dangerous, or toxic by any federal, state, or local statute, regulation, or ordinance presently in effect or subsequently enacted. For purposes of Section 10.7, the term "introduce" means the physical placement or transportation of Hazardous Materials in or on the Project Site regardless of whether the Hazardous Material was specified, required, or otherwise addressed in the Contract Documents.

1.1.38 Landscape Architect: A person lawfully practicing landscape architecture. The term "Landscape Architect" refers to the Landscape Architect or the Landscape Architect's authorized representative.

1.1.39 LEED Certification: A Leadership in Energy and Design Certification issued by the United States Green Building Council (USGBC).

1.1.40 Lump Sum: A way of expressing the Contract Amount for the Work, or the price bid for a portion of the Work, stated as a single price for all labor, materials, supplies, incidental work, overhead, and profit.

1.1.41 Metro: A metropolitan service district organized under the laws of the State of Oregon and the Metro Charter. Metro is the Contract Review Board for MERC.

1.1.42 Metropolitan Exposition Recreation Commission (MERC): An appointed commission of Metro with contracting authority for the Portland's 5 Centers for the Arts, the Oregon Convention Center and the Portland Expo Center.

1.1.43 Metro Chief Operating Officer or COO: The Chief Operating Officer of Metro.

1.1.44 Metro Council or Council: Metro's elected governing body.

1.1.45 Minority Business Enterprise, Women Business Enterprise and Emerging Small Business ("MWESB"): A firm eligible to participate as a Minority Business Enterprise, Women Business Enterprise or Emerging Small Business (collectively referred to as "MWESB") because it meets the criteria as established by the Office of

Construction Agreement

MERC CONTRACT NO. 304037

Minority Women and Emerging Small Business in the State of Oregon. A firm will no longer qualify as an MWESB on this Contract when it receives notification of decertification, denial of recertification, or notice of graduation by the certifying agency.

1.1.46 MWESB Program: Metro's program to provide maximum opportunities to Minority, Women-Owned and Emerging Small Business Enterprises in contracts, which is contained in Metro Code Section 2.04.100 to 2.04.190.

1.1.47 Notice to Proceed: The written notice given by Metro to the Contractor to proceed with all or part of the Work. The Notice to Proceed will also establish the date and time of a preconstruction conference.

1.1.48 Overhead: When applied to the cost of the Work, includes the following items, when reasonable and necessary for completion of the Work:

1.1.48.1 All on-site payroll costs, taxes, insurance, fringe benefits, and bonuses of same, for supervising, estimating, expediting, purchasing, drafting, and clerical/secretarial services where directly incurred in the performance of the Contract.

1.1.48.2 Small tools (less than \$250 capital cost per item).

1.1.48.3 Contractor-owned equipment.

1.1.48.4 Equipment maintenance and repairs.

1.1.48.5 Temporary construction, utilities, and safety requirements.

1.1.48.6 Transportation of materials other than direct identifiable cost of specific deliveries, or as included in price of material.

1.1.48.7 Parking fees for workers (if applicable).

1.1.48.8 Permit fees paid by the Contractor pursuant to the Contract Documents.

1.1.48.9 Cost of reproduction.

1.1.48.10 Field office costs. Home or branch office overhead shall not be included, but shall be part of Contractor's profit and shall include but is not limited to the following:

1.1.48.10.1 Accounting functions of Contractor's home and branch office.

1.1.48.10.2 General expenses of Contractor's home and branch office.

1.1.48.10.3 Interest on capital.

1.1.48.10.4 Salaries of any home and branch office estimators and administration.

1.1.49 Owner: Metro.

1.1.50 Person: An individual, partnership, corporation, joint venture, limited liability corporation, joint stock company, or other legal entity.

1.1.51 Plans: Drawings.

1.1.52 Profit: That portion of Contractor's Bid price that is not Direct Costs or Overhead

1.1.53 Project: The Work described in the Contract Documents.

1.1.54 Project Manager: The Metro representative on the construction Site. The Project Manager will be an employee of Metro who will represent Metro to the extent of his authority as delegated by the Chief Operating Officer. For purposes of administering this Contract the term "Project Manager" will refer to the on-site Metro representative and to any duly appointed assistants who may be designated in writing. The Architect will be called upon as required by and at the direction of Metro for technical assistance and for interpretation of the Contract Documents.

1.1.55 Proposal: The written offer of a Proposer to perform the Work as defined in these Contract Documents submitted in compliance with Metro's Request for Proposals and Public Contracting Rules.

1.1.56 Proposal Documents: Those documents upon which a Proposer responds to a Request for Proposals.

1.1.57 Proposer: A person who responds or intends to respond to a Request for Proposals issued by Metro.

1.1.58 Provide: To furnish and install complete and in place and ready for operation and use.

1.1.59 Punch List: The list prepared by the Architect and/or Project Manager at the time of Substantial Completion that reflects Contractor's incomplete, nonconforming Work. Punch List items must be completed to the satisfaction of the Architect and Metro in order for the Project to reach Final Completion and Acceptance.

1.1.60 Reference Specifications: Bulletins, standards, rules, methods of analysis or testing, codes, and Specifications of other agencies, engineering societies, or industrial associations referred to in the Contract Documents that when included in the Contract Documents establish the basis by which specific portions of the Work

Construction Agreement

MERC CONTRACT NO. 304037

are to be performed. All such references specified refer to the latest edition thereof, including any Amendments in effect and published at the time of advertising for Bids or of issuing the permit for the Project.

1.1.61 Release: When used in regard to environmental laws or regulations, "release" as defined in Oregon or federal law.

1.1.62 Request for Bid (RFB): A solicitation to perform Work where a Contract is awarded based on price.

1.1.63 Request for Information (RFI): A written request made by Contractor for additional information to clarify an ambiguity in the Contract Documents.

1.1.64 Request for Proposals ("RFP"): A solicitation to perform Work issued where a Contract is awarded based on factors other than or in addition to price.

1.1.65 Retainage or Retention: The difference between the amount earned by Contractor on the Contract and the amount paid on the Contract by Metro.

1.1.66 Schedule of Values: The detailed breakdown of a lump-sum contract amount as required in Section 9.2.

1.1.67 Separate Contract: A contract between Metro and a party other than Contractor for the construction or furnishing of a portion of the Project.

1.1.68 Shown, As Shown: Work shown on the drawings that is a part of the Contract Documents.

1.1.69 Site: The real property upon which the Project is located.

1.1.70 Solicitation Documents: An RFB.

1.1.71 Special Inspector: A representative of Metro, Architect, Engineer or Geotechnical Engineer with specialized knowledge applicable to the installation of certain elements of the Work.

1.1.72 Specifications: That portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards, and workmanship for the Work, and performance of related services, including any Reference Specifications.

1.1.73 Subcontractor: A person that has a contract with Contractor to perform a portion of the Work at the Site.

1.1.74 Submittals: Includes shop drawings, samples, manufacturer's brochures, pamphlets, catalog cuts, color charts, or other descriptive data, clearly defining the article, material, equipment, or device proposed by Contractor for use in the Work. "Shop drawings" are the drawings and diagrams showing details of fabrication and erection that Contractor is required to submit to the Architect.

1.1.75 Substantial Completion: The stage in the progress of the Work, as determined by Metro, when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that Metro can lawfully occupy or use the Work for its intended use.

1.1.76 Supplier: An individual, partnership, corporation or joint venture entering into an agreement with Metro or Contractor for furnishing a portion of the Work that requires no labor at the Site, other than common carriers.

1.1.77 Unit Price: The dollar amount to complete a particular portion of the Contract Work, as defined in the Bid and Supplementary Conditions, and includes all costs, including but not limited to equipment, labor, materials, incidentals, Overhead, and Profit for the portion of Work described.

1.1.78 Unusually Persistent Severe Weather: Exists in any period when daily rainfall exceeds 0.50 inch during a month when the monthly average rainfall exceeds the normal monthly average by over twenty-five percent (25%), or when average daytime temperatures at the Project are less than 32 degrees F and are accompanied by accumulations of ice or snow, continuing for a day or more in excess of the annual average number of consecutive days severe weather conditions persist for the part of the Metro region where the Project is located ("Annual Average"). The Annual Average shall be calculated for this purpose based on ten-year averages reported in the Local Climatological Data for Portland Oregon, available at the Portland Weather Service Office. Contractor shall incorporate said Annual Average number of consecutive days severe weather conditions exist into the Project schedule at Project inception.

1.1.79 Work: Unless the context requires otherwise, the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by Contractor to fulfill Contractor's obligations. The Work may constitute all or a portion of the Project as the context requires.

1.2 Interpretation and Use of Contract Documents.

1.2.1 Intent and Effect of the Contract. The Contract Documents form the Contract for construction and represent an integrated agreement between the Parties. The Contract supersedes all prior negotiations,

Construction Agreement

MERC CONTRACT NO. 304037

representations, or agreements between the Parties, either written or oral. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work. Unless otherwise stated in the Contract Documents, words describing materials or Work that have a well-known technical or trade meaning shall be construed in accordance with such meanings.

1.2.2 Modification of Contract Documents. The Contract Documents may only be modified by written Amendment or Change Order signed by both Parties.

1.2.3 Divisions and Headings. Titles and headings are for the convenience of organizing the Contract Documents and shall not control or limit the Contractor's obligations under the Contract.

1.2.4 Mandatory Nature of Specifications and Drawings. Mention in the Specifications or indication on the drawings of articles, materials, operations, sequence, or methods requires Contractor to furnish and install (i.e., provide) each article mentioned or indicated, of the quality or according to qualifications noted, to perform each operation called for, in the sequence called for, and to provide therefore all necessary labor, equipment, and incidentals. The determination of the type of operations and methods to be utilized in the performance of the Work shall be the responsibility of Contractor unless the Contract Documents prescribe a specific type of operation, sequence, or method, in which case Contractor shall comply with the prescribed operation, sequence, or method. Sentences in the imperative tense or command format in these Contract Documents shall be deemed to be directed to Contractor and to require Contractor to perform the services and/or provide the materials described.

1.2.5 Precedence of Contract Documents. All determination of the precedence of, or resolution of discrepancies in, the Contract Documents shall be made by Metro, but in general, precedence will be in accordance with the following list with the highest precedence item at the top:

- 1.2.5.1 Executed Construction Agreement.
- 1.2.5.2 Supplementary Conditions.
- 1.2.5.3 General Conditions, Advertisement for Bids, Instructions to Bidders, Invitation to Bid, Bid Forms, Performance Bond, and Labor and Materials Payment Bond.
- 1.2.5.4 Specifications.
- 1.2.5.5 Drawings.
- 1.2.5.6 Contractor's Proposal. Within each of the above documents, detailed information takes precedence over general information and words take precedence over numbers unless obviously incorrect.

Amendments, Addenda, Clarifications, and all Change Orders to the Contract Documents take the same order of precedence as the specific sections that they are amending.

1.2.6 Meaning of Miscellaneous Phrases. Unless the context requires otherwise, phrases in the Contract Documents shall be interpreted as follows:

1.2.6.1 Wherever the words "as directed," "as instructed," "as required," "as permitted," or words of like effect are used, it shall be understood that the direction, requirement, or permission of Metro is intended.

1.2.6.2 The words "sufficient," "necessary," "proper," and the like shall mean sufficient, necessary, or proper in the judgment of Metro.

1.2.6.3 The words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to Metro.

1.2.7 Discrepancies, Errors and Omissions. The intent of the Contract Documents is to require Contractor to perform and provide every detail and item necessary for completion of the Project. The Contract Documents are not complete in every detail, however, and Contractor shall comply with their intent and meaning, taken as a whole, and shall not avail itself of any manifest errors or omissions to the detriment of the Work. Should any error, omission, discrepancy, or ambiguity appear in the Contract Documents, instructions, or Work done by others, Contractor shall immediately upon discovery submit a Request for Information to Metro pursuant to Section 3.3. If Contractor proceeds with any such Work without receiving a response to the Request for Information, Contractor shall be responsible for all resulting damage and defects, and shall perform any Work necessary to comply with the Request for Information at no cost to Metro. Any Work or material not indicated in the Contract Documents that is manifestly necessary for full and faithful performance of the Work in accordance with the intent of the Contract Documents shall be indicated by Contractor on the shop drawings and provided by Contractor to the same extent as if both indicated and specified. Any Work indicated on the drawings but not specified, or vice versa, shall be furnished in the manner specified above as though fully set forth in both. Work not particularly detailed, marked, or specified shall be the same as similar parts that are detailed, marked, or specified. In case of discrepancy or ambiguity in quantity or quality, the greater quantity or better quality as determined by Metro shall be provided at no extra cost to Metro.

Construction Agreement

MERC CONTRACT NO. 304037

1.2.8 Standards that Apply Where Detailed Specifications Are Not Furnished. Wherever in these Contract Documents or in any directions given by Metro pursuant to or supplementing these Contract Documents, it is provided that Contractor shall furnish materials or manufactured articles or shall do work for which no detailed Specifications are set forth, the materials or manufactured articles shall conform to the usual standards for first-class materials or articles of the kind required, with due consideration of the use to which they are to be put. Work for which no detailed drawings or Specifications are set forth herein shall conform to the usual standards for first-class work of the kind required. Dimensions not expressly provided in the Contract Documents are to be computed, rather than determined by scale or rule.

1.3 Supply of Contract Documents. Metro shall supply Contractor, without charge, a maximum of ten (10) sets of Contract Documents. Contractor shall contact Metro for additional sets of documents for which Contractor shall be charged the cost of printing.

1.4 Use of Contract Documents. The Contract Documents were prepared for use in the construction of this Project only. No part of the Contract Documents shall be used for any other construction or for any other purpose except with the written consent of Metro. Any unauthorized use of the Contract Documents is at the sole responsibility of the user and such unauthorized use shall be deemed an activity in the performance of the Contract for purposes of Contractor's duty to indemnify under Article 11.

1.5 Copyright. All submittals, record documents, and any other products or documents produced by Contractor pursuant to this Contract are the property of Metro and it is agreed by the Parties hereto that such documents are works made for hire. Contractor does hereby convey, transfer, and grant to Metro all rights of reproduction and the copyright to all such documents.

1.6 Contractor's Status as Independent Contractor. It is understood and agreed that the relationship of Contractor to Owner shall be that of an independent contractor under ORS 670.600. The Contractor further agrees that Contractor, its officers, agents, and employees, any Subcontractor or Supplier of Contractor of any tier, or its officers, agents, or employees, are not officers, employees, or agents of Metro under the Oregon Tort Claims Act (ORS 30.260 through 30.300). Contractor and its officers, agents, employees, and its Subcontractors and Suppliers of any tier and their officers, agents, and employees will make no claim whatsoever against Metro for indemnification pursuant to ORS 30.260 to 30.300. Contractor agrees to hold Metro harmless and indemnify Metro from any such claims.

1.7 No Third-Party Beneficiary to the Contract. The Parties agree that the execution of the Contract is not intended to, nor does it, create any third-party beneficiary rights in any person.

1.8 Severability Clause. Should any provision of this Contract at any time be in conflict with any law, regulation, or ruling, or be legally unenforceable for any reason, then such provision shall continue in effect only to the extent that it remains valid. In the event that any provision of this Contract shall become legally unenforceable, in whole or in part, the remaining provisions of this Contract shall nevertheless remain in full force and effect.

1.9 Notice or Service. Any written notice required or allowed under the Contract shall be deemed to have been communicated to the other Party and service thereof shall be deemed to have been made if such notice is delivered in person to the individual, a member of the partnership or joint venture, or an officer of the corporation for whom it was intended, or if delivered at or sent by regular, registered, or certified mail to the last business address of the relevant person or Party known to the person or Party giving the notice, or to Contractor's Site office if the notice is directed to Contractor. Notice may be delivered by e-mail as long as a hard copy is mailed the same day to the relevant person by the methods noted above. The date or time of service for purposes of all notices required or allowed under the Contract shall be the date and/or time upon which the relevant document was mailed or delivered as above described. The address given in the Bid or Proposal by the Contractor is hereby designated as the legal business address of Contractor, but such address may be changed at any time by ten (10) days' prior notice in writing, delivered to Metro.

ARTICLE 2 CONTRACTOR

2.1 Responsibilities of the Contractor.

2.1.1 The Contractor will perform the Work as required by the Contract Documents, including but not limited to providing all labor, materials, equipment, tools, machines, and incidental work necessary for its performance. The Contractor will supervise and direct the Work using the Contractor's best skill and attention. Contractor is solely responsible for and will have control of all of the means and methods of construction. Contractor shall be responsible to Metro for the acts and omissions of the Contractor's employees, Subcontractors, and their agents and employees, and other persons or entities performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors. Contractor shall perform or cause to be performed all labor, services, and Work of

Construction Agreement

MERC CONTRACT NO. 304037

whatever nature and shall provide or cause to be provided all materials, equipment, tools, and other facilities of whatever nature necessary to complete the Work and shall otherwise cause the Work to be completed in accordance with the Contract Documents.

2.1.2 Until the Work is completed and accepted by Metro, the Contractor is responsible for any damage it causes to either permanent or temporary work, utilities, materials, plants, and equipment, all of which must be repaired to the satisfaction of the Project Manager at the Contractor's expense. Damage caused by vandals must be covered by the Contractor's insurance. Damage to any portion of the Work that has been completed and accepted by Metro and that is open for public use is not the responsibility of the Contractor if caused by third persons, such as vandals.

2.1.3 It shall be the duty of Contractor to comply with all procedures established and/or implemented by Metro. In the event any such procedures are at variance with other provisions of these Documents, such procedures shall prevail.

2.2 Documents.

2.2.1 The Contractor will maintain at the Site for Metro one record As-Built copy of the drawings, plans, Specifications, Addenda, Change Orders, and other modifications, in good order and marked currently to record changes and selections made during construction, as well as one record copy of shop drawings that have been reviewed and are being used. These as-built documents shall incorporate all changes and substitutions to the Work, including without limitation changes or substitutions arising from Change Orders, construction change directives, and details clarified by requests for information, supplemental instructions, or approved shop drawings. The Contractor's as-built documentation shall be available to the Architect and Metro during the course of the Project.

2.2.2 The Contractor shall maintain all approved permit drawings in a manner that will make them accessible at the Project Site to governmental inspectors and other authorized agencies. All approved drawings shall be wrapped, marked, and delivered to Metro within 60 days of Substantial Completion.

2.2.3 The Contractor must continuously maintain at the Project Site all material safety data sheets, safety records, daily logs, and other Contract documentation necessary to immediately ascertain the safety of the Work and to establish compliance with life safety policies, hazardous materials requirements, and the Contract Documents.

2.2.4 The Contractor, with its Subcontractors, will prepare draft record Contract Documents showing all as-built conditions as required under this Section 2.2 and submit them to Metro for review. Based on Metro's review and comments, if any, and pursuant to Metro's close-out policies and procedures, Contractor will prepare and deliver to Metro within 60 days of Substantial Completion, final, accurate, and complete record Contract Documents, including without limitation record drawings and Specifications showing the exact "as-built" conditions of the Work.

2.3 Contractor's Authorized Representative. Prior to commencing any Work under this Contract, the Contractor shall appoint in writing an authorized representative or representatives. Such appointment shall include the name and title of each representative along with the extent to which each representative is authorized to represent, bind, and act for Contractor. The description of extent of representation shall include but not be limited to the maximum dollar value of Change Orders that the individual may authorize, whether the individual may respond to RFPs and for what maximum dollar amount, and whether the individual may submit a claim pursuant to Section 3.4.

2.4 On-Site Representation Required. Contractor shall at all times be represented at the Site by one or more of such authorized representatives who, cumulatively, shall have complete authority to represent, bind, and act for Contractor in all matters pertaining to or related to this Contract. In the event that Metro deems it reasonably necessary to take immediate actions at the Site pertaining or relating to this Contract and Contractor has failed to comply with this Section and is consequently not fully represented at the Site at such time, then Contractor shall be deemed to acquiesce in all actions so taken by Metro.

2.5 Contractor's Office at the Site. Prior to commencement of Work at the Site, Contractor shall establish a field office at the Site acceptable to the Project Manager. This office shall be located in a job trailer or temporary building. This office shall be the headquarters of Contractor's representatives authorized to receive notices, instructions, drawings, or other communications from the Project Manager on behalf of Metro or the Architect, and to act on Change Orders or other actions. Such notices, instructions, drawings, or other communications given to such a representative or delivered to Contractor's Site office in his/her absence shall be deemed to have been given to Contractor.

2.6 Use of the Site by Contractor. Contractor shall have complete and exclusive use of the premises for execution of the Work within the boundaries shown on the drawings. The Contractor's use of the premises is limited only by Metro's right to perform Work or to retain other contractors on portions of the Project. All construction activities, storage, staging, and Work shall be confined to the limits of Work, as per the drawings. Under no circumstances shall portions of the Site beyond the limits of Work be disturbed. The Contractor shall appropriately fence and maintain

Construction Agreement

MERC CONTRACT NO. 304037

barriers to confine limits of Work to those areas indicated on the drawings. All driveways and entrances to the Site shall remain clear and available to Metro and emergency vehicles at all times. The Contractor shall not use these areas for parking or storage of materials. The Contractor shall schedule delivery of materials to minimize space and time requirements for storage of materials and equipment on Site. The Contractor shall keep roadway pavement clean, free of mud, rocks, debris associated with materials, and vehicles. The Contractor shall coordinate use of the premises under the direction of the Architect and Owner. The Contractor shall assume all responsibility for the protection and safe keeping of the Site, structures, and products stored on the Site included in this Contract. At no cost to Metro, the Contractor shall move any stored products that interfere with operations of Metro or construction activities. The Contractor shall obtain and pay for the use of additional storage or Work areas needed for operations.

2.7 Review of Project Conditions. Prior to execution of the Contract, the Contractor will evaluate the conditions and limitations under which the Work is to be performed, including without limitation (i) the geographical and topographical location, condition, layout, and nature of the Project Site and surrounding areas; (ii) generally prevailing climatic conditions; (iii) anticipated labor supply and costs; (iv) availability and cost of materials, tools, and equipment; (vi) ease or difficulty of access to the Project Site by vehicles, equipment and workers; and (v) other similar issues. The Contractor shall be solely responsible for providing a safe place for the performance of the Work. Metro will not be required to make any adjustment to the Contract Time or the Contract Price in connection with any failure by the Contractor to have complied with the requirements of this Section.

2.8 Construction Staking. Contractor shall provide all necessary construction staking as to lines and grades shown on the drawings. Contractor shall protect and preserve all control points in their original position or be responsible for providing new control points established from Architect's original control points.

2.9 Construction Staging Area. Coordinate use of the Site with Owner prior to utilization of the area. Providing Site security, barriers, and other temporary protection is the responsibility of the Contractor. Limit all construction activities within the Work limits shown on the drawings. All areas disturbed in any way or during construction and not covered by roads, parking, or structures shall be rehabilitated to their pre-construction condition.

2.10 Key Personnel. Contractor shall submit, in writing, to Metro a list of the names, addresses, and telephone numbers of its key personnel who are to be contacted in case of emergencies on the job during non-working hours, including Saturdays, Sundays, and holidays, and all other key personnel as may be required.

2.11 Contractor's Employees and Subcontractors.

2.11.1 Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them. It is the Contractor's responsibility to hire all personnel for the proper and diligent performance of the Work, and the Contractor shall maintain labor peace for the duration of the Project. In the event of a labor dispute, the Contractor shall not be entitled to any increase in the Contract Sum.

2.11.2 Metro may notify the Contractor that it needs to exclude or remove from the Project Site any or all employees, agents, suppliers, or representatives of the Contractor or its Subcontractors who threaten the safety of others or who are disruptive to the Project or Metro's operations. The Contractor will supply replacement personnel promptly after receiving notice of exclusion or removal. Nothing in this Section requires the Contractor to take any particular employment or contract action with regard to an employee or Subcontractor.

2.11.3 Contractor shall give Metro, at its request at any time, full and correct information as to the number of workers employed in connection with each subdivision of the Work, the classification and rate of pay of each worker, the cost to Contractor of each class of materials, tools, and appliances used by it in the Work, and the amount of each class of materials used in each subdivision of the Work.

2.12 Contractor to Supply Sufficient Material and Workers. Contractor shall at all times keep on the premises sufficient material and employ sufficient supervision and workers to prosecute the Work at the rate necessary to substantially complete the Work within the time specified in the Contract and in accordance with the Construction Schedule. Contractor shall coordinate the Work of its Subcontractors so that information required by one will be provided by others involved in time for incorporation in the Work in proper sequence and without delay of any materials, devices, or provisions for future Work.

2.13 Construction Plant, Equipment, and Methods.

2.13.1 The construction plant and equipment provided by Contractor, and Contractor's methods and organization for handling the Work, shall be such as will secure a good quality of Work and rate of progress that will ensure the completion of the Work within the time specified, in accordance with the Construction Schedule, and without violating city, local, state, or federal environmental regulations during construction.

2.13.2 Contractor shall give Metro full information in advance as to Contractor's plans for carrying on any part of the Work. If at any time before the commencement or during the progress of the Work, any part of

Construction Agreement

MERC CONTRACT NO. 304037

Contractor's plant or equipment, or any of Contractor's methods of executing the Work, appear to Metro to be inadequate to ensure the required quality, environmental protection, or rate of progress of the Work, Metro may order Contractor to increase or improve its facilities or methods, and Contractor shall promptly comply with such orders. Neither compliance with such orders nor failure of Metro to issue such orders shall relieve Contractor from the obligation or liability to secure the quality of Work and the rate of progress required by the Contract. Contractor shall be responsible for overload of any part or parts of structures beyond their safe calculated carrying capacities and for release of pollutants into surrounding waters resulting from Contractor's activities on the Site.

2.13.3 Contractor shall provide temporary utilities pursuant to the Specifications and shall be responsible for the safety and adequacy of its plant, equipment, and methods.

2.14 Permits.

2.14.1 The Contractor, without additional expense to Metro, is responsible for obtaining and paying for any necessary fees, licenses, and Permits and for complying with any federal, state, and municipal laws, codes, and regulations applicable to the performance of the Work, unless expressly provided otherwise in other portions of the Contract Documents. Notwithstanding this Section, Metro will submit Contract Documents to the City of Portland and pay all plan check fees and building permit fees.

2.14.2 The Contractor understands that preliminary approval of Metro's plans and Specifications by regulatory agencies does not prohibit such agencies from requesting changes in order that the Work complies with the provisions of applicable codes, laws, and regulations. The Contractor agrees that a reasonable number of changes directed by regulatory inspectors is inherent in the nature of construction work and that its Bid includes the costs of making them. The Contractor will bear the expense of complying with the requirements of regulatory inspectors for a reasonable number of changes even if such requirements require different or additional Work than that originally contemplated by the Contract Documents.

2.15 Contractor's Temporary Structures. Contractor shall obtain all necessary permits for and shall erect and maintain at its own expense, and remove upon completion of the Work or as ordered by Metro, temporary structures, sheds, barriers, walks, hoisting equipment, scaffolds, etc., as are necessary for the Work pursuant to these Contract Documents. Contractor's temporary structures, equipment, stored materials, stored equipment, etc., shall be located so as not to interfere with the prosecution of the Work. If not so located, they shall be moved by Contractor, as directed by Metro, at no cost to Metro. Contractor's temporary structures, equipment, or materials that obstruct progress of any portion of the Work shall be removed or relocated by Contractor at Contractor's expense.

2.16 Compliance with Product Manufacturer's Recommendations. Unless otherwise directed by the Architect, the Contractor shall perform all Work in accordance with the product manufacturer's recommendations, Specifications, or directions for best results. No predatory step or installation procedure may be omitted unless specifically authorized by the Contract Documents or at the direction of the Architect. Conflicts among manufacturer's directions or the Contract Documents shall be resolved by the Architect.

2.17 Accounting Records.

2.17.1 The Contractor and Subcontractors shall maintain all fiscal records relating to this Contract in accordance with generally accepted accounting principles. In addition, Consultant and sub-consultants shall maintain any other records necessary to clearly document:

2.17.1.1 The performance of the Contractor, including but not limited to Contractor compliance with Contract plans and Specifications, compliance with fair contracting and employment programs, compliance with Oregon law on the payment of wages and accelerated payment provisions, and compliance with any and all requirements imposed on Contractor or Subcontractor under the terms of the Contract or subcontract;

2.17.1.2 Any claims arising from or relating to the performance of Contractor or Subcontractor under this Contract;

2.17.1.3 Any cost and pricing data relating to the Contract; and

2.17.1.4 Payments made to all suppliers and sub-consultants.

2.17.1.5 The records described in this Section 2.17.1 are the Contract Records.

2.17.2 The Contractor and Subcontractors shall maintain the Contract Records for the longer period of (a) six years from the date of final completion of the Contract to which the Contract Records relate or (b) until the conclusion of any audit, controversy, or litigation arising out of or related to the Contract.

2.17.3 The Contractor and Subcontractors shall make Contract Records available to Metro and its authorized representatives, including but not limited to the staff of any Metro department and the staff of Metro's Auditor, within the boundaries of the Metro region, at reasonable times and places regardless of whether litigation has been filed on any claims. If the Contract Records are not made available within the boundaries of Metro, the Contractor or Subcontractor agrees to bear all of the costs for Metro employees, and any necessary consultants hired

Construction Agreement

MERC CONTRACT NO. 304037

by Metro, including but not limited to the costs of travel, per diem sums, salary, and any other expenses that Metro incurs in sending its employees or consultants to examine, audit, inspect, and copy those records. If Contractor elects to have such Contract Records outside these boundaries, the costs paid by Contractor to Metro for inspection, auditing, examining, and copying those records shall not be recoverable costs in any legal proceeding.

2.17.4 The Contractor and Subcontractors authorize and permit Metro and its authorized representatives, including but not limited to the staff of any Metro department and the staff of Metro Auditor, to inspect, examine, copy, and audit the books and records of Contractor or Subcontractor relating to this Contract, including tax returns, financial statements, other financial documents, and any documents that may be placed in escrow according to any Contract requirements. Metro shall keep any such documents confidential to the extent permitted by Oregon law.

2.17.5 The Contractor and Subcontractors agree to disclose the Contract Records requested by Metro and agree to the admission of such records as evidence in any proceeding between Metro and Contractor and Subcontractors, including but not limited to a court proceeding, arbitration, mediation, or other alternative dispute resolution process.

2.17.6 The Contractor and Subcontractors agree that in the event such Contract Records or any audit disclose that Metro is owed any sum of money or establish that any portion of any claim made against Metro is not warranted, Contractor and Subcontractors shall pay all costs incurred by Metro in conducting the audit and inspection. Such costs may be withheld from any sum that is due or that becomes due from Metro.

2.17.7 Failure of the Contractor or Subcontractors to keep or disclose Contract Records as required by this Contract or any solicitation document may result in debarment as a bidder or proposer for future Metro contracts as provided in ORS 279B.130 and Metro Code Section 2.04.070(c), or may result in a finding that the Contractor or Subcontractor is not a responsible bidder or proposer as provided in ORS 279B.110 and Metro Code Section 2.04.052.

ARTICLE 3 ADMINISTRATION OF THE CONTRACT

3.1 Authority and Relationships of Metro and Architect. Except as specifically provided in this Section, no individual other than the Metro Chief Operating Officer or the Project Manager, duly appointed as set forth below, shall have any authority to make representations, statements, or decisions of whatever nature binding Metro or Architect regarding any aspect of this Contract. Except as specifically provided in this Article, Contractor shall have no right to, and shall not rely on, any such representation, statement, or decision. Any reference to action by Metro in this Contract requires the written approval of the Metro Chief Operating Officer or the Project Manager designated in writing by the Metro Chief Operating Officer as having authority to act for Metro, but only to the extent that such authority is expressly delegated in writing.

3.2 Authority of Metro. The Work must be performed to the complete satisfaction of the Project Manager.

3.2.1 The decision of the Project Manager will be final, binding, and conclusive on the Contractor on all questions that arise regarding the quantity of materials and Work, the quality of materials and Work, the acceptability of materials furnished and Work performed, the acceptable rate of progress of the Work, the interpretation of the plans and Specifications, the measurement of all quantities, the acceptable fulfillment of the Contract on the part of the Contractor, and payments under the Contract.

3.2.2 Work will not be considered completed until it has passed final inspection by the Project Manager and is accepted by Metro. The authority of the Project Manager is such that the Contractor must at all times carry out and fulfill the instructions and directions of the Project Manager insofar as they concern the Work to be done under the Contract.

3.2.3 If the Contractor fails to comply with any reasonable order made under the provisions of this Section, the Project Manager may cause unacceptable Work to be remedied or removed and replaced, and unauthorized Work to be removed, and to deduct the costs thereof from any money due or to become due to the Contractor.

3.2.4 The Project Manager has the authority to suspend Work for cause as set forth in Section 3.5.

3.2.5 Metro may call for meetings of Contractor, Contractor's Subcontractors, and Suppliers as Metro deems necessary for the proper supervision and inspection of the Work. Such meetings shall be held at the Site on regular working days during regular working hours, unless otherwise directed by Metro. Attendance shall be mandatory for all Parties notified to attend.

Construction Agreement

MERC CONTRACT NO. 304037

3.2.6 Nothing in this Section or elsewhere in the Contract is to be construed as requiring the Project Manager to direct or advise the Contractor on the method or manner of performing any Work under the Contract. No approval or advice as to the method or manner of performing or producing any materials to be furnished constitutes a representation or warranty by Metro that the result of such method or manner will conform to the Contract, relieve the Contractor of any of the risks or obligations under the Contract, or create any liability to Metro because of such approval or advice.

3.2.7 An Architect, Engineer, designer, or other person hired by Metro under a separate contract is not the Project Manager, unless the Contract Documents expressly state otherwise. The Contractor will be notified in writing if the Project Manager is to be changed.

3.2.8 Contractor has no right to and shall not rely on representations of whatever nature made by any individual, whether or not employed by or purporting to represent Metro, unless such individual has been specifically and expressly delegated authority to make such representations pursuant to these Contract Documents. Likewise, Contractor has no right to and shall not rely on any representations of authorized changes in the Contract of whatever size or nature unless such change is in writing and signed by Metro.

3.2.9 Nothing contained in this Section shall obligate Metro or Architect to supervise Contractor's Work under this Contract, and Contractor shall remain fully responsible for the complete and proper supervision of all of the Work.

3.3 Request for Information. If the Contractor believes that the Work to be done or any of the matters relative to the Contract Documents are not sufficiently detailed or explained in the Contract Documents, or if the Contractor has any questions as to the meaning or intent of the Contract Documents, Contractor shall immediately submit to Architect and Metro a written Request for Information ("RFI") that shall fully describe the information sought.

3.3.1 The RFI shall be directed to the Project Manager and Architect. Subcontractors shall direct correspondence through the Contractor to the Project Manager and Architect. At a minimum the RFI shall contain: (1) project title, (2) identify the nature and location of each clarification/verification, (3) date, (4) response by and RFI number, (5) subject, (6) initiator of the question, (7) indication of the costs, (8) Contract drawings reference, (9) Contract Specification section, and (10) descriptive text and space for a reply. Each RFI shall be numbered sequentially beginning with #001, and a separate RFI shall be submitted for each item. Verbal discussions/clarifications for minor items can be addressed with the Architect by phone and the Contractor shall follow up with a confirming RFI.

3.3.2 It is Contractor's responsibility to request information under this Section in sufficient time for review by the Architect and Metro so that the orderly progress and prosecution of the Work is not delayed.

3.3.3 The Architect, in consultation with Metro, shall interpret the meaning and intent of the Contract Documents and shall issue, within five (5) working days of receiving an RFI from Contractor, a written Clarification describing such meaning and intent. Additionally, the Architect, after consulting with Metro, may at any time issue a written RFI as deemed necessary to carry out the Work included in the Contract Documents. Notwithstanding any dispute or disagreement that Contractor may have concerning any such RFI, Contractor shall perform the Work as prescribed and in accordance with all such RFI.

3.3.4 If notified by Metro or the Architect that an RFI is forthcoming, any related Work done before the receipt of the RFI shall be coordinated with Metro so as to minimize the effect of the RFI on Work in progress. Any related Work not coordinated with Metro or the Architect done before receipt of the RFI shall be at Contractor's risk and at no cost to Metro if that Work does not conform to the Clarification.

3.3.5 If Contractor proceeds with Work that is not sufficiently detailed or explained in the Contract Documents without requesting and obtaining an RFI pursuant to this Section, Contractor shall do so at its own risk and shall, at no cost to Metro, perform any additional Work that may be required by Metro to bring the Work into conformance with the intent of the Contract Documents.

3.4 Contractor's Claims.

3.4.1 Generally. No claim by Contractor shall be considered or allowed under this Contract except as specifically provided and prescribed under this Section. Failure to make a claim as specifically prescribed by this Section or failure to perform disputed Work, if any, as directed by Metro shall bar Contractor from any recovery or extension of time resulting from the facts surrounding the claim. Contractor's full and complete compliance with this Section shall be a condition precedent to any right of Contractor to further prosecute any claim against Metro arising out of or related to Work described in the Contract Documents. Every decision and action of Metro shall be considered final unless Contractor makes a claim concerning such decision or action pursuant to this Section.

3.4.2 Types of Claims. Contractor claims are limited to the following:

3.4.2.1 Claims based on Excusable Delays as described in Section 3.4.3.



Construction Agreement

MERC CONTRACT NO. 304037

3.4.2.2 Claims based on differing Site conditions as described in Section 3.4.4;

3.4.2.3 Claims based on Clarifications or Change Orders issued by Metro or any other decision, action, or failure to act by Metro as described in Section 3.4.5.

3.4.3 Claims For Excusable Delays.

3.4.3.1 Definition of Excusable Delay. A Delay is "Excusable" if such act, event, or condition has a materially adverse effect on the ability of Contractor to perform its obligations under this Contract as scheduled, and/or materially increases the cost to Contractor to perform such obligations as scheduled and if such act, event, or condition and its effect:

3.4.3.1.1 Are beyond the reasonable control of Contractor (or any third party for whom Contractor is directly responsible); and

3.4.3.1.2 Do not arise out of (a) strikes, labor disputes, or other labor difficulties involving Contractor or its Subcontractors or Suppliers or entities providing transportation to Contractor or its Subcontractors or Suppliers; (b) labor shortages; or (c) changing economic conditions; and

3.4.3.1.3 Could not have been reasonably anticipated by Contractor.

3.4.3.2 Types of Excusable Delay Claims. Excusable Delays are either Compensable or Non-compensable. Claims for Non-compensable Excusable Delays are limited to claims for extension of Contract Time. Contractor may claim both an increase in the Contract Amount and an extension of the Contract Time for Compensable Excusable Delays.

3.4.3.3 Non-Compensable Excusable Delay Claims. Delays resulting from the following acts, events, and conditions are Non-Compensable Excusable Delays:

3.4.3.3.1 An Act of God.

3.4.3.3.2 Unusually Persistent Severe Weather. No claim for extension of the Contract Time will be considered for Unusually Persistent Severe Weather unless Contractor submits documentation within 72 hours of the occurrence of the Unusually Persistent Severe Weather satisfactory to Metro establishing that the weather at the Project Site satisfied the definition of Unusually Persistent Severe Weather and that the delay could not have been avoided by either rescheduling the Work or implementing reasonable measures to protect against the weather so that the Work could proceed.

3.4.3.3.3 Acts of a public enemy, war (whether or not declared), or governmental intervention resulting therefrom, blockage, embargo, insurrection, riot, or civil disturbance.

3.4.3.3.4 The failure to issue or renew, or the suspension, termination, interruption, or denial of, any permit, license, consent, authorization, or approval essential to the Work, if such act or event is not the result of the willful or negligent action or inaction of Contractor or of any third party for whom Contractor is directly responsible, and if Contractor is taking, has taken, or will cause to be taken, all reasonable actions in good faith to contest such action (it being understood that the contesting in good faith of any such action shall not constitute or be construed as a willful or negligent act of Contractor).

3.4.3.3.5 The failure of any appropriate federal, state, municipal, county, or other public agency or authority or private utility having operational jurisdiction over the Work or Site to provide and maintain utilities, services, water and sewer lines, and power transmission lines to the Site, that are required for and essential to the Work.

3.4.3.3.6 Epidemics or quarantines.

3.4.3.3.7 Material, equipment, or fuel shortages or freight embargoes.

3.4.3.3.8 Priorities or privileges established for the manufacture, assembly, or allotment of material by order, decree, or otherwise of the U. S. or by any department, bureau, commission, committee, agent, or administrator of any legally constituted public authority.

3.4.3.4 Compensable Excusable Delay Claims. Delays resulting from the following acts, events, and conditions are Compensable Excusable Delays:

3.4.3.4.1 Changes in the Work ordered by Metro if they require additional time to complete the Work and adversely impact the Critical Path.

3.4.3.4.2 The prevention by Metro of Contractor from commencing or prosecuting the Work.

3.4.3.4.3 Failure by the Architect to respond to a Request for Information within five (5) working days of submittal by the Contractor.

3.4.3.5 Inexcusable Delays. Delays resulting from the following acts, events, and conditions shall not result in Excusable Delays:

Construction Agreement

MERC CONTRACT NO. 304037

3.4.3.5.1 Any delay that could have been avoided by the exercise of care, prudence, foresight, and diligence on the part of Contractor.

3.4.3.5.2 Any delay in the prosecution of parts of the Work that may in itself be unavoidable but that does not necessarily prevent or delay the prosecution of other parts of the Work nor the Substantial Completion of the Work of this Contract within the time specified.

3.4.3.5.3 Any reasonable delay resulting from the time required by Metro for review of submittals or shop drawings submitted by Contractor and for the making of surveys, measurements, and inspections.

3.4.3.5.4 Any delay arising from an interruption in the prosecution of the Work on account of the reasonable interference from Other Metro Contractors that does not necessarily prevent the Substantial Completion of the Work of this Contract within the time specified.

3.4.3.5.5 Any delay resulting in any manner from labor disputes, strikes, or difficulties or any delay resulting in any manner from any labor-related event, act, or condition whether or not Contractor has any control over such event, act, or condition.

3.4.3.5.6 Any delays in delivery of equipment or material purchased by Contractor or its Subcontractors or Suppliers (including Metro-selected equipment. Contractor shall be fully responsible for the timely ordering, scheduling, expediting, delivery, and installation of all equipment and materials.

3.4.3.6 Excusable Delay Claims Procedure.

3.4.3.6.1 Contractor shall, within forty-eight (48) hours of the start of the occurrence or Contractor's first knowledge of the occurrence that is the basis of the claim for Excusable Delay, whichever is earlier, notify Metro in writing of such delay. The written notice by Contractor shall indicate the cause of the delay and shall estimate the possible time extension requested. Within ten (10) days after the cause of the delay has been remedied, Contractor shall give written notice to the Project Manager of any actual time extension and, if the Excusable Delay is a Compensable Excusable Delay, any increase in the Contract Amount requested as a result of the aforementioned occurrence in accordance with this Contract. If Contractor believes that a single circumstance or set of facts gives rise to both a claim for an extension to the Contract Time and an increase in the Contract Amount, Contractor must state both such allegations in one written claim or waive the unstated allegation.

3.4.3.6.2 Submission of timely written notice as specified above shall be mandatory and failure to comply shall be a conclusive waiver to any claim for Excusable Delay by Contractor. Oral notice or statement will not be sufficient.

3.4.3.6.3 Within twenty-one (21) days after Contractor submits to the Project Manager such a written notice for an extension of Contract Time and/or increase in the Contract Amount, the Project Manager will issue the decision on each request. If Contractor is dissatisfied with such decision, Contractor may preserve its claim as provided and prescribed by Section 3.4.6.

3.4.4 Claims for Differing Site Conditions-- Contractor shall promptly, and before the conditions are disturbed, give written notice to the Project Manager of (i) subsurface or latent physical conditions at the Site that differ materially from those indicated in this Contract, or (ii) physical conditions at the Site that were unknown and not reasonably discoverable by means of the Review of Project Conditions required by Section 2.7, are of an unusual nature that differ materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract. The Project Manager shall investigate the Site conditions promptly after receiving the notice. If the conditions do materially so differ as to cause an increase or decrease in Contractor's cost of, or the time required for, performing any part of the Work under this Contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made and a Change Order issued. If Contractor is dissatisfied with the decision of the Project Manager under this Section, Contractor may preserve its claim as provided and prescribed by Section 3.4.6.

3.4.5 Other Contractor Claims-- Contractor claims based on Clarifications or Change Orders issued by Metro or any other decision, action, or failure to act by Metro shall be made according to this Section.

3.4.5.1 Contractor shall, within forty-eight (48) hours following discovery of the facts that give rise to its claim, notify the Project Manager in writing of its intent to make the claim. Within ten (10) days following discovery of the facts that give rise to its claim and prior to commencing the Work or conforming to the Clarification on which the claim is based, if any, Contractor shall submit its formal written claim to the Project Manager. Contractor's formal claim shall include a description of:

3.4.5.1.1 The factual occurrences upon which Contractor bases the claim including the decision, action, or failure to act by Metro or its authorized representatives that allegedly give rise to the claim;

Construction Agreement

MERC CONTRACT NO. 304037

3.4.5.1.2 How Metro's decision, action, or failure to act has affected Contractor's performance or otherwise affected Contractor;

3.4.5.1.3 Whether the claim is for an extension in the Contract Time or increase in the Contract Amount, or both, and the specific extension or increase requested;

3.4.5.1.4 The provisions of the Contract upon which the claim is based.

3.4.5.2 Submission of written notice of intent to make a formal claim as specified above shall be mandatory and failure to comply shall be a conclusive waiver to any claim by Contractor. Oral notice or statement will not be sufficient nor will notice or statement after commencing the Work in question.

3.4.5.3 After the written notification is submitted by Contractor (if the claim is not resolved or withdrawn in writing) and only upon written direction by the Project Manager, Contractor shall proceed without delay to perform the Work pursuant to the direction of the Project Manager. While the Work on an unresolved claim is being performed, Contractor shall keep track of costs and maintain records in the manner set forth in the section on Force Account Work, at no cost to Metro. Such notice by Contractor and the fact that Contractor is keeping track of costs and maintaining records shall not in any way be construed as proving the validity of the claim nor the costs thereof.

3.4.5.4 Provided the claim or claims have been submitted in accordance with the requirements of this Section, the Project Manager will consider and investigate the claim or claims of Contractor. Within twenty-one (21) days of receipt of the above-described written notification of claim, the Project Manager will advise Contractor of the Project Manager's decision to accept or reject the claim or claims, in full or in part. If Contractor is dissatisfied with the decision of the Project Manager under this Section, Contractor may preserve its claim as provided and prescribed by Section 3.4.6.

3.4.6 Preservation of Claims -- Within thirty (30) days after a rejection of a claim, in whole or in part, by Metro under Sections 3.4.3, 3.4.4 or 3.4.5, Contractor may preserve its claim by submitting a fully documented claim package to the Metro Procurement Officer. That package shall include substantiating documentation with an itemized breakdown of Contractor and Contractor's Subcontractors' costs on a daily basis that shall include but not be limited to labor, material, equipment, supplies, services, Overhead, and Profit. All documentation that Contractor believes is relevant to the claim shall be provided in the claim package, including without limitation payroll records, purchase orders, quotations, invoices, estimates, correspondence, profit and loss statements, daily logs, ledgers, and journals. Failure to submit the claim package in full compliance with this requirement and/or maintain cost records as herein required will constitute a waiver of the claim. If Contractor elects to pursue any claims by filing a lawsuit against Metro, it must commence such lawsuit within six (6) months after the date of Substantial Completion. Failure to commence a lawsuit within this time limitation shall constitute a waiver of all such claims by Contractor.

3.5 Metro's Right to Stop, Perform, or Delete Work.

3.5.1 If the Contractor fails to correct Work not in conformance with the Contract or fails to carry out Work in accordance with the Contract, Metro may issue a written order to the Contractor to stop all or part of the Work until the deficiency set forth in the order has been corrected. Metro has no duty to exercise this right for the benefit of anyone other than Metro.

3.5.2 If the Contractor refuses or fails to comply with the Contract, Metro may correct any deficiency or defect or perform Work that the Contractor has failed to perform, or take other appropriate action, without prejudice to any other remedy Metro may have under the Contract. Before taking that action, Metro will provide the Contractor and its sureties with seven days' written notice of its intentions, unless an emergency or dangerous condition exists, in which case the action may be taken without notice. If Metro performs part of the Contractor's Work, corrects deficiencies, or is required to take action as a result of an emergency or dangerous condition, Metro will deduct the cost of that action from any payment then or thereafter due the Contractor. If the cost of Metro's action exceeds any sums held by Metro and otherwise payable to the Contractor, the Contractor agrees to reimburse Metro for any excess costs.

3.5.3 Metro has the right to delete Work from this Contract, and the Parties agree that such action does not constitute a breach of contract. Therefore, Metro may delete Work from the Contract and perform it with its own forces or have such Work performed by another Contractor. If Work is deleted from the Contract, the cost of performing such Work will be deducted from the Contract Amount to be paid to the Contractor. Any objection to the change in Contract Amount must be processed as a claim as required by Section 3.4.5.

3.5.4 Metro's rights as stated in this Section 3.5 are in addition to and do not limit Metro's other rights or remedies.

3.6 Metro's Right to Adjust Payments.

3.6.1 Adjusted Payments for Delay. Time is of the essence in this Contract. Metro and Contractor understand and agree that Metro will be damaged if Contractor fails to substantially complete the Work within the

Construction Agreement

MERC CONTRACT NO. 304037

Contract Time, and that Metro will be vulnerable to further damages if Metro is obligated to continue paying Contractor for Work performed after the Contract Time has expired. It is therefore agreed that upon the expiration of the Contract Time, Metro may adjust its payments to Contractor by any combination of the following: (1) making no further payments to Contractor until the Work is substantially complete; (2) paying the Subcontractor costs incurred by Contractor without any overhead, profit, or fee of any kind going to Contractor; and/or (3) collection of liquidated damages as designated in the Contract. Permitting Contractor to continue and finish the Work or any part thereof after the Contract Time has expired shall not waive any of Metro's rights under this Section or the balance of the Contract Documents.

3.6.2 Adjusted Payments Not a Bar to Metro's Right to Other Damages. Payment of adjusted payments shall not release Contractor from obligations in respect to the complete performance of the Work, nor shall the payment of such adjusted payments constitute a waiver of Metro's right to collect any additional adjusted payments that it may sustain by failure of Contractor to fully perform the Work, it being the intent of the Parties that the aforesaid adjusted payments be full and complete payment only for failure of Contractor to complete the Work on time. Metro expressly reserves the right to make claims for any and all other damages that Metro may incur due to Contractor's failure to perform in strict accordance with this Contract.

3.7 Mediation. Both Parties shall endeavor to negotiate resolutions to all disputes arising out of this Contract. Any controversy or claim arising out of or relating to this Contract that remains unresolved after such negotiations shall be submitted to mediation prior to the commencement of litigation.

3.7.1 The mediator shall be an individual mutually acceptable to both Parties. Should the Parties disagree on the selection of a mediator, the Parties shall look to the local circuit court or the Oregon Dispute Resolution Commission. Each Party shall pay its own costs for the time and effort involved in mediation. The cost of the mediator shall be split equally between the two Parties.

3.7.2 Both Parties agree to exercise their best effort in good faith to resolve all disputes in mediation. Participation in mediation is a mandatory requirement on both Metro and Contractor. The schedule and time allowed for mediation shall be mutually acceptable. The mediation process is nonbinding.

3.7.3 Contractor agrees to consolidation of any mediation between Metro and Contractor with any other mediation involving, arising from, or relating to this Contract.

3.8 Litigation. All disputes not resolved by mediation shall be decided exclusively by a court of competent jurisdiction in Multnomah County under the laws of the state of Oregon.

3.9 Work to Continue Notwithstanding Dispute. In no event shall submission of a dispute arising out of this Contract by either Party relieve Contractor of its obligation to fully perform the requirements of the Contract as directed by Metro pending resolution of the dispute pursuant to the procedures set forth in this Article. In the event Contractor, in Metro's opinion, fails to fully perform the requirements of the Contract pending resolution of a dispute, Metro shall be entitled to exercise its rights to impose adjusted payments pursuant to Section 3.6, and/or terminate the Contract pursuant to Article 15 of these General Conditions.

ARTICLE 4

SUBCONTRACTING AND ASSIGNMENT OF THE CONTRACT

4.1 Subcontracting. Contractor shall arrange and delegate its Work in conformance with trade practices and union regulations, if applicable, but shall remain responsible to Metro for performance of all Work required or implied by the Contract Documents. Contractor shall also be responsible for coordinating the efforts of its Subcontractors and Suppliers.

4.2 Objection to Subcontractors or Suppliers. Metro reserves the right to make reasonable objection to any of Contractor's Subcontractors or Suppliers if Metro discovers any data or information at any time during the performance of the Contract that gives Metro a basis for such reasonable objection. Metro will notify Contractor in writing if Metro has any reasonable objection to any of Contractor's Subcontractors or Suppliers. Contractor shall not subcontract with any Subcontractor or Supplier to which Metro has made a reasonable objection. In the event of Metro's reasonable objection to any Subcontractor or Supplier, Contractor shall propose another entity to which Metro has no reasonable objection.

4.3 Substitution, Change, or Addition of Subcontractors or Suppliers. At any time that Contractor intends to substitute, change, or add a Subcontractor or Supplier during the performance of the Contract, Contractor shall give Metro prior written notice of such intention. Contractor shall not substitute, change, or add any such Subcontractor or Supplier if Metro gives Contractor reasonable objection in writing within ten (10) days after Metro receives such notice.

Construction Agreement

MERC CONTRACT NO. 304037

4.4 Removal of Subcontractors at Request of Metro. When any Subcontractor fails to prosecute a portion of the Work in a satisfactory manner, Metro may so notify Contractor. If the Subcontractor fails to cure the unsatisfactory Work promptly, Contractor shall remove such Subcontractor immediately upon written request of Metro and Contractor shall request approval from Metro of a new Subcontractor to perform this section of the Work at no increase in the Contract Amount, and with no change in the Contract Time.

4.5 Metro Not Obligated to Detect Unsatisfactory Work. Nothing contained in this Contract shall obligate Metro or place on Metro an affirmative duty to detect or discover unsatisfactory Work or materials of Contractor's Subcontractors or Suppliers. Failure of Metro to detect or discover such unsatisfactory Work or materials shall not relieve Contractor of any of its obligations under this Contract.

4.6 No Contractual Relationships Between Metro and Contractor's Subcontractors and Suppliers. Nothing contained in this Contract is intended nor shall be construed to create any contractual or third party beneficiary relationship between Metro and any of Contractor's Subcontractors, Suppliers, or agents, save and except in relation to the Labor and Materials Payment Bond.

4.7 Contractor's Agreements with Subcontractors.

4.7.1 Contractor shall provide in all subcontract and supply agreements that the Subcontractor or Supplier will be bound by the terms and conditions of this Contract to the extent that they relate to the Subcontractor's or Supplier's Work. Contractor shall require each Subcontractor to enter into similar agreements with sub-tier Subcontractors and Suppliers. Contractor shall make available to each proposed Subcontractor and Supplier, prior to the execution of the subcontract or supply agreement, copies of the Contract Documents that apply to the Work and materials to be provided by the Subcontractor or Supplier. Subcontractors and Suppliers shall similarly make copies of applicable portions of such documents available to their respective proposed sub-tier Subcontractors and Suppliers.

4.7.2 All Subcontractor and Supplier agreements shall also provide that they are assignable to Metro at Metro's option, in the event that Metro terminates the Contract. Contractor will provide to Metro a copy of all subcontracts and supply contracts for permanent materials.

4.7.3 The Contractor will provide Metro with copies of all of its subcontracts, purchase orders, and supply agreements relating to the Work upon Metro's request within three (3) business days of the request.

4.8 Assignment. Contractor shall constantly give its personal attention to the faithful prosecution of the Work. Contractor shall keep the Work under its personal control and shall not assign any or all of Contractor's rights, by power of attorney or otherwise, nor delegate any of its duties except with the prior written approval of the Metro Council.

ARTICLE 5

TIME OF COMPLETION AND SCHEDULE FOR THE WORK

5.1 Prosecution of Work Generally. Contractor shall commence the Work within five (5) days after issuance of written Notice to Proceed from Metro and will diligently prosecute the Work to its Final Completion and Acceptance. The start of Work shall include attendance at preconstruction conferences, preparation and submittal of shop drawings, equipment lists, Schedule of Values, CPM construction schedules, requests for substitutions, and other similar activities, as described by these Contract Documents.

5.2 Time of Completion.

5.2.1 Contractor shall bring the Work to Substantial Completion within the Contract Time as set forth in the Construction Agreement.

5.2.2 The time limits stated in these Contract Documents are of the essence of this Contract. By executing the Construction Agreement, Contractor confirms that the Contract Time is a reasonable period for performing all of the Work.

5.2.3 Failure of Contractor to substantially complete the Work within the Contract Time and according to the provisions of these Contract Documents shall subject Contractor to liquidated damages pursuant to the applicable sections of these Contract Documents.

5.3 Extensions of Time. Extensions of the Contract Time shall be made pursuant to the procedure and according to the provisions and requirements contained in Articles 3 and 8 of these Contract Documents.

5.4 Project Scheduling. Contractor shall submit to Metro a detailed Construction Schedule for completion of the Work pursuant the Specifications following the Critical Path method. The Construction Schedule shall, when approved and as updated and approved by Metro, become a part of the Contract Documents.

5.5 Use of Completed Parts of the Work Before Acceptance.

5.5.1 Metro may decide to use part of the Work that has been completed before completion of all the Work required by the Contract. If that occurs, Metro will notify the Contractor in writing of its intention.

Construction Agreement

MERC CONTRACT NO. 304037

5.5.2 When use of part of the Work by Metro begins, the Contractor is:

5.5.2.1 Relieved of the duty of maintaining and protecting that portion of the Work, provided that it has been completed in accordance with the Contract.

5.5.2.2 Relieved of responsibility for injury or damage to the portion of Work used by Metro from use by public traffic or from the action of the elements of nature or from any other cause, except injury or damage resulting from the Contractor's own operations or from its negligence.

5.5.2.3 Relieved of the responsibility of cleaning up that portion of the Work before final acceptance, unless the Contractor's own operations require such cleanup.

5.5.3 Use by Metro of a part of the Work as described in this Section does not constitute final acceptance of the Work as a whole or in any part.

ARTICLE 6

COORDINATION WITH OTHER METRO CONTRACTORS

6.1 Other Metro Contractors Generally. Metro reserves the right to award other contracts in connection with the Work. Contractor shall allow such Other Metro Contractors reasonable opportunity for storage of their materials and execution of their Work, shall ensure that the execution of Contractor's Work properly connects and coordinates with Work of all Other Metro Contractors, and shall cooperate with Other Metro Contractors to facilitate the Work in such a manner as Metro may direct. Connection between the Work of the Contractor and Other Metro Contractors will be the responsibility of the Party that is last in time to construct, unless otherwise directed in the Contract Documents.

6.2 Duty to Inspect Other Metro Contractors' Work. Where Contractor's Work is associated with that of Other Metro Contractors, or is to interface in any way with such Other Metro Contractors' Work, Contractor shall examine, inspect, and measure the adjacent or in-place Work of such Other Metro Contractors. If Contractor determines that any defect or condition of such adjacent or in-place Work will impede or increase the cost of Contractor's performance or otherwise prevent the proper execution of Contractor's Work, Contractor shall immediately, and before performing any Work affected by the Other Metro Contractors' work, submit an RFI to Metro pursuant to Section 3.3. If Contractor proceeds without examining or inspecting the Work and submitting a Request for Information, Contractor shall be held to have accepted the Other Metro Contractors' Work or material and the existing conditions, shall be responsible for any defects in Contractor's Work resulting therefrom, and shall not be relieved of any obligation or any warranty under this Contract because of any such condition or imperfection. This provision shall be included in any and all of Contractor's subcontracts for Work to be performed.

6.3 Latent Defects in Other Contractor's Work. Section 6.2 does not apply to latent defects. Contractor shall report latent defects in any Other Metro Contractors' Work at any time such defects become known or Contractor should have known, and Metro shall promptly thereafter take such steps as may be appropriate. If Contractor in the exercise of reasonable care should have known of such defects but did not report them, such defects shall not be considered latent.

6.4 Duty to Maintain Schedule. It shall be the responsibility of Contractor to maintain its schedule so as not to delay the progress of the Project or the Work of Other Metro Contractors. Contractor is required to cooperate in every way possible with Other Metro Contractors. Except as otherwise specifically provided in this Contract, no additional compensation will be paid for such cooperation. If Contractor delays the progress of the Project or the progress of Other Metro Contractors, it shall be the responsibility of Contractor to take all of the steps necessary to bring the affected Work into compliance with any affected schedules and to indemnify Metro from all liability for such delays pursuant to Article 11. Metro shall be under no duty to monitor or detect any delays of Contractor or any Other Metro Contractor on the Project or any lack of coordination on the Project. Consequently, the failure of Metro to so monitor or detect shall not be construed as relieving Contractor of its duties to fully perform all of its obligations under the Contract.

6.5 Failure to Maintain Schedule.

6.5.1 If, in the opinion of Metro, Contractor falls behind the Construction Schedule or delays the progress of Other Metro Contractors and is not entitled to an extension of time pursuant to the Contract Documents, Contractor shall perform all steps that are necessary, in the opinion of Metro, to bring Contractor's Work into compliance with the Construction Schedule or to remedy any delay to the progress of Other Metro Contractors. Contractor shall submit operation plans to Metro that shall fully demonstrate the manner of intended compliance with this Section. The steps referred to above shall include but not be limited to:

6.5.1.1 Increased manpower in such quantities and crafts as will substantially eliminate the backlog of Work.

Construction Agreement

MERC CONTRACT NO. 304037

6.5.1.2 Increase, when permitted, the number of working hours per shift, shifts per working day, working days per week, or the amount of equipment or any combination of the foregoing, sufficient to eliminate the backlog of Work.

6.5.1.3 Reschedule activities to achieve maximum practical concurrence of accomplishment of activities.

6.5.1.4 Expedite delivery of materials and equipment, such as use of airfreight.

6.5.2 If Metro directs Contractor to take measures described in this Section, or if Contractor takes such measures without direction from Metro, Contractor shall bear all costs of complying. Metro shall, however, reimburse Contractor for reasonable costs of complying if such directive to accelerate from Metro was issued to overcome delay caused by the acts or omissions of Metro or persons acting for Metro, provided Contractor has complied with all applicable provisions of Articles 3 and 8 of these General Conditions.

6.5.3 Failure to maintain the construction schedule or to take action to regain the schedule or to furnish a schedule as outlined in the Specifications may result in withholding all or part of the monthly progress payments.

6.6 Failure to Coordinate Work. If Contractor fails to coordinate its Work with the Work of Other Metro Contractors as directed by Metro, Metro may, upon written notice to Contractor:

6.6.1 Withhold any payment otherwise due hereunder until Contractor complies with Metro's directions.

6.6.2 Direct others to perform portions of the affected Work and charge the cost of such Work against the Contract Amount or deduct the cost from sums held in Retainage.

6.6.3 Terminate any or all portions of the Work for Contractor's failure to perform in accordance with the Contract.

6.7 Other Metro Contractors' Failure to Coordinate. If Contractor determines that any Other Metro Contractor on this Project is failing to coordinate its Work with the Work of Contractor, Contractor shall notify Metro immediately and before performing any affected Work.

6.8 Conflicts Among Contractors. Any difference or conflict that may arise between Contractor and Other Metro Contractors in regard to their Work shall be adjusted as determined by Metro. If directed by Metro, Contractor shall suspend any part of the Work specified or shall carry on the same in such a manner as may be prescribed by Metro when such suspension or prosecution is necessary to facilitate the Work of Other Metro Contractors.

6.9 Coordination Drawings. Contractor shall prepare coordination drawings as determined necessary by Metro to satisfactorily coordinate and interface its Work with the Work of all Other Metro Contractors, thereby avoiding conflicts that may arise.

6.10 Furnished by Owner, Installed by Contractor ("FOIC") Items.

6.10.1 Owner Responsibilities for FOIC Items. Owner-furnished products/items are indicated on the drawings as FOIC items. Owner's responsibilities include: (1) arrangement for and delivery of necessary shop drawings, product data, and samples to the contractor; (2) arrangement of and payment for Product delivery to the Site; (3) delivery of Suppliers' bill of materials to Contractor; (4) inspection of deliveries jointly with the Contractor and recording shortages of and damaged or defective items; (5) submission of claims for transportation damage; (6) arrangement for replacement of damaged, defective, or missing items; and (7) arrangement for manufacturers' warranties, bonds, service, and inspections as required. Owner is responsible for scheduling all FOIC items in accordance with Contractor's Construction Schedule.

6.10.2 Contractor Responsibilities for FOIC Items. The following outlines the responsibilities of the Contractor for FOIC items: (1) designating a delivery date for each item in the Construction Schedule; (2) reviewing shop drawings, product data, and samples; (3) immediately notifying the Project Manager of any discrepancies or problems anticipated in the use of the product; (4) reviewing and unloading products at the Site; (5) promptly inspecting products jointly with Owner and recording shortages and damaged or defective items; (6) handling products at the Site, including uncrating and storage; (7) protecting products from exposure to elements and damage; (8) assembling, installing, connecting, adjusting, and finishing product as stipulated in the Specifications; and (9) repairing or replacing items damaged by Contractor.

6.11 Conferences. At any time during the progress of the Work, Metro shall have authority to require Contractor to attend any conference of any or all of the Contractors engaged in the Project or related projects.

6.11.1 Project Meetings. The Contractor will schedule and chair meetings and conferences at the Project Site unless otherwise indicated. Contractor will inform participants and other individuals whose presence is required of the date and time of each meeting. The Contractor shall prepare an agenda, distribute to all attendees, and

Construction Agreement

MERC CONTRACT NO. 304037

prepare minutes that reflect significant discussions and agreements achieved. Meeting minutes shall be distributed to everyone concerned, including Metro, within three (3) days of the meeting.

6.11.2 Pre-construction Conference. The Contractor will schedule a pre-construction conference prior to start of construction. The meeting will be scheduled at a time convenient to Metro and Architect, but no later than five (5) days after execution of the Contract. The conference will be held at the Project Site or another convenient location. The purpose of the meeting is to review responsibilities and personnel assignments. Attendees will include authorized representatives of Metro, Architect and its consultants, Contractor and its superintendent, major subcontractors and suppliers, and other concerned parties. All participants shall be familiar with the Project and be authorized to conclude matters relating to the Work. The agenda shall include tentative construction schedule, phasing, critical Work sequencing and long-lead items, designation of key personnel and their duties, procedures for processing field decisions and Change Orders, procedures for RFIs, procedures for testing and inspecting, procedures for processing applications for payment, distribution of Contract Documents, submittal procedures, preparation of record documents, use of premises, Work restrictions, Owner's occupancy requirements, responsibilities for temporary facilities and Site protection, construction waste management and recycling, parking availability, office, Work, and storage areas, equipment deliveries and priorities, first aid, security, progress cleaning, and working hours.

6.11.3 Pre-installation Conferences – Contractor will conduct a pre-installation conference at the Project Site before each construction activity that requires coordination with other construction and includes installation of FOIC items. Contractor is responsible for conducting these meetings, which shall occur on the same date as progress meetings, if possible. Attendees shall include the installers and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination with other materials or installations. Agenda items will include Contract Documents, options, related RFIs, related Change Orders, purchases, deliveries, submittals, review of mock-ups, possible conflicts, compatibility problems, time schedules, weather limitations, manufacturers' written recommendations, warranty requirements, compatibility of materials, acceptability of materials, temporary facilities and controls, space and access limitations, regulations of authorities having jurisdiction, testing and inspecting, installation procedures, coordination with other Work, required performance results, protection of adjacent Work, and protection of the Site and its elements. The Architect shall record significant conference discussions, agreements, and disagreements, including corrective action measures and action.

ARTICLE 7

CONTROL AND QUALITY OF WORK AND MATERIAL

7.1 Quality Control.

7.1.1 Generally. Contractor has the primary responsibility for quality control. Contractor will provide continuous superintendence and inspection to insure that the Work is completed in accordance with the plans and Specifications. During the performance of the Work, Metro, the Architect, Special Inspectors, and any representatives of federal, state, and local agencies having jurisdiction over the Work may enter the Project Site, the shops where any part of the Work is being prepared, or the factories or sites where any materials for use in the Work are being or will be manufactured or derived. Contractor shall provide proper and safe facilities for such inspections, and shall make arrangements with manufacturers or other suppliers to facilitate inspection of their processes and products to such extent as Metro's interest may require. No claims for extension of the Contract Time or increase in the Contract Amount shall be allowed for any access allowed to Metro under this Section.

7.1.2 Quality Control Plan. Contractor shall prepare and submit a Quality Control Plan to the Project Manager within thirty (30) days following the Notice to Proceed. The Plan will describe the Contractor's procedures for implementing the Quality Control Plan. The Plan shall include without limitation the Quality Control organization, inspection procedures, tests anticipated, materials control, contingency plans related to fire protection and remediation of contaminated releases or other environmental improvement, and reports. Metro reserves the right to accept, reject, or modify the Quality Control Plan. Contractor will submit an interim Quality Control Plan prior to the start of Work to cover the first thirty (30) days of construction.

7.1.3 Quality Control Manager. Prior to initiation of construction, Contractor shall designate in writing a Quality Control Manager who shall be responsible for coordinating Contractor's Quality Control Program. The individual so designated shall be the interface with the Project Manager on matters relating to submittals, inspection, scheduling, unacceptable Work product, and corrective actions. Metro reserves the right to accept or reject the Quality Control Manager designated by Contractor.

7.2 **Inspection**. Contractor has the primary responsibility for providing inspection and testing, except as otherwise set forth in the Specifications. Metro and its agents will also inspect at their discretion or as outlined in the Specifications.

Construction Agreement

MERC CONTRACT NO. 304037

7.2.1 Generally. At all times during construction of the Work, Contractor shall permit Metro, the Architect, and Special Inspectors, or any representatives of federal, state, and local agencies having jurisdiction over the Work, to visit and monitor the progress of the Work for conformance of the Work with the Contract Documents.

7.2.2 Special Inspections.

7.2.2.1 At all times during construction of the Work, Contractor shall permit Metro, the Architect, and Special Inspectors, or any representatives of federal, state, and local agencies having jurisdiction over the Work, to visit and inspect the Work, the materials and the manufacture and preparation of such materials, and subject the Work and materials to inspection and testing to determine if the Work conforms to the requirements of the Contract Documents. Contractor shall maintain proper facilities and safe access for all such inspections.

7.2.2.2 The Contractor is responsible for scheduling and coordination of special inspections. Contractor shall be diligent in scheduling special inspections and make every effort to combine special inspections to avoid unnecessary budget impacts.

7.2.2.3 The Contract Documents or regulatory agencies may require that portions of the Work be observed, reviewed, tested, or inspected before they are obscured or covered. Similarly, upon request, the Project Manager is entitled to observe portions of the Work before they are covered or obscured. Contractor shall be solely responsible for notifying Project Manager at least two (2) working days prior to performing such Work so that necessary arrangements for inspection and testing can be made. If the Contractor covers or obscures a portion of the Work that is required or requested to be observed, it will uncover the Work for observation and bear any cost associated with that activity without a change in Contract Time.

7.2.2.4 The Project Manager may request to see a portion of the Work that has been covered regardless of the requirements of the Contract Documents, regulatory agencies, or a prior request. Thereafter the Contractor must comply with Metro's request. If, on inspection by the Project Manager, the portion of the Work that is uncovered is found to be in accordance with the Contract Documents, Metro will bear all costs associated with that activity and provide additional Contract Time if that activity would cause the Contractor to incur liquidated damages. But if, upon inspection by the Project Manager, the portion of the Work that is uncovered is found not to be in accordance with the Contract Documents, the Contractor will correct the Work and bear any cost associated with that activity without a change in Contract Time. Metro retains the right at any time during construction, or at any time during production, fabrication, or preparation of the Work, to test samples to determine whether they meet the requirements of the Contract Documents. Metro may test any sample, regardless of prior certification, and regardless of whether any prior certification was required. Metro may either conduct the test with its own forces or hire other persons to perform this Work.

7.2.2.5 Metro retains the right at any time during construction, or at any time during production, fabrication, or preparation of the Work, to test samples to determine whether they meet the requirements of the Contract Documents. Metro may test any sample, regardless of prior certification, and regardless of whether any prior certification was required. Metro may either conduct the test with its own forces or hire other persons to perform this Work.

7.2.2.6 If a sample is to be tested prior to its incorporation into the Work, the Contractor may not incorporate the material, product, part, or equipment into the Work until testing is completed and Metro gives permission for its use.

7.2.2.7 Metro will bear the costs of testing unless the tests show that the material, product, part, or equipment failed the test and did not conform to the requirements of the Contract, in which case the Contractor will bear the costs of testing.

7.2.2.8 If the sample was previously incorporated into the Work and testing shows that the sample does not meet the requirements of the Contract Documents, the Contractor will pay for the test and for replacing and repairing any equipment, materials, products, or portion of the Work in order to meet the requirements of the Contract Documents.

7.2.3 Notice to Metro for Certain Work Days. Whenever Contractor intends to perform Work on Saturday, Sunday, or any legal holiday, it shall give written notice to Metro of such intention at least two (2) working days prior to performing such Work, or such other period as may be specified by Metro, so that Metro may make the necessary arrangement for testing and inspection.

7.2.4 Correction of Defective Work Before Acceptance. Any defective Work or Work that otherwise fails to conform to the Contract Documents that is discovered before Final Completion and Acceptance of the Work, shall be corrected immediately by Contractor, and any unsatisfactory materials shall be rejected and replaced with satisfactory materials, notwithstanding that they may have been overlooked by the authorized inspector. The

Construction Agreement

MERC CONTRACT NO. 304037

inspection of the Work by Metro, the Architect, or any other agency shall not relieve Contractor of any of its obligations to perform fully all of the terms and provisions of the Contract Documents.

7.2.5 Acceptance Not Implied by Failure to Object. Failure or neglect on the part of Metro or any of its authorized representatives to condemn or reject defective, improper, or inferior Work or materials shall not be construed to imply a final acceptance of such Work or materials and shall not be construed as relieving Contractor of its duties to perform fully all requirements of the Contract Documents.

7.2.6 Replacement and correction of defective Work before the Work is completed and accepted is not limited by any warranty period otherwise established by the Contract.

7.3 Unsatisfactory Materials and Workmanship.

7.3.1 Generally. Material, Work, or workmanship that, in the opinion of the Project Manager, does not conform to the Contract Documents, or is not equal to the samples submitted to and approved by the Project Manager, or is in any way unsatisfactory or unsuited to the purpose for which it is intended, will be rejected. Contractor shall bear the cost of correcting or removing, as deemed necessary by Metro, all non-conforming materials, defective Work, or unsatisfactory workmanship. Contractor shall make a close inspection of all materials as delivered, and shall promptly replace all defective materials with conforming materials without waiting for their rejection by Metro.

7.3.2 Removal of Rejected or Non-Conforming Work or Material. All rejected material or Work, and all defective or non-conforming Work or material, shall be removed from the Site without delay. If Contractor fails to do so within forty-eight (48) hours after having been so directed by Metro, the rejected material may be removed by Metro and the cost of removal charged against Contractor and deducted from Retainage held by Metro or offset against payments due Contractor, at Metro's option. If in the judgment of Metro it is undesirable or impracticable to replace any defective or non-conforming Work or materials, the compensation to be paid to Contractor shall be reduced by Change Order or Force Account, as applicable, by such amount as, in the judgment of Metro, shall be equitable.

7.4 **General Warranty of Contractor.** Contractor warrants to Metro that materials and equipment provided under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects and contaminants not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by Metro, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. The warranty made by Contractor under this Section shall be in addition to any other specific warranties and certifications required elsewhere in these Contract Documents.

7.5 Third-Party Warranties.

7.5.1 The Contractor shall obtain from Subcontractors, manufacturers, and suppliers guarantees and warranties according to the Contract Documents with the optimum terms and longest periods reasonably obtainable. The documentation must also include all maintenance and operational documentation required to sustain said warranties.

7.5.2 All guarantees or warranties of materials furnished to the Contractor or Subcontractor by any manufacturer or supplier shall be deemed to run for the benefit of the Owner.

7.5.3 As a condition of Substantial Completion of the Project by the Owner, the Contractor shall deliver to the Owner via the Architect three (3) bound volumes of all guarantees and warranties on material furnished by all manufacturers and suppliers to the Contractor and all its Subcontractors, with duly executed instruments properly assigning the guarantees and warranties to the Owner. The guarantees and warranties in each bound volume shall be grouped together by trade and properly indexed. The Contractor shall assign to the Owner, and shall deliver to the Owner, all manufacturers' warranties not later than the date of Substantial Completion.

7.6 **Subcontractor Warranties.** The Contractor shall and does hereby assign to the Owner the benefits of all warranties and guarantees of all Subcontractors, but such assignment shall not relieve the Contractor of its warranty obligations to the Owner under these General Conditions and other Contract Documents.

7.7 Correction of Work by Contractor.

7.7.1 Any portion of the Work that does not conform to the requirements of the Contract is unacceptable or defective and must be removed and corrected by the Contractor, even if it is contended that Project Manager or other assigned personnel knew or should have known of the existence of the unacceptable Work. This obligation includes defective Work discovered during construction and within one (1) year after the date of Substantial Completion.

Construction Agreement

MERC CONTRACT NO. 304037

7.7.1.1 All portions of the Work that do not conform to the requirements of the Contract Documents must be corrected within a reasonable time at the Contractor's sole expense and without an extension of Contract Time.

7.7.1.2 Metro may replace or correct Work within a reasonable time if the Contractor fails to do so and may charge the Contractor with all reasonable costs incurred while performing that Work, as well as the costs of storing any salvageable materials or equipment. If that occurs, Metro is also entitled to deduct such costs from any sums otherwise due the Contractor.

7.7.1.2.1 If salvageable materials, equipment, or both are stored, Metro will notify the Contractor of the storage and give the Contractor ten days to remove the materials. If the Contractor fails to remove them by the end of that time, Metro may sell them in any commercially reasonable manner, whether privately or publicly.

7.7.1.2.2 If sale is made, Metro will keep all proceeds to the extent that the proceeds do not exceed the costs incurred in correcting and replacing the Work and in storing the materials and equipment. The Contractor will pay Metro any difference in costs that may remain after the sale. If the proceeds exceed Metro's cost, however, it will forward those sums to the Contractor.

7.7.2 In the case of equipment manufactured by others and supplied and/or installed by Contractor, the one (1)-year period shall commence upon the date of first beneficial operation of such equipment by Metro. In the case of Work that is corrected or replaced by Contractor, the one (1)-year period shall commence again on the date of acceptance by Metro of such corrected or replaced Work. Testing shall not be construed to mean acceptance.

7.7.3 If Metro does not require correction or replacement of defective Work or Work failing to conform to the Contract Documents, Contractor, if required by Metro, shall repay to Metro such portion of the Contract Amount as is equitable under the circumstances, as determined by Metro.

7.7.4 Contractor's responsibilities under this Section shall not extend to correction or replacement of defects that are attributable to mistreatment by Metro or to normal wear and tear.

7.8 Warranty and Correction Agreements by Subcontractors.

7.8.1 Generally. In addition to any requirements for written warranties required by the Specifications, Contractor shall require all of its Subcontractors and Suppliers of any tier to make the same warranty to Metro as Contractor makes under Section 7.4. Contractor shall also require all of its Subcontractors and Suppliers of any tier to agree to correct or replace defective Work or Work not conforming to the Contract Documents, and to take full responsibility for defective materials in the same manner as Contractor agrees to correct or replace such Work under Section 7.5.

7.8.2 Form of Submissions. Contractor shall require all of its Subcontractors and Suppliers of any tier to sign documents evidencing the promises made pursuant to Section 7.8.1 above and shall submit such documents to Metro with its request for Final Payment. Such documents shall be signed by both Contractor and the applicable Subcontractor or Supplier and shall be in the form attached as Exhibit 1 to these General Conditions.

7.9 Remedies Not Exclusive. The remedies provided for in this Article shall not be exclusive, but are in addition to all other remedies of Metro with respect to latent defects, frauds, or failure to perform all Work as required by the Contract Documents.

7.10 Proof of Compliance with Contract Provisions. For Metro to determine whether Contractor has complied or is complying with the requirements of the Contract that are not readily enforceable by inspection and test of the Work, Contractor shall, upon request, promptly submit to Metro such properly authenticated documents as may be necessary to demonstrate compliance with the Contract or other satisfactory proof of its compliance with such requirements.

7.11 Patents, Copyrights, Trademarks. All fees or costs of claims for any patented invention, article, or arrangement or any copyrights or trademarks that may be used upon or in any manner connected with the performance of the Work or any part thereof, shall be included in the Bid or Proposal for doing the Work. Contractor shall save, keep, hold harmless, and fully indemnify Metro and Architect from all damages, claims for damage, lawsuits, costs, expenses, or liabilities of whatever nature in law or equity, including attorney fees and court costs, that may at any time arise or be set up for any infringement of the patent rights, copyrights, or trademarks of any person or persons in consequence of the use by Metro of articles to be supplied under the Contract and of which Contractor is not the patentee or assignee or has not the lawful right to sell the same. This is in addition to all other hold-harmless and indemnification clauses in these Contract Documents.

7.12 Anti-Trust Claims.

7.12.1 By entering into this Contract, Contractor, for consideration paid to Contractor under the Contract, does irrevocably assign to Metro any claim for relief or cause of action that Contractor now has or that may



Construction Agreement

MERC CONTRACT NO. 304037

accrue to Contractor in the future, including at Metro's option, the right to control any such litigation on such claim for relief or cause of action, by reason of any violation of 15 USC Section 1-15, ORS 646.725, or ORS 646.730 in connection with any goods or services that are used, in whole or in part, for the purpose of carrying out Contractor's obligations under this Contract.

7.12.2 Contractor shall require all Subcontractors and Suppliers to irrevocably assign to Metro, as a third-Party beneficiary, any right, title, or interest that has accrued or may accrue to the Subcontractors or Suppliers by reason of any violation of 15 USC Section 1-15, ORS 646.725, or ORS 646.730, including, at Metro's option, the rights to control any litigation arising hereunder, in connection with any goods or services provided to the Subcontractors or Suppliers by any person, in whole or in part, for the purpose of carrying out the Subcontractors' or Suppliers' obligations as agreed to by Contractor in pursuance of the completion of the Contract. Contractor shall require all Subcontractors and Suppliers to Execute the Assignment of Antitrust Claims attached as Exhibit 2 to these General Conditions as part of Contractor's subcontract with Subcontractor or Supplier.

7.12.3 In connection with Contractor's, Subcontractors' or Suppliers' assignment, it is an express obligation of Contractor, Subcontractor, or Supplier that it will take no action that will in any way diminish the value of the rights conveyed or assigned hereunder to Metro. It is an express obligation of Contractor, Subcontractor, or Supplier to advise the Office of Metro Attorney:

7.12.3.1 In advance, of its intention to commence any action on its own behalf regarding such claims for relief or causes of action;

7.12.3.2 Immediately, upon becoming aware of the fact that an action has been commenced on its own behalf by some other person or persons, of the impendency of such action; and

7.12.3.3 The date on which it notified the obligor(s) of any such claims for relief or causes of action of the fact of its assignment to Metro.

7.12.4 In the event that any payment under any such claim is made to Contractor, Subcontractor, or Supplier, it shall promptly pay over to Metro its proportionate share thereof, if any, assigned to Metro under this Section 7.12.

ARTICLE 8 CHANGES IN THE WORK

8.1 Change Orders Generally.

8.1.1 Metro and the Contractor mutually agree that changes in plans, quantities, or details of the Work are inherent in the nature of construction and may be necessary or desirable. Therefore, without impairing the Contract, Metro reserves the right to require changes determined necessary or desirable to complete the proposed construction within the general scope of the Work provided for in the Contract or to order extra Work if that is required. Performance of changed or extra Work will not invalidate the Contract or release the Contractor's surety from its obligations. Changes to the Contract Amount, if any, as a result of the performance of changed or extra Work must be made pursuant to this Article 8.

8.1.2 The only authorized method for increasing or changing the amount of compensation, increasing the amount of Contract Time, or changing the scope of Work to be performed is through the execution of a written Change Order.

8.1.3 Change Orders must be executed in advance when any changed or extra Work for which additional compensation is due will be performed, unless the Work is Force Account Work.

8.1.4 Metro may, at its discretion, also require the signature of Contractor's surety on the Change Order. Prior to the approval of such Change Order, the Architect shall have approved any design modifications entailed thereby.

8.1.5 Agreement on any Change Order shall constitute a final settlement of all matters relating to the changes in the Work that are the subject of the Change Order, including without limitation all direct and indirect costs associated with such change, and any and all adjustments to the Contract Sum or Contract Time.

8.2 Procedure for Determining Impact of Change Orders on Contract Amount.

8.2.1 Price before Proceeding. If Metro intends to order changes in the Work, it may request a proposal by Contractor for the proposed added or deleted Work before directing Contractor to commence Work. Within fourteen (14) days after issuance of such request by Metro, Contractor shall furnish three (3) copies of a complete breakdown of costs of both credits and additions directly attributable to the change in the Work proposed, itemizing materials, labor, taxes, effect on Contract Time, if any, and Overhead and Profit on a form approved by Metro and in accordance with the limitations described in the following Section. Subcontract Work shall be so indicated and written proposals from Subcontractors or Suppliers shall be included with similar breakdowns provided. Following

Construction Agreement

MERC CONTRACT NO. 304037

submission of its cost breakdown, Contractor shall meet with Metro to discuss all aspects of scope, costs, scheduling, and construction methods.

8.2.2 Proceed While Pricing. If Metro finds it necessary to make changes in the Work in an expeditious manner, it may direct Contractor to proceed with the change while preparing a proposal for the added or deleted Work. In such an instance, Metro may assign an estimated value to the change that Contractor shall not exceed without further authorization by Metro. Within fourteen (14) days after issuance of such by Metro, Contractor shall furnish three (3) copies of a complete breakdown of costs of both credits and additions directly attributable to the change in the Work proposed, itemizing materials, labor, taxes, effect on Contract Time, if any, and Overhead and Profit on a form approved by Metro and in accordance with the limitations described in the following Section. Subcontract Work shall be so included with similar breakdowns provided. Following submission of its cost breakdown, Contractor shall meet with Metro to discuss all aspects of scope, costs, scheduling, and construction methods.

8.2.3 Unit Prices. If the proposed additional or deleted Work is the subject of Unit Prices stated in the Contract Documents or subsequently agreed upon, such Unit Prices shall be binding upon Contractor in calculating the increase or decrease in the Contract Amount attributable to the proposed additional or deleted Work.

8.3 Limitations when Change Orders Impact Contract Amount. The following limitations shall apply in the calculation of the costs of changes in the Work:

8.3.1 Overhead and Profit.

8.3.1.1 Contractor will be permitted a reasonable allowance for Profit and Overhead on its increased Direct Cost resulting from any changes in the Work ordered by Metro. Likewise, Profit and Overhead will be deducted for any portion of the Work that is deleted. In the case of a change involving both credits and extras, Overhead and Profit shall be applied to the net extra after subtraction of credits.

8.3.1.2 Overhead and Profit for the entity performing the Work with its own crews shall not exceed ten percent (10%) of the Direct Cost of the changed Work.

8.3.1.3 Overhead and Profit for Contractor or Subcontractor who has had the Work performed by a lower tier Subcontractor shall not exceed five percent (5%) of the Direct Cost of the changed Work.

8.3.1.4 If the Work is performed by a second-tier Subcontractor, the total Overhead and Profit for all tiers shall in no event exceed twenty percent (20%) of the Direct Cost of the changed Work. Distribution of this Overhead and Profit among the tiers is the responsibility of Contractor.

8.3.2 Taxes and Insurance. Federal, state, regional, county, and local taxes, including but not limited to income taxes, excise taxes, sales and use taxes, and payroll taxes and insurance shall be shown separately, will be allowed on extras, and shall be credited on credits. No Overhead and Profit will be allowed on taxes and insurance.

8.3.3 Bond Premiums. The actual rate of bond premium as paid on the additional Direct Cost plus the cost of taxes defined in 8.3.2 will be allowed. No Overhead and Profit will be allowed on such premiums.

8.3.4 Equipment Costs. The allowance for equipment costs (both rental and Contractor-owned equipment) shall be limited to those rates in the Rental Rate Bluebook published by Dataquest Incorporated, 1290 Ridder Park Drive, San Jose, California 95131-2398, (800) 227-8444.

8.4 Force Account Work.

8.4.1 If Contractor does not respond to Metro's Request for Proposal with a cost breakdown within the fourteen (14)-day period as required above, or if Metro determines that Contractor's breakdown of costs is unreasonable in consideration of the Work proposed to be added or deleted, or if Metro determines that the proposed Work must be commenced promptly to avoid delay to the Project, Metro may issue an order for Force Account Work and Contractor shall promptly perform or delete the Work described in such order. Change, if any, in the Contract Amount due to such Force Account Work shall be the sum total of the following items:

8.4.1.1 Actual labor cost, including premium on worker's compensation insurance and charge for social security taxes, and other taxes pertaining to labor.

8.4.1.2 The proportionate cost of premiums of public liability property damage and other insurance applicable to the extra Work involved and required by these Contract Documents.

8.4.1.3 Actual cost of material, including applicable taxes pertaining to materials.

8.4.1.4 Actual cost of plant and equipment rental, at rates to be agreed upon in writing before the Work is begun or at rates per Section 8.3.4 above. No charge for the cost of repairs to plant or equipment will be allowed. Equipment items having a capital cost of under \$250.00 are considered small tools and classified as Overhead.

8.4.1.5 Overhead and Profit as provided and limited in Section 8.3.

Construction Agreement

MERC CONTRACT NO. 304037

8.4.1.6 The proportionate actual costs of premiums for bonds required by these Contract Documents.

8.4.2 Whenever any Force Account Work is in progress, each working day Contractor shall furnish to Metro a detailed written report signed by Contractor and Project Manager of the amount and cost of all of the items listed in (1) through (6) above, and no claim for compensation for such extra Work will be allowed unless such report shall have been made. Metro reserves the right to provide such materials as it may deem expedient, and no compensation, overhead, or profit will be allowed to Contractor for such materials.

8.5 Contractor Proposals for Changes in Work.

8.5.1 Generally. At any time during the performance of the Work, Contractor may propose to Metro changes in Work that Contractor believes will result in higher quality Work, improve safety, shorten the Contract Time, decrease the Contract Amount, or otherwise result in better or more efficient Work.

8.5.2 Purpose. Metro encourages Contractor to submit Value Engineering Change Proposals ("VECPs") in order to avail Metro of potential cost savings that may result. Contractor and Metro will share any savings, computed in accordance with this Section 8.5. Contractor is encouraged to submit VECPs whenever it identifies an area that can be improved, using the format described herein.

8.5.3 Application. This clause applies to a Contractor-developed and documented VECP that: (1) requires a change to this Contract to implement the VECP, and (2) reduces the Contract Price without impairing essential functions or characteristics of the Work, provided it is not based solely on a change in specified quantities.

8.5.4 Documentation. At a minimum, the following information shall be submitted by Contractor with each VECP: (1) description of the existing requirements of the Contract Documents that are involved in the proposed change; (2) description of the proposed change; (3) discussion of differences between existing requirements and the proposed change, together with advantages and disadvantages of each changed item; (4) itemization of the requirements that must be changed if the VECP is accepted (e.g., drawing numbers and Specifications); (5) justification for changes in function or characteristics of each such affected item and effect of the change on the performance of the end item; (6) effect of proposed change on life-cycle costs, including operation and maintenance, replacement costs, and life expectancy; (7) date or time by which a Change Order adopting the VECP must be issued in order to obtain the maximum cost reduction, noting any effect on Contract Time or delivery schedule; and (8) cost estimate for existing Contract requirements correlated to its lump sum breakdown and proposed changed requirements. Costs of development and implementation by Contractor shall be identified. Estimated Metro costs (e.g., cost of testing and redesign) shall also be identified.

8.5.5 Submission. Proposals will be processed expeditiously; however, Metro will not be liable for any delay in acting upon any proposal submitted pursuant to this clause. Contractor shall have the right to withdraw, in whole or in part, any VECP at any time prior to acceptance by Metro.

8.5.6 Acceptance. Metro may accept, in whole or in part, by Change Order, any VECP submitted pursuant to this clause. Until a Change Order is issued, Contractor shall remain obligated to perform in accordance with this Contract. The decision as to acceptance or rejection of any VECP will be at the sole discretion of Metro and will be final and not subject to review by mediation or otherwise.

8.5.7 Sharing. If a VECP submitted by Contractor pursuant to this clause is accepted, Contractor shall proceed with the change and the Contract Price will be adjusted in accordance with the following provisions:

8.5.7.1 Definitions:

8.5.7.1.1 Estimated Gross Savings to Contractor ("GS"): The difference between cost of performing the Work according to the existing requirement and the cost if performed according to the proposed change. In each instance, Contractor's profit shall not be considered part of the cost.

8.5.7.1.2 Contractor Costs ("CC"): Reasonable costs incurred by Contractor in preparing the VECP and making the change such as cancellation or restocking charges where required.

8.5.7.1.3 Estimated Net Savings to Contractor ("NS"): GS less CC.

8.5.7.1.4 Metro's Costs ("OC"): Reasonable costs incurred by Metro for evaluating and implementing the VECP, such as testing and redesign, where required.

8.5.7.2 Calculations:

8.5.7.2.1 The Contract Price shall be reduced by an amount equal to 70 percent of NS plus 50 percent of OC.

8.5.7.2.2 Contractor's profit will not be reduced by application of the VECP.

8.5.8 Subcontracts. Contractor shall include appropriate value engineering incentive provisions in all subcontracts of \$25,000 or greater. Contractor may include such provisions in any agreement. Subcontracts shall contain a provision that any benefits accruing to Contractor as a result of an accepted VECP initiated by a

Construction Agreement

MERC CONTRACT NO. 304037

Subcontractor shall be shared by Contractor and Subcontractor. To compute any adjustment in the Contract Price under Section 8.5.7.2 above, Contractor's costs of preparation and charge for a VECP shall include any preparation and change costs. Examples are cancellation or restocking charges, when required.

8.6 Impact of Authorized Changes in the Contract. Changes in the Work made pursuant to this Article and extensions of the Contract Time allowed by Metro due to such changes shall not in any way release any warranty or promises given by Contractor pursuant to the provisions of the Contract Documents, nor shall such changes in the Work relieve or release the sureties of bonds executed pursuant to said provisions. The sureties, in executing such bonds, shall be deemed to have expressly agreed to any such change in the Work and to any extension of Contract Time made by reason thereof.

ARTICLE 9 PAYMENTS AND COMPLETION

9.1 Scope of Payment. Payment to Contractor of the Contract Amount for performing all Work required under the Contract, as adjusted for any Change Orders approved as hereinbefore specified, shall be full compensation for furnishing all labor, materials, equipment, and tools necessary to the Work, and for performing and completing, in accordance with these Contract Documents, all Work required under the Contract, and for all expenses incurred by Contractor for any purpose in connection with the performance and completion of said Work. Whenever it is specified in the Contract that Contractor is to do Work or provide materials of any class for which no price is fixed in the Contract, Contractor will do such Work or provide such materials without extra charge or allowance or direct payment of any sort, and that the cost of doing such Work or providing such materials is included in its Bid or Proposal.

9.2 Schedule of Values.

9.2.1 Generally. Within fifteen (15) days after the Notice to Proceed, Contractor shall submit a detailed breakdown costs itemized per Construction Specification Institute division format. The format and detail of the breakdown shall be as directed by Metro. This breakdown shall be referred to as the Schedule of Values.

9.2.2 Review of Schedule of Values. Metro will review the Schedule of Values to ascertain that the dollar amounts of the Schedule of Values are in fact fair cost allocations for the Work item listed. Upon concurrence by Metro, a formal approval of this Schedule of Values will be issued. Metro shall be the sole judge of fair cost allocations. Contractor's monthly progress payment requests shall reflect the cost figures included in the approved Schedule of Values and shall be based on completed Work items or percentages of Work items completed prior to the end of the payment period as more fully described below.

9.3 Progress Payment Procedure.

9.3.1 Generally. Subject to the approval of Metro, disbursements shall be made by Metro of progress payments upon written request of Contractor and pursuant to the Contract Documents as specified in Section 9.3.2.

9.3.2 Before the end of each calendar month, Contractor shall file with the Project Manager in duplicate on a form approved by Metro, a proposed payment estimate for the period commencing on the 26th day of the previous month through midnight on the 25th day of the calendar month in question. Metro and the Architect shall review Contractor's estimate and shall determine the value of Contractor's Work based on the Schedule of Values and incorporated labor and materials for the payment period. Contractor shall not be paid for any Work that is, in Metro's opinion, defective or improper, or for Work needed to correct Contractor's defective or improper Work. Contractor shall be paid 95 percent (95%) of the determined value of Work accomplished, less any offset or withholding of sums by Metro allowed under the Contract Documents, within thirty (30) days after receipt by Metro of Contractor's payment estimate. Metro will routinely withhold five percent (5%) as Retainage. No inaccuracy or error in any monthly progress payment estimates shall operate to release Contractor or its surety from damages arising from such Work or from the enforcement of each and every provision of the Contract Documents, and Metro shall have the right subsequently to correct any error made in any estimate for progress payments.

9.3.3 Retainage.

9.3.3.1 Metro will withhold Retainage from each payment at a rate of five percent (5%) in accordance with ORS 279C.570.

9.3.3.2 All funds retained by Metro under this Section shall be retained in a fund by Metro and paid in accordance with ORS 279C.550 to 279C.580.

9.3.3.3 Contractor may elect to deposit bonds or securities of the type described below with Metro or in any bank or trust company to be held in lieu of the cash Retainage described above and for the benefit of Metro. In such event, Metro shall reduce the Retainage in an amount equal to the value of the bonds and securities

Construction Agreement

MERC CONTRACT NO. 304037

and shall pay the amount of the reduction to Contractor in accordance with ORS.279C.570. Interest on such bonds or securities shall accrue to Contractor. Bonds and securities deposited or acquired as described above shall be of a character approved by the Metro Director of Finance & Regulatory Services including but not limited to:

- 9.3.3.3.1 Bills, certificates, notes, or bonds of the United States.
- 9.3.3.3.2 Other obligations of the United States or its agencies.
- 9.3.3.3.3 Obligations of any corporation wholly owned by the federal government.
- 9.3.3.3.4 Indebtedness of the Federal National Mortgage Association.

9.3.3.4 Contractor may elect to require Metro to deposit the accumulated Retainage in an interest bearing account in a bank, savings bank, trust company, or savings association for the benefit of Metro. Interest on such an account shall accrue to Contractor.

9.3.3.5 If Metro incurs additional costs as a result of Contractor's exercise of any of the above-described options, Metro may recover such costs from Contractor by reduction of the Final Payment. Metro shall inform Contractor of all such accrued costs.

9.3.4 Payment for Material Stored Off Site. Payment for material stored off of the Site will not be allowed unless the payment for such material benefits Metro in terms of lead time, scarcity, schedule, etc. Metro has sole discretion as to what materials will be paid for in advance of delivery to or installation on Site. Proof of off-site material purchases (invoice or checks and photo documentation) and appropriate insurance coverage will be required for payment. Title to all equipment and materials shall pass to Metro upon payment therefore or incorporation into the Work, whichever shall first occur, and Contractor shall prepare and execute all documents necessary to effect and perfect such transfer of title. Contractor must provide to Metro written consent from Contractor's surety approving the advanced payment for materials stored off-site. The maximum prepayment allowed by Metro shall be 75 percent of the actual fair market value of the item being considered. Metro shall be the sole judge of fair market value. Contractor shall protect stored materials from damage, and damaged or otherwise unacceptable materials, even though paid for, shall not be incorporated into the Work.

9.3.5 Other Conditions Precedent to Payment.

9.3.5.1 It is a condition precedent to Contractor's rights to any payments under the Contract that all bills for labor and materials, including labor and materials supplied by or to Contractor, shall have been paid in full and, if requested by Metro, Contractor shall submit receipted invoices and/or lien waivers, as evidence of payment in full of all such accounts. As a further condition precedent to Contractor's right to any payments under this Contract, Contractor shall submit a claims release before any payment in the form set forth in Exhibit 3 to these General Conditions, and a final claims release stating Contractor has been paid in full prior to the Final Payment in the form set forth in Exhibit 4 to these General Conditions.

9.3.5.2 Payments to Contractor shall be conditioned upon Contractor complying with all provisions of this Contract regarding scheduling and progress reports submissions and upon Contractor furnishing all other information and data necessary to ascertain actual progress. Metro's determination that Contractor has failed or refused to furnish the required information, data, schedules, or other reports shall constitute a basis for withholding all payments until the required information, data, revised schedules, and diagrams, if necessary, and other reports are furnished.

9.3.6 Payment Does Not Imply Acceptance of Work. The granting of any progress payment, or the receipt thereof by Contractor, shall not constitute acceptance of the Work or any portion thereof, and shall in no way lessen the liability of Contractor to replace unsatisfactory Work or material, though the unsatisfactory character of such Work or material may or may not have been apparent or detected at the time such payment was made.

9.3.7 Offset of Sums Due Metro from Contractor. In addition to any retention rights allowed Metro under this Contract, it is mutually understood and agreed that Metro may, upon prior written notice to Contractor, offset from any payment otherwise due Contractor as much as may be necessary to protect and compensate Metro from any costs or expenses it may incur due to any breach of the Contract by Contractor, including applicable liquidated damages. Any sums so offset shall become the property of Metro.

9.4 Substantial Completion.

9.4.1 Metro is also entitled to occupy or use all or a portion of the Work on Substantial Completion. Occupancy or use on Substantial Completion does not constitute Metro's acceptance of the Work not complying with the requirements of the Contract Documents, nor does it waive rights Metro has to completion of the Contract in accordance with the requirements of the Contract Documents.



Construction Agreement

MERC CONTRACT NO. 304037

9.4.1.1 When Contractor considers the Work to be substantially complete, Contractor shall submit to Metro a written notice that the Work is substantially complete

9.4.2 Within a reasonable time after receipt of such notice, Metro and Architect will review the Work, including a physical inspection, to determine the status of completion. Should the Architect and Metro determine that the Work is not substantially complete:

9.4.2.1 The Project Manager will promptly notify Contractor in writing, giving the reasons therefore.

9.4.2.2 The Contractor shall remedy the deficiencies in the Work, and thereafter send a second written notice of Substantial Completion to Metro.

9.4.3 The above-described procedure shall be followed until the Work is, in the opinion of Metro and Architect, substantially complete. At that point:

9.4.3.1 The Architect will prepare a Certificate of Substantial Completion on AIA Document G704, accompanied by the approved Punch List of items to be completed or corrected as verified and amended by the Architect.

9.4.3.2 Metro shall submit the Certificate of Substantial Completion to Contractor for signature.

9.4.4 Punch List. When the Work is substantially complete, the Contractor shall prepare a Punch List of items to be completed or corrected for review and approval by Metro and the Architect. The Architect shall be responsible for preparing the final Punch List. The Contractor remains responsible to complete the Work in accordance with the Contract Documents regardless of whether an item is omitted from the Punch List.

9.4.4.1 The Contractor is required to proceed promptly to complete the items on the Punch List and any other items that may be discovered to be incomplete or incorrect regardless of whether they are on the Punch List or not. If the Contractor fails to complete the Punch List within 30 days or such other time as Project Manager may allow, Metro may terminate any further services of the Contractor under the Contract and complete the Punch List items remaining to be completed or corrected with Metro's own forces or by hiring another Contractor to perform the Punch List Work. Costs of performing the Punch List Work by Metro will be deducted from any payments otherwise due the Contractor.

9.4.4.2 The Contractor will notify Metro when the Punch List Work is complete, and Final Payment will then be made in accordance with. After receipt of that Notice, Metro will inspect the Work to determine whether the Punch List is complete as provided in Section 9.5 of these General Conditions.

9.4.4.3 If the Work is not complete despite the Contractor's notice that the Punch List items are complete, and Metro has hired an Architect or Engineer to assist it on the Project, the Contractor will pay costs for the Architect's or Engineer's services if more than two inspections of the Work are required because the Punch List remains incomplete.

9.4.4.4 On Substantial Completion, Metro will be responsible for utilities, insurance, security, maintenance, and damage to Work caused by Metro's agents and employees unless otherwise provided in the Certificate of Substantial Completion. The Contractor remains responsible for damage to Work caused by its Subcontractors, agents, and employees during the performance of Punch List Work.

9.5 Final Completion and Acceptance.

9.5.1 When Contractor considers the Work to be finally complete, Contractor shall submit written certification to Metro that:

9.5.1.1 Contract Documents have been reviewed.

9.5.1.2 Work has been inspected for compliance with Contract Documents.

9.5.1.3 Work has been completed in accordance with Contract Documents to include submission of record documents.

9.5.1.4 Equipment systems have been tested in the presence of Metro and are operational.

9.5.1.5 Work is ready for final inspection.

9.5.2 Architect and Metro will promptly review the Work and include a physical inspection to verify the status of completion and shall inform Metro of the conclusions. Metro shall, within fifteen (15) days after receipt of Contractor's certification, either accept the Work or notify Contractor of the Work yet to be performed on the Contract as outlined below.

9.5.3 Should the Architect and Metro consider that the Work is incomplete or defective:

9.5.3.1 Project Manager or the Architect will promptly notify Contractor in writing, listing the incomplete or defective Work.

Construction Agreement

MERC CONTRACT NO. 304037

9.5.3.2 Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to Metro that the Work is complete. Metro will then advise the Architect.

9.5.3.3 Architect and Metro will review and re-inspect the Work.

9.5.4 The procedure set forth in Section 9.5.3 shall be followed until the Work is, in the opinion of Metro and Architect, finally complete. Contractor shall immediately thereafter prepare and submit Closeout Submittals as described below.

9.6 Closeout Submittals. Contractor shall submit the following items, as applicable, with its request for Final Payment:

9.6.1 Evidence of Compliance with Requirements of Governing Authorities.

9.6.2 Project record documents in accordance with the Specifications.

9.6.3 Operation and maintenance data in accordance with the Specifications.

9.6.4 Warranties in accordance with requirements of various Specification sections and these General Conditions.

9.6.5 Extra stock and maintenance materials. Contractor shall submit receipts, signed by Metro, for the various specific items.

9.6.6 Evidence of payment and release of claims in accordance with the following section.

9.6.7 Consent of surety to Final Payment.

9.6.8 Certificates of insurance for products and completed operations in accordance with Article 12 of these General Conditions.

9.6.9 If Contractor is a non-resident bidder or proposer, complete documentation of Contractor's compliance with ORS 279A.120.

9.7 Releases. Contractor and each assignee under any assignment in effect at the time of Final Payment shall execute and deliver, at the time of application for Final Payment, as a condition precedent to Final Payment, discharging and releasing Metro and the Architect of and from all liabilities, obligations, and claims arising under this Contract. The Final Release shall be in the form attached as Exhibit 4 to these General Conditions. In addition to the above-described release, Contractor shall:

9.7.1 Submit to Metro an affidavit certifying that Contractor has paid all federal, state and local taxes including excise, use, sales, and employee withholding taxes.

9.7.2 Deliver to Metro written releases of all rights to file claims against Metro or to file claims on any bonds in connection with the Contract, signed by each Subcontractor and Supplier who performed labor or furnished materials in connection with the Work. The release shall be in the form attached as Exhibit 5 to these General Conditions.

9.7.3 Deliver to Metro Contractor's written undertaking, with sureties acceptable to Metro:

9.7.3.1 To promptly pay and obtain a release of claims on any bonds that may in the future affect the premises; and

9.7.3.2 To defend, indemnify, and save Metro harmless from any liability or expense because of any claim on any bond or any other claim related to the Contract or the Work.

9.8 Final Payment. Upon application of Contractor and Contractor's completion of and compliance with all of the provisions of the above Sections and settlement of all claims arising from the Contract, including claims that Metro may have against Contractor, Metro shall pay Contractor the balance of the Contract Amount subject to the availability of monies and less any previous payments, offsets, and withholdings allowed Metro under this Contract, and Retainage that has been returned to Contractor. Acceptance of Final Payment by Contractor shall constitute a waiver of all claims of whatever nature that Contractor may have or allege to have against Metro arising out of or related to Work described in the Contract Documents.

9.9 No Waiver of Rights. Neither the final review by Metro, nor any order or certificate for the payment of money, nor any payment for, nor acceptance of the whole or any part of the Work by Metro, nor any extension of time, nor any position taken by Metro shall operate as a waiver of any provision of this Contract or of any power herein reserved by Metro or any right to damage herein provided, nor shall any waiver of any breach of this Contract be held to be a waiver of any other or subsequent breach. All of Metro's remedies provided in this Contract shall be taken and construed as cumulative; that is, in addition to each and every other remedy herein provided; and Metro shall have any and all equitable and legal remedies that it would in any case have.

Construction Agreement

MERC CONTRACT NO. 304037

ARTICLE 10

SAFETY, USE OF SITE, AND PROTECTION OF THE WORK

10.1 Laws and Regulations.

10.1.1 The Contractor must comply with all federal, state, and municipal laws in regard to all matters concerning this Contract. This includes but is not limited to compliance with the ADA. The Contractor must also comply with the orders, rulings, decrees, and decisions of any administrative or judicial officials that in any manner whatsoever affect the Project, the Work, the safety of persons around the Work Site, or the manner in which the Work is performed.

10.1.2 If the Contractor observes that any portion of the Work is to be performed in a way that violates any law, code, or regulation, it must immediately notify Metro in writing.

10.1.3 Contractor will divert a minimum of 85% of all construction and demolition waste to recycling and reuse markets, and, if the Work is performed in the City of Portland, comply with City of Portland Code 17.102.270 and related administrative rules.

10.2 Safety Requirements.

10.2.1 Safety Generally.

10.2.1.1 Contractor shall be solely and completely responsible for the safety of the Work and the Site, including but not limited to the safety of all persons and property involved in the Work at the Site at any time until Final Completion and Acceptance of the Work.

10.2.1.2 All Work shall be performed in full accordance with all applicable safety codes, laws, ordinances, and requirements including but not limited to the Safety and Health Regulations for Construction promulgated by the Secretary of Labor under Section 107 of the Contract Work Hours and Safety Standards Act as set forth in Title 29 of the Code of Federal Regulations, federal and state OSHA, Metro's insurance standards, and all other applicable safety codes. Where any of these are in conflict, the more stringent requirement shall be followed. Contractor's failure to thoroughly familiarize itself with the aforementioned safety provisions shall not relieve it from any requirements in the Contract Documents to comply with such safety provisions or from any penalties for failure to so comply.

10.2.1.3 Contractor shall inspect the Work and the Site daily and immediately correct any unsafe conditions. All job personnel shall be knowledgeable of and comply with the above safety requirements.

10.2.1.4 Contractor shall take all precautions to prevent the possibility of fire resulting from Contract operations. Contractor shall provide properly maintained emergency fire extinguishing equipment of a readily available type and quantity as necessary to meet potential fire hazards.

10.2.1.5 In an emergency affecting safety of persons or property, the Contractor shall act to prevent the threatened damage, injury, or loss and immediately notify Metro.

10.2.2 Health and Safety Program. Contractor shall develop, publish, and implement the overall Health and Safety Program for the Project. This Program shall conform to all applicable codes. Contractor shall submit the written Health and Safety Program to Metro for review and comment within fourteen (14) days after the receipt of the written Notice To Proceed. The Program, as approved by Metro, shall subsequently be distributed to and implemented by Contractor's personnel, as well as its Subcontractors and Suppliers. Contractor shall fully implement and comply with the approved Safety Program.

10.2.3 Health and Safety Officer. Prior to initiation of construction, Contractor shall designate in writing a Site Health and Safety Officer who shall be responsible for coordinating Contractor's Health and Safety Program. The individual so designated shall be the interface with the Project Manager on matters relating to safety and Contractor's compliance with the approved Safety Program. Metro reserves the right to accept or reject the Health and Safety Officer designated by Contractor.

10.3 First Aid.

10.3.1 Contractor shall maintain on the Site during Work operations, a member of its work force who is qualified in administering first aid to its personnel and shall have available in its job office the first aid equipment as required to meet all applicable safety codes. The names and credentials of qualified personnel will be submitted to the Project Manager.

10.3.2 Contractor shall require or provide adequate clothing and protective gear for all personnel working on the job Site. This includes but is not limited to hard hats, substantial boots or shoes, shirts with sleeves at all times, eye and ear protection, gloves, face masks, welding hoods, and safety belts as required for the type of Work being done.

Construction Agreement

MERC CONTRACT NO. 304037

10.4 Use of Site.

10.4.1 The Contractor shall confine operations at the Site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents, and shall not unreasonably encumber the Site with materials or equipment.

10.4.2 Prior to commencement of the Work, the Contractor shall review the Project Site with Metro in detail and identify the area of the Work, staging areas, connections or interfaces with existing structures and operations, and restrictions on the Project Site area. The Contractor will ensure that all forces on the Project Site are instructed about the acceptable working and staging areas and restrictions on use of the Site. The Contractor, with advance consent of Metro, will erect such barriers, signage, and devices as are necessary to restrict access to the Project Site to approved personnel and to prevent unauthorized access by construction personnel to non-Work areas.

10.4.3 The Contractor and its Subcontractors shall receive prior approval from Metro before delivering or storing any materials or tools on Metro's premises. Upon approval, materials and tools will be stored so that they do not hamper the operation of equipment or persons and do not present a fire or safety hazard.

10.4.4 Contractor and its Subcontractors shall not erect on the Project Site any signage intended to advertise or promote their business without the prior written consent of Metro.

10.4.5 If the Contractor removes Metro's property, fixtures, materials, or other equipment to perform the Work, the Contractor shall be responsible for the safekeeping of all such property, fixtures, materials, or other equipment including without limitation assuring that such items are not lost, damaged, or destroyed, and are upon Metro's directive are either returned to their original location, reinstalled, replaced, or repaired as necessary.

10.4.6 When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work, as necessary, from damage by any cause

10.4.7 At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus material from and about the Project, and shall return any damage or altered portion of Metro's property to at least its pre-construction condition.

10.5 Protection of Work, Persons, and Property Against Damage.

10.5.1 Contractor shall protect the Work from damage due to construction operations; the action of the elements, including erosion due to normal and extraordinary weather conditions; the carelessness of other contractors; vandalism; or any other cause whatever until Final Completion and acceptance of the Work.

10.5.2 The Contractor will keep the Project Site safe in compliance with applicable law. Safety includes but is not limited to: (1) providing approved types of secured and adequate barricades or fences that are easily visible from a reasonable distance around open excavations; (2) closing up or covering with steel plates all open excavations at the end of each Working Day in all street areas and in all other areas when it is reasonably required for public safety; (3) marking all open Work and obstructions by lights at night; (4) installing and maintaining all necessary signs, lights, flares, barricades, railings, runways, stairs, bridges, and facilities; (5) observing any and all safety instructions received from Project Manager; and (6) following all laws and regulations concerning worker and public safety. If the law requires greater safety obligations than those imposed by Metro, the Contractor must comply with the law.

10.5.3 The Contractor will protect, and take every reasonable precaution to avoid damage to, all public and private property that might be damaged by its operations.

10.5.4 If public or private property, or both, is damaged by the Contractor's operations, the Contractor must either repair the damage or have the damage repaired by others at its own expense, without additional compensation from Metro. The repair must bring the damaged property back to the same condition it was in before the damage occurred. If repair and restoration is not feasible, the Contractor will pay Metro for the full cost of the damage. If the damage has been caused to property of Metro, Metro has the right to determine whether or not the property will be repaired and restored by the Contractor. If Metro elects to have the property repaired with its own forces or by another entity, the Contractor will pay Metro all costs associated with that repair and restoration.

10.5.5 The Contractor must give reasonable Notice to Metro and occupants of property adjacent to the Work to permit them to remove vehicles, trailers, and other possessions, as well as salvage or relocate plants, trees, fences, sprinkler systems, or other improvements in the Easement or Right-of-Way that are designated for removal or that might be destroyed or damaged by the Contractor's operations.

10.5.6 All federal, state, and local safety and environmental protection laws, rules, and orders, including fire codes, applicable to the Work to be done under the Contract, shall be obeyed, complied with, and enforced by Contractor.

10.5.7 Contractor shall provide and maintain such guards, fences, barriers, signs, regulatory and warning lights, and other traffic control and safety devices adjacent to and on the Site as may be necessary to prevent

Construction Agreement

MERC CONTRACT NO. 304037

accidents to the public and damage to property. Contractor shall also provide, place, and maintain such lights as may be necessary for illuminating the said signs, guards, fences, barriers, and other traffic and safety control devices.

10.5.8 Upon Final Completion and Acceptance of the Work, Contractor shall remove all temporary signs, lights, barriers, etc., from the Site.

10.5.9 The Contractor must protect worksites and storage and disposal areas from washouts and erosion, and take all necessary precaution to control or abate dust, nuisances, and air pollution arising from the performance of Work by taking necessary actions to prevent this. Such actions include but are not limited to cleaning up, sweeping, sprinkling, covering, enclosing, or sheltering Work areas and stockpiled materials, and removing promptly from paved areas earth or other materials that may become airborne or that may be washed into waterways or drainage systems.

10.6 Utilities.

10.6.1 The Contractor is responsible for locating light and power poles, underground electrical, underground communication, sewer, gas, and water piping, gas/water "shut off" boxes and covers, and all other utility lines. The Contractor will follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in the Oregon Administrative Rules. Copies of these rules may be obtained by contacting the Center. If the Contractor has questions about the rules, it is to contact the Center. The Parties agree that any Project plans or permits issued by Metro are deemed to have this language incorporated by reference.

10.6.2 The Contractor will give Notice to Metro of any intended excavation it may have at least 48 hours in advance of the proposed excavation. If the intended excavation or other work would cause any interruption in utility service, the Contractor will give notice to Metro at least five (5) days in advance. The specific schedule for all interruptions in utility services must be coordinated with the Project Manager.

10.6.3 The Contractor will maintain any markings showing the presence of underground facilities. If the Contractor does not maintain such markings, and Metro is required to reestablish them, the Contractor will pay Metro any and all costs associated with that activity.

10.6.4 The Contractor will exercise special care in executing subsurface work in proximity of known subsurface utilities, improvements, and easements. The Contractor will arrange for and pay the cost of disconnecting, removing, relocating, capping, replacing, or abandoning all public and private utilities impeding construction operations, all in accordance with servicing utilities' regulations and governing codes. The Contractor will cap abandoned utilities. The Contractor will provide maintenance of all on-site active above-grade and below-grade services. Any utilities damaged by Contractor shall be repaired immediately to Owner's satisfaction.

10.7 Hazardous Substances Encountered During Construction and Other Environmental Laws.

10.7.1 With respect to Hazardous Materials to be used during the course of the Work, the Contractor will implement and enforce a program to inventory and properly store and secure all Hazardous Materials that may be used or may be present on the Project Site, maintain available for inspection at the Project Site all material safety data sheets, and comply with all regulations required by law for the storage, use, and disposal of Hazardous Materials. The program must provide for notification of all personnel of potential chemical hazards. Review of these hazards must be included in the Contractor's safety training program. The Contractor will submit to Metro a list of all Hazardous Materials to be brought by the Contractor or its Subcontractors onto Metro's property, including the purpose for their use on the Project.

10.7.2 In the event of a release or discovery of a preexisting release of Hazardous Materials, or if it is foreseeable that injury or death to persons may occur because of any material or substance (including without limitation Hazardous Materials) encountered on the Project Site, the Contractor must **immediately** (1) stop the Work or the portion of the Work affected, (2) notify Metro and the Architect orally and in writing, and (3) protect against exposure of persons to the Hazardous Materials. The Contractor is to provide all written warnings, notices, reports, or postings required at law or by contract for the existence, use, release, or discovery of Hazardous Materials.

10.7.3 With respect to any Hazardous Materials or other material or substance reported to Metro under Section 10.7.2 above that were not introduced to the Project Site by the Contractor or its Subcontractors of any tier, Metro will obtain the services of a qualified environmental consultant to verify the presence or absence of the material or substance reported by the Contractor and, if the material or substance is found to be present, to verify that it is rendered harmless. Unless otherwise required by the Contract Documents, Metro will furnish in writing to the Contractor and Architect the names and qualifications of persons or entities that are to perform tests verifying the presence or absence of such material or substance, or that are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to Metro in writing, stating whether or not either has reasonable objection to the persons or entities proposed by Metro. If either the Contractor or the Architect has an objection to a person or entity proposed by Metro, Metro will propose another to which the Contractor

Construction Agreement

MERC CONTRACT NO. 304037

and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area is to resume upon written agreement of Metro and the Contractor. By Change Order, the Contract Time may, subject to agreement by Metro and the Contractor, be extended appropriately and the Contract Amount will be increased in the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up, which adjustments are to be accomplished as provided in Article 8.

10.7.4 With respect to any Hazardous Materials or other material or substance reported to Metro under section 10.7.2 above that was introduced to the Project Site by the Contractor or its Subcontractors of any tier, the Contractor will be responsible to carry out the duties of (1) proposing to Metro and the Architect a qualified environmental consultant, (2) obtaining and paying for the services of the environmental consultant, and (3) verifying that the material is rendered harmless, as otherwise set forth in Section 10.7.3 above. The Contractor will not be entitled to an increase in the Contract Amount as stated in the last sentence of Section 10.7.3 if the Contractor or its Subcontractors of any tier are responsible for the condition requiring the testing of the material and the stoppage of the Work. Remediation Work must be conducted by properly qualified contractors approved in advance by Metro. Generally, Metro may at its option contract directly with environmental consultants and remediation contractors, regardless of whether the Work will be performed at the Contractor's expense.

10.7.5 To the fullest extent permitted by law, Metro will indemnify the Contractor, Subcontractors, Architect, Architect's consultants and agents, and employees of any of them and hold them harmless from and against claims, damages, losses, and expenses, including without limitation attorney fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance was not introduced to the Project Site by the Contractor or its Subcontractors of any tier, presents the risk of bodily injury or death, and has not been rendered harmless. No indemnification provided by Metro under this Section will be required to indemnify the Contractor, Subcontractors, or their employees or agents to the extent of liability for death or bodily injury to persons or damage to property caused in whole or in part by the Contractor's own negligence, but will require indemnity to the extent of the fault of Metro or its agents or representatives.

10.7.6 To the fullest extent permitted by law, the Contractor will indemnify Metro, the Project Manager, and employees of any of them and hold them harmless from and against claims, damages, losses, and expenses, including without limitation attorney fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance was introduced to the Project Site by the Contractor or its Subcontractors of any tier, presents the risk of bodily injury or death, and has not been rendered harmless. No indemnification provided by the Contractor under this Section will be required to indemnify Metro or its agents or representatives to the extent of liability for death or bodily injury to persons or damage to property caused in whole or in part by Metro's own negligence, but will require indemnity to the extent of the fault of the Contractor or its agents or representatives.

10.8 Additional Requirements for Work at Metro Project Sites. The Contractor will comply with the following requirements in addition to the requirements set forth in this Article 10.

10.8.1 Safety and Health Precautions.

10.8.1.1 Contractor shall take all precautions to prevent the possibility of fire resulting from construction operations. Contractor will provide emergency fire extinguishing equipment of adequate type and quantity, readily available, and properly maintained. Contractor shall provide a fire watch and screening whenever welding is in progress in areas accessible or visible to Metro staff or the general public.

10.8.1.2 All contracted employees are expected to follow established safety procedures in the General Contractor's Safety Plan and report any safety violation or unsafe work practice to a lead worker or project manager. Violation of any safety procedure is a serious offense due to the severe consequences that may result and must be reported immediately. It is most important to report safety violations and unsafe work practices to individuals who can take immediate action to resolve the problem.

10.8.1.3 Vests and hardhats (as well as other personal protection attire as required by the General Contractor) are required to be worn at construction worksites. Contractors shall wear such vests at all times on the Project Site.

10.8.1.4 Any physical, mental, or emotional condition that may affect a Contractor or Subcontractor employee's ability to work safely, make sound judgments, or compromise their ability to react quickly in the event of an emergency, must be reported to their lead or project manager prior to the start of their shift.

10.8.1.5 For safety reasons, iPods, MP3 players, and other sound devices requiring earphones are prohibited during working hours.

10.8.1.6 The Contractor will provide warning signs, flagger(s), and other safety and health precautions that may become necessary or required for protection of Work or for protection of the public, Owner's



Construction Agreement

MERC CONTRACT NO. 304037

personnel, and construction personnel, including Owner's and Architect's Representatives engaged on the Project. State of Oregon Workmen's Compensation Board Safety Codes for Construction Work and Federal Safety Codes, form a part of these Specifications.

10.8.2 Access to Metro Project Site. Contractor and Subcontractors will comply with the following requirements:

10.8.2.1 Locations for access to the Project Site by Contractor and Subcontractors shall be approved by the Project Manager.

10.8.2.2 The Contractor's representatives must always be on the premises when Subcontractors are working. Identification will be issued and worn for General Contractor's representatives.

10.8.2.3 The Contractor will keep a log of all Subcontractors that are working on-site each day. Subcontractors must always sign in with the Contractor and wear identification issued by the Contractor.

10.8.2.4 Construction on the Project Site is limited to 7 am to 5 pm, Monday through Friday, unless Work at other times is approved in advance by the Project Manager.

10.8.2.5 When Contractor needs access throughout the day to an area that is normally secured and inaccessible to visitors, the Project Manager will provide "contractor locks" and keys, and Contractor must keep said areas secure.

10.8.2.6 Contractor will ensure that all of its and Subcontractors' officers, employees, and agents are aware of and comply with the access requirements in this Section 10.8.2.

10.8.3 Site Protection/Safety.

10.8.3.1 The Project Site may be in operation and open to the public during construction of the Work. Construction Work in and around Owner's buildings occupied by Metro personnel or frequented by the public shall be conducted in such a manner as to permit such operation without jeopardy and with the absolute minimum of inconvenience to occupants and the public.

10.8.3.2 Metro may restrict hours of work to accommodate Metro activities or special events.

10.8.3.3 Construction Work that requires coordination with Metro staff activities will be planned in advance with the Project Manager. A meeting will be held with Metro staff to identify a plan for the activity.

10.8.3.4 The Contractor will take every precaution to minimize noise, spreading of dust and debris, causing undue vibrations or impacts, and other nuisances. The Contractor shall do no structural or other damage to any in-place improvements.

10.8.3.5 Metro-owned tools, vehicles, and other equipment may not be used at any time.

10.8.3.5.1 Tree/Vegetation Protection. The Contractor shall comply with the local government regulations applicable to the Project, and shall consult with the Project Manager prior to doing work that could impact the health of a tree or vegetation not scheduled for removal by contract documents.

10.8.4 Personnel and Subcontractors.

10.8.4.1 Smoking is prohibited in all areas of the Project Site except in designated smoking areas. Contractor and Project Manager to determine a designated smoking area.

10.8.5 Prejudicial remarks, actions, slurs, and jokes in the workplace that are offensive to people relative to their race, color, religion, national origin, sex, age, marital status, veteran status, disability, or sexual orientation are strictly prohibited. Sexual harassment is strictly prohibited. Contractors are expected to use a reasonable person's standard of good judgment in their working relationships. No person shall be subjected to deliberate or repeated unsolicited verbal comments, gestures, or physical contact of a sexual nature, or that which is offensive, hostile, or intimidating.

10.8.6 Restrictions:

10.8.6.1 Contractors are not allowed to bring the following items onto the Project Site:

10.8.6.1.1 Weapons

10.8.6.1.2 Alcohol, narcotics

10.8.6.1.3 Skates/Skateboards/Rollerblades/Wheelies

10.8.6.1.4 Bicycles (if a Contractor employee is commuting to the Project Site via bicycle, arrangements can be made for appropriate parking and use).

10.8.6.1.5 Pets

10.8.7 Prohibited Conduct:

10.8.7.1 The following conduct is strictly prohibited and will result in the immediate ejection of the offending Contractor employee or Subcontractor from Project Site premises:

Construction Agreement

MERC CONTRACT NO. 304037

- 10.8.7.1.1 Possessing, using, transferring, offering, or being under the influence of any intoxicants or narcotics during working hours.
- 10.8.7.1.2 Willful deceit, gross negligence, or theft, including of personal or public property.
- 10.8.7.1.3 Neglect of duty, violation of Metro ordinances, regulations, and directives.
- 10.8.7.1.4 Willful or repeated negligent violation of established safety policies and procedures.
- 10.8.7.1.5 Possessing a firearm, illegal weapons, fireworks, or explosive device on Metro property
- 10.8.7.1.6 Harassment, discourteous treatment of any kind, or discrimination to staff, volunteers, or members of the public. Obscenities, profanity, yelling, shouting, abusive, or maligning tone of voice and/or language is considered discourteous and is prohibited.
- 10.8.7.1.7 Misuse of Metro property.

ARTICLE 11 INDEMNIFICATION

11.1 Indemnification.

11.1.1 Contractor shall assume all responsibility for the Work and shall bear all losses and damages directly or indirectly resulting to Contractor, Metro, Architect, their officers, agents, and employees, or to others on account of the character or performance of the Work or accidents.

11.1.2 Contractor shall defend, indemnify, and hold harmless Metro, its officers, agents, and employees from all claims, liability, loss, damage, consequential or otherwise, and injury of every kind, nature, and description, directly or indirectly resulting from activities in the performance of the Contract, the ownership, maintenance, or use of motor vehicles in connection therewith, or the acts, omissions, operations, or conduct of Contractor or any Subcontractor or Supplier under the Contract in any way arising out of the Contract, irrespective of whether fault is the basis of the liability or claim.

11.1.3 Any specific duty or liability imposed or assumed by Contractor, as may be otherwise set forth in the Contract Documents, shall not be construed as a limitation or restriction of the general liability or duty imposed upon Contractor by this Section.

11.1.4 Such liabilities and losses from which Contractor shall indemnify and hold harmless the above-described indemnities shall include but not be limited to:

11.1.4.1 Special activities by Metro to verify and/or expedite delivery of materials and those losses incurred by Metro as a result of any delays to Other Metro Contractors resulting from acts of Contractor or its failure to act.

11.1.4.2 Acceleration payments to Other Metro Contractors on the Project or related projects resulting from Contractor falling behind the Construction Schedule for causes not entitling it to an extension of Contract Time under any provisions of the Contract Documents that cause other Metro Contractors to fall behind the Construction Schedule so that they must then accelerate the performance of the Work, as directed by Metro, in order to maintain progress.

11.1.4.3 Violations of the ordinances or regulations of Metro, any federal, state, county, or city laws or order of any properly constituted authority in any manner affecting this Contract, in addition to any laws or regulations that might affect this Contract.

11.1.5 Any and all suits, actions, damages, or claims of every name and description to which the above-indemnified may be subjected or put by reason of injury to persons or property arising out of, in connection with, or incident to the execution of the Work, or resulting from acts or omissions on the part of Contractor, its Subcontractors, officers, employees, or agents, and all attorney fees and court costs incident thereto.

11.1.6 No indemnification provided by the Contractor under this Article 11 or insurance provided under Article 12 will be required to indemnify Metro or its employees or agents to the extent of liability for death or bodily injury to persons or damage to property caused in whole or in part by their own negligence, but will require indemnity to the extent of the fault of the Contractor or those entities or persons for whom the Contractor is responsible.

Construction Agreement

MERC CONTRACT NO. 304037

ARTICLE 12 INSURANCE

12.1 General Insurance Requirement. The Contractor will purchase from and maintain in a company or companies lawfully authorized to do business in the State of Oregon such insurance as will protect the Contractor from claims set forth below that may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

12.1.1 Claims under workers' compensation, disability benefit, and other similar employee benefit acts that are applicable to the Work to be performed;

12.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;

12.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

12.1.4 Claims for damages insured by usual personal injury liability coverage and commercial general liability coverage (or its equivalent as approved in advance by the Owner);

12.1.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

12.1.6 Claims for damages because of bodily injury, death of a person, or property damage arising out of ownership, maintenance, or use of a motor vehicle;

12.1.7 Claims for bodily injury or property damage arising out of completed operations;

12.1.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Article 12 of the General Conditions;

12.1.9 Claims for third-party injury and property damage (including without limitation clean-up costs) as a result of pollution conditions arising from the Contractor's operations or completed operations; and

12.1.10 Claims involving the Contractor's professional liability, solely to the extent that the Contractor accepts design or design/build responsibilities under the Contract.

12.2 Required Coverage. Without waiver of any other requirement of the Contract Documents, the Contractor will provide, pay for, and maintain in full force and effect at all times during the performance of the Work until final acceptance of the Work or for such further duration as required, the following policies of insurance issued by a responsible carrier. All of the Contractor's insurance carriers will be rated A VII or better by A.M. Best's rating service, unless otherwise approved by the Owner.

12.2.1 Workers' Compensation: Workers' compensation coverage sufficient to meet statutory liability limits.

12.2.2 Employer's Liability: The Contractor will purchase and maintain employer's liability insurance in addition to its workers' compensation coverage with at least the minimum limits in Section I.C below.

12.2.3 Commercial General Liability: The Contractor will purchase and maintain commercial general liability ("CGL") insurance on an occurrence basis, written on ISO Form CG 0001 (12/04 or later) or an equivalent form approved in advance by the Owner. CGL coverage will include all major coverage categories including bodily injury, property damage, and products/completed operations coverage maintained for at least six years following final payment. The CGL insurance will also include the following: (a) separation of insured; (b) incidental medical malpractice; and (c) per-project aggregate for premises operations.

12.2.4 Professional Liability/Errors and Omissions: To the extent that the Contractor accepts design or design/build responsibilities, the Contractor will purchase and maintain professional liability/errors and omissions insurance and cause those Subcontractors providing design services do so.

12.2.5 Automobile Liability: The Contractor will purchase and maintain automobile liability insurance with coverage for owned, hired, and non-owned vehicles on ISO form CA 00 01 or an equivalent form approved in advance by the Owner. The automobile liability insurance will include pollution liability coverage resulting from vehicle overturn and collision.

12.2.6 Pollution Liability: The Contractor will purchase a contractors' pollution liability policy. Coverage will include third-party claims for bodily injury, property damage, and environmental damage resulting from pollution conditions caused during the performance of covered operations for both on-site and migrating from the job site. Such coverage will include pollution conditions arising from covered operations including work performed by its Subcontractors and third-party claims against the Contractor alleging improper supervision of its Subcontractors.



Construction Agreement

MERC CONTRACT NO. 304037

12.2.7 Commercial Umbrella/Excess Coverage: The Contractor will purchase or maintain a commercial umbrella or excess liability policy to meet the minimum limits as described below in Section I.C. Commercial umbrella/excess liability coverage will include: (a) "Pay on behalf of" wording; (b) concurrency of effective dates with primary coverage; (c) punitive damages coverage (where not prohibited by law); (d) application of aggregate (where applicable) in primary coverage; (e) "care, custody, and control" coverage that follows the form for primary coverage; and (f) drop-down feature. Excess/umbrella coverage will be scheduled to the CGL, employer's liability, and automobile liability policies.

12.3 Limits. The insurance required by this Article 12 will be written for at least the limits of liability specified in this Section or required by law, whichever is greatest.

12.3.1 Workers' Compensation Statutory Limits

12.3.2 Employer's Liability

12.3.2.1 Each Accident \$1,000,000

12.3.2.2 Each Bodily Injury/Disease \$1,000,000

12.3.2.3 Aggregate Bodily Injury/Disease \$1,000,000

12.3.3 Commercial General Liability

12.3.3.1 Each Occurrence \$2,000,000

12.3.3.2 General Aggregate \$2,000,000

12.3.3.3 Product/Completed Operations \$2,000,000

12.3.3.4 Personal & Advertising Injury \$2,000,000

12.3.3.5 Fire Damage Limit \$2,000,000

12.3.3.6 Medical Expense Limit \$2,000,000

12.3.4 Automobile Liability

12.3.4.1 Combined Single Limit \$2,000,000

12.3.5 Pollution Liability

12.3.5.1 Single Limit \$2,000,000

12.3.5.2 Aggregate \$2,000,000

12.3.6 Commercial Umbrella/Excess Coverage

12.3.6.1 Each Occurrence **Alternates: Min. \$2,000,000/\$5,000,000/\$10,000,000**

12.4 Additional Insureds. The Contractor's third-party liability insurance policies will include the Owner and its officers, employees, agents, volunteers, partners, successors, and assigns as additional insureds. The policy endorsement must extend premise operations and products/completed operations to the additional insureds. The additional insured endorsement for the CGL insurance must be written on ISO Form CG 2010 (11/85), a CG 2037 (07/04) together with CG 2033 (07/04), or the equivalent, but will not use the following forms: CG 20 10 (10 93) or CG 20 10 (03 94).

12.5 Joint Venture. If the Contractor is a joint venture, the joint venture will be a named insured for the liability insurance policies.

12.6 Primary Coverage. The Contractor's insurance will be primary insurance coverage and may not seek contribution from any insurance or self-insurance carried by the Owner or the Architect, including any property damage coverage carried by the Owner. Contractor's insurance will apply separately to each insured against whom a claim is made or suit is brought. The Contractor's insurance will not include any cross-suit exclusion or preclude an additional insured party from asserting a claim as a third party.

12.7 Contractor's Failure to Maintain Insurance. If for any reason the Contractor fails to maintain required insurance coverage, such failure will be deemed a material breach of the Contract and the Owner, at its sole discretion, may suspend or terminate the Contract for cause pursuant to Article 15 of this Contract. The Owner may, but has no obligation to, purchase such required insurance, and without further notice to the Contractor, the Owner may deduct from the Contract Sum any premium costs advanced by the Owner for such insurance. Failure to maintain the insurance coverage required by this Article 12 will not waive the Contractor's obligations to the Owner.

12.8 Certificates of Insurance. The Contractor will supply to the Owner Certificates of Insurance for the insurance policies described in this Article 12 prior to the commencement of the Work and before bringing any equipment or construction personnel onto the Project site.

12.8.1 Additional Certificates. To the extent that the Contractor's insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage will be submitted with the final application for payment. Information concerning reduction of coverage because of revised limits or claims paid under the general aggregate, or both, will be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

Construction Agreement

MERC CONTRACT NO. 304037

12.8.2 Prohibition Until Certificates Received. The Owner will have the right, but not the obligation, to prohibit the Contractor and its Subcontractors from entering the Project site until the required certificates (or other competent evidence that insurance has been obtained in complete compliance with this Article 12) are received and approved by the Owner.

12.8.3 Deductibles/Self-Insured Retentions: Payment of deductibles or self-insured retention is a Cost of the Work and does not justify a Change Order. Satisfaction of all self-insured retentions or deductibles will be the sole responsibility of the Contractor.

12.9 Subcontractor Insurance. The Contractor will cause each Subcontractor to purchase and maintain in full force and effect policies of insurance as specified in this Article 12, except that the coverage limits shall be at least \$1,000,000 combined single limit for each occurrence and in the aggregate. The Contractor will be responsible for the Subcontractors' coverage if the Subcontractors fail to purchase and maintain the required insurance. When requested by the Owner, the Contractor will furnish copies of Certificates of Insurance establishing coverage for each Subcontractor.

12.10 Limitations on Coverage.

12.10.1 No insurance provided by the Contractor under this Article 12 will be required to indemnify the Owner, the Architect, or their employees or agents to the extent of liability for death or bodily injury to persons or damage to property caused in whole or in part by their own negligence, but will require indemnity to the extent of the fault of the Contractor or its agents, representatives, or Subcontractors.

12.10.2 The obligations of the Contractor under this Article 12 will not extend to the liability of the Architect or its consultants for (a) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs, or specifications; or (b) the giving or failure to give directions or instructions to the extent that the directions, or failure to provide directions, are the cause of the injury or damage.

12.10.3 By requiring insurance, the Owner does not represent that coverage and limits will necessarily be adequate to protect the Contractor. Insurance in effect or procured by the Contractor will not reduce or limit the Contractor's contractual obligations to indemnify and defend the Owner for claims or suits that result from or are connected with the performance of the Contract.

12.11 Property Insurance

12.11.1 Builders Risk. Contractor, for the life of this Contract, shall effect and maintain Builders All Risk Insurance and fire insurance with extended coverage and malicious mischief coverage upon the structures on which the Work of this Contract is to be done to 100 percent (100%) of the insurable value thereof, protecting (1) Owner's interest; (2) Contractor's interest; and (3) the Subcontractor's interest in the Work. Contractor's interest and Subcontractor's interest, as used herein, means their property interests and the property interests of others for which they are responsible in the Project, in all materials and supplies entering into or used or destined for use therein, and in all expendable items of equipment that are used in or are incidental to but that do not become a part of the finished Project, located at the job Site at the time of loss or damage. Such insurance shall not exclude coverage for landslides, collapse, explosion, or loss due to the result of faulty workmanship. Such insurance will include coverage for soft costs or delay in opening.

12.11.1.1 Contractor and all Subcontractors shall be responsible for any loss or damage to their machinery and apparatus and nonexpendable items of their equipment.

12.11.1.2 Contractor shall provide adequate fire protection equipment and safeguards to protect Metro and Contractor's interests in accordance with Metro's insurance carrier's requirements.

12.11.1.3 Contractor will furnish copies of Certificates of Insurance establishing coverage prior to project start.

12.11.2 Contractor's Responsibility. Contractor must provide insurance for its own machinery, tools, equipment, or supplies that are not to become a part of the Project.

ARTICLE 13

MINORITY/WOMEN/EMERGING SMALL BUSINESS PROGRAM

13.1 Contractor shall comply with all pertinent provisions of Metro's MWESB Business Program that are contained in Metro Code 2.04.100 to 2.04.190 and that are by this reference expressly incorporated herein and made a part of this Contract.

13.2 Contractor shall not replace a minority, women-owned or emerging small business enterprise Subcontractor with another Subcontractor, either before Contract Award or during Contract performance, without prior written approval of Metro. In replacing a minority, women-owned or emerging small business Subcontractor, Contractor shall replace such minority, women-owned or emerging small business Subcontractor with another

Construction Agreement

MERC CONTRACT NO. 304037

certified minority, women-owned or emerging small business Subcontractor or make good faith efforts to do so. Failure to do so shall constitute Contractor's default of this Contract, and Metro, at its option, may terminate this Contract under the procedures set out in Article 15.

13.3 Metro reserves the right, at all times during the period of this Contract, to monitor Contractor's compliance with the terms of the MWESB Business Program and enforce the program if Contractor should fail to so comply. Contractor shall be bound by any and all representations made concerning its compliance with the program prior to Contract Award and any and all representations made by Contractor concerning the replacement of a minority or women-owned business Subcontractor during the performance of this Contract.

13.4 MWESB Participation in the Contract.

13.4.1 It is Metro's policy that Contractor shall take reasonable steps to ensure that Minority Business Enterprises (MBE), Women Business Enterprises (WBE), and Emerging Small Businesses (ESB) have the opportunity to participate in the Work.

13.4.2 Termination and Substitution of MWESB. The Contractor shall notify Metro in writing and confer with Metro before terminating or replacing a MWESB that has a signed contract with the Contractor.

13.4.3 Changes in Work Committed to MWESB. Metro will consider the impact on MWESB participation in instances where Metro changes, reduces, or deletes Work contracted to MWESB firms at the time of Contract Award. In such instances, the Contractor shall not be required to replace the Work but is encouraged to do so. If the Contractor proposes any changes that involve a contracted MWESB, the Contractor shall notify the MWESB of the proposed change, reduction, or deletion of any Work committed at the time of Contract Award prior to executing the Change Order. The Contractor can choose to enable the affected MWESB to participate in the Change Order request and is requested to make every effort to maintain the contracted MWESB percentage.

13.4.4 Contractor Payments to Subcontractors. The Contractor shall maintain records of all subcontracts entered into with MWESB firms and records of materials purchased from MWESB suppliers. Such records shall show the name and business address of each MWESB subcontractor or vendor and the total dollar amount actually paid to each MWESB subcontractor or vendor. The Contractor shall pay each subcontractor for satisfactory performance of its contract no later than ten (10) Calendar Days from receipt of each payment the Contractor receives from Metro. The Contractor shall also return Retainage payments to each subcontractor within ten (10) Calendar Days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above-referenced time frame may occur only for good cause following written approval of the Metro Project Manager. The Contractor shall submit a completed, signed original "Metro Monthly Subcontractor Payment and Utilization Report," available from Metro. The Contractor shall submit the form when a progress or final payment has been made to each subcontractor or supplier or when any held retainage is returned to a subcontractor or supplier. Contractor shall submit the form no later than the fifth day of each month. At the completion of the Project, Contractors shall submit a final form indicating the total amounts paid to all subcontractors and suppliers.

ARTICLE 14

MISCELLANEOUS STATUTORY RESPONSIBILITIES OF CONTRACTOR

Contractor shall keep itself fully informed of and shall fully comply with all federal, state, regional, and local laws, rules, regulations, ordinances, and orders pertaining in any manner to this Contract and those rules, regulations, and orders of any agency or authority having jurisdiction over the Work or those persons employed or engaged therein. Contractor shall pay all taxes, including federal, state, regional, county, and city, or taxes of any other governmental entity applicable to the Work performed or materials provided under this Contract.

ARTICLE 15

TERMINATION OR SUSPENSION OF THE WORK

15.1 Default of Contractor.

15.1.1 If Contractor should be adjudged bankrupt, or if Contractor should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of insolvency, or if Contractor should refuse to or fail to supply enough properly skilled workers or proper materials for the efficient prosecution of the Work, disregard laws, ordinances, or the instructions of Metro, or otherwise be in violation of any provision of the Contract, Metro may, without prejudice to any other right or remedy and after giving Contractor and Contractor's surety on the Performance Bond prior written notice, terminate the Contract or any portion of the Contract, which termination shall be effective ten (10) days after service of such notice. Such notice shall contain the reasons for the termination and shall state that unless, within ten (10) calendar days of service of the termination notice on Contractor, Contractor or its



Construction Agreement

MERC CONTRACT NO. 304037

surety on the Performance Bond shall have cured or shall have made, in Metro's opinion, appropriate arrangements for prompt cure of all of the cause(s) for termination cited in the notice of termination, the Contract shall terminate.

15.1.2 Upon termination, Metro may take possession of the premises and of all materials, tools, and appliances thereon, as well as all other materials whether on the premises or not, for which Contractor has received partial payment, and may finish the Work or the portion terminated by whatever method it may deem expedient.

15.1.3 In the event action as above indicated is taken by Metro, Contractor or Contractor's surety shall provide Metro with immediate and peaceful possession of all of the materials, tools, and appliances located on the premises, as well as all other materials whether on the premises or not, for which Contractor has received any progress payment. Upon termination, in the event that the surety does not complete the Contract, at the election of Metro, Contractor shall assign any and all subcontracts and material contracts to Metro or Metro's designee. Further, Contractor shall not be entitled to receive any further payment until the Work is completed. On completion of the Work, determination shall be made by Metro of the total amount Contractor would have been entitled to receive for the Work under the terms of the Contract had Contractor completed the Work. If the difference between said total amount and the sum of all amounts previously paid to Contractor, which difference will hereinafter be called the "unpaid balance," exceeds the expense incurred by Metro in completing the Work, including expense for additional managerial and administrative service, and all other costs, damages, and expenses incurred by Metro due to Contractor's failure to complete the Contract, such excess will be paid to Contractor, with the consent of the surety. If, instead, the described expenses incurred by Metro exceed the unpaid balance, the amount of the excess shall be paid to Metro by Contractor or its surety. If only a portion of the Contract is terminated, this Section shall be deemed to apply to that portion of the Work only.

15.1.4 In addition to the above-mentioned right, Metro shall have the right, at its option, to suspend all or part of Contractor's performance under the Contract should any of the events occur that give Metro the right to terminate the Contract as above described. In such event, Metro shall give Contractor and Contractor's surety prior written notice of such suspension and Contractor shall stop or cause to stop all such Work under the Contract immediately on receipt of such notice and shall not commence such Work under the Contract again unless and until Contractor shall receive written notice from Metro to proceed. Metro shall not be responsible or liable to Contractor or others for any costs or expenses of whatever nature related to Contractor's failure to stop Work as directed by Metro.

15.1.5 After receipt of a notice of termination or suspension, and except as otherwise directed by Metro, Contractor shall as it relates to those portions of the Contract terminated or suspended:

15.1.5.1 Stop Work under the Contract on the date and to the extent specified in the notice of termination or suspension.

15.1.5.2 Place no further orders or subcontracts, or suspend the same, as applicable, for materials, services, or facilities except as necessary to complete the portion of the Work under the Contract that is not terminated or suspended.

15.1.5.3 Terminate or suspend, as applicable, all orders and subcontracts to the extent that they relate to the performance of such Work terminated or suspended.

15.1.6 Metro may, at its discretion, avail itself of any or all of the above rights or remedies and its invoking of any one of the above rights or remedies will not prejudice or preclude Metro from subsequently invoking any other right or remedy set forth above or elsewhere in the Contract.

15.1.7 None of the foregoing provisions shall be construed to require Metro to complete the Work nor to waive or in any way limit or modify the provisions of the Contract relating to the fixed and liquidated damages suffered by Metro on account of failure to complete the Project within the time prescribed.

15.2 Termination in the Public Interest.

15.2.1 Metro may unilaterally terminate the Contract in whole or in part for convenience, when Metro determines it to be in the public interest.

15.2.2 When Metro decides to terminate a Contract for convenience, Metro will notify the Contractor and its sureties in writing of its intention to terminate the Contractor's right to proceed with the Work no less than seven (7) days in advance of the date of the actual termination. The date of termination, which is the date after which no Work is to be performed, must be stated in the notice. Notice will be deemed to have been given if sent to the Contractor's or any surety's last known address provided to Metro by the Contractor and its sureties. For purposes of computing time in this Section, the first day counted is the day that the notice is mailed by Metro.

15.2.3 After receipt of a notice of termination, and except as directed by Metro, the Contractor will immediately proceed with the following obligations:

15.2.3.1 Stop Work by the date as specified in the notice;

Construction Agreement

MERC CONTRACT NO. 304037

15.2.3.2 Award no further subcontracts and place no further orders for materials, services, or facilities, except as necessary to complete the continued portion of the Contract, if any;

15.2.3.3 Terminate all Subcontractors and orders to the extent that they relate to the Work terminated;

15.2.3.4 Assign to Metro, if directed by Project Manager, all right, title, and interest of the Contractor under the subcontracts terminated, in which case Metro will have the right to settle or to pay any termination settlement proposals arising out of those terminations;

15.2.3.5 With approval or ratification to the extent required by Metro, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts; the approval or ratification will be final for purposes of this clause;

15.2.3.6 As directed by Metro, transfer title and deliver to Metro (a) the fabricated or unfabricated parts, Work in process, completed Work, supplies, and other materials produced or acquired for the Work terminated, and (b) the completed or partially completed plans, drawings, information, and other property that, if the Contract had been completed, would be required to be furnished to Metro;

15.2.3.7 Take any actions that may be necessary, or that Project Manager may direct, for the protection and preservation of the property related to this Contract that is in the possession of the Contractor and in which Metro has or may acquire an interest; and

15.2.3.8 Use its best efforts to sell, as directed or authorized by Project Manager, any property of the type referred to in Section 14.2.3.6 above, except that the Contractor (a) is not required to extend credit to any purchaser and (b) may acquire the property under the conditions prescribed by, and at prices approved by, the Project Manager. The process of any transfer or disposition will be applied to reduce any payments to be made by Metro under this Contract, credited to the price or cost of the Work, or paid in any other manner directed by Project Manager.

15.2.4 Upon termination, Metro will pay the Contractor the following costs, and no other, as a result of the termination:

15.2.4.1 With regard to the Contract Work performed before the effective date of termination, the total (without duplication of any items) of the following costs:

15.2.4.1.1 The cost of this Work, as determined by the method of payment established by the Contract Documents;

15.2.4.1.2 The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the Contract if such costs are not included in Section 14.2.3.4; and

15.2.4.1.3 A sum as profit on Section 14.2.4.1.1 above, not to exceed ten percent of that amount, unless it appears that the Contractor would have sustained a loss on the entire Contract had it been completed. No profit, however, is permitted on costs compensated under Section 14.2.4.1.2.

15.2.4.2 The reasonable costs of settlement of the Work terminated, including:

15.2.4.2.1 Accounting, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data, except that no allowance will be made for costs incurred as attorney fees;

15.2.4.2.2 The termination and settlement of Subcontractors (excluding the amounts of such settlements); and

15.2.4.2.3 Storage, transportation, and other costs incurred reasonably necessary for the preservation, protection, or disposition of the termination inventory.

15.2.5 No costs other than those allowed in Section 14.2.4 are to be paid. By way of example only, and not by way of limitation, costs that would not be allowed include anticipated profits on unperformed Work, consequential damages, post-termination overhead, Bid or Proposal preparation costs, costs for retraining employees, depreciation on idle equipment, cost of common items reasonably usable on the Contractor's other work, and costs unrelated to the Work performed prior to the date of termination.

15.2.6 Metro may deduct from any sums otherwise due the Contractor under Section 14.2.4 above the cost of advance payments made to the Contractor under the terminated portion of this Contract, any claim that Metro has against the Contractor whether or not arising from this Contract, and the agreed price of, or proceeds of sale of, materials, supplies, or other things acquired by the Contractor or sold under the provision of Section 14.2.3.8 and not recovered by or credited to Metro.

Construction Agreement

MERC CONTRACT NO. 304037

15.2.7 Payment from Metro is not due until the Contractor has submitted an itemization of its recoverable costs to Metro in writing, together with supporting documentation. The Contractor will supply additional supporting documentation on request by Metro in order to recover its costs.

15.2.8 The Contractor will maintain all records and documents relating to the termination until Metro and the Contractor resolve the amount of costs to be paid by Metro to the Contractor as a result of this termination. Such records must be made available to Metro within thirty (30) days of the request.

END OF SECTION

Construction Agreement

MERC CONTRACT NO. 304037

METRO GENERAL CONDITIONS - EXHIBIT 1

WARRANTY FORM

We the undersigned hereby warrant that the [DESCRIBE WORK PERFORMED OR MATERIALS SUPPLIED].that we have provided for [INSERT PROJECT NAME] has been done in accordance with the Contract Documents and that the Work as provided will fulfill the requirements of the warranty included in Article 7 of the Metro General Conditions.

We agree to correct or remove and replace any or all of our Work, together with any other adjacent Work that may be displaced or affected by so doing, that may be defective in its workmanship or materials, or that may fail to conform to the requirements of the Contract Documents, within a period of one (1) year following the later of the date of substantial completion or the date described in Section 7.7 of the Metro General Conditions, without any expense whatsoever to Metro, normal wear and tear and mistreatment excepted.

In the event of our failure to comply with the above-mentioned conditions within twenty (20) calendar days after Metro notifies Contractor in writing, we collectively and separately do hereby authorize Metro to proceed to have said defects repaired and corrected at our expense, and we will honor and pay the costs to dispose of nonconforming materials and charges therefore upon demand. If Metro is required to enforce payment, it shall be entitled to recover its costs and reasonable attorney fees.

CONTRACTOR

By_____

Print Name_____

Date_____

SUBCONTRACTOR

By_____

Print Name_____

Date_____



Metro

600 NE Grand Ave.
Portland, OR 97232-2736
503-797-1700

Construction Agreement

MERC CONTRACT NO. 304037

METRO GENERAL CONDITIONS - EXHIBIT 2

SUBCONTRACTOR ASSIGNMENT OF ANTITRUST CLAIMS

Project: _____

Owner: Metro

General Contractor: _____

Subcontractor: _____

Release Date: _____

1. By entering into a contract with the General Contractor, subcontractor, for consideration paid to subcontractor under the subcontract, does irrevocably assign to Metro any claim for relief or cause of action that subcontractor now has or that may accrue to Subcontractor in the future, including at Metro's option, the right to control any such litigation on such claim for relief or cause of action, by reason of any violation of 15 USC Section 1 15, ORS 646.725, or ORS 646.730 in connection with any goods or services that are used, in whole or in part, for the purpose of carrying out subcontractor's obligations under its subcontract with the General Contractor.

2. Subcontractors irrevocably assigns to Metro, as a third-Party beneficiary of the subcontract, any right, title, or interest that has accrued or may accrue to the Subcontractor by reason of any violation of 15 USC Section 1 15, ORS 646.725, or ORS 646.730, including, at Metro's option, the rights to control any litigation arising hereunder, in connection with any goods or services provided to the Subcontractors or Suppliers by any person, in whole or in part, for the purpose of carrying out the Subcontractor's obligations as agreed to by Subcontractor in pursuance of the completion of the Contract .

3. It is an express obligation of Subcontractor that it will take no action that will in any way diminish the value of the rights conveyed or assigned hereunder to Metro. It is an express obligation of Subcontractor to advise the Office of Metro Attorney:

a. In advance, of its intention to commence any action on its own behalf regarding such claims for relief or causes of action;

b. Immediately, upon becoming aware of the fact that an action has been commenced on its own behalf by some other person or persons, of the imminency of such action; and

c. the date on which it notified the obligor(s) of any such claims for relief or causes of action of the fact of its assignment to Metro.

4. In the event that any payment under any such claim is made to Subcontractor, it shall promptly pay over to Metro its proportionate share thereof, if any, assigned to Metro herein.

SUBCONTRACTOR

By _____

Print Name _____

Date _____



Construction Agreement

MERC CONTRACT NO. 304037

METRO GENERAL CONDITIONS - EXHIBIT 3

AFFIDAVIT, AGREEMENT FOR INDEMNITY, LIEN WAIVER AND RELEASE

(General Contractor – Progress Payment)

This AFFIDAVIT, AGREEMENT FOR INDEMNITY, LIEN WAIVER AND RELEASE is entered into _____, by and between Metro, a Metropolitan Service District established pursuant to Oregon law and the Metro Charter ("Metro") and _____, (the "Undersigned") in accord with Metro Contract No. _____, dated _____, between Metro and the Undersigned for construction of _____ (the "Contract"). As a condition precedent to Metro's Progress Payment No. _____ under the Contract in the amount of \$_____, and in consideration thereof, the Undersigned agrees to make the following representations, warranties, covenants, agreements, and indemnities, and to fully and completely waive, release, and discharge Metro from all liabilities, obligations, and claims arising under the Contract, as follows:

1. The Undersigned hereby certifies, represents, and warrants as follows:

1.1 It has supplied labor, services, equipment, materials, and materials provided or transported to the construction of the _____ as General Contractor under the Contract (the "Project"), and has subcontracted with other persons and entities to so provide.

1.2 It has complied with all federal, state, and local laws, including social security laws, unemployment compensation laws, workers' compensation laws, and tax laws, insofar as applicable to the performance of the Contract work, and has paid all federal, state, and local taxes including excise, use, sales, and withholding taxes.

1.3 All subcontractors, laborers, service providers, equipment suppliers and material suppliers, and transporters for work, services, equipment, or materials supplied to the Project or to the Undersigned and used in the Project have been paid in full by the Undersigned through the period covered by previous progress payments made by Metro.

1.4 It either has paid in full, or within ten (10) business days of receipt of the above set forth Progress Payment, will pay in full all subcontractors, laborers, service providers, equipment suppliers and material suppliers, and transporters for work, services, equipment, or materials supplied to the Project or to the Undersigned connected with or used in the Project, through the period covered by said progress payment made by Metro.

1.5 It has delivered to Metro written releases of all rights to file claims on any bonds in connection with the Contract, signed by each subcontractor, service provider, and supplier who performed work or services, or furnished or transported materials or equipment in connection with the Contract, in accord with Article 9 of the Metro General Conditions to the Contract.

2. The Undersigned acknowledges and agrees that Progress Payments made by Metro up to the date hereof, in the sum of _____, plus Progress Payment No. _____, when paid, constitute payment in full of all amounts due to Undersigned for all labor, services, equipment, and materials provided or transported in connection with the Project up to and through _____, _____, as set forth in the Undersigned's payment application No. _____. The Undersigned agrees that, ***upon receipt of the above set forth progress payment***, which is the full payment due and owing to Undersigned up to and through the date set forth in section 2, Undersigned will be paid in full for all labor (including contributions and benefits), services, equipment, supplies, and materials provided or transported in connection with the Project without exceptions, and that there are no other unsettled claims or demands therefore. The Undersigned agrees that, ***conditioned upon receipt of the above set forth progress payment***, and in consideration thereof, the Undersigned hereby fully and unconditionally waives and releases Metro from all liability for payment, liens or claims of lien, rights to lien, bond claim rights, and any other claim for payment it now has or asserts or may have or assert for labor, services, equipment, materials, and materials provided or transported in connection with the Project through and up to said date, and further releases Metro, the Project land and improvements from any claim, cause of action, or demand whatsoever, arising out of or relating to the Project that arose on or before said date.

3. The Undersigned hereby agrees to promptly pay and obtain a release of claims on any bonds that may in the future affect the Project, and defend, indemnify, and save Metro harmless from any liability or expense because of any claim on any bond or any other claim related to the work under the Contract through and up to the date set forth in section 2.

4. The affiant signing below does hereby swear and attest that he/she has the full authority to sign this document on behalf of the Undersigned and that Metro may rely on this Affidavit, Agreement for Lien Waiver and Release in connection with remitting Progress Payment No. _____ to Undersigned.

Dated: _____ Affiant: _____ Its: _____
STATE OF OREGON)
County of _____)
This instrument was acknowledged before me on _____ by _____ as _____
_____ of _____

Notary Public - State of Oregon



Construction Agreement

MERC CONTRACT NO. 304037

METRO GENERAL CONDITIONS - EXHIBIT 4

AFFIDAVIT, AGREEMENT FOR INDEMNITY, LIEN WAIVER AND RELEASE

(General Contractor – Final Closeout)

This AFFIDAVIT, AGREEMENT FOR INDEMNITY, LIEN WAIVER AND RELEASE is entered into _____, by and between Metro, a Metropolitan Service District established pursuant to Oregon law and the Metro Charter ("METRO") _____, (the "Undersigned") in accord with Metro Contract No. _____, dated _____, between Metro and the Undersigned for construction of the _____ (the "Contract"). As a condition precedent to Metro's final payment under the Contract, in the amount of _____ (the "Final Payment"), and in consideration thereof, the Undersigned agrees to make the following representations, warranties, covenants, agreements and indemnities, and to fully and completely waive, release and discharge Metro from all liabilities, obligations, and claims arising under the Contract, as follows:

1. The Undersigned hereby certifies, represents and warrants as follows:

1.1 It has supplied labor, services, equipment, materials or materials transported to the construction of the _____ as General Contractor under Metro Contract No. _____ (the "Project"), and has subcontracted with other persons and entities to so provide.

1.2 It has complied with all federal, state and local laws, including social security laws, unemployment compensation laws, workers' compensation laws, and tax laws, insofar as applicable to the performance of the Contract work, and has paid all federal, state and local taxes including excise, use, sales and withholding taxes.

1.3 All subcontractors, laborers, service providers, equipment suppliers and material suppliers and transporters for work, services, equipment or materials supplied to the Project or to the Undersigned and used in the Project have been paid in full by the Undersigned through the period covered by previous progress payments made by Metro.

1.4 It either has paid in full, or within ten (10) business days of receipt of the Final Payment, will pay in full all subcontractors, laborers, service providers, equipment suppliers and material suppliers and transporters for work, services, equipment or materials supplied to the Project or to the Undersigned connected with or used in the Project.

1.5 It has delivered to Metro written releases of all rights to file claims on any bonds in connection with the Contract, signed by each subcontractor, service provider and supplier who performed work, services or furnished or transported materials or equipment in connection with the Contract, in accord with Article 9 of the General Conditions to the Contract.

2. The Undersigned covenants and agrees that progress payments made by Metro up to the date hereof, in the sum of \$ _____, plus the Final Payment in the amount of _____, constitute full and final payment of all amounts due to Undersigned for all labor, services, equipment, and materials provided or transported in connection with the Project. The Undersigned agrees that, ***conditioned upon receipt of the Final Payment***, and in consideration thereof, the Undersigned hereby fully and unconditionally waives, discharges and releases Metro from all liabilities, obligations and claims, including all liens, claims of lien, rights to lien, bond claim rights and any other claim for payment it now has or asserts or may have or assert for labor, services, equipment, materials provided or transported in connection with the Contract, and further releases Metro, the Project land and improvements from any claim, cause of action, or demand whatsoever arising out of or relating to the Project.

3. The Undersigned hereby agrees to defend, indemnify and hold Metro harmless from any liability or expense resulting from any claim on any bond or any other claim related to the Contract or work there under, in accord with Articles 9 and 1 of the General Conditions to the Contract.

4. The affiant signing below does hereby swear and attest that he/she has the full authority to sign this document on behalf of the Undersigned and that, ***except for the Final Payment***, which is the full and final payment due and owing to Undersigned, that Undersigned has been paid in full for all labor (including contributions and benefits), services, equipment, supplies and materials provided or transported in connection with the Project without exceptions, and that there are no other unsettled claims or demands therefore. The Undersigned affiant further acknowledges that Metro may rely on this Affidavit, Agreement for Indemnity, Lien Waiver and Release in connection with remitting the Final Payment to Undersigned.

Dated: _____ Undersigned: _____

By: _____ Its: _____

STATE OF OREGON)
) ss.

County of _____)

This instrument was acknowledged before me on _____ by _____ as _____
_____ of _____

Notary Public - State of Oregon



Metro

600 NE Grand Ave.
Portland, OR 97232-2736
503-797-1700

Construction Agreement

MERC CONTRACT NO. 304037

METRO GENERAL CONDITIONS - EXHIBIT 5

AFFIDAVIT, LIEN WAIVER AND RELEASE – CONDITIONAL FINAL

(Subcontractor - Closeout)

1. The undersigned, _____ (“Undersigned”), has provided labor, services, equipment, materials or materials transport to the construction of the improvements at _____ known as _____, as a Subcontractor to _____ (“Contractor”), Metro Contract No. _____ (the “Project”).

2. The Undersigned acknowledges and agrees that the sum of \$_____ constitutes full and final payment of all amounts due to Undersigned for all labor, services, equipment, and materials provided or transported in connection with the Project (the “Final Payment”). The Undersigned agrees that, ***conditioned upon receipt of the Final Payment***, and in consideration thereof, the Undersigned hereby fully and unconditionally waives and releases all liens, claims of lien, rights to lien, bond claim rights and any other claim for payment it now has or asserts or may have or assert for labor, services, equipment, materials provided or transported in connection with the Project, and further releases Metro, the Project land and improvements, and the Contractor from any claim, cause of action, or demand whatsoever arising out of or relating to the Project.

3. The Undersigned hereby certifies as follows:

3.1 It has complied with all federal, state and local laws, including tax laws, social security laws, unemployment compensation laws and workers’ compensation laws, insofar as is applicable to the performance of the subcontract work.

3.2 Its laborers, equipment suppliers and material suppliers have been fully paid through the period covered by previous progress payments made by Contractor except as explicitly noted in writing and attached hereto.

3.3 It either has paid in full, or within five (5) business days of receipt of the Final Payment, will pay in full for all labor, materials and equipment used in or furnished in connection with Project.

4. The affiant signing below does hereby swear and attest that he/she has the full authority to sign this document on behalf of the Undersigned and that, ***conditioned upon receipt of the Final Payment***, which is the full and Final Payment due and owing to Undersigned, that Undersigned has been paid in full for all labor (including contributions and benefits), services, equipment, supplies and materials provided or transported in connection with the Project without exceptions, and that there are no other unsettled claims or demands therefore. The Undersigned affiant and further acknowledges that Metro and Contractor are relying on this Affidavit, Lien Waiver and Release in connection with processing the Final Payment.

Dated: _____ Undersigned | Subcontractor: _____
By: _____
Print Name: _____
Its: _____

STATE OF OREGON)
) ss.
County of Multnomah)

This instrument was acknowledged before me on _____ by _____ as _____
_____ of _____.

Notary Public - State of Oregon

TECHNICAL SPECIFICATIONS

EXPO Center Stormwater Wall

Permit Set

February 24, 2014

Project Number: 113005.2

Prepared by: GreenWorks, P.C.
Landscape Architects
24 NW 2nd Avenue, Suite 100
Portland, Oregon 97209



Stamp or Seal	Company	Applicable Details and Specifications
	GreenWorks, P.C. 	Specifications as noted in Table of Contents Sections: 024119 071113 129300 221413 328000 329300
	Cascade Design Professionals, Inc. 	Specifications as noted in Table of Contents Sections: 033000 055000

TABLE OF CONTENTS

Number	SECTION TITLE
024119	SELECTIVE DEMOLITION
033000	CAST-IN-PLACE CONCRETE
055000	METAL FABRICATIONS
071113	BITUMINOUS DAMPPROOFING
129300	SITE FURNISHINGS
221413	FACILITY STORM DRAINAGE PIPING
328000	IRRIGATION
329300	PLANTS

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Demolition and removal of selected site elements.
 - 2. Excavation

- B. Related Requirements:

- 1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
 - 2. Section 017300 "Execution" for cutting and patching procedures.
 - 3. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- C. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
- D. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- E. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.
- F.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review methods and procedures related to excavation.
 - 3. Review structural load limitations of existing structure.
 - 4. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 5. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 6. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property , for environmental protection , for dust control and , for noise control. Indicate proposed locations and construction of barriers.
- B. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Coordination for shutoff, capping, and continuation of utility services.
 - 3. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Predemolition Photographs or Video: Submit before Work begins.

1.7 CLOSEOUT SUBMITTALS

- A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.8 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Owner's Representative of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

- E. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.
- F.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove plumbing and components indicated to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by excavation operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.
- D. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

3.4 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.5 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
 - 2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

3.6 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.7 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.8 SUBGRADE INSPECTION

- A. Notify Owner's Representative when excavations have reached required subgrade.
- B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Owner's Representative, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation.

3.10 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Proceed with selective demolition systematically, from higher to lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. .
 3. Dispose of demolished items and materials promptly.
- B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition.

3.11 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and and dispose legally off-site.

3.12 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished and excavated materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Burning: Do not burn demolished materials.
- B. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.13 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
 - 1. Footings
 - 2. Planter Walls
 - 3. Slabs-on-grade
- B. Related Sections include the following:
 - 1. Section 071113; Bituminous Dampproofing

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Welding Certificates
- D. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Steel reinforcement and accessories.
 - 3. Semirigid joint filler.
 - 4. Joint-filler strips.

5. Repair materials.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- D. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."
- E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1.6 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 2. Products: Subject to compliance with requirements, provide one of the products specified.
 3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 FORM-FACING MATERIALS

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

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM A 615/A 615M, Grade 60, deformed bars, assembled with clips.

2.4 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 1. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.5 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I, gray.
- B. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
- C. Water: ASTM C 94/C 94M and potable.

2.6 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260. The amount of entrained air shall be 5%+/- 1% by volume.
- B. Water-Reducing Admixture: Conforming to ASTM C494, used in strict accordance with the manufacturers' recommendations, shall be incorporated in the concrete design mix. A high-range water-reducing (HRWR) admixture conforming to ASTM C494, Type F or G, may be used in concrete mixes providing that the slump does not exceed 10".
- C. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.7 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.

2.8 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

2.9 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Admixtures: Use admixtures according to manufacturer's written instructions.

2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.50.
 3. Slump Limit: 4 inches, plus or minus 1 inch.
 4. Air Content: 5-1/2 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
 5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
- B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 3000 psi at 28 days.
 2. Minimum Cementitious Materials Content: 470 lb/cu. yd..
 3. Slump Limit: 4 inches, plus or minus 1 inch.
 4. Air Content: 5-1/2 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
 5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
 6. Synthetic Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd..
- C. Walls and Curbs: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.45.
 3. Slump Limit: 8 inches.
 4. Air Content: 5-1/2 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.

2.11 FABRICATING REINFORCEMENT

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

2.12 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 - 1. Class A, 1/8 inch for smooth-formed finished surfaces.
 - 2. Class B, 1/4 inch for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete as shown on drawings.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of walls and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by **Owner's Representative**.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Weld reinforcing bars according to AWS D1.4, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
- F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.
- G. Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement.

3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by **Owner's Representative**.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Space vertical joints in walls as indicated.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces such as foundation walls, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
 - 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.6 WATERSTOPS

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.7 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by **Owner's Representative**.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement: Comply with ACI 301 and as follows:

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

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply light sand blast finish and sealer to concrete surfaces exposed to public view.

C. Broom Finish: Apply a broom finish to flush concrete curb.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to foundation and planter walls. Coordinate required final finish with **Owner's Representative** before application.

3.9 MISCELLANEOUS CONCRETE ITEMS

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

B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.10 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project..
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.11 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.

- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.12 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
 - 1. Steel reinforcement placement.
 - 2. Steel reinforcement welding.
 - 3. Headed bolts and studs.
 - 4. Verification of use of required design mixture.
 - 5. Concrete placement, including conveying and depositing.
 - 6. Curing procedures and maintenance of curing temperature.
 - 7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
 - 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
 - 5. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 - 6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

- a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
7. Test results shall be reported in writing to **Owner's Representative**, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
8. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by **Owner's Representative** but will not be used as sole basis for approval or rejection of concrete.
9. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by **Owner's Representative**. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by **Owner's Representative**.
10. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
11. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 03300

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Steel framing and supports for stormwater wall frame
 - 2. Aluminum stormwater channel assemblies.
 - 3. Aluminum Expogon assemblies.
 - 4. Steel supports and grates in planter.
 - 5. Aluminum tube down spouts and diverter boxes
 - 6. Surface Preparation and application of paint systems on steel substrates.

- B. Products furnished, but not installed, under this Section include the following:

- 1. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
 - 2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

- C. Related Requirements:

- 1. Section 033000 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:

- 1. Paint products.
 - 2. Grout.

- B. Samples for Verification: For aluminum Stormwater Channel and painted steel framing.

1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- C. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces .

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.3 STEEL

- A. Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- C. Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

2.4 STAINLESS STEEL

- A. Tubing: ASTM A 554, Grade MT 304.
- B. Pipe: ASTM A 312/A 312M, Grade TP 304.
- C. Bars and Shapes: ASTM A 276, Type 304 .
- D. Plate and Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304.

2.5 ALUMINUM

- A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.
- B. Plate and Sheet: ASTM B 209, Alloy 6061-T6.
- C. Extruded Tubing: ASTM B 221, Alloy 6063-T5/T52
- D. Perforated Metal: Aluminum sheet, ASTM B 209, Alloy 6061-T6
 - 1. Basis-of-Design Product: Provide product with perforations matching product indicated on Drawings Drawings available from The Western Group - 4025 NW Express Ave, Portland, OR 97210 - (503) 222-1644.
- E. Woven-Wire Mesh: Intermediate-crimp, square pattern, 1/2-inch woven-wire mesh, made from 0.162-inch- diameter wire complying with ASTM B 211, Alloy 6061-T94.

2.6 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless-steel fasteners for fastening aluminum.
 - 2. Provide stainless-steel fasteners for fastening stainless steel.
- B. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 1 .

- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
- D. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
- E. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; ASTM A 1554, Grade 36. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

2.7 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Section 099113 "Exterior Painting."
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- D. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

2.8 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.9 FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
 1. Fabricate units from slotted channel framing where indicated.
 2. Furnish inserts for units installed after concrete is placed.
- C. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise indicated.
 1. Unless otherwise indicated, fabricate from Schedule 40 steel pipe.
 2. Unless otherwise indicated, provide 3/4-inch baseplates with four 3/4-inch anchor bolts and 1-inch top plates.
- D. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.10 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive size bolts and anchors indicated, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.

1. Provide mitered and welded units at corners.
 2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches larger than expansion or control joint.
- B. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.11 FINISHES, GENERAL

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.
- C. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.12 STEEL FINISHES

- A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.
1. Color shall be **xxxxxx** and shall match finish of Living Screen specified in Section 129300-Site Furnishings.

2.13 ALUMINUM FINISHES

- A. Aluminum Stormwater Channels, Aluminum tube downspouts and diverter boxes and Expogons:
1. Exterior exposed surfaces: AA-M32 – Brushed medium satin finish with grain running parallel with long dimension of channels and tube, horizontal with ground on Expogons.
 2. Interior surfaces of Stormwater Channels: AA-M12
 3. Apply Coricone 1700 Sealer for Non-Ferrous Metals to all exposed exterior surfaces according to manufacturer specifications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Install all components of assembly level, plumb, true, and positioned at locations indicated on Drawings.
- G. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
 - 1. Cast Aluminum: Heavy coat of bituminous paint.
 - 2. Extruded Aluminum: Two coats of clear lacquer.

3.3 INSTALLING BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099113 "Exterior Painting."

END OF SECTION 055000

SECTION 071113 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Cold-applied, emulsified-asphalt dampproofing.
- B. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete" for bituminous vapor retarders.

1.3 ACTION SUBMITTALS

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

1.4 FIELD CONDITIONS

- A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit dampproofing to be performed according to manufacturers' written instructions.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain primary dampproofing materials and primers from single source from single manufacturer. Provide protection course molded-sheet drainage panels and auxiliary materials recommended in writing by manufacturer of primary materials.

2.2 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. As manufactured by: APOC, Inc; a division of Gardner Industries; Henry Company; ITW Polymers Sealants North America (formerly Pacific Polymers, Inc.), or approved equal.
- B. Trowel Coats: ASTM D 1227, Type II, Class 1.
- C. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class 1.

- D. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.

2.3 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.
- B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.
 - 1. Primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I.
- D. Patching Compound: Epoxy or latex-modified repair mortar Asbestos-free fibered mastic of type recommended in writing by dampproofing manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions with Applicator present, for compliance with requirements for surface smoothness, surface moisture, and other conditions affecting performance of bituminous dampproofing work.
 - 1. Test for surface moisture according to ASTM D 4263.
- B. Proceed with application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
- B. Clean substrates of projections and substances detrimental to the dampproofing work; fill voids, seal joints, and remove bond breakers if any, as recommended in writing by prime material manufacturer.
- C. Apply patching compound to patch and fill tie holes, honeycombs, reveals, and other imperfections.

3.3 APPLICATION, GENERAL

- A. Comply with manufacturer's written instructions for dampproofing application, cure time between coats, and drying time before backfilling unless more stringent requirements are indicated.
 - 1. Apply dampproofing to provide continuous plane of protection.
 - 2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.
- B. Apply dampproofing to all interior concrete planter wall surfaces below finished grade line. Do not extend onto surfaces exposed to public view.
 - 1. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where shown as "reinforced," by embedding an 8-inch- wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.

3.4 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Unexposed Face of Concrete Planter Walls: Apply one brush or spray coat at not less than 1.25 gal./100 sq. ft..

3.5 CLEANING

- A. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 071113

SECTION 129300 - SITE FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following site and street furnishings:
 - 1. Living Screen.
 - 2. Rain Cable
 - 3. Expogon Brackets
- B. Related Sections include the following:
 - 1. Section 055000; Metal Fabrications

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, field-assembly requirements, and installation details.
- B. Samples for Initial Selection: For units with factory-applied color finishes.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 - 1. Size: Not less than 6-inch- long linear components and 4-inch- square sheet components.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of site furnishing through one source from a single manufacturer.

PART 2 - PRODUCTS

2.1 SCREEN

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Livingscreen or approved equal, as manufactured by The Western Group, 4025 NW Express Ave, Portland OR 97210, 503-222-1644. <http://www.thewesterngroup.com/>

B. Panels:

1. Provide Livingscreen panels in dimensions as shown on drawings with standard edge flange.
2. Tolerance: 1/8 inch in width and 1/4 inch in length.

C. Accessories:

1. Brackets for mounting Expogons: Provide varying length mounting brackets manufactured by The Western Group as shown on the Drawings.

D. Finishes:

1. Metal components (except fasteners) shall be factory finished after fabrication.
2. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.
3. Color: Color shall be xxxxx.
4. Touch-Up Paint: Provide high quality, exterior-grade spray paint suitable for conditions of use to match color of powder coat finish.

2.2 RAIN CABLE

A. Products: Subject to compliance with requirements, provide the following:

1. Rain Cable:
 - a. Stainless steel wire rope, threaded and termination stud assemblies as indicated on the Drawings and manufactured by Rail-Co International or approved equal. PO Box 5999, Portland OR 97228 – 888-696-8943 <http://railco.wcwr.com>

2.3 MATERIALS

- A. Anchors, Fasteners, Fittings, and Hardware: Stainless steel; commercial quality; tamperproof, vandal and theft resistant; concealed, recessed, and capped or plugged. Provide as required for site and street furnishings' assembly, mounting, and secure attachment.

2.4 FABRICATION

- A. Exposed Surfaces: Polished, sanded, or otherwise finished; smooth all surfaces, free from burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.

2.5 FINISHES, GENERAL

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are

acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Complete field assembly of site furnishings, where required.
- B. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.

3.3 CLEANING

- A. After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

END OF SECTION 129300

SECTION 221413 – FACILITY STORM DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe, tube, drains and fittings.

1.3 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
 - 1. Storm Drainage Piping: 10-foot head of water.

1.4 ACTION SUBMITTALS

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

1.5 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF/ANSI 14, "Plastics Piping System Components and Related Materials," for plastic piping components. Include marking with "NSF-drain" for plastic drain piping and "NSF-sewer" for plastic sewer piping.

PART 2 - PRODUCTS

2.1 ABS PIPE AND FITTINGS

- A. Solid-Wall ABS Pipe: ASTM D 2661, Schedule 40.
- B. Cellular-Core ABS Pipe: ASTM F 628, Schedule 40.
- C. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.

D. Solvent Cement: ASTM D 2235.

1. ABS solvent cement shall have a VOC content of 325 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 PERFORATED PIPE

- A. Rigid Perforated PVC Sewer Pipe and Fittings: ASTM D 2729, bell-and-spigot ends, for loose joints. Sizes as shown on Drawings.

2.3 SPECIALTY PIPE FITTINGS

A. Transition Couplings:

1. General Requirements: Fitting or device for joining piping with small differences in OD's or of different materials. Include end connections same size as and compatible with pipes to be joined.
2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified-piping-system fitting.
3. Unshielded, Nonpressure Transition Couplings:
 - a. Standard: ASTM C 1173.
 - b. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
 - c. Sleeve Materials:
 - 1) For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
 - 2) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
4. Shielded, Nonpressure Transition Couplings:
 - a. Standard: ASTM C 1460.
 - b. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

2.4 DRAINS

- A. Atrim drain: as shown in the Drawings and manufactured by NDS or approved equal. Polyolefin construction.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate location and arrangement of piping systems. Install piping as indicated unless deviations from layout are approved on coordination drawings.
- B. Install piping at indicated slopes.
- C. Install piping free of sags and bends.
- D. Install fittings for changes in direction and branch connections.
- E. Make changes in direction for storm drainage piping using appropriate branches, bends, and long-sweep bends. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- F. Install aboveground ABS piping according to ASTM D 2661.
- G. Plumbing Specialties:
 - 1. Install drains in storm drainage gravity-flow piping as shown in Drawings and per manufacturer specifications.
- H. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
- I. Install sleeves for piping penetrations of walls as shown in the Drawings.
- J. Install sleeve seals for piping penetrations of concrete walls and slabs as shown in the Drawings.

3.2 JOINT CONSTRUCTION

- A. Plastic, Nonpressure-Piping, Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
 - 3. PVC Piping: Join according to ASTM D 2855 and ASTM D 2665 Appendixes.
- B. Join perforated PVC sewer pipe and fittings according to ASTM D 3212 with loose bell-and-spigot, push-on joints.

3.3 SPECIALTY PIPE FITTING INSTALLATION

- A. Transition Couplings:

1. Install transition couplings at joints of piping with small differences in OD's.
2. In Drainage Piping: Unshielded, nonpressure transition couplings.
3. In Aboveground Force-Main Piping: Fitting-type transition couplings.
4. In Underground Force-Main Piping:
 - a. NPS 1-1/2 and Smaller: Fitting-type transition couplings.
 - b. NPS 2 and Larger: Pressure transition couplings.

3.4 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect storm drainage overflow piping to exterior existing storm drainage piping as shown in Drawings. Use transition fitting to join dissimilar piping materials.

3.5 FIELD QUALITY CONTROL

- A. Test storm drainage piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
 1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced storm drainage piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 3. Test Procedure: Test storm drainage piping on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts until completion of inspection, water level must not drop. Inspect joints for leaks.
 4. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 5. Prepare reports for tests and required corrective action.

3.6 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION 221413

SECTION 328000-IRRIGATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, apply to this Section.

1.2 SUMMARY

- A. Work of this section includes all labor and materials necessary to construct the irrigation system as shown on the drawings and specified herein.
- B. The work includes, but is not limited to, the following:
 - 1. Piping
 - 2. Valves
 - 3. Controller(s) and other control elements
 - 4. Sprinkler Heads
 - 5. Distribution Tubing and Emission Devices
- C. Related Documents and Sections:
 - 1. Section 329300; Plants

1.3 DEFINITIONS

- A. American Public Works Association (APWA).
- B. American Standards for Testing and Materials (ASTM).
 - 1. D 1785-99 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
 - 2. D 2241-00 - Standard Specifications for Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).
 - 3. D 2466-91 (1996) - Standard Specifications for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
 - 4. D 2564-96a - Standard Specifications for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
 - 5. B3-01 - Specification for Soft or Annealed Copper Wire
 - 6. D2564-96a - Specification for Solvent Cements for PVC Plastic Pipe and Fittings
- C. American Water Works Association (AWWA)
 - 1. C500 - Gate Valves for Water and Sewerage Systems.

1.4 SUBMITTALS

- A. Submit three copies of the proposed irrigation shop drawings to the Owner's Representative for review and approval a minimum of 10 working days prior to commencement of work. The plan must follow the specifications and design criteria as outlined herein.
 - 1. Each submittal shall include manufacturer's product information ('cut') sheets for all components and materials proposed for use in fabricating and installing the irrigation system.
- B. Record Copy Drawings: During the course of installation, carefully show all field changes in red line on a print of the irrigation system as installed. This drawing shall be labeled "Record Copy", and shall be made available for inspection. The status of the 'Record Drawing' must correlate directly with the percentage of work complete described in the Contractor's Pay Request and may be used as a guide when approving payments.
- C. Upon completion of the work of this section and as a condition of its acceptance, the Contractor shall deliver to the **Owner's Representative** the following:
 - 1. As-Built Drawings: Submit three prints and one reproducible and/or electronic file of as-built drawings. As-built drawings shall clearly show all original components of the Record Copy and all changes documented in the Record Copy. Main lines, drain valves, valve boxes, and valve markers and other buried equipment shall be positively located by a minimum of two dimensions each from fixed reference points.
 - 2. Maintenance Manual: Submit three copies of containing the following:
 - a. Catalog cuts of all irrigation materials installed.
 - b. Contractor's name, address and telephone number.
 - c. The duration of the guarantee period.
 - d. The name and address of the local manufacturer's representative.
 - e. List and description of routine maintenance procedures, including winterization, start-up, and recommended watering times for each zone.
 - f. Troubleshooting guide.
 - 3. Controller Reference Chart: Submit one chart for each controller installed on site showing the area covered by each sprinkler zone. The chart shall be a reduced copy of the as-built drawings, color coded to differentiate zone areas, sized to fit the controller door, and hermetically sealed between 20 mil. plastic sheets.
 - 4. Supplemental Equipment: Submit two each of keys to the following: quick coupling valves, quick coupling valve lids, valve markers, manual drain valves, valve boxes, and controller cabinets.

1.5 QUALITY ASSURANCE

- A. Proprietary items shown on the drawings and specified herein are shown to establish standards of quality, utility, design and function. Equivalent units by other manufacturers (substitutions) will be considered provided they are similar in

characteristics. They shall be substituted only if approved by the **Owner's Representative**.

- B. The Contractor shall store all PVC pipe and fittings out of direct sunlight and protect from physical damage.
- C. The Contractor shall store and protect all specified components from adverse weather conditions until installation is complete.
- D. The Contractor shall handle all components as directed by the manufacturer's handling and installation instructions. Damage from transportation or other handling of materials shall be the responsibility of the Contractor.
- E. All local, municipal and state laws and rules and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these specifications and the Contractor shall carry out their provisions. Any specification herein contained, shall not be construed to conflict with the above rules, regulations or requirements.

1.6 PROJECT CONDITIONS

- A. Inspection of the site: The contractor shall inspect the site prior to construction and verify the extent of the work required. Commencement of construction by the Contractor designates acceptance of the site conditions apparent at outset.
- B. The Contractor shall verify the locations of all existing utilities, structures, and services before commencing work. The location of utilities, structures and services shown on these plans are approximate only. Any discrepancies between these plans and the actual field conditions shall be reported to the Owner's representative immediately.
- C. Weather Limitations: Soil work shall be performed only when weather conditions do not detrimentally affect the quality of work.
- D. Project Limits: Areas, as specified within which work is to be performed.
- E. If new mainline is required in areas not currently served, submit a shop drawing of location, hydraulics, and system layout for new extension to Owner's Representative for approval prior to commencement of construction.
- F. The Contractor shall protect all areas of work defined on the drawings and any existing on-site vegetation, structures, utilities, etc. All damage as a result of work under this contract shall be repaired at no cost to the Owner. The Contractor shall be responsible for the provision of traffic control, barricades, safety guards, and any other structures or improvements necessary for the complete protection of the public. The Contractor shall verify non-potable water sources and install labeled components as required by state and federal laws.
- G. The Contractor shall verify, locate and protect all existing utilities and features on and adjacent to the project site during construction and shall repair, at their own expense; all damage as a result of construction activities.

- H. The Contractor shall, at all times, take adequate precautions to keep rock, dirt, gravel, debris, and all other foreign materials from entering piping, valves and other irrigation equipment.

1.7 COORDINATION

- A. Coordinate with other trades affecting or affected by work of this section.
- B. Verify that sleeving and other conduits, of sizes and types specified, are installed as required.

1.8 GUARANTEE

- A. The Contractor guarantees that all new irrigation components installed, as part of this work shall be free from defects in materials, design and workmanship for a period of one year from the Date of Substantial Completion.
- B. Upon notice from the **Owner's Representative** of failure on any part of this equipment during the guarantee period, due to faulty installation procedures, new replacement parts shall be promptly furnished and installed by the Contractor at no additional cost to the Owner. Damages to property or site improvements resulting from the failure of specified components shall be repaired promptly, at no additional cost to the Owner.
- C. The contractor shall be responsible for grade settlement, and/or erosion of soil surfaces resulting from defects in irrigation installation throughout the specified warranty period.

1.9 DESIGN CRITERIA (FOR DESIGN-BUILD SYSTEMS)

- A. Submitted plans shall meet the following criteria and shall be approved for construction only upon verification that all required criteria have been met.
 - 1. Drawings submitted for design approval:
 - a. Must clearly illustrate head, valve, controller and point of connection locations. Individual valves and controllers shall be numbered sequentially. The size and maximum flow through each valve and capacity of each controller shall be clearly noted.
 - b. Must clearly illustrate pipe sizes for all laterals and mainline pipe.
 - c. Must utilize graphics that clearly distinguish between:
 - 1) Lateral and mainline pipe and sleeves under pavement,
 - 2) Different manufacture and models of irrigation head and nozzle types,
 - 3) Manual or automatic control valves, isolation valves and drain valves,
 - 4) Irrigation controllers and
 - 5) All other equipment located on the plan.
 - d. Drawings must be drawn to a standard measurable engineering or architectural scale that is at a minimum equal to the scale of the site planting plan(s) or site layout plan(s).

- e. Drawings must be drawn with ink on vellum, mylar or other reproducible media.
 - f. Drawings must include a legend that describes all symbols and materials represented on the plan.
 - g. Drawings must clearly illustrate that the proposed irrigation system meets all performance criteria as shown on the drawings, and described by these specifications.
- 2. Irrigation system as designed and installed shall perform within the tolerances and specifications of the specified manufacturers.
 - 3. The system shall be fully adjustable to fine tune system performance for specific zones. Indicate water pressure and gallonage parameters at available water source on the required submittal.
 - 4. Sprinkler heads shall be of single type, nozzling and manufacturer in respective zones.
 - 5. Sprinkler nozzling shall have matched precipitation rates throughout respective zones. Do not mix head types within a zone, or run valves together where heads have a precipitation rate that varies by more than 10%.
 - 6. Spacing: Use manufacturer's recommended triangular or square spacing, allowing for 8 MPH wind.
 - 7. System shall be designed to supply manufacturer's specified minimum operating pressure to farthest head from water connection.
 - 8. Piping shall not exceed 5 ft. per second velocity. Demands of system design shall not exceed performance criteria of water meter.
 - 9. System shall furnish components sized to allow operation within manufacturer's specified tolerances for optimum performance. Undersized components shall not be approved for installation.
 - 10. If water source is other than typical municipal water system, identify source, and submit engineer's report of operating criteria and/or respective components specified for relative water source.
 - 11. The system shall be gravity drained. The contractor shall provide appropriate manual drains at low point in system.

PART 2 - PRODUCTS

2.1 GENERAL PRODUCT REQUIREMENTS

- A. Materials and equipment shall be new, delivered to site in original factory condition, and as specified in this section.

IRRIGATION SYSTEM

328000 - 5

2.2 PLASTIC PIPE

- A. All plastic pipe shall be polyvinyl chloride (PVC) continuously bearing the seal of the National Sanitation Foundation, with the exception of polyethylene pipe specified as follows.
- B. Polyvinyl Chloride (PVC) pipe
 - 1. Lateral Lines: PVC Class 200, Type 1, white, NSF approved, solvent weld pipe meeting the requirements of ASTM D2241-00. Use for all exposed pipe, UVR-PVC Sch 40 solvent weld pipe, meeting the requirements of ASTM 2855-96 Size as required to meet manufacturer's velocity specifications.
 - 2. Main Lines: PVC Class 200, Type 1, white, NSF approved, solvent weld pipe meeting the requirements of ASTM D2241-00. Use for all exposed pipe, UVR-PVC Sch, 40 solvent weld pipe, meeting the requirements of ASTM D2855-96 Size as required to meet manufacturer's velocity specifications.
 - 3. Sleeves:
 - a. Sleeves installed beneath walls and walkways: PVC Class 200 pipe meeting the requirements of ASTM D2241-00.
 - b. Sized per the requirements of the irrigation system.
- C. Risers and Nipples: PVC, Type 1, Schedule 80 one piece gray, standard weight with molded threads, both ends, ASTM D1784-99a, D2464-99.
- D. Polyethylene Pipe and fittings: flexible, thick walled designed to withstand 400 psi burst pressure test: Quality and wall thickness equivalent to RainBird SP Series, or approved equal. Sized per manufacturer's specified velocity tolerances.

2.3 PLASTIC FITTINGS

- A. For Polyethylene Pipe: As specified by manufacturer of polyethylene pipe.
- B. For PVC Class 200 Pipe: PVC Schedule 40 meeting the requirements of ASTM D2466-01.
- C. For PVC Schedule 40 Pipe: Schedule 80 meeting the requirements of ASTM D2464-99 PVC.
- D. Manufactured Swing Joints 3/4" (or greater in size shall be RainBird TSJ series or approved equal.

2.4 PIPE JOINING COMPOUNDS

- A. Cement and Primer for Solvent Weld Joints: As recommended by manufacturer of PVC pipe.
- B. Teflon Tape for Threaded Joints (PVC or galvanized): DuPont or approved equal.

2.5 ELECTRIC CONTROL WIRE AND CONNECTORS

- A. Wire: Single strand copper, UL approved for direct burial. Sized in accordance with manufacturer's specifications. Control (hot) wires shall be red and common (ground) wire shall be white. Spare wire shall be black.
- B. Wire Connectors and Sealant: UL approved for direct burial.

2.6 AUTOMATIC CONTROLLER

- A. Automatic controllers: as shown on drawing, or approved equal. Controller shall have ability for all zones to fully operate and meet both normal and specified low volume system requirements as shown on drawings, and as required by site conditions.
 - 1. Controller shall be battery operated TBOS-II and have a single station for each control valve plus a minimum of one unused station for future expansion and shall be installed per manufacturer's recommended installation procedures.
 - 2. Controller must be suitable for either indoor or outdoor mounting. The Contractor shall coordinate with the Owner to identify location for Controller mount and provide appropriate, lockable cabinet for location.
 - 3. Field Transmitter shall be RainBird TBOS-II.

2.7 VALVES, FILTERS, PRESSURE REGULATORS

- A. Bronze Gate Valves: MSS SP-80, Class 125, Type 1, nonrising-stem, bronze body with solid wedge, threaded ends, and malleable-iron handwheel.
 - 1. Available Manufacturers:
 - a. Crane Co.; Crane Valve Group; Crane Valves.
 - b. Crane Co.; Crane Valve Group; Jenkins Valves.
 - c. Grinnell Corp.
 - d. Hammond Valve.
 - e. Milwaukee Valve Company.
 - f. NIBCO INC.
 - g. Red-White Valve Corp.
 - h. Stockham.
- B. Manual Isolation Valves: Bronze Globe Valves: MSS SP-80, Class 125, Type 2, with bronze body and nonmetallic PTFE or TFE disc.
 - 1. Available Manufacturers:
 - a. Cincinnati Valve Co.
 - b. Crane Co.; Crane Valve Group; Crane Valves.
 - c. Crane Co.; Crane Valve Group; Jenkins Valves.
 - d. Grinnell Corp.
 - e. Hammond Valve.
 - f. Kitz Corporation.

- g. McWane, Inc.; Kennedy Valve Div.
- h. Milwaukee Valve Company.
- i. NIBCO INC.
- j. Powell, Wm. Co.
- k. Red-White Valve Corp.
- l. Stockham.
- m. Walworth Company (The).
- n. Watts Industries, Inc.; Water Products Div.

C. Battery Operated Control Valve(s):.

- 1. Battery operated controller valves shall be RainBird PEB with RainBird TBOS potted latching solenoid. Valve size shall be as noted in valve schedule on drawings.
- 2. A PRS-B module shall be installed where pressure regulation is required. A Master Valve may not be necessary if Central Control System is not included in design. However, may Owner's (especially public institutions) may include the Master Valve even if a Central Control System is not specified. Verify this requirement with Owner.

D. Manual Drain Valve: 3/4-inch size bronze angle valve with rising stem and cross-type handle. Hammond, Buckner or approved equal.

E. Automatic Drain Valve shall be RainBird 16A-FDV or 16A-FDV-075.

F. Quick Coupling Valve and Accessories: RainBird 44RC with key and Swivel hose ell of same manufacture, or approved equal.

G. Pressure Reducing Valve (if required): As indicated on drawings.

2.8 VALVE BOXES

- A. Quick coupler valve: Plastic valve box with locking lid, sized to provide a minimum of 3 inches clear on all sides of quick coupler valve to facilitate access, maintenance, repair or removal. Ametek, Carson, or approved equal. ..
- B. Automatic Flush Valve: Install RainBird VB-6RND with all automatic flush valves as shown in drawings.

2.9 DRAIN VALVE MARKER COVER

- A. Cover as shown on drawings, or approved equal.

2.10 BACKFLOW PREVENTION DEVICE

- A. Size and type as approved by local authorities.

2.11 SPRINKLERS

- A. Sprinkler heads shall be as indicated on plans, or approved equal.
- B. Pop-up riser heights shall be as shown on drawings.

2.12 OTHER MATERIALS:

- A. Gravel: 3/4-inch minus, washed, crushed rock
- B. Manual Drain Valve Key: Minimum length 30 inches
- C. All other materials, not specifically described, but required for a complete and proper irrigation system installation, shall be new and of first quality and must be approved by the **Owner's Representative** prior to installation on site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prior to all work of this section, the Contractor shall carefully inspect all previously installed work and verify that all such work is complete to the point where specified installation may properly commence.
- B. Verify that irrigation system may be installed in strict accordance with all pertinent codes and regulations, the accepted design, the referenced standards, and the manufacturer's specifications.

3.2 PIPE INSTALLATION

- A. Trench depths shall provide minimum covers of:
 - 1. 12 inches for lateral lines in base planter.
- B. Pipe connections: Do not use solvent cement on threaded joints. Wrap threads with minimum of three wraps of Teflon tape in accordance with manufacturer's recommendations. Tighten fittings only to manufacturer's specifications. Follow manufacturer's instructions for solvent welding of PVC pipe and fittings to achieve tight and inseparable joints.

3.3 PIPE CONNECTIONS

- A. Solvent weld PVC pipes only during non-freezing weather. Solvent weld PVC pipes only under cover in rainy weather. Do not allow flooding of welded piping until specified cure time has elapsed.

- B. Air temperature of PVC mating surfaces for plastic pipe and fittings shall be between 40 degrees F and 100 degrees
- C. Do not use solvent cement on threaded joints. Wrap threads with minimum of three wraps of Teflon tape in accordance with manufacturer's specifications.
- D. Follow manufacturer's instructions for solvent welding of PVC pipe and fittings to achieve tight and inseparable joints.
- E. Cementing plastic pipe:
 - 1. Cut all ends squarely with approved pipe cutting tool. Bevel ends with a deburring tool.
 - 2. Clean all pipe ends prior to assembly.
 - 3. Clear all pipe lengths of dirt and debris. Protect from contamination.
 - 4. Do not use excess primer and solvent when joining pipe ends.
 - 5. Insert pipe ends to full depth of fitting, hold tightly as necessary to insure full depth bonding.
 - 6. Allow 15 minutes curing time following joint assembly prior to moving or handling jointed pipe.

3.4 BACKFILLING

- A. The Contractor shall completely fill trench with specified growing media. The Contractor must fill all voids and tamp thoroughly in compacted layers of 6 inches at a time. The Contractor shall place and compact soil to eliminate settling of final trench grades. The Contractor shall backfill trenches only after main and lateral line inspection and testing and after receiving written approval from **Owner's Representative**. The Contractor shall notify the **Owner's Representative** a minimum of 24 hours in advance when requesting inspection.

3.5 DRAIN VALVE INSTALLATION

- A. Install one manual drain valve at discharge side of each remote control valve and at all low points in main line pipe to allow for complete drainage of all main lines.
- B. Install drain valves as shown on drawings.

3.6 VALVE INSTALLATION

- A. Install as shown on drawings.
- B. Install specified quick coupling valve, in specified box, at point of connection, and as shown and noted on plans.
- C. Install specified automatic flush valves, in specified box, as shown in Drawings. Shim bottom of box with block as necessary so top of box sits flush with finished grade of growing media in stormwater channels. Install valve with minimum 2" clear space between valve and bottom of channel and per manufacturer specifications.

- D. Install valves in access vault as shown in drawings. Coordinate location in vault with **Owner's Representative** for future flow monitoring equipment (NIC). Valves shall be securely fastened and not loose in vault.
 - E. Battery Operated Control Modules:
 - 1. Where indicated on the Contract Drawings, battery operated control modules shall be installed within vault, and as approved by the Owner's Representative.
 - 2. Terminal connections shall be made at the potted latching solenoids and the control modules utilizing specified waterproof connectors.
- Using specified Field Transmitter, program control modules to achieve optimal irrigation.

3.7 BACKFLOW PREVENTION DEVICE INSTALLATION

- A. Comply with state and local codes. Coordinate location and installation with **Owner's Representative**.

3.8 CONTROLLER INSTALLATION

- A. Install controller in accordance with manufacturer's specifications, and respective State and Local codes. Install at location as shown on drawings. Notify **Owner's Representative** prior to installation, of conflicts or complications with specified controller locations.

3.9 SPRINKLER INSTALLATION

- A. Install in accordance with manufacturer's specifications.
- B. Install all sprinklers on flexible risers, using flexible polyethylene pipe or PVC swing joints.
- C. Sprinklers located on slopes which are less than three percent shall be installed plumb. Those that are located on slopes greater than three percent shall be installed at an angle midway between plumb and perpendicular to the slope.

3.10 SYSTEM FLUSHING

- A. After piping, risers, and valves are installed, but prior to installing sprinkler heads, thoroughly flush piping system under full water head.
- B. Maintain flushing for five minutes or until water flows clearly.
- C. Cap risers immediately after flushing.

3.11 PRESSURE TESTING

- A. Conduct test in presence of **Owner's Representative**.

- B. Test shall be conducted with backflow prevention, quick couplers, control valves and manual drains in place and prior to backfilling. Laterals will be visually inspected for proper solvent welds and leaks prior to backfilling but no pressure test will be required.
- C. Piping must not lose more than 4 psi after 60 minutes at 125 psi
- D. Correct defects and retest until **Owner's Representative** approves.
- E. Notify **Owner's Representative** a minimum of 24 hours in advance when requesting inspection of pressure test.

3.12 SYSTEM PROGRAMMING

- A. Calculate three irrigation programs: Spring / Early Summer, Summer, Late Summer/Fall. System operation requirements shall be based on annual precipitation rates, plant material maturation requirements, solar exposure, and topography and soil conditions.
- B. Submit seasonal controller operation program with as-built record drawings and include laminated copy of program at controller location in controller cabinet. Include total application quantities in inches per week for all zones, for establishment period and normal system operation.

3.13 FINAL INSPECTION

- A. Thoroughly clean, adjust and balance the installed irrigation system. Adjust spray pattern of nozzles to reduce throw of water onto buildings, structures, vehicles, and paved surfaces. Monitor and re-adjust system operation until components operate continually as specified.
- B. The Contractor shall operate the system in the presence of the **Owner's Representative** to demonstrate satisfactory performance and coverage. The Contractor shall give the **Owner's Representative** a minimum of 48 hours advance notice when requesting final inspection.
- C. The Contractor shall demonstrate complete operation of the system, including controller-operating program, start-up and winterizing procedures, and deliver all supplemental equipment to the Owner's designated operating personnel.

3.14 MAINTENANCE

- A. The Contractor shall provide a minimum one-year maintenance period unless otherwise specified in the contract documents. The maintenance period shall start on the day following the date of written acceptance of system installation by the **Owner's Representative**.
- B. After two weeks of operation, flush lines and remove particulates from system. Adjust and clean all filters and/or screens bi-monthly.

- C. Review site conditions and plant vitality on a monthly basis and adjust watering schedule and components as necessary to maintain plant health.
- D. Run through controller and verify time settings, upon each inspection.
- E. Perform seasonal winterization and system start-up. Demonstrate start-up and winterizing procedures to operating personnel.
- F. Repair and adjust system throughout warranty period, and prior to turning maintenance schedule over to Owner's operating personnel.

END OF SECTION 328000

SECTION 329300-PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
1. The work covered in this section consists of furnishing all labor, materials and equipment for testing, preparation, and placement of Planting Soil and Growing Media as indicated by the drawings and as specified.
 2. Furnishing all labor, materials and equipment for installation of landscape planting as shown on the drawings and as specified.
- B. Related Sections include the following:
1. Section 328000, Irrigation

1.3 DEFINITIONS

- A. The following publications, referred to thereafter by basic designation only, form a part of this specification to the extent indicated by references:
1. STANDARDIZED PLANT NAMES, 1942 Edition, published by J. Horace McFarland Company.
 2. FLORA OF THE PACIFIC NORTHWEST; by Hitchcock and Cronquist, latest edition,
 3. Federal Standard for Fertilizers - Mixed, Commercial: FS0-F-241D
- B. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of exterior plant required.
- C. Finish Grade: Elevation of finished surface of planting soil.
- D. Planting Soil: Imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

1.4 SUBMITTALS

- A. At least 10 working days prior to use on site the Contractor shall submit the following information to the **Owner's Representative**.

1. Submit certifications, or samples of material requested for substitution.
 2. Certified analysis of Growing Media.
 3. Provide data of Growing Media for stormwater channels with specified parameters and third party certification of saturated weights.
 4. Provide product data and samples of growing media and all components of stormwater channel assembly and planter.
- B. A minimum of 1 week prior to purchase, the Contractor shall submit to the **Owner's Representative**, copies of all nursery invoices for plant materials to be used on site. The copies must indicate source of supply by name, address and phone number, order invoice number, and size and quantity for each species or variety ordered.
- C. Inspection certificates:
1. All plant material shall meet requirements of State and Federal laws with respect to inspection for plant diseases and infestation.
 2. Inspection certificates required by law shall accompany each shipment of plant materials and be submitted to the **Owner's Representative**.

1.5 QUALITY ASSURANCE

- A. Work and material supplied shall comply with applicable requirements of the United States Department of Agriculture (USDA).
- B. The Contractor shall protect all materials, at all times during handling, shipping and storage, from extreme weather conditions, wind, drying of roots or root ball injury.
- C. Plant materials showing damage from handling, shipping or during planting shall be rejected by the **Owner's Representative** and shall be replaced by the Contractor at their expense.
- D. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."
- E. Observation: **Owner's Representative** may observe trees and shrubs either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size, and quality. **Owner's Representative** retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
- F. Store fertilizers in a dry place and protect from intrusion of moisture.
- G. Planting
1. All landscaping work shall be done under the supervision of a Contractor currently licensed in landscape construction, under respective jurisdictions, and having a minimum of two years experience in landscape construction. All work shall be done in accordance with proper horticultural practices and hereinafter described.
 2. Installer's Personnel Certifications: Certified Landscape Technician, CLT-Exterior.
- H. Herbicide Application

1. Application of herbicides for weed control as may be required shall be made only by an applicator currently licensed under state law.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver exterior plants freshly dug.
- B. Do not prune shrubs before delivery, except as approved by Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery.
- C. Handle planting stock by root ball.
- D. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist.
 1. Do not remove container-grown stock from containers before time of planting.
 2. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.7 PROJECT CONDITIONS AND COORDINATION

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
 1. Spring Planting: Feb. 15th – June 15th
 2. Fall Planting: August 30th – October 31st
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.
- C. The Contractor shall coordinate planting work with soil placement.

1.8 PLANT MATERIALS SUBSTITUTION

- A. Plants, not specifically named in the plant list, will not be accepted unless specifically accepted in writing by the **Owner's Representative**.
- B. Substitutes proposed for approval, in each case shall possess the same essential characteristics as the kind of plant actually specified in regard to appearance, ultimate height, shape, and habit of growth, general soil, and other requirements.

1.9 WARRANTY

- A. Shrubs, Vines, and Ornamental Grasses: 12 months.

- B. At the end of the guarantee period, all plants not in a healthy growing condition, will be noted and as soon as seasonal conditions permit, shall be removed from the site and replaced with plants of the same species and size as originally specified. Such replacement shall be made in the same manner as specified for the original plantings, and at no extra cost to the Owner. The guarantee on replacement plants shall be extended for one full seasons cycle after the replacement plants have been installed.

PART 2 - PRODUCTS

2.1 STORMWATER CHANNEL MATERIALS

- A. Filter Fabric: Woven geotextile manufactured for separation applications and made of polypropylene, polyolefin, or polyester fibers or combination of them.
- B. Drainage Mat: Henry 'DBR-50' Prefabricated Drainage, Water Retention, and Root Barrier System.
- C. Growing Media: Utilize the following growing media, or approved equal.
1. 'Pro Grow Semi-Intensive' mix from Pro-Gro Soils or approved equal, Tualatin, Oregon 503-682-3500: Saturated Bulk Density = 73 lbs per cubic foot.

2.2 PLANTER MATERIALS

- A. Drain Rock: Sound crushed stone or gravel complying with ASTM D 448 for Size No. 57.
- B. Choker Course: Washed, sound crushed stone or gravel complying with ASTM D 448 for Size No. 8.
- C. Growing Media: Utilize the following growing media, or approved equal.
1. 'Pro Grow Intensive' mix from Pro-Gro Soils or approved equal, Tualatin, Oregon 503-682-3500

2.3 SHRUBS AND GROUND COVER

- A. General species, variety, quantity, size and condition of plant will be provided as indicated on the drawings.

Plant material shall be supplied, but not limited to form and conditions defined as follows:

Bulb:	Single bulb mass
Container:	Standard pot or bag, per ANSI standard sizing.

- B. Nomenclature shall conform to "Standardized Plant Names."

- C. Quality definitions, grading tolerances, and caliper to height ratios no less than minimum specified in ANSI Z60.1.
- D. Plant material shall be healthy nursery stock, well branched, full foliated when in leaf, free from disease, injury, insects, all weeds and weed roots.
- E. Cold storage plants shall not be permitted.
- F. Plant materials shall be nursery-grown unless otherwise specified. Nursery-grown plants shall have been growing continuously in licensed nurseries for the following minimum number of growing seasons:

Plant Materials	Time in Nursery
Evergreens and conifers	Two growing seasons
Deciduous	One growing season
Groundcover and Vines	One growing season

- G. Potted and container stock shall be well rooted, vigorous enough to ensure survival and exhibit healthy growth.
- H. Container stock shall have been growing in its container for a minimum of six (6) months and a maximum of two (2) years, with roots filling the containers but not showing evidence of being or having been root bound.
- I. Plant materials shall be free from disease, insects, disfiguring knots, sun scale, injuries, bark abrasion, evidence of improper pruning and other objectionable disfigurements.
- J. Shrubs shall have all developed branching system; shrubs shall have full foliage and shall not be leggy.
- K. Thin, weak, leggy, or misshapen plants will be rejected by the **Owner's Representative**.
- L. Labels: The correct horticultural name, size and caliper and/or other data, as specified in the Plant Material List, written on durable labels in weather-resistant ink, shall be securely attached to all individually shipped plants and to each box, bundle, bale and container of plant materials. Labels shall remain on representative plant materials until final acceptance of planting. Labels shall be affixed in such a manner that will not girdle the plant materials.
- M. The species (botanical and common names), size, manner in which the plants are furnished, and spacing of the required plant materials, are noted on the planting plan.
- N. The quantities of plant materials shall be as determined by the Contractor in accordance with the specified spacing, or location on plan. Surplus or shortages of plant quantities shall be the responsibility of the Contractor.

2.4 MULCHES

- A. Hemlock bark, 1-inch minus size with less than 30% bark finer than 1/4-inch size. Sawdust and wood shavings will not be acceptable.

1. Organic Matter Content: 50 to 60 percent of dry weight.

PART 3 - EXECUTION

3.1 STORMWATER CHANNELS

- A. Install components as shown on details and as specified.
 1. Drainage layer mat material providing complete coverage along entire bottom of stormwater channels.
 2. Install filter fabric where shown in details. Completely wrap growing medium on all sides and bottom of stormwater channels to prevent any erosion of growing medium through channel wall penetrations. Hold filter fabric 1" below finished surface of growing media.
 3. Growing Media: Install growing media in stormwater channels to depth shown on drawings.
 - a. Place growing media carefully to avoid damage or displacement of other materials.

3.2 PLANTER

- A. Install components as shown on details and as specified:
 1. Place drain rock and choker course rock to depth as shown in plans
 2. Place growing media to depth shown on plans.
 3. Place 2" depth bark mulch over entire planter surface.

3.3 INITIAL INSPECTION OF PLANT MATERIAL

- A. All plant materials must be inspected by the **Owner's Representative** before planting. All plant material shall be free from insects, diseases, and injuries and sizing shall be equal to or exceeding measurements specified. Transport and handle all materials in strict accordance with proper horticultural standards. The Contractor shall provide plants with habit and growth that is normal, sound, healthy and vigorous.
- B. All plant materials not meeting specification requirements shall be rejected.

3.4 PLANT LAYOUT AND INSPECTION

- A. Layout of planting areas as indicated on the plans are approximate only, and the locations and identity of all, shrubs and ground covers shall be outlined in the field by the Contractor, subject to review and approval.
- B. Inspection: The Contractor shall notify the **Owner's Representative** forty-eight (48) hours prior to beginning any planting. The **Owner's Representative** may adjust plant material location to meet field conditions. Planting shall not occur until the **Owner's Representative** has approved the location and layout of all plant beds.

3.5 SHRUBS AND GROUNDCOVER PLANTING

- A. Plant shrubs upright and adjust to set best appearance or relationship to adjacent plants. Shrubs and groundcovers shall be planted as shown on plans.

Native Plant material shall be planted with regard to condition specified on plan, per, but not limited to the following:

Bulb:	Set into soil 4 inches- 6 inches deep; point up
Container:	Placed into plant pit twice the size of container

- B. Planting dates:
1. Critical dates for planting operations include the following; (subject to revision by Owner's Representative)
 - a. Planting of container stock: Feb.15 - June 15, Aug. 30-Oct.31.
- C. Excavation for planting
1. Diameter or minimum width of planting pit or trenches shall be as shown on the drawings.
- D. Prior to completing backfilling, the upper two-thirds of the plant pit shall be flooded with the plant starter solution. Allow solution to soak away. Finish filling holes to finish grade and lightly compact soil around root ball.
- E. Placement and compaction: Place and compact backfill soil mixture carefully to avoid injury to roots; fill all voids.

3.6 SHRUBS AND GROUNDCOVER PLANTING BED GRADES

- A. Establish finish grades and slopes as shown in plans.

3.7 MULCHING

- A. Mulch all shrubs and ground cover planting beds with a 2 inch layer of mulch material within two (2) days after planting. Cover entire bed areas; apply evenly. Do not apply mulch to planting in stormwater channels.

3.8 CLEANUP

- A. Keep premises free from accumulation of debris, growing media and other material.
- B. At completion of each area of work, remove all debris, equipment and surplus materials
- C. Any paved area or surfaces stained or soiled from landscaping materials shall be cleaned with a power sweeper using water under pressure. Building surfaces shall be washed with proper equipment and materials as approved by the **Owner's Representative**.

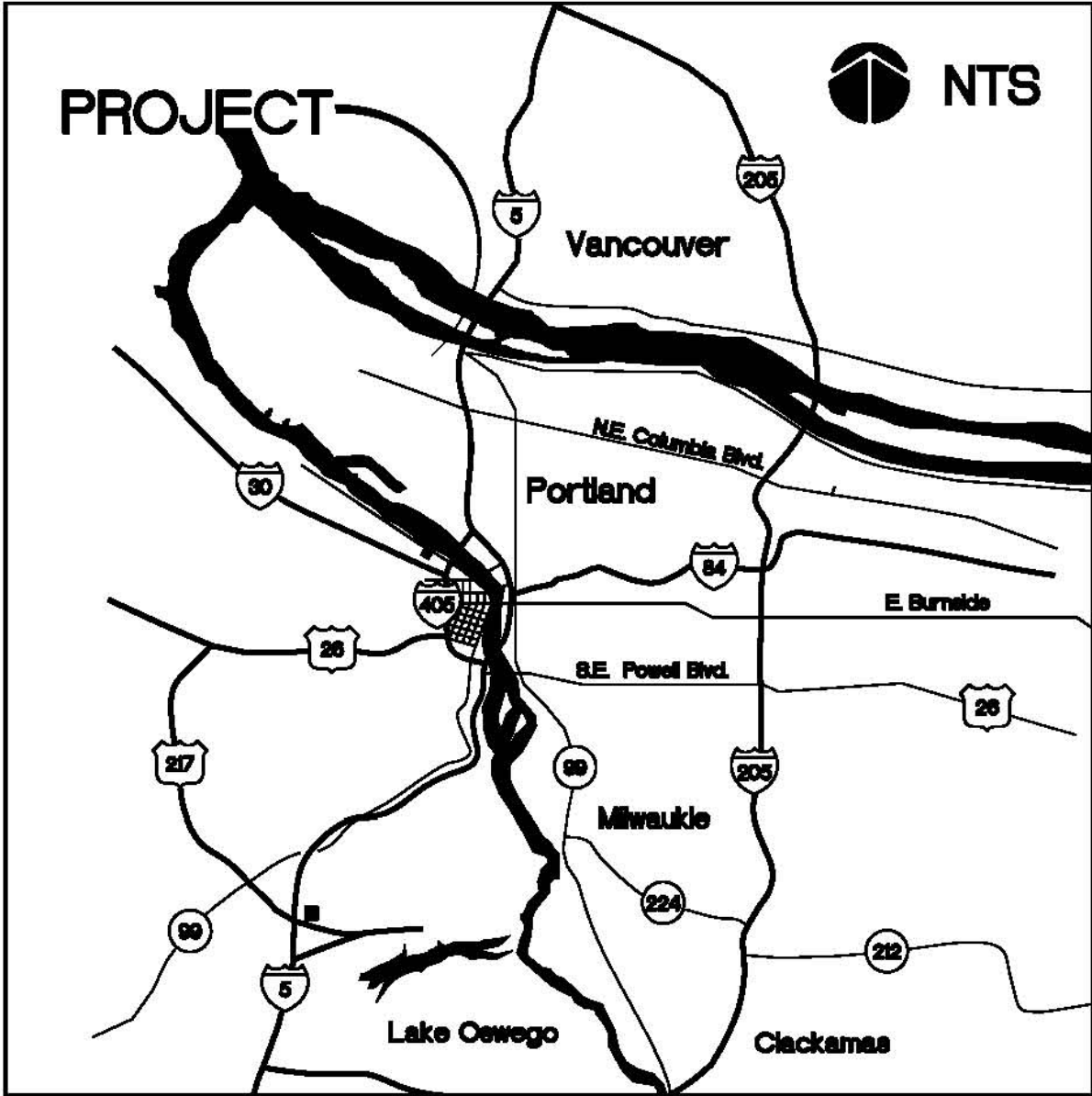
END OF SECTION 329300

EXPO CENTER STORMWATER WALL

Permit Set
February 24, 2014

VICINITY MAP

SITE MAP



DRAWING INDEX

SHEET DESCRIPTION	SHEET NUMBER
STRUCTURAL NOTES	S1.0
EXISTING CONDITIONS & DEMO PLAN	L1.0
OVERALL PLAN DETAILS	L2.0
OVERALL PLAN DETAILS	L2.1
FRAMING AND FOUNDATION DETAILS	L3.0
FRAMING AND FOUNDATION DETAILS	L3.1
STORMWATER CHANNEL DETAILS	L4.0
RAIN CABLE DETAILS	L4.1
PRIMARY DIVERTER & PIPE DETAILS	L4.2
SECONDARY DIVERTER & PIPE DETAILS	L4.3
SCREEN & EXPOGON DETAILS	L5.0
PLANTER CONSTRUCTION DETAILS	L5.1
IRRIGATION PLAN AND DETAILS	L6.0
IRRIGATION DETAILS	L6.1
PLANTING PLAN AND DETAILS	L7.0
PLANTING DETAILS	L7.1

PROJECT DIRECTORY

OWNER:



PORTLAND EXPO CENTER
2060 N MARINE DRIVE
PORTLAND, OR 97217

PROJECT MANAGER: LYDIA NEILL
503-975-4522
LYDIA.NEILL@OREGONMETRO.GOV

GENERAL NOTES

1. FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH WORK.
2. DIMENSIONS TAKE PRECEDENCE OVER DRAWINGS. DO NOT SCALE DRAWINGS. NOTIFY LANDSCAPE ARCHITECT OF DISCREPANCIES PRIOR TO PROCEEDING WITH WORK.
3. CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS.
4. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND COORDINATION OF SUBCONTRACTORS WORK, COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS AND ACCURATE LOCATION OF STRUCTURAL MEMBERS.
5. DETAILS NOTED AS "TYPICAL" OR "TYP" APPLY IN ALL CASES UNLESS SPECIFICALLY REFERENCED. DETAILS THAT ARE SPECIFICALLY REFERENCED SHALL TAKE PRECEDENCE OVER DETAILS NOTED AS "TYPICAL" OR "TYP". SPECIFIC NOTES AND DETAILS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND DETAILS.
6. LOCATE EXISTING UTILITIES WHETHER INDICATED OR NOT AND PROTECT FROM DAMAGE. CONTRACTOR SHALL BEAR REPAIR OR REPLACEMENT EXPENSE OF UTILITIES OR OTHER PROPERTY DAMAGED BY OPERATIONS IN CONJUNCTION WITH THE PROSECUTION OF THE WORK.

ABBREVIATIONS

&	AND
@	AT
Ø	DIAMETER
#	NUMBER
"	INCHES
'	FOOT (FEET)
CONT	CONTAINER
GAL	GALLON

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STRUCTURAL ENGINEER:



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paulk@cascadedesign.net

GENERAL

- G 1

SCOPE

THE GENERAL NOTES AND TYPICAL DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY.
- G 2

MEANS, METHODS & CONSTRUCTION LOADS

CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. CONTRACTOR IS RESPONSIBLE FOR MEANS, METHODS AND SEQUENCE OF CONSTRUCTION, AND SHALL MAKE ADEQUATE PROVISION TO MAINTAIN THE INTEGRITY OF ALL STRUCTURES AT ALL STAGES OF CONSTRUCTION. DETERMINATION OF AND PROVISIONS FOR CONSTRUCTION LOADING SHALL BE PROVIDED BY THE CONTRACTOR.
- G 3

SAFETY

CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO ENSURE THE SAFETY OF WORKERS AND VISITORS TO THE SITE, INCLUDING BUT NOT LIMITED TO SHORING, BRACING AND ACCESS RESTRICTION. COMPLY WITH ALL FEDERAL, STATE AND LOCAL SAFETY CODES AND STANDARDS.
- G 4

DRAINAGE SURFACES

SLOPE DRAINAGE SURFACES UNIFORMLY TO DRAIN. SLOPE SHALL BE 1/8" TO 1/4" PER FOOT EXCEPT WHERE NOTED OTHERWISE ON THE PLANS

DESIGN CRITERIA

- D 1

GOVERNING BUILDING CODE

2006 INTERNATIONAL BUILDING CODE LOCALLY AMENDED. THE ABOVE SHALL GOVERN EXCEPT WHERE OTHER APPLICABLE CODES OR CONTRACT PROVISIONS ARE MORE RESTRICTIVE.
- D 2

ROOF SNOW LOAD

FLAT ROOF SNOW LOAD

SNOW EXPOSURE FACTOR

SNOW IMPORTANCE FACTOR

THERMAL FACTOR

Pf = 25.0 PSF

Ce = 1.0

Is = 1.0

Ct = 1.0
- D 3

WIND, BASIC WIND SPEED (3 - SEC GUST)110 MPH

EXPOSURE

WIND IMPORTANCE FACTOR

ENCLOSURE CLASSIFICATION

INTERNAL PRESSURE COEFFICIENT

COMPONENT AND CLADDING DESIGN PRESSURE

D

I = 1.15

PARTIALLY ENCLOSED
- D 4

SEISMIC (asce 7-05) - CONTROL BUILDING:

MCE ACCELERATION, SHORT PERIOD

MCE ACCELERATION, 1-SEC PERIOD

SITE CLASS

Ss = 0.983

S1 = 0.334

D

FOUNDATION

- F 1

DESIGN BASIS

FOUNDATION DESIGN IS BASED ON RECOMMENDATIONS CONTAINED IN THE IBC AND OREGON STRUCTURAL SPECIALTY CODE. CONTRACTOR SHALL FOLLOW THE PROJECT SPECIFICATIONS AND TAKE INTO CONSIDERATION RECOMMENDATIONS CONTAINED IN THE REPORT. NOTIFY THE OWNER'S REPRESENTATIVE OF CONFLICTS BETWEEN SPECIFICATIONS AND THE REPORT RECOMMENDATIONS FOR RESOLUTION.
- F 2

ALLOWABLE BEARING PRESSURE

DEEP FOUNDATIONS BEARING ON STABILIZED SOIL HAVE BEEN DESIGNED FOR AN ALLOWABLE BEARING PRESSURE OF 1500 PSF.
- F 3

EXCAVATION, DEWATERING & SAFETY

CONTRACTOR SHALL PROVIDE FOR ALL DE-WATERING OF EXCAVATIONS, AND DESIGN / PROVIDE ALL CRIBBING, SHORING AND BRACING REQUIRED FOR SAFETY AND TO ALLOW CONSTRUCTION OF THE WORK PRESENTED HEREIN.

CONCRETE

- C 1

APPLICABLE CODE AND MIX DESIGN

CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ACI BUILDING CODE (ACI 318 BUILDINGS). MIX DESIGNS SUBMITTED FOR REVIEW SHALL BEAR THE SEAL OF A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF OREGON.
- C 2

REINFORCING STEEL DETAILS

ALL DETAILING, FABRICATION AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED SHALL BE IN ACCORDANCE WITH MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (ACI-315), LATEST EDITION.

- C 3

DESIGN STRENGTH

1. CONCRETE.....f_c=4,000 PSI

ULTIMATE COMPRESSIVE STRESS AT 28 DAYS

2. REINFORCING STEEL.....ASTM A-615, GRADE 60

DEFORMED BARS UNLESS OTHERWISE NOTED
- C 4

CONCRETE COVER

CONCRETE COVER FOR REINFORCING BARS SHALL CONFORM TO ACI 350 AND AS FOLLOWS WITH MINIMUM COVER OF ONE BAR DIAMETER.

1. FOOTING AND FOUNDATION MATS CAST ON GROUND.....3"

2. CONCRETE IN CONTACT WITH SEWAGE OR WATER

PRINCIPAL REINFORCEMENT.....2-1/2"

STIRRUPS & TIES.....2"

3. CONCRETE IN CONTACT WITH GROUND OR WEATHER

a. SLAB AND JOISTS

BARS GREATER THAN #5.....2"

BARS #5 OR LESS.....1-1/2"

b. BEAMS AND COLUMNS

STIRRUPS AND TIES.....2"

PRINCIPAL REINFORCEMENT.....2-1/2"

4. CONCRETE NOT TO BE EXPOSED TO GROUND, WEATHER OR LIQUID

BEAMS AND COLUMNS.....1-1/2"

SLABS, WALLS AND JOISTS.....1"

- C 5

BAR DEVELOPMENT AND LAP SPLICE LENGTH

ALL DEVELOPMENT AND SPLICE LENGTHS SHALL BE PER ACI 318-08. MINIMUMS FOR f_c=4,500 PSI, f_y=60,000 PSI, CLEAR SPACING GREATER OR EQUAL TO 3 BAR DIAMETER, MINIMUM COVER PER NOTE C4, AND CLASS B SPLICES, UNCOATED, SHALL BE AS IN TABLE BELOW:

BAR SIZE	DEVELOPMENT LENGTH		SPLICE LENGTH	
	TOP BARS	OTHER	TOP BARS	OTHER
#3 - #6	47 DIA	36 DIA	61 DIA	47 DIA
#7	4'-3"	3'-4"	5'-6"	4'-4"
#8	4'-11"	3'-9"	6'-4"	4'-10"
#9	5'-6"	4'-3"	7'-1"	5'-6"
#10	6'-1"	4'-8"	7'-10"	6'-0"
#11	6'-8"	5'-2"	8'-8"	6'-8"

- C 6

WELDING REINFORCING BARS

IF APPROVED BY THE CONSTRUCTION MANAGER, REINFORCING MAY BE WELDED IN ACCORDANCE WITH WITH AWS SPECIFICATION D1.4 AND DETAIL E/S-05. ALL REINFORCING TO BE WELDED SHALL CONFORM TO ASTM A706.
- C 7

STANDARD HOOKS

BARS ENDING IN RIGHT ANGLE BENDS OR HOOKS SHALL CONFORM TO THE REQUIREMENTS OF PARAGRAPH 7.1, ACI-318. PROVIDE STANDARD HOOK IN BARS WHICH TERMINATE AT WALL OR SLAB INTERSECTIONS THAT PROVIDE LESS THAN THE SPECIFIED DEVELOPMENT LENGTH.
- C 8

CHAMFERS

EXCEPT AS OTHERWISE REQUIRED, EXPOSED CONCRETE CORNERS AND EDGES SHALL HAVE 3/4" CHAMFERS. RE-ENTRANT CORNERS SHALL NOT HAVE FILLETS.
- C 9

ANCHOR BOLTS

ANCHOR BOLTS SHALL BE ASTM A320 TYPE 316 MATERIAL UNLESS OTHERWISE NOTED. EMBEDMENT, EDGE DISTANCES AND ALLOWABLE LOADS SHALL CONFORM TO IBC TABLE 1912.2 OR AS NOTED ON THE DRAWINGS. CONFORM TO ADDITIONAL REQUIREMENTS IN SPECIFICATION SECTION 05501 AS APPLICABLE.
- C 10

COMPATIBLE FINISHES

CURING COMPOUNDS AND OTHER SURFACE TREATMENTS, CONCRETE ADMIXTURES AND SUB-SLAB DRAINAGE SHALL BE REVIEWED BY CONTRACTOR AND CERTIFIED COMPATIBLE WITH FINISHES TO BE APPLIED LATER IN THE CONSTRUCTION SEQUENCE.

STEEL

- ST 1

APPLICABLE CODE

STEEL CONSTRUCTION SHALL CONFORM TO SPECIFICATIONS AND STANDARDS PRESENTED IN THE 13TH EDITION OF THE AISC STEEL CONSTRUCTION MANUAL. CAMBERING OF BEAMS AND GIRDERS SHALL BE AS SPECIFIED IN TABLE OF MAXIMUM AND MINIMUM INDUCED CAMBER UNLESS OTHERWISE SPECIFIED.
- ST 2

MATERIALS

1. SUBMIT CERTIFIED MILL TEST REPORTS TO OWNER'S REPRESENTATIVE FOR REVIEW.

2. STEEL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992. OTHER SHAPES AND PLATES SHALL CONFORM TO ASTM A36.

3. STRUCTURAL PIPE SHALL CONFORM TO ASTM A53 TYPES E OR S GRADE B, OR A500 GRADE A. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B.

4. ALL STAINLESS STEEL SHALL BE TYPE 316 MEETING ASTM A276 UNLESS OTHERWISE SPECIFIED.

- ST 3

WELDING

1. WELDING SHALL CONFORM TO AWS D1.1-1.

2. ELECTRODES FOR SHOP AND FIELD WELDS SHALL CONFORM TO AWS A5.1 OR A5.5, CLASS E70XX.

3. ALL WELDS USED IN MEMBERS AND CONNECTIONS IN THE SEISMIC LOAD RESISTING SYSTEM (SLRS) SHALL BE MADE WITH A FILLER METAL THAT CAN PRODUCE WELDS THAT HAVE A MINIMUM CHARPY V-NOTCH TOUGHNESS OF 20 FT-LBF AT MINUS 20degF AS DETERMINED BY AWS CLASSIFICATION OR MANUFACTURER'S CERTIFICATION. SPECIFICATIONS IDENTIFY SLRS ASSEMBLIES.

4. SUBMIT WELD PROCEDURES AND WELDER CERTIFICATIONS TO OWNER'S REPRESENTATIVE FOR REVIEW.

5. STAINLESS STEEL WELDING SHALL CONFORM TO AWS D1.6 WITH A5.4 OR A5.9 ELECTRODES.
- ST 4

BOLTS

STRUCTURAL BOLTS SHALL CONFORM TO ASTM A325N UNLESS MACHINE BOLTS, A-307, ARE NOTED ON THE DRAWINGS. HIGH STRENGTH BOLTS SHALL BE FULLY TENSIONED UNLESS CONNECTING HSS SHAPES OR OTHERWISE NOTED.
- ST 5

ENCASED STEEL

STEEL COMPLETELY ENCASED IN CONCRETE SHALL NOT BE GALVANIZED OR PAINTED AND SHALL HAVE A CLEAN SURFACE FOR BONDING TO CONCRETE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- ST 6

PAINTING

STRUCTURAL STEEL SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATIONS. SHOP PRIMER SHALL BE COMPATIBLE WITH FINISH COATINGS.

SPECIAL INSPECTIONS

- SI 1

GENERAL AND NON-STRUCTURAL ITEMS

1. SPECIFICATION SECTION 01410 DESCRIBES OWNER-FURNISHED TESTING LABORATORY SAMPLING, TESTING AND REPORTING FOR SPECIAL INSPECTION.

2. CONTRACTOR SHALL NOTIFY SPECIAL INSPECTION COORDINATOR A MINIMUM OF 24 WORKING HOURS PRIOR TO EACH SPECIAL INSPECTION REQUIRED. THE CONTRACTOR SHALL PROVIDE REASONABLE AND CUSTOMARY ACCESS TO THE WORK AND ASSISTANCE TO FACILITATE SAMPLING.
- SI 2

CAST IN PLACE ANCHOR BOLTS

PERIODIC, VISUAL INSPECTION AS TO SIZE, NUMBER, SPACING GENERALLY, ATTACHMENT, AND MATERIAL TYPE. INSPECT ALL ANCHOR BOLTS FOR BUILDING STRUCTURAL COMPONENTS AND INSTALLED EQUIPMENT FOR SEISMIC AND LATERAL FORCE RESISTANCE.
- SI 3

POST-INSTALLED CONCRETE ANCHORS

1. CONFIRM THAT PROPOSED ANCHORS ARE ACCEPTABLE FOR USE IN ACCORDANCE WITH THE LIMITATIONS SPECIFIED IN SPECIFICATION SECTION 05500. VERIFY THAT A REVIEWED AND ACCEPTED ICC EVALUATION REPORT FOR EACH ANCHOR TYPE IS ON SITE PRIOR TO INSTALLATION.

2. PERIODIC, VISUAL INSPECTION AS TO SIZE, SPACING AND ATTACHMENT PER THE DRAWINGS AND SPECIFICATIONS, AND AS REQUIRED BY ICC EVALUATION REPORTS.
- SI 4

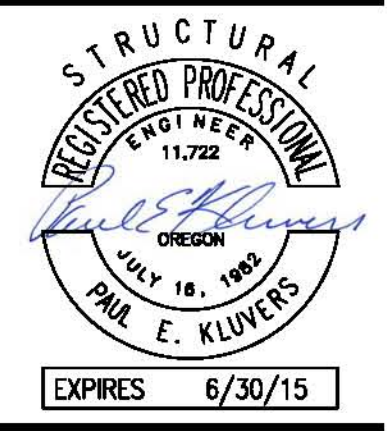
EXCESSIVE RE-INSPECTION:

EXCESSIVE RE-INSPECTION IS ANY REQUIRED INSPECTION AFTER THE FIRST RE-INSPECTION WHICH IS NECESSITATED BY INSPECTION FAILURES, CANCELLED OR RE-SCHEDULED INSPECTIONS FOR THAT ITEM. CONTRACTOR SHALL REIMBURSE OWNER FOR THIS EXCESSIVE RE-INSPECTION AT COST ON A MONTHLY BASIS.

STRUCTURAL OBSERVATION

COORDINATE STRUCTURES TO RECEIVE STRUCTURAL OBSERVATION WITH SPECIAL INSPECTION COORDINATOR. NOTIFY ENGINEER AT LEAST 48 HOURS BEFORE A DESIGNATED WORK IS TO BE COVERED.

ITEM	DESCRIPTION
1. FOUNDATIONS	REINFORCING STEEL
2. FINAL, ALL STRUCTURES	SUBSTANTIAL COMPLETION



project: **EXPO CENTER Stormwater Wall**
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submittal: **PERMIT SET**
sheet title: **STRUCTURAL NOTES**

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Date: 02.24.14

Revisions:

Drawn By: PK
Checked By: PK
Job No. 113005.2
Approved: PK

S1.0



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neill@metro.dst.or.us

submit: PERMIT SET

sheet title:
**EXISTING COND.
DEMO PLAN**

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Date: 02.24.14

Revisions:

Rev.1 04.04.14

Saw cut extents

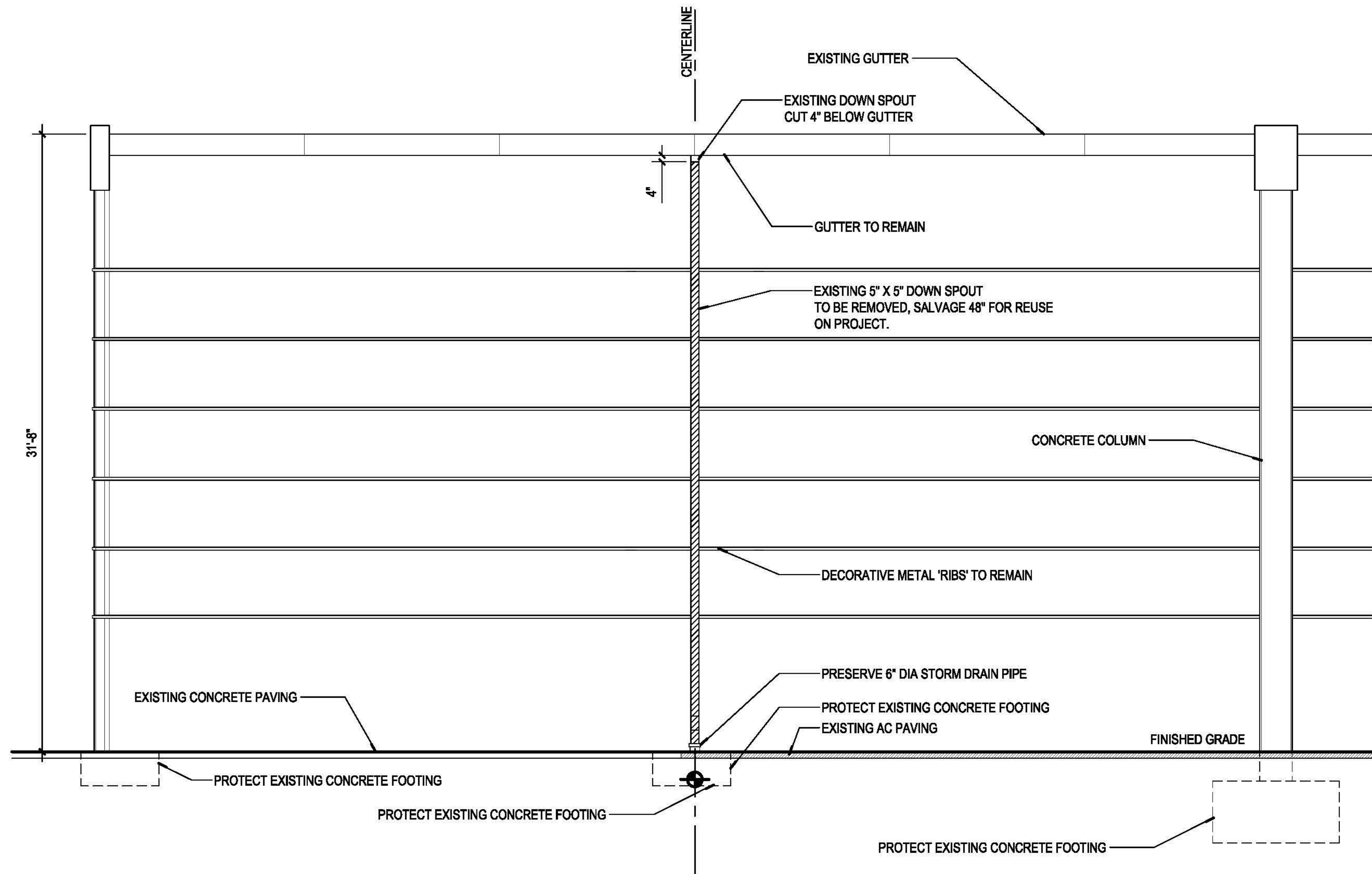
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Checked By: DE/RT

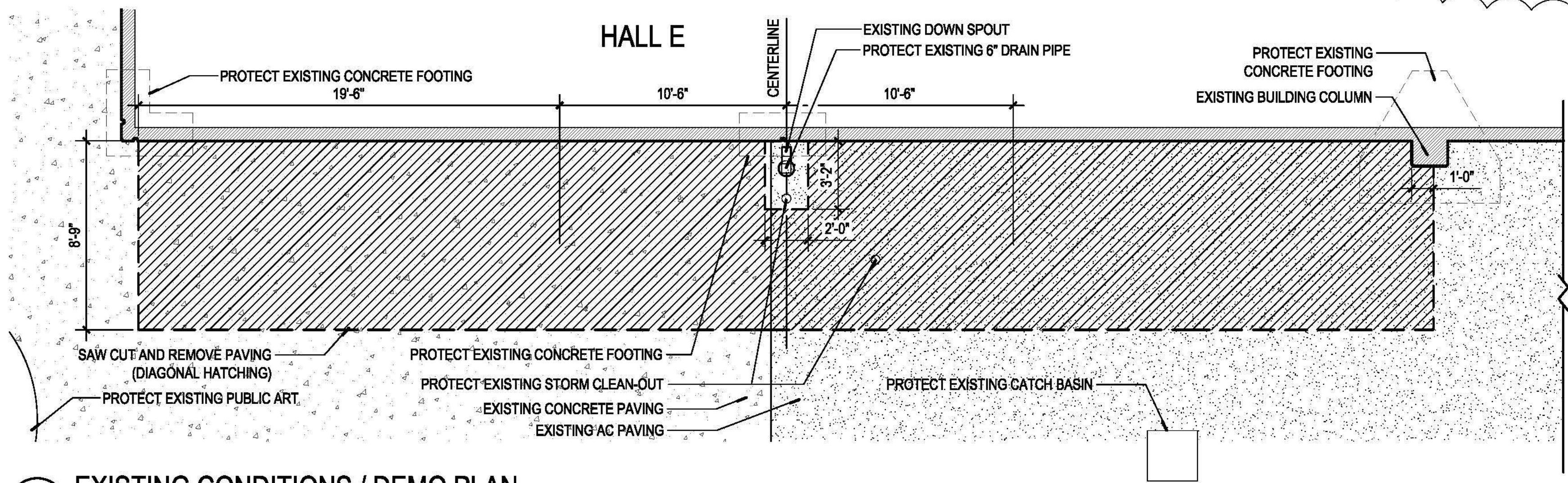
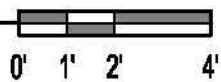
Job No. 113005.2

Approved: MF

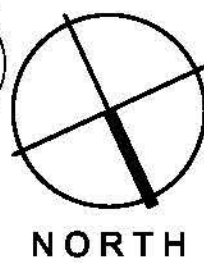
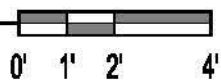
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1 EXISTING CONDITIONS / DEMO PLAN
ELEVATION



2 EXISTING CONDITIONS / DEMO PLAN
PLAN



GREENWORKS

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REGISTERED
LANDSCAPE ARCHITECT
Michael F. Fahn
P. MICHAEL F. FAHN
1031/1988
OREGON

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Stormwater Wall**

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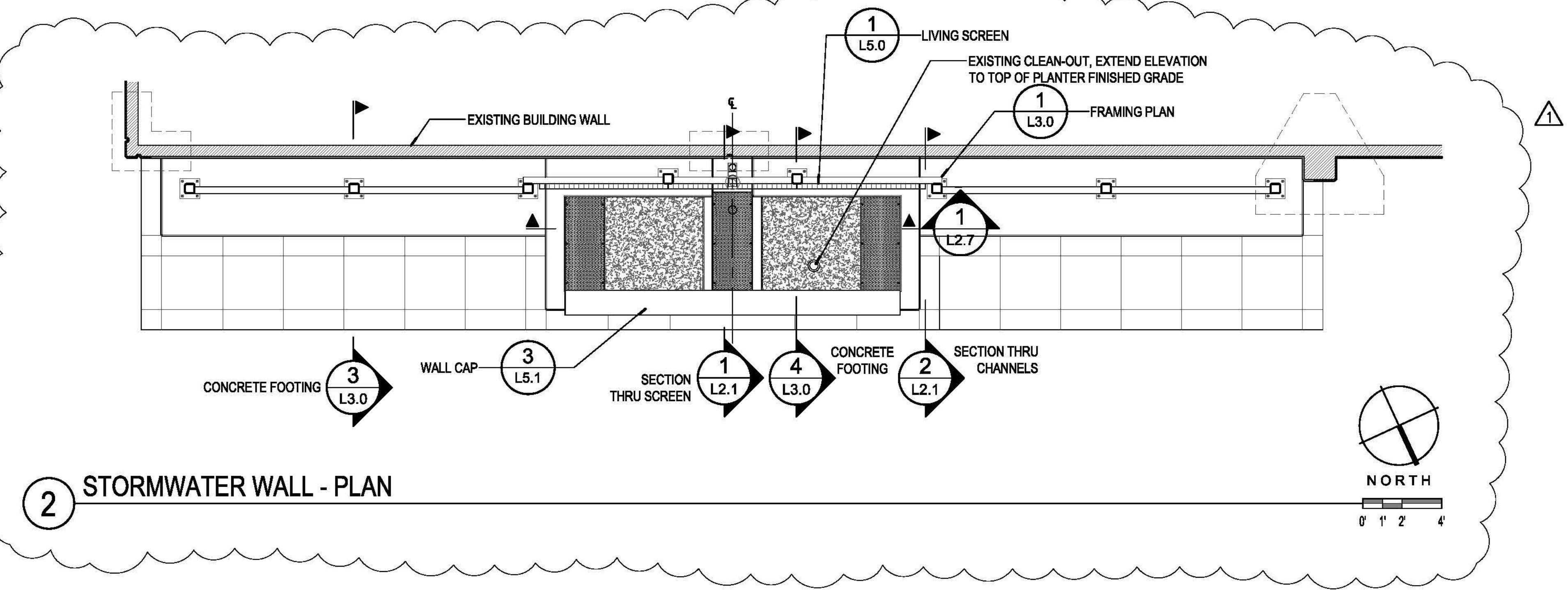
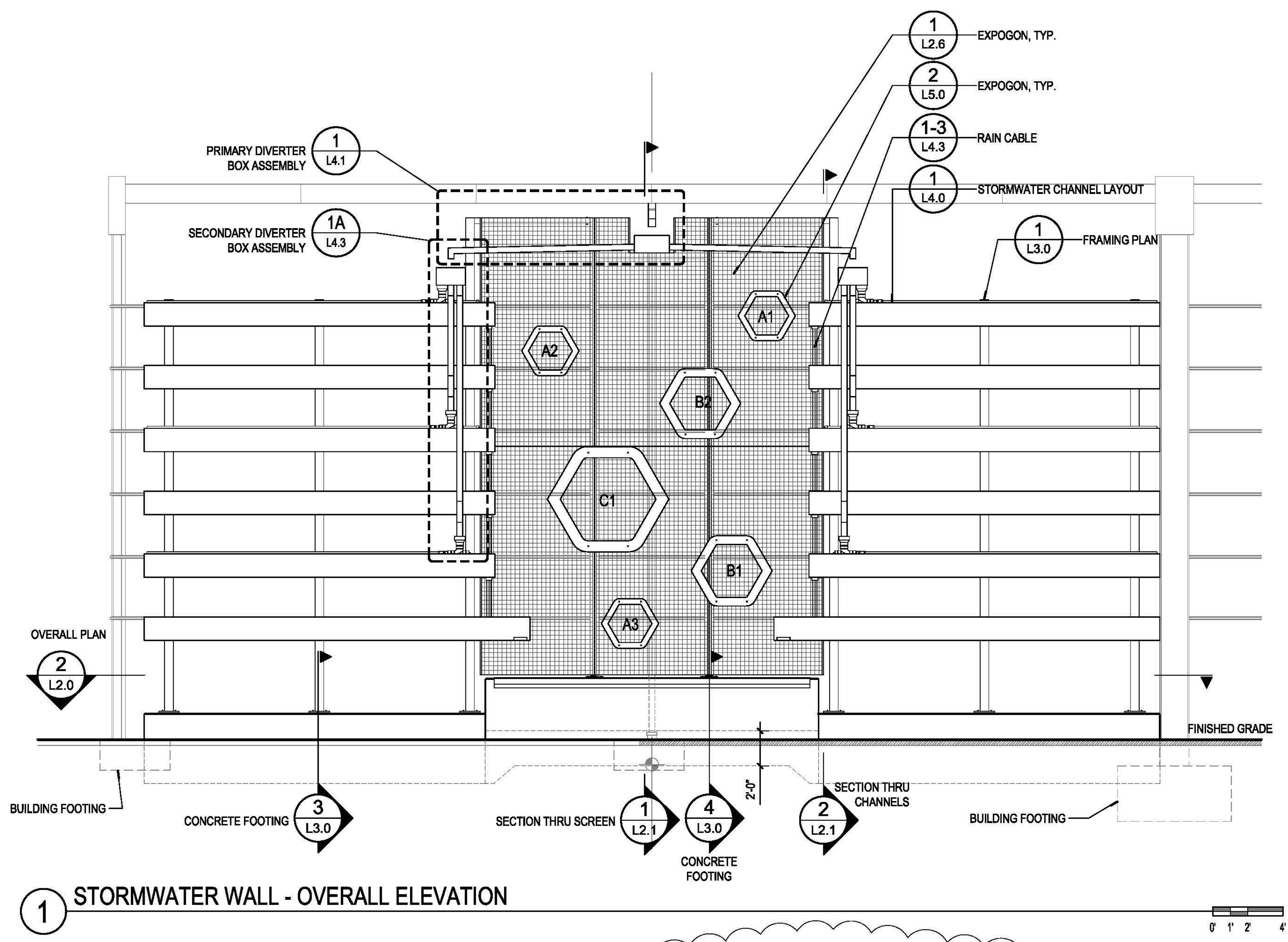
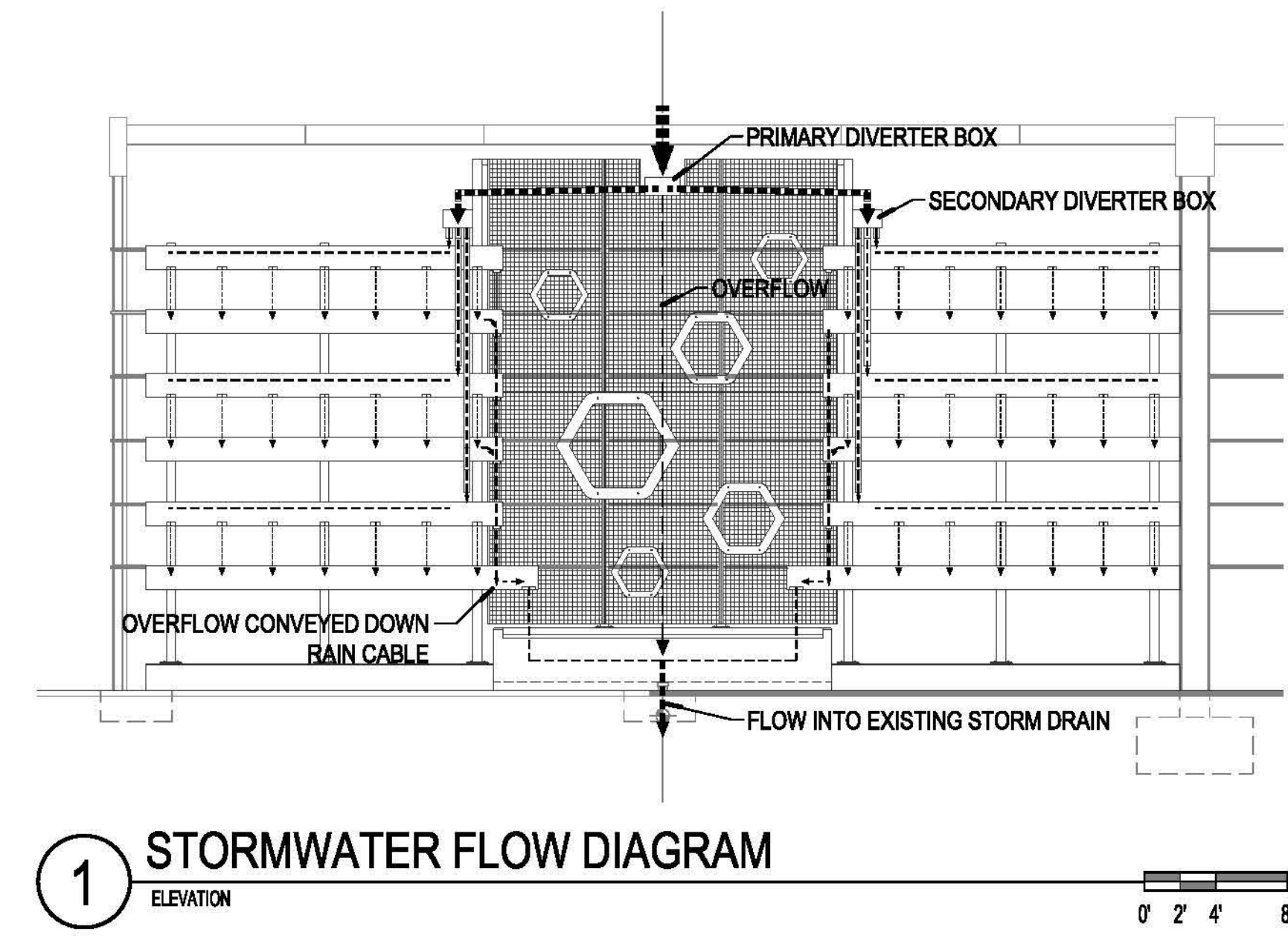
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**OVERALL PLAN
DETAILS**

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Date: 02.24.14
Revisions:
Rev.1 04.04.14
Paving extents

Drawn By: DE/SK
Checked By: DE/RT
Job No. 113005.2
Approved: MF

L2.0





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submital: PERMIT SET

sheet title:

**OVERALL PLAN
DETAILS**

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Date: 02.24.14

Revisions:

Rev.1 04.04.14

Footing width

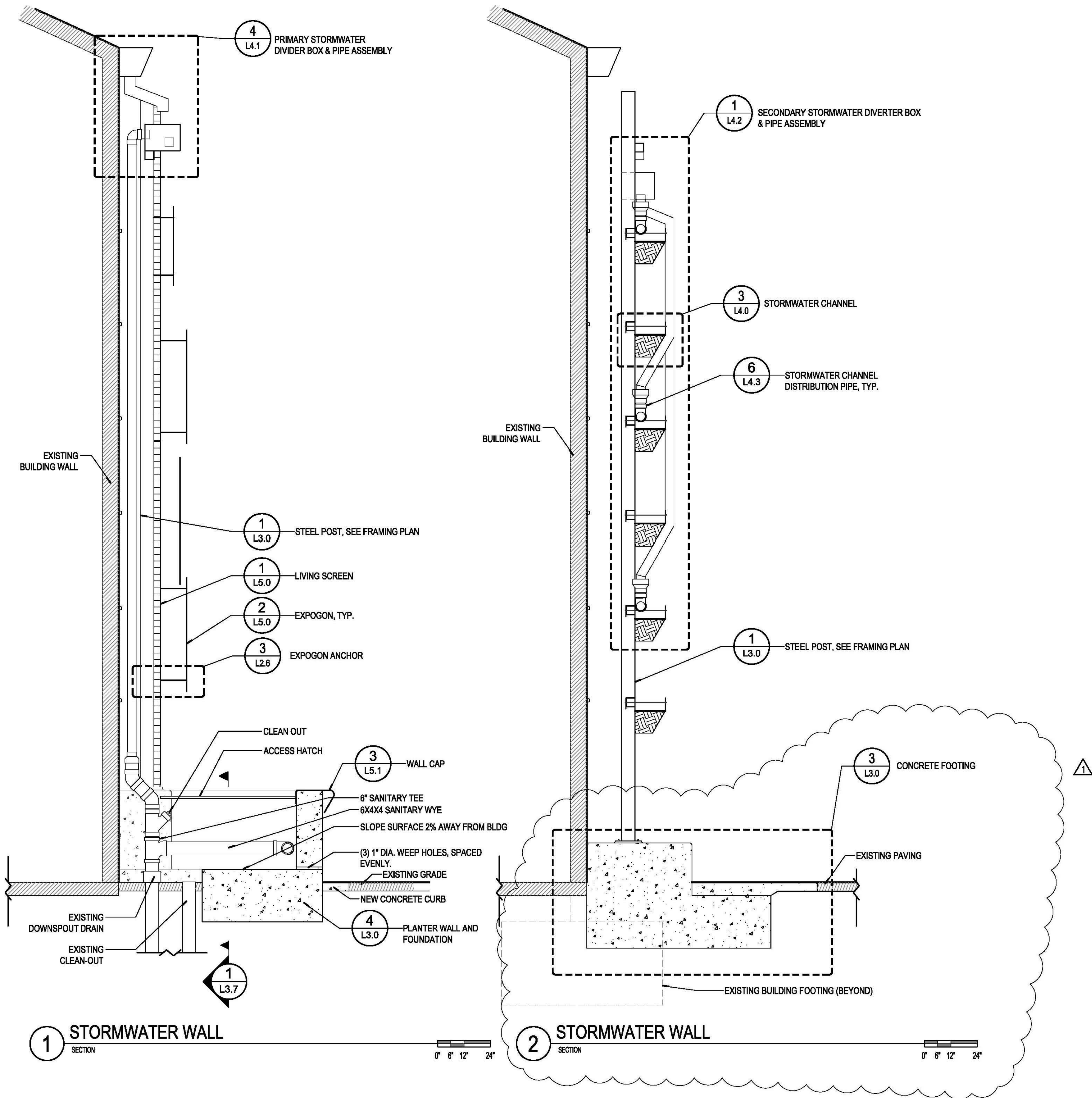
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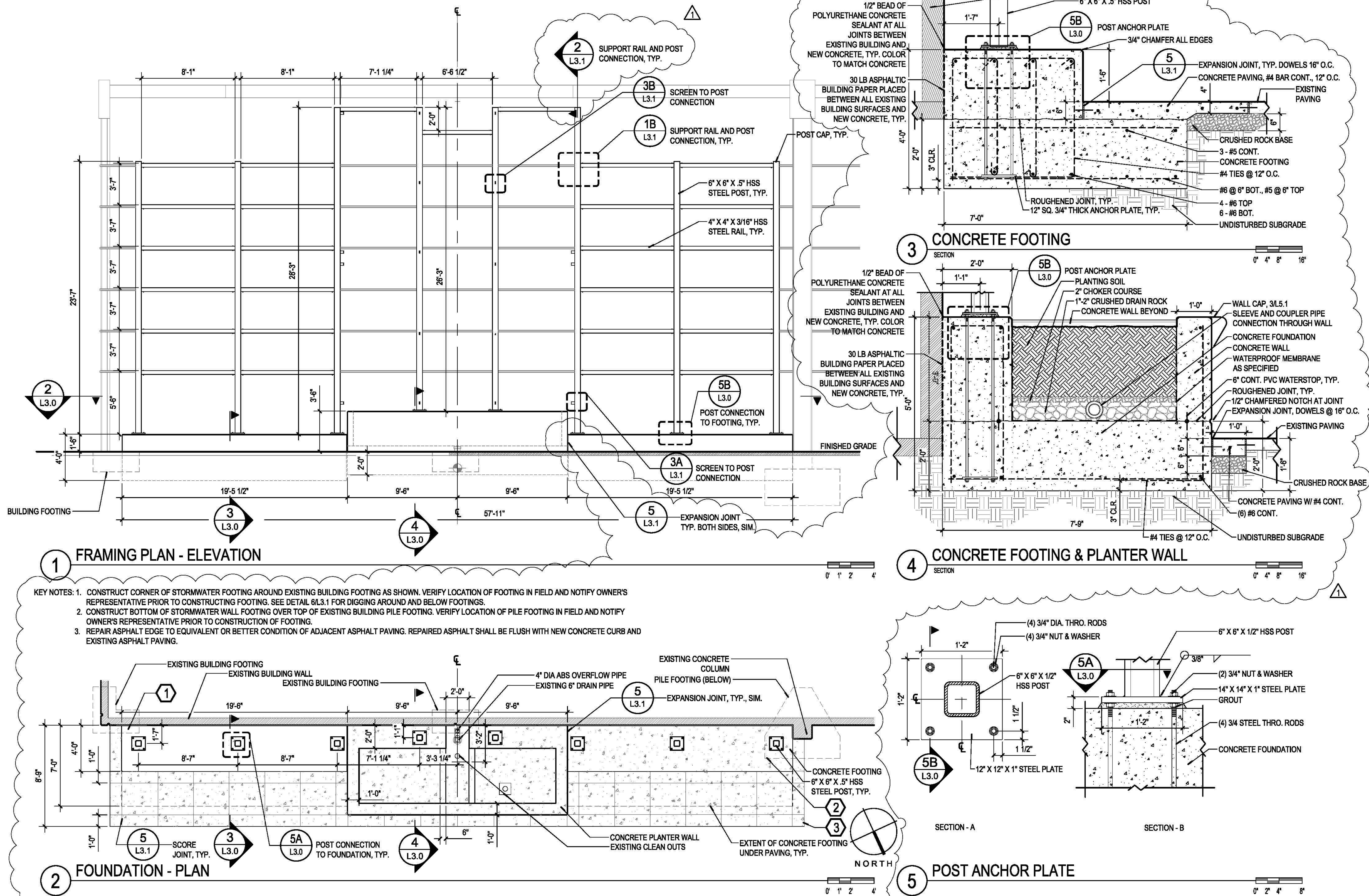
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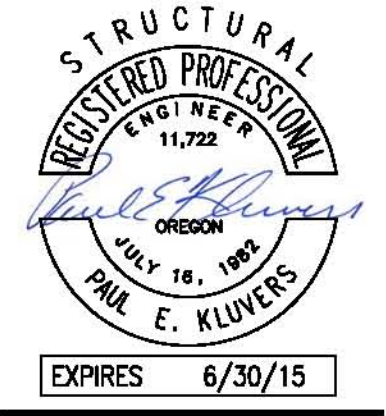
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Approved: MF

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project:
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500 NE Grand Avenue
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P 503.797.1830 (Ph) / F 503.797.1849
neill@metro.dst.or.us

submit: PERMIT SET
sheet title:
**FRAMING AND
FOUNDATION
DETAILS**

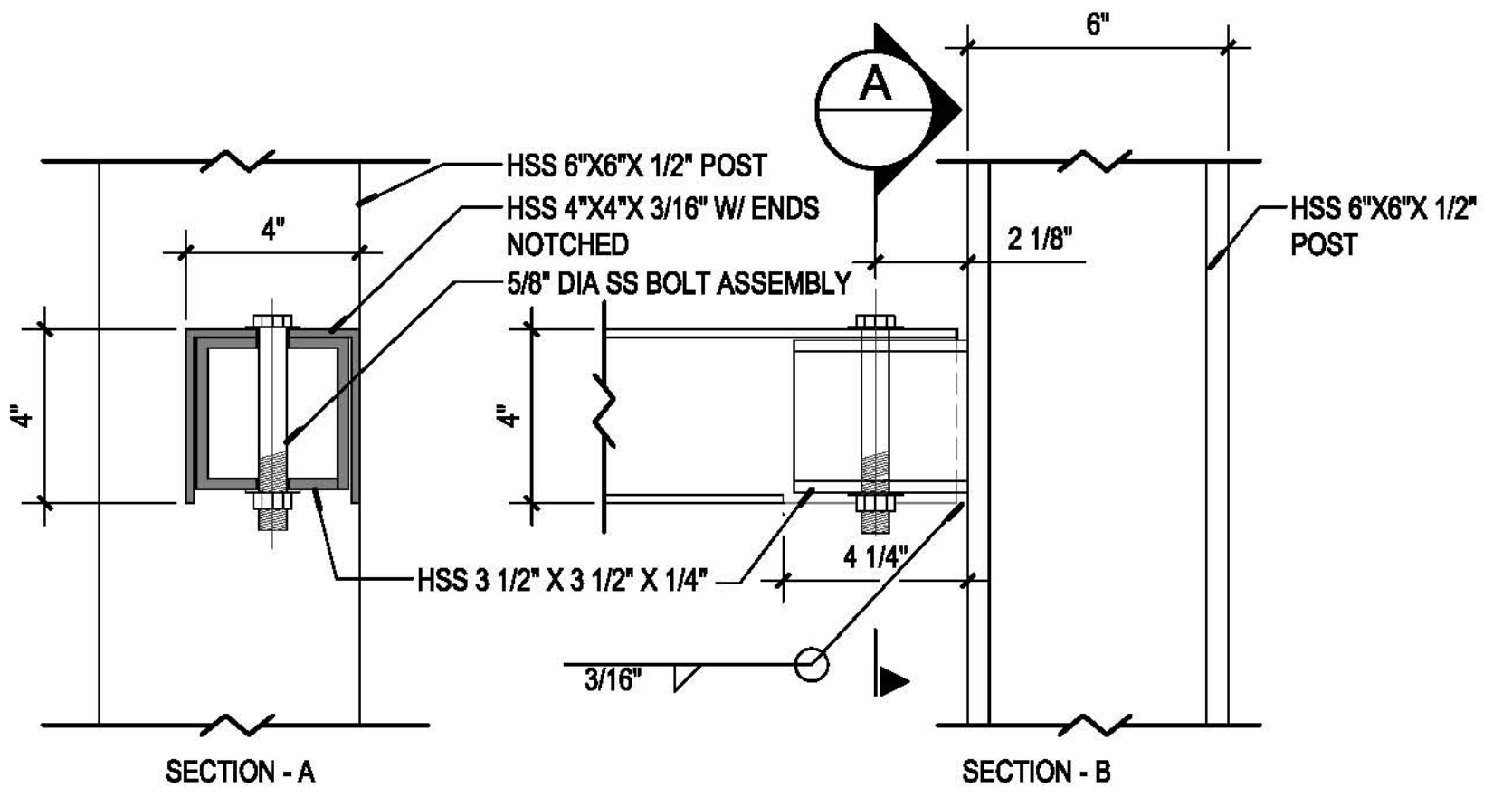
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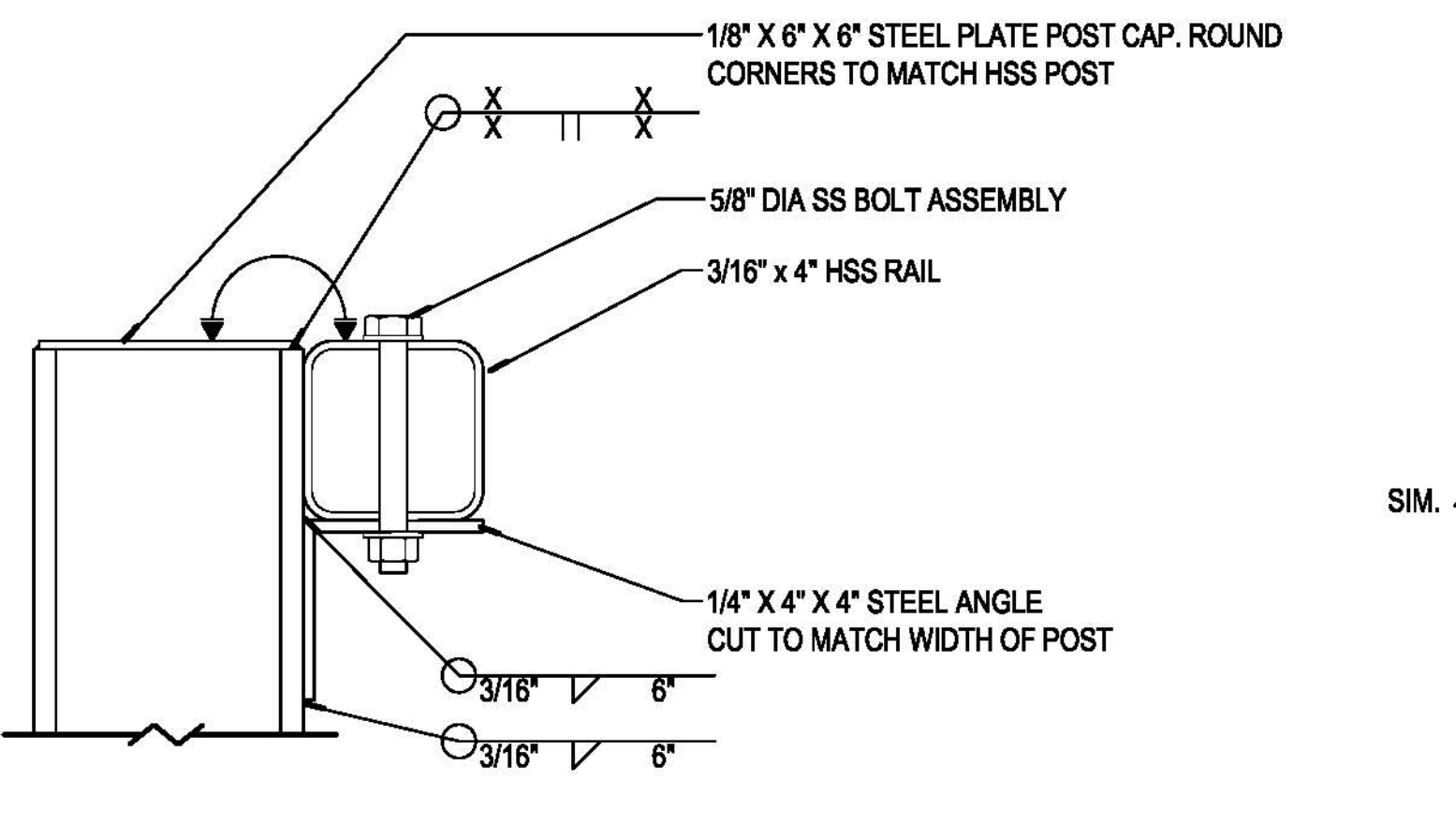
Revisions:

Drawn By: DE/SK
Checked By: PK/DE
Job No. 113005.2
Approved: MF

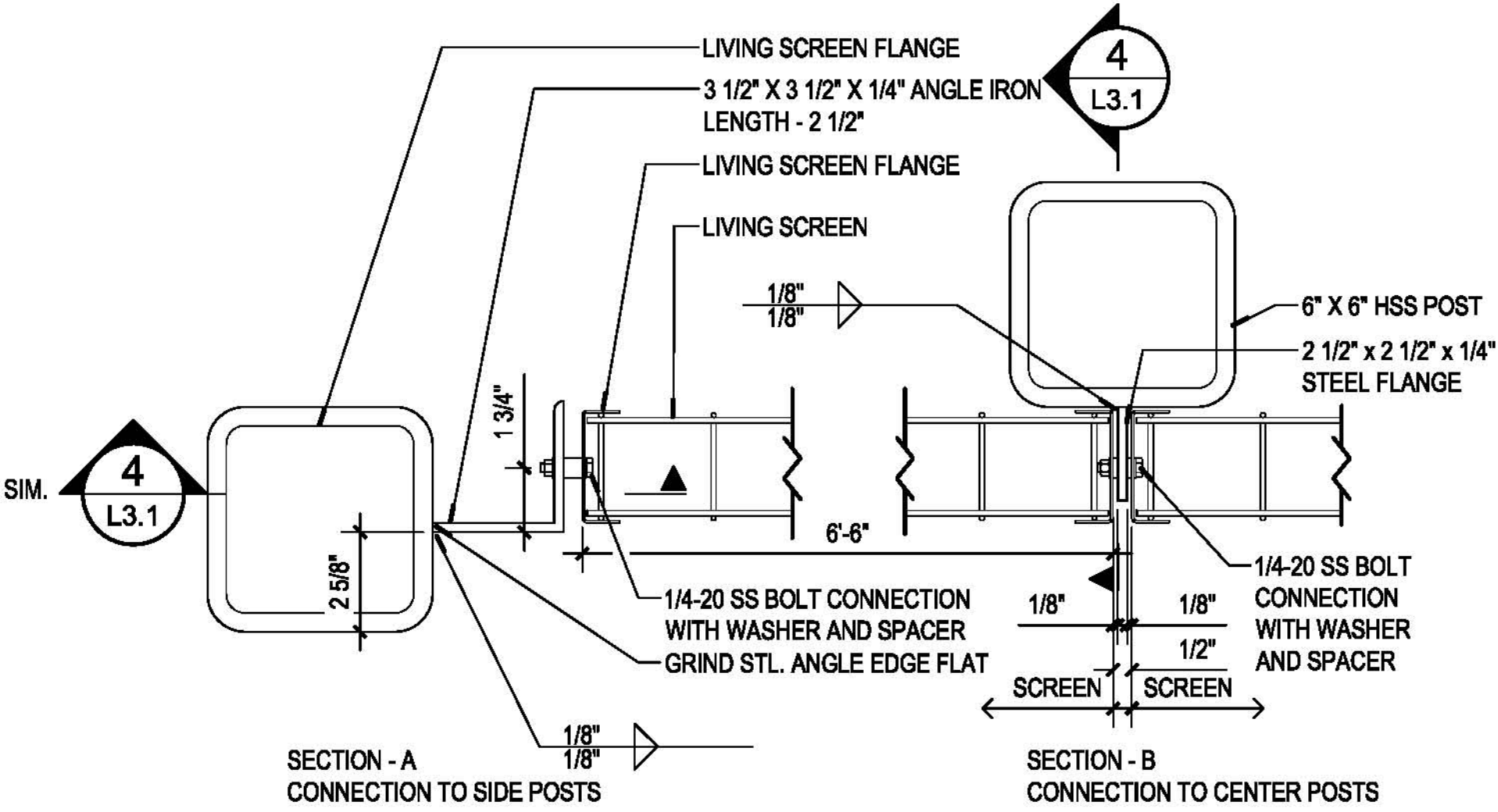
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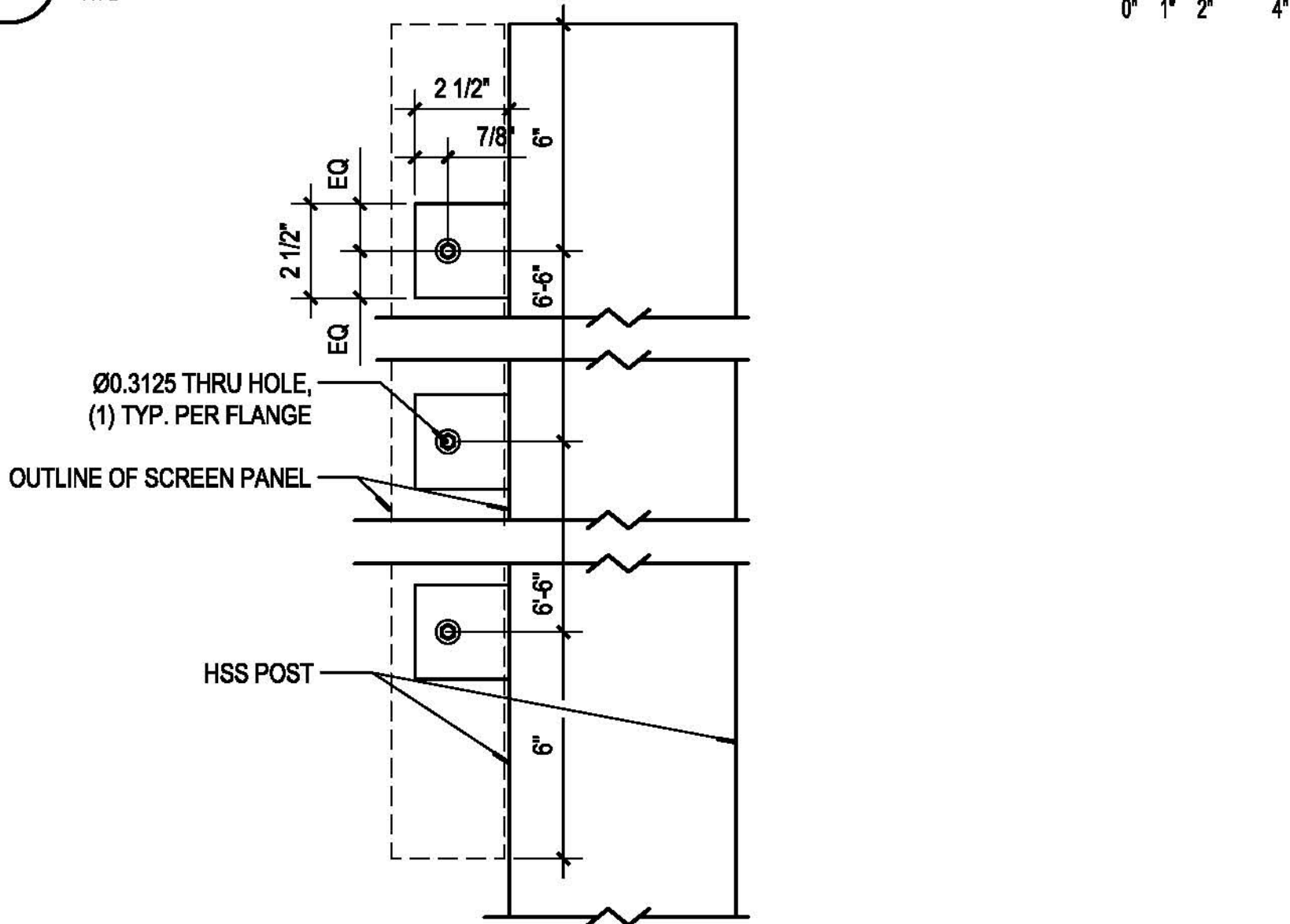
1 SUPPORT RAIL AND POST CONNECTION
TYPE
0' 1' 2' 4'



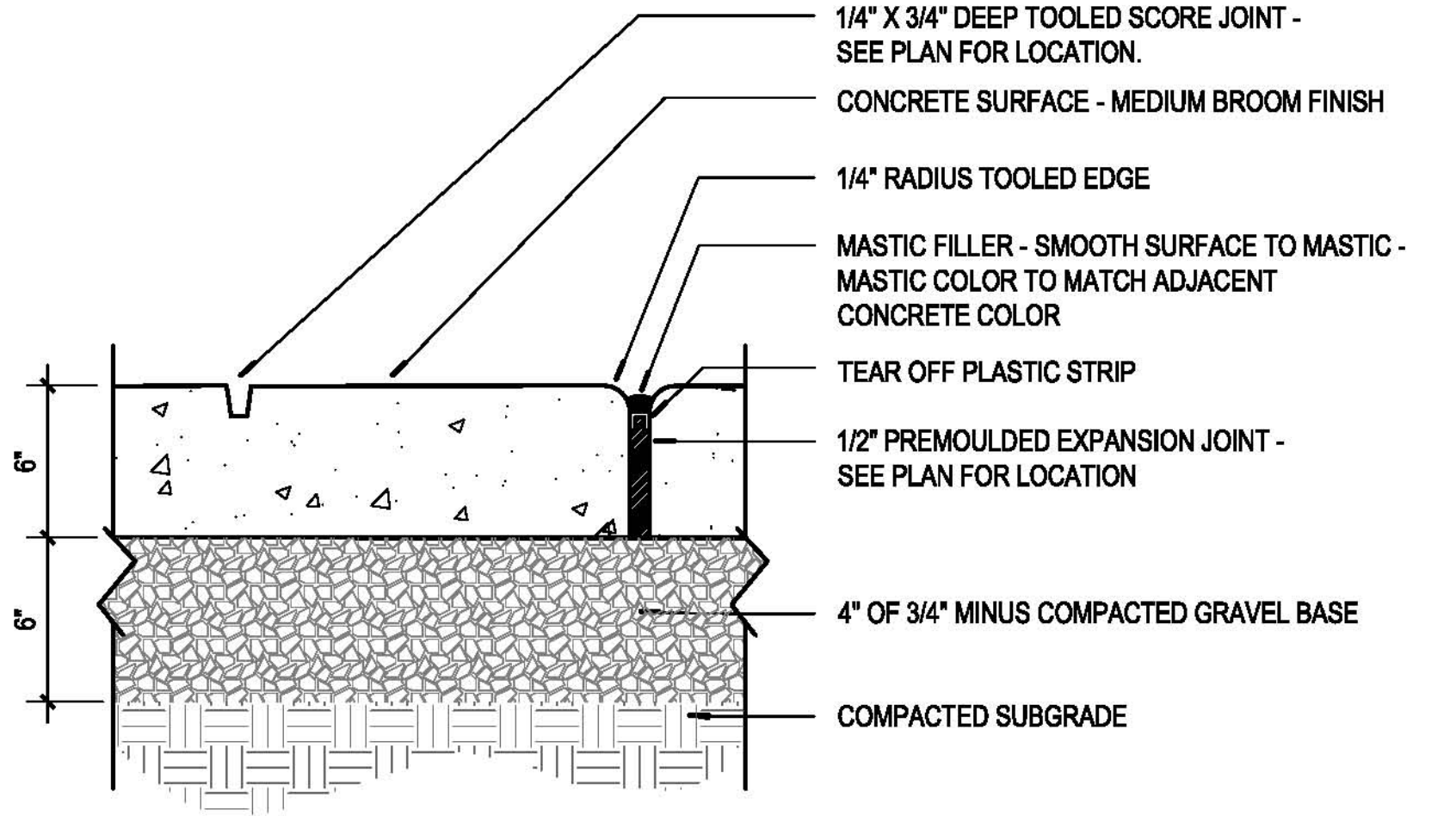
2 SUPPORT RAIL AND POST CONNECTION
SECTION
0' 1' 2' 4'



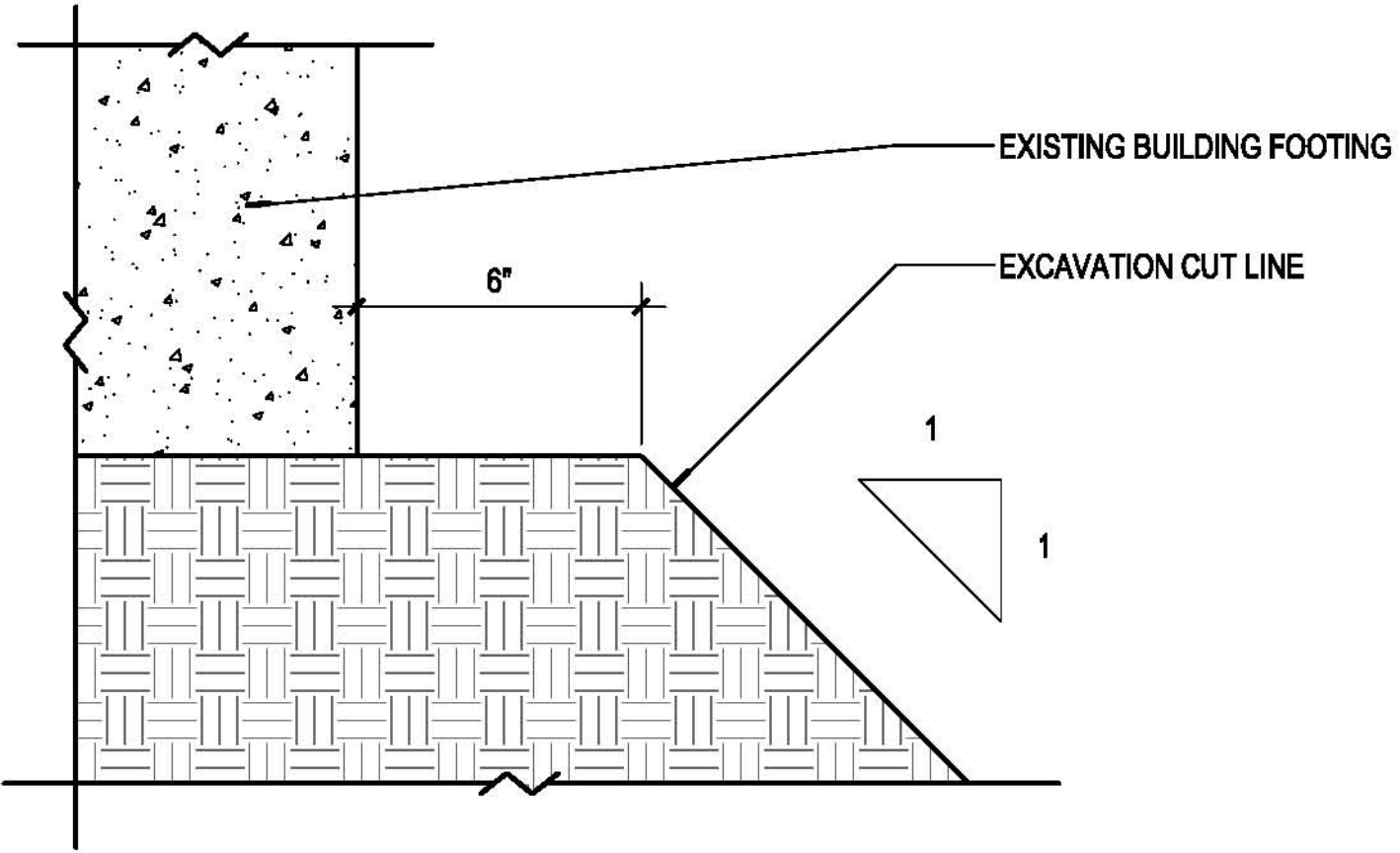
3 SCREEN TO POST CONNECTION
SECTION
0' 1' 2' 4'



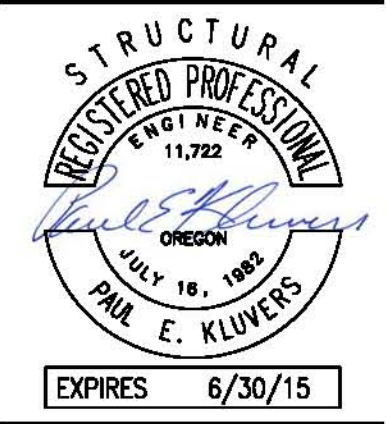
4 SCREEN TO POST CONNECTION
SECTION
0' 1' 2' 4'



5 EXPANSION & SCORE JOINT
Section
0' 1' 2' 4'



6 EXCAVATION ADJACENT TO EX. FOOTINGS
SECTION
0' 1' 2' 4'



project: **EXPO CENTER Stormwater Wall**
METRO
600 NE Grand Avenue
Portland, Oregon
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neill@metro.dst.or.us

submit: **PERMIT SET**
sheet title: **STORMWATER CHANNEL DETAILS**

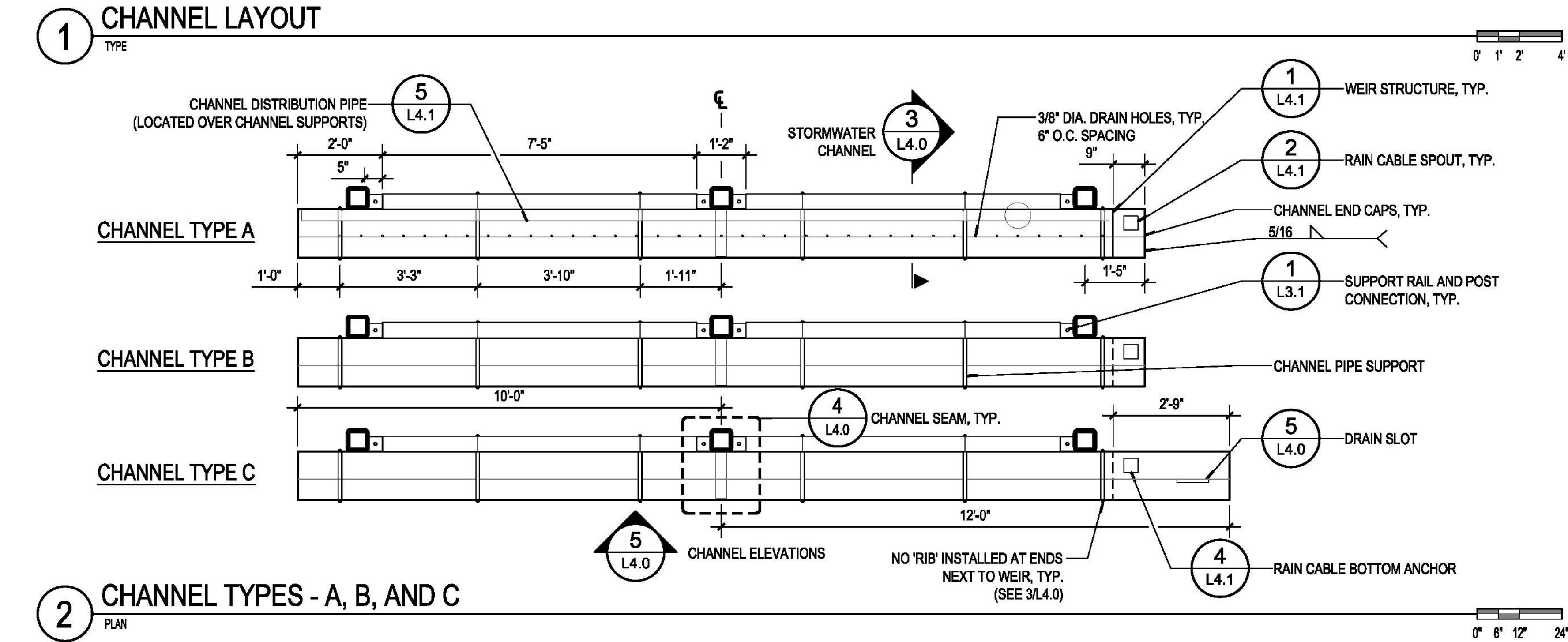
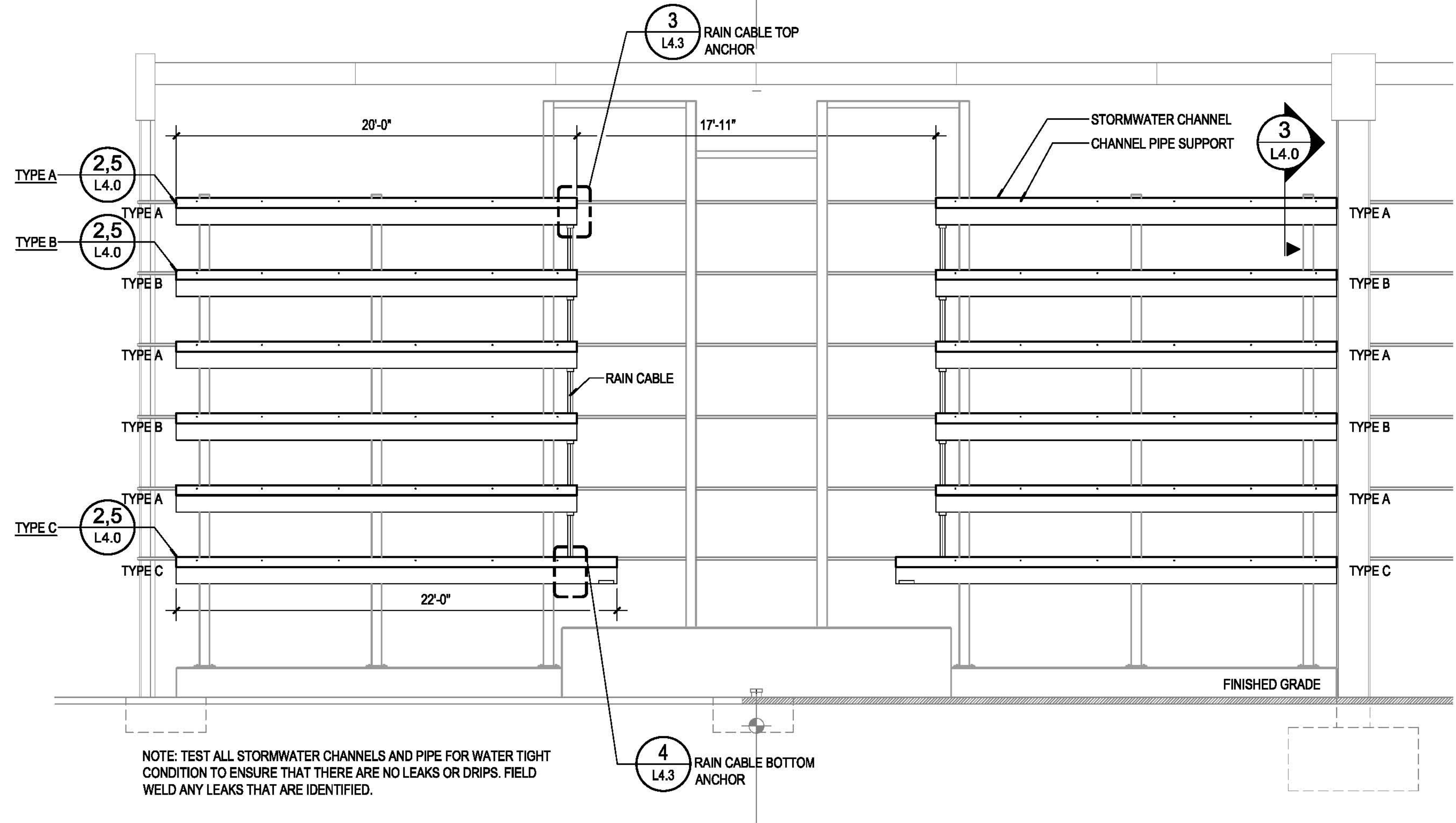
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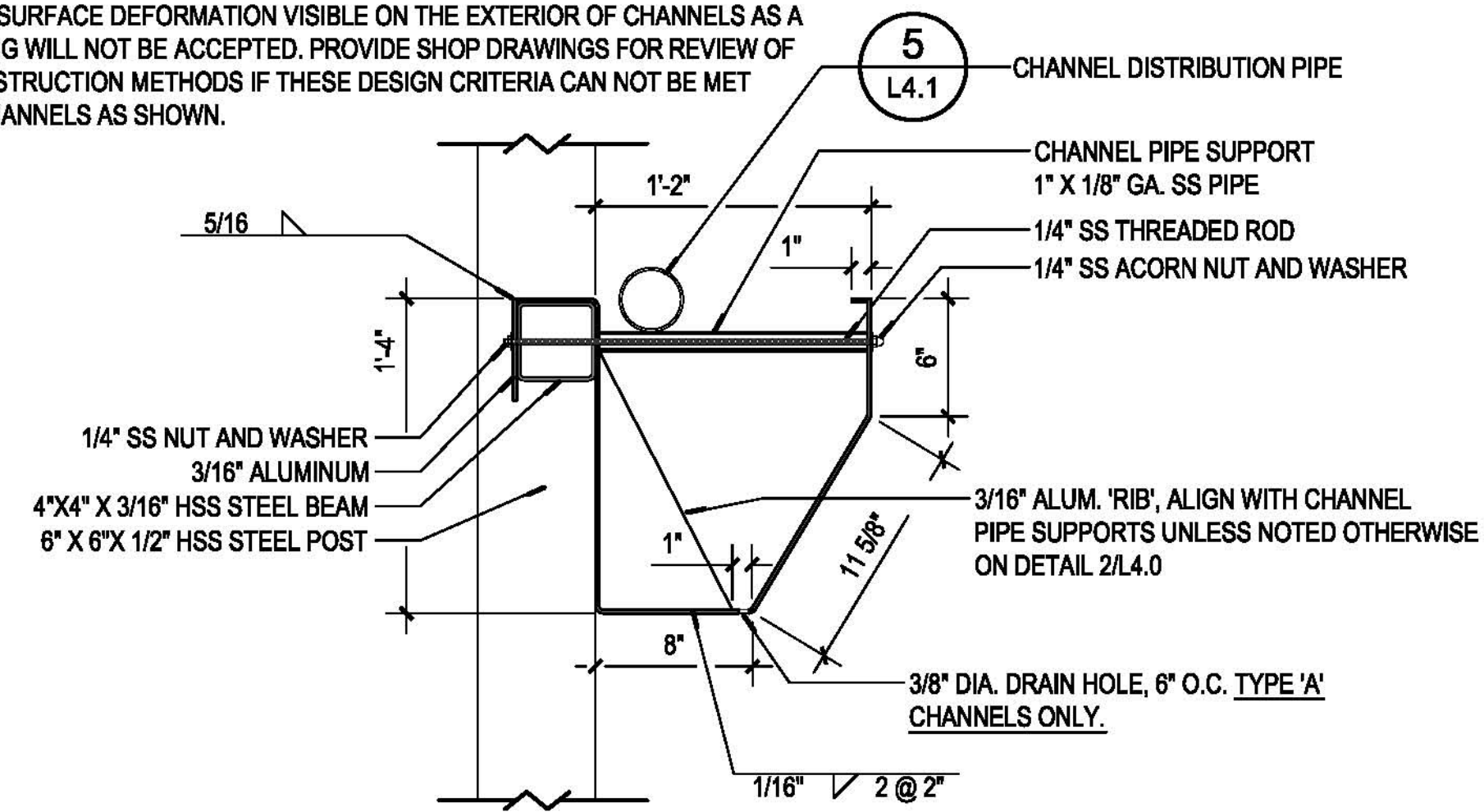
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Checked By: PK/DE
Job No. 113005.2
Approved: MF

L4.0

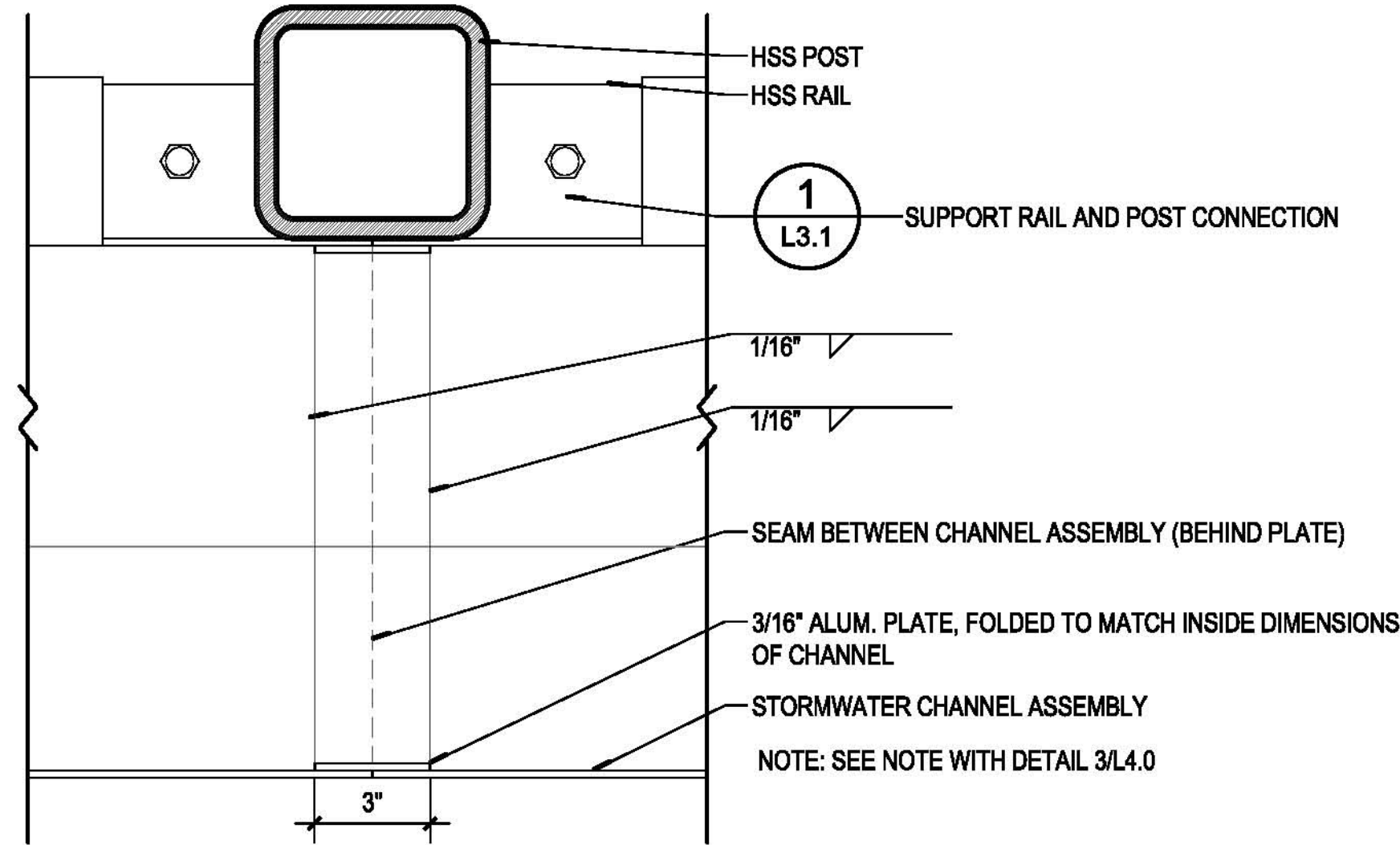
NOTE: MARKS AND SURFACE DEFORMATION VISIBLE ON THE EXTERIOR OF CHANNELS AS A RESULT OF WELDING WILL NOT BE ACCEPTED. PROVIDE SHOP DRAWINGS FOR REVIEW OF ALTERNATIVE CONSTRUCTION METHODS IF THESE DESIGN CRITERIA CAN NOT BE MET CONSTRUCTING CHANNELS AS SHOWN.



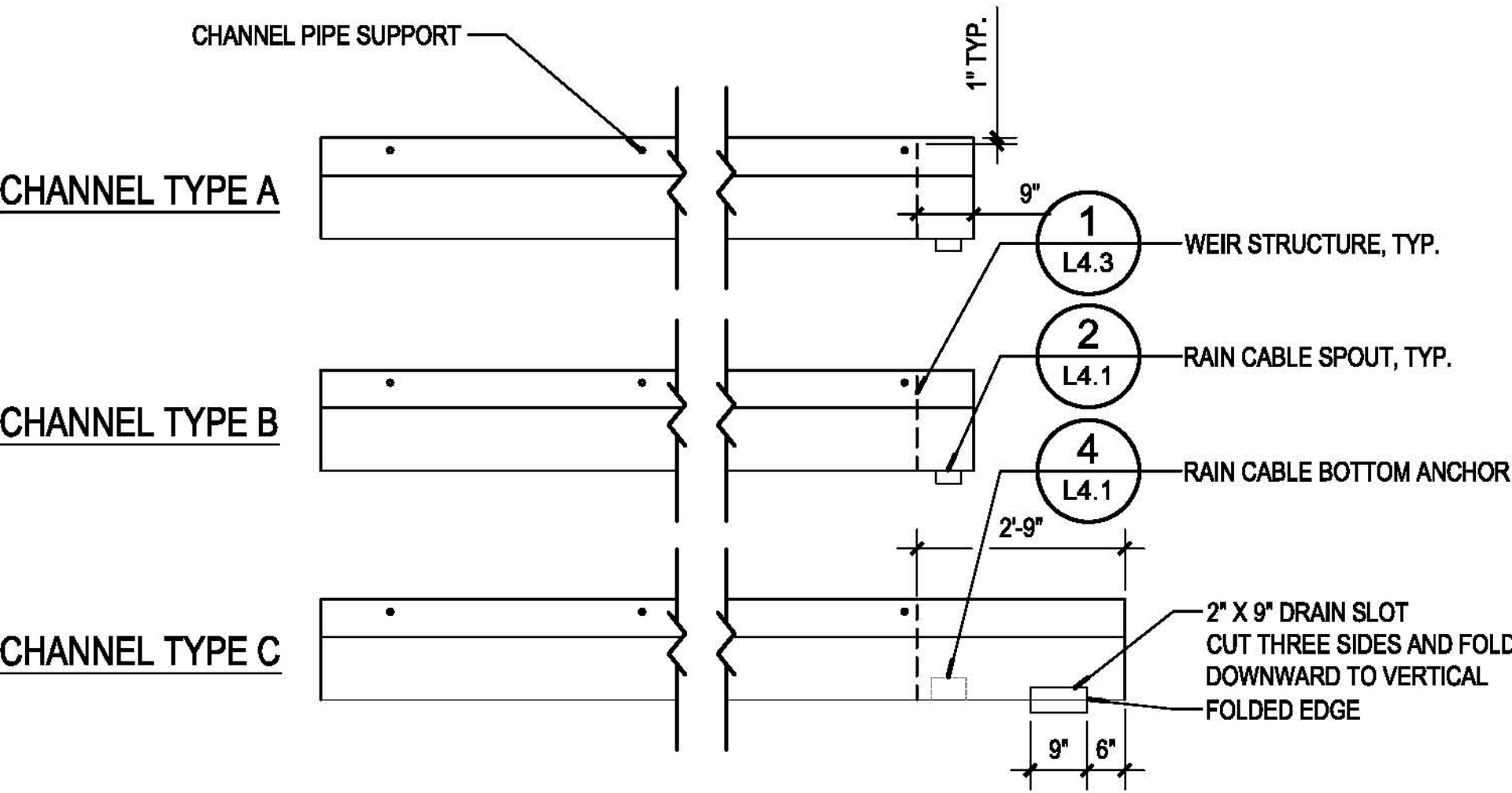
2 CHANNEL TYPES - A, B, AND C
PLAN



3 STORMWATER CHANNEL
SECTION



4 STORMWATER CHANNEL SEAM
PLAN



5 CHANNEL TYPES - A, B, AND C
ELEVATION



project: **EXPO CENTER Stormwater Wall**
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Portland, Oregon
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submit: **PERMIT SET**
sheet title: **RAIN CABLE DETAILS**

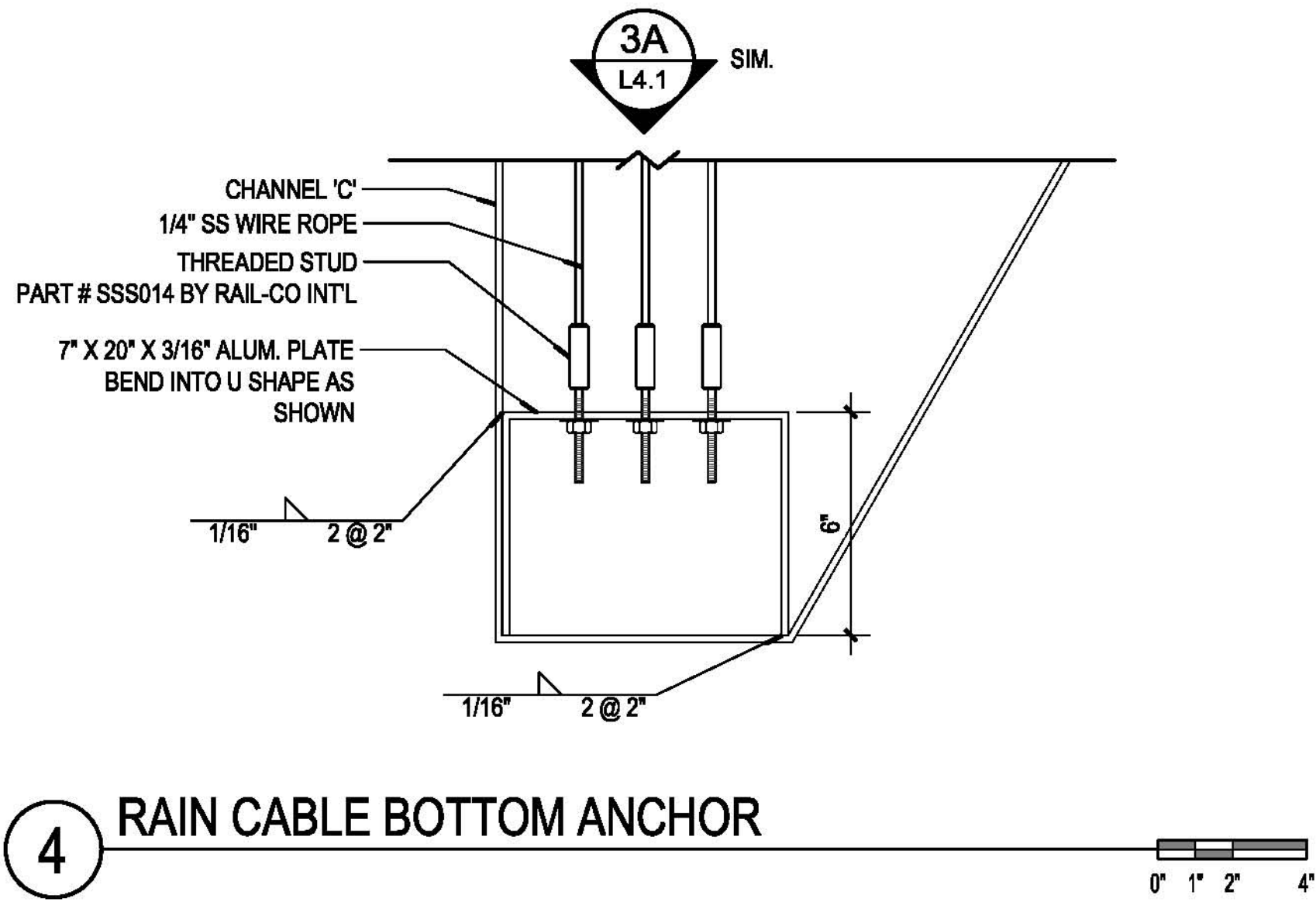
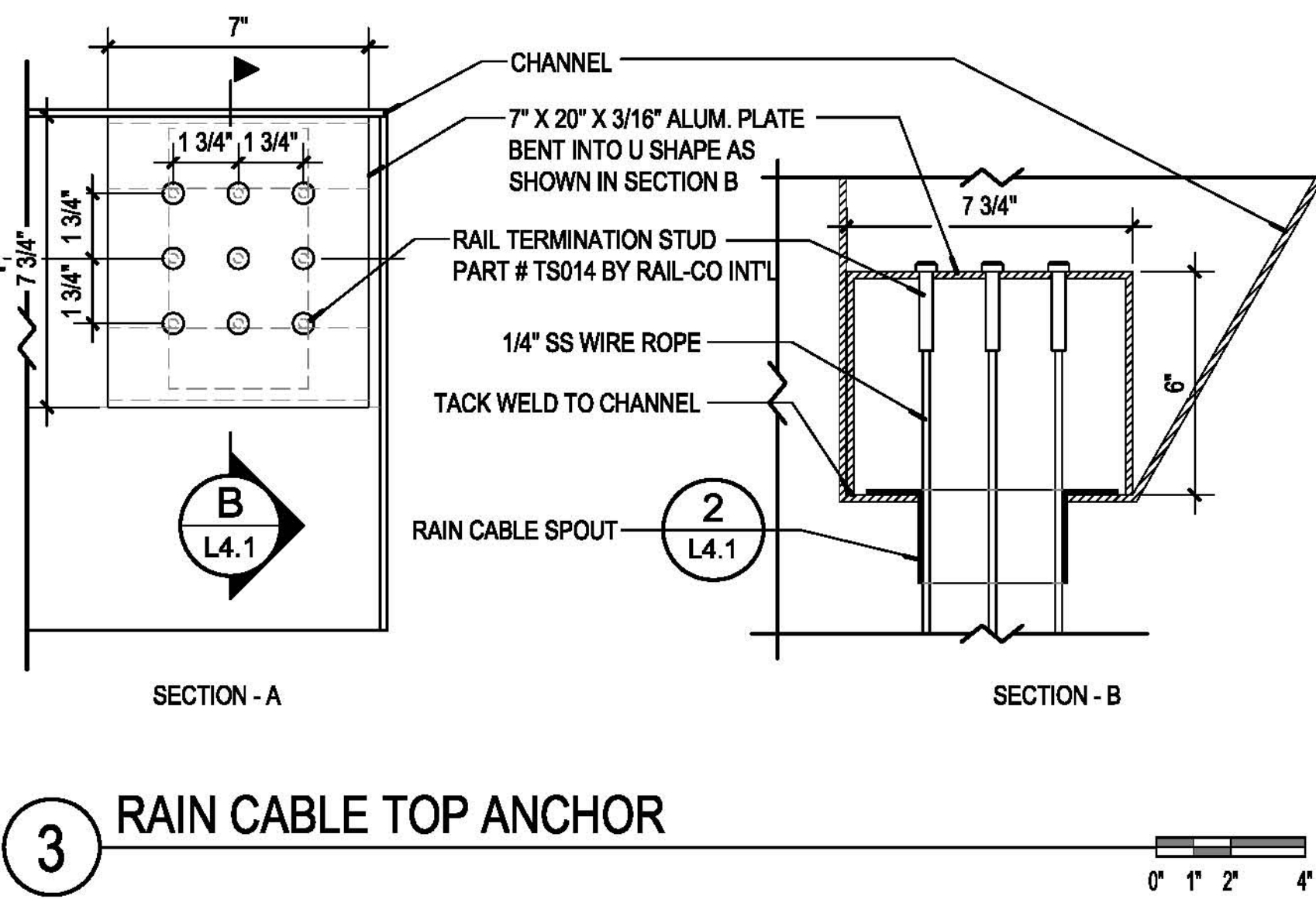
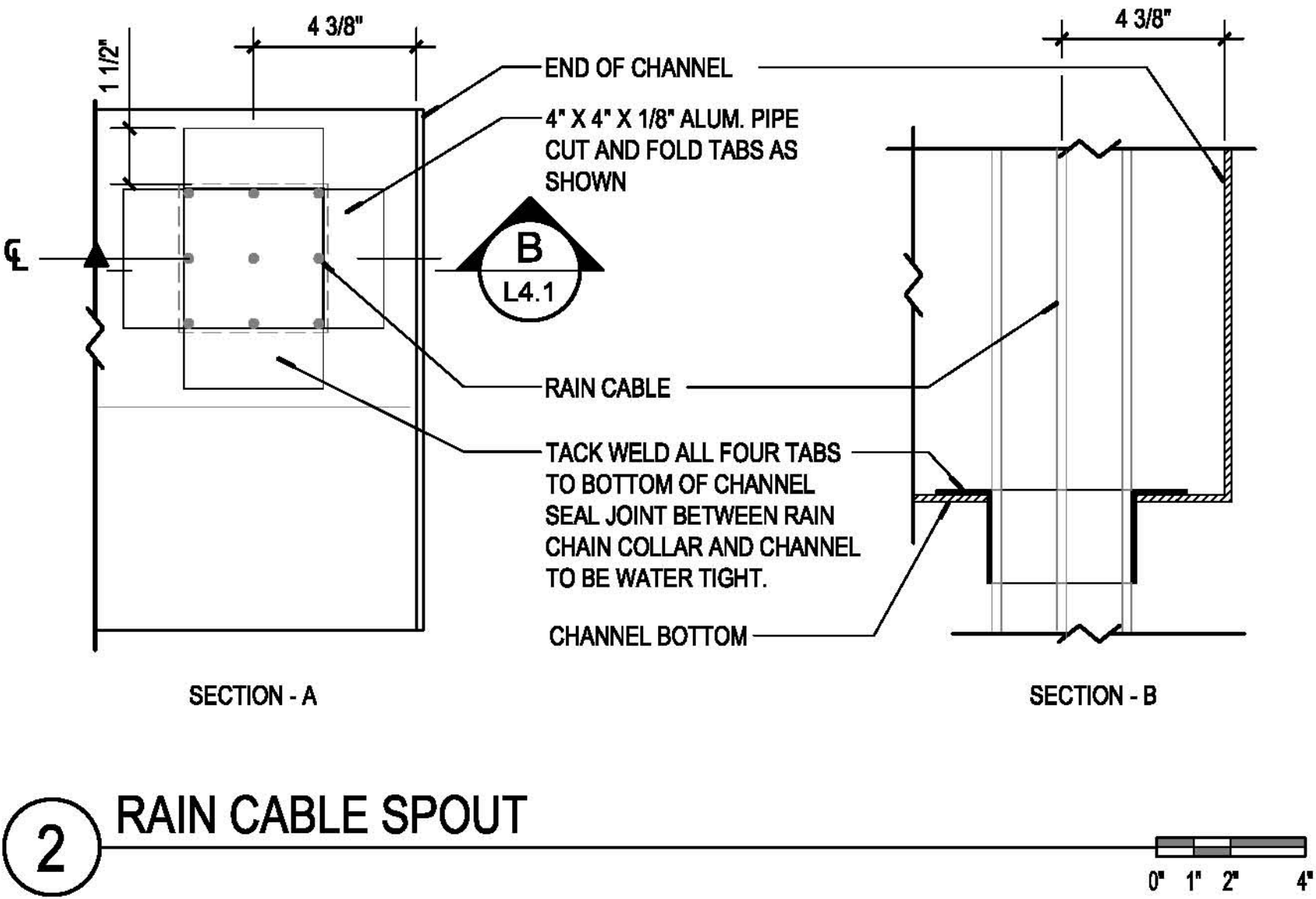
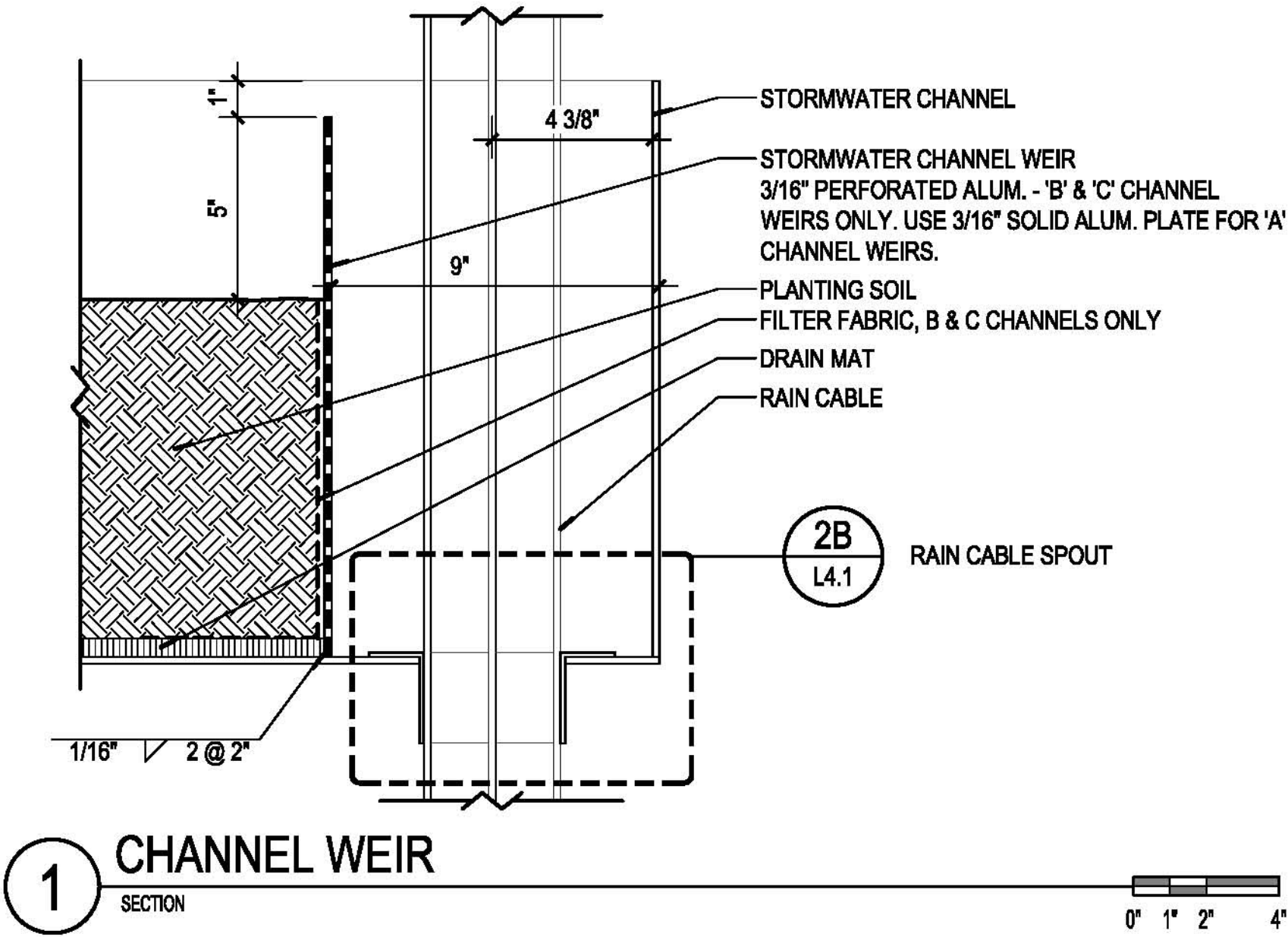
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Revisions:

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Job No. 113005.2
Approved: MF

L4.1





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METRO
500 NE Grand Avenue
Portland, Oregon
P 503.797.1830 (Ph) / F 503.797.1849
neill@metro.dst.or.us

submit: PERMIT SET
sheet title: **PRIMARY DIVERTER & PIPE DETAILS**

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Revisions:

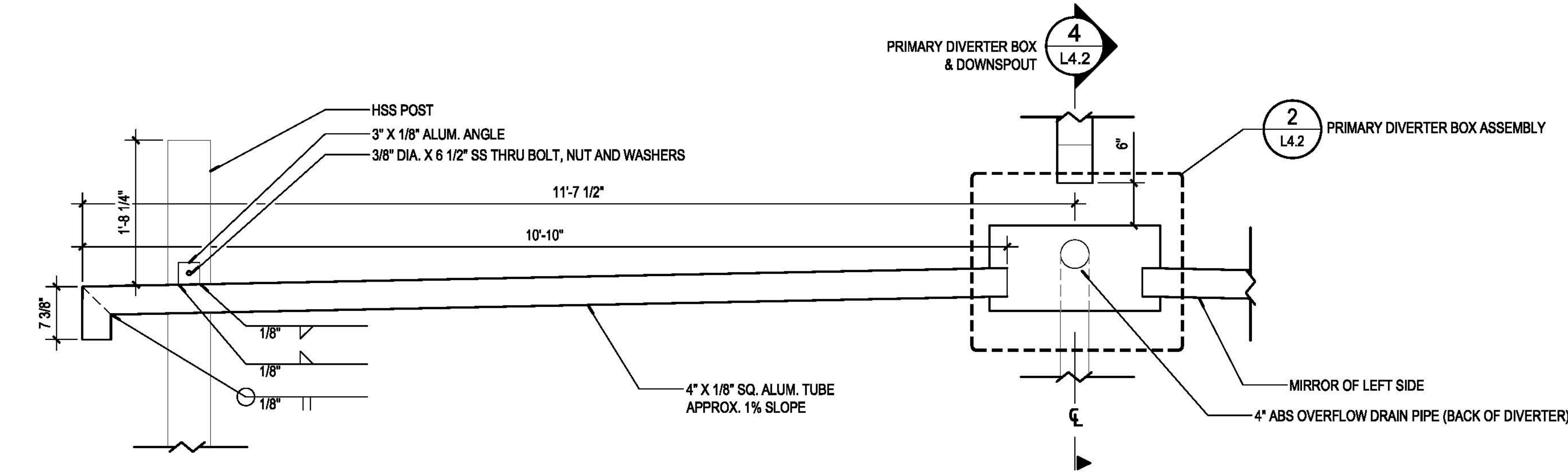
Drawn By: DE/SK

Checked By: DE/RT

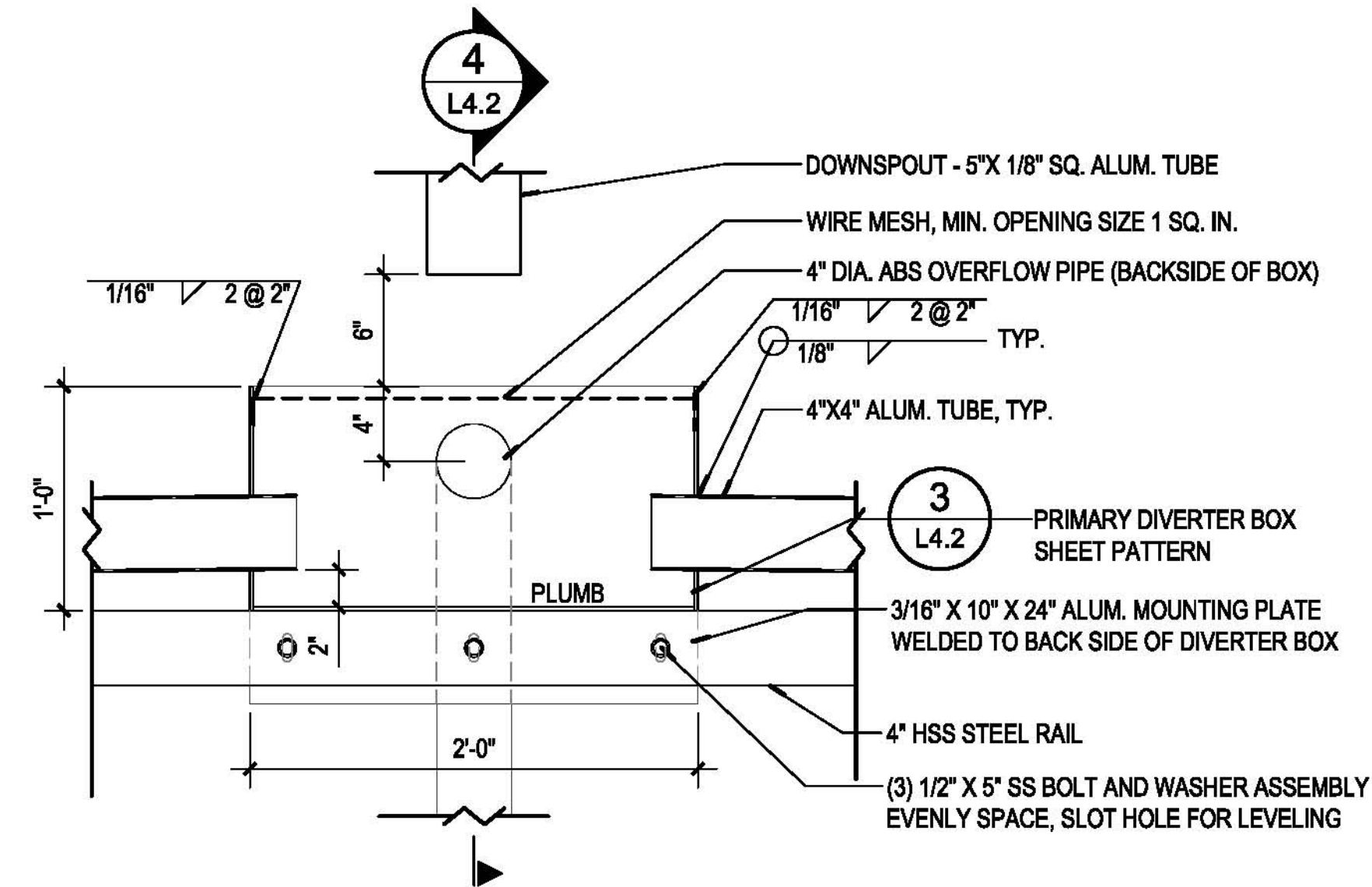
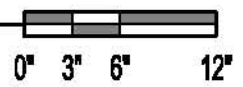
Job No. 113005.2

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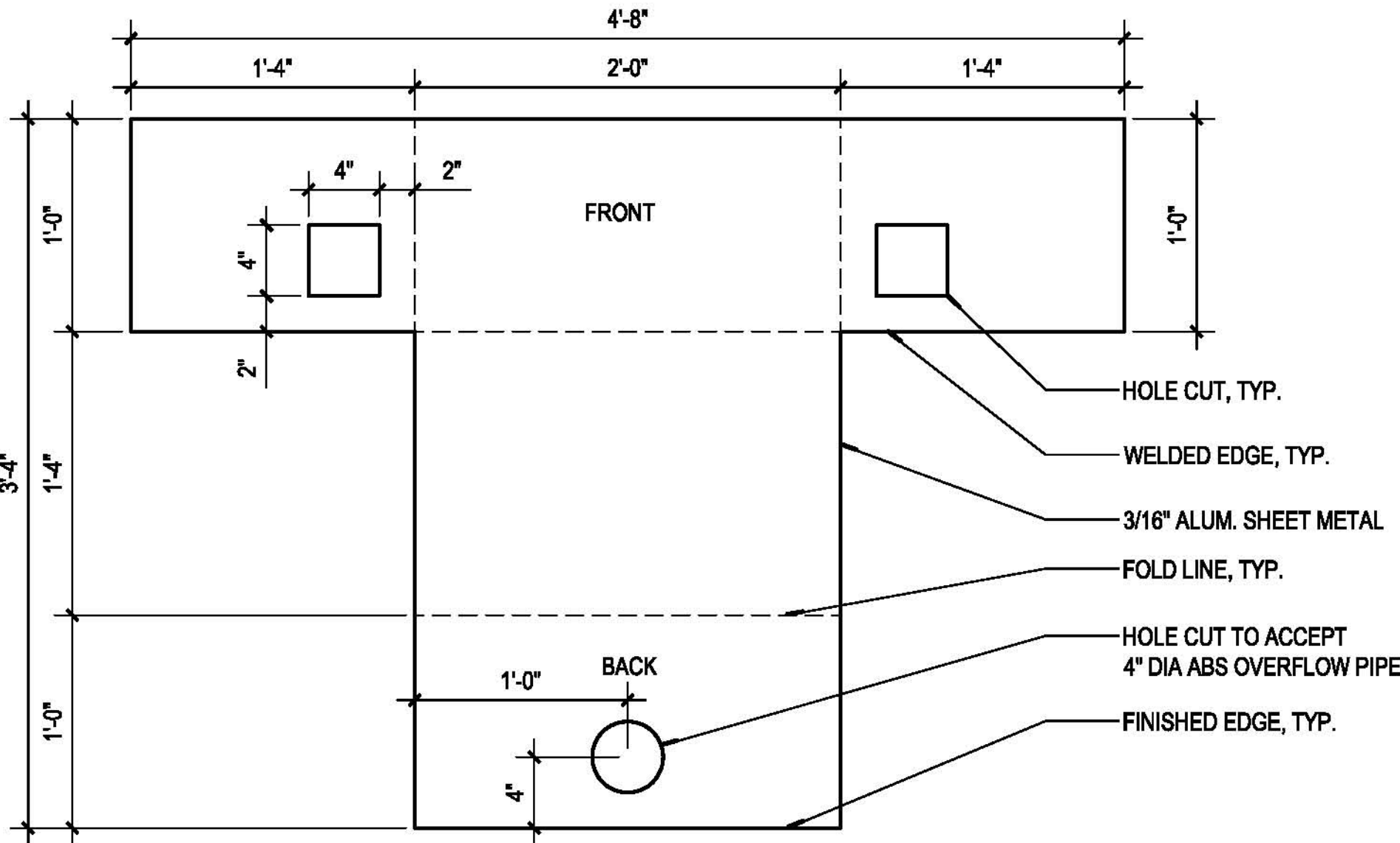
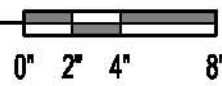
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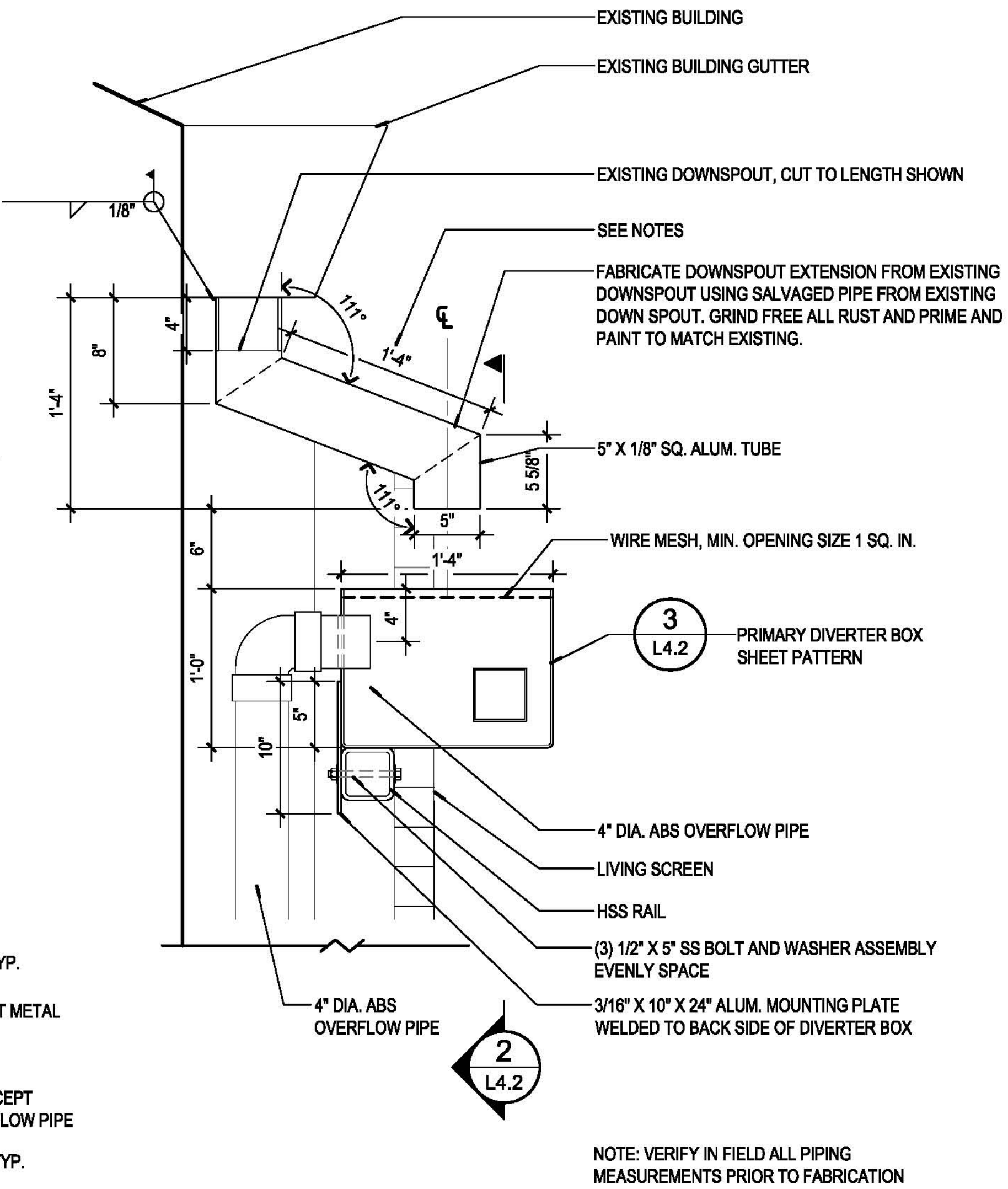
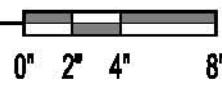
1 PRIMARY DIVERTER BOX AND PIPE ASSEMBLY
TYPE



2 PRIMARY DIVERTER BOX ASSEMBLY
SECTION



3 PRIMARY DIVERTER BOX - SHEET PATTERN



2 PRIMARY DIVERTER BOX ASSEMBLY & PIPE ASSEMBLY
SECTION





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500 NE Grand Avenue
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neill@metro.dst.or.us

submit: **PERMIT SET**
sheet title: **SECONDARY DIVERTER & PIPE DETAILS**

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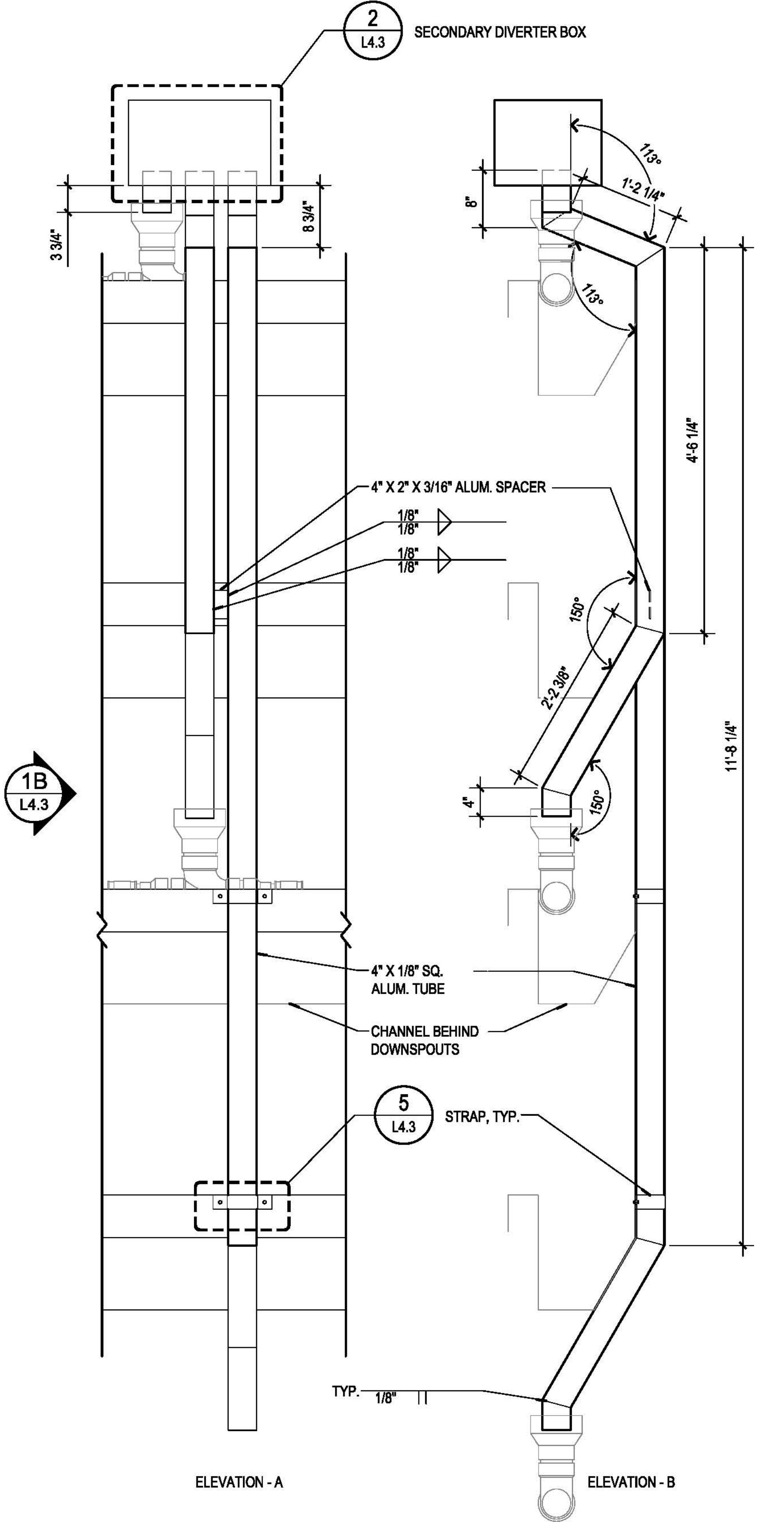
Date: 02.24.14
Revisions:

Drawn By: DE/SK
Checked By: DE/RT
Job No. 113005.2
Approved: MF

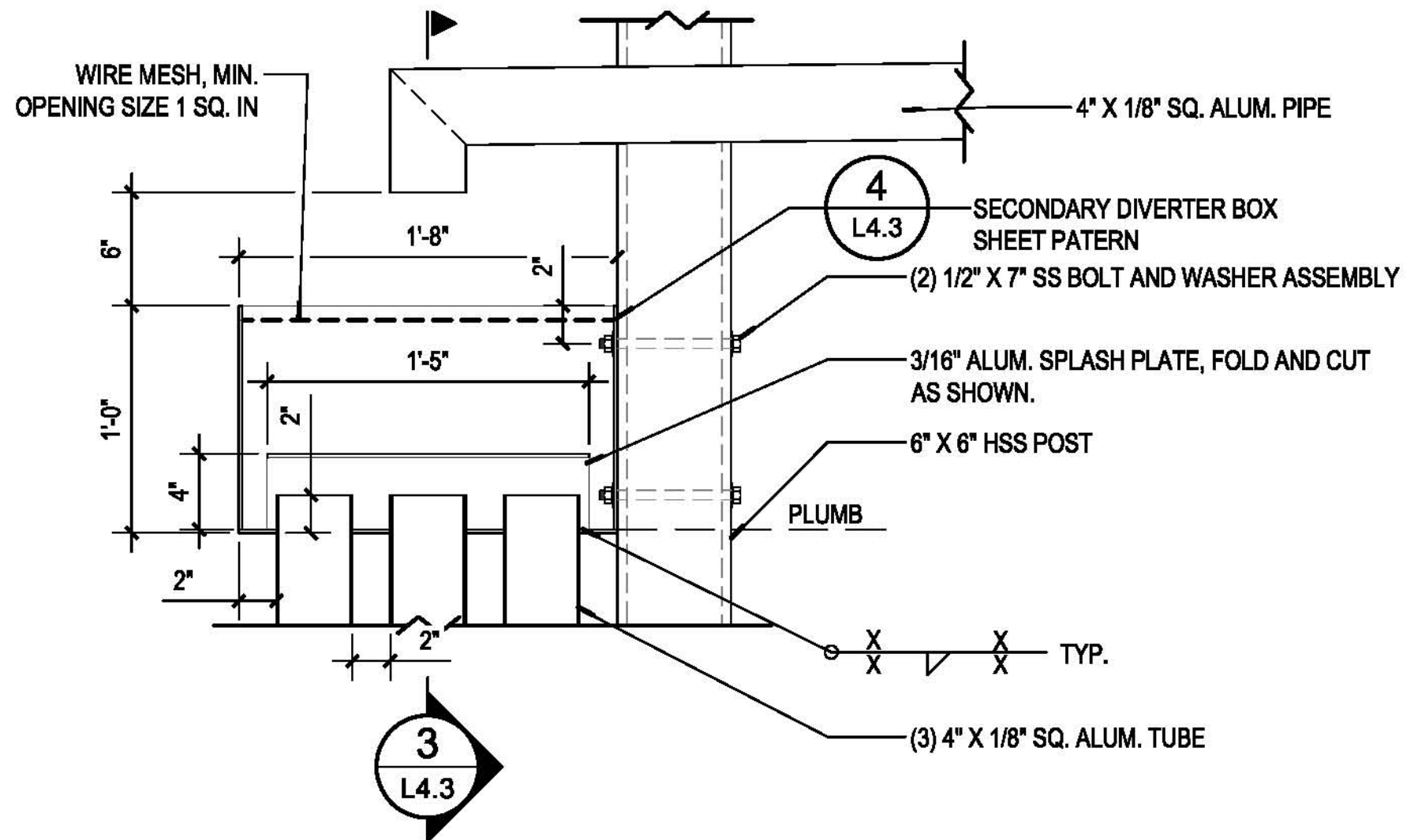
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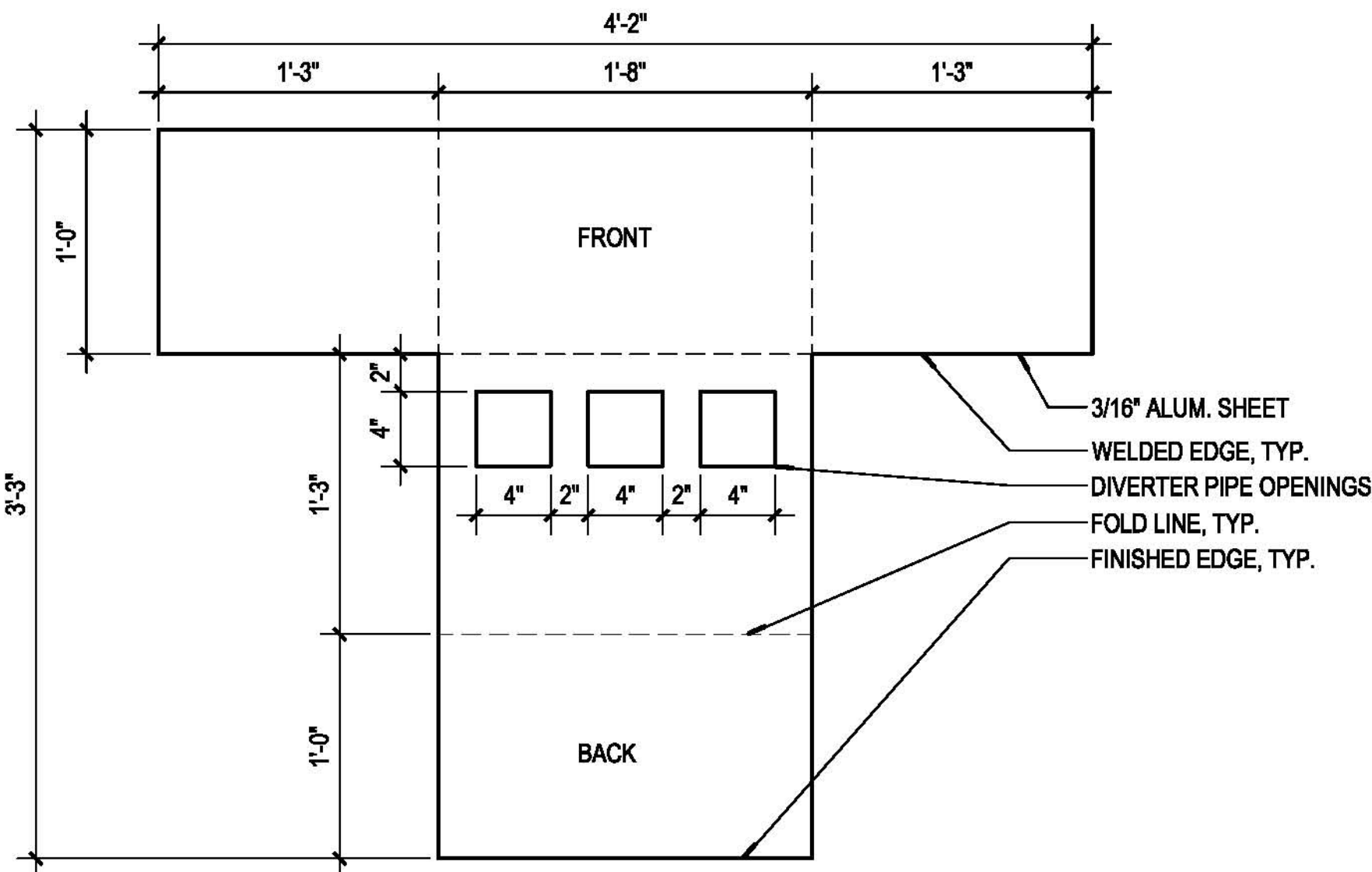
NOTE: FIELD VERIFY ALL MEASUREMENTS FOR ACCURACY PRIOR TO FABRICATING SECONDARY DIVERTER BOX DOWN SPOUT ASSEMBLY.



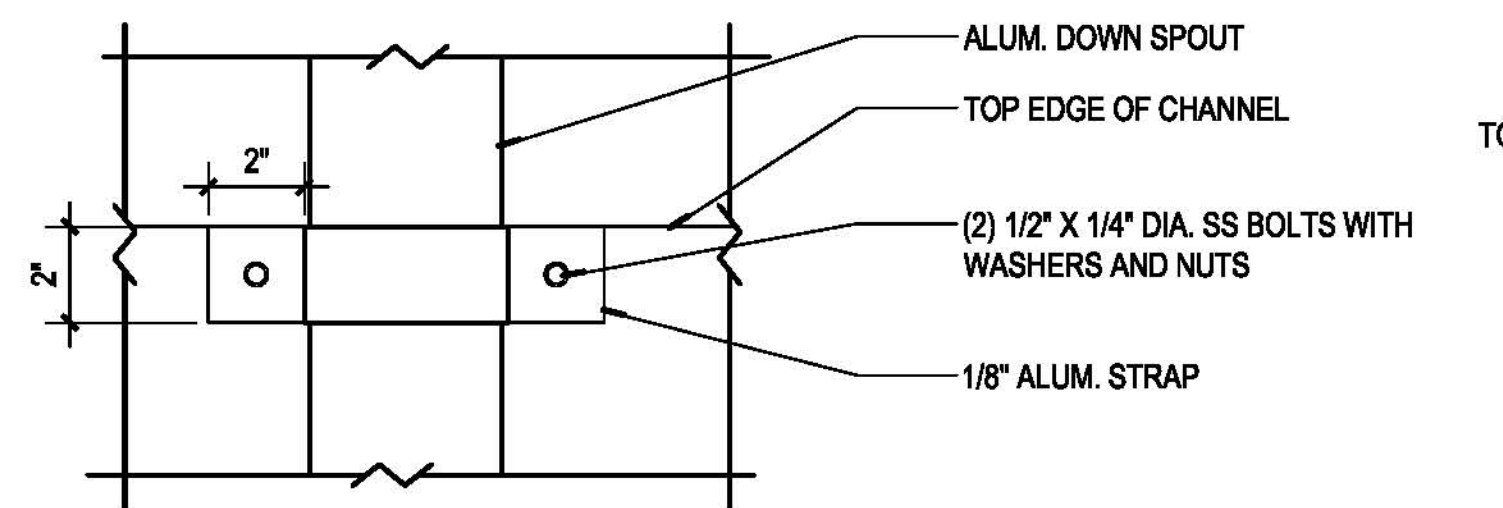
1 SECONDARY DIVERTER & PIPE ASSEMBLY
ELEVATION
0' 3' 6' 12'



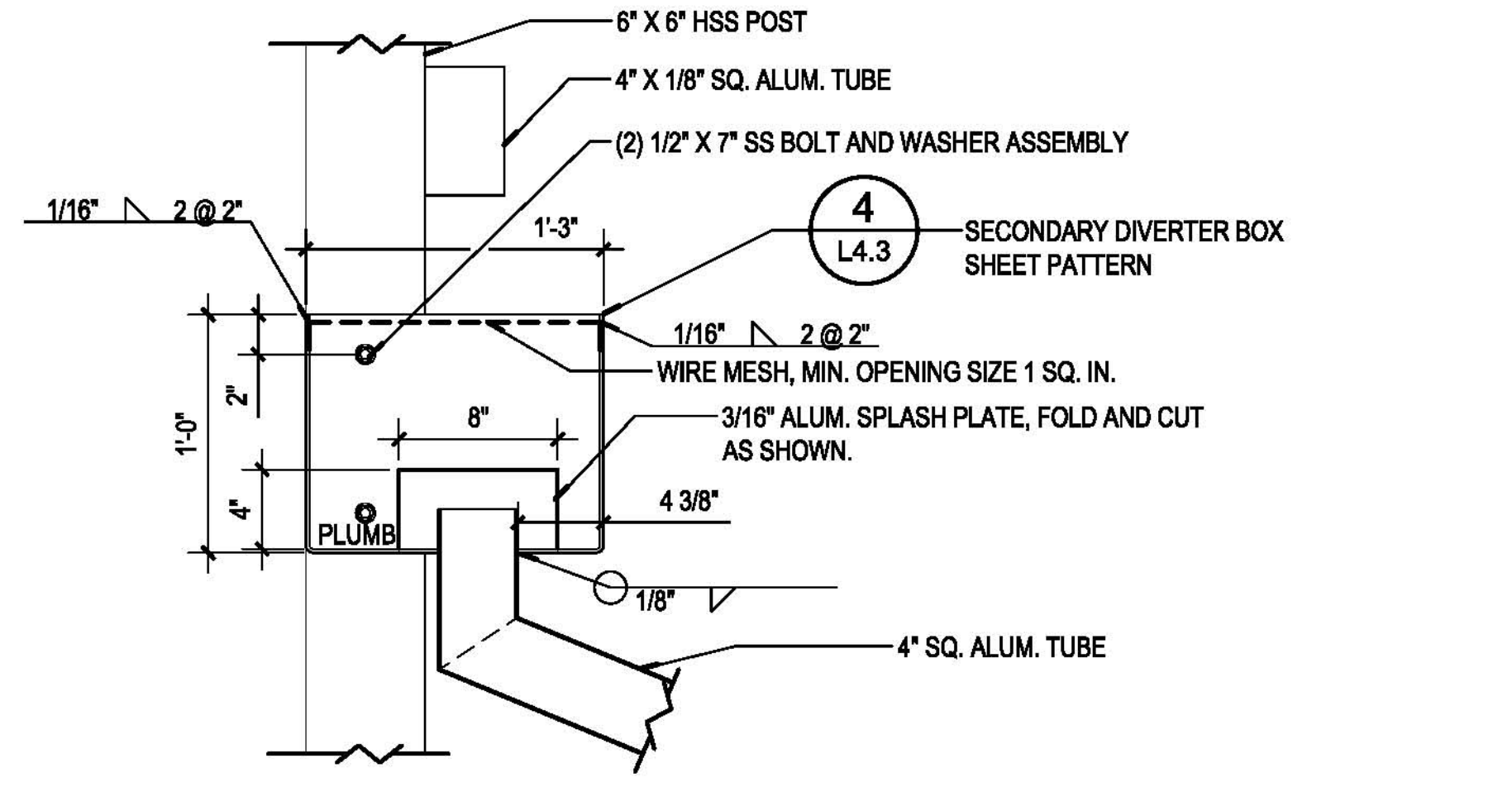
2 SECONDARY DIVERTER BOX ASSEMBLY
SECTION
0' 2' 4' 8'



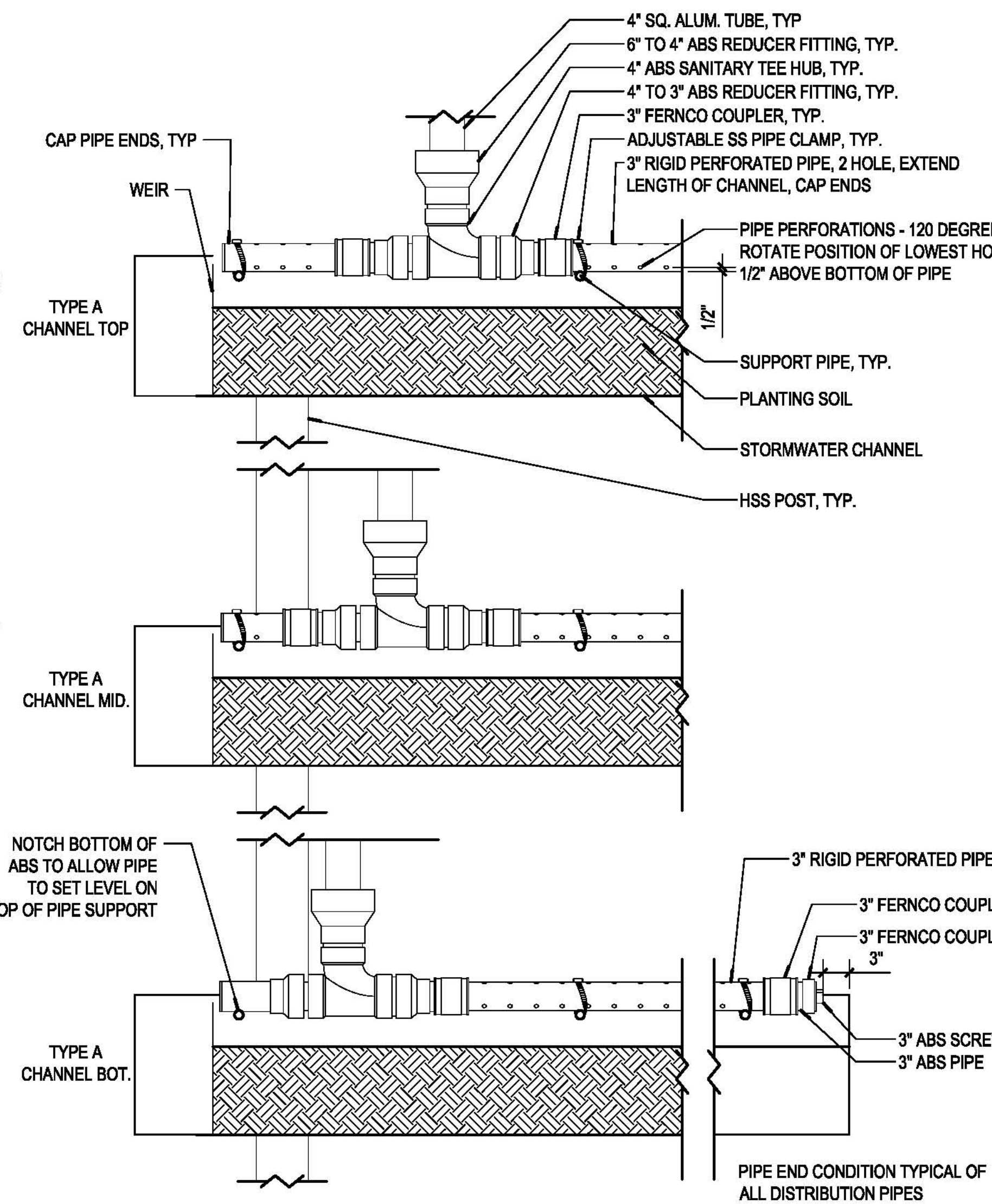
4 SECONDARY DIVERTER BOX - SHEET PATTERN
0' 2' 4' 8'



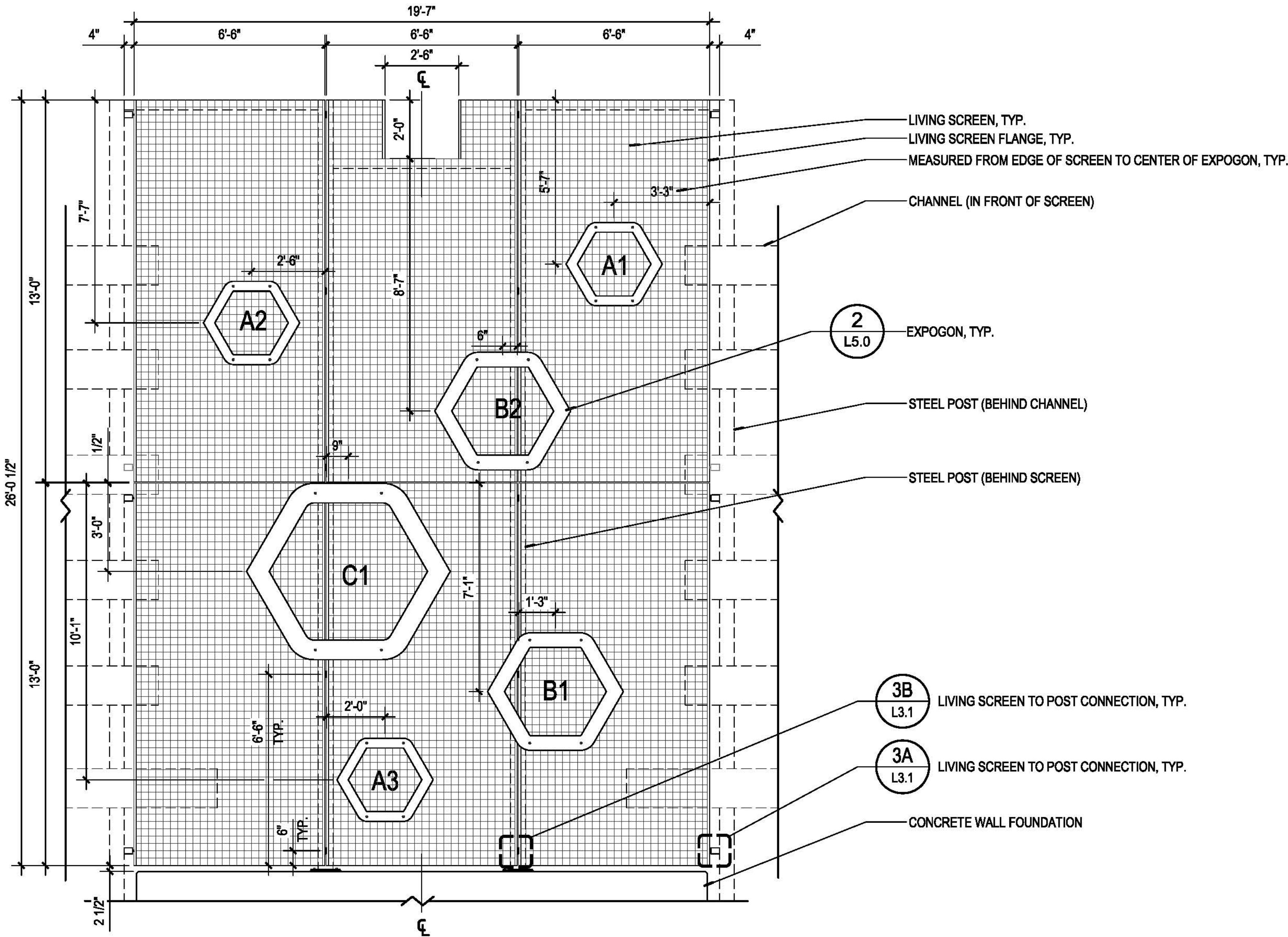
5 DOWNSPOUT STRAP
ELEVATION
0' 1' 2' 4'



3 SECONDARY DIVERTER BOX ASSEMBLY
SECTION
0' 2' 4' 8'



6 CHANNEL PIPE DISTRIBUTION
SECTION
0' 3' 6' 12'

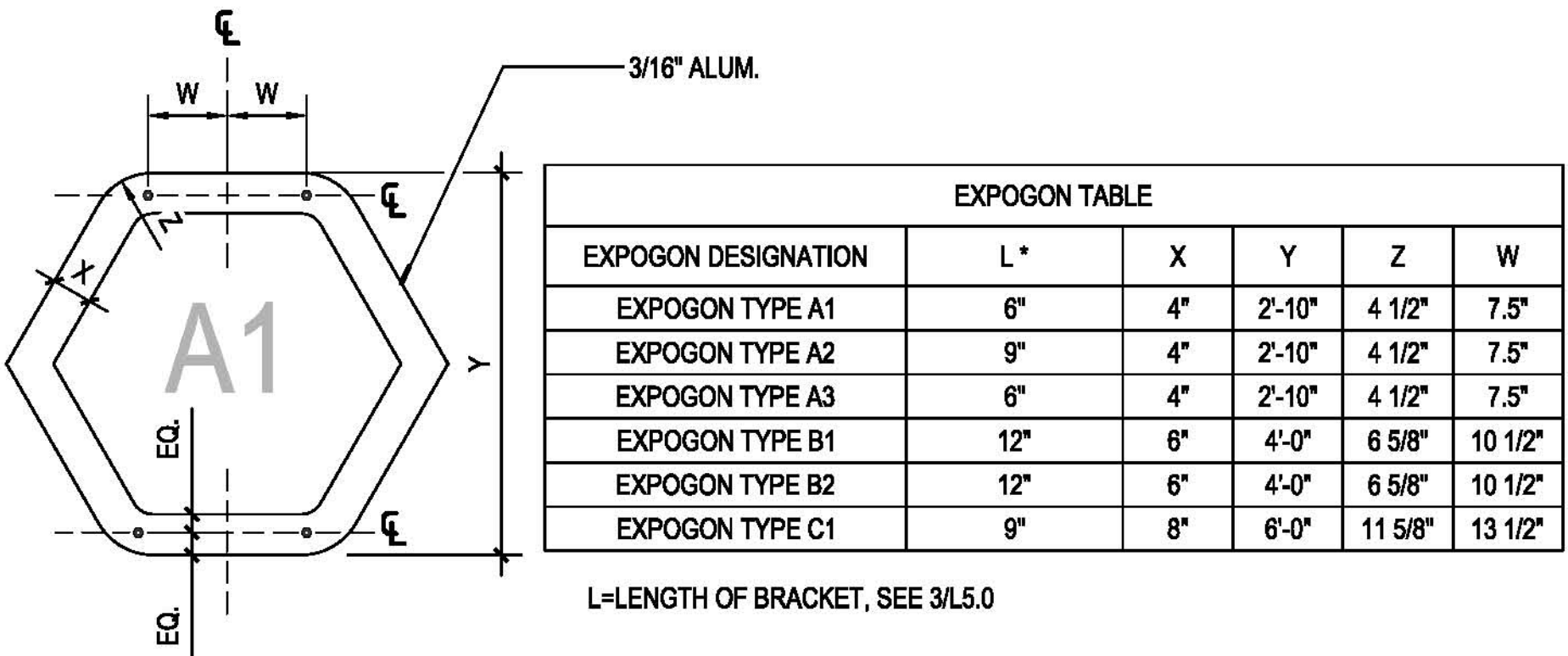


1 SCREEN & EXPOGON LAYOUT
ELEVATION

0" 8" 16" 32"

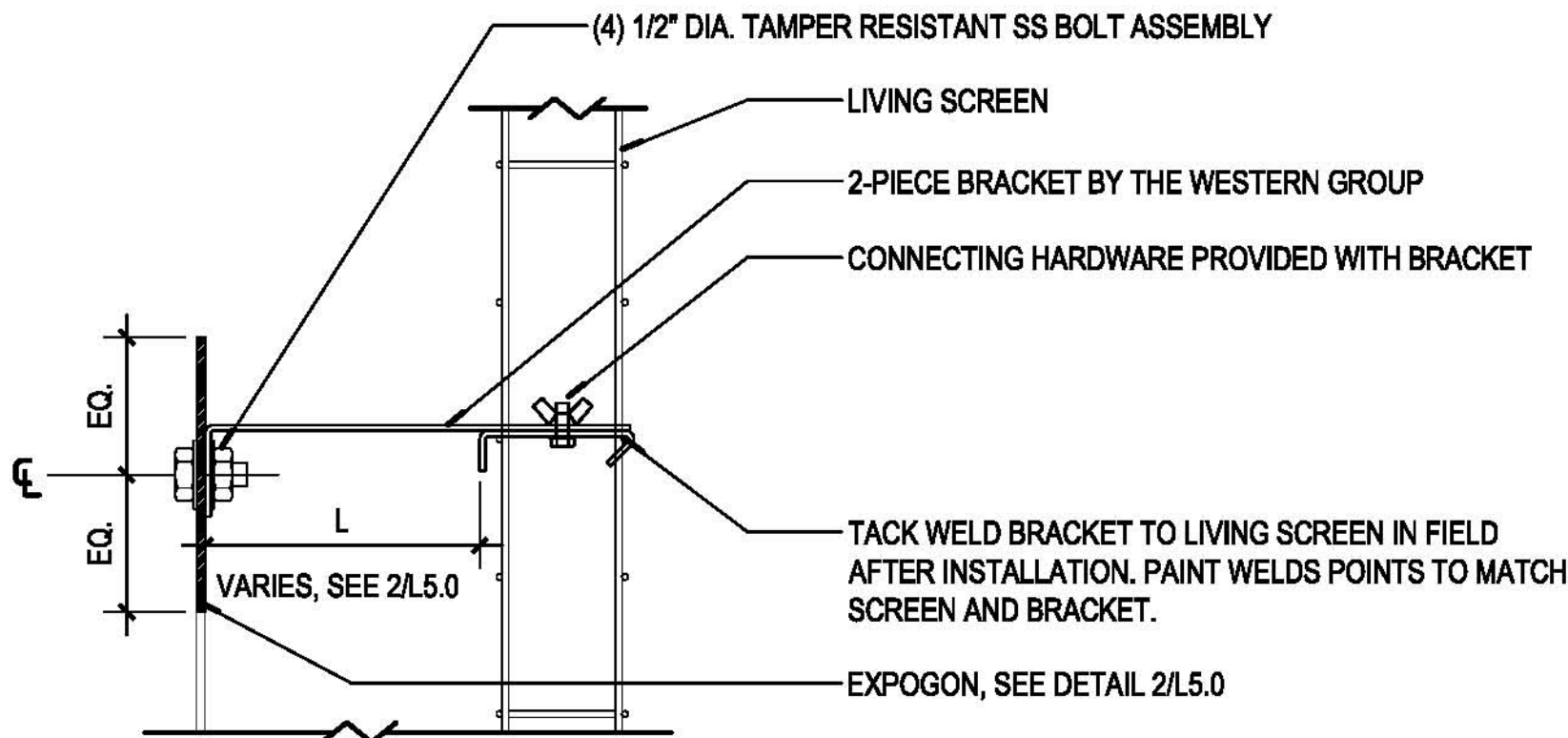
3 EXPOGON CONNECTION TO SCREEN
SECTION

0" 1" 2" 4"



2 EXPOGONS
TYPE

0" 1" 2" 4"





GreenWorks, P.C.
Landscape Architecture
Environmental Design
24 NW 2nd Avenue, Suite 100
Portland, Oregon 97209
Ph: 503.222.5612 / F: 503.222.2283
Email: info@greenworkspc.com



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Stormwater Wall**
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submittal: PERMIT SET
sheet title:
**PLANTER
CONSTRUCTION
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Revisions:

Rev.1 04.04.14

Footing clarification

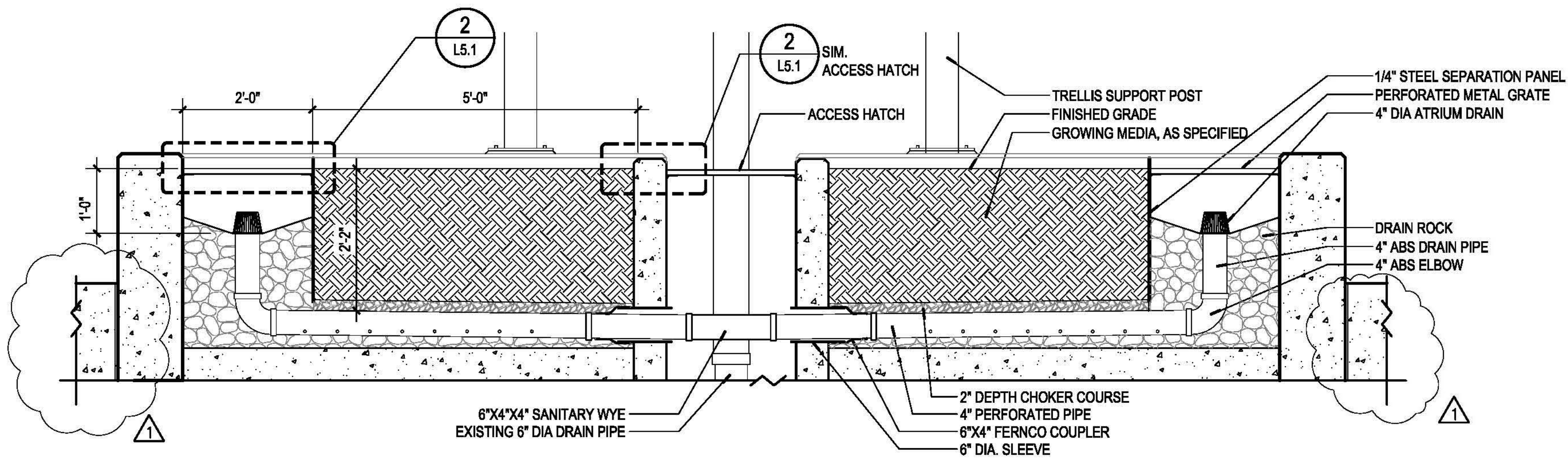
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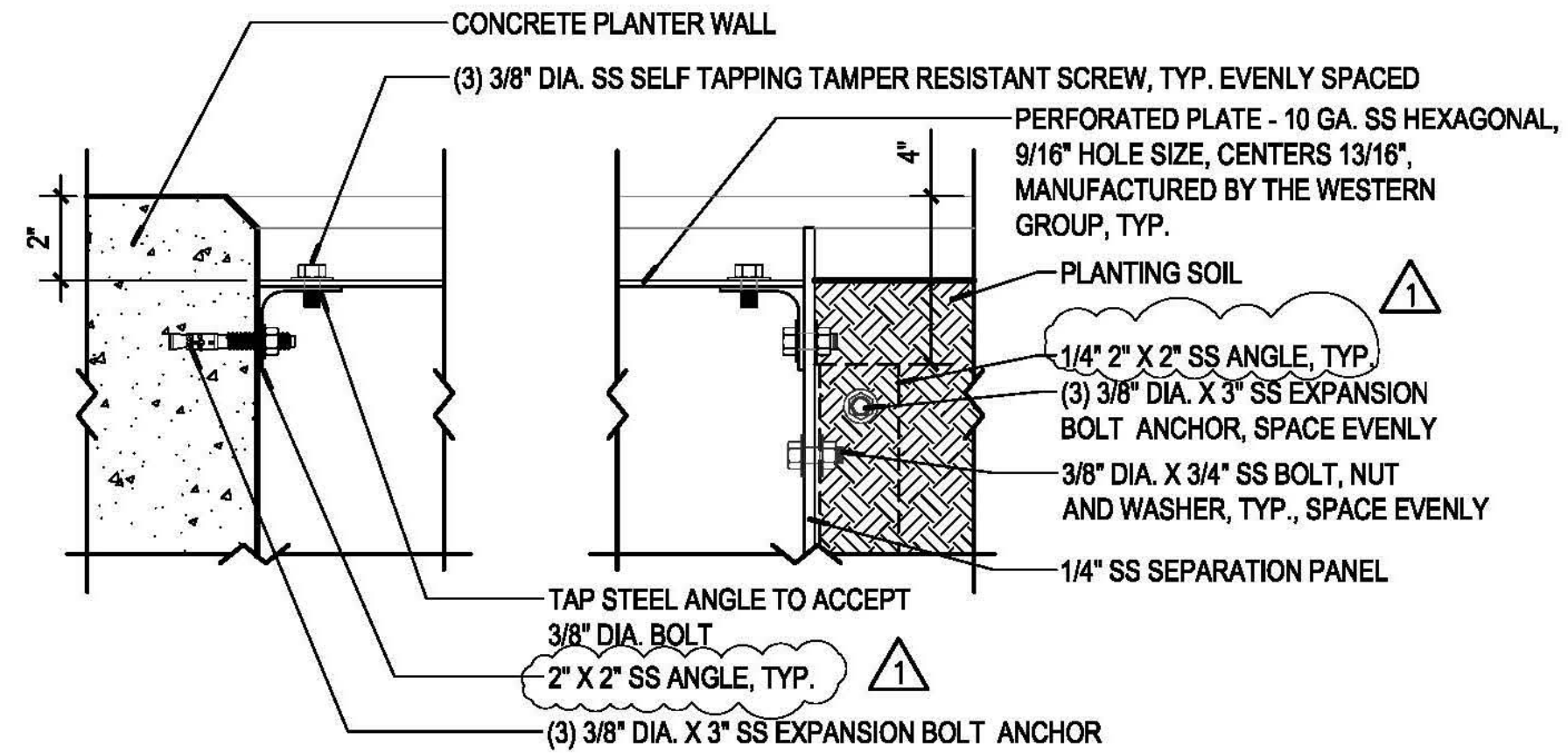
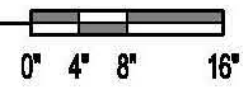
Job No. 1130005.2

Approved: MF

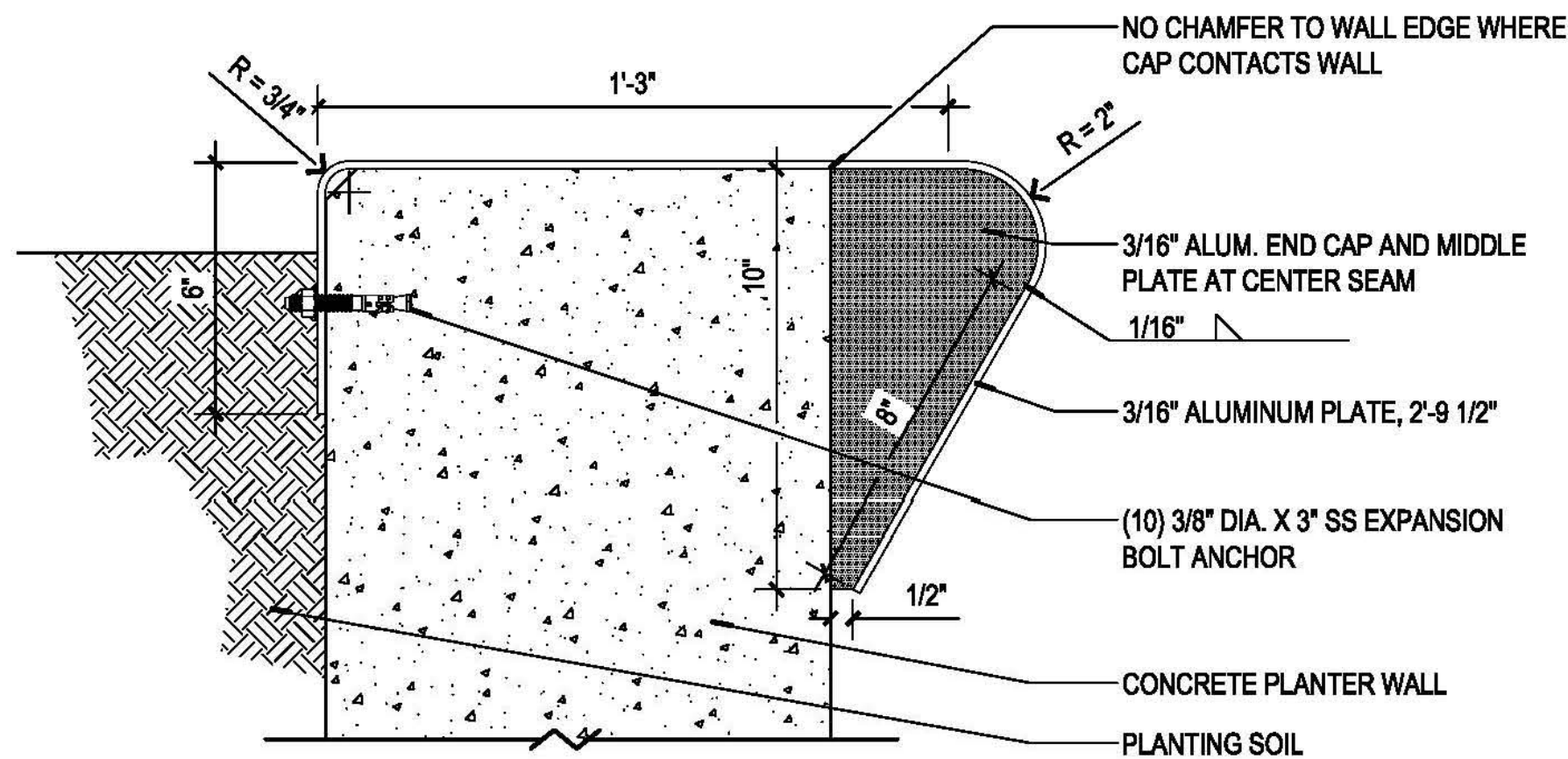
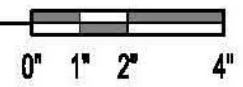
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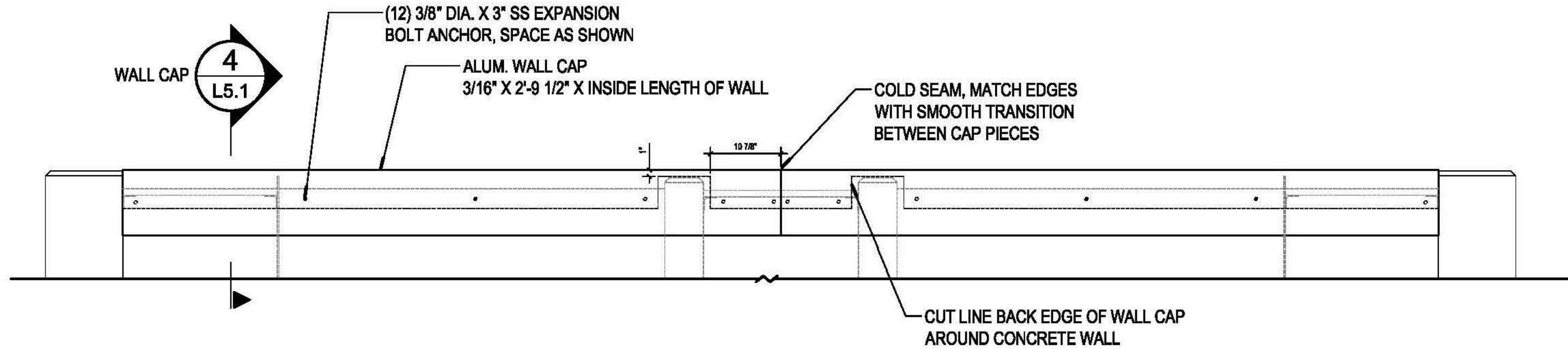
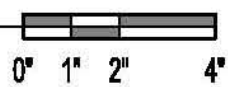
1 PLANTER DRAINAGE DETAIL
TYPE



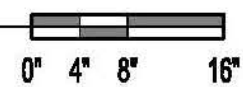
2 DRAIN GRATE & ACCESS HATCH
SECTION



3 WALL CAP
SECTION



4 WALL CAP
ELEVATION





project: **EXPO CENTER Stormwater Wall**
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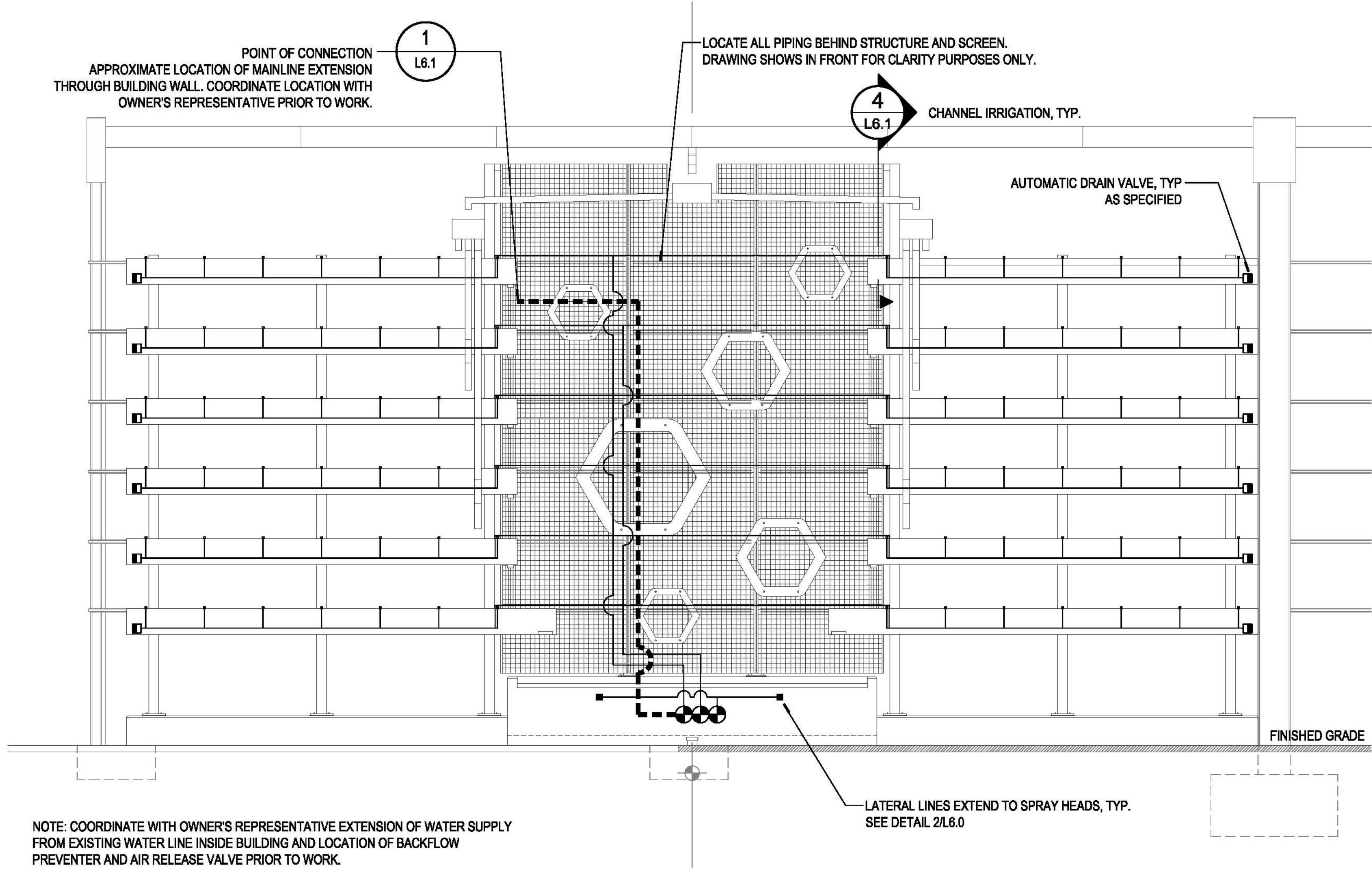
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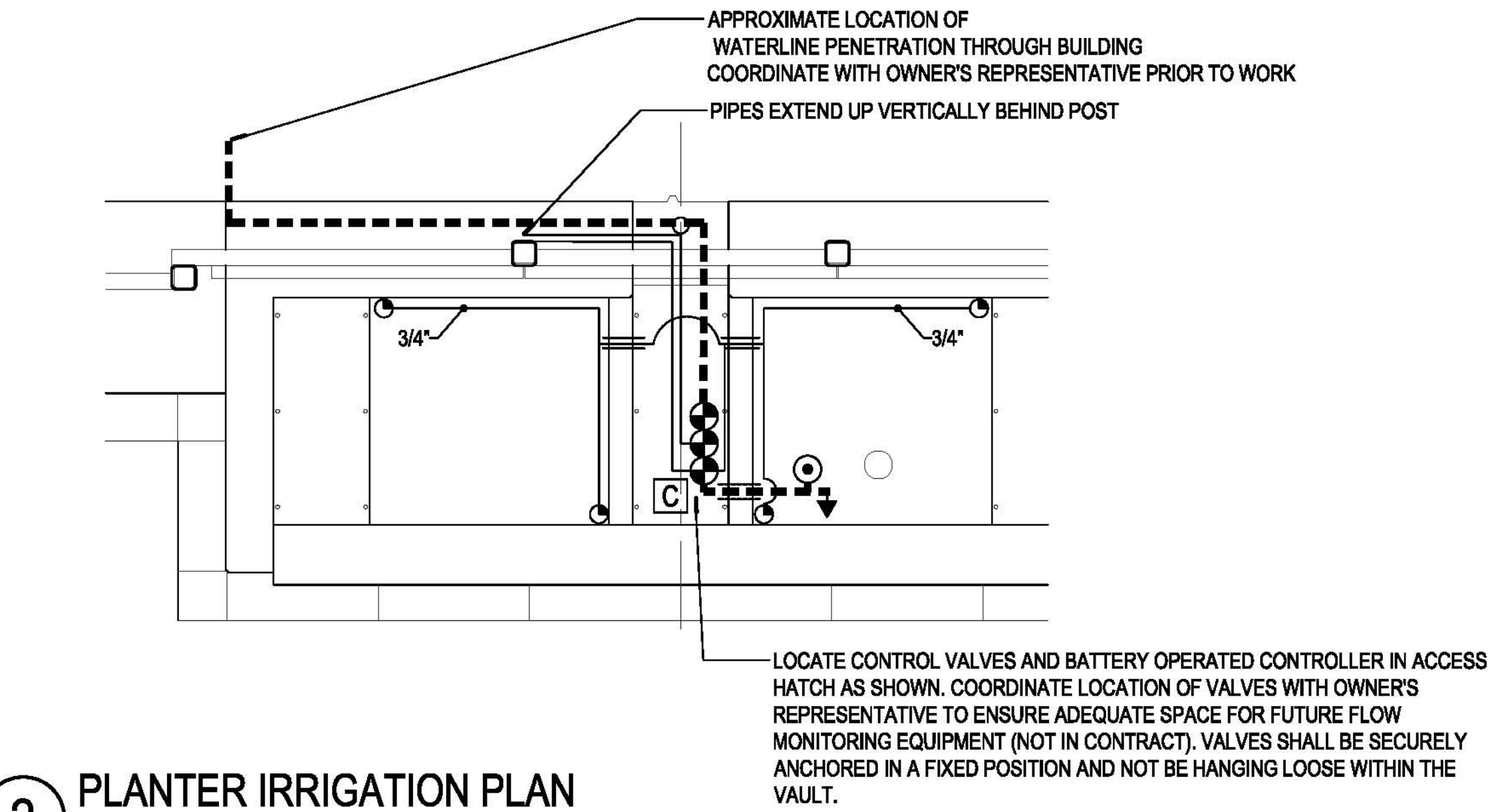
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L6.0



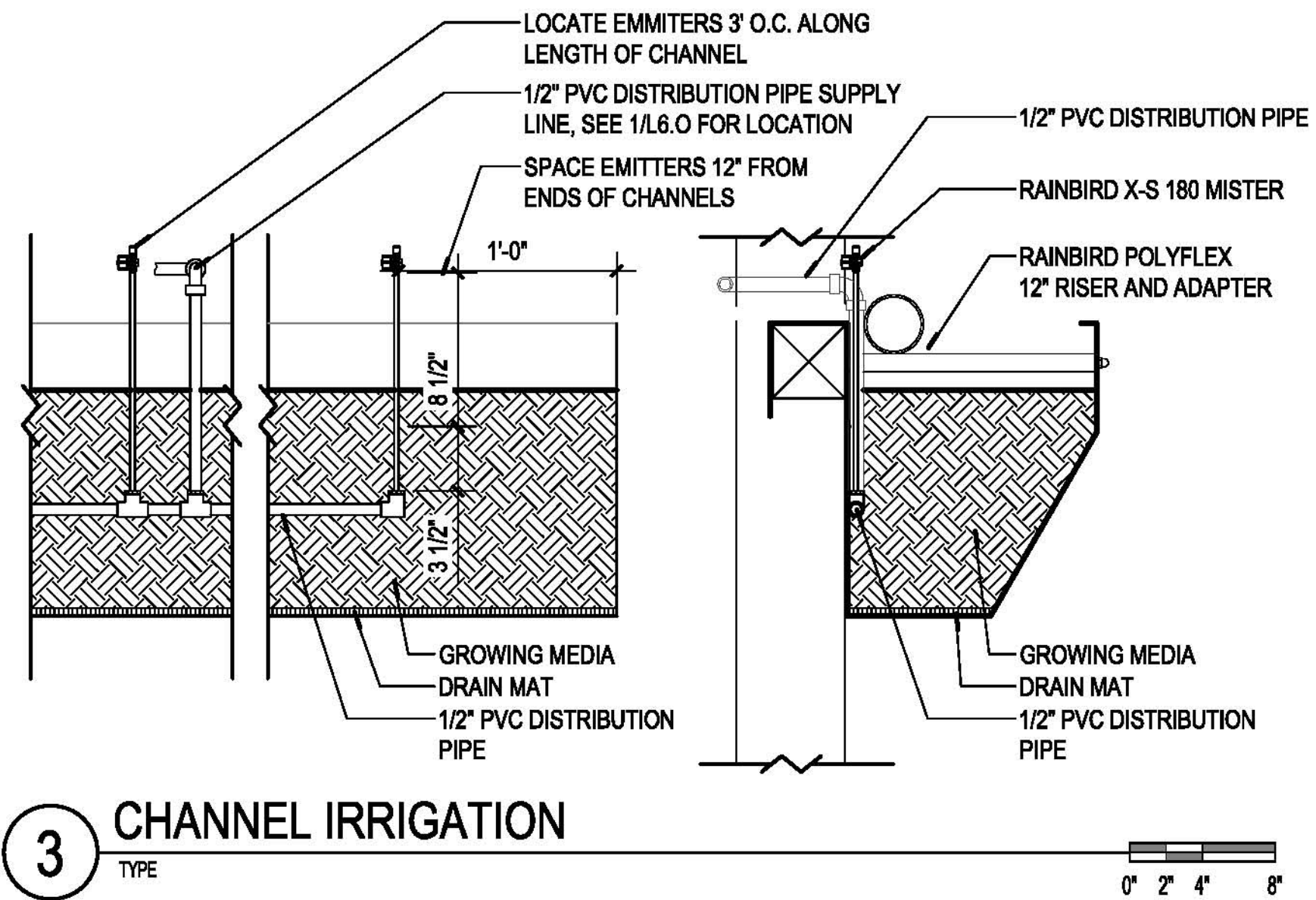
1 IRRIGATION PIPING PLAN



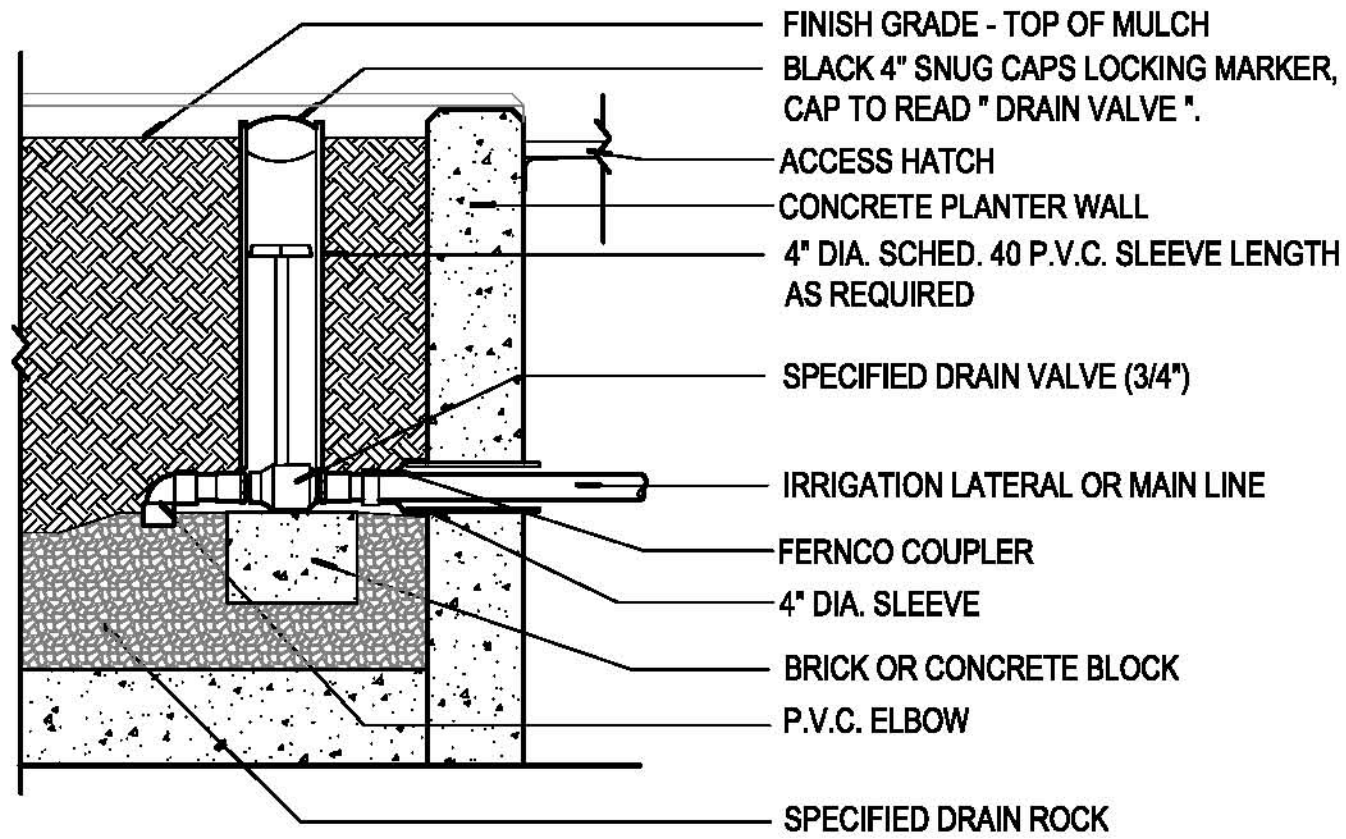
2 PLANTER IRRIGATION PLAN

IRRIGATION LEGEND

SYMBOL	DESCRIPTION
	RAINBIRD 1812-SAM-PRS-5Q
	BATTERY OPERATED CONTROL VALVE RAINBIRD PEB SERIES
	QUICK COUPLER
	MANUAL DRAIN VALVE
	BATTERY OPERATED CONTROLLER - RAINBIRD TBOS2 - 6 STATION WITH FIELD TRANSMITTER - TBOS2
	IRRIGATION LATERAL LINE
	IRRIGATION MAIN LINE
	IRRIGATION SLEEVE



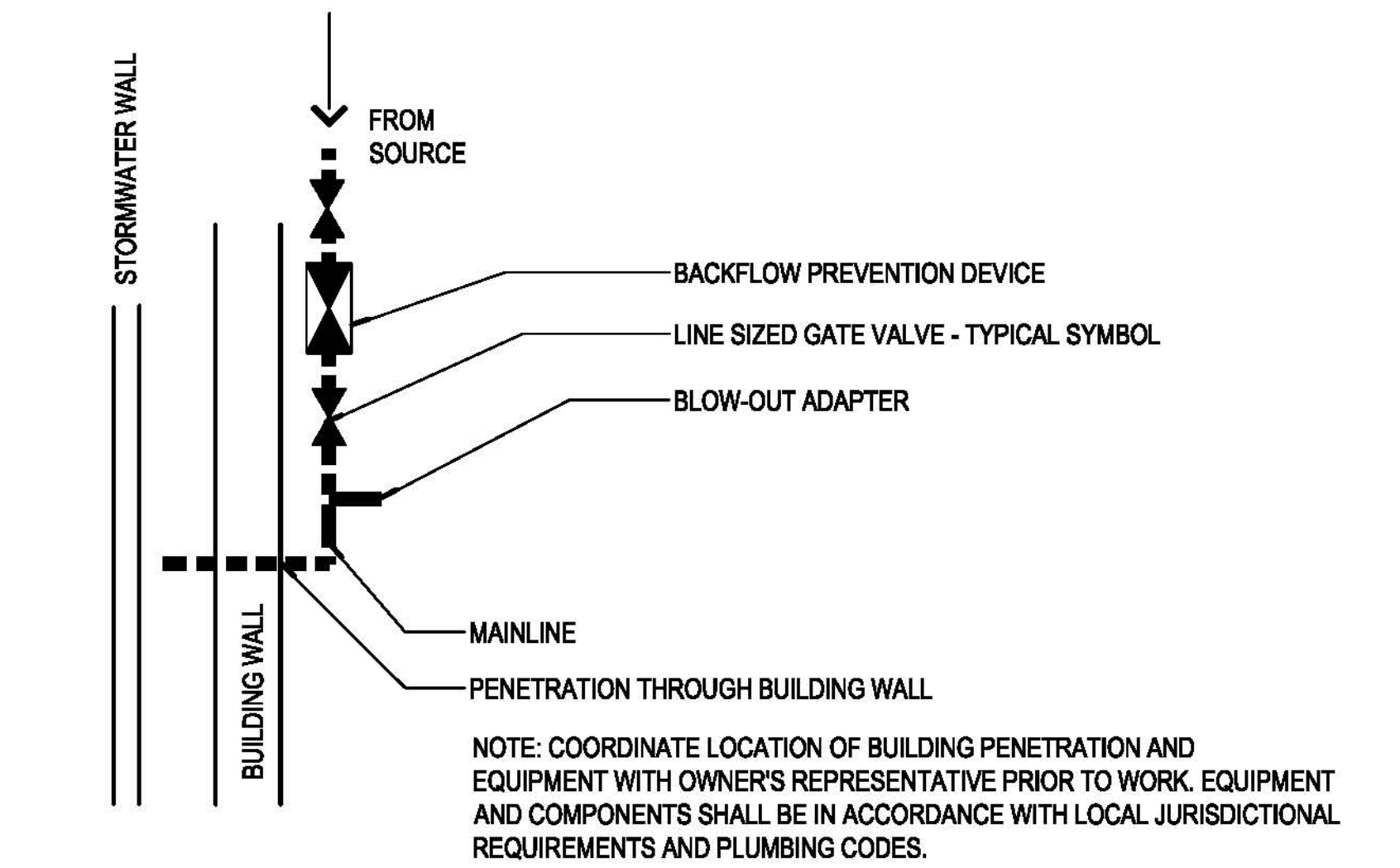
3 CHANNEL IRRIGATION



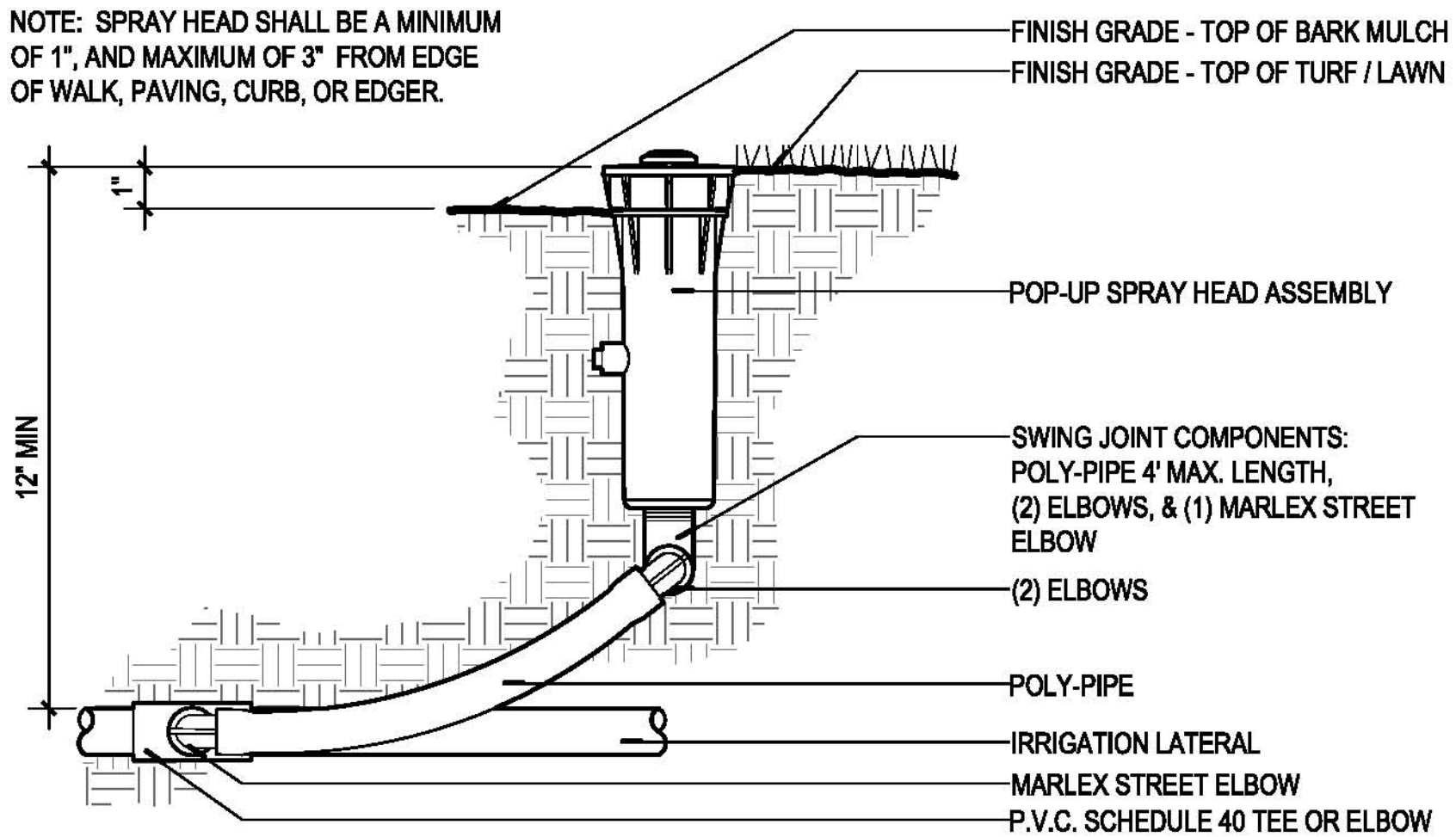
4 MANUAL DRAIN VALVE ASSEMBLY

IRRIGATION NOTES

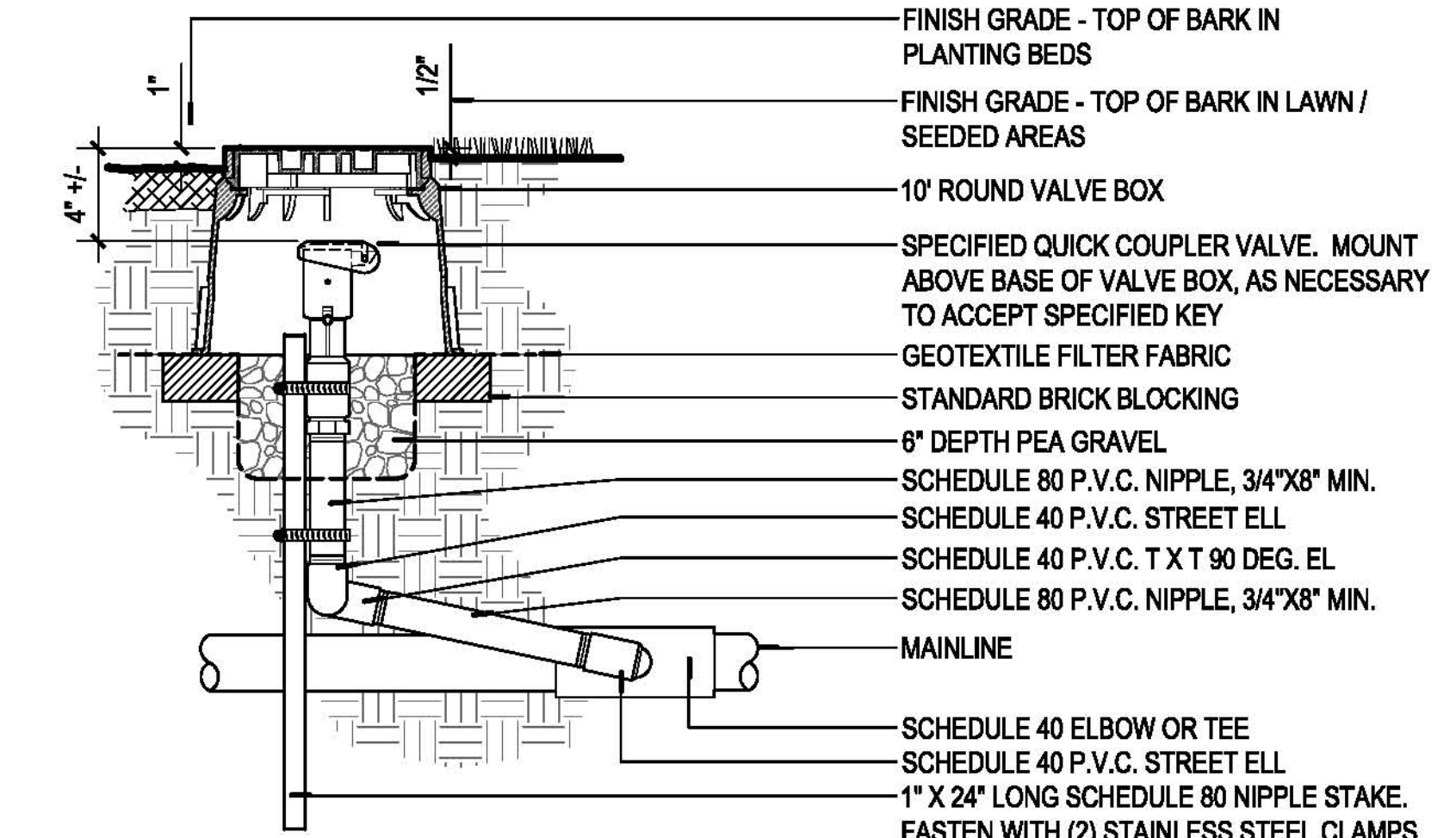
- IRRIGATION DESIGN SHOWN IN 1/L6.0 AND 2/L6.0 IS INTENDED TO SHOW DESIGN INTENT ONLY. IRRIGATION DESIGN SHALL BE DESIGN BUILD. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO OWNER'S REPRESENTATIVE THAT SHOWS PROPOSED IRRIGATION DESIGN PRIOR TO STARTING WORK.
- POINT OF CONNECTION THROUGH BUILDING WALL IS APPROXIMATE. COORDINATE LOCATION WITH OWNER'S REPRESENTATIVE PRIOR TO DRILLING THROUGH BUILDING WALL TO CONNECT TO BUILDING INTERNAL WATER SUPPLY.
- COORDINATE WITH OWNER'S REPRESENTATIVE CONNECTION TO AND EXTENSION OF BUILDING INTERNAL WATER SUPPLY. LOCATION OF BACKFLOW PREVENTION DEVICE GATE VALVE AND AIR RELIEF VALVE INSIDE BUILDING PRIOR TO WORK. INSTALL ALL PIPES AND EQUIPMENT IN ACCORDANCE TO LOCAL JURISDICTIONAL REQUIREMENTS AND PLUMBING CODES.
- ALL LATERAL LINE AND MAIN LINE SHALL BE LOCATED IN A MANNER SO AS TO BE HIDDEN BY STORMWATER WALL STRUCTURE TO THE GREATEST EXTENT POSSIBLE.
- THE CONTRACTOR SHALL INSTALL THE IRRIGATION CONTROLLER(S) AT THE LOCATION(S) SHOWN ON THE DRAWINGS, PER THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL VERIFY THE LOCATION WITH THE OWNER PRIOR TO INSTALLATION.
- INSTALL FERNCO COUPLER TYP. AT ALL SLEEVE PENETRATIONS THROUGH PLANTER WALL FOR WATER TIGHT SEAL.



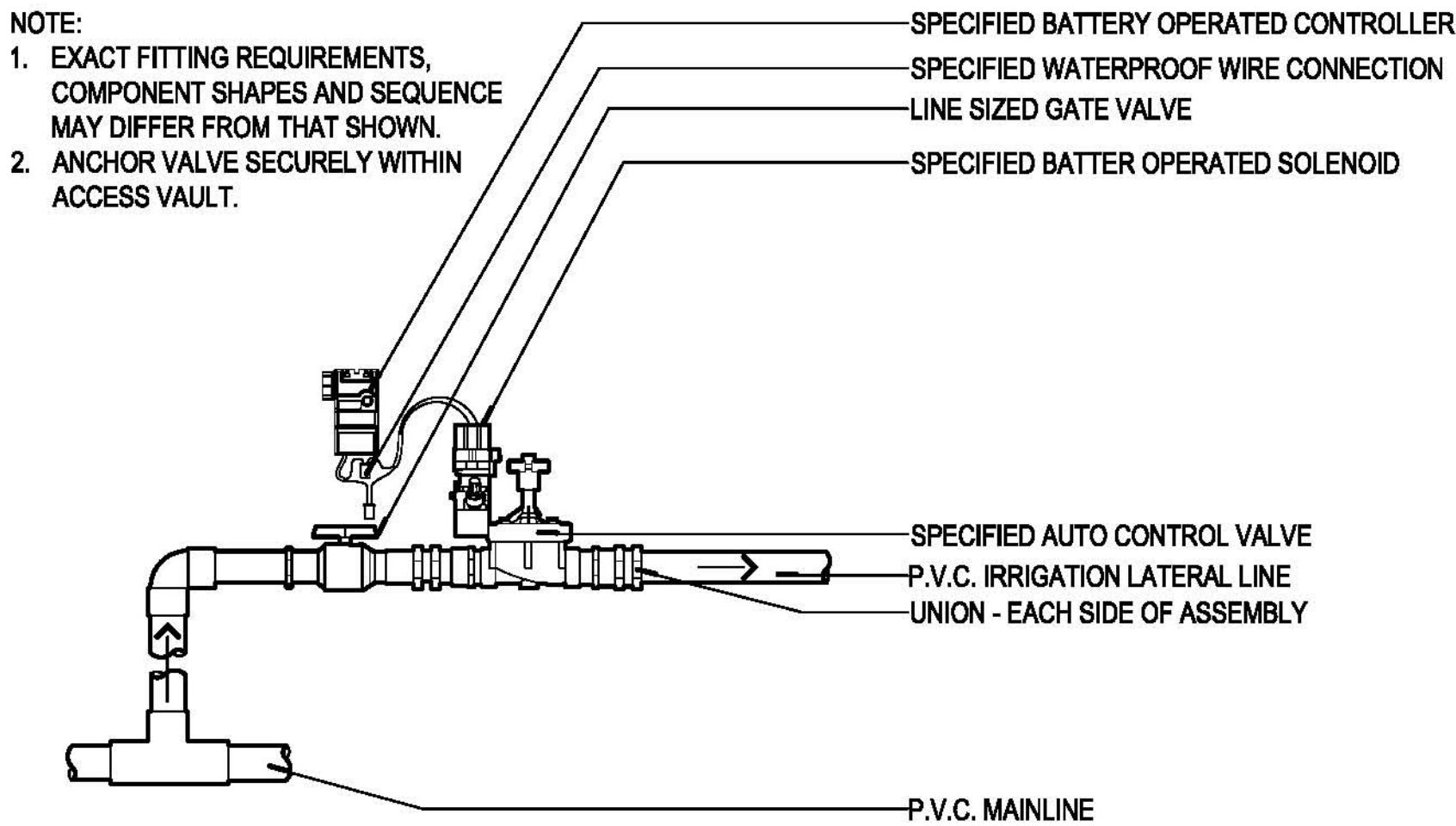
1 POINT OF CONNECTION DIAGRAM
PLAN NOT TO SCALE



2 SPRAY HEAD - POLY SWING PIPE ASSEMBLY
Section NOT TO SCALE



3 QUICK COUPLER VALVE ASSEMBLY
SECTION NOT TO SCALE



4 BATTERY OPERATED CONTROLLER / AUTOMATIC CONTROL VALVE ASSEMBLY
SECTION NOT TO SCALE



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500 NE Grand Avenue
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sheet title: **IRRIGATION DETAILS**

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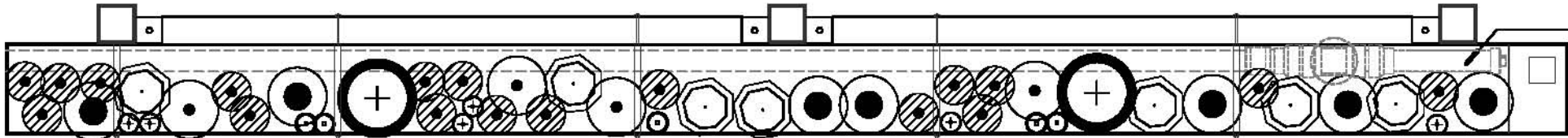
Revisions:

Drawn By: DE/SK
Checked By: RT
Job No. 113005.2
Approved: MF

L6.1

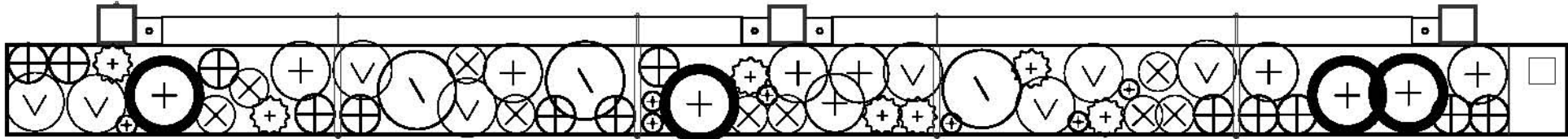
TOP

CHANNEL
TYPE A1

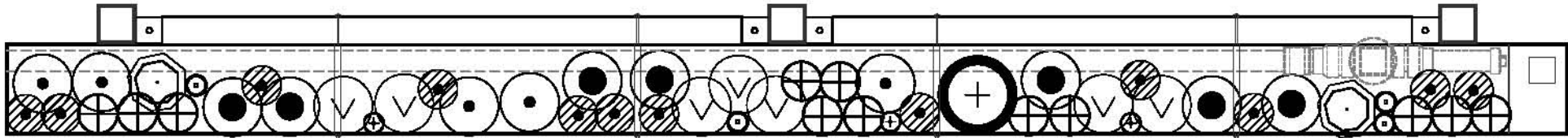


STORMWATER DISTRIBUTION
PIPE, TYP.

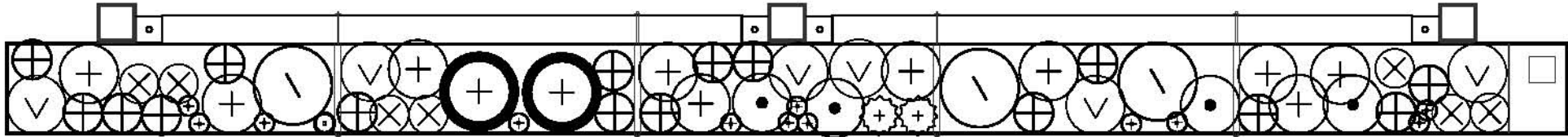
CHANNEL
TYPE B1



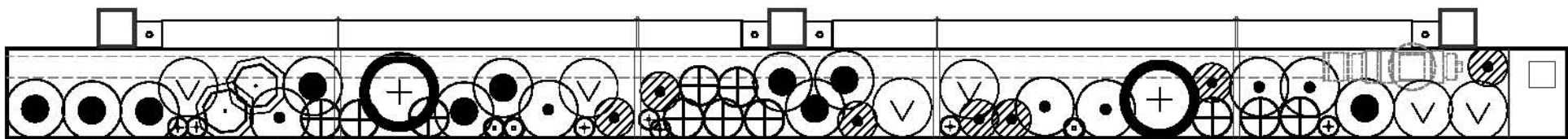
CHANNEL
TYPE A2



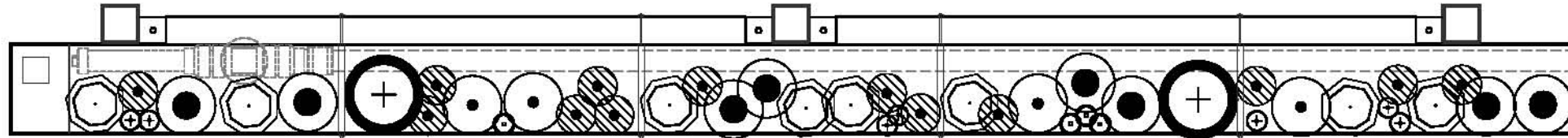
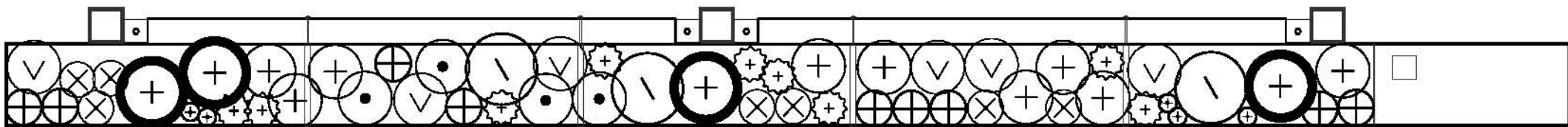
CHANNEL
TYPE B2



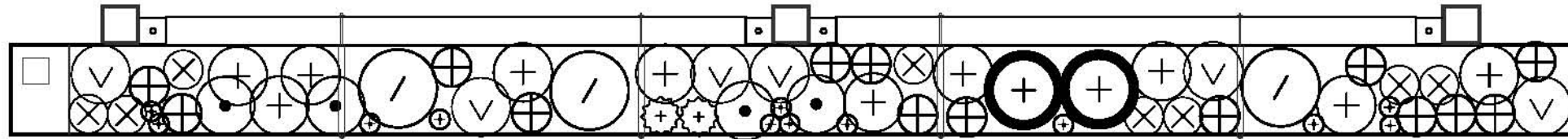
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TYPE A3



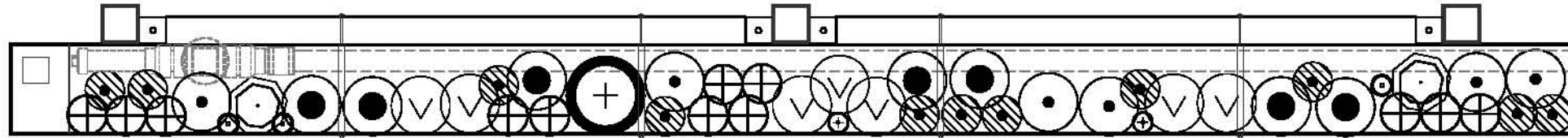
CHANNEL
TYPE C1



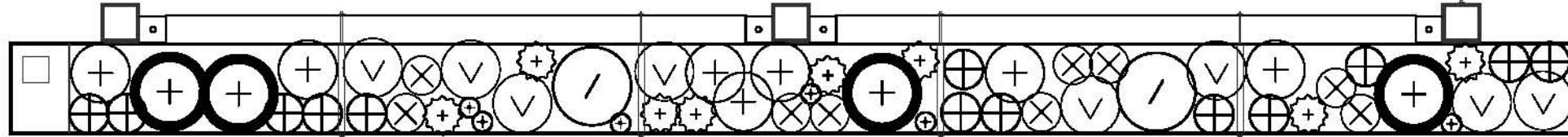
CHANNEL
TYPE A4



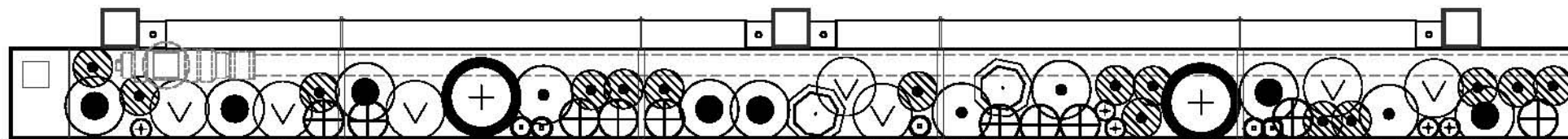
CHANNEL
TYPE B3



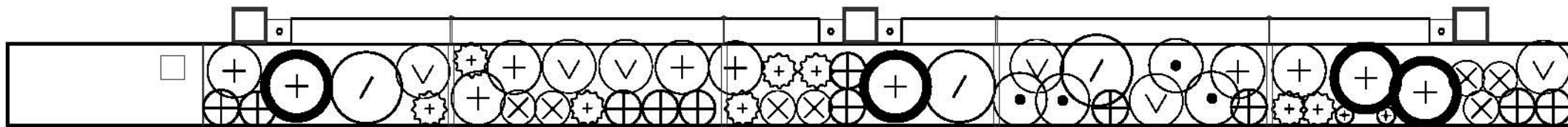
CHANNEL
TYPE A5



CHANNEL
TYPE B4



CHANNEL
TYPE A6



CHANNEL
TYPE C2

BOTTOM

LEGEND

	QTY ADIANTUM PEDATUM 36 MAIDEN HAIR FERN, 4" POT, SPACE AS SHOWN
	QTY BLECHNUM SPICANT 47 DEER FERN, 4" POT., SPACE AS SHOWN
	QTY CAMASSIA QUAMASH 25 COMMON CAMAS, BULB, SPACE AS SHOWN
	QTY CAREX Densa 45 DENSE SEDGE, 4" POT, SPACE AS SHOWN

	QTY CAREX DEWEYANA 23 DEWEY SEDGE, 4" POT, SPACE AS SHOWN
	QTY CORNUS SERICEA 'KELSEY' 30 KELSEY DOGWOOD, 1 GAL. CONT., SPACE AS SHOWN
	QTY GAULTHERIA SHALLON 50 SALAL, 1 GAL. CONT., SPACE AS SHOWN
	QTY IRIS TENAX 74 OREGON IRIS, BULBS, SPACE AS SHOWN

	QTY JUNCUS PATENS 46 SPREADING RUSH, 4" POT, SPACE AS SHOWN
	QTY POLYPODIUM GLYCYRRHIZA 121 LICORICE FERN, 4" POT, SPACE AS SHOWN
	QTY POLYSTICHUM MUNITUM 67 SWORD FERN, 1 GAL. CONT., SPACE AS SHOWN
	QTY SCRIPTUS MICROCARPUS 76 SMALL FRUITED BULRUSH, 4" POT., SPACE AS SHOWN

	QTY VACCINIUM OVATUM 17 EVERGREEN HUCKLEBERRY, 1 GAL. CONT., SPACE AS SHOWN
--	------------------------------------------------------------------------------------

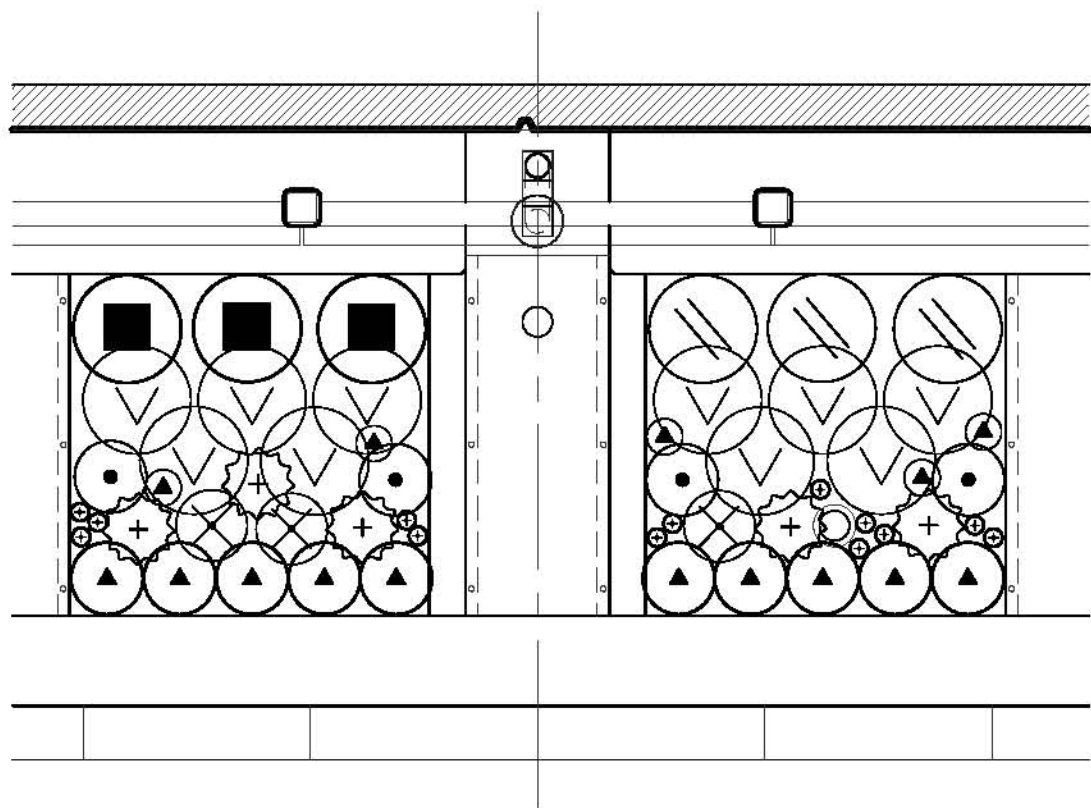
NOTES:

1. CONTRACTOR SHALL PROVIDE PLANTING SOIL, SOIL AMENDMENTS AND MULCH AS SPECIFIED
2. ALL PLANTS SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS AND SPECIFICATIONS PROVIDED AS PART OF THE CONSTRUCTION DOCUMENT PACKAGE.
3. QUANTITIES ARE LISTED FOR THE CONTRACTOR'S CONVENIENCE ONLY. ALL COUNTS MUST BE VERIFIED BY THE CONTRACTOR. IN THE CASE OF A DISCREPANCY BETWEEN THE LEGEND AND THE PLAN, PLANTS INDICATED ON THE PLAN SHALL SUPERCEDE QUANTITIES LISTED IN THE LEGEND.

1 STORMWATER CHANNEL PLANTING TEMPLATES

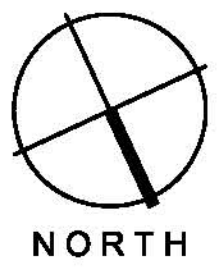
PLAN

0' 6' 12' 24'

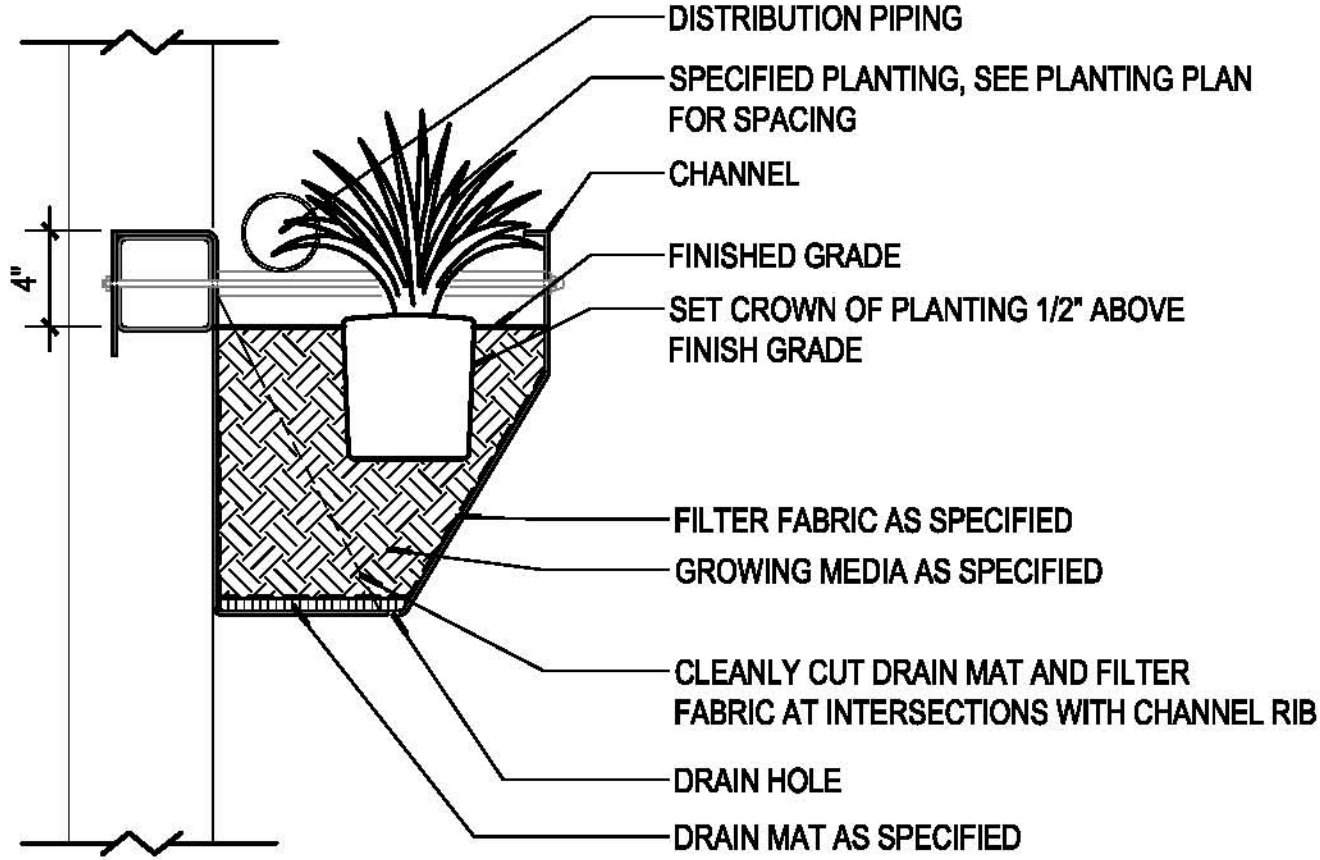


LEGEND

	QTY ADIANTUM PEDATUM 5 MAIDEN HAIR FERN, 1 GAL. CONT., SPACE AS SHOWN
	QTY BLECHNUM SPICANT 3 DEER FERN, 1 GAL. CONT., SPACE AS SHOWN
	QTY CAREX Densa 4 DENSE SEDGE, 1 GAL. CONT., SPACE AS SHOWN
	QTY DICENTRA FORMOSA 5 PACIFIC BLEEDING HEART, 1 GAL. CONT., SPACE AS SHOWN
	QTY IRIS TENAX 13 OREGON IRIS, BULBS, SPACE AS SHOWN
	QTY HYDRANGEA INTEGRIFOLIA 'TAIPING SHAN' 3 TAIPING SHAN EVERGREEN CLIMBING HYDRANGEA 5 GAL CONT., STAKED VINES, SPACE AS SHOWN
	QTY MAHONIA REPENS 10 CREEPING MAHONIA, 1 GAL CONT., SPACE AS SHOWN
	QTY POLYSTICHUM MUNITUM 10 SWORD FERN, 3 GAL CONT., SPACE AS SHOWN
	QTY TRACHELOSPERMUM JASMINOIDES 3 STAR JASMINE, 5 GAL CONT., STAKED VINES, SPACE AS SHOWN



0' 8' 16' 32'



3 STORMWATER CHANNEL PLANTING

SECTION

0' 2' 4' 8'

2 PLANTER PLANTING PLAN

PLAN



project: **EXPO CENTER Stormwater Wall**
METRO
500 NE Grand Avenue
Portland, Oregon
P 503.797.1830 (Ph) / F 503.797.1849
neill@metro.dst.or.us

submit: PERMIT SET

sheet title:

**PLANTING PLANS
AND DETAILS**

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Date: 02.24.14

Revisions:

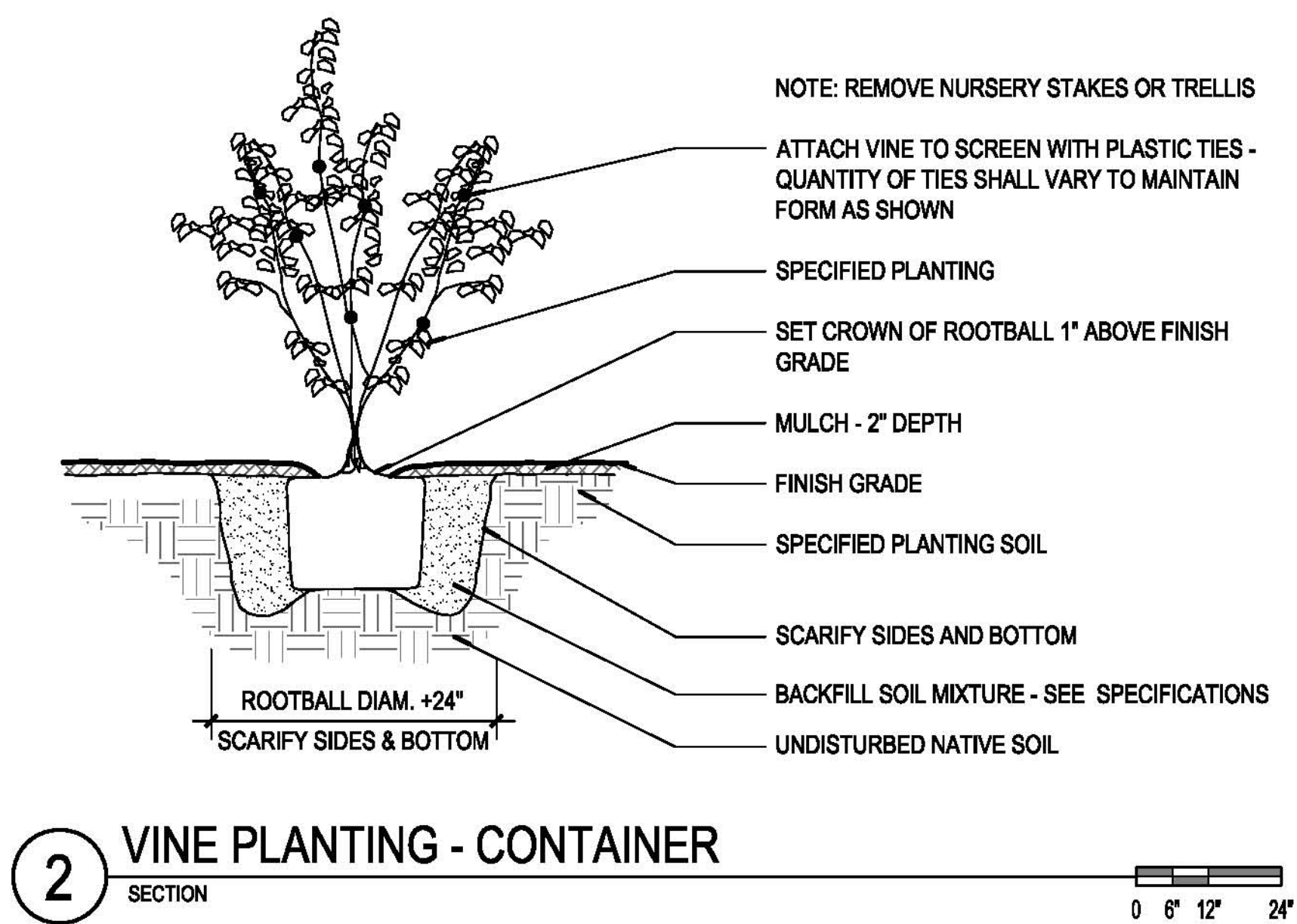
Drawn By: SK

Checked By: RT

Job No. 113005.2

Approved: MF

L7.0



submital: PERMIT SET

sheet title:

PLANTING DETAILS

project:

**EXPO CENTER
Stormwater Wall**

METRO

600 NE Grand Avenue
Portland, OR 97232
P 503.797.1830 (ph) / F 503.797.1849
neill@metro.dstor.us

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Date: 02.24.14

Revisions: _____

Drawn By: SK

Checked By: RT

Job No. 113005.2

Approved: MF

L7.1



CALCULATIONS

PROJECT: "GREENWALL" STRUCTURE

LOCATION: METRO EXPOSITION CENTER
PORTLAND, OR

CLIENT: GREENWORKS, PC, LANDSCAPE ARCHITECTS
PORTLAND, OREGON

CODE: OREGON STRUCTURAL SPECIALTY CODE (2010)

DESIGN CRITERIA:

SNOW:	25 PSF
FLOOR:	N.A.
SEISMIC:	$S_s = 1.04$, $S_1 = 0.34$, Site Class D
WIND:	90 MPH (3-Sec Gust)
ALLOW. SOIL BRG:	2,000 PSF (TYPE S_D) (Assumed)

NARRATIVE: Project consists of steel "pole" structure supporting metal troughs that are filled with planting materials, vegetation and stored rain runoff. Lateral loading is taken by cantilever action of the pole supported by a large concrete footing. No loads are exerted onto the existing building.

CONTENTS:

Cover/Info/Assumptions	Page 0
Calculations, etc.	Pages 1 - 11
Sketches	Pages SK-1 and 2



EXPIRATION DATE: 06-30-15



Project: Metro Greenwall No: _____ Date: 10/17/13
Subject: Gutter Capacity By: PER Sheet: 1

Check gutter for span -

Wt. = 90 pcf. (from Greenworks)

$L = 10'$

Assume gutter is supported for its length
Use HSS for support.

HSS 4x4x

$$M = (1/8)(100 \text{ pcf})(10)^2 = 1250 \text{ lb}'$$

$$S_{\text{req'd}} = (12)(1250) / (6.0)(46 \text{ ksi})$$

$$= 0.54 \text{ in}^3$$

$$\text{HSS } 4 \times 4 \times 3/16 \quad S = 3.30 \text{ in}^3$$

Check deflection:

$$\Delta = \frac{5(100)(10)^4(1728)}{384(29 \times 10^4)(4.59)}$$

$$= 0.12''$$

Wt = 9.4 pcf



Project: Metro Greenwall No: _____ Date: 10/17/13
Subject: _____ By: PER Sheet: 2

Compute total weight-

110 pcf per trough, w/ 10' / pole

$$\begin{aligned} \text{Total wt} &= (110 \text{ pcf})(10') (60 \text{ troughs}) \\ &= 66000 \text{ lbs/pole.} \end{aligned}$$

footing - $q_a = 1500 \text{ psf}$ (assumed)

$$\begin{aligned} 66000 \text{ lbs} / 1500 \text{ psf} &= 4.4 \text{ SF needed} \\ 2' \times 2' + 1' - \end{aligned}$$

Check for lateral - treat as cantilever w/ fixed base.

Assume $V_s = 0.4 \text{ Wt}$

$$= (0.4)(6.6 \text{ k}) = 2.6 \text{ k}$$

$$M_{07} = (13') (2.6 \text{ k}) = 34.32 \text{ k'}$$

$$\begin{aligned} S_{\text{req'd}} &= (12)(34.32) / 0.6 (46 \text{ ksi}) \\ &= 14.92 \text{ in}^3 \end{aligned}$$



$$\text{HSS } 6 \times 6 \times 1/2 \rightarrow S = 16.8 \text{ in}^3 \text{ OK}$$

$$\text{wt} = 35.2 \text{ pcf.}$$

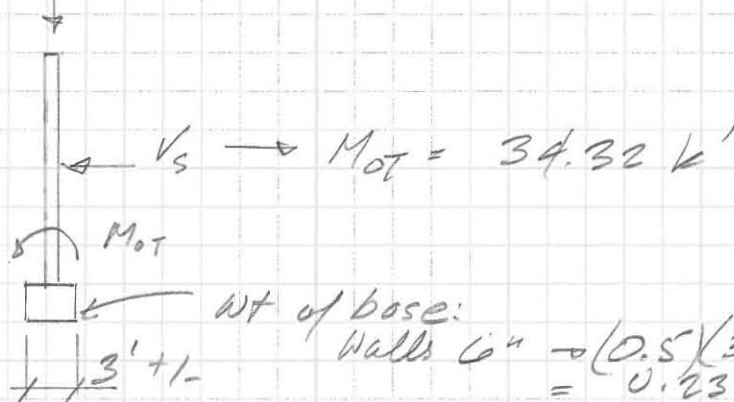
ATTACHMENT E



Project: _____ No: _____ Date: _____
Subject: _____ By: _____ Sheet: 3

Natural (cont) - look @ overturning -

$WT = 60.6 \text{ k}$



WT of base:

*Walls 6" $\rightarrow (0.5)(3.0)(0.15)$
 $= 0.23 \text{ lbs/ft}$*

*Base 10" $(10/12)(3')(0.15)$
 $= 0.38 \text{ lbs/ft}$*

Consider 10' length

$10'(0.23 + 0.38) = 6.1 \text{ k}$

$M_R = (60.6 \text{ k} + 6.1 \text{ k})(3'/2) = 19.1 \text{ k}' < M_{OT}$
NG

Need $1.5 \times M_{OT} = 51.48 \text{ k}'$

\therefore Increase WT & width -

Go to 4' \therefore 15" base

$(10)(4')(1.5)(0.15) = 9.0 \text{ k} + 2 = 11 \text{ k}$

$M_{Res} = (11 + 60)(2') = 34 \text{ k}'$



Project: _____ No: _____ Date: _____
Subject: _____ By: _____ Sheet: 4

Try 2' x 4' base

$$2 \times 4 \times 0.15 \times 10 = 12 \text{ k}$$

$$M_{res} = (12 + 2 + 6)(2') = 40 \text{ k}' < 115 \text{ Mor}$$

Add wt. of rocks in trough -

$$\text{assume } 100 \text{ lbs / CF} \times 3' \times 10' \times 2' \\ = 6 \text{ k}$$

$$M_{res} = (12 + 2 + 6 + 6)(2) = 52 \text{ k}' \text{ OK}$$

w/ 4' w x 3' DP Cont. ftg.

$$WT = (0.150)(3)(4)(10') = 18 \text{ k}$$

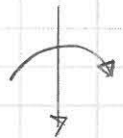
$$\text{w/ } 4 \times 4' \quad (0.15)(4)(4)10 = 24 \text{ k}$$

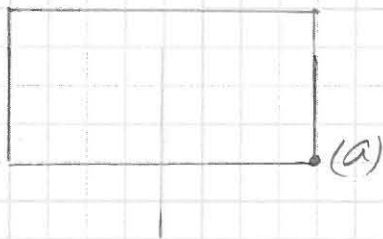
$$M_{res} = (2')(24 \text{ k} + 6 \text{ k}) = 60 \text{ k}' \\ > 52 \text{ k}' \\ \text{OK}$$



Project: Metro Green wall No: _____ Date: _____
Subject: _____ By: _____ Sheet: 5

Check footing pressures -

6.6 k
 $M_{OT} = 34.32 \text{ k'}$



$$A = 4' \times 10' = 40 \text{ SF}$$

$$\bar{S} = \frac{P}{A} \pm \frac{M}{S}$$

Wt. of footing (10' section)

$$4' \times 4' \times 10' \times 0.150 \text{ kcf.}$$

$$= 24 \text{ k}$$

$$\therefore P = 6.6 + 24 = 30.6 \text{ k}$$

$$S = \frac{bd^2}{6}$$

$$= \frac{(10')(4')^2}{6}$$

$$= 26.67 \text{ ft}^3$$

$$\bar{S} = \frac{30.6 \text{ k}}{40 \text{ SF}} \pm \frac{34.32}{26.67}$$

$$= 0.765 \text{ ksf} \pm 1.28 \text{ ksf}$$

$$= 2.0 \text{ ksf}, -0.52 \text{ ksf}$$

Soy OK



Project: _____ No: _____ Date: _____
Subject: _____ By: _____ Sheet: Ce

Anchorage -

$$M_o = 34.32 \text{ k'}$$

$$\text{Bolt } T = (12)34.32 / (2)(10^n) = 20.6 \text{ k}$$

*See attached Simpson calcs/output.
Use embed. plate to account for
concrete breakout.*

*Use 4- 3/4" ϕ threaded rods into
Embed. Plate.*



Company:		Date:	1/15/2014
Engineer:	Kluvers	Page:	1/4
Project:	Metro Greenwall		
Address:			
Phone:			
E-mail:			

1. Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description: Base anchorage for greenwall posts
Location: Portland, OR
Fastening description:

2. Input Data & Anchor Parameters

General

Design method: ACI 318-11
Units: Imperial units

Anchor Information:

Anchor type: Cast-in-place
Material: AB_H
Diameter (inch): 0.750
Effective Embedment depth, h_{ef} (inch): 5.000
Anchor category: -
Anchor ductility: Yes
 h_{min} (inch): 7.13
 C_{min} (inch): 4.50
 S_{min} (inch): 4.50

Base Material

Concrete: Normal-weight
Concrete thickness, h (inch): 18.00
State: Uncracked
Compressive strength, f_c (psi): 3000
 $\Psi_{e,v}$: 1.4
Reinforcement condition: B tension, B shear
Supplemental reinforcement: No
Do not evaluate concrete breakout in tension: No
Do not evaluate concrete breakout in shear: No
Ignore 6do requirement: No
Build-up grout pad: No

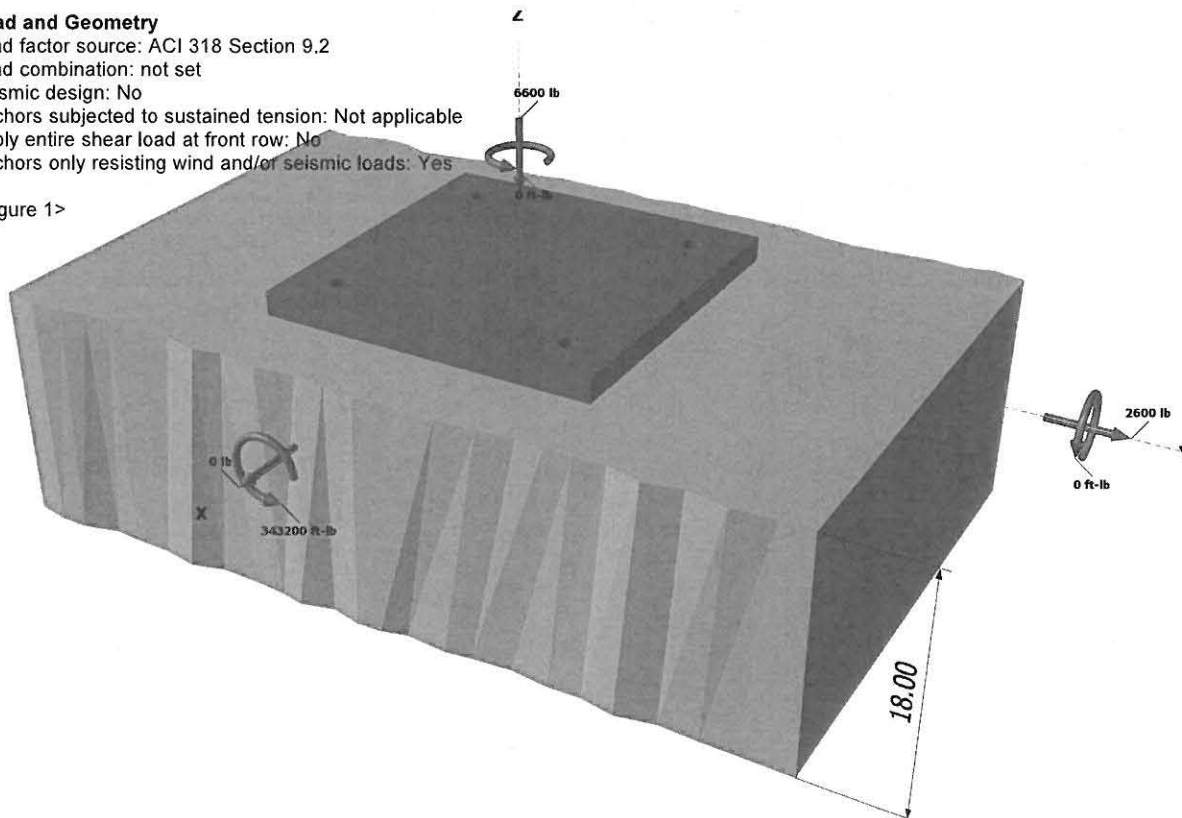
Base Plate

Length x Width x Thickness (inch): 14.00 x 14.00 x 1.00

Load and Geometry

Load factor source: ACI 318 Section 9.2
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: Not applicable
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

<Figure 1>



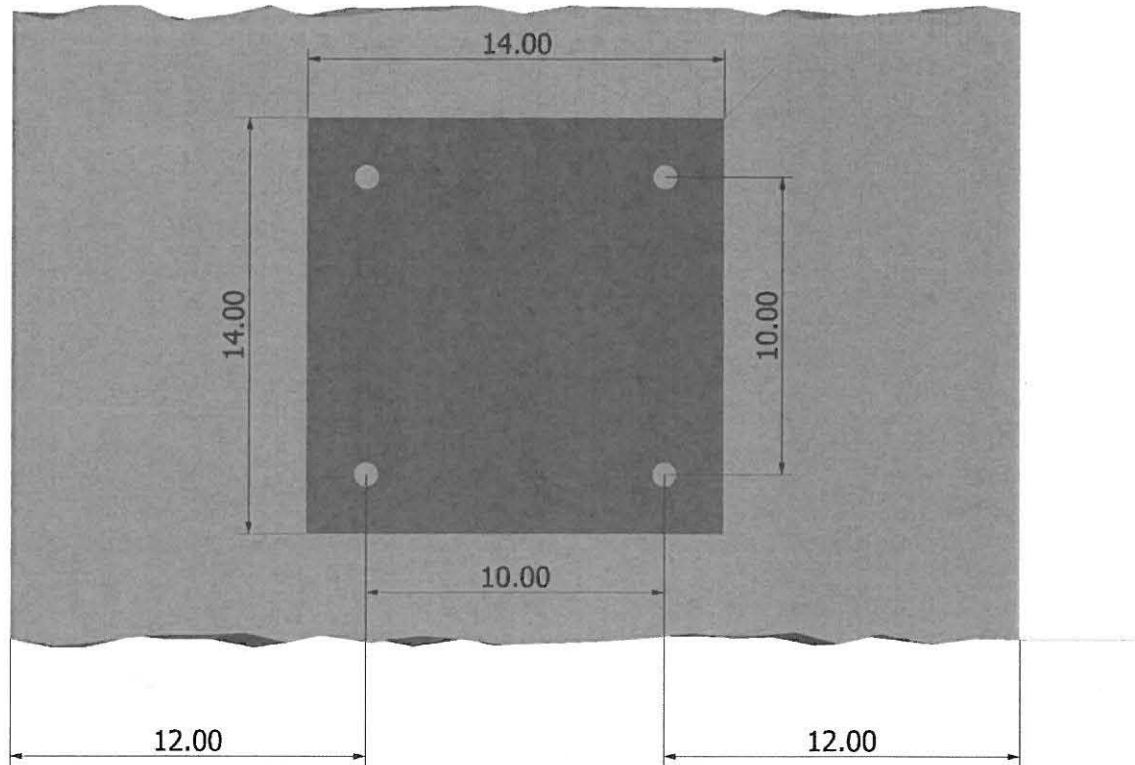
Input data and results must be checked for agreement with the existing circumstances, the standards and guidelines must be checked for plausibility.

5956 W. Las Positas Boulevard Pleasanton, CA 94588 Phone: 925.560.9000 Fax: 925.847.3871 www.strongtie.com



Company:		Date:	1/15/2014
Engineer:	Kluvers	Page:	2/4
Project:	Metro Greenwall		
Address:			
Phone:			
E-mail:			

<Figure 2>

**Recommended Anchor**

Anchor Name: PAB Pre-Assembled Anchor Bolt - PAB6H (3/4"Ø)



Input data and results must be checked for agreement with the existing circumstances, the standards and guidelines must be checked for plausibility.

SIMPSON STRONG-TIE COMPANY, INC. 5956 W. Las Positas Boulevard Pleasanton, CA 94588 Phone: 925.560.9000 Fax: 925.847.3871 www.strongtie.com



Anchor Designer™
Software
Version 2.0.5154.1

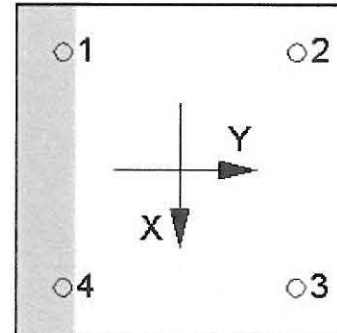
Company:		Date:	1/15/2014
Engineer:	Kluvers	Page:	3/4
Project:	Metro Greenwall		
Address:			
Phone:			
E-mail:			

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2 + (V_{uay})^2}$ (lb)
1	0.0	0.0	650.0	650.0
2	182782.4	0.0	650.0	650.0
3	182782.4	0.0	650.0	650.0
4	0.0	0.0	650.0	650.0
Sum	365564.9	0.0	2600.0	2600.0

Maximum concrete compression strain (%): 4.82
Maximum concrete compression stress (psi): 20958
Resultant tension force (lb): 365565
Resultant compression force (lb): 372165
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

<Figure 3>



4. Steel Strength of Anchor in Tension (Sec. D.5.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
40080	0.75	30060

5. Concrete Breakout Strength of Anchor in Tension (Sec. D.5.2)

$$N_b = k_c \lambda_a \sqrt{f_c} h_{ef}^{1.5} \text{ (Eq. D-6)}$$

K_c	λ_a	f_c (psi)	h_{ef} (in)	N_b (lb)
24.0	1.00	3000	5.000	14697

$$\phi N_{cbg} = \phi (A_{Nc} / A_{Nco}) \psi_{ec,N} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \text{ (Sec. D.4.1 \& Eq. D-4)}$$

A_{Nc} (in ²)	A_{Nco} (in ²)	$\psi_{ec,N}$	$\psi_{ed,N}$	$\psi_{c,N}$	$\psi_{cp,N}$	N_b (lb)	ϕ	ϕN_{cbg} (lb)
459.00	225.00	1.000	1.000	1.25	1.000	14697	0.70	26234

6. Pullout Strength of Anchor in Tension (Sec. D.5.3)

$$\phi N_{pn} = \phi \psi_{c,P} N_p = \phi \psi_{c,P} 8 A_{brg} f_c \text{ (Sec. D.4.1, Eq. D-13 \& D-14)}$$

$\psi_{c,P}$	A_{brg} (in ²)	f_c (psi)	ϕ	ϕN_{pn} (lb)
1.4	3.56	3000	0.70	83689

Input data and results must be checked for agreement with the existing circumstances, the standards and guidelines must be checked for plausibility.

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Company:		Date:	1/15/2014
Engineer:	Kluvers	Page:	4/4
Project:	Metro Greenwall		
Address:			
Phone:			
E-mail:			

8. Steel Strength of Anchor in Shear (Sec. D.6.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
24050	1.0	0.65	15633

9. Concrete Breakout Strength of Anchor in Shear (Sec. D.6.2)**Shear perpendicular to edge in y-direction:**

$$V_{by} = \min[7(l_e/d_a)^{0.2}d_a\lambda_a\sqrt{f_c}C_{at}^{1.5}; 9\lambda_a\sqrt{f_c}C_{at}^{1.5}] \text{ (Eq. D-33 \& Eq. D-34)}$$

l_e (in)	d_a (in)	λ_a	f_c (psi)	C_{at} (in)	V_{by} (lb)
5.00	0.75	1.00	3000	22.00	50073

$$\phi V_{cbgy} = \phi (A_{Vc} / A_{Vco}) \psi_{ec,v} \psi_{ed,v} \psi_{c,v} \psi_{h,v} V_{by} \text{ (Sec. D.4.1 \& Eq. D-31)}$$

A_{Vc} (in ²)	A_{Vco} (in ²)	$\psi_{ec,v}$	$\psi_{ed,v}$	$\psi_{c,v}$	$\psi_{h,v}$	V_{by} (lb)	ϕ	ϕV_{cbgy} (lb)
1368.00	2178.00	1.000	1.000	1.400	1.354	50073	0.70	41733

10. Concrete Pryout Strength of Anchor in Shear (Sec. D.6.3)

$$\phi V_{cpg} = \phi K_{cp} N_{cbg} = \phi K_{cp} (A_{Nc} / A_{Nco}) \psi_{ec,N} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \text{ (Eq. D-41)}$$

K_{cp}	A_{Nc} (in ²)	A_{Nco} (in ²)	$\psi_{ec,N}$	$\psi_{ed,N}$	$\psi_{c,N}$	$\psi_{cp,N}$	N_b (lb)	ϕ	ϕV_{cpg} (lb)
2.0	729.00	225.00	1.000	1.000	1.250	1.000	14697	0.70	83332

11. Interaction of Tensile and Shear Forces (Sec. D.7)

Interaction of Tension and Shear (Sec. D.7.1)					
Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio		Status
Steel	182782	30060	6.08		Fail
Concrete breakout	365565	26234	13.93		Fail (Governs)
Pullout	182782	83689	2.18		Fail
Shear	Factored Load, V_{ua} (lb)	Design Strength, ϕV_n (lb)	Ratio		Status
Steel	650	15633	0.04		Pass
T Concrete breakout y+	2600	41733	0.06		Pass (Governs)
Pryout	2600	83332	0.03		Pass
Interaction check	$N_{ua}/\phi N_n$	$V_{ua}/\phi V_n$	Combined Ratio	Permissible	Status
Sec. D.7.1	13.93	0.00	1,393.5 %	1.0	Fail

FAIL! Selected anchor type and embedment do not meet the selected design criteria.**12. Warnings**

- Calculated concrete compression stress exceeds the permissible bearing stress of diameter 0.85f_c per ACI 318-08 Section 10.14.
- Designer must exercise own judgement to determine if this design is suitable.

Channel Component	Wt per LF (Lbs)	Wt (Lbs) per Channel (Assumes 20' length)	Remarks
Channel Structure (assumes .1620 GA Aluminum)	9.9	197.97	4.33 SF per LF @ 2.286 Lbs/SF
Drain Mat (Saturated)	1.5	30.33	Henry Co DB50 - .5" Thickness
Growing Medium (Blend)	76.0	1,520.00	100 lbs/CF, .76 CF/LF
Plants	2.0	40.00	Assumes 2 Lbs/LF
Water Storage (Assumes 4" Depth)	8.4	168.85	4" storage depth = .41 SF
Total Wt. per Channel	97.9	1,957.15	
Combined Wt of 6 Channels		11,742.89	

Channel Height (Top to Bottom)

Channel #1: 26' - 2"
Channel #2: 22' - 7"
Channel #3: 19' - 0"
Channel #4: 15' - 5"
Channel #5: 11' - 10"
Channel #6: 8' - 4"

Soil Data	Saturated Wt.	Unit
EcoRoof Extensive Growing Media	72	lbs/CUFT
EcoRoof Intensive Growing Media	85	lbs/CUFT
Planting Soil Blend	100	lbs/CUFT
Standard Loam Soil	120	lbs/CUFT



Project: METRO GREEN WALL

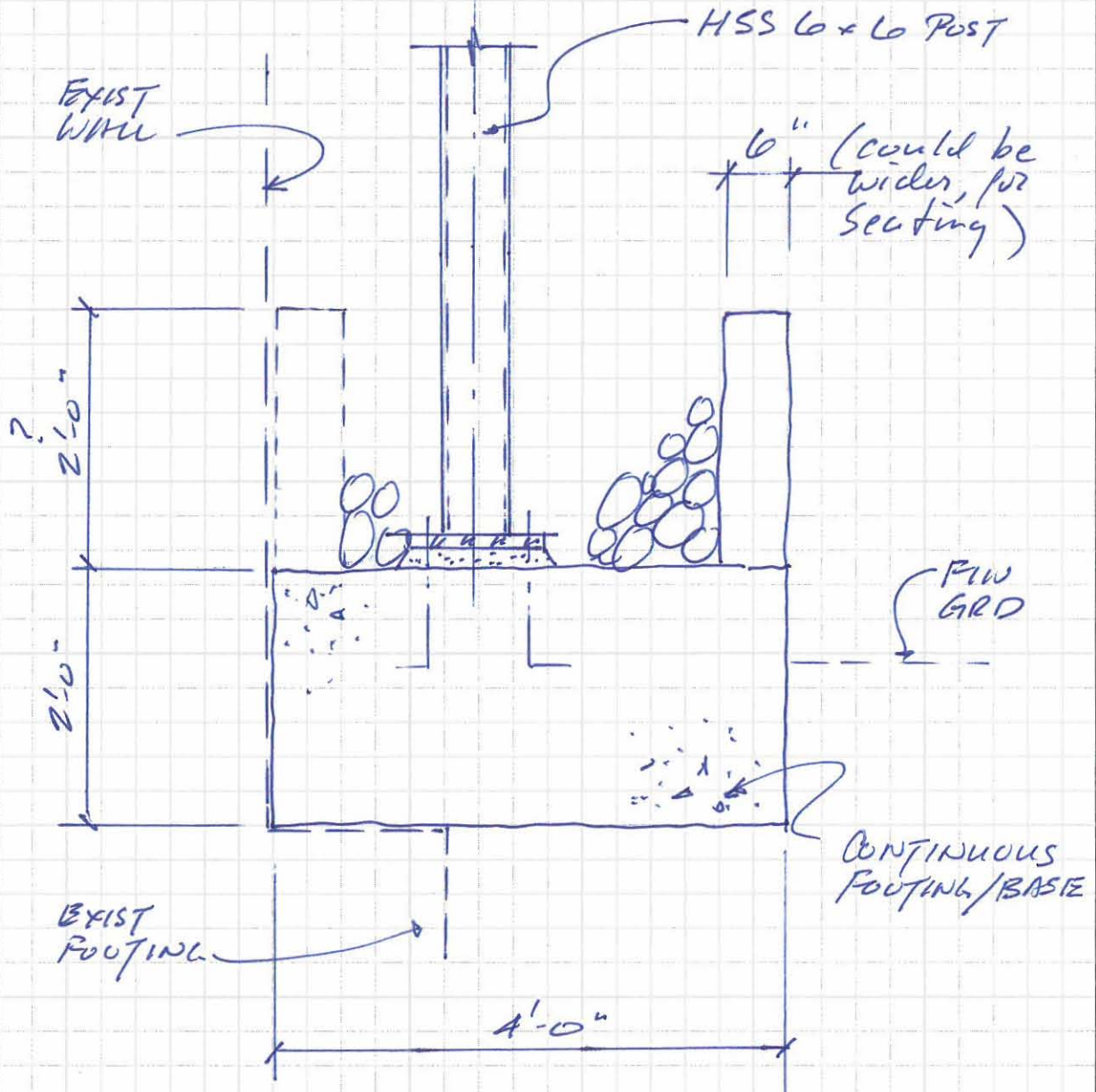
No: _____

Date: 6/17/13

Subject: _____

By: PICK

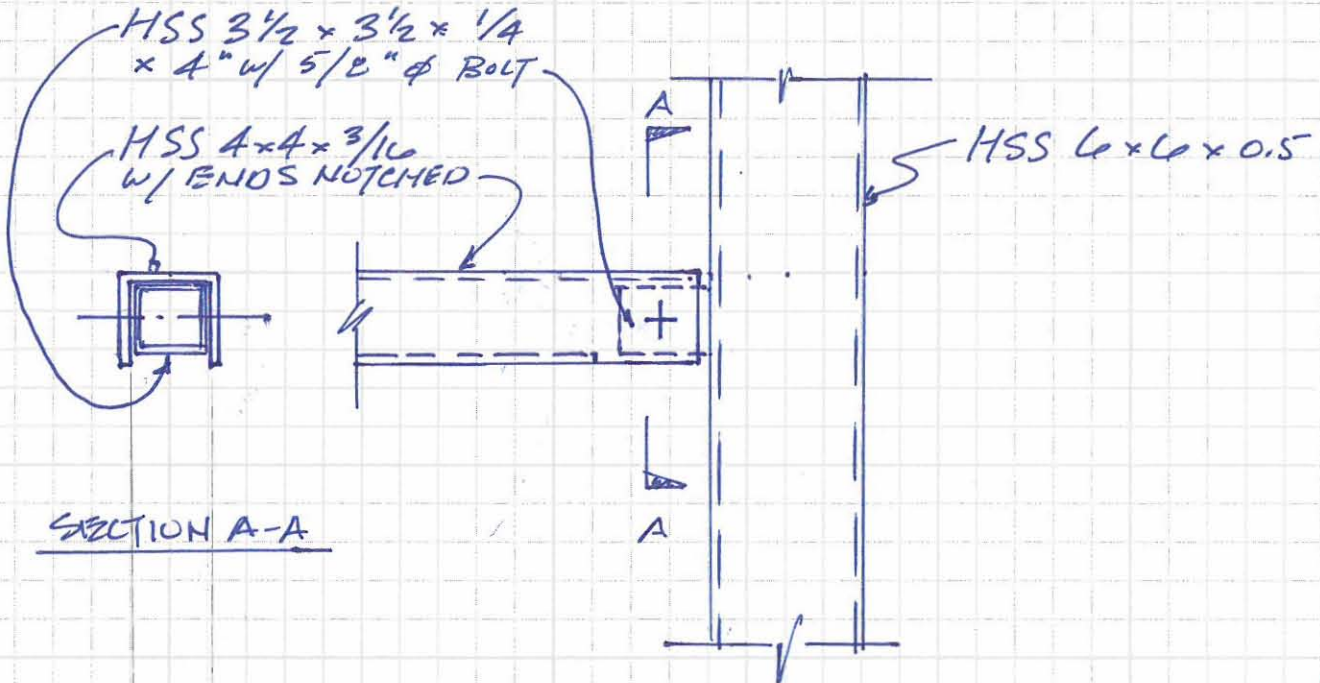
Sheet: SK-1



$$\frac{\text{FOOTING/BASE}}{3/4" = 1'-0"}$$



Project: METRO GREEN WALL No: _____ Date: _____
Subject: _____ By: _____ Sheet: SK-2



Inside
Clear =
 $4" - (2)(0.187)$
 $= 3.625"$

SUPPORT RAIL/POST CONN
 $1\frac{1}{2}" = 1'-0"$

ENVIRONMENTAL PROTECTION AGENCY (EPA) REGION 10 CONTRACT SPECIFICATIONS

GENERAL. The construction work is being partially funded by the Environmental Protection Agency (EPA). Therefore, all construction work under this contract(s) is (are) subject to applicable Federal laws and regulations.

All applicable Federal, state, and local laws are to be complied with during bidding and construction. The contractor is responsible for its own and its employees' acts or omissions under the laws and the contract. The contractor and its subcontractor are jointly and equally responsible for the acts or omissions of the subcontractor and its employees.

EPA grantees and subgrantees are responsible for the successful administration and completion of federally assisted projects. EPA is not a party to any of the grantee's and/or subgrantees' subagreements for the construction of the proposed project. Reviews and approvals by EPA are: for administrative purposes only; used to determine compliance with Federal laws and regulations; and used to determine the level of Federal participation.

COMPLIANCE WITH STATE & LOCAL LAWS. The construction of the project, including the letting of subcontracts, shall conform to the requirements of state and local laws and ordinances. If such requirements conflict with Federal laws and regulations, Federal laws and regulations shall prevail (e.g., retention of records).

MAINTENANCE OF EXISTING TREATMENT WORKS DURING CONSTRUCTION.

Where construction consists of replacement of, or modification to, an existing sewer line, pump station or waste treatment works, the contractor shall provide for maintaining that works' conveyance of wastes and its existing level of treatment at all times during construction.

ACCESS TO CONSTRUCTION SITE. The contractor shall provide for access to all sites on contract work for duly authorized representatives from EPA and the state with adequate notice.

ACCESS TO RECORDS. The contractor shall provide for access for duly authorized representatives from EPA and state to any books, documents, papers, and records of the contractor which are pertinent to that specific contract for the purpose of making audit, examination, exerts, and transcriptions.

RECORDS RETENTION. The grantee, subgrantees, and prime contractors shall retain all records for three years after final payments or other pending matters (e.g., litigation and audit) are closed, whichever is longer.

BONDING REQUIREMENTS. At a minimum, bidders on contracts less than \$100,000 shall be subject to state and local requirements relating to bid guarantees and bonding requirements. However, lower thresholds may apply, depending on applicable state and local law. For contracts and subcontracts exceeding \$100,000, EPA may accept the bonding policy and requirements of the grantee or subgrantee if EPA made a determination that its interest is adequately protected. If such a determination has not been made, each contractor awarded a construction contract in excess of \$100,000 shall meet the minimum requirements as follows:

- Bid Guarantee from each bidder equivalent to five percent of the bid price.
- Performance and Payment Bond on part of the contractor for 100 percent of the contract price.

AWARDING OF SUBAGREEMENTS. For sealed bids and where two or more responsible bidders are willing and able to compete effectively, grantees or subgrantees will make awards to the lowest, responsive, responsible bidder whose bid conforms with all the material, terms and conditions of the invitation for bids.

In instances where competition by sealed bids is determined inadequate (e.g., only one sealed bid is received), the grantee or subgrantee must obtain EPA approval prior to executing noncompetitive procurement contracts. Otherwise, EPA funding of the project may be withdrawn.

SETTLEMENT OF PROCUREMENT ISSUES. Grantees and subgrantees alone will be responsible for the settlement of all contracts and administrative issues arising out of procurement. Grantees and subgrantees will have procedures to handle and resolve procurement issues and shall disclose information regarding such issues to EPA. Such issues include, but are not limited to, source evaluation, bid protests, disputes, and claims.

EPA is not a party to any of the grantee's or subgrantee's subagreements for the construction of the proposed project. EPA's funding of this project does not relieve the grantee or subgrantee of any contractual responsibilities under its contracts. Reviews and approvals by EPA are: for administrative purposes only; used to determine compliance with Federal laws and regulations; and used to determine the level of Federal participation.

EPA will not substitute its judgment for that of the grantee or subgrantee unless the matter is primarily a Federal concern. Violations of law will be referred to the local, state, or Federal authority having jurisdiction. Reviews by EPA will be limited to the violations specified below. All other issues received by EPA will be referred to the grantee or subgrantee.

- Violations of Federal law or regulations and the standards (violations of State or local law will be under the jurisdiction of state or local authorities); and
- Violations of the grantee's or subgrantee's protest procedures for failure to review a complaint or protest.

BID PROTESTS. Grantees and subgrantees will have procedures to resolve bid protest appeals and shall disclose information regarding the protest to EPA and the state. A protestor must exhaust all administrative remedies at the grantee's and subgrantee's level before pursuing a protest with EPA.

Only parties with a financial interest which are adversely affected by the grantee's or subgrantee's decision on the initial bid protest may file a bid protest appeal with EPA. **EPA will not substitute its judgment for the grantee or subgrantee unless the matter is primarily a Federal concern.** Reviews by EPA will be limited to the violations described under the preceding section entitled "Settlement of Procurement Issues". Violations of law will be referred to the appropriate local or state authority.

Bid protest appeals must be filed with the Office of Regional Counsel, EPA Region 10, ORC- 158, EPA, Region 10, 1200 Sixth Avenue, Seattle, WA 98101. A protest appeal must:

- Be a written complaint regarding the grantee's or subgrantee's determination of a bid protest appeal;
- Include a copy of the grantee's or subgrantee's determination of the protest, and State the basis for the appeal.

The party filing the bid protest appeal must concurrently transmit a copy of all protest documents and any attachments to all other financially interested parties which may be adversely affected by the determination of the protest appeal.

EPA will only consider written protest appeals received by the Office of Regional Counsel (ORC) **within seven (7) calendar days** after the adversely affected party can meet the seven day notice requirements by telegraphing or faxing to ORC within the seven calendar day period of its intent to file a protest appeal, provided the adversely affected party submits a complete protest appeal within seven (7) calendar days of the date it sent the telegram or fax. If the seventh day falls on a Saturday, Sunday, or holiday, the next working day shall be the last day to submit a protest appeal.

For any protest appeal based upon alleged improprieties in the solicitation which were clearly apparent before receipt of initial proposals, EPA may dismiss as untimely any such appeals if the grantee or subgrantee does not receive the initial protest before bid opening or the closing date for receipt of proposals.

COST ANALYSIS. The grantee and subgrantee must perform a cost analysis for all procurement actions to determine the reasonableness of the proposed contract price. The method and degree of analysis is dependent on the facts surrounding the particular procurement situation, but as a starting point, grantees must make independent estimates before receiving bids or proposals.

A cost analysis will be necessary when adequate price competition is lacking; for sole source procurement; for contract modifications, and for change orders.

COMPLIANCE WITH OTHER FEDERAL REGULATIONS. The grantee and subgrantee are to ensure that their contracts include appropriate provisions in their bid documents to ensure contractors' compliance with the following:

- Administrative, contractual or legal remedies in instances where contractors violate or breach contract terms, and provide sanctions and penalties.

- Termination for cause or convenience by the grantee and sub-grantee including the manner by which it will be effected and the basis for settlement.
- Compliance with Executive Orders and Department of Labor pertaining to Equal Employment Opportunity. (Pertains to all construction contracts in excess of \$10,000.)
- Compliance with the Copeland Anti-Kickback Act. Compliance with sections 103 and 107 of the Contract Work Hours and Safety Standards Act. (Pertains to construction contracts in excess of \$2,000 and in excess of \$2,500 for contracts involving employment of mechanics or laborers.)
- Compliance with all applicable standards, orders, or requirements under 306 of the Clean Air Act, section 508 of the Clean Water Act, Executive Order 11738 and EPA regulations 40 CFR, Part 15. (Pertains to contracts and subcontracts in excess of \$100,000.)
- Requirements of the energy efficiency contained in the state energy conservation plan issued under the Energy Policy and Conservation Act. P.L. 94-163.

EPA REGULATORY REFERENCES. 40 CFR Part 31. In circumstances where the provisions of Part 31 are ambiguous EPA will generally look for guidance to the language of 40 CFR Part 33 and past requirements and determinations made pursuant to Part 33.

DAVIS BACON WAGE RATES

OR140029 MOD 1 REVISED 01/24/14 OR29
 ***** THIS WAGE DETERMINATION WAS REPLACED ON 01/24/14*****
 General Decision Number: OR140029 01/17/2014

Superseded General Decision Number: OR20130029
 State: Oregon
 Construction Type: Building
 County: Multnomah County in Oregon.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Modification Number	Publication Date
0	01/03/2014
1	01/17/2014

BROR0001-014 06/01/2013

	Rates	Fringes
BRICK FINISHER.....	\$ 21.82	11.15
BRICKLAYER.....	\$ 32.75	16.15
TILE FINISHER.....	\$ 21.82	11.02
TILE SETTER.....	\$ 29.19	14.64

 CARP0001-025 06/01/2012

	Rates	Fringes
Carpenters:		
Hardwood floors and batt insulation.....	\$ 32.76	14.44
Including metal stud installation, from work and scaffold building.....	\$ 32.61	14.44

 CARP9001-003 06/01/2012

	Rates	Fringes
Acoustical Ceiling Installer & Drywall Hanger.....	\$ 32.90	14.15
LATHER.....	\$ 31.02	16.03

 ELEC0048-018 07/01/2013

	Rates	Fringes
ELECTRICIAN.....	\$ 38.05	19.54

 ELEC0048-020 07/01/2013

	Rates	Fringes
ELECTRICIAN		
Computer Installation, telephone installation, HVAC temperature control installation, Electrical low voltage wiring installer and sound technician only.....	\$ 22.50	14.08
Electrical installer alarms.....	\$ 28.75	15.21

* ENGI0701-022 01/01/2014

	Rates	Fringes
Power equipment operators:		
GROUP 1.....	\$ 38.25	13.70
GROUP 1A.....	\$ 40.16	13.70
GROUP 1B.....	\$ 42.08	13.70
GROUP 2.....	\$ 36.56	13.70
GROUP 3.....	\$ 35.54	13.70
GROUP 4.....	\$ 34.56	13.70
GROUP 5.....	\$ 33.43	13.70
GROUP 6.....	\$ 30.34	13.70

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

- GROUP 1: CRANE: Helicopter Operator, when used in erecting work; Whirley Operator, 90 ton and over; LATTICE BOOM CRANE: Operator 200 tons through 299 tons, and/or over 200 feet boom; HYDRAULIC CRANE: Hydraulic Crane Operator 90 tons through 199 tons with luffing or tower attachments
- GROUP 1A: HYDRAULIC CRANE: Hydraulic Operator, 200 tons and over (with luffing or tower attachment); LATTICE BOOM CRANE: Operator, 200 tons through 299 tons, with over 200 feet boom;
- GROUP 1B: LATTICE BOOM CRANE: Operator, 300 tons through 399 tons with over 200 feet boom; Operator 400 tons and over
- GROUP 2: CRANE: Cableway Operator, 25 tons and over; HYDRAULIC CRANE: Hydraulic crane operator 90 tons through 199 tons (without luffing or tower attachment); TOWER/WHIRLEY OPERATOR: Tower Crane Operator; Whirley Operator, under 90 tons; LATTICE BOOM CRANE: 90 through 199 tons and/or 150 to 200 feet boom; HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (with luffing or tower attachment); Rubber tired scraper with tandem scrapers, multi-engine Trenching Machine-Wheel Operator; Excavator over 130,000 lbs; Loader 120,000 lbs and above; BLADE: Auto Grader; Blade Operator-Robotic
- GROUP 3: HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (without luffing or tower attachment); LATTICE BOOM CRANES: Lattice Boom Crane-50 through 89 tons (and less than 150 feet boom); Rubber Tired Scraper: with tandem scrapers; self loading, paddle wheel, auger type, finish and/or 2 or more units; Excavator over 80,000 lbs through 130,000; Loader 60,000 lbs and less than 120,000 lbs.
- GROUP 4: CRANE: Hydraulic Crane Operator, under 50 tons; LATTICE BOOM CRANE OPERATOR: Lattice Boom Crane Operator, under 50 tons; TRACKHOE/EXCAVATOR-ROBOTIC: up to and including 20,000 lbs. with any or all attachments; Excavator Operator over 20,000 lbs through 80,000 lbs.; BLADE: Blade Operator; Tractor operator with boom attachment; DRILLING: Churm Drill and Earth Boring Machine Operator; Directional Drill Operator over 20,000 lbs pullback; CRANE: Chicago boom and similar types; Boom type lifting device, 5 ton capacity or less; HYDRAULIC HOES: Robotic Hydraulic backhoe operator, track and wheel type up to and including 20,000 lbs. with any or all attachments; Asphalt Paver; Screed Operator; Rubber-Tired Scraper, single engine, single scraper; Compactor-Self Propelled; Trenching Machine, digging capacity over 3 ft Depth; Excavator over 20,000 lbs through 80,000 lbs; Loaders 25,000 lbs and less than 60,000 lbs
- GROUP 5: TRACKHOE/EXCAVATOR-HYDRAULIC: up to and including 20,000 lbs.; Boom truck operator; DRILLING: Churm Drill and Earth Boring Machine Operator; Directional Drill Operator less than 20,000 lbs pullback; HYDRAULIC HOES: Hydraulic Backhoe Operator, wheel type Ford, John Deere, Case type); Hydraulic Backhoe Operator track type up to and including 20,000 lbs.; Concrete Pumper; Concrete Paver; Compactor; Loaders, rubber tired type, less than 25,000 lbs; Forklift over 5 ton, Man Lift/Outside Elevator
- GROUP 6: LOADERS: (less than 1 cu yd.); Roller(Non-Asphalt); Oiler; Bobcat/Skid Loader; Grade Checker; Crane oiler; Forklift

Zone Differential (add to Zone 1 rates):

Zone 2 - \$3.00

Zone 3 - \$6.00

For the following metropolitan counties: MULTNOMAH; CLACKAMAS; MARION; WASHINGTON; YAMHILL; AND COLUMBIA; CLARK; AND COWLITZ COUNTY, WASHINGTON WITH MODIFICATIONS AS INDICATED:

All jobs or projects located in Multnomah, Clackamas and Marion Counties, West of the western boundary of Mt. Hood National Forest and West of Mile Post 30 on Interstate 84 and West of Mile Post 30 on State Highway 26 and West of Mile Post 30 on Highway 22 and all jobs or projects located in Yamhill County, Washington County and Columbia County and all jobs or projects located in Clark & Cowlitz County, Washington except that portion of Cowlitz County in the Mt. St. Helens "Blast Zone" shall receive Zone I pay for all classifications.

All jobs or projects located in the area outside the identified boundary above, but less than 50 miles from the Portland City Hall shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the Portland City Hall, but outside the identified border above, shall receive Zone III pay for all classifications.

For the following cities: ALBANY; BEND; COOS BAY; EUGENE; GRANTS PASS; KLAMATH FALLS; MEDFORD; ROSEBURG

All jobs or projects located within 30 miles of the respective city hall of the above mentioned cities shall receive Zone I pay for all classifications.

All jobs or projects located more than 30 miles and less than 50 miles from the respective city hall of the above mentioned cities shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the respective city hall of the above mentioned cities shall receive Zone III pay for all classifications.

IRON0029-011 07/01/2013

	Rates	Fringes
IRONWORKER (Ornamental, Reinforcing, and Structural).....	\$ 34.12	21.35

LABO0001-030 09/01/2013

	Rates	Fringes
Laborers: (Mason Tender-Cement/Concrete).....	\$ 27.63	12.85

LABO0001-031 06/01/2013

	Rates	Fringes
Laborers: (Mason Tender-Brick)...	\$ 27.63	12.85

LABO0001-032 06/01/2013

	Rates	Fringes
Laborers: (Mason Tender-Stone)...	\$ 27.63	12.85

LABO0003-011 06/01/2013

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 26.09	12.85
GROUP 2.....	\$ 27.09	12.85

LABORER CLASSIFICATIONS

GROUP 1: Form-Stripping, Power Tool Operator, General Laborer

GROUP 2: Vibrating Plate, Grade Checker, Pipelayer

PAIN0055-025 07/01/2013

	Rates	Fringes
PAINTER		
BRUSH, ROLLER AND SPRAY.....	\$ 21.01	8.83

PAIN0055-026 08/13/2012		
	Rates	Fringes
DRYWALL FINISHER/TAPER.....	\$ 32.22	12.40

PAIN0740-002 01/01/2013		
	Rates	Fringes
GLAZIER.....	\$ 35.80	13.89

* PAIN1236-007 01/01/2014		
	Rates	Fringes
FLOOR LAYER: Vinyl Flooring.....	\$ 27.28	12.67

PLAS0082-004 06/01/2011		
	Rates	Fringes
PLASTERER		
Including Stucco.....	\$ 25.08	11.32

PLAS0555-006 06/01/2012		
	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 29.98	17.76

PLUM0290-009 04/01/2013		
	Rates	Fringes
PIPEFITTER		
Including HVAC Pipe		
Installation.....	\$ 39.71	22.10

PLUM0290-010 04/01/2013		
	Rates	Fringes
PLUMBER.....	\$ 39.71	22.10

ROOF0049-004 07/01/2012		
	Rates	Fringes
ROOFER		
Excluding Metal Roof.....	\$ 28.03	9.55

SFOR0669-002 07/01/2013		
	Rates	Fringes
SPRINKLER FITTER		
Fire Sprinklers.....	\$ 33.08	19.85

SHEE0016-015 07/01/2013		
	Rates	Fringes
Sheet Metal Worker		
Including HVAC Duct		
Installation.....	\$ 36.68	16.61

TEAM0037-008 06/01/2013		
	Rates	Fringes

Truck drivers:

GROUP 1.....	\$ 26.90	13.75
GROUP 2.....	\$ 27.02	13.75
GROUP 3.....	\$ 27.15	13.75
GROUP 4.....	\$ 27.41	13.75
GROUP 5.....	\$ 27.63	13.75
GROUP 6.....	\$ 27.79	13.75
GROUP 7.....	\$ 27.99	13.75

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: Dump trucks, side, end and bottom dumps: up to and including 10 cu. yds.

GROUP 2: Dump trucks/articulated dumps 6 cu to 10 cu.;

GROUP 3: Dump trucks, side, end and bottom dumps: over 10 cu. yds. and including 30 cu. yds., includes articulated dump trucks

GROUP 4: Dump trucks, side, end and bottom dumps: over 30 cu. yds. and including 50 cu. yds. and includes articulated dump trucks

GROUP 5: Dump trucks, side, end and bottom dumps: over 50 cu. yds. and including 60 cu. yds. and includes articulated dump trucks

GROUP 6: Dump trucks, side, end and bottom dumps: over 60 cu. yds. and including 80 cu. yds. and includes articulated dump trucks

GROUP 7: Dump trucks, side, end and bottom dumps: over 80 cu. yds. and including 100 cu. yds., includes articulated dump trucks

SUOR2009-027 11/09/2009

	Rates	Fringes
ELECTRICIAN (Low Voltage Wiring for Alarms).....	\$ 27.97	6.41
LABORER: Asphalt Raker.....	\$ 20.94	7.05
LABORER: Landscape.....	\$ 12.38	0.00
MILLWRIGHT.....	\$ 18.45	3.54
TRUCK DRIVER: Water Truck.....	\$ 18.11	5.05

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters, PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

----- WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations.

Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7).

Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board).

Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION