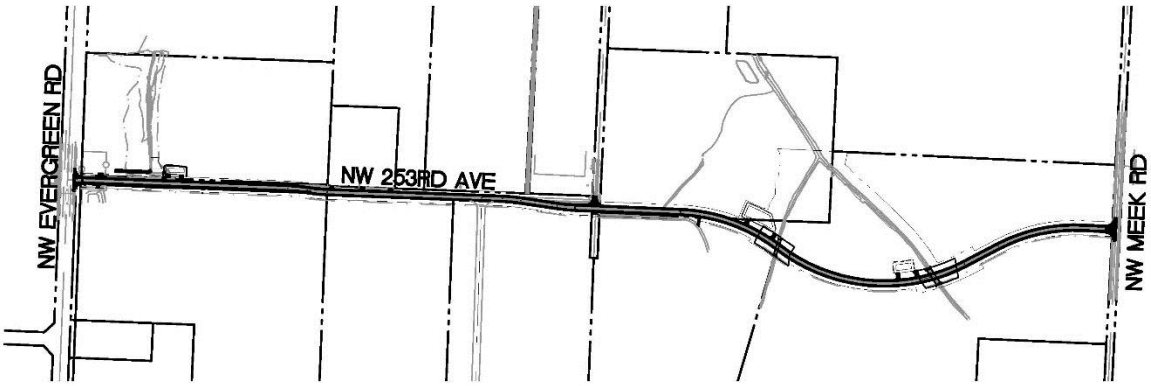
DATE ISSUED: 5/8/15 **DOCUMENT NUMBER**:_____

BOOK 1 OF 2

OF THE BID DOCUMENTS

FOR:



NW 253rd Avenue Improvements and Extension

Grading, Drainage, Asphalt, Concrete Paving, Signing, Striping and Structures

Bid Documents

BID NUMBER: 10705

A CITY OF HILLSBORO
PUBLIC WORKS, ENGINEERING DIVISION
PUBLIC IMPROVEMENT PROJECT

7/2015

City of Hillsboro, Oregon

Invitation to Bid – Public Improvement

NW 253rd Avenue Improvements and Extension
ITB No. 10705

Bids Due:	**Due Date and Time:** Not Later than 2:00:00 PM Pacific Time, May 28, 2015. Bid Closing is the Due Date and Time shown above. Late Bids shall be rejected. First Tier Subcontractor Disclosure: Not later than 4:00:00 PM Pacific Time, May 28, 2015
Submit Bids to:	**City of Hillsboro** Charlie Shell Public Works Department, Engineering Division 150 East Main Street, 4th Floor Hillsboro, OR 97123 All bid documents shall be submitted in hard copy to address above no later than the Due Date and Time. Electronic or e-mailed bids shall be rejected.
Contact:	**Direct questions to:** ITB Contact: Charlie Shell Email: charlie.shell@hillsboro-oregon.gov Phone: 503-681-6252
Request Deadline:	**For all substitution, clarification and change requests as well as solicitation protests:** **5:00 pm, May 20, 2015**
Prevailing Wages:	This project is a Public Work and subject to ORS 279C.800 – ORS 279C.870 including but not limited to: payment of prevailing wages, reporting and public works bond.
Bidder Prequalification	Bidder Prequalification is not required
Pre-bid Conference:	No pre-bid conference will be held.
Public Bid Opening:	A Public Bid Opening to be held at the following time and location: 2:00 PM, May 28, 2015, Engineering Dept., 150 East Main Street, 4th Floor, Hillsboro, OR 97123.

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ATTACHMENT A:
FORM OF CONTRACT, GENERAL CONDITIONS

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LIST OF DRAWINGS:

- **CONSTRUCTION PLANS TITLED "NW 253RD AVE. IMPROVEMENTS AND EXTENSION", PREPARED BY GROUP MACKENZIE, CONSISTING OF 52 PAGES.**
- **SHOP DRAWINGS TITLED "NW 253RD AVE. STA 47+21.60 AND 55+74", PREPARED BY CONTECH, CONSISTING OF 49 PAGES.**

TECHNICAL SPECIFICATIONS:

- **BOOK 2 OF 2 OF THE BID DOCUMENTS**
- **GEOTECHNICAL REPORT TITLED "NW 253RD AVENUE FROM NW EVERGREEN ROAD TO MEEK ROAD" PREPARED BY GEODESIGN INC, DATED AUGUST 28, 2013 AND AS AMMENDED BY GEODESIGN MEMORANDUM DATED APRIL 29, 2015**
- **CITY OF HILLSBORO DESIGN AND CONSTRUCTION STANDARDS 2013 (BY REFERENCE)**
- **CLEAN WATER SERVICES DESIGN AND CONSTRUCTION STANDARDS 2007 (BY REFEREENCE)**
- **OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION 2008 (BY REFERENCE)**

This Invitation Bid Document is comprised of all Part A and Part B documents, including, but not limited to: instructions, forms, drawings and specifications. The drawings and specifications pertaining to this ITB are hereby incorporated by reference.

SCHEDULE

ITB ISSUED	**May 8, 2015**
BIDDER PRE-QUALIFICATION DEADLINE	**No prequalification required.**
REQUEST DEADLINE FOR: SUBSTITUTION, CLARIFICATION, OR CHANGE AND SOLICITATION PROTEST DEADLINE	**5:00 pm, May 20, 2015**
LAST ADDENDA ISSUED	**NOT LATER THAN 72 HOURS PRIOR TO BIDS DUE**
BIDS DUE	**See Page 1**
FIRST-TIER SUBCONTRACTOR DISCLOSURE	**See Page 1**
ANTICIPATED CONTRACT START	**July 6, 2015**
ANTICIPATED FINAL COMPLETION	**November 1, 2016**

NOTE: The City reserves the right to deviate from this schedule.

ADVERTISEMENT

CITY OF HILLSBORO
Public Works Department
Invitation to Bid (ITB) – Public Improvement
NW 253rd Avenue Improvements and Extension
No. 10705

Bids due and Bid Closing Date and Time: May 28, 2015 2:00 PM
First Tier Subcontractor Disclosure due: Not later than May 28, 2015 4:00 PM

The City of Hillsboro seeks sealed bids from qualified firms able to provide roadway construction services including grading, drainage, concrete paving, signing, striping, roadside development, structures, and landscaping.

The general nature and approximate quantities of work shall include furnishing all equipment, materials, and labor required to install the following:

> Furnish all equipment, materials, and labor required to complete the construction of a public street, storm sewer, and sensitive area mitigation planting. Proposed street improvements are approximately 5500 linear feet in length, consisting of approximately 14,600 square yards of concrete street, 1,720 tons of asphalt surfacing, cement treatment of subgrade, curbing, signing, and striping. Proposed storm sewer improvements include the installation of approximately 782 linear feet of 30" pipe, 1,037 linear feet of 24" pipe, 225 linear feet of 20" pipe, 869 linear feet of 18" pipe, 2,332 linear feet of 16" pipe or smaller, 30 concrete manholes of various sizes, 39 storm inlets, 3 storm water quality and detention ponds, the installation of one approximately 22 foot wide by 89 foot long precast concrete arch culvert creek crossing (the City will provide the precast components), the installation of one approximately 31 foot wide by 97 foot long precast concrete arch culvert creek crossing (the City will provide the precast components), and all associated excavation, embankment, erosion control, restoration, and repair work.
>
> The purpose of this project is to improve NW 253rd Avenue to provide access to new industrial lands being added to the City of Hillsboro.

There is no pre-qualification process for this ITB.

Late bids will be rejected as non-responsive.

Sealed bids will be received by Charlie Shell, Project Manager at: Public Works Department, Engineering Division, Hillsboro Civic Center, 150 E. Main St., 4th Floor, Hillsboro, OR 97123. Questions about this ITB may be directed to the Contact: Charlie Shell, 503-681-6252, charlie.shell@hillsboro-oregon.gov.

ITB documents may be obtained from the office of the Public Works Department, Engineering Division, 150 E. Main St., Fourth Floor, Hillsboro, Oregon 97123 for $35.00 (non-refundable) plus postage for mailing. Contract documents are also available for download from the City's website at www.hillsboro-oregon.gov/PublicWorksITB and through area plan centers. Please call (503) 681-6146 for additional information.

Hard copy ITB documents may be viewed at the above address.

This ITB is for construction of a Public Work subject to ORS 279C.800 to 279C.870 (prevailing wage law).

Please Publish:
Argus: May 8th and 13th
Daily Journal: May 8th and 11th

PART A:

SECTION 1- SUMMARY AND INSTRUCTIONS TO BIDDERS

1.01. BRIEF SUMMARY OF THE WORK

A. The City requests sealed Bids to provide roadway construction services including grading, drainage, concrete and asphalt paving, signing, striping, roadside development, structures, and landscaping.

B. ENGINEER'S PROJECT ESTIMATE: $4,250,000 to $5,250,000

1.02. IMPORTANT ITB EVENTS

A. PRE-BID CONFERENCE

There will be no Pre-bid conference.

B. RECEIPT OF BIDS

Sealed bids ("Bids") will be received at the location, Due Date and Time specified on page 1 of this document.

C. BID CLOSING

Bid Closing is shown as the Due Date and Time on page 1 of this document. Bids received after Bid Closing will be considered Late. The City will not accept Offers after Bid Closing.

D. FIRST-TIER SUBCONTRACTOR DISCLOSURE

The first-tier subcontractor disclosure form is due at the time and date shown on page 1 of this document. Failure to submit first-tier subcontractor disclosure form by this due date and time may result in Bid rejection.

E. PUBLIC BID OPENING

The Public Bid Opening will be held at the location, time and date shown on page 1 of this document.

1.03. BID REQUIREMENTS

Bid Requirements Checklist The following is a listing of Bid submission components		
	Signed Bid Form – all pages	Submit with Bid
	Bid Security	Submit with Bid
	Bidder Responsibility Information Form – all pages	Submit with Bid
	First-Tier Subcontractor Disclosure	Submit as per page 1

The Bid Requirements checklist is provided for the Bidder's convenience. Bidder is advised to thoroughly review ITB documents to be certain that it has met all requirements and included all required documents, forms and information in its Bid. In the event of a conflict between the Bid Requirements Checklist and other ITB Documents, other ITB Documents shall take precedence.

A. FIRST-TIER SUBCONTRACTOR DISCLOSURE

As per the form of first-tier subcontractor disclosure set forth in ORS 279C.370, Bidder shall submit to the City a disclosure of the first-tier subcontractors that:

(a) Will be furnishing labor or will be furnishing labor and materials in connection with the public improvement contract; and

(b) Will have a contract value that is equal to or greater than five percent of the total project Bid or $15,000, whichever is greater, or $350,000 regardless of the percentage of the total project base bid. Bidder must submit this documentation in accordance with Section 1, 1.08 and Section 3, 3.4.

B. BID SECURITY

Bid security shall accompany each Bid exceeding $100,000 as per Section 1, 1.08, F.

C. OREGON CONSTRUCTION CONTRACTORS BOARD

Bidders shall be licensed with the Oregon Construction Contractors Board prior to bidding on this project.

D. BIDDER PRE-QUALIFICATION

Prequalification is not required for this bid.

E. BIDDER'S QUALIFICATIONS AND RESPONSIBILITY

Each Bidder shall submit a completed Bidder's Responsibility Information Form along with its Bid. The Bidder's Responsibility Information Form will be used to evaluate the qualifications of any Bidder whose Bid is under consideration for Contract Award (in addition to Bidder Pre-qualification, if applicable). Bidder's responses to requirements in Supplementary Instruction to Bidders may also be utilized in this evaluation.

Prior to award and execution of a Contract, the City will evaluate whether the apparent successful Bidder meets the applicable standards of responsibility identified in ORS 279C.375 and COH-49-0390. See also COH-49-0440(1)(c)(H). In doing so, the City may investigate Bidder and request information in addition to that already required in this document, when the City, in its sole discretion, considers it necessary or advisable. Submission of a signed Bid shall constitute approval for the City to obtain any information that the City deems necessary to conduct the evaluation.

Bids will be evaluated to identify the lowest responsive Bid submitted by a responsible Bidder which is not otherwise disqualified. (Refer to ORS 279C.375 and COH-49-0390. See also COH-49-0440(1)(c)(H)).

The City may postpone the award of the Contract after announcement of the apparent successful Bidder in order to complete its investigation and evaluation. Failure of the apparent successful Bidder to demonstrate responsibility shall render the Bidder non-responsible and shall constitute grounds for Bid rejection, as required under COH-049-0390.

Any Bidder who fails to submit a complete Bidder Responsibility Information Form will be deemed to be non-responsive and will not be considered for Award of Contract.

If a Bidder is found not to be responsible, documentation of the reasoning will be sent to the Oregon Construction Contractor's Board (OCCB). Such documentation will be based upon the criteria set forth in ORS 279C.375(3).

1.04. CONTRACT REQUIREMENTS

A. PREVAILING WAGES

The selected Contractor and its subcontractors shall pay the applicable prevailing wages to their workers as required by ORS 279C.840. This ITB and the resulting Contract are subject to the following BOLI wage rate requirements and the prevailing wage rates set forth in the following booklets:

(a.) The "Prevailing Wage Rates for Public Works Contracts in Oregon" dated January 2015 and any applicable amendments to these rates.

(b.) The "PWR Apprenticeship Rates" dated April 2015 and any applicable amendments to these rates.

The complete publications may be found online at the BOLI website at: http://www.oregon.gov/boli/WHD/PWR/Pages/pwr_state.aspx and are incorporated by reference.

B. DAVIS BACON ACT – FEDERALLY FUNDED CONTRACTS

This project is subject to the Davis-Bacon Act (40 U.S.C. 3141 et seq.), Federal Department of Labor Prevailing Wages. Yes: ☐ No: ☒. If Yes, see Attachment B for applicable Prevailing Wage Rate information.

C. CONTRACT, BONDS AND INSURANCE

The successful Bidder must enter into a Contract with the City in the form included here as Attachment A. Agreement Form. The successful Bidder must obtain and maintain insurance and bonding as per Section 1, 1.11 A., Section 3, 3.7 Performance Bond, 3.8 Labor and Materials Payment Bond, and 3.6 Agreement Form. The successful Bidder shall obtain a Payment Bond and a Performance Bond issued by a surety which is authorized to transact surety business in the State of Oregon and which has an A.M. Best "A" or better rating.

D. WARRANTY BONDING

The selected Contractor will be required to provide the City a Warranty Bond.

YES: ☒ NO: ☐

"A Warranty Bond in the form provided herein as "3.9 Warranty Bond" is required for this project and must be provided by the Contractor before the final payment on the contract is issued by the City. The warranty security furnished by the Contractor for the work performed will be ten percent (10%) of the original contract amount. This security is to guarantee replacement and repair of the public improvements, provided by the Contractor under the contract, for a period of one (1) year following the issuance of the written Notice of Substantial Completion.

1.05. AVAILABILITY OF ITB DOCUMENTS

ITB documents may be obtained from the office of the Public Works Department, Engineering Division, 150 E Main St., Fourth Floor, Hillsboro, Oregon 97123 for $50 (non refundable) plus postage for mailing. Contract documents are also available for download from the City's website at www.hillsboro-oregon.gov/PublicWorksITB and through area plan centers. Please call (503) 681-6146 for additional information.

Hard copy ITB documents may be viewed at the above address.

1.06. ITB/PROJECT CONTACT

All questions, requests for clarification, requests for change, requests for substitution and any solicitation protests

must be addressed to the ITB Contact shown on page 1 of this document.

1.07. SOLICITATION PROTEST; REQUEST FOR CHANGE; REQUEST FOR CLARIFICATION; REQUEST FOR BRAND NAME/PRODUCT SUBSTITUTION

A. PROCEDURE: Questions and clarification requests must be directed to the contact shown on page 1 of this ITB. The appropriate means of seeking changes to provisions of this ITB are through (a) requests for approval of an "approved equivalent" (b) requests for changes to contractual terms, Specifications, or Plans; and (c) protests of contractual terms, Specifications, or Plans.

Any Offer/Bid response that includes non-approved alternate product brands or products, that takes exception to the Specifications or Plans or contractual terms of the ITB may be deemed non-responsive and may be rejected.

B. METHOD OF SUBMITTING REQUESTS FOR CHANGES TO THIS ITB: Emailed or mailed requests must be marked as follows:

(a) Bid Request for Substitution Request (Request for Clarification, Request for Change, or Protest, whichever is applicable)

(b) ITB Number

Requests must be received by the contact listed on Page 1 of the ITB, in writing, either in hardcopy or by email, no later than the Request Deadline on the Schedule shown on Page 2 of the ITB. Unless this specific deadline is extended by subsequent Addenda, no requests for substitution, requests for clarification, requests for change, or protests pertaining to provisions contained in the originally-issued ITB will be considered after the date specified herein.

C. REQUEST FOR APPROVAL OF AN "APPROVED EQUIVALENT": Bidders shall provide the named product unless another is approved through a request for approval of an "or approved equal" or an "or approved equivalent, or a product exemption has been issued (ORS 279C.345). Other brands of equal quality, merit and utility will be considered upon proper submittal of the request with appropriate documentation:

(a) Requests must provide all of the information necessary for the City to determine product acceptability.

(b) Failure to provide sufficient information with the request will cause the request to be considered not equivalent.

(c) Any product subsequently approved for substitution will be listed on an Addenda issued by the City and posted on ORPIN.

(d) Bidders are advised to use the "Substitution" form for such requests. (Section 3, 3.3A).

D. REQUEST FOR CLARIFICATION: Any Bidder who finds discrepancies in, or omissions from, any provision of the ITB, Plans, Specifications, or Contract Documents, or has doubt as to the meaning, shall make a request for clarification in writing, to the contact listed on Page 1 of the ITB. To be considered, the request for clarification must be received by the Request Deadline as specified in 1.06 B.

E. REQUEST FOR CHANGES TO CONTRACTUAL TERMS OR SPECIFICATIONS OR PLANS: Any Bidder may submit a request for changes to contractual terms, Plans, or Specifications, in writing, to the contact listed on Page 1 of the ITB. To be considered, the request for changes must be received by the Request Deadline specified in 1.06 B. above. The request must include the specific changes requested, and the reason for requested changes supported by factual documentation, and any proposed changes.

F. PROTEST OF CONTRACT TERMS AND CONDITIONS OR SPECIFICATIONS: Any Bidder may submit a protest of solicitation terms and conditions, in writing, in accordance with COH-049-0260 to the contact listed on Page 1 of the ITB. To be considered, the protest must be received by the deadline specified in 1.07 B. above. The protest shall include the legal and factual grounds for the protest, a description of the resulting prejudice to the Bidder if the protest is not granted, and a statement of the relief or changes proposed.

G. RESPONSE TO REQUESTS FOR CLARIFICATION: Clarifications, whether verbal, or in writing, or included in an addendum as "*clarification",* do not change Plans, Specifications, contractual terms, or procurement requirements of an ITB. If a request for clarification raises an issue that the City determines should be handled by formally amending the ITB, the City will do so only by announcing such a change in an Addendum, not through

information identified as a "clarification."

H. RESPONSE TO REQUESTS FOR BRAND APPROVAL, REQUESTS FOR SUBSTITUTION, REQUESTS FOR CHANGE, AND PROTESTS: The City shall promptly respond to each properly-submitted written request for brand approval, request for substitution, request for change, and protest no less than 72 hours before Closing. Where appropriate, the City will issue ITB revisions via Addendum posted on the City's website at: www.hillsboro-oregon.gov/PublicWorksITB.

Failure to protest solicitation terms and conditions, Contract terms and conditions or Specifications, as indicated in this section, precludes appeal or protest of a decision to award based upon such solicitation terms and conditions, Contract terms and conditions, or Specifications.

I. PROTEST OF ADDENDUM: Requests for clarification, requests for change and protests of Addendum must be received by the time and date specified in the Addendum or they will not be considered.

1.08. OFFER FORMAT AND BID SUBMISSION

A. FORMS TO BE USED

Bids shall be submitted on unaltered Bid Forms furnished by the City, or on exact duplicates thereof. Bids shall be made in accordance with all instruction, requirements and specification to be considered. All blanks on Bid Forms shall be completed in ink or typewritten. Alterations and erasures shall be initialed by the signatory of the Bid.

A Bidder shall not make their Bid contingent upon the City's acceptance of Specifications, Plans or Contract terms that conflict with or are in addition to those in the ITB documents.

B. REQUIRED SIGNATURES

Bids shall be signed in ink, with the signer's name typed or printed in the space provided. Where Bidder is a corporation, Bids shall be signed with the legal name of the corporation and the legal signature of an officer authorized to bind the corporation to a contract. Digital signatures are not acceptable. At least one Bid submitted by Bidder must bear an original signature.

C. NUMBER OF COPIES

Bidders shall submit one (1) original Bid.

D. SEALED BIDS

Sealed Bids will be received at the location shown on page 1 and by the Contact shown on page 1.). All Bids shall be time stamped no later than the Due Date and Time shown on page 1.

Bids must be submitted in a sealed envelope appropriately marked with the Bid Title, Bid Number, and the name of the Bidder.

It is the sole responsibility of the Bidder to assure that the Bid is delivered and time stamped at the location shown on page 1 by the deadline specified. All late Bids shall be rejected.

E. STATE OCCB REGISTRATION REQUIREMENTS

Bidders shall be licensed with the Oregon Construction Contractors Board prior to bidding on this project. Failure to comply with this requirement shall result in Bid rejection. Bidders shall insert Bidder's current, valid registration number and expiration date thereof in the spaces provided on the Bid Form. Landscaping contractors and all subcontractors participating in this project shall be licensed respectively, by the State Landscape Contractors Board, as required by ORS 671.530 and the Oregon Construction Contractors Board, as required by ORS 701.026, at the time they propose to engage in subcontract work. Any Bid received from a Bidder identified by the Oregon Construction Contractors Board as ineligible to hold public contracts in accordance with ORS 701.227 shall be disqualified from consideration.

F. BID SECURITY: Each Bid exceeding $100,000 shall be accompanied by Bid security in the form of:

(a) a Bid bond as set forth in Section 3,

(b) an irrevocable letter of credit issued by an insured institution as defined in ORS 706.008, or

(c) a certified check or cashier's check,

Such Bid security must be in an amount equal to ten percent (10%) of the total amount of the submitted Bid, which has been executed in favor of the City of Hillsboro, 150 E. Main St., Hillsboro OR 97123.

Bid security of the successful Bidder will be returned or released after the Bidder's written Contract, Performance Bond, Payment Bond, and required certificates of insurance have been promptly and properly executed, delivered to, and accepted by the City. If the successful Bidder fails to (1) promptly and properly execute the Contract, (2) furnish a good and sufficient Performance Bond and a good and sufficient Payment Bond, and/or (3) furnish required certificates of insurance within seven (7) calendar days of the written notification of intent to award a Contract, then the City may cash the check, draw under the letter of credit or otherwise collect under the Bid security.

The City reserves the right to retain the Bid security of the next two (2) lowest Bidders until the successful Bidder has been awarded a Contract or until no more than 60 days after Bid opening, whichever is shorter. Bid security of all other Bidders will be returned as soon as practicable after Bid opening.

G. MODIFICATION OR WITHDRAWAL OF BID

After submittal, Bids may be modified or withdrawn on written request received from Bidders prior to the Bid Closing. Modifications shall be sealed and submitted in same manner as the Bid. Offers may also be withdrawn in person before Closing upon presentation of appropriate identification and evidence of authorization to act for Bidder to the Contact listed on page 1 of this ITB.

Bids may not be modified or withdrawn after closing except as provided in ORS 279C and City's Public Contracting Rules.

H. DURATION OF BIDS

Each Bid shall be irrevocable for a period of 60 days from the date of Bid. Award of a Contract to any Bidder shall not constitute rejection of any other Bid.

The City may request that Bidders extend, in writing, the time during which the City may consider their Bids. If a Bidder agrees to such an extension, the Bid shall continue as a firm Offer, irrevocable, valid and binding on the Bidder for the agreed upon extension period.

I. RESIDENT BIDDER

Bidder shall indicate on the Bid Form whether Bidder is a "resident bidder" as defined in ORS 279A.120. A "nonresident bidder" means a Bidder who has neither paid unemployment taxes nor income taxes in the State of Oregon during the 12 calendar months immediately preceding submission of its Bid, nor has a business address in the State of Oregon.

In determining the lowest responsive Bidder for this Work, a percentage may be added to the Bid of a non-resident Bidder equal to the percentage, if any, of the preference given to that Bidder in the state in which the Bidder resides. This percentage, if utilized, shall not be added to the dollar value of Contract to be awarded as a result of this ITB.

J. LIST OF FIRST-TIER SUBCONTRACTORS

In accordance with ORS 279C.370, Bidders are required to complete and submit the first-tier subcontractor disclosure form, provided as Section 3, form 3.4, within two (2) hours of the Bid Closing Date and time.

K. ACCEPTANCE OF CONDITIONS/SITE VISITATION

The Bidder, by making a Bid, represents that:

(a) The Bidder has read and understands the Bid documents and the Bid is made in accordance with the Bid documents.

(b) The Bidder has visited each project site, become familiar with the local conditions under which the Work is to be performed, and has correlated the Bidder's personal observations with the

requirements of the proposed Contract Documents.

(c) The Bid is based upon the materials, equipment, systems, required by the Bid documents without exceptions.

L. RESERVATIONS

1. The City reserves the following rights:

(a) To reject all Bids.

(b) To reject any Bid not in compliance with all prescribed public bidding procedures and requirements, including the requirement to demonstrate the Bidder's responsibility under ORS 279C.375(3)(b), and to reject for good cause any or all Bids upon a finding that it is in the public interest to do so.

(c) To reject Bids which it determines to be non-responsive.

(d) To reject Bids upon the City's finding that the Bidder:

i. Has been declared ineligible under ORS 279C.860 by the Commissioner of Bureau of Labor and Industries

ii. Has been identified by the Oregon Construction Contractors Board as ineligible to hold public contracts in accordance with ORS 701.227; or

iii. Is not responsible.

(e) To waive any informalities in Bids submitted.

(f) In the event two or more Bidders quote identical amounts for the same Work, to award the contract by drawing lots between such Bidders or by such other means as it deems appropriate.

(g) To return the Bid unopened, in the event only one Bid is received.

M. ASBESTOS ABATEMENT

Work to be performed under the contract will not require the Bidder or any subcontractors to be licensed for asbestos abatement work under ORS 468A.720.

1.09. BID EVALUATION

A. BID EVALUATION CRITERIA

Bids will be evaluated to identify the lowest responsive Bid submitted by a responsible Bidder and not otherwise disqualified. (Refer to COH-049-0390 and 137-049-0440). Adjustments made to account for reciprocal preferences will be for Bid evaluation purposes only. No such adjustments shall operate to amend a Bid or any Contract awarded pursuant thereto.

B. RESPONSIVENESS:

To be considered responsive, the Bidder must substantially comply in all material respects with applicable solicitation procedures and requirements and the solicitation documents. In making such evaluation, City may waive minor informalities and irregularities.

C. RESPONSIBILITY:

Prior to award of a Contract, City will evaluate whether the apparent successful Bidder meets the applicable standards of responsibility identified in COH-049-0390. See also, COH-049-0440(1)(C)(h). In doing so, City may investigate Bidder and request information in addition to that already required in the ITB, when City in its sole discretion, considers it necessary or advisable.

D. OREGON PREFERENCE:

Awards shall be subject to preference for goods or services that have been produced or manufactured in Oregon, if price, fitness, availability and quality are otherwise equal (ORS 279A.120); See also; COH-046-0300.

E. RECIPROCAL PREFERENCE:

Solely for the purpose of evaluating offers, City will add a percent increase to the Bid of a non-resident Bidder equal to the percent, if any, of the preference given to the Bidder in the state in which the Bidder resides. For example, if the Bidder is from a state that grants a ten (10) percent preference to local Bidders, City will add ten (10) percent to that Bidder's Bid price. (COH-046-0310).

F. PROCESSING OF BIDS:

Neither the release of a Bid Security, nor acknowledgment that the selection process is complete (whether by posting of a Bid tabulation sheet, issuance of notice intent to award, or otherwise), shall operate as a representation by City that any Bid submitted was complete, sufficient, lawful in any respect, or otherwise in substantial compliance with the ITB requirements.

G. WITHDRAWAL BY CITY OF BID ITEMS PRIOR TO AWARD:

City reserves the right to delete Bid items. The deletion of one or more Bid items will not affect the method of award.

H. NOTICE OF INTENT TO AWARD

The Notice of Intent to Award shall serve as notice to all Bidders that the City intends to make a contract award.

1.10. PROTEST OF INTENT TO AWARD

A. PROTEST OF INTENT TO AWARD

Adversely affected or aggrieved Bidders shall have **seven (7) calendar** days from the date of the Notice of Intent to Award within which to file a written protest of award. Protests received after that date will not be considered. Protests must specify the grounds upon which the protest is based.

1. Protests must be sent to:

Purchasing Manager
Finance Department
City of Hillsboro
150 E. Main St.
Hillsboro, OR 97123

2. In order to be an adversely affected or aggrieved Bidder, the Bidder must claim to be eligible for award of the Contract as the lowest responsible and responsive Bidder and that any and all lower Bids are ineligible to receive Contract award.

3. An actual Bidder who is adversely affected or aggrieved by the award of the Contract to another Bidder may protest award, in writing, within the timeline established. The written protest shall state the grounds upon which the protest is based. No protest of award shall be considered after the deadline.

4. Pursuant to COH-049-0260, no protest against award shall be considered because of the content of Bid Specifications, Plans, or contract Terms after the deadline established for submitting protests of Bid Specifications, Plans or Contract Terms.

B. RESPONSE TO INTENT-TO-AWARD PROTESTS:

The City Manager will respond in writing to intent-to-award protests submitted by adversely-affected or aggrieved Bidders. City may also respond to intent-to-award protests submitted by other Bidders for purposes of clarification. However, any response provided by City is not intended to, and shall not in and of itself constitute, confirmation that the bidder is, in fact, adversely affected or aggrieved, and therefore entitled to protest an intent to award, or that the protest was timely filed.

C. AWARD

After expiration of the intent-to-award protest period, and resolution of all protests, City will proceed with final award. (If City receives only one Bid, City may dispense with the intent-to-award protest period and proceed with award of a Contract.)

1.11. INFORMATION TO BE PROVIDED BY THE SUCESSFUL BIDDER: CONTRACT, BONDS AND INSURANCE

A. CONTRACTOR CONTRACT EXECUTION

Within 14 days after receipt of Notice of Intent to Award, the successful Bidder shall be prepared to execute the Contract provided by the City. The City contract form is provided as Part A, Attachment A. of this ITB. At the same time, the successful Bidder shall furnish City: a Performance Bond, a Payment Bond, and all required Certificates of Insurance. Prior to starting work under the Contract, the selected Bidder shall provide a performance bond and a payment bond each issued by a surety satisfactory to the City, in an amount equal to the full dollar value of the Contract for the faithful performance of the Contract and all provisions thereof.

B. CITY CONTRACT EXECUTION

After receipt and acceptance of the properly executed Contract, Performance Bond, Payment Bond, and Certificates of Insurance, the City will execute the Contract and issue a Notice to Proceed. No work shall be performed until the Contract is fully executed and a written Notice to Proceed is issued.

C. FAILURE TO EXECUTE

A successful Bidder who fails to execute the Contract or furnish the Performance Bond, Payment Bond and provide Certificates of Insurance in the time and manner indicated herein shall forfeit its Bid security.

D. PUBLIC WORKS BOND

Before starting Work the successful Bidder shall file with the Oregon Construction Contractors Board, and maintain in full force and effect, the separate public works bond required by ORS 279C.836, unless otherwise exempt under those provisions. The successful Bidder shall also include in every subcontract a provision requiring the subcontractor to have a public works bond filed with the Oregon Construction Contractors Board before starting Work, unless otherwise exempt, and shall verify that the subcontractor has filed a public works bond before permitting the subcontractor to start Work.

A disadvantaged, minority, women or emerging small business enterprise certified under ORS 200.055 may, for up to four years after certification, elect not to file a public works bond as required under Section 279C.836 (1). If a business enterprise elects not to file a public works bond, the business enterprise shall give the Oregon Construction Contractors Board written verification of the certification and written notice that the business enterprise elects not to file the bond.

Questions regarding the public works bond may be directed to BOLI at the BOLI website (www.oregon.gov/BOLI) or at the following address:

Bureau of Labor and Industries
Wage and Hour Division
Prevailing Wage Unit
800 N.E. Oregon Street, #32
Portland, Oregon 97232

E. JOINT VENTURE/PARTNERSHIP INFORMATION

The successful Bidder, if a Joint Venture/Partnership, shall provide a copy of the joint venture agreement or partnership agreement evidencing authority to Offer and enter into the resulting Contract that may be awarded, together with corporate resolutions (if applicable) evidencing corporate authority to participate as a joint venture or partner. A contact person must also be designated for purposes of receiving all notices and communications under the Contract. All partners and joint venture members will be required to sign the awarded Contract.

1.12. COMPLIANCE WITH LAW

The selected Contractor shall be required to comply with the City's standard construction contract provisions as provided in Attachment A. In addition, the selected contractor shall comply with and require its subcontractors to

comply with all applicable provisions of federal, state and local laws, statutes, ordinances, codes, orders, rules and regulations which pertain to the work specified in this ITB.

1.13. MINORITY-OWNED, WOMEN-OWNED AND EMERGING SMALL BUSINESSES (MWESB)

Minority-owned, Women-owned and Emerging Small Businesses (MWESB) are encouraged to respond to this ITB. All Bidders are encouraged to contact and seek sub-bids from MWESB subcontractors. MWESB subcontractors are encouraged to attend any pre-proposal conferences.

PART A:

SECTION 2 - SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

There are no supplementary instructions for this bid.

PART A:

SECTION 3 - FORMS

3.1 BID FORM

BID FORM (PAGE 1 OF 5)

CITY OF HILLSBORO, OREGON

INVITATION TO BID NO. 10705
NW 253rd Avenue Improvements and Extension

The undersigned hereby certifies that Bidder: _____
Bidder Name CCB Number

1. Has the authority and/or responsibility to submit a Bid and to represent the organization in all phases of this Bid process.
2. The information is true and accurate to the best of their knowledge.
3. Shall furnish, in strict compliance with the Bid and Contract Documents for the above-referenced Project, all labor, materials, equipment, apparatus, appliances, tools, transportation, and other facilities and services necessary to perform the Work described therein, and to perform said Work in strict compliance therewith, for the amounts set forth in this Bid.
4. Is a ☐ Resident Bidder, ☐ Non-Resident Bidder, as defined in ORS 279A.120

   A "non-resident bidder" is a Bidder who has neither paid unemployment taxes nor income taxes in the State of Oregon during the 12 calendar months immediately preceding submission of this Bid, nor has a business address in the State of Oregon.

   In determining the lowest responsive Bidder for this Work, a percentage may be added to the Bid of a non-resident Bidder equal to the percentage, if any, of the preference given to that Bidder in the state in which the Bidder resides. This percentage, if utilized, will not be added to the dollar value of the contract to be awarded as a result of this ITB.
5. Understands any false statement may disqualify this Bid from further consideration or be cause for contract termination.
6. Has read, understands and agrees to be bound by all terms and conditions herein.
7. Understands by submitting this Bid, the undersigned certifies conformance to the applicable Federal Acts, Executive Orders and Oregon Statutes and Regulations concerning Affirmative Action toward equal employment opportunities. All information and reports required by the Federal or Oregon State Governments, having responsibility for the enforcement of such laws, shall be supplied to the City upon request for purposes of investigation to ascertain compliance with such acts, regulations, and orders.
8. **Acknowledges Receipt of Addenda No's. _____ through _____ inclusive.**

Please check the applicable box regarding Bid security:

☐ Bid security in form of cashier's check ☐, certified check ☐, Bid bond in the form set forth in Section 3., 3.2 ☐, irrevocable letter of credit issued by an insured institution as defined in ORS 706.008 ☐ (check applicable clause) in the amount of ten percent (10%) of the total amount of the submitted Bid, which has been executed in favor of City of Hillsboro, 150 E. Main St. , Hillsboro OR 97123, is enclosed.

☐ Bid Price is for $100,000 or less; therefore, Bid security is not required.

BID FORM (PAGE 2 OF 5)

Bidder Name: _____ Bidder CCB# _____

Provide Bids on all items below.

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	EXTRA WORK CONTINGENCY (00100)				
1	Miscellaneous Field Changes (As Authorized)	AA	AA	$125,000.00	$125,000.00
2	Miscellaneous Right-of-Way Commitments (As Authorized)	AA	AA	$125,000.00	$125,000.00
				Subtotal	**$250,000.00**
	TEMPORARY FEATURES AND APPURTENANCES (00200)				
3	Mobilization (00210)	LS	ALL		
4	Temporary Work Zone Traffic Control, Complete (00225)	LS	ALL		
5	Erosion Control (00280)	LS	ALL		
6	Pollution Control Plan (00290)	LS	ALL		
				Subtotal	
	ROADWORK (00300)				
7	Removal of Structures and Obstructions (00310)	LS	ALL		
8	Clearing and Grubbing (00320)	LS	ALL		
9	General Excavation (00330)	CY	6,000		
10	Embankment in Place (00330)	CY	17,600		
11	Drainage Ditch (00330)	CY	250		
12	Cement-Amended Subgrade Preparation (14" thick) (00344)	SY	21,833		
13	Portland Cement (00344)	TON	970		
14	Subgrade Geotextile (00350)	SY	170		
15	Loose Riprap Mixture, Class 50 (00390)	CY	91		
				Subtotal	
	DRAINAGE AND SEWERS (00400)				
16	10 inch DIP Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	179		
17	12 inch DIP Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	385		
18	15 inch DIP Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	89		
19	18 inch DIP Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	472		
20	24 inch DIP Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	114		
21	30 inch DIP Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	442		
22	10 inch C900 Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	629		
23	12 inch C900 Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	438		
24	14 inch C905 Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	375		
25	16 inch C905 Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	57		
26	18 inch C905 Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	87		
27	20 inch C905 Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	225		
28	24 inch C905 Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	549		

29	30 inch C905 Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	340		
30	12 inch HDPE Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	180		
31	18 inch HDPE Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	310		
32	24 inch HDPE Storm Sewer Pipe, 0 to 10.0 FT Depth (00445)	FT	374		
33	Concrete Manholes, Standard (00470)	EA	4		
34	Concrete Manholes, Flat Top (00470)	EA	5		
35	Concrete Manholes, Large Precast (60" Dia.) (00470)	EA	7		
36	Concrete Manholes, Large Precast Flat Top (60" Dia.) (00470)	EA	2		
37	Concrete Manholes, Large Precast (72" Dia.) (00470)	EA	2		
38	Concrete Manholes, Large Precast Flat Top (72" Dia.) (00470)	EA	3		
39	Concrete Manholes, Large Precast Flat Top (84" Dia.) (00470)	EA	1		
40	Concrete Manholes 72" Dia. Flow Control (00470)	EA	3		
41	Concrete Manholes 60" Dia. Water Quality (with Snout) (00470)	EA	2		
42	Concrete Manholes 84" Dia. Water Quality (with Snout) (00470)	EA	1		
43	Concrete Catch Basin, Type CG-2 (00470)	EA	30		
44	Concrete Catch Basin, Type CG-48 (00470)	EA	1		
45	Concrete Inlets, Area Drain Type II (00470)	EA	8		
46	Remove and Relocate Pipe End Grate (00490)	EA	2		
47	Field Drain Connections	FT	250		
				Subtotal	
	BRIDGES (00500)				
48	Install Precast Concrete Footings (00550)	LS	ALL		
49	Install Arch Culverts (00550)	LS	ALL		
50	Install Precast Concrete Headwalls (00550)	LS	ALL		
51	Structure Excavation and Backfill (00510)	CY	1,735		
				Subtotal	
	BASES (00600)				
52	Aggregate Base (00641)	CY	4,000		
53	Gravel Driveway/ Gravel Access Road (00641)	CY	100		
				Subtotal	
	WEARING SURFACES (00700)				
54	Level 3, 1/2 inch Dense MHMAC (00744)	Ton	1,720		
55	Extra for Asphalt Approaches, Driveway (00749)	SF	1,660		
56	Plain Concrete Pavement, Dowelled, 9 inches Thick (00756)	SY	14,600		
57	Concrete Curbs, Mountable (00759)	FT	10,900		
58	Concrete Impact Slab (00759)	FT	160		
				Subtotal	
	PERMANENT TRAFFIC SAFETY AND GUIDANCE DEVICES (00800)				
59	Bi-Directional Yellow Type I Markers (00855)	EA	150		
60	Longitudinal Pavement Markings - Paint (00860)	FT	11,080		
61	Thermoplastic, Non-Profile, 120 mils, Extruded or Sprayed (00865)	FT	11,080		
62	Pavement Bar, Type A (00867)	SF	90		

BID FORM (PAGE 4 OF 5)

				Subtotal	
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS (00900)					
63	Remove and Reinstall Existing Signs (00905)	LS	ALL		
64	Sign and Sign Support (00940)	EA	5		
				Subtotal	
RIGHT OF WAY DEVELOPMENT AND CONTROL (01000)					
65	Water Quality/ Detention Pond "A" (01011)	LS	ALL		
66	Water Quality/ Detention Pond "B" (01011)	LS	ALL		
67	Water Quality/ Detention Pond "C" (01011)	LS	ALL		
68	Permanent Seeding (01030)	AC	4.6		
69	Amended Topsoil (01040)	CY	1,270		
70	Wetland Buffer Mitigation Planting (01040)	LS	ALL		
71	Second Year Landscape Establishment (01040)	LS	ALL		
72	Remove and Rebuilding Fence (01050)	FT	240		
73	CL-4R Fence, Black Vinyl Clad (01050)	FT	1,220		
74	CL-6R Fence, Black Vinyl Clad (01050)	FT	120		
75	12 ft x 48 inch Chain Link Double Gate, Black Vinyl Clad (01050)	EA	3		
76	Monument Boxes - Installed (01065)	EA	11		
				Subtotal	
				TOTAL	

Bidder Name: _____ BID FORM (PAGE 5 OF 5)

REPRESENTATIONS AND CERTIFICATIONS

Bidder shall submit 3.5 Bidder's Responsibility Information Form as per Section 1, 1.03 along with the Bid Form and any other required Bid submittals.

BIDDER'S EMPLOYERS FEDERAL TAX IDENTIFICATION NUMBER (EIN) < >
OR
SOCIAL SECURITY IDENTIFICATION NUMBER < >

State of Oregon Certified Minority-owned, Women-owned or Emerging Small Business ☐ YES ☐ NO
IF YES, PROVIDE CERTIFICATION NUMBER < >

The undersigned hereby certifies under penalty of perjury that to the best of my knowledge the Bidder does not discriminate in its employment practices with regard to race, creed, age, religious affiliation, sex, disability, sexual orientation, or national origin. Nor has Bidder or will Bidder discriminate against a subcontractor in the awarding of a subcontract because the subcontractor is:

- A minority-owned, women-owned, or emerging small business enterprise certified under ORS 200.055, or
- A business enterprise that is owned or controlled by or that employs a disabled veteran, as defined in ORS 408.225.

If awarded, the Bidder (Contractor) agrees to be bound by and will comply with the provisions of 279C.838, 279.840 or 40 U.S.C. 3141 to 3148.

The undersigned hereby certifies under penalty of perjury that to the best of my knowledge the Bid was prepared independently from all other Bidders, and without collusion, fraud, or other dishonesty.

The Bid submitted is in response to the specific language contained in the ITB, and Bidder has made no assumptions based upon either (a) verbal or written statements not contained in the ITB, or (b) any previously-issued ITB, if any.

The undersigned hereby certifies that Bidder has the authority and/or responsibility to submit a Bid and to represent the Bidder in all phases of this Bid process.

Bidder's (Company) Name: _____ Date: _____

CCB#: _____

Signature _____

Name _____

Title _____

Street Address _____ City _____State _____ Zip _____

Phone _____ E-Mail _____

FAILURE TO COMPLETE, SIGN AND SUBMIT THIS FORM MAY BE CAUSE FOR BID REJECTION. ELECTRONIC SIGNATURES <u>NOT</u> ACCEPTED.

3.2 FORM OF BID BOND

We, _____ as "Principal," and _____
(Name of Principal) (Name of Surety)

an _____ Corporation,

authorized to transact Surety business in Oregon, as "Surety," hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns to pay unto City of Hillsboro, 150 E. Main St., Hillsboro, OR 97123 ("Obligee") the sum of

($ _____) _____ dollars.

WHEREAS, the condition of the obligation of this bond is that Principal has submitted its proposal or Bid to the Obligee in response to Obligee's procurement document ( ) for the project identified as:

_____

Title:

_____ which proposal or Bid is made a part of

this bond by reference, and Principal is required to furnish Bid security in an amount equal to ten (10%) percent of the total amount of the Bid pursuant to ORS 279C.365(5) and the procurement document.

NOW, THEREFORE, if the proposal or Bid submitted by Principal is accepted, and if a contract pursuant to the proposal or Bid is awarded to Principal, and if Principal enters into and executes such contract within the time specified in the procurement document and executes and delivers to Obligee its good and sufficient performance bond and payment bond required by Obligee within the time fixed by Obligee, then this obligation shall be void; otherwise, it shall remain in full force and effect.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives this _____ day of _____ 20 _____

PRINCIPAL:

By _____
Signature

_____
Official Capacity

Attest: _____
Corporation Secretary

SURETY: _____

BY ATTORNEY-IN-FACT:
Power-of-Attorney must accompany each surety bond]

_____
Name

_____
Signature

_____
Address

_____
City State Zip

_____
Phone Fax

3.3 SUBSTITUTION REQUESTS

REQUEST FOR BRAND NAME/PRODUCT SUBSTITUTION

3.01. SUBSTITUTION REQUEST

A. During Bidding, the City will consider written Substitution Requests received up to the Request Deadline shown on page 2 of this ITB. Requests received after that time **will not** be considered.

B. Submit a written request using the substitution request form included on the next page. Submit the form in hard copy or by email to the contact on page 1 of this ITB by the Request Deadline.

C. Prepare separate requests for each product.

D. Combined requests may not be considered.

E. In making Substitution Requests, Bidder represents:

1. Bidder has personally investigated proposed product or method, and determined that it is equal or superior in all respects to that specified.
2. Bidder will provide the same guarantee for substitution as for product or method specified.
3. Bidder will coordinate installation of accepted substitution into Work, making such changes as may be required for Work to be completed in all respects.
4. Bidder waives all claims for additional costs related to substitutions which consequently become apparent.

F. All accepted substitutions will be confirmed by inclusion in an addendum. Items not appearing in such addendum shall be deemed rejected.

3.02. SUBSTITUTION REQUEST FORM

A. The Substitution Request Form is included on the next page.

City of Hillsboro

3.3A SUBSTITUTION REQUEST FORM

TO: **Charlie Shell**

ITB NUMBER/TITLE: 10705 / NW 253rd Avenue Improvements and Extension

SPECIFIED ITEM/PRODUCT:

Page No. ☐ **Item/Product No.** ☐ **Description** ☐

PROPOSED SUBSTITUTION:

Attached data includes manufacturer's product description, specifications, drawings, photographs, performance and test data, and includes, when requested by the City, one (1) sample adequate for evaluation of the request including identification of applicable data portions.

Attached data also includes the description of changes to Contract Documents and the requirements of the proposed substitution for proper installation.

The undersigned certifies the following items, unless modified by attachments, are correct:

1. Proposed substitution does not affect dimensions shown (only if supplied with Bid documents).
2. Undersigned pays for changes to building/equipment design, including engineering design, detailing, and proposed substitution has no adverse effect on other trades, construction schedule, or specified warranty requirements.
3. Maintenance and service parts are available locally or are readily obtainable for the proposed substitution.

Undersigned further certifies function, appearance, and quality of proposed substitution are equivalent or superior to specified item.

Undersigned agrees, if this page is reproduced, terms and conditions for substitutions found in Bidding Documents apply to this proposed substitution.

Request Submitted by:

Name (Printed or typed)

Signature

Vendor Name

Street Address

City, State, Zip

Date

Telephone Number

Email

Fax Number

Architect Approval:

☐ Approved ☐ Approved as noted
☐ Not Approved ☐ Received too late

By

Date

Remarks:

For use by: City Staff

☐ Approved ☐ Approved as noted
☐ Not Approved ☐ Received too late

By

Date

Remarks:

City of Hillsboro

3.4 FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM

TITLE/PROJECT NAME: NW 253rd Avenue Improvements and Extension

ITB #: 10705 BID CLOSING DATE: May 28, 2015 TIME: 2:00 PM

This form must be submitted at the location specified in the Invitation to Bid on the advertised Bid Closing Date and within two hours after the advertised Bid Closing Time ("Disclosure Deadline"). List below the name of each subcontractor that will be furnishing labor or will be furnishing labor and materials and that is required to be disclosed, the category of work and the dollar value of the subcontract. Enter the word "NONE" if there are no first-tier subcontractors subject to disclosure. ATTACH ADDITIONAL SHEETS IF NECESSARY**.**

NAME	CATEGORY OF WORK	DOLLAR VALUE
1.		$
2.		$
3.		$

The above listed first-tier subcontractor(s) are providing labor or labor and materials with a Dollar Value equal to or greater than:

a. 5% of the total project Bid, or $15,000, whichever is greater. [If the Dollar Value is less than 15,000.00, do not list the subcontractor above.]; or

b. $350,000 regardless of the percentage of the total Contract Price.

FAILURE TO SUBMIT THIS FORM BY THE DISCLOSURE DEADLINE WILL RESULT IN A NON-RESPONSIVE BID AND SUCH NON-RESPONSIVE BID WILL NOT BE CONSIDERED FOR AWARD.

Bids which are submitted by Bid Closing, but for which the disclosure submittal has not been made by the specified deadline, are NOT Responsive and shall NOT be considered for Contract award.

Form submitted by (Bidder Name): _____

CCB#: _____

Contact Name and phone number: CONTACT SHOWN ON PAGE 1 OF THIS ITB.

Deliver Form to Agency: CITY OF HILLSBORO, DEPARTMENT, CONTACT AND ADDRESS AS SHOWN ON PAGE 1 OF THIS ITB.

Person Designated to Receive form: CONTACT SHOWN ON PAGE 1 OF THIS ITB.

Agency's Address: 150 E Main St. Hillsboro, OR 97123

UNLESS OTHERWISE STATED IN THE ORIGINAL SOLICITATION, THIS DOCUMENT SHALL NOT BE FAXED. IT IS THE RESPONSIBILITY OF BIDDERS TO SUBMIT THIS DISCLOSURE FORM AND ANY ADDITIONAL SHEETS, WITH THE BID NUMBER AND PROJECT NAME CLEARLY MARKED, AT THE LOCATION INDICATED BY THE SPECIFIED DISCLOSURE DEADLINE. SEE INSTRUCTIONS TO BIDDERS.

City of Hillsboro

3.5 BIDDER'S RESPONSIBILITY INFORMATION FORM

BIDDER MUST COMPLETE ALL PAGES OF THIS FORM.

Bidder Name: _____ **CCB #:** _____

This form is designed for electronic use. It may also be completed by hand. Use additional pages as needed to provide full and complete responses.

1. EXPERIENCE: List the number of years Bidder has been operating its business under its current license. If Bidder's business has been in continuous existence under a current active license and a previous license number, then identify the previous license number. List and briefly describe a minimum of three (3) similar projects performed by Bidder in the past five(5) years that best characterize Bidder's capabilities. Include relevant data such as the type of work involved and project dates. Describe how Bidder meets this experience requirement (use separate sheet if additional space is needed):

2. LAWSUITS/JUDGMENTS: Within the past 5 years, has Bidder had any lawsuits filed against it involving contract disputes? For the purposes of this request, "lawsuits" include requests for arbitration and "judgments" includes arbitration awards. YES / NO If "YES" indicate dates and ultimate resolution of suit (with regard to judgments, include jurisdiction and date of final judgment or dismissal.)

3. BANKRUPTCY: Within the past 36 months, has Bidder filed a bankruptcy action, filed for reorganization, made a general assignment of assets for the benefit of creditors, or had an action for insolvency instituted again it? YES / NO If "YES" supply filing dates, jurisdictions, type of action, ultimate resolution, and dates of judgment or dismissal, if applicable.

4. LAWSUITS BY CREDITORS: Within the past 24 months, has Bidder had any lawsuits filed against it by creditors? YES / NO If "YES" indicate dates and ultimate resolution of suit (with regard to judgments include jurisdiction and date of final judgment or dismissal).

5. OREGON CONSTRUCTION CONTRACTORS BOARD LICENSING: Is Bidder licensed with the Oregon Construction Contractors Board at the time Bidder submits a Bid for the Work under this ITB? YES / NO If "YES" indicate Oregon Construction Contractors Board license number and expiration date.

6. ABILITY TO PERFORM WITHIN TIME SPECIFIED: List the project titles, original contract time and change order extensions for three specific projects in the past five (5) years. Bidder shall document that it achieved substantial completion of such three projects of similar size and scope within no more than 105% of the final contracted time for completion (including change ordered adjustments). If the Bidder cannot document three such projects, the Bidder may submit alternative documentation of one or more similar projects where the Bidder did not achieve substantial completion within 105% of the final contract time, a calculation of the total percentage of time over the final contract time necessary to achieve substantial completion, and an explanation as to why the required additional time was beyond the Bidder's control.

City of Hillsboro
3.5 BIDDER'S RESPONSIBILITY INFORMATION FORM

BIDDER MUST COMPLETE ALL PAGES OF THIS FORM.

Bidder Name: _____

7. DEBARMENT: Has Bidder been debarred by any public agency within the past two (2) years? YES / NO If "YES" identify the public agencies.

8. NON-COMPLETION: Has Bidder failed to complete a contract in the last five (5) years? YES / NO If "YES" identify the project(s).

9. COMPLETION BY SURETY: Has Bidder ever defaulted on a contract forcing a surety to suffer a loss? YES / NO If "YES" identify the project(s).

10. SUSPENSION, DISMISSAL, DEFAULT: Has Bidder been suspended, dismissed or declared in default from a project during the last five (5) years? YES / NO If "YES" identify the project(s) and the type of action taken against Bidder.

11. BONDABILITY REQUIREMENT: For the project described under this ITB, Bidder shall obtain payment bond and performance bond issued by a surety which is authorized to transact surety business in the State of Oregon and which has an A.M. Best "A" or better rating. YES / NO If "YES" identify name of surety, contact name, address, phone number, & email address.

12. LIENS AND SURETY CLAIMS: Have there been any liens or surety claims against Bidder's company on any contracts which have been performed or are in the course of being performed? YES / NO If "YES" identify the project and explain the nature of the claims.

13. REVOKED LICENSE: Has Bidder's company or any key person in the company, had a license revoked by the Oregon Construction Contractors Board? YES / NO If "YES" explain the underlying reason for the revocation of the license.

14. CRIMINAL OFFENSE: Has Bidder's company or any key person in the company been convicted of a crime involving fraud, material misrepresentation or any crime involving the awarding of a contract for a government construction project or the bidding or performance of a government contract? YES / NO

15. DEMAND ON PERFORMANCE BOND: In the last five years, has an owner ever made a demand on your performance bond? YES / NO

City of Hillsboro
3.5 BIDDER'S RESPONSIBILITY INFORMATION FORM

BIDDER MUST COMPLETE ALL PAGES OF THIS FORM.

Bidder Name: _____

16. TERMINATION OF BONDING/INSURANCE COVERAGE: In the last five years, has a surety or insurance company terminated your or your company's existing bonding and/or insurance coverage due to excessive claims history and/or nonpayment of premiums? YES / NO

17. CITATIONS OR ENFORCEMENT ACTIONS. Within the last five years, have you or your company been cited or subject to any enforcement action for violation of any applicable law or regulations related to its performance of a prior construction contract? For the purposes of this section, "applicable law or regulations" includes without limitation, any building, zoning, environmental, site development, or Oregon Public Contracting Code regulations with which a prior project was required to comply, including non-discrimination regulations and prevailing wage requirements.

    Answer Yes or No. If Yes: please state the date, nature, and final resolution of every such citation or enforcement action.

18. BONDING. What is the largest contract you have had bonded through the surety company named in Question #11 above? Please identify the project name, the nature of the project, the date of the project and the original contract price.

19. BIDDER INSURANCE
    Provide Liability Insurance Certificate showing that your company is covered by liability insurance in amounts required in the sample contract (Attachment A). Prior to contract execution, Successful Bidder must provide City all Insurance Certificates as specified in 1.11.

20. WORKER'S COMPENSATION: CARRIER-INSURED EMPLOYER OR SELF-INSURED EMPLOYER.
    Does your company qualify as a carrier-insured employer or self-insured employer under ORS 656.407?

    Answer Yes or No. If Yes, indicate which:
    If No, has your company elected coverage under ORS 656.128?

3.5 BIDDER'S RESPONSIBILITY INFORMATION FORM

BIDDER MUST COMPLETE ALL PAGES OF THIS FORM.

Bidder Name: _____

21. BIDDER REFERENCES FOR COMPARABLE PROJECTS IN SIZE AND SCOPE

Bidder shall provide a list of three different project references with their Bid that can be contacted regarding the quality of workmanship and service that the Bidder provided on projects of comparable size and scope within the past 5 years. Bidder must provide all information requested below and may use either the form provided in this section or their own form. PLEASE NOTE: If a different form is used, it must still include ALL information required below, including a project description.

Project Reference #1
Name and Dates of Project:
Project Location:
Project Description:
Contact Person #1 Name:
Contact Person #1 Firm Name:
Contact Person #1 Phone, Email:
Contact Person #2 Name:
Contact Person #2 Firm Name:
Contact Person #2 Phone, Email:
Project Reference #2
Name and Dates of Project:
Project Location:
Project Description:
Contact Person #1 Name:
Contact Person #1 Firm Name:
Contact Person #1 Phone, Email:
Contact Person #2 Name:
Contact Person #2 Firm Name:
Contact Person #2 Phone, Email:
Project Reference #3
Name and Dates of Project:
Project Location:
Project Description:
Contact Person #1 Name:
Contact Person #1 Firm Name:
Contact Person #1 Phone, Email:
Contact Person #2 Name:
Contact Person #2 Firm Name:
Contact Person #2 Phone, Email:

Failure to submit the above-required information to the satisfaction of the City may render the Bid non-responsive.

3.6 FORM OF AGREEMENT AND LIQUIDATED DAMAGES

1.01. FORM OF AGREEMENT

A. The Contract between the Owner and the selected contractor for the Work of this project, will be executed on the City of Hillsboro Large Construction Contract and General Conditions. This is the City's required "Form of Agreement".

B. A sample copy of the Contract is attached as Attachment A.

C. Do not sign or complete this sample contract.

1.02. LIQUIDATED DAMAGES

A. Liquidated damages are addressed in the "Miscellaneous Provisions" section of the City's sample contract. Liquidated damages for this project will be $1300.00 per day.

City of Hillsboro
3.7 FORM OF PERFORMANCE BOND

Bond No. _____ **Bond Value: $** _____ **Invitation to Bid No.** _____

Principal:	**Surety:**	**Obligee:** City of Hillsboro
Address:	Address:	Address 150 E. Main St. Hillsboro, OR 97123
Phone:	Phone:	Phone (503) 681-6100

Agreement: Principal has entered into a contract ("Contract") with Obligee for the following Project: _____

We, _____ as Principal, and the above identified Surety, authorized to transact surety business in Oregon, as Surety, hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns firmly by these presents to pay unto the Obligee the sum of (Total Penal Sum of Bond) $_____.

and

WHEREAS, the Principal has entered into a contract with the Obligee, the plans, specifications, terms and conditions of which are contained in the above-referenced Solicitation;

WHEREAS, the terms and conditions of the contract, together with applicable plans, standard specifications, special provisions, schedule of performance, and schedule of contract prices, are made a part of this Performance Bond by reference, whether or not attached to the contract (all hereafter called "Contract"); and

WHEREAS, the Principal has agreed to perform the Contract in accordance with the terms, conditions, requirements, plans and specifications, and all authorized modifications of the Contract which increase the amount of the work, the amount of the Contract, or constitute an authorized extension of the time for performance, notice of any such modifications hereby being waived by the Surety:

NOW, THEREFORE, THE CONDITION OF THIS BOND IS SUCH that if the Principal herein shall faithfully and truly observe and comply with the terms, conditions and provisions of the Contract, in all respects, and shall well and truly and fully do and perform all matters and things undertaken by Contractor to be performed under the Contract, including without limitation warranty and maintenance work required under the Contract, upon the terms set forth therein, and within the time prescribed therein, or as extended as provided in the Contract, with or without notice to the Sureties, and shall indemnify and save harmless the Obligee, its officers, employees and agents, against any direct or indirect damages or claim of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the Contract by the Principal or its subcontractors, and shall in all respects perform said contract according to law, then this obligation is to be void; otherwise, it shall remain in full force and effect.

Nonpayment of the bond premium will not invalidate this bond nor shall the Obligee be obligated for the payment of any premiums.

This bond is given and received under authority of ORS Chapter 279C, the provisions of which hereby are incorporated into this bond and made a part hereof.

IN WITNESS WHEREOF, WE HAVE CAUSED THIS INSTRUMENT TO BE EXECUTED AND SEALED BY OUR DULY AUTHORIZED LEGAL REPRESENTATIVES.

Dated this _____ day of _____ 20 _____

PRINCIPAL: _____

By: _____

Signature

Official Capacity

Attest: _____

Corporation Secretary

SURETY: _____

BY ATTORNEY-IN-FACT:
[Power-of-Attorney must accompany each surety bond]

Name

Signature

Address

City State Zip

Phone Fax

City of Hillsboro
3.8 FORM OF LABOR AND MATERIAL PAYMENT BOND

Bond No. _____ **Bond Value: $** _____ **Invitation to Bid No.** _____

Principal:	**Surety:**	**Obligee:** City of Hillsboro
Address:	Address:	Address 150 E. Main St. Hillsboro, OR
Phone:	Phone:	Phone (503) 681-6100

Agreement: Principal has entered into a contract ("Contract") with Obligee for the following Project: _____

We, _____ as Principal, and the above identified Surety, authorized to transact surety business in Oregon, as Surety, hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns firmly by these presents to pay unto the Obligee the sum of (Total Penal Sum of Bond) $_____.

and

WHEREAS, the Principal has entered into a contract with the Obligee, the plans, specifications, terms and conditions of which are contained in above-referenced Solicitation;

WHEREAS, the terms and conditions of the contract, together with applicable plans, standard specifications, special provisions, schedule of performance, and schedule of contract prices, are made a part of this Payment Bond by reference, whether or not attached to the contract (all hereafter called "Contract"); and

WHEREAS, the Principal has agreed to perform the Contract in accordance with the terms, conditions, requirements, plans and specifications, and schedule of contract prices which are set forth in the Contract and any attachments, and all authorized modifications of the Contract which increase the amount of the work, or the cost of the Contract, or constitute authorized extensions of time for performance of the Contract, notice of any such modifications hereby being waived by the Surety:

NOW, THEREFORE, THE CONDITION OF THIS BOND IS SUCH that if the Principal shall faithfully and truly observe and comply with the terms, conditions and provisions of the Contract, in all respects, and shall well and truly and fully do and perform all matters and things by it undertaken to be performed under said Contract and any duly authorized modifications that are made, upon the terms set forth therein, and within the time prescribed therein, or as extended therein as provided in the Contract, with or without notice to the Sureties, and shall indemnify and save harmless the Obligee, its officers, employees and agents, against any claim for direct or indirect damages of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the Contract by the Contractor or its subcontractors, and shall promptly pay all persons supplying labor, materials or both to the Principal or its subcontractors for prosecution of the work provided in the Contract; and shall promptly pay all contributions due the State Industrial Accident Fund and the State Unemployment Compensation Fund from the Principal or its subcontractors in connection with the performance of the Contract; and shall pay over to the Oregon Department of Revenue all sums required to be deducted and retained from the wages of employees of the Principal and its subcontractors pursuant to ORS 316.167, and shall permit no lien nor claim to be filed or prosecuted against the Obligee on account of any labor or materials furnished; and shall do all things required of the Principal by the laws of the State of Oregon, then this obligation shall be void; otherwise, it shall remain in full force and effect.

Nonpayment of the bond premium will not invalidate this bond nor shall the Obligee be obligated for the payment of any premiums.

This bond is given and received under authority of ORS Chapter 279C, the provisions of which hereby are incorporated into this bond and made a part hereof. For the purposes of this bond, a claimant is any person who has a right of action against the bond under ORS 279C.600. A claimant's right of action on this bond and limitations on the institution of an action shall be governed by ORS 279C.380.

IN WITNESS WHEREOF, WE HAVE CAUSED THIS INSTRUMENT TO BE EXECUTED AND SEALED BY OUR DULY AUTHORIZED LEGAL REPRESENTATIVES:

Dated this _____ day of _____ 20 _____

PRINCIPAL:

By:

Signature

Official Capacity

Attest:

Corporation Secretary

SURETY:

BY ATTORNEY-IN-FACT:
[Power-of-Attorney must accompany each surety bond]

Name

Signature

Address

City State Zip

Phone Fax

3.9 FORM OF WARRANTY BOND

BOND NO._____

PREMIUM NO._____

PROJECT NO._____ PROJECT NAME: _____

WHEREAS, the City of Hillsboro (hereafter "City") and _____(hereafter "Contractor") have entered into a contract ("Contract") dated _____, 20____, whereby Contractor agreed to install and complete certain designated public improvements as a condition of, relating to, at Contractor's own expense and which Contract is hereby referred to and made a part hereof; and

WHEREAS, Contractor is required under the terms of the Contract to furnish warranty security for the work performed pursuant to the Contract in the amount of ten percent (10%) of the original amount of the contract to guarantee replacement and repair of the improvements as described in the Contract for a period of one year following the issuance of the Notice of Substantial Completion.

NOW, THEREFORE, we, Contractor, and ("Surety"), are held and firmly bound unto City in the penal sum of _____($_____) lawful money of the United States, for the payment of which we bind ourselves, our heirs, successors, executors, and administrators, jointly and severally.

The condition of this obligation is such that if Contractor shall indemnify City for all loss that City may sustain by reason of any defective materials or workmanship which become apparent during the period of one year from and after acceptance of the improvements by the City Council of City, then this obligation shall be null and void; otherwise, this obligation shall remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified, costs and reasonable expenses and fees shall be included, including reasonable attorneys' fees incurred by City in successfully enforcing the obligation, all to be taxed as costs and included in any judgment rendered.

Surety shall provide City with thirty (30) days' written notice of Contractor's default prior to Surety terminating, suspending or revoking the bond.

In witness whereof, this instrument has been duly executed by Contractor and Surety on _____, 20__.

_____ _____
Contractor Surety

By _____ _____
Attorney-in-Fact

State of OREGON
County of _____ Address_____

_____

Signed or attested before me on _____, 20__ by _____

_____
Notary Public – State of Oregon

ATTACHMENT A: SAMPLE CONTRACT

PUBLIC IMPROVEMENT CONTRACT
between

CITY OF HILLSBORO, OREGON
and

FULL, LEGAL NAME OF CONTRACTOR

Contract No.

This Public Improvement Contract ("Contract") is made by the City of Hillsboro, Oregon and Full, legal name of Contractor ("Contractor") to provide construction services on the following Project Name ("Project"), briefly described below:

Insert brief description of the Project

The parties agree as follows:

CONTRACTOR DATA

Full Business Name: Full legal name of Contractor
Contractor Contact Person:
Address:
City, State, ZIP:
Business Telephone:
Facsimile:
Email:
Oregon CCB License Number:

Contractor certifies under penalty of perjury that Contractor is a:

☐ Sole Proprietor

☐ Corporation

☐ Limited Liability Company

☐ Partnership

☐ Other [describe: _____]

TERMS AND CONDITIONS

1. **Work.** Contractor shall execute fully the Work described by the Contract Documents, unless specifically indicated in the Contract Documents to be the responsibility of others. "Work" means the construction and any related services required by or reasonably inferable from the Contract Documents, whether completed or partially completed, including (except as otherwise expressly stated in this Contract) all other labor, materials, equipment, tools, permits, fees, licenses, facilities, taxes, transportation, supervision, temporary constructions of every nature, and all other services, management, and facilities of every nature whatsoever necessary to fulfill Contractor's duties by executing and completing this Contract within the Contract Time. The Work may constitute the whole or a part of the Project.

2. **Effective Date and Termination Date.** The effective date of this Contract shall be the Contract Start Date identified in section 2.a. or the date on which each Party has signed this Contract, whichever is later. Unless earlier terminated as provided below, the termination date shall be the Contract End Date**,** subject to extension as provided in the Contract Documents.

Offer and Contract Dates

a. Contract Start Date

"Work" Time Dates

a. Anticipated Notice to Proceed Date
b. Anticipated Substantial Completion Date
c. Anticipated Final Completion Date
d. Contract End Date
e. "Work" Time in Calendar Days

PLEASE NOTE: Contractor shall not commence Work under this Contract until the Notice to Proceed has been issued.

3. **Enumeration of Contract Documents.** The "Contract Documents" include the following:

a. This Contract with these Terms and Conditions.
b. **EXHIBIT A:** City's General Conditions to the Contract - included in this form
c. **EXHIBIT B:** Insurance Requirements - included in this form
d. **EXHIBIT C:** BOLI Prevailing Wage Rates: Indicate "BOLI Prevailing Wage Rates version xx incorporated by reference
e. **EXHIBIT D:** Contractor's Bid Response
f. **EXHIBIT E:** Project Manual
g. **EXHIBIT F:** Drawings
h. **EXHIBIT G:** Addenda
i. **EXHIBIT H:** Additional Documents. List any additional documents which are a part of this contract or remove this Exhibit Reference.

4. **Contract; Contract Documents; Entire Agreement.** This Contract and the other Contract Documents forms the entire and integrated agreement between the parties. Unless the context requires otherwise, any reference to the "Contract" includes the Contract Documents.

5. **The Contract Time.** Contractor shall achieve Substantial Completion of the Work under this Contract within consecutive calendar days ("Contract Time") from the date specified in City's Notice to Proceed, subject to adjustments of this Contract Time as provided in the Contract Documents.

6. **The Contract Total**

   a. The Contract Total is **$0**. The Contract Total is the total amount payable by the City to Contractor for the completion of the Work in its entirety under the Contract Documents.

   b. The following bid alternates are included in the Contract Total: List or refer to Exhibit

   c. Unit prices if any: List or refer to Exhibit

   d. Allowances included in the Contract Total, if any: List or refer to Exhibit

   e. Notwithstanding any other provision of this Contract or the Contract Documents, the Contract Total includes all construction contingencies for existing site conditions other than for pre-existing Hazardous Materials. Contractor is thoroughly acquainted with and has inspected the Project site without restriction, understands the potential risks in this construction Work, and accepts the full risk of construction contingencies to complete the Work within the Contract Time and Contract Total set out in this Agreement.

7. **Progress Payments.**

   a. The Contractor will submit an application for payment to the City Representative as provided in the General Conditions. The City Representative may require the Contractor to simultaneously submit an application for payment to the Design Professional working on the Project.

   b. Each application for payment shall be for one calendar month ending on the last day of the month.

   c. Payments are due and payable 30 days following receipt of the Contractor's complete Application for Payment or 15 days from the date after payment is approved by the City Representative, whichever is earlier. Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate set forth in ORS 279C.570(2).

   d. The amount of each progress payment shall be determined as provided in the General Conditions, less retainage of 5% pursuant to ORS 279C.550 to 279C.565, ORS 701.420 and 701.430, and less liquidated damages, if any.

8. Designation of Representatives.

a. The City's Representative is: Name and Contact Information

b. The Contractor's Representative is: Name and Contact Information

c. A party may change its designated representative upon 30 days written notice to the other party.

9. Notice and Communications.

a. Notices and communications between the parties to this Contract may be sent to the following addresses:

City:	**Contractor:**
City of Hillsboro	Name
Department	Company Name
Address	Address
Hillsboro, OR Zipcode	City, State, Zipcode

b. The party giving notice will provide notice in writing, dated and signed by the party giving notice or by a duly authorized representative of that party. Notice is not effective for any purpose whatsoever unless served in one of the following manners:

c. If notice is given by personal delivery, it is deemed delivered on the day of delivery.

d. If notice is given by overnight delivery service, it is deemed delivered one (1) day after date deposited, as indicated by the delivery service.

e. If notice is given by depositing same in United States mail, enclosed in a sealed envelope, it is deemed delivered three days after date deposited, as indicated by the postmarked date.

f. If notice is given by registered or certified mail with postage prepaid, return receipt requested, it is deemed delivered on the day the notice is signed for.

10. Independent Contractor Status. By its signature on this contract, Contractor certifies that the service or services to be performed under this Contract are those of an independent contractor as defined in ORS 670.600, and that Contractor is solely responsible for the work performed under this Contract. Contractor represents and warrants that Contractor, its subcontractors, employees, and agents are not "officers, agents, or employees" of the City within the meaning of the Oregon Tort Claims Act (ORS 30.260 through 30.300). Contractor shall be responsible for all federal, state, and local taxes and any and all fees applicable to payments for services under this Agreement.

11. Request for Taxpayer Identification Number. Contractor must be a current vendor with the City or must submit a completed "Request for Taxpayer Identification Number and Certification" (Form W-9) with this signed Contract. Payment information will be reported to the Internal Revenue Service under the name and TIN or SSN provided by Contractor. Contractor shall be responsible for all federal, state, and local taxes and any fees applicable to payments for Work under this Contract.

12. Compliance With Applicable Law. Contractor shall comply with all federal, state, and local laws applicable to the Work under this Contract, and all regulations and administrative rules established pursuant to those laws, including without limitation, the following requirements of the Oregon Public Contract Code:

a. ORS 279A.110 (Non-discrimination Certification): Contractor shall certify that Contractor has not discriminated and will not discriminate against a Subcontractor in the awarding of a subcontract because the Subcontractor is a minority, women, or emerging small business enterprise (certified under ORS 200.055.), or a business that is owned or controlled by, or employs a disabled veteran (as defined in ORS 408.225).

b. ORS 279C.380 (Performance and Payment Bonds): Unless exempted by the City in writing pursuant to the City's local public contracting rules, prior to starting work under this Contract, Contractor or its Subcontractor shall execute and deliver to City a good and sufficient performance bond, in a form acceptable to City, in a sum equal to 100% of the construction portion of the Contract Price, and Contractor or its Subcontractor shall execute and deliver to City a good and sufficient payment bond, in a form acceptable to City, in a sum equal to 100% of the construction portion of the Contract Price, solely for the protection of claimants under ORS 279C.600.

c. ORS 279C.505 (Prompt Pay Requirement, Liens, Taxes, and Drug Testing): Contractor shall make payment promptly, as due, to all persons supplying to such Contractor labor or material for the performance of the Work provided for in such Contract; pay all contributions or amounts due the Industrial Accident Fund from such Contractor or Subcontractor incurred in the performance of the Contract; not permit any lien or claim to be filed or prosecuted against the state or a county, school district, municipality, municipal corporation or subdivision thereof, on account of any labor or material furnished; and pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167. Contractor shall further demonstrate that an employee drug testing program is in place.

d. ORS 279C.510 (Recycling/Composting): If this Contract includes demolition work, the Contractor shall salvage or recycle construction and demolition debris, if feasible and cost-effective. If this Contract includes lawn or landscape maintenance, the Contractor shall compost or mulch yard waste material at an approved site, if feasible and cost-effective.

e. ORS 279C.515 (Failure to Pay Promptly): If Contractor fails, neglects, or refuses to make prompt payment of any Claim for labor or services furnished to the Contractor or a Subcontractor by any person in connection with this Contract as such Claim becomes due, the City may pay such Claim to the person furnishing the labor or services and charge the amount of the payment against funds due or to become due the Contractor by reason of this Contract. The payment of a Claim in the manner authorized in this section shall not relieve the Contractor or the Contractor's surety from any obligation with respect to any unpaid Claims. Unless the payment is subject to a good-faith dispute as defined in ORS 279C.580, if Contractor or any first-tier Subcontractor fails to pay any Claim for materials or labor furnished under this Contract within 30 days after being paid by City, interest shall be due on such claim as specified in ORS 279C.515(2) at the end of the 10-day period that payment is due under ORS 279C.580(4). A person with any such unpaid Claim may file a complaint with the Construction Contractor's Board unless the complaint is subject to a good-faith dispute as defined in ORS 279C.580.

f. ORS 279C.520 and 279C.540 (Hours of Labor, Holidays, and Overtime): Except as otherwise provided in an applicable collective bargaining agreement with a labor organization, Contractor shall not employ and shall require that its Subcontractors not employ any person to perform construction work for more than ten hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency, or where the public policy absolutely requires it, and in such cases, except in cases of Contracts for personal services as defined in ORS 279A.055, the laborer shall be paid at least time and a half pay:

   1. For all overtime in excess of eight hours a day or 40 hours in any one week when the work week is five consecutive days, Monday through Friday; and

   2. For all overtime in excess of ten hours a day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday; and

   3. For work performed on Saturday and on any legal holiday specified in any applicable collective bargaining agreement or ORS 279C.540(1)(b).

   4. The requirement to pay at least time and a half for all overtime worked in excess of 40 hours in any one week shall not apply to individuals who are excluded under ORS 653.010 to 653.261 or under 29 U.S.C. Section 201 to 209 from receiving overtime. Contractor shall and shall require its Subcontractors to give notice in writing to their employees who work under this Contract, either at the time of hire or before commencement of Work on the Contract, or by posting a notice in a location frequented by employees, of the number of hours per day and days per week that the employees may be required to work.

g. ORS 279C.525 (Notice of Environmental Regulations): State law requires that solicitation documents for a public improvement contract make specific reference to federal, state, and local agencies that have enacted ordinances, rules, or regulations dealing with the prevention of environmental pollution or the preservation of natural resources that may affect the performance of this Contract. These agencies include, but are not limited to:

1. Federal Agencies: Department of Agriculture, Forest Service, Soil and Water Conservation Service, Coast Guard, Department of Defense, Army Corps of Engineers, Department of Emergency, Federal Energy Regulatory Commission, Environmental Protection Agency, Department of Health and Human Services, Department of Housing and Urban Development, Solar Energy and Energy Conservation Bank, Department of Interior, Bureau of Land Management, Bureau of Indian Affairs, Bureau of Mines, Bureau of Reclamation, Geological Survey, Minerals Management Service, U.S. Fish and Wildlife Service, Department of Labor, Mine Safety and Health Administration, Occupational Safety and Health Administration, Department of Transportation, Federal Highway Administration, and Water Resources Council.

2. State Agencies: Department of Administrative Services, Department of Agriculture, Soil and Water Conservation Commission, Columbia River Gorge Commission, Department of Energy, Department of Environmental Quality, Department of Fish and Wildlife, Department of Forestry, Department of Geology and Mineral Industries, Department of Human Resources, Department of Consumer and Business Services, Land Conservation and Development Commission, Department of Parks and Recreation, Division of State Lands, and Department of Water Resources.

3. Local Agencies: City councils, county courts, county boards of commissioners, metropolitan service district councils, design commissions, historic preservation commissions, planning commissions, development review commissions, special district boards of directors, and other and special governmental agencies such as Tri-Met, urban renewal agencies, and Port districts.

4. Tribal Governments.

h. ORS 279C.530 (Payment for Medical Care and Workers' Compensation): Contractor shall promptly, as due, make payments to any person, co-partnership, association, or corporation furnishing medical, surgical, and hospital care or other needed care and attention, incident to sickness or injury, to the employees of such Contractor, of all sums which the Contractor agrees to pay for such services and all moneys and sums which the Contractor collected or deducted from the wages of employees pursuant to any law, contract, or agreement for the purpose of providing or paying for such service. All employers, including the Contractor, that employ subject workers who work under this Contract in the State of Oregon shall comply with ORS 656.017 and provide the required workers' compensation coverage, unless such employers are exempt under ORS 656.126. Contractor shall ensure that each of its Subcontractors complies with these requirements.

i. ORS 279C.545 (Time Limitations on Claims for Overtime): Construction workers employed by the Contractor or its Subcontractor shall be foreclosed from the right to collect for any overtime under this Contract unless a claim for payment is filed with the Contractor or Subcontractor within 90 days from the completion of the Contract, providing the Contractor or Subcontractor has:

1. Caused a circular clearly printed in blackface pica type and containing a copy of this section to be posted in a prominent place alongside the door of the timekeeper's office or in a similar place which is readily available and freely visible to any or all workers employed on the Work; and

2. Maintained such circular continuously posted from the inception to the completion of the Contract on which workers are or have been employed.

j. ORS 279C.580(3) (Prompt Payment of First-Tier Subcontractors): Contractor shall include in each subcontract for property or services with a first-tier Subcontractor a clause that obligates the Contractor to pay the first-tier Subcontractor for satisfactory performance under its subcontract within ten days out of such amounts as are paid to the Contractor by the City. Contractor shall also include in each subcontract a clause that states that if the Contractor fails to pay any claim for materials or labor furnished under this Contract within 30 days after being paid by City, interest shall be due on such claim as specified in ORS 279C.515(2) at the end of the ten-day period that payment is due under ORS 279C.580(3). Contractor shall require each first-tier Subcontractor to include a payment clause and interest clause conforming to the requirements of ORS 279C.580 in each of its subcontracts, and to require each of its Subcontractors to include a similar clause in each contract with a lower-tiered subcontractor or supplier.

k. ORS 279C.605 (Notice of Claim on Bond): Any person claiming a right of action under ORS 279C.600 must file a notice of claim as provided in ORS 279C.605.

l. ORS 279C.800 to 279C.870 (Payment of Prevailing Wage Required):

1. The hourly rate of wage to be paid by Contractor or any Subcontractor to workers in each trade or occupation required for the public works employed in the performance of this Contract shall not be less than the specified minimum rate of wage in accordance with ORS 279C.838 and ORS 279C.840 for each trade or occupation as defined by the Commissioner of the Oregon Bureau of Labor and Industries in the applicable publication entitled Definitions of Covered Occupations for Public Works Contracts in Oregon available at http://www.boli.state.or.us/BOLI/WHD/PWR/pwr_state.shtml.

2. This contract is subject to the prevailing wage rates published as specified in the City's Invitation to Bid document included in this contract as Exhibit Insert Exhibit letter or number.

3. Contractor and all Subcontractors shall keep the prevailing wage rates for this Project posted in a conspicuous and accessible place in or about the Project.

4. The City shall pay a fee to the Commissioner of the Oregon Bureau of Labor and Industries as provided in ORS 279C.825. The fee shall be paid to the Commissioner under the administrative rule of the Commissioner.

5. If Contractor or any Subcontractor also provides for or contributes to a health and welfare plan or a pension plan, or both, for its employees on the Project, it shall post notice describing such plans in a conspicuous and accessible place in or about the Project. The notice shall contain information on how and where to make claims and where to obtain future information.

m. ORS 279C.836 (Public Works Bond Required): Contractor shall:

1. File a public works bond with the Construction Contractors Board pursuant to ORS 279C.836 before starting work on the Project, unless exempt under ORS 279C.836(2), (7) or (8); and

2. Include in every subcontract a provision requiring the Subcontractor to file a public works bond with the Construction Contractors Board pursuant to ORS 279C.836 before starting work on the Project, unless exempt under ORS 279C.836(2), (7) or (8).

n. ORS 279C.845 (Prevailing Wage Certification; Additional Retainage):

1. Contractor and every Subcontractor shall file certified statements with City in writing in the form prescribed by the Commissioner of the Bureau of Labor and Industries, certifying the hourly rate of wage paid each worker whom Contractor or Subcontractor has employed upon such public work, and further certifying that no worker employed upon such public work has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the Contract, which certificate and statement shall be verified by the oath of Contractor or Contractor's surety or Subcontractor or Subcontractor's surety that Contractor and any Subcontractor has read such statement and certificate and knows the contents thereof, and that the same is true to Contractor or Subcontractor's knowledge. The certified statements shall set out accurately and completely the payroll records for the prior week including the name and address of each worker, the worker's correct classification, rate of pay, daily and weekly number of hours worked, deductions made, and actual wages paid.

2. The certified statement shall be delivered or mailed by Contractor or Subcontractor to City. Certified statements for each week during which the Contractor or Subcontractor employs a worker upon the public work shall be submitted once a month, by the fifth business day of the following month. Information submitted on certified statements may be used only to ensure compliance with the provisions of ORS 279C.800 to 279C.870. Notwithstanding any other provision of this Contract and in addition to any other retainage required under this Contract, the City shall retain 25% of any amount earned by the Contractor until the Contractor has filed the certified statements with the City as required by this Section. The City will pay the retainage required under this Section within 14 days after Contractor files the certified statements required by this Section.

3. Contractor and each Subcontractor shall preserve the certified statements for a period of three years from the date of completion of the Contract.

o. ORS 671.560, 701.026 (Landscape/Construction Contractors License Required): If Contractor is performing work as a landscape contractor as defined in ORS 671.520(2), Contractor must have a current, valid landscape contractor's license issued under ORS 671.560. If Contractor is performing work as a Contractor as defined in ORS 701.005(2), Contractor must have a current, valid construction contractor's license issued under ORS 701.026. Contractor shall further certify

that all Subcontractors performing Work described in ORS 701.005(2) are registered with the Construction Contractors Board or licensed by the State Landscaping Contractor's Board as required by the above-noted statutes before they commence Work under this Contract. Contractor shall maintain in effect all licenses, permits, and certifications required for the performance of the Work. Contractor shall notify City immediately if any license, permit, or certification required for performance of this Contract shall cease to be in effect for any reason.

Contractor has the power and authority to enter into and perform this Contract. The persons executing this Contract on behalf of Contractor have the actual authority to bind Contractor to the terms of this Contract.

CONTRACTOR	**CITY**
Full, legal name of Contractor	City of Hillsboro
_____	_____
Signature	Signature Printed name of signer
_____	Title
Printed Name and Title	
_____	_____
Date	Date

EXHIBIT A

CITY OF HILLSBORO
PUBLIC IMPROVEMENT CONTRACT
GENERAL CONDITIONS
July, 2014

I) General Provisions.

i) Contract Documents**.** The "Contract Documents" are enumerated in Item 3. ("Enumeration of Contract Documents") of the Public Improvement Contract between City and Contractor ("Contract") and consist of the Contract, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, additions or deletions to, material changes in, or general interest explanations of a Solicitation Document ("Addenda") (other than Addenda relating to bidding requirements) issued prior to the bid, other documents listed in the Contract, and Modifications issued after execution of the Contract. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all. Performance by Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

ii) Contract Schedule**.** The "Contract Schedule" is the graphical representation of the practical plan for carrying out the Work and completing the Work within the Contract Time as set forth in the Contract Documents. The Contract Schedule provides a list of intended events and times to complete each event as set forth in the Contract Documents.

iii) Drawings**.** The "Drawings" are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

iv) Knowledge**.** The terms "knowledge," "recognize" and "discover" their respective derivatives and similar terms in the Contract Documents, when used in reference to the Contractor, means that which the Contractor knows or should know, recognizes or should recognize and discovers or should discover. Analogously, the expression "reasonably inferable" and similar terms in the Contract Documents means reasonably inferable by a contractor familiar with the Project and exercising the care, skill and diligence required of the Contractor by the Contract Documents.

v) Modification**.** A "Modification" is

1) a written amendment to this Contract signed by both parties;

2) a Change Order;

3) a Construction Change Directive; or

4) a written order for a minor change in the Work issued by the Architect.

vi) Organization of Drawings and Specifications. "Organization of Drawings and Specifications" into divisions, sections, articles, or otherwise arranged will not control Contractor in dividing the Work among subcontractors or in establishing the extent of Work to be performed by any trade subcontractor.

vii) Project. The "Project" is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by City and by separate Contractors.

viii) Project Site. The "Project Site" is the property upon which the Project lies and City's property that surrounds the Project, extending to the City's property boundary.

ix) Specifications. The "Specifications" are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards, and workmanship for the Work and performance of related services.

II) City's Responsibilities.

i) Authorized Representative. City shall designate a person in writing to be the authorized representative with express authority, to the extent permitted by law, to bind and communicate on behalf of City with respect to all matters requiring City's approval or authorization ("City Representative"). The term "City" includes City Representative.

ii) Contract Administration. City shall provide contract administrative services for the Project through City's authorized representative. The City Representative may engage and delegate authority to such additional staff and professional and technical consultants as City deems necessary to assist in perform its administrative tasks. Contractor shall direct all Project communications to City and in accordance with the Contract Documents, or as City directs in writing.

1) City may engage professional architects or engineers to assist City during construction of the Project to interpret technical contract provisions and to determine the amount, quality, acceptability, and fitness of the Work. Such architects or engineers will be authorized to act on behalf of City only to the extent expressly provided in the Contract Documents or as City otherwise directs in writing.

2) City may engage a consulting construction manager to provide Project administrative services on City's behalf. Such construction manager will be authorized to act on behalf of City to the extent expressly provided in the Contract Documents or as City otherwise directs in writing.

3) City may retain certain project inspectors to monitor compliance with Drawings and Specifications for the Project, as well as applicable codes and ordinances. Such project inspectors will be authorized to act on behalf of City to the extent expressly provided in the Contract Documents or as City otherwise directs in writing.

iii) Access to the Work. City and its designated representatives shall have free access to the Work at all times. Contractor shall not carry on Work except with the knowledge of City and its designated representatives. City may require special inspection or testing of any portion of the Work, whether it has been fabricated, installed, or fully completed. Inspection or observation of Work shall not relieve Contractor from any obligation to fulfill the Contract.

iv) Right to Stop or Reject Work. City may reject Work that fails to conform to the Contract Documents, as determined by City. If Contractor fails to promptly correct such defective Work, City may issue a written order directing Contractor to stop the Work, or designated portion thereof, until the cause for such order is eliminated. The right of City to stop the Work shall not give rise to a duty on the part of City, or any of its representatives, to discover nonconforming Work or to exercise the right to stop the Work for the benefit of Contractor or any other person or entity.

v) Permits and Access. Except for permits and fees that are Contractor's responsibility under the Contract Documents, City shall secure and pay for all other necessary approvals, easements, assessments and charges required to complete the Work..

vi) Subsurface Surveys. City shall make available to Contractor, and Contractor shall study, the results of such test borings and information that City has concerning subsurface conditions and site geology. Contractor shall inform City of any other site investigation, analysis, study, or test conducted by or for Contractor or its agents and shall make the results available to City upon City's request.

vii) City's Rights. The rights stated in this section and elsewhere in the Contract Documents are cumulative and do not limit any rights City may have under the Contract Documents, at law or in equity. Without limiting the generality of the foregoing sentence, any right City has under the Contract Documents to compel Contractor to fix defective Work, up to and including any warranty period the Contract Documents may establish, does not operate to shorten or otherwise limit statutes of limitations applicable to the Work.

III) Contractor's Responsibilities.

i) General Responsibilities**.**

1) Authorized Representative. Contractor shall designate a person in writing to be the authorized representative with express authority to bind and communicate on behalf of Contractor with respect to all matters requiring Contractor's approval or authorization ("Contractor Representative"). The term "Contractor" means the Contractor or the Contractor Representative.

2) Materials, Equipment, and Services. The Contractor will provide all labor, materials, equipment, and services necessary to complete the Work, all of which will be provided in full accord with the Contract Documents.

3) Supervision and Coordination. Unless otherwise expressly provided in the Contract Documents, the Contractor will be solely responsible for the supervision and coordination of the Work, including the construction means, methods, techniques, sequences, and procedures utilized.

4) Project Correspondence. Contractor shall provide City with a copy of all written communications between Contractor and City's consultants at the same time as that communication is made to such consultants, including, without limitation, all requests for information, correspondence, submittals, notices, and change order proposals. Contractor shall confirm oral communications in writing.

5) Project Boundary. Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

6) Taxes. Contractor shall pay all applicable taxes for the Work provided by Contractor that are legally applicable at the time the bid is submitted, whether or not yet effective or merely scheduled to go into effect.

7) Permits, Fees and Notices. Except as otherwise provided in the Contract Documents, Contractor shall secure and pay for all permits, licenses, and certificates that are the Contractor's responsibility under the Contract Documents and that are necessary for prosecution of Work before the date of the commencement of the Work or before the permits, licenses, and certificates are legally required to continue the Work without interruption. Contractor shall obtain and pay, when legally required, for all licenses, permits, inspections, and inspection certificates required by any authority having jurisdiction over any part of the Work included in the Contract. Contractor shall deliver all final permits, licenses, and certificates to City before demand is made for final payment.

ii) Worksite Conditions**.**

1) Benchmarks and Monuments. Contractor shall protect and preserve established benchmarks and monuments and shall not change locations of benchmarks and monuments without City's prior written approval. Contractor shall replace any benchmarks or monuments that are lost or destroyed subsequent to proper notification of City and with City's approval.

2) Field Verification. Prior to the commencement of the Work, Contractor shall review the Project Site with City in detail and identify the area of the Work, staging areas, connections or interfacing with existing structures and operations, and restrictions on the Work site area. Contractor shall ensure that all forces on the Project Site are instructed about the acceptable working and staging areas and restrictions on use of the site. Contractor, with advance consent of City, shall erect such barriers and devices as are necessary to restrict access within the Work site to authorized areas and to prevent unauthorized access to non-Work areas.

3) Utility Locates. Contractor will be responsible to locate existing utilities and underground facilities that are indicated in the Contract Documents or that are known or reasonably should be known to exist in proximity to the Work. Contractor shall provide timely notice and locate requests with any affected utility or through contact with appropriate notification centers before commencing excavation or demolition Work that Contractor knows or reasonably should know is in proximity to such utilities or facilities. Contractor assumes the sole risk and will be responsible for all delay and expense arising out of Contractor's failure to do so. Contractor acknowledges that utility companies and other third parties owning or managing facilities that may need to be relocated are not City's agents and do not act for the City.

iii) Responsibility for Performance**.**

1) Before beginning the Work, Contractor shall examine and compare the drawings and specifications with information furnished by City that are Contract Documents, relevant filed measurements made by the Contractor, and any visible conditions at the worksite affecting the Work.

2) Reporting Inconsistencies. Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, but Contractor shall promptly report any nonconformity it discovers to City. Contractor will be liable to City for damages if it fails, in the exercise of normal diligence, to recognize any error, inconsistency, omission or difference between field conditions and the Contract Documents. Contractor shall promptly report any errors, inconsistencies, or omissions it discovers, as a request for information, in such a form as City or Architect may require. Contractor will not be entitled to any modification in Contract Total or Contract Time solely by the request for information. Contractor shall carefully study and compare all Contract Documents, including Drawings, Specifications, and other instructions and shall at once report, in writing to City any error, inconsistency, or omission that Contractor or its employees or subcontractors may discover. In the event of an inconsistency within or between parts of the Contract Documents, or between the Contract Documents and applicable law, and regardless of whether Contractor reports the inconsistency to the City, the Contractor must: (i) provide the better quality or greater quantity of Work; or (ii) comply with the more stringent requirement as applicable.

3) Unnecessary Inquiries. Contractor is liable for costs incurred by City for professional services for interpretations or decisions of matters where the information sought is equally available to the party making the request.

iv) Construction Materials and Supplies**.**

1) Quantities of Materials. Contractor shall provide materials in sufficient quantities on hand at such times as to insure uninterrupted progress of Work and shall store materials properly and protect materials as required.

2) Complete Assembly. For all materials and equipment specified or indicated in the Drawings, Contractor shall provide all labor, materials, equipment, and services necessary for complete assemblies and complete working systems, functioning as intended. Contractor shall furnish incidental items not indicated on Drawings, nor mentioned in the Specifications, that can be legitimately and reasonably inferred to belong to the Work described, or necessary in good practice to provide a complete assembly or system, as though itemized here in every detail. In all instances, Contractor shall install material and equipment in strict accordance with each manufacturer's most recent published recommendations and specifications. Contractor shall be responsible for appropriately sequencing the Work and for verification of suitability of prior work before subsequent construction activities.

3) Timely Ordering of Materials. Contractor shall coordinate submittal approvals and place orders for materials and/or equipment so that delivery of same will be made without delays to the Work. Contractor shall, upon City's reasonable request, provide documentary evidence that orders have been placed.

4) No Right to Lien. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver the site to City, together with all improvements and appurtenances constructed or placed thereon by it, and free from any claims, liens, or charges. Because City's property is public property, Contractor and any person, firm, or corporation furnishing any materials or labor for any Work covered by this Contract, will not have any right to lien any portion of the Project Site or any improvement or appurtenance thereon.

5) Storage. Contractor and its subcontractors shall obtain City approval before delivering or storing materials or tools on City's premises. Upon approval, Contractor shall store materials and tools so that they do not hamper the operation of equipment or persons and do not present a fire or safety hazard.

v) Construction Personnel and Supervision**.**

1) Supervision. During progress of the Work, Contractor shall keep on the Project Site, and at all other locations where any Work related to this Contract is being performed, a competent project manager, construction superintendent and staff, who are employees of Contractor, to whom City does not object and at least one of whom is fluent in English, written and verbal. Contractor shall provide efficient supervision to the Work, using its best skill and attention. Before commencing the Work, Contractor shall give written notice to City of the name of its project manager and construction superintendent. Contractor is bound by all directions given to Contractor's project manager and/or construction superintendent as if such direction was given to Contractor.

2) Replacement of Supervision. Contractor shall not otherwise remove or replace the construction superintendent or project manager for any reason, including their need to work on other projects, or to take extended vacations, without submitting thirty (30) days' written notice to City. If Contractor's project manager, construction superintendent, or support staff member is no longer employed by Contractor, Contractor shall provide City with notice of the termination of the employment relationship and shall consult with City with respect to replacement personnel.

3) Discipline and Removal. Contractor shall at all times enforce strict discipline and good order among its subcontractors and employees and shall not employ or work any unfit person, or anyone not skilled in work assigned to that person. City may require Contractor to permanently remove unfit persons from Project Site. Contractor shall not employ any person whom City may deem incompetent or unfit on the Project except with the prior written consent of City. City may require removal and replacement of any or all construction superintendents or project managers upon ten (10) days' notice to Contractor.

4) Acts or Omissions. Contractor is responsible to City for acts and omissions of Contractor's employees, subcontractors and their agents and employees, and other persons or entities performing portions of the Work for or on behalf of Contractor or any of its subcontractors.

5) Identification Badges. The Contractor and its subcontractors, and the employees and the agents of any of them shall comply with City's policies and requirements to obtain, display, and return identification badges at any time while they are present on City's property.

vi) Contractor's Construction Master Schedule**.**

1) Schedule Required. Within no more than ten (10) days of being awarded the Contract, and before commencing the Work, Contractor shall prepare and submit to City for City's approval a construction master schedule for the Work. The construction schedule shall be in a detailed precedence-style critical path method (CPM) type format, which will include any interim dates that are critical in insuring the timely completion of the Work as provided in the Contract Documents. City shall provide approval or comment on the submitted schedule within seven (7) days. Contractor shall be responsible for amending construction schedule in response to City comments.

2) Logic. Schedule shall use retained logic during the development and updating of the schedule. Any function that would cause the retained logic of the logic network to be overridden is prohibited unless approved, in writing and in advance, by the Architect and City.

3) Schedule shall include: date of Notice to Proceed, date of Substantial Completion, and date of Final Completion in accordance with Contract Documents.

4) Schedule Maintenance. The schedule shall not exceed the Contract Time for the Work. Contractor shall revise and update the schedule at appropriate intervals, no greater than monthly, or as required by City or the conditions of the Work and Project. Should the Contractor fail to meet any scheduled date as shown on the current Construction Progress Schedule, the Contractor shall promptly notify the City, and if requested, be required at its own expense to submit within five (5) days of the request an updated Construction Progress Schedule. If the Contractor's progress indicates to the City that the Work will not be Substantially Completed within the Contract Time, the Architect and City may require the Contractor develop a Recovery Schedule that adequately demonstrates how the Contractor will, at its own expense, increase its work force and/or working hours to bring the actual completion dates of the activities into conformance with the Construction Progress Schedule and Substantial Completion within the Contract Time. Neither the City nor the Architect will, however, be obligated to review the substance or sequence of the Construction Progress Schedule or otherwise determine whether it is correct, appropriate or attainable.

5) Submittal Schedule. Contractor shall prepare and keep current, for City's review and acceptance, a schedule of submittals that is coordinated with the construction schedule and allows City and its consultants reasonable time to review submittals and to provide information necessary for procurement and installation of Work for which allowances are provided under the Contract Documents. City may require Contractor to include preparation of Contract submittals as a line item payment in the schedule of values.

6) Execution of Schedule. Contractor shall perform the Work in general accordance with the most recent schedules submitted to and accepted by City. Contractor shall indicate in the schedule updates any Work that is not proceeding according to the schedule and shall provide a written plan of action to bring the Work into compliance with the schedule or to otherwise ensure that the Work will be completed within the Contract Time.

vii) Documents and Records**.**

1) Record Documents. Contractor shall update at least weekly, at the Project Site, or at such other location as City may authorize in writing, one legible copy of all Contract Documents annotated with all changes ("Record Documents"), including but not limited to Addenda, RFIs, ASIs, and Change Orders. Contractor shall also maintain on site a complete record and copy of all approved submittals, shop drawings and product samples. Failure to update in a timely manner as required by this section may result in withholding payment by City. Contractor shall keep these documents in good order and available to City's consultants or representatives and all authorities having jurisdiction. Contractor shall coordinate with City's representatives and consultants and shall submit its verified report(s) according to Oregon law or as required by authorities having jurisdiction. The Contractor shall submit the completed and finalized project record to City in accordance with the contract documents prior to Final Acceptance.

2) Daily Job Reports. Contractor shall maintain at least one (1) set of reports on the Project prepared by Contractor's employee(s) present on site, and which includes following information: a brief description of all Work performed on that day; a summary of all pertinent events and/or occurrences on that day including records of all tests and inspections; a list of all subcontractor(s) working on that day; a list of each Contractor employee working on that day; the total hours worked for each employee; a complete list of all equipment on the Project that day, whether in use or not; the time Work commenced and ended; weather conditions; accidents or injuries; and Work progress made for that day ("Daily Job Reports"). Contractor shall keep the Daily Job Reports current and in good order and shall make current copies available to City upon request.

3) Maintenance of Records after Final Payment. Contractor shall make available at its office at all reasonable times the materials described in this paragraph for the examination, audit, or reproduction until six (6) years after final payment under this Contract: (a) all Daily Job Reports or other Project records of Contractor's project manager(s), construction superintendent(s), and/or project foreperson(s); (b) all certified payroll records and/or related documents including, without limitation, payroll, payment, timekeeping and tracking documents; (c) all books, estimates, records, contracts, documents, bid documents, bid cost data, subcontract job cost reports, and other data of Contractor, any subcontractor, and/or supplier, including computations and projections related to bidding, negotiating, pricing, or performing the Work or Contract modification, in order to evaluate the accuracy, completeness, and currency of the cost, manpower, coordination, supervision, or pricing data at no additional cost to City. These documents may be duplicative and/or be in addition to any bid documents held in escrow by City.

4) Submittals. Contractor shall submit shop drawings, product data, samples and mock ups as required by the Contract Documents that have been verified and coordinated with the requirements of the Work and of the Contract Documents. Contractor shall not perform any portion of the Work until the submittals for that portion have been approved by City.

5) Professional Design Services. City will not require Contractor to perform professional services which constitute the practice of architecture, engineering, or surveying unless such services are specifically required by the Contract Documents as a part of the Work or unless Contractor must provide such services in order to carry out Contractor's responsibilities under the Contract. City shall specify performance and design criteria that such professional services must satisfy.

6) Ownership of Documents. All copies of Drawings, Specifications, and copies of other incidental architectural and engineering work, or copies of other Contract Documents furnished by City or generated by Contractor, including those in electronic form, are the property of City.

7) Copyright and License. Neither Contractor nor any subcontractor, or material or equipment supplier, will own or claim a copyright in the documents prepared by the City's consultants. City hereby grants Contractor, subcontractors, sub-subcontractors, and material or equipment suppliers a limited license to use applicable portions of the Drawings and Specifications prepared for the Project in the execution of their Work under the Contract Documents.

8) Royalties, Licenses and Copyrights. Contractor shall obtain and pay, when required by law, all royalties and license fees necessary for prosecution of Work before the earlier of the date of the commencement of the Work or the date the license is legally required to continue the Work without interruption. Contractor shall defend suits or claims of infringement of patent, copyright, or other rights and shall hold City, City's consultants, and City's representatives harmless and indemnify them from loss on account of claims for infringement to the extent Contractor knew, or with reasonable diligence should have known, that the use of a specified design, process, or product would constitute infringement.

9) Intellectual Property. The review by City or Architect of any method of construction, invention, appliance, process, article, device, or material of any kind is limited to a review for adequacy for the Work and is not approval for use by Contractor in violation of any patent or other rights of any person or entity.

viii) Tests and Inspections**.**

1) Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities.

2) Unless otherwise provided, Contractor shall arrange for such tests, inspections, and approvals, and shall bear the associated costs. Contractor shall notify City of scheduled tests and/or inspections and approvals, so that City or its designated representative may be present for such procedures, which presence shall be at City's expense.

3) Contractor shall not incorporate any material into the Work that has not satisfied all testing, inspection, or approval requirements of the Contract Documents.

4) Contractor shall secure and promptly deliver required certificates of testing, inspection or approval to City, unless otherwise provided by the Contract Documents.

5) If testing, inspection, or approval required by the Contract Documents, or otherwise required by City, reveal failure of the Work to comply with requirements of the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation of City's costs, shall be at Contractor's expense.

ix) Work Under the Contract**.**

1) Defective Work. At City's sole option, Contractor shall repair or replace any and all Work, together with any other Work that may be displaced in doing so, that may prove defective in workmanship and/or materials within a one (1) year period from Substantial Completion of the Work without expense whatsoever to City. In the event Contractor fails to commence and diligently pursue such replacements or repairs within ten (10) days after being notified in writing, Contractor hereby acknowledges and agrees that City may correct such defects, without voiding any guarantee or warranty, at Contractor's expense. Payment shall become due upon City's demand, and shall be an obligation secured by Contractor's performance bond.

2) Correction of Work. If, in the opinion of City, defective Work creates an exigent or dangerous condition or requires immediate correction or attention to prevent injury to persons or property or to prevent interruption of City operations, City may, upon making a good faith attempt to notify Contractor, proceed to make some or all replacements or repairs as may be reasonably required in the circumstances. The costs of such work will be charged against Contractor and shall become due upon City's demand.

3) Manufacturer's Warranties. The above provisions do not in any way limit the guarantees on any items for which a longer guarantee is specified or on any items for which a manufacturer gives a guarantee for a longer period. Contractor shall furnish to City all appropriate guarantee or warranty certificates as indicated in the Specifications or upon request by City. Contractor shall obtain and preserve for the benefit of City, manufacturer's warranties on material, fixtures, and equipment incorporated into the Work. Contractor shall furnish City with all guarantee or warranty certificates as indicated in the Specifications or upon City's request.

4) Cutting and Patching. Contractor shall do all cutting, fitting, patching, and preparation of Work as required to make its several parts come together properly, to fit it to receive, or be received by work of other Contractors, and to coordinate tolerances to various pieces of work, showing upon, or reasonably implied by, the Drawings and Specifications for the completed structure, and shall conform them as City may direct.

5) Alteration of Work by Contractor or Others. Contractor shall not endanger any Work performed by it or anyone else by cutting, excavating, or otherwise altering Work and shall not cut or alter Work of any other Contractor except with consent of City.

6) Cleaning up. Contractor shall keep the Project Site and surrounding area, including public rights of way, free from dust, mud, dirt, or accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, Contractor shall clean the site, streets, and sidewalks and shall remove from the Project waste materials, rubbish, Contractor's tools, construction equipment, machinery, and surplus materials.

7) Access to Work. Contractor shall provide City and its representatives access to the Work in preparation and progress wherever located.

x) Allowances**.**

1) Contractor shall include all allowances stated in the Contract Documents in the Contract Total. Unless the Contract Documents provide otherwise, Contractor shall include in the Contract Total, separate from allowances, amounts necessary to cover the cost of materials and equipment delivered at the site and all required taxes, less applicable trade discounts, Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance. City shall adjust the Contract Total through a Change Order whenever costs are more than allowances. City shall provide a Change Order amount that reflects the difference between the actual cost and the allowance.

xi) Warranty**.**

1) Contractor warrants to City and Architect that materials and equipment furnished 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 not inherent in the quality required or permitted, and that the Work will conform to 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 and normal usage. If required by Architect or City, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

2) Contractor guarantees all work against defects in material or workmanship for a period of one (1) year from the date of substantial completion.

3) If, after 10 days' notice, Contractor fails to proceed to cure any breach of this warranty, City may have the defects corrected and Contractor and its surety shall be liable for all expenses incurred. In case of an emergency, where, in the opinion of City or Architect, delay would cause serious loss or damage, corrective work may be undertaken without advance notice to Contractor; but Contractor and its surety shall remain liable for all expenses incurred. The remedies stated in this subsection are not exclusive, but are cumulative of any other remedies City may have.

4) Contractor shall assign, and shall obtain from subcontractors and assign, all manufacturers' warranties to City and all guarantees and warranties of goods supplied under this Contract shall be deemed to run to the benefit of City. Contractor shall provide City with all manufacturers' warranty documentation and operations and maintenance manuals not later than the date of Final Acceptance of the Work by the City.

IV) Subcontractors.

i) Subcontractor Disclosure. Contractor shall provide City a list of all subcontractors and major suppliers with a name, address, telephone and fax numbers, Oregon license number(s), classification, and monetary value of each subcontract for labor, material, or equipment. If City objects, City shall promptly provide a written notice of objection. Contractor shall not contract with a proposed person or entity to which City reasonably objects or that is ineligible to receive a subcontract under ORS 279C.860, and shall procure a replacement subcontractor that is acceptable to City. City shall provide a Change Order before commencement of substitute subcontractor's Work for the increase or decrease in the Contract Total and Contract Time occasioned by such change, unless the subcontractor is ineligible under ORS 279C.860, and Contractor shall be fully responsible for performance of the substituted subcontractor under the Contract Documents. Contractor shall be solely responsible to determine whether any proposed subcontractor is eligible.

ii) Pass-Through. Contractor shall require each subcontractor, by written agreement, to be bound to Contractor by terms of this Contract to the extent it applies to the Work performed by subcontractor. Contractor shall provide copies of subcontract agreements upon City's request.

iii) No Waiver**.** City's consent or failure to object to any subcontractor does not relieve Contractor of any obligations under this Contract and is not a waiver of any provisions of this Contract. A waiver is not effective unless it is in writing and is signed by the City.

iv) Substitution and Assignment. Contractor shall not, without City's written consent:

1) Substitute any person as a subcontractor in place of the subcontractor designated in the original bid.

2) Permit any Subcontract to be assigned or transferred, or allow any portion of the Work to be performed by anyone other than the subcontractor listed in the original bid; or

3) Sublet or subcontract any portion of the Work in excess of one-half of one percent (1/2 of 1%) of Contractor's total bid as to which his original bid did not designate a subcontractor.

v) Coordination of Work. Contractor shall coordinate the trades, subcontractors, sub-subcontractors and material or equipment suppliers working on the Project.

vi) Subcontractor Dispute Resolution. Contractor shall settle any difference between Contractor and its subcontractor(s) or between subcontractors.

vii) Assignment. Contractor shall include assignment provisions in each subcontract as indicated in the termination provisions set forth in these General Conditions.

1) Contingent Assignment of Subcontractors. Contractor shall assign to City each subcontract agreement for a portion of the Work provided that:

(A) Assignment is effective only after termination of this Contract by City for cause or stoppage of the Work by City, and only for those subcontract agreements which City accepts in its sole discretion by notifying the subcontractor and Contractor in writing; and

(B) Assignment is subject to the prior rights of the surety, if any, obligated under bond relating to this Contract.

2) Upon such assignment, if the Work has been suspended for more than thirty (30) days, City shall equitably adjust subcontractor's compensation for increases in cost resulting from the suspension.

viii) Prompt Payment of Subcontractors. Contractor shall promptly pay subcontractors as required by the Contract.

V) Construction by City.

i) Other Contractors. City may let other contractors perform work with its own forces, in connection with the Project. Contractor shall afford other contractors reasonable opportunity for introduction and storage of materials and execution of their work and shall properly coordinate and connect the Work with the work of other contractors. If Contractor claims that delay or additional cost is involved because of such action by City, Contractor shall make such claim in the manner provided in the Contract Documents.

1) Contractor shall protect the work of other contractors that it encounters while working on the Project.

2) If any part of Contractor's Work depends upon completion of the work of City or others for proper execution, Contractor shall inspect and promptly report to City any discrepancy or defective condition in such work. Contractor's failure to inspect and report will be deemed acceptance of all work of others as fit and proper for reception of Contractor's Work. Contractor is liable for damages for work of others that Contractor failed to inspect, except for defects that were not discoverable and may develop in City's or any other contractor's work after execution of Contractor's Work.

ii) Mutual Responsibility. Contractor shall reimburse City for costs incurred by City which are payable to a separate contractor because of delays, improperly timed activities or defective construction of Contractor. City shall reimburse Contractor for costs incurred by Contractor because of delays, improperly timed activities, and damage to the Work or defective construction of a separate contractor.

iii) City's Right to Clean Up. If a dispute arises among Contractor, separate contractors and City as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, City may clean up and the City shall allocate the cost among those responsible.

VI) Changes in the Work.

i) Change Orders**.**

1) Change Order. A document prepared by the City Representative and signed by the City, the City Representative, the Architect, and the Contractoror assigned designee, stating their agreement upon all of the following: (1) a change in the Work; (2) the amount of the adjustment in the Contract Total, including all costs, overhead and profit, if any; and (3) the extent of the adjustment in the Contract Time, if any, issued after the effective date of the Agreement.

2) A Proposed Change Order (PCO) is a document prepared by the Contractor to seek additional compensation and/or time from the City. The Contractor shall provide a written PCO narrative explaining its reasons for requesting additional compensation or time. The written PCO narrative shall reference all related schedule activities and contract specification sections and drawings directly pertaining to the PCO, include all costs, overhead and profit.

3) Change Pricing. In the absence of applicable unit prices or other agreement, the changed work will be priced in accordance with the following provisions:

(A) In no case shall the sum of the individual markups applied to a General Contractor's Modification exceed fifteen percent (15%), regardless of the number of Subcontractor tiers involved in performing the Work.

(B) The total combined mark-up for a Subcontractor and his lower-tier Subcontractor shall not exceed ten percent (10%). Costs of tax and insurance shall not be marked up.

(C) For work perform by a subcontractor, the subcontractor will receive 10% markup for direct costs. The General Contractor shall receive a five percent (5%) of the subcontractor's direct costs for processing.

(D) For self-performed work by the General Contractor, the markup shall equal fifteen percent (15%) of the direct cost as defined herein.

(E) Bonding may be increased a maximum of one percent (1%) provided the Contractor demonstrates to the City a requirement to increase bonding.

(F) If the net value of a change results in a credit from the Contractor or subcontractor, the credit shall be the actual net cost, plus five percent (5%) for overhead and profit. When both additions and credits covering related work or substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase or decrease, if any, with respect to the change.

4) Equipment Costs:

(A) The allowance for equipment costs (both rental as well as Contractor-owned equipment) shall be based on actual and verified rental company rates. Hourly, daily, weekly, or monthly rates shall be used, whichever is lower. Hourly rates including operator shall not be used. Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for determination of applicable rental rates.

(B) The actual time to be paid for equipment shall be the time that the equipment is in productive operation on the Work under Contract Modification. In computing the hourly rental of equipment, any time less than thirty (30) minutes shall be considered one-half (1/2) hour. No payment will be made for time while equipment is inoperative due to breakdown, or for non-workdays. In addition, the rental time shall not include the time required to move the equipment to and from the project site. No mobilization or demobilization will be allowed for equipment already on site. If such equipment is not moved by its own power, then loading and transportation costs will be paid in lieu of rental time thereof. However, neither moving time nor loading and transportation costs will be paid if the equipment is used on the Project Site in any other way than upon the work directly related to the Contract Modification.

5) Small Tools**.** Individual pieces of equipment having a replacement value of two thousand dollars ($2,000) or less shall be considered to be small tools or small equipment, and no payment will be made since the costs of these tools and equipment is included as part of the markup for overhead and profit defined herein.

6) Labor rates will not be recognized when in excess of the applicable prevailing wage rate pursuant to ORS 279C.800 to 279C.870 or wage established in any applicable collective bargaining agreement, whichever is higher. The costs for all supervision, including general superintendents and foreman, shall be included in the markup defined herein. Working foreman will be considered a direct cost if the individual is on the project site only installing Work under Contract Modification with no other work being performed at the time. A breakdown of the payroll rates for each trade used for Contract Modifications shall be furnished to the City within thirty (30) calendar days of the Contract Notice to Proceed.

7) Premium Time Rate. Shall be the difference between the Overtime Hourly Rate and Straight Time Rate per specific trade and classification as more fully defined herein. City will pay taxes on the Premium Time Rate only. The Premium Time Rate shall be paid without overhead and profit calculated against the differential.

8) Material costs directly required for the performance of the Contract Modification. Such costs may include the cost of transportation. If a trade reduction by an actual supplier is available to the Contractor, it shall be credited to the City. If the materials are obtained from a supplier or source owned wholly by or in part by the Contractor, payment thereof will not exceed the current wholesale price for the materials. The term trade reduction includes the concept of cash discounting.

9) Agreement on Change Order. Agreement on any Change Order is a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments to the Contract Total and the construction schedule.

10) Additional Credits. Contractor shall credit all trade discounts, rebates, refunds, and returns from the sale of surplus material to City

11) Cost Accounting Records. Contractor shall provide all cost accounting records to City upon City's request.

ii) Construction Change Directives. A Construction Change Directive is a written order signed by City, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Total or Contract Time, or both. City may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract, the Contract Total and Contract Time being adjusted accordingly. City and Contractor may use a Construction Change Directive in the absence of total agreement on the terms of a Change Order. Upon receipt of a Construction Change Directive, Contractor shall promptly proceed with the change in Work directed and shall advise City of Contractor's agreement or disagreement with the proposed method, if any, provided in the Construction Change Directive for adjustment in the Contract Total or Contract Time.

1) Force Account. When a definite price has not been agreed upon in advance and it is to be paid on a force account basis, City may establish a not-to-exceed budget. Contractor shall submit daily all direct costs necessarily incurred and paid for labor, material, equipment, permit fees, taxes, and increased costs of bonds and insurance related to the Work for approval by City. Contractor shall not exceed the budget unless City specifically authorizes the overrun in writing. City shall pay only for actual costs verified in the field by City on a daily basis. When City and Contractor reach agreement upon the adjustment for price and time, Contractor and City shall prepare and execute an appropriate Change Order.

2) Negotiating Changes. If City and Contractor are unable to agree upon change order terms, or if in the opinion of City the Work must proceed before an agreement can be negotiated, City may order Contractor to proceed with the changes, and Contractor shall comply. In such event, Contractor shall keep detailed daily records as to all labor employed in connection with the changes. Contractor's records will itemize costs for labor, materials, equipment rental, and transportation. Contractor shall submit the records for approval to the City. If Contractor fails to keep such records, all such Work will be deemed to have been performed at Contractor's own expense. City and Contractor shall attempt to negotiate fair and reasonable adjustments to the Contract for changes in the Work. Contractor shall submit to City all evidence in support of Contractor's proposals.

3) Markup. No fee or other markup of any kind will be applicable to any premium portion of wages, taxes, or related benefits. In the event of addition or deletion of like items in a change order or change directive, the like item quantity will be summed and the unit prices or the percentage fee will be applied to the total.

4) Written Authorization Required. In no event shall Contractor proceed with changes in the Work without a written order from City to so proceed. City will be under no obligation to pay for unauthorized extra, additional, or changed Work performed by Contractor without a written Change Order, Construction Change Directive, or other written order to proceed duly authorized and executed by City.

5) Minor Changes. Contractor shall promptly carry out minor changes in the Work issued through written order of City's representative, through the authority granted to it by City, not involving adjustment in the Contract Total or extension of the Contract Time, and not inconsistent with the intent of the Contract Documents.

VII) Time.

i) Time is of the Essence. Time limits stated in the Contract Documents are of the essence of the Contract. Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

ii) No Work Without Insurance. Contractor shall not, except by written direction by City, prematurely commence operations on the site or elsewhere prior to the effective date of insurance to be furnished by City and Contractor. The date of commencement of the Work is not changed by the effective date of insurance.

iii) Notice to Proceed. City shall issue a Notice to Proceed within a reasonable time following the date of execution of this Contract. To the maximum extent permitted by law, Contractor is not entitled to additional compensation as a result of a postponement of the issuance of Notice to Proceed. The Parties acknowledge the sole remedy for the Contractor in such circumstances is an extension of Contract Time to achieve Substantial Completion.

iv) Working Hours. Contractor shall perform Work during regular working hours as permitted by City. Contractor shall, when required to achieve Substantial Completion within the Contract Time, Work outside of regular working hours such as evenings and/or weekends at no additional cost to City. Contractor shall perform all evening and/or weekend work only upon City's advance approval and in compliance with all applicable rules, regulations, laws, and local ordinances including, without limitation, all noise and light limitations.

v) Delays and Extensions of Time.

1) Float and Slack. Float or slack is the amount of time between the early start date and the late start date, or the early finish date and the late finish date, of any activity in the schedule. Any float time to activities not on the critical path shall belong to the Project, and may be used by the Project to optimize its construction process. Any float time between the end of the final construction activity and the final completion date shall belong to the City, and may be used by the City in determining if additional contract days are to be awarded for changes in the contract or for delays to the contract caused by the City. The Contractor will not be entitled to any adjustment in the Contract Time, the Construction Schedule, or the Contract Total, or to any additional payment of any sort by reason of the City's use of float time between the end of the final construction activity and the final completion date or by reason of the loss or use of any float time, including time between the Contractor's anticipated completion date and end of the Contract Time, whether or not the float time is described as such on the Construction Progress Schedule.

2) Adverse Weather. Contract Time is determined with consideration given to the average climate weather conditions prevailing in the County in which the Project is located during any given month as published by the National Oceanic and Atmospheric Administration (NOAA) and averaged over the past 10 years. Contractor may request a time extension for adverse weather if it causes delays that unreasonably increase the labor required to complete the scheduled tasks on the day affected by adverse weather not reasonably anticipated. Contractor shall not be allowed an increase in Contract Total for the delay. Contractor shall work additional days if necessary at no cost to City, irrespective of adverse weather, to maintain access and the Contract Schedule, and to protect the Work from the effects of Adverse Weather.

3) Extensions of Time. Extensions of Contract Time will be permitted for a delay only to the extent the delay: (1) is not caused or could not have been anticipated by the Contractor; (2) could not be limited or avoided by the Contractor's timely notice to the City of the delay or reasonable likelihood that a delay will occur; and (3) is of a duration not less than one day.. Such occurrences may include industry-wide labor dispute, fire, unavoidable casualties, adverse weather conditions not reasonably anticipated, or other occurrences that City determines may justify delay. Any extension the City grants will be net of any delays caused by or due to the fault or negligence of Contractor, and net of any contingency or "float" allowance included in the Progress Schedule. Contractor will not be allowed an increase in Contract Total for an extension of Contract Time. The Contractor shall be deemed to have control over the supply of labor, materials, equipment, methods, techniques and over the Contractor's subcontractors and suppliers.

4) Requests for Extension. Contractor shall submit requests for extension of time in writing and shall include (a) the duration of the activity relating to changes in the Work and the resources, including manpower, equipment, and material, required to perform the activities within the stated duration; (b) specific logical ties to the Contract Schedule for the proposed change showing the activities that are affected by the change and/or delay; and (c) recovery schedule.

VIII) Protection of Persons, Property, and the Environment

i) Safety Program**.** Contractor shall initiate, maintain, and supervise all safety precautions and programs in connection with performance of the Contract. Contractor is solely and completely responsible for conditions of the Work site, including safety of all persons and property during performance of the Work, including the property of third-parties and real and personal property outside the Project area. This requirement will apply continuously and is not limited to normal working hours.

ii) City's Policies. This Contract and all individual contracts and purchase orders incorporate by this reference City's safety policies current as of the date of commencement of Work, which have been or will be made available to Contractor.

iii) Subcontractor Safety. Contractor shall review with all subcontractors the methods, materials, tools, and equipment to be used to verify their compliance with all safety standards and laws and Contractor shall comply with them, to ensure safe, hazard-free conditions for all persons visiting or working on the entire Project Site and City's adjoining facilities. Contractor shall implement and maintain a safety program that is specifically adapted for the Project and complies with all applicable requirements of Oregon OSHA. Contractor shall furnish a copy of the safety program to City before commencing Work.

iv) MSDS Sheets. Contractor shall provide Material Safety Data Sheets to City for all chemicals used on the Project Site as required by law.

v) Safety Coordinator. Contractor shall designate a responsible member of its organization on the Project, whose duty is to post information regarding protection and obligations of workers and other notices required under occupational safety and health laws, to comply with reporting and other occupational safety requirements, and to protect the life, safety, and health of workers. Contractor shall report the name and position of person so designated to City.

vi) Correction of Unsafe Conditions. Contractor shall correct any violations of safety laws, rules, orders, standards, or regulations. Contractor shall correct violations promptly upon the issuance of a citation or notice of violation by the Division of Occupational Safety and Health.

vii) Personal Protection Equipment. Contractor's personnel and all workers shall wear personal protective equipment at all times. Contractor shall maintain supplies of protective equipment sufficient to properly equip all employees and visitors.

viii) Safety Devices. Contractor shall take, and require subcontractors to take, all reasonably necessary precautions for safety of workers on the Project. Contractor shall furnish, erect, and properly maintain at all times, all necessary safety devices, safeguards, construction canopies, signs, nets, barriers, lights, and watchmen for protection of workers and the public and shall post danger signs warning against hazards created by such features in the course of the Work.

ix) Barricades and Signage. Contractor shall post necessary warning signs and barricades to ensure the safety of all occupants. Contractor shall not display any signs not required by law or the Contract Documents without City's prior written approval.

x) Labeling of Containers. Contractor shall ensure proper labeling of substances on the Project Site.

xi) Storage. Contractor shall confine apparatus, the storage of materials, and the operations of workers to limits indicated by law, ordinances, permits, or directions of City, and shall not interfere with the Work or unreasonably encumber the Project Site or overload any structure with materials. Contractor shall enforce all instructions of City regarding signs, advertising, fires, and smoking, and require that all workers comply with all regulations while on Project Site

xii) Protection of Work. Contractor shall protect the Work, including stored materials and equipment, from all damage or harm, including damage from heat, cold, rain, snow, wind, flooding, and dampness. Contractor shall provide and maintain temporary roofs, window and door coverings, enclosures, or other construction reasonably required to protect the Work at all times during the course of construction. Contractor shall take all additional steps reasonably necessary, or as directed by City, to protect the Project, the Site, and the Work from damage associated with anticipated extreme weather events. Contractor shall not be entitled to additional payment or time to the extent its costs or delays would have been avoided if Contractor had complied.

xiii) Protection of Existing Structures. Contractor shall protect existing structures, walks, curbs, pavements, roads, trees, landscaping, survey markers, monuments, or other devices marking property boundaries or corners, and/or improvements in working areas, utilities, and adjoining property (including, without limitation, protection from settlement or loss of lateral support). Contractor shall replace same at his expense with same kind, quality, and size of Work or item if temporary removal is necessary, or damage occurs due to the Work.

xiv) Water Quality. Contractor shall comply with all applicable water quality laws and regulations, including permitting, monitoring, and reporting of storm water discharge applicable to the Work, at no additional cost to City. Contractor shall indemnify and hold City harmless from loss, cost, or liability arising out of Contractor's violation of such laws or regulations.

xv) Neighborhood Impacts. Contractor shall take all reasonable precautions to protect neighborhood property from damage or nuisance associated with the Work. Contractor shall promptly respond to complaints by neighbors or authorities concerning impacts to neighboring properties and public facilities and shall be solely responsible for cleaning, repair, or replacement of property soiled or damaged by Contractor's operations and settlement of claims or demands of neighbors associated with conduct of its personnel.

xvi) Housekeeping. Contractor shall maintain good housekeeping practices to reduce the risk of fire damage and shall make a fire extinguisher, fire blanket, and/or fire watch, as applicable, available at each location where cutting, braising, soldering, and/or welding is being performed or where there is an increased risk of fire.

xvii) Security and Site Access. Contractor shall ensure that all existing or operating systems, utilities, existing on-site services and access avenues are on and in operating condition before leaving the Project Site each day. If any system, utility, or access avenue is not operable, Contractor shall notify City before Contractor leaves the Project Site that day.

IX) Hazardous Materials.

i) 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 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 shall submit to the City a list of all Hazardous Materials to be brought by the Contractor or its Subcontractors onto the City's property, including the purpose for their use on the Project.

ii) 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 shall immediately (a) stop the Work or the portion of the Work affected; (b) notify the City orally and in writing; and (c) protect against exposure of persons to the Hazardous Materials. The Contractor shall provide all written warnings, notices, reports, or postings required at law or by contract for the existence, use, release, or discovery of Hazardous Materials.

iii) With respect to any Hazardous Materials or other material or substance reported to the City under the above that was not introduced to the Project site by the Contractor or its Subcontractors of any tier, the City shall obtain the services of a qualified environmental consultant to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to verify it to be rendered harmless. Unless otherwise required by the Contract Documents, the City shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the City in writing stating whether or not either has reasonable objection to the persons or entities proposed by the City. If either the Contractor or Architect has an objection to a person or entity proposed by the City, the City shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the City and Contractor. By Change Order, the Contract Time may, subject to agreement by the City and the Contractor, be extended appropriately and the Contract Total shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up, which adjustments shall be accomplished as provided in the Contract.

iv) With respect to any Hazardous Materials or other material or substance reported to the City under the above that was introduced to the Project site by the Contractor or its Subcontractors of any tier, the Contractor shall be responsible to carry out the duties of (a) proposing to the City and the Architect a qualified environmental consultant; (b) obtaining and paying for the services of the environmental consultant; and (c) verifying that the material is rendered harmless, as otherwise set forth in the above. The Contractor will not be entitled to an increase in the Contract Total 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 the City. Generally, the City 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.

v) To the extent permitted by the Oregon Constitution and the Oregon Tort Claims Act, the City shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and the agents and employees of the Contractor, Subcontractors, Architect, and Architect's consultants 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 the City 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 the City or its agents or representatives.

vi) To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the City, the City's Representatives, and the employees of the Cityfrom 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 the City 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 the City's own negligence, but will require indemnity to the extent of the fault of the City or its agents or representatives.

vii) Hazardous Materials are 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 Article 9, 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.

X) Insurance and Bonds.

i) Contractor's Insurance. Contractor shall procure, prior to commencement of Work, and maintain for the duration of this Contract, or such longer time as may be provided, insurance against claims for injuries to persons or damages to property that may arise from or in connection with the performance of the Work by Contractor, its agents, representatives, employees and subcontractors as set forth in the Contract Documents. Contractor's liabilities, including but not limited to Contractor's indemnity obligations, under this Contract, will not be deemed limited in any way to the insurance coverage required herein. Maintenance of insurance coverage is a material requirement of this Contract and Contractor's failure to maintain or renew coverage or to provide evidence of renewal during the term of this Contract, as required or when requested, may be treated as a material breach.

ii) Performance Bond and Payment Bond. Contractor shall provide a performance bond and a payment bond as required by the Contract prior to start of Work.

XI) Uncovering and Correction of Work.

i) Uncovering of Work. If a portion of the Work is covered without Project Inspector and/or Architect approval or not in compliance with the Contract Documents, Contractor shall, if required in writing by City, Project Inspector, or Architect, uncover the Work for observation and replace it at Contractor's expense without change in Contract Total or Contract Time.

ii) Correction of Work. Contractor shall, at its own expense, promptly correct Work that is rejected by City, Architect, or any governmental authority or otherwise fails to conform to the requirements of the Contract Documents, regardless of when it is discovered and regardless of whether the Work is fabricated, installed or completed. Contractor shall pay for all additional testing, inspection, or other compensation including City and Architect's additional services required for the correction of Work.

iii) Correction of Work after Substantial Completion. If, after Substantial Completion, any Work is not in accordance with the requirements of the Contract Documents, City shall provide Contractor with written notice to correct the Work promptly after discovery of the condition. Contractor shall correct the nonconforming Work within a reasonable time after receipt of notice.

XII) Rights and Remedies.

i) No Waiver. The duties and obligations imposed by the Contract Documents and rights and remedies available are in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law. No action or failure to act by any party shall constitute a waiver of a right or duty afforded the party under this Contract, nor does any act or omission constitute approval of or acquiescence in a breach, except as may be specifically agreed in writing.

ii) Independent Contractor**.**

1) Contractor is engaged as an independent Contractor. Although City reserves the right: (a) to determine (and modify) the delivery schedule for the Work; and (b) to evaluate the quality of the completed performance, City cannot and will not control the means or manner of Contractor's performance, nor provide any tools or equipment for the performance of the Work, except as provided elsewhere in this Contract. Contractor shall determine the appropriate means and manner of performing the Work.

2) Contractor is wholly responsible for the manner in which it and its subcontractors perform the Work required of it by the Contract Documents. City may monitor Contractor's activities to determine compliance with the terms of this Contract.

3) Contractor shall pay all federal, state and local taxes applicable to compensation or payments paid to Contractor under this Contract and, unless Contractor is subject to backup withholding, City shall not withhold from such compensation or payments any amount(s) to cover Contractor's tax obligations.

4) Contractor is not an employee of the federal government or the State of Oregon.

5) Contractor is not a contributing member of the Public Employees Retirement System.

6) Neither Contractor, nor any of Contractor's subcontractors, agents or employees are "officers," "employees," or "agents" of City or any of City's employees or agents, as those terms are used in ORS 30.265. Contractor bears exclusive responsibility for the acts of its employees as they relate to the services to be provided during the course and scope of their employment. Contractor, its subcontractors, agents, and its employees are not entitled to any rights or privileges of City employees.

XIII) Compliance With Laws.

i) Contractor shall comply with all laws, codes, regulations, and applicable requirements imposed by governmental authorities having jurisdiction over the Work, including but not limited to, environmental, zoning, building code, public contracting, and other related laws.

ii) Environmental Mitigation. Contractor shall comply with all applicable mitigation measures, if any, adopted by any public agency with respect to this Project pursuant to the environmental protections laws of the State of Oregon.

iii) Work Performed Illegally. Contractor will bear all costs arising from Work performed that it knew, or through exercise of reasonable care should have known, was contrary to any applicable laws, ordinance, rules, or regulations.

iv) Prior Approvals. Contractor shall obtain approval of material, processes, or procedures by the Oregon state agencies or other body or agency where required by the Specifications or Drawings.

XIV) Claims and Disputes.

i) Claim. A Claim is a demand or assertion by a party seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time, or other relief with respect to the terms of the Contract. Claim includes other disputes and matters in question between City and Contractor arising out of or relating to the Contract. Parties will initiate Claims only by written notice. The party making the Claim is responsible for substantiating the Claim.

ii) Time to Initiate Claim. The party making a Claim shall initiate the Claim within fourteen (14) days after the occurrence of the event giving rise to such Claim or within fourteen (14) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. The party making the Claim shall submit written notice to the other party that identifies the known bases for each Claim and the nature and amount of relief sought.

iii) Written Notice of Claim. If Contractor claims that any instructions issued after the effective date of this Contract, by Drawings or otherwise, involve extra costs, Contractor will be entitled to reimbursement for such extra costs only to the extent Contractor so notifies City in writing before proceeding to execute the affected Work and within five (5) days after receipt of such instructions. Claims and demands for any other cause, whatsoever, by Contractor against City must be served in writing upon City within five (5) days from the occurrence of the cause giving rise to the claim. Timely compliance with the written claim requirements of this Contract is a condition precedent to Contractor's right to payment on account of any claim and failure to provide such written claim or demand or notice will constitute a waiver of such claim.

iv) No Work Stoppage. Contractor shall proceed diligently with performance of this Contract and City shall continue to make payments in accordance with the Contract Documents pending final resolution of a Claim, except as otherwise agreed in writing or provided for in this Contract.

v) Differing Site Conditions. A party shall give notice to the other party promptly, and in no event later than five (5) days after first observation, before conditions encountered at the site are disturbed that are: (a) subsurface or otherwise concealed physical conditions that differ materially from those indicated on the Contract Documents; or (b) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents. The parties shall promptly investigate such conditions, and if they differ materially and cause an increase or decrease in the cost of or time required for performance of any part of the Work, City will propose an equitable adjustment in the Contract Total, Contract Time, or both. If City does not find that the conditions differ materially and cause an increase or decrease in the cost of or time required for performance of any part of the Work, City will notify Contractor in writing. If Contractor disputes City's determination, Contractor shall proceed with the Work and may initiate a Claim no later than twenty one (21) days after receiving notice of the decision.

vi) Claim for Additional Cost. Contractor shall file a Claim for additional cost under this section if Contractor believes additional cost is involved for reasons including: (a) City's written interpretation of the Contract Documents; (b) City's order to stop Work where Contractor is not at fault; (c) written order for a minor change in Work issued by City's consultant or representative; (d) failure of payment by City; (e) termination of Contract by City; (f) City's suspension; or (g) other reasonable grounds.

vii) Claim for Delay. If Contractor wishes to make a Claim for a delay, written notice shall be given within fourteen (14) calendar days of the occurrence of the event giving rise to the delay. Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary. Contractor will not be entitled to additional Contract Time for delays that do not affect the critical path of the Work.

viii) Claim for Additional Time (Adverse Weather). If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction. Contractor shall not be entitled to additional compensation for delays caused by adverse weather conditions or any causes beyond City's control. If the Oregon Office of Emergency Management orders Contractor to halt the Work for reasons beyond Contractor's control and that were not reasonably anticipated, the Contract Time shall be equitably extended by Change Order, but only on condition that Contractor provides City with written notice of the delay in accordance with the notice requirements of this Contract.

ix) Claim for Injury or Damage to Person or Property. If any person suffers physical injury or property damage arising from the Work, regardless of the cause, the party shall immediately give notice of such injury or damage, whether or not insured, to City and Contractor with sufficient detail to enable City and any other party affected to investigate the matter.

x) Acceptance of Claim. Upon timely receipt of a properly completed Claim and all documentation and/or evidence necessary to substantiate the Claim, City shall evaluate the Claim and provide Contractor with its written decision either accepting the Claim (in whole or in part) or rejecting the Claim (in whole or in part) within twenty (20) days. Should City reject the Claim in whole or in part, City shall generally explain the reasons for such rejection.

xi) Mediation. Contractor and City agree that any dispute that may arise under the Contract will be submitted to a mediator agreed to by both parties as soon as such dispute arises, but in any event prior to commencement of arbitration or litigation. This provision shall be specifically enforceable in any arbitral or judicial proceeding through stay or abatement of the proceeding upon petition of a party. Mediation shall be conducted in Portland, Oregon, and the mediation fee and expenses shall be shared equally by the parties who agree to exercise their best efforts in good faith to resolve all disputes in mediation.

XV) Termination or Suspension by Contractor.

i) Termination by Contractor for Work Stoppage. Contractor may terminate this Contract if the Work is stopped for a period of thirty (30) consecutive days through no act or fault of Contractor, subcontractor, or sub subcontractor, or their agents or employees, or any other persons or entities performing portions of the Work under direct or indirect contract with Contractor, for any of the following reasons: (a) issuance of an order of a court or other public authority having jurisdiction which requires all Work to be stopped; (b) an act of government, such as a declaration of a national emergency which requires all Work to be stopped; (c) because the Architect has not issued a Certificate of Payment and has not notified Contractor of the reason for withholding certification, or because City has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or (d) City failed to furnish to Contractor reasonable evidence that financial arrangements have been made to fulfill City's obligations under this Contract.

ii) Termination by Contractor for Work Interruption. Contractor may terminate this Contract if, through no act or fault of Contractor, subcontractor, or sub subcontractor, or their agents or employees, or any other persons or entities performing portions of the Work under direct or indirect contract with Contractor, repeated suspensions, delays or interruptions of the entire Work by City constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365 day period, whichever is less, or if Work is stopped for a period of sixty (60) consecutive days.

iii) Compensation. Contractor may recover from City payment for Work executed and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery including reasonable profit and overhead if it provides seven (7) days' written notice to Architect and City prior to termination for the reasons set forth above.

XVI) Termination or Suspension by City.

i) Termination by City for Cause. City may terminate Contract and/or terminate Contractor's right to perform the Work of this Contract without prejudice to any other rights or remedies by providing seven (7) days' written notice to Contractor and Contractor's surety if Contractor:

1) refuses or fails to execute the Work or any separable part with sufficient diligence to ensure its completion within the time specified or any extension;

2) persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

3) fails to make payment to subcontractors in accordance with respective agreements;

4) persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction;

5) files a petition for relief as a debtor, or a petition is filed against Contractor without its consent, and the petition is not dismissed within sixty (60) days;

6) makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency; or

7) is otherwise guilty of a substantial breach of a provision of the Contract Documents or fails to observe the training, safety, and other precautions including City's policies and Contractor's own safety policies for the Project.

ii) City's Right to Take Possession. Upon termination for cause, City may take possession of the site and of all materials, equipment, tools, and construction equipment and machinery on the site owned by Contractor, accept assignment of subcontracts, and finish the Work by whatever reasonable method City may deem expedient. Upon request, City shall provide Contractor a detailed accounting of the costs incurred in finishing the Work.

iii) Compensation. Contractor will not be entitled to receive further payment until the Work is finished. If the unpaid balance of the Contract Total exceeds City's costs to finishing the Work, including compensation for City's consultants and representatives for services made necessary by Contractor's default, and other damages incurred by City which have not been expressly waived, City shall pay the excess to Contractor. If City's costs and damages exceed the unpaid balance, Contractor shall pay the difference to City.

iv) Suspension for Convenience. City may, without cause, order Contractor in writing to suspend, delay, or interrupt the Work in whole or in part for such period of time as City may determine. City shall adjust Contract Total and Contract Time for increases in the cost (including profit) and time caused by the suspension, delay, or interruption referenced in Section 16.3.1, so long as the performance would not have been suspended, delayed, or interrupted by another cause for which Contractor is responsible and City has not already made or denied another equitable adjustment under another provision of this Contract for the suspension, delay, or interruption.

v) Termination for Convenience. City may terminate all or part of this Contract for City's convenience at any time and without cause. Contractor shall, upon written notice of such termination, cease operations as directed by City, take actions necessary to protect and preserve the Work, and terminate all existing subcontracts and purchase orders that are not required to perform the Work up to the effective date of termination and the portion of Work not terminated, and enter into no further subcontracts or purchase orders for the portion of this Contract that was terminated. City shall pay Contractor for Work executed and costs reasonably incurred by reason of such termination, along with reasonable overhead and profit on the Work completed. City will not pay profit or overhead allocable to Work which is not performed at the time of termination. If the City terminates Contractor for cause and a court or other tribunal finds that City did not have cause to terminate Contractor, then the court or other tribunal will deem the City's termination a termination for convenience under this section.

XVII) Payments and Completion

i) Contract Total. The Contract Total is stated in the Contract, and including authorized adjustments, is the total amount payable by City to Contractor for performance of Work under the Contract Documents.

ii) Schedule of Values. Prior to submission of the first Application for Payment, Contractor shall submit a preliminary schedule of values for all of the Work, including quantities and prices of items aggregating the Contract Total and subdividing the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Contractor shall include, at a minimum: (a) overhead and profit; (b) supervision; (c) general conditions; (d) layout; (e) mobilization; (f) scheduling; (g) submittals; (h) bonds and insurance; (i) close-out documentation; (j) demolition; (k) installation; (l) rough-in; (m) finishes; (n) testing; and (o) punch list and acceptance ("Schedule of Values").

iii) Applications for Payment. Contractor shall submit an itemized and notarized application for payment for operations completed in accordance with the Schedule of Values and reflecting applicable retainage ("Application for Payment"). Applications for Payment shall be prepared using forms provided by the City. Contractor shall submit data substantiating Contractor's right to payment where required, such as copies of requisitions from subcontractors and material suppliers, Construction Change Directives, Change Orders, and/or force account information. Contractor shall provide:

1) The amount paid to the date of the Application for Payment to Contractor, all its subcontractors, and all others furnishing labor, material, or equipment for this Contract;

2) The amount being requested by Contractor on its own behalf and separately stating the amount requested on behalf of each of the subcontractors and all others furnishing labor, material, or equipment for this Contract;

3) The balance that is due to each of such entities after payment is made;

4) Certification that the Record Documents are current;

5) Itemized breakdown of Work done for the purpose of requesting partial payment;

6) Updated construction schedule;

7) Additions and subtractions from the Contract Total and Contract Time;

8) Total of retainage held;

9) Material invoices, evidence of equipment purchases, rentals, and other support City may request;

10) Percentage complete of Contractor's Work by line item;

11) A Schedule of Values updated from the preceding Application for Payment; and

12) Contractors' Certified Payroll.

iv) Waivers and Releases. Contractor shall submit conditional waivers and releases upon progress payment from Contractor and each subcontractor of any tier and supplier to be paid from current progress payment along with an unconditional waiver and release upon progress payment from Contractor and each subcontractor of any tier that received payment from the previous progress payment. Contractor shall certify as follows: "Contractor warrants title to all Work performed and materials purchased as of the date of the payment application; and Contractor warrants that all Work performed and materials purchased as of the date of the payment application are free and clear of liens, claims, security interests, or encumbrances in favor of any persons or entities making a claim by reason of having provided labor, materials, or equipment relating to the Work, except those of which City has been informed."

v) False Claims. Contractor is subject to the False Claims Act set forth under ORS Chapter 180 for information provided with any Application for Payment.

vi) Certificates for Payment**.**

1) City shall review the Contractor's Application for Payment within a reasonable time after receipt not to exceed seven (7) days for the purpose of determining that it is properly submitted. City shall either return the Application for Payment to Contractor with a document setting forth the reasons why the Application for Payment is not proper, or shall issue a Certificate for Payment for the amounts properly due.

2) City's issuance of a Certificate for Payment is a representation by City, based upon City's evaluation of the Work and the data comprising the Application for Payment, that Contractor is entitled to payment in the amount certified because the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. City's approval of the certified Application for Payment is based on Contractor complying with all requirements for a fully complete and valid certified Application for Payment.

vii) Decisions to Withhold Certification**.**

1) City shall notify Contractor in writing if any amounts are not due, and the reasons for withholding certification in whole or in part. If Contractor and City cannot agree on a revised amount, City shall promptly issue a Certificate for Payment for the amount for which City determines that Contractor is entitled to payment. City may withhold Certificate for Payment or nullify the whole or part of a Certificate for Payment previously issued, to such extent as may be reasonably necessary to protect City from loss for which Contractor is responsible, including loss resulting from acts and omissions because of defective Work not remedied, third party claims filed or reasonable evidence indicating probable filing of such claim unless security acceptable to City is provided by Contractor, failure of Contractor to make payments properly to subcontractors or for labor, materials, or equipment, reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Total, damage to City or another contractor, reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay, persistent failure to carry out the Work in accordance with the Contract Documents, or failure to maintain Record Documents.

2) Contractor shall not receive any interest on any retainage or amounts withheld due to the failure of Contractor to perform in accordance with the Contract Documents.

3) City may apply any withheld amount to pay outstanding claims or obligations on behalf of Contractor, without prior judicial determination of the claim or obligation. If any payment is made by City, that amount is deemed a payment made under this Contract by City to Contractor.

4) City shall promptly issue a Certificate for Payment for amounts previously withheld when the reasons for withholding certification are removed.

viii) Progress Payments**.**

1) City shall make payment in the manner and within the time provided in the Contract Documents. City may withhold the portion of any progress payment for which certified payroll statements have not been received until such certified statements are submitted.

2) Contractor shall promptly pay each subcontractor, upon receipt of payment from City, out of the amount City paid to Contractor on account of each subcontractor's portion of the Work. Contractor shall, by written agreement, require each subcontractor to make payments to sub-subcontractors in a similar manner.

3) City may issue joint checks made payable to Contractor, subcontractor(s) and material or equipment suppliers. Joint check payees are responsible for the allocation and disbursement of funds included as part of any such joint check payment. Joint check payment does not create a contract, rights, or obligations between City and any subcontractor or material or equipment supplier.

4) Certificate for Payment, progress payment, or partial or entire use or occupancy of the Project does not constitute acceptance of Work not in accordance with the Contract Documents.

ix) Substantial Completion**.**

1) Substantial Completion. Substantial completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that City can occupy or utilize the Work for its intended purpose.

2) Punch List. When Contractor considers the Work or a designated portion of the Work to be substantially complete, Contractor shall prepare and submit to City a comprehensive list of items to be completed or corrected prior to final payment ("Punch List"). The Punch List does not alter Contractor's responsibility to complete the Work in accordance with the Contract Documents.

3) Certificate of Substantial Completion. Upon receipt of Contractor's Punch List, City shall make an inspection to determine whether the Work or designated portion thereof is substantially complete. If City determines that the Work is not substantially complete, City shall notify Contractor of any Work to be completed in accordance with the Contract Documents before the Work or designated portion can be certified as such, and Contractor shall complete all such items. Upon determining that the Work or designated portion thereof is substantially complete, City and Contractor shall execute a Certificate of Substantial Completion.

4) Commencement of Warranty. Contractor's general and special warranties shall be effective as of the date that the Work is deemed finally complete.

5) Close-Out Documentation. Contractor shall assemble for City's approval within thirty (30) days of Substantial Completion all close-out documentation as required by the Contract Documents, including the required number of copies of operating, maintenance, and warranty data from all manufacturers whose equipment is installed in the Work, and Record Documents of the Work.

x) Final Completion**.**

1) The Work will be deemed finally complete when all conditions set out in the Contract Documents are satisfied and City accepts such Work. Final completion is achieved when all punchlist work is complete, all close-out documentation has been received, all final testing, equipment calibration and training have been completed, and the Contractor is entitled to Final Payment. Unless special circumstances exist that are defined at the time of Punch List creation, Contractor shall achieve Final Completion within 45 days of Substantial Completion.

2) Final Inspection. When Contractor considers all of the Punch List Work to be complete, Contractor shall notify City which shall inspect such Work.

3) Final Application for Payment. If City finds the Punch List Work complete and acceptable under the Contract Documents, City shall notify Contractor, who shall then submit its Final Application for Payment.

4) Payment of Retainage. City shall make payment of retainage applying to such Work or designated portion thereof after receiving all Close Out Documentation, an affidavit that bills for indebtedness connected with the Work for which City's property might be encumbered have been satisfied; a certificate to indicate that insurance required by the Contract Documents shall remain in force after final payment is in effect and will not be cancelled or expire until thirty (30) days' prior written notice is given to City and that Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents; the consent of surety to final payment; and valid waivers of all construction lien claims, bond claims, and other claims by Contractor and each subcontractor in a form acceptable to City.

5) Bond in Lieu of Waiver. If a subcontractor refuses to furnish a release or waiver required by City, Contractor may furnish a bond satisfactory to City to indemnify City against such lien. If such lien remains unsatisfied after payments are made, Contractor shall refund to City all money that City may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

6) Delay in Final Completion. City shall make payment of the balance due for any portion of the Work fully completed and accepted if final completion is materially delayed through no fault of Contractor or by issuance of Change Orders affecting final completion. In the event that final completion is not accomplished within thirty (30) days after the date of Substantial Completion due to any fault of Contractor, City may withhold from the final payment 150 percent of the reasonable cost to complete the unfinished Work and to attain final completion. In the event Contractor fails to complete the Work necessary to attain final completion after forty five (45) days from Substantial Completion, City may, without waiving other remedies it may have, complete the Work and deduct the actual cost thereof from the funds withheld.

7) Contractor's Waiver of Claims. Contractor's acceptance of final payment constitutes a waiver of claims except those previously made in writing and identified by Contractor as unsettled at the time of final Application for Payment.

XVIII) Indemnity and Liability.

i) To the fullest extent permitted by Oregon law, Contractor shall indemnify, defend with legal counsel reasonably acceptable to City, and hold harmless City and its consultants and separate contractors, and their respective council members, board members, officers, representatives, agents, trustees, volunteers, and employees, in both individual and official capacities ("Indemnitees"), against all suits, claims, damages, losses, and expenses, including but not limited to attorney's fees, caused by, arising out of, resulting from, or incidental to, the performance of the Work under this Contract by Contractor, its subcontractors, vendors, or suppliers, including, without limitation, any such suit, claim, damage, loss, or expense attributable to, without limitation, bodily injury, sickness, disease, death, alleged patent violation or copyright infringement, or to injury to or destruction of tangible property (including damage to the Work itself) including the loss of use resulting therefrom, except to the extent caused by the sole negligence, active negligence, or willful misconduct of the Indemnitees, and/or to any extent that would render these provisions void or unenforceable. This agreement and obligation of Contractor will not be construed to negate, abridge, or otherwise reduce any right or obligation of indemnity that would otherwise exist as to any party or person described herein. This indemnification, defense, and hold harmless obligation includes any failure or alleged failure by Contractor to comply with any provision of law, any failure or alleged failure to timely and properly fulfill all of its obligations under the Contract Documents in strict accordance with their terms.

ii) Contractor shall fully indemnify, defend, and hold harmless City, and each person, entity, firm, or agency that owns or has any interest in adjacent property in any action arising out of any agreement between Contractor and adjacent property owners that is made for the purpose of entering upon the adjacent property to perform the Work. Contractor shall obtain City's approval of the form and content of the agreement prior to the commencement of any Work on or about the adjacent property.

iii) Severability of Indemnity Provisions. Contractor shall give prompt notice to City in the event of any injury (including death), loss, or damage included herein. Without limitation of the provisions herein, if Contractor's agreement to indemnify, defend, and hold harmless the Indemnitees as provided herein against liability for damage arising out of bodily injury to persons or damage to property caused by or resulting from the negligence of any of the Indemnitees will to any extent be or be determined to be void or unenforceable, it is the intention of the parties that these circumstances will not otherwise affect the validity or enforceability of Contractor's agreement to indemnify, defend, and hold harmless the rest of the Indemnitees, as provided herein, and in the case of any such suits, claims, damages, losses, or expenses caused in part by the default, negligence, or act or omission of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, and in part by any of the Indemnitees, Contractor shall be and remain fully liable on its agreements and obligations herein to the full extent permitted by law.

iv) In any and all claims against any of the Indemnitees by any employee of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, Contractor's indemnification obligation herein shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts, unless it is limited by ORS 30.140.

v) Contractor's defense and indemnification obligations survive the completion of Work, including any warranty period and/or termination of this Contract.

XIX) *Security*

i) Security. Contractor shall not use or disturb City's property, materials or documents except for the purpose of responding to City's request for proposal or invitation to bid or pursuant to completion of the Work under this Contract. Contractor shall treat all documents as confidential and shall not disclose such documents without approval from City. Any unauthorized disclosure of documents or removal of City property will be deemed a substantial breach of this Contract. Contractor shall bear sole responsibility for any liability including, but not limited to, attorneys' fees, resulting from any action or suit brought against City as a result of Contractor's willful or negligent release of information, documents, or property contained in or on City property. City hereby deems all information, documents, and property contained in or on City property privileged and confidential.

ii) Employee Removal. At City's request, Contractor shall immediately remove any employee from all City properties in cases where City determines in its sole discretion that removal of that employee is in City's best interests.

XX) Miscellaneous Provisions.

i) Non-Appropriation; Adequate Funding. City shall, at Contractor's written request, prior to commencement of Work, provide Contractor with reasonable evidence that financial arrangements have been made to fulfill City's obligations under the Contract. If payment for Work under this Contract extends into City's next fiscal year, City's obligation to pay for such Work is subject to approval of future city council appropriations to fund this Contract. Continuation of this Contract at specified levels is specifically conditioned on adequate funding under City's budget adopted in June of each year. City may adjust the Work provided for in this Contract in accordance with funding levels adopted by the City Council.

ii) Law and Venue. Any dispute under this Contract or related to this Contract is governed by all provisions of the Oregon Constitution and laws of Oregon governing, controlling, or affecting City, or the property, funds, operations, or powers of City, which are incorporated herein by reference. This Contract is deemed to include any provision that the law requires to be included. Any litigation arising out of this Contract shall be conducted in in the Circuit Court for Washington County, Oregon. The Contractor consents to the personal jurisdiction of this court.

iii) Severability. If any term or provision of this Contract is declared by a court of competent jurisdiction to be illegal or in conflict with any law, the validity of the remaining terms and provisions are not affected, and the rights and obligations of the parties are construed and enforced as if this Contract did not contain the particular term or provision held to be invalid.

iv) No Waiver. The failure of City in any one or more instances to insist upon strict performance of any of the terms of this Contract or to exercise any option herein conferred is not a waiver or relinquishment to any extent of the right to assert or rely upon any such terms or option on any future occasion. No action or failure to act by City, Architect, or Construction Manager waives any right or duty afforded City under this Contract, nor does action or failure to act constitute an approval of or acquiescence in any breach, except as specifically agreed in writing.

v) Non-discrimination. Contractor shall comply with all applicable federal, state and local laws, rules and regulations regarding nondiscrimination in employment because of race, color, ancestry, national origin, religion, sex, marital status, age, medical condition, or disability.

vi) No Third Party Beneficiaries. City and Contractor are the only parties to this Contract and are the only parties entitled to enforce its terms. Nothing in this Contract provides any benefit or right, directly or indirectly, to third persons unless they are individually identified by name in this Contract and expressly described as intended beneficiaries of this Contract. The Contract Documents shall not be construed to create a contractual relationship of any kind: (a) between Contractor and City's representatives or consultants, (b) between City and a subcontractor or a sub-subcontractor, (c) between City and a supplier; or (d) between any persons or entities other than City and Contractor.

vii) Media Contacts. Contractor shall issue no news release, press release, or other statement to members of the news media or any other publication regarding this Agreement or the Project within one (1) year of Project completion without City's prior written authorization. Contractor shall not post or publish any textual or visual representations of the Project without approval of City.

viii) Successors in Interest. This Contract will bind, and inure to the benefit of, the parties, their successors, and approved assigns, if any.

1) Contractor shall not assign all or any part of this Contract including, without limitation, any services or money to become due under this Contract without the prior written consent of City. Assignment without City's prior written consent is null and void. Any assignment of money due or to become due under this Contract is subject to a prior lien for services rendered or material supplied for performance of Work called for under this Contract in favor of all persons, firms, or corporations rendering services or supplying material to the extent that claims are filed pursuant to Oregon law, and is also subject to deductions for liquidated damages or withholding of payments as determined by City in accordance with this Contract. Contractor shall not assign or transfer in any manner to a subcontractor or supplier the right to prosecute or maintain an action against City.

2) Contractor shall first notify City prior to any change in the name or legal nature of Contractor's entity. City shall determine if Contractor's intended change is permissible while performing this Contract.

ix) Liquidated Damages.

1) Failure to complete the Project by the specified time will result in damages to the City. The parties to this contract agree that establishing the exact amount of damages the City will incur will be difficult. In order to compensate the City, the parties to this contract have estimated the amount the City would be damaged for every calendar day completion is delayed. Consequently, the Contractor agrees to pay the City the sum of $ per day, not as a penalty but as liquidated damages, for each day elapsed beyond the Substantial Completion date set forth in the bid document. The total liquidated damages shall be deducted from the final payment due the Contractor. The City may waive its right to claim part or all of the liquidated damages due under this provision, but such full or partial waiver shall not negate or abridge any other right of action the City may have to enforce the provisions of this Contract. Contractor will not contest such sums as being other than a reasonable measure of delay damages in the event those damages become payable under these provisions.

x) Workers' Compensation.

1) All employers, including Contractor, that employ subject workers who work under this contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. This shall include Employer's Liability Insurance with coverage limits of not less than $1,000,000 for each accident. Contractors who perform the Work without the assistance or labor of any employee need not obtain such coverage if the Contractor certifies so in writing. Contractor shall ensure that each of its Subcontractors complies with these requirements. The Contractor shall require proof of such Workers' Compensation by receiving and keeping on file a certificate of insurance from each Subcontractor or anyone else directly employed by either the Contractor or its Subcontractors.

EXHIBIT B

CITY OF HILLSBORO, OREGON
PUBLIC IMPROVEMENT CONTRACT
INSURANCE REQUIREMENTS

1. Contractor shall maintain all insurances required of it by law. In addition, the Contractor shall maintain the following:

a. **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 shall be rated A VII or better by A.M. Best's rating service, unless otherwise approved by the City.

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

2. Employer's Liability. The Contractor shall purchase and maintain employer's liability insurance in addition to its workers' compensation coverage with at least the minimum limits in section **b.** below.

3. Commercial General Liability. The Contractor shall purchase and maintain commercial general liability ("CGL") insurance for off-site exposures on an occurrence basis, written on ISO Form CG 00 01 (12/04 or later) or an equivalent form approved in advance by the City. CGL coverage shall include all major coverage categories including bodily injury, property damage and products/completed operations coverage. The CGL insurance will also include the following: (1) separation of insureds; (2) incidental medical malpractice; and (3) per-project aggregate for premises operations.

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

5. Automobile Liability. The Contractor shall 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 City. The automobile liability insurance shall include pollution liability coverage resulting from vehicle overturn and collision.

b. **Limits.** The insurance required by this exhibit shall be written for at least the limits of liability specified in this Section or required by law, whichever is greater.

Workers' Compensation.	Statutory Limits
Employer's Liability.	
Each Accident:	$1,000,000
Each Bodily Injury Disease:	$1,000,000
Aggregate Bodily Injury Disease:	$1,000,000
Commercial General Liability.	
Each Occurrence:	$1,000,000
General Aggregate:	$2,000,000
Product/Completed Operations:	$2,000,000
Personal & Advertising Injury:	$1,000,000
Fire Damage Limit:	$100,000
Medical Expense Limit:	$5,000
Automobile Liability.	
Combined Single Limit:	$1,000,000

Professional Liability/Errors & Omissions.

Single Limit:	$1,000,000
Aggregate:	$1,000,000

c. **Additional Insureds.** The Contractor's third-party liability insurance policies shall include the City and its officers, employees, and agents as additional insureds. The policy endorsement must extend premises operations and products/completed operations to the additional insureds. The additional insured endorsement for the CGL insurance must be written on ISO Form CG 20 10 (11/85), a CG 20 37 (07/04) together with CG 20 33 (07/04), or the equivalent; but shall not use the following forms: CG 20 10 (10/93) or CG 20 10 (03/94).

d. **Joint Venture.** If the Contractor is a joint venture, the joint venture shall be a named insured for the liability insurance policies.

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

f. **Contractor's Failure to Maintain Insurance.** If the Contractor for any reason fails to maintain required insurance coverage, such failure shall be deemed a material breach of the Contract and the City, at its sole discretion, may suspend or terminate the Contract pursuant to Section 108.11 of the General Conditions. The City may, but has no obligation to, purchase such required insurance, and without further notice to the Contractor, the City may deduct from the Contract Total any premium costs advanced by the City for such insurance. Failure to maintain the insurance coverage required by this exhibit shall not waive the Contractor's obligations to the City.

g. **Certificates of Insurance**. Prior to commencement of the Work, and before bringing any equipment or construction equipment on to the project site, the Contractor shall provide Certificates of Insurance, to the City Representative, for the insurance policies required by this contract.

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

2. Prohibition Until Certificates Received. The City shall 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 exhibit) are received and approved by the OCIP Administrator and or City.

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

h. **Subcontractors Insurance.** The Contractor shall cause each Subcontractor to purchase and maintain in full force and effect policies of insurance as specified in this exhibit, except for coverage limits, which will be agreed upon between the City and the Contractor. The Contractor will be responsible for the Subcontractors' coverage if the Subcontractors fail to purchase and maintain the required insurance. When requested by the City, the Contractor will furnish copies of certificates of insurance establishing coverage for each Subcontractor.

i. **Limitations on Coverage.**

1. No insurance provided by the Contractor under this exhibit will be required to indemnify the City, 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.

2. The obligations of the Contractor under this exhibit shall not extend to the liability of the Architect or its consultants for (1) the preparation or approval of maps, Drawings, opinions, reports, surveys, Change Orders, designs, or specifications, or (2) 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.

3. By requiring insurance, the City 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 City for claims or suits that result from or are connected with the performance of the Contract.

2. PROPERTY INSURANCE:

a. Builder's Risk: (For new construction or building additions) During the term of this Contract, the Contractor shall maintain in force, at its own expense, Builder's Risk insurance on an all risk form, including earthquake and flood, for an amount equal to the full amount of the Contract. Any deductible shall not exceed $50,000 for each loss, except the earthquake and flood deductible shall not exceed 2 percent of each loss or $50,000, whichever is more. The policy will include as loss payees the City, the Contractor and its Subcontractors as their interests may appear.

b. Builder's Risk Installation Floater: (For other than new construction) The Contractor shall obtain, at the Contractor's expense, and keep in effect during the term of this Contract, a Builder's Risk Installation Floater for coverage of the Contractor's labor, materials and equipment to be used for completion of the Work performed under this Contract. The minimum amount of coverage to be carried shall be equal to the full amount of the Contract. This insurance shall include as loss payees the City, the Contractor and its Subcontractors as their interests may appear.

c. Such insurance shall be maintained until the City has occupied the facility.

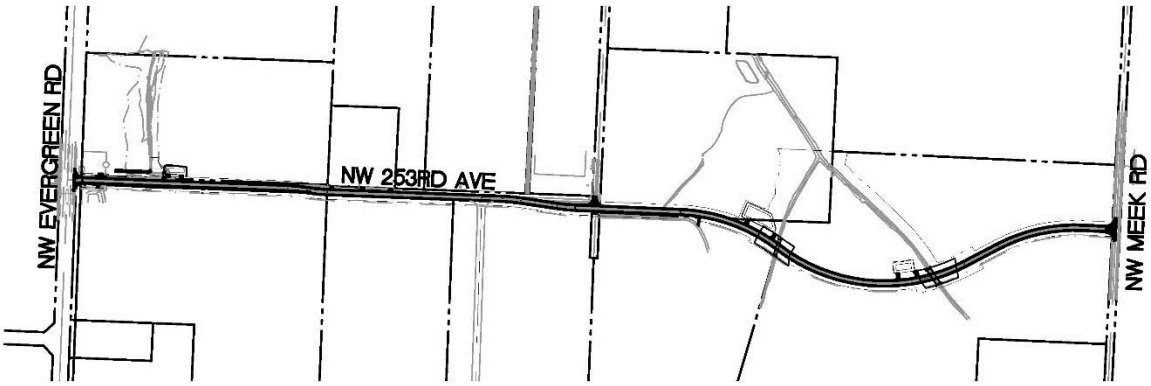
d. Contractor must provide insurance for its own machinery, tools, equipment, or supplies that are not to become a part of the Project.

DATE ISSUED: 5/8/15 **DOCUMENT NUMBER**:_____

BOOK 2 OF 2

OF THE BID DOCUMENTS

FOR:



NW 253rd Avenue Improvements and Extension

Grading, Drainage, Asphalt, Concrete Paving, Signing, Striping and Structures

Special Provisions

BID NUMBER: 10705

A CITY OF HILLSBORO
PUBLIC WORKS, ENGINEERING DIVISION
PUBLIC IMPROVEMENT PROJECT

7/2015

BOOK 2

TABLE OF CONTENTS

PART 4.0 – PROJECT INFORMATION

WORK TO BE DONE

The Work to be done under this Contract consists of the following on NW 253rd Avenue between NW Evergreen and NW Meek in Hillsboro, Oregon:

1. Construct Roadway Improvements including Concrete Road, Asphalt Road, Curb, and Sidewalk
2. Construct Storm Drainage Improvements.
3. Install Landscaping
4. Structures (Culverts)
5. Water Quality/Detention Facilities
6. Perform additional and incidental Work as called for by the Specifications and Plans.

Note : Construction of the NW 253rd Avenue project as shown in the construction plans is dependent on the acquisition of right-of-way from two adjacent property owners. The City anticipates that this acquisition will occur by July 15, 2015 and work on those properties will be allowed to go forward.

In the event that these rights-of-way are not acquired by July 15th, the following portions of the project could potentially be delayed.

- All work north of station 47+00. This includes the two creek crossings, fills, and mitigation area.
- Work on the east side of NW 253rd Avenue would be limited to that which could be done within the existing right-of-way (20 feet from centerline) from Evergreen Road to Station 23+50.

All other work could be initiated in as much as it does not require trespass on the two areas listed above.

The City recognizes that construction of this project is highly weather dependant. To facilitate the construction of the creek crossings prior to the start of the 2015 fall rains, the City has already ordered the precast arches, footings, headwalls, and wing walls to be used for the two creek crossings from Contech Engineered Solutions. Additional information regarding the installation of these culverts can be found on Contech's web site. These precast materials are currently being stored in East Wenatchee, Washington. The contractor will be responsible to arrange for shipping and delivery. Shop drawings for the two culverts have been included in the bid package to provide bidders information regarding the size and type of materials to be installed.

In the event that right-of-way acquisition delays prevent the installation of the culverts prior to the start of fall rains, the project schedule will be adjusted accordingly taking into account DSL and Army Corp permit conditions for work in the vicinity of the creeks. Said permits are available for review upon request.

APPLICABLE SPECIFICATIONS

The Technical Specification (referred to hereafter as "Standard Specifications") that is applicable to the Work on this Project are the 2008 edition of the Oregon Standard Specifications for Construction, Volume 1 and Volume 2 except where superseded by City of Hillsboro Standard Contract Provisions and the City of Hillsboro Design & Construction Standards.

All number references in these Special Provisions shall be understood to refer to the Sections and subsections of the Standard Specifications, Volume 1 and Volume 2, bearing like numbers and to Sections and subsections contained in these Special Provisions in their entirety.

CLASS OF PROJECT

This is a City of Hillsboro Project.

PROJECT CONTACTS

Submit written questions to the City Project Manager via e-mail, fax, or letter.

Answers to these questions will be distributed via faxed addendum.

Project Management:

Charlie Shell, Project Manager
Charlie.shell@hillsboro-oregon.gov
City of Hillsboro Public Works, Engineering Division
150 E Main Street, Fourth Floor
Hillsboro, OR 97123
(503)681-6252

Design Engineers

Ralph Henderson
RHenderson@mcknze.com
RiverEast Center
1515 SE Water Ave, Suite 100
Portland OR 97214
(503)224-9560

PART 5.0 – PREVAILING WAGE RATES

Prevailing Wage Rates are hereby incorporated into these specifications by reference and the text for these publications is available on BOLI's website at:

www.oregon.gov/boli

The applicable publications are:

- July 1, 2014 Definitions of Covered Occupations for Public Works Contracts in Oregon
- April 1, 2015 State Prevailing Wage Apprenticeship Rates
- January 1, 2015 Prevailing Wage Rates for Public Works Contracts in Oregon

A copy of these rules may be requested by calling the Bureau of Labor and Industries directly.

Bureau of Labor and Industries – (971) 673-0838

PART 6.0 – NON-FIELD TESTED MATERIALS

Non-Field Tested Materials are hereby incorporated into these specifications by reference and are available by visiting the Oregon Department of Transportation website at:

http://www.oregon.gov/ODOT/HWY/CONSTRUCTION/docs/NFTMAG2008.pdf

PART 7.0 – SPECIAL PROVISIONS

SECTION 00110 - ORGANIZATION, CONVENTIONS, ABBREVIATIONS AND DEFINITIONS

Comply with City of Hillsboro Standard Contract Provisions and Section 00110 of the Standard Specifications modified as follows:

00110.00 Organization of Specifications - Add the following:

- Book 1 of the Bid Documents as issued by City of Hillsboro

00110.20 Definitions - Add or modify the following:

Bid Booklet - Delete this definition

Bid Documents - Replace with the following:

The bound two Books (Book 1 and Book 2) of the Solicitation Documents, plans, addendums, geotechnical reports, cross sections, permits and ROW obligations.

Contract Administration Engineer - Add the following:

Contract Documents - As defined by the Contract Agreement. See Book 1 of the Bid Documents.

Effective Date of the Agreement - The date recorded on the contract agreement when it is executed by the last party to sign.

Extra Work Directive - Written order issued by the Project Manager modifying or requesting work and if applicable establishing the basis of payment per change order. The cost of this order has to be within the contract approved contingency as stated in the bid schedule for extra work.

Field Directive - Supplemental instructions, clarifications, and/or minor changes consisting of a written directive which may or may not modify the contract or the contract amount.

Notice to Proceed - A written notice to the Contractor from the Agency to begin tasks required of the contractor prior to beginning onsite construction.

Substantial Completion - The work or specified parts of the work which are sufficiently complete, in accordance with the contract documents in order that they can be utilized by the Agency for the purposes intended as determined by the Engineer.

Work Day - Any and every calendar day from January 1 to December 31 of every year, excluding Saturdays, Sundays, and legal holidays (as defined per ORS279C.540)

Work Hour - For the purpose of bidding and related submittals, any hour in a workday between 8:00 a.m. and 5:00 p.m., including lunch-hour, when the Agency is performing regular business.

SECTION 00120 - BIDDING REQUIREMENTS AND PROCEDURES

This section is not applicable; refer to City of Hillsboro Standard Contract and Book 1 of the Bid Documents

SECTION 00130 - AWARD AND EXECUTION OF CONTRACT

This section is not applicable; refer to City of Hillsboro Standard Contract and Book 1 of the Bid Documents

SECTION 00140 - SCOPE OF WORK

Comply with City of Hillsboro Standard Contract Provisions and Section 00140 of the Standard Specifications modified as follows:

00140.70 Cost Reduction Proposals - Replace the paragraph that begins "The Contractor may submit…" with the following paragraph:

The Contractor may submit written proposals to the Engineer that modify Plans, Specifications, or other Contract Documents for the sole purpose of reducing the total cost of construction. Unless otherwise agreed to in writing by the Agency, a proposal that is solely or primarily a proposal to reduce estimated quantities or delete Work, as determined by the Engineer, is not eligible for consideration as a cost reduction proposal and will instead be addressed under 00140.30, whether proposed or suggested by the Agency or the Contractor.

SECTION 00150 - CONTROL OF WORK

Comply with City of Hillsboro Standard Contract Provisions and Section 00150 of the Standard Specifications modified as follows:

00150.02 Inspector's Authority and Duties –

Add the following to the third bulleted item of the first paragraph:

The inspector may orally suspend work temporarily, until the issue in question can be referred to the Engineer for decision for:

- Unsafe practice
- Non-compliance with the contract documents
- Non-compliance with erosion control requirements
- Non-compliance with hazardous material handling rules and regulations
- Non-compliance with air, noise, and water pollution control
- Traffic Control
- Work Hours and Noise limitations

00150.05 Cooperative Arrangements - Delete this subsection.

150.10 – Order of Precedence – add the following bullet above Standard Specification:

- City of Hillsboro 2013 Design & Construction Standards

Add the following subsection:

00150.21 Agency Use of Consultants - The Contractor is advised that the availability of Agency personnel on this Project is limited and the Agency may hire consultants to perform some of its responsibilities for Material testing, Material weighing and checking, and/or surveying. The Contractor shall provide the Engineer with a written notification that such personnel are needed a minimum of 72 hours before performing Work requiring Material testing, Material weighing and checking, and/or surveying. If the Contractor suspends Work for more than 3 days on Work items requiring Material testing, Material weighing and checking, and/or surveying by the Agency, Contractor shall again provide notice as set forth above. The Agency will not be responsible for delays occasioned by the Contractor's failure to provide the required written notice. The Contractor shall provide such notice whether or not the Agency hires a consultant to perform the required services.

00150.30 Delivery of Notices - Replace this subsection, except for the subsection number and title, with the following:

Written notices to the Contractor by the Engineer or the Agency will be delivered:

- In person;
- By U.S. Postal Service first class mail or priority mail (which at the sender's option may include certified or registered mail return receipt requested), to the current office address as shown in the records of the Agency; or
- By overnight delivery service of a private industry courier, to the current office address as shown in the records of the Agency.

Notices shall be considered as having been received by the Contractor:

- At the time of actual receipt when delivered in person;
- At the time of actual receipt or seven Calendar Days after the postmarked date when deposited for delivery by first class or priority mail, whichever is earlier; or
- At the time of actual receipt or three Calendar Days after deposit with a private industry courier for overnight delivery service, whichever is earlier.

Written notices to the Engineer or the Agency by the Contractor shall be delivered to the Agency address shown in the Special provisions, unless a different address is agreed to by the Engineer, and shall be delivered:

- In person;
- By U.S. Postal Service first class mail or priority mail (which at the sender's option may include certified or registered mail return receipt requested); or
- By overnight delivery service of a private industry courier.

Notices will be considered as having been received by the Agency:

- At the time of actual receipt when delivered in person;
- At the time of actual receipt or seven Calendar Days after the postmarked date when deposited for delivery by first class or priority mail, whichever is earlier; or
- At the time of actual receipt or three Calendar Days after deposit with a private industry courier for overnight delivery service, whichever is earlier.

00150.35(c) Number and Size of Drawings - Replace this subsection, except for the subsection number and title, with the following:

The Contractor shall submit Working Drawings according to one of the following methods:

(1) Paper Submittal - For paper submissions, submit seven copies of Working Drawings for steel Structures and six copies of Working Drawings for other Structures to the Engineer. The submitted copies shall be clear and readable. Drawing dimensions shall be 8 1/2 inches by 11 inches, 11 inches by 17 inches, or 22 inches by 36 inches in size. One copy of the submitted Working Drawings will be returned to the Contractor after processing. The Contractor shall submit such additional number of copies to the Engineer for processing that the Contractor would like to have returned.

00150.35(d-1) Stamped Working Drawings - Replace the sentence with the following sentence:

Stamped Working Drawings will be designated as "reviewed" or "reviewed with comments" by the Engineer.

00150.35(d-2) Unstamped Working Drawings - Replace the sentence with the following sentence:

Unstamped Working Drawings will be designated on the face of the Drawing, as "approved", "approved as noted", or "returned for correction" by the Engineer.

00150.40 Cooperation and Superintendence by the Contractor - Replace this subsection, except for the subsection number and title, with the following:

The Contractor is responsible for full management of all aspects of the Work, including superintendence of all Work by Subcontractors, Suppliers, and other providers. The Contractor shall appoint a single Superintendent and may also appoint alternate Superintendents as necessary to control the Work. The form of appointment of the alternate shall state, in writing, the alternate's name, duration of appointment in the absence of the Superintendent, and scope of authority. The Contractor shall:

- Provide for the cooperation and superintendence on the Project by:
  - Furnishing the Engineer all data necessary to determine the actual cost of all or any part of the Work, added Work, or changed Work.
  - Allowing the Engineer reasonable access to the Contractor's books and records at all times. To the extent permitted by public records laws, the Engineer will make

reasonable efforts to honor the Contractor's request for protection of confidential information.

- Keeping one complete set of Contract Documents on the Project Site at all times, available for use by all the Contractor's own organization, and by the Engineer if necessary.

- Appoint a single Superintendent and any alternate Superintendent who shall meet the following qualifications:
  - Appointees shall be competent to manage all aspects of the Work.
  - Appointees shall be from the Contractor's own organization.
  - Appointees shall have performed similar duties on at least one previous project of the size, scope and complexity as the current Contract.
  - Appointees shall be experienced in the types of Work being performed.
  - Appointees shall be capable of reading and thoroughly understanding the Plans and Specifications.
- The appointed single Superintendent, or any alternate Superintendent shall:
  - Be present for all On-Site Work, regardless of the amount of work to be performed by the Contractor, Subcontractors, Suppliers, or other providers, unless the Engineer provides prior approval of the Superintendent's or alternate Superintendent's absence.
  - Be equipped with a two way radio or cell phone capable of communicating throughout the project during all the hours of Work on the Project Site and be available for communication with the Engineer.
  - Have full authority and responsibility to promptly execute orders or directions of the Engineer.
  - Have full authority and responsibility to promptly supply the Materials, Equipment, labor, and Incidentals required for performance of the Work.
  - Coordinate and control all Work performed under the Contract, including without limitation the Work performed by Subcontractors, Suppliers, and Owner Operators.
  - Diligently pursue progress of the Work according to the schedule requirements of Section 00180.
  - Cooperate in good faith with the Engineer, Inspectors, and other contractors in performance of the Work.
  - Provide all assistance reasonably required by the Engineer to obtain information regarding the nature, quantity, and quality of any part of the Work.
  - Provide safe access, facilities and assistance to the Engineer for inspection, and for establishing such lines, grades and points as the Engineer requires.
  - Carefully protect and preserve the Engineer's marks and stakes.

Any Superintendent, or alternate Superintendent, who repeatedly fails to follow the Engineer's written or oral orders, directions, instructions, or determinations, shall be subject to removal from the project.

If the Contractor fails or neglects to provide a Superintendent, or an alternate Superintendent, and no prior approval has been granted, the Engineer has the authority to suspend the Work according to 00180.70. Any continued Work by the Contractor, Subcontractors, Suppliers, or other providers may be subject to rejection and removal. The Contractor's repeated failure or

neglect to provide the superintendence required by these provisions constitutes a material breach of the Contract, and the Engineer may impose any remedies available under the Contract, including but not limited to Contract termination.

00150.50(b) Agency Responsibilities - Replace this subsection, except for the subsection number and title, with the following:

During the design of this project, the Agency made preliminary contacts with Utilities to make them aware of anticipated agency work within the limits of the project, how it may affect their facilities, and instructed the utilities to make arrangements to relocate their facilities that are known to conflict with anticipated agency work. The Agency has listed in 00150.50(f) the known utilities, their owners, and contact information. The Plans will not normally show the anticipated new location of utilities that have been or will be adjusted.

00150.50(c) Contractor's Responsibilities - Add the following bulleted items:

- Meet with each utility agency prior to the preconstruction meeting that has or may have utilities within the limits of the work on this project.
- Check on-site locations of each utility against known location data, if any, and notify the utility of any discrepancies before starting the work.

Add the following:

In accepting the above responsibilities, both stated and implied, the Contractor understands that it is highly likely that there will be interfering utilities, i.e. service laterals, drains, pipe and conduits (ducts), and related structures which are not shown or are not accurately indicated on the plans or have not been previously discovered at the project site.

Utilities that are in the way of or in close proximity to the work, known as potential conflicts, may require a change in the Contractor's operations and should be reflected in the Contractor's bid and in the project schedule.

Existing utilities may affect the work causing additional time or cost. Reasonable delays and/or resulting cost increases will be considered as part of the normal progress of work and will not be cause for extra compensation to the Contractor. The Contractor agrees to provide for a reasonable amount of additional time or cost in the bid.

Locating, such as potholing, excavations, or boring, deemed necessary to determine the exact locations(s) of any utility which may interfere with the work shall be done prior to the start of construction at no additional cost to the Agency unless otherwise indicated or provided for in these contract documents.

00150.50(d) Delay - Replace this paragraph with the following:

00150.50(d) Delay – No additional Contract Time or additional compensation will be considered due to utility delays.

Add the following subsections:

00150.50(f) Utility Information - Contact those utilities having buried facilities and request that they locate and mark them for their protection prior to construction. The Utilities notification system telephone number is 811 or (800) 332-2344.

The following organizations may be adjusting utilities within the limits of this project during the period of the Contract:

Utility Representatives			
	Utility	**Representative**	**Telephone**
1	City of Hillsboro Water	Erika Murphy	503-615-6720
2	City of Hillsboro Sanitary	Charlie Shell	503-681-6252
3	AT&T	Shawn Dalbec	503-495-0112
4	Comcast	Margaret Porter	503-372-1383
5	Intregra	Bob Davidson	503-453-8247
6	Frontier	Robert Plant	503-643-0375
7	NW Natural	Andrew Young	503-226-4211x2980
8	PGE	Tod Shattuck	503-672-5466
9	Verizon Business	Brad Landis	425-201-0901
10	Commstructure (Time Warner, AT&T, & Level3 Representative)	Scott Butler	503-343-4134

Energized power lines overhang portions of the Work with a minimum vertical clearance of 18 feet. Contractor shall maintain at least 10 feet of safety clearance.

This Project is located within the Oregon Utility Notification Center area which is a Utilities notification system for notifying owners of Utilities about Work being performed in the vicinity of their facilities. The Utilities notification system telephone number is 811 (or use the old number which is 1-800-332-2344).

00150.90(a) On-Site Construction Work - Replace the paragraph that begins "When all On-Site Work…" with the following:

When all On-Site Work on the Project is completed, including but not limited to Change Order Work and Extra Work, and the Post-Construction Review meeting has been held in accordance with 00150.91 with the Contractor in attendance, the Engineer will issue Second Notification as specified in 00180.50(g).

Add the following subsection:

00150.90(c) Rescinding Second Notice - If the punch list items have not been completed within 60 days of issuance of "Second Notification", the second notice will be rescinded, the contract time will be restarted and liquidated damages will be assessed per 00180.85.

00150.91 Post-Construction Review - Replace this subsection, except for the number and title, with the following:

The Contractor or the Engineer may request a Post-Construction Review meeting, to be held prior to issuance of Second Notification. The meeting may be held if agreed to by both parties. The party making the request will conduct the meeting, and will announce the time and place of the meeting at least 15 days prior to the meeting date. The purpose of this meeting is to examine the Project for possible process improvements that may benefit future projects.

SECTION 00160 - SOURCE OF MATERIALS

Comply with City of Hillsboro Standard Contract Provisions and Section 00160 of the Standard Specifications modified as follows:

00160.20(a) Buy America - Delete this subsection.

00160.30 Agency-Furnished Material - Add the following:

The Agency will furnish the listed items at H2 Precast, 3835 N. Clemons Street, East Wenatchee, WA 98802:

- Arch Culverts
- Precast Concrete Headwalls
- Precast Concrete Footings

Contractor is responsible for transportation of Agency Furnished materials.
Additional information in Section 550

SECTION 00165 - QUALITY OF MATERIALS

Comply with City of Hillsboro Standard Contract Provisions.

No equipment or materials shall be stored in the public right of way without City approval. It is the contractor's responsibility to arrange for an offsite storage location. Notify the engineer of arrangements for storage locations. Offsite storage areas are subject to city permitting regulations and should be available for inspection by City forces. Erosion control measures should be in place for all stockpiles.

Construction equipment should not be parked on public streets. Equipment parked on the street will be subject to applicable parking regulations. Illegally parked equipment may be fined by the police department. Any construction equipment creating a hazard to the public must be moved to a safe location immediately. Hazards are determined by the engineer or the police dept. Any equipment moved due to hazardous conditions will require the appropriate traffic control in place during the move.

No separate payment will be made for staging areas.

SECTION 00170 - LEGAL RELATIONS AND RESPONSIBILITIES

Comply with City of Hillsboro Standard Contract Provisions and Section 00170 of the Standard Specifications modified as follows:

00170.01(c) Local Agencies - Add the following:

Service Districts
Clean Water Services

SECTION 00180 - PROSECUTION AND PROGRESS

Comply with City of Hillsboro Standard Contract Provisions and Section 00180 of the Standard Specifications modified as follows:

00180.21(d) Terms of Subcontracts - Replace this subsection, except for the subsection number and title, with the following:

Subcontracts shall provide that work performed under the subcontract shall be conducted and performed according to the terms of the Contract. All subcontracts, including Contractor's with the first-tier Subcontractors and those of the first-tier Subcontractors with their subcontractors, and any other lower tier subcontracts shall contain a clause or condition that if the Contractor or a Subcontractor fails, neglects, or refuses to make payment to an Entity furnishing labor or Materials in connection with the Contract, the Entity may file a complaint with the Construction Contractors Board, unless payment is subject to a good-faith dispute as defined in ORS 279C.580. Additionally, according to the provisions of ORS 279C.580, subcontracts shall include:

(1) A payment clause that obligates the Contractor to pay the first-tier Subcontractor for satisfactory performance under the subcontract within 10 Calendar Days out of amounts the Agency pays to the Contractor under the Contract.

(2) A clause that requires the Contractor to provide the first-tier Subcontractor with a standard form that the first-tier Subcontractor may use as an application for payment or as another method by which the Subcontractor may claim a payment due from the Contractor.

(3) A clause that requires the Contractor, except as otherwise provided in this subsection, to use the same form and regular administrative procedures for processing payments during the entire term of the subcontract. The Contractor may change the form or the regular administrative procedures the Contractor uses for processing payments if the Contractor:

- Notifies the Subcontractor in writing at least 45 Calendar days before the date on which the Contractor makes the change; and
- Includes with the written notice a copy of the new or changed form or a description of the new or changed procedure.

(4) An interest penalty clause that obligates the Contractor, if the Contractor does not pay the first-tier Subcontractor within 30 Calendar Days after receiving payment from the Agency, to pay the first-tier Subcontractor an interest penalty on amounts due in each payment the Contractor does not make in accordance with the payment clause included in the subcontract

under 00180.21(d-1). The Contractor or first-tier Subcontractor is not obligated to pay an interest penalty if the only reason that the Contractor or first-tier Subcontractor did not make payment when payment was due is that the Contractor or first-tier Subcontractor did not receive payment from the Agency or the Contractor when payment was due. The interest penalty applies to the period that begins on the day after the required payment date and ends on the date on which the amount due is paid; and shall be computed at the rate specified in 00170.10(c).

(5) A clause that requires the Contractor's first-tier Subcontractor to include a payment clause and an interest penalty clause that conform to the standards of ORS 279C.580 (see 00180.21(d-1) and 00180.21(d-4)) in each of the first-tier Subcontractor's subcontracts and to require each of the first-tier Subcontractor's subcontractors to include such clauses in their subcontracts with each lower-tier subcontractor or Material supplier.

These payment clauses shall require the Contractor to return all retainage withheld from the Subcontractor, whether held by the Contractor or the Agency, as specified in 00195.50(d).

As required by ORS 279C.800 through ORS 279C.870, subcontracts shall include:

- A provision requiring the subcontractor to have a public works bond filed with the Construction Contractors Board before starting Work on the Project, unless exempt.
- A provision requiring that the workers shall be paid not less than the specified minimum hourly rate of prevailing wage.

00180.40(b) On-Site Work - Replace the third bulleted item with the following:

- Submitted a responsive schedule

Add the following subsection:

00180.40(c) Specific Limitations - Limitations of operations specified in these Special Provisions include, but are not limited to, the following:

Limitations	**Subsection**
Cooperation with Utilities	00150.50
Interim Completion Time	00180.50
Final Completion Time	00180.50
Right-of-Way and Access Delays	00180.65
Traffic Restrictions	00220.40
Special Events	00220.40(e)
Noise Control	Per COH Contract
Work Outside Roadway (not affected by TP&DT)….	Per COH Contract

Be aware of and subject to schedule limitations in the Standard Specifications that are not listed in this subsection.

00180.41 Project Work Schedules - After the paragraph that begins "Contractor's activity…" add the following paragraphs:

The Contractor shall submit a supplemental "look ahead" Project Work schedule each week to the Engineer. The "look ahead" Project Work schedule is supplemental to the Type A, B, or C schedule specified below. The supplemental "look ahead" Project Work schedule shall:

- Identify the sequencing of activities and time required for prosecution of the Work.
- Provide for orderly, timely, and efficient prosecution of the Work.
- Contain sufficient detail to enable both the Contractor and the Engineer to plan, coordinate, analyze, document, and control their respective Contract responsibilities.

The supplemental "look ahead" Project Work schedule shall be written in common terminology and show the planned Work activities broken down into logical, separate activities by area, stage, and size and include the following information:

- The resources the Contractor, subcontractors, or services will use.
- The locations of each activity that will be done including the limits of the work by mile posts, stations, or other indicators.
- The time frames of each activity by Calendar Days, shifts, and hours.
- All anticipated shoulder, lane, and road closures.

At a minimum, the Contractor shall prepare a bar chart that:

- Shows at least three weeks of activity including the week the bar chart is issued.
- Uses a largest time scale unit of one Calendar Day. Smaller time scale units may be used if needed.
- Is appropriate to the activities.
- Identifies each Calendar Day by month and day.

Include the Contract name, Contract number, Contractor's name, and date of issue on each page of the bar chart.

The Contractor shall submit the supplemental "look ahead" Project Work schedule starting at First Notification and continuing each week until Second Notification has been issued and all punch list items and final trimming and cleanup has been completed. The Contractor shall meet with the Engineer each week to review the supplemental "look ahead" Project Work schedule. If the Engineer or the Contractor determines that the current supplemental "look ahead" Project Work schedule requires changes or additions, either notations can be made on the current schedule or the Engineer may require the submittal of a revised supplemental "look ahead" Project Work schedule. Review of the current and subsequent supplemental "look ahead" Project Work schedules does not relieve the Contractor of responsibility for timely and efficient execution of the Contract.

In addition to the "look ahead" Project Work schedule, a Type B schedule as detailed in the Standard Specifications is required on this Contract,

00180.41(b-2) Detailed Schedule - Replace the paragraph that begins "In addition to the above requirements…" with the following two paragraphs:

In addition to the above requirements, and within 30 Calendar Days after the Notice to Proceed, the Contractor shall provide the Engineer one digital copy and four paper copies of a detailed time-scaled bar chart Project Work schedule indicating the critical course of the Work. The digital copy shall be compatible with MS Project 2007.

Detailed work schedule activities shall include the following:

Replace the paragraph that begins "Within 10 Calendar Days…" with the following paragraph:

Within 10 Calendar Days after submission of the Project schedule the Engineer and the Contractor shall meet to review the Project schedule as submitted. Within 10 Days of the review meeting the Contractor shall resubmit to the Engineer one digital and four paper copies of the Project schedule, including required revisions.

00180.41(b-3-a) Review with the Engineer - In the paragraph that begins "The Contractor shall evaluate…", replace the sentence that begins "The Contractor shall submit…" with the following sentence:

The Contractor shall submit one digital and four paper copies of the updated bar chart to the Engineer within seven Days after the progress meeting, along with a progress report as required by "b." below.

00180.42 Preconstruction Conference - Replace this subsection, except for the subsection number and title, with the following:

Before any work is performed under the contract and within 15 calendar days of the Notice to Proceed, unless otherwise approved in writing, meet with the Agency for a preconstruction conference at a time mutually agreed upon. Submit the following during the preconstruction conference unless otherwise directed:

- Project work schedule (see 00180.41)
- Traffic control plans (see 00225.05)
- Erosion control plan (see 00280.00)
- Complete list of subcontractors
- List of utilities affected by the work (see 00150.50(c))
- Submit off-site disposal locations (see 00290.20(c-3-f))
- List of All contractors and subcontractors equipment, types/capacities , numbers and rental rates

Before meeting with the Engineer for the preconstruction conference, hold a group utility scheduling meeting with representatives from the utility companies involved with this project. Incorporate each utility's time needs into the Contractor's schedule submitted at the preconstruction conference.

00180.43 Commencement and Performance of Work - Add the following at the end of this subsection:

Conduct the work at all times in a manner and sequence that will ensure minimal interference with traffic. The Contractor shall not begin work that will interfere with work already started. If it is in the Agency's best interest to do so, the Agency may require the Contractor to finish a portion or unit of the project on which work is in progress or to finish a construction operation before work is started on an additional portion or unit of the project.

Add the following subsection:

00180.44 Critical Time Periods - Note the following critical time periods when certain types of Work cannot be performed.

- There are no critical time periods but the contractor should expect slower traffic during the Oregon Air Show.
- Tree removal shall adhere to the Migratory Bird Treaty Act (MBTA) principles and practices and ODOT Specifications Section 290.36.
- In the event that these rights-of-way are not acquired by July 15th, the following portions of the project could potentially be delayed.
    - All work north of station 47+00. This includes the two creek crossings, fills, and mitigation area.
    - Work on the east side of NW 253rd Avenue would be limited to that which could be done within the existing right-of-way (20 feet from centerline) from Evergreen Road to Station 23+50.

Add the following subsection:

00180.50(h) Contract Time - There are multiple Contract Times on this Project as follows:

(1) Box Culverts to be installed and accepted prior to October 30, 2015.
(2) Complete all Work to be done under the Contract, except for seeding and plant establishment, not later than November 1, 2016.

00180.65 Right-of-Way and Access Delays – Add the following paragraph:

It is anticipated that the ending date of an anticipated delay for the following properties will be as shown:

The City anticipates early possession of the Genentech property from station 10+00 to 23+50 on the east side, and the Erdmans property north of station 47+00 on or before July 15, 2015.

00180.90(a) Termination for Default - Add the following bulleted item:

- Fails to begin scheduled work within 10 calendar days from the date stated in the First Notice unless excused as part of the accepted project construction schedule.

SECTION 00190 - MEASUREMENT OF PAY QUANTITIES

Comply with City of Hillsboro Standard Contract Provisions and Section 00190 of the Standard Specifications.

SECTION 00195 - PAYMENT

Comply with City of Hillsboro Standard Contract Provisions:

SECTION 00196 - PAYMENT FOR EXTRA WORK

Comply with City of Hillsboro Standard Contract Provisions and Section 00196 of the Standard Specifications.

SECTION 00197 - PAYMENT FOR FORCE ACCOUNT WORK

Comply with City of Hillsboro Standard Contract Provisions and Section 00197 of the Standard Specifications.

SECTION 00199 - DISAGREEMENTS, PROTESTS, AND CLAIMS

Comply with City of Hillsboro Standard Contract Provisions:

SECTION 00210 - MOBILIZATION

Comply with Section 00210 of the Standard Specifications.

SECTION 00220 - ACCOMMODATIONS FOR PUBLIC TRAFFIC

Comply with Section 00220 of the Standard Specifications modified as follows:

00220.02 Public Safety and Mobility - Add the following bullets to the end of the bullet list:

- Do not close any city or county street until approved according to 00220.03(b) and signed according to Section 00225.

- Do not reduce roadway width until approved according to 00220.03(d), and signed according to the approved TCP and the requirements of Sections 00220 and 00225.

    - Sweep/Clean travel lanes on a “regular” basis or as directed at no additional cost to the agency.

Replace the bullet that begins, "Do not stop or hold vehicles..." with the following bullet:

- Maintain at least one lane of traffic at all times. Do not stop or hold traffic in any one direction more than 10 minutes. Do not block driveways, intersections or approaches. Provide reasonable access to driveways, intersections and approaches at no additional cost to the Agency.

00220.03(a) Over-Dimensional Vehicle Restrictions - Replace this subsection, except for the subsection number and title, with the following:

When a project restricts the width, length, height, or weight of vehicles through a work zone or detours trucks around a work zone, notify the Engineer at least 35 calendar days before the restriction or detour takes effect.

00220.03(b) Closures - Modify this subsection as follows:

Replace the bulleted item that begins “Roads - A minimum…” with the following bulleted item:

- **Roads** - A minimum of 14 calendar days before closure, regardless of the closure duration. Obtain permission from the Engineer before closing any city or county street. Provide copy of city or county approval with closure schedule submittal.

Add the following subsections:

00220.03(d) Roadway Width Reductions - When narrowing the roadway:

- Maintain 1 lane of traffic in each direction with a minimum lane width of 11 feet clear of all TCDs.

00220.40(e) Lane Restrictions - Replace the paragraph that begins "Do not close any…" with the following paragraph:

Do not close any traffic lanes on Evergreen Parkway and Meek Road, and remove all barricades and objects from the roadway during the following periods:

Replace subsection (1) with the following:

(1) Weekdays:

- Between 6:30 a.m. and 9:00 a.m. and between 3:30 p.m. and 6:00 p.m. Monday through Thursday

- Between 6:30 a.m. and 9:00 a.m. Friday

(2) Weekends - Between 3:00 p.m. on Friday and midnight (12:01 a.m.) on Monday

(3) Special Events - Add the following to the end of this subsection:

The following special events will occur during this Project:

- Oregon Air Show

00220.60(a-1) Contractor Responsibility - Replace the bullet that begins, "Keep roads, streets, bikeways…" with the following bullet:

- Keep surfaces being used by public traffic free of all dirt, mud, gravel, materials, or other debris.
- Relocate project signs as necessary to accommodate work. Signs shall remain in the general vicinity as originally installed.

SECTION 00225 - WORK ZONE TRAFFIC CONTROL

Comply with Section 00225 of the Standard Specifications modified as follows:

00225.02 General Requirements - Add the following after the last paragraph of this subsection:

Install two sign flag boardsabove the following sign:

- "TRUCKS ENTERING TRAFFIC"

00225.05 Contractor Traffic Control Plan - Replace the introductory paragraph of this subsection with the following:

Submit for approval, the Contractor TCP in writing five calendar days before the preconstruction conference:

00225.80 Measurement – Work covered under this Section will be measured my by:

- **Method "B" – Lump Sum Basis** – Under this method, no measurement of quantities will be made.

00225.90 Payment – Work covered under this Section will be paid for by:

- **Method "B" – Lump Sum Basis** – In the paragraph that begins "Payment will be….. add flaggers.

00225.90(b) Temporary Work Zone Traffic Control, Complete - Add the following bullets to the list of incidentals:

- Preparing and signing the daily "Traffic Control Inspection Report".
- Furnishing, placing, maintaining, and moving the initial sets of portable signs for flagging operations required by 00225.41(h).
- Furnishing, installing, and removing Temporary Removable Tape, Temporary Non-Removable Tape, and Temporary Non-Reflective Tape, as applicable.
- There should be no compensation for Asst. TCS and flaggers used to assist TCS will not be paid flagger hours.

SECTION 00280 - EROSION AND SEDIMENT CONTROL

Comply with Section 00280 of the Standard Specifications modified as follows:

00280.02 Erosion and Sediment Control Plan on Agency Controlled Lands - Replace this subsection, except for the subsection number and title, with the following:

Use either the Agency's ESCP, a Contractor modify version of the Agency's ESCP, or a Contractor developed ESCP. Submit the following for approval ten calendar days before the preconstruction conference:

- When using the Agency's ESCP without modification, a written notification indicating the Agency's ESCP will be used without modification.

- When using a Contractor modified version of the Agency's ESCP or when using a Contractor developed ESCP, include the following:

    - Proposed ESCP showing all erosion BMP and quantities of all BMP.

    - Implementation schedule for all BMP.

Do not begin any site activities that have potential to cause erosion or sediment movement until the ESCP and implementation schedules are approved by the Engineer.

Update the ESCP and schedule as needed for unexpected storm or other events to ensure that sediment-laden water does not leave the construction site.

Add the following subsection:

00280.14(e) Slope and Channel Liner Matting - Add the following paragraph to the end of this subsection:

Where shown, furnish hydraulically applied bonded fiber matrix slope protection matting that consists of fully biodegradable long fiber strands held together by a water resistant bonding agent.

Add the following subsection:

00280.14(f) Compost Erosion Blanket - Furnish commercially manufactured medium compost material meeting the requirements of Section 01030.15.

When shown, add a tackifier meeting the requirements of 01030.16. Apply tackifier at the rates shown or as recommended by the manufacturer.

Add the following subsection:

00280.15(f) Compost Filter Sock - Furnish filter sock material and compost meeting the following requirements:

- **Filter Sock Material** - 8, 12, and 18 inch diameter, 5 mil thick woven tubular mesh netting consisting of continuous HDPE filament or polypropylene material with 3/8 inch openings or 100 percent biodegradable burlap or coir as shown.

- **Compost** - Commercially manufactured coarse compost material meeting the requirements of Section 01030.15.

00280.16(d) Inlet Protection - Add the following bullet to the end of the bullet list:

- **Compost Filter Sock** - Sock material and compost meeting the following requirements:

    - **Filter Sock Material** - 8, 12, and 18 inch diameter, 5 mil thick woven tubular mesh netting consisting of continuous HDPE filament or polypropylene material with 3/8 inch openings or 100 percent biodegradable burlap or coir as shown.

- **Compost** - Commercially manufactured coarse compost material meeting the requirements of Section 01030.15.

00280.16(e) Sediment Barriers - Add the following bullets to the end of the bullet list:

- **Type 8: Compost Filter Sock** - Sock material, compost and stakes meeting the following requirements:

  - **Filter Sock Material** - 8, 12, and 18 inch diameter, 5 mil thick woven tubular mesh netting consisting of continuous HDPE filament or polypropylene material with 3/8 inch openings or 100 percent biodegradable burlap or coir as shown.

  - **Compost** - Commercially manufactured coarse compost material meeting the requirements of Section 01030.15.

  - **Stakes** - 1 1/2 by 1 1/2 inch wooden stakes that are a minimum length equal to the diameter of the sock plus 16 inches.

- **Type 9: Compost Filter Berm** - Commercially manufactured coarse compost material meeting the requirements of Section 01030.15.

  When shown, add a tackifier meeting the requirements of 01030.16. Apply tackifier at the rates shown or as recommended by the manufacturer.

Add the following subsection:

00280.44(f) Compost Erosion Blanket - Apply compost with a pneumatic blower or other equipment that propels the material directly at the soil surface and achieves direct contact with the soil. Apply compost at a uniform depth of 2 inches. Apply at least 3 feet over the top of the slope or overlap the material into existing vegetation.

Add the following subsection:

00280.45(f) Compost Filter Socks - Install compost filter socks perpendicular to the water flows that are not more than 3 feet deep. Stake at intervals of 6 to 8 feet. Install stakes through the center of the filter sock and at least 1 foot into the ground with no more than 4 inches protruding above the filter sock.

00280.46(d) Inlet Protection - Add the following bullet to the end of the bullet list:

- **Type 7: Compost Filter Sock** - Install compost filter socks as shown.

00280.46(e) Sediment Barriers - Add the following bullets to the end of the bullet list:

- **Type 8: Compost Filter Sock** - Place and arrange compost filter socks as shown or directed.

- **Type 9: Compost Filter Berm** - Install compost filter berms as shown or directed.

00280.48 Emergency Materials - Add the following paragraphs after the paragraph that begins "Provide, stockpile, and protect...":

Provide and stockpile the following emergency materials on the Project site:

Item	Quantity
(a) Straw Wattle Sediment Barrier	100 FT
(b) Biofilter Bags	25 EA
(c) Plastic Sheeting	250 SY
(d) Temporary Mulch (Straw Bales)	0.1 AC
(e) Sediment Fence (orange)	200 FT

00280.70 Removal - Add the following paragraph to the end of this section:

If shown or if directed, compost filter material may be dispersed in place. Cut open compost filter socks and dispose of sock material according to 00290.20

00280.80(d) Area Basis - Replace the paragraph that begins "Area basis items..." with the following paragraph:

Area basis items will be measured on the area basis along the ground surface, and computed to the square yard or acre as appropriate.

00280.80 Measurement

(a) Erosion Control ……Lump Sum Basis

Items (a) includes: add:

- Furnish, install and maintain all erosion and sediment control measures as shown on the erosion control plan or necessary to keep the site in compliance of all permits.

00280.90 Payment - In the paragraph that begins "Item (a) includes...", delete the bullet that begins "providing the Erosion and...".

Replace the paragraph that begins "When only Item (a) is..." with the following paragraph:

When only item (a) is listed in the Contract Schedule of Items, additional BMP required for permit compliance will be paid for as Extra Work according to Section 00196.

SECTION 00290 - ENVIRONMENTAL PROTECTION

Comply with Section 00290 of the Standard Specifications modified as follows:

00290.51 Protection of Sensitive Cultural Sites - Add the following to the end of this subsection:

There may be sensitive cultural sites on this Project. At the time of preparation of the Plans, there was a site studied, but nothing was identified as culturally sensitive. In the event there is an inadvertent discovery, refer to the "Inadvertent Discovery of Cultural Resources and Human Remains" plan. A copy of the plan can be obtained from the Project Manager.

All contact with the Tribe or the Agency Archaeologist shall be through the Project Manager's office.

SECTION 00310 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Comply with Section 00310 of the Standard Specifications modified as follows:

00310.41(a) General - Replace this subsection, except for the subsection number and title, with the following:

Where an abutting structure or part of a structure is to be left in place, make clean, smooth, vertical cuts with a saw or other approved cutting device. Avoid operations that may damage any portion of the remaining structure.

Add the following:

00310.41(d) Irrigation Systems – cut and cap irrigation systems that are stubbed into the work zone. For irrigation systems looped through the work zone, re-establish irrigation system outside of right-of-way per section 1120. All irrigation systems must be in working condition. Use like materials. No separate measurement or payment will be made for reestablishing irrigation systems.

00310.43 Disposal of Material - Replace this subsection, except for the subsection number and title, with the following:

Dispose of materials according to 00290.20.

00310.44 Earthwork in Connection with Removal - Replace the second paragraph with the following:

Backfill holes according to 00330.45. No separate or additional payment will be made for this work.

00320.90 Payment - Add the following after the first paragraph of this subsection:

No separate or additional payment will be made for irrigation system repairs and restoration.

Add the following to the end of the section:
Kinds of Incidental Items -

- Remove existing culverts under driveways.
- Remove existing fencing
- Remove existing driveways outside the daylight lines.

SECTION 00320 - CLEARING AND GRUBBING

Comply with Section 00320 of the Standard Specifications modified as follows:

00320.40(a) Clearing Trees and Other Vegetation - Add the following:

Meet the requirements of 00290.36(a).

Add the following:

All tree removal shown in the plans is incidental to this section.
All tree cutting for firewood as out-lined on sheet R1.5 is incidental to this section.

00320.40(b) Preserving and Trimming Vegetation - Add the following to the end of this subsection:

(4) Trees To Be Saved - The Engineer will identify and mark trees to be saved. Provide and place orange plastic mesh fencing, from the QPL, around critical root zones of marked trees or tree groups as directed. Do not begin construction activity or move equipment into existing tree areas until the plastic mesh fencing is in place.

Do not work within the critical root zone of marked trees unless written approval is obtained from the Engineer. Be responsible for all damage to or for removal of marked trees. Tree damage will be determined by a certified arborist selected by the Engineer.

00320.42 Ownership and Disposal of Matter - Add:

All oak trees on the Greg property (Station 37+75 to 47+00 –east side) shall be cut into 16” rounds and left on owner’s property. The diameter of the rounds shall be between 4” and 12”.

00320.90 Payment - Add the following after the first paragraph of this subsection:

Payment for Tree Protection Fencing will be paid per bid item Tree Protection Fencing.
No separate or additional payment will be made for Timber Salvage
No separate or additional payment will be made for yard restoration related to root/stump removal.

SECTION 00330 - EARTHWORK

Comply with Section 00330 of the Standard Specifications modified as follows:

00330.03 Basis of Performance - Add the following paragraph to the end of this subsection:

Perform all earthwork under this Section on the excavation and embankment basis.

00330.20 Tamping Foot Rollers - In the paragraph, replace "115 tons" with "15 tons".

00330.41(a-5) Waste Materials - Replace this subsection, except for the subsection number and title, with the following:

Unless otherwise specifically allowed and subject to the requirements of 00280.03, dispose of materials, classed as waste materials in 00330.41(a-3) and 00330.41(a-4), outside and beyond the limits of the Project and Agency controlled property according to 00290.20. Do not dispose of materials on wetlands, either public or private, or within 300 feet of rivers or streams. The City requires documentation including land use approvals and issued permits for contractor disposal sites to ensure compliance with applicable laws.

00330.41(a-7) Abandoned Pipes and Miscellaneous Matter - Replace this subsection, except for the subsection number and title, with the following:

Remove and dispose of all abandoned pipe and miscellaneous matter:

- Encountered in the work
- Located within 2 feet below subgrade
- Located within 2 feet of finished slope

Remove remaining abandoned pipes and structures, or completely fill abandoned pipes and structures with CLSM that meets the requirements of 00442.

Perform removal work as part of the earthwork. Dispose of waste materials according to 00290.20.

00330.41(a-9-c) Unstable Subgrade Material - Replace with the following:

Where unstable material is encountered below subgrade in roadbed excavations, excavate such material as directed per section 00331.

00330.42(c-3) Embankment Slope Protection - Add the following paragraph:

Construct the outer 6 inches of embankments with suitable materials to establish slope stabilization through permanent seeding. If suitable material is not available, provide suitable materials from a Contractor-provided source which conforms to the requirements of 00330.11 or 00330.13 and provides favorable conditions for germination of seed and growth of grass.

00330.45 Filling of Holes - Replace the last two sentences of this subsection with the following:

No separate or additional payment will be made for this work.

Add the following subsection:

00330.48 Temporary Widening Earthwork - Perform excavation and embankment meeting the requirements of this Section to construct the temporary widening. Unless otherwise shown, construct subgrade for the temporary widening at 11 inches below finish grade of the temp widening.

Work includes removing and disposing of temporary materials according to 00290.20 when temporary widening is no longer required.

00330.71 Daily Progress Reports - Delete this subsection.

00330.80 Measurement - Add the following after the bulleted list:

No field measurement of earthwork items will be performed. The quantity will be the theoretical neat line volume constructed and accepted for each item. If changes are ordered, only the quantity included in the ordered changes will be measured.

Add the following subsection:

00330.83 Temporary Widening Earthwork - No measurement of quantities will be made for temporary widening earthwork or removal of temporary widening performed under this Section.

00330.91(b) Foundation Excavation - Add the following bulleted item:

- When foundation excavation is not included in the Schedule of Items, foundation excavation will be paid according to 00331.90.

00330.91(d) General Excavation - Replace the last sentence of the fourth bulleted item with the following:

When such excavation is not part of a continuous operation, the roadway excavation is complete, and the Contractor is required to move equipment in to perform the excavation, the excavation will be paid according to 00331.90.

00330.92 Kinds of Incidental Earthwork - Delete the bullet that reads "If shown on the plans.".

Add the following bullet(s) to the end of the bullet list:

- Additional quantities of materials required due to clearing and grubbing operations and compaction requirements within embankment limits.

- Earthwork required for driveways and road approaches. Earthwork for driveways and road approaches will be that which is outside the neat line limits shown on the typical section(s).

- Removal of existing gravel or asphalt road where needed.

- Compaction of subgrade per geotechnical requirements (minimum 95% of T-180)

- Filling of drainage ditches with structural fill.

- Rock excavation as encountered during earthwork activities.

- Sawcutting of existing asphalt or concrete roadways at the limits of earthwork activities.

00330.94 – Embankment Basis Payment – Replace the last sentence in this section with the following:

Excavation of unstable material that is below subgrade in roadbed excavation areas, according to 00330.41(a-9), will be paid for according to 00331.

SECTION 00344 - TREATED SUBGRADE

Comply with Section 00344 of the Standard Specifications modified as follows:

00344.41 Addition of Stabilizing Material - Replace the second sentence with the following:

The use of blade graders to distribute stabilizing material will not be allowed.

Add the following:

Use equipment:

- Capable of distributing the stabilizing material in one pass without verifying more than ±1% from the specified amount.
- Capable of automatically compensating for varying load, velocity, and grade while distributing the material.
- Use a pulverizer/mixer capable of uniformly mixing the cement into the soil to the design depth. The pulverizer/mixer shall consist of a BOMAG MPH-100, CAT RR-250, or an alternate approved by the Geotechnical Engineer.
- Alternate approved by the Geotechnical Engineer
- Equipment should be tracked or use balloon tires sufficient to distribute vehicle loads without damaging subgrade below treated depth.

00344.42 Mixing – add the following:

Equipment should be tracked or use balloon tires sufficient to distribute vehicle loads without damaging subgrade below treated depth.

00344.45 Compaction – add the following:

(e) Use a static, sheep's-footed or segmented pad roller with a minimum static weight of 40,000 pounds for initial compaction of fine-grained soils (silt and clays), or an alternate approved by the Geotechnical Engineer.

Add the following new subsection:

00344.50 Embankment Stabilization – Apply Portland Cement to treat unstable material onsite excavation used for embankment at the locations and to the lines, grade, thickness, and cross sections shown or directed. Percent of cement application rate will be determined after field testing. Apply cement using methods described for treated subgrade under this section. For purposes of estimating and per the Geotechnical recommendation assume 8% cement amendment.

SECTION 00350 - GEOSYNTHETIC INSTALLATION

Comply with Section 00350 of the Standard Specifications modified as follows:

00350.00 Scope - In the sentence, replace the word "geotextile" with the word "geosynthetics".

00350.10 Materials - Add the following to the end of this subsection:

Provide manufacturer's certifications complying with 02320.10(c) for the following geosynthetic(s):

	Certification	
Geotextile	**Level A**	**Level B**
Cc	X	

SECTION 00405 - TRENCH EXCAVATION, BEDDING, AND BACKFILL

Comply with Section 00405 of the Standard Specifications supplemented and/or modified as follows:

00405.12 Bedding - Use commercially available 3/4" – 0 crushed aggregate.

00405.13 Pipe Zone Material - Use commercially available 3/4" – 0 crushed aggregate.

00405.14 Trench Backfill - For all trenches within the right-of-way use Class B 3/4" – 0 crushed aggregate backfill. For trenches outside of the right-of-way use Class B 3/4" – 0 crushed aggregate backfill, except when not under structures the top 2 feet may be Class A Backfill.

00405.40 General - Add the following:

At no expense to the Agency, the Contractor shall restore all known facilities that are damaged by his operations to at least preexisting condition.

00405.46(e) Temporary Trench Plating - replace with the following:

When temporary steel plates are installed over a street cut, they shall be capable of carrying at least an HS25 loading and have a skid-resistant driving surface. Place steel plates with a minimum of 12 inches bearing on all sides of a cut. Anchor steel plates to minimize shifting. Shim the edges of all steel plates with cold mix asphalt.

Temporary trench plating may not be used for more than a maximum of 24 hours at any one location. Any period exceeding 24 hours will require the backfilling of the trench with aggregate and capping with temporary HMAC at no expense to the City.

00405.82 Trench Foundation - Quantities will be calculated on a volume basis.

00405.90 Payment - Add the following bullet to the bullet list:

- tracer wire
- Magnetic Tape
- Temporary Trench Plating

SECTION 00440 - COMMERCIAL GRADE CONCRETE

Comply with Section 00440 of the Standard Specifications modified as follows:

00440.13 Field-Mixed Concrete - Replace this subsection, except for the subsection number and title with the following:

CGC mixed work items listed in 00440.14(a) may be field mixed. When approved, concrete sidewalks, concrete driveways, and other flat concrete surfaces may be field mixed by volumetric or mobile mixers.

00440.14(a) General - In the work item list, replace the square tube sign support line with the following line:

Perforated Steel Square Tube Sign Support Footings……. 00920

00440.40(b) Placing - Add the following bulleted item:

- Place concrete according to 00540.48(a) through 00540.48(c) for sign supports, signal supports, and luminaire supports.

SECTION 00445 - STORM, CULVERT, SIPHON, AND IRRIGATION PIPE

Comply with Section 00445 of the Standard Specifications modified as follows:

00445.00 Scope - Add the following:

Install and test storm pipe according to the current (June 2007) Clean Water Services Design and Construction Standards, except as modified herein. Contact the Engineer for direction if there is a conflict in requirements.

00445.01 Definitions and Descriptive Terms - Replace the "Culvert" and "Flexible Pipe" definitions with the following definitions:

Culvert - Concrete, corrugated metal, ductile iron, polyethylene, steel reinforced polyethylene or polypropylene pipe.

Flexible Pipe - Pipe constructed of corrugated or spiral rib metal, PVC, polypropylene, polyethylene, and steel reinforced polyethylene. For the purposes of these Specifications, all potable water pipes are considered flexible pipes.

Add the following:

00445.04 Additional Requirements - All work and materials provided and performed in this section must meet Clean Water Services requirements.

Add the following definition:

Steel Reinforced Polyethylene - Steel reinforced ribbed high density polyethylene.

00445.11 Materials - Add the following to the end of the material list:

Steel Reinforced Polyethylene Pipe ……..02410.60
Polypropylene Pipe…….02410.75

Add the following subsection:

00445.43(h) Steel Reinforced Polyethylene Pipe - Install steel reinforced polyethylene pipe and fittings according to the manufacturer's recommendations.

00445.43(i) Polypropylene Pipe - Install polypropylene pipe and fittings according to the manufacturer's recommendations.

Provide joints made with either bell and bell or bell and spigot coupling.

When the ambient air temperature is less than 10 °F, do not install, move, cover, bury, or otherwise handle the polypropylene pipe. All polypropylene pipe handled at temperatures below 10 °F will be rejected and not allowed to be used on the Project.

Add the following subsection:

00445.49 Roof or Field Drain Connections - Connect existing roof, lot or field drain pipe to the curb or nearest storm drain line as directed. Provide pipe, cleanouts and fittings meeting the requirements of the Standard Specifications as specified herein, and match existing pipe size. Use a manufactured tee or inserta tee to connect to storm drain with an approved rigid coupling connection to the existing pipe, and install a tracer wire with the drain line.

Use pipe materials that conform to Clean Water Services Specification with a diameter matching existing pipe size. The plans show anticipated locations of possible roof and field drains. The locations shown are approximate and additional field drains may be encountered.

00445.80(a) Pipes - In the length bullet, add ", to the nearest foot" after the word "applicable".

Replace the first paragraph of the second bullet with the following:

- **Depth** - Depth will be used to determine the maximum depth and pay item for each pipe. The maximum depth range, to the flow line, for each pipe will be 0 to 10.0 feet, and over 10.0 feet as applicable.

00445.80(j) Video Inspection - Replace this subsection, except for the heading, with the following:

Video inspection will not be measured. It will be incidental to all pipe work.

00445.91 Payment - Modify this section as follows:

Delete the pay item (l) Video Inspection. No separate or additional payment will be made for video inspection.

Add the following:

	Pay Items	Unit of Measurement
(n)	Roof or Field Drain Connections	foot

Payment for item (n) includes cleanouts and fittings. No separate or additional payment will be made for earthwork, ditch excavation, or connection to inlet structure.

SECTION 00470 - MANHOLES, CATCH BASINS, AND INLETS

Comply with Section 00470 of the Standard Specifications modified as follows:

Add the following:

00470.02 Additional Requirements - All work and materials provided and performed in this section must meet Clean Water Services requirements.

00470.10 Materials - Change the subsection reference for the concrete drain tile to 02410.10(i).

00470.41(c) Grates, Frames, Covers, and Fittings - Add the following:

Within asphalt street areas, initially set manholes and boxes to finished base aggregate grade. Adjust to final grade prior to final lift of asphalt.

Make vertical cuts in pavements with a concrete saw for setting manhole to final grade. Cut a minimum of 12 inches from the manhole frame.

Cut one of the following:

- A diamond-shaped opening at 45 degrees to the traffic lane.
- A circular-shaped opening centered about the manhole frame.

Back fill with high early strength concrete that meets the requirements of 00490.11 and will cure in time to carry traffic during the hours of darkness. Leave concrete 2 inches below finish grade of the manhole. Complete the top 2 inches with 1/2 inch HMAC. Apply asphalt tack to all surfaces before placing the final 2 inches of asphalt concrete.

The final grade of the pavement surface and adjusted manholes and boxes shall not vary more than 1/4 inch from the finish grade and cross section at any point along a straightedge. Test adjusted manholes and boxes with a straightedge positioned as far as practical, over the center of the cover. Furnish the straightedge and operate it under the direction of the Engineer.

00470.41(d) Concrete Manholes, __" diameter Water Quality (with Snout) – Construct __" diameter water quality manhole with snout as shown. Furnish and install Snout Hood Device manufactured by BMP, Inc. or an approved equal.

00470.90 Payment - Add the following pay items:

Pay Item	Unit of Measure
(l) Concrete Manholes ____ Dia. Water Quality (with Snout)	Each
(m) Concrete Manholes ____ Dia. Flow Control …….	Each
(o) Concrete Catch Basin, Type CG-2…….....	Each
(p) Concrete Catch Basin, Type CG-48……	Each
(q) Concrete Inlets, Type Area Drain Type II……	Each

SECTION 00490 - WORK ON EXISTING SEWERS AND STRUCTURES

Comply with Section 00490 of the Standard Specifications modified as follows:

Add the following:
00490.02 Additional Requirements - All work and materials provided and performed in this section must meet Clean Water Services requirements.

00490.40 General - Add the following:

Within asphalt street areas, initially set manholes and boxes to finished base aggregate grade. Adjust to final grade prior to final lift of asphalt.

Make vertical cuts in pavements with a concrete saw for setting manhole to final grade. Cut a minimum of 12 inches from the manhole frame.

Cut one of the following:
- A diamond-shaped opening at 45 degrees to the traffic lane.
- A circular-shaped opening centered about the manhole frame.

Back fill with high early strength concrete that meets the requirements of 00490.11 and will cure in time to carry traffic during the hours of darkness. Leave concrete 2 inches below finish grade of the manhole. Complete the top 2 inches with 1/2 inch HMAC. Apply asphalt tack to all surfaces before placing the final 2 inches of asphalt concrete. Place temporary AC wedges around all manhole frames that are not protected from traffic until final paving.

The final grade of the pavement surface and adjusted manholes and boxes shall not vary more than 1/4 inch from the finish grade and cross section at any point along a straightedge. Test adjusted manholes and boxes with a straightedge positioned as far as practical, over the center of the cover. Furnish the straightedge and operate it under the direction of the Engineer.

00490.44 Filling Abandoned Pipes, Manholes, and Catch Basins – Replace the first sentence with the following: “Grout or sand fill all pipes to be abandoned in place.” In the third sentence replace “according to AASHTO T 99” with “according to section 00405.46(c-2)”.

00490.46(b-2) Concrete and Masonry Manholes - In the paragraph that begins "Precast sections removed…", replace the sentence that begins "Precast items that…" with the following sentence:

Dispose of precast items, not reused on the Project, according to 00290.20.

00490.90 Payment - Add the following pay items:

Pay Item	Unit of Measure
(i) Remove and Relocate Pipe End Grate	Each

SECTION 00510 - STRUCTURE EXCAVATION AND BACKFILL

Comply with Section 00510 of the Standard Specifications modified as follows:

00510.80(b-1) Structure Excavation (Lump Sum) - Add the following to the end of this subsection:

The estimated quantity of structure excavation is:

Location	Structure Excavation (Cubic Yard)
Total	115

00510.80(c-1) Structure Excavation Below Elevations Shown (Lump Sum) - In the first bullet, replace "00190.10(f)" with "00190.10(h)".

00510.80(d) Granular Wall/Structure Backfill - Replace this subsection, except for the subsection number and title, with the following:

No measurement of quantities will be made for granular wall backfill or granular structure backfill. The estimated quantity of granular wall backfill or granular structure backfill is:

Location	Granular Wall/Structure Backfill (Cubic Yard)
STA 47+21.60	490
STA 55+77.00	1,130

00510.90(c-1) Structure Excavation Below Elevations Shown (Lump Sum) - In the sentence that begins "For excavation 0 to 3 feet…", replace "00190.10(f)" with "00190.10(h)".

00510.90(d) Granular Wall/Structure Backfill - Replace this subsection, except for the subsection number and title, with the following:

Granular wall backfill and granular structure backfill will be paid for at the Contract lump sum amount for the items "Granular Wall Backfill" or "Granular Structure Backfill", as applicable.

SECTION 00550 – PRECAST PRE-STRESSED CONCRETE MEMBERS

Comply with Section 00550 of the Standard Specifications modified as follows:

00550.80 Measurement – The quantities of work performed under this section will be measured on a Lump Sum basis. . These are based on transportation and installation – the City has already procured the items listed below.

00550,90 Payment – To the Pay Items, add the following:

d Concrete Arch Culvert……..Lump Sum
e Concrete Headwall……...Lump Sum
f Concrete Footings (2 per culvert)……...Lump Sum

Add the following to No Separate or Additional Payment will be made:

Lump Sum Payment will be payment in full for furnishings to the site and placing all materials including any necessary provisions to provide access the site (temporary access road), and furnishing all equipment, labor, transportation and incidentals to complete the work as specified.

SECTION 00641 - AGGREGATE SUBBASE, BASE, AND SHOULDERS

Comply with Section 00641 of the Standard Specifications modified as follows:

00641.12 Limits of Mixture - Replace this subsection, except the subsection number and title, with the following two paragraphs:

Provide a mixture of aggregate and water having a uniform moisture content sufficient to obtain the required compaction. Introduce water in a mixing plant or on the grade. Proportions will be in percentages by weight and will be known as the Mix Design. Determine the proportion of aggregate and water according to the MFTP. The amount of water for the Mix Design will be based on the dry weight of the aggregate.

When introducing water at the mixing plant, furnish the mixture with a tolerance of $\pm$ 2% of the optimum water content at the time of mixing. If approved, excess percentage of water may be allowed. The Agency will treat excess percentage of water according to 00641.80(d).

00641.20 Mixing Plant - Replace the sentence that begins "Mix aggregate and water…" with the following two sentences:

Mix aggregate and water according to paragraph (a) of this subsection. Road mix is not allowed on this Project.

00641.41 Mixing, Hauling, and Placing - Replace the sentence that begins "Add water to the aggregate…" with the following two sentences:

Add water to the aggregate while mixing to provide a moisture content according to 00641.12 and paragraph (a) of this subsection. Road mix is not allowed on this Project.

00641.44(a-1) Dense-graded Aggregates - Replace this subsection, except for the subsection number and title, with the following:

Begin compaction of each layer of dense-graded aggregates immediately after the material is spread. Continue compaction to achieve a minimum of 100% of maximum density. Determine maximum density according to AASHTO T 99, Method D, and coarse particle correction according to AASHTO T 224. Test in place density according to AASHTO T 310. Determine in place compaction of non-density testable material according to ODOT TM 158.

00641.80 Volume Basis - Replace this subsection, except for the subsection number and title, with the following:

When measurement is by volume, quantities will be the theoretical neat line quantity constructed and accepted.

The theoretical neat line quantity of aggregate shoulders will be shown in the Contract Schedule of Items.

Field measurement of the quantity will not be performed, except for Subgrade Stabilization and ordered changes. A quantity is included in the Contract Schedule of Items for ordered changes and subgrade stabilization. If changes are ordered or subgrade stabilization is necessary, only the quantity included in the ordered changes or subgrade stabilization will be measured.

00641.90 Payment - Add the following to the end of this subsection:

No separate or additional payment will be made for aggregate base shown but not included in the theoretical neat line quantities listed in 00641.80.

SECTION 00744 - MINOR HOT MIXED ASPHALT CONCRETE (MHMAC) PAVEMENT

Comply with Section 00744 of the Standard Specifications modified as follows:

00744.01 Abbreviations - Add the following:

MWMAC - Minor Warm Mix Asphalt Concrete

00744.02 Definitions - Add the following definitions:

Minor Warm Mix Asphalt Concrete (MWMAC) - An asphalt concrete mix following all the requirements of MHMAC except that through the use of additives or processes it is able to be mixed and placed at lower temperatures. Each use of the term MHMAC is interchangeable with the term MWMAC except in 00744.49. Use of submitted and approved MWMAC is allowed.

Sublot Size - A sublot is 1,000 tons of MHMAC, or the amount of MHMAC placed in a day if less than 1,000 tons is placed.

00744.10(c) Fractured Faces - In the sentence that begins "Provide crushed aggregate…", replace "AASHTO TP 61" with "AASHTO T 335".

00744.10(f) Fine Aggregate - Replace the paragraph that begins "Blend Sand…" with the following paragraph:

Blend sand is allowed for Levels 1, 2, and 3 mixes. Do not use more than 6% natural or uncrushed blend sand, by weight, in the total aggregate. Provide a means of verifying and documenting the amount of blend sand added to the aggregate.

00744.11(b) Asphalt Cement Additives - Add the following to the end of this subsection:

Use the additives or processes identified in Table 00744-1 for MWMAC. Submit equivalent alternates for review and approval.

Table 00744-1

MWMAC Additives and Processes		
MWMAC Technology	**Process Type**	**Supplier**
Advera (Synthetic Zeolite)	Foaming Process	PQ Corporation
Aspha-Min (Synthetic Zeolite)	Foaming Process	Aspha-Min
Evotherm	Chemical Additive	MeadWestvaco Asphalt Innovations
Redi-Set WMX	Chemical Additive	Akzo Nobel Surfactants, Inc.
Sasobit	Organic Additive	Sasol Wax Americas, Inc.
Plant Foaming Equipment	Foaming Process	Various Suppliers

00744.13 Job Mix Formula (JMF) Requirements - Replace the paragraph that begins "Provide a JMF for the Project meeting the following…" with the following paragraph:

Do not begin production of MHMAC for use on the Project until the JMF is reviewed by the Engineer and written consent is provided to proceed. A new JMF is required if the asphalt cement grade, additives, or the source of the aggregate changes during production. Provide a JMF for the Project meeting the following criteria:

Add the following paragraph to the end of this subsection:

For dense graded Level 3 wearing course mixes, the mix design submittal shall include the results of the performance testing as outlined in the latest ODOT Contractor Mix Design Guidelines for Asphalt Concrete.

00744.14 Tolerances and Limits - Under the "Constituent of Mixture/MHMAC All Types" list, delete the "Asphalt Cement - ODOT TM 321 (Cold Feed/Meter)…" line.

00744.16 MHMAC Acceptance - Replace this subsection with the following subsection:

00744.16 MHMAC Acceptance - A CAT-1 shall perform a minimum of one asphalt content, gradation, mix moisture, and Maximum Specific Gravity (AASHTO T 209) test per day and provide results to the Engineer by the middle of the following work shift. Provide split samples to the Engineer when requested. Upon written notice, the Engineer may waive testing and visually accept the mix according to Section 4(b) of the MFTP.

Add the following subsection:

00744.17 Small Quantity Acceptance - When less than three test results are obtained on a project, and testing has not been waived by the Engineer, the MHMAC will be accepted according to the following:

(a) Within Specification Limits - If all sublot sample test results are within specification limits for all constituents (including compaction) the material will be accepted and the full bid price will be paid for the material represented by that test.

(b) Outside Specification Limits - If a sublot sample test result for any constituent is outside the specification limit the Engineer will have the backup sample tested.

(1) Backup Within Specifications - If the backup sample test results for all constituents are within specification, the material will be accepted and the full bid price will be paid for the material represented by that test.

(2) Backup Out of Specifications - If the backup sample test results are out of specification, the Contractor may choose to sample the in-place material for further testing. The price adjustments will be computed using all original test results as well as all backup test results. (If there are less than three tests, average the two tests you have and use the average as the third test result). In no case will the composite pay factor (CPF) be greater than 1.0.

(3) In-Place Samples - If the in-place material is sampled, the Engineer will select and sample from three random locations from the area represented by the lot in question. Those samples will be tested and if found to be within specification the material will be accepted and paid for at the full bid price. If the material proves to be outside of the specification limits, the material will be accepted and paid for at an adjusted price according to 00744.95. In no case will the CPF be above 1.0.

00744.24(a) Steel-Wheeled Rollers - Replace this subsection, except for the subsection number and title, with the following:

Provide steel-wheeled rollers with a minimum gross static weight as follows:

	Level 1 and Level 2	**Level 3**
Breakdown and Intermediate	8 ton	10 ton
Finish	6 ton	8 ton

00744.43 MHMAC Mixing Temperatures - Replace this subsection with the following:

00744.43 MHMAC/MWMAC Mixing Temperatures - Produce MHMAC within the temperature ranges specified in the JMF. Produce MWMAC with a maximum temperature of 280 °F at the mixer and a minimum of 215 °F behind the paver.

00744.44 Tack Coat - Add the following paragraph to the end of this subsection:

Treat all paved surfaces on and against which MHMAC is to be place with an asphalt tack coat according to Section 00730. Immediately before applying the tack coat, clean and dry the surface to be tacked. Remove all material, loose or otherwise, that will reduce adhesion of the tack by brooming, flushing with water, or other approved methods.

Add the following subsection:

00744.48 Hauling, Depositing, and Placing - Haul, deposit, and place MHMAC as follows:

(a) Hauling - Cover MHMAC if rain or cold air temperatures are encountered any time between loading and placement.

MHMAC will be rejected before placing if one or more of the following is found:

- Below specified placing temperature limit
- Slumping or separating
- Solidifying or crusting
- Absorbing moisture

Dispose of rejected loads at no additional cost to the Agency.

Deliver the mixture to the paving machine at a rate that provides continuous operation of the paving machine, except for unavoidable delay or breakdown. If excessive stopping of the paving machine occurs during paving operations, the Engineer may suspend paving operations until the mixture delivery rate matches the paving machine operation.

(b) Depositing - Deposit MHMAC from the hauling vehicles so segregation is prevented.

When MHMAC is windrowed, the pick-up equipment shall:

- Pick up substantially all of the MHMAC deposited on the roadway.
- Be self-supporting, not exerting any vertical load on the paving machine, or causing vibrations or other motions which could have a harmful effect on the riding quality of the completed pavement.

(c) Placing - Alternative equipment and means may be allowed by the Engineer if the use of a paver is impractical.

Do not place MHMAC during rain or other adverse weather conditions, unless allowed by the Engineer. MHMAC in transit at the time adverse conditions occur may be placed if:

- It has been covered during transit.
- The MHMAC temperature is satisfactory.
- It is placed on a foundation free from pools or flow of water.
- All other requirements are met.

When leveling irregular surfaces and raising low areas, do not exceed 2 inches actual compacted thickness of any one lift, except the actual compacted thickness of intermittent areas of 1,000 square feet or less may exceed 2 inches, but not more than 4 inches. This may require portions of the mixture to be laid in two or more lifts.

Place the mixture in the number of lifts and courses, and to the compacted thickness for each lift and course, as shown. Place each course in one lift unless otherwise specified. Do not exceed

a compacted thickness of 4 inches for any lift. Limit the minimum lift thickness to twice the maximum aggregate size in the mix.

Do not intermingle MHMAC produced from more than one JMF. Each base course panel placed during a working shift shall conform to a single JMF. The wearing course shall conform to a single JMF.

00744.49 Compaction - Replace this subsection with the following subsection:

00744.49 Compaction - Immediately after the MHMAC has been spread, struck off, and surface irregularities and other defects remedied, roll it uniformly with rollers meeting the requirements of 00744.24 until compacted to a minimum of 92% of MAMD. Perform finish rolling and continue until all roller marks are eliminated. Determine the density of each sublot by averaging five QC tests performed at random locations by a CDT with the nuclear gauge operated in the backscatter mode according to WAQTC TM 8. Calculate MAMD according to ODOT TM 305. When less than three sublot test results are obtained on a project, the MHMAC will be accepted according to 00744.17. Perform a minimum of one sublot density test (five individual tests) per day. The Engineer may waive compaction testing upon written notice.

Complete breakdown and intermediate compaction of MWMAC before the MWMAC temperature drops below the threshold recommended by the additive supplier or equipment manufacturer.

00744.71 Joints - Seal joints between existing and new pavement surfaces as directed. Seal joints with a mixture of tack and asphalt sand. Provide a liberal application to the joint with a maximum width of 6 inches either side of the joint.

00744.80 Measurement - Delete the second sentence of the paragraph that begins "No separate measurement will be made…".

00744.90 Payment - Add the following to this subsection:

No separate or additional payment will be made for MWMAC.

SECTION 00749 - MISCELLANEOUS ASPHALT CONCRETE STRUCTURES

Comply with Section 00749 of the Standard Specifications modified as follows:

00749.00 Scope - Replace this subsection, except for the subsection number and title, with the following:

This work consists of furnishing and placing asphalt concrete in private road approaches, driveways, and other miscellaneous or minor items of asphalt concrete, as shown, specified, or directed. The items in this Section will be collectively referred to as "structures".

This work does not include asphalt concrete construction on traffic lanes, auxiliary lanes, shoulders, median areas, tapers, widening, public road approaches, guardrail flares, mailbox turnouts, freeway exit and entrance ramps, patching and leveling on similar areas.

00749.11 Aggregate Base - Replace this subsection, except for the subsection number and title, with the following:

Furnish aggregate base materials for base, foundation courses, leveling courses, and bedding meeting the requirements of Section 02630. If a designated size is not shown, or given, furnish either 1 1/2" - 0 or 3/4" - 0, as directed.

00749.13 Asphalt Concrete - Replace this subsection, except for the subsection number and title, with the following:

Furnish the level of 1/2" dense graded mix shown. If no dense graded mix is shown, provide Level 2, 1/2" dense graded mix meeting the requirements of the Asphalt Concrete Section included in the Special Provisions. When conditions justify, the mixture may be varied, if approved. Perform acceptance testing as directed.

00749.80 Measurement - Replace the paragraph that begins "Work performed under this Section…" with the following:

Work performed under this Section will be measured by one of the methods described in 00749.81 and 00749.82. Private road approaches which have a line designation, typical section, and profile will not be measured for payment. Public road approaches which occur at the beginning or end of the Project, or which have a line designation, typical section, or profile, will not be measured for payment.

00749.90 Payment - Replace this subsection, except for the subsection number and title, with the following:

The accepted quantities of structures placed under this Section will be paid for at the Contract unit price, per unit of measurement, for the items listed in 00749.91 and 00749.92.

Aggregate will be paid for according to 00640.90 and 00641.90 as appropriate.

No separate or additional payment will be made for earthwork.

00749.91 Method "A" - Weight and Extras Basis - Replace the following pay item:

Pay Item	Unit of Measurement
(j) Extra for Asphalt Driveway Approaches	Square Foot

SECTION 00756 - PLAIN CONCRETE PAVEMENT

Comply with Section 00756 of the Standard Specifications modified as follows:

00756.23 Paving Equipment - Replace the paragraph that begins "Place the PCC with either..." with the following paragraph:

Provide self-propelled paving machines that conform to the following:

00756.23(b) Slipform Paver - Add the following bullets to the end of the bullet list:

- Equipped with a positive interlock system to stop all vibration and tamping elements when the forward motion of the machine is interrupted.
- For projects that have more than 1,000 feet of concrete paving, equipped with an electronic monitoring device that:

    - Is near the operator's controls visible to the paver operator and Engineer.
    - Operates continuously while paving.
    - Displays the operating frequency of each individual internal vibrator for both manual and automatic sequencing.
    - Records the time of day, station location, paver track speed and the operating frequencies.

00756.23(c) Paving Machine - Replace the bullet that begins "Vibratory equipment..." with the following bullet:

- Vibratory equipment shall be of the surface pan type or internal type with immersed tube or multiple spuds. The vibrator shall provide full slab width vibration to the concrete. The rate of vibration shall be not less than 3,500 cycles per minute for surface vibrators and shall be not less than 7,000 cycles per minute for internal vibrators and as necessary for proper consolidation and compaction.

00756.41 Preparation of Base - Add the following paragraph after the paragraph that begins " Before paving operations begin...":

The base shall be moist before the concrete is placed. When the base is a treated base the surface shall be clean and free of all loose material. Place concrete on existing and new treated base only when the surface temperature is less than 90 °F. If water is used for cooling, remove all excess water standing in pools or flowing on the surface before placing concrete.

00756.43 Placing Dowel Bars - Replace this subsection with the following subsection:

00756.43 Placing Dowel Bars and Tie Bars:

(a) Dowel Bars - Provide smooth, round, epoxy coated dowel bars. Coat with plastic, grease, heavy oil, or other approved material that will neither bond with nor be harmful to the PCC. Use a framework to place dowels that is continuous across the entire lane width, holds the dowels parallel with each other, holds the dowels parallel with the surface of the pavement, and holds the dowels parallel to the roadway centerline. For dowels placed across an expansion joint, use a dowel bar basket or other system of support that leaves no permanent incompressible members in place within the joint. Maximum alignment tolerance shall be 5 degrees or 3/16 inch in the length of the dowel. Place dowels within 3/8 inch of the center of the slab vertically. The supporting framework for dowel bars shall be a welded wire assembly (basket) that supports the dowel bars in their proper position and alignment with alternating ends of the dowel bars tack welded, on one end only, to the framework.

Securely fasten the dowel bar to a supporting framework to prevent the dowel bars from being displaced from their proper position during placing of the concrete.

Place dowel bars for joint contact at existing concrete pavement surfaces by drilling the existing concrete section and then inserting the dowel bars and epoxy grouting them in place. Drill the holes large and deep enough to insert the dowel bars with adequate grout. Adjust hole locations to avoid damaging any existing reinforcement when drilling the holes. Blow the dowel bar holes clean with compressed air before grouting. Center the bar in the hole for the full length of embedment before grouting. Pump the grout into the hole around the bar so the back of the hole will be filled first. Do not allow blocking or shimming to impede the flow of the grout into the hole. If dams are needed, place them at the front of the holes to confine the grout. Place the dams to permit the escape of air without leaking grout. Do not remove dams until grout has cured in the hole.

(b) Tie Bars - Provide epoxy coated tie bars and place them for contact-type longitudinal joints by one of the following methods:

- By drilling the hardened concrete section and then inserting and epoxy grouting the tie bars into place. Drill the holes large and deep enough to insert the tie bars with adequate grout. Take care not to damage the reinforcement when drilling the holes. Drill after the concrete attains enough strength so no damage to the concrete is caused by the drilling. Replace loose tie bars at no additional cost to the Agency.
- By inserting the tie bars into the plastic slipformed concrete before vibrating and finishing the concrete. The tie bars may be bent before insertion. Replace any loose tie bars by drilling and grouting, as described above, at no additional cost to the Agency.
- By using threaded mechanical splice couplers from the QPL, or approved equal. Submit splices for approval before using. Rebar splices shall be:
    - Accompanied by manufacturer's quality compliance certificate according to 00165.35.
    - Installed according to manufacturer's recommendations.

00756.46 Placing Concrete - Replace the paragraph that begins "Place concrete by either..." with the following paragraph:

Place the concrete pavement with a slip form paving machine as described in (a), (b), (c), and (d) below. Concrete pavement may be constructed between stationary side forms as described in (e) below only when:

- Areas of continuous concrete pavement are less than 1,000 square yards.
- Areas are inaccessible to slipform paving equipment.
- In areas of irregular geometry.
- In short sections of pavement which are necessary to facilitate traffic movement.

00756.46(c) Two Separate Machines - Replace this subsection with the following subsection:

00756.46(c) Spreading and Finishing Construction - Place the concrete with slip-form paving equipment designed to spread, consolidate, screed, and float-finish the plastic concrete in one complete pass of the machine to provide a dense and homogeneous pavement surface with a minimum of hand finishing. Use hand screeding and float finishing only on small irregular areas.

Consolidate the plastic concrete by internal vibration with transverse vibrating units located within the specified thickness of pavement sections for the full width of pavement. A series of equally spaced longitudinal vibrating units may be used to supplement or replace the transverse vibrating units.

Maintain the frequency of vibration of each vibrating unit above 7,500 cycles per minute. Maintain the frequency or amplitude of vibration to consolidate the plastic concrete along the entire length of the vibrating unit and for a distance of at least 1 foot. Vary the frequency or vibration of amplitude proportionately with the rate of travel to result in a uniform density and air content.

Horizontally space vibrators according to the manufacturer's recommendations or not more than 18 inches, center-to-center, whichever is less. Do not exceed a 9 inch space from the outer edge of the pavement to the outside vibrator.

00756.46(h) Protect Surface - Add the following paragraph at the end of this subsection:

When concrete is placed adjacent to an existing pavement, equip that part of the equipment which is supported on the existing pavement with protective pads on crawler tracks or use rubber-tired wheels. Offset the track or wheels to run a sufficient distance from the edge of the pavement to avoid breaking the pavement edge.

00756.48(b-2) Longitudinal Weakened Plane Joints - Replace the sentence that begins "Perform sawing as soon as…", with the following sentence:

Saw longitudinal weakened plane joints at the earliest possible time following placement of the concrete to prevent uncontrolled cracking without damaging the pavement or joint.

Delete the paragraph that begins " If the top width...".

00756.48(c) Construction Joints - In the paragraph that begins "Construct construction joints…", replace "20 minutes" with "45 minutes".

00756.48(d) Contraction Joints - Replace this subsection with the following subsection:

00756.48(d) Transverse Contraction Joints - Form transverse contraction joints by sawing to the required dimensions shown on the Plans. Saw transverse contraction joints at the earliest possible time following placement of the concrete to prevent uncontrolled cracking without damaging the pavement or joint. Repair any damage to the curing material during the sawing operations immediately after the sawing is completed.

Add the following subsection:

00756.48(e) Sealing Sawed Joints - Fill sawed longitudinal weakened plane joints and transverse contraction joints with poured joint filler. Thoroughly clean joints at the time of sealing. Ensure the curing period for joints is complete before allowing construction equipment and vehicles on the pavement.

00756.49(b) Textured Finish - Replace the paragraph that begins "Accomplish the textured…" with the following paragraph:

Accomplish the textured finish with a steel-tine tool with 1/8 inch wide tines spaced 3/4 inches apart that will mark the finished surface to a depth of 1/8 to 3/16 inch without tearing the surface. Avoid overlaps of the texturing. Texture the surface perpendicular to the roadway centerline and full roadway width.

00756.52 Edge Tooling and Filling - Replace the paragraph that begins "Tool edges at construction…" with the following paragraph:

Tool edges at longitudinal contact joints and construction joints of new pavement and clean joints of previously placed concrete to remove laitance and mortar resulting from finishing operations, and to provide clean rounded edges without ridges on the surface. Perform tooling of the edges of concrete pavement so that a nominal 5/8 inch diameter radius is produced. Perform tooling of edges at construction joints so that no more than a 1/8 inch radius is produced.

00756.53 Curing Concrete - Replace this subsection, except for the subsection number and title, with the following:

Immediately after the final floating, surface finishing and edging have been completed, and while the concrete surface is still moist, cover and cure the entire exposed surface of the newly placed concrete for at least 72 hours according to one of the following provisions:

(a) Liquid Membrane-Forming Compounds - Apply liquid membrane-forming compound uniformly to the concrete by pressure-spray methods at a rate of at least 1 gallon per 150 square feet. Mix the liquid membrane-forming compound thoroughly before and during use.

(b) Other Coverings - Apply the covering to damp concrete as soon as it can be placed without marring the surface. Place the membrane in contact with the surface, extend beyond the sides or edges of the slabs or forms, and weight down as required to hold it in position as a waterproof and moisture-proof covering. Laps shall be sufficient to maintain tightness equivalent to the sheeting and use:

(1) Polyethylene Film - Sheeting shall be clear or white.

(2) Waterproof Paper - Transverse laps shall be at least 18 inches, and cement longitudinal seams.

(3) Cotton or Jute Mats - Before placing, saturate the mats with water and keep fully wetted during the curing period.

00756.55 Surface Tolerance, Testing, and Correction - In the sentence that begins "Except as specified…", replace "0.6 mile" with "1,500 feet".

00756.56(a) Survey Method - Replace this subsection with the following subsection:

00756.56(a) Sticking Measurements - Determine conformance with minimum thickness requirements by random sticking measurements of the plastic concrete according to ODOT TM 775 under the Engineer's observation. Report thickness to the nearest 0.1 inch.

Divide the panel into units and partial units equivalent to a maximum of 200 lane feet. Normally, unit lengths will be 200 feet for one lane, 100 feet for two lanes, 70 feet for three lanes and as appropriate for transition areas. When directed, take one sticking measurement at a randomly selected location in each unit and partial unit. Record measurements to the nearest 0.1 inch. Take the measurements:

- After consolidation and screeding and before the float finish.
- No closer than 2 feet from the panel edges.
- Within 10 feet longitudinally and 1 foot transversely from the calculated random location determined by the Engineer.

If a sticking is not obtained for a unit or a partial unit, or is not available to represent the area of pavement remaining after the limits of pavement over 1.0 inch deficient is determined, the measurement will be assumed to be the same as the preceding or following sticking measurement, that is nearest in distance.

00756.60 Protection of Concrete - Replace this subsection, except for the subsection number and title, with the following subsection:

Remove and replace any part of the pavement damaged by traffic or damaged from any other cause before its official acceptance, according to 00170.80.

Do not operate construction equipment on newly placed concrete until the requirements of (a), (b), and (c) are met. Do not allow public traffic on newly placed concrete until all of the following requirements are met:

(a) The Contractor complies with 00150.60.

(b) The concrete attains a compressive strength of at least 70% of the specified 28 day strength as determined by testing at least three cylinders cured according to AASHTO T 23 (field cure) and tested according to AASHTO T 22.

The maturity method, AASHTO T 325, may be used to estimate concrete strength for opening pavement to construction traffic. Install at least two maturity thermocouples for each day's placement in areas where the maturity method will be used for early opening. Install the thermocouples near the day's final placement for areas being evaluated for early opening.

When the maturity method is used, the Engineer may verify the maturity method with strength specimens. Establish a new strength-maturity relationship if strength specimens deviate more than 10 percent from the maturity-estimated strengths. Suspend use of the maturity method for opening pavements to traffic when the strength-maturity relationship deviates by more than 10 percent until a new strength maturity relationship is established.

(c) The surface of the concrete is protected from scarring or abrasion and kept free of stones, loose mortar and other matter apt to be deleterious to the concrete in the paths of equipment.

(d) The pavement meets all of the requirements of 00756.55.

00756.61 Opening to Construction Equipment or Traffic – replace (b) with the following:

(b) The concrete attains a compressive strength of at least 95% of the specified 28-day strength as determined by at least three cylinders cured according to AASHTO T 23 (field cure) and tested according to AASHTO T22; a minimum of seven days have passed since placement; if curing is done under cold weather condition, the compress strength has reached at least 95% of the mix design strength; and both the City and the Design Engineer agree that the street is ready for traffic and construction loads.

00756.90 Kinds of Incidentals to Plain Concrete Pavement

Add the following sentence to the end of section:

No separate payment for reinforcing rebar mat around manholes.

00756.95 Bonus Payment for Smoothness – Remove this section in entirety.

SECTION 00759 - MISCELLANEOUS PORTLAND CEMENT CONCRETE STRUCTURES

Comply with Section 00759 of the Standard Specifications modified as follows:

00759.00 Scope - Replace this subsection, except for the subsection number and title, with the following:

This work consists of furnishing, placing and finishing commercial grade concrete curbs, islands, traffic separators, driveways, walks, monolithic curb and sidewalks, and miscellaneous surfaces in close conformity to the lines, grades and dimensions shown or established. The commercial grade concrete items in this Section will be collectively referred to as "structures".

00759.90 Payment - Add the following pay items:

Pay Item	Unit of Measurement
(a) Concrete Curb, Mountable Curb	Foot
(k) Concrete Impact Slab, Perimeter	Foot

SECTION 00850 - COMMON PROVISIONS FOR PAVEMENT MARKINGS

Comply with Section 00850 of the Standard Specifications modified as follows:

Add the following subsection:

00850.11 Flexible Bituminous Adhesive - At least two weeks before using, submit for Agency testing and approval a 15 pound brick sample of flexible bituminous adhesive for each manufacturer lot number, including previously tested and approved lot numbers that are over one year old, that will be used on the Project. All previously rejected lot number samples will not be retested. Agency testing and approval is only for acceptance of use of the adhesive.

00850.20(b) Equipment for Longitudinal Lines - Replace the paragraph that begins "Use equipment capable of…" with the following paragraph and bullets:

Provide equipment that can:

- Place two parallel lines simultaneously with 4 inch minimum to 12 inch maximum spacings between the two lines.
- Place the entire width of a line in one pass.

00850.40 Projects Without Striping Plans and 00850.41 Projects With Striping Plans - Replace these two subsections with the following subsection:

00850.40 Plans:

(a) Projects With Complete Striping Plans - When striping Supplemental Drawings are included in the Project, install striping as shown.

(b) Projects With Partial Striping Plans - When partial Supplemental Drawings are included in a Project, install striping according to the following:

- In areas where striping details are shown on the Supplemental Drawings, install striping as shown.
- In areas where striping details are not shown on the Supplemental Drawings, install striping to match the original striping configuration with the appropriate striping items listed in the Contract Schedule of Items.

(c) Projects Without Striping Plans - When striping Supplemental Drawings are not included in the Project, install striping to match the original striping configuration with the appropriate striping items listed in the Contract Schedule of Items.

For Projects with partial striping plans or Projects without striping plans, document all existing striping, that is not shown, by survey according to Special Provision 00305. Submit survey documentation to the Engineer seven calendar days before the loss of existing pavement markings.

00850.46 Placement Tolerance - Replace the bullet that begins "Thickness of lines…" with the following bullet:

- **Thickness of flat, surface applied lines:** + 1/3 of the specified thickness, – 1/10 of the specified thickness

00850.47(b) Curing of Material - Replace this subsection, except for the subsection number and title, with the following:

At the time of installation, note and report to the Engineer all soft spots and darkened areas that may result in poor bonding and durability of the pavement markings.

00850.47(c) Retroreflectivity - Replace this subsection, except for the subsection number and title, with the following:

Except for paint applications, evaluate longitudinal and transverse marking retroreflectivity according to ODOT TM 777. Acceptance will be according to the following:

- **Longitudinal Markings** - Each longitudinal marking sublot will be accepted if the average of the measurements and at least 90 percent of the individual measurements within the sublot meet or exceed the required minimum initial retroreflectivity.

  If more than 10 percent but no more than 25 percent of the individual measurements in a sublot fail, take additional measurements within the sublot according to ODOT TM 777, Section 7.2.1 halfway between the measurements taken during initial evaluation. Combine these additional measurements with the initial measurements and re-evaluate the sublot. If the combined sublot measurements do not meet the 90 percent criteria, remove and replace the entire longitudinal marking sublot at no additional cost to the Agency.

  If more than 25 percent of the individual measurements in a sublot fail remove and replace the entire longitudinal marking sublot at no additional cost to the Agency.

- **Transverse Markings** - Each transverse marking sublot will be accepted if the average of the measurements and at least 90 percent of the individual measurements within the sublot meet or exceed the required minimum initial retroreflectivity.

  If more than 10 percent but not more than 25 percent of the individual measurements in a sublot fail, take additional measurements within the sublot according to ODOT TM 777, Section 7.2.2. The Engineer will randomly select an equal number of untested transverse markings to test. Combine these additional measurements with the initial measurements and re-evaluate the sublot. If the combined sublot measurements do not meet the 90 percent criteria, remove and replace the entire transverse marking sublot at no additional cost to the Agency

  If more than 25 percent of the individual measurements in a sublot fail remove and replace the entire transverse marking sublot at no additional cost to the Agency.

00850.70 Disposal of Waste - Replace this subsection with the following subsection:

00850.70 Disposal of Materials - Dispose of all materials according to 00290.20.

00850.75 Manufacturer's Warranty - Replace the paragraph that begins "For Sections referencing…" with the following paragraph:

For Sections referencing 00850.75, furnish a Manufacturer's Warranty on Agency supplied warranty forms. The forms are available from the Engineer.

SECTION 00855 - PAVEMENT MARKERS

Comply with Section 00855 of the Standard Specifications modified as follows:

00855.40(c) Installation - In the paragraph that begins "Do not install…", replace the sentence that begins "Adjust spacing between…" with the following two sentences:

To avoid longitudinal cracks and joints, adjust pavement markers up to one half the width of the marker. To avoid transverse cracks and joints, adjust pavement markers ahead or back on line ± 5 inches.

SECTION 00860 - LONGITUDINAL PAVEMENT MARKINGS - PAINT

Comply with Section 00860 of the Standard Specifications modified as follows:

00860.00 Scope – add the following:

In addition to the requirements of Section 00860, install painted longitudinal pavement markings per Signing and Striping Plan sheets SS-04, SS-05, SS-06, and SS-07 (see construction note #1 on plan sheets).

00860.45 Installation - Replace this subsection, except for the subsection number and title, with the following:

Apply painted longitudinal pavement markings as follows:

- Apply one application at thickness of 15 mils wet, equivalent to 17 gallons per mile for a 4 inch wide solid stripe.
- Apply reflective elements at a minimum rate of 5 pounds per gallon of paint. Embed by means of wicking, a minimum of 80 percent of the reflective elements in the paint to a minimum depth of 50 percent of their diameter.

Minimum initial retroreflectivity shall be:

- White - 250 mcd/m^2/lx
- Yellow - 200 mcd/m^2/lx

SECTION 00865 - LONGITUDINAL PAVEMENT MARKINGS - DURABLE

Comply with Section 00865 of the Standard Specifications modified as follows:

00865.45 Installation - Replace this subsection, except for the subsection number and title, with the following:

Place durable markings only when the manufacturer's representative determines that the pavement is ready for the pavement marking material.

Apply reflective elements at a rate to obtain the following minimum initial retroreflectivity readings:

- White - 250 mcd/m^2/lx
- Yellow - 200 mcd/m^2/lx

Apply marking materials by one or more of the following methods:

- **Method A: Extruded Markings** - Apply markings with an extrusion or ribbon type process and according to the following:
  - For grooved markings, grind the slot depth as shown. Apply the specified marking material into the slot so the slot is filled from edge to edge as shown. The top of the marking shall be flat or slightly convex.
  - For profiled markings, place lines and bumps straight and square.
- **Method B: Spray Markings** - Apply two separate applications of spray markings with each application being one half the total specified thickness. Retrace the second application directly over the first application within 1/16 inch. For white colored markings, apply the second application in the same direction of the first application. For yellow colored markings that delineate two-way traffic, apply the second application in the opposite direction of the first application. For yellow colored markings on one-way roadways, apply the second application in the same direction of the first application.

00865.90 Payment - Replace this subsection, except for the subsection number and title, with the following:

The accepted quantities of work performed under this Section will be paid for at the Contract unit price, per unit of measurement, for the following items:

Pay Item	Unit of Measurement
Method AB (Non-Profiled Extruded or Sprayed)	
(g) Methyl Methacrylate, Extruded or Sprayed, Surface, Non-Profiled	Foot
(h) Thermoplastic, Extruded or Sprayed, Surface, Non-Profiled	Foot

SECTION 00867 - TRANSVERSE PAVEMENT MARKINGS - LEGENDS AND BARS

All pavement markings works shall conform to the NW 253rd Avenue plans, special provisions, and current City of Hillsboro Specifications for Public Works Constriction. All work shall be to City of Hillsboro Standards, Sheet R3.1 through R3.4 of the project plans.

00867.00 Scope – Replace in entirety with the following:

00867.00 Scope – In addition to the requirements of Section 00850 and 00865, install durable longitudinal pavement markings according to the following Specifications.

Add the following:

00867.10 Materials – Cold applied tape shall be installed with SPA 60 adhesive or approved equal. Tape shall be 3M 380 AW or approved equal. Install cold applied tape on all new or existing concrete.

00867.90 Payment - Replace this subsection, except for the subsection number and title, with the following:

The accepted quantities of work performed under this Section will be paid for at the Contract unit price, per unit of measurement, for the following items:

Pay Item	Unit of Measurement
(a) Pavement Bar, Type A	Square Foot

In item (a) the type of pavement marking material will be inserted in the first blank.

Item (d) includes all transverse pavement markings that are defined as a "BAR", including but not limited to, stop bars, crosswalk bars, chevron bars, transverse median bars, and transverse shoulder bars.

Payment will be payment in full for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

Payment for work under this Section will be limited to 75% of the amount due until the Agency has received the signed warranty.

SECTION 00905 - REMOVAL AND REINSTALLATION OF EXISTING SIGNS

Comply with Section 00905 of the Standard Specifications modified as follows:

00905.40 General - Add the following:

Protect existing signs and posts that are designated for “removal only”. Deliver removed signs and posts to City of Hillsboro Public Works Operations Division at 142 SE Maple Street, Hillsboro, OR 97123.

SECTION 00930 - METAL SIGN SUPPORTS

Comply with Section 00930 of the Standard Specifications modified as follows:

00930.01 Definitions and Terms - In the "Triangular Base Breakaway Sign Supports, Pipe Breakaway Sign Supports, and Square Tube Breakaway Sign Supports" definition, replace the words "Square Tube Breakaway Sign Supports" with the words "Square Tube Sign Supports".

In the "Pipe Sign Supports and Square Tube Sign Supports" definition, replace the words "Square Tube Sign Supports" with the words "Perforated Steel Square Tube ~~Anchor~~ Sign Supports".

In the "Minor Sign Supports" definition, replace the words "Square Tube Breakaway Sign Supports" with the words "Perforated Steel Square Tube Breakaway Sign Supports" and replace the words "Square Tube Sign Supports" with the words "Perforated Steel Square Tube Supports".

Add the following definition to the list of definitions:

00930.02 Working Drawings - In the paragraph that begins "Working drawings are not…", delete the "Square Tube Sign Supports" bullet.

00930.10 Materials - In the paragraph that begins "Furnish galvanized bolts…", add the words "for Minor Sign Supports" after the words "job site".

In the paragraph that begins "All components of…", replace the sentence that begins "Galvanizing shall conform to…" with the following sentence:

Except for perforated steel square tube ~~slip base~~ breakaway sign supports and for perforated steel square tube ~~anchor~~ sign supports, galvanizing shall conform to the requirements of Section 02530. Galvanize perforated steel square tube ~~slip base~~ breakaway sign supports and perforated steel square tube ~~anchor~~ sign supports according to ASTM A653 G140.

00930.40(b) Assembly of Metal - Add the following paragraph to the end of this subsection:

Faying surfaces of plates shall be flat to within a tolerance of 1/32 inch in 12 inches and a tolerance of 1/16 inch overall. Base plates with leveling nuts shall be flat to within a tolerance of 1/8 inch in 12 inches and a tolerance of 3/16 inch overall.

00930.40(c) Welding - Replace the paragraph that begins "Weld steel sign structures..." with the following:

Weld steel sign structures according to AWS D1.1 with the following exceptions:

- AWS D1.1, Clause 3 prequalified welds for complete joint penetration (CJP) are not allowed.

- Qualify CJP welds according to AWS D1.1, Clause 4. Perform V-notch (CVN) testing at 70 °F meeting the requirements of the absorbed energy values of Table 4.14.

The fabricator shall inspect welds according to the details and requirements called out on the Contract Documents. This requirement will override all appropriate weld inspection requirements called out in Section 5.15 WELDED CONNECTIONS in AASHTO "Standard

Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals". Submit all Procedure Qualification Records, Welding Procedure Specifications, and testing procedures for Engineer's review prior to starting manufacturing. Submit certified copies of inspection reports to the Engineer for review.

00930.80 Measurement - Add the following to the end of this subsection:

The estimated quantities of structural steel are as follows:

Item	Estimated Quantity
Perforated Steel Square Tube Breakaway Sign Supports	Each

00930.90 Payment - Replace pay item (n) with the following pay items:

(n) Square Tube Sign Supports.....Each

Replace the paragraph that begins "No separate or additional payment…" with the following paragraph:

No separate or additional payment will be made for route marker frames, wind bracing, pole clamps, stainless steel clamps, mast arm street name sign mounts, or special sign brackets.

SECTION 00940 - SIGNS

Comply with Section 00940 of the Standard Specifications modified as follows:

00940.03 Drawings - Replace this subsection, except for the subsection number and title, with the following:

Submit working drawings for non-standard signs based on the guidelines furnished in City of Hillsboro's Permanent Signing Legend detail. Standard signs called for in the Contract Documents shall be constructed using drawings available in FHWA's "Standard Highway Signs" (FHWA English Version) or ODOT's "Sign Policy and Guidelines for the State Highway System".

Add the following subsection:

00940.04 Construction - Fabricate each individual sign on a separate sign blank. Fabricate all components of each individual sign with sheeting from the same supplier to ensure that all components are compatible, and are warrantable by the manufacturer. Removable legend sheeting is not required to be from the same supplier as the background sheeting for sign panels.

00940.46 Inspection - Replace the sentences that begin "Inspection will…" and "Testing for…" with the following sentence:

Each individual sign will be available for inspection on the ground at a mutually agreed upon location between the Contractor and the Agency a minimum of 5 working days before

placement for acceptability to place. After placement further inspection will be for conformance to the plans and Specifications, and for conformance to nighttime visibility.

SECTION 01011 - STORMWATER CONTROL, PONDS

Section 01011, which is not a Standard Specification, is included for this Project by Special Provision.

Description

01011.00 Scope - This work consists of furnishing and installing stormwater ponds as shown.

Materials

01011.10 Materials - Furnish material meeting the following requirements:

Manholes, Catch Basins, and Inlets	00470.11
River Rock	01040
Geotextile Fabric, Type 1, Certification Level B	02320
Seeding	01030
Planting	01040

01011.12 Amended Soil - Furnish medium compost meeting the requirements of Section 03020. Furnish soil meeting the following gradation requirements:

Sieve Size	Percent Passing (by Weight)
No. 4	100
No 10	95 - 100
No. 40	40 - 60
No. 100	10 - 25
No. 200	5 - 10

Sample soil according to AASHTO T 2. Determine sieve analysis according to AASHTO T 27 and AASHTO T 11.

Blend the medium compost and soil so that the mixture:

- Is composed of between 20 percent and 25 percent medium compost material and between 75 percent and 80 percent soil material.
- Has a pH between 5.5 and 8.0.
- Does not have clumps greater than 3 inches in any direction.

Construction

01011.40 General - Construct storage facility as shown. Perform excavation and fine grading work only when the facility area is dry and only from the top of the pond area. Do not stockpile material in the facility area.

01011.41 Storage Pond - Scarify the subsoil area a minimum 12 inches deep. After scarification, place the water quality mixture in maximum 12 inch lifts. Compact each lift with a water filled landscape roller.

01011.42 Water Quality / Detention Pond:

(a) Scarify - Scarify the subsoil area a minimum 12 inches deep.

(b) Laying Pipe - Lay the pipe according to Section 00445. Place pipe with perforations down unless otherwise directed.

(c) Joining Pipe - Fasten pipes together with coupling fittings or bands as specified for the type of pipe used. Cap the upstream end of the pipe.

(d) Inspection and Repair - Place Type 2 water quality mixture only after all the pipe is laid, joined, and inspected. Remove and reinstall or replace all pipe that is out of alignment, has settled, or is damaged at no additional cost to the Agency.

(e) Placement of Water Quality Mixture - Place water quality mixture in maximum 12 inch lifts. Compact each lift by using a water filled roller.

01011.43 Facility Field Markers - Install field markers as shown and according to Section 00842.

Maintenance

01011.70 Cleaning - If a stormwater control facility is used for erosion and sediment control, remove all accumulated sediment and debris before completing the facility.

Measurement

01011.80 Measurement - No measurement of quantities will be made for work performed under this Section. The estimated quantities of materials are:

Water Quality / Detention Pond "A" Quantities:

Item	Quantity
Pipe Inlet with Grate	1 Each
3" River Rock (across pond bottom)	16 CY
High-Density Jute (GeoJute, in treatment area)	2,520 Sq. Ft.
Low-Density Jute (EconoJute, all other areas)	1,521 Sq. Ft.
Freeboard Seeding	19 lb @ 120 lb/AC.
Excavation	170 CY
Embankment	61 CY
Planting: Acer Circinatum (Vine Maple)	29 Each

Planting: Cornus Sericea (Red Osier Dogwood) ..... 38 Each
Planting: Ribes Sanguimeum (Red Flowering Currant) ..... 53 Each
Planting: Philadelphius Lewisii (Mock Orange) ..... 54 Each
Planting: Juncus Pateus (Spreading Rush) ..... 4,875 Each
Planting: Scripus Microcarpus (Small-fruited Bulrush)..... 4,875 Each

Water Quality / Detention Pond "B" Quantities:

Item	Quantity
Pipe Inlet with Grate	1 Each
3" River Rock (across pond bottom)	74 CY
High-Density Jute (GeoJute, in treatment area)	9,450 Sq. Ft.
Low-Density Jute (EconoJute, all other areas)	3,473 Sq. Ft.
Freeboard Seeding	36 lb @ 120 lb/AC
Excavation	952 CY
Embankment	314 CY
Planting: Acer Circinatum (Vine Maple)	66 Each
Planting: Cornus Sericea (Red Osier Dogwood)	86 Each
Planting: Ribes Sanguimeum (Red Flowering Currant)	124 Each
Planting: Philadelphius Lewisii (Mock Orange)	122 Each
Planting: Juncus Pateus (Spreading Rush)	15,778 Each
Planting: Scripus Microcarpus (Small-fruited Bulrush)	15,778 Each
Planting: Carex Obnupta (Slough Sedge)	15,778 Each

Water Quality / DetentionPond "C" Quantities:

Item	Quantity
Pipe Inlet with Grate	1 Each
3" River Rock (across pond bottom)	22 CY
High-Density Jute (GeoJute, in treatment area)	3,910 Sq. Ft.
Low-Density Jute (EconoJute, all other areas)	1,970 Sq. Ft.
Freeboard Seeding	26 lb @ 120 lb/AC
Excavation	40 CY
Embankment	418 CY
Planting: Acer Circinatum (Vine Maple)	43 Each
Planting: Cornus Sericea (Red Osier Dogwood)	57 Each
Planting: Ribes Sanguimeum (Red Flowering Currant)	72 Each
Planting: Philadelphius Lewisii (Mock Orange)	84 Each
Planting: Juncus Pateus (Spreading Rush)	6,861 Each
Planting: Scripus Microcarpus (Small-fruited Bulrush)	6,861 Each

Payment

01011.90 Payment - The accepted quantities of work performed under this Section will be paid for at the Contract lump sum amount for the items:

Pay Item	Unit of Measurement
(a) Water Quality / Detention Pond "A", "B" and "C"	Lump Sum

The drainage facility identification number will be inserted in the blank.

Payment will be payment in full for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

SECTION 01012 – WETLAND BUFFER MITIGATION

Section 01012, which is not a Standard Specification, is included for this Project by Special Provision.

Description

01012.00 Scope - This work consists of mitigating and planting wetland buffers as shown.

Construction

01012.40 General – Mitigate wetland buffers as shown. Perform planting preferably only between February 1 and May 1 or between October 1 and November 15. Plants may be installed at other times of the year; however, addition measures may be necessary to ensure plant survival. Do not stockpile material in the facility area.

Irrigation or other water practices (i.e. polymer, plus watering) shall be used during the two-year maintenance period. Watering shall be provided at a rate of at least one inch per week between June 12 and October 15.

Planting shall be mulched a minimum of three inches in depth and 18 inches in diameter to retain moisture and discourage weed growth around newly installed plant material.

Tree planting shall be protected from wildlife damage (beaver, nutria) by installing tree-protector tubes or wire mesh cylinders around newly installed plantings.

Alternative plant species may be substituted with written City approval due to stock availability and/or cost. All plants installed must be native and included on Clean Water Service's planting palette in Appendix A of the Design and Construction Standards R&O 07.

Maintenance

Clean Water Services requires a two-year maintenance period for wetland buffer mitigation. The mitigation site is to be inspected annually, a minimum of three times during the growing season and one time prior to onset of the growing season. Invasive species control is to be conducted as needed based upon the site inspections.

Measurement

01012.80 Measurement - No measurement of quantities will be made for work performed under this Section. The estimated quantities of materials are:

Wetland Buffer Replacement Mitigation Area Quantities:

Item	Quantity
Planting: Acer Macrophyllum (Big Leaf Maple)	214 Each
Planting: Abies Gradis (Grand Fir)	214 Each
Planting: Pseudotsuga Menziesii (Douglas Fir)	214 Each
Planting: Holidiscus Discolor (Ocean Spray)	643 Each
Planting: Rosa Gymnocarpa (Baldhip Rose)	643 Each
Planting: Sambaucus Racemosa (Red Elderberry)	643 Each
Symphoricarpos Albus (Snowberry)	644 Each
Excavation	1,513 CY

Wetland Buffer Enhancement Mitigation Area Quantities:

Item	Quantity
Planting: Alnus Rubra (Red Alder)	349 Each
Planting: Fraxinas Latifolia (Oregon Ash)	350 Each
Planting: Pseudotsuga Menziesii (Douglas Fir)	350 Each
Planting: Cornus Stoniferia (Red-Osier Dogwood)	1,279 Each
Planting: Oemleria Cerasiformis (Indian Plum)	1,279 Each
Planting: Rosa Pisocarpa (Swamp Rose)	1,280 Each
Planting: Symphoricarpos Albus (Snowberry)	1,280 Each

Advanced Wetland Buffer Mitigation Area Quantities:

Item	Quantity
Planting: Acer Macrophyllum (Big Leaf Maple)	155 Each
Planting: Abies Gradis (Grand Fir)	155 Each
Planting: Pseudotsuga Menziesii (Douglas Fir)	156 Each
Planting: Holidiscus Discolor (Ocean Spray)	466 Each
Planting: Mahonia Aquifolium (Tall Oregon Grape)	466 Each
Planting: Rosa Gymnocarpa (Baldhip Rose)	466 Each
Planting: Sambaucus Racemosa (Red Elderberry)	466 Each
Planting: Symphoricarpos Albus (Snowberry)	466 Each

Payment

01012.90 Payment - The accepted quantities of work performed under this Section will be paid for at the Contract lump sum amount for the items:

Pay Item	Unit of Measurement
(a) Wetland Buffer Mitigation	Lump Sum

Excavation will be considered incidental to this pay item.
Payment will be payment in full for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

SECTION 01030 - SEEDING

Comply with Section 01030 of the Standard Specifications modified as follows:

01030.13(a) Label – Replace this subsection, except for the heading, with the following subsection:

Deliver all seed in standard, sealed containers meeting the requirements of the Oregon Seed law. See ORS 633.520 and OAR 603-056 for specific labeling requirements.

In addition to the labeling requirements of the Oregon Seed Law, label all native seed containers with the date and location of where the original stock seed originated. Seed whose origin cannot be traced may not meet the definition of "native". For native seed collected for direct use on a Project, label containers with the date and field location of collection of each seed type.

01030.13(b) Quality - Add the following section

Furnish "Oregon Certified Seed" for seed types in the mix listed with an asterisk (*) in 01030.13(f).

01030.13(f) Types of Seed Mixes - Add the following to the end of this subsection:

Provide the following seed mix formulas:

Grass Mix Seeding

(Common Name)	**Percent (%)**	**Application Rate (LBS/ 1,000 SF)**
Nobility Perennial Ryegrass –	33%	8 lbs / 1,000 SF
Delaware Dwarf Perennial Ryegrass -	33%	
Pleasure Perennial Ryegrass –	34%	

01030.14(b-3) Statewide, Sensitive Areas, and Near Water - Fertilizer is not allowed in sensitive areas or within 50 feet of waters of the State or U.S.

01030.15 Mulch - Add the following paragraph and bullets to the end of this subsection:

Furnish garden mulch for all roadside erosion control seeding except hydromulch may be used under the following conditions:

- Spring planting west of the Cascades between March 1 and May 15.
- Slopes are steeper than 1V to 1.5H and longer than 16 feet.
- Residential or commercial sites with low erosion potential such as sidewalk, median, or parking lot planter strips.

Projects that have variable slopes may include straw mulch and hydromulch when approved.

Add the following subsection:

01030.15(d) Compost - Commercially manufactured fine and medium compost material meeting the requirements of Section 03020.

01030.61(c) **All Other Seeding** – Add the following:

Establishment periods for temporary seeding begins upon acceptance of the initial seeding work and ends as follows:

(1) If the area was seeded during the seeding season and all establishment responsibilities have been met, the seeding establishment period will end with either one of the following, whichever is longer:

- The issuance of Second Notification or
- Three weeks into the next permanent seeding period.

(2) If the original seeding construction is completed outside the permanent seeding dates the establishment period will end with completion of any necessary reseeding and either one of the following, whichever is longer:

- The issuance of Second Notification or,
- Three weeks into the second permanent seeding period following seeding construction.

01030.62(a) Erosion Control Seeding – Add the following:

Beginning the 1st of March through the 31st of October mow permanent seeding whenever the grass height is two (2) inches or more, and temporary seeding whenever the grass height is six (6) inches) or more.

01030.71 Waste Disposal - Replace this subsection with the following subsection:

01030.71 Disposal of Materials - Dispose of all materials according to 00290.20.

01030.90 General

Pay Item	**Unit of Measurement**
(n) Grass Mix Seeding	Lump Sum

Add the following paragraph(s) to the end of this subsection:

When temporary seeding, applied according to 01030.41, is later accepted as permanent seeding according to 01030.42, payment will be made only one time under the permanent seeding pay item. No separate payment will be made for initial temporary seeding.

SECTION 01040 - PLANTING

Comply with Section 01040 of the Standard Specifications modified as follows:

Replace Sections 1040.00 through 1040.78 with Sections 705 through Section 765.4 of the City of Hillsboro Design and Construction Standards.

Add the following:

705(C) Inspection – All plant material must be delivered to the site for visual inspection by City a minimum of 1 week prior to installation. Material shall be staged to allow for 100% inspection.

705(D) Restoration – All landscaping and other items disturbed by construction shall be restored to original or better conditions. This work will be considered incidental.

720(A) Street Tree Size Standards at Time of Planting – replace "measured 4-feet above mean ground level" with "per American Association of Nurserymen Standards ANSI Z-60.1-1996)

01040.55 Miscellaneous Items

Add item to end of list:

(k) River Rock – No additional payment will be made for river rock. This is an incidental item and will be paid for under the Stormwater Control, Ponds pay item.

01040.90(d) Plant Materials – Delete the paragraph that begins with "Partial payments for plant materials will be made…" and replace it with the following:

Partial payments for plant materials will be made as follows:

At the time of the original planting.....70%
After the first plant establishment inspection.....10%
After the second plant establishment inspection.....10%
At completion of the establishment period 10%

01040.90(h) Wetland Buffer Mitigation Planting – Wetland Buffer Mitigation Planting will be paid for on the Lump Sum basis. Payment will be payment in full for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified and as shown on sheet 2L-10.

Partial payments for Wetland Buffer Mitigation Planting will be made as follows:

At the time of the original planting.....70%
After the first plant establishment inspection.....10%
After the second plant establishment inspection.....10%

At completion of the establishment period 10%

01040.90(i) Additional Establishment Period – Partial payments for the second year of establishment will be made as follows:

Partial payments for Wetland Buffer Mitigation Planting will be made as follows:

After the fourth plant establishment inspection 25%
After the fifth plant establishment inspection.....25%
After the sixth plant establishment inspection 25%
At completion of the second year establishment period 25%

SECTION 01050 – FENCE

01050.90 Payment

(b) Chain Link Fence

Pay Item	**Unit of Measurement**
(a) CL-4R Chain Link Fence with Black Vinyl Clad	FT
(b) CL-6R Chain Link Fence with Black Vinyl Clad	Each
(c) 12 Foot x 48 Inch Chain Link Double Gates	Each

SECTION 01065 - MONUMENT BOXES

Section 01065, which is not in the Standard Specifications, is included for this project by Special Provision.

Description

01065.00 Scope - This work shall consist of installing monument frames and covers at the locations designated by the Engineer.

Materials

01065.10 Materials – Monument boxes shall be from City approved supplier, or approved equal:

Olympic Foundry	East Jordan Iron Works
Model M1035 – 12” Frame & Cover	Model #3673Z w/3673A(WC)

Construction

01065.40 Construction - Install monument boxes with final paving. Set monument cases flush with the finished pavement surface (0 to 1/8 inch) at the slope and grade of the street surface. Install the monuments at the time and location as directed by the Engineer.

Measurement

01065.80 Measurement - The quantities of work performed under this Section will be measured on the unit basis.

Payment

01065.90 Payment - The accepted quantities of monument boxes will be paid for at the Contract unit price, per each, for the item "12” Monument Boxes - Installed".

Payment will be payment in full for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

SECTION 02001 - CONCRETE

Comply with Section 02001 of the Standard Specifications modified as follows:

02001.02 Abbreviations and Definitions - Replace the "Modifiers" line with the following:

Modifiers - Pozzolans, ground granulated blast furnace slag, and latex.

Replace the "Pozzolans" line with the following:

Pozzolans - Fly ash, silica fume, and metakaolin.

02001.20(a) Strength: Change the Maximum W/cm Ratio for Paving from 0.44 to 0.40.

02001.30 Concrete Mix Design - In the paragraph that begins “Submit new or current…”, replace the sentence that begins “Allow 14 calendar days…” with the following sentence:

Allow 21 calendar days for the review.

Replace the paragraph that begins "High performance concrete..." with the following paragraph and bullets:

High performance concrete (HPC) mix designs shall contain any of the following:

- Cementitious material with 66% portland cement, 30% fly ash, and 4% silica fume.
- Cementitious material with modifiers proportioned according to 02001.31(c) and with trial batches performed to demonstrate that the proposed alternate mix design provides a maximum of 1,000 coulombs at 90 days when tested according to AASTHO T 277.
- Cementitious material with modifiers and with trial batches performed to demonstrate that the proposed alternate mix design provides a maximum of 1,000 coulombs at 90 days when tested according to AASTHO T 277.

02001.31(b) Pozzolans - Replace this subsection, except for the subsection number and title, with the following:

Pozzolans or GGBFS may be used separately or in combinations up to 30% of the total cementitious materials content.

02001.31(c) Modifiers - Replace this subsection, except for the subsection number and title, with the following:

Modifiers may be used separately or in combinations as approved by the Engineer. Alternate HPC proportions may be:

Fly Ash	12% - 18%
GGBFS	20% - 35%
Silica Fume	3% - 5%

For alternate HPC mix designs do not replace more than 50% of total cementitious material with modifiers.

When silica fume is added to truck mixed concrete, mix the batch a minimum of 100 revolutions at the mixing speed specified by the manufacturer before leaving the batch plant.

02001.31(f) Aggregate - Replace the paragraph that begins "If the nominal... and the three bullets with the following paragraph and bullets:

If the nominal maximum size of the coarse aggregate is not included as a part of the class of concrete, or shown on the plans, any size from 1 1/2 inch to 3/8 inch nominal maximum size aggregate may be used according to the ACI guidelines except:

- Use 3/4 inch nominal maximum size or larger aggregates in bridge deck concrete.
- Use 1 1/2 inch nominal maximum size aggregates in paving concrete unless otherwise indicated.
- Use 3/8 inch nominal maximum size aggregates in drilled shafts unless otherwise indicated.

02001.32(b) Plastic Concrete - Add the following to the bottom of the test and test method list:

Length Change	ASTM C 157
Permeability	AASHTO T 277

Add the following subsections:

02001.32(d) Length Change Tests - For all HPC mix designs, make at least three specimens from the trial batch for length change testing. Test samples according to ASTM C 157. Wet cure the samples until they have reached an age of 14 days, including the period in the molds. Store and measure samples according to ASTM C 157, section 11.1.2. Report length change results at 4, 7, 14, 28, and 56 day time intervals.

02001.32(e) Permeability Tests - For alternate HPC mix designs, make at least three specimens for permeability testing. Prepare, cure, dry and test according to AASHTO T 277. Report permeability in coulombs at 90 days.

Permeability tests are not required when HPC mix designs contain cementitious material with 66% portland cement, 30% fly ash, and 4% silica fume.

02001.33(c) Flexural Beams – Change 600psi to 650psi.

02001.34 Current Mix Designs - Add the following paragraphs to the end of this subsection:

For HPC mix designs, test according to the following and submit results:

Test	Test Method	Acceptance Value
Length Change	ASTM C 157	–
Permeability	AASHTO T 277	1,000 coulombs (max.) at 90 days

Add the following subsections:

02001.34(a) Length Change Tests - For all HPC mix designs make at least three specimens for length change testing. Test samples according to ASTM C 157. Wet cure the samples until they have reached an age of 14 days, including the period in the molds. Store and measure samples according to ASTM C 157, section 11.1.2. Report length change results at 4, 7, 14, 28, and 56 day time intervals.

02001.34(b) Permeability Tests - For alternate HPC mix designs make at least three specimens for permeability testing. Prepare, cure, dry and test according to AASHTO T 277. Report permeability in coulombs at 90 days.

Permeability tests are not required when HPC mix designs contain cementitious material with 66% portland cement, 30% fly ash, and 4% silica fume.

SECTION 02030 - MODIFIERS

Comply with Section 02030 of the Standard Specifications modified as follows:

02030.10 Fly Ash - Replace this subsection with the following subsection:

02030.10 Fly Ash - Furnish Class C, Class F, or Class N fly ash from the QPL and meeting the requirements of AASHTO M 295 (ASTM C 618).

SECTION 02050 - CURING MATERIALS

Comply with Section 02050 of the Standard Specifications modified as follows:

02050.10 Liquid Compounds - In the paragraph that begins "Furnish liquid…", replace "AASHTO M 148" with "ASTM C 309".

Add the following to the end of this subsection:

Before using liquid compounds, submit one quart samples of each lot for testing except samples are not required for commercial grade concrete applications unless the liquid compound is a conditionally approved product.

SECTION 02060 - SEALERS

Replace Section 02060 of the Standard Specifications with the following Section 002060:

SECTION 02060 - CONCRETE AND CRACK SEALERS

Description

02060.00 Scope - This Section includes the requirements for concrete and crack sealers.

Materials

02060.10 Low Modulus Concrete and Crack Sealer - Furnish low modulus concrete and crack sealer from the QPL.

02060.20 High Modulus Concrete and Crack Sealer - Furnish high modulus concrete and crack sealer from the QPL.

02060.30 Water Repellent Concrete Sealer - Furnish water repellent concrete sealer from the QPL.

SECTION 02110 - POSTS, BLOCKS, AND BRACES

Comply with Section 02110 of the Standard Specifications modified as follows:

02110.40 Wood Sign Posts - Replace the sentence that begins "Fabricate wood sign posts…" with the following sentence:

Fabricate wood sign posts from Douglas fir, surfaced four sides (S4S) and free of heart center (FOHC).

02110.40(a) Grading - Replace the Douglas Fir and Hem-Fir grading requirements with the following grading requirements:

Species	4" x 4"	4" x 6"	6" x 6" and Larger
Douglas Fir	No. 1 124-b WCLIB 42.11 WWPA	No. 1 123-b WCLIB 62.11 WWPA	No. 1 131-b WCLIB 80.11 WWPA

SECTION 02320 - GEOSYNTHETICS

Comply with Section 02320 of the Standard Specifications modified as follows:

02320.10(a-1) Geotextiles - Replace the bullet that begins "Meet or exceed…" with the following bullet:

- Meet or exceed the properties specified in 02320.20.

02320.10(c-2) Level B - Manufacturer's Quality Compliance Certificate - In the paragraph that begins "If the brochure…" replace the words "in Table 02320-1" with the words "in 02320.20".

SECTION 02410 - CONCRETE AND PLASTIC PIPE

Comply with Section 02410 of the Standard Specifications modified as follows:

02410.00 Scope - Replace this subsection, except for the subsection number and title, with the following:

This Section includes the requirements for non-reinforced and reinforced concrete pipe, concrete drain pipe and tile, non-reinforced corrugated polyethylene pipe and, polyvinyl chloride (PVC) pipe and polypropylene pipe.

Add the following subsection:

02410.75 Polypropylene Pipe - Furnish polypropylene pipe and fittings meeting the following requirements:

Dual wall polypropylene pipe and fittings,	ASTM F 2736 and listed on the QPL
Triple wall polypropylene pipe and fittings,	ASTM F 2764 and listed on the QPL
Watertight joints,	ASTM D 3212 and listed on the QPL

SECTION 02440 - JOINT MATERIALS

Comply with Section 02440 of the Standard Specifications modified as follows:

02440.10 Preformed Joint Fillers for Concrete - Replace this subsection, except for the subsection number and title with the following:

Furnish preformed joint fillers for concrete from the QPL conforming to the requirements of AASHTO M 153 or AASHTO M 213.

SECTION 02450 - MANHOLE AND INLET MATERIALS

Comply with Section 02450 of the Standard Specifications modified as follows:

02450.30 Metal Frames, Covers, Grates, and Ladders - Under the Projects on State Highways requirements, replace the "Inlet frames and grates" line with the following lines:

Inlet frames and grates	M 306	Class 35 B
	M 227 (A 663)	65
	M 270 (A 709) A 36	36
	M 103 (A 27)	65 - 35

SECTION 02510 - REINFORCEMENT

Comply with Section 02510 of the Standard Specifications modified as follows:

02510.10 Deformed Bar Reinforcement - Replace the sentence that begins "Unless otherwise specified…" with the following sentence:

Unless otherwise specified or shown, all reinforcing bars shall be Grade 60.

SECTION 02530 - STRUCTURAL STEEL

Comply with Section 02530 of the Standard Specifications modified as follows:

02530.71 Repair of Hot-Dip Galvanizing - Replace this subsection, except for the subsection number and title, with the following:

Repair damaged hot-dip galvanizing according to ASTM A 780 and ASTM A 123. Minimum dry film thickness is 3 mils. Minimum zinc content for Method A2 is 92 percent on the dry film.

SECTION 02560 - FASTENERS

Comply with Section 02560 of the Standard Specifications modified as follows:

02560.70 Lubricating Fasteners - Replace this subsection, except for the subsection number and title, with the following:

Furnish all galvanized and coated fasteners with a factory applied commercial water-soluble wax that contains a visible dye of a color that contrasts with the color of galvanizing or coating. Black fasteners shall be "oily" to the touch when installed.

Field lubricate galvanized bolts in tapped holes, galvanized anchor rods, and galvanized tie rods with a lubricant from the QPL. Apply lubricant to threads and to bearing surfaces that will turn during installation.

Protect fasteners from dirt and moisture at the job site. Clean, relubricate with a lubricant from the QPL, and retest fasteners that do not pass the field rotational capacity test. Obtain the Manufacturer's approval before relubricating tension control fasteners that are designed to automatically provide the tension.

Coat the outer surface of the collar in lock-pin and collar fasteners with an approved Manufacturer lubricant.

SECTION 02630 - BASE AGGREGATE

Comply with Section 02630 of the Standard Specifications modified as follows:

02630.10(a) Grading - In Table 02630-01, add the following sieve size line before the No. 10 sieve size line and add the following footnote at the end to the table:

No. 4 *	–	–	–	–	–

* Report percent passing sieve when no grading requirements are listed

02630.10(b) Fracture of Rounded Rock - In the sentence that begins "Fracture of rounded rock…", replace "AASHTO TP 61" with "AASHTO T 335".

02630.11(b) Fracture of Rounded Rock - In the sentence that begins "Fracture of rounded rock…", replace "AASHTO TP 61" with "AASHTO T 335".

SECTION 02690 - PCC AGGREGATE

Comply with Section 02690 of the Standard Specifications modified as follows:

02690.20(e-1) Fracture - In the sentence that begins "Provide aggregate…", replace "AASHTO TP 61" with "AASHTO T 335".

SECTION 02910 - SIGN MATERIALS

Comply with Section 02910 of the Standard Specifications modified as follows:

02910.02 Types of Signs - Add "O6", "O8", "W12", and "YW" sign types and replace the "B2", "B3", "C1", "C2", "F1", "G1", "G2", "G3", "G4", "O3", "O4", "O5", "R1","W9", "W11", and "Y7" sign types with the following:

"B2" Blue Type III or Type IV sheeting background with white Type IX permanent removable legend.

"B3" Blue Type IX sheeting background with white Type IX permanent or removable legend or white Type IX sheeting overlaid with blue transparent paste background, with retroreflective silver-white screened legend.

"C1" Brown Type III or Type IV sheeting background with white Type IX permanent or removable legend.

"C2" Brown Type IX sheeting background with white Type IX permanent or removable legend or white Type IX sheeting overlaid with brown transparent paste background, with retroreflective silver-white screened legend.

"F1" White Type IX sheeting background overlaid with red and blue transparent paste background with white Type IX permanent legend.

"G1" Green Type III or Type IV sheeting background with white Type IX removable legend.

"G2" Green Type III or Type IV sheeting background with white Type IX permanent legend.

"G3" Green Type IX sheeting background with white Type IX permanent legend, or white Type IX sheeting background overlaid with green transparent paste background with retroreflective silver-white screened legend.

"G4" Green Type IX sheeting background with white Type IX removable legend.

"O3" Fluorescent orange Type VIII, or Type IX sheeting background with black nonreflective permanent legend and red retroreflective symbol (Stop or Yield Ahead Symbol Sign).

"O4" Fluorescent orange Type VIII or Type IX sheeting background with black nonreflective permanent legend.

"O5" Fluorescent orange Type VIII or Type IX sheeting background with black nonreflective removable legend.

"O6" Fluorescent orange Type VIII or Type IX sheeting background with black nonreflective permanent legend and red, yellow, and green Type VIII and Type IX circles. (Signal Ahead Symbol Sign)

"O8" Fluorescent orange Type VIII or Type IX sheeting background with black nonreflective screened or cut-out permanent legend and silver-white Type VIII or Type IX symbol. (Speed Reduction Symbol Sign)

"R1" White Type IX sheeting background overlaid with red transparent paste background with white Type IX permanent legend.

"W9" Silver-white Type III or Type IV sheeting background with blue nonreflective screened or cut-out permanent legend.

"W11" Silver-white Type III or Type IV sheeting background with black nonreflective screened or cut-out permanent legend with red Type III or Type IV symbol.

"W12" Silver-white Type III or Type IV sheeting background with transparent green screened legend or green Type III or Type IV cut-out permanent legend with blue Type III or Type IV symbol.

"Y7" Fluorescent yellow Type IX sheeting background with black nonreflective screened or cut-out permanent legend and red Type IX symbol. (Stop or Yield Ahead Symbol Sign)

"YW" Yellow Type III or Type IV sheeting background with black nonreflective screened or cut-out permanent legend, and white Type III or Type IV sheeting background with black nonreflective screened or cut-out permanent legend and red Type III or Type IV symbol.

02910.10 Aluminum - In the paragraph that begins "Fabricate sheet...", replace the sentence that begins "Fabricate sheet aluminum..." with the following two sentences:

Fabricate sheet aluminum signs from aluminum alloy 6061-T6, 5052-H38, 5154-H38, or approved equal. Give a chromate treatment conforming to ASTM B 449, Class 2 or a titanium-based coating according to ASTM B 921.

02910.20(a) General - Replace the sentence that begins "Use reflective sheeting…" with the following sentence:

Use reflective sheeting Type I and retroreflective sheeting Type III, Type IV, Type VIII, and Type IX from the QPL and the following:

02910.32(b) Retroreflective Sheeting Legend - In the paragraph that begins "The silver-white or…", replace the sentence that begins "The white retroreflective sheeting…" with the following sentence:

The white retroreflective sheeting shall consist of Type IX sheeting conforming to 02910.20.

02910.75 Manufacturer's Warranty - Replace the paragraph that begins "For retroreflective Type III…" with the following paragraph:

For retroreflective Type III and Type IV sheeting used for permanent signs, provide a Warranty, for a Warranty period of 10 years, for restoring sign panels and replacing sheeting if the sheeting has failed as defined below.

In the paragraph that begins "For purposed of the Warranty…", replace the bullet that begins "70% of minimum coefficient…", with the following bullet:

- 70% of minimum coefficient of retroreflection for designated sheeting or cuttable film according to ASTM D 4956 for the remaining 3 years of the Warranty period for Type III and Type IV sheeting and remaining 5 years of the Warranty period for Type IX sheeting.

SECTION 02920 - COMMON ELECTRICAL MATERIALS

Comply with Section 02920 of the Standard Specifications modified as follows:

02920.11 Nonmetallic Conduit - Replace the bullet that begins "Liquid-Tight..." with the following bullet:

- **Liquid-Tight Flexible Nonmetallic Conduit** - Meet the requirements of Article 351 of the NEC and shall be UL1660 listed.

02920.12 Conduit Fittings - Add the following bullets to the end of the bullet list:

- **Conduit Hub** - Hot-dip galvanized malleable iron screw-on style with Neoprene "O" ring.

- **HDPE Fittings** - Factory mechanical HDPE coupling with individual reverse locking threads and built in center stop meeting the requirements of ASTM F 2176.

Add the following subsection:

02920.14(f) Communication Junction Box - Communication junction boxes are large style polymer concrete for use in underground systems. The communication junction boxes are used to accommodate the large bending radius of fiber optic cabling and to provide room for cable storage. They are to be installed in non-deliberate vehicular traffic areas only. Materials shall consist of aggregate bonded with a polyester resin and reinforced with fiberglass strands. Covers shall be capable of withstanding a test load of 15,000 pounds over a 10 by 10 inches area as described in ASTM C 857. The communication junction box and cover shall be gray in color. Covers shall have a skid resistant surface and bolt to the box with stainless steel hex head bolts. The size of the communication junction box shall be as shown.

Communication junction boxes shall have the legend “COMMUNICATIONS” stamped or embossed on the cover.

Communication junction boxes shall be Synertech Underground Products, Strongwell Quazite or approved equal.

02920.23 Wire - Add the following bullet to the end of the bullet list:

- **TFFN Wire** - Insulated stranded copper wire rated for 194 °F operation in dry locations and be UL listed as TFFN.

SECTION 03010 - FENCING MATERIALS

Comply with Section 03010 of the Standard Specifications modified as follows:

03010.40 Vinyl Clad Fabric - Replace the sentence that begins "The color of…" with the following:

The color of the PVC coating shall be as shown or specified, and comply with the Standard Polymer Colors listed in Table 1 of ASTM F 934. Unless otherwise indicated, the color shall be black.

NW 253RD AVE. IMPROVEMENTS AND EXTENSION

CITY OF HILLSBORO, OREGON

1 R1.1 NW 253RD OVERALL PLAN VIEW 1"=600'

600 0 300 600 1200 2400

(IN FEET)
1 inch = 600 ft.

CLIENT

CITY OF HILLSBORO
CONTACT: CHARLIE SHELL
150 E MAIN STREET, 4TH FLOOR
HILLSBORO, OR 97123
PHONE: 503-681-6252
CHARLIE.SHELL@HILLSBORO-OREGON.GOV

WETLAND CONSULTANT

SWCA ENVIRONMENTAL CONSULTANTS
CONTACT: C. MIRTH WALKER
1220 SW MORRISON, SUITE 700
PORTLAND, OR 97205
PHONE: 503-224-0333
CMWALKER@SWCA.COM

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CIVIL ENGINEER

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RHENDERSON@GRPMACK.COM

NOTICE TO EXCAVATORS:
ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.
(NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503)-232-1987).

POTENTIAL UNDERGROUND FACILITY OWNERS

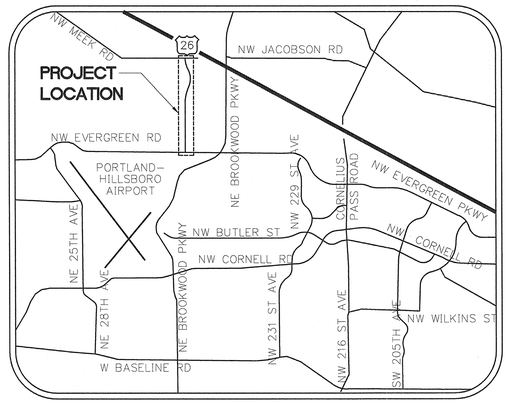
Dig Safely.

Call the Oregon One-Call Center
DIAL 811 or 1-800-332-2344

EMERGENCY TELEPHONE NUMBERS

NW NATURAL GAS	
M-F 7am-6pm	503-226-4211 Ext.4313
AFTER HOURS	503-226-4211
PGE	503-464-7777
QWEST	1-800-573-1311
TVWD	503-642-1511
VERIZON	1-800-483-1000

SHEET INDEX



VICINITY MAP
N.T.S.

LEGEND

	EXISTING	PROPOSED
1' CONTOUR	256	256
5' CONTOUR	256	256
PROPOSED R.O.W.		
TAX LOT BOUNDARY		
FUTURE ELECTRIC LINE		
BARBED-WIRE FENCE		
CHAIN-LINK FENCE		
POND FENCING		
POWER LINE	PWR	
FUTURE PGE LINE		
COMMUNICATION LINE	FO	FO
GAS LINE	GAS	GAS
TOE OF SLOPE		
SLOPE EASEMENT		
100-YR FLOOD ELEV.		
STORM LINE		
PROPOSED CURB		
SANITARY SEWER LINE		SS
ORDINARY HIGH WATER		
WETLAND BOUNDARY		
WETLAND 50' VEGETATED CORRIDOR		
TREE		
UTILITY POLE		
UTILITY VAULT	UV	UV
JUNCTION BOX	JB	JB
TELEPHONE BOX	T	T
LUMINAIRE		
SIGN		
GUY LINE		
CATCH BASIN		
WATER METER BOX	WM	
WATER VALVE	W	
GAS VALVE		
HYDRANT		
SURVEY MONUMENT		
CONCRETE PAVEMENT		
ASPHALT PAVEMENT-INTERSECTION		
ASPHALT PAVEMENT-SHOULDERS		
WETLAND AREA		
CANOPY DRIPLINE AREA		
STORM		STM
WATER QUALITY		WQ

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE STANDARD SPECIFICATIONS AND THE REQUIREMENTS OF CITY OF HILLSBORO AND WASHINGTON COUNTY, AND CLEAN WATER SERVICES (C.W.S.), DESIGN AND CONSTRUCTION STANDARDS, R&O 04-9, CITY OF HILLSBORO WATER, AND THE CURRENT AMERICAN PUBLIC WORKS ASSOCIATION STANDARDS FOR PUBLIC WORKS CONSTRUCTION.
2. THE WORKING DRAWINGS ARE GENERALLY DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND OR ELBOW REQUIRED FOR INSTALLATION IN THE SPACE PROVIDED. THEY DO NOT SHOW EVERY DIMENSION, COMPONENT PIECE, SECTION, JOINT OR FITTING REQUIRED TO COMPLETE THE PROJECT.
3. ALL LOCATIONS FOR WORK SHALL BE CHECKED AND COORDINATED WITH EXISTING CONDITIONS IN THE FIELD BEFORE BEGINNING CONSTRUCTION. EXISTING UNDERGROUND UTILITIES LAYING WITHIN THE LIMITS OF EXCAVATION SHALL BE VERIFIED AS TO CONDITION, SIZE AND LOCATION BY UNCOVERING, PROVIDING SUCH IS PERMITTED BY LOCAL PUBLIC AUTHORITIES WITH JURISDICTION, BEFORE BEGINNING CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES.
4. EFFECTIVE EROSION CONTROL IS REQUIRED. EROSION CONTROL DEVICES MUST BE INSTALLED AND MAINTAINED TO MEET CITY REQUIREMENTS. THE CITY MAY, AT ANY TIME, ORDER CORRECTIVE ACTION AND STOPPAGE OF WORK TO ACCOMPLISH EFFECTIVE EROSION CONTROL.
5. EFFECTIVE DRAINAGE CONTROL IS REQUIRED. DRAINAGE SHALL BE CONTROLLED WITHIN THE WORK SITE AND SHALL BE ROUTED SO THAT ADJACENT PRIVATE PROPERTY, PUBLIC PROPERTY, AND THE RECEIVING SYSTEM ARE NOT ADVERSELY IMPACTED. THE CITY MAY, AT ANY TIME, ORDER CORRECTIVE ACTION AND STOPPAGE OF WORK TO ACCOMPLISH EFFECTIVE DRAINAGE CONTROL.
6. CONTRACTOR SHALL ADJUST ALL STRUCTURES IMPACTED BY CONSTRUCTION IMPROVEMENTS TO NEW FINISH GRADES AND REPAIR AND ANY DAMAGE DONE DURING CONSTRUCTION.
7. EXCAVATION: EXCAVATE FOR PAVING, AND OTHER IMPROVEMENTS TO SIZES AND LEVELS SHOWN OR REQUIRED. ALLOW FOR FORM CLEARANCE AND FOR PROPER COMPACTING OF REQUIRED BACK FILLING MATERIAL. EXCAVATOR(S) MUST COMPLY WITH O.R.S. 757.541 THROUGH 757.571; EXCAVATOR(S) SHALL NOTIFY ALL UTILITY COMPANIES FOR LINE LOCATIONS SEVENTY-TWO (72) HOURS (MINIMUM) PRIOR TO START OF WORK. DAMAGE TO UTILITIES SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
8. EXISTING UTILITIES HAVE BEEN SHOWN ON THESE PLANS AND ARE TO BE USED FOR REFERENCE ONLY. THE ENGINEER MAKES NO CLAIM AS TO THE ACCURACY OR THE COMPLETENESS OF ANY OF THE EXISTING UNDERGROUND FEATURES. IT IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY EXISTENCE, LOCATION, AND DEPTH OF ALL UTILITIES LOCATED WITHIN CONSTRUCTION AREA. NOTIFY ENGINEER AND COUNTY INSPECTOR OF ANY DISCREPANCIES OR CONFLICTS PRIOR TO CONSTRUCTION.
9. CONTRACTOR SHALL PROTECT, AND ADJUST TO GRADE AS REQUIRED, ALL EXISTING UTILITIES LOCATED WITHIN THE LIMITS OF THE CONSTRUCTION ZONE. CONTRACTOR SHALL, AT THEIR OWN EXPENSE, REPAIR OR REPLACE ALL UTILITIES DAMAGED OR DISTURBED AS A RESULT OF CONSTRUCTION EFFORTS ASSOCIATED WITH THIS PROJECT.
10. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES UNTIL CONTRACT COMPLETION. WHEN ALL WORK IS COMPLETED, THE CONTRACTOR SHALL PERMANENTLY SEED ALL EXPOSED SOILS WITH THE FOLLOWING EROSION CONTROL SEED MIX OR APPROVED EQUAL: 3-WAY PERENNIAL RYEGRASS BLEND (33% NOBILITY PERENNIAL RYEGRASS, 33% DELAWARE DWARF PERENNIAL RYE, 34% PLEASURE PERENNIAL RYEGRASS). IMMEDIATELY FOLLOWING SEEDING, ALL SEED SHALL BE COVERED WITH A 2" THICK LAYER OF STERILE STRAW MULCH.
11. REQUESTS BY THE CONTRACTOR FOR CHANGES TO THE PLANS MUST BE APPROVED BY THE ENGINEER, OR RESPECTIVE JURISDICTION.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO THE START OF CONSTRUCTION AND TO NOTIFY THE ENGINEER OF ANY POTENTIAL CONFLICTS. THE CONTRACTOR SHALL DIG TEST HOLES OVER ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION TO DETERMINE THEIR EXACT LOCATION. CALL 1-800-332-2344 FOR UTILITIES LOCATE, A MINIMUM OF 48 HOURS PRIOR TO START OF CONSTRUCTION.
13. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROCURE ALL APPLICABLE PERMITS, LICENSES AND CERTIFICATES RELATIVE TO THE TRADES TO COMPLETE THE PROJECT AND FOR THE USE OF SUCH WORK WHEN COMPLETED. COMPLIANCE SHALL BE AT ALL LEVELS, FEDERAL, STATE AND CITY, RELATING TO THE PERFORMANCE OF THIS WORK.
14. ANY SIGNIFICANT DEVIATIONS FROM THE PLANS WILL REQUIRE A REQUEST FROM THE APPLICANT'S ENGINEER AND APPROVAL FROM THE CITY'S ENGINEER, CITY INSPECTOR, AND WASHINGTON COUNTY.
15. ALL CONSTRUCTION WITHIN CITY OF HILLSBORO OR WASHINGTON COUNTY RIGHT-OF-WAY SHALL HAVE AN APPROVED TRAFFIC CONTROL PLAN, RIGHT-OF-WAY PERMIT, AND FACILITY PERMIT PRIOR TO ANY ON-SITE CONSTRUCTION ACTIVITY.
16. THE CONTRACTOR MAY BE REQUIRED TO PROVIDE FLAGGING, SIGNS, AND OTHER TRAFFIC CONTROL DEVICES FOR SAFE TRUCK ACCESS ONTO PUBLIC STREETS. ALL SUCH DEVICES SHALL CONFORM TO THE STANDARDS ESTABLISHED IN THE LATEST ADOPTED EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) PUBLISHED BY THE U.S. DEPARTMENT OF TRANSPORTATION AND THE MODIFICATIONS TO THE MUTCD FOR STREETS AND HIGHWAYS FOR THE STATE OF OREGON.
17. IN ORDER TO ENHANCE TRAFFIC AND SAFETY ELEMENTS, THE CONTRACTOR SHALL MAINTAIN ADEQUATE SIGHT DISTANCE AT THE SITE ACCESS POINTS AND INTERSECTIONS. DRIVEWAY EXITS SHALL MEET THE SIGHT DISTANCE REQUIREMENTS PER PLANS AND WASHINGTON COUNTY. ANY OBSTRUCTIONS BY LANDSCAPING, SIGNING, PARKING, BUILDINGS, OR OTHER OBJECTS ARE UNSAFE. THE APPLICANT SHALL INSURE THAT NONE OF THESE INTERFERE WITH VISION CLEARANCE REQUIREMENTS.
18. ANY PUBLIC, OR PRIVATE, CURB, GUTTER, SIDEWALK, OR ASPHALT DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO CITY OF HILLSBORO OR WASHINGTON COUNTY STANDARDS.
19. WHERE CONNECTING TO AN EXISTING PIPE, AND PRIOR TO ORDERING MATERIALS, THE CONTRACTOR SHALL EXPOSE THE END OF THE EXISTING PIPE, VERIFY THE LOCATION, SIZE, AND ELEVATION. NOTIFY ENGINEER OF ANY DISCREPANCIES.
20. ALL ROADWAY COMPACTION SHALL CONFORM TO THE CITY ROAD STANDARDS AND THE LATEST ODOT/APWA STANDARD SPECIFICATIONS FOR CONSTRUCTION.
21. THIS DESIGN COMPLIES WITH ORS 92.044 (7) IN THAT NO UTILITY INFRASTRUCTURE IS DESIGNED TO BE WITHIN ONE FOOT OF A SURVEY MONUMENT LOCATION SHOWN ON A SUBDIVISION OR PARTITION PLAT. NO DESIGN MODIFICATIONS NOR FINAL FIELD LOCATION CHANGE SHALL BE PERMITTED IF IT WOULD CAUSE ANY UTILITY INFRASTRUCTURE TO BE PLACED WITHIN THE PROHIBITED AREA.
22. ALL STORM SEWERS SHALL MEET CLEAN WATER SERVICES AND COUNTY REQUIREMENTS. CORRUGATED POLYETHYLENE PIPE (CPP) SHALL MEET AASHTO M252 FOR PIPES 10" OR LESS AND AASHTO M 294 OR ASTM F 2306 FOR PIPES 12" THROUGH 60" GRADE AROUND ALL AREA DRAINS TO PROVIDE POSITIVE DRAINAGE.
23. STORM SEWER JOINTS SHALL BE GASKETED UNLES OTHERWISE APPROVED BY THE DISTRICT OR CITY. POLYVINYL CHLORIDE PIPE-PVC GASKETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM 477 AND ASTM 3212. DUCTILE IRON TRANSITION COUPLINGS SHALL MEET ASTM D2000 3 BA75 FOR GASKETS. HDPE PIPE GASKETING SHALL CONFORM TO THE REQUIREMTNS OF ASTM F477.
24. DOWELS SHALL BE 1¼" DIAMETER, SMOOTH, ROUND DOWEL BARS COATED WITH PLASTIC, GREASE, HEAVY OIL, OR OTHER APPROVED MATERIAL THAT WILL NEITHER BOND WITH, NOR HARM THE PCC. DOWELS SHALL BE PLACED WITHIN ⅜" OF THE CENTER OF THE SLAB, BE AT LEAST 18" IN LENGTH, BE PLACED 12" ON CENTERS, INSTALLED BY A METHOD THAT ENSURES ALL DOWELS ARE HELD PARALLEL WITH EACH OTHER, PARALLEL WITH THE SURFACE OF THE PAVEMENT AND PERPENDICULAR TO THE JOINT. MAXIMUM ALIGNMENT TOLERANCE SHALL BE 5' OF 3/16" IN THE LENGTH OF THE DOWEL.
25. ALL MANHOLES ARE 48" IN DIAMETER UNLESS OTHERWISE NOTED ON PLANS.
26. BACKFILL ALL STORM LINE TRENCHES TO FULL DEPTH WITH ¾"-0 ROCK.

BENCH MARK

T.B.M.
WASHINGTON COUNTY BENCH MARK NO. 8
ELEVATION OF BENCH MARK = 191.193 FEET, NGVD 1984

LOCATION: A BRASS DISK SET IN CONCRETE SW CORNER OF MEEK RD. AND SEWELL ROAD. 52' SOUTH OF THE CENTER OF MEEK ROAD. 20' EAST OF THE CENTER OF SEWELL ROAD. 6' NORTH OF PGE POLE #1152 "1981"

FIELD WORK WAS COMPLETED DURING JANUARY, 2013

WASHINGTON COUNTY BENCHMARK 530
ELEVATION OF BENCH MARK = 214.075 FEET, NGVD 1984

LOCATION: SET IN MONUMENT BOX INTERSECTION OF EVERGREEN ROAD AND SHUTE ROAD (242ND TO NORTH). SET AT DLC CORNER (SEE BT BOOK). CENTER OF NORTH LANE OF WESTBOUND NW EVERGREEN PKWY

CHECKED DATE: JULY 19, 2001

BID SET 5/1/2015

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Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

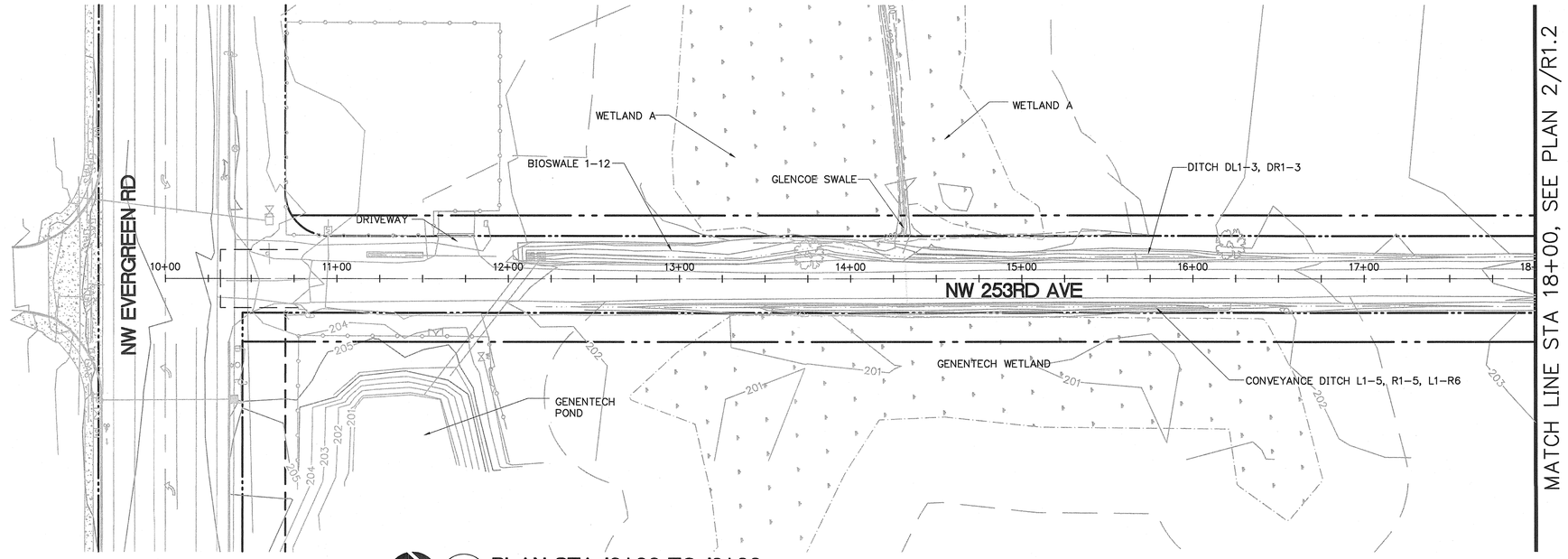
REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY 11, 2006 RALPH J.R. HENDERSON
Ralph J.R. Henderson
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

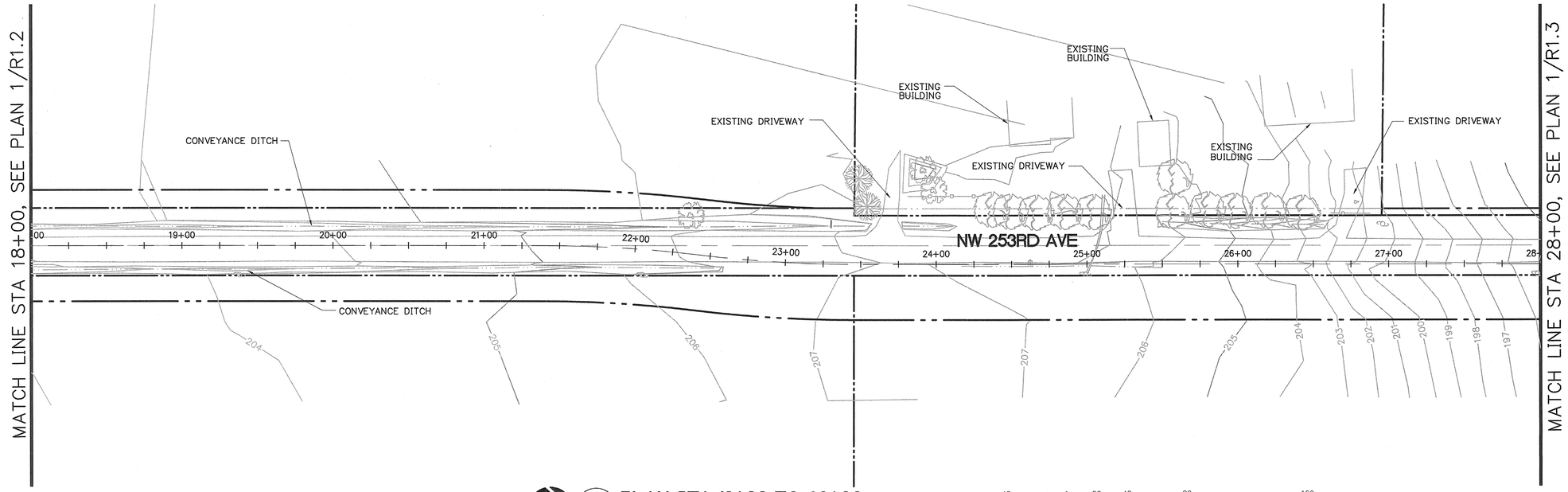
SHEET TITLE:
COVER SHEET

DRAWN BY: BMR
CHECKED BY: RJH
SHEET:
R1.1
JOB NO. 2120550.00



1 R1.2 PLAN STA 10+00 TO 18+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.



2 R1.2 PLAN STA 18+00 TO 28+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

BID SET 5/1/2015

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY, 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

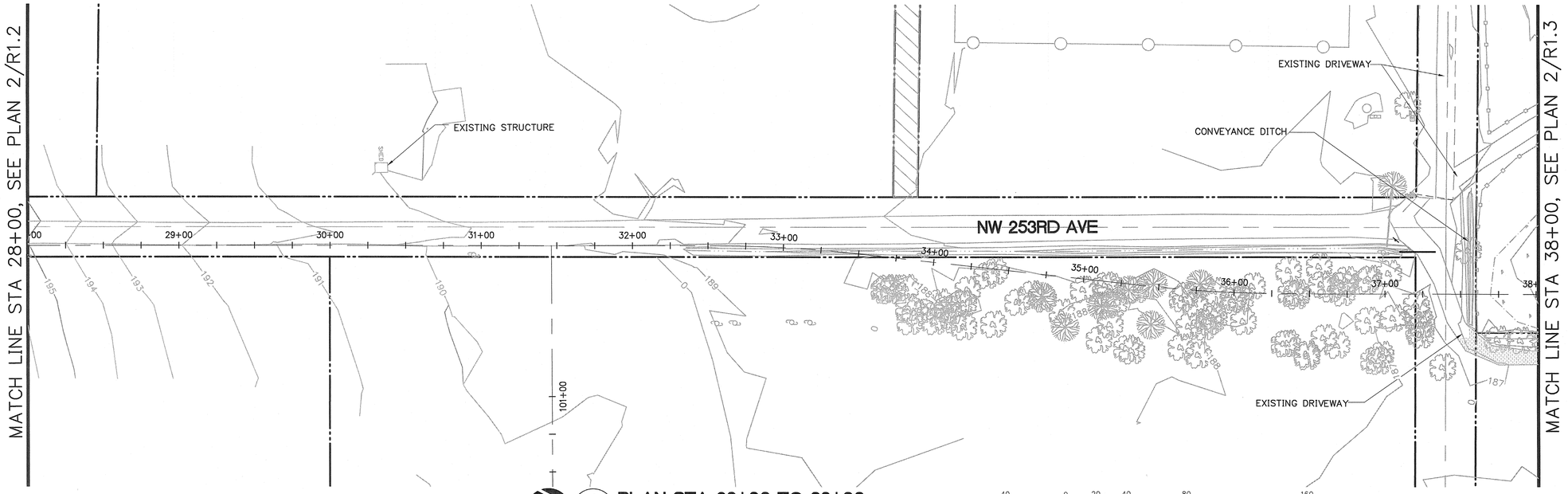
SHEET TITLE:
EXISTING CONDITIONS PLAN
STA 10+00 TO
STA 28+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R1.2

JOB NO. 2120550.00



1 R1.3 PLAN STA 28+00 TO 38+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

2 R1.3 PLAN STA 38+00 TO 48+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

BID SET 5/1/2015

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY 11, 2000 RALPH J.R. HENDERSON
Ralph J.R. Henderson
EXPIRES: 6/30/15

REVISIONS:

REVISION SEQ. #	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

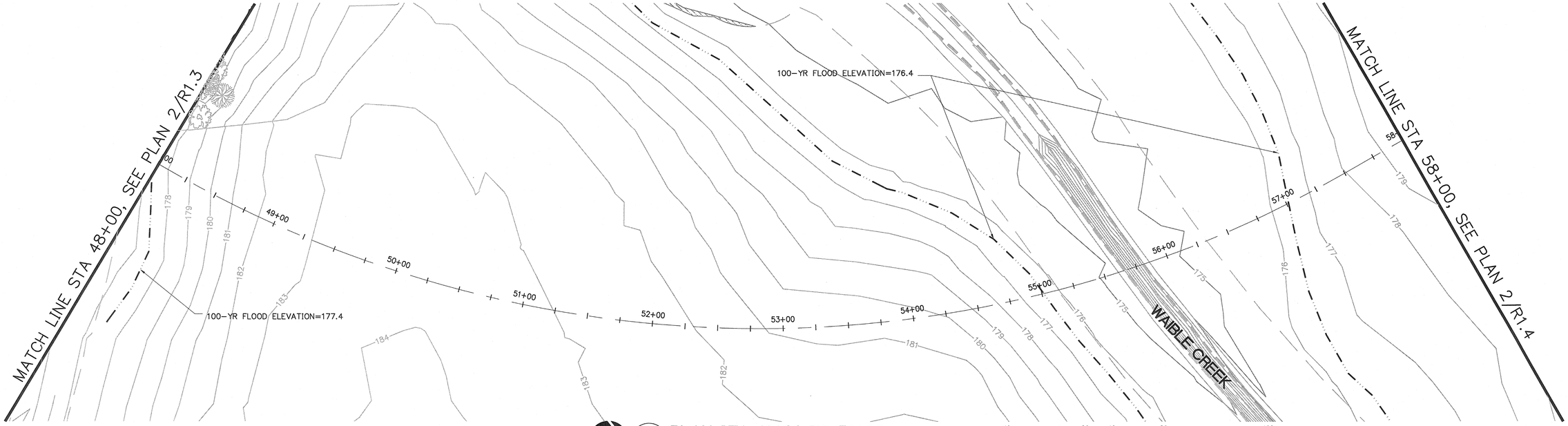
SHEET TITLE:
EXISTING CONDITIONS PLAN
STA 28+00 TO
STA 48+00

DRAWN BY: BMR

CHECKED BY: RJH

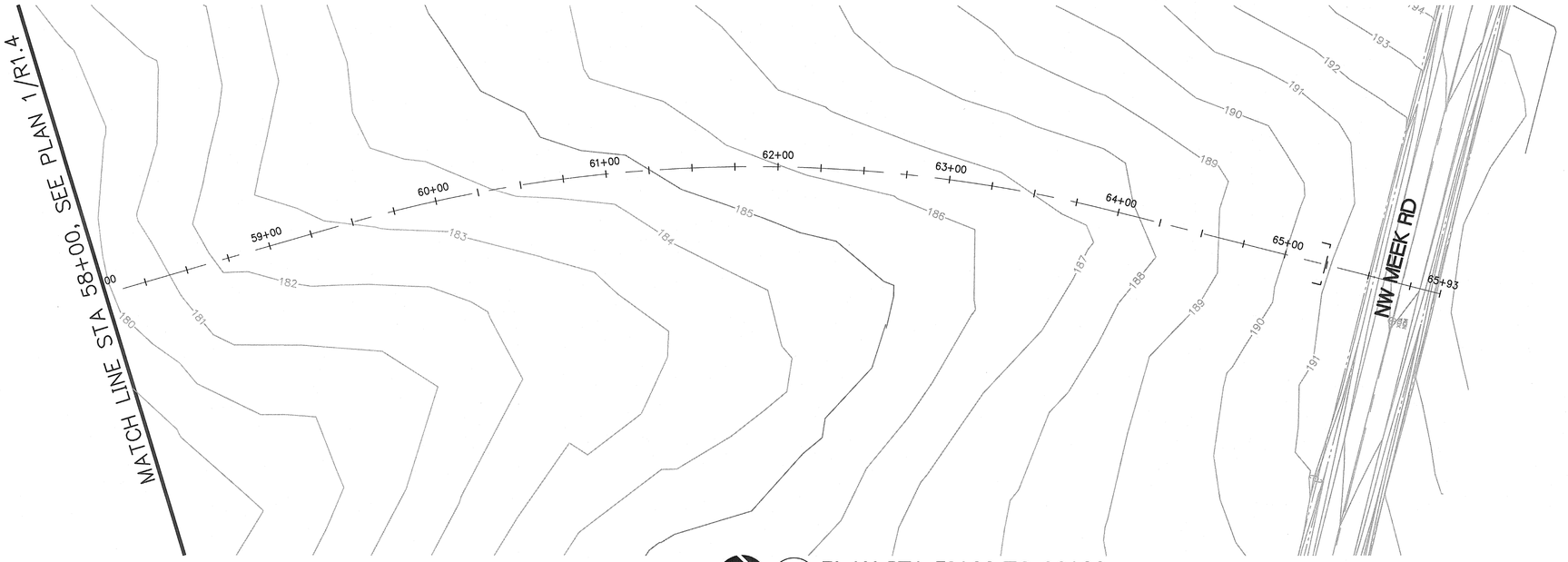
SHEET:
R1.3

JOB NO. 2120550.00



1 R1.4 PLAN STA 48+00 TO 58+00
1"=40'

40 0 20 40 80 160
1:1
(IN FEET)
1 inch = 40 ft.



2 R1.4 PLAN STA 58+00 TO 66+00
1"=40'

40 0 20 40 80 160
1:1
(IN FEET)
1 inch = 40 ft.

BID SET 5/1/2015

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NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY 11, 2000 RALPH J.R. HENDERSON
Ralph J.R. Henderson
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

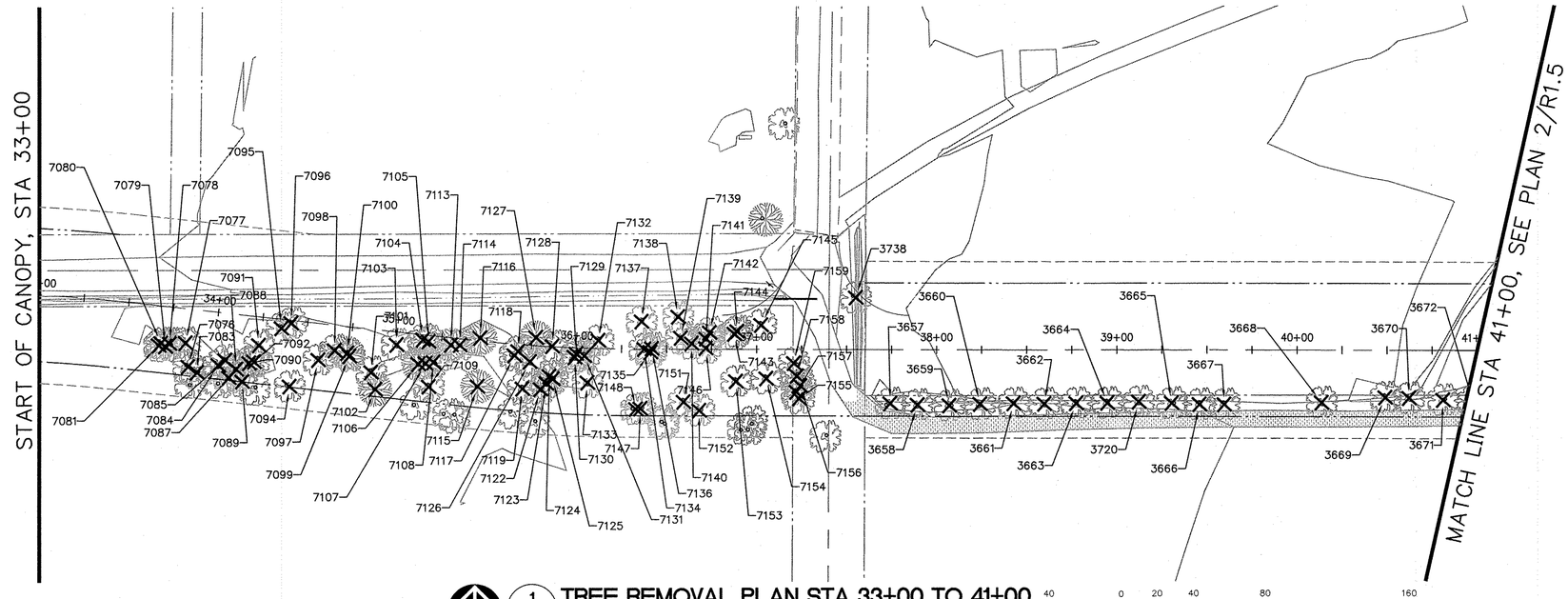
SHEET TITLE:
EXISTING CONDITIONS PLAN
STA 48+00 TO
STA 66+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R1.4

JOB NO. 2120550.00



1 R1.5 **TREE REMOVAL PLAN STA 33+00 TO 41+00**

1"=40'

1:1

2 R1.5 **TREE REMOVAL PLAN STA 41+00 TO 49+00**

1"=40'

1:1

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

TREE REMOVAL IDENTIFICATION CHART

POINT	TYPE	DIAMETER (IN.)	POINT	TYPE	DIAMETER (IN.)	POINT	TYPE	DIAMETER (IN.)
3572	OAK	30	7098	OAK	10	7152	OAK	8
3573	UNK	16	7099	OAK	20	7153	OAK	6
3574	OAK	30	7100	FIR	24	7154	OAK	2X24
3657	POPLAR	12	7101	OAK	8	7155	OAK	8
3658	POPLAR	12	7102	FIR	12	7156	OAK	8
3659	POPLAR	12	7103	OAK	12	7157	OAK	6
3660	POPLAR	12	7104	OAK	12 & 6	7158	OAK	6
3661	POPLAR	12	7105	OAK	6	7159	OAK	6
3662	POPLAR	12	7106	FIR	20	7168	OAK	36
3663	POPLAR	12	7107	OAK	24 & 20	7169	OAK	18
3664	POPLAR	12	7108	OAK	20	7170	OAK	18
3665	POPLAR	12	7109	OAK	8	7172	OAK	18
3666	POPLAR	12	7113	FIR	12	7178	OAK	18
3667	POPLAR	12	7114	OAK	3X10	7179	OAK	18
3668	POPLAR	12	7115	FIR	36	7180	OAK	18
3669	POPLAR	12	7116	FIR	24	7181	OAK	18
3670	POPLAR	12	7117	OAK	12	7182	OAK	3X18
3671	POPLAR	12	7118	OAK	14 & 10	7183	OAK	20
3672	POPLAR	12	7119	OAK	12	7184	OAK	8
3673	POPLAR	12	7122	OAK	6	7185	OAK	18
3674	POPLAR	12	7123	OAK	6	7186	OAK	18
3675	POPLAR	12	7124	OAK	6	7187	OAK	18
3676	POPLAR	12	7125	OAK	10	7188	OAK	12
3677	POPLAR	12	7126	OAK	10	7192	OAK	14
3678	POPLAR	12	7127	FIR	10 & 16	7193	OAK	16
3679	POPLAR	12	7128	OAK	3X6 & 12	7194	OAK	24
3720	POPLAR	16	7129	OAK	6	7199	OAK	8
3738	OAK	10	7130	OAK	6	7200	OAK	6
7076	OAK	6	7131	OAK	6	7201	OAK	36
7077	OAK	10	7132	OAK	14 & 8 & 6	7202	OAK	18
7078	OAK	10	7133	OAK	16	7203	OAK	12
7079	OAK	6	7134	OAK	2X12	7204	OAK	12
7080	OAK	10	7135	OAK	10	7205	OAK	12
7081	OAK	8	7136	OAK	6	7206	OAK	14
7083	OAK	6	7137	OAK	8	7207	OAK	24
7084	OAK	8	7138	OAK	12	7208	OAK	12
7085	OAK	6	7139	OAK	6	7211	OAK	8
7087	OAK	6	7140	OAK	2X6	7212	OAK	12
7088	OAK	6	7141	OAK	24	7213	FIR	18
7089	OAK	6	7142	OAK	16	7214	OAK	18
7090	OAK	12	7143	OAK	18 & 24	7215	OAK	18
7091	OAK	10	7144	OAK	10 & 12	7216	OAK	18
7092	OAK	6	7145	OAK	6	7217	OAK	36
7094	OAK	10	7146	OAK	6	7218	OAK	16
7095	OAK	3X8	7147	OAK	6	7219	OAK	20
7096	OAK	24	7148	OAK	8	7221	OAK	20
7097	OAK	10	7151	OAK	8	7222	FIR	24

NOTES:
1. CONTRACTOR TO COMPLY WITH ODOT SPECIFICATION 00290.36 FOR TREE REMOVAL AND SUBMIT A PLAN AND SCHEDULE FOR TREE REMOVAL IN ADVANCE TO THE CITY FOR APPROVAL.
2. STA 37+75 TO STA 47+00: ON EAST SIDE OF PROPOSED ROAD, ALL OAK TREES 4" TO 12" IN DIA. ARE TO BE CUT DOWN INTO LENGTHS OF 16" TO 18" AND RETURNED TO PROPERTY OWNER (THE GREGG FAMILY). DO NOT SPLIT THE WOOD.

BID SET 5/1/2015

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CITY PROJECT # 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #19432 OREGON SEPT. 16, 1987 MATTHEW W. BUTTS

EXPIRES: 12/31/15

REVISIONS:

REVISION DELTA THIS SHEET	REVISIONS	REVISION DELTA CLOSING DATE

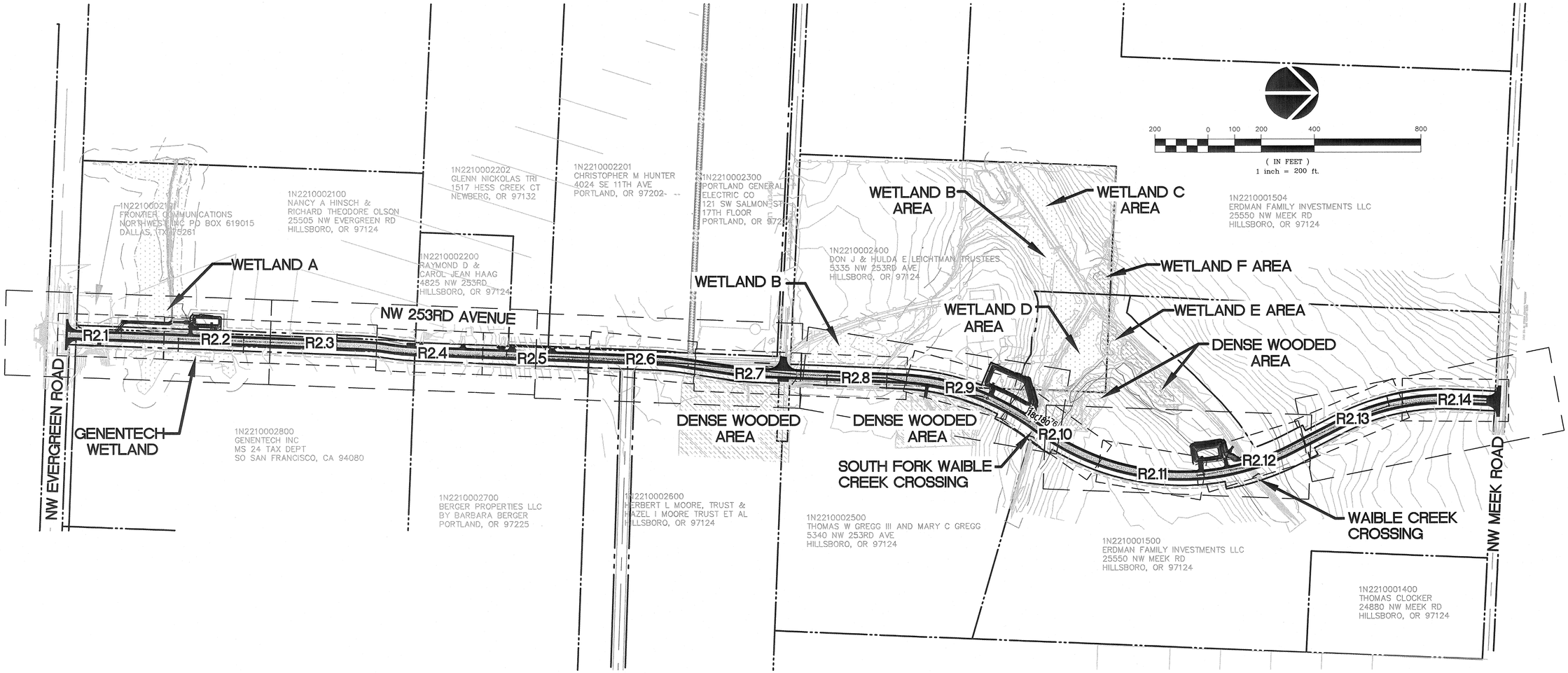
SHEET TITLE:
TREE REMOVAL PLAN STA 33+00 TO STA 49+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R1.5

JOB NO. 2120550.00



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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY 11, 2006 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
OVERALL KEY PLAN

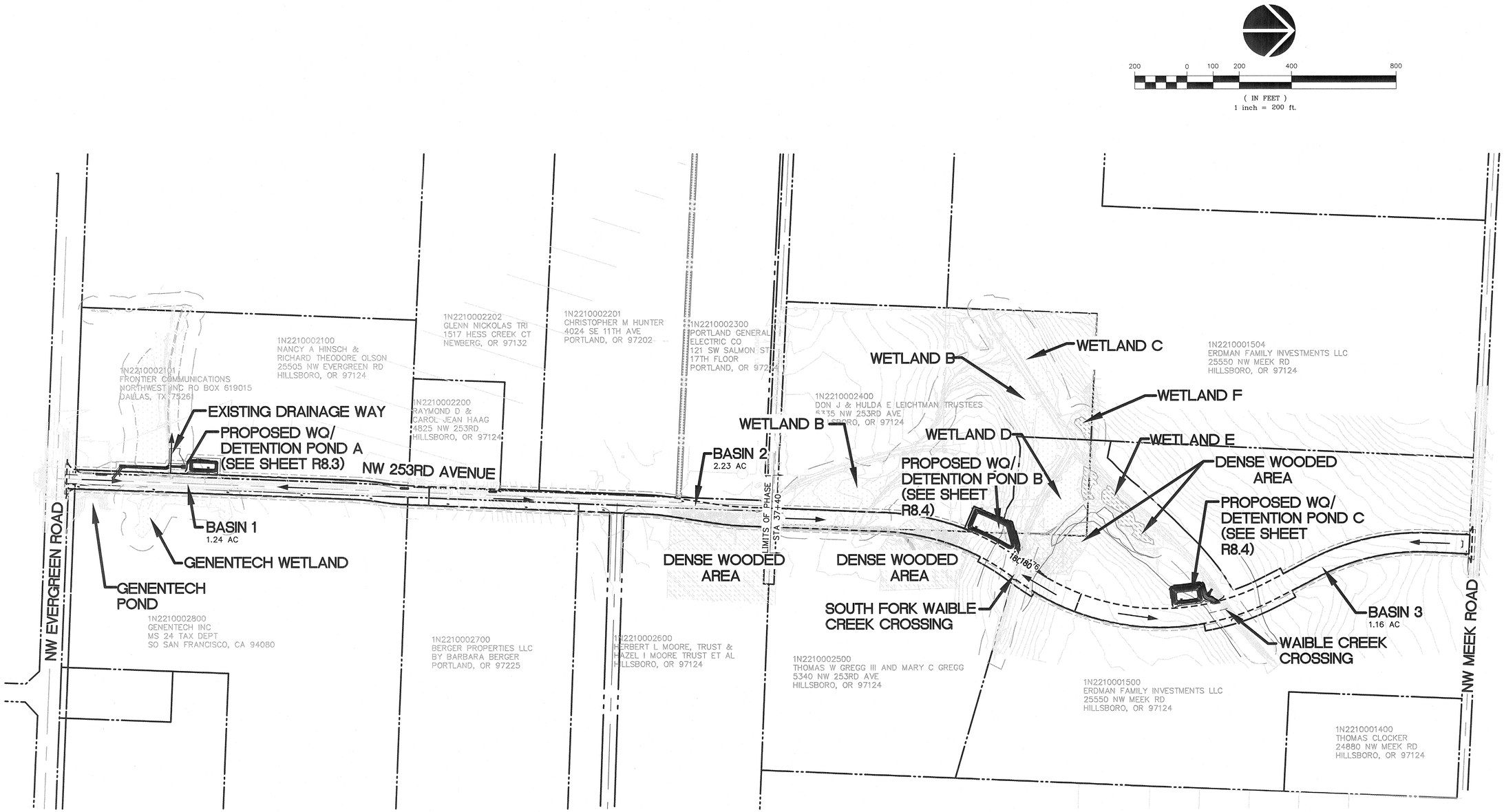
DRAWN BY: BMR

CHECKED BY: RJH

SHEET:

R1.6

JOB NO. 2120550.00



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CITY PROJECT #: 10705

Project
NW 253RD AVE
IMPROVEMENTS AND
EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56600 OREGON JULY 11, 2000 RALPH J.R. HENDERSON
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

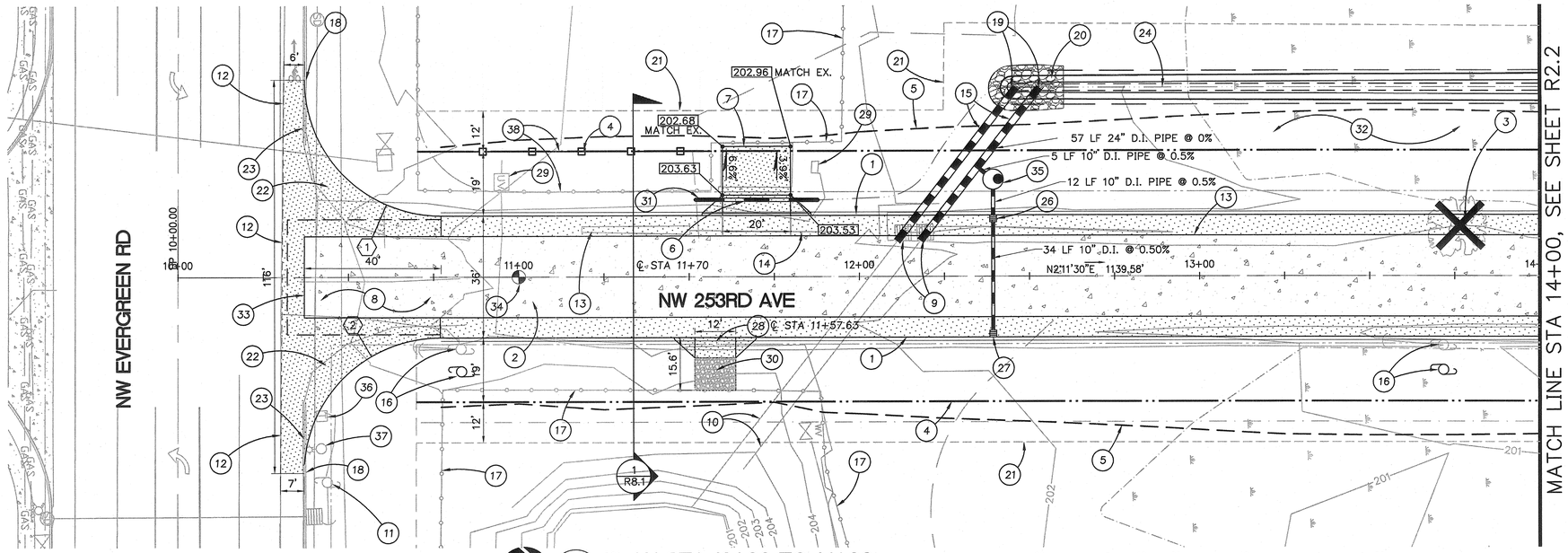
SHEET TITLE:
OVERALL
WATER QUALITY
PLANS

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R1.7

JOB NO. 2120550.00



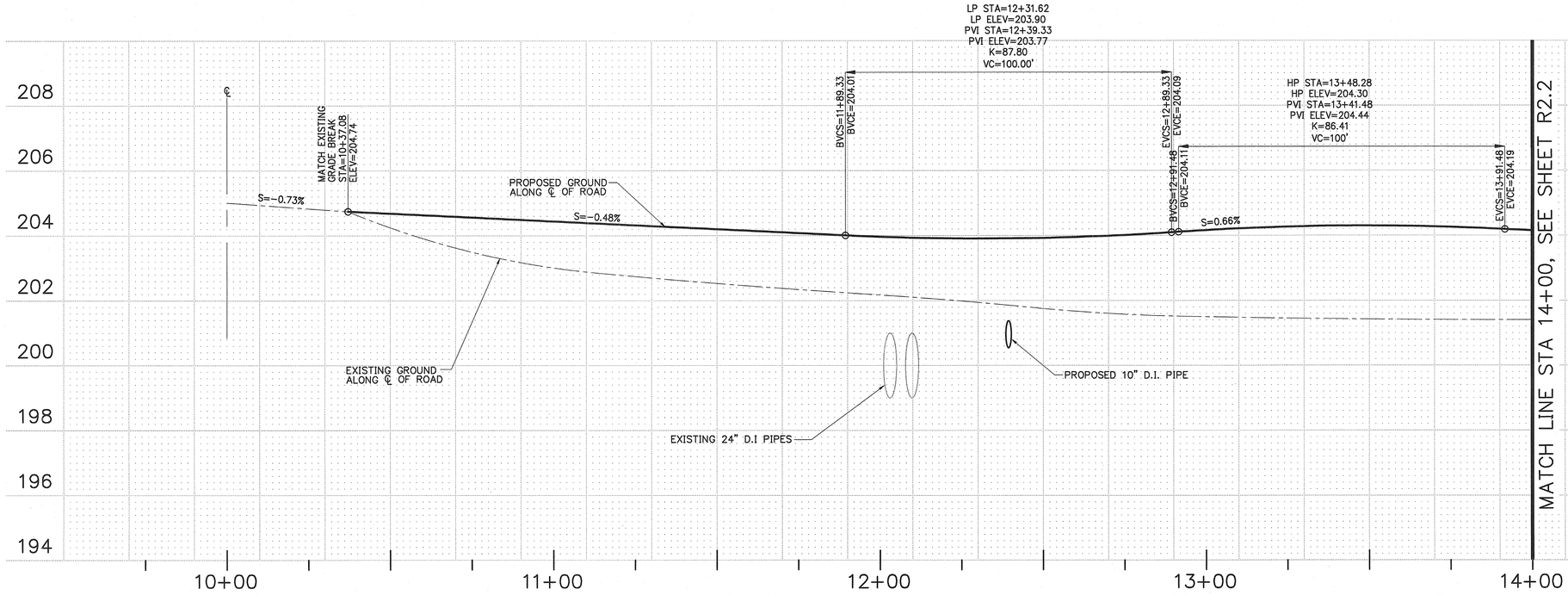
1 R2.1 **PLAN STA 10+00 TO 14+00**
1"=20'

1:1 20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	BCR	1/4 Δ	1/2 Δ	3/4 Δ	ECR
1	40'	63.0083'	90°15'00"	204.76	204.71	204.48	204.23	204.09
2	40'	62.7463'	89°52'48"	204.43	204.47	204.35	204.20	204.09

*LOW POINT



2 R2.1 **PROFILE STA 10+00 TO 14+00**
1"=20' HORIZONTAL
1"=2' VERTICAL
1:1

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2013

KEYNOTES

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. REMOVE EXISTING TREE, POINT 3574 30" OAK
4. PROPOSED R.O.W.
5. TOE OF SLOPE
6. INSTALL 20' WIDE AC DRIVEWAY APPROACH, SEE DETAIL 6/R8.7 AND 7/R8.7
7. SAW CUT AND REMOVE EXISTING DRIVEWAY APPROACH, INSTALL 20' WIDE AC DRIVEWAY, SEE DETAIL 6/R8.7 AND 7/R8.7
8. REMOVE EXISTING ASPHALT AND BASE
9. REMOVE EXISTING PIPE END GRATES
10. RUN CAMERAS THROUGH EXISTING LINES TO CHECK CONDITIONS. PROTECT EX. STORM LINE. NOTIFY ENGINEER IF ANY DEFICIENCIES EXIST.
11. PROTECT EXISTING UTILITY POLE
12. SAW CUT EXISTING ASPHALT PAVEMENT AT BIKE LANE LINE, FILL WITH AC PAVEMENT
13. FILL IN EXISTING DRAINAGE DITCH WITH STRUCTURAL FILL, REFER TO GEOTECHNICAL REQUIREMENTS. REMOVE EXISTING IRRIGATION SYSTEM AND CAP AT SOURCE.
14. REMOVE EXISTING CULVERT PIPE
15. INSTALL (2) 24" D.I. STORM PIPES, CONNECT TO EXISTING PIPE
16. EXISTING UTILITY POLE TO BE REMOVED AND NEW POLE TO BE INSTALLED BY OTHERS APPROXIMATELY 36' FROM CENTERLINE OF ROAD. CONTRACTOR TO COORDINATE INSTALLATION AND RELOCATION WITH PGE.
17. PROTECT EXISTING FENCE
18. MATCH EXISTING PAVEMENT
19. REINSTALL GRATE AT OUTFALL
20. INSTALL 22'X13' CLASS 50 RIP RAP, 12" THICKNESS, AT OUTFALL LOCATION, SEE DETAIL 3/R8.3
    STA 12+46 (55.62' LT)
    STA 12+53 (55.62' LT)
    IE=199.01
21. PUBLIC UTILITY EASEMENT
22. INSTALL INTERSECTION ASPHALT PAVING SECTION, SEE DETAIL 3/R8.7
23. SAW CUT AND REMOVE EXISTING CURB
24. CONSTRUCT DRAINAGE DITCH, SEE DETAIL 2/R8.3.
25. RELOCATE EXISTING IRRIGATION AND RECONNECT AT EXISTING POINT OF CONNECTION
26. CONSTRUCT CG-2 CATCH BASIN. SEE DETAIL 5/R8.5
    STA 12+39.33 (18' LT)
    RIM ELEV=203.33 (1½" DROP INCLUDED)
    IE IN=200.46 (10" E)
    IE OUT=200.46 (10" W)
27. CONSTRUCT CG-2 CATCH BASIN. SEE DETAIL 5/R8.5
    STA 12+39.33 (18' RT) (1½" DROP INCLUDED)
    RIM ELEV=203.33
    IE OUT=200.63 (10"W)
28. INSTALL 12' WIDE AC DRIVEWAY APPROACH, SEE DETAIL 7/R8.7
29. PROTECT EXISTING ELECTRICAL VAULT
30. INSTALL 12' WIDE GRAVEL DRIVEWAY, SEE DETAIL 4/R8.7
31. INSTALL 36 LF 12" C-900 CULVERT AND GRADE TO ENSURE POSITIVE DRAINAGE TO DITCH.
    IE IN=202.40(S)
    IE OUT=202.40(N)
    STA 11+51.87 TO 11+87.87
32. ENSURE COMPACTED SHOULDER TO MAINTAIN DITCH. REFER TO GEOTECHNICAL REPORT FOR COMPACTION REQUIREMENTS.
33. INSTALL CONCRETE IMPACT SLAB AT PAVEMENT TRANSITION, SEE DETAIL 5/R8.7
34. INSTALL SURVEY MONUMENT BOX AT STA 11+00, SEE DETAIL 4/R8.10
35. INSTALL 48" SUMPED FLAT TOP MH
    SEE CWS DETAIL 010 ON SHEET R8.6
    STA 12+39.32 (28.54' LT)
    RIM=203.97
    SUMP=198.20
    IE IN=200.40 (10" E)
    IE OUT=200.20 (10" SW)
36. PROTECT EXISTING COMMUNICATION BOX.
37. PROTECT EXISTING LIGHT POLE.
38. REMOVE AND RELOCATE EXISTING FENCE TO PROPOSED R.O.W.
    STA 10+70.46 (37.00' LT) TO STA 11+56.53 (37.00' LT)

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Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

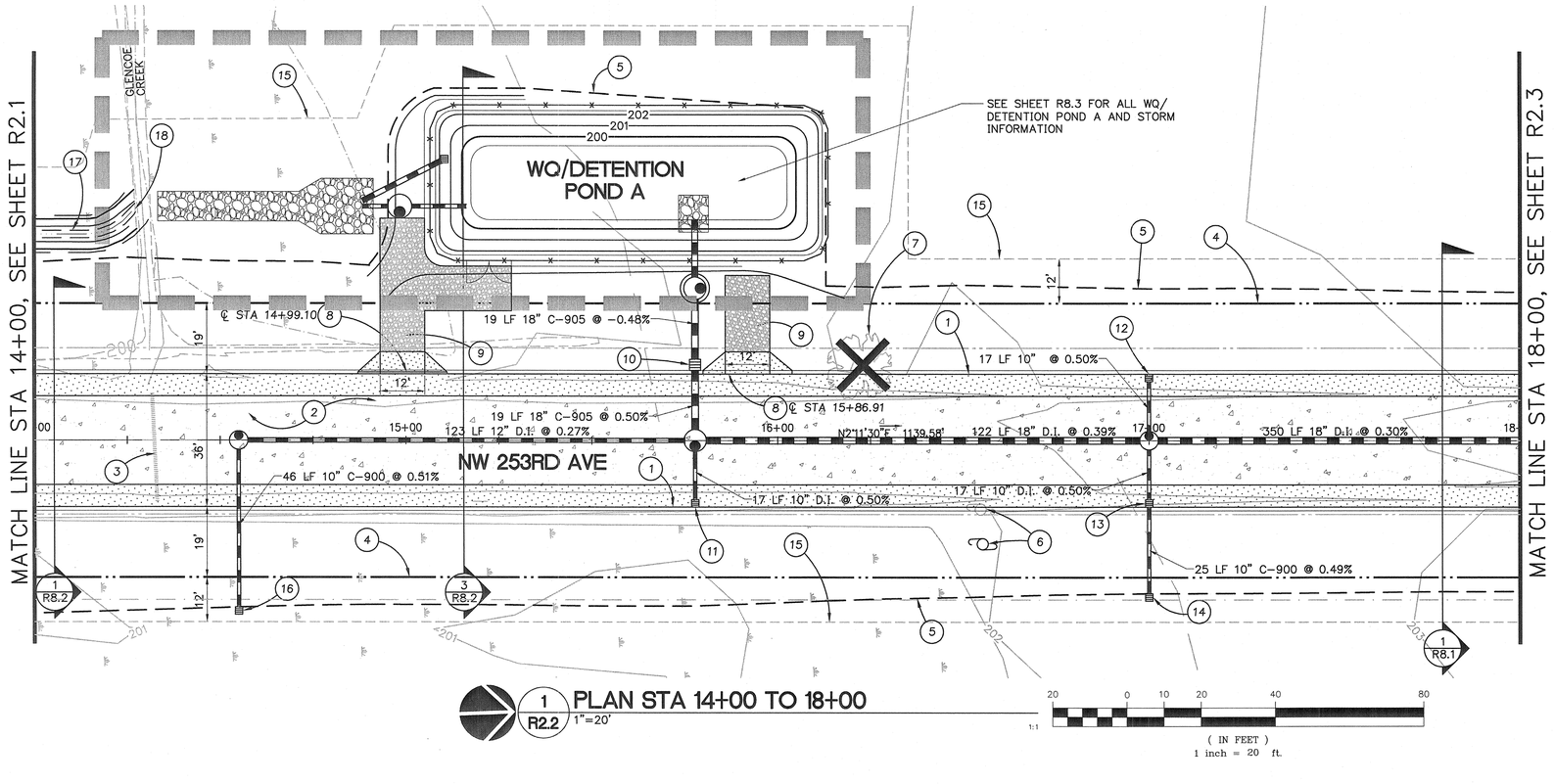
REGISTERED PROFESSIONAL ENGINEER #56860 OREGON JULY. 11, 2000 RALPH J.R. HENDERSON
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

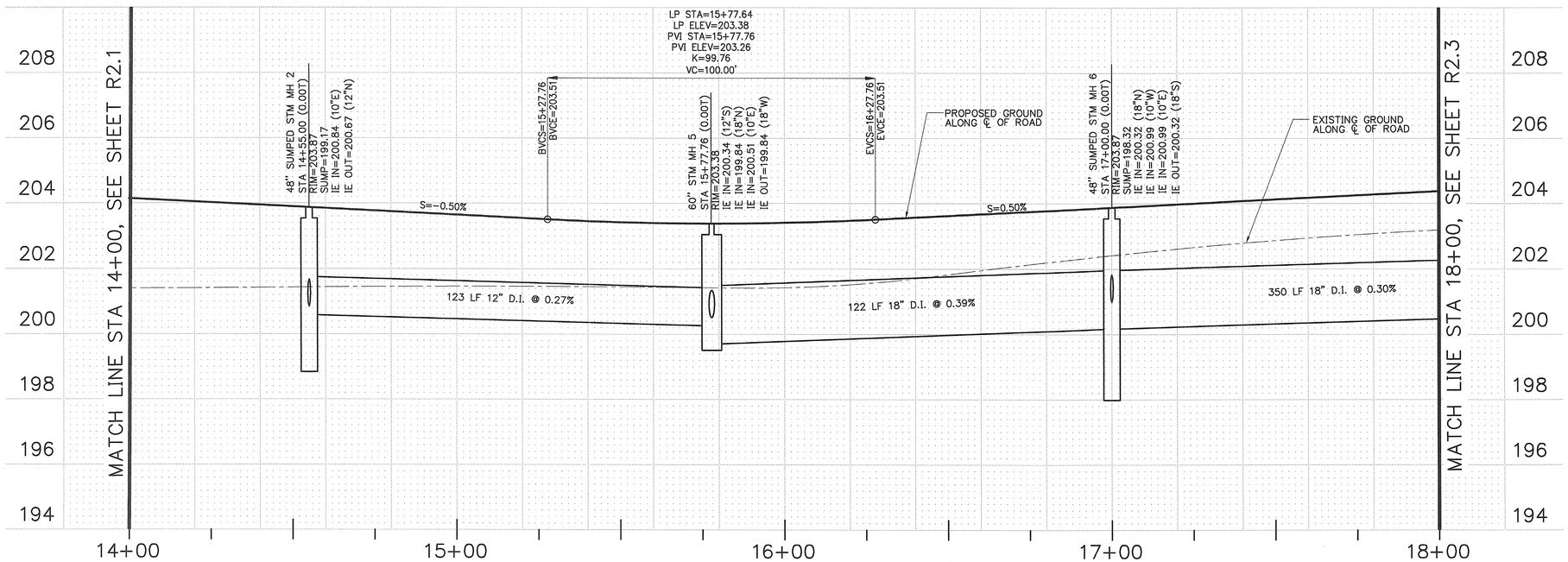
SHEET TITLE:
PLAN AND PROFILE SHEET STA 10+00 TO STA 14+00

DRAWN BY: BMR
CHECKED BY: RJH
SHEET:
R2.1
JOB NO. 2120550.00



1 R2.2 PLAN STA 14+00 TO 18+00
1"=20'

(IN FEET)
1 inch = 20 ft.



2 R2.2 PROFILE STA 14+00 TO 18+00
1"=20' HORIZONTAL
1"=2' VERTICAL

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2013

KEYNOTES

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. REMOVE EXISTING CULVERT.
4. PROPOSED R.O.W.
5. TOE OF SLOPE
6. EXISTING UTILITY POLE TO BE REMOVED AND NEW POLE TO BE INSTALLED BY OTHERS APPROXIMATELY 36' FROM CENTERLINE OF ROAD. CONTRACTOR TO COORDINATE INSTALLATION AND RELOCATION WITH PGE.
7. REMOVE EXISTING TREE, POINT 3573 16" UNK
8. INSTALL 12' WIDE AC DRIVEWAY APPROACH, SEE DETAIL 7/R8.7.
9. INSTALL 12' WIDE GRAVEL ACCESS ROAD, SEE DETAIL 4/R8.7
10. CONSTRUCT CG-48 CATCH BASIN
    SEE STANDARD DETAILS ON SHEET R8.6
    TRANSITION CURB FROM MOUNTABLE TO STANDARD OVER 2' BOTH SIDES OF CG-48
    STA 15+77.75 (20' LT)
    RIM (TC) ELEV=202.89
    IE IN=199.74 (E)
    IE OUT=199.74 (W)
11. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 15+77.76 (18' RT)
    RIM ELEV=202.81 (1½" DROP INCLUDED)
    IE OUT=200.60 (W)
12. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 17+00 (18' LT)
    RIM ELEV=203.30 (1½" DROP INCLUDED)
    IE OUT=201.08 (E)
13. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 17+00 (18' RT)
    RIM ELEV=203.3 (1½" DROP INCLUDED)
    IE IN=201.07 (E)
    IE OUT=201.07 (W)
14. INSTALL TYPE II AREA DRAIN. PLACE AREA DRAIN AT LOW AREAS AND GRADE 10' MIN. AROUND TO PROVIDE POSITIVE DRAINAGE, REFER TO SPECS. SEE CWS STD DETAIL 380 ON SHEET R8.10
    STA 16+99.98 (35' RT)
    RIM=203.72
    IE OUT=201.18 (W)
15. PUBLIC UTILITY EASEMENT
16. INSTALL TYPE II AREA DRAIN. PLACE AREA DRAIN AT LOW AREAS AND GRADE 10' MIN. AROUND TO PROVIDE POSITIVE DRAINAGE, REFER TO SPECS. SEE CWS STD DETAIL 380 ON SHEET R8.10
    STA 14+55 (41.58' RT)
    RIM=203.92
    IE OUT=201.44 (W)
17. CONSTRUCT DRAINAGE DITCH, SEE DETAIL 2/R8.3
18. DITCH OUTFALL TO EX. GLENCOE SWALE
    FLOWLINE ELEV=199.2±
    MATCH EX. CHANNEL

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY. 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

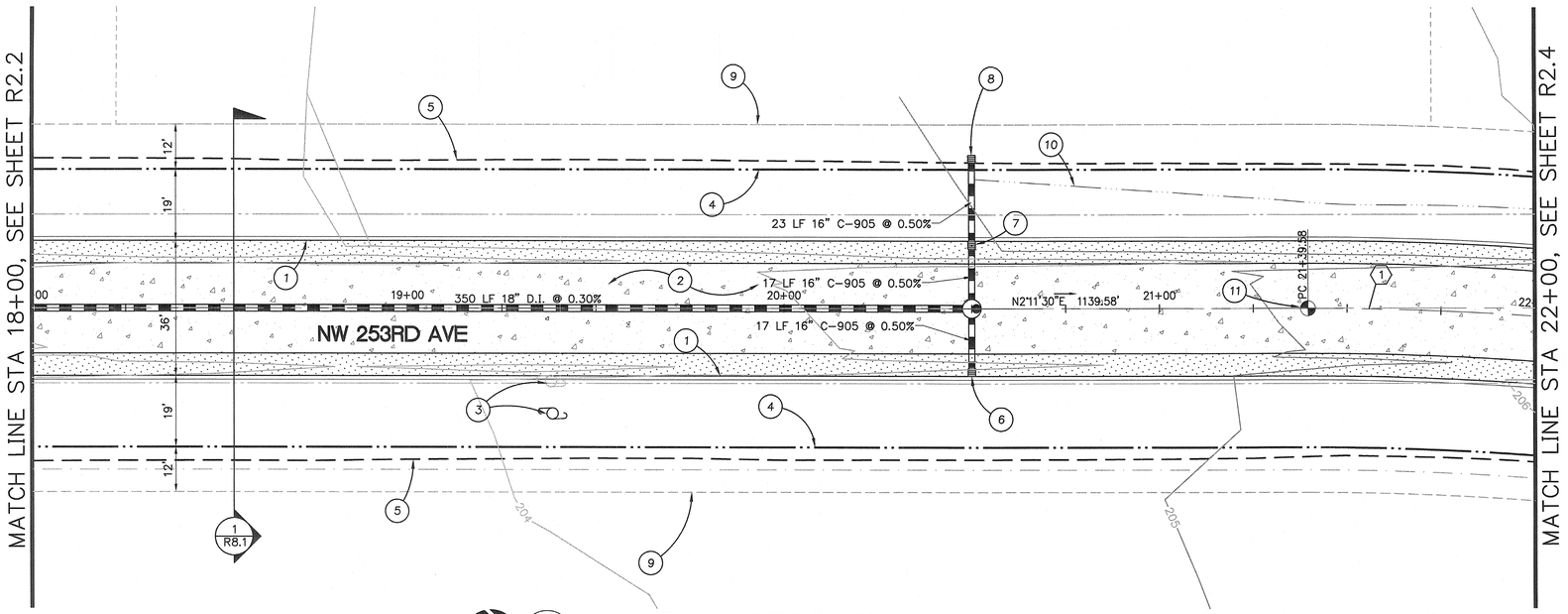
SHEET TITLE:
PLAN AND PROFILE SHEET
STA 14+00 TO STA 18+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R2.2

JOB NO. 2120550.00

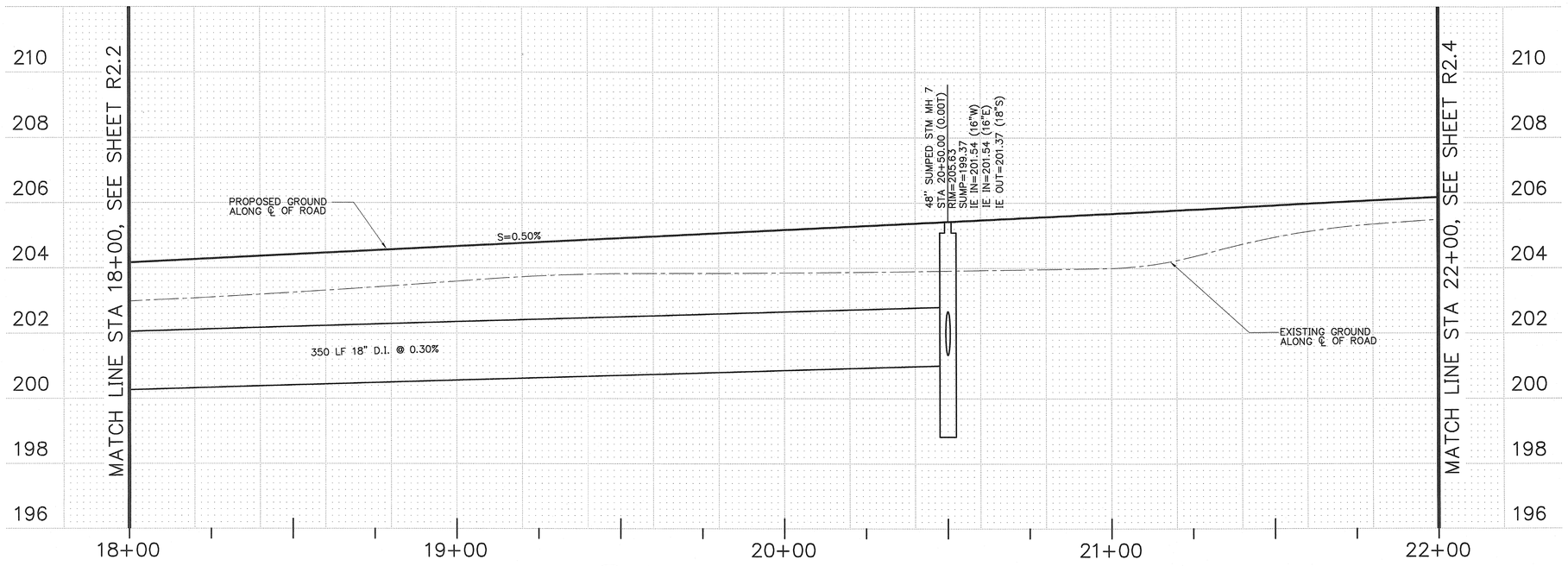


1 R2.3 PLAN STA 18+00 TO 22+00
1"=20'

20 0 10 20 40 80
1:1
(IN FEET)
1 inch = 20 ft.

KEYNOTES

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. EXISTING UTILITY POLE TO BE REMOVED AND NEW POLE TO BE INSTALLED BY OTHERS APPROXIMATELY 36' FROM CENTERLINE OF ROAD. CONTRACTOR TO COORDINATE INSTALLATION AND RELOCATION WITH PGE.
4. PROPOSED R.O.W.
5. TOE OF SLOPE
6. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 20+50 (18' LT)
   RIM ELEV=205.06 (1½" DROP INCLUDED)
   IE OUT=201.62
7. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 20+50 (18' RT)
   RIM ELEV=205.06 (1½" DROP INCLUDED)
   IE IN=201.62 (E)
   IE OUT=201.62 (W)
8. INSTALL TYPE II AREA DRAIN. PLACE AREA DRAIN AT LOW AREAS AND GRADE 10' MIN. AROUND TO PROVIDE POSITIVE DRAINAGE, REFER TO SPECS. SEE CWS STD DETAIL 380 ON SHEET R8.10
   STA 20+50 (39.83' LT)
   RIM=204.67
   IE=201.73 (E)
9. PUBLIC UTILITY EASEMENT
10. EXTEND DRAINAGE DITCH TO AREA DRAIN TO ENSURE POSITIVE DRAINAGE, DITCH TO BE 12" DEEP WITH 2:1 SIDE SLOPES
11. INSTALL SURVEY MONUMENT BOX PER DETAIL 4/R8.10



2 R2.3 PROFILE STA 18+00 TO 22+00
1"=20' HORIZONTAL
1"=2' VERTICAL
1:1

CURVE TABLE #			
CURVE	RADIUS	LENGTH	DELTA
1	855'	103'	6°54'05"

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2013

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY, 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

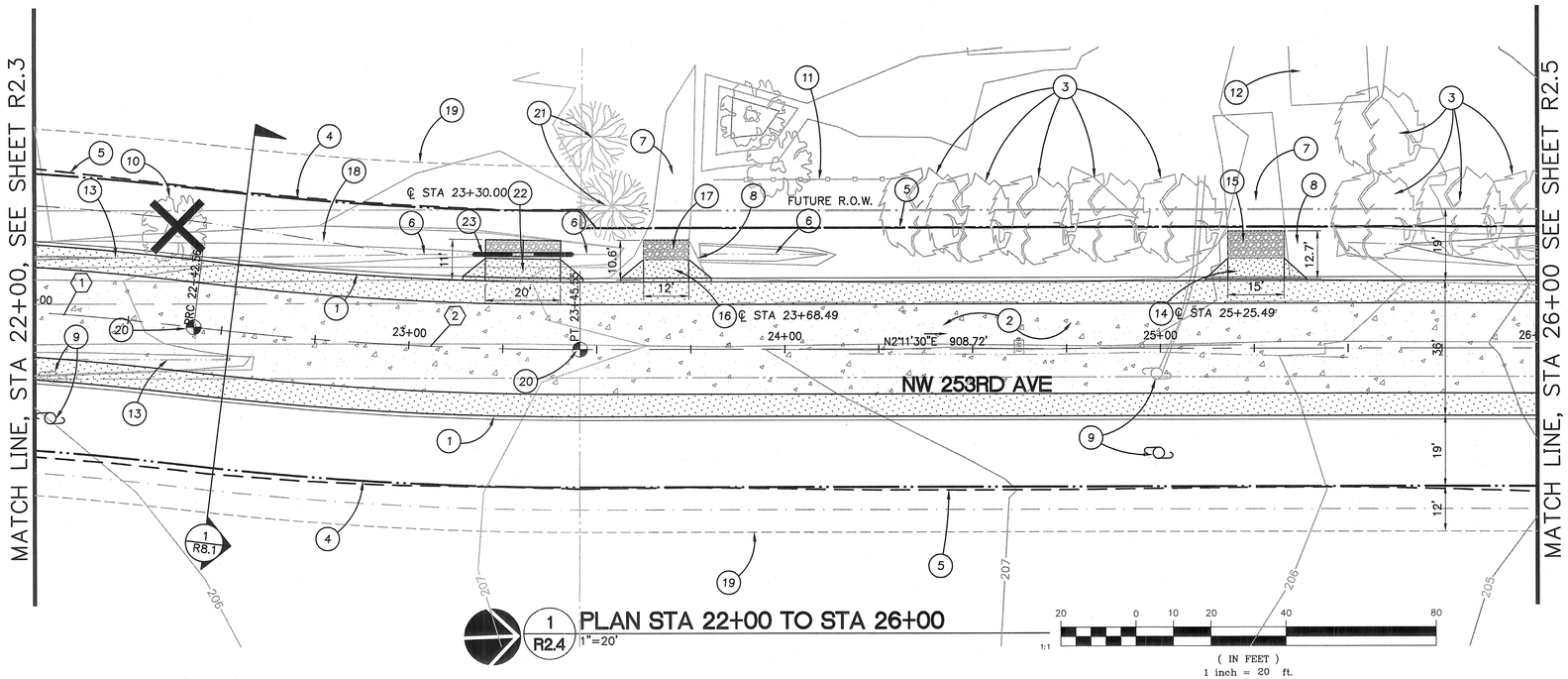
SHEET TITLE:
PLAN AND PROFILE SHEET
STA 18+00 TO STA 22+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R2.3

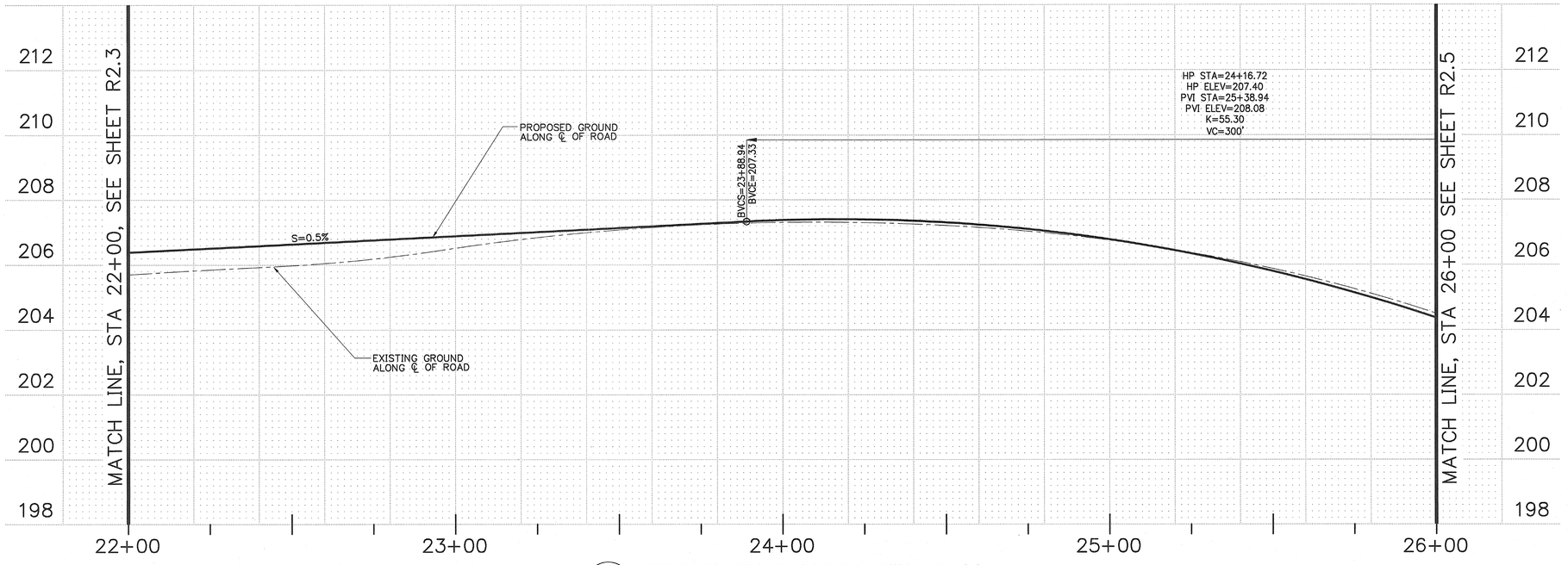
JOB NO. 2120550.00



1 R2.4 **PLAN STA 22+00 TO STA 26+00**
1"=20'

1:1

20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.



2 R2.4 **PROFILE STA 22+00 TO STA 26+00**
1"=20' HORIZONTAL
1"=2' VERTICAL

1:1

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2013

KEYNOTES

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. PROTECT EXISTING HEDGE LINE
4. PROPOSED R.O.W.
5. TOE OF SLOPE
6. PROTECT EXISTING DRAINAGE DITCH
7. PROTECT EXISTING DRIVEWAY
8. PROTECT EXISTING PIPE UNDER DRIVEWAY
9. EXISTING UTILITY POLE TO BE REMOVED AND NEW POLE TO BE INSTALLED BY OTHERS APPROXIMATELY 36' FROM CENTERLINE OF ROAD. CONTRACTOR TO COORDINATE INSTALLATION AND RELOCATION WITH PGE.
10. REMOVE EXISTING TREE, POINT 3572 (30") OAK
11. PROTECT EXISTING FENCE
12. PROTECT EXISTING STRUCTURE
13. FILL IN EXISTING DRAINAGE DITCH WITH STRUCTURAL FILL, SEE GEOTECHNICAL REQUIREMENTS
14. INSTALL 15' WIDE AC DRIVEWAY APPROACH. SEE DETAIL 7/R8.7. DRIVEWAY THROAT MAY HAVE 1" MAX. LIP TRANSITION FROM 4" MOUNTABLE CURB TO 1" FLAT CURB OVER 6' WING.
15. INSTALL 15' WIDE GRAVEL DRIVEWAY SEE DETAIL 4/R8.7
16. INSTALL 12' WIDE AC DRIVEWAY APPROACH. SEE DETAIL 7/R8.7. DRIVEWAY THROAT MAY HAVE 1" MAX. LIP TRANSITION FROM 4" MOUNTABLE CURB TO 1" FLAT CURB OVER 6' WING.
17. INSTALL 12' WIDE GRAVEL DRIVEWAY SEE DETAIL 4/R8.7
18. EXTEND DRAINAGE DITCH TO AREA DRAIN TO ENSURE POSITIVE DRAINAGE, DITCH TO BE 12" DEEP WITH 2:1 SIDE SLOPES
19. PUBLIC UTILITY EASEMENT
20. INSTALL SURVEY MONUMENT BOX PER DETAIL 4/R8.10
21. PROTECT EXISTING TREES
22. INSTALL 20' WIDE AC DRIVEWAY APPROACH. SEE DETAIL 7/R8.7. DRIVEWAY THROAT MAY HAVE 1" MAX. LIP TRANSITION FROM 4" MOUNTABLE CURB TO 1" FLAT CURB OVER 6' WING.
23. INSTALL 26 LF 12" DUCTILE IRON CULVERT UNDER NEW DRIVEWAY AND GRADE DITCH TO ENSURE POSITIVE DRAINAGE.
    IE IN=205.23' (N)
    IE OUT=205.10' (S)
    STA 23+16.56 TO STA 23+43.34

CURVE TABLE (#)

CURVE	RADIUS	LENGTH	DELTA
1	855'	103'	6°54'05"
2	855'	103'	6°54'05"

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Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY 11, 2008 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

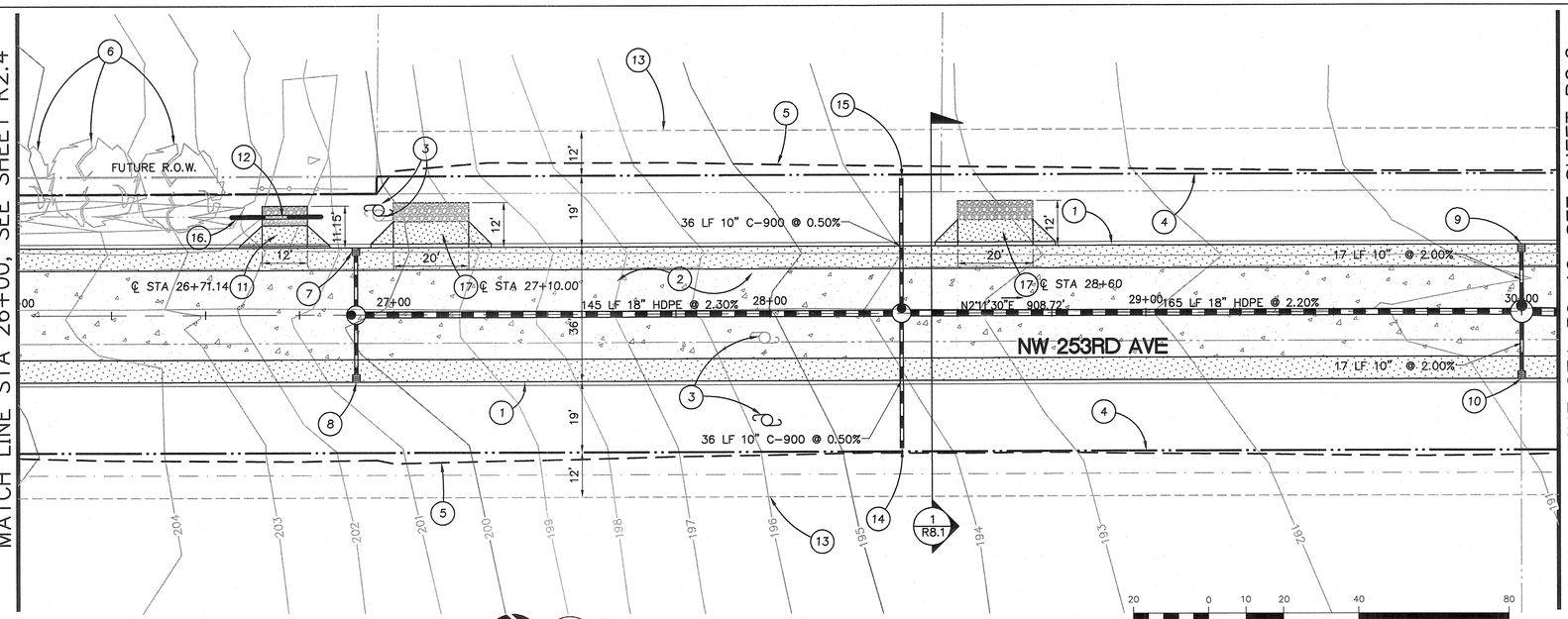
SHEET TITLE:
PLAN AND PROFILE SHEET STA 22+00 TO STA 26+00

DRAWN BY: BMR

CHECKED BY: RJH

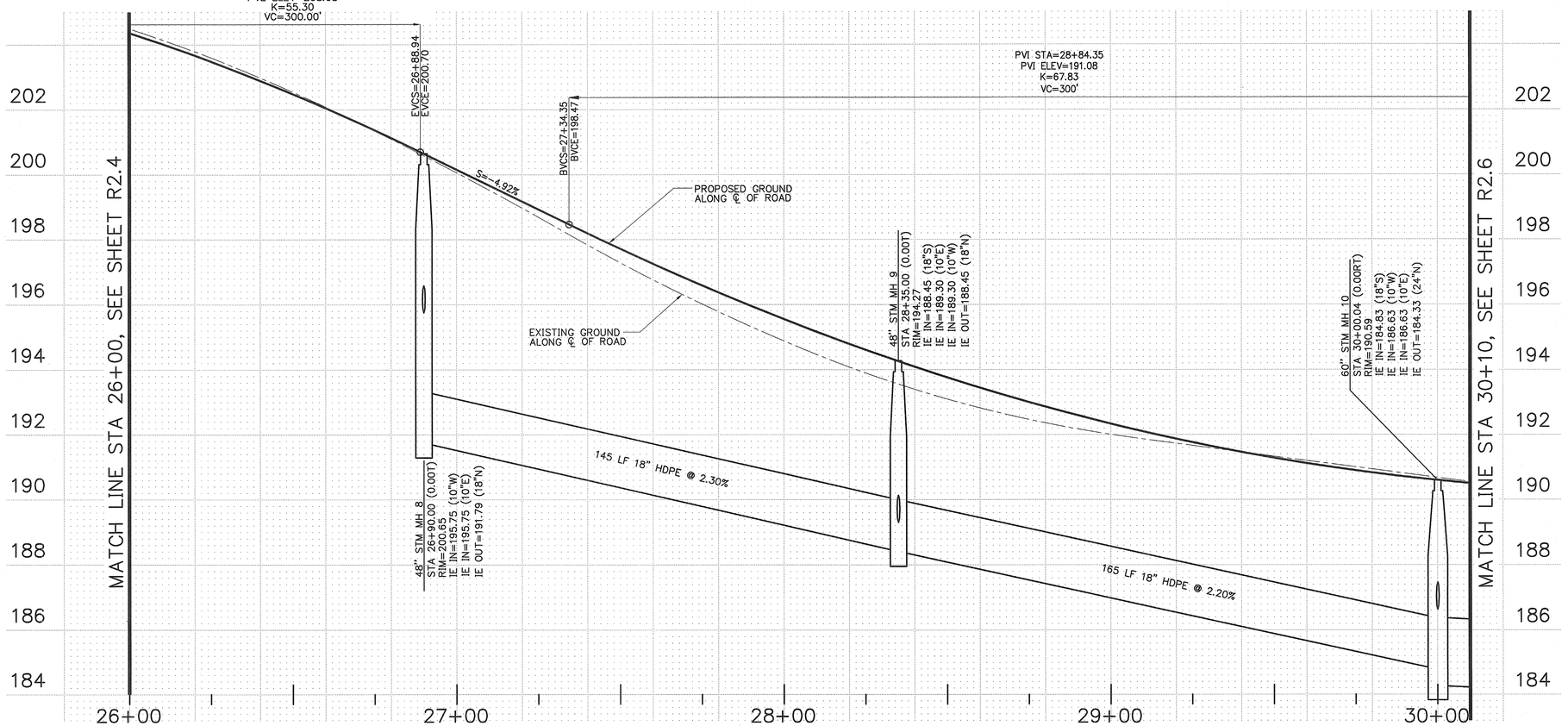
SHEET:
R2.4

JOB NO. 2120550.00



1 R2.5 **PLAN STA 26+00 TO 30+00**
1"=20'

(IN FEET)
1 inch = 20 ft.



2 R2.5 **PROFILE STA 26+00 TO 30+00**
1"=20' HORIZONTAL
1"=2' VERTICAL

KEYNOTES

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. EXISTING UTILITY POLE TO BE REMOVED AND NEW POLE TO BE INSTALLED BY OTHER APPROXIMATELY 36' FROM CETNERLINE OF ROAD. CONTRACTOR TO COORDINATE INSTALLATION AND RELOCATION WITH PGE.
4. PROPOSED R.O.W.
5. TOE OF SLOPE
6. PROTECT EXISTING HEDGE LINE
7. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 26+90 (18' LT)
   RIM ELEV=200.07 (1½" DROP INCLUDED)
   IE OUT=195.84 (W)
8. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 26+90 (18' RT)
   RIM ELEV=200.07 (1½" DROP INCLUDED)
   IE OUT=195.84 (W)
9. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 30+00 (18' LT)
   RIM ELEV=190.02 (1½" DROP INCLUDED)
   IE OUT=186.97 (W)
10. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 30+00 (18' RT)
    RIM ELEV=190.02 (1½" DROP INCLUDED)
    IE OUT=186.97 (W)
11. INSTALL 12' WIDE AC DRIVEWAY APPROACH, DRIVEWAY THROAT TO HAVE 1" MAX. LIP TRANSITION FROM 4" MOUNTABLE CURB TO 1" FLAT CURB OVER 6" WING. SEE DETAIL 7/R8.7
12. REMOVE EXISTING DRIVEWAY APPROACH AND INSTALL 12' WIDE GRAVEL DRIVEWAY, SEE DETAIL 4/R8.7
13. PUBLIC UTILITY EASEMENT
14. INSTALL LATERAL, PLUG AND MARK
    IE=189.48(W)
15. INSTALL LATERAL, PLUG AND MARK
    IE=189.48 (E)
16. INSTALL 24 LF OF 12" DUCTILE IRON CULVERT UNDER NEW DRIVEWAY AND GRADE DITCH TO ENSURE POSITIVE DRAINAGE
    IE IN=200.79' (S)
    IE OUT=200.11' (N)
    STA 26+56.90 TO STA 26+80.90
17. INSTALL 20' WIDE AC DRIVEWAY APPROACH, SEE DETAIL 7/R8.7. DRIVEWAY THROAT MAY HAVE 1" MAX. LIP TRANSITION FROM 4" MOUNTABLE CURB TO 1" FLAT CURB OVER 6' WING.

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CITY PROJECT # 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

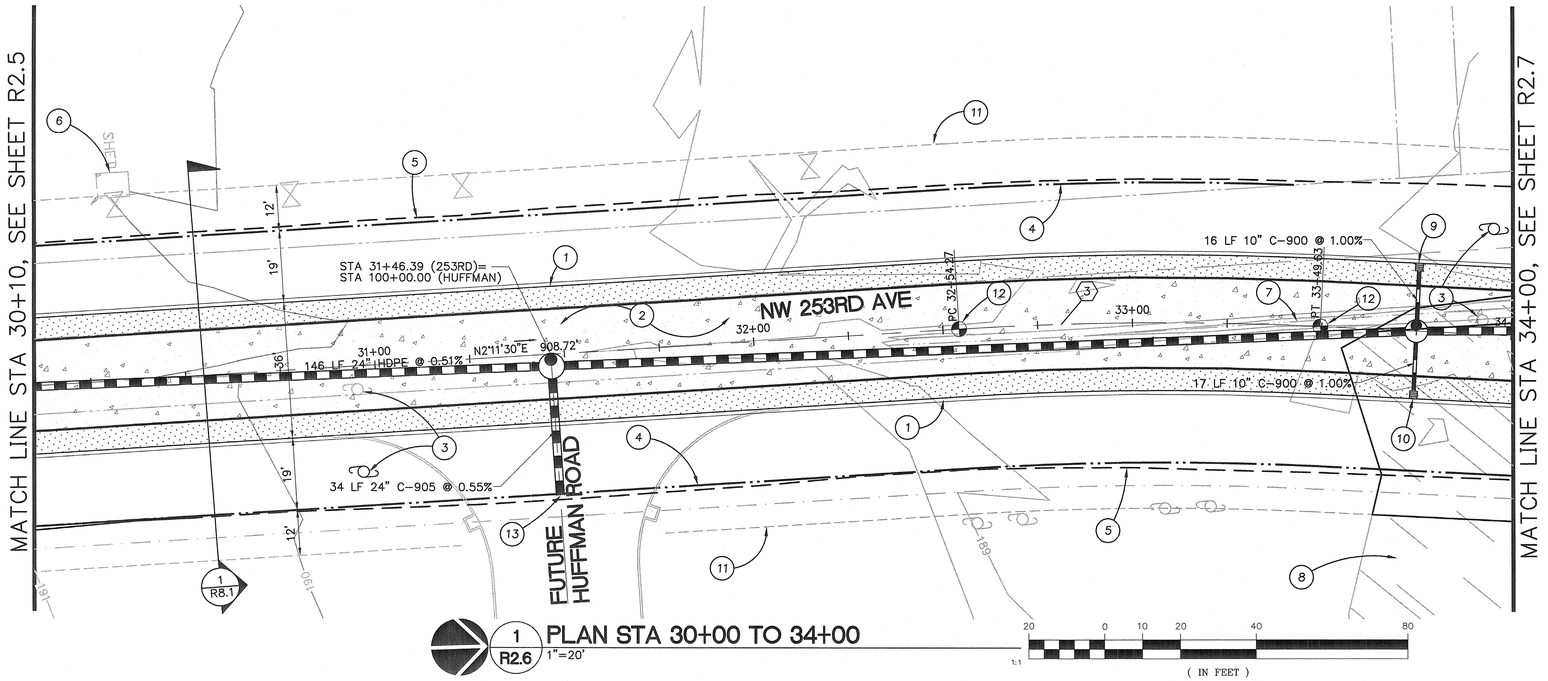
REGISTERED PROFESSIONAL ENGINEER #56660 OREGON
Ralph J.R. Henderson
May. 11, 2009
RALPH J.R. HENDERSON
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
PLAN AND PROFILE SHEET STA 26+00 TO STA 30+10

DRAWN BY: BMR
CHECKED BY: RJH
SHEET:
R2.5
JOB NO. 2120550.00



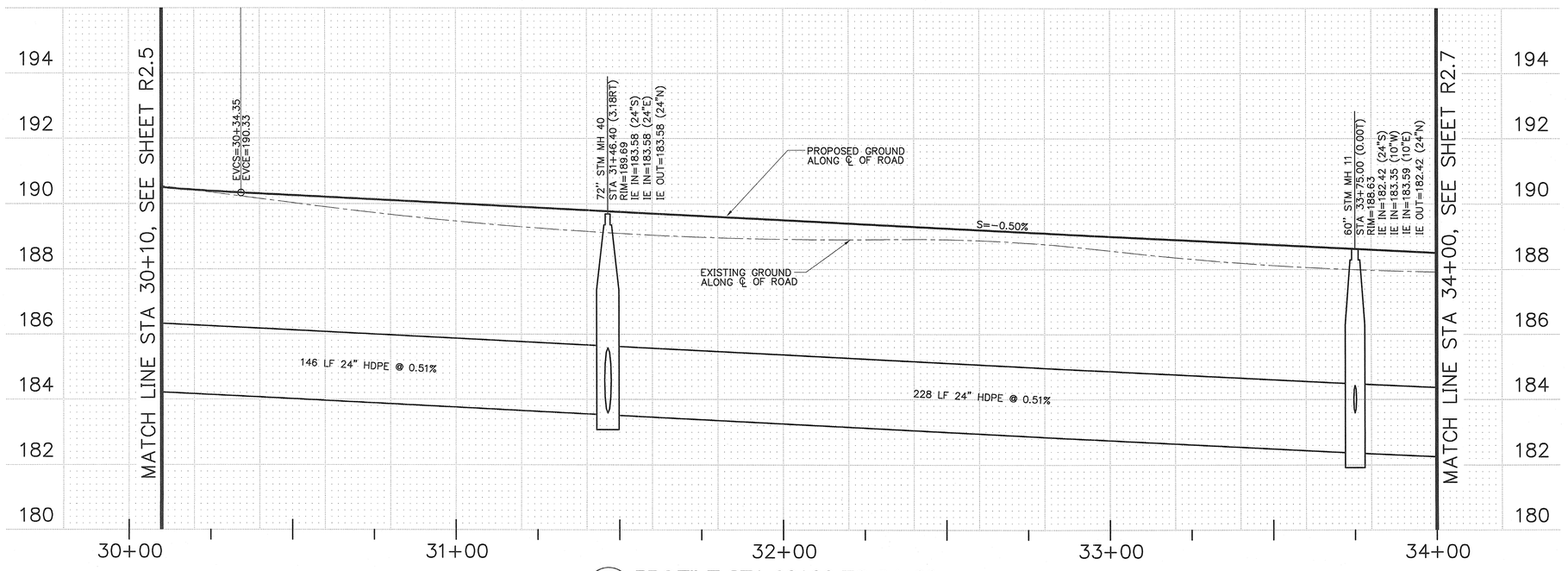
1 R2.6 PLAN STA 30+00 TO 34+00
1"=20'

1:1

20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEYNOTES

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. EXISTING UTILITY POLE TO BE REMOVED AND NEW POLE TO BE INSTALLED BY OTHERS APPROXIMATELY 36' FROM CENTERLINE OF ROAD. CONTRACTOR TO COORINATE INSTALLATION AND RELOCATION WITH PGE.
4. PROPOSED R.O.W.
5. TOE OF SLOPE
6. PROTECT EXISTING STRUCTURE
7. FILL IN EXISTING DRAINAGE DITCH WITH STRUCTURAL BACKFILL, REFER TO GEOTECHNICAL REQUIREMENTS
8. DENSE WOODED AREA, REFER TO SHEET R1.5 FOR TREE REMOVAL PLAN
9. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 33+75 (18' LT)
   RIM ELEV=188.05 (1½" DROP INCLUDED)
   IE OUT=183.51 (E)
10. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 33+75 (18' RT)
    RIM ELEV=188.05 (1½" DROP INCLUDED)
    IE OUT=183.76 (W)
11. PUBLIC UTILITY EASEMENT
12. INSTALL SURVEY MONUMENT BOX PER DETAIL 4/R8.10
13. INSTALL AND PLUG AND MARK 24" STORM MAIN FOR FUTURE CONNECTION TO NW HUFFMAN STORM



2 R2.6 PROFILE STA 30+00 TO 34+00
1"=20' HORIZONTAL
1"=2' VERTICAL

1:1

CURVE TABLE #			
CURVE	RADIUS	LENGTH	DELTA
3	855'	95.4'	6°23'26"

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2013

BID SET 5/1/2015

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

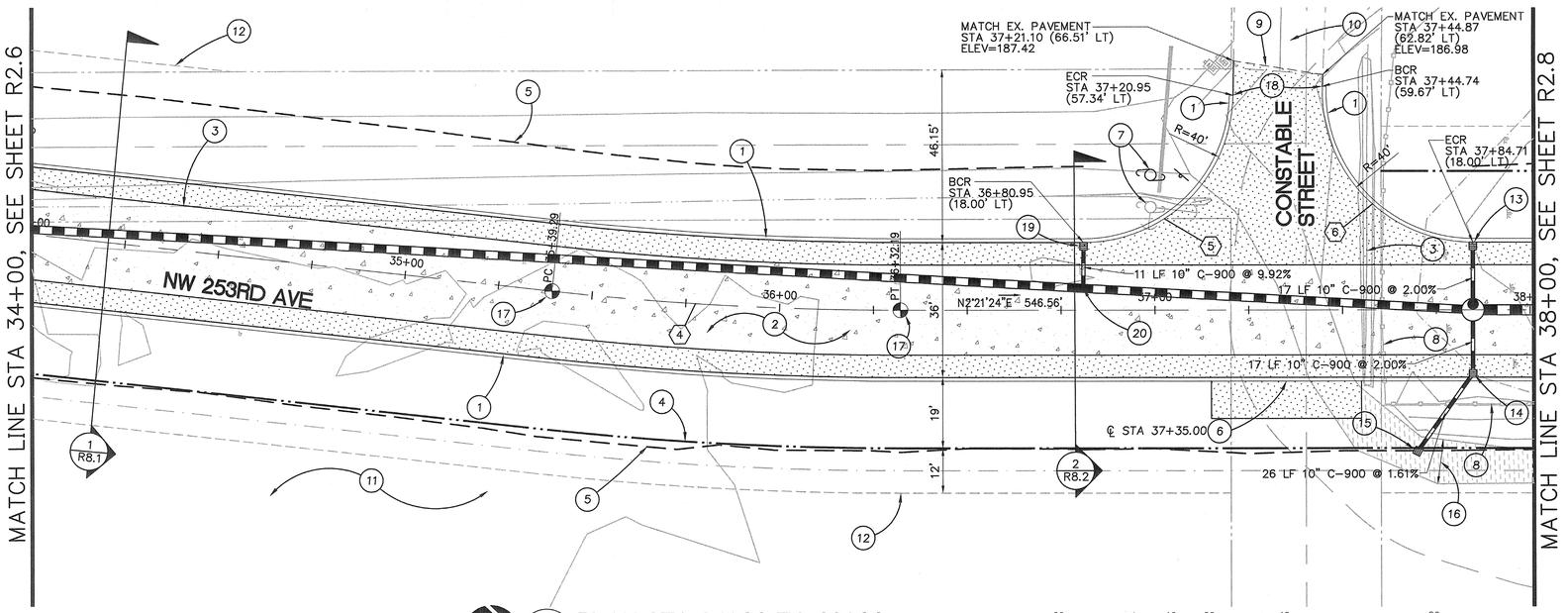
REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY, 11, 2000 RALPH J.R. HENDERSON
Ralph J.R. Henderson
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS	REVISION DELTA CLOSING DATE
THIS SHEET		

SHEET TITLE:
PLAN AND PROFILE SHEET
STA 30+10 TO STA 34+00

DRAWN BY: BMR
CHECKED BY: RJH
SHEET:
R2.6
JOB NO. 2120550.00



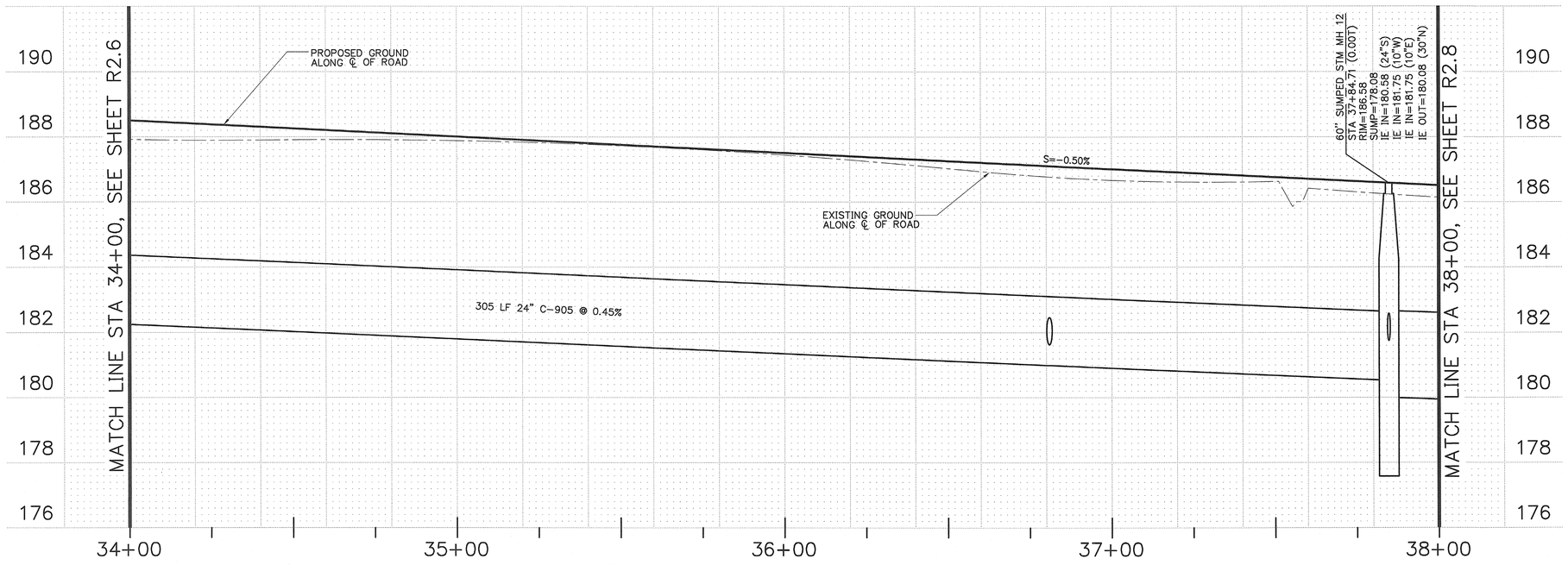
1 R2.7 PLAN STA 34+00 TO 38+00
1"=20'

20 0 10 20 40 80
1:1
(IN FEET)
1 inch = 20 ft.

CURB RETURN TABLE (#)

CURVE	RADIUS	LENGTH	DELTA	BCR	1/4Δ	1/2Δ	3/4Δ	ECR
5	40'	62.1733'	89°03'18"	186.65	186.70	187.00	187.31	187.42
6	40'	64.5074'	92°24'59"	186.98	186.84	186.56	186.28	186.13

*ALL GRADES SHOWN ARE PAVEMENT GRADE AT FACE OF CURB UNLESS OTHERWISE NOTED



2 R2.7 PROFILE STA 34+00 TO 38+00
1"=20' HORIZONTAL
1"=2' VERTICAL
1:1

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2013

KEYNOTES (#)

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. FILL IN EXISTING DRAINAGE DITCH WITH STRUCTURAL BACKFILL, REFER TO GEOTECHNICAL REQUIREMENTS
4. PROPOSED R.O.W.
5. TOE OF SLOPE
6. INSTALL 40' X 10' AC DRIVEWAY. SEE DETAIL 3/R8.7.
7. EXISTING UTILITY POLE TO BE REMOVED AND NEW POLE TO BE INSTALLED BY OTHER APPROXIMATELY 36' FROM CENTERLINE OF ROAD. CONTRACTOR TO COORDINATE INSTALLATION AND RELOCATION WITH PGE.
8. REMOVE EXISTING FENCE WITHIN R.O.W. BOUNDARY
9. SAW CUT AND MATCH TO EXISTING ASPHALT PAVEMENT
10. PROTECT EXISTING AC PAVEMENT
11. DENSE WOODED AREA, REFER TO SHEET R1.5 FOR TREE REMOVAL PLAN
12. PUBLIC UTILITY EASEMENT
13. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 37+84.17 (17' LT)
    RIM ELEV=186.23 (1½" DROP INCLUDED)
    IE OUT=182.09 (E)
14. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 37+84.17 (17' RT)
    RIM ELEV=186.23 (1½" DROP INCLUDED)
    IE IN=182.09 (NE)
    IE OUT=182.09 (W)
15. INSTALL TYPE II AREA DRAIN. PLACE AREA DRAIN AT LOW AREAS AND GRADE 10' MIN. AROUND TO PROVIDE POSITIVE DRAINAGE, REFER TO SPECS. SEE OWS STD DETAIL 380 ON SHEET R8.10
    STA 37+55.87 (27.71' RT)
    RIM=186.77
    IE=182.50 (SW)
16. REMOVE GRAVEL AND AC DRIVEWAY
17. INSTALL SURVEY MONUMENT BOX PER DETAIL 4/R8.10
18. END OF CURB RETURN. BEGIN EDGE OF PAVEMENT
19. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 37+84.17 (17' RT)
    RIM ELEV=186.55 (1½" DROP INCLUDED)
    IE OUT= 182.73 (W)
20. TEE 10" LATERAL TO 24" STORM MAIN
    IE=181.63 (10")

CURVE TABLE (#)

CURVE	RADIUS	LENGTH	DELTA
4	855'	92.9'	6°13'32"

BID SET 5/1/2015

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CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56600 OREGON JULY 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

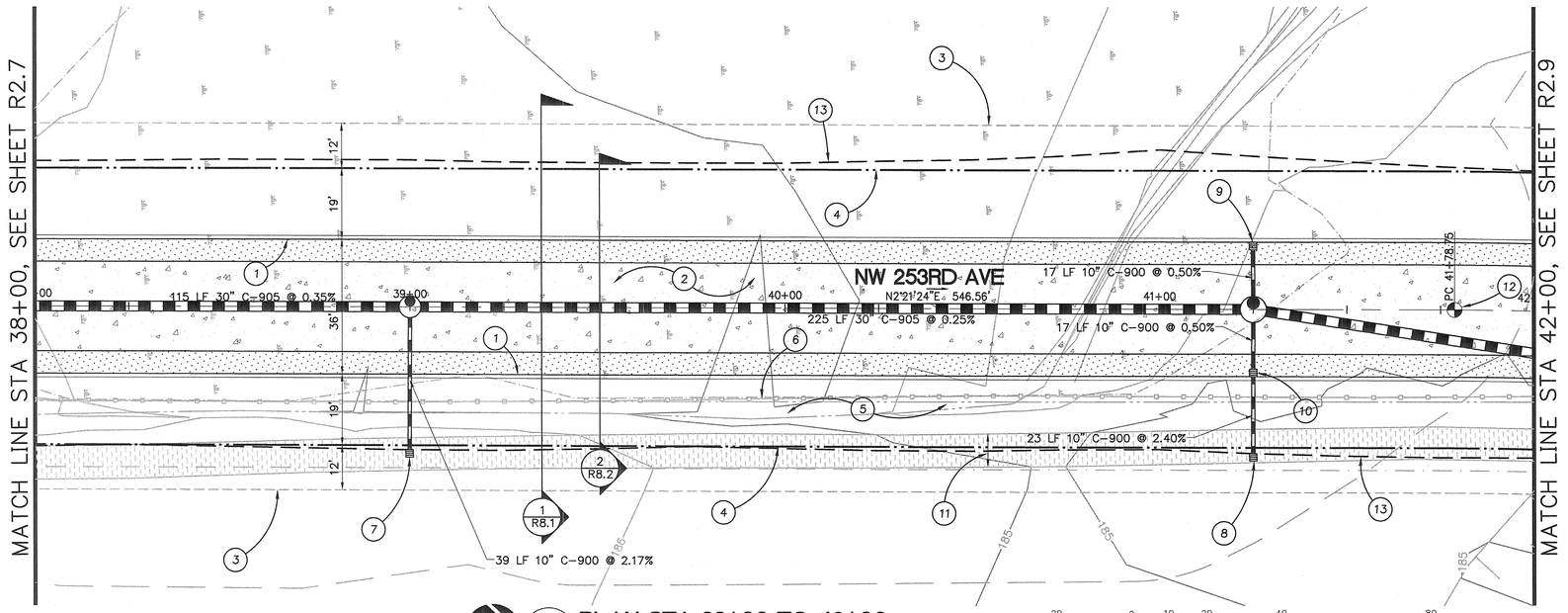
SHEET TITLE:
PLAN AND PROFILE SHEET
STA 34+00 TO STA 38+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R2.7

JOB NO. 2120550.00

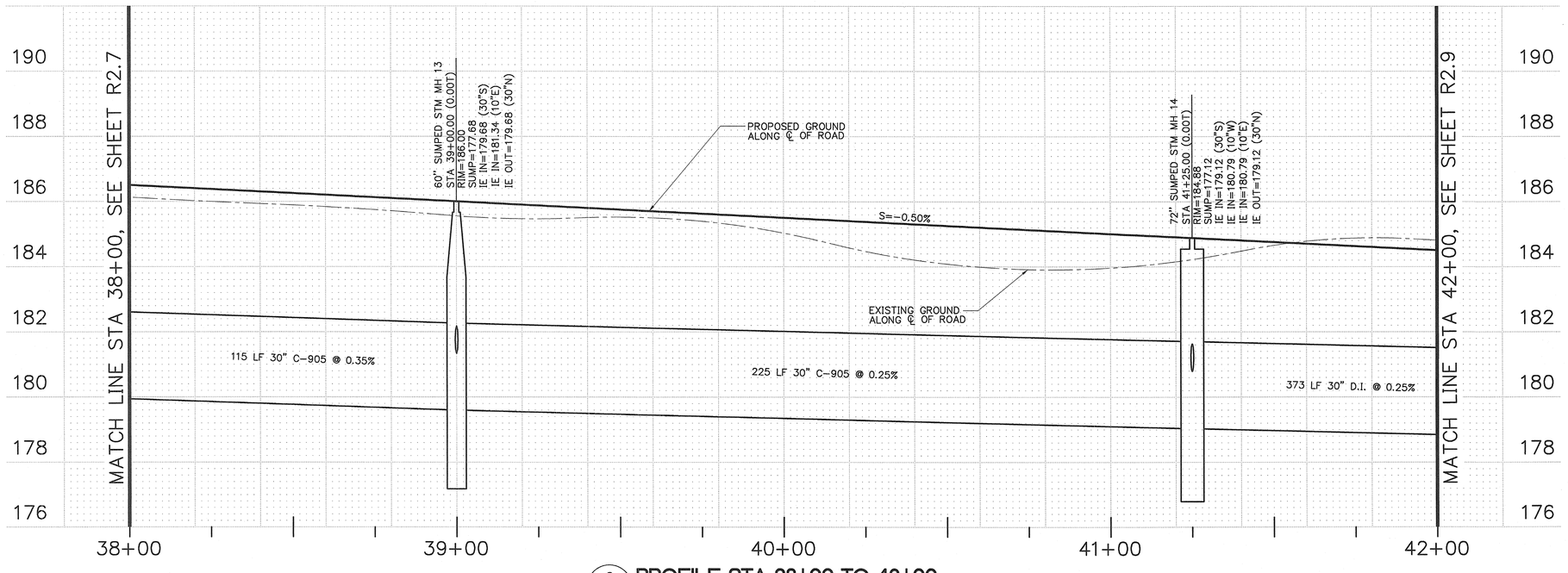


1 R2.8 PLAN STA 38+00 TO 42+00
1"=20'

1:1 20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEYNOTES

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. PUBLIC UTILITY EASEMENT
4. PROPOSED R.O.W.
5. EXISTING TREE LINE, REFER TO SHEET R1.5 FOR TREE REMOVAL PLAN
6. REMOVE EXISTING FENCE
7. INSTALL TYPE II AREA DRAIN. PLACE AREA DRAIN AT LOW AREAS AND GRADE 10' MIN. AROUND TO PROVIDE POSITIVE DRAINAGE, REFER TO SPECS. SEE CWS STD DETAIL 380 ON SHEET R8.10
   STA 39+00 (39.18' RT)
   RIM=184.50 (1½" DROP INCLUDED)
   IE OUT=182.19(W)
8. INSTALL TYPE II AREA DRAIN. PLACE AREA DRAIN AT LOW AREAS AND GRADE 10' MIN. AROUND TO PROVIDE POSITIVE DRAINAGE, REFER TO SPECS. SEE CWS STD DETAIL 380 ON SHEET R8.10
   STA 41+25 (39.55' RT)
   RIM=183.93 (W) (1½" DROP INCLUDED)
   IE OUT=181.41 (W)
9. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 41+25 (18' LT)
   RIM ELEV=184.31 (1½" DROP INCLUDED)
   IE OUT=180.87 (E)
10. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 41+25 (18' RT)
    RIM ELEV=184.31 (1½" DROP INCLUDED)
    IE IN=180.87 (E)
    IE OUT=180.87 (W)
11. REMOVE EXISTING AC ROAD TO NEW DRIVEWAY APPROACH
12. INSTALL SURVEY MONUMENT BOX PER DETAIL 4/R8.10
13. TOE OF SLOPE



2 R2.8 PROFILE STA 38+00 TO 42+00
1"=20' HORIZONTAL
1"=2' VERTICAL
1:1

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2013

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56680 OREGON JULY 11, 2000 RALPH J.R. HENDERSON
Ralph J.R. Henderson
EXPIRES: 6/30/15

REVISIONS:

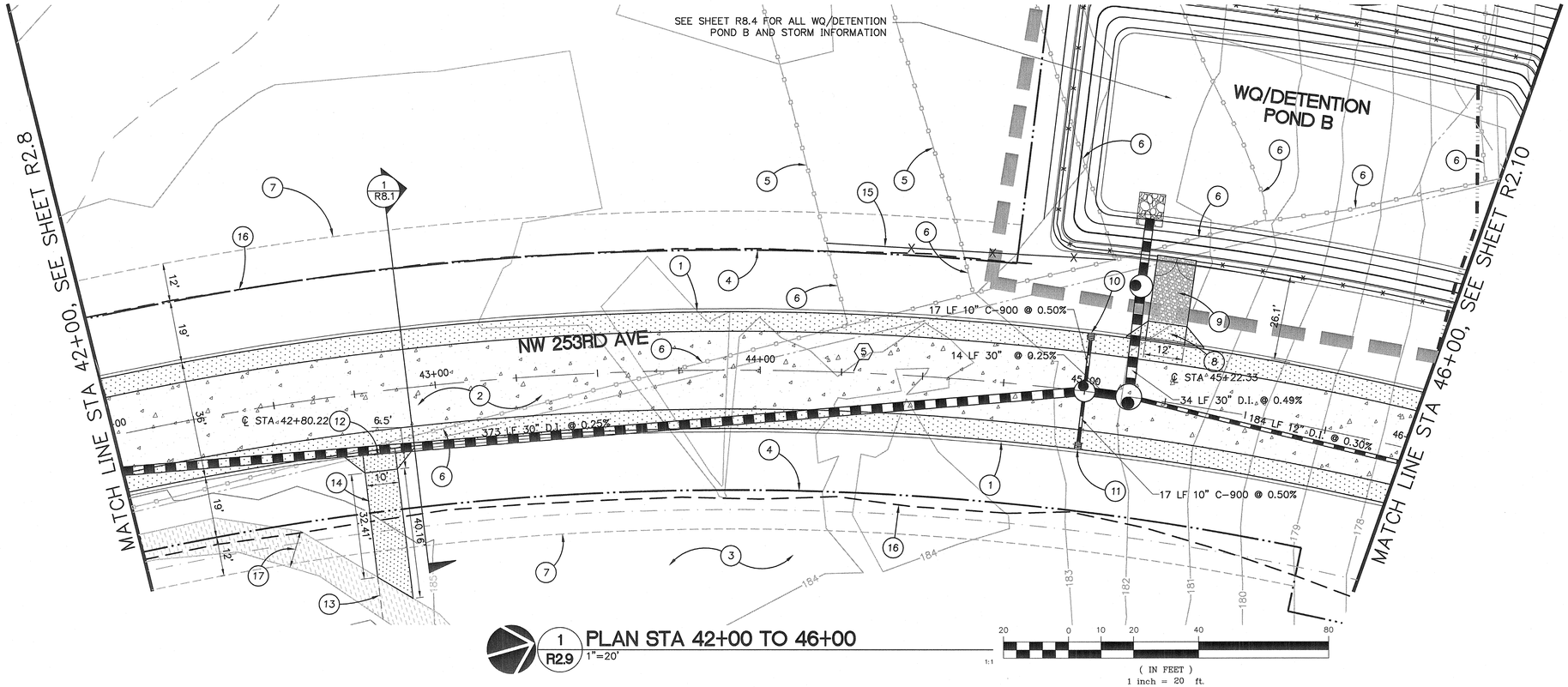
REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
PLAN AND PROFILE SHEET
STA 38+00 TO STA 42+00

DRAWN BY: BMR
CHECKED BY: RJH

SHEET:
R2.8

JOB NO. 2120550.00

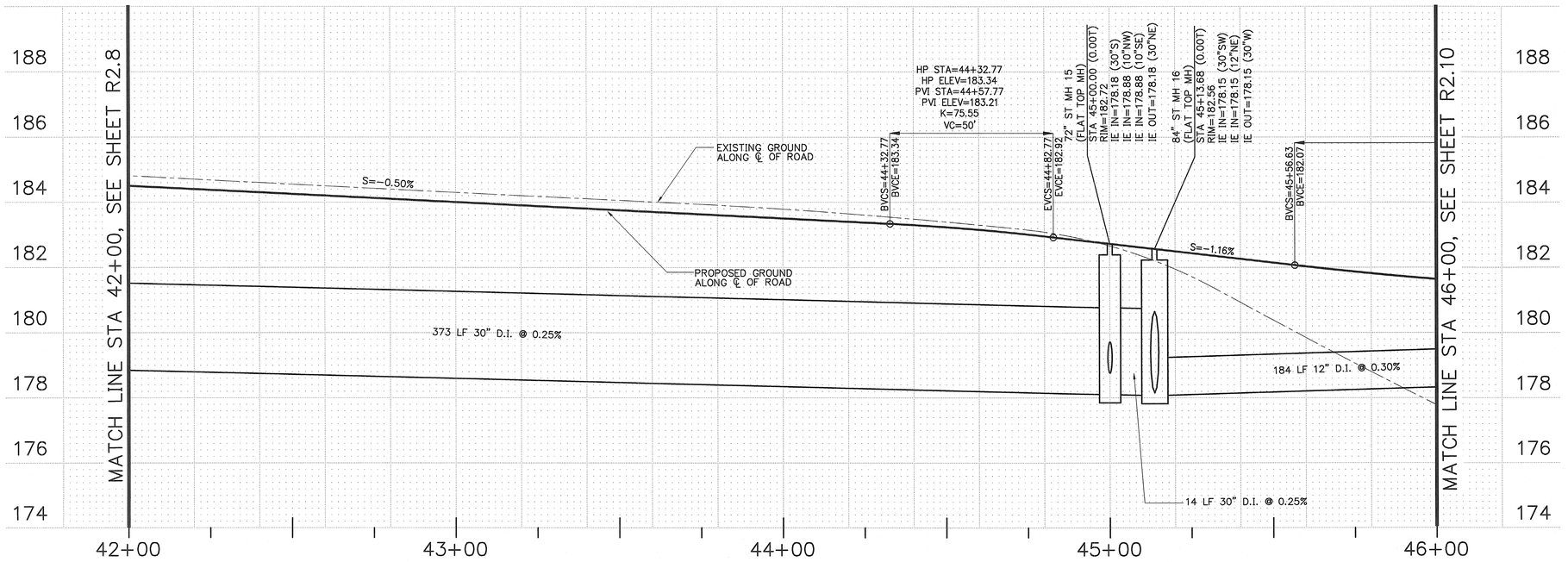


1 R2.9 PLAN STA 42+00 TO 46+00
1"=20'

1:1

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



2 R2.9 PROFILE STA 42+00 TO 46+00
1"=20' HORZ
1" = 2' VERT

1:1

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2015

KEYNOTES (#)

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. EXISTING TREE LINE. SEE SHEET R1.5 FOR TREE REMOVAL PLAN.
4. PROPOSED R.O.W.
5. PROTECT EXISTING FENCE TO DISTURBED AREA
6. REMOVE EXISTING FENCE WITHIN DISTURBED AREA
7. PUBLIC UTILITY EASEMENT
8. INSTALL 12' WIDE AC DRIVEWAY APPROACH. DRIVEWAY THROAT TO HAVE 1" MAX. LIP TRANSITION FROM 4" MOUNTABLE CURB TO 1" FLAT CURB OVER 6' WING. SEE DETAIL 7/R8.7.
9. INSTALL 12' WIDE GRAVEL DRIVEWAY, SEE DETAIL 4/R8.7
10. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 45+00 (18' LT)
    RIM ELEV=182.15 (1½" DROP INCLUDED)
    IE OUT=178.96 (E)
11. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 45+00 (18' RT)
    RIM ELEV=182.15 (1½" DROP INCLUDED)
    IE OUT=178.96 (W)
12. INSTALL 10' WIDE AC DRIVEWAY APPROACH. DRIVEWAY THROAT TO HAVE 1" MAX. LIP TRANSITION FROM 4" MOUNTABLE CURB TO 1" FLAT CURB OVER 6' WING. SEE DETAIL 7/R8.7.
13. SAWCUT EXISTING AC ROAD. REMOVE AC ROAD TO THE SOUTH AND PROTECT AC ROAD TO THE NORTH.
14. INSTALL NEW AC SECTION FROM NEW DRIVEWAY APPROACH TO MATCH EXISTING AC ROAD.
15. RELOCATE FENCING. COORDINATE LOCATION WITH PROPERTY OWNER.
16. TOE OF SLOPE
17. REMOVE GRAVEL AND AC DRIVEWAY

CURVE TABLE (#)			
CURVE	RADIUS	LENGTH	DELTA
5	900'	550.5'	35°02'42"

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56600 OREGON MAY. 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
PLAN AND PROFILE SHEET
STA 42+00 TO STA 46+00

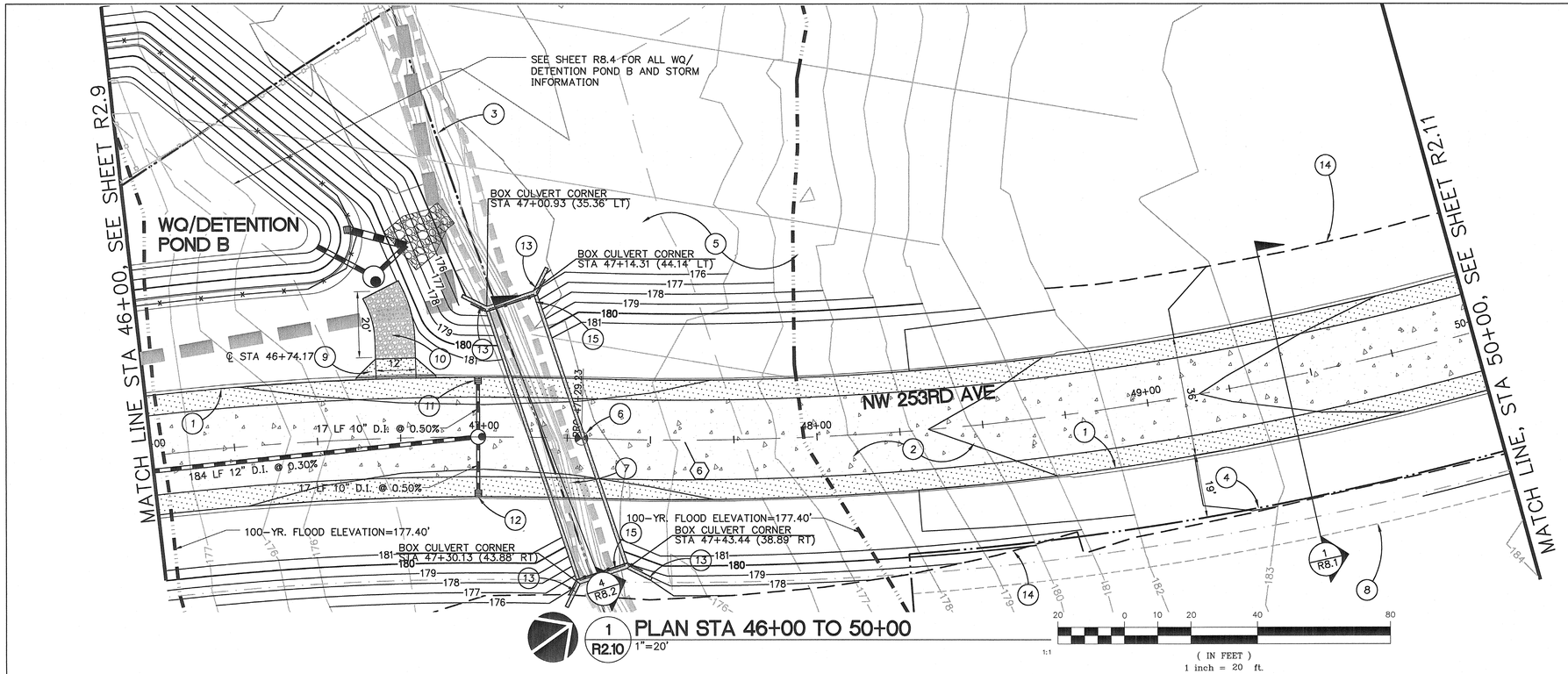
DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R2.9

JOB NO. 2120550.00

BID SET 5/1/2015

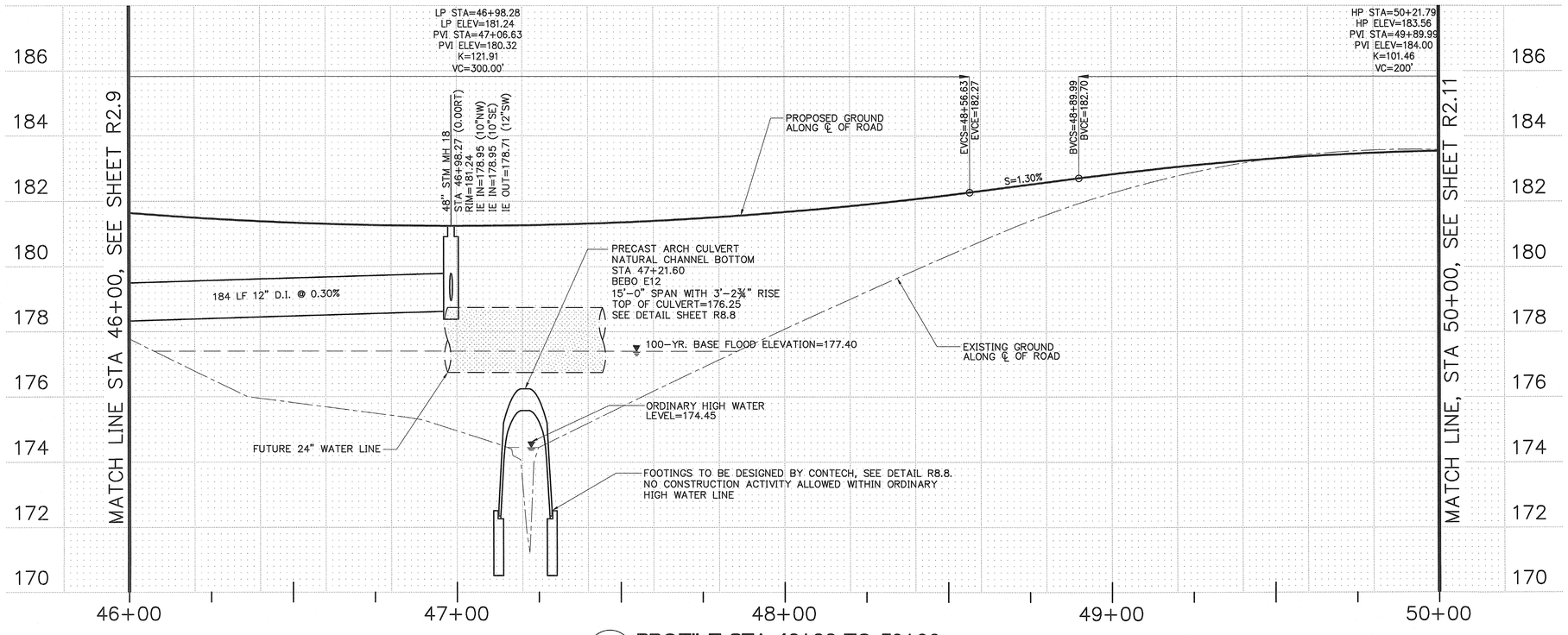


1 R2.10 **PLAN STA 46+00 TO 50+00**
1"=20'

(IN FEET)
1 inch = 20 ft.

KEYNOTES

1. INSTALL MOUNTABLE CURB, SEE DETAIL 8/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. PROTECT EXISTING DITCH CHANNEL TO REMAIN
4. PROPOSED R.O.W.
5. DENSE WOODED AREA, REFER TO SHEET R1.5 FOR TREE REMOVAL PLAN
6. INSTALL SURVEY MONUMENT CASE PER DETAIL 4/R8.10
7. S. FORK WAIBLE CREEK CULVERT CROSSING
   INSTALL PRECAST ARCH CULVERT
   NATURAL CHANNEL BOTTOM
   STA 47+21.60
   BEBO E12 OR EQUIVALENT
   15'-0" SPAN WITH 3'-2¾" RISE
   SEE SHEET R8.8 AND R8.9
8. PUBLIC UTILITY EASEMENT
9. INSTALL 12' WIDE AC DRIVEWAY APPROACH. SEE DETAIL 7/R8.7.
10. INSTALL 12' WIDE GRAVEL ACCESS ROAD, SEE DETAIL 4/R8.7
11. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 46+98 (18' LT)
    RIM ELEV=180.66 (1½" DROP INCLUDED)
    IE OUT=179.03 (E)
12. CONSTRUCT CG-2 CATCH BASIN
    SEE DETAIL 5/R8.5
    STA 46+98 (18' RT)
    RIM ELEV=180.66 (1½" DROP INCLUDED)
    IE OUT=179.03 (W)
13. INSTALL PRECAST CONCRETE CULVERT HEADWALL, SEE CULVERT DETAILS ON SHEET R8.8 AND R8.9
14. TOE OF SLOPE
15. INSTALL CL-6R CHAIN-LINK, BLACK VINYL CLAD FENCE SEE SPECIFICATIONS.



2 R2.10 **PROFILE STA 46+00 TO 50+00**
1"=20' HORIZONTAL
1"=2' VERTICAL

CURVE TABLE (#)			
CURVE	RADIUS	LENGTH	DELTA
6	900'	1018.5'	64°50' 31"

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2013

BID SET 5/1/2015

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

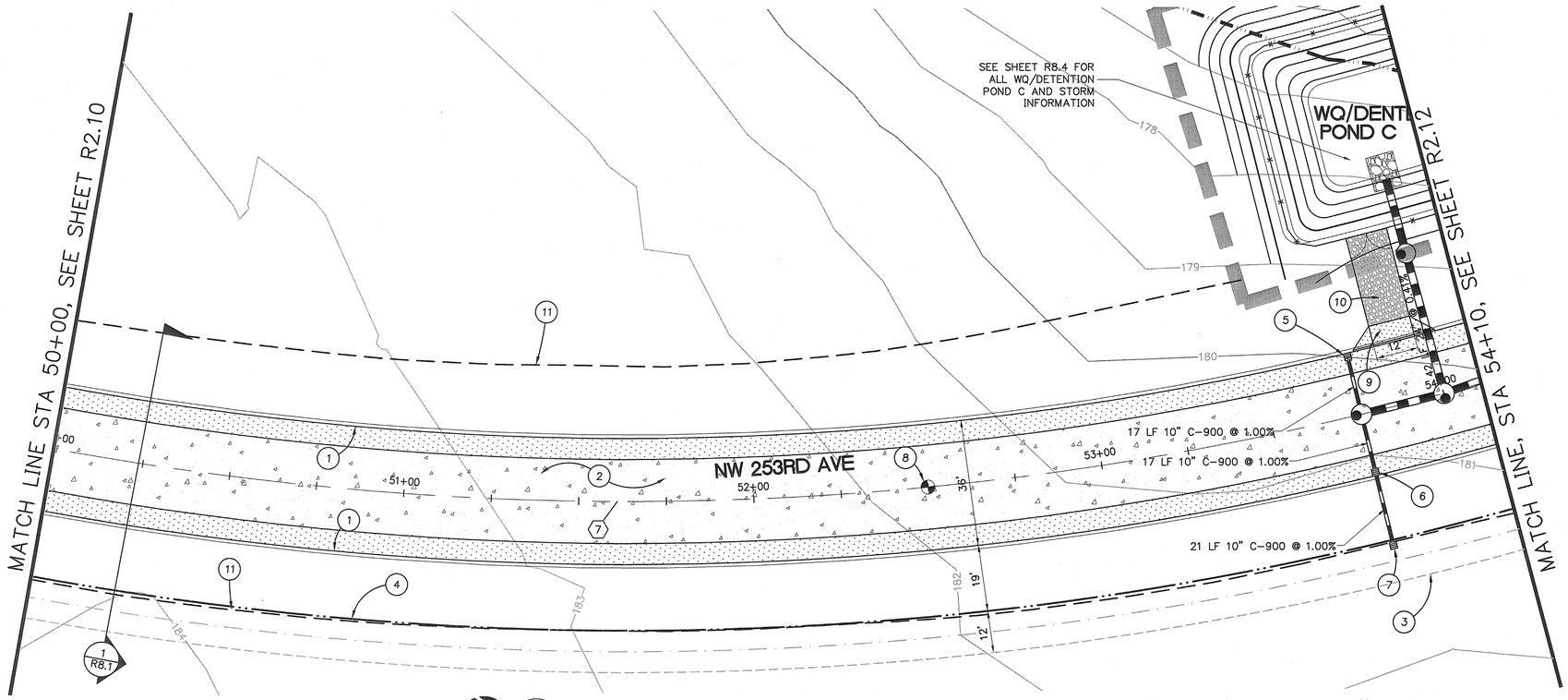
SHEET TITLE:
PLAN AND PROFILE SHEET
STA 46+00 TO STA 50+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R2.10

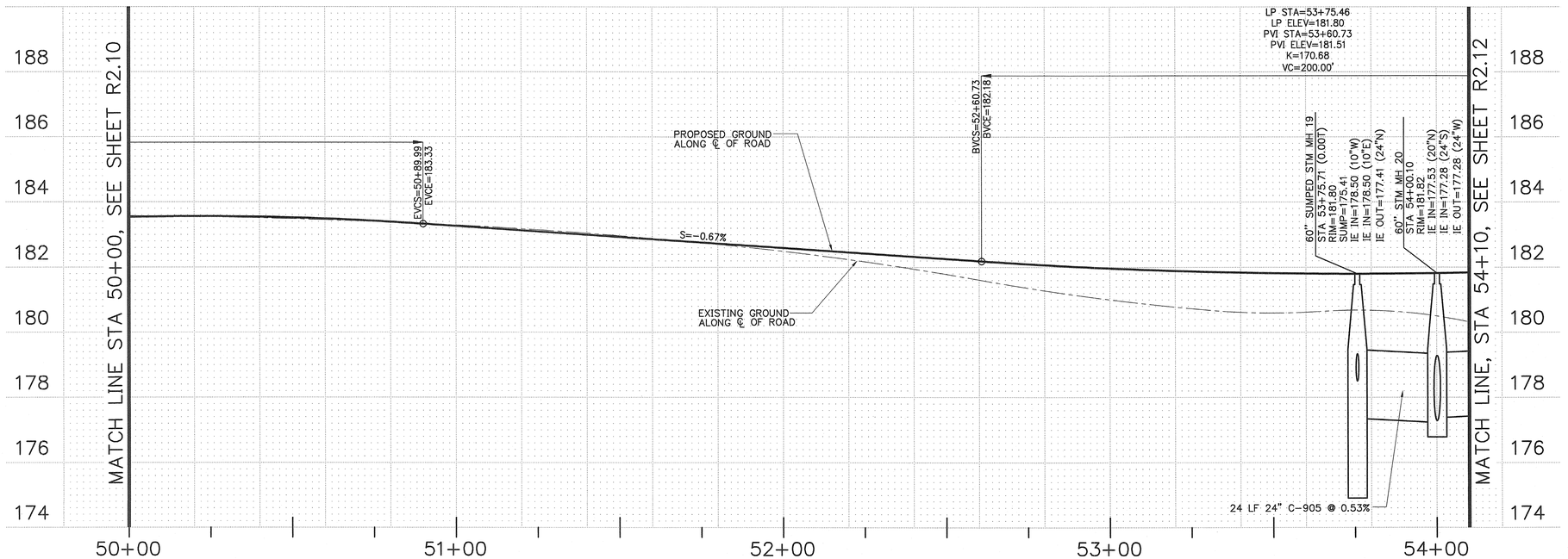
JOB NO. 2120550.00



1 R2.11 PLAN STA 50+00 TO 54+10
1"=20'

1:1

20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.



2 R2.11 PROFILE STA 50+00 TO 54+10
1"=20' HORIZONTAL
1"=2' VERTICAL

1:1

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2013

KEYNOTES (#)

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. PUBLIC UTILITY EASEMENT
4. PROPOSED R.O.W.
5. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 53+75.71 (18' LT)
   RIM ELEV=181.22 (1½" DROP INCLUDED)
   IE OUT=178.67 (E)
6. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 53+75.71 (18' RT)
   RIM ELEV=181.22 (1½" DROP INCLUDED)
   IE IN=178.67 (W)
   IE OUT=178.67 (E)
7. INSTALL TYPE II AREA DRAIN. PLACE AREA DRAIN AT LOW AREAS AND GRADE 10' MIN. TO ENSURE POSITIVE DRAINAGE. REFER TO SPECS. SEE CWS STD DETAIL 380 ON SHEET R8.10
   STA 53+75.71 (38.53' RT)
   RIM=181.38
   IE=178.88 (W)
8. INSTALL SURVEY MONUMENT BOX AT STA 52+50 PER DETAIL 4/R8.10
9. INSTALL 12' WIDE AC DRIVEWAY APPROACH. SEE DETAIL 7/R8.7.
10. INSTALL 12' WIDE GRAVEL DRIVEWAY, SEE DETAIL 4/R8.7
11. TOE OF SLOPE

CURVE TABLE (#)

CURVE	RADIUS	LENGTH	DELTA
7	900'	1018.53'	64°50' 31"

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NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56680 OREGON JULY. 11, 2006 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

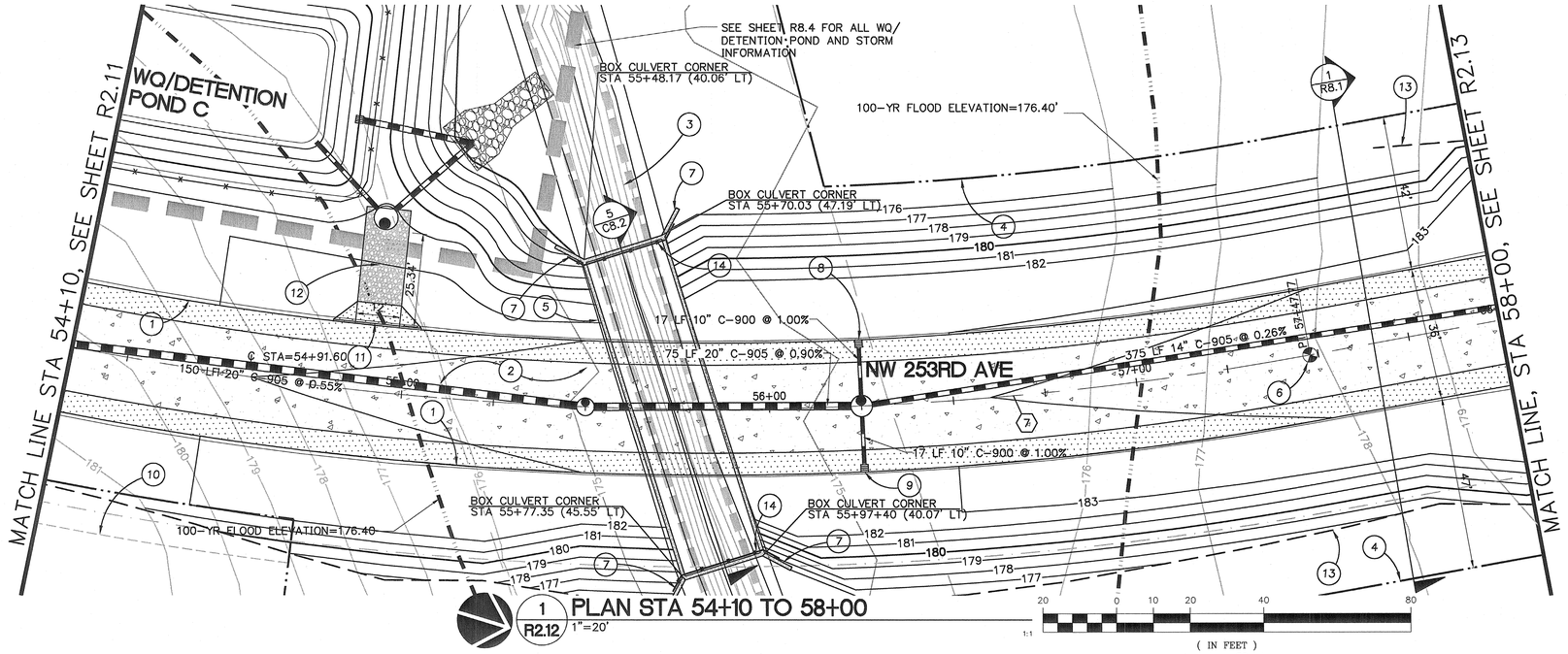
SHEET TITLE:
PLAN AND PROFILE SHEET
STA 50+00 TO STA 54+10

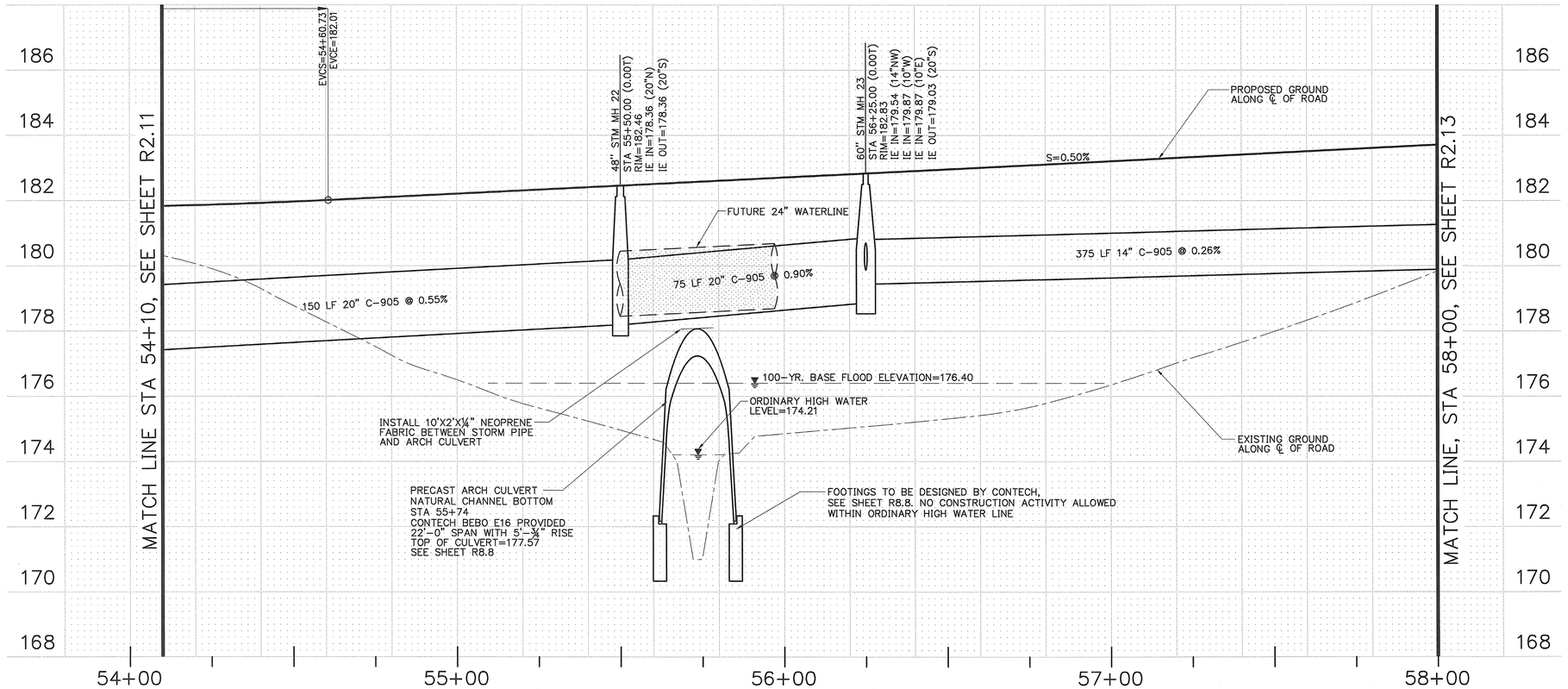
DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R2.11

JOB NO. 2120550.00





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2 R2.12 PROFILE STA 54+10 TO 58+00
1"=20' HORIZONTAL
1"=2' VERTICAL
1:1

KEYNOTES

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. DO NOT DISTURB EXISTING WAIBLE CREEK CHANNEL BEYOND LIMITS OF WORK
4. PROPOSED R.O.W.
5. WAIBLE CREEK CULVERT CROSSING
   INSTALL PRECAST ARCH CULVERT
   NATURAL CHANNEL BOTTOM
   STA 55+74
   CONTECH BEBO E16 OR EQUIVALENT
   22'-0" SPAN WITH 5'-¾" RISE
   SEE SHEETS R8.8 AND R8.9
6. INSTALL SURVEY MONUMENT CASE PER DETAIL 4/R8.10
7. INSTALL PRECAST CONCRETE HEADWALL, SEE CULVERT DETAILS ON SHEET R8.8 AND R8.9
8. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 56+25 (18' LT)
   RIM ELEV=182.26 (1½" DROP INCLUDED)
   IE OUT=180.04 (W)
9. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 56+25 (18' RT)
   RIM ELEV=182.26 (1½" DROP INCLUDED)
   IE OUT=180.04 (W)
10. PUBLIC UTILITY EASEMENT
11. INSTALL 12' WIDE AC DRIVEWAY APPROACH. SEE DETAIL 7/R8.7
12. INSTALL 12' WIDE GRAVEL ACCESS ROAD. SEE DETAIL 4/R8.7
13. TOE OF SLOPE
14. INSTALL CL-6R CHAIN-LINK, BLACK VINYL CLAD FENCE. SEE SPECIFICATIONS.

CURVE TABLE (#)

CURVE	RADIUS	LENGTH	DELTA
7	900'	1018.53'	64°50' 31"

BID SET 5/1/2015

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 Ralph J.R. Henderson OREGON JULY 11, 2006 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

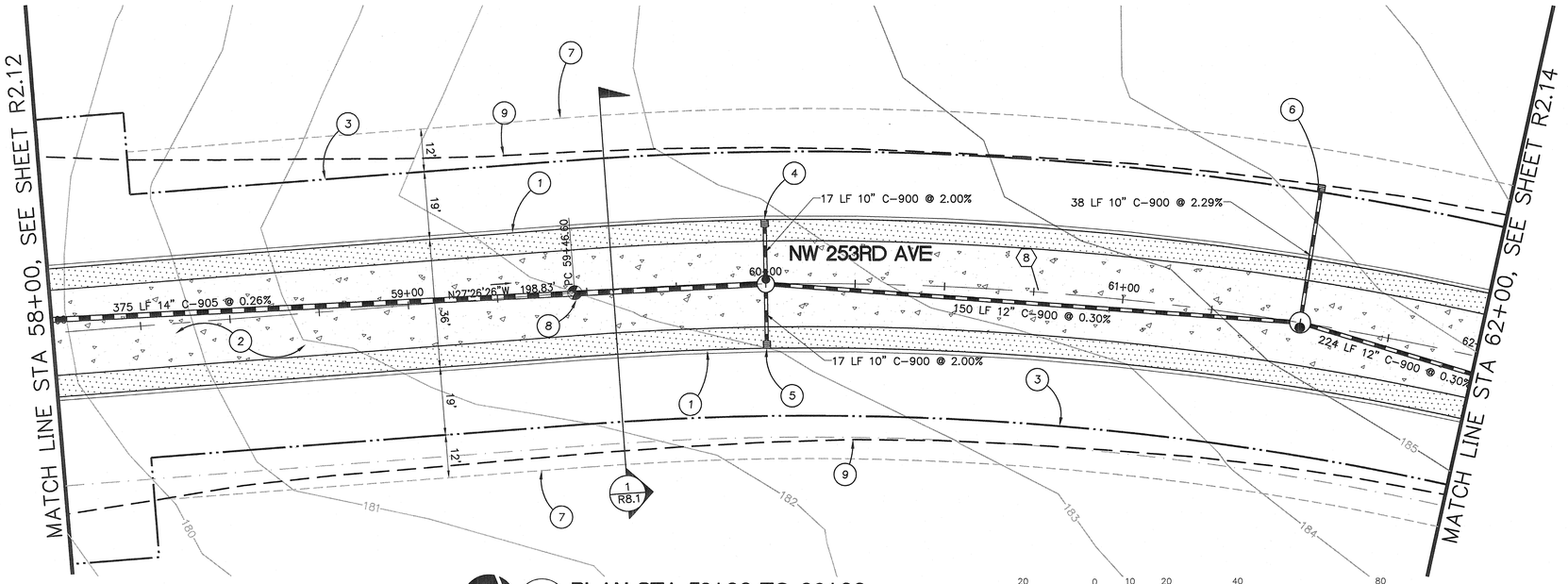
SHEET TITLE:
PLAN AND PROFILE SHEET STA 54+10 TO STA 58+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R2.12

JOB NO. 2120550.00

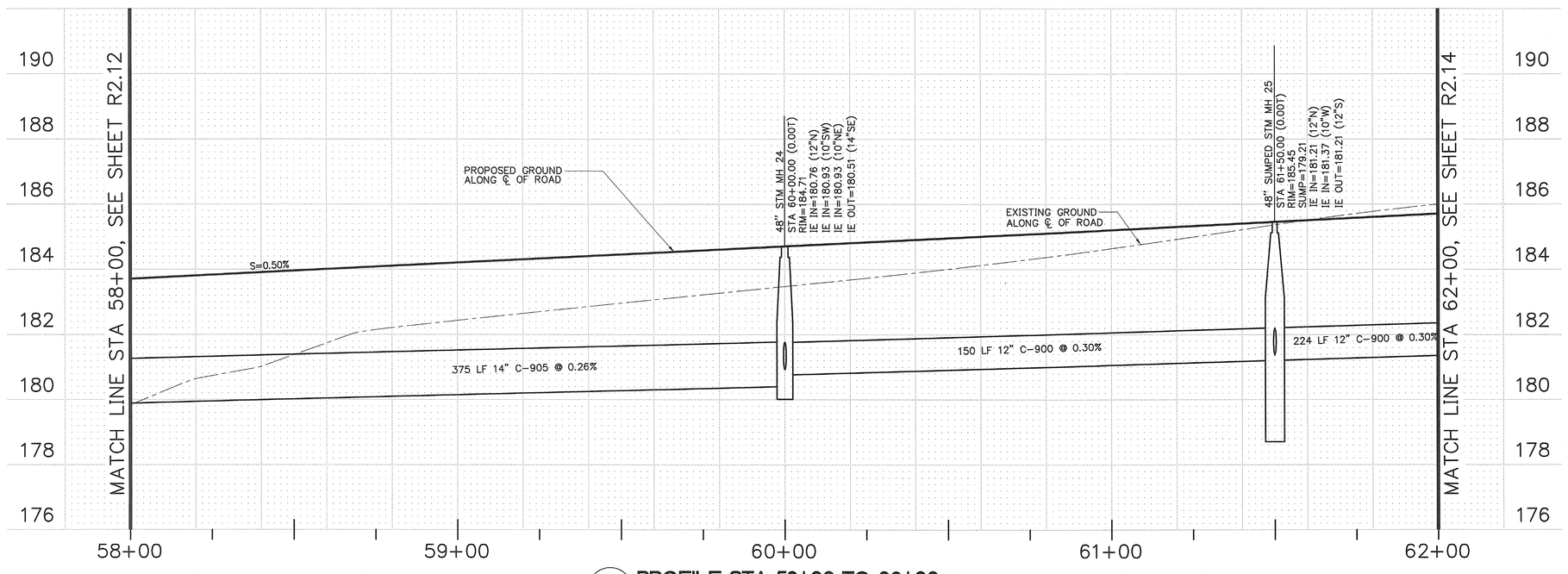


1 R2.13 **PLAN STA 58+00 TO 62+00**
1"=20'

20 0 10 20 40 80
1:1
(IN FEET)
1 inch = 20 ft.

KEYNOTES

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/R8.1 AND 3/R8.7
3. PROPOSED R.O.W.
4. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 60+00 (18' LT)
   RIM ELEV=184.14 (1½" DROP INCLUDED)
   IE OUT=181.27 (E)
5. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 60+00 (18' RT)
   RIM ELEV=184.14 (1½" DROP INCLUDED)
   IE OUT=181.27 (W)
6. INSTALL TYPE II AREA DRAIN. PLACE AREA DRAIN AT LOW AREAS AND GRADE AROUND 10' MIN TO ENSURE POSITIVE DRAINAGE, REFER TO SPECS. SEE CWS STD DETAIL 380 ON SHEET R8.10
   STA 61+50 (38' LT)
   RIM=185.84
   IE=181.80 (E)
7. PUBLIC UTILITY EASEMENT
8. INSTALL SURVEY MONUMENT BOX PER DETAIL 4/R8.10
9. TOE OF SLOPE



2 R2.13 **PROFILE STA 58+00 TO 62+00**
1"=20' HORIZONTAL
1"=2' VERTICAL
1:1

CURVE TABLE ⟨#⟩			
CURVE	RADIUS	LENGTH	DELTA
8	855'	453.37'	30°22'52"

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2013

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Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

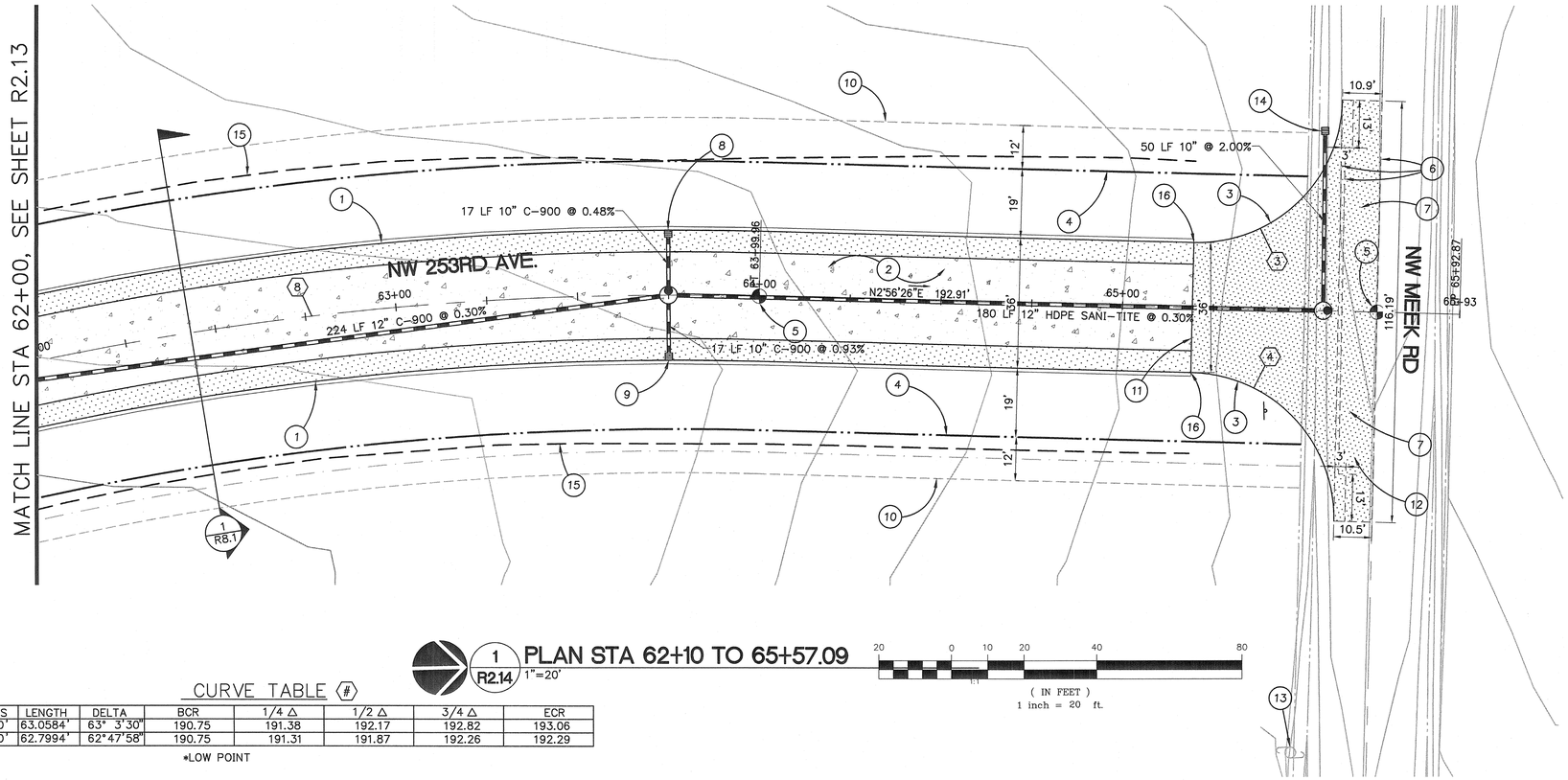
SHEET TITLE:
PLAN AND PROFILE SHEET
STA 58+00 TO STA 62+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R2.13

JOB NO. 2120550.00



1 R2.14 PLAN STA 62+10 TO 65+57.09

1"=20'

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

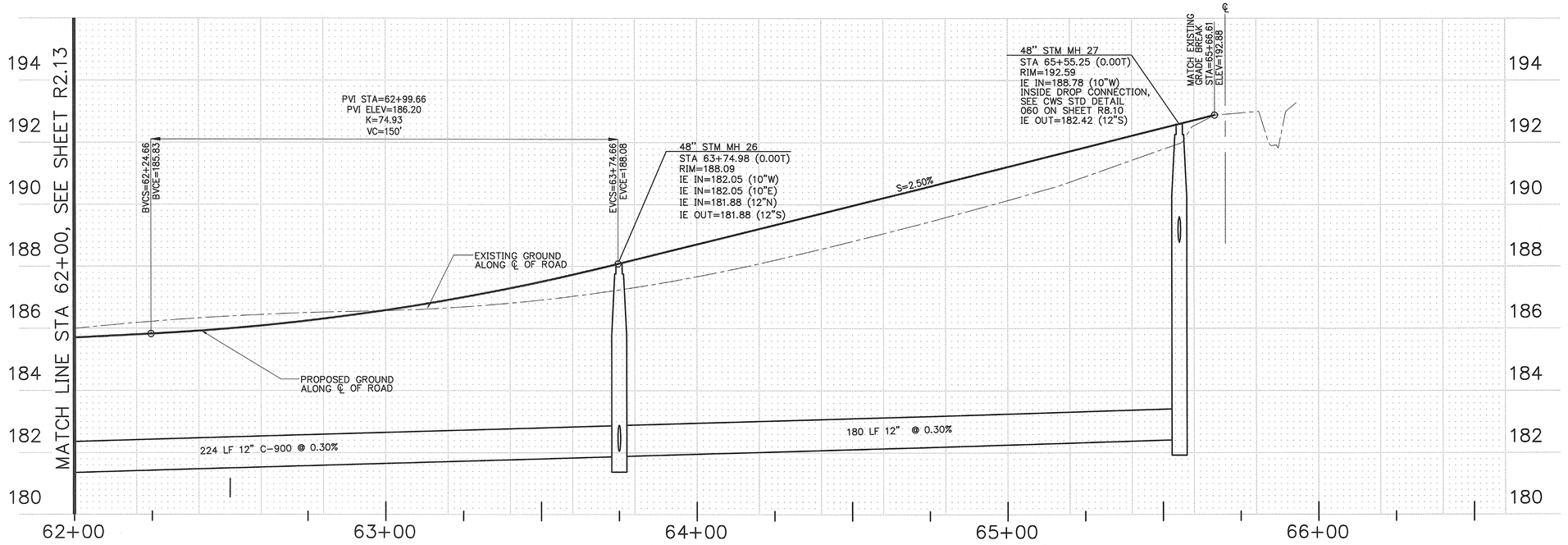
CURVE TABLE (#)

CURVE	RADIUS	LENGTH	DELTA	BCR	1/4 Δ	1/2 Δ	3/4 Δ	ECR
3	40'	63.0584'	63° 3'30"	190.75	191.38	192.17	192.82	193.06
4	40'	62.7994'	62°47'58"	190.75	191.31	191.87	192.26	192.29

*LOW POINT

CURVE TABLE (#)

CURVE	RADIUS	LENGTH	DELTA
8	855'	453.37'	30°22'52"



2 R2.14 PROFILE STA 62+10 TO 65+57.09

1"=20'

1:1

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY: CITY OF HILLSBORO DATE: 1/9/2013

BID SET 5/1/2015

KEYNOTES (#)

1. INSTALL MOUNTABLE CURB, SEE DETAIL 1/R8.11
2. PROPOSED CONCRETE ROADWAY, SEE DETAIL 1/8.1 AND 3/R8.7
3. EDGE OF PAVEMENT
4. PROPOSED R.O.W.
5. INSTALL SURVEY MONUMENT BOX PER DETAIL 4/R8.10
6. SAWCUT EXISTING ASPHALT PAVEMENT 1' MIN. FROM EDGE OF PAVEMENT
7. INSTALL INTERSECTION ASPHALT PAVEMENT SECTION, SEE DETAIL 3/R8.7
8. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 63+75 (18' LT)
   RIM ELEV=186.52 (1½" DROP INCLUDED)
   IE OUT=182.13 (E)
9. CONSTRUCT CG-2 CATCH BASIN
   SEE DETAIL 5/R8.5
   STA 63+75 (18' RT)
   RIM ELEV=186.52 (1½" DROP INCLUDED)
   IE OUT=182.21 (W)
10. PUBLIC UTILITY EASEMENT
11. INSTALL IMPACT SLAB AT PAVEMENT TRANSITION, SEE DETAIL 5/R8.7.
12. PROVIDE 2" GRIND AND OVERLAY FROM SAWCUT LINE TO CENTERLINE OF MEEK RD.
13. INSTALL LUMINAIRE ON EXISTING POLE BY PGE. CONTRACTOR TO COORDINATE INSTALLATION WITH PGE PRIOR TO START OF CONSTRUCTION.
14. INSTALL TYPE II AREA DRAIN. PLACE AREA DRAIN AT LOW AREAS AND GRADE AROUND 10' MIN TO ENSURE POSITIVE DRAINAGE, REFER TO SPECS. SEE CWS STD DETAIL 380 ON SHEET R8.10
    STA 61+50 (36' LT)
    RIM=191.77
    IE=189.77 (E)
15. TOE OF SLOPE
16. END OF MOUNTABLE CURB
    STA 65+19.20 (18' LT, RT)

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Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56680 OREGON
Ralph J.R. Henderson
JULY. 11, 2008
RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

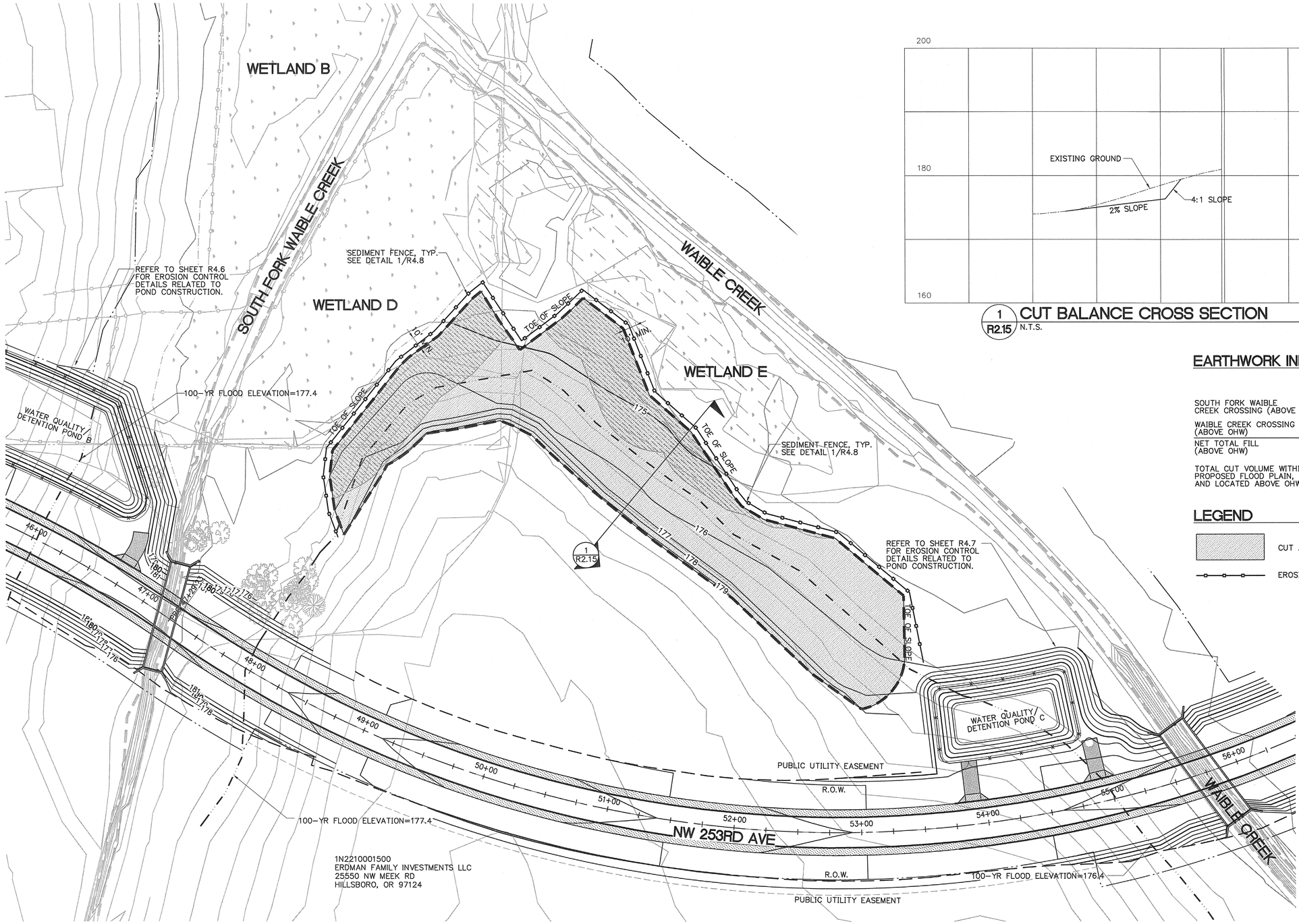
SHEET TITLE:
PLAN AND PROFILE SHEET
STA 62+00 TO STA 66+00

DRAWN BY: BMR

CHECKED BY: RJH

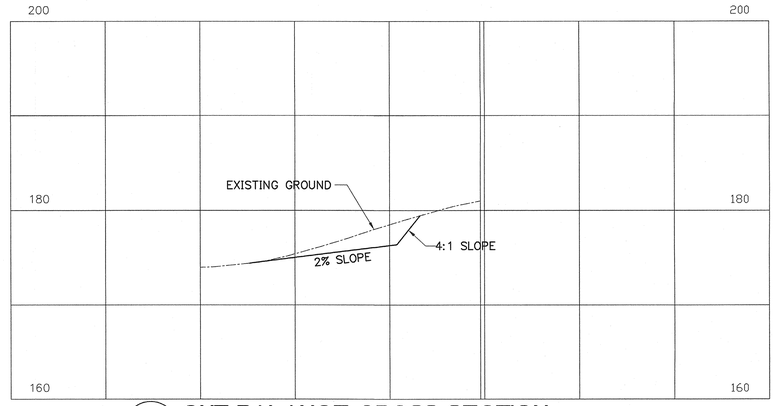
SHEET:
R2.14

JOB NO. 2120550.00



2 R2.15 PLAN STA 46+00 TO 57+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.



1 R2.15 CUT BALANCE CROSS SECTION
N.T.S.

EARTHWORK INFORMATION

	TOTAL FILL WITHIN P.U.E. AND BASE FLOOD ELEV.
SOUTH FORK WAIBLE CREEK CROSSING (ABOVE OHW)	886 CY
WAIBLE CREEK CROSSING (ABOVE OHW)	627 CY
NET TOTAL FILL (ABOVE OHW)	1,513 CY
TOTAL CUT VOLUME WITHIN PROPOSED FLOOD PLAIN, AND LOCATED ABOVE OHW	1,513 CY

LEGEND

CUT AREA

EROSION CONTROL SEDIMENT FENCE

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EXPIRES: 6/30/15

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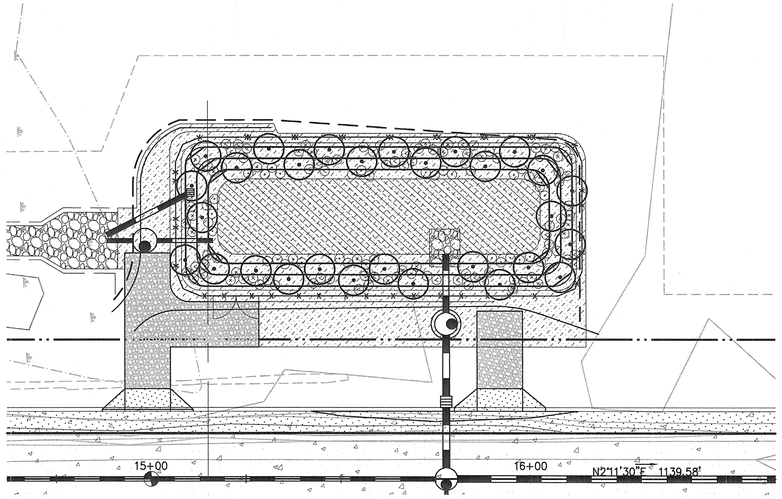
SHEET TITLE:
GRADING BALANCE WITHIN FLOODPLAIN STA 46+00 TO STA 57+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R2.15

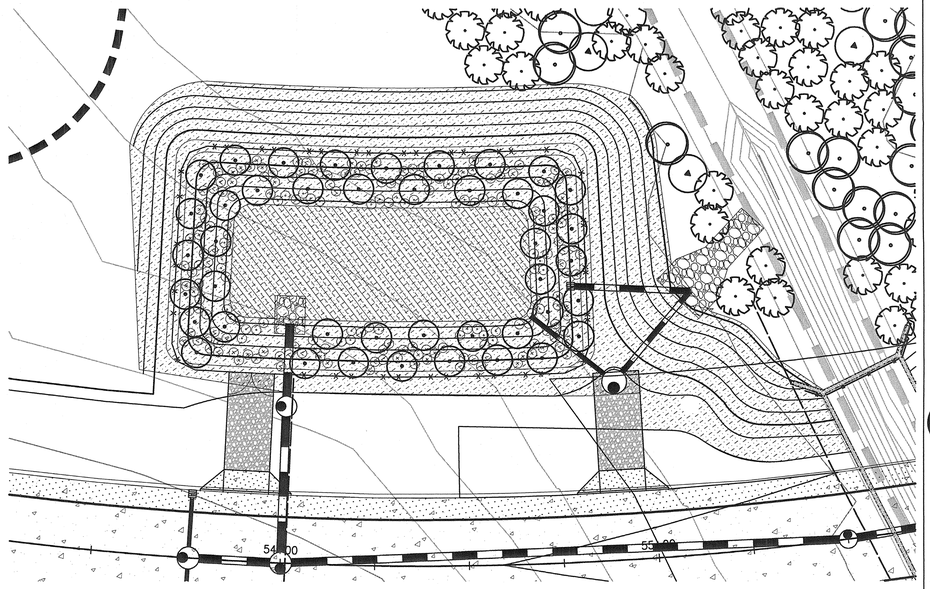
JOB NO. 2120550.00



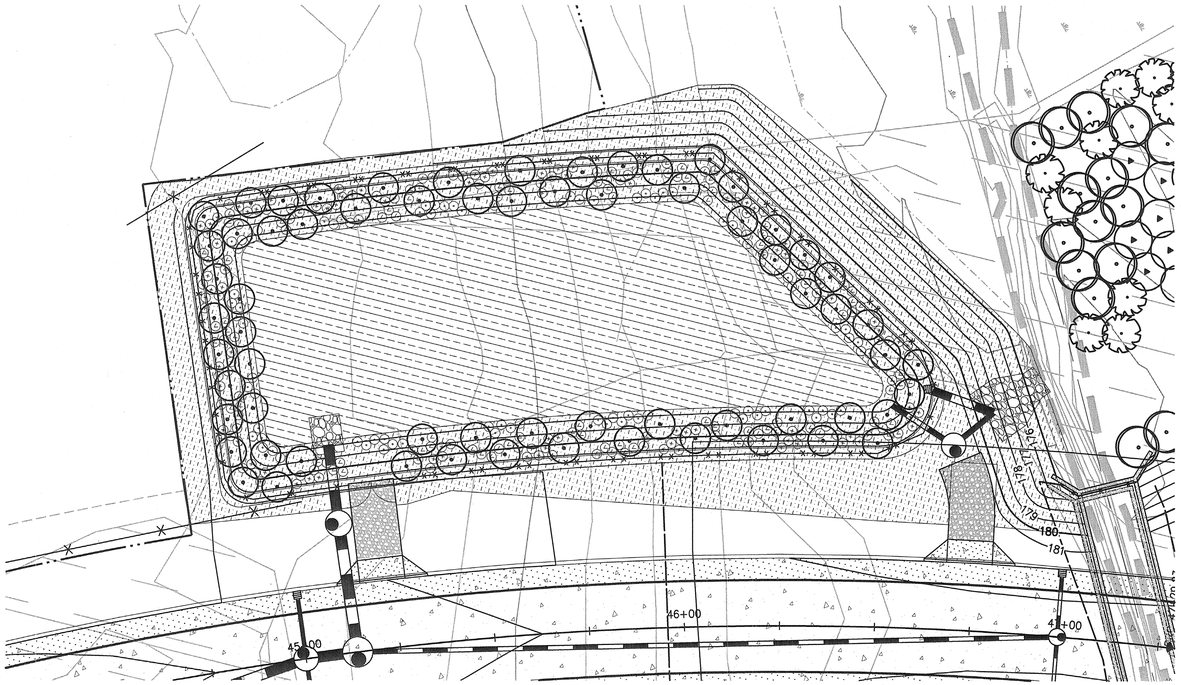
1 R2.16 POND DETAIL - WQ/DETENTION POND A
SCALE: 1" = 20'

PLANT MATERIAL SCHEDULE - POND A

SYMBOL	#	BOTANICAL NAME – COMMON NAME	SIZE/ SPACING
		TREES	
⊙	29	ACER CIRCINATUM VINE MAPLE	2 GAL. CONT. 3' MIN. HT./ AS SHOWN
		SHRUBS	
⊙	38	CORNUS SERICEA RED–OSIER DOGWOOD	1 GAL. CONT. 2' MIN. HT./ AS SHOWN
⊙	53	RIBES SANGUINEUM RED FLOWERING CURRANT	1 GAL. CONT. 1.5' MIN. HT./ AS SHOWN
⊙	54	PHILADELPHUS LEWISII MOCK ORANGE	1 GAL. CONT. 2' MIN. HT./ AS SHOWN
		HERBACEOUS	
	4,875	JUNCUS PATENS SPREADING RUSH	PLUGS 6" MIN. HT./ 6 PER SF
	4,875	SCIRPUS MICROCARPUS SMALL–FRUITED BULRUSH	PLUGS 6" MIN. HT./ 6 PER SF
		GROUNDCOVER	
	6,852 SF	FREEBOARD AREA SEED MIX – 40% DWARF TALL FESCUE – 30% DWARF PERENNIAL RYE – 25% CREEPING RED FESCUE – 5% COLONIAL BENT GRASS	120 LBS./ACRE



2 R2.16 POND DETAIL - WQ/DETENTION POND C
SCALE: 1" = 20'



3 R2.16 POND DETAIL - WQ/DETENTION POND B
SCALE: 1" = 20'

PLANT MATERIAL SCHEDULE - POND B

SYMBOL	#	BOTANICAL NAME – COMMON NAME	SIZE/ SPACING
		TREES	
⊙	66	ACER CIRCINATUM VINE MAPLE	2 GAL. CONT. 3' MIN. HT./ AS SHOWN
		SHRUBS	
⊙	86	CORNUS SERICEA RED–OSIER DOGWOOD	1 GAL. CONT. 2' MIN. HT./ AS SHOWN
⊙	124	RIBES SANGUINEUM RED FLOWERING CURRANT	1 GAL. CONT. 1.5' MIN. HT./ AS SHOWN
⊙	122	PHILADELPHUS LEWISII MOCK ORANGE	1 GAL. CONT. 2' MIN. HT./ AS SHOWN
		HERBACEOUS	
	15,778	JUNCUS PATENS SPREADING RUSH	PLUGS 6" MIN. HT./ 6 PER SF
	15,778	SCIRPUS MICROCARPUS SMALL–FRUITED BULRUSH	PLUGS 6" MIN. HT./ 6 PER SF
	15,778	CAREX OBNUPTA SLOUGH SEDGE	PLUGS 6" MIN. HT./ 6 PER SF
		GROUNDCOVER	
	13,119 SF	FREEBOARD AREA SEED MIX – 40% DWARF TALL FESCUE – 30% DWARF PERENNIAL RYE – 25% CREEPING RED FESCUE – 5% COLONIAL BENT GRASS	120 LBS./ACRE

PLANT MATERIAL SCHEDULE - POND C

SYMBOL	#	BOTANICAL NAME – COMMON NAME	SIZE/ SPACING
		TREES	
⊙	43	ACER CIRCINATUM VINE MAPLE	2 GAL. CONT. 3' MIN. HT./ AS SHOWN
		SHRUBS	
⊙	57	CORNUS SERICEA RED–OSIER DOGWOOD	1 GAL. CONT. 2' MIN. HT./ AS SHOWN
⊙	72	RIBES SANGUINEUM RED FLOWERING CURRANT	1 GAL. CONT. 1.5' MIN. HT./ AS SHOWN
⊙	84	PHILADELPHUS LEWISII MOCK ORANGE	1 GAL. CONT. 2' MIN. HT./ AS SHOWN
		HERBACEOUS	
	6,861	JUNCUS PATENS SPREADING RUSH	PLUGS 6" MIN. HT./ 6 PER SF
	6,861	SCIRPUS MICROCARPUS SMALL–FRUITED BULRUSH	PLUGS 6" MIN. HT./ 6 PER SF
		GROUNDCOVER	
	9,344 SF	FREEBOARD AREA SEED MIX – 40% DWARF TALL FESCUE – 30% DWARF PERENNIAL RYE – 25% CREEPING RED FESCUE – 5% COLONIAL BENT GRASS	120 LBS./ACRE

GENERAL NOTES

1. REFER TO CIVIL DRAWINGS FOR AMENDED SOIL IN POND AREAS. SEE DETAIL 5/R8.3.

BID SET 5/1/2015

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CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED 331
Ronald A. Heiden
OREGON
10/12/95
LANDSCAPE ARCHITECT

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
POND PLANTING PLAN

DRAWN BY: BMR

CHECKED BY: RAH

SHEET:
R2.16

JOB NO. 2120550.00

WETLAND F

WETLAND B

SOUTH FORK WAIBLE CREEK

50' VEGETATED CORRIDOR

WETLAND D

WETLAND E

WAIBLE CREEK

93'-WIDE, MIN., ADVANCED WETLAND BUFFER REPLACEMENT MITIGATION AREA. EXISTING CONDITION IS "DEGRADED."

50'-WIDE WETLAND BUFFER ENHANCEMENT AREA. EXISTING CONDITION IS "DEGRADED"

100-YR FLOOD ELEVATION=177.4

WQ/ DETENTION POND B

42+00

43+00

48+00

49+00

50+00

51+00

52+00

53+00

54+00

55+00

56+00

57+00

PROTECT EXISTING TREES TO REMAIN

50'

WIDTH VARIES

WQ/DETENTION POND C

R.O.W.

100-YR FLOOD ELEVATION=176.4

100-YR FLOOD ELEVATION=177.4

50' VEGETATED CORRIDOR

R.O.W.

ADVANCED WETLAND BUFFER MITIGATION AREA, WIDTH VARIES. EXISTING CONDITION IS "DEGRADED."

PUBLIC UTILITY EASEMENT

LEGEND

- 50' WETLAND BUFFER
- 2.41 AC. WETLAND BUFFER ENHANCEMENT AREA
- 1.47 AC. WETLAND BUFFER REPLACEMENT MITIGATION
- 1.07 AC. ADVANCED WETLAND BUFFER MITIGATION AREA
- WETLAND BUFFER SIGNAGE PER CWS STD DWG NO. 790

GENERAL NOTES

1. SEE SHEET R2.17A FOR PLAN SCHEDULES FOR EACH ENHANCEMENT/MITIGATION AREA

1 R2.17 PLAN STA 46+00 TO 57+00
1"=40'

1:1

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

BID SET 5/1/2015

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331
Ronald A. Heiden
OREGON
10/12/95
LANDSCAPE ARCHITECT

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

SHEET TITLE:
PROPOSED WETLAND BUFFER MITIGATION PLANTING PLAN STA 46+00 TO STA 57+00

DRAWN BY: BMR

CHECKED BY: RAH

SHEET:
R2.17

JOB NO. 2120550.00

PLANT MATERIAL SCHEDULE - WETLAND BUFFER ENHANCEMENT OF "DEGRADED" CONDITION REPLACEMENT MITIGATION AREA ON TAX LOT 1500 TO "GOOD" CONDITION = 64,337 SF (1.47 AC.)

SYMBOL	#	BOTANICAL NAME – COMMON NAME	SIZE/ SPACING
		TREES	
	214	ACER MACROPHYLLUM BIG LEAF MAPLE	2 GAL. CONT. 10' ON CENTER
	214	ABIES GRADIS GRAND FIR	2 GAL. CONT. 10' ON CENTER
	214	PSEUDOTSUGA MENZIESII DOUGLAS FIR	2 GAL. CONT. 10' ON CENTER
		SHRUBS	
	643	HOLIDISCUS DISCOLOR OCEANSPRAY	1 GAL. CONT. 4–5' ON CTR./
	643	MAHONIA AQUIFOLIUM TALL OREGON GRAPE	1 GAL. CONT. 4–5' ON CTR./
	643	ROSA GYMNOCARPA BALDHIP ROSE	1 GAL. CONT. 4–5' ON CTR./
	643	SAMBUCUS RACEMOSA RED ELDERBERRY	1 GAL. CONT. 4–5' ON CTR./
	644	SYMPHORICARPOS ALBUS SNOWBERRY	1 GAL. CONT. 4–5' ON CTR./
		SEED MIX	
	AS NEEDED FOR BARE SOIL AREAS >25 SQ. FT. FOLLOWING INVASIVE SPECIES REMOVAL	BROMUS CARINATUS NATIVE CALIFORNIA BROME	10 LBS PLS/ACRE
		ELYMUS GLAUCUS BLUE WILDRYE	10 LBS PLS/ACRE
		FESTUCA RUBRA VAR. RUBRA NATIVE RED FESCUE	5 LBS PLS/ACRE
		LUPINUS POLYPHYLLUS LARGE–LEAFED LUPINE	8 LBS PLS/ACRE

PLANT MATERIAL SCHEDULE - WETLAND BUFFER ENHANCEMENT OF "DEGRADED" CORRIDOR ON TAX LOTS 1500 AND 2400 = 104,979 SF (2.41 AC.)

SYMBOL	#	BOTANICAL NAME – COMMON NAME	SIZE/ SPACING
		TREES	
	349	ALNUS RUBRA RED ALDER	2 GAL. CONT. 10' ON CENTER
	350	FRAXINAS LATIFOLIA OREGON ASH	2 GAL. CONT. 10' ON CENTER
	350	PSEUDOTSUGA MENZIESII DOUGLAS FIR	2 GAL. CONT. 10' ON CENTER
		SHRUBS	
	1,279	CORNUS STONIFERIA RED–OSIER DOGWOOD	1 GAL. CONT. 4–5' ON CTR./
	1,279	OEMLERIA CERASIFORMIS INDIAN PLUM	1 GAL. CONT. 4–5' ON CTR./
	1,280	ROSA PISOCARPA SWAMP ROSE	1 GAL. CONT. 4–5' ON CTR./
	1,280	SYMPHORICARPOS ALBUS SNOWBERRY	1 GAL. CONT. 4–5' ON CTR./
		SEED MIX	
	AS NEEDED FOR BARE SOIL AREAS >25 SQ. FT. FOLLOWING INVASIVE SPECIES REMOVAL	AGROSTIS EXARATA SPIKE BENTGRASS	10 LBS PLS/ACRE
		GLYCERIA ELATEA TALL MANNAGRASS	10 LBS PLS/ACRE

PLANT MATERIAL SCHEDULE - WETLAND BUFFER ENHANCEMENT OF "DEGRADED" CONDITION ADVANCE MITIGATION AREA ON TAX LOT 1500 TO "GOOD" CONDITION = 46,609 SF (1.07 AC.)

SYMBOL	#	BOTANICAL NAME – COMMON NAME	SIZE/ SPACING
		TREES	
	155	ACER MACROPHYLLUM BIG LEAF MAPLE	2 GAL. CONT. 10' ON CENTER
	155	ABIES GRADIS GRAND FIR	2 GAL. CONT. 10' ON CENTER
	156	PSEUDOTSUGA MENZIESII DOUGLAS FIR	2 GAL. CONT. 10' ON CENTER
		SHRUBS	
	466	HOLIDISCUS DISCOLOR OCEANSPRAY	1 GAL. CONT. 4–5' ON CTR./
	466	MAHONIA AQUIFOLIUM TALL OREGON GRAPE	1 GAL. CONT. 4–5' ON CTR./
	466	ROSA GYMNOCARPA BALDHIP ROSE	1 GAL. CONT. 4–5' ON CTR./
	466	SAMBUCUS RACEMOSA RED ELDERBERRY	1 GAL. CONT. 4–5' ON CTR./
	466	SYMPHORICARPOS ALBUS SNOWBERRY	1 GAL. CONT. 4–5' ON CTR./
		SEED MIX	
	AS NEEDED FOR BARE SOIL AREAS >25 SQ. FT. FOLLOWING INVASIVE SPECIES REMOVAL	BROMUS CARINATUS NATIVE CALIFORNIA BROME	10 LBS PLS/ACRE
		ELYMUS GLAUCUS BLUE WILDRYE	10 LBS PLS/ACRE
		FESTUCA RUBRA VAR. RUBRA NATIVE RED FESCUE	5 LBS PLS/ACRE
		LUPINUS POLYPHYLLUS LARGE–LEAFED LUPINE	8 LBS PLS/ACRE

GENERAL NOTES

1. REFER TO CIVIL DRAWINGS FOR AMENDED SOIL IN POND AREAS. SEE DETAIL 5/R8.3.

PLANTING NOTES

1. PLANTING AND SEEDING TO OCCUR WITHIN THE FOLLOWING WINDOWS:
   SPRING: APRIL 1–JUNE 15*
   FALL: SEPT. 1– OCT. 31*

   *SUBJECT TO APPROPRIATE WEATHER CONDITIONS FOR PLANT SURVIVAL.

PLANTING NOTES (PER CWS DESIGN AND CONSTRUCTION STANDARDS, APPENDIX A PLANTING REQUIREMENTS, JUNE 2007)

1. PLANTINGS SHOULD PREFERABLY BE INSTALLED BETWEEN FEBRUARY 1 AND MAY 1 OR BETWEEN OCTOBER 1 AND NOVEMBER 15. PLANTS MAY BE INSTALLED AT OTHER TIMES OF THE YEAR; HOWEVER, ADDITIONAL MEASURES MAY BE NECESSARY TO ENSURE PLANT SURVIVAL. IRRIGATION OR OTHER WATER PRACTICES (I.E. POLYMER, PLUS WATERING) SHALL BE USED DURING THE TWO–YEAR MAINTENANCE PERIOD. WATERING SHALL BE PROVIDED AT A RATE OF AT LEAST ONE INCH PER WEEK BETWEEN JUNE 15 AND OCTOBER 15.

2. PLANTINGS SHALL BE MULCHED A MINIMUM OF THREE INCHES IN DEPTH AND 18 INCHES IN DIAMETER TO RETAIN MOISTURE AND DISCOURAGE WEED GROWTH AROUND NEWLY INSTALLED PLANT MATERIAL.

3. TREE PLANTINGS SHALL BE PROTECTED FROM WILDLIFE DAMAGE (BEAVER, NUTRIA) BY INSTALLING TREE–PROTECTOR TUBES OR WIRE MESH CYLINDERS AROUND NEWLY INSTALLED PLANTINGS.

4. ALTERNATE PLANT SPECIES MAY BE SUBSTITUTED DUE TO STOCK AVAILABILITY AND/OR COST. ALL PLANTS INSTALLED MUST BE NATIVE AND INCLUDED ON CWS'S PLANTING PALETTE IN APPENDIX A OF THE DESIGN AND CONSTRUCTION STANDARDS R&O 07.

MAINTENANCE PLAN

1. CLEAN WATER SERVICES REQUIRES A TWO–YEAR MAINTENANCE PERIOD FOR VEGETATED CORRIDOR MITIGATION. THE MITIGATION SITE IS TO BE INSPECTED ANNUALLY, A MINIMUM OF THREE TIMES DURING THE GROWING SEASON AND ONE TIME PRIOR TO ONSET OF THE GROWING SEASON. INVASIVE SPECIES CONTROL IS TO BE CONDUCTED AS NEEDED BASED UPON THE SITE INSPECTIONS.

2. CLEAN WATER SERVICES' SUCCESS CRITERION FOR VEGETATED CORRIDOR LANDSCAPING IS 80% SURVIVAL OF TREE AND SHRUB PLANTINGS DURING THE 2 YEARS FOLLOWING PLANTING. THE VEGETATED CORRIDOR LANDSCAPING SHOULD BE MONITORED ANNUALLY IN THE SPRING OR FALL TO ASSESS SURVIVAL OF TREE AND SHRUB PLANTINGS. IF MORTALITY IS NOTED ON THE SITE, THE FACTOR LIKELY TO HAVE CAUSED MORTALITY OF PLANTINGS IS TO BE DETERMINED AND CORRECTED IF POSSIBLE. IF SURVIVAL FALLS BELOW 80% AT ANY TIME DURING THE TWO–YEAR MAINTENANCE PERIOD, THE PLANTINGS SHALL BE REPLACED, AND OTHER CORRECTIVE MEASURES, SUCH AS ADDITIONAL MULCHING OR IRRIGATION, MAY NEED TO BE IMPLEMENTED. IF REPLANTING IS NECESSARY, THE MAINTENANCE PERIOD WILL BE EXTENDED FOR TWO YEARS FROM THE DATE OF REPLANTING.

2. FOR FURTHER INFORMATION REGARDING MAINTENANCE REQUIREMENTS, CONTACT CHARLIE SHELL WITH THE CITY OF HILLSBORO AT CHARLIE.SHELL@HILLSBORO–OREGON.GOV.

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CITY PROJECT #: 10705

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REGISTERED
331
Ronald A. Heiden
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10/12/95
LANDSCAPE ARCHITECT

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

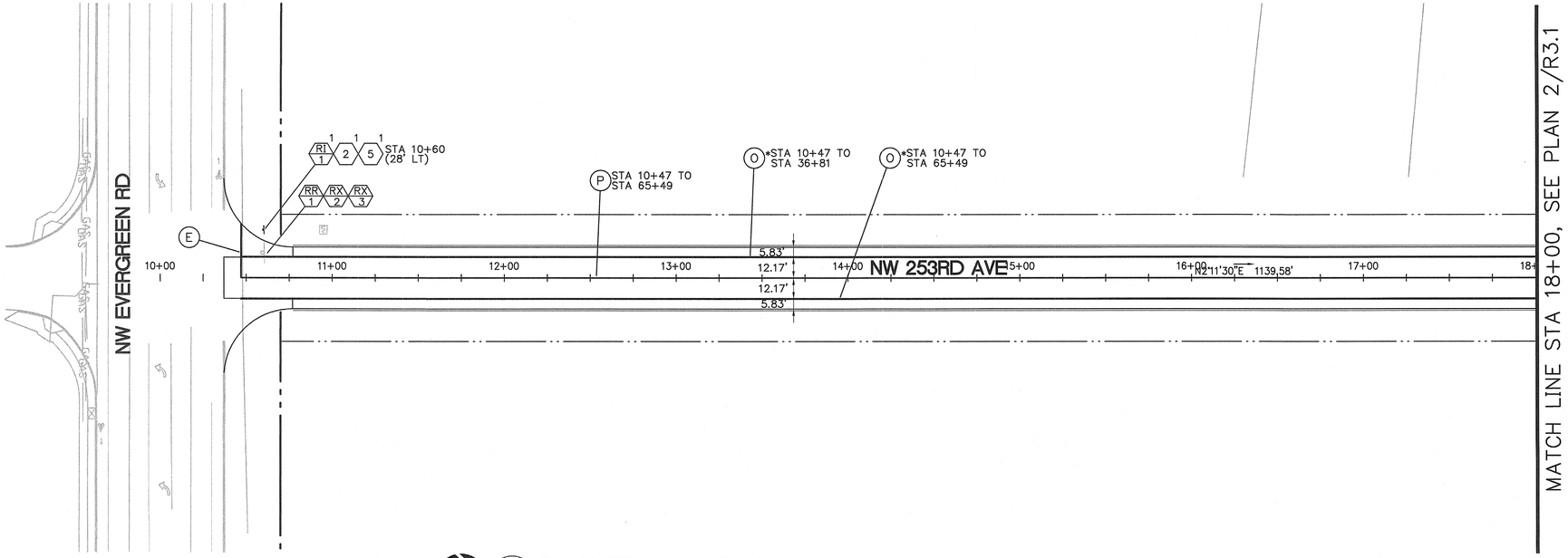
SHEET TITLE:
PROPOSED WETLAND BUFFER MITIGATION PLANTING PLAN NOTES AND DETAILS

DRAWN BY: BMR

CHECKED BY: RAH

SHEET:
R2.17A

JOB NO. 2120550.00



1 R3.1 PLAN STA 10+00 TO 18+00
1"=40'

40 0 20 40 80 160
1:1
(IN FEET)
1 inch = 40 ft.

GENERAL NOTES

1. SEE SHEET R1.1 FOR GENERAL NOTES

STRIPING NOTES (#)

1. STRIPING MATERIAL TO BE PAINT
2. SEE SHEET R3.4 FOR STRIPING LEGEND

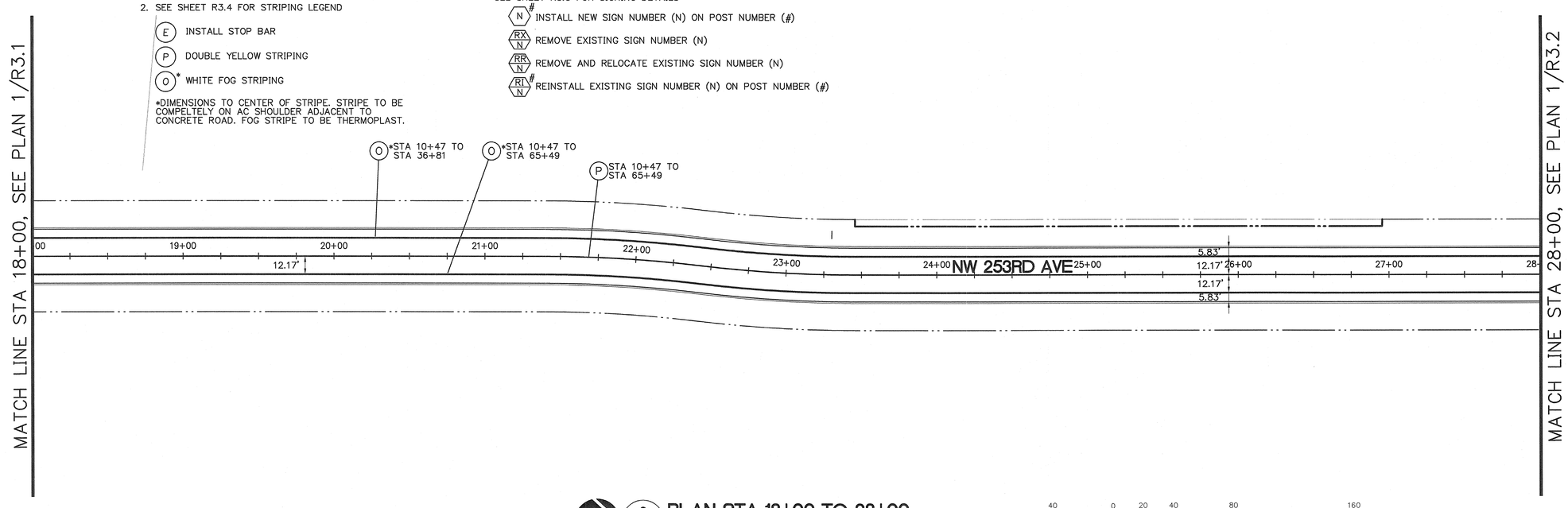
(E) INSTALL STOP BAR
(P) DOUBLE YELLOW STRIPING
(O)* WHITE FOG STRIPING

*DIMENSIONS TO CENTER OF STRIPE. STRIPE TO BE COMPELTELY ON AC SHOULDER ADJACENT TO CONCRETE ROAD. FOG STRIPE TO BE THERMOPLAST.

SIGNING NOTES (#)

SEE SHEET R3.5 FOR SIGNING DETAILS

(N) # INSTALL NEW SIGN NUMBER (N) ON POST NUMBER (#)
(RX N) REMOVE EXISTING SIGN NUMBER (N)
(RR N) REMOVE AND RELOCATE EXISTING SIGN NUMBER (N)
(RT N) # REINSTALL EXISTING SIGN NUMBER (N) ON POST NUMBER (#)



2 R3.1 PLAN STA 18+00 TO 28+00
1"=40'

40 0 20 40 80 160
1:1
(IN FEET)
1 inch = 40 ft.

BID SET 5/1/2015

Architecture ▪ Interiors
Planning ▪ Engineering

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503.224.9560
Vancouver, WA
360.695.7879
Seattle, WA
206.749.9993
www.mcknze.com

MACKENZIE.
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Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY, 11, 2008 RALPH J.R. HENDERSON
Ralph J.A. Henderson
EXPIRES: 6/30/15

REVISIONS:

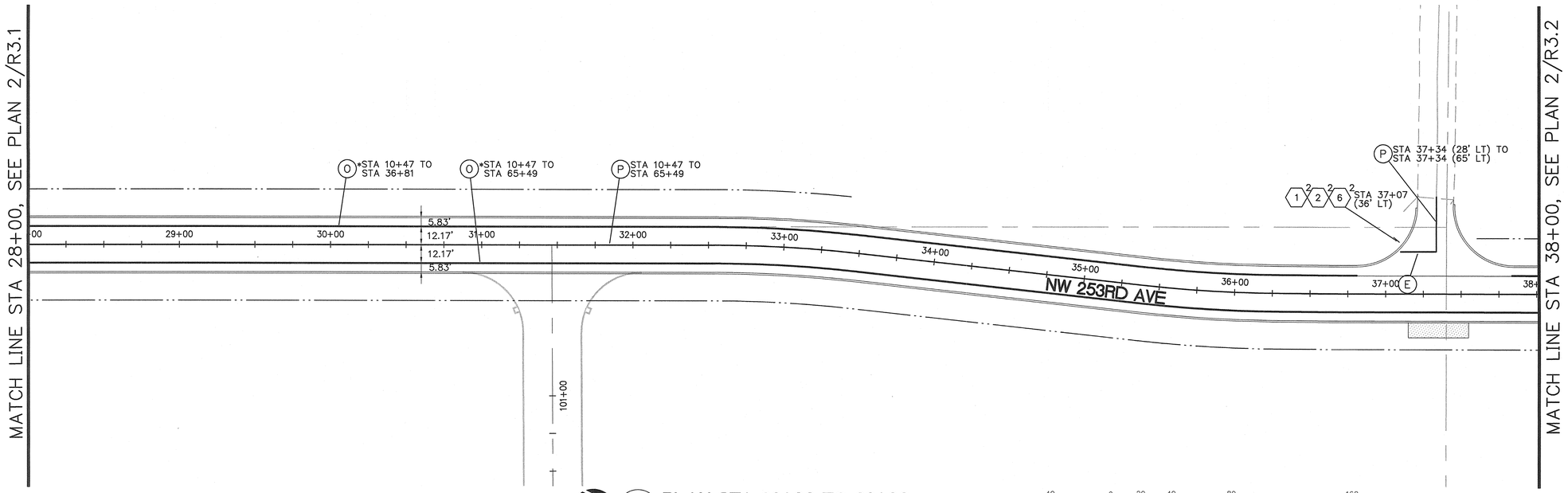
REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
SIGNING AND STRIPING SHEET
STA 10+00 TO STA 28+00

DRAWN BY: BMR
CHECKED BY: RJH

SHEET:
R3.1

JOB NO. 2120550.00



1 R3.2 PLAN STA 28+00 TO 38+00
1"=40'

40 0 20 40 80 160
1:1
(IN FEET)
1 inch = 40 ft.

GENERAL NOTES

1. SEE SHEET R1.1 FOR GENERAL NOTES

STRIPING NOTES (#)

1. STRIPING MATERIAL TO BE PAINT
2. SEE SHEET R3.4 FOR STRIPING LEGEND

(E) INSTALL STOP BAR

(P) DOUBLE YELLOW STRIPING

(O)* WHITE FOG STRIPING

*DIMENSIONS TO CENTER OF STRIPE. STRIPE TO BE COMPELTELY ON AC SHOULDER ADJACENT TO CONCRETE ROAD. FOG STRIPE TO BE THERMOPLAST.

SIGNING NOTES (#)

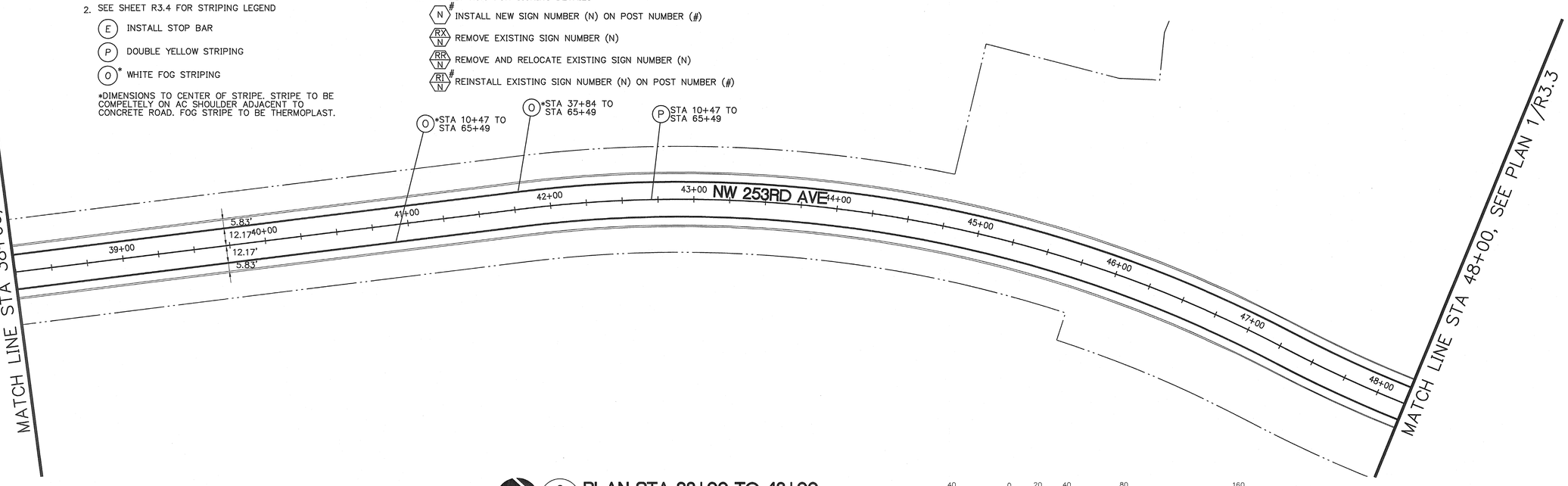
SEE SHEET R3.5 FOR SIGNING DETAILS

(N)# INSTALL NEW SIGN NUMBER (N) ON POST NUMBER (#)

(RX N) REMOVE EXISTING SIGN NUMBER (N)

(RR N) REMOVE AND RELOCATE EXISTING SIGN NUMBER (N)

(RI N)# REINSTALL EXISTING SIGN NUMBER (N) ON POST NUMBER (#)



2 R3.2 PLAN STA 38+00 TO 48+00
1"=40'

40 0 20 40 80 160
1:1
(IN FEET)
1 inch = 40 ft.

BID SET 5/1/2015

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Client
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Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY, 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

SHEET TITLE:
SIGNING AND STRIPING PLAN
STA 28+00 TO
STA 48+00

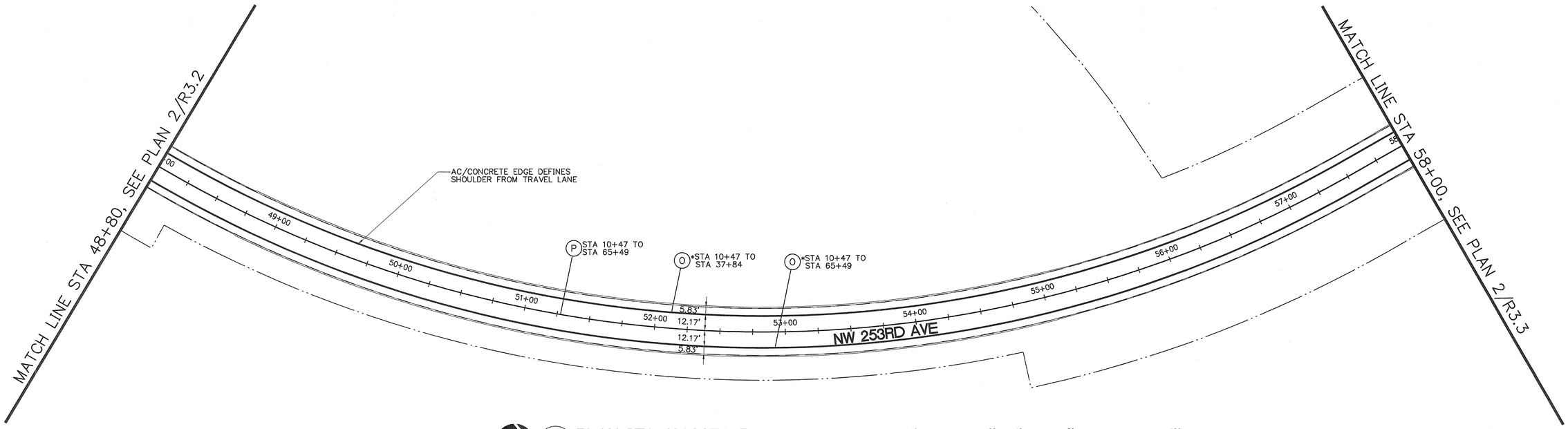
DRAWN BY: BMR

CHECKED BY: RJH

SHEET:

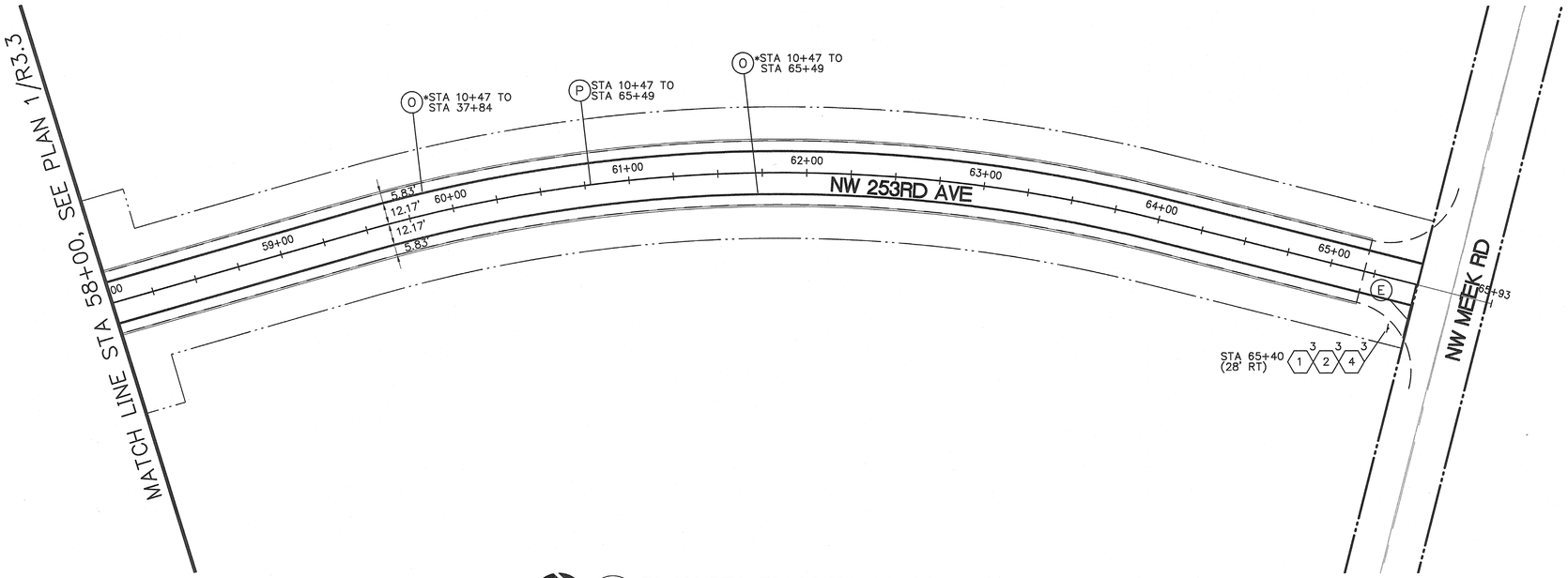
R3.2

JOB NO. 2120550.00



1 R3.3 PLAN STA 48+00TO 58+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.



2 R3.3 PLAN STA 58+00 TO 66+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

GENERAL NOTES

1. SEE SHEET R1.1 FOR GENERAL NOTES

STRIPING NOTES (#)

1. STRIPING MATERIAL TO BE PAINT
2. SEE SHEET R3.4 FOR STRIPING LEGEND

(E) INSTALL STOP BAR

(P) DOUBLE YELLOW STRIPING

(O)* WHITE FOG STRIPING

*DIMENSIONS TO CENTER OF STRIPE. STRIPE TO BE COMPELTELY ON AC SHOULDER ADJACENT TO CONCRETE ROAD. FOG STRIPE TO BE THERMOPLAST.

SIGNING NOTES (#)

SEE SHEET R3.5 FOR SIGNING DETAILS

(N)# INSTALL NEW SIGN NUMBER (N) ON POST NUMBER (#)

(RX N) REMOVE EXISTING SIGN NUMBER (N)

(RR N) REMOVE AND RELOCATE EXISTING SIGN NUMBER (N)

(RI N)# REINSTALL EXISTING SIGN NUMBER (N) ON POST NUMBER (#)

BID SET 5/1/2015

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Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY. 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

SHEET TITLE:
SIGNING AND STRIPING PLAN
STA 48+00 TO STA 66+00

DRAWN BY: BMR

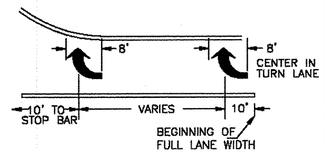
CHECKED BY: RJH

SHEET:
R3.3

JOB NO. 2120550.00

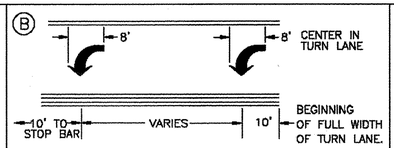
STRIPING DETAILS LEGEND

Ⓐ



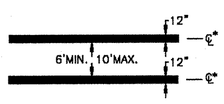
RIGHT TURN LANE MARKINGS – SEE MUTCD FOR DETAILS.

Ⓑ



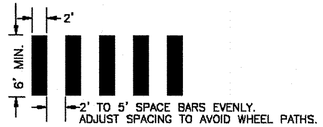
LEFT TURN LANE MARKINGS – SEE MUTCD FOR DETAILS.

Ⓒ



CROSSWALK – SPACE TWO 12" WHITE LINES AS SHOWN ON PLANS.

Ⓓ

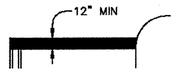


HIGH VISIBILITY CROSSWALK – PLACE 2' WIDE LONGITUDINAL WHITE LINES AS SHOWN ON PLANS. SPACE LINES TO AVOID WHEEL PATHS.

NOTES:

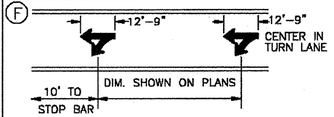
1. ALL PAVEMENT MARKINGS SHALL CONFORM TO THIS LEGEND AND THE MOST CURRENT EDITION OF THE MUTCD, WITH OREGON SUPPLEMENT.
2. THIS LEGEND MAY HAVE MORE RESTRICTIVE REQUIREMENTS THAN THE MUTCD. WHERE THERE IS A CONFLICT BETWEEN THIS LEGEND AND THE MUTCD, THE MUTCD REQUIREMENTS SHALL APPLY.
3. ALL STRIPING EXCEPT STOP BARS SHALL BE PAINT. PAINT STRIPING SHALL OCCUR AFTER CONCRETE IS CURED OR 28 DAYS AFTER PAVING. STOP BARS TO BE THERMOPLASTIC STRIPING. CONTACT THE CITY ENGINEER PRIOR TO FINAL PAVING FOR STRIPING MATERIAL REQUIREMENTS. FOG LINE STRIPE TO BE THERMOPLASTIC AND TO BE COMPLETELY ON AC SHOULDER.
4. REMOVAL OF EXISTING STRIPING IS TO BE DETERMINED IN THE FIELD AND IS CONSIDERED INCIDENTAL WORK. STRIPING SHALL BE GROUND OFF AS DIRECTED BY THE CITY ENGINEER.
5. LOCATE STOP BARS 10' BACK OF THE EXTENDED FOG LINE, EDGE OF PAVEMENT, OR CURB FACE. LOCATE STOP BARS BEHIND CURB RAMPS WHEN PRESENT. VERIFY STOP DISTANCE.
6. ALL MATERIALS SHALL CONFORM TO THE MOST CURRENT ODOT SPECIFICATIONS.

Ⓔ



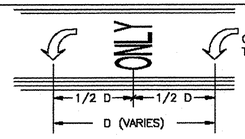
STOP BAR – 12" WIDE WHITE LINE. SEE NOTE 5 FOR PLACEMENT INFORMATION.

Ⓕ



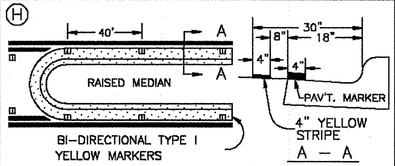
THRU AND TURN LANE MARKINGS – SEE MUTCD FOR DETAILS.

Ⓖ



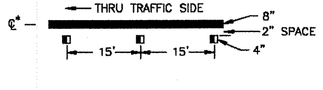
ONLY" PAVEMENT LEGEND – CENTER "ONLY" LEGEND BETWEEN TURN OR THRU ARROWS. SEE MUTCD FOR DETAILS.

Ⓗ



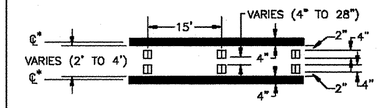
RAISED MEDIAN STRIPE – 4" YELLOW LINE WITH TYPE I BI-DIRECTIONAL YELLOW RAISED PAVEMENT. MARKERS.

Ⓘ



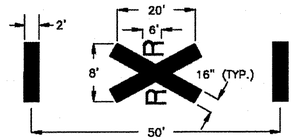
TURN LANE LINE – 8" WHITE LINE WITH MONO-DIRECTIONAL CRYSTAL TYPE I MARKERS (WHITE).

Ⓙ



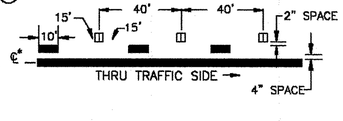
MEDIAN NOSE – TWO 4" YELLOW LINES WITH BI-DIRECTIONAL YELLOW TYPE I MARKERS.

Ⓚ



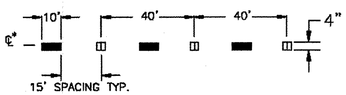
RAILROAD CROSSING – SHALL BE WHITE AND INSTALLED PER DETAIL. PLACE PER P.U.C. DIRECTIONS.

Ⓛ



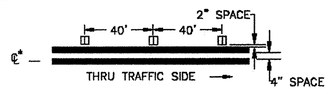
TWO WAY LEFT TURN STRIPE – 4" YELLOW LINES WITH TYPE I BI-DIRECTIONAL RAISED PAVEMENT MARKERS. OUTSIDE LINE IS SOLID. INSIDE AT 10'/30' PATTERN.

Ⓜ X



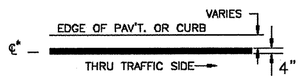
SKIP CTR.LINE – 4" YELLOW OR WHITE LINE WITH TYPE I BI-DIRECTIONAL YELLOW OR WHITE/RED RAISED PAVEMENT MARKERS.

Ⓝ



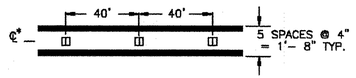
MEDIAN STRIPE – TWO 4" YELLOW LINES WITH TYPE I BI-DIRECTIONAL YELLOW RAISED PAVEMENT MARKERS.

Ⓞ X



FOG LINE – 4" YELLOW OR WHITE LINE AS SHOWN ON PLANS.

Ⓟ

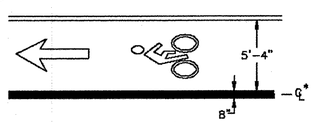


CENTER LINES – TWO 4" YELLOW LINES WITH BI-DIRECTIONAL YELLOW TYPE I MARKERS.

X SUBSCRIPT FOR PAVEMENT MARKING. DENOTES COLOR. (Y) YELLOW OR (W) WHITE.

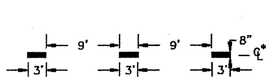
* LANE MARKING DIMENSION LOCATION AT ℄ OF STRIPING UNLESS NOTED OTHERWISE.

Ⓠ



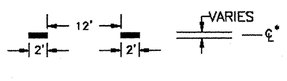
BIKE LANE LINE – 8" WIDE WHITE LINE.

Ⓡ



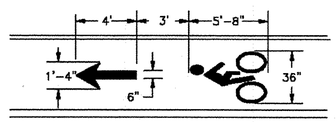
BIKE LANE SKIP LINE – 8" WIDE WHITE LINE.

Ⓢ X



PAVEMENT MARKING EXTENSIONS THRU INTERSECTIONS – WHITE OR YELLOW LINE. WIDTH AND COLOR SAME AS LINE BEING EXTENDED.

Ⓣ



BICYCLE LANE MARKING – SHALL BE WHITE AND INSTALLED PER DETAIL.

CITY OF HILLSBORO
ENGINEERING DEPARTMENT
150 E MAIN ST, 4TH FLOOR HILLSBORO, OR 97123

FILE: CITYSTRIPE.DWG LAST UPDATED: 10/6/2008 BY: GREDO

BID SET 5/1/2015

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DESIGN DRIVEN ▪ CLIENT FOCUSED

Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT # 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #19432 OREGON SEPT. 16, 1997 MATTHEW W. BUTTS
EXPIRES: 12/31/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
STRIPING DETAILS

DRAWN BY: BMR
CHECKED BY: RJH
SHEET:
R3.4
JOB NO. 2120550.00

GENERAL SIGNING NOTES:

1) CONTRACTOR SHALL SUPPLY AND INSTALL ALL SIGNS, AND IS RESPONSIBLE FOR STAKING SIGN LOCATIONS AND OBTAINING UTILITY LOCATES FOR STAKED SIGN LOCATIONS. SIGNS SHALL BE LOCATED PER TYPICAL SIGN LOCATION OR AS SHOWN ON THE PLANS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE FINAL STREET NAMES WITH THE COUNTY SURVEY OFFICE AT 846-8723 BEFORE ORDERING AND INSTALLING STREET NAME SIGNS.

2) ALL SIGNING SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND THE CITY'S PERMANENT SIGNING LEGEND.

3) STREET NAME SIGNS SHALL BE: (VERIFY FINAL STREET NAMES BEFORE ORDERING AND INSTALLING)

A) FOR LOCAL AND NEIGHBORHOOD ROUTE STREET INTERSECTIONS (25MPH MAX SPEED):
SIX (6) INCH 0.100 INCH FLAT BLADE ALUMINUM BLANKS, MOUNTED ON TOP OF POST WITH SPECIAL BRACKETS.

LETTERING: FOUR (4) INCH UPPER CASE FIRST LETTER WITH REMAINING LETTERS THREE (3) INCH LOWER CASE SERIES C
PRE-FIXES AND SUFFIXES: THREE (3) INCH UPPER CASE SERIES C
SUPERSCRIPT FOR NUMERICAL STREET NAMES: TWO (2) INCH UPPERCASE SERIES C
LAYOUT PER "TYPICAL STREET NAME SIGN LAYOUT" TWO (2) SIDED

B) FOR ARTERIAL AND COLLECTOR STREET INTERSECTIONS (40MPH MAX SPEED):
NINE (9) INCH 0.100 INCH FLAT BLADE ALUMINUM BLANKS, MOUNTED DIRECTLY TO POST WITH RIVETS.

LETTERING: SIX (6) INCH UPPER CASE FIRST LETTER WITH REMAINING LETTERS FOUR AND ONE HALF (4.5) INCH SERIES C
PRE-FIXES AND SUFFIXES: FOUR AND ONE HALF (4.5) INCH UPPERCASE SERIES C
SUPERSCRIPT FOR NUMERICAL STREET NAMES: THREE (3) INCH UPPERCASE SERIES C
LAYOUT PER "TYPICAL STREET NAME SIGN LAYOUT" ONE (1) SIDED, TWO (2) SIGNS PER STREET NAME.

C) FOR ARTERIAL AND COLLECTOR STREET INTERSECTIONS (GREATER THAN 40 MPH):
TWELVE (12) INCH 0.125 INCH FLAT BLADE ALUMINUM BLANKS, MOUNTED DIRECTLY TO POST WITH RIVETS.

LETTERING: EIGHT (8) INCH UPPER CASE FIRST LETTER WITH REMAINING LETTERS SIX (6) INCH SERIES C
PRE-FIXES AND SUFFIXES: SIX (6) INCH UPPERCASE SERIES C
SUPERSCRIPT FOR NUMERICAL STREET NAMES: FOUR (4) INCH UPPERCASE SERIES C
LAYOUT PER "TYPICAL STREET NAME SIGN LAYOUT" ONE (1) SIDED, TWO (2) SIGNS PER STREET NAME.

D) FOR SIGNALIZED INTERSECTIONS:
TWELVE (12) INCH 0.125 INCH FLAT BLADE ALUMINUM BLANKS, MOUNTED TO MAST ARM OR STRAIN POLE FOR SPAN WIRE SIGNAL SYSTEMS.

LETTERING: EIGHT (8) INCH UPPER CASE FIRST LETTER WITH REMAINING LETTERS SIX (6) INCH SERIES C
PRE-FIXES AND SUFFIXES: SIX (6) INCH UPPERCASE SERIES C
SUPERSCRIPT FOR NUMERICAL STREET NAMES: FOUR (4) INCH UPPERCASE SERIES C
LAYOUT PER "TYPICAL STREET NAME SIGN LAYOUT" ONE (1) SIDED WITH BORDER

MATERIAL FOR ALL STREET NAME SIGNS PER "SIGNING MATERIALS"

WIDTH OF SIGN PER BELOW TABLES FOR SIX (6) AND NINE (9) INCH BLANKS.

SUFFIXES ABBREVIATIONS PER: "COMMON ABBREVIATIONS"

6 INCH BLANKS (TWO SIDED)

# OF CHARACTERS (NOT INCLUD. PREFIXES AND SUFFIXES)	BLANK WIDTH
UP TO 6	24 INCH
7 TO 9	30 INCH
10 TO 11	36 INCH
12 TO 13	42 INCH
OVER 13	48 INCH

9 INCH BLANKS (ONE SIDED)

# OF CHARACTERS (NOT INCLUD. PREFIXES AND SUFFIXES)	BLANK WIDTH
UP TO 6	38 INCH
7 TO 9	48 INCH
10 TO 11	55 INCH
12 TO 13	61 INCH
14 TO 15	68 INCH

FOR MAST ARM STREET NAME SIGN LETTER SPACING USE ODOT'S STANDARDS

COMMON ABBREVIATIONS

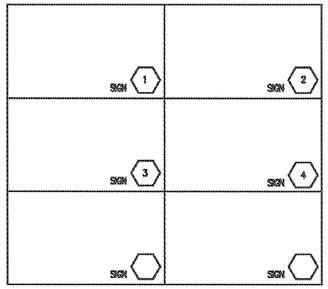
AVE = AVENUE	LN = LANE	RD = ROAD
BLVD= BOULEVARD	LP = LOOP	ST = STREET
CIR = CIRCLE	PKWY = PARKWAY	TER = TERRACE
CT = COURT	PL = PLACE	WAY = WAY
DR = DRIVE		

4) POSTS

A MINIMUM OF 2 X 2 INCH X 10 FOOT GALVANIZED "UNISTRUT TELESPAR" OR 12 GAUGE PERFORATED POSTS OR APPROVED EQUIVALENT SHALL BE USED.

A 2 X 2 INCH X 12 FOOT (MIN.) 12 GAUGE GALVANIZED "UNISTRUT TELESPAR" OR 12 GAUGE PERFORATED POSTS OR APPROVED EQUIVALENT SHALL BE USED WHEN A COMBINATION OF SIGNS IS MORE THAN 36 INCHES IN HEIGHT. SIGN COMBINATION AND MINIMUM SIGN MOUNTING HEIGHT SHALL DETERMINE POST LENGTH.

SIGN POSTS AND ANCHORS SHALL BE INSTALLED PER "TYPICAL SIGN INSTALLATION" NO OTHER TYPE OF POST SHALL BE USED UNLESS PRIOR APPROVAL OF THE CITY TRAFFIC ENGINEER IS OBTAINED.

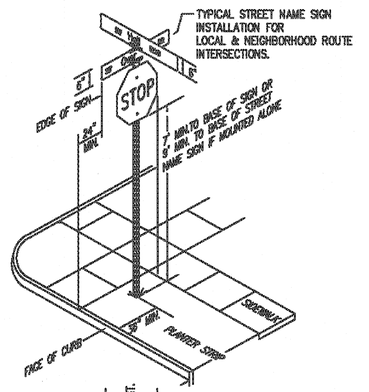


PERMANENT SIGNING LEGEND

N	INSTALL NEW SIGN
N / M	INSTALL NEW SIGN (N) ON NEW (M) SUPPORT
RXN	REMOVE EXISTING SIGN (N)
RXN / M	REMOVE EXISTING SIGN (N) AND (M) SUPPORT
RIN / M	REINSTALL SIGN (N) ON NEW (M) SUPPORT
EXN	MAINTAIN AND PROTECT EXISTING SIGN (N) AND SUPPORT
RIN	REINSTALL EXISTING SIGN ON EXISTING SUPPORT

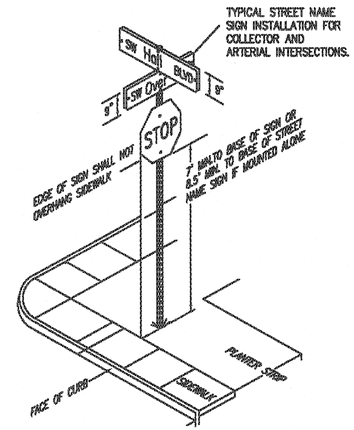
N = SIGN NUMBER
M = MATERIALS, OPTIONS ARE:
S = STEEL "TELESPAR"

◇ SIGNS SHOWN WITH BROKEN BORDERS ARE EXISTING.



TYPICAL SIGN LOCATIONS

NTS

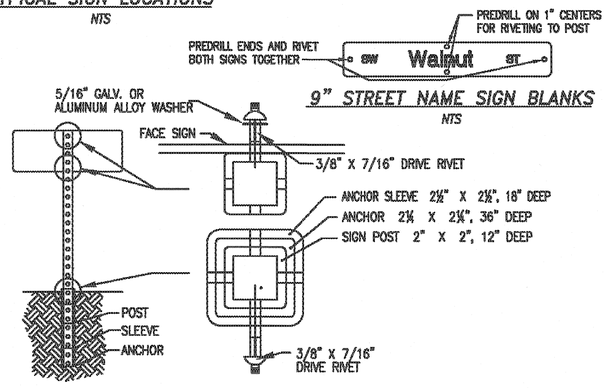


TYPICAL "STREET NAME" SIGN LAYOUT

NTS

SIGNING MATERIALS	
STOP & YIELD SIGNS	REFLECTIVE SHEETING, TYPE IV
SCHOOL ADVANCE AND CROSSING SIGNS	YELLOW/GREEN REFLECTIVE SHEETING TYPE 9
STREET NAME SIGNS (POST & OVERHEAD MOUNTED)	LETTERS - SHEETING, TYPE IV BACKGROUND - REFLECTIVE SHEETING, TYPE IV
ALL OTHER SIGNS (POST MOUNTED)	REFLECTIVE SHEETING, TYPE IV
OVERHEAD SIGNING (EXCEPT STREET NAME SIGNS)	REFLECTIVE SHEETING, TYPE 9
TYPICAL SIGN SIZES	
STOP SIGNS - 30"x30"	
SPEED SIGNS - 30"x36"	
NO PARKING SIGNS - R7-1, 12"x18" IS STANDARD SIGNS AT BOTH ENDS OF THE ZONE SHALL HAVE SINGLE ARROWS POINTING IN THE APPROPRIATE DIRECTION WITH DOUBLE ARROWS IN BETWEEN.	

FOR SPECIFIC SIGN DETAILS (SUCH AS THE "STREET STUB SIGN") CONTACT THE CITY TRAFFIC SECTION AT 503-615-6562.

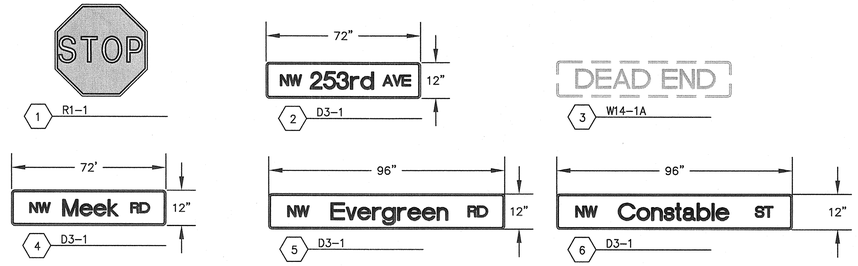


9" STREET NAME SIGN BLANKS

NTS

TYPICAL SIGN INSTALLATION

NTS



NOTE: SEE NOTE 3.C ON CITY OF HILLSBORO DETAIL PW-180 FOR LETTER AND NUMBER SIZING

SIGN TABLE

POST #	STATION (OFFSET)* (NW 253RD AVE)	SUPPORT TYPE	SIGN MATERIAL	SIGN TYPE	LENGTH OF** SIGN SUPPORT	REMARKS
1	10+60 (28' LT)	STEEL "TELESPAR" SQUARE TUBE	ALUMINUM	***	13'	MOUNT SIGN N=1 ON BOTTOM THEN SIGN N=5 AND SIGN N=2 ON TOP. ALIGN STREET NAME SIGNS WITH APPLICABLE ROADWAY.
2	37+07 (36' LT)	STEEL "TELESPAR" SQUARE TUBE	ALUMINUM	***	13'	MOUNT SIGN N=1 ON BOTTOM THEN SIGN N=6 AND SIGN N=2 ON TOP. ALIGN STREET NAME SIGNS WITH APPLICABLE ROADWAY.
3	65+40 (28' RT)	STEEL "TELESPAR" SQUARE TUBE	ALUMINUM	***	13'	MOUNT SIGN N=1 ON BOTTOM THEN SIGN N=4 AND SIGN N=2 ON TOP. ALIGN STREET NAME SIGNS WITH APPLICABLE ROADWAY.

*OFFSET GIVEN TO CENTER OF POLE
**THE ANCHOR WILL BE 3' IN THE GROUND. THE POLE WILL EXTEND 1' INSIDE THE ANCHOR FOR A TOTAL POLE LENGTH OF 13'.
***SEE SIGN LEGEND FOR NEW SIGN TYPE

#	DATE	REVISION	BY	APP'D

SCALE: PLAN NTS; PROFILE HORIZ. N/A, VERT. N/A
DRAWN: CW
CHECKED: DG

SIGNS AND SIGNPOSTS

Hillsboro OREGON
PHONE: 503.681.6146 | FAX: 503.681.6245
150 E MAIN ST | 4TH FLOOR | HILLSBORO, OR 97123-4089

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

SHEET NO. PW-180
DRAWING NO. OF

FILE NAME: PW-180.DWG
PLOT DATE: 2/11/2013 11:24 AM

BID SET 5/1/2015

Architecture ▪ Interiors
Planning ▪ Engineering

Portland, OR 503.224.9560
Vancouver, WA 360.695.7879
Seattle, WA 206.749.9993
www.mcknze.com

MACKENZIE.
DESIGN DRIVEN | CLIENT FOCUSED

Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY 11, 2006 RALPH J.R. HENDERSON
EXPIRES: 6/30/15

REVISIONS:

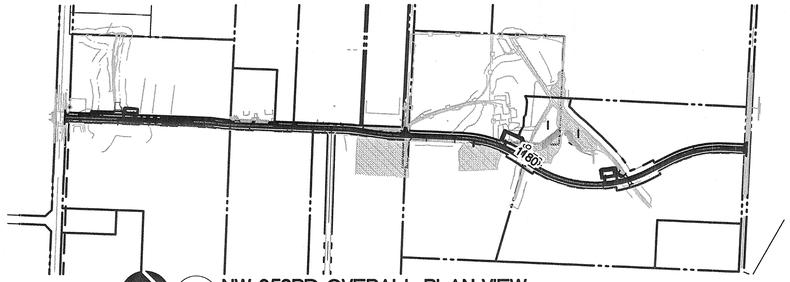
REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
SIGNING DETAILS

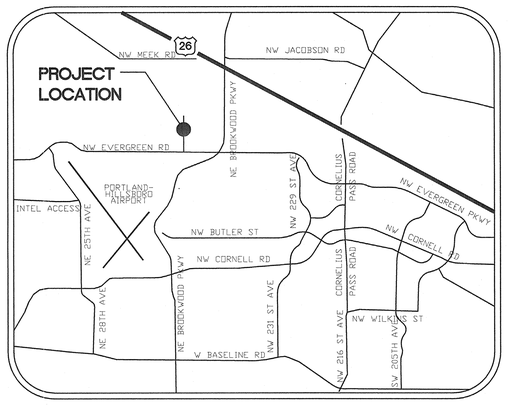
DRAWN BY: BMR
CHECKED BY: RJH
SHEET: R3.5
JOB NO. 2120550.00

NW 253RD IMPROVEMENTS AND EXTENSION

EROSION AND SEDIMENT CONTROL PLANS 1200-C



NW 253RD OVERALL PLAN VIEW



VICINITY MAP
N.T.S.

PROJECT LOCATION:

NEAR THE PORTLAND-HILLSBORO AIRPORT
OFF EVERGREEN ROAD,
WASHINGTON
COUNTY, OREGON
LATITUDE = 45.557303,
LONGITUDE = -122.936497

PROPERTY DESCRIPTION:

TAX LOTS 1N2210002800, 1N2210002700, 1N2210002600
1N2210002500, 1N2210002400, 1N2210002300, 1N2210002202, 1N2210002201, 1N2210002200, 1N2210002101, 1N2212100, 1N2210001500
SECTION 21, TOWNSHIP 1 NORTH, RANGE 2 WEST, WILLAMETTE MERIDIAN, WASHINGTON COUNTY, OREGON

ATTENTION EXCAVATORS:

OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 503-232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER AT LEAST TWO BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 503-246-6699.

LOCAL AGENCY-SPECIFIC EROSION CONTROL NOTES:

1. IF VEGETATIVE SEED MIXES ARE SPECIFIED, SEEDING MUST TAKE PLACE NO LATER THAT SEPTEMBER 1; THE TYPE AND PERCENTAGES OF SEED IN THE MIX MUST BE IDENTIFIED ON THE PLANS.
2. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE DISCHARGED OVER AN UNDISTURBED, PREFERABLY VEGETATED AREA, AND THROUGH A SEDIMENT CONTROL BMP I.E. (FILTER BAG).
3. ALL EXPOSED SOILS MUST BE COVERED DURING THE WET WEATHER PERIOD, OCTOBER 01 - MAY 31.

DEVELOPER

DEVELOPER/COMPANY: CITY OF HILLSBORO
CONTACT: CHARLIE SHELL
150 E MAIN STREET, 4TH FLOOR
HILLSBORO, OR 97123
PHONE: 503-681-6294
CHARLIE.SHELL@HILLSBORO_OREGON.GOV

SURVEYING FIRM

CITY OF HILLSBORO
CONTACT: MICHAEL FILICKY
150 E MAIN STREET, 4TH FLOOR
HILLSBORO, OR 97123
PHONE: 503-681-6294
MICHAEL.FILICKY@HILLSBORO_OREGON.GOV

ENGINEERING FIRM

GROUP MACKENZIE
CONTACT: RALPH HENDERSON
1515 SE WATER AVE.
PORTLAND, OR 97293
PHONE: 503.224.9560
RHENDERSON@GRPMACK.COM

NARRATIVE DESCRIPTIONS

EXISTING SITE CONDITIONS

* EXISTING GRAVEL ROADWAY, 4 WETLAND CROSSINGS, 2 STREAM CROSSINGS, DENSE WOODED AREA AT SOME LOCATIONS

DEVELOPED CONDITIONS

* APPROX. 1 MI. OF NEW ROADWAY, 36' WIDE CONCRETE PAVING (INTERIM), 50' WIDE CONCRETE PAVING (FUTURE)

NATURE OF CONSTRUCTION ACTIVITY AND ESTIMATED TIME TABLE

* MASS GRADING (JUNE 2015 - AUG 2015)
* UTILITY INSTALLATION (JULY 2015 - SEPT 2015)
* STREET CONSTRUCTION (AUG 2015 - DEC 2015)
* FINAL STABILIZATION (DEC 2015 - JAN 2016)

TOTAL SITE AREA = 576,304 SF 13.23 AC

TOTAL DISTURBED AREA = 576,304 SF 13.23 AC

SITE SOIL CLASSIFICATION:

1 - ALOHA SILT LOAM
2 - AMITY SILT LOAM
15 - DAYTON SILT LOAM
42 - VERBOORT SILTY CLAY LOAM
45A - WOODBURN SILT LOAM, 0 TO 3 PERCENT SLOPES
45B - WOODBURN SILT LOAM, 3 TO 7 PERCENT SLOPES

RECEIVING WATER BODIES:

NEAREST WATER BODY: WAIBLE CREEK

PERMITTEE'S SITE INSPECTOR:

COMPANY/AGENCY: RALPH HENDERSON, GROUP MACKENZIE
PHONE: 503-224-9560
FAX: 503-228-1285
E-MAIL: RJH@GRPMACK.COM
EXPERIENCE: 17 YEARS OF EROSION CONTROL DESIGN AND FIELD REVIEW

STANDARD EROSION AND SEDIMENT CONTROL PLAN DRAWING NOTES:

1. ALL PERMIT REGISTRANTS MUST IMPLEMENT THE ESCP. FAILURE TO IMPLEMENT ANY OF THE CONTROL MEASURES OR PRACTICES DESCRIBED IN THE ESCP IS A VIOLATION OF THE PERMIT. (SCHEDULE A 8.A)
2. THE ESCP MEASURES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, UPGRADE THESE MEASURES AS NEEDED TO COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL EROSION AND SEDIMENT CONTROL REGULATIONS. (SCHEDULE A.8.C.II.(1)(C))
3. SUBMISSION OF ALL ESCP REVISIONS IS NOT REQUIRED. SUBMITTAL OF THE ESCP REVISIONS IS ONLY UNDER SPECIFIC CONDITIONS. SUBMIT ALL NECESSARY REVISION TO DEQ OR AGENT. (SCHEDULE A.12.III)
4. PHASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION. (SCHEDULE A 8.C.II.(1)(D))
5. IDENTIFY, MARK, AND PROTECT (BY FENCING OFF OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS. (SCHEDULE A.8.C.I.(1) & (2))
6. PRESERVE EXISTING VEGETATION WHEN PRACTICAL AND RE-VEGETATE OPEN AREAS. RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED. (SCHEDULE A.7.B.III(1) AND A.7.B.III(3))
7. EROSION AND SEDIMENT CONTROL MEASURES INCLUDING PERIMETER SEDIMENT CONTROL MUST BE IN PLACE BEFORE VEGETATION IS DISTURBED AND MUST REMAIN IN PLACE AND BE MAINTAINED, REPAIRED, AND PROMPTLY IMPLEMENTED FOLLOWING PROCEDURES ESTABLISHED FOR THE DURATION OF CONSTRUCTION, INCLUDING PROTECTION FOR ACTIVE STORM DRAIN INLETS AND CATCH BASINS AND APPROPRIATE NON-STORMWATER POLLUTION CONTROLS. (SCHEDULE A.7.D.I AND A.8.C)
8. ESTABLISH CONCRETE TRUCK AND OTHER CONCRETE EQUIPMENT WASHOUT AREAS BEFORE BEGINNING CONCRETE WORK. (SCHEDULE A.8.C.I.(6))
9. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES AND FOR ALL ROADWAYS INCLUDING GRAVEL ROADWAYS. (SCHEDULE A.8.C.II.(2))
10. ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS. (SCHEDULE A.8.C.I.(7))
11. PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BMPS SUCH AS: GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ONSITE, OR USE AN EXIT TIRE WASH. THESE BMPS MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES. (SCHEDULE A 7.D.II.(1) AND A.8.C.I(4))
12. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE. (SCHEDULE A.7.D.II.(3))
13. USE BMPS TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS; VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES; AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, LEFTOVER PAINTS, SOLVENTS, AND GLUES FROM CONSTRUCTION OPERATIONS. (SCHEDULE A.7.E.I.(2))
14. IMPLEMENT THE FOLLOWING BMPS WHEN APPLICABLE: WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES, EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES, SPILL KITS IN ALL VEHICLES, REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY, MATERIAL DELIVERY AND STORAGE CONTROLS, TRAINING AND SIGNAGE, AND COVERED STORAGE AREAS FOR WASTE AND SUPPLIES. (SCH A 7.E.III.)
15. USE WATER, SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUE AS NEEDED TO AVOID WIND-BLOWN SOIL. (SCHEDULE A 7.B.II)
16. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. EXERCISE CAUTION WHEN USING TIME-RELEASE FERTILIZERS WITHIN ANY WATERWAY RIPARIAN ZONE. (SCHEDULE A.9.B.III)
17. IF A STORMWATER TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN PLAN APPROVAL BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS. (SCHEDULE A.9.D)
18. TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE REGISTRANT IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR. (SCHEDULE A 7.B)
19. AT THE END OF EACH WORKDAY SOIL STOCKPILES MUST BE STABILIZED OR COVERED, OR OTHER BMPS MUST BE IMPLEMENTED TO PREVENT DISCHARGES TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS. (SCHEDULE A 7.E.II.(2))
20. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND CREATION OF BARE GROUND DURING WET WEATHER. (SCHEDULE A.7.A.I)
21. SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL. (SCHEDULE A.9.C.I)
22. OTHER SEDIMENT BARRIERS (SUCH AS BIOBAGS): REMOVE SEDIMENT BEFORE IT REACHES TWO INCHES DEPTH ABOVE GROUND HEIGHT. AND BEFORE BMP REMOVAL. (SCHEDULE A.9.C.II)
23. CATCH BASINS: CLEAN BEFORE RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT. SEDIMENT BASINS AND SEDIMENT TRAPS: REMOVE TRAPPED SEDIMENTS BEFORE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT AND AT COMPLETION OF PROJECT. (SCHEDULE A.9.C.III & IV)
24. WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE, MUST BE REMEDIATED. INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIMEFRAME. (SCHEDULE A.9.B.I)
25. THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS OR DRAINAGE WAYS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASED SEDIMENTS. (SCHEDULE A.9.B.II)
26. THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, TEMPORARY SEEDING, OR OTHER METHOD SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR 30 DAYS OR MORE. (SCHEDULE A.7.F.I)
27. PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE. (SCHEDULE A.7.F.II)
28. PROVIDE PERMANENT EROSION CONTROL MEASURES ON ALL EXPOSED AREAS. DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED. HOWEVER, DO REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AS EXPOSED AREAS BECOME STABILIZED, UNLESS DOING SO CONFLICTS WITH LOCAL REQUIREMENTS. PROPERLY DISPOSE OF CONSTRUCTION MATERIALS AND WASTE, INCLUDING SEDIMENT RETAINED BY TEMPORARY BMPS. (SCHEDULE A.7.B.III(2) AND A.8.C.III)

SHEET INDEX

EROSION AND SEDIMENT CONTROL PLANS

THE PERMITTEE IS REQUIRED TO MEET ALL THE CONDITIONS OF THE 1200C PERMIT. THIS ESCP AND GENERAL CONDITIONS HAVE BEEN DEVELOPED TO FACILITATE COMPLIANCE WITH THE 1200C PERMIT REQUIREMENTS. IN CASES OF DISCREPANCIES OR OMISSIONS, THE 1200C PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS OF THIS PLAN.

BMP MATRIX FOR CONSTRUCTION PHASES

REFER TO DEQ GUIDANCE MANUAL FOR A COMPREHENSIVE LIST OF AVAILABLE BMP'S.

	CLEARING	MASS GRADING	UTILITY INSTALLATION	STREET CONSTRUCTION	FINAL STABILIZATION	WET WEATHER (OCT. 1 - MAY 31ST)
EROSION PREVENTION						
PRESERVE NATURAL VEGETATION						
GROUND COVER					X	X
HYDRAULIC APPLICATIONS						
PLASTIC SHEETING				X		X
MATTING				X		X
DUST CONTROL	X	X	X	X	X	X
TEMPORARY/PERMANENT SEEDING				X		X
BUFFER ZONE						
OTHER:						
SEDIMENT CONTROL						
SEDIMENT FENCE (PERIMETER)	X	X	X	X	X	X
SEDIMENT FENCE (INTERIOR)						
STRAW WATTLES						
FILTER BERM						
INLET PROTECTION	X	X	X	X	X	X
DEWATERING						
SEDIMENT TRAP						
OTHER:						
RUN OFF CONTROL						
CONSTRUCTION ENTRANCE	X	X	X	X		
PIPE SLOPE DRAIN						
OUTLET PROTECTION	X	X	X	X	X	X
SURFACE ROUGHENING						
CHECK DAMS						
OTHER:						
POLLUTION PREVENTION						
PROPER SIGNAGE	X	X	X	X	X	X
HAZ WASTE MGMT	X	X	X	X	X	X
SPILL KIT ON-SITE	X	X	X	X	X	X
CONCRETE WASHOUT AREA			X	X	X	X
OTHER:						

** SIGNIFIES BMP THAT WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBING ACTIVITY.

RATIONALE STATEMENT

A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQ'S GUIDANCE MANUAL HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE ABOVE LISTED BMP'S WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THIS PROJECT BASED ON SPECIFIC SITE CONDITIONS, INCLUDING SOIL CONDITIONS TOPOGRAPHIC CONSTRAINTS, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS, AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESC PLAN, AN ACTION PLAN WILL BE SUBMITTED.

RJH INITIAL

INSPECTION FREQUENCY TABLE

SITE CONDITION	MINIMUM FREQUENCY
1. ACTIVE PERIOD	DAILY WHEN STORMWATER RUNOFF, INCLUDING RUNOFF FROM SNOWMELT, IS OCCURRING. AT LEAST ONCE EVERY TWO (2) WEEKS REGARDLESS OF WETHER STORMWATER RUNOFF IS OCCURRING.
2. PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OF SITE INACCESSIBILITY.	ONCE TO ENSURE THAT EROSION AND SEDIMENT CONTROL MEASURES ARE IN WORKING ORDER. ANY NECESSARY MAINTENANCE AND REPAIR MUST BE MADE PRIOR TO LEAVING THE SITE.
3. INACTIVE PERIODS GREATER THAN FOURTEEN (14) CONSECUTIVE CALENDAR DAYS.	ONCE EVERY TWO (2) WEEKS
4. PERIODS DURING WHICH THE SITE IS INACCESSIBLE DUE TO INCLEMENT WEATHER.	IF PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION

* HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS. (Schedule A.8.c.i.(3))
* ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS.
* INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS.
* RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY. DURING INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS, RETAIN THE ESCP AT THE CONSTRUCTION SITE OR AT ANOTHER LOCATION. (Schedule B.2.a)

BID SET 5/1/2015

M.
Architecture ▪ Interiors
Planning ▪ Engineering

Portland, OR
503.224.9560
Vancouver, WA
360.695.7879
Seattle, WA
206.749.9993
www.mcknze.com

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DESIGN DRIVEN | CLIENT FOCUSED

Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT # 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY. 11, 2000 RALPH J.R. HENDERSON
Ralph J.R. Henderson
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

SHEET TITLE:
EROSION AND SEDIMENT CONTROL COVER SHEET

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R4.1

JOB NO. 2120550.00

LEGEND

- SEDIMENT FENCE
- DIRECTIONAL FLOW
- CONSTRUCTION ENTRANCE

PRE-CONSTRUCTION, CLEARING, AND DEMOLITION NOTES:

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

2. SEDIMENT BARRIERS APPROVED FOR USE INCLUDE SEDIMENT FENCE, BERMS CONSTRUCTED OUT OF MULCH, CHIPPINGS, OR OTHER SUITABLE MATERIAL, STRAW WATTLES, OR OTHER APPROVED MATERIALS.

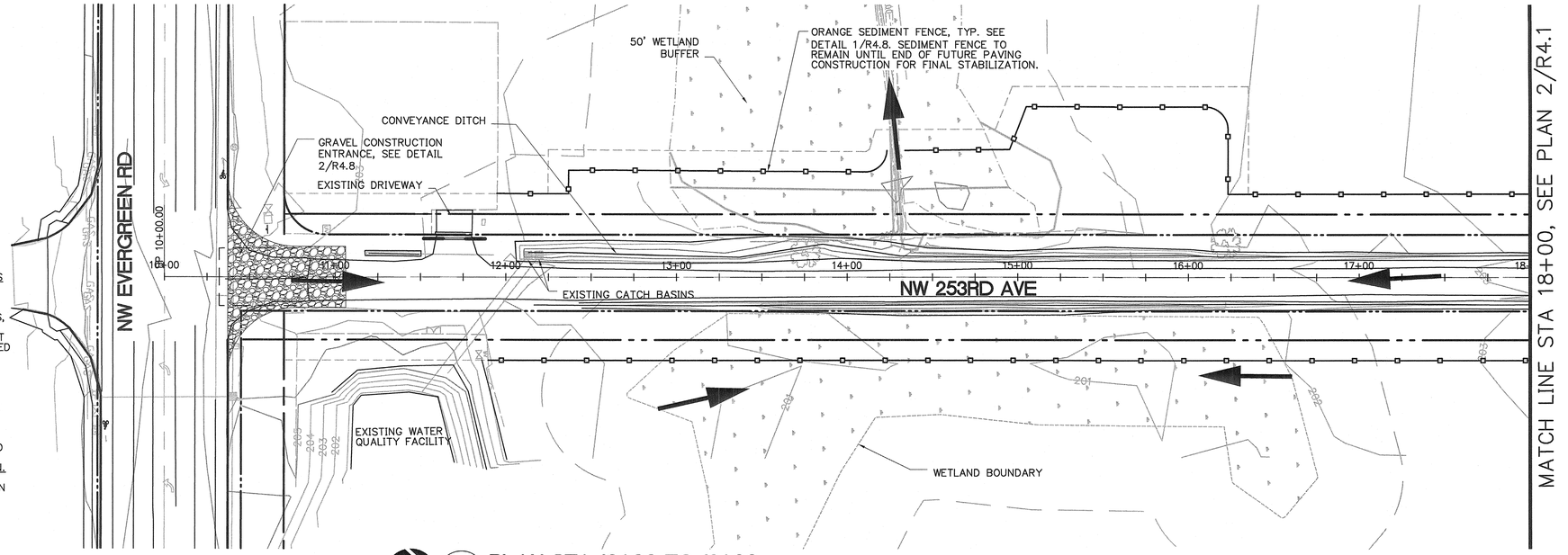
3. SENSITIVE RESOURCES INCLUDING, BUT NOT LIMITED TO, TREES, WETLANDS, AND RIPARIAN PROTECTION AREAS SHALL BE CLEARLY DELINEATED WITH ORANGE CONSTRUCTION FENCING OR CHAIN LINK FENCING IN A MANNER THAT IS CLEARLY VISIBLE TO ANYONE IN THE AREA. NO ACTIVITIES ARE PERMITTED TO OCCUR BEYOND THE CONSTRUCTION BARRIER.

4. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, STREET SWEEPING AND VACUUMING, MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

5. RUN-ON AND RUN-OFF CONTROLS SHALL BE IN PLACE AND FUNCTIONING PRIOR TO BEGINNING SUBSTANTIAL CONSTRUCTION ACTIVITIES. RUN-ON AND RUN-OFF CONTROL MEASURES INCLUDE: SLOPE DRAINS (WITH OUTLET PROTECTION), CHECK DAMS, SURFACE ROUGHENING, AND BANK STABILIZATION.

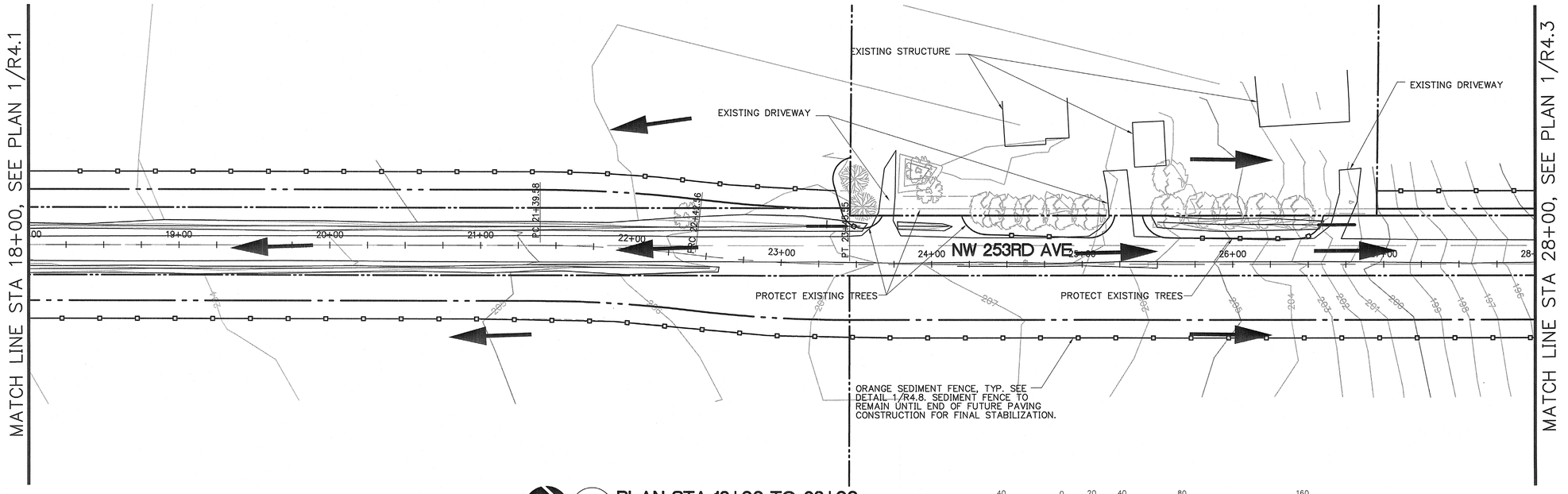
6. "WET WEATHER" CONSTRUCTION MEAUSURES NEED TO BE APPLIED BETWEEN OCTOBER 1ST AND MAY 31ST.

IMPACTED VEGETATED CORRIDOR



1 R4.2 PLAN STA 10+00 TO 18+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.



2 R4.2 PLAN STA 18+00 TO 28+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56680 OREGON MAY. 11, 2000 RALPH J.R. HENDERSON
J.R. Henderson
EXPIRES: 6/30/15

REVISIONS:

REVISION NO.	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

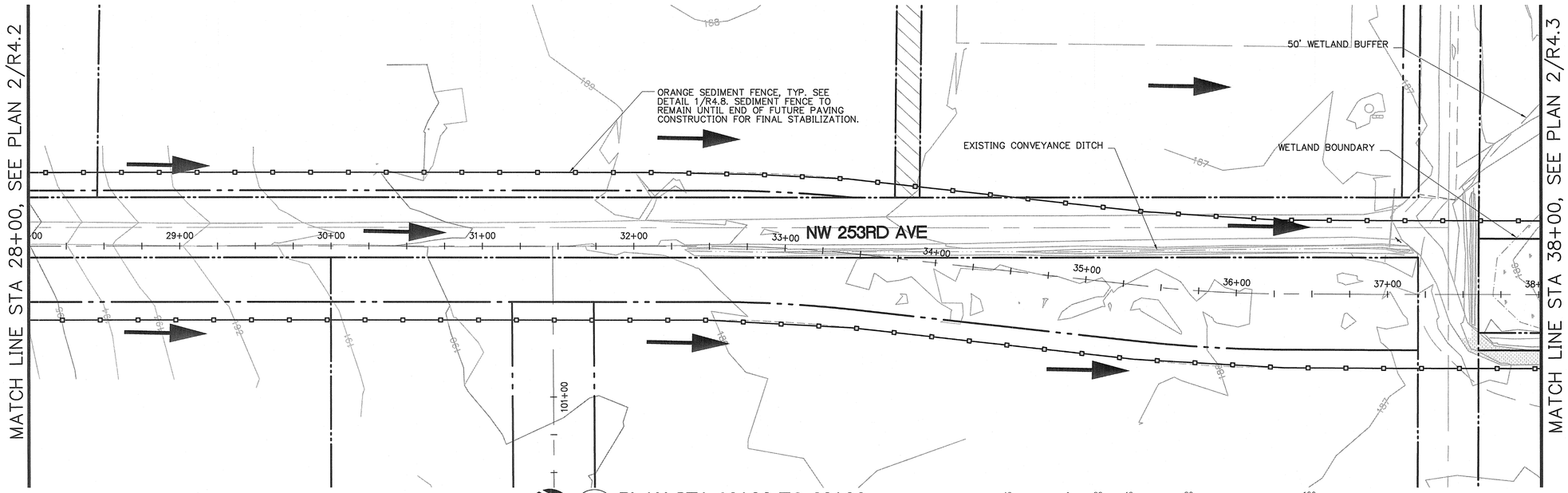
SHEET TITLE:
CLEARING AND DEMO ESCP STA 10+00 TO STA 28+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R4.2

JOB NO. 2120550.00



1 R4.3 PLAN STA 28+00 TO 38+00
1"=40'

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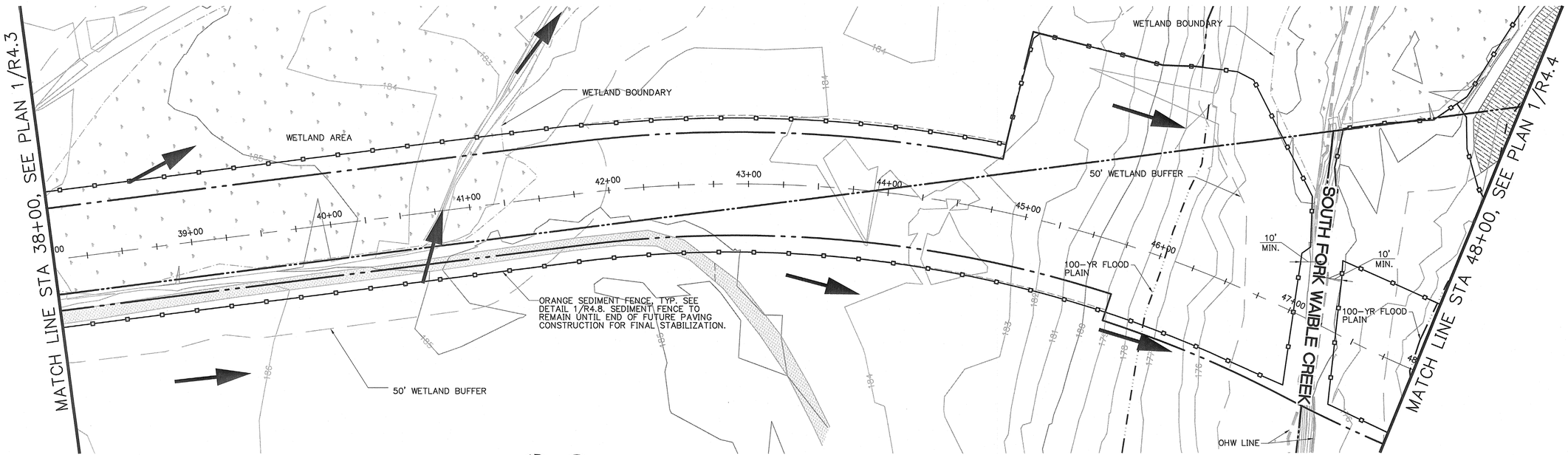
(IN FEET)
1 inch = 40 ft.



2 R4.3 PLAN STA 38+00 TO 48+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LEGEND

- SEDIMENT FENCE
- DIRECTIONAL FLOW
- IMPACTED VEGETATED CORRIDOR

ESC NOTES

REFER TO SHEET R4.2 FOR PRE-CONSTRUCTION, CLEARING, AND DEMOLITION NOTES

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56600 OREGON
Ralph J.R. Henderson
JULY. 11, 2006
RALPH J.R. HENDERSON
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

SHEET TITLE:
CLEARING AND DEMO ESCP
STA 28+00 TO STA 48+00

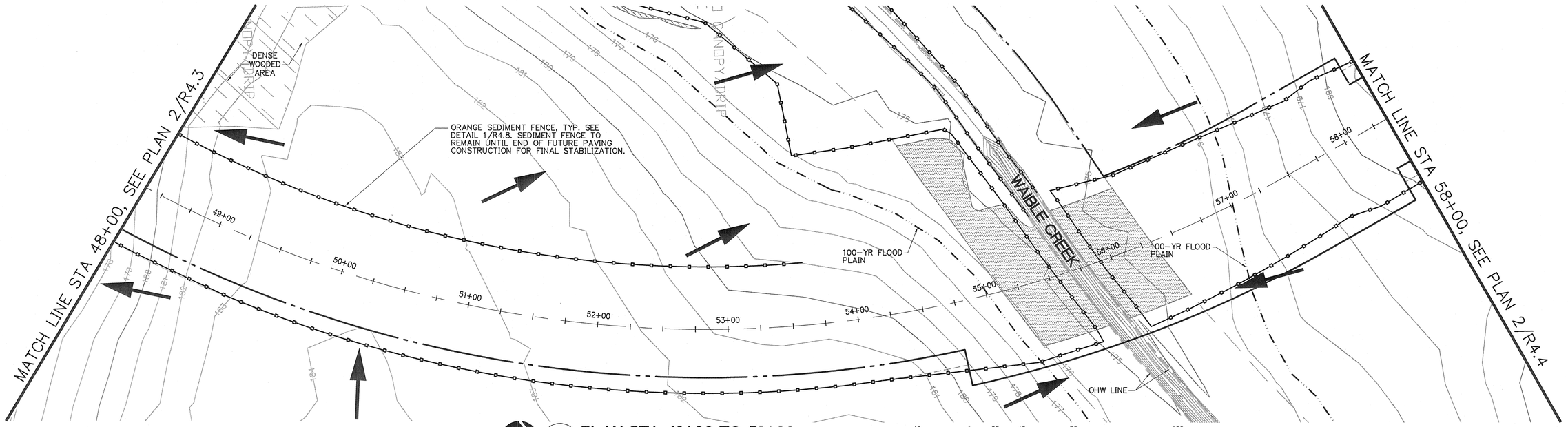
DRAWN BY: BMR

CHECKED BY: RJH

SHEET:

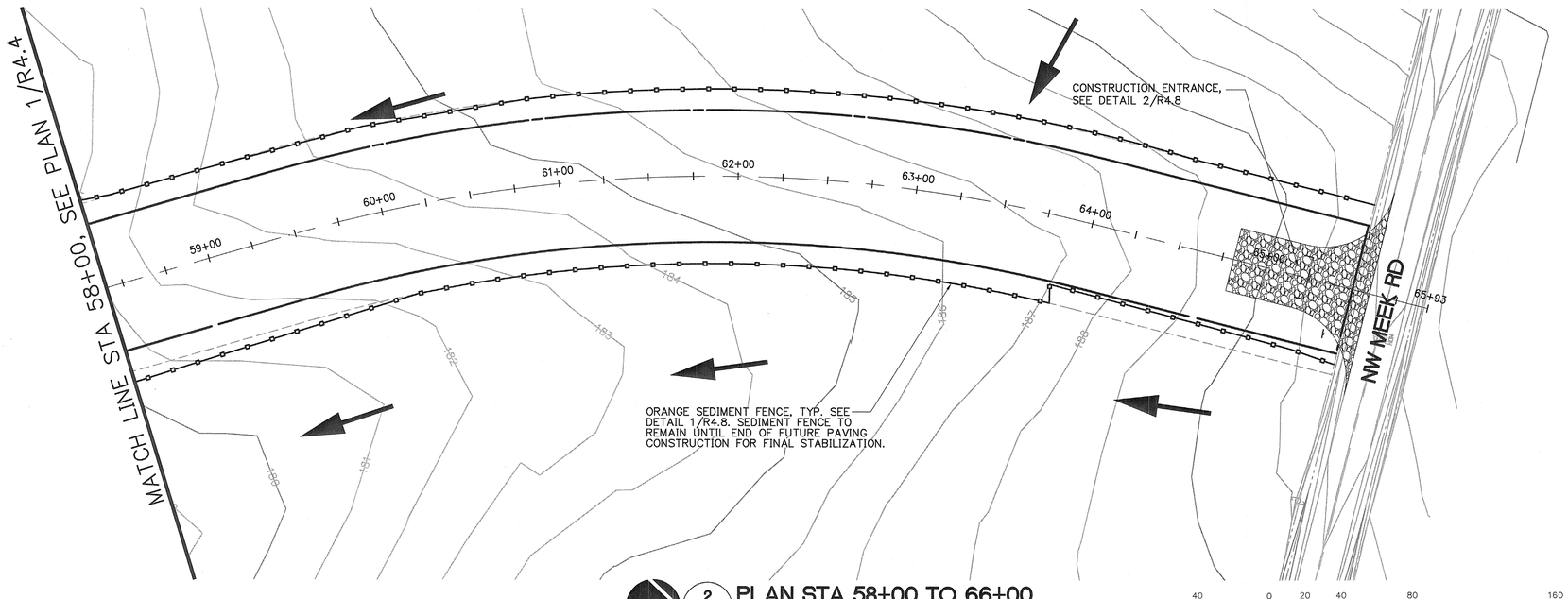
R4.3

JOB NO. 2120550.00



1 R4.4 PLAN STA 48+00 TO 58+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.



2 R4.4 PLAN STA 58+00 TO 66+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LEGEND

- SEDIMENT FENCE
- DIRECTIONAL FLOW
- CONSTRUCTION ENTRANCE
- IMPACTED VEGETATED CORRIDOR
- VEGETATED CORRIDOR MITIGATION

ESC NOTES

REFER TO SHEET R4.2 FOR PRE-CONSTRUCTION, CLEARING, AND DEMOLITION NOTES

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NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56680 OREGON JULY 11, 2000 RALPH J.R. HENDERSON
Ralph J.R. Henderson
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

SHEET TITLE:
CLEARING AND DEMO ESCP
STA 48+00 TO STA 66+00

DRAWN BY: BMR
CHECKED BY: RJH

SHEET:
R4.4

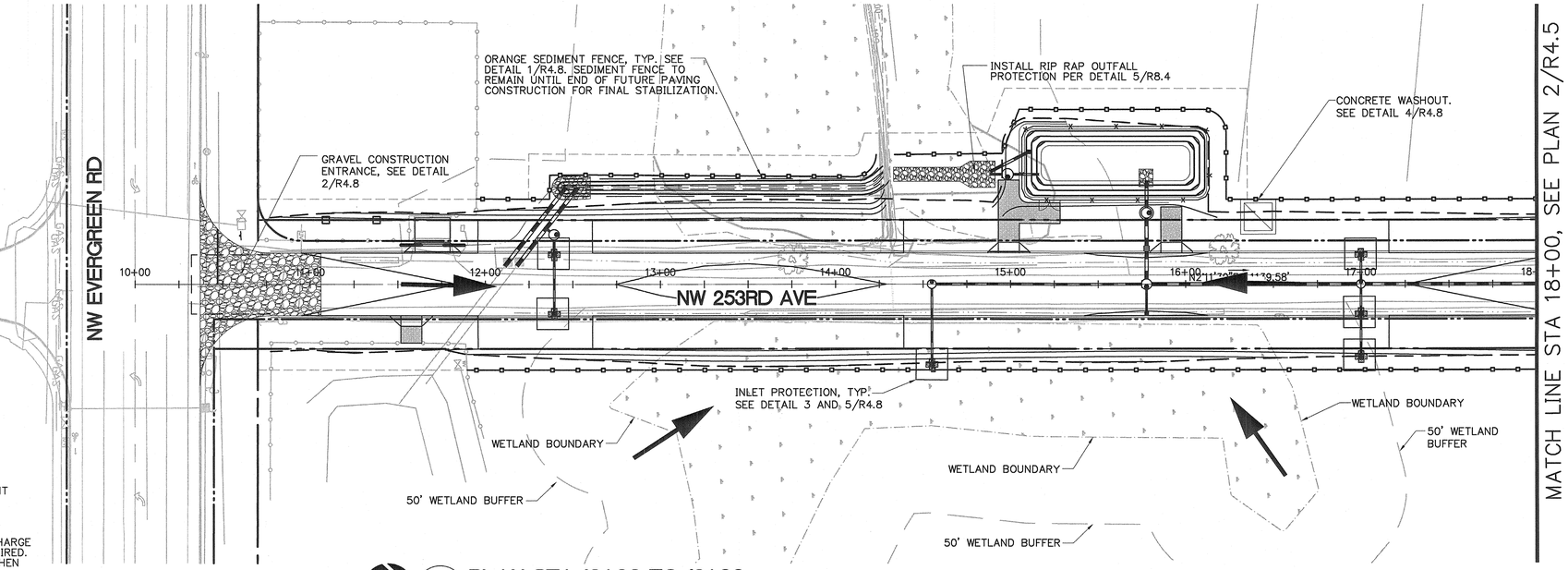
JOB NO. 2120550.00

GRADING, STREET AND UTILITY EROSION AND SEDIMENT CONSTRUCTION NOTES

1. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL BE COMPOSED OF ONE OF THE FOLLOWING MIXTURES, UNLESS OTHERWISE AUTHORIZED:
   A. TEMPORARY EROSION CONTROL SEEDING:
      SUNMARK SEEDS STREAMBANK MIX (2 LBS PER 1000 SF)
      1. 60% BLUE WILDRYE
      2. 30% NATIVE RED FESCUE
      3. 10% CALIFORNIA BROME

   B. PERMANENT SEEDING:
      HOBBS AND HOPKINS COMPANION SEED MIX (7 LBS PER 1000 SF)
      1. 85% DWARF PERENNIAL RYEGRASS
      2. 15% CREEPING RED FESCUE

   C. GROUNDCOVER PLANTING PER LANDSCAPE PLAN
2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.
3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.
4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.
5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. DURING "WET WEATHER" PERIODS, STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.
6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES EXCEEDING 25% MAY REQUIRE ADDITIONAL EROSIONCONTROL MEASURES.
7. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.
8. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. ACTIVE INLETS TO STORM WATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.
10. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.
11. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORM WATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.
12. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORM WATER SYSTEM. SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.
13. AVOID PAVING IN WET WEATHER WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORM WATER SYSTEM.
14. USE BMPs SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.
15. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORM WATER SYSTEM.
16. "WET WEATHER"CONSTRUCTION MEASURES NEED TO BE APPLIED BETWEEN OCTOBER 1ST AND MAY 31ST.

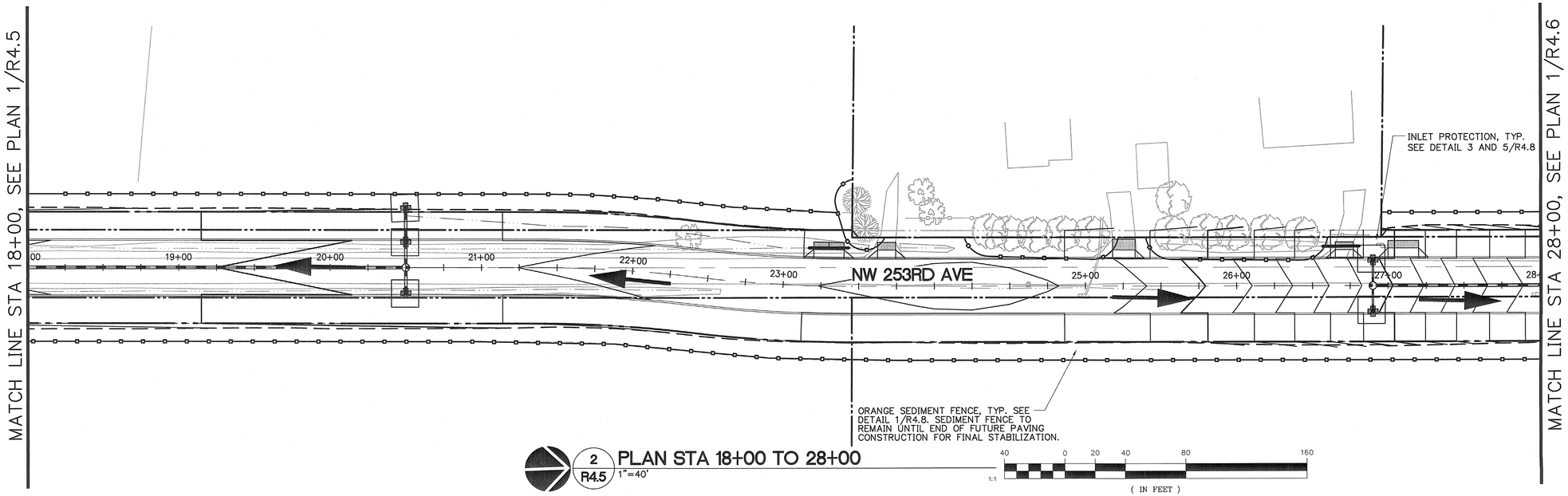


1 R4.5 PLAN STA 10+00 TO 18+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LEGEND

- INLET PROTECTION
- SEDIMENT FENCE
- DIRECTIONAL FLOW
- CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT
- IMPACTED VEGETATED CORRIDOR



2 R4.5 PLAN STA 18+00 TO 28+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

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CITY PROJECT #: 10705

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NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56600 OREGON JULY. 11, 2006 RALPH J.R. HENDERSON
Ralph J.R. Henderson
EXPIRES: 6/30/15

REVISIONS:

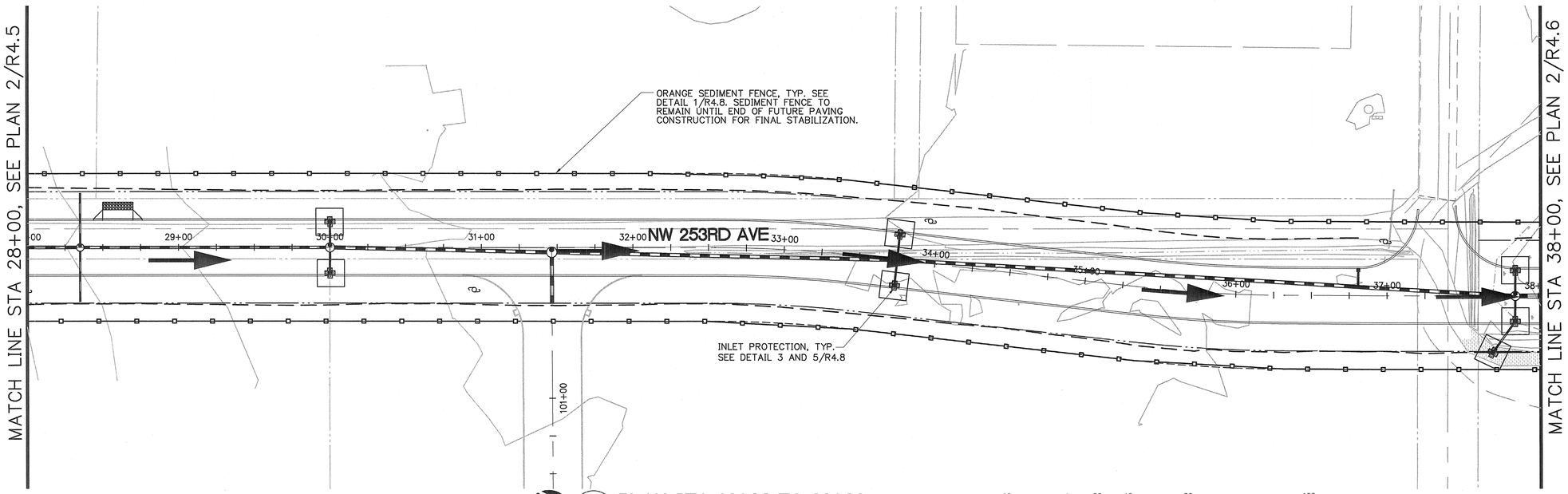
REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
EROSION CONTROL PLANS
STA 10+00 TO STA 28+00

DRAWN BY: BMR
CHECKED BY: RJH

SHEET:
R4.5

JOB NO. 2120550.00



1 R4.6 PLAN STA 28+00 TO 38+00
1"=40'

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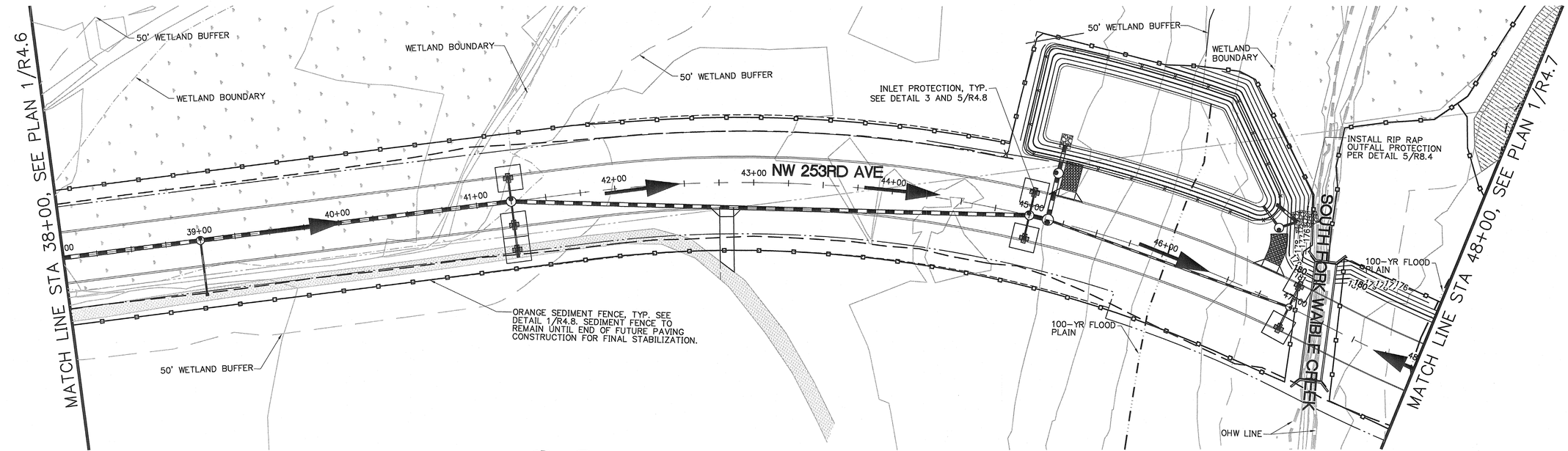
(IN FEET)
1 inch = 40 ft.



2 R4.6 PLAN STA 38+00 TO 48+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LEGEND

- INLET PROTECTION
- SEDIMENT FENCE
- DIRECTIONAL FLOW
- CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT
- IMPACTED VEGETATED CORRIDOR

ESC NOTES

REFER TO GRADING, STREET AND UTILITY EROSION AND SEDIMENT CONSTRUCTION NOTES ON SHEET R4.5

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REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY. 11, 2006 RALPH J.R. HENDERSON
Ralph J.R. Henderson
EXPIRES: 6/30/15

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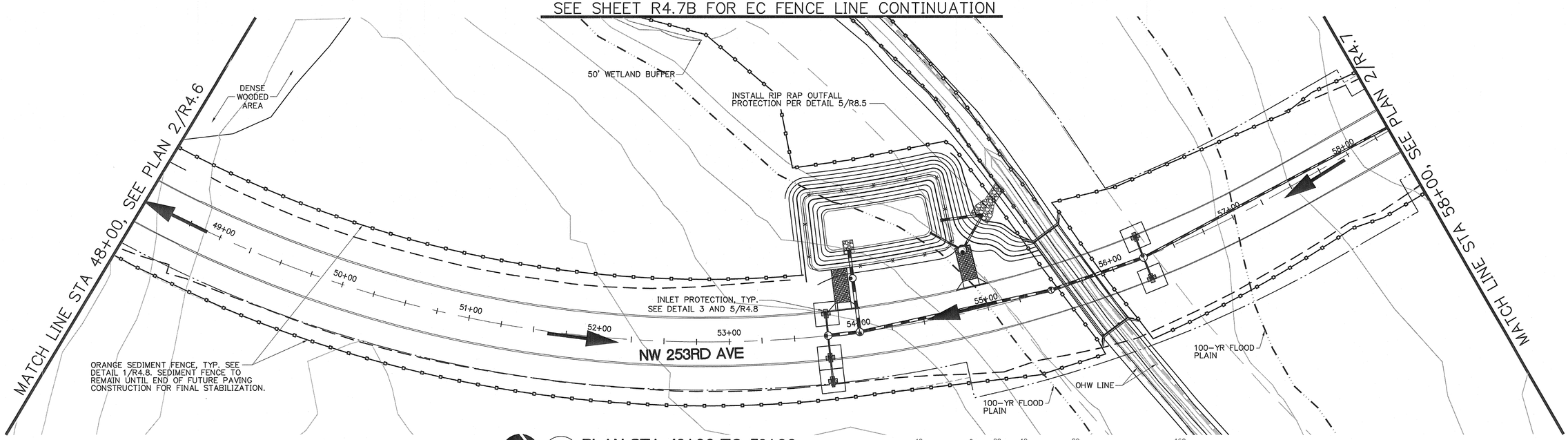
SHEET TITLE:
EROSION AND SEDIMENT CONTROL PLAN
STA 28+00 TO STA 48+00

DRAWN BY: BMR
CHECKED BY: RJH
SHEET: R4.6
JOB NO. 2120550.00

SEE SHEET R4.7B FOR EC FENCE LINE CONTINUATION



1 R4.7 PLAN STA 48+00 TO 58+00
1"=40'

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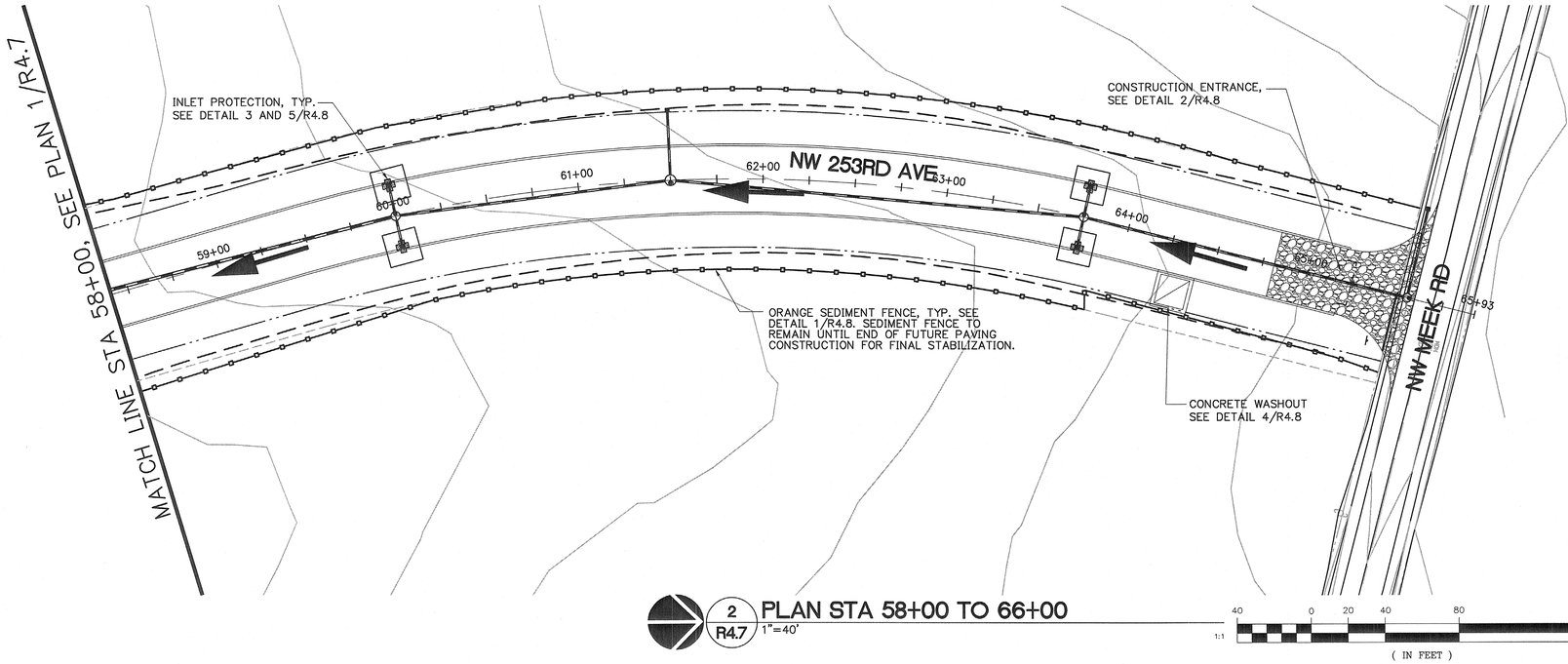
(IN FEET)
1 inch = 40 ft.



2 R4.7 PLAN STA 58+00 TO 66+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LEGEND

- INLET PROTECTION
- SEDIMENT FENCE
- DIRECTIONAL FLOW
- CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT
- IMPACTED VEGETATED CORRIDOR
- VEGETATED CORRIDOR MITIGATION

ESC NOTES

REFER TO GRADING, STREET AND UTILITY EROSION AND SEDIMENT CONSTRUCTION NOTES ON SHEET R4.5

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Ralph J.R. Henderson
EXPIRES: 6/30/15

REVISIONS:

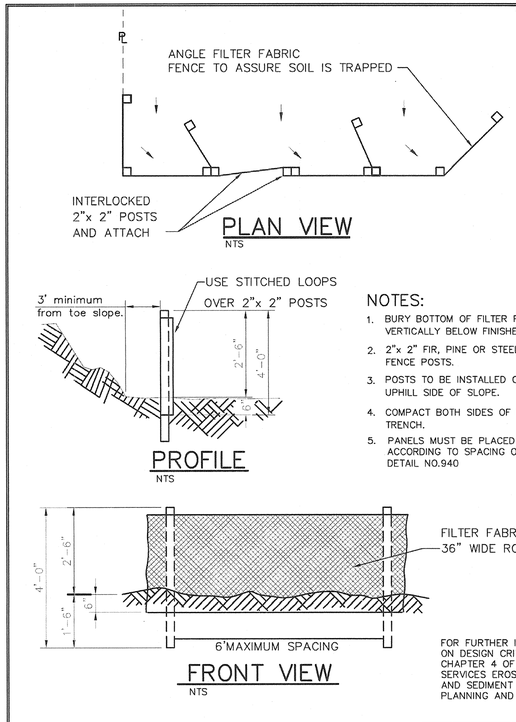
REVISION DELTA	REVISION DELTA CLOSING DATE

SHEET TITLE:
EROSION AND SEDIMENT CONTROL PLAN
STA 48+00 TO STA 66+00

DRAWN BY: BMR
CHECKED BY: RJH

SHEET:
R4.7

JOB NO. 2120550.00



NOTES:

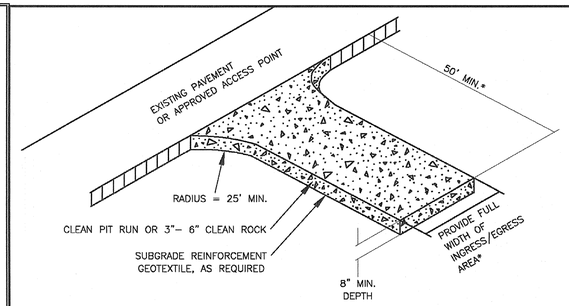
1. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
2. 2"x 2" FIR, PINE OR STEEL FENCE POSTS.
3. POSTS TO BE INSTALLED ON UPHILL SIDE OF SLOPE.
4. COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.
5. PANELS MUST BE PLACED ACCORDING TO SPACING ON DETAIL NO.940

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

1 R4.8 SEDIMENT FENCE

DRAWING NO. 875 REVISED 12-06

CleanWater Services ●ur commitment is clear.



*20' MIN. FOR SINGLE FAMILY AND DUPLEX RESIDENTIAL

NOTES:

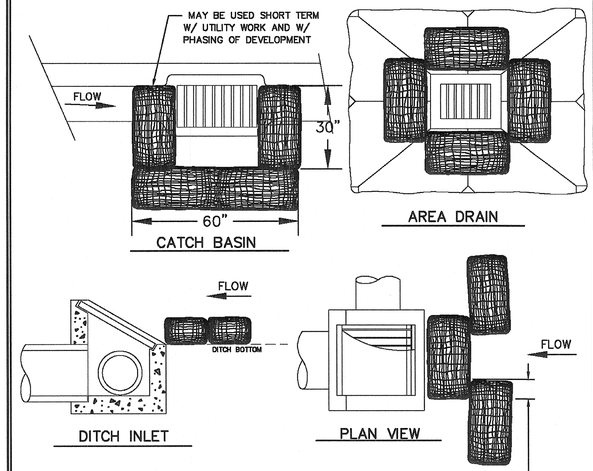
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF- WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. DIMENSIONS
   SINGLE FAMILY
   20' LONG BY 20' WIDE 8" DEEP OF ¾" MINUS CLEAN ROCK.
   COMMERCIAL
   50' LONG BY 20' WIDE 3-6" CLEAN ROCK, GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

2 R4.8 CONSTRUCTION ENTRANCE

Detail Drawing 855 REVISED 12-06

CleanWater Services ●ur commitment is clear.



NOTES:

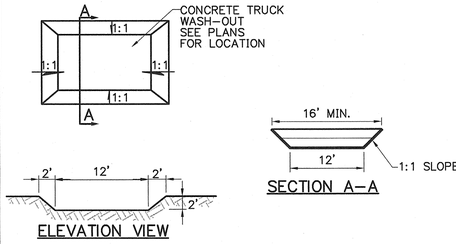
1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPES.
2. BIO-FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2"WOODEN STAKES OR APPROVED EQUAL PER BAG.
3. WHEN USING 30" BIO-BAGS TO PROTECT A CATCH BASIN YOU MUST HAVE 4 BAGS AND THEY SHALL BE OVERLAPPED BY 6".

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

3 R4.8 INLET PROTECTION TYPE 4

DRAWING NO. 915 REVISED 12-06

CleanWater Services ●ur commitment is clear.

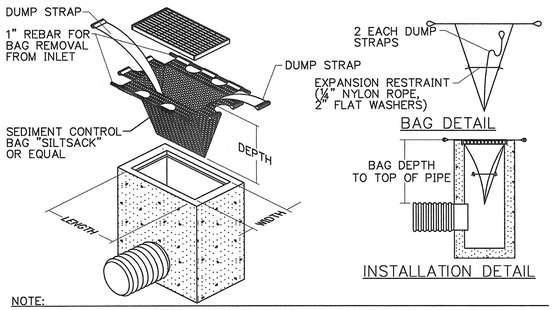


NOTES:

1. CONCRETE WASHOUT AREA. LOCATED SO RUNOFF CANNOT ENTER STORM SYSTEM. IF WASH-OUT CANNOT BE LOCATED MINIMUM OF 50' FROM ENTRY TO STORM SYSTEM, THAN SECONDARY MEASURES SUCH AS BERMS AND TEMPORARY SETTLING PITS MAY BE REQUIRED.
2. CONTRACTOR SHALL CLEAN OUT CONCRETE TRUCK WASH-OUT AREA WHEN DEPTH REACHES 1'.

4 R4.8 CONCRETE WASHOUT

N.T.S.

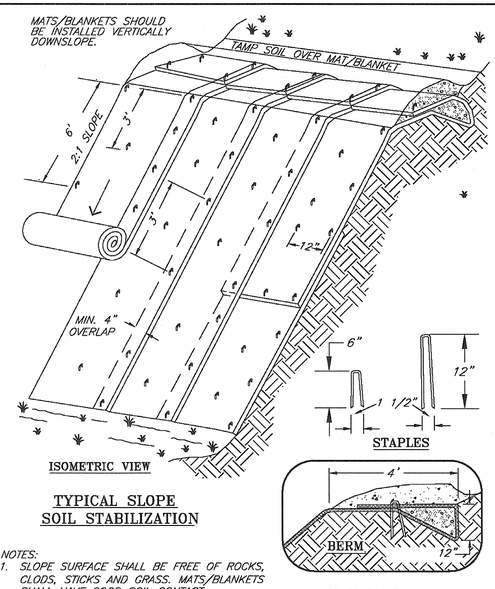


NOTE:

1. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE CORRECT SIZE DEVICE FOR EACH AREA DRAIN. THE CONTRACTOR SHALL MEASURE DIMENSIONS IN THE FIELD AND ORDER THE APPROPRIATE SIZE(S).
2. THE AREA DRAIN SEDIMENT CONTROL DEVICE SHALL BE OF REGULAR FLOW DESIGN (40 GAL/MIN/SF), AS PER THE MANUFACTURER'S SPECS.
3. THE SEDIMENT CONTROL DEVICE SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED A MINIMUM ONCE PER MONTH OR WITHIN THE 48 HOURS FOLLOWING A STORM EVENT.
4. SUBSTITUTION OF A SHEET OF FILTER FABRIC PLACED OVER THE OPENING OF THE AREA DRAIN IS NOT APPROVED.

5 R4.8 CATCH BASIN SEDIMENT FILTER BAG

N.T.S. CBSACK3



NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.

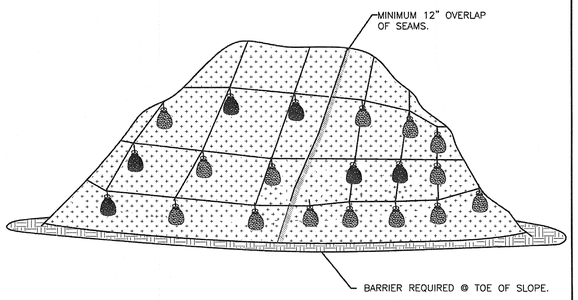
FILE: BLNKTSLP

6 R4.8 MATTING SLOPE INSTALLATION

DRAWING NO. 805 REVISED 12-06

CleanWater Services ●ur commitment is clear.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.



PLASTIC SHEETING

NOTES:

1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
2. BARRIER REQUIRED @ TOE OF STOCK PILE.
3. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.

7 R4.8 PLASTIC SHEETING

DRAWING NO. 810 REVISED 12-06

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Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE
IMPROVEMENTS AND
EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON MAY. 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
EROSION CONTROL
NOTES AND DETAILS

DRAWN BY: BMR

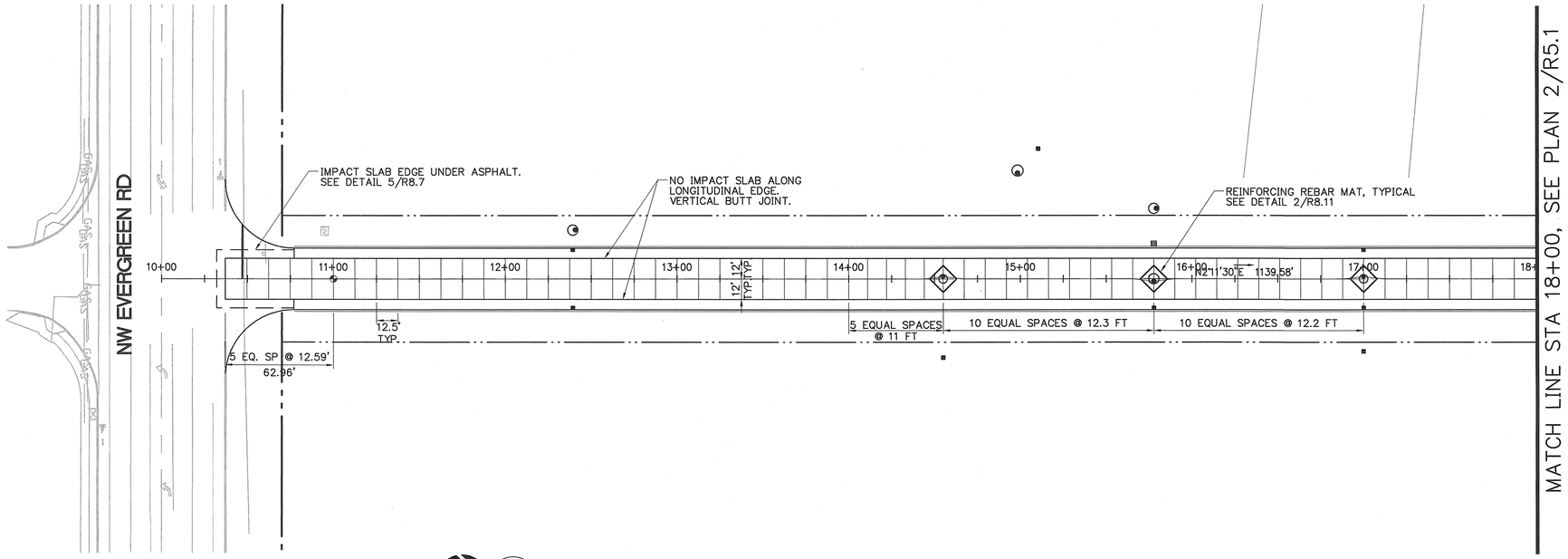
CHECKED BY: RJH

SHEET:
R4.8

JOB NO. 2120550.00

BID SET 5/1/2015

2120550000\CIVIL\550-R4.8.DWG BMR 05/06/15 09:45 1:1

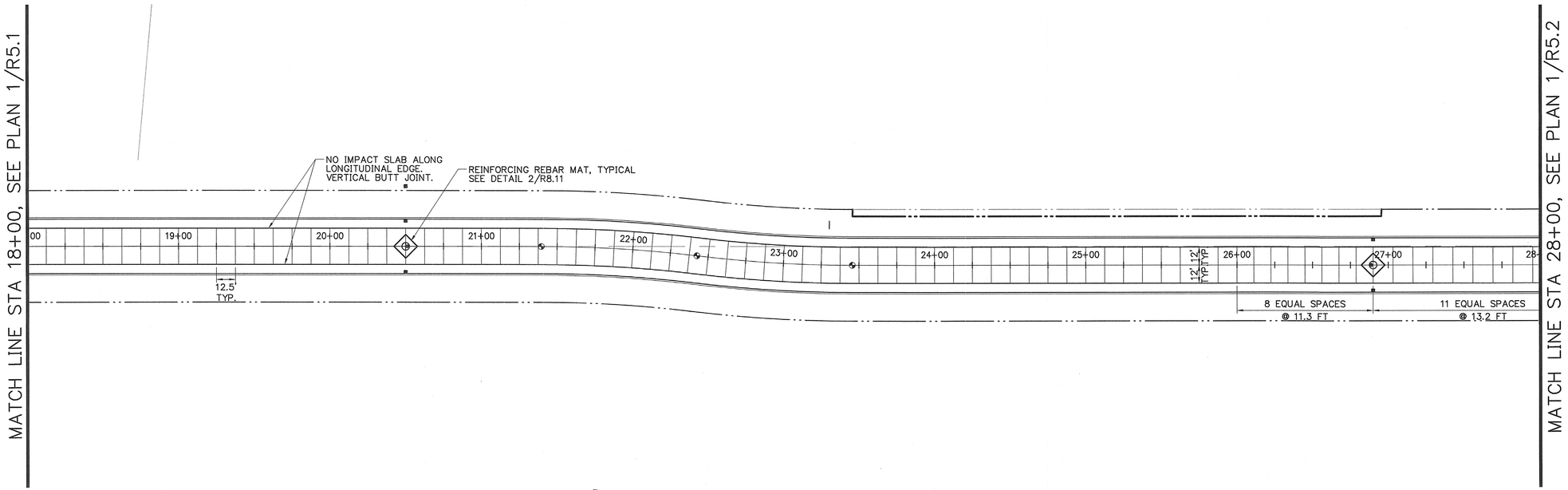


1 R5.1 PLAN STA 10+00 TO 18+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

NOTE

CENTERLINE JOINT SHALL USE DEFORMED BARS AND ALL OTHER JOINTS SHALL USE DOWELS. SEE DETAIL 5/R8.11 FOR DOWELING DETAILS.



2 R5.1 PLAN STA 18+00 TO 28+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

BID SET 5/1/2015

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY, 11, 2000 RALPH J.R. HENDERSON
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

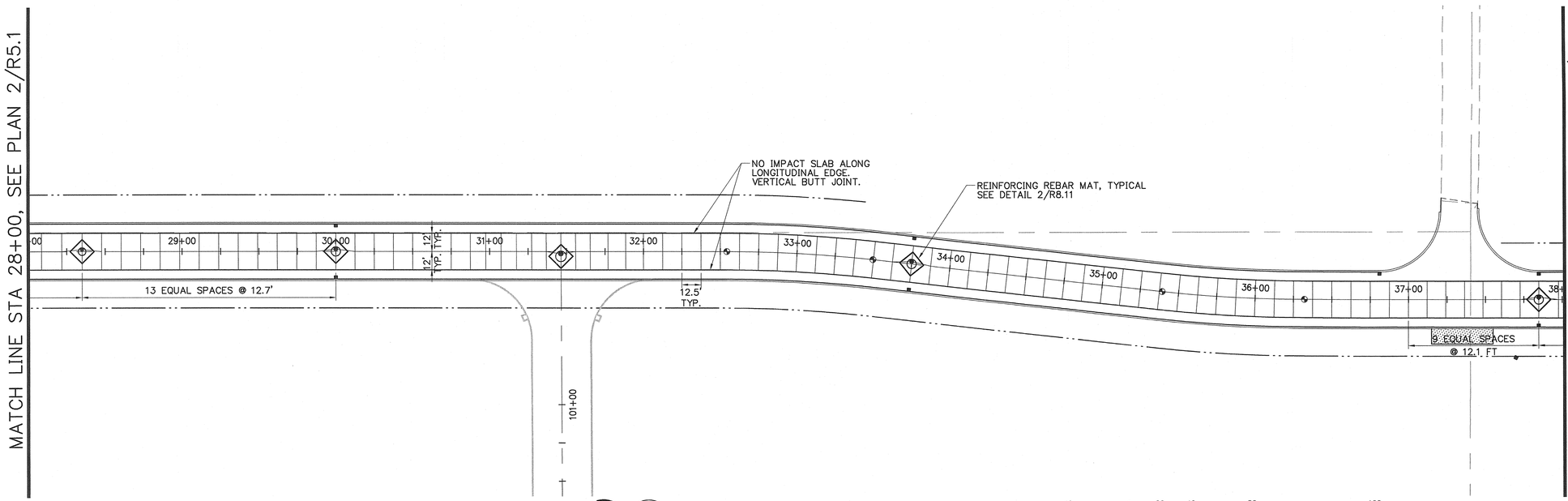
SHEET TITLE:
CONCRETE JOINTING PLAN
STA 10+00 TO
STA 28+00

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R5.1

JOB NO. 2120550.00

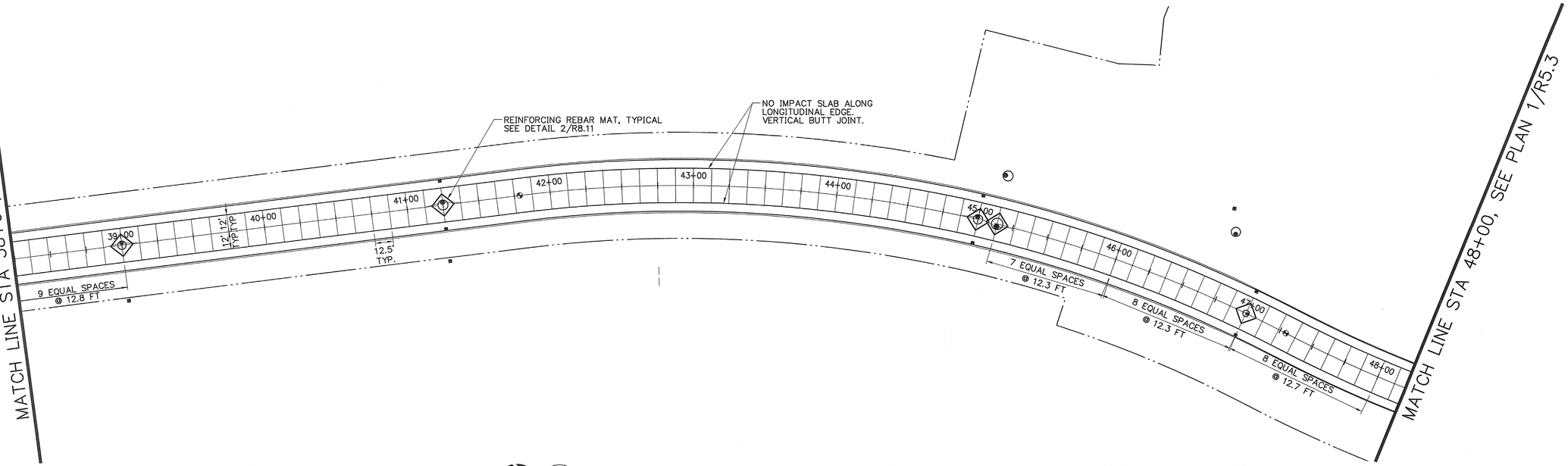


1 R5.2 PLAN STA 28+00 TO 38+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

NOTE

CENTERLINE JOINT SHALL USE DEFORMED BARS AND ALL OTHER JOINTS SHALL USE DOWELS. SEE DETAIL 5/R8.11 FOR DOWELING DETAILS.



2 R5.2 PLAN STA 38+00 TO 48+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

BID SET 5/1/2015

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REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY, 11, 2000 RALPH J.R. HENDERSON
Ralph J.R. Henderson
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

SHEET TITLE:
CONCRETE JOINTING PLAN
STA 28+00 TO
STA 48+00

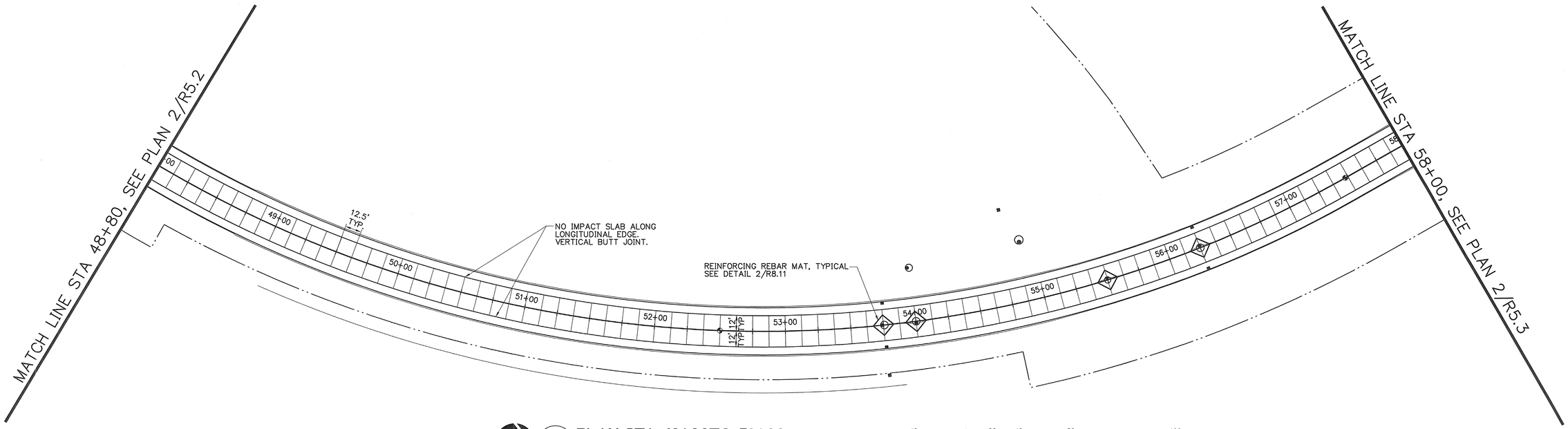
DRAWN BY: BMR

CHECKED BY: RJH

SHEET:

R5.2

JOB NO. 2120550.00

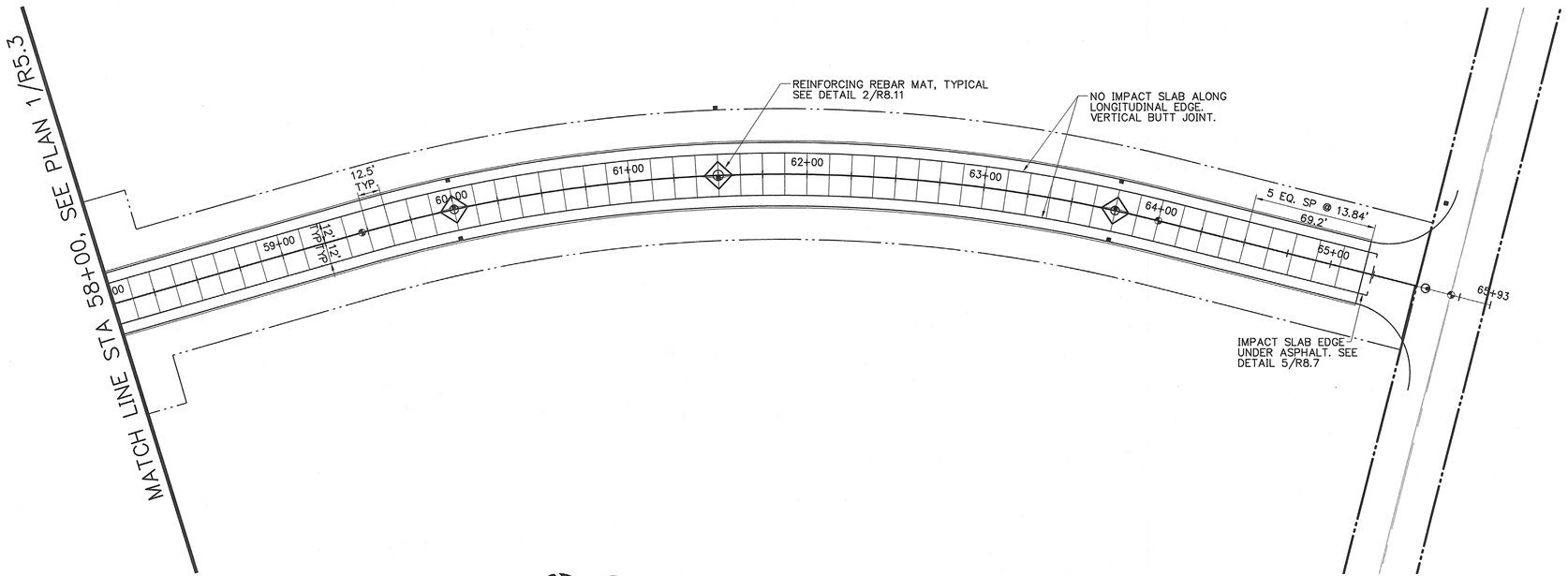


1 R5.3 PLAN STA 48+00TO 58+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

NOTE

CENTERLINE JOINT SHALL USE DEFORMED BARS AND ALL OTHER JOINTS SHALL USE DOWELS. SEE DETAIL 5/R8.11 FOR DOWELING DETAILS.



2 R5.3 PLAN STA 58+00 TO 66+00
1"=40'

1:1 40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

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NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY. 11, 2000 RALPH J.R. HENDERSON

Ralph J.A. Henderson

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISION DELTA CLOSING DATE

SHEET TITLE:
CONCRETE JOINTING PLAN
STA 48+00 TO
STA 66+00

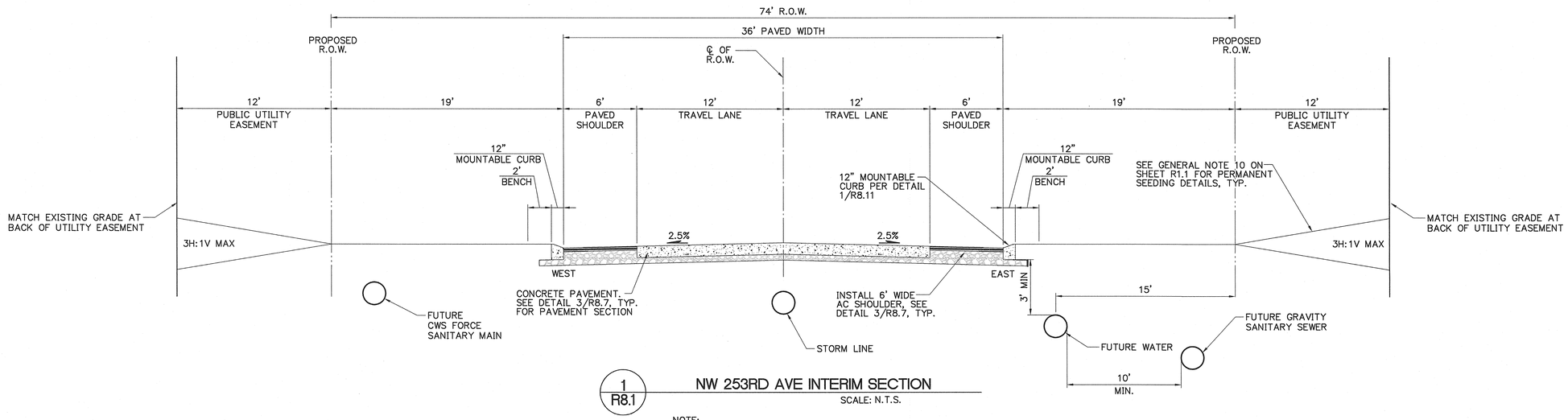
DRAWN BY: BMR

CHECKED BY: RJH

SHEET:

R5.3

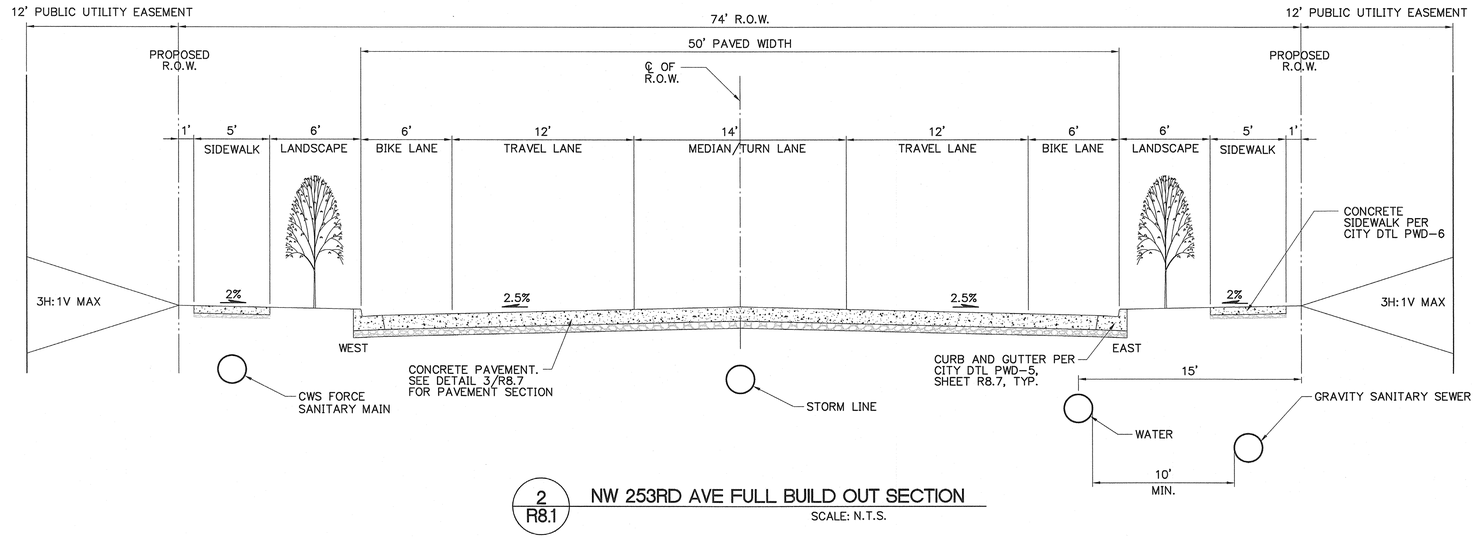
JOB NO. 2120550.00



1 / R8.1 NW 253RD AVE INTERIM SECTION

SCALE: N.T.S.

NOTE:
REFER TO THE "REPORT OF GEOTECHNICAL SERVICES, NW 253RD AVENUE FROM NW EVERGREEN ROAD TO MEEK ROAD" PREPARED BY GEODESIGN AND DATED FEBRUARY 25, 2013, FOR PAVEMENT SPECIFICATIONS.



2 / R8.1 NW 253RD AVE FULL BUILD OUT SECTION

SCALE: N.T.S.

NOTE:
REFER TO THE "REPORT OF GEOTECHNICAL SERVICES, NW 253RD AVENUE FROM NW EVERGREEN ROAD TO MEEK ROAD" PREPARED BY GEODESIGN AND DATED FEBRUARY 25, 2013, FOR PAVEMENT SPECIFICATIONS.

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NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56680 OREGON JULY. 11, 2000 RALPH J.R. HENDERSON
Ralph J.R. Henderson
EXPIRES: 6/30/15

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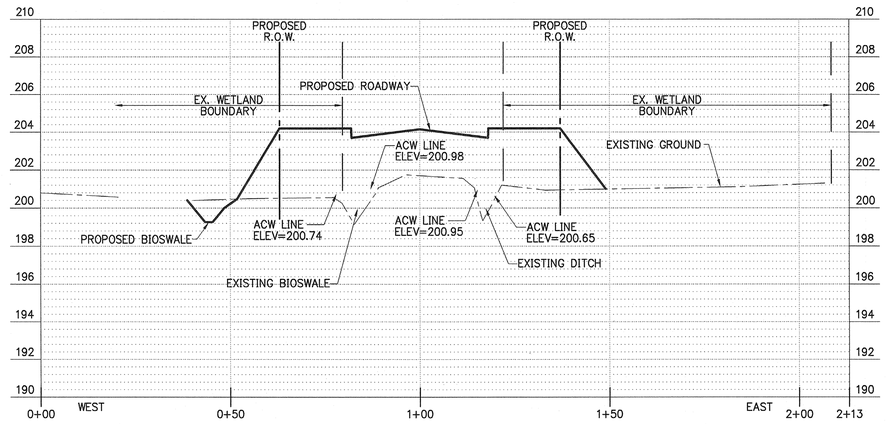
SHEET TITLE:
NW 253RD ROAD CROSS SECTION DETAILS

DRAWN BY: BMR

CHECKED BY: RJH

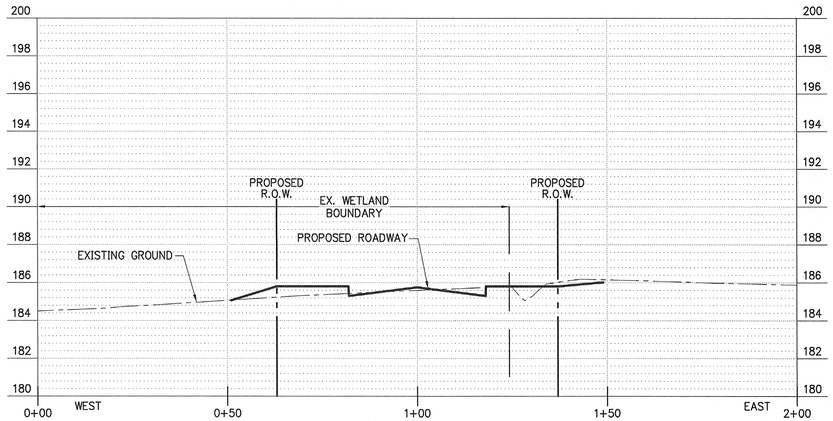
SHEET:
R8.1

JOB NO. 2120550.00



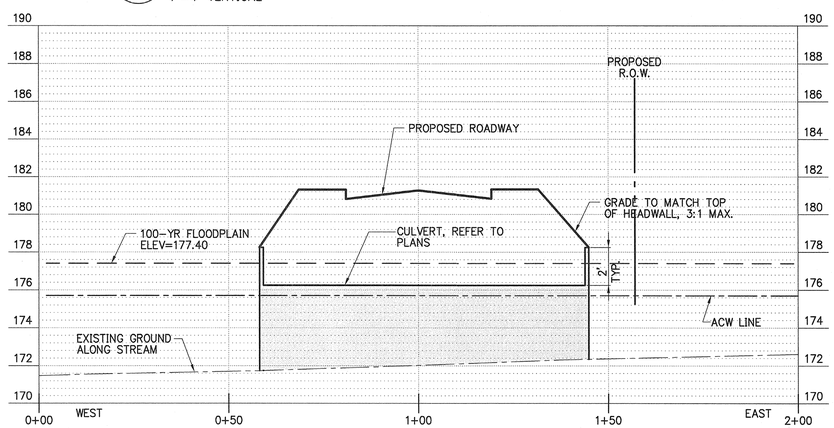
1 / R8.2 WETLAND SECTION 1 - STA 14+00

1"=20' HORIZONTAL
1"=4' VERTICAL



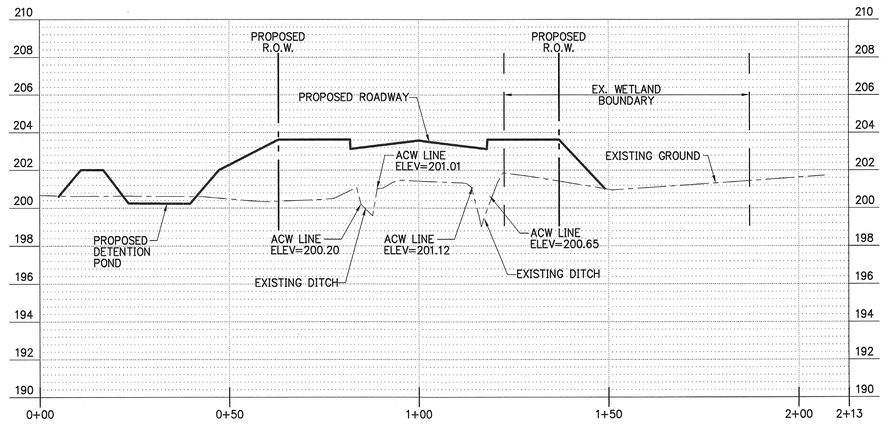
2 / R8.2 WETLAND SECTION 2 - 39+50

1"=20' HORIZONTAL
1"=4' VERTICAL



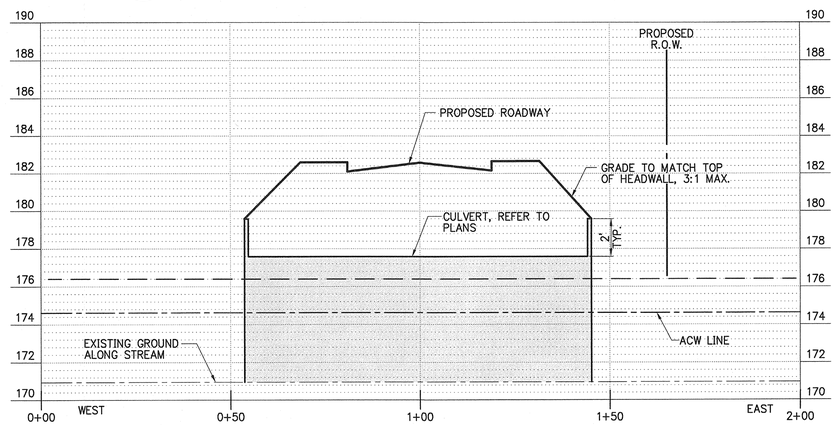
4 / R8.2 STREAM SECTION 1 - STA 47+20

1"=20' HORIZONTAL
1"=4' VERTICAL



3 / R8.2 DITCH SECTION 2 - STA 15+15

1"=20' HORIZONTAL
1"=4' VERTICAL



5 / R8.2 STREAM SECTION 2 - STA 55+73

1"=20' HORIZONTAL
1"=4' VERTICAL

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NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JAN. 11, 2000 RALPH J.R. HENDERSON

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REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
WETLAND STREAM AND CROSS-SECTION DETAILS

DRAWN BY: BMR
CHECKED BY: RJH

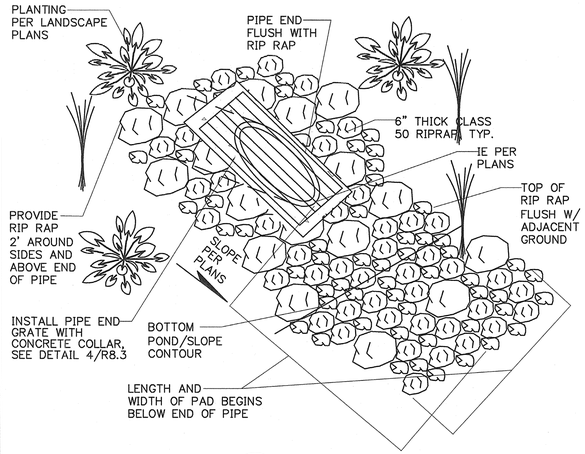
SHEET:
R8.2

JOB NO. 2120550.00

FLOW CONTROL STRUCTURE TABLE

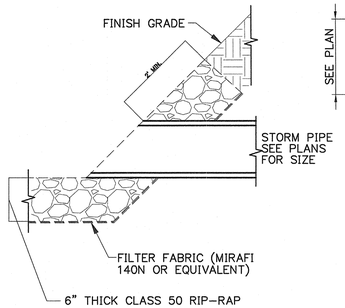
	POND A	POND B	POND C
CONTROL MANHOLE DIAMETER (IN)	72	72	72
FLOW LINE (IN)	199.50	176.90	176.76
FLOW LINE (OUT)	199.50	176.90	176.76
OUTLET PIPE DIAM. (IN)	12	15	12
NUMBER OF ORIFICES	2	2	2
ORIFICE A ELEV	199.59	177.90	176.90
ORIFICE A DIAM (IN)	0.79	1.54	1.11
ORIFICE B ELEV	200.45	178.67	178.68
ORIFICE B DIAM (IN)	12.00	12.00	11.00
OVERFLOW ELEV	201.36	180.14	179.87
RIM ELEV	202.86	181.64	181.34
RISER DIAM (IN)	12	12	12

1 R8.3 FLOW CONTROL STRUCTURE TABLE
N.T.S.

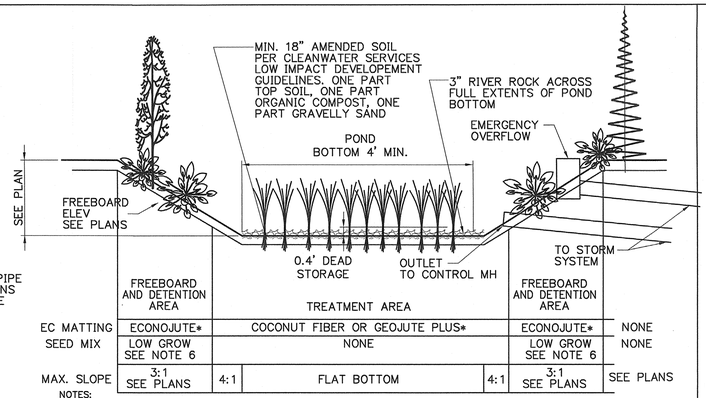


3 R8.3 PIPE OUTFALL
N.T.S.

PIPE-OUTFALL
1:1



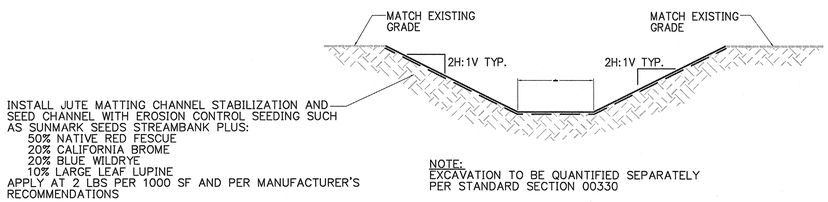
SECTION



	FREEBOARD AND DETENTION AREA		TREATMENT AREA		FREEBOARD AND DETENTION AREA	
EC MATTING	ECONOJUTE*		COCONUT FIBER OR GEOJUTE PLUS*		ECONOJUTE*	NONE
SEED MIX	LOW GROW SEE NOTE 6		NONE		LOW GROW SEE NOTE 6	NONE
MAX. SLOPE	3:1 SEE PLANS	4:1	FLAT BOTTOM	4:1	3:1 SEE PLANS	SEE PLANS

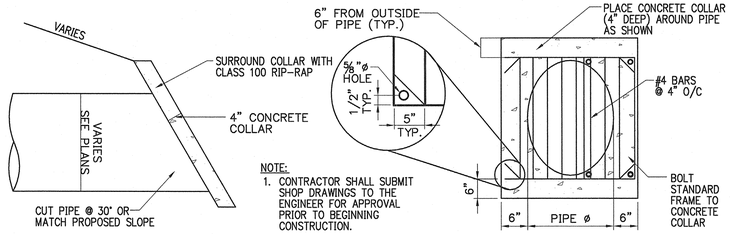
NOTES:
1. SEE LANDSCAPE PLANS AND SPECIFICATIONS FOR REQUIREMENTS INCLUDING TREE PLACEMENT, AMENDED SOIL AND ALL PLANTING SPECIFICATIONS.
2. PROVIDE IRRIGATION AS PER THE LANDSCAPE PLAN.
3. 18-INCHES OF AMENDED SOIL SHALL BE PLACED THROUGHOUT THE WATER QUALITY FACILITY.
4. SEE CIVIL PLANS FOR LOCATION, DIMENSION AND GRADING OF POND. SEE STORM REPORT FOR SIZING AND TREATMENT CALCULATIONS.
5. JUTE MATTING - GEOJUTE PLUS IN TREATMENT AREA, ECONOJUTE FOR ALL OTHER AREAS, OR SIMILAR FABRICS. COCONUT FIBER IS ALSO ACCEPTABLE.
6. FREEBOARD AREA SEED MIX: DWARF TALL FESCUE 40%, DWARF PERENIAL RYE 30%, CREEPING RED FESCUE 25%, COLONIAL BENT GRASS 5%. APPLY AT 120 LB/ACRE, SEE LANDSCAPE PLAN FOR PLACEMENT LOCATION.

5 R8.3 TYPICAL POND SECTION
N.T.S.
CWS STD DTL 700, MODIFIED BY GROUP MACKENZIE



NOTE:
EXCAVATION TO BE QUANTIFIED SEPARATELY PER STANDARD SECTION 00330

2 R8.3 DRAINAGE DITCH TYPICAL SECTION
N.T.S.



NOTE:
1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION.

4 R8.3 PIPE END GRATE
N.T.S.

PIPE_END_GRATE

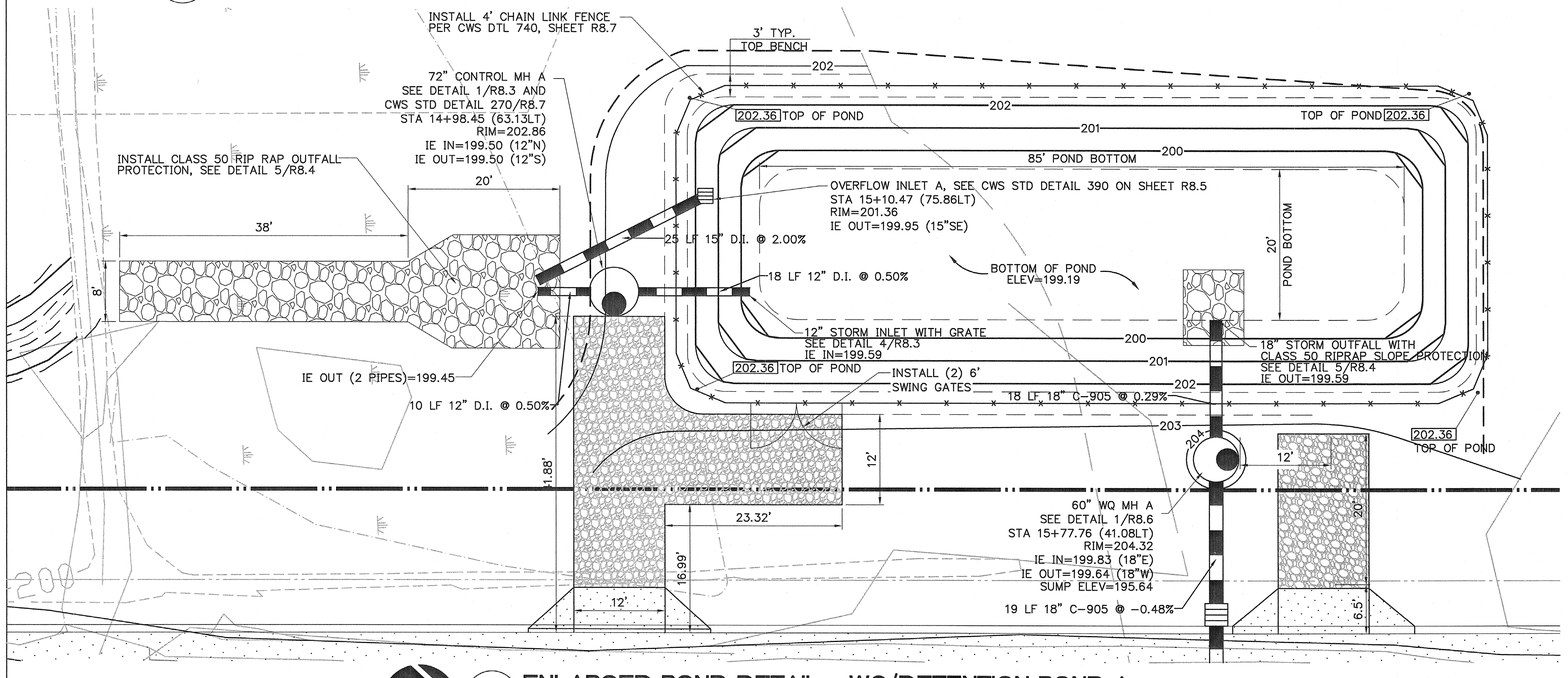
WQ / DETENTION POND STANDARD NOTES

CONSTRUCTION

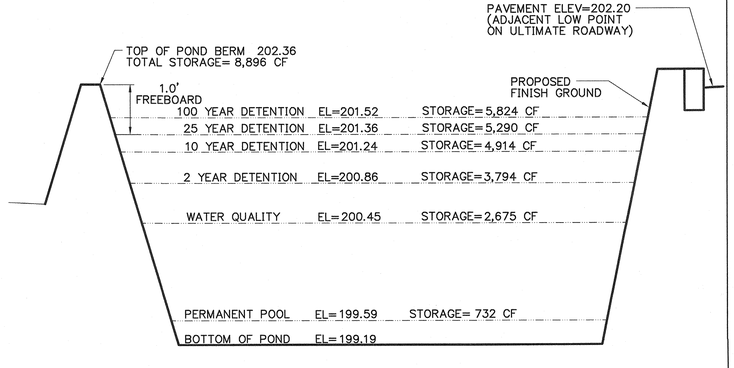
1. WATER QUALITY SWALE SHALL BE OVER-EXCAVATED AND FILLED TO FINAL GRADE WITH 18-INCH AMENDED TOPSOIL. TOPSOIL AMENDMENTS SHALL BE GARDEN COMPOST, NOT CONVENTIONAL FERTILIZER AMENDMENTS.
2. A BIODEGRADABLE EROSION CONTROL MATTING SHALL BE PLACED OVER THE TOPSOIL THROUGHOUT THE SWALE CROSS SECTION, FABRIC SHALL BE HELD IN PLACE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION REQUIREMENTS. ANCHOR SPACING SHALL BE BASED ON 3 FPS FLOW OVER THE FABRIC.
   A. TREATMENT AREA - HIGH-DENSITY JUTE MATTING (GEOJUTE PLUS OR OTHER APPROVED EQUAL)
   B. ALL OTHER AREAS - LOW-DENSITY JUTE MATTING (ECONOJUTE OR OTHER APPROVED EQUAL)
3. 2.5-3 INCHES OF 2"-1" RIVER RUN ROCK SHALL BE PLACED OVER THE MATTING EVENLY THROUGHOUT THE LENGTH AND WIDTH OF THE BOTTOM OF THE SWALE.
4. PLANT MATERIALS SHALL BE PLACED IN ACCORDANCE WITH THE PLAN AND PLANT TABLE AS SHOWN ON APPROVED PLANS.
5. THE WATER QUALITY SWALE TREATMENT AREA PLANTINGS CAN BE DEEMED "SUBSTANTIALLY COMPLETE" ONCE ACTIVE GREEN GROWTH HAS OCCURRED TO AN AVERAGE GROWTH OF 3" AND PLANT DENSITY IS AN AVERAGE OF APPROX. 6 PLANTS (MINIMUM 1-INCH PLUGS OR EQUIVALENT) PER SQUARE FOOT.
6. THE FACILITY SHALL BE DEEMED ACCEPTABLE TO BEGIN THE MAINTENANCE PERIOD WHEN PLANT GROWTH AND DENSITY MATCHES THE ENGINEER'S DESIGN AS SHOWN ON THE APPROVED PLANS AND ALL OTHER REQUIREMENTS HAVE BEEN MET. THE ENGINEER MUST CERTIFY THE FACILITY TO BE FUNCTIONAL, IN ACCORDANCE WITH THE APPROVED PLAN DESIGN TO BEGIN THE TWO-YEAR MAINTENANCE PERIOD.

MAINTENANCE

1. THE PERMITTEE IS RESPONSIBLE FOR THE MAINTENANCE OF THIS FACILITY FOR A MINIMUM OF TWO YEARS FOLLOWING CONSTRUCTION AND ACCEPTANCE OF THIS FACILITY PER CHAPTER 2.
2. IRRIGATION IS TO BE PROVIDED PER SEPARATE IRRIGATION PLAN AS APPROVED.
   NOTE: IRRIGATION NEEDS ARE TO BE MET USING A TEMPORARY IRRIGATION SYSTEM WITH A TIMER DURING THE DRY SEASON. SYSTEMS SHOULD BE WINTERIZED DURING THE WET SEASON TO ASSURE LONGEVITY AND GUARD AGAINST DAMAGE FROM FREEZING TEMPERATURES.
3. CITY OR CITY'S REPRESENTATIVE IS TO VISIT AND EVALUATE THE SITE A MINIMUM OF TWICE ANNUALLY (SPRING AND FALL). THE LANDSCAPING SHALL BE EVALUATED AND REPLANTED AS NECESSARY TO ENSURE A MINIMUM OF 80% SURVIVAL RATE OF THE REQUIRED VEGETATION AND 90% AERIAL COVERAGE. NON-NATIVE, INVASIVE PLANT SPECIES SHALL BE REMOVED WHEN OCCUPYING MORE THAN 20% OF THE SITE.
4. THE FACILITY SHALL BE RE-EXCAVATED AND PLANTED IF SILTATION GREATER THAN 3 INCHES IN DEPTH OCCURS WITHIN THE TWO-YEAR MAINTENANCE PERIOD.



6 R8.3 ENLARGED POND DETAIL - WQ/DETENTION POND A
SCALE: 1" = 10'



7 R8.3 SCHEMATIC WQ/DETENTION POND A
N.T.S.

BID SET 5/1/2015

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY, 11, 2000 RALPH J.R. HENDERSON
EXPIRES: 6/30/15

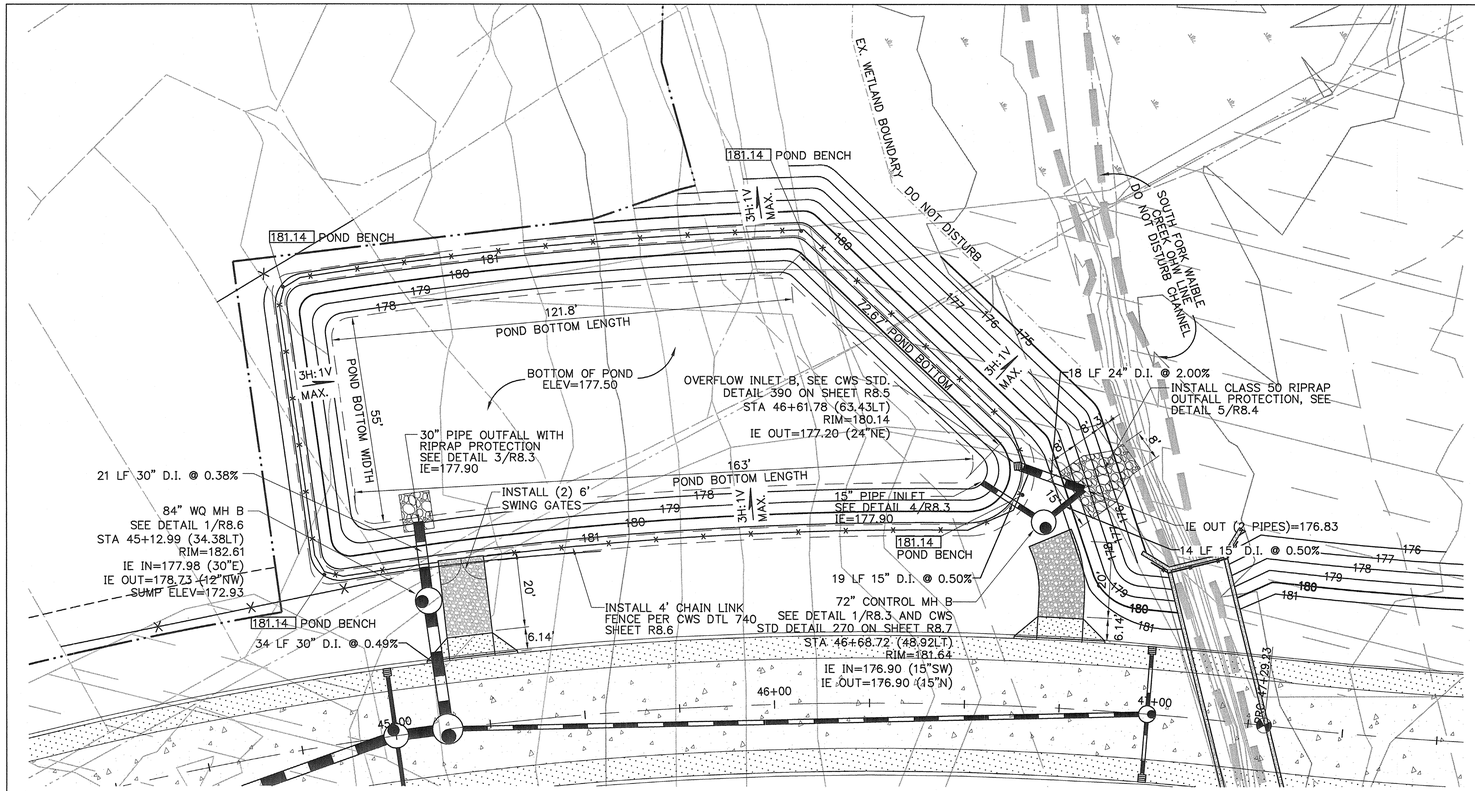
REVISIONS:

REVISION NO.	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
WATER QUALITY AND POND DETAILS

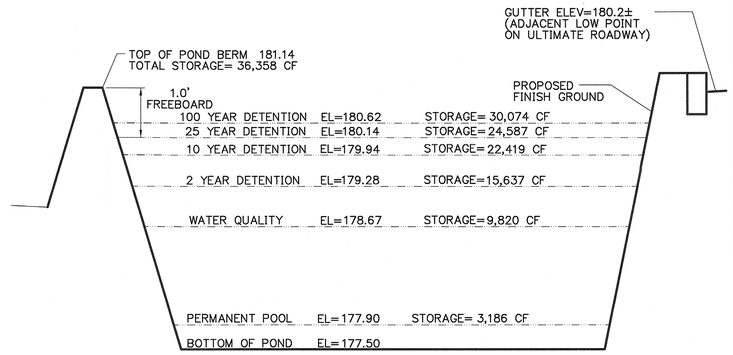
DRAWN BY: BDN
CHECKED BY: RJH
SHEET: R8.3
JOB NO. 2120550.00

2120550000\CIVIL\550-R8.3.DWG BMR 05/06/15 09:48 1:10



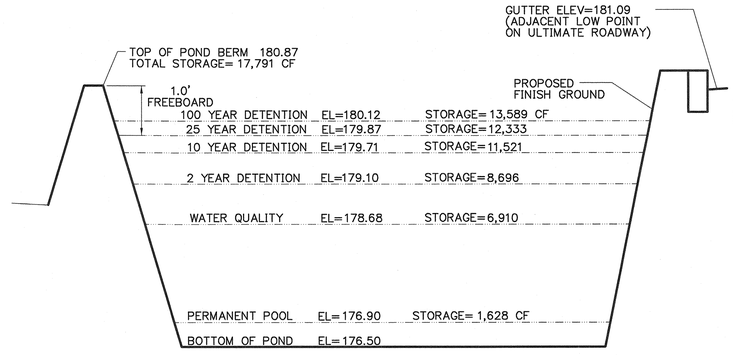
1 R8.4 POND DETAIL - WQ/DETENTION POND B

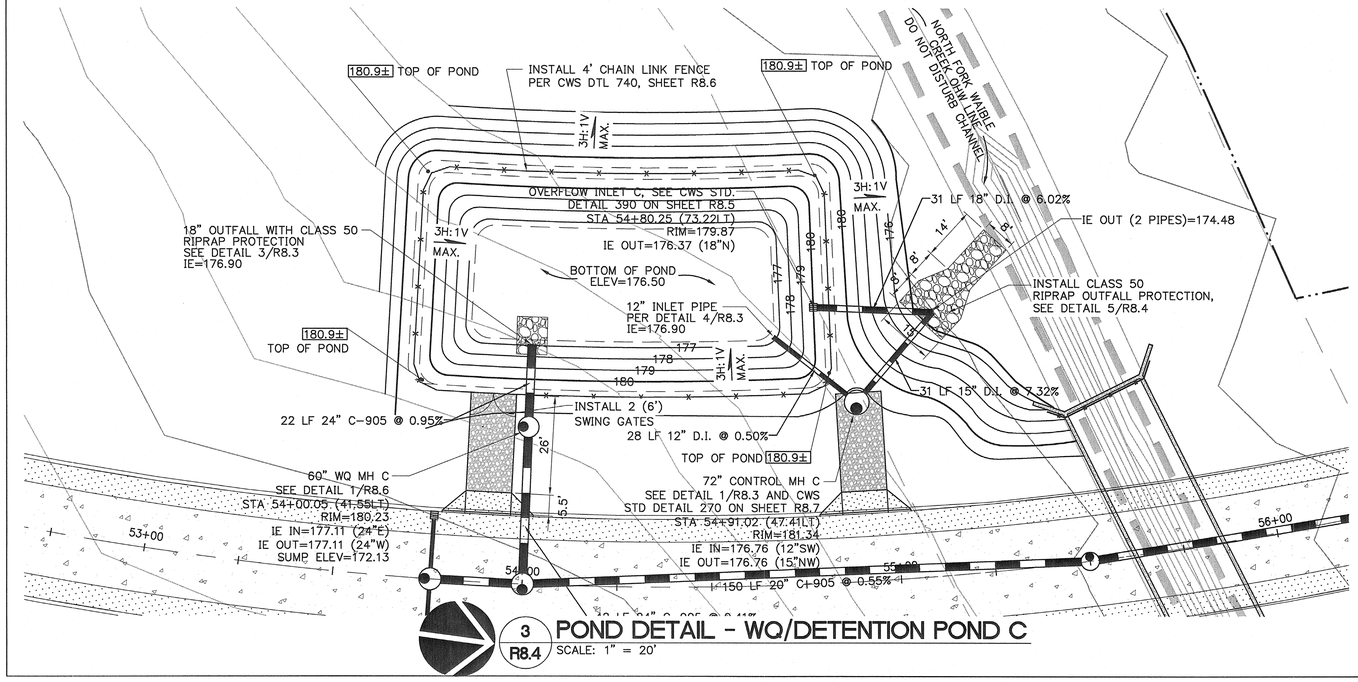
SCALE: 1" = 20'



2 R8.4 SCHEMATIC WQ/DETENTION POND B

N.T.S.



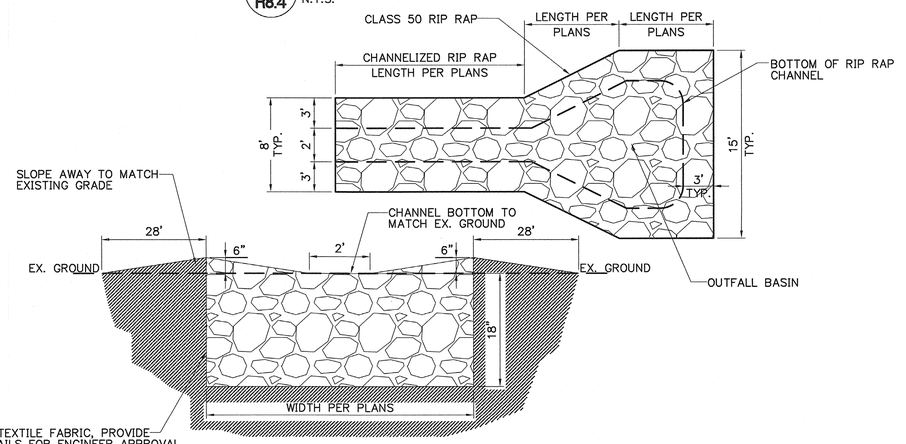


3 R8.4 POND DETAIL - WQ/DETENTION POND C

SCALE: 1" = 20'

4 R8.4 SCHEMATIC WQ/DETENTION POND C

N.T.S.



5 R8.4 CHANNELIZED RIP RAP OUTFALL DETAIL

N.T.S.

BID SET 5/1/2015

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Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56600 OREGON JULY 11, 2006 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA THIS SHEET	REVISIONS	REVISION DELTA CLOSING DATE

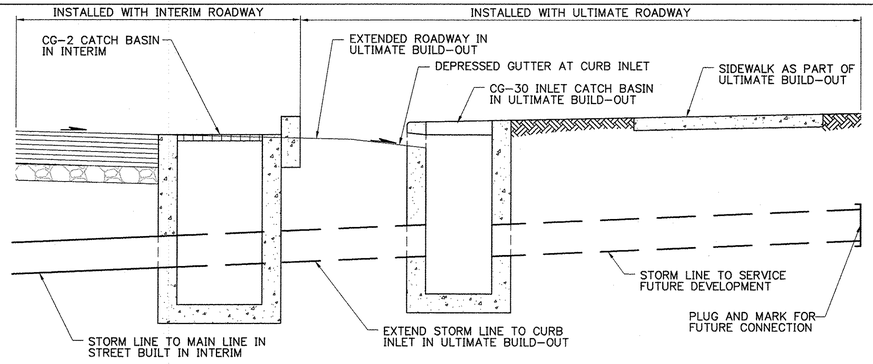
SHEET TITLE:
POND DETAILS

DRAWN BY: BDN

CHECKED BY: RJH

SHEET:
R8.4

JOB NO. 2120550.00



1 R8.5 STORM CONNECTION DETAIL

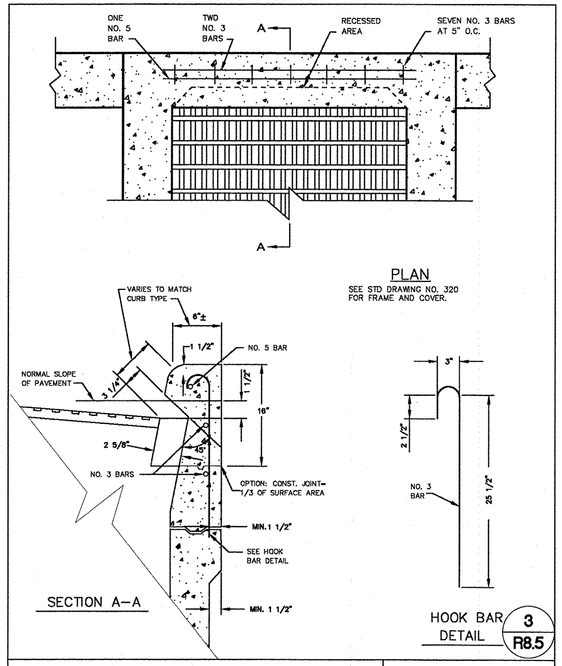
N.T.S.

1:1

2 R8.5 NOT USED

N.T.S.

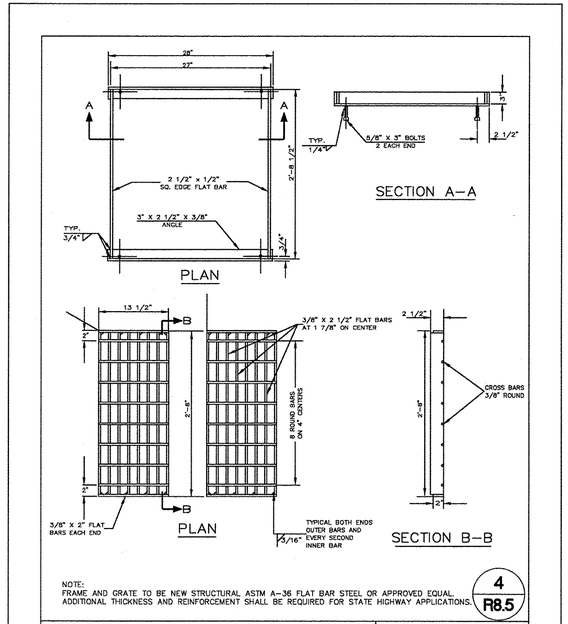
1:1



GUTTER & CURB INLET CATCH BASIN (CG-2) REINFORCEMENT

DRAWING NO 310 REVISED 12-06

CleanWater Services
Our commitment is clear.



CATCH BASIN FRAME AND GRATE (CG-2)

DRAWING NO. 320 REVISED 12-06

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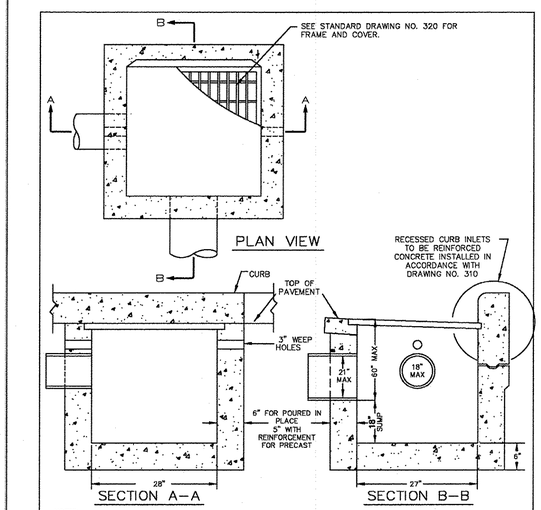

5 R8.5 GUTTER & CURB INLET CATCH BASIN (CG-2)

DRAWING NO. 300 REVISED 12-06

CleanWater Services
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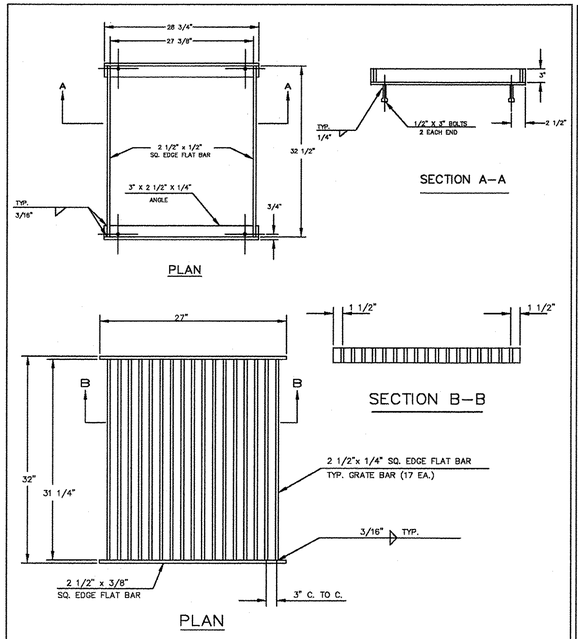

NOTE:
FRAME AND GRATE SHALL BE NEW STRUCTURAL ASTM A-36 FLAT BAR STEEL OR APPROVED EQUAL.

6 R8.5 DITCH INLET FRAME AND GRATE

DRAWING NO. 400 REVISED 12-06

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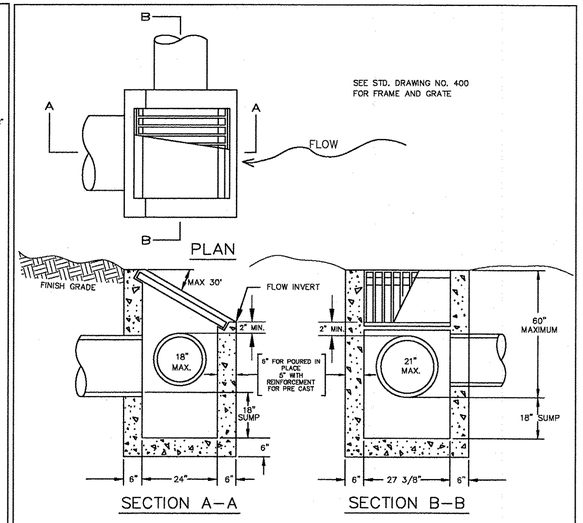

NOTES:
1. ALL PRE CAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C-478.
2. INSTALL STRUCTURE ON MINIMUM OF 8" OF 3/4" – 0" COMPACTED BASE MATERIAL.
3. PRE CAST REINFORCEMENT SHALL BE REBAR MEETING ASTM A615 GRADE 60 OR WELDED WIRE MEETING ASTM A497
4. ALL POURED IN PLACE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 3000 PSI AND SLUMP OF 2" TO 4".
5. PRE-CAST STRUCTURE'S CONFORMING TO O.D.O.T. TYPE G-2 CATCH BASIN DESIGN/WITH DITCH INLET TOP ARE AN ACCEPTABLE ALTERNATE. ALL GRATE MATERIALS SHALL MEET C.W.S. STANDARDS AS SHOWN ON DETAIL #400

7 R8.5 DITCH INLET

DRAWING NO. 390 REVISED 05-07

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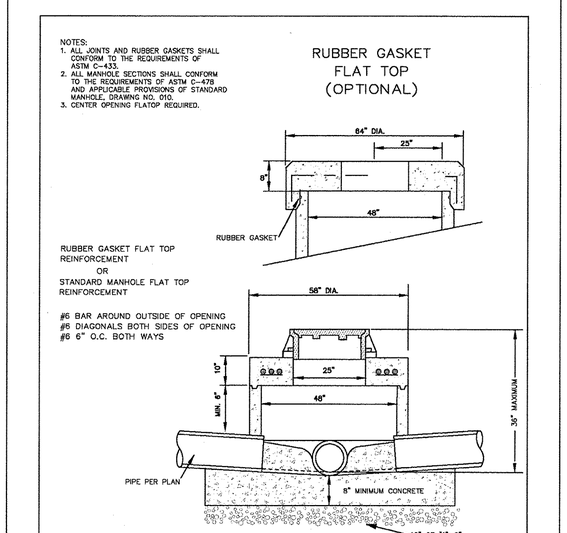

8 R8.5 SHALLOW FLAT TOP MANHOLE

DRAWING NO. 040 REVISED 02-03

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Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #19432 OREGON SEPT. 16, 1997 MATTHEW W. BUTTS
EXPIRES: 12/31/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
DETAIL SHEET

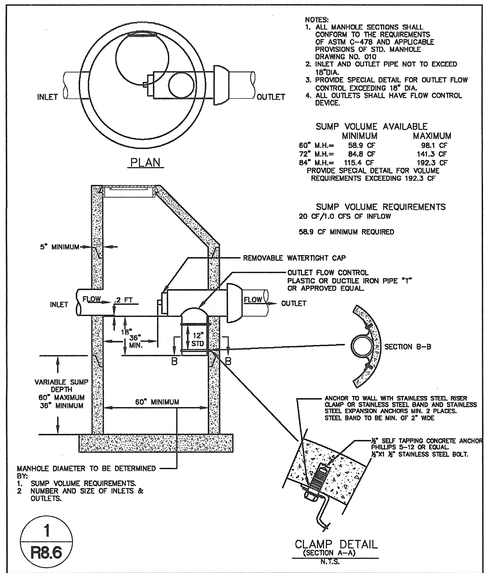
DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R8.5

JOB NO. 2120550.00

BID SET 5/1/2015

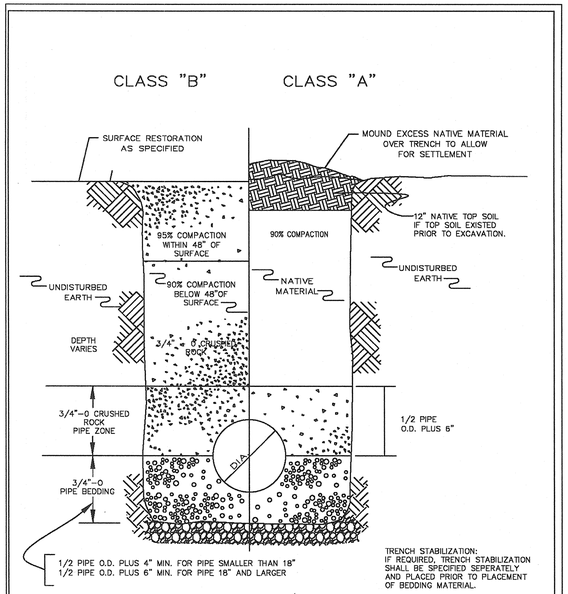


1 R8.6

WATER QUALITY MANHOLE (MECHANICAL)

DRAWING NO. 240 REVISED 12-06

CleanWater Services ●Our commitment is clear.



2 R8.6

NOTE:
ALL COMPACTTION REQUIREMENTS PER AASHTO T-99 AND ODOT/APWA SPEC 00405.

TRENCH BACKFILL DETAILS

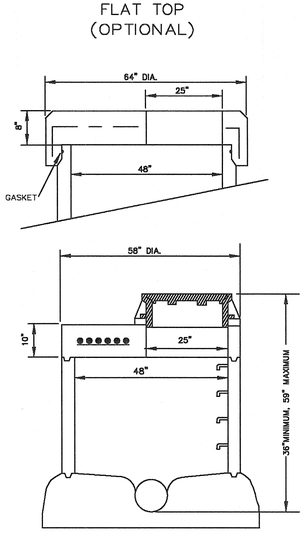
DRAWING NO. 590 REVISED 12-06

CleanWater Services ●Our commitment is clear.

NOTES:
1. ALL JOINTS AND RUBBER GASKETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-433.
2. ALL MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478 AND APPLICABLE PROVISIONS OF STANDARD MANHOLE, DRAWING NO. 010.
3. STEPS REQUIRED ON FLAT TOP MANHOLES DEEPER THAN 48".

RUBBER GASKET FLAT TOP REINFORCEMENT
OR
STANDARD MANHOLE FLAT TOP REINFORCEMENT

#6 BAR AROUND OUTSIDE OF OPENING
#6 DIAGONALS BOTH SIDES OF OPENING
#6 6" O.C. BOTH WAYS



3 R8.6

FLAT TOP MANHOLE

DRAWING NO. 050 REVISED 02-03

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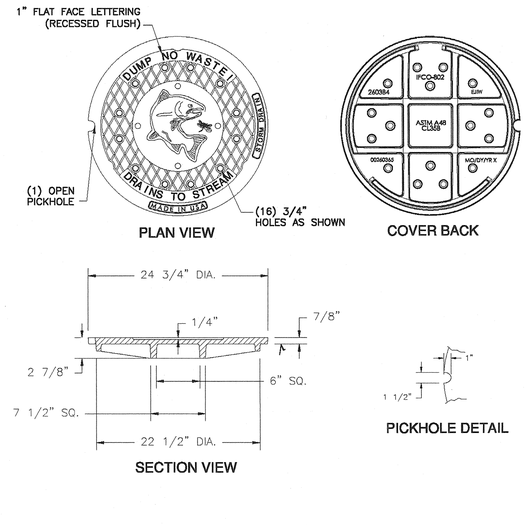

SEE DETAIL #110 FOR MANHOLE FRAME SPECIFICATIONS.

4 R8.6

STORM WATER MANHOLE LID

DRAWING NO. 120 REVISED 12-06

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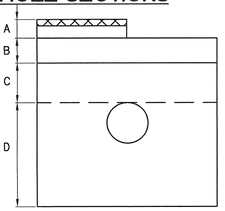
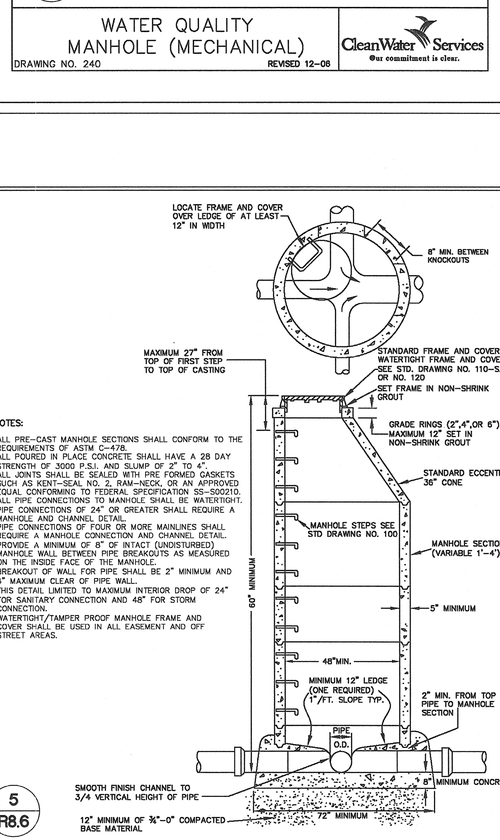
FLAT TOP MANHOLE SECTIONS

MH #	A	B	C	D
2	7"	10"	8.4"	41.0"
*5	7"	10"	5.8"	23.7"
6	7"	10"	5.9"	39.8"
7	7"	10"	14.4"	47.8"
14	7"	10"	20.3"	58.8"
*15	7"	10"	5.6"	34.8"
*16	7"	10"	4.0"	34.8"

NOTE: COLUMN C INCLUDES ASSUMPTION THAT GROUTING FOR PIPES WILL REQUIRE AN ADDITIONAL INCH IN DIAMETER CUT IN MH

*SHALLOW FLAT TOP MH, SEE DETAIL 8/R8.5





NOTES:
1. ALL PRE-CAST MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478.
2. ALL POURED IN PLACE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 3000 P.S.I. AND SLUMP OF 2" TO 4".
3. ALL JOINTS SHALL BE SEALED WITH PRE FORMED GASKETS SUCH AS KENT-SEAL NO. 2, RAM-NECK, OR AN APPROVED EQUAL CONFORMING TO FEDERAL SPECIFICATION SS-S00210.
4. ALL PIPE CONNECTIONS TO MANHOLE SHALL BE WATERTIGHT.
5. PIPE CONNECTIONS OF 24" OR GREATER SHALL REQUIRE A MANHOLE AND CHANNEL DETAIL.
6. PIPE CONNECTIONS OF FOUR OR MORE MAINLINES SHALL REQUIRE A MANHOLE CONNECTION AND CHANNEL DETAIL.
7. PROVIDE A MINIMUM OF 8" OF INTACT (UNDISTURBED) MANHOLE WALL BETWEEN PIPE BREAKOUTS AS MEASURED ON THE INSIDE FACE OF THE MANHOLE.
8. BREAKOUT OF WALL FOR PIPE SHALL BE 2" MINIMUM AND 4" MAXIMUM CLEAR OF PIPE WALL.
9. THIS DETAIL LIMITED TO MAXIMUM INTERIOR DROP OF 24" FOR SANITARY CONNECTION AND 48" FOR STORM CONNECTION.
10. WATERTIGHT/TAMPER PROOF MANHOLE FRAME AND COVER SHALL BE USED IN ALL EASEMENT AND OFF STREET AREAS.

5 R8.6

STANDARD MANHOLE

DRAWING NO. 010 REVISED 02-03

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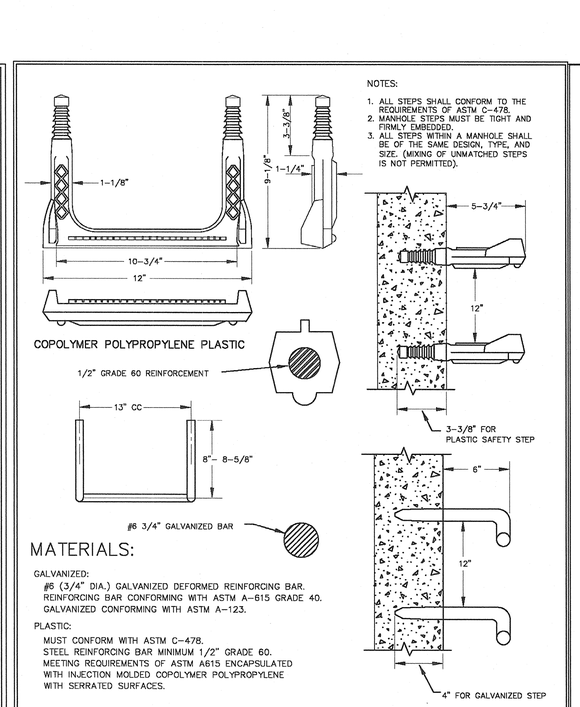

MATERIALS:

GALVANIZED:
#6 (3/4" DIA.) GALVANIZED DEFORMED REINFORCING BAR. REINFORCING BAR CONFORMING WITH ASTM A-615 GRADE 40. GALVANIZED CONFORMING WITH ASTM A-123.

PLASTIC:
MUST CONFORM WITH ASTM C-478.
STEEL REINFORCING BAR MINIMUM 1/2" GRADE 60. MEETING REQUIREMENTS OF ASTM A615 ENCAPSULATED WITH INJECTION MOLDED COPOLYMER POLYPROPYLENE WITH SERRATED SURFACES.

6 R8.6

MANHOLE STEP

DRAWING NO. 100 REVISED 02-03

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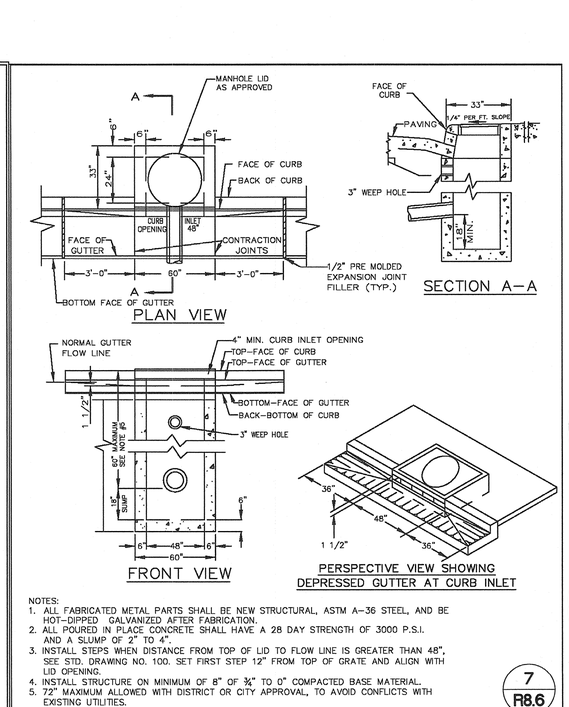

NOTES:
1. ALL FABRICATED METAL PARTS SHALL BE NEW STRUCTURAL, ASTM A-36 STEEL, AND BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
2. ALL POURED IN PLACE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 3000 P.S.I. AND A SLUMP OF 2" TO 4".
3. INSTALL STEPS WHEN DISTANCE FROM TOP OF LID TO FLOW LINE IS GREATER THAN 48", SEE STD. DRAWING NO. 100. SET FIRST STEP 12" FROM TOP OF GRATE AND ALIGN WITH LID OPENING.
4. INSTALL STRUCTURE ON MINIMUM OF 8" OF ¾" TO 0" COMPACTED BASE MATERIAL.
5. 72" MAXIMUM ALLOWED WITH DISTRICT OR CITY APPROVAL, TO AVOID CONFLICTS WITH EXISTING UTILITIES.

7 R8.6

INLET CATCH BASIN (CG-48)

DRAWING NO. 340 REVISED 05-07

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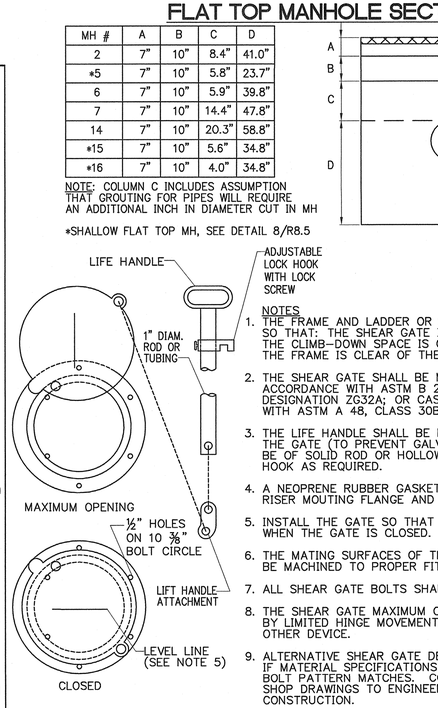

NOTES
1. THE FRAME AND LADDER OR STEPS ARE TO BE OFFSET SO THAT: THE SHEAR GATE IS VISIBLE FROM THE TOP: THE CLIMB-DOWN SPACE IS CLEAR OF RISER AND GATE; THE FRAME IS CLEAR OF THE CURB.
2. THE SHEAR GATE SHALL BE MADE OF ALUMINUM ALLOY IN ACCORDANCE WITH ASTM B 26M AND ASTM B 275, DESIGNATION ZG32A; OR CAST IRON IN ACCORDANCE WITH ASTM A 48, CLASS 30B.
3. THE LIFE HANDLE SHALL BE MADE OF SIMILAR METAL TO THE GATE (TO PREVENT GALVANIC CORROSION). IT MAY BE OF SOLID ROD OR HOLLOW TUBING WITH ADJUSTABLE HOOK AS REQUIRED.
4. A NEOPRENE RUBBER GASKET IS REQUIRED BETWEEN THE RISER MOUTING FLANGE AND THE GATE FLANGE.
5. INSTALL THE GATE SO THAT THE LEVEL-LINE IS LEVEL WHEN THE GATE IS CLOSED.
6. THE MATING SURFACES OF THE LID AND THE BODY SHALL BE MACHINED TO PROPER FIT.
7. ALL SHEAR GATE BOLTS SHALL BE STAINLESS STEEL.
8. THE SHEAR GATE MAXIMUM OPENING SHALL BE CONTROLLED BY LIMITED HINGE MOVEMENT, A STOP TAB, OR SOME OTHER DEVICE.
9. ALTERNATIVE SHEAR GATE DESIGNS ARE ACCEPTABLE, IF MATERIAL SPECIFICATIONS ARE MET AND FLANGE BOLT PATTERN MATCHES. CONTRACTOR TO SUBMIT SHOP DRAWINGS TO ENGINEER PRIOR TO ORDERING OR CONSTRUCTION.

8 R8.6

SHEAR GATE DETAIL

N.T.S. 1:1

BID SET 5/1/2015

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Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY, 11, 2000 RALPH J.R. HENDERSON
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
DETAIL SHEET

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R8.6

JOB NO. 2120550.00

2120550000\CIVIL\550-R8.6.DWG BMR 05/06/15 09:49 1:20.00

DRAWING NO. 270

FLOW CONTROL STRUCTURE DETAIL

REVISED 12-06

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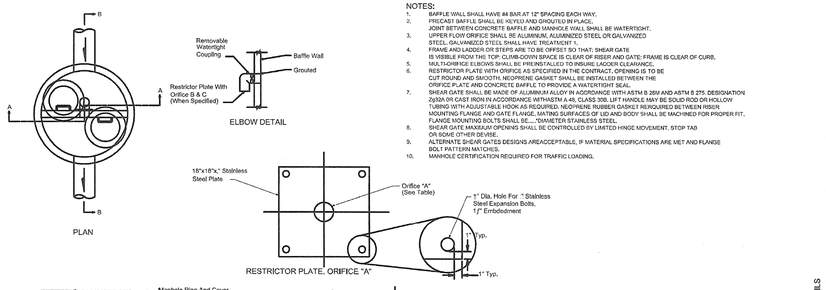

FLOW CONTROL STRUCTURE DETAIL
NTS

1
R8.7

*SEE DETAIL 1/R8.3 FOR FLOW CONTROL STRUCTURE TABLE INFORMATION

NOTES:
1. BAFFLE WALL SHALL HAVE #4 BAR AT 12" SPACING EACH WAY.
2. PRECAST BAFFLE SHALL BE KEYED AND GROUTED IN PLACE. JOINT BETWEEN CONCRETE BAFFLE AND MANHOLE WALL SHALL BE WATERTIGHT.
3. UPPER FLOW ORIFICE SHALL BE ALUMINUM, ALUMINIZED STEEL OR GALVANIZED STEEL. GALVANIZED STEEL SHALL HAVE TREATICNT 1.
4. FRAME AND LADDER OR STEPS ARE TO BE OFFSET SO THAT SHEAR GATE IS VISIBLE FROM THE TOP. CLIMB-DOWN SPACE IS CLEAR OF RISER AND GATE; FRAME IS CLEAR OF CURB.
5. MULTI-ORIFICE ELBOWS SHALL BE PREINSTALLED TO INSURE LADDER CLEARANCE.
6. RESTRICTOR PLATE WITH ORIFICE AS SPECIFIED IN THE CONTRACT, OPENING IS TO BE CUT ROUND AND SMOOTH. NEOPRENE GASKET SHALL BE INSTALLED BETWEEN THE ORIFICE PLATE AND CONCRETE BAFFLE TO PROVIDE A WATERTIGHT SEAL.
7. SHEAR GATE SHALL BE MADE OF ALUMINUM ALLOY IN ACCORDANCE WITH ASTM B 26V AND ASTM B 275. DESIGNATION 2g3bX OR CAST IRON IN ACCORDANCE WITHASTM A 48, CLASS 30B. LIFT HANDLE MAY BE SOLID ROD OR HOLLOW TUBING WITH ADJUSTABLE HOOK AS REQUIRED. NEOPRENE RUBBER GASKET REROUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE. MATING SURFACES OF LID AND BODY SHALL BE MACHINED FOR PROPER FIT. FLANGE MOUNTING BOLTS SHALL BE....."DIAMETER STAINLESS STEEL
8. SHEAR GATE MAXIMUM OPENING SHALL BE CONTROLLED BY LIMITED HINGE MOVEMENT. STOP TAB OR SOME OTHER DEVISE.
9. ALTERNATE SHEAR GATES DESIGNS AREACCEPTABLE, IF MATERIAL SPECIFICATIONS ARE MET AND FLANGE BOLT PATTERN MATCHES.
10. MANHOLE CERTIFICATION REQUIRED FOR TRAFFIC LOADING.

DRAINAGE DETAILS

2B-2

DRAWING NO. 740

CHAIN LINK FENCE AND GATE

REVISED 12-06

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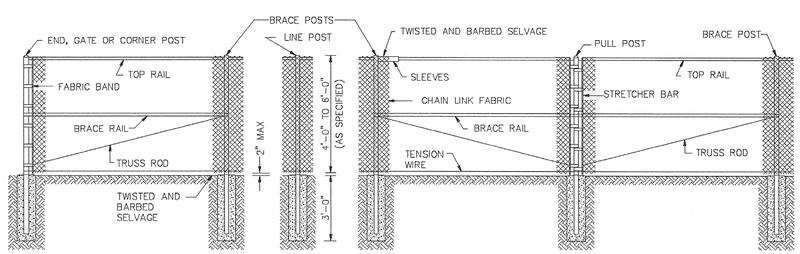
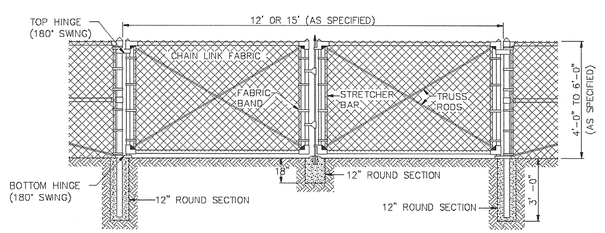
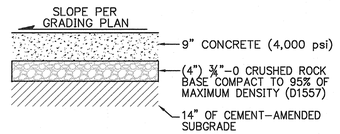
MEMBER	NOMINAL DIA (IN)	MATERIAL	
BRACE RAIL	1.660	GALV TUBULAR STL	
GATE FRAME	2.00	GALV TUBULAR STL	
LINE POSTS	2.375	GALV TUBULAR STL	
END & CORNER POST	2.875	GALV TUBULAR STL	
CHAIN LINK FABRIC		9 GA. W/GREEN OR BLACK PVC COATING.	
	GATE OPENING (ft)	NOMINAL DIA (IN)	MATERIAL
GATE POST	12' OR 15'	4	GALV TUBULAR STL

NOTES:
1. ALL FITTINGS, FASTENERS, & AND FABRIC TIES SHALL BE HOT DIP GALV.
2. CONC SHALL BE MIN 2500 PSI @ 28 DAYS.
3. PROVIDE BRACE RAIL BETWEEN END POSTS AND LINE POSTS. LENGTHS AS REQ'D.
4. PROVIDE GATE STOPS AND DROP RECEIVERS SET IN CONCRETE, EACH GATE.
5. PROVIDE EXTENSION ARMS ON LINE, END AND CORNER POSTS & GATE POSTS AS REQ'D.
6. PROVIDE SIGHT OBSCURING SLATS WITH ALL WASTEWATER PUMP STATIONS.
7. CENTER BRACE RAIL NOT REQUIRED WITH FENCE HEIGHT OF 5' OR LESS.
8. ALL POSTS AND RAILS TO MATCH FENCE COLOR.

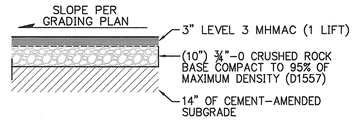




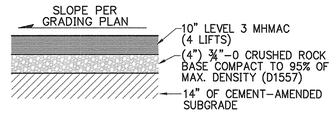
2
R8.7



CONCRETE PAVING



AC PAVING – NW 253RD SHOULDERS



AC PAVEMENT – INTERSECTIONS

NOTES:

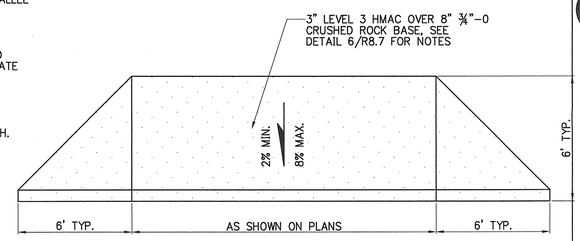
1. REFER TO THE "REPORT OF GEOTECHNICAL ENGINEERING SERVICES, NW 253RD AVENUE FROM NW EVERGREEN ROAD TO MEEK ROAD" PREPARED BY GEODESIGN AND DATED FEBRUARY 25, 2013, FOR PAVEMENT SPECIFICATIONS.
2. PCC SHALL BE CLASS 4000 1½" PLAIN DOWELED CONCRETE AS LISTED IN THE 2008 OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION SECTION 00756 (PLAIN DOWELED CONCRETE PAVEMENT).
3. DOWELS SHALL BE 1¼" DIAMETER, SMOOTH, ROUND DOWEL BARS COATED WITH PLASTIC, GREASE, HEAVY OIL, OR OTHER APPROVED MATERIAL THAT WILL NEITHER BOND WITH, NOR HARM THE PCC. DOWELS SHALL BE PLACED WITHIN ⅜" OF THE CENTER OF THE SLAB, BE AT LEAST 18" IN LENGTH, BE PLACED 12" ON CENTERS, INSTALLED BY A METHOD THAT ENSURES ALL DOWELS ARE HELD PARALLEL WITH EACH OTHER, PARALLEL WITH THE SURFACE OF THE PAVEMENT AND PERPENDICULAR TO THE JOINT. MAXIMUM ALIGNMENT TOLERANCE SHALL BE 5' OR 3/16" IN THE LENGTH OF THE DOWEL.
4. TRANSVERSE AND LONGITUDINAL SAWED JOINTS SHALL BE AS SHOWN ON THE CONCRETE JOINTING PLAN. SAWING SHALL BE DONE AS SOON AS THE CONCRETE HAS SET ENOUGH TO PERMIT SAWING WITHOUT TEARING OR RAVELING. SAWING SHALL BE GUIDED TO THE TRUE LINE. SAW JOINTS SHALL BE FILLED WITH POURED RUBBER-ASPHALT FILLER WITH AN APPROVED MATERIAL ON THE STATE QPL, SAW JOINT SHALL BE FLUSHED OR VACUUMED TO REMOVE SLURRY BEFORE JOINT FILLER IS INSTALLED.
5. SEE DETAIL 1/R8.9 FOR CONCRETE JOINTING DETAILS.
6. TEXTURED FINISH – UPON COMPLETION OF THE MACHINE FLOATING, STRAIGHTEDGE TESTING, EDGE TOOLING AND, IF NECESSARY, HAND FLOATING, AND BEFORE INITIAL SET OF THE SURFACE CONCRETE, GIVE THE SURFACE OF THE CONCRETE A TEXTURED FINISH. ACCOMPLISH THE TEXTURED FINISH WITH A STEEL-TINE TOOL WITH ½" TINES THAT WILL WORK THE FINISHED CONCRETE TO A DEPTH OF 3/16" TO ⅛".RANDOMLY SPACE THE MARKINGS FROM ½" TO 1¼" AS APPROVED. AVOID OVERLAPS OF THE TEXTURING. WORKINGS SHALL BE TRANSVERSE TO THE ROADWAY CENTERLINE AND FULL ROADWAY WIDTH.

1. ALL AC DRIVEWAYS POURED WITHIN THE CITY RIGHT-OF-WAY SHALL BE 3" LEVEL 3 HMAC. BATCH MIX TICKETS SHALL BE MADE AVAILABLE AT INSPECTOR'S REQUEST.
2. SUB-BASE SHALL BE COMPACTED TO A FIRM & UNYIELDING SURFACE TRUE TO GRADE WITH UNIFORM BEARING STRENGTH. WHERE SUB GRADE HAS BEEN DISTURBED IN THE PREVIOUS 12 MONTHS OR UNSUITABLE AS DETERMINED BY THE CITY ENGINEER, CONSTRUCTION SHALL HAVE MIN. 2" OF 3/4" MINUS COMPACTED BASE ROCK, OR AS DIRECTED BY ENGINEER.

6 R8.7 DRIVEWAY NOTES

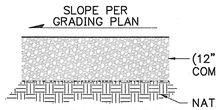
N.T.S.

1:1



3 R8.7 PAVEMENT SECTIONS

N.T.S.



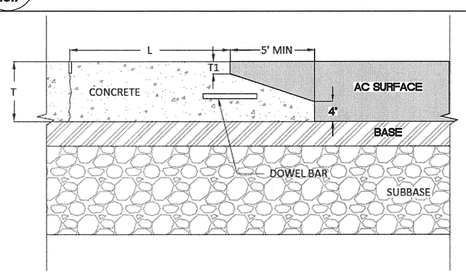
GRAVEL DRIVEWAY AREAS

NOTE:
REFER TO THE "REPORT OF GEOTECHNICAL SERVICES, NW 253RD AVENUE FROM NW EVERGREEN ROAD TO MEEK ROAD" PREPARED BY GEODESIGN AND DATED FEBRUARY 25, 2013, FOR PAVEMENT SPECIFICATIONS.

4 R8.7 GRAVEL DRIVEWAY/ACCESS ROAD

N.T.S.

1:1



NOTES
1. T = THICKNESS OF CONCRETE (MINIMUM 7")
2. L = PANEL LENGTH (JOINT SPACING)
3. T1 = (T + 1.5") / 2

5
R8.7

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CONCRETE IMPACT SLAB

VERIFY SCALES: BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" — IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY

SHEET NO. PW-192

PROJECT NO.

FILE NAME: PW-192.DWG

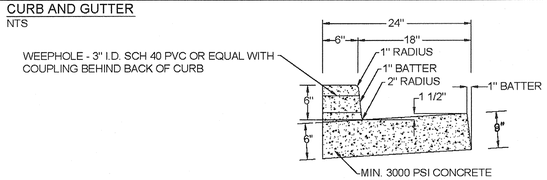
PLOT DATE: 6/4/2013 5:06 PM

7 R8.7 DRIVEWAY APPROACH DETAIL

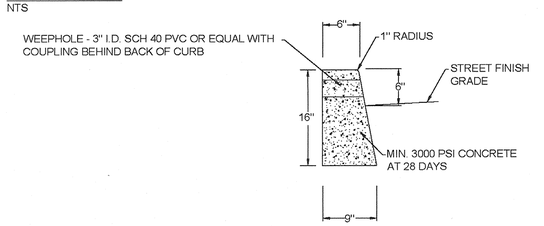
N.T.S.

1:1

CURB AND GUTTER
NTS



STANDARD CURB
NTS



NOTES

1. EXPANSION JOINTS SHALL BE PROVIDED AT EACH POINT OF TANGENCY OF THE CURB MATERIAL SHALL BE PRE-MOLDED, NON-EXTRUDING, WITH A MIN. THICKNESS OF 1/2".
2. CONTRACTION JOINTS SHALL BE A MINIMUM OF 2" DEEP & SPACED A MAXIMUM OF 15 FT. APART.
3. BASE ROCK 1-1/2" MINUS, COMPACTED TO 95% AASHTO T-180 - SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4" IN DEPTH, WHICHEVER IS GREATER, EXTENDING 1' BEHIND CURB.
4. SLOPE OF GUTTER SHALL NOT EXCEED 5% AT WHEELCHAIR ACCESS RAMP.

8
R8.7

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STANDARD CURB

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SHEET NO. PWD-5

PROJECT NO.

FILE NAME:PWD-5.DWG

PLOT DATE: 11/8/2012 9:02 AM

BID SET 5/1/2015

Architecture ▪ Interiors
Planning ▪ Engineering

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Vancouver, WA
360.695.7879
Seattle, WA
206.749.9993
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Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 Ralph J. Henderson OREGON JULY. 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
DETAIL SHEET

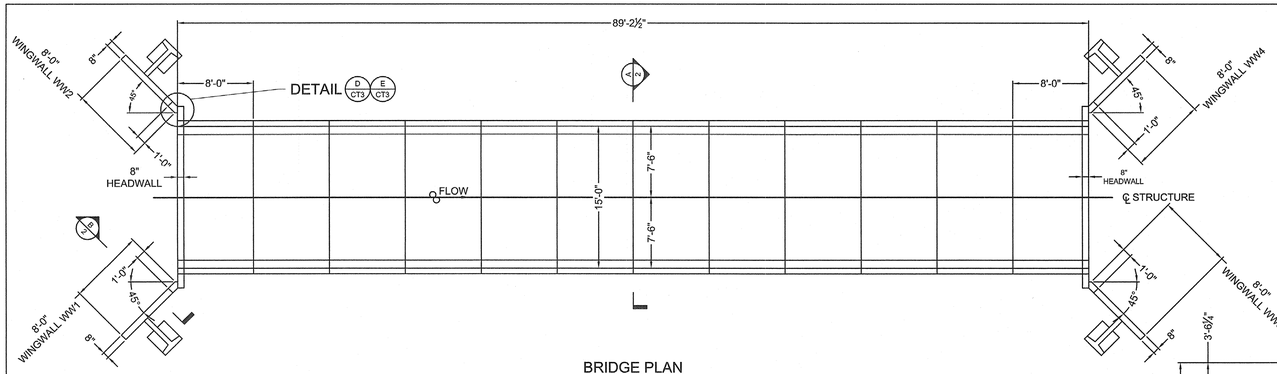
DRAWN BY: BMR

CHECKED BY: RJH

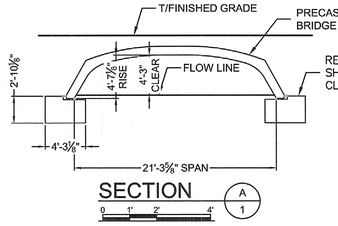
SHEET:
R8.7

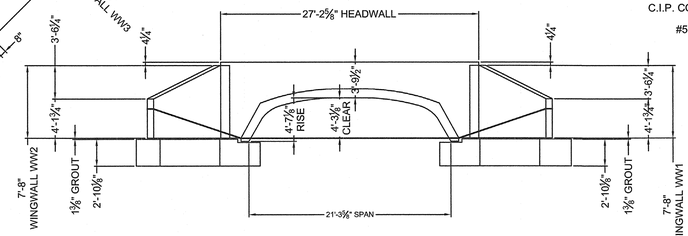
JOB NO. 2120550.00

PLOTTED: 05/06/15 09:49 by 1:20.00

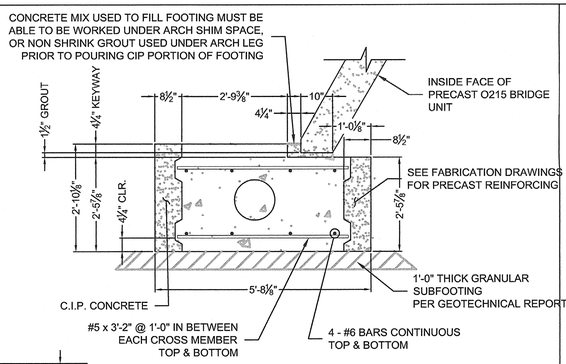


BRIDGE PLAN



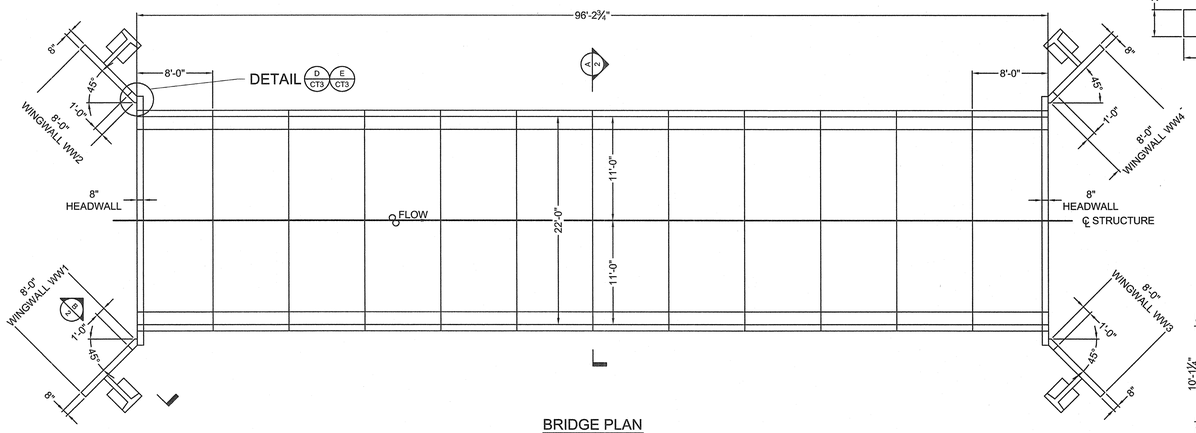


TYPICAL END ELEVATION



DETAIL 1 CT4

1 R8.8 ARCH CULVERT - STA 47+20
SCALE: 1/8" = 1'-0"



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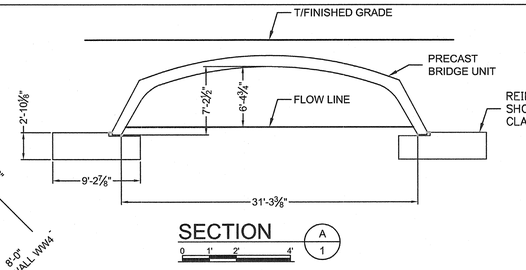
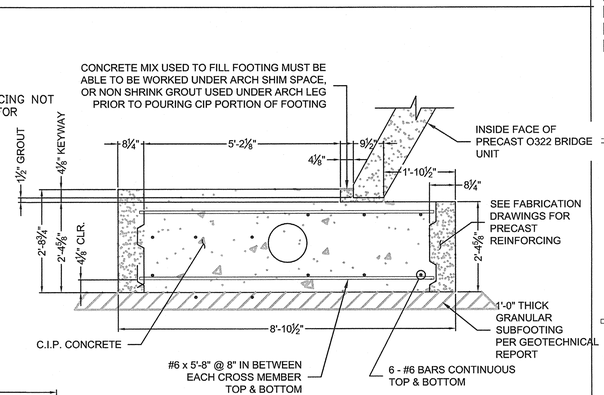
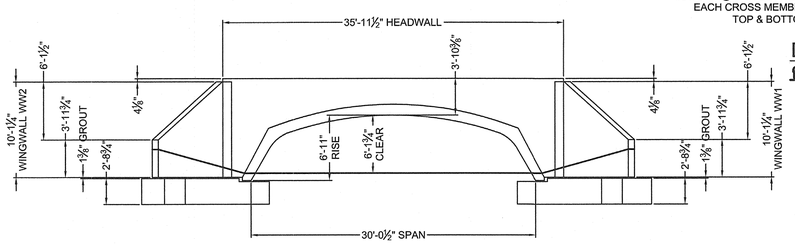






DETAIL 1 CT4

TYPICAL END ELEVATION

2 R8.8 ARCH CULVERT - STA 55+75
SCALE: 1/8" = 1'-0"

DESIGN DATA

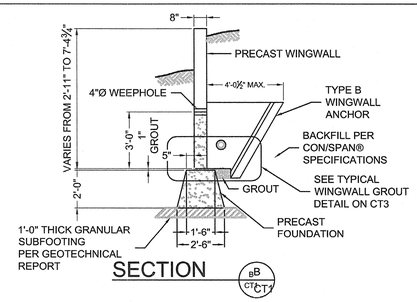
DESIGN LOADING:
BRIDGE UNITS: HS-20
DESIGN FILL HEIGHT: 2'-0" MIN. TO 4'-6" MAX.
FROM TOP OF CROWN TO TOP OF PAVEMENT.
DESIGN METHOD: LOAD RESISTANCE FACTORED DESIGN
NET ALLOWABLE SOIL BEARING PRESSURE: 2500 PSF *
GROSS ALLOWABLE SOIL BEARING PRESSURE: 2980 PSF

*FOUNDATION EXCAVATION AND SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT FOR THIS PROJECT PREPARED BY GEO DESIGN, INC DATED 2/25/13.

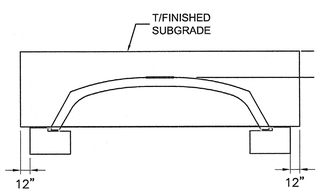
MATERIALS

PRECAST UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CON/SPAN® SPECIFICATIONS. CONCRETE FOR FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. REINFORCING STEEL FOR FOOTINGS SHALL CONFORM TO ASTM A615 OR A996-GRADE 60.

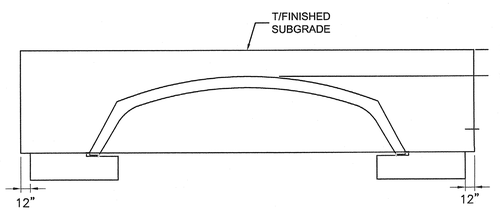
NOTE: PRECAST ARCH STRUCTURE INFORMATION PROVIDED BY CONTECH ENGINEERED STRUCTURES, BASED ON INFORMATION PROVIDED BY MACKENZIE



3 R8.8 TYPICAL WINGWALL DETAILS
SCALE: 1/8" = 1'-0"



4 R8.8 EXCAVATION/EMBANKMENT LIMITS
SCALE: 1/8" = 1'-0"
STA 47+21.60



5 R8.8 EXCAVATION/EMBANKMENT LIMITS
SCALE: 1/8" = 1'-0"
STA 55+75

BID SET 5/1/2015

Architecture ▪ Interiors
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Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER
#56600
OREGON
JULY 11, 2000
RALPH J.R. HENDERSON
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
PRECAST ARCH CULVERT DETAILS

DRAWN BY: BMR
CHECKED BY: RJH
SHEET:
R8.8
JOB NO. 2120550.00

2120550\00\CIVIL\550-R8.8.DWG BMR 05/06/15 09:49 1:96

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS

1. DESCRIPTION
1.1. TYPE - THIS WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTING A CON/SPAN® BRIDGE SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON THE PLANS OR AS ESTABLISHED BY THE ENGINEER. IN SITUATIONS WHERE TWO OR MORE SPECIFICATIONS APPLY TO THIS WORK, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.
1.2. DESIGNATION - PRECAST REINFORCED CONCRETE CON/SPAN® BRIDGE UNITS MANUFACTURED IN ACCORDANCE WITH THESE SPECIFICATIONS SHALL BE DESIGNATED BY SPAN AND RISE. PRECAST REINFORCED CONCRETE WINGWALLS AND HEADWALLS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT, AND DEFLECTION ANGLE.

2. DESIGN
2.1. SPECIFICATIONS - THE PRECAST ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" 17TH EDITION, ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002. A MINIMUM OF ONE FOOT OF COVER ABOVE THE CROWN OF THE MAIN UNIT IS REQUIRED IN THE INSTALLED CONDITION. (UNLESS NOTED OTHERWISE ON THE SHOP DRAWINGS AND DESIGNED ACCORDINGLY.)

3. MATERIALS
3.1. CONCRETE - THE CONCRETE FOR THE PRECAST ELEMENTS SHALL BE AIR-ENTRAINED WHEN INSTALLED IN AREAS SUBJECT TO FREEZE-THAW CONDITIONS, COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGREGATES, ADMIXTURES AND WATER. AIR-ENTRAINED CONCRETE SHALL CONTAIN 6 ± 2 PERCENT AIR. THE AIR-ENTRAINING ADMIXTURE SHALL CONFORM TO AASHTO M154. THE MINIMUM COMPRESSIVE STRENGTH SHALL BE AS SHOWN ON THE SHOP DRAWINGS.
3.1.1. PORTLAND CEMENT - SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATIONS C150/150 M-11, TYPE I, OR TYPE III CEMENT.
3.1.2. COARSE AGGREGATE - SHALL CONSIST OF STONE HAVING A MAXIMUM SIZE OF 1 INCH. AGGREGATE SHALL MEET REQUIREMENTS FOR ASTM C33.
3.1.3. WATER REDUCING ADMIXTURE - THE MANUFACTURER MAY SUBMIT, FOR APPROVAL BY THE ENGINEER, A WATER-REDUCING ADMIXTURE FOR THE PURPOSE OF INCREASING WORKABILITY AND REDUCING THE WATER REQUIREMENT FOR THE CONCRETE.
3.1.4. CALCIUM CHLORIDE - THE ADDITION TO THE MIX OF CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE WILL NOT BE PERMITTED.
3.1.5. MIXTURE - THE AGGREGATES, CEMENT AND WATER SHALL BE PROPORTIONED AND MIXED IN A BATCH MIXER TO PRODUCE A HOMOGENEOUS CONCRETE MEETING THE STRENGTH REQUIREMENTS OF THIS SPECIFICATION. THE PROPORTION OF PORTLAND CEMENT IN THE MIXTURE SHALL NOT BE LESS THAN 564 POUNDS (6 SACKS) PER CUBIC YARD OF CONCRETE.
3.2. STEEL REINFORCEMENT
3.2.1. THE MINIMUM STEEL YIELD STRENGTH SHALL BE 60,000 PSI, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS.
3.2.2. ALL REINFORCING STEEL FOR THE PRECAST ELEMENTS SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE DETAILED SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER.
3.2.3. REINFORCEMENT SHALL CONSIST OF WELDED WIRE FABRIC CONFORMING TO ASTM SPECIFICATION A 185 OR A 497, OR DEFORMED BILLET-STEEL BARS CONFORMING TO ASTM SPECIFICATION A 615, GRADE 60. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS.
3.3. STEEL HARDWARE
3.3.1. BOLTS AND THREADED RODS FOR WINGWALL CONNECTIONS SHALL CONFORM TO ASTM A 307. NUTS SHALL CONFORM TO AASHTO M292 (ASTM A194) GRADE 2H. ALL BOLTS, THREADED RODS AND NUTS USED IN WINGWALL CONNECTIONS SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
3.3.2. STRUCTURAL STEEL FOR WINGWALL CONNECTION PLATES AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709) GRADE 36 AND SHALL BE HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
3.3.3. INSERTS FOR WINGWALLS SHALL BE 1" DIAMETER TWO-BOLT PRESET WINGWALL ANCHORS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
3.3.4. FERRULE LOOP INSERTS SHALL BE F-64 FERRULE LOOP INSERTS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
3.3.5. HOOK BOLTS USED IN ATTACHED HEADWALL CONNECTIONS SHALL BE ASTM A307.
3.3.6. INSERTS FOR DETACHED HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL, F-58 EXPANDED COIL INSERTS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700. COIL RODS AND NUTS USED IN HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL, WASHERS USED IN HEADWALL DOWEL CONNECTIONS SHALL BE EITHER AISI TYPE 304 STAINLESS STEEL, PLATE WASHERS OR AASHTO M270 (ASTM A709) GRADE 36 PLATE WASHERS HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
3.3.7. REINFORCING BAR SPLICES SHALL BE MADE USING THE DOWEL BAR SPLICE SYSTEM AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700, AND SHALL CONSIST OF THE DOWEL BAR SPLICER (SB-SAR) AND DOWEL BAR (DB).

4. MANUFACTURE OF PRECAST ELEMENTS - SUBJECT TO THE PROVISIONS OF SECTION 5, BELOW, THE PRECAST ELEMENT DIMENSION AND REINFORCEMENT DETAILS SHALL BE AS PRESCRIBED IN THE PLAN AND SHOP DRAWINGS PROVIDED BY THE MANUFACTURER.
4.1. FORMS - THE FORMS USED IN MANUFACTURE SHALL BE SUFFICIENTLY RIGID AND ACCURATE TO MAINTAIN THE REQUIRED PRECAST ELEMENT SHAPE WITHIN THE PERMISSIBLE VARIATIONS GIVEN IN SECTION 5 OF THESE SPECIFICATIONS. FORM SURFACES SHALL BE OF A SMOOTH MATERIAL.
4.2. PLACEMENT OF REINFORCEMENT
4.2.1. PLACEMENT OF REINFORCEMENT IN PRECAST BRIDGE UNITS - THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MINIMUM. THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE ½" MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 3" FROM THE ENDS OF EACH SECTION. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING SINGLE OR MULTIPLE LAYERS OF WELDED WIRE FABRIC (NOT TO EXCEED 3 LAYERS), SUPPLEMENTED WITH A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS, WHEN NECESSARY. WELDED WIRE FABRIC SHALL BE COMPOSED OF CIRCUMFERENTIAL AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE BRIDGE UNIT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL NOT BE LESS THAN 564 POUNDS (6 SACKS) PER CUBIC YARD OF CONCRETE.
4.2.2. BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL REINFORCING STEEL FOR THE CORNERS OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROPRIATE TO THE CONFIGURATION OF THE BRIDGE'S OUTSIDE CORNER.
4.2.3. PLACEMENT OF REINFORCEMENT FOR PRECAST WINGWALLS AND HEADWALLS - THE COVER OF CONCRETE OVER THE LONGITUDINAL AND TRANSVERSE REINFORCEMENT SHALL BE 2" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 1½" NOR MORE THAN 3". REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
4.3. LAPS, WELDS, SPACING
4.3.1. LAPS, WELDS, AND SPACING FOR PRECAST BRIDGE UNITS - TENSION SPLICES IN THE CIRCUMFERENTIAL REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.2 AND 8.32.6. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.1 AND 8.32.5. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL BE MEASURED BETWEEN THE OUTER-MOST LONGITUDINAL BARS OF EACH PANEL SHEET. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.25. FOR SPLICES OTHER THAN TENSION SPLICES, THE OVERLAP SHALL BE A MINIMUM OF ONE FOOT. FOR WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS, THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES OR BARS IN EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
4.3.2. LAPS, WELDS, AND SPACING FOR PRECAST WINGWALLS AND HEADWALLS - SPLICES IN THE REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.2 AND 8.32.6. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.1 AND 8.32.5. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.25. THE SPACING CENTER-TO-CENTER OF THE WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 8".
4.4. CURING - THE PRECAST CONCRETE ELEMENTS SHALL BE CURED FOR A SUFFICIENT LENGTH OF TIME SO THAT THE CONCRETE WILL DEVELOP THE SPECIFIED COMPRESSIVE STRENGTH IN 28 DAYS OR LESS. ANY ONE OF THE FOLLOWING METHODS OR COMBINATIONS THERE OF SHALL BE USED:
4.4.1. STEAM CURING - THE PRECAST ELEMENTS MAY BE LOW-PRESSURE STEAM CURED BY A SYSTEM THAT WILL MAINTAIN A MOIST ATMOSPHERE.
4.4.2. WATER CURING - THE PRECAST ELEMENTS MAY BE WATER CURED BY ANY METHOD THAT WILL KEEP THE SECTIONS WET.
4.4.3. MEMBRANE CURING - A SEALING MEMBRANE CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION C309 MAY BE APPLIED AND SHALL BE LEFT INTACT UNTIL THE REQUIRED CONCRETE COMPRESSIVE STRENGTH IS ATTAINED. THE CONCRETE TEMPERATURE AT THE TIME APPLICATION SHALL BE WITHIN +/- 10 DEGREES F OF THE ATMOSPHERIC TEMPERATURE. ALL EXPOSED SURFACES SHALL BE KEPT MOIST PRIOR TO THE APPLICATION OF THE COMPOUNDS AND SHALL BE DAMP WHEN THE COMPOUND IS APPLIED.
4.5. STORAGE, HANDLING & DELIVERY
4.5.1. STORAGE - PRECAST CONCRETE BRIDGE ELEMENTS SHALL BE LIFTED AND STORED IN "AS-CAST" POSITION. PRECAST CONCRETE HEADWALL AND WINGWALL UNITS ARE CAST, STORED AND SHIPPED IN A FLAT POSITION. THE PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER TO PREVENT CRACKING OR OTHER DAMAGE. SUPPORTS USING TIMBER SUPPORTS AS APPROPRIATE. THE UNITS SHALL NOT BE MOVED UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED A MINIMUM STRENGTH AS SPECIFIED. UNITS SHALL BE STORED IN AN UPRIGHT POSITION.
4.5.2. HANDLING - HANDLING DEVICES SHALL BE PERMITTED IN EACH PRECAST ELEMENT FOR THE PURPOSE OF HANDLING AND TRANSPORTATION. A SPREADER BEAMS MAY BE REQUIRED FOR THE LIFTING OF PRECAST CONCRETE BRIDGE ELEMENTS TO PRECLUDE DAMAGE FROM BENDING OR TORSION FORCES.
4.5.3. DELIVERY - PRECAST CONCRETE ELEMENTS MUST NOT BE SHIPPED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, OR AS DIRECTED BY THE DESIGN ENGINEER. PRECAST CONCRETE ELEMENTS MAY BE UNLOADED AND PLACED ON THE GROUND AT THE SITE UNTIL INSTALLED. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE.
4.6. QUALITY ASSURANCE - THE PRECASTER SHALL DEMONSTRATE ADHERENCE TO THE STANDARDS SET FORTH IN THE NPCA QUALITY CONTROL MANUAL. THE PRECASTER SHALL MEET EITHER SECTION 4.6.1 OR 4.6.2
4.6.1. CERTIFICATION - THE PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRECAST ELEMENTS COVERED BY THIS SPECIFICATION.
4.6.2. QUALIFICATIONS, TESTING AND INSPECTION
4.6.2.1. THE PRECASTER SHALL HAVE BEEN IN THE BUSINESS OF PRODUCING PRECAST CONCRETE PRODUCTS SIMILAR TO THOSE SPECIFIED FOR A MINIMUM OF THREE YEARS. HE SHALL MAINTAIN A PERMANENT QUALITY CONTROL DEPARTMENT OR RETAIN AN INDEPENDENT AGENCY ON A CONTINUING BASIS. THE AGENCY SHALL BE NOT LESS THAN ANNUALLY CERTIFIED BY A LICENSED ENGINEER, DETAILING THE ABILITY OF THE PRECASTER TO PRODUCE QUALITY PRODUCTS CONSISTENT WITH CONTRACT REQUIREMENTS.
4.6.2.2. THE PRECASTER SHALL SHOW THAT THE FOLLOWING TESTS ARE PERFORMED IN ACCORDANCE WITH THE ASTM STANDARDS INDICATED. TESTS SHALL BE PERFORMED AS INDICATED IN SECTION 6 OF THESE SPECIFICATIONS.
4.6.2.2.1. AIR CONTENT: C231 OR C173
4.6.2.2.2. COMPRESSIVE STRENGTH: C31,C39,C697
4.6.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION FROM DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH®ENGINEERED SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST.
4.6.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS CONTRACTED FOR UNDER THIS SPECIFICATION ARE BEING MANUFACTURED.
4.6.3. DOCUMENTATION - THE PRECASTER SHALL SUBMIT PRECAST PRODUCTION REPORTS TO CONTECH® BRIDGE SOLUTIONS AS REQUIRED.

5. PERMISSIBLE VARIATIONS
5.1. BRIDGE UNITS
5.1.1. INTERNAL DIMENSIONS - THE INTERNAL DIMENSION SHALL VARY NOT MORE THAN 1% FROM THE DESIGN DIMENSIONS OR NOT MORE THAN 1 ½" WHICHEVER IS LESS.
5.1.2. SLAB AND WALL THICKNESS - THE SLAB AND WALL THICKNESS SHALL NOT BE LESS THAN THAT SHOWN IN THE DESIGN BY MORE THAN ¼". A THICKNESS MORE THAN THAT REQUIRED IN THE DESIGN SHALL NOT BE CAUSE FOR REJECTION.
5.1.3. LENGTH OF OPPOSITE SURFACES - VARIATIONS IN LAYING LENGTHS OF TWO OPPOSITE SURFACES OF THE BRIDGE UNIT SHALL NOT BE MORE THAN ½" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.
5.1.4. LENGTH OF SECTION - THE UNDERRUN IN LENGTH OF A SECTION SHALL NOT BE MORE THAN ½" IN ANY BRIDGE UNIT.
5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1 ½" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR BE LESS THAN 1" FOR THE INSIDE CIRCUMFERENTIAL STEEL AS MEASURED TO THE EXTERNAL OR INTERNAL SURFACE OF THE BRIDGE. THESE TOLERANCES OR COVER REQUIREMENTS DO NOT APPLY TO MATING SURFACES OF JOINTS.
5.1.6. AREA OF REINFORCEMENT - THE AREAS OF STEEL REINFORCEMENT SHALL BE THE DESIGN STEEL AREAS AS SHOWN IN THE MANUFACTURERS SHOP DRAWINGS. STEEL AREAS GREATER THAN THOSE REQUIRED SHALL NOT BE CAUSE FOR REJECTION. THE PERMISSIBLE VARIATION IN QUANTITY OF ANY REINFORCEMENT SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCEMENT.
5.2. WINGWALLS & HEADWALLS
5.2.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ¼".
5.2.2. LENGTH/HEIGHT OF WALL SECTIONS - THE LENGTH AND HEIGHT OF THE WALL SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN ½" NOR MORE THAN 1½".
5.2.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING STEEL. AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.

6. TESTING/ INSPECTION
6.1. TESTING
6.1.1. TYPE OF TEST SPECIMEN - CONCRETE COMPRESSIVE STRENGTH SHALL BE DETERMINED FROM COMPRESSION TESTS MADE ON CYLINDERS OR CORES. FOR CYLINDER TESTING, A MINIMUM OF 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. EACH ELEMENT SHALL BE FINISHED SEPARATELY FOR THE PURPOSE OF TESTING AND ACCEPTANCE.
6.1.2. COMPRESSION TESTING - CYLINDERS SHALL BE MADE AND TESTED AS PRESCRIBED BY THE ASTM C39 SPECIFICATION. CYLINDERS SHALL BE CURED IN THE SAME MANNER AS THE BRIDGE ELEMENTS. CORES SHALL BE OBTAINED AND TESTED FOR COMPRESSIVE STRENGTH IN ACCORDANCE WITH THE PROVISIONS OF THE ASTM C42 SPECIFICATION.
6.1.3. ACCEPTABILITY OF CYLINDER TESTS - WHEN THE AVERAGE COMPRESSIVE STRENGTH OF ALL CYLINDERS TESTED IS EQUAL TO OR GREATER THAN THE DESIGN COMPRESSIVE STRENGTH, AND NOT MORE THAN 10% OF THE CYLINDERS TESTED HAVE A COMPRESSIVE STRENGTH LESS THAN THE SPECIFICATIONS MINIMUM DEMONSTRATING THAN 80% OF THE DESIGN COMPRESSIVE STRENGTH, THEN THE ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE REQUIREMENTS, THE ACCEPTABILITY OF THE ELEMENT MAY BE DETERMINED AS DESCRIBED IN SECTION 6.1.4, BELOW.
6.1.4. ACCEPTABILITY OF CORE TESTS - THE COMPRESSIVE STRENGTH OF THE CONCRETE IN A BRIDGE ELEMENT IS ACCEPTABLE WHEN THE AVERAGE CORE TEST STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH, WHEN THE COMPRESSIVE STRENGTH OF CORES TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN MAY BE RE-CORED. WHEN THE COMPRESSIVE STRENGTH OF THE RE-CORE IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH, THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THAT BRIDGE ELEMENT IS ACCEPTABLE.
6.1.4.1. WHEN THE COMPRESSIVE STRENGTH OF ANY RE-CORE IS LESS THAN 85% OF THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH CORE WAS TAKEN SHALL BE REJECTED.
6.1.4.2. ALL HOLES FROM WHICH THE CORE HOLES SHALL BE PLUGGED AND SEALED BY THE MANUFACTURER IN A MANNER SUCH THAT THE ELEMENTS WILL PASS THE SPECIFIED TEST REQUIREMENTS OF THIS SPECIFICATION. PRECAST ELEMENTS SO SEALED SHALL BE CONSIDERED SATISFACTORY FOR USE.
6.1.4.3. TEST EQUIPMENT - EVERY MANUFACTURER FURNISHING PRECAST ELEMENTS UNDER THIS SPECIFICATION SHALL FURNISH ALL FACILITIES AND PERSONNEL NECESSARY TO CARRY OUT THE TEST REQUIRED.
6.2. INSPECTION - THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.

7. JOINTS
THE BRIDGE UNITS SHALL BE PRODUCED WITH FLAT BUTT ENDS. THE ENDS OF THE BRIDGE UNITS SHALL BE SUCH THAT WHEN THE SECTIONS ARE LAID TOGETHER THEY WILL MAKE A CONTINUOUS LINE WITH A SMOOTH INTERIOR FREE OF APPRECIABLE IRREGULARITIES, ALL COMPATIBLE WITH THE PERMISSIBLE VARIATIONS IN SECTION 5, ABOVE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED 3".

8. WORKMANSHIP/ FINISH
THE BRIDGE UNITS, WINGWALLS, AND HEADWALLS SHALL BE SUBSTANTIALLY FREE OF FRACTURES. THE ENDS OF THE BRIDGE UNITS SHALL BE NORMAL TO THE WALLS AND CENTERLINE OF THE BRIDGE SECTION. WITHIN THE LIMITS OF THE VARIATIONS GIVEN IN SECTION 5 ABOVE, EXCEPT WHERE BEVELED ENDS ARE SPECIFIED, THE FACES OF THE WINGWALLS AND HEADWALLS SHALL BE PARALLEL TO EACH OTHER, WITHIN THESE LIMITS OR VARIATIONS GIVEN IN SECTION 5, ABOVE. THE SURFACE OF THE PRECAST ELEMENTS SHALL BE A SMOOTH STEEL FORM OR TROWELED SURFACE. TRAPPED AIR POCKETS CAUSING SURFACE DEFECTS SHALL BE CONSIDERED AS PART OF A SMOOTH, STEEL FORM FINISH.

9. REPAIRS
PRECAST ELEMENTS MAY BE REPAIRED, IF NECESSARY, BECAUSE OF IMPERFECTIONS IN MANUFACTURE OR HANDLING DAMAGE AND WILL BE ACCEPTABLE WHEN IN THE OPINION OF THE PURCHASER, THE REPAIRS ARE SOUND, PROPERLY FINISHED AND CURED. REFER TO REPAIR SECTION CONFORMS TO THE REQUIREMENTS OF THIS SPECIFICATION.

10. REJECTION
THE PRECAST ELEMENTS SHALL BE SUBJECT TO REJECTION ON ACCOUNT OF ANY OF THE SPECIFICATION REQUIREMENTS. INDIVIDUAL PRECAST ELEMENTS MAY BE REJECTED BECAUSE OF ANY OF THE FOLLOWING:
10.1. FRACTURES OR CRACKS PASSING THROUGH THE WALL, EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED ONE-HALF THE THICKNESS OF THE WALL.
10.2. DEFECTS THAT INDICATE PROPORTIONING, MIXING, AND MOLDING NOT IN COMPLIANCE WITH SECTION 4 OF THESE SPECIFICATIONS.
10.3. HONEYCOMBED OR OPEN TEXTURE.
10.4. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.

11. MARKING
EACH BRIDGE UNIT SHALL BE CLEARLY MARKED BY WATERPROOF PAINT. THE FOLLOWING SHALL BE SHOWN ON THE INSIDE OF THE VERTICAL LEG OF THE BRIDGE SECTION:
BRIDGE SPAN x BRIDGE RISE
DATE OF MANUFACTURE
NAME OR TRADEMARK OF THE MANUFACTURER

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS (CONT'D)

12. INSTALLATION PREPARATION
TO ENSURE CORRECT INSTALLATION OF THE PRECAST CONCRETE BRIDGE SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN FORMING THE SUPPORT AREAS FOR BRIDGE UNITS, HEADWALL, AND WINGWALL ELEMENTS. EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.
12.1. FOOTINGS
DO NOT OVER EXCAVATE FOUNDATIONS UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.

THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE BEARING CAPACITY MEETS OR EXCEEDS THE FOOTING DESIGN REQUIREMENTS, PRIOR TO THE CONTRACTOR POURING OF THE FOOTINGS.

THE BRIDGE UNITS AND WINGWALLS SHALL BE INSTALLED ON EITHER PRECAST OR CAST-IN-PLACE CONCRETE FOOTINGS. THE SIZE AND ELEVATION OF THE FOOTINGS SHALL BE AS DESIGNED BY THE ENGINEER. A KEYWAY SHALL BE FORMED IN THE TOP SURFACE OF THE BRIDGE FOOTING AS SPECIFIED ON THE PLANS. NO KEYWAY IS REQUIRED IN THE WINGWALL FOOTINGS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

THE FOOTINGS SHALL BE GIVEN A SMOOTH FLOAT FINISH AND SHALL REACH A COMPRESSIVE STRENGTH OF 2,000 PSI BEFORE PLACEMENT OF THE BRIDGE AND WINGWALL ELEMENTS. BACKFILLING SHALL NOT BEGIN UNTIL THE FOOTING HAS REACHED THE FULL DESIGN COMPRESSIVE STRENGTH.

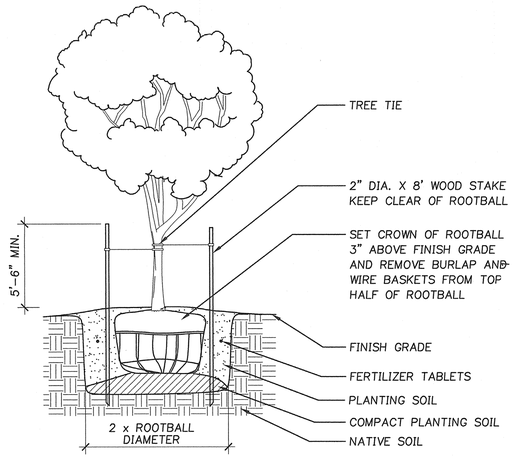
THE FOOTING SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN TESTED WITH A 10'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN ½" IN 10'-0".

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOOTING PRIOR TO PLACING THE PRECAST FOOTING.

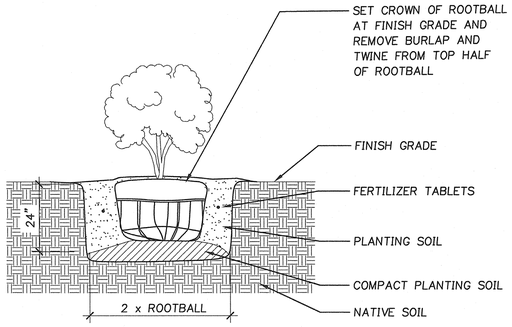
THE FOUNDATIONS FOR PRECAST CONCRETE BRIDGE ELEMENTS AND WINGWALLS MUST BE CONNECTED BY REINFORCEMENT TO FORM ONE MONOLITHIC BODY. EXPANSION JOINTS SHALL NOT BE USED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE FOUNDATIONS PER THE PLANS AND SPECIFICATIONS.

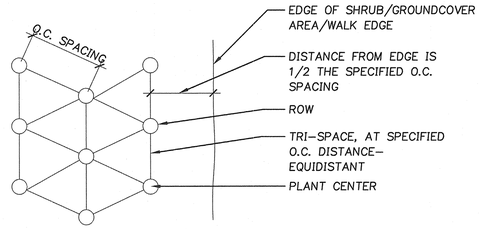
13. INSTALLATION
13.1. GENERAL - THE INSTALLATION OF THE PRECAST CONCRETE ELEMENTS SHALL BE AS EXPLAINED IN THE PUBLICATION CON/SPAN BRIDGE SYSTEMS INSTALLATION HANDBOOK.
13.1.1. LIFTING - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A CRANE OF THE CORRECT LIFTING CAPACITY IS AVAILABLE TO HANDLE THE PRECAST CONCRETE UNITS. THIS CAN BE ACCOMPLISHED BY USING THE WEIGHTS GIVEN FOR THE PRECAST CONCRETE COMPONENTS AND BY DETERMINING THE LIFTING REACH FOR EACH CRANE UNIT. SITE CONDITIONS MUST BE CHECKED WELL IN ADVANCE OF SHIPPING TO ENSURE PROPER CRANE LOCATION AND TO AVOID ANY LIFTING RESTRICTIONS. THE LIFT ANCHORS OR HOLES PROVIDED IN EACH UNIT ARE THE ONLY MEANS TO BE USED TO LIFT THE ELEMENTS. THE PRECAST CONCRETE ELEMENTS MUST NOT BE SUPPORTED OR RAISED BY OTHER MEANS THAN THOSE GIVEN IN THE MANUALS AND DRAWINGS WITHOUT WRITTEN APPROVAL FROM CONTECH® BRIDGE SOLUTIONS.
13.1.2. CONSTRUCTION EQUIPMENT WEIGHT RESTRICTIONS - IN NO CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD (HS20 OR HS25) BE PERMITTED OVER THE BRIDGE UNITS UNLESS APPROVED BY CONTECH® BRIDGE SOLUTIONS.
13.1.2.1. IN THE IMMEDIATE AREA OF THE BRIDGE UNITS, THE FOLLOWING RESTRICTIONS FOR THE USE OF HEAVY CONSTRUCTION MACHINERY DURING BACKFILLING OPERATIONS APPLY:
NO CONSTRUCTION EQUIPMENT SHALL CROSS THE BARE PRECAST CONCRETE BRIDGE UNIT. AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 4" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 10 TONS MAY CROSS THE BRIDGE.
AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 1'-0" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 30 TONS MAY CROSS THE BRIDGE.
AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 1'-6" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 50 TONS MAY CROSS THE BRIDGE.
13.2. LEVELING PADS/SHIMS - THE BRIDGE UNITS AND WINGWALLS SHALL BE SET ON MASONITE OR STEEL SHIMS MEASURING 5" x 5", MINIMUM, UNLESS SHOWN OTHERWISE ON THE PLANS. A MINIMUM GAP OF ½" SHALL BE PROVIDED BETWEEN FOOTING AND THE BOTTOM OF THE BRIDGE'S VERTICAL LEGS OR THE BOTTOM OF THE WINGWALL. ALSO, A SUPPLY OF ¼", ½" & ½" THICK STEEL OR MASONITE SHIMS FOR VARIOUS SHIMMING PURPOSES SHOULD BE



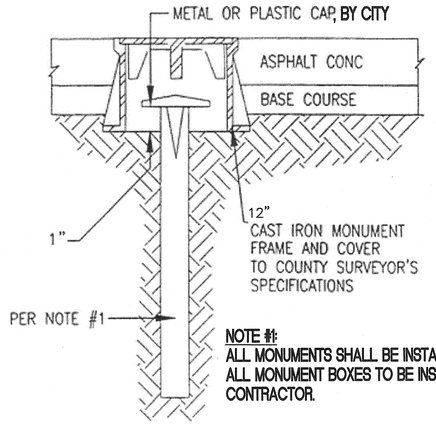
1 R8.10 **TREE PLANTING - DOUBLE STAKE**
SCALE: NTS



2 R8.10 **CONTAINER/B+B SHRUB PLANTING**
SCALE: NTS

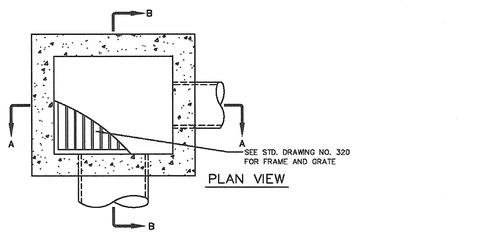


3 R8.10 **SHRUB/GROUNDCOVER SPACING**
SCALE: NTS
SPACE_DTL

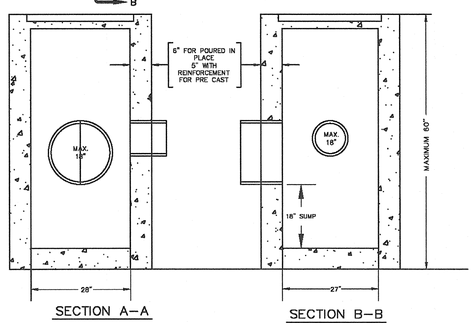


4 R8.10 **MONUMENT BOX**
N.T.S.

1:1



PLAN VIEW



SECTION A–A SECTION B–B

NOTES:
1. ALL PRE CAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C-478.
2. INSTALL STRUCTURE ON MIN. OF 8" OF ¾"-0" COMPACTED BASE MATERIAL.
3. PRE CAST REINFORCEMENT SHALL BE REBAR MEETING ASTM A615 GRADE OR WELDED WIRE MEETING ASTM A497.
4. ALL POURED INPLACE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 3000 P.S.I. AND A SLUMP OF 2" TO 4".
5. CHANNEL REQUIRED IN FLOW THROUGH APPLICATIONS, AS APPROVED. ALL OTHER APPLICATIONS REQUIRE AN 18" SUMP BELOW LOWEST PIPE INVERT.
6. INSTALL STEPS WHEN DISTANCE FROM TOP OF GRATE TO FLOW LINE OF PIPE IS GREATER THAN 48". SEE STANDARD DRAWING NO. 100. SET FIRST STEP 12" FROM TOP OF GRATE.
7. PRE-CAST STRUCTURE'S CONFORMING TO O.D.O.T. TYPE G-2 CATCH BASIN INLET ARE AN ACCEPTABLE ALTERNATE. (ALL GRATE MATERIALS SHALL MEET C.W.S. STANDARDS AS SHOWN ON DETAIL #320)

5 R8.10

AREA DRAIN
TYPE II

DRAWING NO. 380 REVISED 12-06

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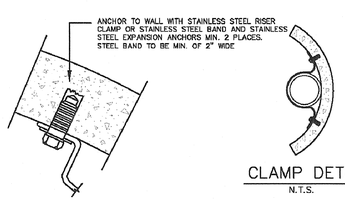
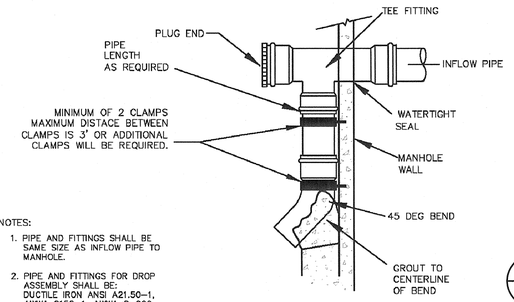


CLAMP DETAIL
N.T.S.

MECHANICAL INSIDE DROP
(OPTIONAL)



NOTES:
1. PIPE AND FITTINGS SHALL BE SAME SIZE AS INFLOW PIPE TO MANHOLE.
2. PIPE AND FITTINGS FOR DROP ASSEMBLY SHALL BE: DUCTILE IRON ANSI A21.50-1, AWWA C150-1, AWWA C-900 OR PVCASTM 3034 SDR 35.

6 R8.10

MECHANICAL INSIDE
DROP MANHOLE

DRAWING NO. 060 **REVISED 12-06**

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CITY PROJECT #: 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

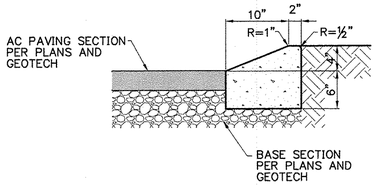
REGISTERED PROFESSIONAL ENGINEER #56660
OREGON JULY 11, 2000 RALPH J.R. HENDERSON
EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
DETAIL SHEET

DRAWN BY: TEB
CHECKED BY: RML
SHEET:
R8.10
JOB NO. 2120550.00

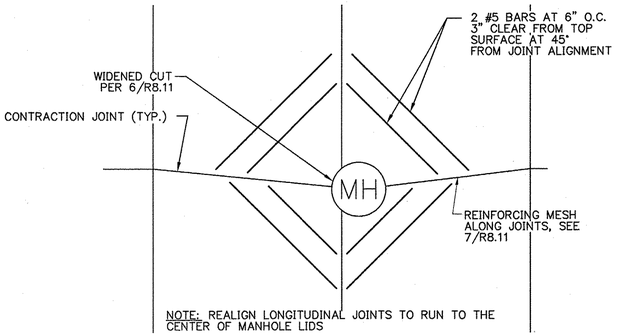


NOTE:
* CONCRETE TO HAVE STRENGTH OF 3,000 PSI IN 28 DAYS, 2" TO 4" SLUMP.
* CONTROL JOINTS AT 2'-0" O/C AND EXPANSION JOINTS AT 20'-0" O/C

1 R8.11 MOUNTABLE CURB AND GUTTER

N.T.S.

CURB-MOUNT

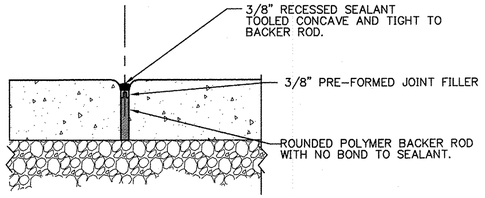


NOTE: REALIGN LONGITUDINAL JOINTS TO RUN TO THE CENTER OF MANHOLE LIDS

2 R8.11 REBAR MAT AT 4-WAY JOINT INTERSECTION

N.T.S.

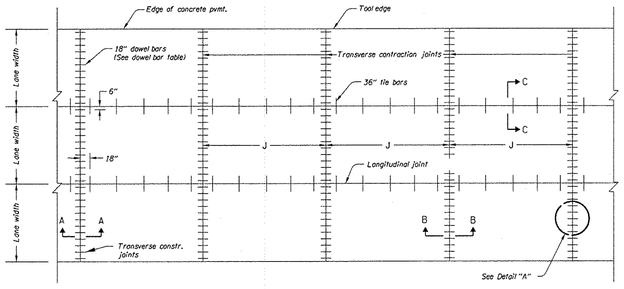
1:1



3 R8.11 EXPANSION JOINT

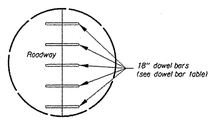
N.T.S.

1:1



PAVEMENT DETAILS	
Pvmt. Thkn. T (in)	Joint Spacing J (ft)

DOWEL BAR TABLE		
Pvmt. Thkn. T	Dowel Dia.	C/C Dowel Spacing
6" - 8"	1"	12"
8½" - 10"	1¼"	12"
10½" & up	1½"	12"



DETAIL "A"

TRANSVERSE JOINT

LONGITUDINAL JOINT

GENERAL NOTES:
1. Lane width as shown. See typical sections.
2. Center tie bars and dowel bars on joint.

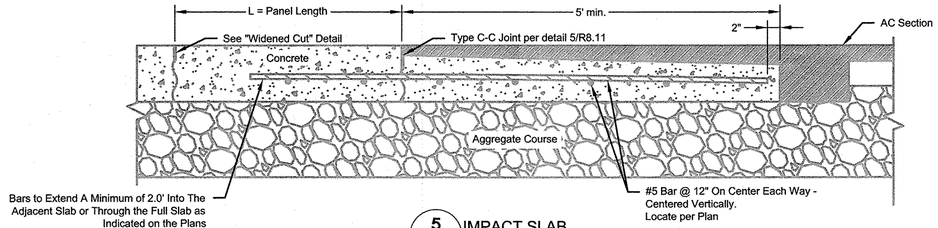
4 R8.11

NOTE: CONTRACTOR SHALL SUBMIT JOINTING PLAN TO ENGINEER FOR APPROVAL

The selection and use of this detail, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

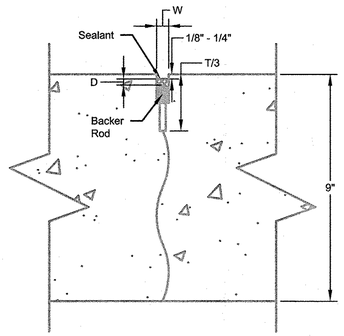
OREGON DEPARTMENT OF TRANSPORTATION
TECHNICAL SERVICES
DETAILS

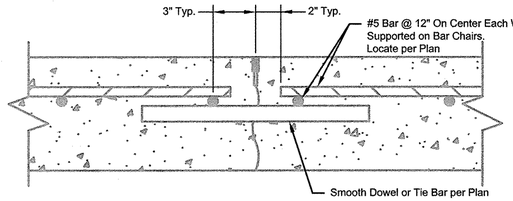
PLAIN CONCRETE PAVEMENT, DOWELLED	DETAIL NO. DET1600



5 R8.11 IMPACT SLAB

SCALE: NTS





Note:

All joints shall be sealed with Crafco Roadsaver 221 joint sealant or approved equal meeting the QPL and placed in a joint reservoir sized in accordance with the recommendations of the joint sealant manufacturer (typically the reservoir width should be twice the sealant depth). The sealant shall be supported by a backer rod of the size and material recommended by the joint sealant manufacturer. The top of the sealant shall be recessed below the slab surface by 1/8 to 1/4 inch.

6 R8.11 WIDENED CUT

7 R8.11 REINFORCING MESH PLACEMENT NEAR JOINTS

SCALE: NTS

Notes:

1) All longitudinal construction or contraction joints shall be tied in accordance with ODOT Standard Detail DET1600 for plain concrete pavement, dowelled (8-inches thick or greater), and ODOT Standard Detail DET1602 for plain concrete pavement, undoweled (less than 8-inches thick).
2) Joint construction, dowel bar installation and tie bar installation shall conform to the details shown on ODOT Standard Detail DET1601 and DET1602. Dowel bars shall be 18-inch long, smooth, epoxy coated, greased, circular Grade 60 steel bars installed at 12-inches on center along dowelled joints. The dowel bar diameter shall be 1.25-inch for slabs less than 10-inch thick or 1.5-inch for slabs 10-inch thick or greater.
3) All joints shall be sealed with Crafco Roadsaver 221 joint sealant or approved equal meeting the QPL and placed in a joint reservoir sized in accordance with the recommendations of the joint sealant manufacturer (typically the reservoir width should be twice the sealant depth). The sealant shall be supported by a backer rod of the size and material recommended by the joint sealant manufacturer. The top of the sealant shall be recessed below the slab surface by 1/8 to 1/4-inch.

BID SET 5/1/2015

Architecture ▪ Interiors
Planning ▪ Engineering

Portland, OR
503.224.9560
Vancouver, WA
360.695.7879
Seattle, WA
206.749.9993
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DESIGN DRIVEN | CLIENT FOCUSED

Client
CITY OF HILLSBORO

Hillsboro OREGON

CITY PROJECT # 10705

Project
NW 253RD AVE IMPROVEMENTS AND EXTENSION

REGISTERED PROFESSIONAL ENGINEER #56660 OREGON JULY 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/15

REVISIONS:

REVISION DELTA	REVISIONS THIS SHEET	REVISION DELTA CLOSING DATE

SHEET TITLE:
DETAIL SHEET

DRAWN BY: BMR

CHECKED BY: RJH

SHEET:
R8.11

JOB NO. 2120550.00

NOTES

GENERAL NOTES:

1. THIS BRIDGE HAS BEEN DESIGNED FOR GENERAL SITE CONDITIONS. THE PROJECT ENGINEER SHALL BE RESPONSIBLE FOR THE STRUCTURE'S SUITABILITY TO THE EXISTING SITE CONDITIONS AND FOR THE HYDRAULIC EVALUATION – INCLUDING SCOUR AND CONFIRMATION OF SOIL CONDITIONS.

2. PRIOR TO CONSTRUCTION, CONTRACTOR MUST VERIFY ALL ELEVATIONS SHOWN THROUGH THE ENGINEER.

3. ONLY CONTECH ENGINEERED SOLUTIONS LLC, THE CON/SPAN® APPROVED PRECASTER IN OREGON MAY PROVIDE THE STRUCTURE DESIGNED IN ACCORDANCE WITH THESE PLANS.

4. THE USE OF ANOTHER PRECAST STRUCTURE WITH THE DESIGN ASSUMPTIONS USED FOR THE CON/SPAN® STRUCTURE MAY LEAD TO SERIOUS DESIGN ERRORS. USE OF ANY OTHER PRECAST STRUCTURE WITH THIS DESIGN AND DRAWINGS VOIDS ANY CERTIFICATION OF THIS DESIGN AND WARRANTY. CONTECH ENGINEERED SOLUTIONS, LLC ASSUMES NO LIABILITY FOR DESIGN OF ANY ALTERNATE OR SIMILAR TYPE STRUCTURES.

5. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT DRAWINGS AND CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF OREGON, EMPLOYED BY THE PRECAST CONCRETE BRIDGE SUPPLIER, ARE SUBMITTED TO THE ENGINEER 2 WEEKS PRIOR TO THE BID DATE FOR REVIEW AND APPROVAL.

6. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT THE ALTERNATE DESIGN DOES NOT REDUCE THE HYDRAULIC OPENING OF THE STRUCTURE AS SHOWN ON THE DRAWINGS. AT A MINIMUM THE ALTERNATE STRUCTURE MUST PROVIDE THE SAME OR LARGER SPAN AND RISE AS THE STRUCTURE SHOWN ON THE DRAWINGS.

7. THE PRECAST ARCH SUPPLIER MUST ATTEND THE PRE-BID MEETING, IF ONE IS HELD.

8. SUPPLIER OF PROPOSED ALTERNATES TO A CON/SPAN® BRIDGE SYSTEM MUST SUBMIT AT LEAST TWO (2) INDEPENDENTLY VERIFIED FULL SCALE LOAD TESTS THAT CONFIRM THE PROPOSED DESIGN METHODOLOGY OF THE THREE SIDED/ARCH STRUCTURE(S). THE PROPOSED ALTERNATE, UPON SATISFACTORY CONFIRMATION OF DESIGN METHODOLOGY, MAY BE CONSIDERED AN ACCEPTABLE ALTERNATE.

9. PROPOSED ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT THE PRECAST CONCRETE BRIDGE STRUCTURES ARE PROVIDED BY A SUPPLIER THAT HAS A MINIMUM OF TWO (2) REGISTERED PROFESSIONAL ENGINEERS ON STAFF THAT ARE DEDICATED TO THE DESIGN OF THESE TYPES OF STRUCTURES. SUPPLIER MUST PROVIDE THESE NAMES, P.E. LICENSE NUMBERS AND DATES OF HIRE AT TIME OF ALTERNATE SUBMITTAL.

DESIGN DATA

DESIGN LOADING:
- BRIDGE UNITS: HS20
- HEADWALLS: EARTH PRESSURE ONLY
- WINGWALLS: EARTH PRESSURE ONLY

DESIGN FILL HEIGHT: 2'-0" MIN. TO 5'-0" MAX.
FROM TOP OF CROWN TO TOP OF PAVEMENT.
DESIGN METHOD: LOAD FACTOR PER AASHTO SPECIFICATION
ALLOWABLE SOIL BEARING PRESSURE: 3000 PSF* (1.5" TOTAL SETTLEMENT)

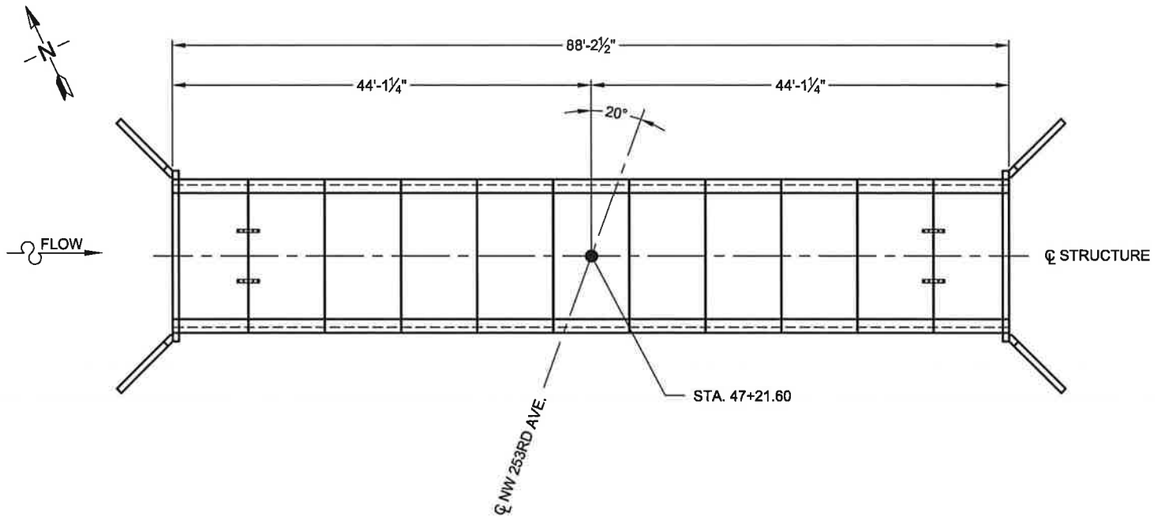
*FOUNDATION EXCAVATION AND SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT FOR THIS PROJECT PREPARED BY GEODESIGN, INC. DATED: 2/25/2013

MATERIALS

PRECAST UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CON/SPAN® SPECIFICATIONS. CONCRETE FOR FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. REINFORCING STEEL FOR FOOTINGS SHALL CONFORM TO ASTM A615 OR A996-GRADE 60.

NW 253RD AVE.
STA. 47+21.60

HILLSBORO, OREGON



LOCATION PLAN

NOT TO SCALE

9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER

EXPIRATION DATE: 12/31/13

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH® ENGINEERED SOLUTIONS LLC
www.ContechES.com
5670 Greenwood Plaza Blvd., Suite 530, Greenwood Village, CO 80111
800-526-3999 720-587-2700 720-587-2651 FAX

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HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	010	8/29/2013
DESIGNED: JAL	DRAWN: JA	
CHECKED: DM	APPROVED: PAC	
SHEET NO.: CT1 OF CT7		

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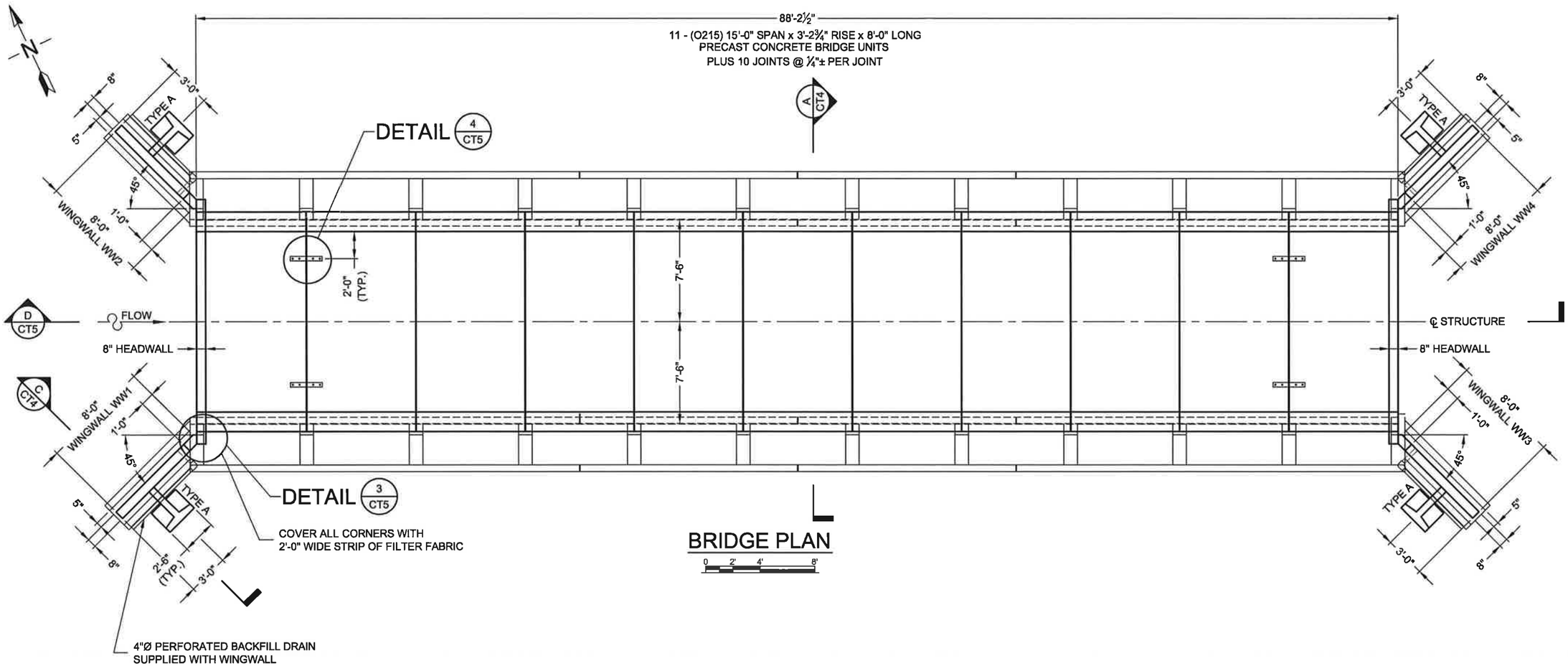
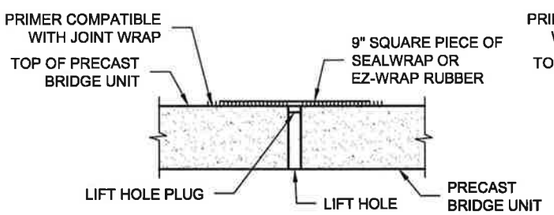
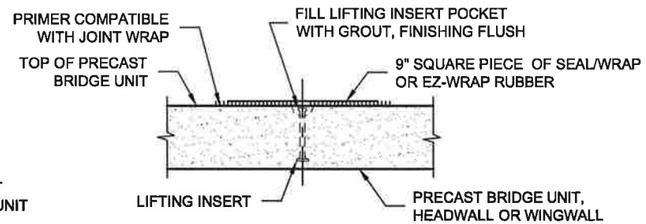




LIFTING HOLES



LIFTING INSERTS

TYPICAL LIFT POINT SEALING DETAIL

NOT TO SCALE

9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER
EXPIRATION DATE: 12/31/13

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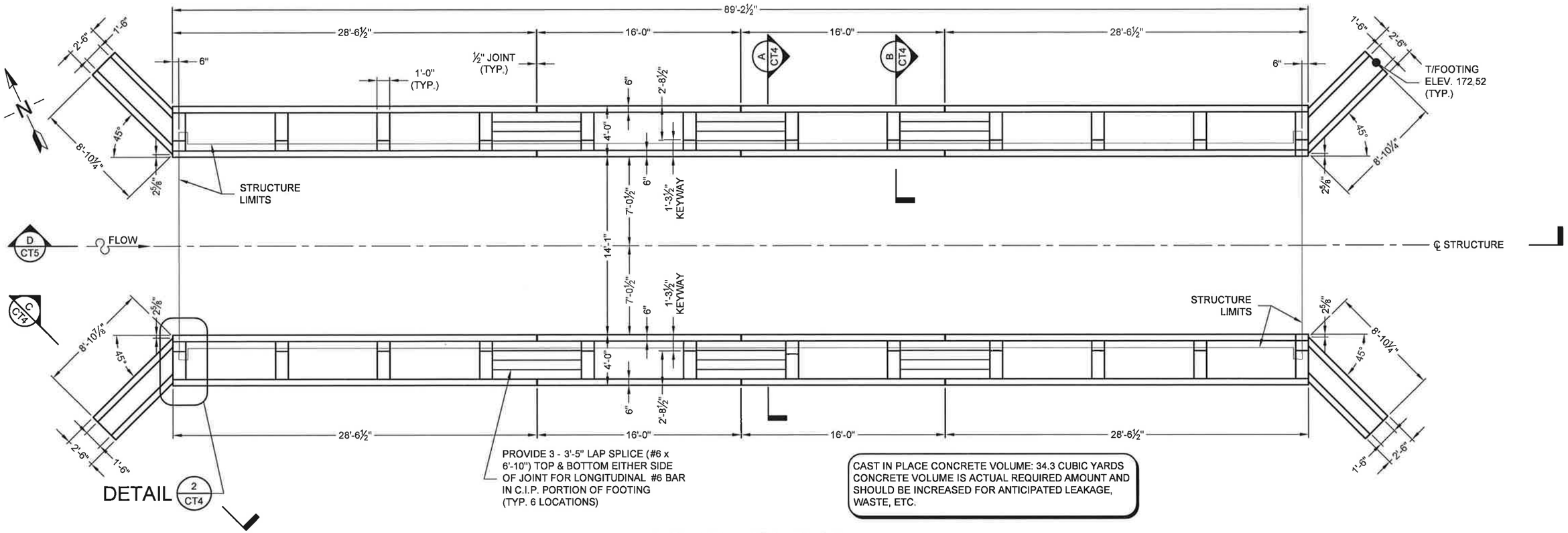

FOUNDATION PLAN

0 2' 4' 8'

PRECAST REINFORCED CONCRETE EXPRESS ™ FOUNDATION NOTES:

1. PRECAST FOUNDATION UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN BRIDGE SYSTEMS.
2. PRECAST AND CAST-IN-PLACE CONCRETE FOR EXPRESS FOUNDATIONS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI. REINFORCING STEEL FOR FOUNDATIONS SHALL CONFORM TO ASTM A615 OR A996, GRADE 60.
3. PRECAST FOUNDATION UNITS SHALL BE SET ON A MINIMUM 4-INCH THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOUNDATION.
4. COMPACTED BACKFILL MATERIAL MUST BE PLACED UP TO THE TOP OF THE PRECAST FOUNDATION UNITS ON BOTH SIDES PRIOR TO PLACING CAST-IN-PLACE CONCRETE PORTION OF FOUNDATIONS.
5. CONCRETE SURFACES WHICH CAST-IN-PLACE CONCRETE WILL BE PLACED AGAINST SHALL BE CLEAN, FREE OF LAITANCE, DIRT, STANDING WATER AND ANY OTHER MATERIAL THAT MAY IMPAIR THE BOND BETWEEN THE PRECAST CONCRETE AND CAST-IN-PLACE CONCRETE.
6. CAST-IN-PLACE CONCRETE MIX USED TO FILL FOUNDATION SHALL BE ABLE TO FLOW INTO ARCH SHIM SPACE OR NON-SHRINK GROUT SHALL BE PLACED UNDER ARCH UNIT LEG AT FOUNDATION CROSS MEMBERS PRIOR TO PLACEMENT OF CAST-IN-PLACE PORTION OF FOUNDATION.
7. IF THE AMBIENT TEMPERATURE AT THE TIME OF PLACEMENT OF CAST-IN-PLACE CONCRETE IS ABOVE 90°F OR EXPECTED TO GO BELOW 35°F DURING THE CURE PERIOD, THE CONTRACTOR SHALL FOLLOW THE REQUIREMENTS OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, SECTION 8.6.2 HOT WEATHER PROTECTION OR SECTION 8.6.4 COLD WEATHER PROTECTION.
8. IF PRECAST ARCH UNITS ARE TO BE ERECTED ON PRECAST FOUNDATION UNITS PRIOR TO PLACEMENT OF CAST-IN-PLACE CONCRETE, THE CABLE TIES/RODS MUST REMAIN IN PLACE AND MAY NOT BE REMOVED UNTIL CAST-IN-PLACE CONCRETE HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
9. IF CABLE TIES/RODS MUST BE REMOVED PRIOR TO SETTING OF ARCH UNITS, CAST-IN-PLACE CONCRETE PORTION OF FOUNDATIONS MUST BE PLACED AND ALLOWED TO REACH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI BEFORE PLACEMENT OF PRECAST ARCH UNITS, HEADWALLS AND WINGWALLS. CONTRACTOR MUST FOLLOW SPECIFICATION SECTION 13.4 AND NOTIFY CONTECH ENGINEER PRIOR TO REMOVING CABLES TIES/RODS.
10. IF CAST-IN-PLACE CONCRETE PORTION OF FOUNDATION IS TO BE PLACED PRIOR TO SETTING OF ARCH UNITS, HEADWALLS OR WINGWALLS, CAST-IN-PLACE CONCRETE SHALL REACH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI BEFORE PRECAST ARCH UNITS, HEADWALLS AND WINGWALLS ARE SET.
11. FOUNDATION CONCRETE SHALL REACH ITS FULL DESIGN STRENGTH BEFORE BACKFILLING OF ARCH UNITS MAY COMMENCE.

9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER
EXPIRATION DATE: 12/31/13

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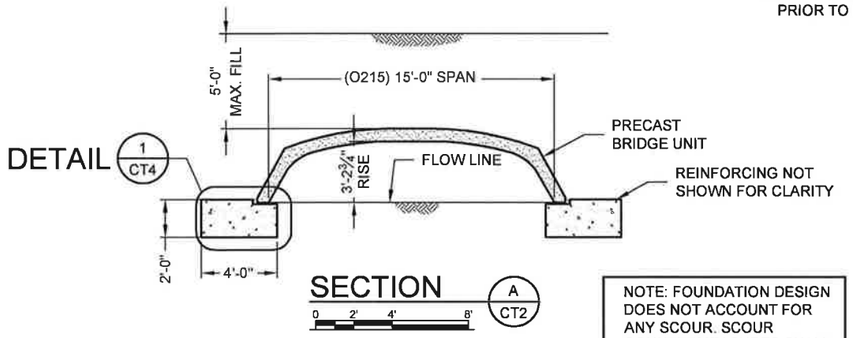
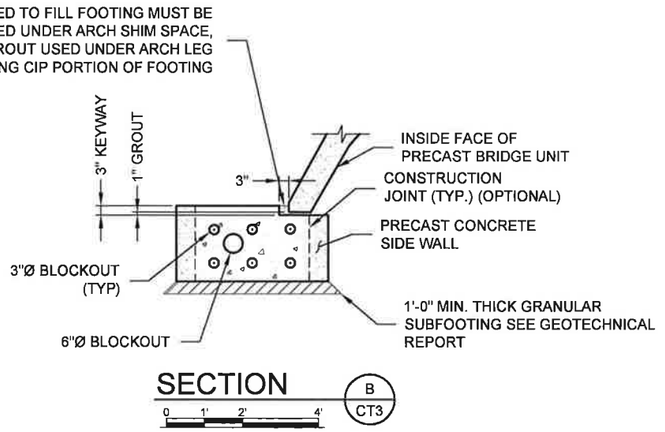
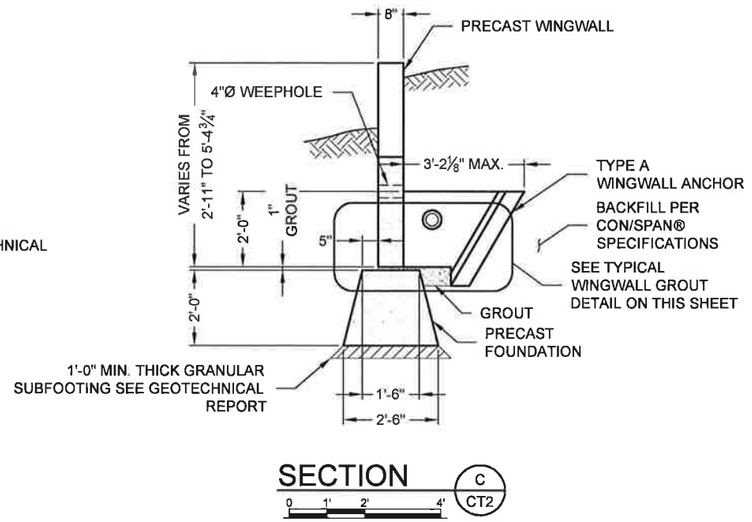
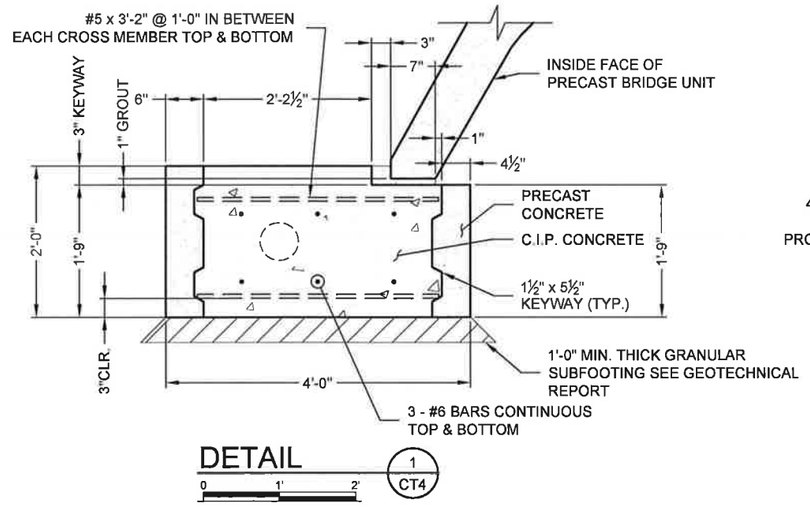
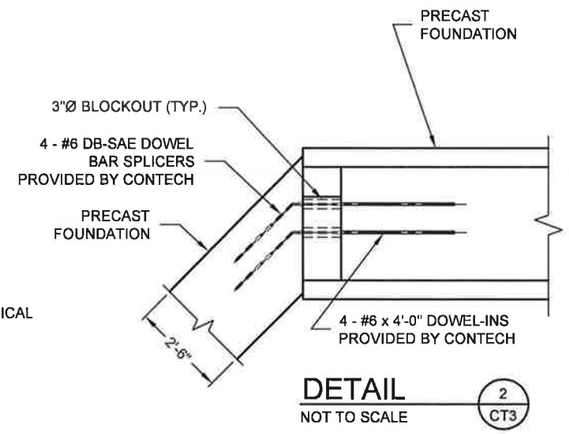


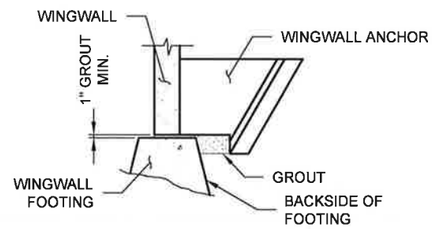
NOTE: FOUNDATION DESIGN DOES NOT ACCOUNT FOR ANY SCOUR. SCOUR COUNTERMEASURES SHALL BE SPECIFIED BY THE ENGINEER OF RECORD, GROUP MACKENZIE











NOTES:
- MINIMUM 1" GROUT UNDER WINGWALL LEG & ANCHOR STEM.
- AREA BETWEEN WINGWALL FOOTING AND WINGWALL ANCHOR SHALL BE GROUTED SOLID BEFORE BACKFILL.
- FORM BACKSIDE OF FOOTING TO DIMENSIONS SHOWN ON FOUNDATION PLAN.

TYPICAL WINGWALL GROUT DETAIL

NOT TO SCALE

9/3/13

PROFESSIONAL ENGINEER 83223PE OREGON JULY 14, 2009 PHILIP A. CREAMER

EXPIRATION DATE: 12/31/13

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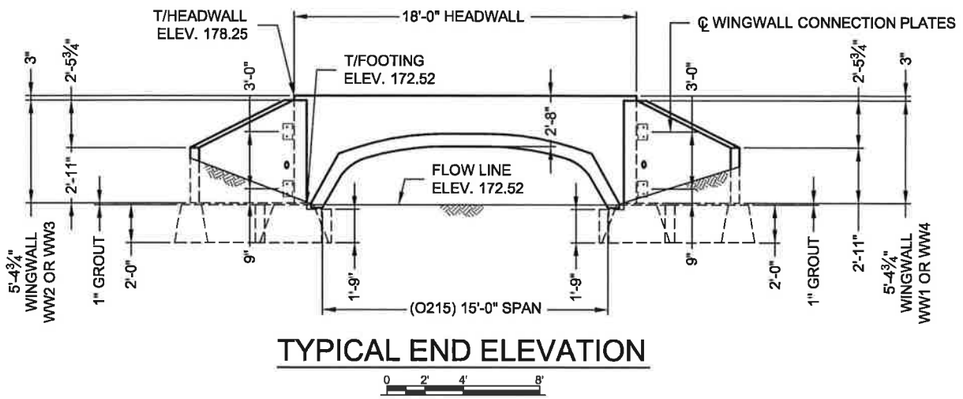
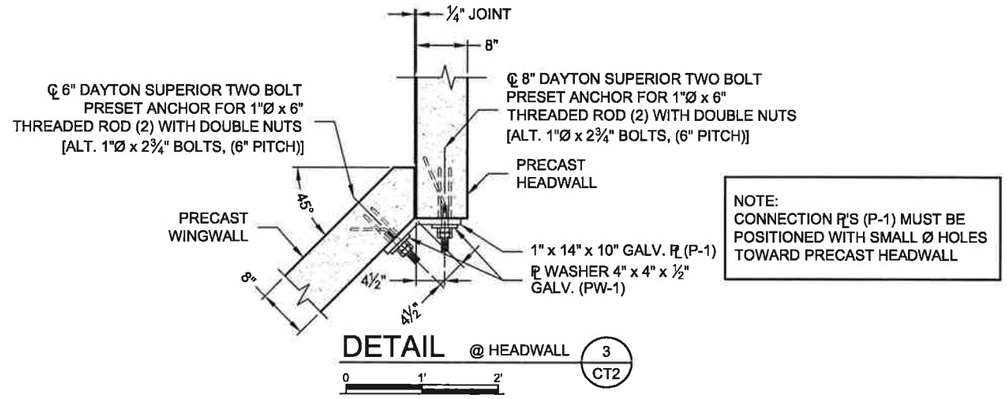


TYPICAL END ELEVATION

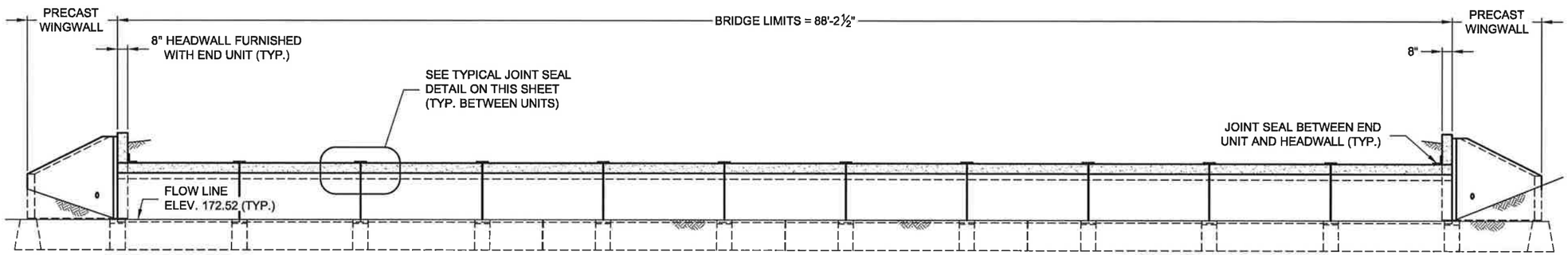
0 2' 4' 8'



NOTE:
CONNECTION PL'S (P-1) MUST BE POSITIONED WITH SMALL Ø HOLES TOWARD PRECAST HEADWALL

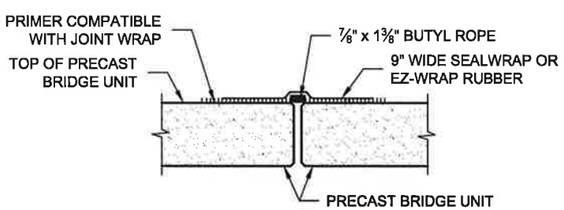
DETAIL @ HEADWALL 3 CT2

0 1' 2'



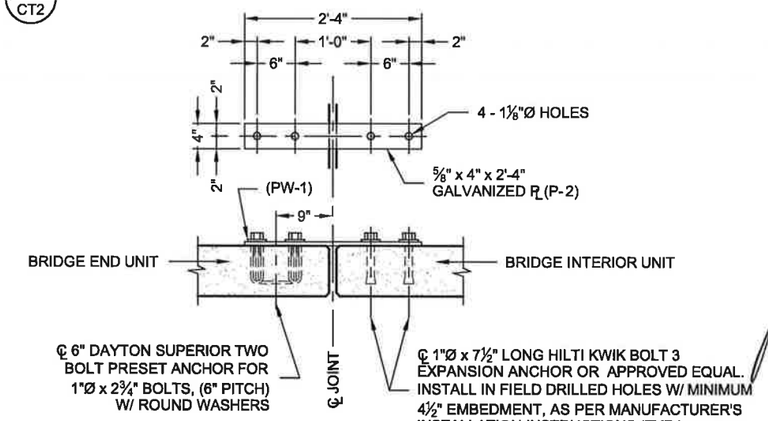
SECTION D CT2

0 2' 4' 8'



TYPICAL JOINT SEAL DETAIL

NOT TO SCALE



DETAIL 4 CT2

NOT TO SCALE

9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER
EXPIRATION DATE: 12/31/13

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SHEET NO.: CT5 OF CT7		

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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS

1. DESCRIPTION
   1.1. TYPE - THIS WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTING A CON/SPAN® BRIDGE SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON THE PLANS OR AS ESTABLISHED BY THE ENGINEER. IN SITUATIONS WHERE TWO OR MORE SPECIFICATIONS APPLY TO THIS WORK, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.
   1.2. DESIGNATION - PRECAST REINFORCED CONCRETE CON/SPAN® BRIDGE UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY SPAN AND RISE. PRECAST REINFORCED CONCRETE WINGWALLS AND HEADWALLS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT, AND DEFLECTION ANGLE.

2. DESIGN
   2.1. SPECIFICATIONS - THE PRECAST ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" 17TH EDITION, ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002. A MINIMUM OF ONE FOOT OF COVER ABOVE THE CROWN OF THE BRIDGE UNITS IS REQUIRED IN THE INSTALLED CONDITION. (UNLESS NOTED OTHERWISE ON THE SHOP DRAWINGS AND DESIGNED ACCORDINGLY.)

3. MATERIALS
   3.1. CONCRETE - THE CONCRETE FOR THE PRECAST ELEMENTS SHALL BE AIR-ENTRAINED WHEN INSTALLED IN AREAS SUBJECT TO FREEZE-THAW CONDITIONS, COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGREGATES, ADMIXTURES AND WATER. AIR-ENTRAINED CONCRETE SHALL CONTAIN 6 ± 2 PERCENT AIR. THE AIR- ENTRAINING ADMIXTURE SHALL CONFORM TO AASHTO M154. THE MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE AS SHOWN ON THE SHOP DRAWINGS.
      3.1.1. PORTLAND CEMENT - SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATIONS C150-TYPE I, TYPE II, OR TYPE III CEMENT.
      3.1.2. COARSE AGGREGATE - SHALL CONSIST OF STONE HAVING A MAXIMUM SIZE OF 1 INCH. AGGREGATE SHALL MEET REQUIREMENTS FOR ASTM C33.
      3.1.3. WATER REDUCING ADMIXTURE - THE MANUFACTURER MAY SUBMIT, FOR APPROVAL BY THE ENGINEER, A WATER-REDUCING ADMIXTURE FOR THE PURPOSE OF INCREASING WORKABILITY AND REDUCING THE WATER REQUIREMENT FOR THE CONCRETE.
      3.1.4. CALCIUM CHLORIDE - THE ADDITION TO THE MIX OF CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE WILL NOT BE PERMITTED.
      3.1.5. MIXTURE - THE AGGREGATES, CEMENT AND WATER SHALL BE PROPORTIONED AND MIXED IN A BATCH MIXER TO PRODUCE A HOMOGENEOUS CONCRETE MEETING THE STRENGTH REQUIREMENTS OF THIS SPECIFICATION. THE PROPORTION OF PORTLAND CEMENT IN THE MIXTURE SHALL NOT BE LESS THAN 564 POUNDS (6 SACKS) PER CUBIC YARD OF CONCRETE.
   3.2. STEEL REINFORCEMENT
      3.2.1. THE MINIMUM STEEL YIELD STRENGTH SHALL BE 60,000 PSI, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS.
      3.2.2. ALL REINFORCING STEEL FOR THE PRECAST ELEMENTS SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE DETAILED SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER.
      3.2.3. REINFORCEMENT SHALL CONSIST OF WELDED WIRE FABRIC CONFORMING TO ASTM SPECIFICATION A 185 OR A 497, OR DEFORMED BILLET STEEL BARS CONFORMING TO ASTM SPECIFICATION A 615, GRADE 60. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS.
   3.3. STEEL HARDWARE
      3.3.1. BOLTS AND THREADED RODS FOR WINGWALL CONNECTIONS SHALL CONFORM TO ASTM A 307. NUTS SHALL CONFORM TO AASHTO M292 (ASTM A194) GRADE 2H. ALL BOLTS, THREADED RODS AND NUTS USED IN WINGWALL CONNECTIONS SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.2. STRUCTURAL STEEL FOR WINGWALL CONNECTION PLATES AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709) GRADE 36 AND SHALL BE HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.3. INSERTS FOR WINGWALLS SHALL BE 1" DIAMETER TWO-BOLT PRESET WINGWALL ANCHORS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
      3.3.4. FERRULE LOOP INSERTS SHALL BE F-64 FERRULE LOOP INSERTS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
      3.3.5. HOOK BOLTS USED IN ATTACHED HEADWALL CONNECTIONS SHALL BE ASTM A307.
      3.3.6. INSERTS FOR DETACHED HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL, F-58 EXPANDED COIL INSERTS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700. COIL RODS AND NUTS USED IN HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL. WASHERS USED IN HEADWALL CONNECTIONS SHALL BE EITHER AISI TYPE 304 STAINLESS STEEL PLATE WASHERS OR AASHTO M270 (ASTM A709) GRADE 36 PLATE WASHERS HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.7. REINFORCING BAR SPLICES SHALL BE MADE USING THE DOWEL BAR SPLICER SYSTEM AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700, AND SHALL CONSIST OF THE DOWEL BAR SPLICER (DB-SAE) AND DOWEL-IN (DI).

4. MANUFACTURE OF PRECAST ELEMENTS - SUBJECT TO THE PROVISIONS OF SECTION 5, BELOW, THE PRECAST ELEMENT DIMENSION AND REINFORCEMENT DETAILS SHALL BE AS PRESCRIBED IN THE PLAN AND SHOP DRAWINGS PROVIDED BY THE MANUFACTURER.
   4.1. FORMS - THE FORMS USED IN MANUFACTURE SHALL BE SUFFICIENTLY RIGID AND ACCURATE TO MAINTAIN THE REQUIRED PRECAST ELEMENT DIMENSIONS WITHIN THE PERMISSIBLE VARIATIONS GIVEN IN SECTION 5 OF THESE SPECIFICATIONS. ALL CASTING SURFACES SHALL BE OF A SMOOTH MATERIAL.
   4.2. PLACEMENT OF REINFORCEMENT
      4.2.1. PLACEMENT OF REINFORCEMENT IN PRECAST BRIDGE UNITS - THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MINIMUM. THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 1½" MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING SINGLE OR MULTIPLE LAYERS OF WELDED WIRE FABRIC (NOT TO EXCEED 3 LAYERS), SUPPLEMENTED WITH A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS, WHEN NECESSARY. WELDED WIRE FABRIC SHALL BE COMPOSED OF CIRCUMFERENTIAL AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE BRIDGE UNIT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW. THE ENDS OF THE LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL BE NOT MORE THAN 3" AND NOT LESS THAN 1½" FROM THE ENDS OF THE BRIDGE UNIT.
      4.2.2. BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL REINFORCING STEEL FOR THE CORNERS OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROXIMATELY EQUAL TO THE CONFIGURATION OF THE BRIDGE'S OUTSIDE CORNER.
      4.2.3. PLACEMENT OF REINFORCEMENT FOR PRECAST WINGWALLS AND HEADWALLS - THE COVER OF CONCRETE OVER THE LONGITUDINAL AND TRANSVERSE REINFORCEMENT SHALL BE 2" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 1½" NOR MORE THAN 3". REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC, OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
   4.3. LAPS, WELDS, SPACING
      4.3.1. LAPS, WELDS, AND SPACING FOR PRECAST BRIDGE UNITS - TENSION SPLICES IN THE CIRCUMFERENTIAL REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.2 AND 8.32.6. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.1 AND 8.32.5. THE OVERLAP OF WELDED WIRE FABRIC SHALL BE MEASURED BETWEEN THE OUTER-MOST LONGITUDINAL WIRES OF EACH FABRIC SHEET. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.25. FOR SPLICES OTHER THAN TENSION SPLICES, THE OVERLAP SHALL BE A MINIMUM OF 1'-0" FOR WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS. THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL DISTRIBUTION STEEL FOR EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
      4.3.2. LAPS, WELDS, AND SPACING FOR PRECAST WINGWALLS AND HEADWALLS - SPLICES IN THE REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.2 AND 8.32.6. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.1 AND 8.32.5. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.25. THE SPACING CENTER-TO-CENTER OF THE WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 8".
   4.4. CURING - THE PRECAST CONCRETE ELEMENTS SHALL BE CURED FOR A SUFFICIENT LENGTH OF TIME SO THAT THE CONCRETE WILL DEVELOP THE SPECIFIED COMPRESSIVE STRENGTH IN 28 DAYS OR LESS. ANY ONE OF THE FOLLOWING METHODS OF CURING OR COMBINATIONS THERE OF SHALL BE USED:
      4.4.1. STEAM CURING - THE PRECAST ELEMENTS MAY BE LOW-PRESSURE STEAM CURED BY A SYSTEM THAT WILL MAINTAIN A MOIST ATMOSPHERE.
      4.4.2. WATER CURING - THE PRECAST ELEMENTS MAY BE WATER CURED BY ANY METHOD THAT WILL KEEP THE SECTIONS MOIST.
      4.4.3. MEMBRANE CURING - A SEALING MEMBRANE CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION C309 MAY BE APPLIED AND SHALL BE LEFT INTACT UNTIL THE REQUIRED CONCRETE COMPRESSIVE STRENGTH IS ATTAINED. THE CONCRETE TEMPERATURE AT THE TIME OF APPLICATION SHALL BE WITHIN +/- 10 DEGREES F OF THE ATMOSPHERIC TEMPERATURE. ALL SURFACES SHALL BE KEPT MOIST PRIOR TO THE APPLICATION OF THE COMPOUNDS AND SHALL BE DAMP WHEN THE COMPOUND IS APPLIED.
   4.5. STORAGE, HANDLING & DELIVERY
      4.5.1. STORAGE - PRECAST CONCRETE BRIDGE ELEMENTS SHALL BE LIFTED AND STORED IN "AS-CAST" POSITION. PRECAST CONCRETE HEADWALL AND WINGWALL UNITS ARE CAST, STORED AND SHIPPED IN A FLAT POSITION. THE PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER TO PREVENT CRACKING OR DAMAGE. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE. THE UNITS SHALL NOT BE MOVED UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED A MINIMUM OF 2500 PSI, AND THEY SHALL NOT BE STORED IN AN UPRIGHT POSITION.
      4.5.2. HANDLING - HANDLING DEVICES SHALL BE PERMITTED IN EACH PRECAST ELEMENT FOR THE PURPOSE OF HANDLING AND SETTING. SPREADER BEAMS MAY BE REQUIRED FOR THE LIFTING OF PRECAST CONCRETE BRIDGE ELEMENTS TO PRECLUDE DAMAGE FROM BENDING OR TORSION FORCES.
      4.5.3. DELIVERY - PRECAST CONCRETE ELEMENTS MUST NOT BE SHIPPED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, OR AS DIRECTED BY THE DESIGN ENGINEER. PRECAST CONCRETE ELEMENTS MAY BE UNLOADED AND PLACED ON THE GROUND AT THE SITE UNTIL INSTALLED. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE.
   4.6. QUALITY ASSURANCE - THE PRECASTER SHALL DEMONSTRATE ADHERENCE TO THE STANDARDS SET FORTH IN THE NPCA QUALITY CONTROL MANUAL. THE PRECASTER SHALL MEET EITHER SECTION 4.6.1 OR 4.6.2
      4.6.1. CERTIFICATION - THE PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRODUCTS COVERED BY THIS SPECIFICATION.
      4.6.2. QUALIFICATIONS, TESTING AND INSPECTION
         4.6.2.1. THE PRECASTER SHALL HAVE BEEN IN THE BUSINESS OF PRODUCING PRECAST CONCRETE PRODUCTS SIMILAR TO THOSE SPECIFIED FOR A MINIMUM OF THREE YEARS. HE SHALL MAINTAIN A PERMANENT QUALITY CONTROL DEPARTMENT OR RETAIN AN INDEPENDENT TESTING AGENCY ON A CONTINUING BASIS. THE AGENCY SHALL ISSUE A REPORT, CERTIFIED BY A LICENSED ENGINEER, DETAILING THE ABILITY OF THE PRECASTER TO PRODUCE QUALITY PRODUCTS CONSISTENT WITH INDUSTRY STANDARDS.
         4.6.2.2. THE PRECASTER SHALL SHOW THAT THE FOLLOWING TESTS ARE PERFORMED IN ACCORDANCE WITH THE ASTM STANDARDS INDICATED. TESTS SHALL BE PERFORMED AS INDICATED IN SECTION 6 OF THESE SPECIFICATIONS.
            4.6.2.2.1. AIR CONTENT: C231 OR C173
            4.6.2.2.2. COMPRESSIVE STRENGTH: C31,C39,C497
         4.6.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH® BRIDGE SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST.
         4.6.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS COVERED BY THIS SPECIFICATION ARE BEING MANUFACTURED.
      4.6.3. DOCUMENTATION - THE PRECASTER SHALL SUBMIT PRECAST PRODUCTION REPORTS TO CONTECH® BRIDGE SOLUTIONS AS REQUIRED.

5. PERMISSIBLE VARIATIONS
   5.1. BRIDGE UNITS
      5.1.1. INTERNAL DIMENSIONS - THE INTERNAL DIMENSION SHALL VARY NOT MORE THAN 1% FROM THE DESIGN DIMENSIONS NOR MORE THAN 1½" WHICHEVER IS LESS.
      5.1.2. SLAB AND WALL THICKNESS - THE SLAB AND WALL THICKNESS SHALL NOT BE LESS THAN THAT SHOWN IN THE DESIGN BY MORE THAN ¼". A THICKNESS MORE THAN THAT REQUIRED IN THE DESIGN SHALL NOT BE CAUSE FOR REJECTION.
      5.1.3. LENGTH OF OPPOSITE SURFACES - VARIATIONS IN LAYING LENGTHS OF TWO OPPOSITE SURFACES OF THE BRIDGE UNIT SHALL NOT BE MORE THAN ½" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.
      5.1.4. LENGTH OF SECTION - THE UNDERRUN IN LENGTH OF A SECTION SHALL NOT BE MORE THAN ½" IN ANY BRIDGE UNIT.
      5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR BE LESS THAN 1" FOR THE INSIDE CIRCUMFERENTIAL STEEL AS MEASURED TO THE EXTERNAL OR INTERNAL SURFACE OF THE BRIDGE. THESE TOLERANCES OR COVER REQUIREMENTS DO NOT APPLY TO MATING SURFACES OF THE JOINTS.
      5.1.6. AREA OF REINFORCEMENT - THE AREAS OF STEEL REINFORCEMENT SHALL BE THE DESIGN STEEL AREAS AS SHOWN IN THE MANUFACTURER'S SHOP DRAWINGS. STEEL AREAS GREATER THAN THOSE REQUIRED SHALL NOT BE CAUSE FOR REJECTION. THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCEMENT SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCEMENT.
   5.2. WINGWALLS & HEADWALLS
      5.2.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.2. LENGTH/HEIGHT OF WALL SECTIONS - THE LENGTH AND HEIGHT OF THE WALL SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.2.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.

6. TESTING/ INSPECTION
   6.1. TESTING
      6.1.1. TYPE OF TEST SPECIMEN - CONCRETE COMPRESSIVE STRENGTH SHALL BE DETERMINED FROM COMPRESSION TESTS MADE ON CYLINDERS OR CORES. FOR CYLINDER TESTING, A MINIMUM OF 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. EACH ELEMENT SHALL BE CONSIDERED SEPARATELY FOR THE PURPOSE OF TESTING AND ACCEPTANCE.
      6.1.2. COMPRESSION TESTING - CYLINDERS SHALL BE MADE AND TESTED AS PRESCRIBED BY THE ASTM C39 SPECIFICATION. CYLINDERS SHALL BE CURED IN THE SAME ENVIRONMENT AS THE BRIDGE ELEMENTS. CORES SHALL BE OBTAINED AND TESTED FOR COMPRESSIVE STRENGTH IN ACCORDANCE WITH THE PROVISIONS OF THE ASTM C42 SPECIFICATION.
      6.1.3. ACCEPTABILITY OF CYLINDER TESTS - WHEN THE AVERAGE COMPRESSIVE STRENGTH OF ALL CYLINDERS TESTED IS EQUAL TO OR GREATER THAN THE DESIGN COMPRESSIVE STRENGTH, AND NOT MORE THAN 10% OF THE CYLINDERS TESTED HAVE A COMPRESSIVE STRENGTH LESS THAN THE DESIGN CONCRETE STRENGTH, AND NO CYLINDER TESTED HAS A COMPRESSIVE STRENGTH LESS THAN 80% OF THE DESIGN COMPRESSIVE STRENGTH, THEN THE ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA, THE ACCEPTABILITY OF THE ELEMENT MAY BE DETERMINED AS DESCRIBED IN SECTION 6.1.4, BELOW.
      6.1.4. ACCEPTABILITY OF CORE TESTS - THE COMPRESSIVE STRENGTH OF THE CONCRETE IN A BRIDGE ELEMENT IS ACCEPTABLE WHEN THE AVERAGE CORE TEST STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH. WHEN THE COMPRESSIVE STRENGTH OF A CORE TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN MAY BE RE-CORED. WHEN THE COMPRESSIVE STRENGTH OF THE RE-CORE IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH, THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THAT BRIDGE ELEMENT IS ACCEPTABLE.
         6.1.4.1. WHEN THE COMPRESSIVE STRENGTH OF ANY RECORE IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN SHALL BE REJECTED.
         6.1.4.2. PLUGGING CORE HOLES - THE CORE HOLES SHALL BE PLUGGED AND SEALED BY THE MANUFACTURER IN A MANNER SUCH THAT THE ELEMENTS WILL MEET ALL OF THE TEST REQUIREMENTS OF THIS SPECIFICATION. PRECAST ELEMENTS SO SEALED SHALL BE CONSIDERED SATISFACTORY FOR USE.
         6.1.4.3. TEST EQUIPMENT - EVERY MANUFACTURER FURNISHING PRECAST ELEMENTS UNDER THIS SPECIFICATION SHALL FURNISH ALL FACILITIES AND PERSONNEL NECESSARY TO CARRY OUT THE TEST REQUIRED.
   6.2. INSPECTION - THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.

7. JOINTS
   THE BRIDGE UNITS SHALL BE PRODUCED WITH FLAT BUTT ENDS. THE ENDS OF THE BRIDGE UNITS SHALL BE SUCH THAT WHEN THE SECTIONS ARE LAID TOGETHER THEY WILL MAKE A CONTINUOUS LINE WITH A SMOOTH INTERIOR FREE OF APPRECIABLE IRREGULARITIES, ALL COMPATIBLE WITH THE PERMISSIBLE VARIATIONS IN SECTION 5, ABOVE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

8. WORKMANSHIP/ FINISH
   THE BRIDGE UNITS, WINGWALLS, AND HEADWALLS SHALL BE SUBSTANTIALLY FREE OF FRACTURES. THE ENDS OF THE BRIDGE UNITS SHALL BE NORMAL TO THE WALLS AND CENTERLINE OF THE BRIDGE SECTION, WITHIN THE LIMITS OF THE VARIATIONS GIVEN IN SECTION 5, ABOVE, EXCEPT WHERE BEVELED ENDS ARE SPECIFIED. THE FACES OF THE WINGWALLS AND HEADWALLS SHALL BE PARALLEL TO EACH OTHER, WITHIN THE LIMITS OF VARIATIONS GIVEN IN SECTION 5, ABOVE. THE SURFACE OF THE PRECAST ELEMENTS SHALL BE A SMOOTH STEEL FORM OR TROWELED SURFACE. TRAPPED AIR POCKETS CAUSING SURFACE DEFECTS SHALL BE CONSIDERED AS PART OF A SMOOTH, STEEL FORM FINISH.

9. REPAIRS
   PRECAST ELEMENTS MAY BE REPAIRED, IF NECESSARY, BECAUSE OF IMPERFECTIONS IN MANUFACTURE OR HANDLING DAMAGE AND WILL BE ACCEPTABLE IF, IN THE OPINION OF THE PURCHASER, THE REPAIRS ARE SOUND, PROPERLY FINISHED AND CURED, AND THE REPAIRED SECTION CONFORMS TO THE REQUIREMENTS OF THIS SPECIFICATION.

10. REJECTION
    THE PRECAST ELEMENTS SHALL BE SUBJECT TO REJECTION ON ACCOUNT OF ANY OF THE SPECIFICATION REQUIREMENTS. INDIVIDUAL PRECAST ELEMENTS MAY BE REJECTED BECAUSE OF ANY OF THE FOLLOWING:
    10.1. FRACTURES OR CRACKS PASSING THROUGH THE WALL, EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED ONE HALF THE THICKNESS OF THE WALL.
    10.2. DEFECTS THAT INDICATE PROPORTIONING, MIXING, AND MOLDING NOT IN COMPLIANCE WITH SECTION 4 OF THESE SPECIFICATIONS.
    10.3. HONEYCOMBED OR OPEN TEXTURE.
    10.4. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.

11. MARKING
    EACH BRIDGE UNIT SHALL BE CLEARLY MARKED BY WATERPROOF PAINT. THE FOLLOWING SHALL BE SHOWN ON THE INSIDE OF THE VERTICAL LEG OF THE BRIDGE SECTION:
    BRIDGE SPAN x BRIDGE RISE
    DATE OF MANUFACTURE
    NAME OR TRADEMARK OF THE MANUFACTURER

9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER

EXPIRATION DATE: 6/30/15

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DESIGNED: JAL	DRAWN: JA	
CHECKED: DM	APPROVED: PAC	
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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS (CONT'D)

12. INSTALLATION PREPARATION

TO ENSURE CORRECT INSTALLATION OF THE PRECAST CONCRETE BRIDGE SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN FORMING THE SUPPORT AREAS FOR BRIDGE UNITS, HEADWALL, AND WINGWALL ELEMENTS. EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.

12.1. FOOTINGS

DO NOT OVER EXCAVATE FOUNDATIONS UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.

THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE BEARING CAPACITY MEETS OR EXCEEDS THE FOOTING DESIGN REQUIREMENTS, PRIOR TO THE CONTRACTOR POURING OF THE FOOTINGS.

THE BRIDGE UNITS AND WINGWALLS SHALL BE INSTALLED ON EITHER PRECAST OR CAST-IN-PLACE CONCRETE FOOTINGS. THE SIZE AND ELEVATION OF THE FOOTINGS SHALL BE AS DESIGNED BY THE ENGINEER. A KEYWAY SHALL BE FORMED IN THE TOP SURFACE OF THE BRIDGE FOOTING AS SPECIFIED ON THE PLANS. NO KEYWAY IS REQUIRED IN THE WINGWALL FOOTINGS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

THE FOOTINGS SHALL BE GIVEN A SMOOTH FLOAT FINISH AND SHALL REACH A COMPRESSIVE STRENGTH OF 2,000 PSI BEFORE PLACEMENT OF THE BRIDGE AND WINGWALL ELEMENTS. BACKFILLING SHALL NOT BEGIN UNTIL THE FOOTING HAS REACHED THE FULL DESIGN COMPRESSIVE STRENGTH.

THE FOOTING SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN TESTED WITH A 10'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN ¼" IN 10'-0".

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOOTING PRIOR TO PLACING THE PRECAST FOOTING.

THE FOUNDATIONS FOR PRECAST CONCRETE BRIDGE ELEMENTS AND WINGWALLS MUST BE CONNECTED BY REINFORCEMENT TO FORM ONE MONOLITHIC BODY. EXPANSION JOINTS SHALL NOT BE USED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE FOUNDATIONS PER THE PLANS AND SPECIFICATIONS.

13. INSTALLATION

13.1. GENERAL - THE INSTALLATION OF THE PRECAST CONCRETE ELEMENTS SHALL BE AS EXPLAINED IN THE PUBLICATION CON/SPAN BRIDGE SYSTEMS INSTALLATION HANDBOOK.

13.1.1. LIFTING - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A CRANE OF THE CORRECT LIFTING CAPACITY IS AVAILABLE TO HANDLE THE PRECAST CONCRETE UNITS. THIS CAN BE ACCOMPLISHED BY USING THE WEIGHTS GIVEN FOR THE PRECAST CONCRETE COMPONENTS AND BY DETERMINING THE LIFTING REACH FOR EACH CRANE UNIT. SITE CONDITIONS MUST BE CHECKED WELL IN ADVANCE OF SHIPPING TO ENSURE PROPER CRANE LOCATION AND TO AVOID ANY LIFTING RESTRICTIONS. THE LIFT ANCHORS OR HOLES PROVIDED IN EACH UNIT ARE THE ONLY MEANS TO BE USED TO LIFT THE ELEMENTS. THE PRECAST CONCRETE ELEMENTS MUST NOT BE SUPPORTED OR RAISED BY OTHER MEANS THAN THOSE GIVEN IN THE MANUALS AND DRAWINGS WITHOUT WRITTEN APPROVAL FROM CONTECH® BRIDGE SOLUTIONS.

13.1.2. CONSTRUCTION EQUIPMENT WEIGHT RESTRICTIONS - IN NO CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD (HS20 OR HS25) BE PERMITTED OVER THE BRIDGE UNITS UNLESS APPROVED BY CONTECH® BRIDGE SOLUTIONS.

13.1.2.1. IN THE IMMEDIATE AREA OF THE BRIDGE UNITS, THE FOLLOWING RESTRICTIONS FOR THE USE OF HEAVY CONSTRUCTION MACHINERY DURING BACKFILLING OPERATIONS APPLY:

NO CONSTRUCTION EQUIPMENT SHALL CROSS THE BARE
- PRECAST CONCRETE BRIDGE UNIT.

AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF
- 4" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 10 TONS MAY CROSS THE BRIDGE.

AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF
- 1'-0" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 30 TONS MAY CROSS THE BRIDGE.

AFTER THE COMPACTED FILL LEVEL HAS REACHED THE DESIGN
- COVER, OR 2'-0" MINIMUM, OVER THE CROWN OF THE PRECAST CONCRETE BRIDGE, CONSTRUCTION EQUIPMENT WITHIN THE DESIGN LOAD LIMITS FOR THE ROAD MAY CROSS THE PRECAST CONCRETE BRIDGE.

13.2. LEVELING PAD/SHIMS - THE BRIDGE UNITS AND WINGWALLS SHALL BE SET ON MASONITE OR STEEL SHIMS MEASURING 5" x 5", MINIMUM, UNLESS SHOWN OTHERWISE ON THE PLANS. A MINIMUM GAP OF ½" SHALL BE PROVIDED BETWEEN THE FOOTING AND THE BOTTOM OF THE BRIDGE'S VERTICAL LEGS OR THE BOTTOM OF THE WINGWALL. ALSO, A SUPPLY OF ¼", ½" & ⅛" THICK STEEL OR MASONITE SHIMS FOR VARIOUS SHIMMING PURPOSES SHOULD BE ON SITE.

13.3. PLACEMENT OF BRIDGE UNITS - THE BRIDGE UNITS SHALL BE PLACED AS SHOWN ON THE ENGINEER'S PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

13.4. IT IS IMPERATIVE THAT ANY LATERAL SPREADING OF THE BRIDGE ELEMENTS BE AVOIDED DURING AND AFTER THEIR PLACEMENT. GENERALLY, HORIZONTAL CABLE TIES OR TIE RODS ARE SHIPPED IN THE BRIDGE ELEMENTS TO PREVENT THIS SPREADING. CABLE TIES/TIE RODS SHALL NOT BE REMOVED UNTIL BRIDGE UNITS ARE GROUTED AND GROUT HAS CURED. IF, HOWEVER, DUE TO SITE RESTRICTIONS, THESE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO PLACEMENT OF THE BRIDGE ELEMENTS, THE CONTRACTOR MUST NOTIFY CONTECH (MANUFACTURER) AND REQUEST A SUGGESTED INSTALLATION PROCEDURE.

IN ADDITION, IF THE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO SETTING ARCH UNITS, THE FOLLOWING QUALITY CONTROL PROCEDURE MUST BE FOLLOWED:

1) FIND "MEASURED SPAN" UPON ARCH UNIT'S DELIVERY TO SITE, PRIOR TO LIFTING FROM TRUCK AND REMOVING CABLE TIES/TIE RODS. "MEASURED SPAN" SHALL BE THE AVERAGE OF (3) SPAN MEASUREMENTS ALONG THE LAY LENGTH OF THE ARCH UNIT.

2) AFTER SETTING OF BRIDGE UNIT ON THE FOUNDATION, VERIFY THE SPAN. THIS "INSTALLED SPAN MEASUREMENT" SHALL NOT EXCEED THE MAXIMUM OF
   A) THE NOMINAL SPAN +½" OR
   B) THE "MEASURED SPAN".

IF THE "INSTALLED SPAN MEASUREMENT" EXCEEDS THIS AMOUNT, THE ARCH UNIT SHALL BE LIFTED AND RE-SET UNTIL THE "INSTALLED SPAN MEASUREMENT" MEETS THE LIMITS.

13.5. PLACEMENT OF WINGWALLS & HEADWALLS - THE WINGWALLS AND HEADWALLS SHALL BE PLACED AS SHOWN ON THE PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE.

13.6. WATERPROOFING/JOINT PROTECTION AND SUBSURFACE DRAINAGE

13.6.1. EXTERNAL PROTECTION OF JOINTS - THE BUTT JOINT MADE BY TWO ADJOINING BRIDGE UNITS SHALL BE COVERED WITH A ⅛" x 1¾" PREFORMED BITUMINOUS JOINT SEALANT AND A MINIMUM OF A 9" WIDE JOINT WRAP. THE SURFACE SHALL BE FREE OF DIRT BEFORE APPLYING THE JOINT MATERIAL. A PRIMER COMPATIBLE WITH THE JOINT WRAP TO BE USED SHALL BE APPLIED FOR A MINIMUM WIDTH OF 9" ON EACH SIDE OF THE JOINT. THE EXTERNAL WRAP SHALL BE EITHER EZ-WRAP RUBBER BY PRESS-SEAL GASKET CORPORATION, SEAL WRAP BY MAR MAC MANUFACTURING CO. INC. OR APPROVED EQUAL. THE JOINT SHALL BE COVERED CONTINUOUSLY FROM THE BOTTOM OF ONE BRIDGE SECTION LEG, ACROSS THE TOP OF THE BRIDGE AND TO THE OPPOSITE BRIDGE SECTION LEG. ANY LAPS THAT RESULT IN THE JOINT WRAP SHALL BE A MINIMUM OF 6" LONG WITH THE OVERLAP RUNNING DOWNHILL.

13.6.2. IN ADDITION TO THE JOINTS BETWEEN BRIDGE UNITS, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE HEADWALL SHALL ALSO BE SEALED AS DESCRIBED ABOVE. IF PRECAST WINGWALLS ARE USED, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE WINGWALL SHALL BE SEALED WITH A 2'-0" STRIP OF FILTER FABRIC. ALSO, IF LIFT HOLES ARE FORMED IN THE BRIDGE UNITS, THEY SHALL BE PRIMED AND COVERED WITH A 9" x 9" SQUARE OF JOINT WRAP.

13.6.3. DURING THE BACKFILLING OPERATION, CARE SHALL BE TAKEN TO KEEP THE JOINT WRAP IN ITS PROPER LOCATION OVER THE JOINT.

13.6.4. SUBSOIL DRAINAGE SHALL BE AS DIRECTED BY THE ENGINEER.

13.7. GROUTING

13.7.1. GROUTING SHALL NOT BE PERFORMED WHEN TEMPERATURES ARE EXPECTED TO GO BELOW 35° FOR A PERIOD OF 72 HOURS. FILL THE BRIDGE-FOUNDATION KEYWAY WITH CEMENT GROUT (PORTLAND CEMENT AND WATER OR CEMENT MORTAR COMPOSED OF PORTLAND CEMENT, SAND AND WATER) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI. VIBRATE AS REQUIRED TO ENSURE THAT THE ENTIRE KEY AROUND THE BRIDGE ELEMENT IS COMPLETELY FILLED. IF BRIDGE ELEMENTS HAVE BEEN SET WITH TEMPORARY TIES (CABLES, BARS, ETC.) GROUT MUST ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI BEFORE TIES MAY BE REMOVED.

13.7.2. ALL GROUT SHALL HAVE A MAXIMUM AGGREGATE SIZE OF ¼".

13.7.3. LIFTING AND ERECTION ANCHOR RECESSES SHALL BE FILLED WITH GROUT.

13.8. BACKFILL

13.8.1. DO NOT PERFORM BACKFILLING DURING WET OR FREEZING WEATHER.

13.8.2. NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURAL ELEMENTS UNTIL THEY HAVE BEEN APPROVED BY THE ENGINEER.

13.8.3. BACKFILL SHALL BE CONSIDERED AS ALL REPLACED EXCAVATION AND NEW EMBANKMENT ADJACENT TO THE PRECAST CONCRETE ELEMENTS. THE PROJECT CONSTRUCTION AND MATERIAL SPECIFICATIONS, WHICH INCLUDE THE SPECIFICATIONS FOR EXCAVATION FOR STRUCTURES AND ROADWAY EXCAVATION AND EMBANKMENT CONSTRUCTION, SHALL APPLY EXCEPT AS MODIFIED IN THIS SECTION.

13.8.4. BACKFILL ZONES:

IN-SITU SOIL
- ZONE A: CONSTRUCTED EMBANKMENT OR OVERFILL.
- ZONE B: FILL THAT IS DIRECTLY ASSOCIATED WITH PRECAST
- CONCRETE BRIDGE INSTALLATION.

ZONE C: ROAD STRUCTURE.

13.8.5. REQUIRED BACKFILL PROPERTIES

13.8.5.1. IN-SITU SOIL - NATURAL GROUND IS TO BE SUFFICIENTLY STABLE TO ALLOW EFFECTIVE SUPPORT TO THE PRECAST CONCRETE BRIDGE UNITS. AS A GUIDE, THE EXISTING NATURAL GROUND SHOULD BE OF SIMILAR QUALITY AND DENSITY TO ZONE B MATERIAL FOR MINIMUM LATERAL DIMENSION OF ONE BRIDGE SPAN OUTSIDE OF THE BRIDGE FOOTING.

13.8.5.2. ZONE A - ZONE A REQUIRES FILL MATERIAL WITH SPECIFICATIONS AND COMPACTING PROCEDURES EQUAL TO THAT FOR NORMAL ROAD EMBANKMENTS.

13.8.5.3. ZONE B - GENERALLY, SOILS SHALL BE REASONABLY FREE OF ORGANIC MATTER, AND, NEAR CONCRETE SURFACES, FREE OF STONES LARGER THAN 3" IN DIAMETER SEE CHARTS FOR DETAILED DESCRIPTIONS OF ACCEPTABLE SOILS.

13.8.5.4. ZONE C - ZONE C IS THE ROAD SECTION OF GRAVEL, ASPHALT OR CONCRETE BUILT IN COMPLIANCE WITH LOCAL ENGINEERING PRACTICES.

13.8.5.5. GEOTECHNICAL ENGINEER SHALL REVIEW GRADATIONS OF ALL INTERFACING MATERIALS AND, IF NECESSARY, RECOMMEND GEOTEXTILE FILTER FABRIC (PROVIDED BY CONTRACTOR)

13.8.6. PLACING AND COMPACTING BACKFILL

DUMPING FOR BACKFILLING IS NOT ALLOWED ANY NEARER THAN 3'-0" FROM THE BRIDGE LEG.

THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL ON OPPOSITE SIDES OF THE BRIDGE MUST NOT EXCEED 2'-0".

THE FILL BEHIND WINGWALLS MUST BE PLACED AT THE SAME TIME AS THAT OF THE BRIDGE FILL. IT MUST BE PLACED IN PROGRESSIVELY PLACED HORIZONTAL LAYERS NOT EXCEEDING 8" PER LAYER.

THE BACKFILL OF ZONE B SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% OF THE STANDARD PROCTOR, AS REQUIRED BY AASHTO T-99.

SOIL WITHIN 1'-0" OF CONCRETE SURFACES SHOULD BE HAND-COMPACTED. ELSEWHERE, USE OF ROLLERS IS ACCEPTABLE. IF VIBRATING ROLLER-COMPACTORS ARE USED, THEY SHOULD NOT BE STARTED OR STOPPED WITHIN ZONE B AND THE VIBRATION FREQUENCY SHOULD BE AT LEAST 30 REVOLUTIONS PER SECOND.

THE BACKFILL MATERIAL AND COMPACTING BEHIND WINGWALLS SHOULD SATISFY THE CRITERIA FOR THE BRIDGE BACKFILL, ZONE B.

BACKFILL AGAINST A WATERPROOFED SURFACE SHALL BE PLACED CAREFULLY TO AVOID DAMAGE TO THE WATERPROOFING MATERIAL.

13.8.7. BRIDGE UNITS

FOR FILL HEIGHTS OVER 12'-0", NO BACKFILLING MAY BEGIN UNTIL A BACKFILL COMPACTION TESTING PLAN HAS BEEN COORDINATED WITH AND APPROVED BY CONTECH® BRIDGE SOLUTIONS. COST OF THE BACKFILL COMPACTION TESTING SHALL BE INCLUDED IN THE COST OF THE PRECAST UNITS. THIS INCLUDED COST APPLIES ONLY TO PROJECTS WITH FILL HEIGHTS OVER 12'-0" (AS MEASURED FROM TOP CROWN OF BRIDGE TO FINISHED GRADE).

13.8.8. WINGWALLS

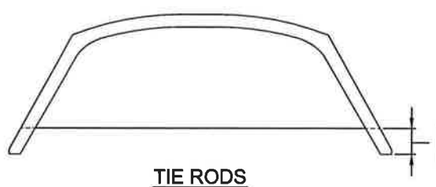
BACKFILL IN FRONT OF WINGWALLS SHALL BE CARRIED TO GROUND LINES SHOWN IN THE PLANS.

13.8.9. MONITORING

THE CONTRACTOR SHALL CHECK SETTLEMENTS AND HORIZONTAL DISPLACEMENT OF FOUNDATION TO ENSURE THAT THEY ARE WITHIN THE ALLOWABLE LIMIT PROVIDED BY THE ENGINEER. THESE MEASUREMENTS SHOULD GIVE AN INDICATION OF THE SETTLEMENTS AND DEFORMATIONS ALONG THE LENGTH OF THE FOUNDATIONS.

THE FIRST MEASUREMENT ROW SHOULD TAKE PLACE AFTER THE ERECTION OF ALL PRECAST BRIDGE SYSTEM ELEMENTS, A SECOND AFTER COMPLETION OF BACKFILLING, AND A THIRD BEFORE OPENING OF THE BRIDGE TO TRAFFIC. FURTHER MEASUREMENTS MAY BE MADE ACCORDING TO LOCAL CONDITIONS.

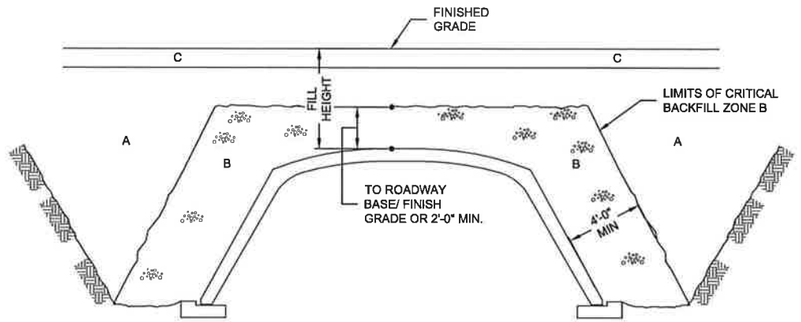
THE MAXIMUM DIFFERENCE IN VERTICAL DISPLACEMENTS 'V' SHOULD NOT EXCEED 1" ALONG THE LENGTH OF ONE FOUNDATION.



TIE RODS

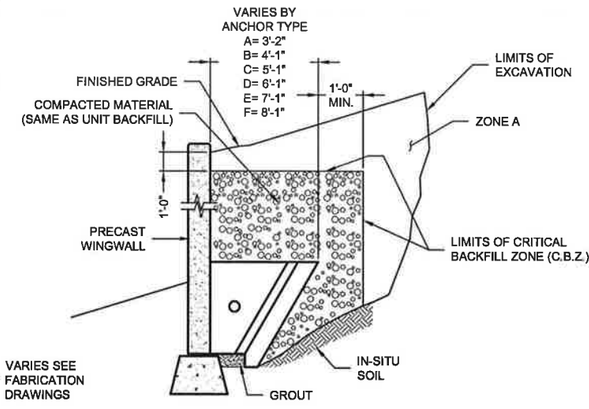
ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

TYPICAL USCS MATERIALS	AASHTO GROUP	AASHTO SUBGROUP	PERCENT PASSING US SIEVE NO.			CHARACTER OF FRACTION PASSING NO. 40 SIEVE		SOIL DESRIPTION
			#10	#40	#200	LIQUID LIMIT	PLASTICITY INDEX	
GW, GP, SP	A1	A-1a	50 MAX	30 MAX	15 MAX		6 MAX	LARGELY GRAVEL BUT CAN INCLUDE SAND AND FINES
GM, SW, SP, SM		A-1b		50 MAX	25 MAX		6 MAX	GRAVELLY SAND OR GRADED SAND, MAY INCLUDE FINES
GM, SM, ML, SP, GP	A2	A-2-4			35 MAX	40 MAX	10 MAX	SANDS, GRAVELS WITH LOW-PLASTICITY SILT FINES
SC, GC, GM		A-2-5			35 MAX	41 MIN	10 MAX	SANDS, GRAVELS WITH PLASTIC SILT FINES
SP, SM, SW	A3			51 MIN	10 MAX		NON-PLASTIC	FINE SANDS
ML, SM, SC	A4				36 MIN	40 MAX	10 MAX	LOW-COMPRESSIBILTY SILTS



SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE ZONE B
≤ 24'-0"	≥ 12'-0"	A1, A3
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4
> 24'-0"	ALL	A1, A3

BACKFILL REQUIREMENTS



WALL BACKFILL REQUIREMENTS

9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER

EXPIRATION DATE: 12/31/13

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CHECKED: DM	APPROVED: PAC	
SHEET NO.: CT7 OF CT7		

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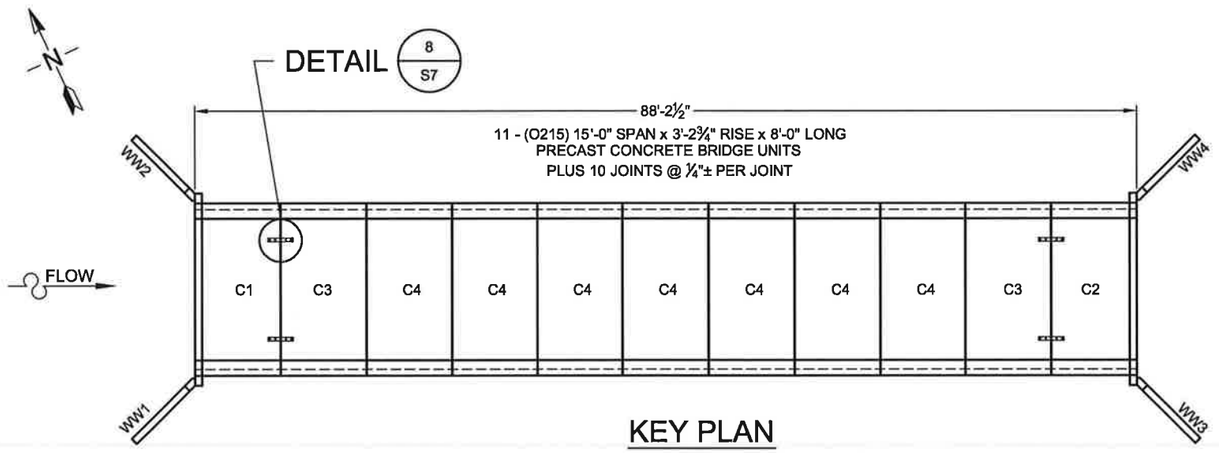
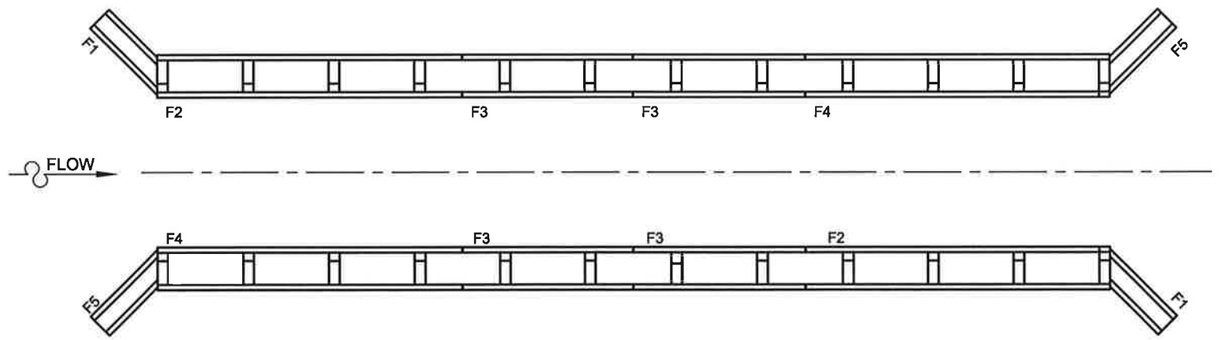


KEY PLAN



FOOTING KEY PLAN

9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER

EXPIRATION DATE: 12/31/13

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SHEET NO.: S1 OF S16		

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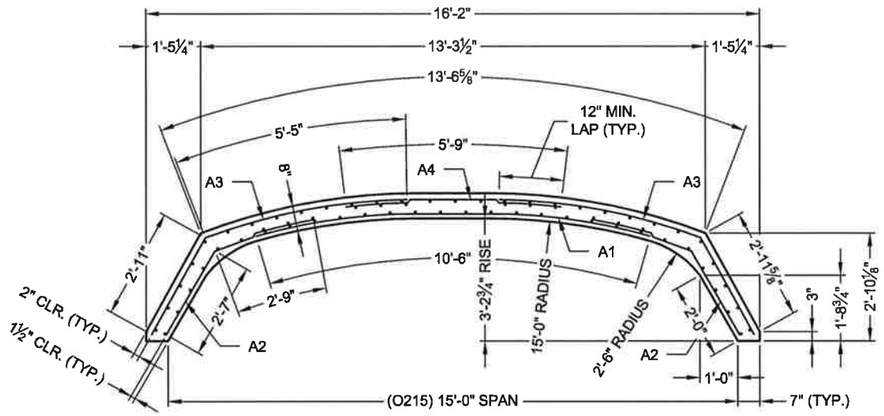
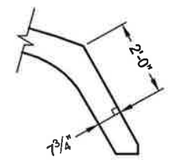
NOTES:
1. MINIMUM 28-DAY CONCRETE COMPRESSIVE STRENGTH SHALL BE 4000 PSI.
2. OVERLAP LENGTH SHALL BE MEASURED FROM LAST CROSSWIRE.
3. DIMENSIONS SHOWN ARE FOR FORM SYSTEM O-200 SERIES.
4. MINIMUM YIELD STRENGTH FOR WELDED WIRE FABRIC SHALL BE 65,000 PSI.
5. REINFORCING SHALL BE LIMITED TO A MAXIMUM OF THREE LAYERS OF REINFORCING (WWF OR BARS) PER AREA (A1, A2, A3 OR A4).
6. ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER.
7. SPACING OF LONGITUDINAL REINFORCEMENT MUST BE A MAXIMUM OF 8" O.C. FOR MULTIPLE LAYERS OF MESH, ONLY THE OUTER MOST LAYER (A1A OR A3A) MUST BE A MAXIMUM OF 8" O.C.
8. SPACING OF A2 & A4 CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MIN. TO 4" MAX. SPACING OF A1 & A3 CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2".



PRECAST UNIT REINFORCEMENT



INCREMENTAL ARCH LEG THICKNESSES

WEIGHT OF REQUIRED REINFORCEMENT = 69 LBS/FT

SHEET NO.	CIRCUMFERENTIAL AREA REQ'D (IN²/FT)	LONGITUDINAL AREA REQ'D (IN²/FT)	MESH SIZE	LENGTH (FT)	CIRCUMFERENTIAL AREA SUPL'D (IN²/FT)	LONGITUDINAL AREA SUPL'D (IN²/FT)
1	A1 = 0.54	0.13		10'-6"		
2	A2 = 0.24	0.13		5'-4"		
3	A3 = 0.30	0.13		8'-4"		
4	A4 = 0.24	0.13		5'-9"		
5						

DESIGN LOADING: HS20-44 COVER = 2'-0" MIN. \ 5'-0" MAX.

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER
EXPIRATION DATE: 12/31/13

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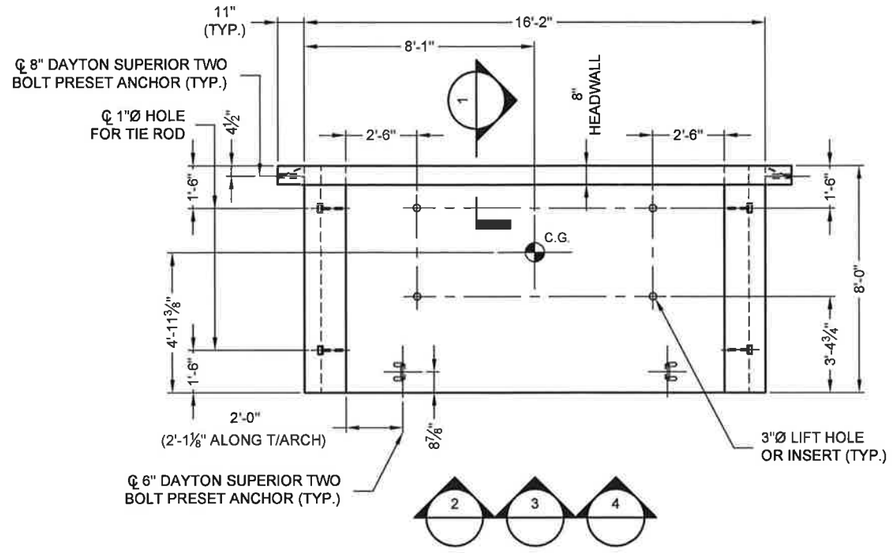
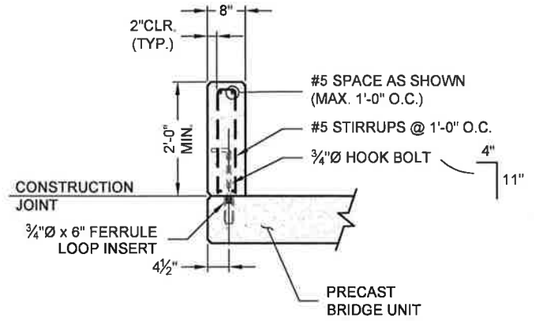


2 3 4

PLAN - C1 & C2

UNIT WEIGHT = 7.6 TONS
HEADWALL WEIGHT = 2.7 TONS
TOTAL WEIGHT = 10.3 TONS

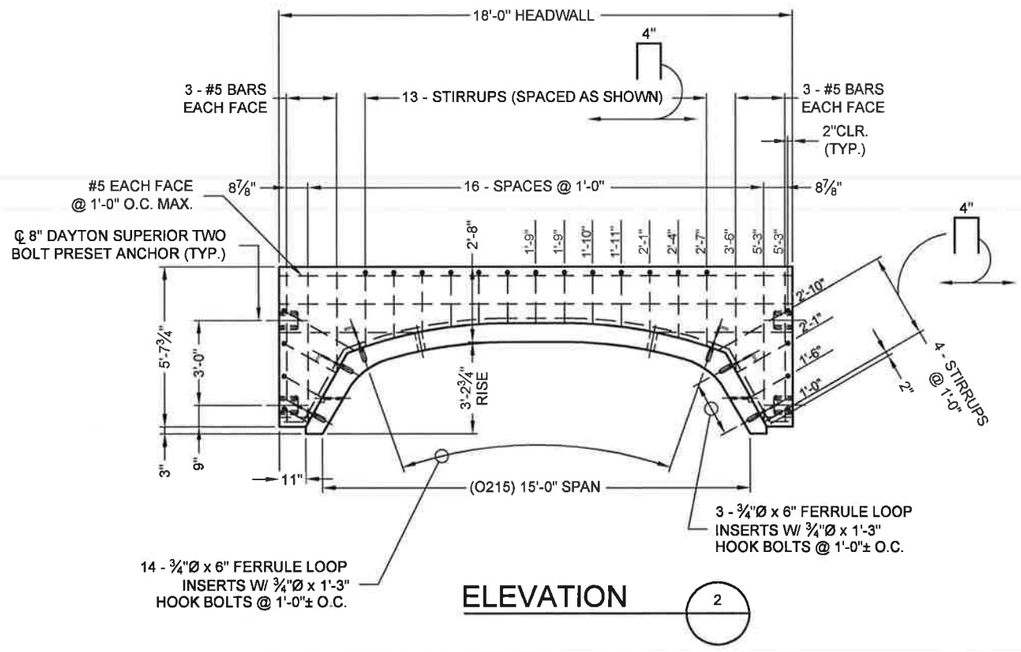


SECTION 1

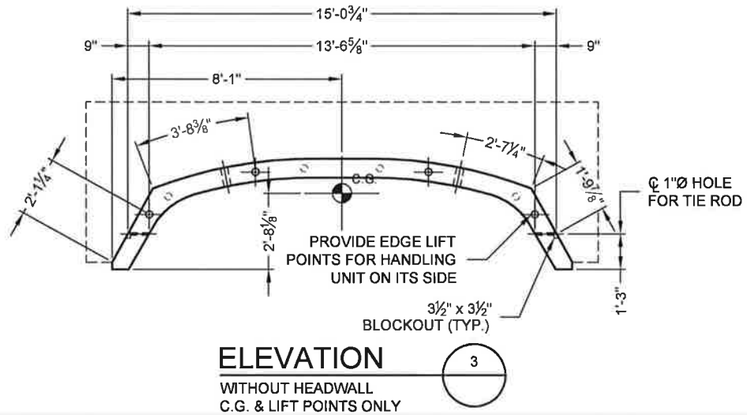
NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF HEADWALL
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS
- INSTALL TIE RODS BEFORE UNIT IS SET UPRIGHT & LEAVE IN PLACE UNTIL UNIT IS GROUTED INTO FINAL POSITION
- BRIDGE UNIT WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

HEADWALL		ARCH UNIT		
CONCRETE	REINF. STEEL	CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

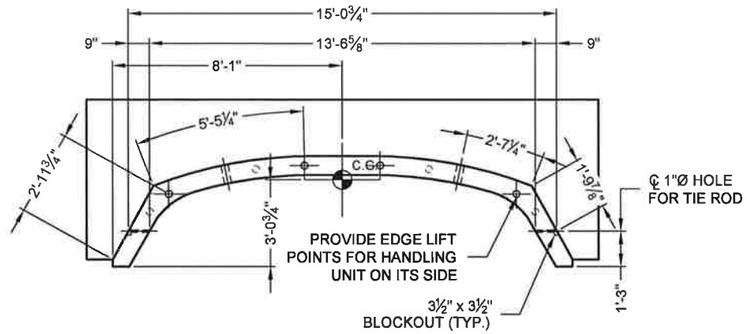
WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.



ELEVATION 2



ELEVATION 3
WITHOUT HEADWALL
C.G. & LIFT POINTS ONLY



ELEVATION 4
WITH HEADWALL
C.G. & LIFT POINTS ONLY

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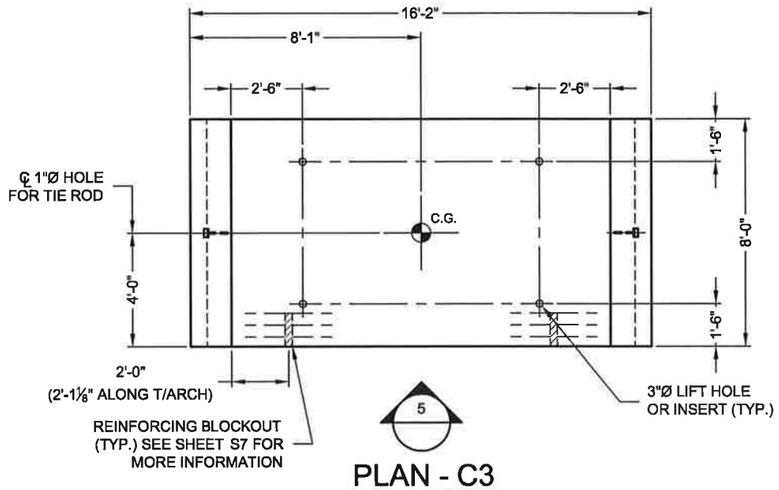
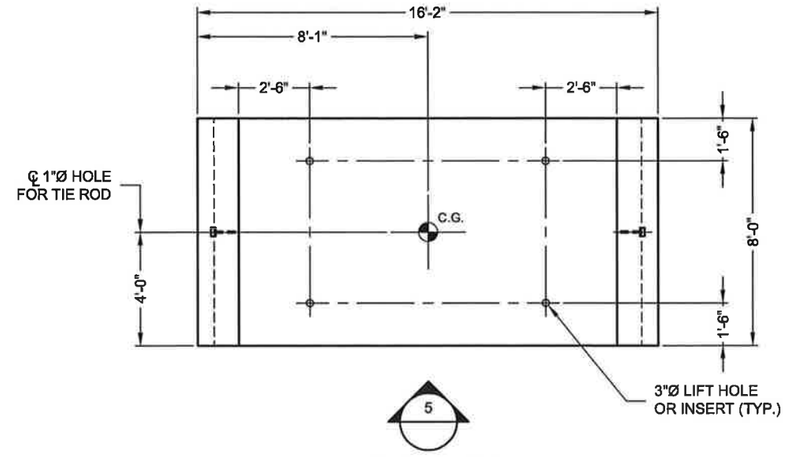


PLAN - C3

TOTAL WEIGHT = 7.6 TONS



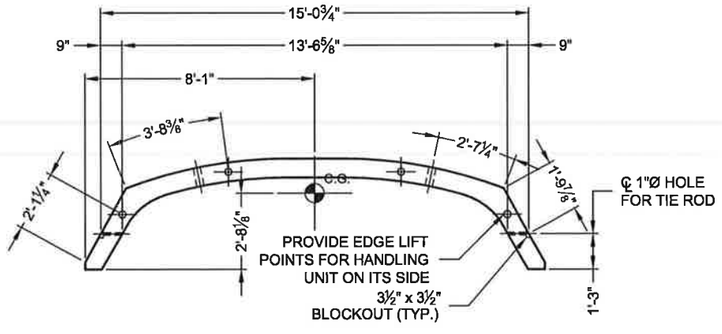
PLAN - C4

TOTAL WEIGHT = 7.6 TONS

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS
- INSTALL TIE RODS BEFORE UNIT IS SET UPRIGHT & LEAVE IN PLACE UNTIL UNIT IS GROUTED INTO FINAL POSITION
- MANUFACTURER SHALL MARK END OF UNIT C3 WITH REINFORCING BLOCKOUT PRIOR TO SHIPPING.

ARCH UNIT		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.



ELEVATION 5

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NW 253RD AVE.
STA. 47+21.60

HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	010	8/29/2013
DESIGNED: JAL		DRAWN: JA
CHECKED: DM		APPROVED: PAC
SHEET NO.: S4 OF S16		

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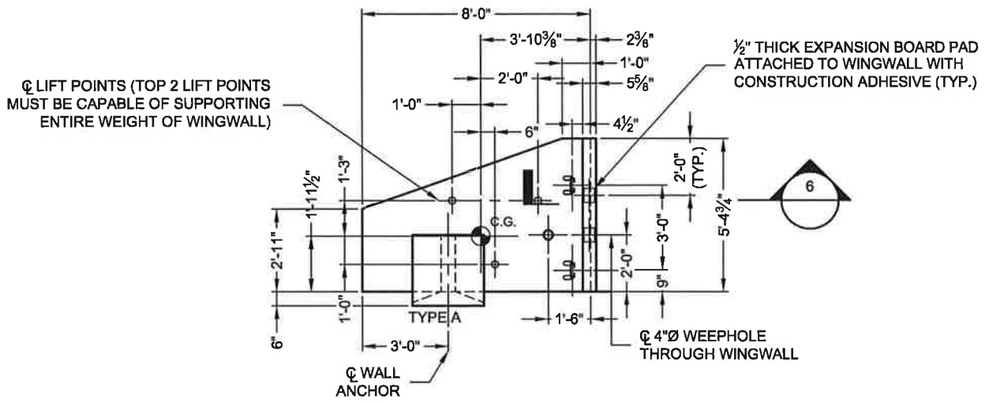
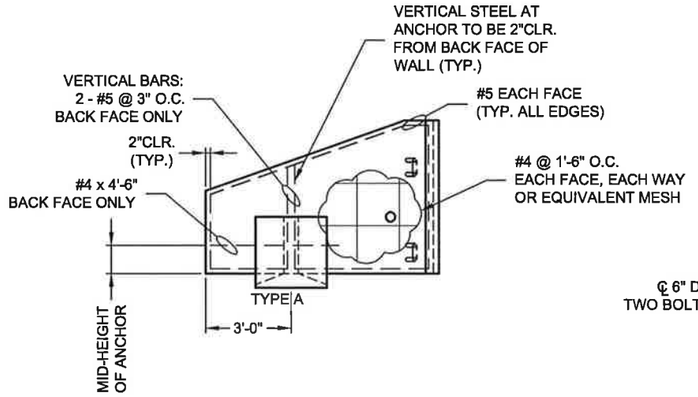


WINGWALL - WW1 & WW4

TOTAL WEIGHT = 2.2 TONS



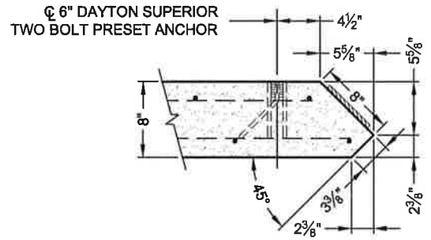
REINFORCING DETAIL - WW1 & WW4

(FOR ANCHOR REINFORCING SEE SHEET S6)

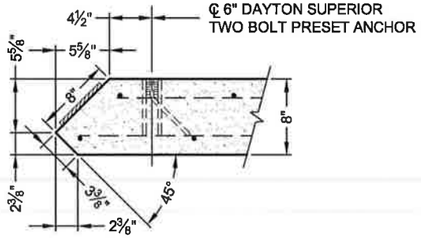
NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF WINGWALL
- BACK FACE DENOTES ANCHOR SIDE OF WINGWALL
- WINGWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

WINGWALL		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

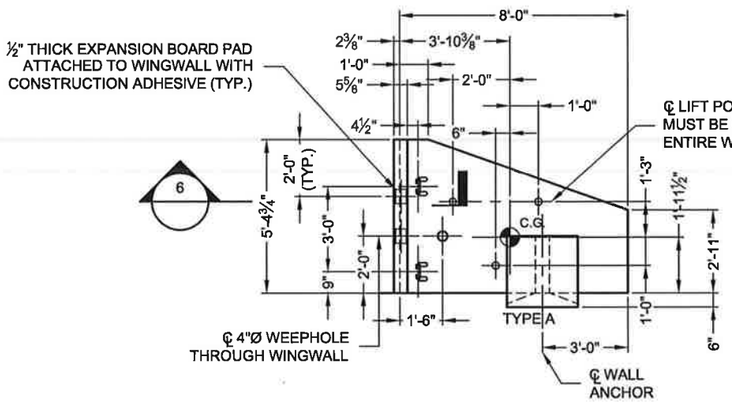
WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.



SECTION 6

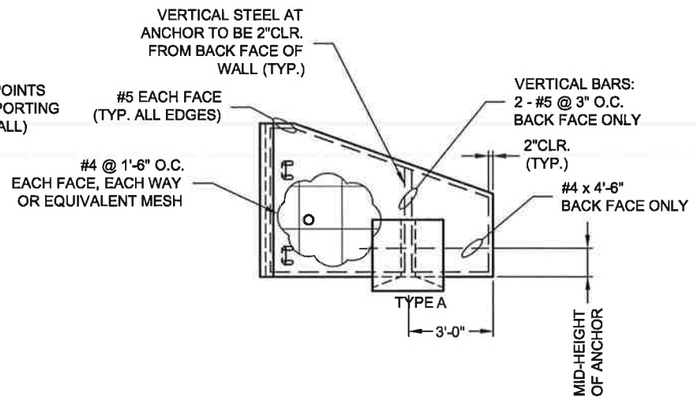


SECTION 7



WINGWALL - WW2 & WW3

TOTAL WEIGHT = 2.2 TONS



REINFORCING DETAIL - WW2 & WW3

(FOR ANCHOR REINFORCING SEE SHEET S6)

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PROJECT No.:	SEQ. No.:	DATE:
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DESIGNED: JAL	DRAWN: JA	
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SHEET NO.: S5 OF S16		

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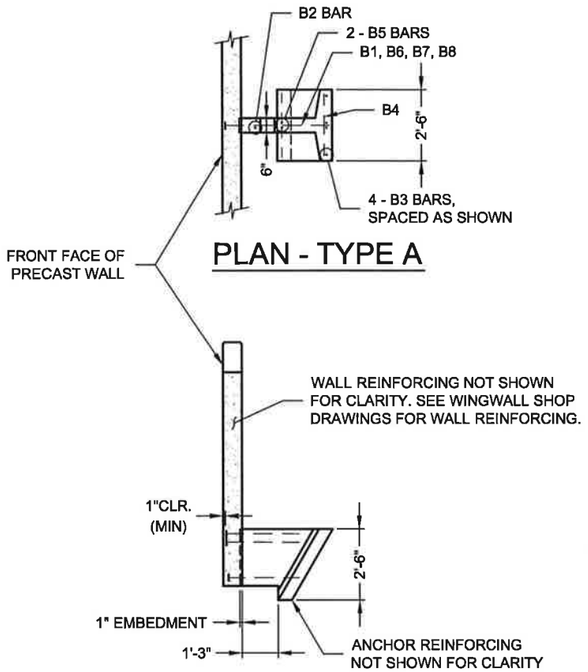
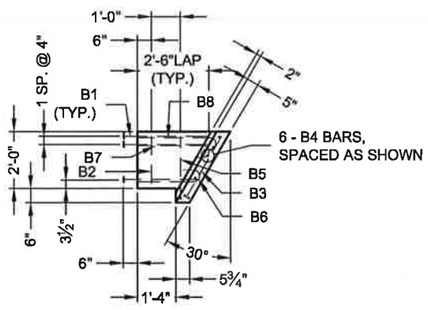


PLAN - TYPE A

SECTION - TYPE A

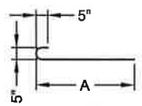
BAR LIST - TYPE A						
MARK	QTY.	SIZE	A	TYPE	LENGTH	FINISH
B1	3	#6	3'-0"	3	——	EPOXY*
B2	1	#5	——	STR.	1'-8"	BLACK
B3	4	#5	——	STR.	2'-6"	BLACK
B4	6	#5	——	STR.	2'-2"	BLACK
B5	2	#5	2'-2"	2	——	BLACK
B6	1	#5	2'-2"	1	——	BLACK
B7	1	#5	2'-6"	1	——	BLACK
B8	1	#5	2'-9"	1	——	BLACK

NOTE: "STR." DENOTES STRAIGHT BAR. STANDARD CLEARANCE = 2"

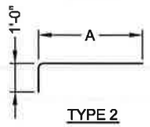


PRECAST ANCHOR TYPE A

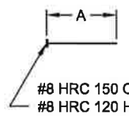
TOTAL WEIGHT = .428 TONS



TYPE 1



TYPE 2

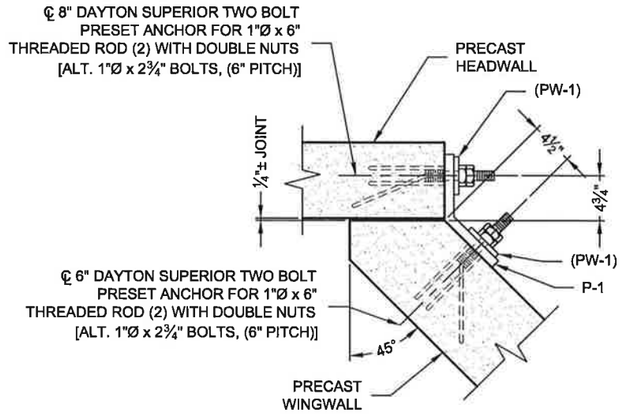


#8 HRC 150 OR
#8 HRC 120 HEAD (OR EQUAL)
WELDED TO #6 BAR

TYPE 3
(EPOXY COATED*)

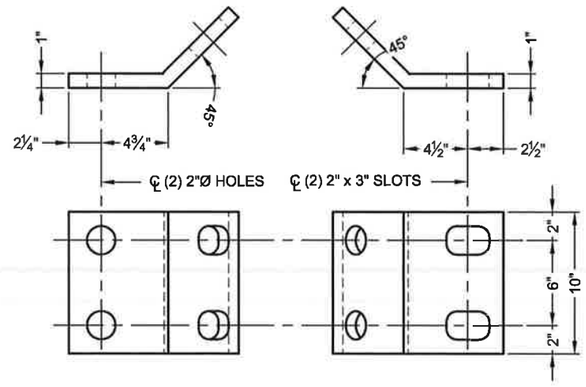
*NOTE: EPOXY COATING IS NOT REQUIRED ON HEADED ENDS OF TYPE 3 BARS, BUT WILL NOT BE DETRIMENTAL IF PROVIDED.

*NOTE: HRC HEADS PROVIDED BY HEADED REINFORCEMENT CORP.



PLAN VIEW

TYPICAL CONNECTION DETAIL - P-1

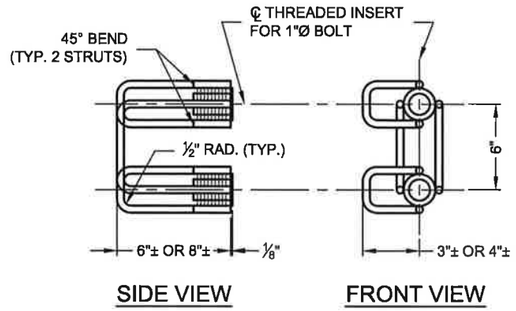


HEADWALL LEG WINGWALL LEG

P-1

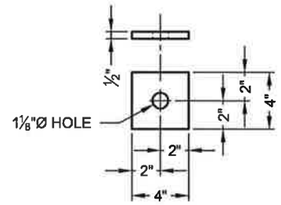
(℄, 1" x 14" x 10")
(GALVANIZED AS PER ASTM A153)

PLATE P-1
TOTAL REQUIRED = 8 (4) PW-1 REQ'D. PER PLATE



SIDE VIEW FRONT VIEW

DAYTON SUPERIOR TWO BOLT PRESET ANCHOR



PW-1

(℄ WASHER, ½" x 4" x 4")
(GALVANIZED AS PER ASTM A153)

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SHEET NO.: S6 OF S16		

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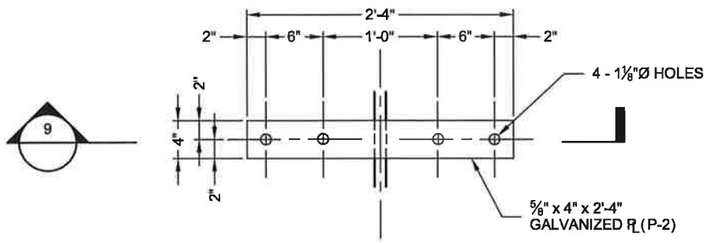
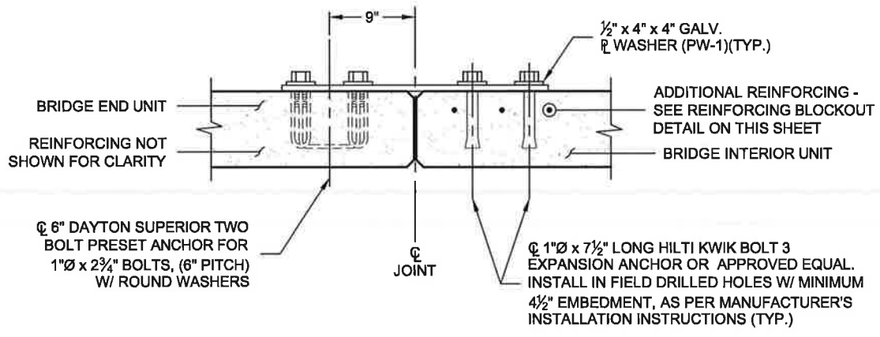


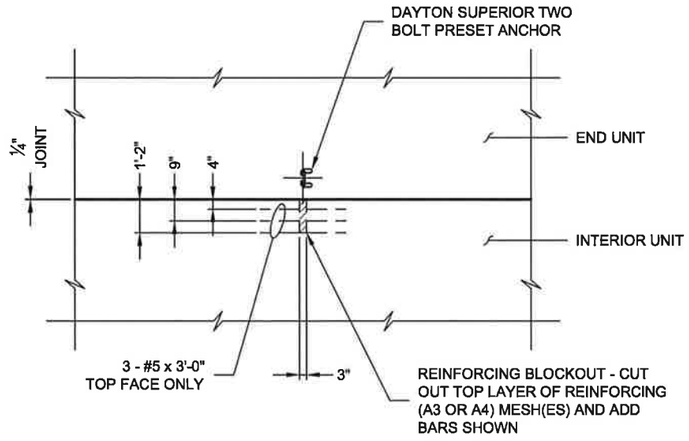
9

DETAIL 8 / S1

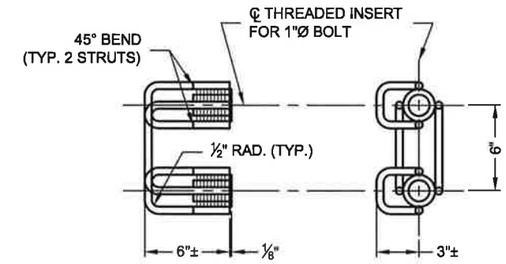


SECTION 9

PLATE P-2
TOTAL REQUIRED = 4 (4) PW-1 REQ'D. PER PLATE

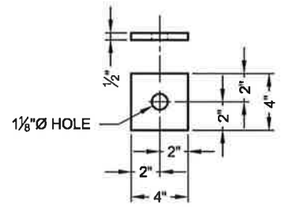


REINFORCING BLOCKOUT DETAIL



SIDE VIEW FRONT VIEW

DAYTON SUPERIOR TWO BOLT PRESET ANCHOR



PW-1

(PL WASHER, ½" x 4" x 4")
(GALVANIZED AS PER ASTM A153)

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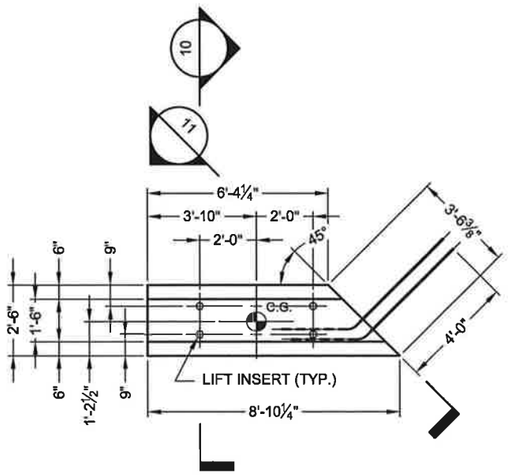
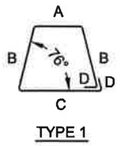
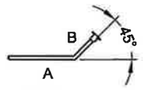


FOOTING - F1 - 2 REQUIRED

TOTAL WEIGHT = 2.3 TONS



TYPE 1



TYPE 2

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- FOOTING WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

FOOTING		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.

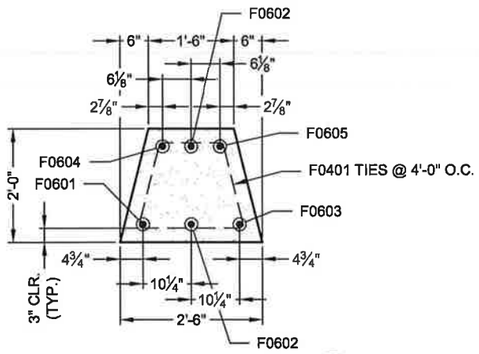
FOUNDATION BILL OF MATERIALS (PER PIECE) CAST INTO PRECAST - FOOTING F1

MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D
F0401	4	3	6'-10¾"	1	1'-1⅜"	1'-6½"	1'-10⅜"	5"
F0601	6	1	6'-0"	STR.				
F0602	6	2	7'-0"	STR.				
F0603	6	1	8'-0"	STR.				
F0604	6	1	6'-6"	STR.				
F0605	6	1	7'-6"	STR.				
DBSAE SPLICER	6	4	3'-0"	2	2'-6"	6"		
LIFTING INSERT		4						

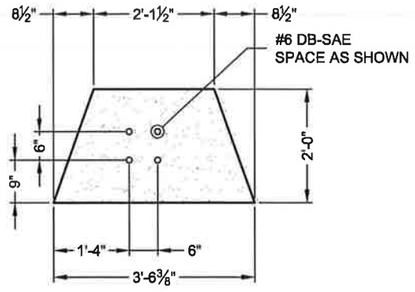
PRECAST CONCRETE: 1.2 CUBIC YARDS

FOUNDATION BILL OF MATERIALS (PER PIECE) SHIPPED LOOSE WITH PRECAST - FOOTING F1

DBSAE DOWEL-IN	6	4	4'-0"	STR.				



SECTION 10



SECTION 11

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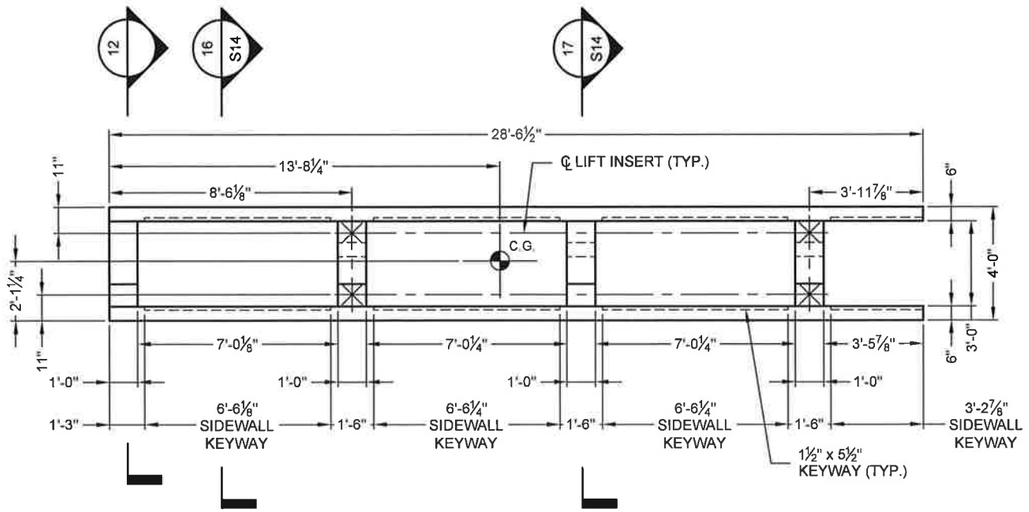
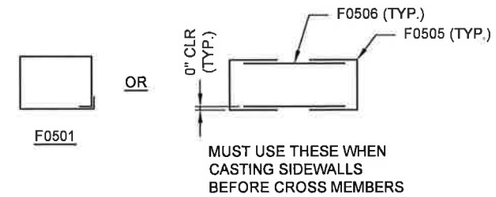
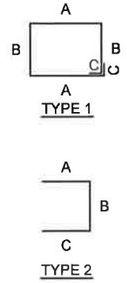


FOOTING - F2 - 2 REQUIRED

TOTAL WEIGHT = 5.4 TONS

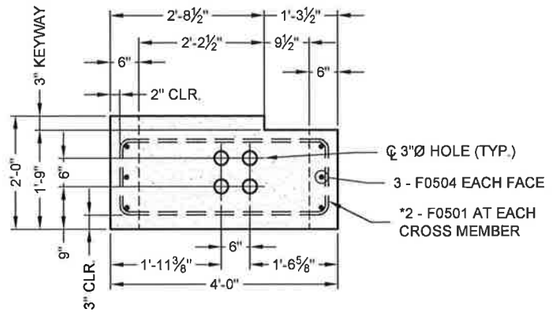




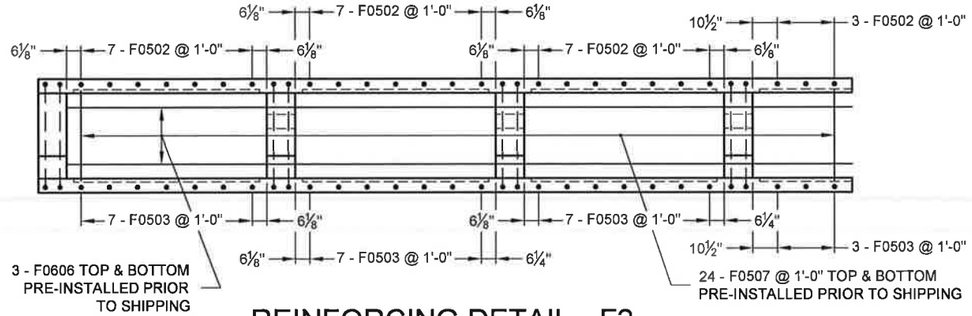
NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- FOOTING WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

FOOTING		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.



SECTION 12



REINFORCING DETAIL - F2

FOUNDATION BILL OF MATERIAL (PER PIECE) CAST INTO PRECAST - FOOTINGS F2

MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D
*F0501	5	8	10'-10"	1	3'-8"	1'-4"	5"	
F0502	5	24	1'-6"	STR.				
F0503	5	24	1'-3"	STR.				
F0504	5	6	28'-0"	STR.				
*F0505	5	16	3'-4"	2	1'-0"	1'-4"	1'-0"	
*F0506	5	16	2'-8"	STR.				
LIFTING INSERT		4						
PRECAST CONCRETE: 2.7 CUBIC YARDS								

FOUNDATION BILL OF MATERIALS (PER PIECE) TIED INTO PRECAST - FOOTINGS F2

F0507	5	48	3'-2"	STR.				
F0606	6	6	27'-6"	STR.				

FOUNDATION BILL OF MATERIALS SHIPPED LOOSE WITH PRECAST - FOOTING F2

WIRING TOOL		1						
WIRING		300						
F0609	6	36	6'-10"	STR.				

*F0501 MAY BE SUBSTITUTED FOR F0505 AND F0506.

MARK	DATE	REVISION DESCRIPTION	BY

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HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	010	8/29/2013
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SHEET NO.: S9 OF S16		

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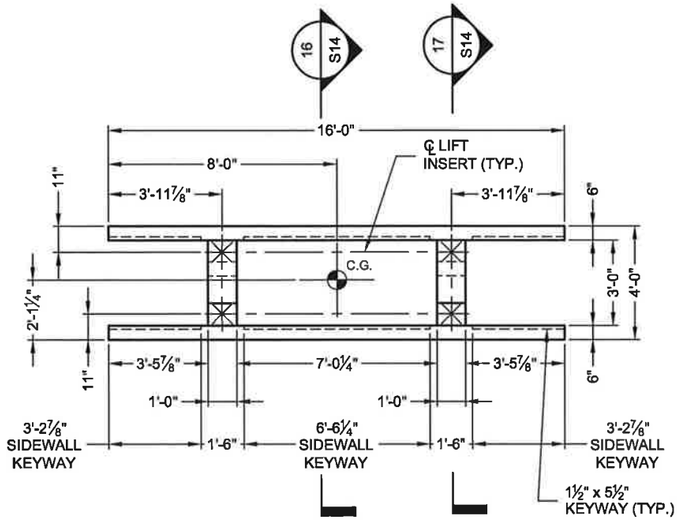
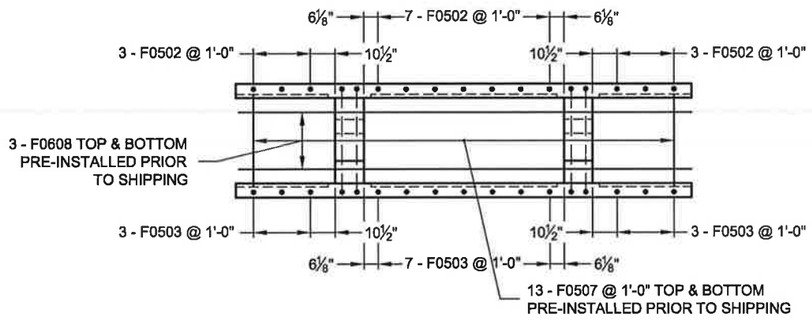


FOOTING - F3 - 4 REQUIRED

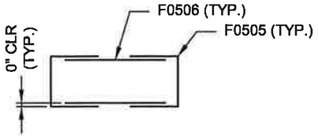
TOTAL WEIGHT = 2.9 TONS



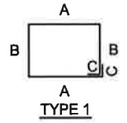
REINFORCING DETAIL - F3

F0501

OR



MUST USE THESE WHEN CASTING SIDEWALLS BEFORE CROSS MEMBERS



TYPE 1

TYPE 2

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- FOOTING WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

FOOTING		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.

FOUNDATION BILL OF MATERIAL (PER PIECE) CAST INTO PRECAST - FOOTINGS F3

MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D
*F0501	5	4	10'-10"	1	3'-8"	1'-4"	5"	
F0502	5	13	1'-6"	STR.				
F0503	5	13	1'-3"	STR.				
F0508	5	6	15'-6"	STR.				
*F0505	5	8	3'-4"	2	1'-0"	1'-4"	1'-0"	
*F0506	5	8	2'-8"	STR.				
LIFTING INSERT		4						

PRECAST CONCRETE: 1.5 CUBIC YARDS

FOUNDATION BILL OF MATERIALS (PER PIECE) TIED INTO PRECAST - FOOTINGS F3

F0507	5	26	3'-2"	STR.				
F0608	6	6	16'-0"	STR.				

*F0501 MAY BE SUBSTITUTED FOR F0505 AND F0506.

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HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	010	8/29/2013
DESIGNED: JAL		DRAWN: JA
CHECKED: DM		APPROVED: PAC
SHEET NO.: S10 OF S16		

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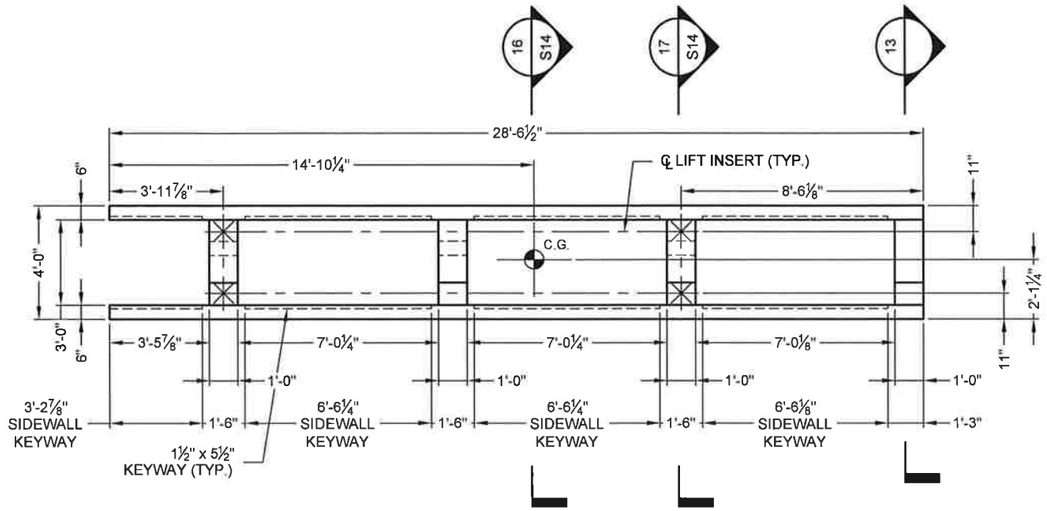
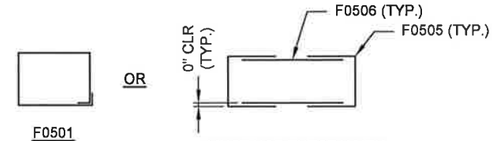
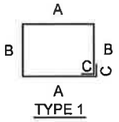


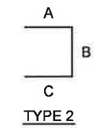
FOOTING - F4 - 2 REQUIRED

TOTAL WEIGHT = 5.4 TONS



MUST USE THESE WHEN CASTING SIDEWALLS BEFORE CROSS MEMBERS

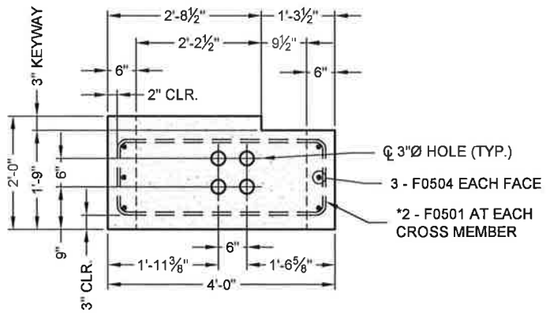




NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- FOOTING WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

FOOTING		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.



SECTION 13

FOUNDATION BILL OF MATERIAL (PER PIECE) CAST INTO PRECAST - FOOTINGS F4

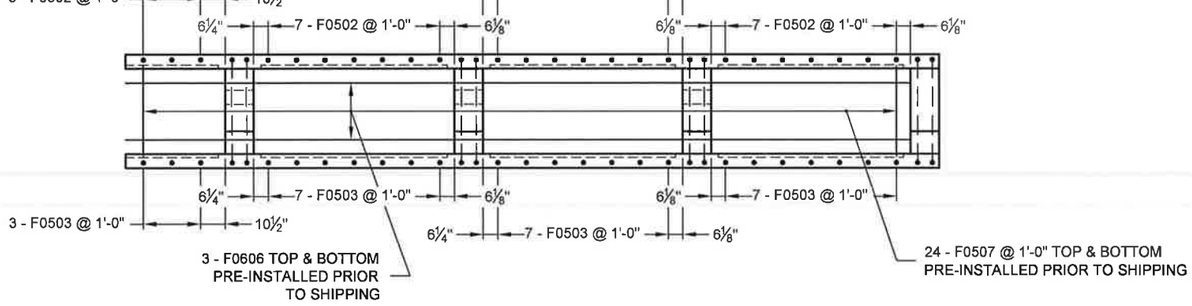
MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D
*F0501	5	8	10'-10"	1	3'-8"	1'-4"	5"	
F0502	5	24	1'-6"	STR.				
F0503	5	24	1'-3"	STR.				
F0504	5	6	28'-0"	STR.				
*F0505	5	16	3'-4"	2	1'-0"	1'-4"	1'-0"	
*F0506	5	16	2'-8"	STR.				
LIFTING INSERT		4						

PRECAST CONCRETE: 2.7 CUBIC YARDS

FOUNDATION BILL OF MATERIALS (PER PIECE) TIED INTO PRECAST - FOOTINGS F4

F0507	5	48	3'-2"	STR.				
F0606	6	6	27'-6"	STR.				

*F0501 MAY BE SUBSTITUTED FOR F0505 AND F0506.



REINFORCING DETAIL - F4

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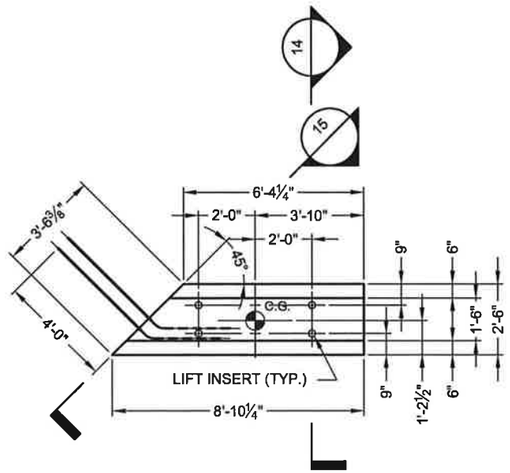
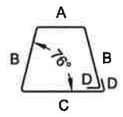


FOOTING - F5- 2 REQUIRED

TOTAL WEIGHT = 2.3 TONS



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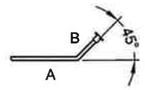


TYPE 2

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- FOOTING WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

FOOTING		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

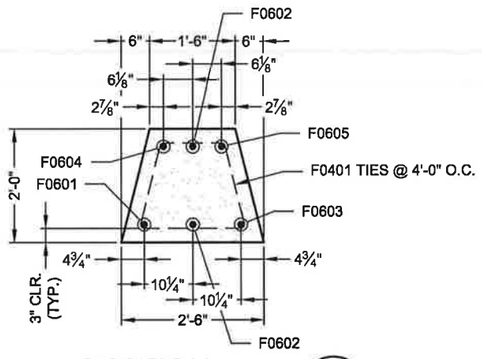
WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.

FOUNDATION BILL OF MATERIALS (PER PIECE) CAST INTO PRECAST - FOOTING F5

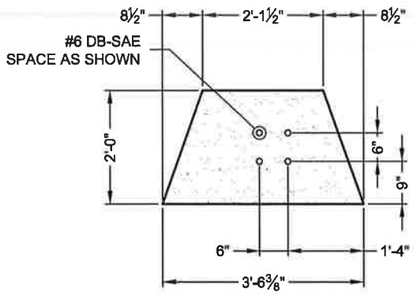
MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D
F0401	4	3	6'-10¾"	1	1'-1⅜"	1'-6½"	1'-10⅜"	5"
F0601	6	1	6'-0"	STR.				
F0602	6	2	7'-0"	STR.				
F0603	6	1	8'-0"	STR.				
F0604	6	1	6'-6"	STR.				
F0605	6	1	7'-6"	STR.				
DBSAE SPLICER	6	4	3'-0"	2	2'-6"	6"		
LIFTING INSERT		4						
PRECAST CONCRETE: 1.2 CUBIC YARDS								

FOUNDATION BILL OF MATERIALS (PER PIECE) SHIPPED LOOSE WITH PRECAST - FOOTING F5

DBSAE DOWEL-IN	6	4	4'-0"	STR.				



SECTION 14



SECTION 15

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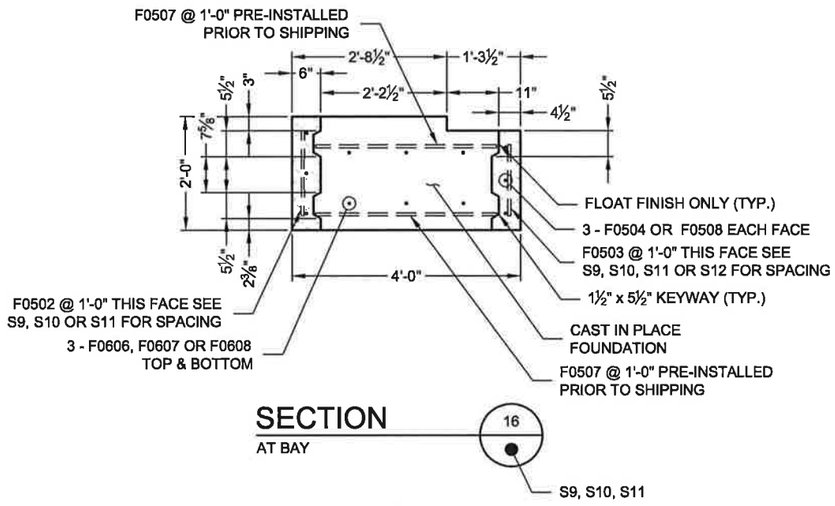
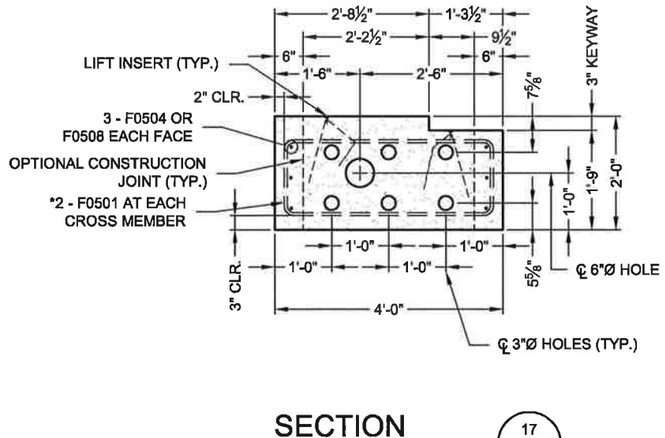


SECTION
AT BAY
16
S9, S10, S11



SECTION
AT CROSS MEMBER
17
S9, S10, S11

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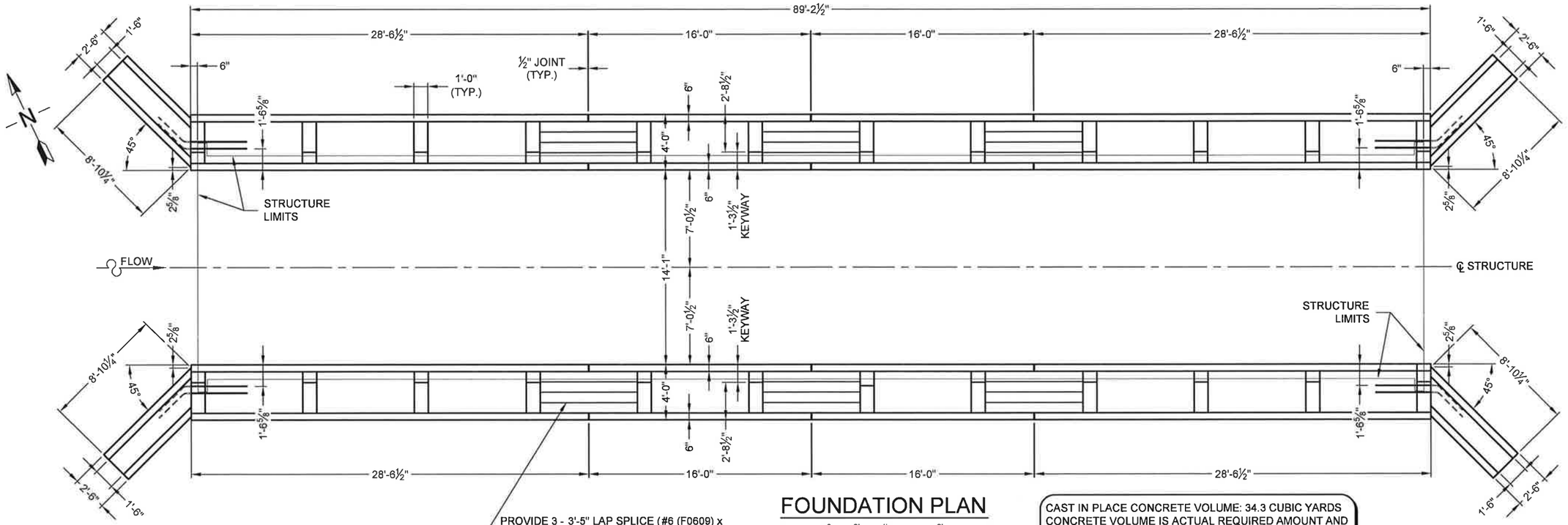

PROVIDE 3 - 3'-5" LAP SPLICE (#6 (F0609) x 6'-10") TOP & BOTTOM EITHER SIDE OF JOINT FOR LONGITUDINAL #6 BAR IN C.I.P. PORTION OF FOOTING (TYP. 6 LOCATIONS)

FOUNDATION PLAN

0 2' 4' 8'

CAST IN PLACE CONCRETE VOLUME: 34.3 CUBIC YARDS
CONCRETE VOLUME IS ACTUAL REQUIRED AMOUNT AND SHOULD BE INCREASED FOR ANTICIPATED LEAKAGE, WASTE, ETC.

PRECAST REINFORCED CONCRETE EXPRESS ™ FOUNDATION NOTES:

1. PRECAST FOUNDATION UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN BRIDGE SYSTEMS.
2. PRECAST AND CAST-IN-PLACE CONCRETE FOR EXPRESS FOUNDATIONS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI. REINFORCING STEEL FOR FOUNDATIONS SHALL CONFORM TO ASTM A615 OR A996, GRADE 60.
3. PRECAST FOUNDATION UNITS SHALL BE SET ON A MINIMUM 4-INCH THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOUNDATION.
4. COMPACTED BACKFILL MATERIAL MUST BE PLACED UP TO THE TOP OF THE PRECAST FOUNDATION UNITS ON BOTH SIDES PRIOR TO PLACING CAST-IN-PLACE CONCRETE PORTION OF FOUNDATIONS.
5. CONCRETE SURFACES WHICH CAST-IN-PLACE CONCRETE WILL BE PLACED AGAINST SHALL BE CLEAN, FREE OF LAITANCE, DIRT, STANDING WATER AND ANY OTHER MATERIAL THAT MAY IMPAIR THE BOND BETWEEN THE PRECAST CONCRETE AND CAST-IN-PLACE CONCRETE.
6. CAST-IN-PLACE CONCRETE MIX USED TO FILL FOUNDATION SHALL BE ABLE TO FLOW INTO ARCH SHIM SPACE OR NON-SHRINK GROUT SHALL BE PLACED UNDER ARCH UNIT LEG AT FOUNDATION CROSS MEMBERS PRIOR TO PLACEMENT OF CAST-IN-PLACE PORTION OF FOUNDATION.
7. IF THE AMBIENT TEMPERATURE AT THE TIME OF PLACEMENT OF CAST-IN-PLACE CONCRETE IS ABOVE 90°F OR EXPECTED TO GO BELOW 35°F DURING THE CURE PERIOD, THE CONTRACTOR SHALL FOLLOW THE REQUIREMENTS OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, SECTION 8.6.2 HOT WEATHER PROTECTION OR SECTION 8.6.4 COLD WEATHER PROTECTION.
8. IF PRECAST ARCH UNITS ARE TO BE ERECTED ON PRECAST FOUNDATION UNITS PRIOR TO PLACEMENT OF CAST-IN-PLACE CONCRETE, THE CABLE TIES/RODS MUST REMAIN IN PLACE AND MAY NOT BE REMOVED UNTIL CAST-IN-PLACE CONCRETE HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
9. IF CABLE TIES/RODS MUST BE REMOVED PRIOR TO SETTING OF ARCH UNITS, CAST-IN-PLACE CONCRETE PORTION OF FOUNDATIONS MUST BE PLACED AND ALLOWED TO REACH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI BEFORE PLACEMENT OF PRECAST ARCH UNITS, HEADWALLS AND WINGWALLS. CONTRACTOR MUST FOLLOW SPECIFICATION SECTION 13.4 AND NOTIFY CONTECH ENGINEER PRIOR TO REMOVING CABLES TIES/RODS.
10. IF CAST-IN-PLACE CONCRETE PORTION OF FOUNDATION IS TO BE PLACED PRIOR TO SETTING OF ARCH UNITS, HEADWALLS OR WINGWALLS, CAST-IN-PLACE CONCRETE SHALL REACH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI BEFORE PRECAST ARCH UNITS, HEADWALLS AND WINGWALLS ARE SET.
11. FOUNDATION CONCRETE SHALL REACH ITS FULL DESIGN STRENGTH BEFORE BACKFILLING OF ARCH UNITS MAY COMMENCE.

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PROJECT No.:	SEQ. No.:	DATE:
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DESIGNED: JAL	DRAWN: JA	
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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS

1. DESCRIPTION
   1.1. TYPE - THIS WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTING A CON/SPAN® BRIDGE SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON THE PLANS OR AS ESTABLISHED BY THE ENGINEER. IN SITUATIONS WHERE TWO OR MORE SPECIFICATIONS APPLY TO THIS WORK, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.
   1.2. DESIGNATION - PRECAST REINFORCED CONCRETE CON/SPAN® BRIDGE UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY SPAN AND RISE. PRECAST REINFORCED CONCRETE WINGWALLS AND HEADWALLS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT, AND DEFLECTION ANGLE.

2. DESIGN
   2.1. SPECIFICATIONS - THE PRECAST ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" 17TH EDITION, ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002. A MINIMUM OF ONE FOOT OF COVER ABOVE THE CROWN OF THE BRIDGE UNITS IS REQUIRED IN THE INSTALLED CONDITION. (UNLESS NOTED OTHERWISE ON THE SHOP DRAWINGS AND DESIGNED ACCORDINGLY.)

3. MATERIALS
   3.1. CONCRETE - THE CONCRETE FOR THE PRECAST ELEMENTS SHALL BE AIR-ENTRAINED WHEN INSTALLED IN AREAS SUBJECT TO FREEZE-THAW CONDITIONS, COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGREGATES, ADMIXTURES AND WATER. AIR-ENTRAINED CONCRETE SHALL CONTAIN 6 ± 2 PERCENT AIR. THE AIR- ENTRAINING ADMIXTURE SHALL CONFORM TO AASHT0 M154. THE MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE AS SHOWN ON THE SHOP DRAWINGS.
      3.1.1. PORTLAND CEMENT - SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATIONS C150-TYPE I, TYPE II, OR TYPE III CEMENT.
      3.1.2. COARSE AGGREGATE - SHALL CONSIST OF STONE HAVING A MAXIMUM SIZE OF 1 INCH. AGGREGATE SHALL MEET REQUIREMENTS FOR ASTM C33.
      3.1.3. WATER REDUCING ADMIXTURE - THE MANUFACTURER MAY SUBMIT, FOR APPROVAL BY THE ENGINEER, A WATER-REDUCING ADMIXTURE FOR THE PURPOSE OF INCREASING WORKABILITY AND REDUCING THE WATER REQUIREMENT FOR THE CONCRETE.
      3.1.4. CALCIUM CHLORIDE - THE ADDITION TO THE MIX OF CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE WILL NOT BE PERMITTED.
      3.1.5. MIXTURE - THE AGGREGATES, CEMENT AND WATER SHALL BE PROPORTIONED AND MIXED IN A BATCH MIXER TO PRODUCE A HOMOGENEOUS CONCRETE MEETING THE STRENGTH REQUIREMENTS OF THIS SPECIFICATION. THE PROPORTION OF PORTLAND CEMENT IN THE MIXTURE SHALL NOT BE LESS THAN 564 POUNDS (6 SACKS) PER CUBIC YARD OF CONCRETE.
   3.2. STEEL REINFORCEMENT
      3.2.1. THE MINIMUM STEEL YIELD STRENGTH SHALL BE 60,000 PSI, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS.
      3.2.2. ALL REINFORCING STEEL FOR THE PRECAST ELEMENTS SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE DETAILED SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER.
      3.2.3. REINFORCEMENT SHALL CONSIST OF WELDED WIRE FABRIC CONFORMING TO ASTM SPECIFICATION A 185 OR A 497, OR DEFORMED BILLET STEEL BARS CONFORMING TO ASTM SPECIFICATION A 615, GRADE 60. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS.
   3.3. STEEL HARDWARE
      3.3.1. BOLTS AND THREADED RODS FOR WINGWALL CONNECTIONS SHALL CONFORM TO ASTM A 307. NUTS SHALL CONFORM TO AASHTO M292 (ASTM A194) GRADE 2H. ALL BOLTS, THREADED RODS AND NUTS USED IN WINGWALL CONNECTIONS SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.2. STRUCTURAL STEEL FOR WINGWALL CONNECTION PLATES AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709) GRADE 36 AND SHALL BE HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.3. INSERTS FOR WINGWALLS SHALL BE 1" DIAMETER TWO-BOLT PRESET WINGWALL ANCHORS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
      3.3.4. FERRULE LOOP INSERTS SHALL BE F-64 FERRULE LOOP INSERTS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
      3.3.5. HOOK BOLTS USED IN ATTACHED HEADWALL CONNECTIONS SHALL BE ASTM A307.
      3.3.6. INSERTS FOR DETACHED HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL, F-58 EXPANDED COIL INSERTS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700. COIL RODS AND NUTS USED IN HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL. WASHERS USED IN HEADWALL CONNECTIONS SHALL BE EITHER AISI TYPE 304 STAINLESS STEEL PLATE WASHERS OR AASHTO M270 (ASTM A709) GRADE 36 PLATE WASHERS HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.7. REINFORCING BAR SPLICES SHALL BE MADE USING THE DOWEL BAR SPLICER SYSTEM AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700, AND SHALL CONSIST OF THE DOWEL BAR SPLICER (DB-SAE) AND DOWEL-IN (DI).

4. MANUFACTURE OF PRECAST ELEMENTS - SUBJECT TO THE PROVISIONS OF SECTION 5, BELOW, THE PRECAST ELEMENT DIMENSION AND REINFORCEMENT DETAILS SHALL BE AS PRESCRIBED IN THE PLAN AND SHOP DRAWINGS PROVIDED BY THE MANUFACTURER.
   4.1. FORMS - THE FORMS USED IN MANUFACTURE SHALL BE SUFFICIENTLY RIGID AND ACCURATE TO MAINTAIN THE REQUIRED PRECAST ELEMENT DIMENSIONS WITHIN THE PERMISSIBLE VARIATIONS GIVEN IN SECTION 5 OF THESE SPECIFICATIONS. ALL CASTING SURFACES SHALL BE OF A SMOOTH MATERIAL.
   4.2. PLACEMENT OF REINFORCEMENT
      4.2.1. PLACEMENT OF REINFORCEMENT IN PRECAST BRIDGE UNITS - THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MINIMUM. THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 1½" MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING SINGLE OR MULTIPLE LAYERS OF WELDED WIRE FABRIC (NOT TO EXCEED 3 LAYERS), SUPPLEMENTED WITH A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS, WHEN NECESSARY. WELDED WIRE FABRIC SHALL BE COMPOSED OF CIRCUMFERENTIAL AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE BRIDGE UNIT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW. THE ENDS OF THE LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL BE NOT MORE THAN 3" AND NOT LESS THAN 1½" FROM THE ENDS OF THE BRIDGE UNIT.
      4.2.2. BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL REINFORCING STEEL FOR THE CORNERS OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROXIMATELY EQUAL TO THE CONFIGURATION OF THE BRIDGE'S OUTSIDE CORNER.
      4.2.3. PLACEMENT OF REINFORCEMENT FOR PRECAST WINGWALLS AND HEADWALLS - THE COVER OF CONCRETE OVER THE LONGITUDINAL AND TRANSVERSE REINFORCEMENT SHALL BE 2" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 1½" NOR MORE THAN 3". REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC, OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
   4.3. LAPS, WELDS, SPACING
      4.3.1. LAPS, WELDS, AND SPACING FOR PRECAST BRIDGE UNITS - TENSION SPLICES IN THE CIRCUMFERENTIAL REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.2 AND 8.32.6. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.1 AND 8.32.5. THE OVERLAP OF WELDED WIRE FABRIC SHALL BE MEASURED BETWEEN THE OUTER-MOST LONGITUDINAL WIRES OF EACH FABRIC SHEET. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.25. FOR SPLICES OTHER THAN TENSION SPLICES, THE OVERLAP SHALL BE A MINIMUM OF 1'-0" FOR WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS. THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL DISTRIBUTION STEEL FOR EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
      4.3.2. LAPS, WELDS, AND SPACING FOR PRECAST WINGWALLS AND HEADWALLS - SPLICES IN THE REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.2 AND 8.32.6. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.1 AND 8.32.5. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.25. THE SPACING CENTER-TO-CENTER OF THE WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 8".
   4.4. CURING - THE PRECAST CONCRETE ELEMENTS SHALL BE CURED FOR A SUFFICIENT LENGTH OF TIME SO THAT THE CONCRETE WILL DEVELOP THE SPECIFIED COMPRESSIVE STRENGTH IN 28 DAYS OR LESS. ANY ONE OF THE FOLLOWING METHODS OF CURING OR COMBINATIONS THERE OF SHALL BE USED:
      4.4.1. STEAM CURING - THE PRECAST ELEMENTS MAY BE LOW-PRESSURE STEAM CURED BY A SYSTEM THAT WILL MAINTAIN A MOIST ATMOSPHERE.
      4.4.2. WATER CURING - THE PRECAST ELEMENTS MAY BE WATER CURED BY ANY METHOD THAT WILL KEEP THE SECTIONS MOIST.
      4.4.3. MEMBRANE CURING - A SEALING MEMBRANE CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION C309 MAY BE APPLIED AND SHALL BE LEFT INTACT UNTIL THE REQUIRED CONCRETE COMPRESSIVE STRENGTH IS ATTAINED. THE CONCRETE TEMPERATURE AT THE TIME OF APPLICATION SHALL BE WITHIN +/- 10 DEGREES F OF THE ATMOSPHERIC TEMPERATURE. ALL SURFACES SHALL BE KEPT MOIST PRIOR TO THE APPLICATION OF THE COMPOUNDS AND SHALL BE DAMP WHEN THE COMPOUND IS APPLIED.
   4.5. STORAGE, HANDLING & DELIVERY
      4.5.1. STORAGE - PRECAST CONCRETE BRIDGE ELEMENTS SHALL BE LIFTED AND STORED IN "AS-CAST" POSITION. PRECAST CONCRETE HEADWALL AND WINGWALL UNITS ARE CAST, STORED AND SHIPPED IN A FLAT POSITION. THE PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER TO PREVENT CRACKING OR DAMAGE. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE. THE UNITS SHALL NOT BE MOVED UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED A MINIMUM OF 2500 PSI, AND THEY SHALL NOT BE STORED IN AN UPRIGHT POSITION.
      4.5.2. HANDLING - HANDLING DEVICES SHALL BE PERMITTED IN EACH PRECAST ELEMENT FOR THE PURPOSE OF HANDLING AND SETTING. SPREADER BEAMS MAY BE REQUIRED FOR THE LIFTING OF PRECAST CONCRETE BRIDGE ELEMENTS TO PRECLUDE DAMAGE FROM BENDING OR TORSION FORCES.
      4.5.3. DELIVERY - PRECAST CONCRETE ELEMENTS MUST NOT BE SHIPPED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, OR AS DIRECTED BY THE DESIGN ENGINEER. PRECAST CONCRETE ELEMENTS MAY BE UNLOADED AND PLACED ON THE GROUND AT THE SITE UNTIL INSTALLED. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE.
   4.6. QUALITY ASSURANCE - THE PRECASTER SHALL DEMONSTRATE ADHERENCE TO THE STANDARDS SET FORTH IN THE NPCA QUALITY CONTROL MANUAL. THE PRECASTER SHALL MEET EITHER SECTION 4.6.1 OR 4.6.2
      4.6.1. CERTIFICATION - THE PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRODUCTS COVERED BY THIS SPECIFICATION.
      4.6.2. QUALIFICATIONS, TESTING AND INSPECTION
         4.6.2.1. THE PRECASTER SHALL HAVE BEEN IN THE BUSINESS OF PRODUCING PRECAST CONCRETE PRODUCTS SIMILAR TO THOSE SPECIFIED FOR A MINIMUM OF THREE YEARS. HE SHALL MAINTAIN A PERMANENT QUALITY CONTROL DEPARTMENT OR RETAIN AN INDEPENDENT TESTING AGENCY ON A CONTINUING BASIS. THE AGENCY SHALL ISSUE A REPORT, CERTIFIED BY A LICENSED ENGINEER, DETAILING THE ABILITY OF THE PRECASTER TO PRODUCE QUALITY PRODUCTS CONSISTENT WITH INDUSTRY STANDARDS.
         4.6.2.2. THE PRECASTER SHALL SHOW THAT THE FOLLOWING TESTS ARE PERFORMED IN ACCORDANCE WITH THE ASTM STANDARDS INDICATED. TESTS SHALL BE PERFORMED AS INDICATED IN SECTION 6 OF THESE SPECIFICATIONS.
            4.6.2.2.1. AIR CONTENT: C231 OR C173
            4.6.2.2.2. COMPRESSIVE STRENGTH: C31,C39,C497
         4.6.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH® BRIDGE SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST.
         4.6.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS COVERED BY THIS SPECIFICATION ARE BEING MANUFACTURED.
      4.6.3. DOCUMENTATION - THE PRECASTER SHALL SUBMIT PRECAST PRODUCTION REPORTS TO CONTECH® BRIDGE SOLUTIONS AS REQUIRED.

5. PERMISSIBLE VARIATIONS
   5.1. BRIDGE UNITS
      5.1.1. INTERNAL DIMENSIONS - THE INTERNAL DIMENSION SHALL VARY NOT MORE THAN 1% FROM THE DESIGN DIMENSIONS NOR MORE THAN 1½" WHICHEVER IS LESS.
      5.1.2. SLAB AND WALL THICKNESS - THE SLAB AND WALL THICKNESS SHALL NOT BE LESS THAN THAT SHOWN IN THE DESIGN BY MORE THAN ½". A THICKNESS MORE THAN THAT REQUIRED IN THE DESIGN SHALL NOT BE CAUSE FOR REJECTION.
      5.1.3. LENGTH OF OPPOSITE SURFACES - VARIATIONS IN LAYING LENGTHS OF TWO OPPOSITE SURFACES OF THE BRIDGE UNIT SHALL NOT BE MORE THAN ½" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.
      5.1.4. LENGTH OF SECTION - THE UNDERRUN IN LENGTH OF A SECTION SHALL NOT BE MORE THAN ½" IN ANY BRIDGE UNIT.
      5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR BE LESS THAN 1" FOR THE INSIDE CIRCUMFERENTIAL STEEL AS MEASURED TO THE EXTERNAL OR INTERNAL SURFACE OF THE BRIDGE. THESE TOLERANCES OR COVER REQUIREMENTS DO NOT APPLY TO MATING SURFACES OF THE JOINTS.
      5.1.6. AREA OF REINFORCEMENT - THE AREAS OF STEEL REINFORCEMENT SHALL BE THE DESIGN STEEL AREAS AS SHOWN IN THE MANUFACTURER'S SHOP DRAWINGS. STEEL AREAS GREATER THAN THOSE REQUIRED SHALL NOT BE CAUSE FOR REJECTION. THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCEMENT SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCEMENT.
   5.2. WINGWALLS & HEADWALLS
      5.2.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.2. LENGTH/HEIGHT OF WALL SECTIONS - THE LENGTH AND HEIGHT OF THE WALL SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.2.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.

6. TESTING/ INSPECTION
   6.1. TESTING
      6.1.1. TYPE OF TEST SPECIMEN - CONCRETE COMPRESSIVE STRENGTH SHALL BE DETERMINED FROM COMPRESSION TESTS MADE ON CYLINDERS OR CORES. FOR CYLINDER TESTING, A MINIMUM OF 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. EACH ELEMENT SHALL BE CONSIDERED SEPARATELY FOR THE PURPOSE OF TESTING AND ACCEPTANCE.
      6.1.2. COMPRESSION TESTING - CYLINDERS SHALL BE MADE AND TESTED AS PRESCRIBED BY THE ASTM C39 SPECIFICATION. CYLINDERS SHALL BE CURED IN THE SAME ENVIRONMENT AS THE BRIDGE ELEMENTS. CORES SHALL BE OBTAINED AND TESTED FOR COMPRESSIVE STRENGTH IN ACCORDANCE WITH THE PROVISIONS OF THE ASTM C42 SPECIFICATION.
      6.1.3. ACCEPTABILITY OF CYLINDER TESTS - WHEN THE AVERAGE COMPRESSIVE STRENGTH OF ALL CYLINDERS TESTED IS EQUAL TO OR GREATER THAN THE DESIGN COMPRESSIVE STRENGTH, AND NOT MORE THAN 10% OF THE CYLINDERS TESTED HAVE A COMPRESSIVE STRENGTH LESS THAN THE DESIGN CONCRETE STRENGTH, AND NO CYLINDER TESTED HAS A COMPRESSIVE STRENGTH LESS THAN 80% OF THE DESIGN COMPRESSIVE STRENGTH, THEN THE ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA, THE ACCEPTABILITY OF THE ELEMENT MAY BE DETERMINED AS DESCRIBED IN SECTION 6.1.4, BELOW.
      6.1.4. ACCEPTABILITY OF CORE TESTS - THE COMPRESSIVE STRENGTH OF THE CONCRETE IN A BRIDGE ELEMENT IS ACCEPTABLE WHEN THE AVERAGE CORE TEST STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH. WHEN THE COMPRESSIVE STRENGTH OF A CORE TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN MAY BE RE-CORED. WHEN THE COMPRESSIVE STRENGTH OF THE RE-CORE IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH, THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THAT BRIDGE ELEMENT IS ACCEPTABLE.
         6.1.4.1. WHEN THE COMPRESSIVE STRENGTH OF ANY RECORE IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN SHALL BE REJECTED.
         6.1.4.2. PLUGGING CORE HOLES - THE CORE HOLES SHALL BE PLUGGED AND SEALED BY THE MANUFACTURER IN A MANNER SUCH THAT THE ELEMENTS WILL MEET ALL OF THE TEST REQUIREMENTS OF THIS SPECIFICATION. PRECAST ELEMENTS SO SEALED SHALL BE CONSIDERED SATISFACTORY FOR USE.
         6.1.4.3. TEST EQUIPMENT - EVERY MANUFACTURER FURNISHING PRECAST ELEMENTS UNDER THIS SPECIFICATION SHALL FURNISH ALL FACILITIES AND PERSONNEL NECESSARY TO CARRY OUT THE TEST REQUIRED.
   6.2. INSPECTION - THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.

7. JOINTS
   THE BRIDGE UNITS SHALL BE PRODUCED WITH FLAT BUTT ENDS. THE ENDS OF THE BRIDGE UNITS SHALL BE SUCH THAT WHEN THE SECTIONS ARE LAID TOGETHER THEY WILL MAKE A CONTINUOUS LINE WITH A SMOOTH INTERIOR FREE OF APPRECIABLE IRREGULARITIES, ALL COMPATIBLE WITH THE PERMISSIBLE VARIATIONS IN SECTION 5, ABOVE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

8. WORKMANSHIP/ FINISH
   THE BRIDGE UNITS, WINGWALLS, AND HEADWALLS SHALL BE SUBSTANTIALLY FREE OF FRACTURES. THE ENDS OF THE BRIDGE UNITS SHALL BE NORMAL TO THE WALLS AND CENTERLINE OF THE BRIDGE SECTION, WITHIN THE LIMITS OF THE VARIATIONS GIVEN IN SECTION 5, ABOVE, EXCEPT WHERE BEVELED ENDS ARE SPECIFIED. THE FACES OF THE WINGWALLS AND HEADWALLS SHALL BE PARALLEL TO EACH OTHER, WITHIN THE LIMITS OF VARIATIONS GIVEN IN SECTION 5, ABOVE. THE SURFACE OF THE PRECAST ELEMENTS SHALL BE A SMOOTH STEEL FORM OR TROWELED SURFACE. TRAPPED AIR POCKETS CAUSING SURFACE DEFECTS SHALL BE CONSIDERED AS PART OF A SMOOTH, STEEL FORM FINISH.

9. REPAIRS
   PRECAST ELEMENTS MAY BE REPAIRED, IF NECESSARY, BECAUSE OF IMPERFECTIONS IN MANUFACTURE OR HANDLING DAMAGE AND WILL BE ACCEPTABLE IF, IN THE OPINION OF THE PURCHASER, THE REPAIRS ARE SOUND, PROPERLY FINISHED AND CURED, AND THE REPAIRED SECTION CONFORMS TO THE REQUIREMENTS OF THIS SPECIFICATION.

10. REJECTION
   THE PRECAST ELEMENTS SHALL BE SUBJECT TO REJECTION ON ACCOUNT OF ANY OF THE SPECIFICATION REQUIREMENTS. INDIVIDUAL PRECAST ELEMENTS MAY BE REJECTED BECAUSE OF ANY OF THE FOLLOWING:
   10.1. FRACTURES OR CRACKS PASSING THROUGH THE WALL, EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED ONE HALF THE THICKNESS OF THE WALL.
   10.2. DEFECTS THAT INDICATE PROPORTIONING, MIXING, AND MOLDING NOT IN COMPLIANCE WITH SECTION 4 OF THESE SPECIFICATIONS.
   10.3. HONEYCOMBED OR OPEN TEXTURE.
   10.4. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.

11. MARKING
   EACH BRIDGE UNIT SHALL BE CLEARLY MARKED BY WATERPROOF PAINT. THE FOLLOWING SHALL BE SHOWN ON THE INSIDE OF THE VERTICAL LEG OF THE BRIDGE SECTION:
   BRIDGE SPAN x BRIDGE RISE
   DATE OF MANUFACTURE
   NAME OR TRADEMARK OF THE MANUFACTURER

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH® ENGINEERED SOLUTIONS LLC
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478306	010	8/29/2013
DESIGNED: JAL	DRAWN: JA	
CHECKED: DM	APPROVED: PAC	
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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS (CONT'D)

12. INSTALLATION PREPARATION
TO ENSURE CORRECT INSTALLATION OF THE PRECAST CONCRETE BRIDGE SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN FORMING THE SUPPORT AREAS FOR BRIDGE UNITS, HEADWALL, AND WINGWALL ELEMENTS. EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.

12.1. FOOTINGS
DO NOT OVER EXCAVATE FOUNDATIONS UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.

THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE BEARING CAPACITY MEETS OR EXCEEDS THE FOOTING DESIGN REQUIREMENTS, PRIOR TO THE CONTRACTOR POURING OF THE FOOTINGS.

THE BRIDGE UNITS AND WINGWALLS SHALL BE INSTALLED ON EITHER PRECAST OR CAST-IN-PLACE CONCRETE FOOTINGS. THE SIZE AND ELEVATION OF THE FOOTINGS SHALL BE AS DESIGNED BY THE ENGINEER. A KEYWAY SHALL BE FORMED IN THE TOP SURFACE OF THE BRIDGE FOOTING AS SPECIFIED ON THE PLANS. NO KEYWAY IS REQUIRED IN THE WINGWALL FOOTINGS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

THE FOOTINGS SHALL BE GIVEN A SMOOTH FLOAT FINISH AND SHALL REACH A COMPRESSIVE STRENGTH OF 2,000 PSI BEFORE PLACEMENT OF THE BRIDGE AND WINGWALL ELEMENTS. BACKFILLING SHALL NOT BEGIN UNTIL THE FOOTING HAS REACHED THE FULL DESIGN COMPRESSIVE STRENGTH.

THE FOOTING SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN TESTED WITH A 10'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN ¼" IN 10'-0".

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOOTING PRIOR TO PLACING THE PRECAST FOOTING.

THE FOUNDATIONS FOR PRECAST CONCRETE BRIDGE ELEMENTS AND WINGWALLS MUST BE CONNECTED BY REINFORCEMENT TO FORM ONE MONOLITHIC BODY. EXPANSION JOINTS SHALL NOT BE USED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE FOUNDATIONS PER THE PLANS AND SPECIFICATIONS.

13. INSTALLATION

13.1. GENERAL - THE INSTALLATION OF THE PRECAST CONCRETE ELEMENTS SHALL BE AS EXPLAINED IN THE PUBLICATION CON/SPAN BRIDGE SYSTEMS INSTALLATION HANDBOOK.

13.1.1. LIFTING - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A CRANE OF THE CORRECT LIFTING CAPACITY IS AVAILABLE TO HANDLE THE PRECAST CONCRETE UNITS. THIS CAN BE ACCOMPLISHED BY USING THE WEIGHTS GIVEN FOR THE PRECAST CONCRETE COMPONENTS AND BY DETERMINING THE LIFTING REACH FOR EACH CRANE UNIT. SITE CONDITIONS MUST BE CHECKED WELL IN ADVANCE OF SHIPPING TO ENSURE PROPER CRANE LOCATION AND TO AVOID ANY LIFTING RESTRICTIONS. THE LIFT ANCHORS OR HOLES PROVIDED IN EACH UNIT ARE THE ONLY MEANS TO BE USED TO LIFT THE ELEMENTS. THE PRECAST CONCRETE ELEMENTS MUST NOT BE SUPPORTED OR RAISED BY OTHER MEANS THAN THOSE GIVEN IN THE MANUALS AND DRAWINGS WITHOUT WRITTEN APPROVAL FROM CONTECH® BRIDGE SOLUTIONS.

13.1.2. CONSTRUCTION EQUIPMENT WEIGHT RESTRICTIONS - IN NO CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD (HS20 OR HS25) BE PERMITTED OVER THE BRIDGE UNITS UNLESS APPROVED BY CONTECH® BRIDGE SOLUTIONS.

13.1.2.1. IN THE IMMEDIATE AREA OF THE BRIDGE UNITS, THE FOLLOWING RESTRICTIONS FOR THE USE OF HEAVY CONSTRUCTION MACHINERY DURING BACKFILLING OPERATIONS APPLY:
NO CONSTRUCTION EQUIPMENT SHALL CROSS THE BARE
- PRECAST CONCRETE BRIDGE UNIT.
AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF
- 4" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 10 TONS MAY CROSS THE BRIDGE.
AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF
- 1'-0" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 30 TONS MAY CROSS THE BRIDGE.
AFTER THE COMPACTED FILL LEVEL HAS REACHED THE DESIGN
- COVER, OR 2'-0" MINIMUM, OVER THE CROWN OF THE PRECAST CONCRETE BRIDGE, CONSTRUCTION EQUIPMENT WITHIN THE DESIGN LOAD LIMITS FOR THE ROAD MAY CROSS THE PRECAST CONCRETE BRIDGE.

13.2. LEVELING PAD/SHIMS - THE BRIDGE UNITS AND WINGWALLS SHALL BE SET ON MASONITE OR STEEL SHIMS MEASURING 5" x 5", MINIMUM, UNLESS SHOWN OTHERWISE ON THE PLANS. A MINIMUM GAP OF ½" SHALL BE PROVIDED BETWEEN THE FOOTING AND THE BOTTOM OF THE BRIDGE'S VERTICAL LEGS OR THE BOTTOM OF THE WINGWALL. ALSO, A SUPPLY OF ¼", ½" & ⅛" THICK STEEL OR MASONITE SHIMS FOR VARIOUS SHIMMING PURPOSES SHOULD BE ON SITE.

13.3. PLACEMENT OF BRIDGE UNITS - THE BRIDGE UNITS SHALL BE PLACED AS SHOWN ON THE ENGINEER'S PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

13.4. IT IS IMPERATIVE THAT ANY LATERAL SPREADING OF THE BRIDGE ELEMENTS BE AVOIDED DURING AND AFTER THEIR PLACEMENT. GENERALLY, HORIZONTAL CABLE TIES OR TIE RODS ARE SHIPPED IN THE BRIDGE ELEMENTS TO PREVENT THIS SPREADING. CABLE TIES/TIE RODS SHALL NOT BE REMOVED UNTIL BRIDGE UNITS ARE GROUTED AND GROUT HAS CURED. IF, HOWEVER, DUE TO SITE RESTRICTIONS, THESE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO PLACEMENT OF THE BRIDGE ELEMENTS, THE CONTRACTOR MUST NOTIFY CONTECH (MANUFACTURER) AND REQUEST A SUGGESTED INSTALLATION PROCEDURE.

IN ADDITION, IF THE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO SETTING ARCH UNITS, THE FOLLOWING QUALITY CONTROL PROCEDURE MUST BE FOLLOWED:
1) FIND "MEASURED SPAN" UPON ARCH UNIT'S DELIVERY TO SITE, PRIOR TO LIFTING FROM TRUCK AND REMOVING CABLE TIES/TIE RODS. "MEASURED SPAN" SHALL BE THE AVERAGE OF (3) SPAN MEASUREMENTS ALONG THE LAY LENGTH OF THE ARCH UNIT.

2) AFTER SETTING OF BRIDGE UNIT ON THE FOUNDATION, VERIFY THE SPAN. THIS "INSTALLED SPAN MEASUREMENT" SHALL NOT EXCEED THE MAXIMUM OF
A) THE NOMINAL SPAN +½" OR
B) THE "MEASURED SPAN".
IF THE "INSTALLED SPAN MEASUREMENT" EXCEEDS THIS AMOUNT, THE ARCH UNIT SHALL BE LIFTED AND RE-SET UNTIL THE "INSTALLED SPAN MEASUREMENT" MEETS THE LIMITS.

13.5. PLACEMENT OF WINGWALLS & HEADWALLS - THE WINGWALLS AND HEADWALLS SHALL BE PLACED AS SHOWN ON THE PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE.

13.6. WATERPROOFING/JOINT PROTECTION AND SUBSURFACE DRAINAGE

13.6.1. EXTERNAL PROTECTION OF JOINTS - THE BUTT JOINT MADE BY TWO ADJOINING BRIDGE UNITS SHALL BE COVERED WITH A ⅛" x 1⅜" PREFORMED BITUMINOUS JOINT SEALANT AND A MINIMUM OF A 9" WIDE JOINT WRAP. THE SURFACE SHALL BE FREE OF DIRT BEFORE APPLYING THE JOINT MATERIAL. A PRIMER COMPATIBLE WITH THE JOINT WRAP TO BE USED SHALL BE APPLIED FOR A MINIMUM WIDTH OF 9" ON EACH SIDE OF THE JOINT. THE EXTERNAL WRAP SHALL BE EITHER EZ-WRAP RUBBER BY PRESS-SEAL GASKET CORPORATION, SEAL WRAP BY MAR MAC MANUFACTURING CO. INC. OR APPROVED EQUAL. THE JOINT SHALL BE COVERED CONTINUOUSLY FROM THE BOTTOM OF ONE BRIDGE SECTION LEG, ACROSS THE TOP OF THE BRIDGE AND TO THE OPPOSITE BRIDGE SECTION LEG. ANY LAPS THAT RESULT IN THE JOINT WRAP SHALL BE A MINIMUM OF 6" LONG WITH THE OVERLAP RUNNING DOWNHILL.

13.6.2. IN ADDITION TO THE JOINTS BETWEEN BRIDGE UNITS, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE HEADWALL SHALL ALSO BE SEALED AS DESCRIBED ABOVE. IF PRECAST WINGWALLS ARE USED, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE WINGWALL SHALL BE SEALED WITH A 2'-0" STRIP OF FILTER FABRIC. ALSO, IF LIFT HOLES ARE FORMED IN THE BRIDGE UNITS, THEY SHALL BE PRIMED AND COVERED WITH A 9" x 9" SQUARE OF JOINT WRAP.

13.6.3. DURING THE BACKFILLING OPERATION, CARE SHALL BE TAKEN TO KEEP THE JOINT WRAP IN ITS PROPER LOCATION OVER THE JOINT.

13.6.4. SUBSOIL DRAINAGE SHALL BE AS DIRECTED BY THE ENGINEER.

13.7. GROUTING

13.7.1. GROUTING SHALL NOT BE PERFORMED WHEN TEMPERATURES ARE EXPECTED TO GO BELOW 35° FOR A PERIOD OF 72 HOURS. FILL THE BRIDGE-FOUNDATION KEYWAY WITH CEMENT GROUT (PORTLAND CEMENT AND WATER OR CEMENT MORTAR COMPOSED OF PORTLAND CEMENT, SAND AND WATER) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI. VIBRATE AS REQUIRED TO ENSURE THAT THE ENTIRE KEY AROUND THE BRIDGE ELEMENT IS COMPLETELY FILLED. IF BRIDGE ELEMENTS HAVE BEEN SET WITH TEMPORARY TIES (CABLES, BARS, ETC.) GROUT MUST ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI BEFORE TIES MAY BE REMOVED.

13.7.2. ALL GROUT SHALL HAVE A MAXIMUM AGGREGATE SIZE OF ½".

13.7.3. LIFTING AND ERECTION ANCHOR RECESSES SHALL BE FILLED WITH GROUT.

13.8. BACKFILL

13.8.1. DO NOT PERFORM BACKFILLING DURING WET OR FREEZING WEATHER.

13.8.2. NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURAL ELEMENTS UNTIL THEY HAVE BEEN APPROVED BY THE ENGINEER.

13.8.3. BACKFILL SHALL BE CONSIDERED AS ALL REPLACED EXCAVATION AND NEW EMBANKMENT ADJACENT TO THE PRECAST CONCRETE ELEMENTS. THE PROJECT CONSTRUCTION AND MATERIAL SPECIFICATIONS, WHICH INCLUDE THE SPECIFICATIONS FOR EXCAVATION FOR STRUCTURES AND ROADWAY EXCAVATION AND EMBANKMENT CONSTRUCTION, SHALL APPLY EXCEPT AS MODIFIED IN THIS SECTION.

13.8.4. BACKFILL ZONES:
IN-SITU SOIL
- ZONE A: CONSTRUCTED EMBANKMENT OR OVERFILL.
- ZONE B: FILL THAT IS DIRECTLY ASSOCIATED WITH PRECAST
- CONCRETE BRIDGE INSTALLATION.
ZONE C: ROAD STRUCTURE.

13.8.5. REQUIRED BACKFILL PROPERTIES

13.8.5.1. IN-SITU SOIL - NATURAL GROUND IS TO BE SUFFICIENTLY STABLE TO ALLOW EFFECTIVE SUPPORT TO THE PRECAST CONCRETE BRIDGE UNITS. AS A GUIDE, THE EXISTING NATURAL GROUND SHOULD BE OF SIMILAR QUALITY AND DENSITY TO ZONE B MATERIAL FOR MINIMUM LATERAL DIMENSION OF ONE BRIDGE SPAN OUTSIDE OF THE BRIDGE FOOTING.

13.8.5.2. ZONE A - ZONE A REQUIRES FILL MATERIAL WITH SPECIFICATIONS AND COMPACTING PROCEDURES EQUAL TO THAT FOR NORMAL ROAD EMBANKMENTS.

13.8.5.3. ZONE B - GENERALLY, SOILS SHALL BE REASONABLY FREE OF ORGANIC MATTER, AND, NEAR CONCRETE SURFACES, FREE OF STONES LARGER THAN 3" IN DIAMETER SEE CHARTS FOR DETAILED DESCRIPTIONS OF ACCEPTABLE SOILS.

13.8.5.4. ZONE C - ZONE C IS THE ROAD SECTION OF GRAVEL, ASPHALT OR CONCRETE BUILT IN COMPLIANCE WITH LOCAL ENGINEERING PRACTICES.

13.8.5.5. GEOTECHNICAL ENGINEER SHALL REVIEW GRADATIONS OF ALL INTERFACING MATERIALS AND, IF NECESSARY, RECOMMEND GEOTEXTILE FILTER FABRIC (PROVIDED BY CONTRACTOR)

13.8.6. PLACING AND COMPACTING BACKFILL
DUMPING FOR BACKFILLING IS NOT ALLOWED ANY NEARER THAN 3'-0" FROM THE BRIDGE LEG.

THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL ON OPPOSITE SIDES OF THE BRIDGE MUST NOT EXCEED 2'-0".

THE FILL BEHIND WINGWALLS MUST BE PLACED AT THE SAME TIME AS THAT OF THE BRIDGE FILL. IT MUST BE PLACED IN PROGRESSIVELY PLACED HORIZONTAL LAYERS NOT EXCEEDING 8" PER LAYER.

THE BACKFILL OF ZONE B SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% OF THE STANDARD PROCTOR, AS REQUIRED BY AASHTO T-99.

SOIL WITHIN 1'-0" OF CONCRETE SURFACES SHOULD BE HAND-COMPACTED. ELSEWHERE, USE OF ROLLERS IS ACCEPTABLE. IF VIBRATING ROLLER-COMPACTORS ARE USED, THEY SHOULD NOT BE STARTED OR STOPPED WITHIN ZONE B AND THE VIBRATION FREQUENCY SHOULD BE AT LEAST 30 REVOLUTIONS PER SECOND.

THE BACKFILL MATERIAL AND COMPACTING BEHIND WINGWALLS SHOULD SATISFY THE CRITERIA FOR THE BRIDGE BACKFILL, ZONE B.

BACKFILL AGAINST A WATERPROOFED SURFACE SHALL BE PLACED CAREFULLY TO AVOID DAMAGE TO THE WATERPROOFING MATERIAL.

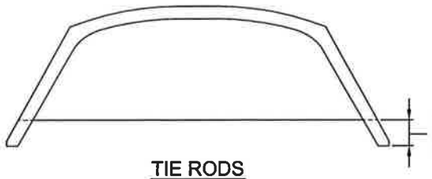
13.8.7. BRIDGE UNITS
FOR FILL HEIGHTS OVER 12'-0", NO BACKFILLING MAY BEGIN UNTIL A BACKFILL COMPACTION TESTING PLAN HAS BEEN COORDINATED WITH AND APPROVED BY CONTECH® BRIDGE SOLUTIONS. COST OF THE BACKFILL COMPACTION TESTING SHALL BE INCLUDED IN THE COST OF THE PRECAST UNITS. THIS INCLUDED COST APPLIES ONLY TO PROJECTS WITH FILL HEIGHTS OVER 12'-0" (AS MEASURED FROM TOP CROWN OF BRIDGE TO FINISHED GRADE).

13.8.8. WINGWALLS
BACKFILL IN FRONT OF WINGWALLS SHALL BE CARRIED TO GROUND LINES SHOWN IN THE PLANS.

13.8.9. MONITORING
THE CONTRACTOR SHALL CHECK SETTLEMENTS AND HORIZONTAL DISPLACEMENT OF FOUNDATION TO ENSURE THAT THEY ARE WITHIN THE ALLOWABLE LIMIT PROVIDED BY THE ENGINEER. THESE MEASUREMENTS SHOULD GIVE AN INDICATION OF THE SETTLEMENTS AND DEFORMATIONS ALONG THE LENGTH OF THE FOUNDATIONS.

THE FIRST MEASUREMENT ROW SHOULD TAKE PLACE AFTER THE ERECTION OF ALL PRECAST BRIDGE SYSTEM ELEMENTS, A SECOND AFTER COMPLETION OF BACKFILLING, AND A THIRD BEFORE OPENING OF THE BRIDGE TO TRAFFIC. FURTHER MEASUREMENTS MAY BE MADE ACCORDING TO LOCAL CONDITIONS.

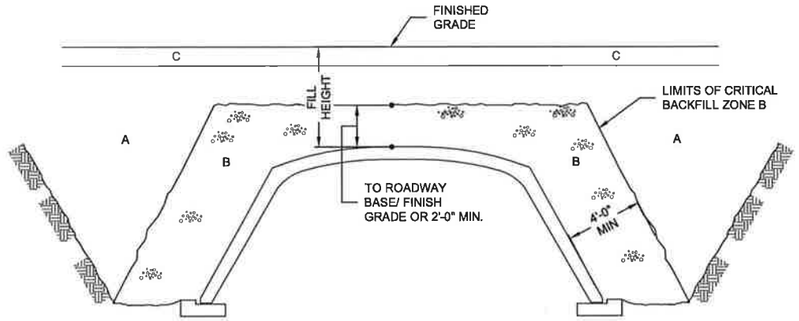
THE MAXIMUM DIFFERENCE IN VERTICAL DISPLACEMENTS 'V' SHOULD NOT EXCEED 1" ALONG THE LENGTH OF ONE FOUNDATION.



TIE RODS

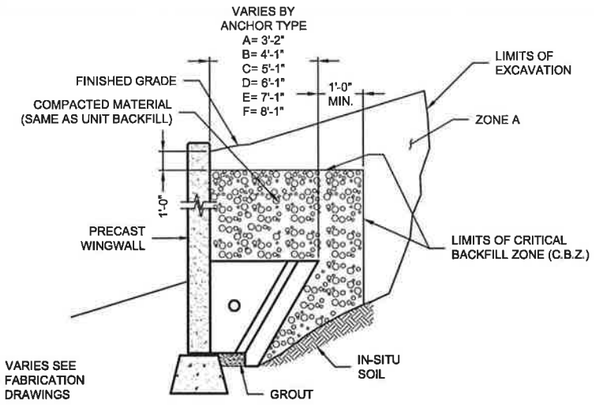
ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

TYPICAL USCS MATERIALS	AASHTO GROUP	AASHTO SUBGROUP	PERCENT PASSING US SIEVE NO.			CHARACTER OF FRACTION PASSING NO. 40 SIEVE		SOIL DESRIPTION
			#10	#40	#200	LIQUID LIMIT	PLASTICITY INDEX	
GW, GP, SP	A1	A-1a	50 MAX	30 MAX	15 MAX		6 MAX	LARGELY GRAVEL BUT CAN INCLUDE SAND AND FINES
GM, SW, SP, SM		A-1b		50 MAX	25 MAX		6 MAX	GRAVELLY SAND OR GRADED SAND, MAY INCLUDE FINES
GM, SM, ML, SP, GP	A2	A-2-4			35 MAX	40 MAX	10 MAX	SANDS, GRAVELS WITH LOW-PLASTICITY SILT FINES
SC, GC, GM		A-2-5			35 MAX	41 MIN	10 MAX	SANDS, GRAVELS WITH PLASTIC SILT FINES
SP, SM, SW	A3			51 MIN	10 MAX		NON-PLASTIC	FINE SANDS
ML, SM, SC	A4				36 MIN	40 MAX	10 MAX	LOW-COMPRESSIBILTY SILTS



SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE ZONE B
≤ 24'-0"	≥ 12'-0"	A1, A3
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4
> 24'-0"	ALL	A1, A3

BACKFILL REQUIREMENTS



WALL BACKFILL REQUIREMENTS

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CON/SPAN® -SERIES EXPRESS™ Foundations
FABRICATION DRAWING

NW 253RD AVE.
STA. 47+21.60

HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	010	8/29/2013
DESIGNED: JAL		DRAWN: JA
CHECKED: DM		APPROVED: PAC
SHEET NO.: S16 OF S16		

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NOTES

GENERAL NOTES:

1. THIS BRIDGE HAS BEEN DESIGNED FOR GENERAL SITE CONDITIONS. THE PROJECT ENGINEER SHALL BE RESPONSIBLE FOR THE STRUCTURE'S SUITABILITY TO THE EXISTING SITE CONDITIONS AND FOR THE HYDRAULIC EVALUATION – INCLUDING SCOUR AND CONFIRMATION OF SOIL CONDITIONS.
2. PRIOR TO CONSTRUCTION, CONTRACTOR MUST VERIFY ALL ELEVATIONS SHOWN THROUGH THE ENGINEER.
3. ONLY CONTECH ENGINEERED SOLUTIONS LLC, THE CON/SPAN® APPROVED PRECASTER IN OREGON MAY PROVIDE THE STRUCTURE DESIGNED IN ACCORDANCE WITH THESE PLANS.
4. THE USE OF ANOTHER PRECAST STRUCTURE WITH THE DESIGN ASSUMPTIONS USED FOR THE CON/SPAN® STRUCTURE MAY LEAD TO SERIOUS DESIGN ERRORS. USE OF ANY OTHER PRECAST STRUCTURE WITH THIS DESIGN AND DRAWINGS VOIDS ANY CERTIFICATION OF THIS DESIGN AND WARRANTY. CONTECH ENGINEERED SOLUTIONS, LLC ASSUMES NO LIABILITY FOR DESIGN OF ANY ALTERNATE OR SIMILAR TYPE STRUCTURES.
5. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT DRAWINGS AND CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF OREGON, EMPLOYED BY THE PRECAST CONCRETE BRIDGE SUPPLIER, ARE SUBMITTED TO THE ENGINEER 2 WEEKS PRIOR TO THE BID DATE FOR REVIEW AND APPROVAL.
6. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT THE ALTERNATE DESIGN DOES NOT REDUCE THE HYDRAULIC OPENING OF THE STRUCTURE AS SHOWN ON THE DRAWINGS. AT A MINIMUM THE ALTERNATE STRUCTURE MUST PROVIDE THE SAME OR LARGER SPAN AND RISE AS THE STRUCTURE SHOWN ON THE DRAWINGS.
7. THE PRECAST ARCH SUPPLIER MUST ATTEND THE PRE-BID MEETING, IF ONE IS HELD.
8. SUPPLIER OF PROPOSED ALTERNATES TO A CON/SPAN® BRIDGE SYSTEM MUST SUBMIT AT LEAST TWO (2) INDEPENDENTLY VERIFIED FULL SCALE LOAD TESTS THAT CONFIRM THE PROPOSED DESIGN METHODOLOGY OF THE THREE SIDED/ARCH STRUCTURE(S). THE PROPOSED ALTERNATE, UPON SATISFACTORY CONFIRMATION OF DESIGN METHODOLOGY, MAY BE CONSIDERED AN ACCEPTABLE ALTERNATE.
9. PROPOSED ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT THE PRECAST CONCRETE BRIDGE STRUCTURES ARE PROVIDED BY A SUPPLIER THAT HAS A MINIMUM OF TWO (2) REGISTERED PROFESSIONAL ENGINEERS ON STAFF THAT ARE DEDICATED TO THE DESIGN OF THESE TYPES OF STRUCTURES. SUPPLIER MUST PROVIDE THESE NAMES, P.E. LICENSE NUMBERS AND DATES OF HIRE AT TIME OF ALTERNATE SUBMITTAL.

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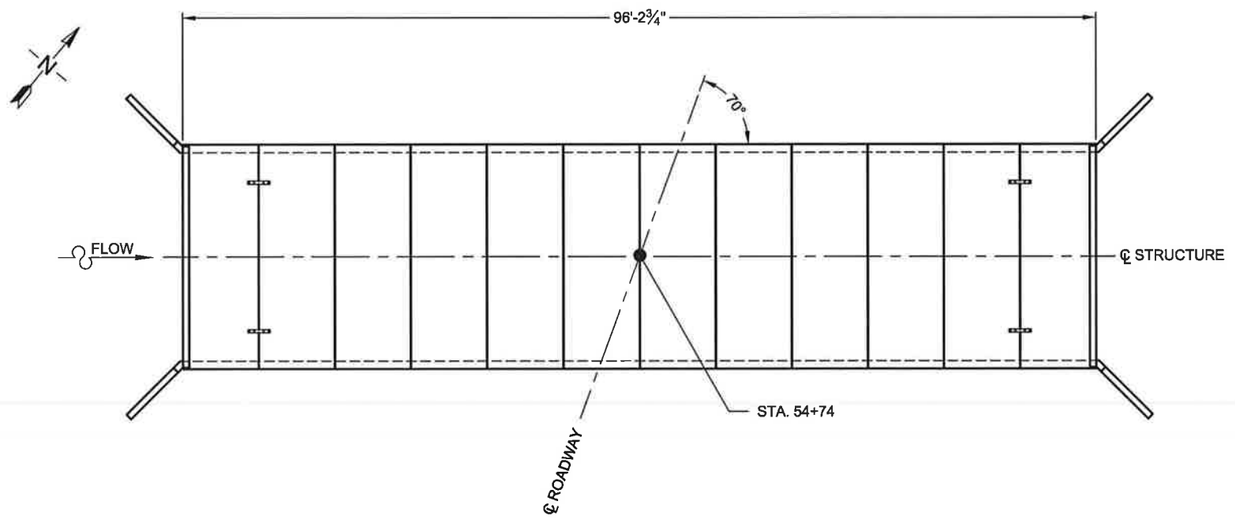
HILLSBORO, OREGON



LOCATION PLAN

NOT TO SCALE

DESIGN DATA

DESIGN LOADING:
- BRIDGE UNITS: HS20
- HEADWALLS: EARTH PRESSURE ONLY
- WINGWALLS: EARTH PRESSURE ONLY

DESIGN FILL HEIGHT: 2'-0" MIN. TO 5'-0" MAX.
FROM TOP OF CROWN TO TOP OF PAVEMENT.
DESIGN METHOD: LOAD FACTOR PER AASHTO SPECIFICATION
ALLOWABLE SOIL BEARING PRESSURE: 3000 PSF* (1.5" TOTAL SETTLEMENT)

*FOUNDATION EXCAVATION AND SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT FOR THIS PROJECT PREPARED BY GEODESIGN, INC. DATED: 2/25/2013

MATERIALS

PRECAST UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CON/SPAN® SPECIFICATIONS. CONCRETE FOR FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. REINFORCING STEEL FOR FOOTINGS SHALL CONFORM TO ASTM A615 OR A996-GRADE 60.

9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER

EXPIRATION DATE: 12/31/13

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH® ENGINEERED SOLUTIONS LLC
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PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/19/2013
DESIGNED: JAL	DRAWN: JA	
CHECKED: DM	APPROVED: PAC	
SHEET NO.: CT1 OF CT8		

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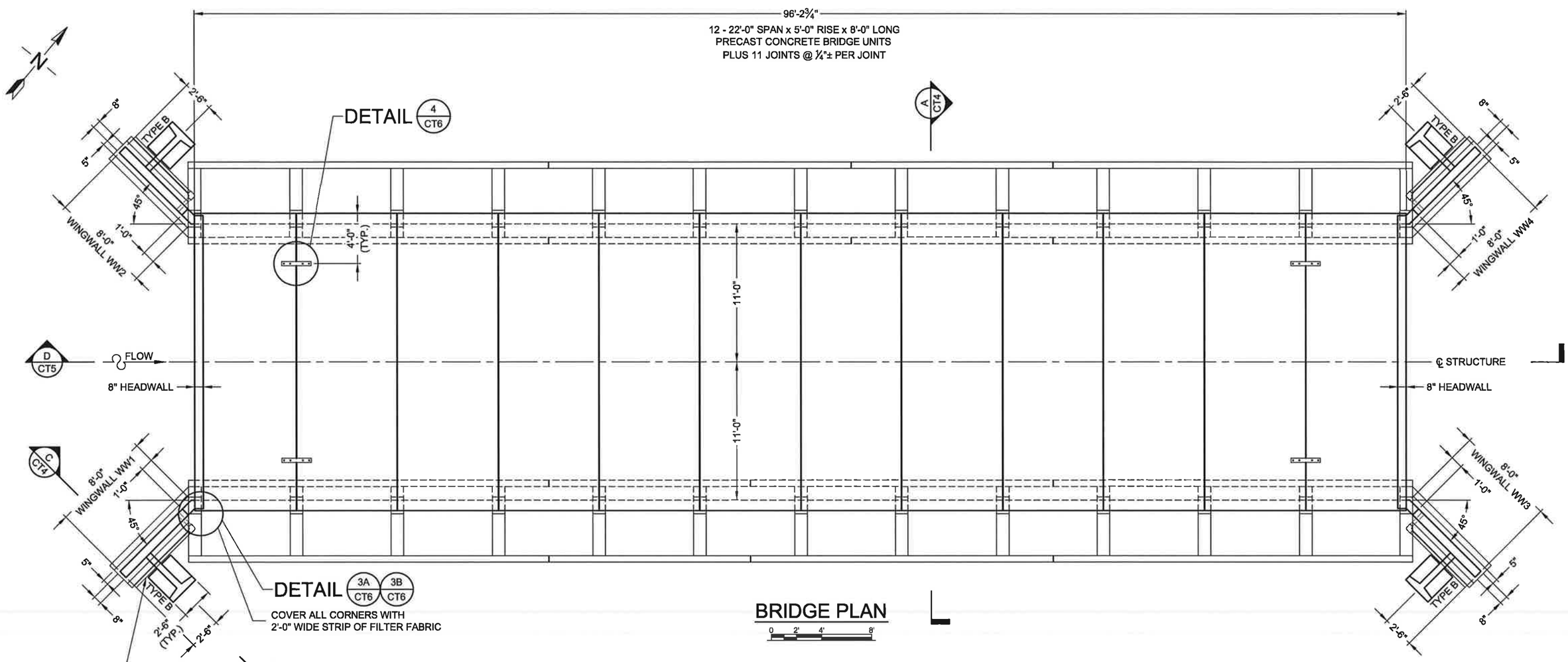
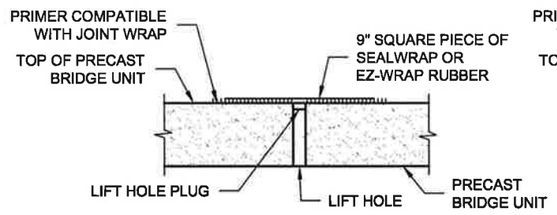
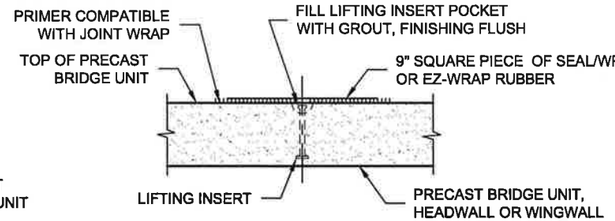


BRIDGE PLAN

0 2' 4' 8'



LIFTING HOLES



LIFTING INSERTS

TYPICAL LIFT POINT SEALING DETAIL

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9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER

EXPIRATION DATE: 12/31/13

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SHEET NO.: CT2 OF CT8		

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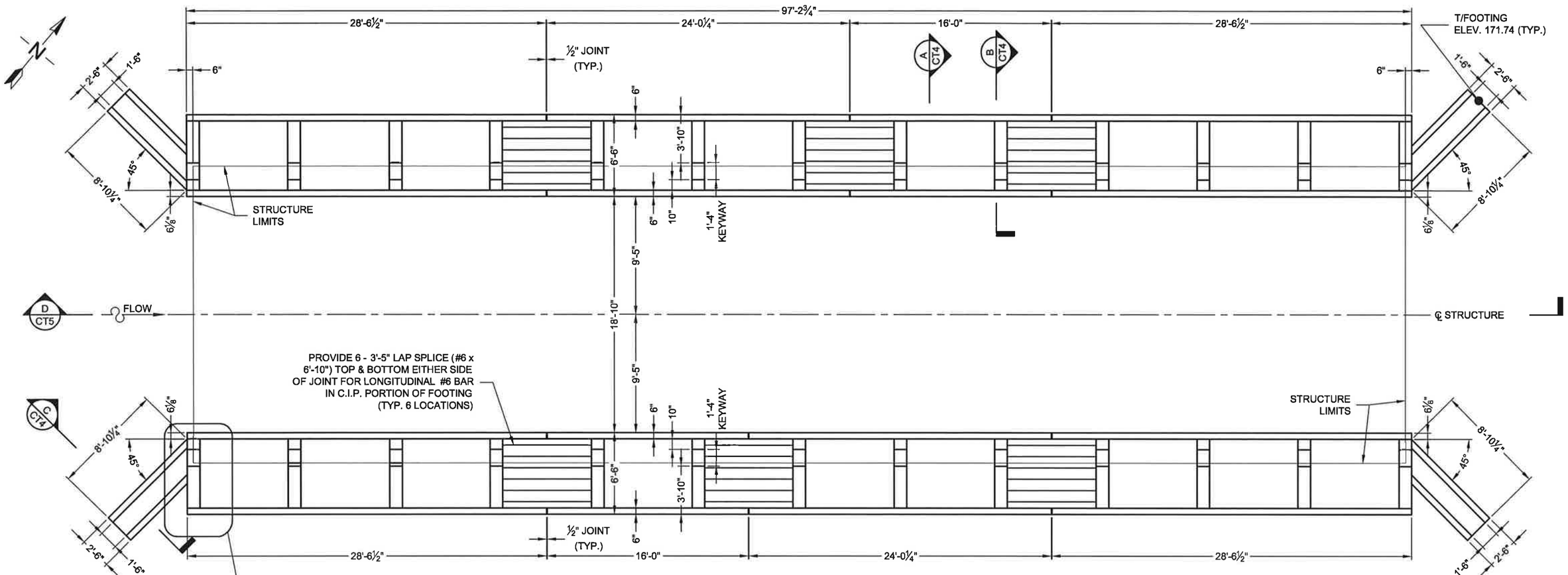

DETAIL 2 CT4

FOUNDATION PLAN

0 2' 4' 8'

PRECAST REINFORCED CONCRETE EXPRESS ™ FOUNDATION NOTES:

1. PRECAST FOUNDATION UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN BRIDGE SYSTEMS.
2. PRECAST AND CAST-IN-PLACE CONCRETE FOR EXPRESS FOUNDATIONS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI. REINFORCING STEEL FOR FOUNDATIONS SHALL CONFORM TO ASTM A615 OR A996, GRADE 60.
3. PRECAST FOUNDATION UNITS SHALL BE SET ON A MINIMUM 4-INCH THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOUNDATION.
4. COMPACTED BACKFILL MATERIAL MUST BE PLACED UP TO THE TOP OF THE PRECAST FOUNDATION UNITS ON BOTH SIDES PRIOR TO PLACING CAST-IN-PLACE CONCRETE PORTION OF FOUNDATIONS.
5. CONCRETE SURFACES WHICH CAST-IN-PLACE CONCRETE WILL BE PLACED AGAINST SHALL BE CLEAN, FREE OF LAITANCE, DIRT, STANDING WATER AND ANY OTHER MATERIAL THAT MAY IMPAIR THE BOND BETWEEN THE PRECAST CONCRETE AND CAST-IN-PLACE CONCRETE.
6. CAST-IN-PLACE CONCRETE MIX USED TO FILL FOUNDATION SHALL BE ABLE TO FLOW INTO ARCH SHIM SPACE OR NON-SHRINK GROUT SHALL BE PLACED UNDER ARCH UNIT LEG AT FOUNDATION CROSS MEMBERS PRIOR TO PLACEMENT OF CAST-IN-PLACE PORTION OF FOUNDATION.
7. IF THE AMBIENT TEMPERATURE AT THE TIME OF PLACEMENT OF CAST-IN-PLACE CONCRETE IS ABOVE 90°F OR EXPECTED TO GO BELOW 35°F DURING THE CURE PERIOD, THE CONTRACTOR SHALL FOLLOW THE REQUIREMENTS OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, SECTION 8.6.2 HOT WEATHER PROTECTION OR SECTION 8.6.4 COLD WEATHER PROTECTION.
8. IF PRECAST ARCH UNITS ARE TO BE ERECTED ON PRECAST FOUNDATION UNITS PRIOR TO PLACEMENT OF CAST-IN-PLACE CONCRETE, THE CABLE TIES/RODS (SHIPPED WITH LONG-SPAN STRUCTURES) MUST REMAIN IN PLACE AND MAY NOT BE REMOVED UNTIL CAST-IN-PLACE CONCRETE HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
9. IF CABLE TIES/RODS (SHIPPED WITH LONG-SPAN STRUCTURES) MUST BE REMOVED PRIOR TO SETTING OF ARCH UNITS, CAST-IN-PLACE CONCRETE PORTION OF FOUNDATIONS MUST BE PLACED AND ALLOWED TO REACH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI BEFORE PLACEMENT OF PRECAST ARCH UNITS, HEADWALLS AND WINGWALLS. CONTRACTOR MUST FOLLOW SPECIFICATION SECTION 13.4 AND NOTIFY CONTECH ENGINEER PRIOR TO REMOVING CABLES TIES/RODS.
10. IF CAST-IN-PLACE CONCRETE PORTION OF FOUNDATION IS TO BE PLACED PRIOR TO SETTING OF ARCH UNITS, HEADWALLS OR WINGWALLS, CAST-IN-PLACE CONCRETE SHALL REACH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI BEFORE PRECAST ARCH UNITS, HEADWALLS AND WINGWALLS ARE SET.
11. FOUNDATION CONCRETE SHALL REACH ITS FULL DESIGN STRENGTH BEFORE BACKFILLING OF ARCH UNITS MAY COMMENCE.

CAST IN PLACE CONCRETE VOLUME: 68.6 CUBIC YARDS
CONCRETE VOLUME IS ACTUAL REQUIRED AMOUNT AND SHOULD BE INCREASED FOR ANTICIPATED LEAKAGE, WASTE, ETC.

9/3/13

REGISTERED PROFESSIONAL ENGINEER 83231PE OREGON JULY 14, 2009 PHILIP A. CREAMER

EXPIRATION DATE: 12/31/13

MARK	DATE	REVISION DESCRIPTION	BY

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HILLSBORO, OREGON

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478306	030	8/19/2013
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SHEET NO.: CT3 OF CT8		

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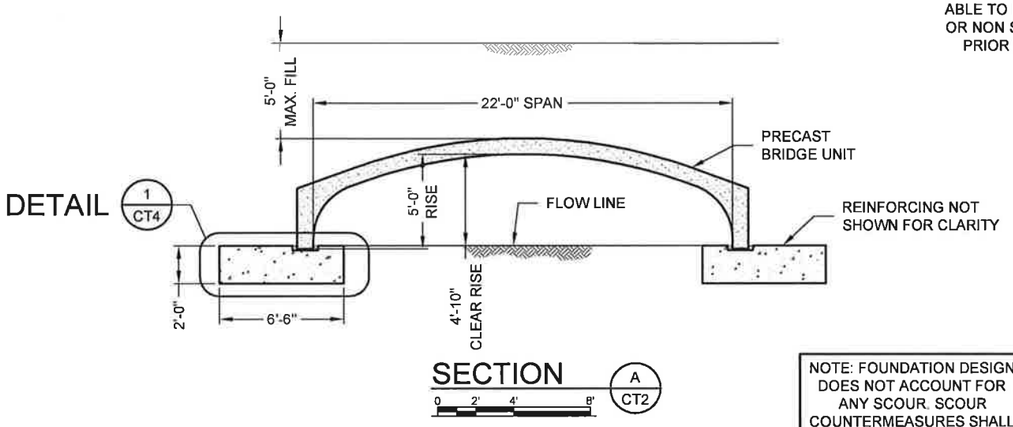
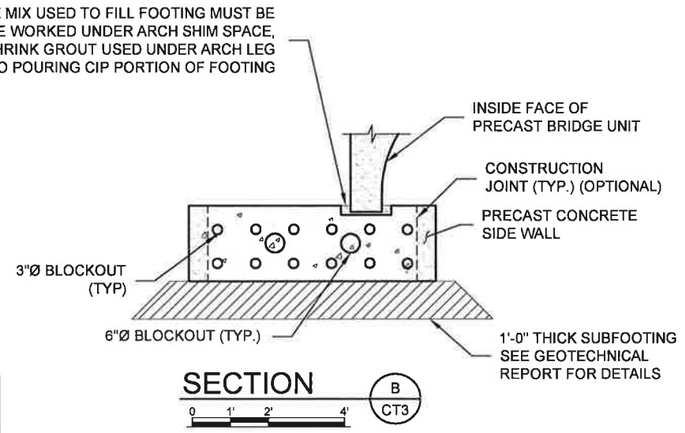
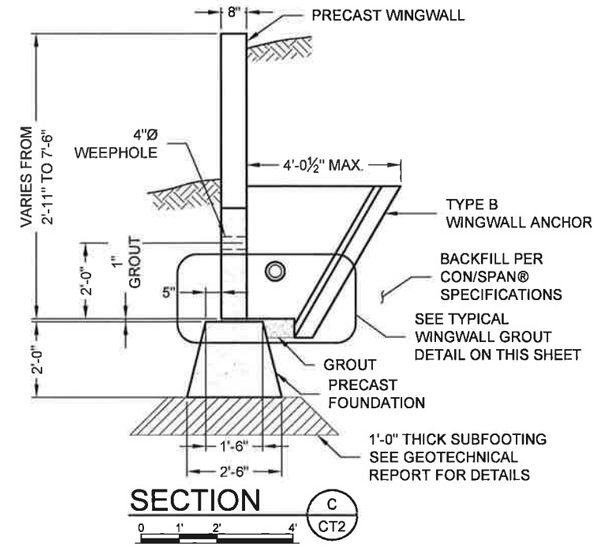
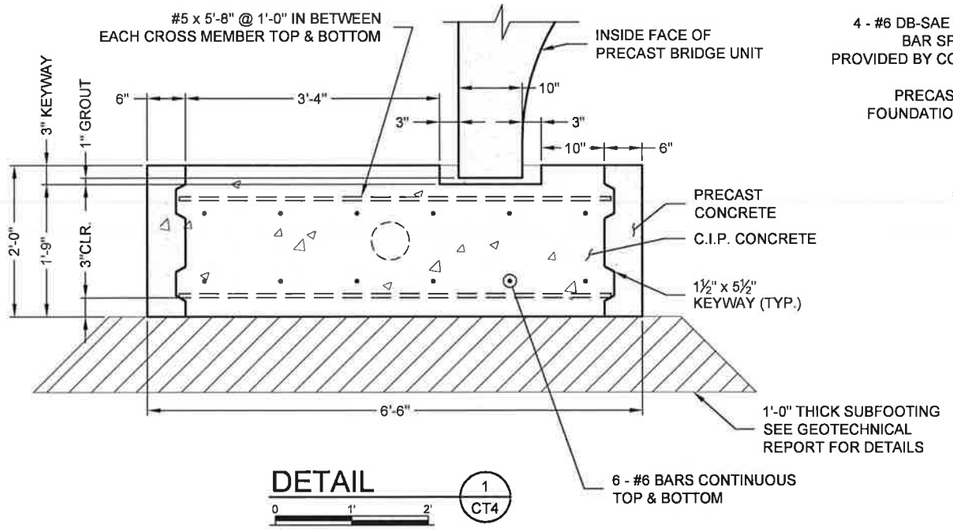
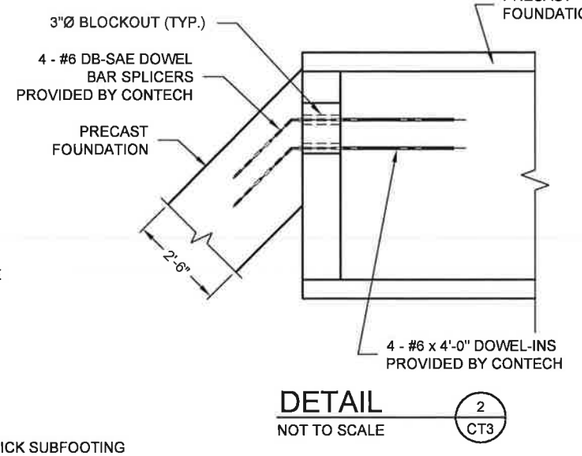


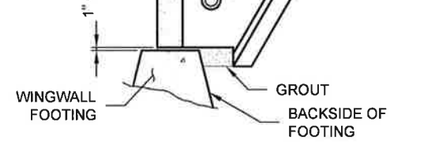
NOTE: FOUNDATION DESIGN DOES NOT ACCOUNT FOR ANY SCOUR. SCOUR COUNTERMEASURES SHALL BE SPECIFIED BY THE ENGINEER OF RECORD, GROUP MACKENZIE











NOTES:
- MINIMUM 1" GROUT UNDER WINGWALL LEG & ANCHOR STEM.
- AREA BETWEEN WINGWALL FOOTING AND WINGWALL ANCHOR SHALL BE GROUTED SOLID BEFORE BACKFILL.
- FORM BACKSIDE OF FOOTING TO DIMENSIONS SHOWN ON FOUNDATION PLAN.

TYPICAL WINGWALL GROUT DETAIL

NOT TO SCALE

9/3/13

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CHECKED: DM		APPROVED: PAC
SHEET NO.: CT4 OF CT8		

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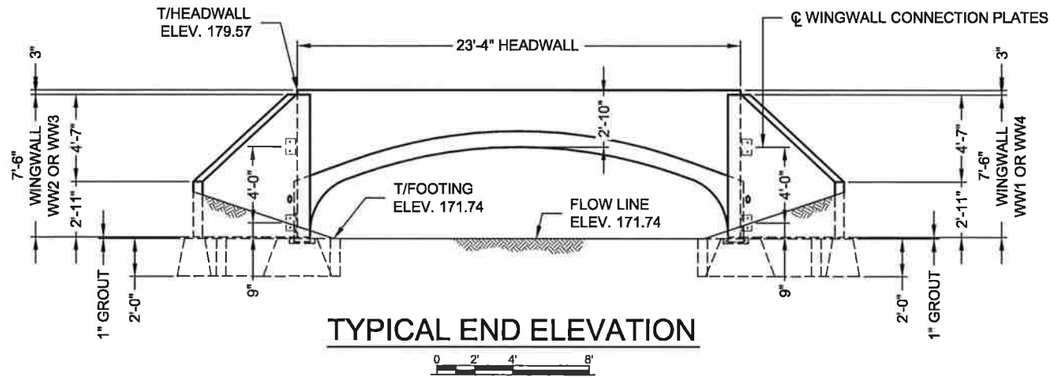

TYPICAL END ELEVATION

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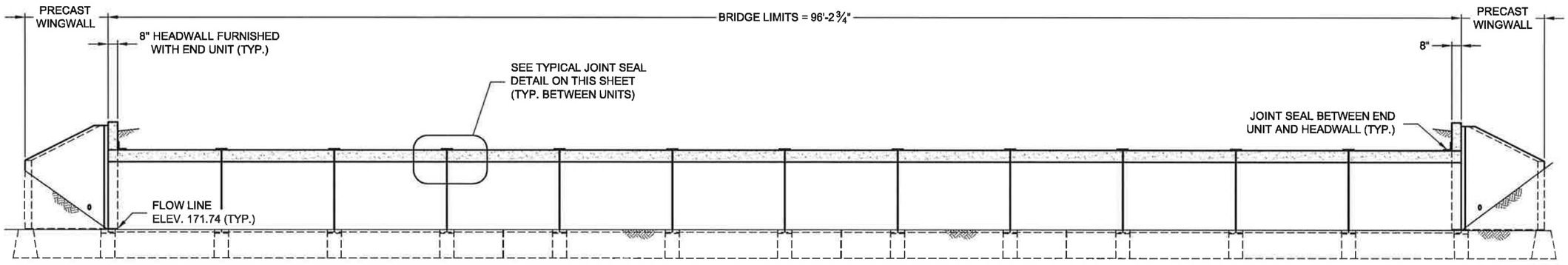

SECTION D CT2

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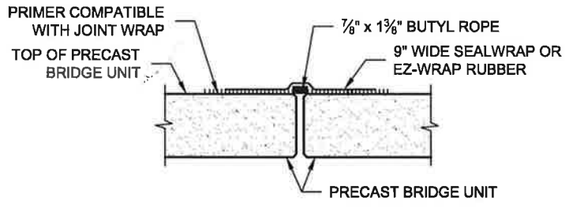

TYPICAL JOINT SEAL DETAIL

NOT TO SCALE

9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER

EXPIRATION DATE: 12/31/13

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH® ENGINEERED SOLUTIONS LLC
www.ContechES.com
5670 Greenwood Plaza Blvd., Suite 530, Greenwood Village, CO 80111
800-526-3999 720-587-2700 720-587-2651 FAX

CONSPAN® BRIDGE SYSTEMS
EXPRESS® Foundations
CONTRACT DRAWING

NW 253RD AVE.
STA. 55+74
HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/19/2013
DESIGNED: JAL	DRAWN: JA	
CHECKED: DM	APPROVED: PAC	
SHEET NO.: CT5 OF CT8		

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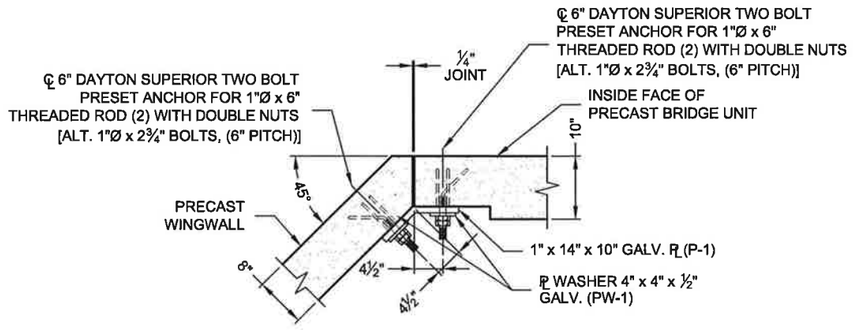
NOTE:
CONNECTION PL'S (P-1) MUST BE POSITIONED WITH SMALL Ø HOLES TOWARD PRECAST BRIDGE UNIT



DETAIL @ UNIT LEG 3A CT2

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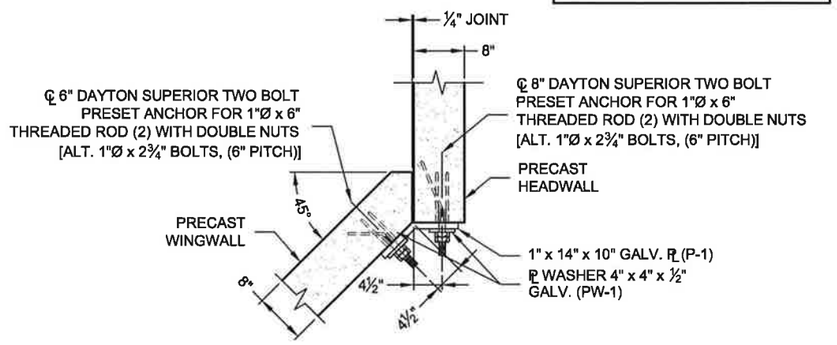
NOTE:
CONNECTION PL'S (P-1) MUST BE POSITIONED WITH SMALL Ø HOLES TOWARD PRECAST HEADWALL



DETAIL @ HEADWALL 3B CT2

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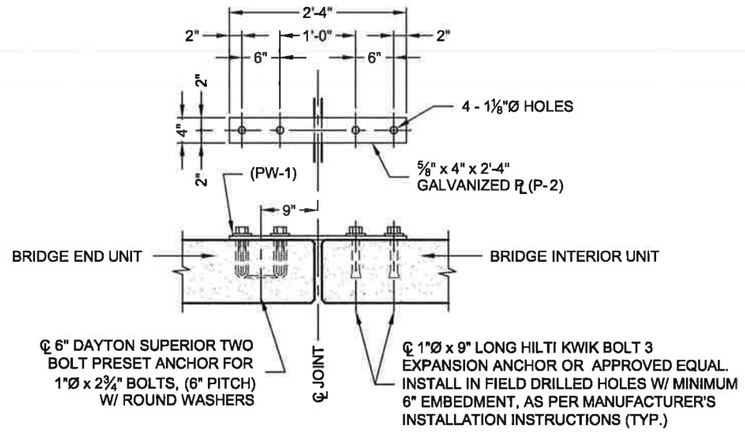

DETAIL NOT TO SCALE 4 CT2

9/3/17

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER

EXPIRATION DATE: 12/31/13

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478306	030	8/19/2013
DESIGNED: JAL	DRAWN: JA	
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SHEET NO.: CT6 OF CT8		

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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS

1. DESCRIPTION
   1.1. TYPE - THIS WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTING A CON/SPAN® BRIDGE SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON THE PLANS OR AS ESTABLISHED BY THE ENGINEER. IN SITUATIONS WHERE TWO OR MORE SPECIFICATIONS APPLY TO THIS WORK, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.
   1.2. DESIGNATION - PRECAST REINFORCED CONCRETE CON/SPAN® BRIDGE UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY SPAN AND RISE. PRECAST REINFORCED CONCRETE WINGWALLS AND HEADWALLS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT, AND DEFLECTION ANGLE. PRECAST REINFORCED CONCRETE EXPRESS™ FOUNDATION UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT AND WIDTH.

2. DESIGN
   2.1. SPECIFICATIONS - THE PRECAST ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" 17TH EDITION, ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002. A MINIMUM OF ONE FOOT OF COVER ABOVE THE CROWN OF THE BRIDGE UNITS IS REQUIRED IN THE INSTALLED CONDITION. (UNLESS NOTED OTHERWISE ON THE SHOP DRAWINGS AND DESIGNED ACCORDINGLY.)

3. MATERIALS
   3.1. CONCRETE - THE CONCRETE FOR THE PRECAST ELEMENTS SHALL BE AIR-ENTRAINED WHEN INSTALLED IN AREAS SUBJECT TO FREEZE-THAW CONDITIONS, COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGREGATES, ADMIXTURES AND WATER. AIR-ENTRAINED CONCRETE SHALL CONTAIN 6 ± 2 PERCENT AIR. THE AIR- ENTRAINING ADMIXTURE SHALL CONFORM TO AASHT0 M154. THE MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE AS SHOWN ON THE SHOP DRAWINGS.
      3.1.1. PORTLAND CEMENT - SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATIONS C150-TYPE I, TYPE II, OR TYPE III CEMENT.
      3.1.2. COARSE AGGREGATE - SHALL CONSIST OF STONE HAVING A MAXIMUM SIZE OF 1 INCH. AGGREGATE SHALL MEET REQUIREMENTS FOR ASTM C33.
      3.1.3. WATER REDUCING ADMIXTURE - THE MANUFACTURER MAY SUBMIT, FOR APPROVAL BY THE ENGINEER, A WATER-REDUCING ADMIXTURE FOR THE PURPOSE OF INCREASING WORKABILITY AND REDUCING THE WATER REQUIREMENT FOR THE CONCRETE.
      3.1.4. CALCIUM CHLORIDE - THE ADDITION TO THE MIX OF CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE WILL NOT BE PERMITTED.
      3.1.5. MIXTURE - THE AGGREGATES, CEMENT AND WATER SHALL BE PROPORTIONED AND MIXED IN A BATCH MIXER TO PRODUCE A HOMOGENEOUS CONCRETE MEETING THE STRENGTH REQUIREMENTS OF THIS SPECIFICATION. THE PROPORTION OF PORTLAND CEMENT IN THE MIXTURE SHALL NOT BE LESS THAN 564 POUNDS (6 SACKS) PER CUBIC YARD OF CONCRETE.
   3.2. STEEL REINFORCEMENT
      3.2.1. THE MINIMUM STEEL YIELD STRENGTH SHALL BE 60,000 PSI, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS.
      3.2.2. ALL REINFORCING STEEL FOR THE PRECAST ELEMENTS SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE DETAILED SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER.
      3.2.3. REINFORCEMENT SHALL CONSIST OF WELDED WIRE FABRIC CONFORMING TO ASTM SPECIFICATION A 185 OR A 497, OR DEFORMED BILLET STEEL BARS CONFORMING TO ASTM SPECIFICATION A 615, GRADE 60, LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS.
   3.3. STEEL HARDWARE
      3.3.1. BOLTS AND THREADED RODS FOR WINGWALL CONNECTIONS SHALL CONFORM TO ASTM A 307. NUTS SHALL CONFORM TO AASHTO M292 (ASTM A194) GRADE 2H. ALL BOLTS, THREADED RODS AND NUTS USED IN WINGWALL CONNECTIONS SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.2. STRUCTURAL STEEL FOR WINGWALL CONNECTION PLATES AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709) GRADE 36 AND SHALL BE HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.3. INSERTS FOR WINGWALLS SHALL BE 1" DIAMETER TWO-BOLT PRESET WINGWALL ANCHORS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700 AND SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.4. FERRULE LOOP INSERTS SHALL BE F-64 FERRULE LOOP INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
      3.3.5. HOOK BOLTS USED IN ATTACHED HEADWALL CONNECTIONS SHALL BE ASTM A307.
      3.3.6. INSERTS FOR DETACHED HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL, EXPANDED COIL INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700. COIL RODS AND NUTS USED IN HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL. WASHERS USED IN HEADWALL CONNECTIONS SHALL BE EITHER AISI TYPE 304 STAINLESS STEEL PLATE WASHERS OR AASHTO M270 (ASTM A709) GRADE 36 PLATE WASHERS HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.7. MECHANICAL SPLICES OF REINFORCING BARS SHALL BE MADE USING THE DOWEL BAR SPLICER SYSTEM AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700, AND SHALL CONSIST OF THE DOWEL BAR SPLICER (DB-SAE) AND DOWEL-IN (DI).

4. MANUFACTURE OF PRECAST ELEMENTS - SUBJECT TO THE PROVISIONS OF SECTION 5, BELOW, THE PRECAST ELEMENT DIMENSION AND REINFORCEMENT DETAILS SHALL BE AS PRESCRIBED IN THE PLAN AND SHOP DRAWINGS PROVIDED BY THE MANUFACTURER.
   4.1. FORMS - THE FORMS USED IN MANUFACTURE SHALL BE SUFFICIENTLY RIGID AND ACCURATE TO MAINTAIN THE REQUIRED PRECAST ELEMENT DIMENSIONS WITHIN THE PERMISSIBLE VARIATIONS GIVEN IN SECTION 5 OF THESE SPECIFICATIONS. ALL CASTING SURFACES SHALL BE OF A SMOOTH MATERIAL.
   4.2. PLACEMENT OF REINFORCEMENT
      4.2.1. PLACEMENT OF REINFORCEMENT IN PRECAST BRIDGE UNITS - THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MINIMUM. THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 1½" MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING SINGLE OR MULTIPLE LAYERS OF WELDED WIRE FABRIC (NOT TO EXCEED 3 LAYERS), SUPPLEMENTED WITH A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS, WHEN NECESSARY. WELDED WIRE FABRIC SHALL BE COMPOSED OF CIRCUMFERENTIAL AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE BRIDGE UNIT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW. THE ENDS OF THE LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL BE NOT MORE THAN 3" AND NOT LESS THAN 1½" FROM THE ENDS OF THE BRIDGE UNIT.
      4.2.2. BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL REINFORCING STEEL FOR THE CORNERS OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROXIMATELY EQUAL TO THE CONFIGURATION OF THE BRIDGE'S OUTSIDE CORNER.
      4.2.3. PLACEMENT OF REINFORCEMENT FOR PRECAST WINGWALLS AND HEADWALLS - THE COVER OF CONCRETE OVER THE LONGITUDINAL AND TRANSVERSE REINFORCEMENT SHALL BE 2" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 1½" NOR MORE THAN 3". REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC, OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
      4.2.4. PLACEMENT OF REINFORCEMENT FOR PRECAST FOUNDATION UNITS - THE COVER OF CONCRETE OVER THE BOTTOM REINFORCEMENT SHALL BE 3 INCHES MINIMUM. THE COVER OF CONCRETE FOR ALL OTHER REINFORCEMENT SHALL BE 2 INCHES MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 2 INCHES NOR MORE THAN 3 INCHES. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC OR A SINGLE LAYER OF DEFOREMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
   4.3. LAPS, WELDS, SPACING
      4.3.1. LAPS, WELDS, AND SPACING FOR PRECAST BRIDGE UNITS - TENSION SPLICES IN THE CIRCUMFERENTIAL REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.2 AND 5.11.6.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.1 AND 5.11.6.1. THE OVERLAP OF WELDED WIRE FABRIC SHALL BE MEASURED BETWEEN THE OUTER-MOST LONGITUDINAL WIRES OF EACH FABRIC SHEET. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.1 FOR SPLICES OTHER THAN TENSION SPLICES, THE OVERLAP SHALL BE A MINIMUM OF 1'-0" FOR WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS. THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL DISTRIBUTION STEEL FOR EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
      4.3.2. LAPS, WELDS, AND SPACING FOR PRECAST WINGWALLS, HEADWALLS AND FOUNDATIONS - SPLICES IN THE REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.2 AND 5.11.6.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.1 AND 5.11.6.1. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.1. THE SPACING CENTER-TO-CENTER OF THE WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 8".
   4.4. CURING - THE PRECAST CONCRETE ELEMENTS SHALL BE CURED FOR A SUFFICIENT LENGTH OF TIME SO THAT THE CONCRETE WILL DEVELOP THE SPECIFIED COMPRESSIVE STRENGTH IN 28 DAYS OR LESS, ANY ONE OF THE FOLLOWING METHODS OF CURING OR COMBINATIONS THERE OF SHALL BE USED:
      4.4.1. STEAM CURING - THE PRECAST ELEMENTS MAY BE LOW-PRESSURE STEAM CURED BY A SYSTEM THAT WILL MAINTAIN A MOIST ATMOSPHERE.
      4.4.2. WATER CURING - THE PRECAST ELEMENTS MAY BE WATER CURED BY ANY METHOD THAT WILL KEEP THE SECTIONS MOIST.
      4.4.3. MEMBRANE CURING - A SEALING MEMBRANE CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION C309 MAY BE APPLIED AND SHALL BE LEFT INTACT UNTIL THE REQUIRED CONCRETE COMPRESSIVE STRENGTH IS ATTAINED. THE CONCRETE TEMPERATURE AT THE TIME OF APPLICATION SHALL BE WITHIN +/- 10 DEGREES F OF THE ATMOSPHERIC TEMPERATURE. ALL SURFACES SHALL BE KEPT MOIST PRIOR TO THE APPLICATION OF THE COMPOUNDS AND SHALL BE DAMP WHEN THE COMPOUND IS APPLIED.
   4.5. STORAGE, HANDLING & DELIVERY
      4.5.1. STORAGE - PRECAST CONCRETE BRIDGE ELEMENTS SHALL BE LIFTED AND STORED IN "AS-CAST" POSITION. PRECAST CONCRETE HEADWALL AND WINGWALL UNITS ARE CAST, STORED AND SHIPPED IN A FLAT POSITION. THE PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER TO PREVENT CRACKING OR DAMAGE. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE. THE UNITS SHALL NOT BE MOVED UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED A MINIMUM OF 2500 PSI, AND THEY SHALL NOT BE STORED IN AN UPRIGHT POSITION.
      4.5.2. HANDLING - HANDLING DEVICES SHALL BE PERMITTED IN EACH PRECAST ELEMENT FOR THE PURPOSE OF HANDLING AND SETTING. SPREADER BEAMS MAY BE REQUIRED FOR THE LIFTING OF PRECAST CONCRETE BRIDGE ELEMENTS TO PRECLUDE DAMAGE FROM BENDING OR TORSION FORCES.
      4.5.3. DELIVERY - PRECAST CONCRETE ELEMENTS MUST NOT BE SHIPPED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, OR AS DIRECTED BY THE DESIGN ENGINEER. PRECAST CONCRETE ELEMENTS MAY BE UNLOADED AND PLACED ON THE GROUND AT THE SITE UNTIL INSTALLED. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE.
   4.6. QUALITY ASSURANCE - THE PRECASTER SHALL DEMONSTRATE ADHERENCE TO THE STANDARDS SET FORTH IN THE NPCA QUALITY CONTROL MANUAL. THE PRECASTER SHALL MEET EITHER SECTION 4.6.1 OR 4.6.2
      4.6.1. CERTIFICATION - THE PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRODUCTS COVERED BY THIS SPECIFICATION.
      4.6.2. QUALIFICATIONS, TESTING AND INSPECTION
         4.6.2.1. THE PRECASTER SHALL HAVE BEEN IN THE BUSINESS OF PRODUCING PRECAST CONCRETE PRODUCTS SIMILAR TO THOSE SPECIFIED FOR A MINIMUM OF THREE YEARS. HE SHALL MAINTAIN A PERMANENT QUALITY CONTROL DEPARTMENT OR RETAIN AN INDEPENDENT TESTING AGENCY ON A CONTINUING BASIS. THE AGENCY SHALL ISSUE A REPORT, CERTIFIED BY A LICENSED ENGINEER, DETAILING THE ABILITY OF THE PRECASTER TO PRODUCE QUALITY PRODUCTS CONSISTENT WITH INDUSTRY STANDARDS.
         4.6.2.2. THE PRECASTER SHALL SHOW THAT THE FOLLOWING TESTS ARE PERFORMED IN ACCORDANCE WITH THE ASTM STANDARDS INDICATED. TESTS SHALL BE PERFORMED AS INDICATED IN SECTION 6 OF THESE SPECIFICATIONS.
            4.6.2.2.1. AIR CONTENT: C231 OR C173
            4.6.2.2.2. COMPRESSIVE STRENGTH: C31,C39,C497
         4.6.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH® ENGINEERED SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST.
         4.6.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS COVERED BY THIS SPECIFICATION ARE BEING MANUFACTURED.
      4.6.3. DOCUMENTATION - THE PRECASTER SHALL SUBMIT PRECAST PRODUCTION REPORTS TO CONTECH® ENGINEERED SOLUTIONS AS REQUIRED.

5. PERMISSIBLE VARIATIONS
   5.1. BRIDGE UNITS
      5.1.1. INTERNAL DIMENSIONS - THE INTERNAL DIMENSION SHALL VARY NOT MORE THAN 1% FROM THE DESIGN DIMENSIONS NOR MORE THAN 1½" WHICHEVER IS LESS.
      5.1.2. SLAB AND WALL THICKNESS - THE SLAB AND WALL THICKNESS SHALL NOT BE LESS THAN THAT SHOWN IN THE DESIGN BY MORE THAN ¼". A THICKNESS MORE THAN THAT REQUIRED IN THE DESIGN SHALL NOT BE CAUSE FOR REJECTION.
      5.1.3. LENGTH OF OPPOSITE SURFACES - VARIATIONS IN LAYING LENGTHS OF TWO OPPOSITE SURFACES OF THE BRIDGE UNIT SHALL NOT BE MORE THAN ½" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.
      5.1.4. LENGTH OF SECTION - THE UNDERRUN IN LENGTH OF A SECTION SHALL NOT BE MORE THAN ½" IN ANY BRIDGE UNIT.
      5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR BE LESS THAN 1" FOR THE INSIDE CIRCUMFERENTIAL STEEL AS MEASURED TO THE EXTERNAL OR INTERNAL SURFACE OF THE BRIDGE. THESE TOLERANCES OR COVER REQUIREMENTS DO NOT APPLY TO MATING SURFACES OF THE JOINTS.
      5.1.6. AREA OF REINFORCEMENT - THE AREAS OF STEEL REINFORCEMENT SHALL BE THE DESIGN STEEL AREAS AS SHOWN IN THE MANUFACTURER'S SHOP DRAWINGS. STEEL AREAS GREATER THAN THOSE REQUIRED SHALL NOT BE CAUSE FOR REJECTION. THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCEMENT SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCEMENT.
   5.2. WINGWALLS & HEADWALLS
      5.2.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.2. LENGTH/HEIGHT OF WALL SECTIONS - THE LENGTH AND HEIGHT OF THE WALL SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.2.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.
   5.3. FOUNDATION UNITS
      5.3.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.3.2. LENGTH/ HEIGHT/WIDTH OF FOUNDATION SECTIONS - THE LENGTH, HEIGHT AND WIDTH OF THE FOUNDATION UNITS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.3.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.3.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.

6. TESTING/ INSPECTION
   6.1. TESTING
      6.1.1. TYPE OF TEST SPECIMEN - CONCRETE COMPRESSIVE STRENGTH SHALL BE DETERMINED FROM COMPRESSION TESTS MADE ON CYLINDERS OR CORES. FOR CYLINDER TESTING, A MINIMUM OF 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. EACH ELEMENT SHALL BE CONSIDERED SEPARATELY FOR THE PURPOSE OF TESTING AND ACCEPTANCE.
      6.1.2. COMPRESSION TESTING - CYLINDERS SHALL BE MADE AND TESTED AS PRESCRIBED BY THE ASTM C39 SPECIFICATION. CYLINDERS SHALL BE CURED IN THE SAME ENVIRONMENT AS THE BRIDGE ELEMENTS. CORES SHALL BE OBTAINED AND TESTED FOR COMPRESSIVE STRENGTH IN ACCORDANCE WITH THE PROVISIONS OF THE ASTM C42 SPECIFICATION.
      6.1.3. ACCEPTABILITY OF CYLINDER TESTS - WHEN THE AVERAGE COMPRESSIVE STRENGTH OF ALL CYLINDERS TESTED IS EQUAL TO OR GREATER THAN THE DESIGN COMPRESSIVE STRENGTH, AND NOT MORE THAN 10% OF THE CYLINDERS TESTED HAVE A COMPRESSIVE STRENGTH LESS THAN THE DESIGN CONCRETE STRENGTH, AND NO CYLINDER TESTED HAS A COMPRESSIVE STRENGTH LESS THAN 80% OF THE DESIGN COMPRESSIVE STRENGTH, THEN THE ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA, THE ACCEPTABILITY OF THE ELEMENT MAY BE DETERMINED AS DESCRIBED IN SECTION 6.1.4, BELOW.
      6.1.4. ACCEPTABILITY OF CORE TESTS - THE COMPRESSIVE STRENGTH OF THE CONCRETE IN A BRIDGE ELEMENT IS ACCEPTABLE WHEN THE AVERAGE CORE TEST STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH. WHEN THE COMPRESSIVE STRENGTH OF A CORE TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN MAY BE RE-CORED. WHEN THE COMPRESSIVE STRENGTH OF THE RE-CORE IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH, THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THAT BRIDGE ELEMENT IS ACCEPTABLE.
         6.1.4.1. WHEN THE COMPRESSIVE STRENGTH OF ANY RECORE IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN SHALL BE REJECTED.
         6.1.4.2. PLUGGING CORE HOLES - THE CORE HOLES SHALL BE PLUGGED AND SEALED BY THE MANUFACTURER IN A MANNER SUCH THAT THE ELEMENTS WILL MEET ALL OF THE TEST REQUIREMENTS OF THIS SPECIFICATION. PRECAST ELEMENTS SO SEALED SHALL BE CONSIDERED SATISFACTORY FOR USE.
         6.1.4.3. TEST EQUIPMENT - EVERY MANUFACTURER FURNISHING PRECAST ELEMENTS UNDER THIS SPECIFICATION SHALL FURNISH ALL FACILITIES AND PERSONNEL NECESSARY TO CARRY OUT THE TEST REQUIRED.
   6.2. INSPECTION - THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.

7. JOINTS
   THE BRIDGE UNITS SHALL BE PRODUCED WITH FLAT BUTT ENDS. THE ENDS OF THE BRIDGE UNITS SHALL BE SUCH THAT WHEN THE SECTIONS ARE LAID TOGETHER THEY WILL MAKE A CONTINUOUS LINE WITH A SMOOTH INTERIOR FREE OF APPRECIABLE IRREGULARITIES, ALL COMPATIBLE WITH THE PERMISSIBLE VARIATIONS IN SECTION 5, ABOVE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

8. WORKMANSHIP/ FINISH
   THE BRIDGE UNITS, WINGWALLS, HEADWALLS AND FOUNDATION UNITS SHALL BE SUBSTANTIALLY FREE OF FRACTURES. THE ENDS OF THE BRIDGE UNITS SHALL BE NORMAL TO THE WALLS AND CENTERLINE OF THE BRIDGE SECTION, WITHIN THE LIMITS OF THE VARIATIONS GIVEN IN SECTION 5, ABOVE, EXCEPT WHERE BEVELED ENDS ARE SPECIFIED. THE FACES OF THE WINGWALLS AND HEADWALLS SHALL BE PARALLEL TO EACH OTHER, WITHIN THE LIMITS OF VARIATIONS GIVEN IN SECTION 5, ABOVE. THE SURFACE OF THE PRECAST ELEMENTS SHALL BE A SMOOTH STEEL FORM OR TROWELED SURFACE. TRAPPED AIR POCKETS CAUSING SURFACE DEFECTS SHALL BE CONSIDERED AS PART OF A SMOOTH, STEEL FORM FINISH.

9. REPAIRS
   PRECAST ELEMENTS MAY BE REPAIRED, IF NECESSARY, BECAUSE OF IMPERFECTIONS IN MANUFACTURE OR HANDLING DAMAGE AND WILL BE ACCEPTABLE IF, IN THE OPINION OF THE PURCHASER, THE REPAIRS ARE SOUND, PROPERLY FINISHED AND CURED, AND THE REPAIRED SECTION CONFORMS TO THE REQUIREMENTS OF THIS SPECIFICATION.

10. REJECTION
    THE PRECAST ELEMENTS SHALL BE SUBJECT TO REJECTION ON ACCOUNT OF ANY OF THE SPECIFICATION REQUIREMENTS. INDIVIDUAL PRECAST ELEMENTS MAY BE REJECTED BECAUSE OF ANY OF THE FOLLOWING:
    10.1. FRACTURES OR CRACKS PASSING THROUGH THE WALL, EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED ONE HALF THE THICKNESS OF THE WALL.
    10.2. DEFECTS THAT INDICATE PROPORTIONING, MIXING, AND MOLDING NOT IN COMPLIANCE WITH SECTION 4 OF THESE SPECIFICATIONS.
    10.3. HONEYCOMBED OR OPEN TEXTURE.
    10.4. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.

9/3/13

PROFESSIONAL ENGINEER 83223PE OREGON JULY 14, 2009 PHILIP A. CREAMER

EXPIRATION DATE: 12/31/10

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CON/SPAN® BRIDGE SYSTEMS
EXPRESS™ Foundations
CONTRACT DRAWING

NW 253RD AVE.
STA. 55+74
HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/19/2013
DESIGNED: JAL	DRAWN: JA	
CHECKED: DM	APPROVED: PAC	
SHEET NO.: CT7 OF CT8		

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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS (CONT'D)

11. MARKING
EACH BRIDGE UNIT SHALL BE CLEARLY MARKED BY WATERPROOF PAINT. THE FOLLOWING SHALL BE SHOWN ON THE INSIDE OF THE VERTICAL LEG OF THE BRIDGE SECTION:
BRIDGE SPAN x BRIDGE RISE
DATE OF MANUFACTURE
NAME OR TRADEMARK OF THE MANUFACTURER

12. INSTALLATION PREPARATION
TO ENSURE CORRECT INSTALLATION OF THE PRECAST CONCRETE BRIDGE SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN FORMING THE SUPPORT AREAS FOR BRIDGE UNITS, HEADWALL, AND WINGWALL ELEMENTS. EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.

12.1. FOOTINGS
DO NOT OVER EXCAVATE FOUNDATIONS UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.

THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE BEARING CAPACITY MEETS OR EXCEEDS THE FOOTING DESIGN REQUIREMENTS, PRIOR TO THE CONTRACTOR POURING OF THE FOOTINGS.

THE BRIDGE UNITS AND WINGWALLS SHALL BE INSTALLED ON EITHER PRECAST OR CAST-IN-PLACE CONCRETE FOOTINGS. THE SIZE AND ELEVATION OF THE FOOTINGS SHALL BE AS DESIGNED BY THE ENGINEER. A KEYWAY SHALL BE FORMED IN THE TOP SURFACE OF THE BRIDGE FOOTING AS SPECIFIED ON THE PLANS. NO KEYWAY IS REQUIRED IN THE WINGWALL FOOTINGS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

THE FOOTINGS SHALL BE GIVEN A SMOOTH FLOAT FINISH AND SHALL REACH A COMPRESSIVE STRENGTH OF 2,000 PSI BEFORE PLACEMENT OF THE BRIDGE AND WINGWALL ELEMENTS. BACKFILLING SHALL NOT BEGIN UNTIL THE FOOTING HAS REACHED THE FULL DESIGN COMPRESSIVE STRENGTH.

THE FOOTING SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN TESTED WITH A 10'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN ¼" IN 10'-0".

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOOTING PRIOR TO PLACING THE PRECAST FOOTING.

THE FOUNDATIONS FOR PRECAST CONCRETE BRIDGE ELEMENTS AND WINGWALLS MUST BE CONNECTED BY REINFORCEMENT TO FORM ONE MONOLITHIC BODY. EXPANSION JOINTS SHALL NOT BE USED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE FOUNDATIONS PER THE PLANS AND SPECIFICATIONS.

13. INSTALLATION
13.1. GENERAL - THE INSTALLATION OF THE PRECAST CONCRETE ELEMENTS SHALL BE AS EXPLAINED IN THE PUBLICATION CON/SPAN BRIDGE SYSTEMS INSTALLATION HANDBOOK.
13.1.1. LIFTING - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A CRANE OF THE CORRECT LIFTING CAPACITY IS AVAILABLE TO HANDLE THE PRECAST CONCRETE UNITS. THIS CAN BE ACCOMPLISHED BY USING THE WEIGHTS GIVEN FOR THE PRECAST CONCRETE COMPONENTS AND BY DETERMINING THE LIFTING REACH FOR EACH CRANE UNIT. SITE CONDITIONS MUST BE CHECKED WELL IN ADVANCE OF SHIPPING TO ENSURE PROPER CRANE LOCATION AND TO AVOID ANY LIFTING RESTRICTIONS. THE LIFT ANCHORS OR HOLES PROVIDED IN EACH UNIT ARE THE ONLY MEANS TO BE USED TO LIFT THE ELEMENTS. THE PRECAST CONCRETE ELEMENTS MUST NOT BE SUPPORTED OR RAISED BY OTHER MEANS THAN THOSE GIVEN IN THE MANUALS AND DRAWINGS WITHOUT WRITTEN APPROVAL FROM CONTECH® ENGINEERED SOLUTIONS.
13.1.2. CONSTRUCTION EQUIPMENT WEIGHT RESTRICTIONS - IN NO CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD (HS20 OR HS25) BE PERMITTED OVER THE BRIDGE UNITS UNLESS APPROVED BY CONTECH® ENGINEERED SOLUTIONS.
13.1.2.1. IN THE IMMEDIATE AREA OF THE BRIDGE UNITS, THE FOLLOWING RESTRICTIONS FOR THE USE OF HEAVY CONSTRUCTION MACHINERY DURING BACKFILLING OPERATIONS APPLY:
- NO CONSTRUCTION EQUIPMENT SHALL CROSS THE BARE PRECAST CONCRETE BRIDGE UNIT.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 4" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 10 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 1'-0" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 30 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED THE DESIGN COVER, OR 2'-0" MINIMUM, OVER THE CROWN OF THE PRECAST CONCRETE BRIDGE, CONSTRUCTION EQUIPMENT WITHIN THE DESIGN LOAD LIMITS FOR THE ROAD MAY CROSS THE PRECAST CONCRETE BRIDGE.

13.2. LEVELING PAD/SHIMS - THE BRIDGE UNITS AND WINGWALLS SHALL BE SET ON HARDBOARD SHIMS CONFORMING TO ASTM D1037 OR PLASTIC SHIMS (DAYTON SUPERIOR P-80, P-81 OR APPROVED EQUAL) MEASURING 5" x 5", MINIMUM, UNLESS SHOWN OTHERWISE ON THE PLANS. A MINIMUM GAP OF ½" SHALL BE PROVIDED BETWEEN THE FOOTING AND THE BOTTOM OF THE BRIDGE'S VERTICAL LEGS OR THE BOTTOM OF THE WINGWALL. ALSO, A SUPPLY OF ½", ¼" AND ⅛" THICK HARDBOARD OR PLASTIC SHIMS FOR VARIOUS SHIMMING PURPOSES SHALL BE ON SITE.

13.3. PLACEMENT OF BRIDGE UNITS - THE BRIDGE UNITS SHALL BE PLACED AS SHOWN ON THE ENGINEER'S PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

13.4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE STRUCTURE SPAN DURING ALL PHASES OF INSTALLATION. DUE TO THE ARCH SHAPE, BRIDGE ELEMENTS WILL TEND TO SPREAD UNDER SELF-WEIGHT. IT IS IMPERATIVE THAT ANY LATERAL SPREADING OF THE BRIDGE ELEMENTS BE AVOIDED DURING AND AFTER THEIR PLACEMENT. GENERALLY, HORIZONTAL CABLE TIES OR TIE RODS ARE SHIPPED IN THE LARGER BRIDGE ELEMENTS TO ASSIST IN PREVENTING THIS SPREADING. CABLE TIES/TIE RODS SHALL NOT BE REMOVED UNTILL BRIDGE UNITS ARE GROUTED AND GROUT HAS CURED. IT IS RECOMMENDED THAT TEMPORARY HARDWOOD BLOCKS BE USED IN CONJUNCTION WITH THE CABLE TIES/TIE RODS TO MAINTAIN SPAN. IF, HOWEVER, DUE TO SITE RESTRICTIONS, THESE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO PLACEMENT OF THE BRIDGE ELEMANTS, THE CONTRACTOR MUST NOTIFY CONTECH (MANUFACTURER) AND REQUEST A SUGGESTED INSTALLATION PROCEDURE.

IN ADDITION, IF THE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO SETTING ARCH UNITS, THE FOLLOWING QUALITY CONTROL PROCEDURE MUST BE FOLLOWED:
1) FIND "MEASURED SPAN" UPON ARCH UNIT'S DELIVERY TO SITE, PRIOR TO LIFTING FROM TRUCK AND REMOVING CABLE TIES/TIE RODS. "MEASURED SPAN" SHALL BE THE AVERAGE OF (3) SPAN MEASUREMENTS ALONG THE LAY LENGTH OF THE ARCH UNIT.
2) AFTER SETTING OF BRIDGE UNIT ON THE FOUNDATION, VERIFY THE SPAN. THIS "INSTALLED SPAN MEASUREMENT" SHALL NOT EXCEED THE MAXIMUM OF:
A) THE NOMINAL SPAN +½" OR
B) THE "MEASURED SPAN"
IF THE "INSTALLED SPAN MEASUREMENT" EXCEEDS THIS AMOUNT, THE ARCH UNIT SHALL BE LIFTED AND RE-SET UNTIL THE "INSTALLED SPAN MEASUREMENT" MEETS THE LIMITS.

13.5. PLACEMENT OF WINGWALLS, HEADWALLS AND FOUNDATION UNITS - THE WINGWALLS, HEADWALLS AND FOUNDATIONS SHALL BE PLACED AS SHOWN ON THE PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE.

13.6. WATERPROOFING/JOINT PROTECTION AND SUBSURFACE DRAINAGE
13.6.1. EXTERNAL PROTECTION OF JOINTS - THE BUTT JOINT MADE BY TWO ADJOINING BRIDGE UNITS SHALL BE COVERED WITH A ⅜" x 1⅜" PREFORMED BITUMINOUS JOINT SEALANT AND A MINIMUM OF A 9" WIDE JOINT WRAP. THE SURFACE SHALL BE FREE OF DIRT BEFORE APPLYING THE JOINT MATERIAL. A PRIMER COMPATIBLE WITH THE JOINT WRAP TO BE USED SHALL BE APPLIED FOR A MINIMUM WIDTH OF 9" ON EACH SIDE OF THE JOINT. THE EXTERNAL WRAP SHALL BE CS212 BY CONCRETE SEALANTS INC., EZ-WRAP RUBBER BY PRESS-SEAL GASKET CORPORATION, SEAL WRAP BY MAR MAC MANUFACTURING CO. INC. OR APPROVED EQUAL. THE JOINT SHALL BE COVERED CONTINUOUSLY FROM THE BOTTOM OF ONE BRIDGE SECTION LEG, ACROSS THE TOP OF THE BRIDGE AND TO THE OPPOSITE BRIDGE SECTION LEG. ANY LAPS THAT RESULT IN THE JOINT WRAP SHALL BE A MINIMUM OF 6" LONG WITH THE OVERLAP RUNNING DOWNHILL.
13.6.2. IN ADDITION TO THE JOINTS BETWEEN BRIDGE UNITS, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE HEADWALL SHALL ALSO BE SEALED AS DESCRIBED ABOVE. IF PRECAST WINGWALLS ARE USED, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE WINGWALL SHALL BE SEALED WITH A 2'-0" STRIP OF FILTER FABRIC. ALSO, IF LIFT HOLES ARE FORMED IN THE BRIDGE UNITS, THEY SHALL BE PRIMED AND COVERED WITH A 9" x 9" SQUARE OF JOINT WRAP.
13.6.3. DURING THE BACKFILLING OPERATION, CARE SHALL BE TAKEN TO KEEP THE JOINT WRAP IN ITS PROPER LOCATION OVER THE JOINT.
13.6.4. SUBSOIL DRAINAGE SHALL BE AS DIRECTED BY THE ENGINEER.

13.7. GROUTING
13.7.1. GROUTING SHALL NOT BE PERFORMED WHEN TEMPERATURES ARE EXPECTED TO GO BELOW 35° FOR A PERIOD OF 72 HOURS. FILL THE BRIDGE-FOUNDATION KEYWAY WITH CEMENT GROUT (PORTLAND CEMENT AND WATER OR CEMENT MORTAR COMPOSED OF PORTLAND CEMENT, SAND AND WATER) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI. VIBRATE AS REQUIRED TO ENSURE THAT THE ENTIRE KEY AROUND THE BRIDGE ELEMENT IS COMPLETELY FILLED. IF BRIDGE ELEMENTS HAVE BEEN SET WITH TEMPORARY TIES (CABLES, BARS, ETC.) GROUT MUST ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI BEFORE TIES MAY BE REMOVED.
13.7.2. ALL GROUT SHALL HAVE A MAXIMUM AGGREGATE SIZE OF ¼".
13.7.3. LIFTING AND ERECTION ANCHOR RECESSES SHALL BE FILLED WITH GROUT.
13.7.4. AFTER GROUT HAS REACHED ITS DESIGN STRENGTH THE TEMPORARY HARDWOOD WEDGES SHALL BE REMOVED AND THEIR HOLES FILLED WITH GROUT.

13.8. BACKFILL
13.8.1. DO NOT PERFORM BACKFILLING DURING WET OR FREEZING WEATHER.
13.8.2. NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURAL ELEMENTS UNTIL THEY HAVE BEEN APPROVED BY THE ENGINEER.
13.8.3. BACKFILL SHALL BE CONSIDERED AS ALL REPLACED EXCAVATION AND NEW EMBANKMENT ADJACENT TO THE PRECAST CONCRETE ELEMENTS. THE PROJECT CONSTRUCTION AND MATERIAL SPECIFICATIONS, WHICH INCLUDE THE SPECIFICATIONS FOR EXCAVATION FOR STRUCTURES AND ROADWAY EXCAVATION AND EMBANKMENT CONSTRUCTION, SHALL APPLY EXCEPT AS MODIFIED IN THIS SECTION.
13.8.4. BACKFILL ZONES:
- IN-SITU SOIL
- ZONE A: CONSTRUCTED EMBANKMENT OR OVERFILL.
- ZONE B: FILL THAT IS DIRECTLY ASSOCIATED WITH PRECAST CONCRETE BRIDGE INSTALLATION.
- ZONE C: ROAD STRUCTURE.

13.8.5. REQUIRED BACKFILL PROPERTIES
13.8.5.1. IN-SITU SOIL - NATURAL GROUND IS TO BE SUFFICIENTLY STABLE TO ALLOW EFFECTIVE SUPPORT TO THE PRECAST CONCRETE BRIDGE UNITS. AS A GUIDE, THE EXISTING NATURAL GROUND SHOULD BE OF SIMILAR QUALITY AND DENSITY TO ZONE B MATERIAL FOR MINIMUM LATERAL DIMENSION OF ONE BRIDGE SPAN OUTSIDE OF THE BRIDGE FOOTING.
13.8.5.2. ZONE A - ZONE A REQUIRES FILL MATERIAL WITH SPECIFICATIONS AND COMPACTING PROCEDURES EQUAL TO THAT FOR NORMAL ROAD EMBANKMENTS.
13.8.5.3. ZONE B - GENERALLY, SOILS SHALL BE REASONABLY FREE OF ORGANIC MATTER, AND, NEAR CONCRETE SURFACES, FREE OF STONES LARGER THAN 3" IN DIAMETER SEE CHARTS FOR DETAILED DESCRIPTIONS OF ACCEPTABLE SOILS.
13.8.5.4. ZONE C - ZONE C IS THE ROAD SECTION OF GRAVEL, ASPHALT OR CONCRETE BUILT IN COMPLIANCE WITH LOCAL ENGINEERING PRACTICES.
13.8.5.5. GEOTECHNICAL ENGINEER SHALL REVIEW GRADATIONS OF ALL INTERFACING MATERIALS AND, IF NECESSARY, RECOMMEND GEOTEXTILE FILTER FABRIC (PROVIDED BY CONTRACTOR)

13.8.6. PLACING AND COMPACTING BACKFILL
DUMPING FOR BACKFILLING IS NOT ALLOWED ANY NEARER THAN 3'-0" FROM THE BRIDGE LEG.

THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL ON OPPOSITE SIDES OF THE BRIDGE MUST NOT EXCEED 2'-0".

THE FILL BEHIND WINGWALLS MUST BE PLACED AT THE SAME TIME AS THAT OF THE BRIDGE FILL. IT MUST BE PLACED IN PROGRESSIVELY PLACED HORIZONTAL LAYERS NOT EXCEEDING 8" PER LAYER.

THE BACKFILL OF ZONE B SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% OF THE STANDARD PROCTOR, AS REQUIRED BY AASHTO T-99.

SOIL WITHIN 1'-0" OF CONCRETE SURFACES SHALL BE HAND-COMPACTED. ELSEWHERE, USE OF ROLLERS IS ACCEPTABLE. IF VIBRATING ROLLER-COMPACTORS ARE USED, THEY SHALL NOT BE STARTED OR STOPPED WITHIN ZONE B AND THE VIBRATION FREQUENCY SHOULD BE AT LEAST 30 REVOLUTIONS PER SECOND.

THE BACKFILL MATERIAL AND COMPACTING BEHIND WINGWALLS SHALL SATISFY THE CRITERIA FOR THE BRIDGE BACKFILL, ZONE B.

BACKFILL AGAINST A WATERPROOFED SURFACE SHALL BE PLACED CAREFULLY TO AVOID DAMAGE TO THE WATERPROOFING MATERIAL.

13.8.7. BRIDGE UNITS
FOR FILL HEIGHTS OVER 12 FEET (AS MEASURED FROM TOP CROWN OF BRIDGE TO FINISHED GRADE), NO BACKFILLING MAY BEGIN UNTIL A BACKFILL COMPACTION TESTING PLAN HAS BEEN COORDINATED WITH AND APPROVED BY CONTECH® ENGINEERED SOLUTIONS.

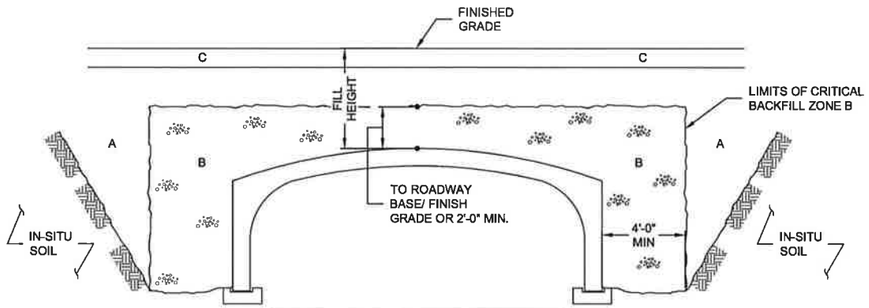
13.8.8. WINGWALLS
BACKFILL IN FRONT OF WINGWALLS SHALL BE CARRIED TO GROUND LINES SHOWN IN THE PLANS.

13.8.9. MONITORING
THE CONTRACTOR SHALL CHECK SETTLEMENTS AND HORIZONTAL DISPLACEMENT OF FOUNDATION TO ENSURE THAT THEY ARE WITHIN THE ALLOWABLE LIMIT PROVIDED BY THE ENGINEER. THESE MEASUREMENTS SHOULD GIVE AN INDICATION OF THE SETTLEMENTS AND DEFORMATIONS ALONG THE LENGTH OF THE FOUNDATIONS.

THE FIRST MEASUREMENT SHOULD TAKE PLACE AFTER THE ERECTION OF ALL PRECAST BRIDGE SYSTEM ELEMENTS, A SECOND AFTER COMPLETION OF BACKFILLING, AND A THIRD BEFORE OPENING OF THE BRIDGE TO TRAFFIC. FURTHER MEASUREMENTS MAY BE MADE ACCORDING TO LOCAL CONDITIONS.

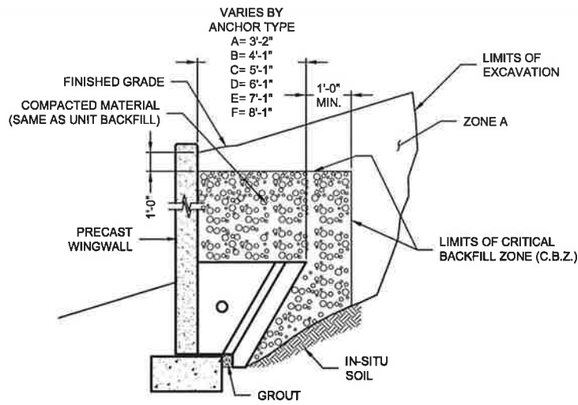
ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

TYPICAL USCS MATERIALS	AASHTO GROUP	AASHTO SUBGROUP	PERCENT PASSING US SIEVE NO.			CHARACTER OF FRACTION PASSING NO. 40 SIEVE		SOIL DESRIPTION
			#10	#40	#200	LIQUID LIMIT	PLASTICITY INDEX	
GW, GP, SP	A1	A-1a	50 MAX	30 MAX	15 MAX		6 MAX	LARGELY GRAVEL BUT CAN INCLUDE SAND AND FINES
GM, SW, SP, SM		A-1b		50 MAX	25 MAX		6 MAX	GRAVELLY SAND OR GRADED SAND, MAY INCLUDE FINES
GM, SM, ML, SP, GP	A2	A-2-4			35 MAX	40 MAX	10 MAX	SANDS, GRAVELS WITH LOW-PLASTICITY SILT FINES
SC, GC, GM		A-2-5			35 MAX	41 MIN	10 MAX	SANDS, GRAVELS WITH PLASTIC SILT FINES
SP, SM, SW	A3			51 MIN	10 MAX		NON-PLASTIC	FINE SANDS
ML, SM, SC	A4				36 MIN	40 MAX	10 MAX	LOW-COMPRESSIBILTY SILTS

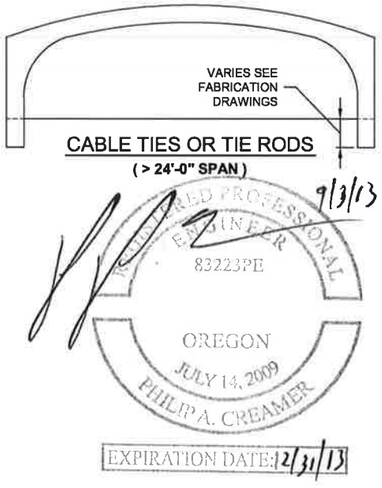


SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE ZONE B
≤ 24'-0"	≥ 12'-0"	A1, A3
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4
> 24'-0"	ALL	A1, A3

BACKFILL REQUIREMENTS



WALL BACKFILL REQUIREMENTS



CABLE TIES OR TIE RODS

(> 24'-0" SPAN)

PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER
9/3/13

EXPIRATION DATE: 12/31/13

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DETAIL 8/S8

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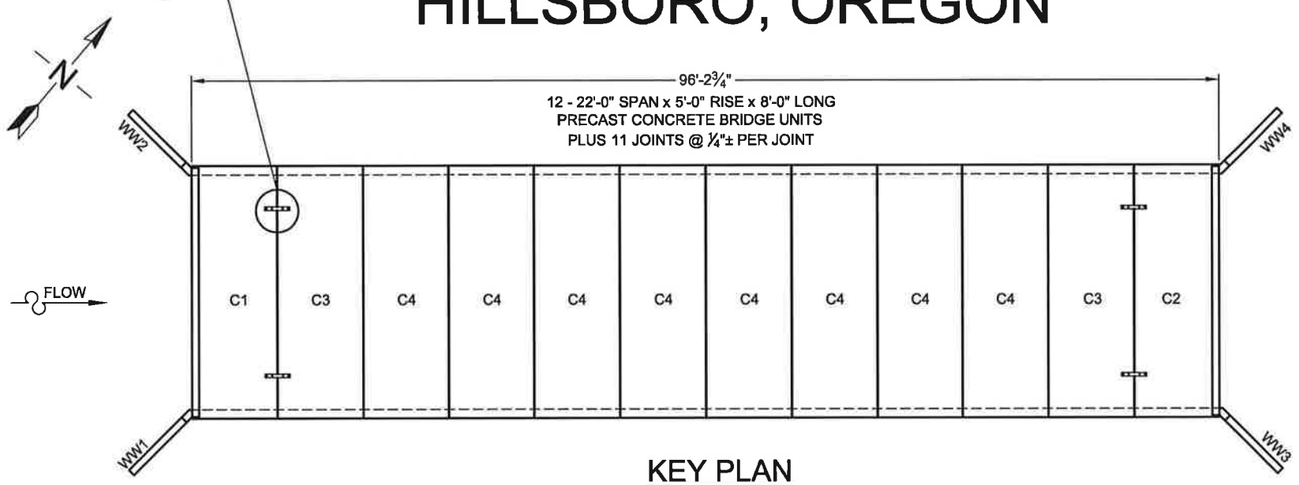
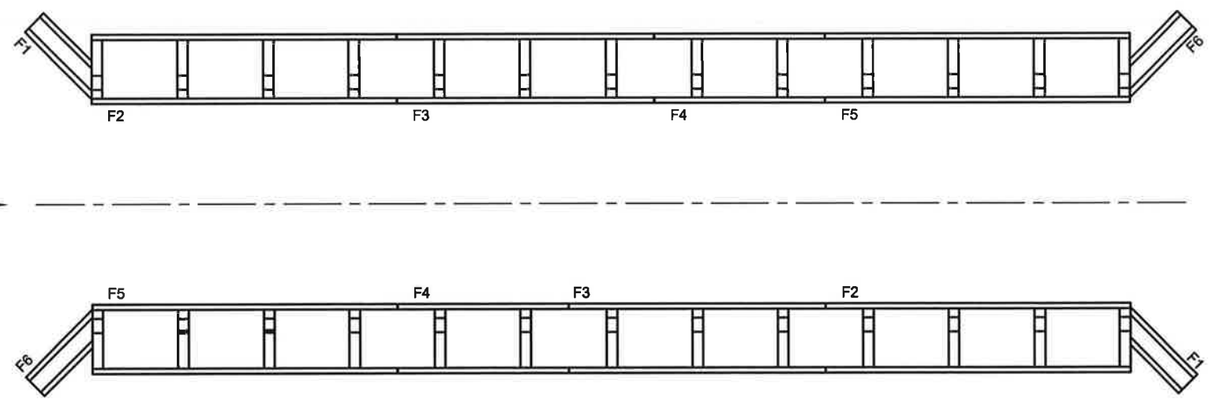


KEY PLAN



FOOTING KEY PLAN

9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER
EXPIRATION DATE: 6/30/13

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PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/29/2013
DESIGNED: JAL	DRAWN: JA	
CHECKED: DM	APPROVED: PAC	
SHEET NO.: S1 OF S18		

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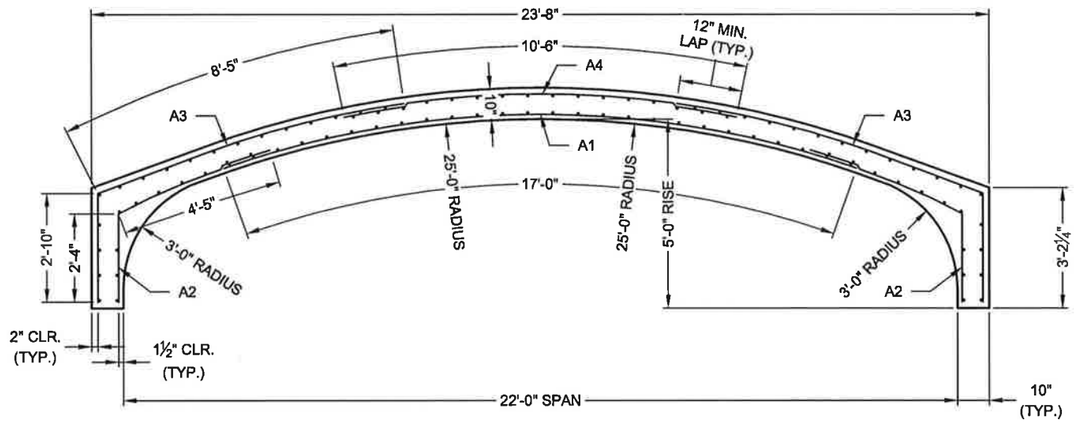
NOTES:

1. MINIMUM 28-DAY CONCRETE COMPRESSIVE STRENGTH SHALL BE 4000 PSI.
2. OVERLAP LENGTH SHALL BE MEASURED FROM LAST CROSSWIRE.
3. DIMENSIONS SHOWN ARE FOR FORM SYSTEM"A".
4. MINIMUM YIELD STRENGTH FOR WELDED WIRE FABRIC SHALL BE 65,000 PSI.
5. REINFORCING SHALL BE LIMITED TO A MAXIMUM OF THREE LAYERS OF REINFORCING (WWF OR BARS) PER AREA (A1, A2, A3 OR A4).
6. ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER.
7. SPACING OF LONGITUDINAL REINFORCEMENT MUST BE A MAXIMUM OF 8" O.C. FOR MULTIPLE LAYERS OF MESH, ONLY THE OUTER MOST LAYER (A1A OR A3A) MUST BE A MAXIMUM OF 8" O.C.
8. SPACING OF A2 & A4 CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MIN. TO 4" MAX. SPACING OF A1 & A3 CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2".



PRECAST UNIT REINFORCEMENT

WEIGHT OF REQUIRED REINFORCEMENT = 107 LBS/FT

SHEET NO.	CIRCUMFERENTIAL AREA REQ'D (IN²/FT)	LONGITUDINAL AREA REQ'D (IN²/FT)	MESH SIZE	LENGTH (FT)	CIRCUMFERENTIAL AREA SUPL'D (IN²/FT)	LONGITUDINAL AREA SUPL'D (IN²/FT)
1	A1 = 0.54	0.13		17'-0"		
2	A2 = 0.24	0.13		6'-9"		
3	A3 = 0.36	0.13		11'-3"		
4	A4 = 0.24	0.13		10'-6"		
5						
6						
7						

DESIGN LOADING: HS20-44 COVER = 2'-0" MIN. \ 5'-0" MAX.

9/3/13

REGISTERED PROFESSIONAL ENGINEER
83223PE
OREGON
JULY 14, 2009
PHILIP A. CREAMER

EXPIRATION DATE: 12/31/13

MARK	DATE	REVISION DESCRIPTION	BY

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STA.55+74

HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/29/2013
DESIGNED: JAL	DRAWN: JA	
CHECKED: DM	APPROVED: PAC	
SHEET NO.: S2 OF S18		

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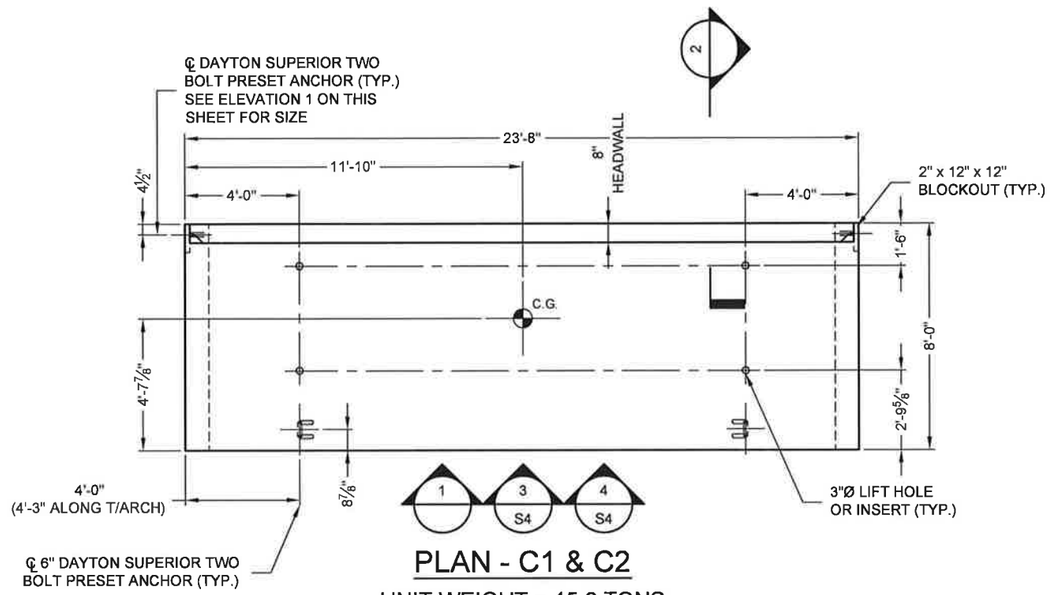
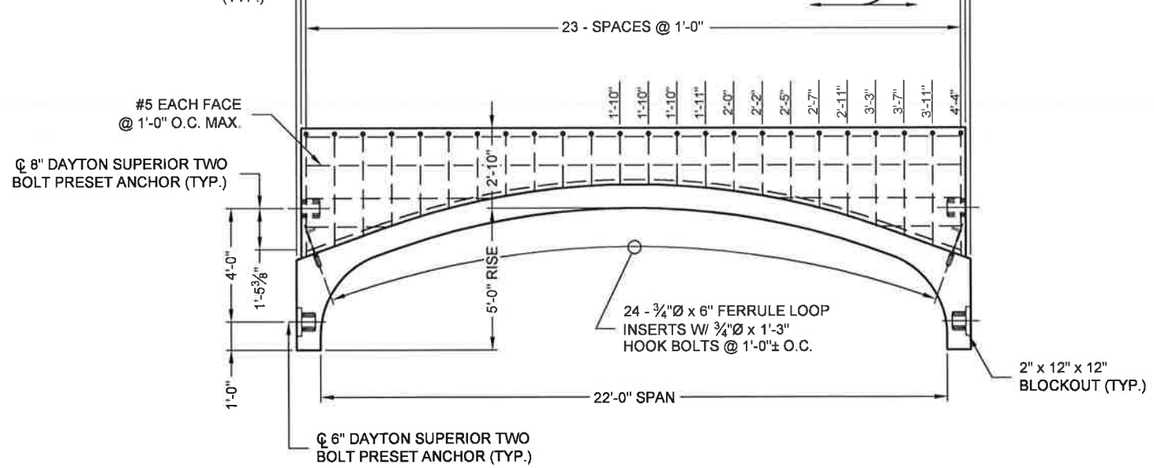
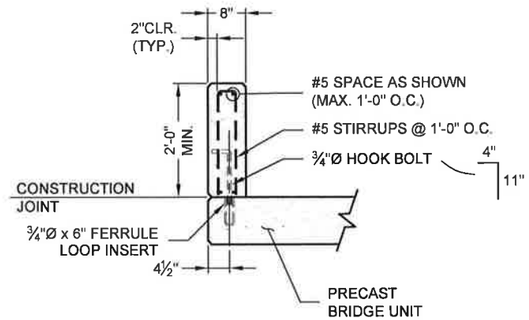


PLAN - C1 & C2

UNIT WEIGHT = 15.6 TONS
HEADWALL WEIGHT = 3.3 TONS
TOTAL WEIGHT = 18.9 TONS



ELEVATION 1



SECTION 2

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF HEADWALL
- SEE SHEET S4 FOR C.G. & LIFT POINTS
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS
- BRIDGE UNIT WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

HEADWALL		ARCH UNIT		
CONCRETE	REINF. STEEL	CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.

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PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/29/2013
DESIGNED: JAL	DRAWN: JA	
CHECKED: DM	APPROVED: PAC	
SHEET NO.: S3 OF S18		

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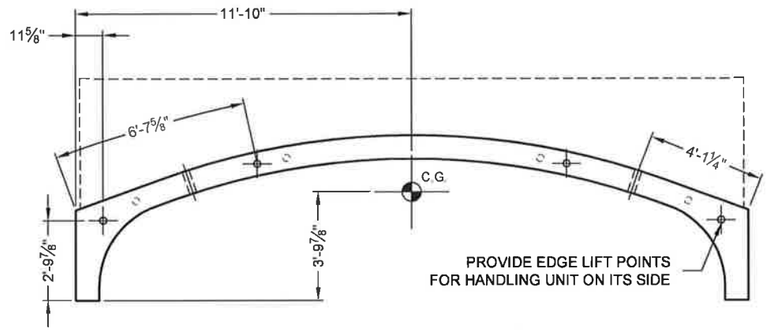
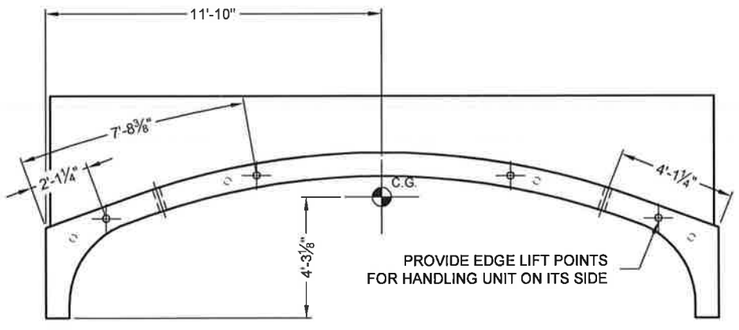
NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS
- BRIDGE UNIT WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED



ELEVATION 3/S3

WITHOUT HEADWALL
C.G. & LIFT POINTS ONLY



ELEVATION 4/S3

WITH HEADWALL
C.G. & LIFT POINTS ONLY

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DESIGNED: JAL		DRAWN: JA
CHECKED: DM		APPROVED: PAC
SHEET NO.: S4 OF S18		

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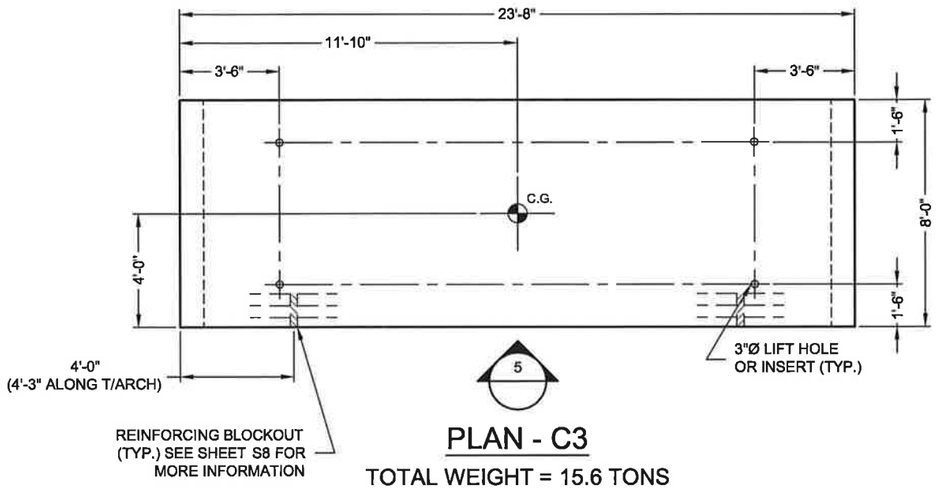
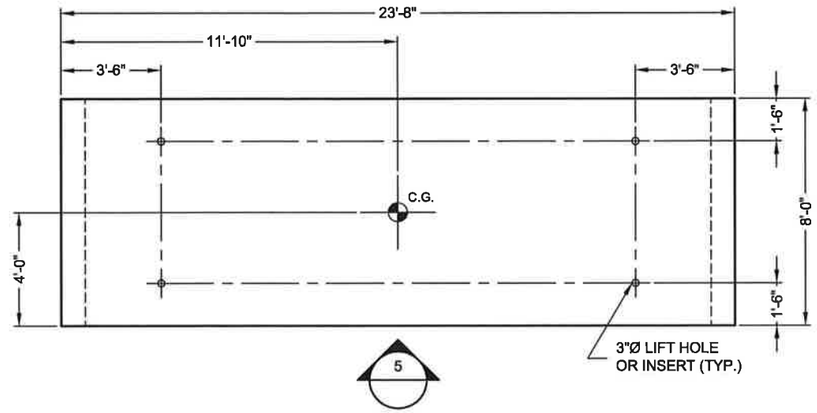


PLAN - C3

TOTAL WEIGHT = 15.6 TONS



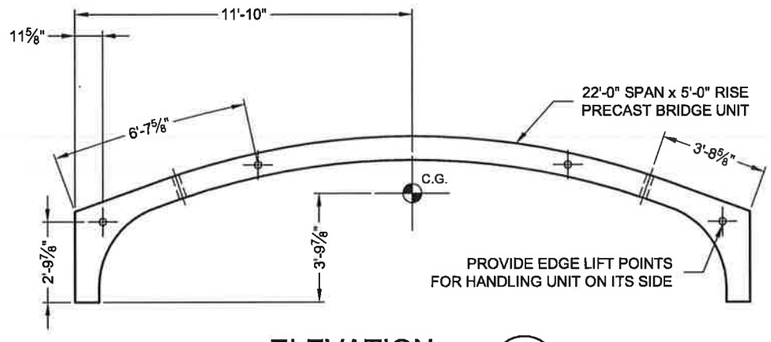
PLAN - C4

TOTAL WEIGHT = 15.6 TONS

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- SEE SHEET S2 FOR BRIDGE UNIT DIMENSIONS
- INSTALL CABLE TIES BEFORE UNIT IS SET UPRIGHT & LEAVE IN PLACE UNTIL UNIT IS GROUTED INTO FINAL POSITION
- BRIDGE UNIT WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED
- MANUFACTURER SHALL MARK END OF UNIT C3 WITH REINFORCING BLOCKOUT PRIOR TO SHIPPING.

ARCH UNIT		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.



ELEVATION 5

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PROJECT No.:	SEQ. No.:	DATE:
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DESIGNED: JAL		DRAWN: JA
CHECKED: DM		APPROVED: PAC
SHEET NO.: S5 OF S18		

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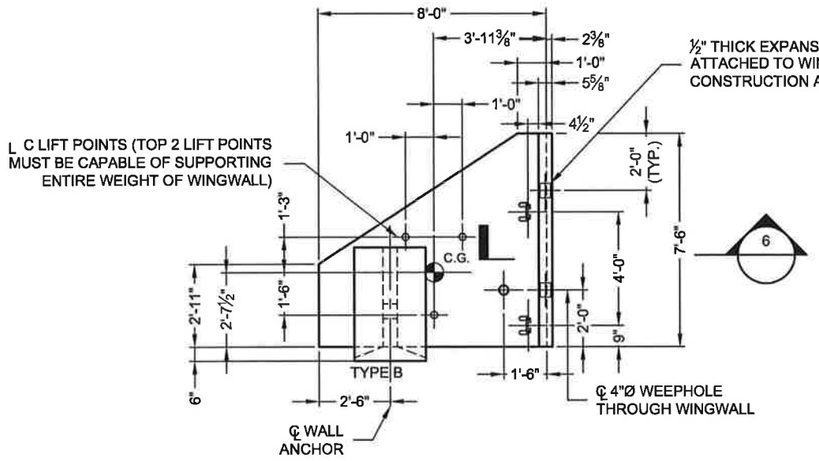
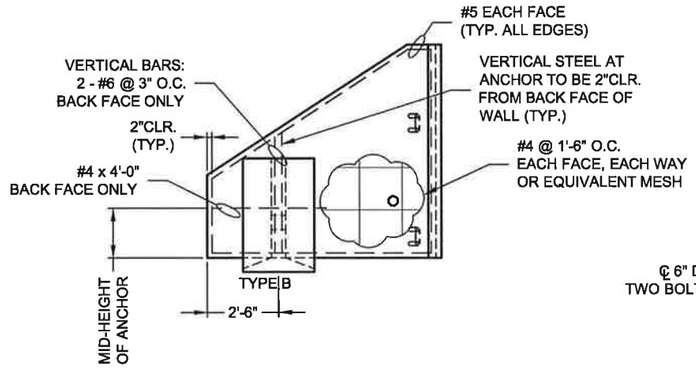


WINGWALL - WW1 & WW4

TOTAL WEIGHT = 3.0 TONS



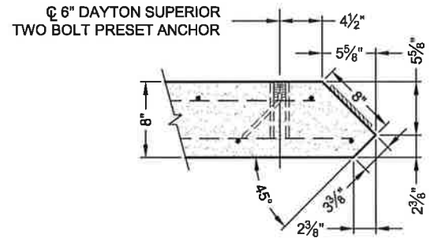
REINFORCING DETAIL - WW1 & WW4

(FOR ANCHOR REINFORCING SEE SHEET S7)

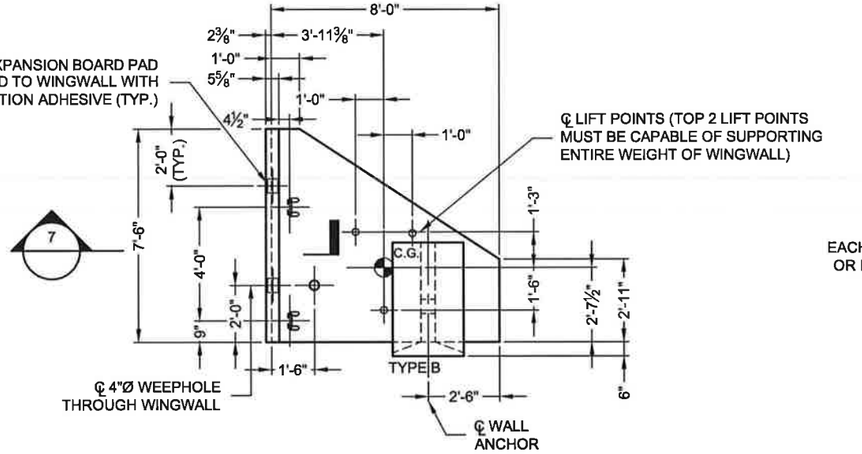
NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- ELEVATION IS LOOKING AT BACK FACE OF WINGWALL
- BACK FACE DENOTES ANCHOR SIDE OF WINGWALL
- WINGWALL WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

WINGWALL		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.

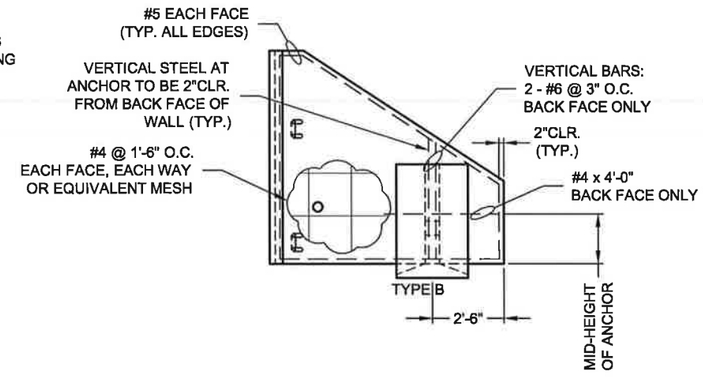


SECTION 6



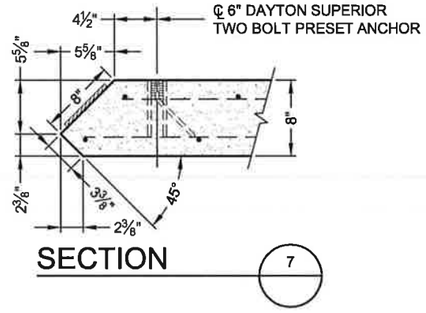
WINGWALL - WW2 & WW3

TOTAL WEIGHT = 3.0 TONS



REINFORCING DETAIL - WW2 & WW3

(FOR ANCHOR REINFORCING SEE SHEET S7)



SECTION 7

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478306	030	8/29/2013
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SHEET NO.: S6 OF S18		

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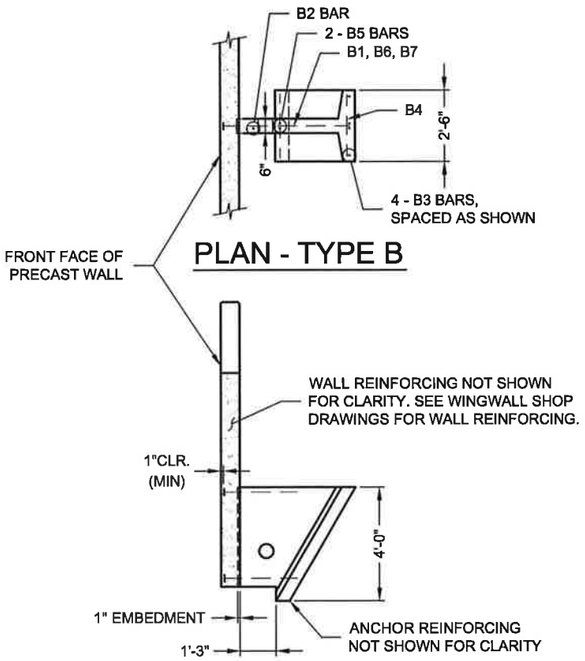
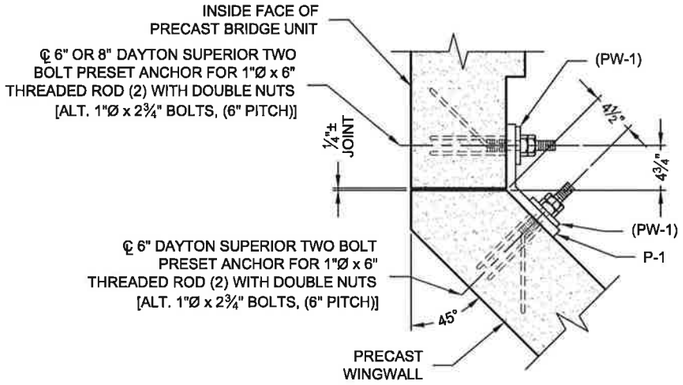


PLAN - TYPE B

SECTION - TYPE B

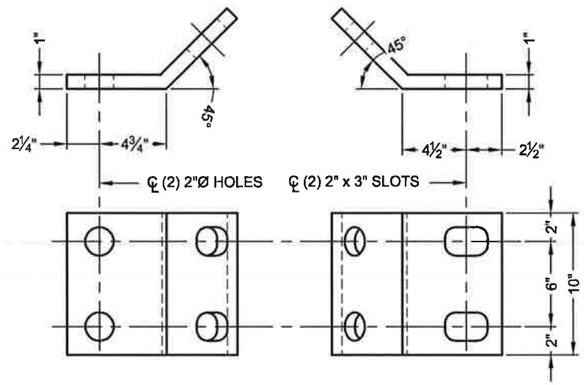
BAR LIST - TYPE B						
MARK	QTY.	SIZE	A	TYPE	LENGTH	FINISH
B1	2	#6	3'-0"	3	——	EPOXY*
B2	1	#5	——	STR.	3'-2"	BLACK
B3	4	#5	——	STR.	4'-3"	BLACK
B4	7	#5	——	STR.	2'-2"	BLACK
B5	2	#5	3'-8"	2	——	BLACK
B6	1	#5	2'-2"	1	——	BLACK
B7	1	#5	3'-7"	1	——	BLACK

NOTE: "STR." DENOTES STRAIGHT BAR. STANDARD CLEARANCE = 2"



PLAN VIEW

TYPICAL CONNECTION DETAIL - P-1

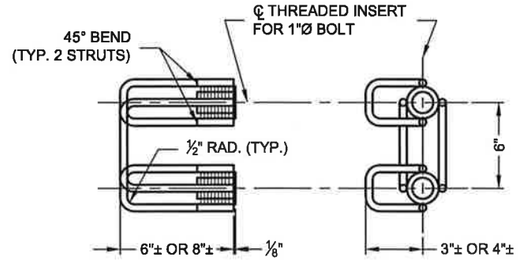


UNIT LEG WINGWALL LEG

P-1

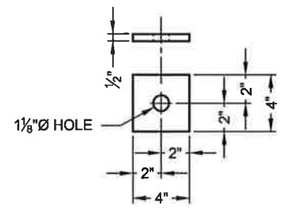
(℗, 1" x 14" x 10")
(GALVANIZED AS PER ASTM A153)

PLATE P-1
TOTAL REQUIRED = 4 (4) PW-1 REQ'D. PER PLATE



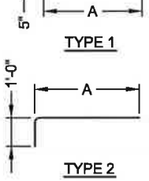
SIDE VIEW FRONT VIEW

DAYTON SUPERIOR TWO BOLT PRESET ANCHOR



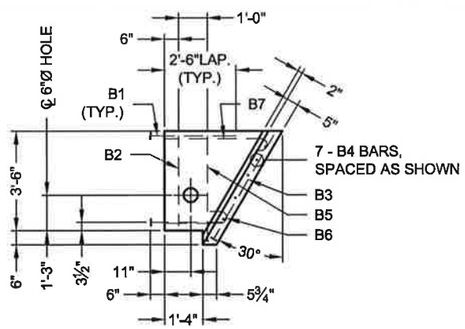
PW-1

(℗ WASHER, ½" x 4" x 4")
(GALVANIZED AS PER ASTM A153)



*NOTE: EPOXY COATING IS NOT REQUIRED ON HEADED ENDS OF TYPE 3 BARS, BUT WILL NOT BE DETRIMENTAL IF PROVIDED.

*NOTE: HRC HEADS PROVIDED BY HEADED REINFORCEMENT CORP.



PRECAST ANCHOR TYPE B

TOTAL WEIGHT = .765 TONS

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478306	030	8/29/2013
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SHEET NO.: S7 OF S18		

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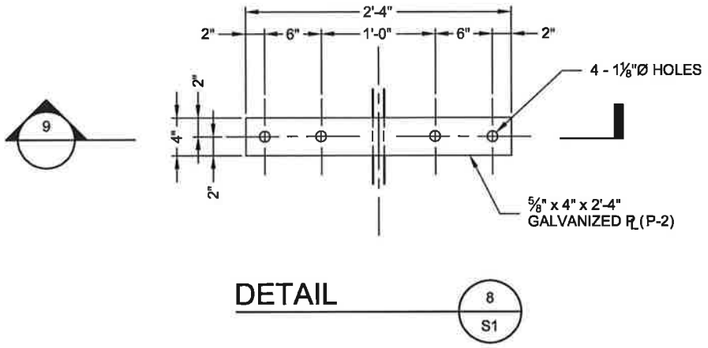
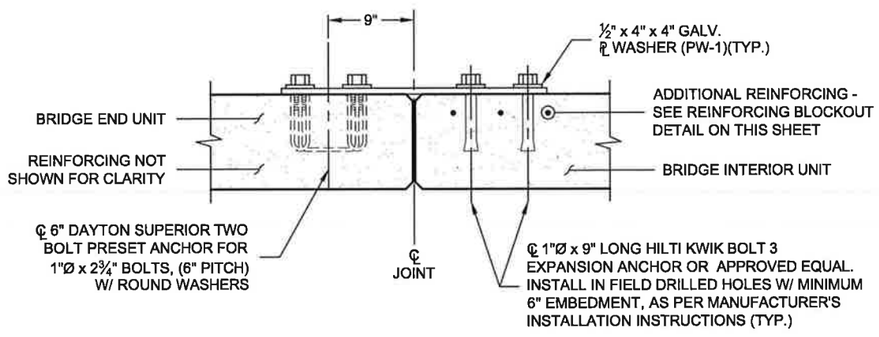


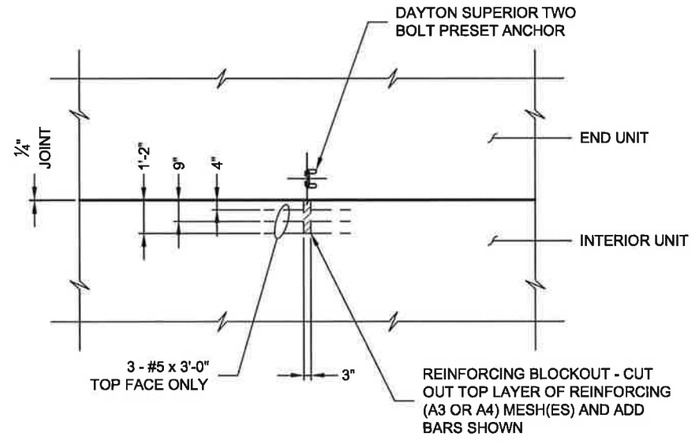
9

DETAIL 8 / S1

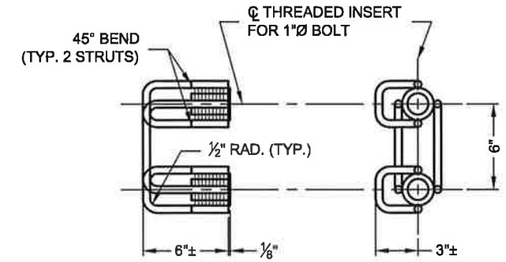


SECTION 9

PLATE P-2
TOTAL REQUIRED = 4 (4) PW-1 REQ'D. PER PLATE

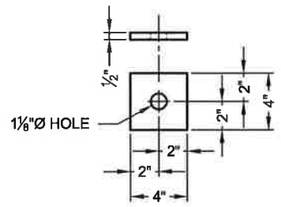


REINFORCING BLOCKOUT DETAIL



SIDE VIEW FRONT VIEW

DAYTON SUPERIOR TWO BOLT PRESET ANCHOR



PW-1

(℄ WASHER, ½" x 4" x 4")
(GALVANIZED AS PER ASTM A153)

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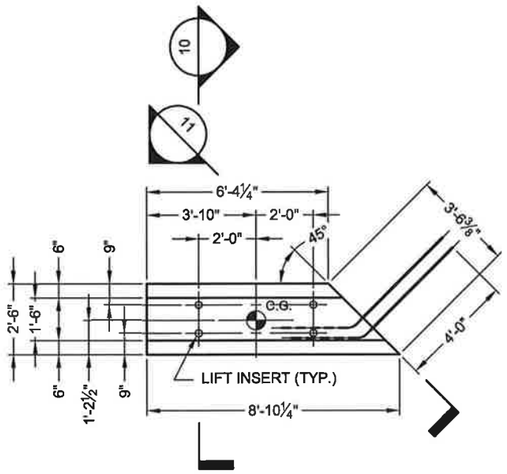
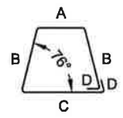
SHEET NO.: S8 OF S18		

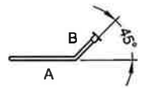


FOOTING - F1 - 2 REQUIRED

TOTAL WEIGHT = 2.3 TONS



TYPE 1



TYPE 2

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- FOOTING WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

FOOTING		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

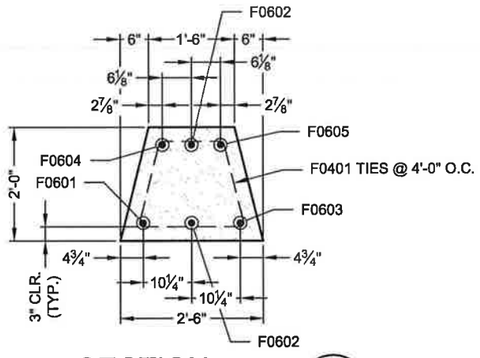
WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.

FOUNDATION BILL OF MATERIALS (PER PIECE) CAST INTO PRECAST - FOOTING F1

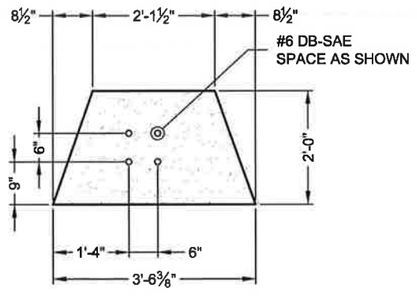
MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D
F0401	4	3	6'-10¾"	1	1'-1⅜"	1'-6½"	1'-10⅜"	5"
F0601	6	1	6'-0"	STR.				
F0602	6	2	7'-0"	STR.				
F0603	6	1	8'-0"	STR.				
F0604	6	1	6'-6"	STR.				
F0605	6	1	7'-6"	STR.				
DBSAE SPLICER	6	4	3'-0"	2	2'-6"	6"		
LIFTING INSERT		4						
PRECAST CONCRETE: 1.2 CUBIC YARDS								

FOUNDATION BILL OF MATERIALS (PER PIECE) SHIPPED LOOSE WITH PRECAST - FOOTING F1

DBSAE DOWEL-IN	6	4	4'-0"	STR.				



SECTION 10



SECTION 11

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NW 253RD AVE.
STA.55+74

HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/29/2013
DESIGNED: JAL		DRAWN: JA
CHECKED: DM		APPROVED: PAC
SHEET NO.: S9 OF S18		

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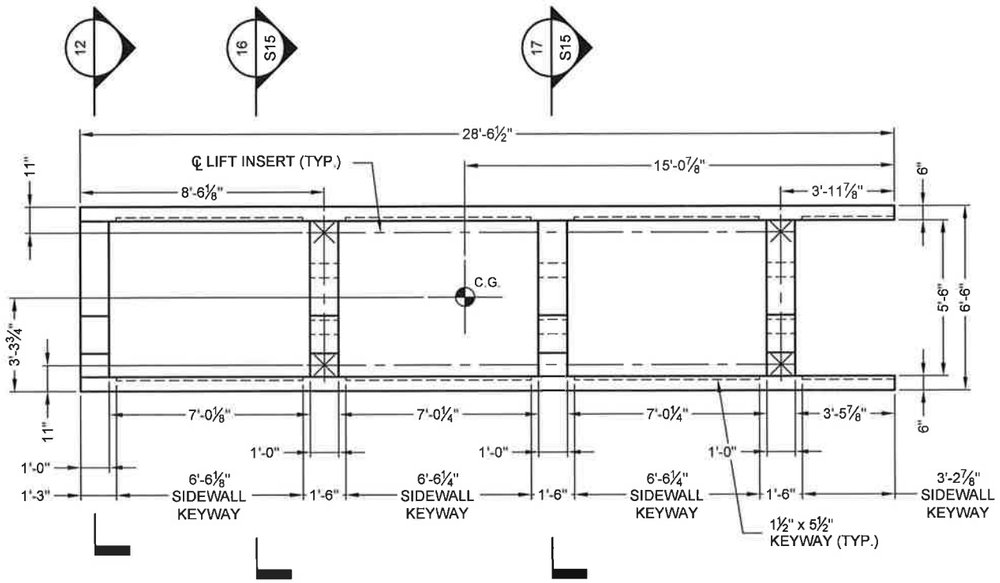
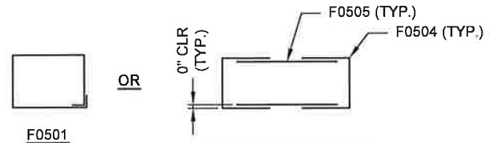
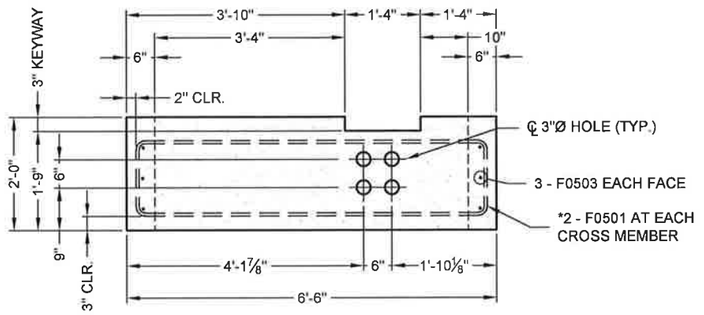


FOOTING - F2 - 2 REQUIRED

TOTAL WEIGHT = 7.1 TONS

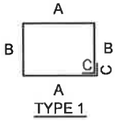


MUST USE THESE WHEN CASTING SIDEWALLS BEFORE CROSS MEMBERS



SECTION

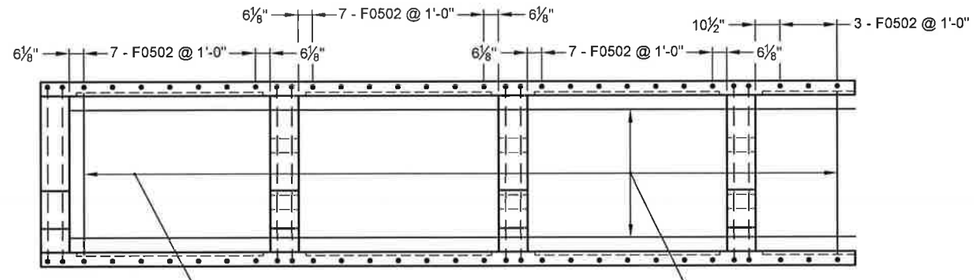
AT CROSS MEMBER 12



NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- FOOTING WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

FOOTING		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.



REINFORCING DETAIL - F2

FOUNDATION BILL OF MATERIAL (PER PIECE) CAST INTO PRECAST - FOOTINGS F2

MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D
*F0501	5	8	15'-10"	1	6'-2"	1'-4"	5"	
F0502	5	48	1'-6"	STR.				
F0503	5	6	28'-0"	STR.				
*F0504	5	16	3'-4"	2	1'-0"	1'-4"	1'-0"	
*F0505	5	16	5'-2"	STR.				
LIFTING INSERT		4						
PRECAST CONCRETE: 3.6 CUBIC YARDS								

FOUNDATION BILL OF MATERIALS (PER PIECE) TIED INTO PRECAST - FOOTINGS F2

F0506	5	48	5'-8"	STR.				
F0606	6	12	27'-6"	STR.				

FOUNDATION BILL OF MATERIALS SHIPPED LOOSE WITH PRECAST - FOOTING F2

WIRING TOOL		1						
WIRING		300						
F0609	6	72	6'-10"	STR.				

*F0501 MAY BE SUBSTITUTED FOR F0504 AND F0505.

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HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/29/2013
DESIGNED: JAL	DRAWN: JA	
CHECKED: DM	APPROVED: PAC	
SHEET NO.: S10 OF S18		

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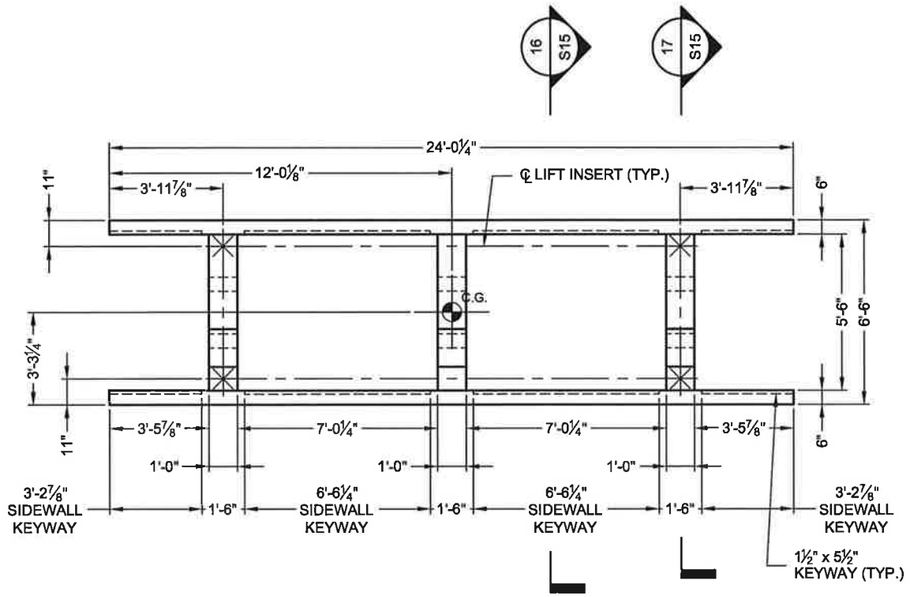
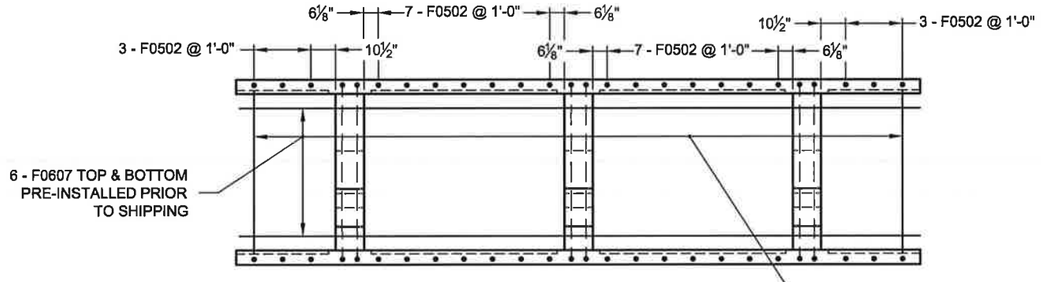


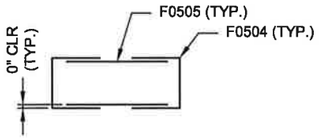
FOOTING - F3 - 2 REQUIRED

TOTAL WEIGHT = 5.7 TONS

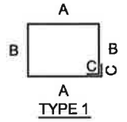


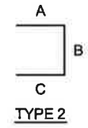
REINFORCING DETAIL - F3

OR



MUST USE THESE WHEN CASTING SIDEWALLS BEFORE CROSS MEMBERS





NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- FOOTING WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

FOOTING		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.

FOUNDATION BILL OF MATERIAL (PER PIECE) CAST INTO PRECAST - FOOTINGS F3

MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D
*F0501	5	6	15'-10"	1	6'-2"	1'-4"	5"	
F0502	5	40	1'-6"	STR.				
F0507	5	6	23'-6"	STR.				
*F0504	5	12	3'-4"	2	1'-0"	1'-4"	1'-0"	
*F0505	5	12	5'-2"	STR.				
LIFTING INSERT		4						
PRECAST CONCRETE: 2.9 CUBIC YARDS								

FOUNDATION BILL OF MATERIALS (PER PIECE) TIED INTO PRECAST - FOOTINGS F3

F0506	5	40	5'-8"	STR.				
F0607	6	12	24'-0"	STR.				

*F0501 MAY BE SUBSTITUTED FOR F0504 AND F0505.

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PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/29/2013
DESIGNED: JAL		DRAWN: JA
CHECKED: DM		APPROVED: PAC
SHEET NO.: S11 OF S18		

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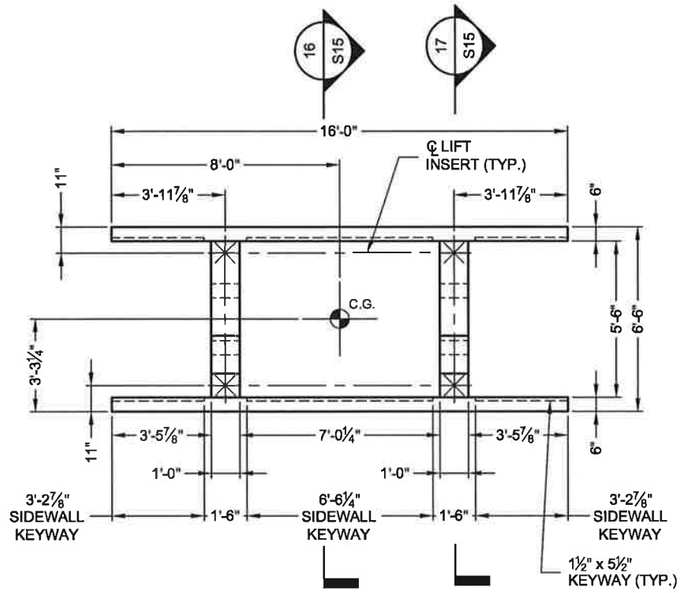
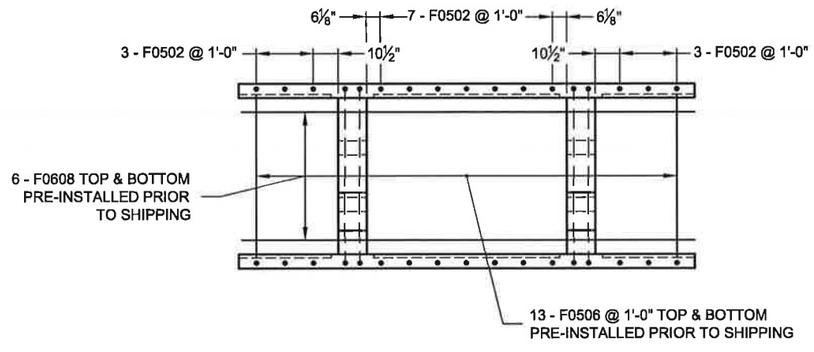


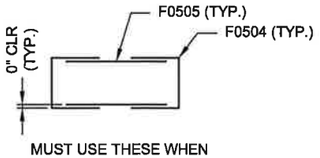
FOOTING - F4 - 2 REQUIRED

TOTAL WEIGHT = 3.8 TONS



REINFORCING DETAIL - F4

OR



MUST USE THESE WHEN CASTING SIDEWALLS BEFORE CROSS MEMBERS

TYPE 1

TYPE 2

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- FOOTING WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

FOOTING		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.

FOUNDATION BILL OF MATERIAL (PER PIECE) CAST INTO PRECAST - FOOTINGS F4

MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D
*F0501	5	4	15'-10"	1	6'-2"	1'-4"	5"	
F0502	5	26	1'-6"	STR.				
F0508	5	6	15'-6"	STR.				
*F0504	5	8	3'-4"	2	1'-0"	1'-4"	1'-0"	
*F0505	5	8	5'-2"	STR.				
LIFTING INSERT		4						
PRECAST CONCRETE: 1.9 CUBIC YARDS								

FOUNDATION BILL OF MATERIALS (PER PIECE) TIED INTO PRECAST - FOOTINGS F4

F0506	5	26	5'-8"	STR.				
F0608	6	12	16'-0"	STR.				

*F0501 MAY BE SUBSTITUTED FOR F0504 AND F0505.

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PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/29/2013
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SHEET NO.: S12 OF S18		

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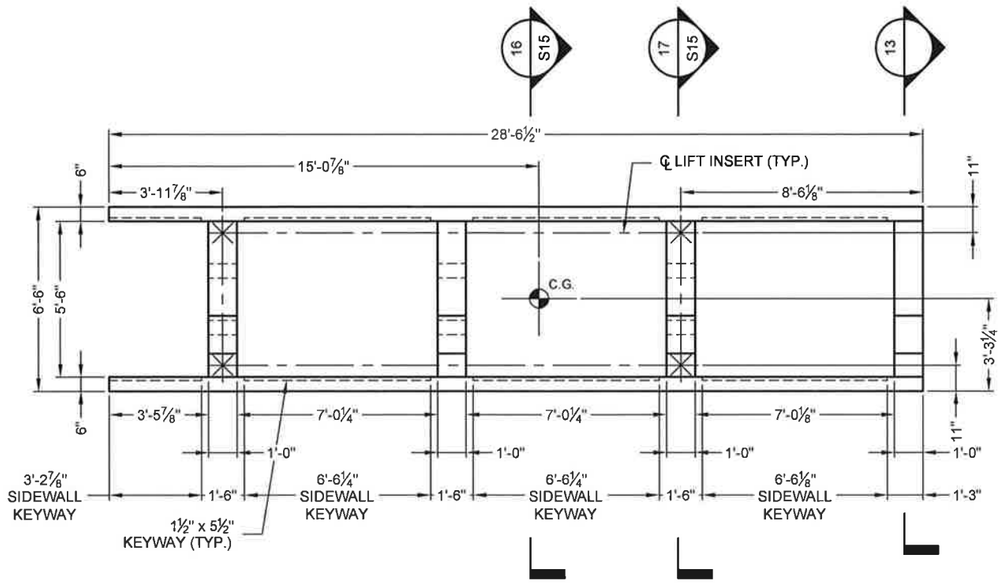
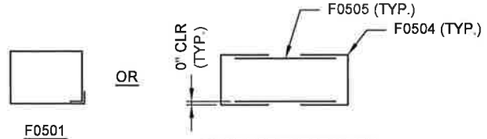
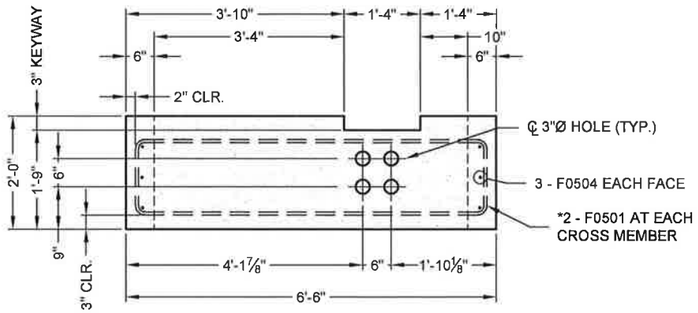


FOOTING - F5 - 2 REQUIRED

TOTAL WEIGHT = 7.1 TONS

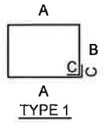


MUST USE THESE WHEN CASTING SIDEWALLS BEFORE CROSS MEMBERS



SECTION 13

AT CROSS MEMBER



NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- FOOTING WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

FOOTING		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.

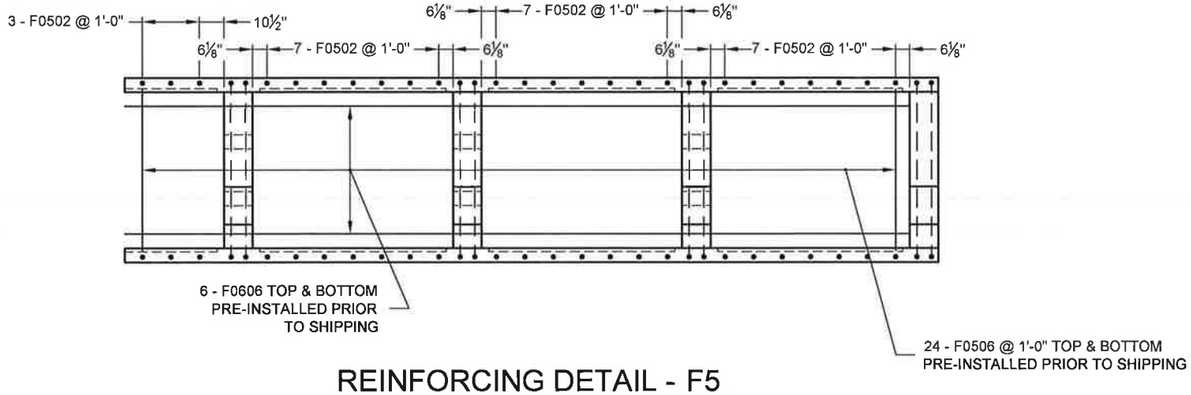
FOUNDATION BILL OF MATERIAL (PER PIECE) CAST INTO PRECAST - FOOTINGS F5

MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D
*F0501	5	8	15'-10"	1	6'-2"	1'-4"	5"	
F0502	5	48	1'-6"	STR.				
F0503	5	6	28'-0"	STR.				
*F0504	5	16	3'-4"	2	1'-0"	1'-4"	1'-0"	
*F0505	5	16	5'-2"	STR.				
LIFTING INSERT		4						
PRECAST CONCRETE: 3.6 CUBIC YARDS								

FOUNDATION BILL OF MATERIALS (PER PIECE) TIED INTO PRECAST - FOOTINGS F5

F0506	5	48	5'-8"	STR.				
F0606	6	12	27'-6"	STR.				

*F0501 MAY BE SUBSTITUTED FOR F0505 AND F0506.



REINFORCING DETAIL - F5

MARK	DATE	REVISION DESCRIPTION	BY

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HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/29/2013
DESIGNED: JAL	DRAWN: JA	
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SHEET NO.: S13 OF S18		

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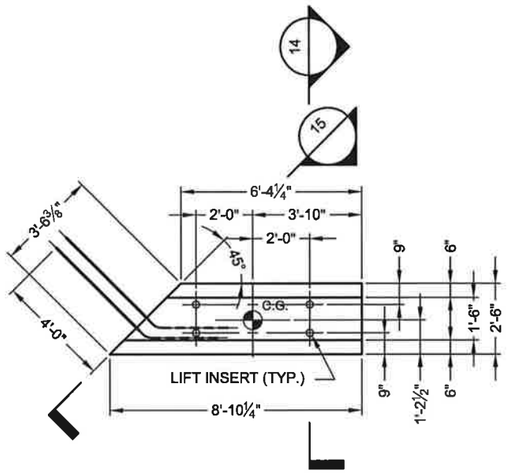
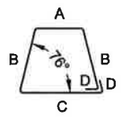


FOOTING - F6 - 2 REQUIRED

TOTAL WEIGHT = 2.3 TONS



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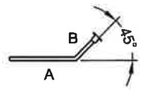


TYPE 2

NOTES:
- ALL EDGES OF PRECAST TO HAVE A ¾" CHAMFER
- FOOTING WILL NOT HANG LEVEL. ADJUST CABLE LENGTHS AS REQUIRED

FOOTING		
CONCRETE	REINF. STEEL	WWF
28-DAY: 4000 PSI	60,000 PSI UNCOATED	65,000 PSI UNCOATED

WHEREVER THE REINFORCING IS CUT FOR THE PLACEMENT OF LIFT HOLES OR OTHER BLOCKOUTS, REINFORCING BARS OR WIRES OF EQUIVALENT CROSS-SECTIONAL AREA SHALL BE PLACED SYMMETRICALLY AROUND THE HOLE. AT LEAST ONE BAR MUST BE ON EACH SIDE OF THE HOLE, AND THE DEVELOPMENT LENGTH OF THE BAR MUST BE ACHIEVED ON EITHER SIDE OF THE CUT.

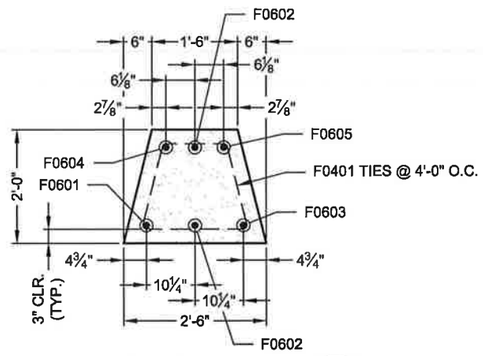
FOUNDATION BILL OF MATERIALS (PER PIECE) CAST INTO PRECAST - FOOTING F6

MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D
F0401	4	3	6'-10¾"	1	1'-1⅜"	1'-6½"	1'-10⅜"	5"
F0601	6	1	6'-0"	STR.				
F0602	6	2	7'-0"	STR.				
F0603	6	1	8'-0"	STR.				
F0604	6	1	6'-6"	STR.				
F0605	6	1	7'-6"	STR.				
DBSAE SPLICER	6	4	3'-0"	2	2'-6"	6"		
LIFTING INSERT		4						

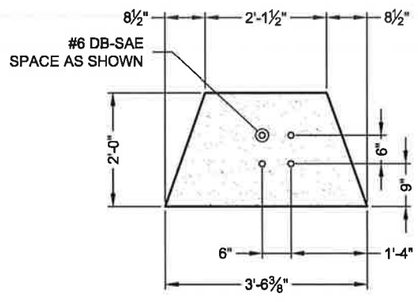
PRECAST CONCRETE: 1.2 CUBIC YARDS

FOUNDATION BILL OF MATERIALS (PER PIECE) SHIPPED LOOSE WITH PRECAST - FOOTING F6

DBSAE DOWEL-IN	6	4	4'-0"	STR.				



SECTION 14



SECTION 15

MARK	DATE	REVISION DESCRIPTION	BY

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478306	030	8/29/2013
DESIGNED: JAL		DRAWN: JA
CHECKED: DM		APPROVED: PAC
SHEET NO.: S14 OF S18		

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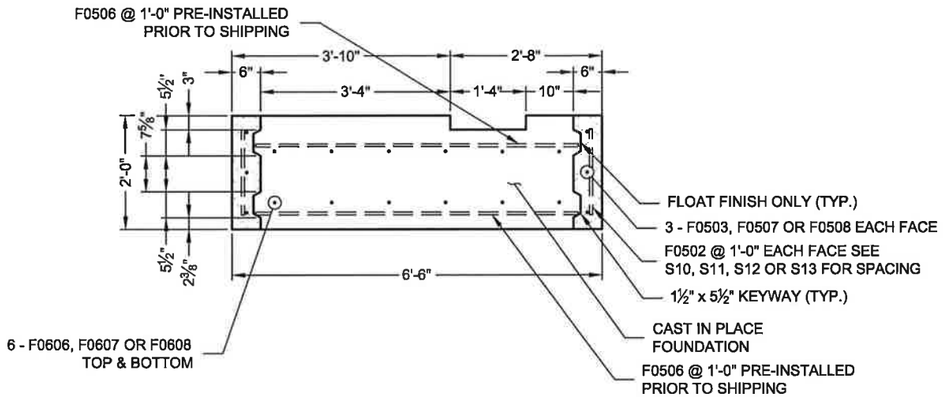
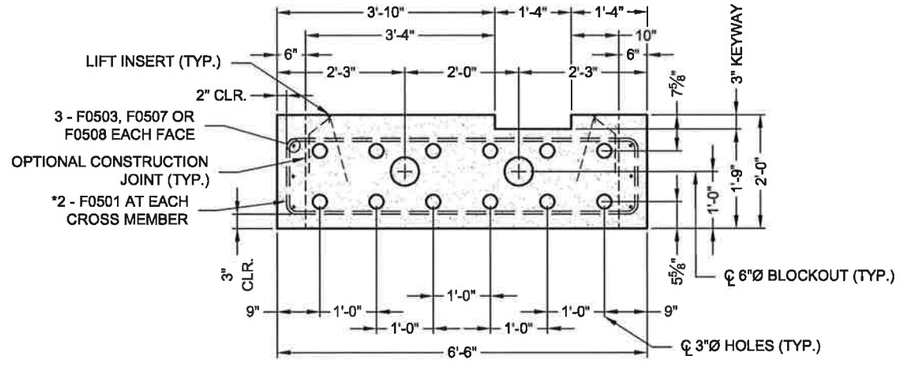


SECTION
AT BAY

16

S10, S11, S12, S13



SECTION
AT CROSS MEMBER

17

S10, S11, S12, S13

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH®
ENGINEERED SOLUTIONS LLC
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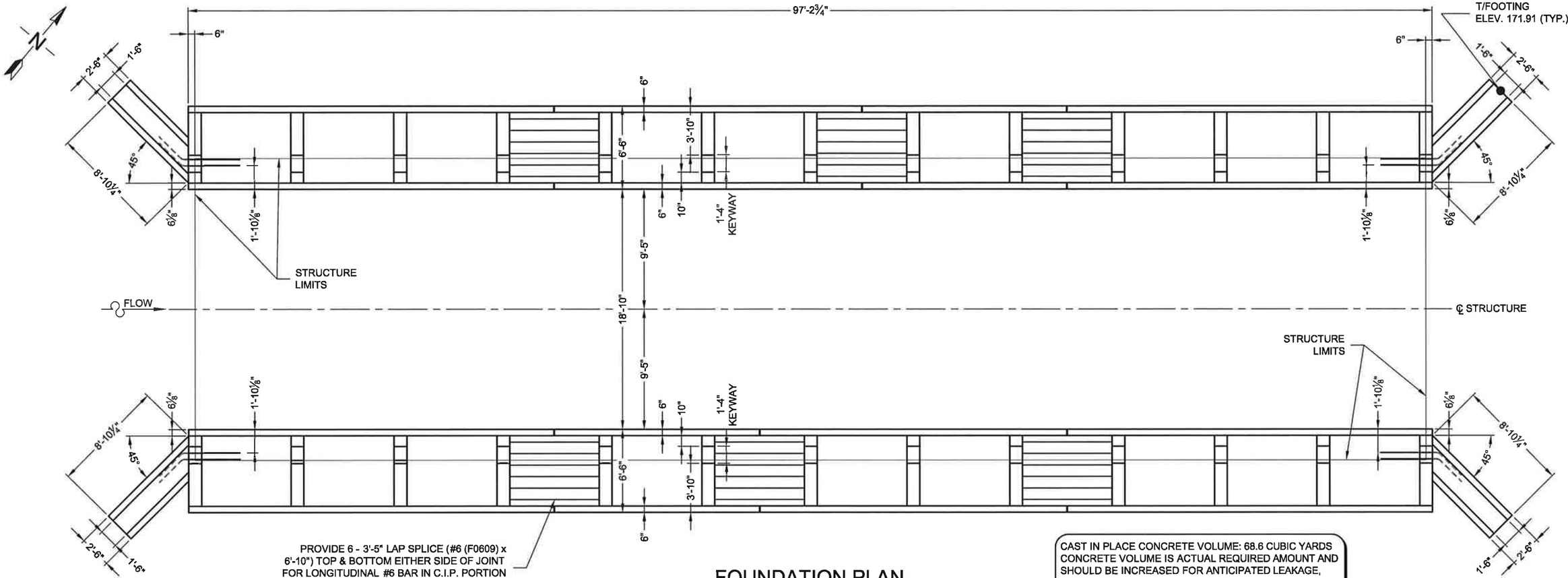
CONSPAN® BRIDGE SYSTEMS
EXPRESS® Foundations
FABRICATION DRAWING

NW 253RD AVE.
STA.55+74

HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/29/2013
DESIGNED: JAL		DRAWN: JA
CHECKED: DM		APPROVED: PAC
SHEET NO.: S15 OF S18		



FOUNDATION PLAN

0 2' 4' 8'

CAST IN PLACE CONCRETE VOLUME: 68.6 CUBIC YARDS
CONCRETE VOLUME IS ACTUAL REQUIRED AMOUNT AND
SHOULD BE INCREASED FOR ANTICIPATED LEAKAGE,
WASTE, ETC.

PRECAST REINFORCED CONCRETE EXPRESS ™ FOUNDATION NOTES:

1. PRECAST FOUNDATION UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN BRIDGE SYSTEMS.
2. PRECAST AND CAST-IN-PLACE CONCRETE FOR EXPRESS FOUNDATIONS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI. REINFORCING STEEL FOR FOUNDATIONS SHALL CONFORM TO ASTM A615 OR A996, GRADE 60.
3. PRECAST FOUNDATION UNITS SHALL BE SET ON A MINIMUM 4-INCH THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOUNDATION.
4. COMPACTED BACKFILL MATERIAL MUST BE PLACED UP TO THE TOP OF THE PRECAST FOUNDATION UNITS ON BOTH SIDES PRIOR TO PLACING CAST-IN-PLACE CONCRETE PORTION OF FOUNDATIONS.
5. CONCRETE SURFACES WHICH CAST-IN-PLACE CONCRETE WILL BE PLACED AGAINST SHALL BE CLEAN, FREE OF LAITANCE, DIRT, STANDING WATER AND ANY OTHER MATERIAL THAT MAY IMPAIR THE BOND BETWEEN THE PRECAST CONCRETE AND CAST-IN-PLACE CONCRETE.
6. CAST-IN-PLACE CONCRETE MIX USED TO FILL FOUNDATION SHALL BE ABLE TO FLOW INTO ARCH SHIM SPACE OR NON-SHRINK GROUT SHALL BE PLACED UNDER ARCH UNIT LEG AT FOUNDATION CROSS MEMBERS PRIOR TO PLACEMENT OF CAST-IN-PLACE PORTION OF FOUNDATION.
7. IF THE AMBIENT TEMPERATURE AT THE TIME OF PLACEMENT OF CAST-IN-PLACE CONCRETE IS ABOVE 90°F OR EXPECTED TO GO BELOW 35°F DURING THE CURE PERIOD, THE CONTRACTOR SHALL FOLLOW THE REQUIREMENTS OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, SECTION 8.6.2 HOT WEATHER PROTECTION OR SECTION 8.6.4 COLD WEATHER PROTECTION.
8. IF PRECAST ARCH UNITS ARE TO BE ERECTED ON PRECAST FOUNDATION UNITS PRIOR TO PLACEMENT OF CAST-IN-PLACE CONCRETE, THE CABLE TIES/RODS (SHIPPED WITH LONG-SPAN STRUCTURES) MUST REMAIN IN PLACE AND MAY NOT BE REMOVED UNTIL CAST-IN-PLACE CONCRETE HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
9. IF CABLE TIES/RODS (SHIPPED WITH LONG-SPAN STRUCTURES) MUST BE REMOVED PRIOR TO SETTING OF ARCH UNITS, CAST-IN-PLACE CONCRETE PORTION OF FOUNDATIONS MUST BE PLACED AND ALLOWED TO REACH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI BEFORE PLACEMENT OF PRECAST ARCH UNITS, HEADWALLS AND WINGWALLS. CONTRACTOR MUST FOLLOW SPECIFICATION SECTION 13.4 AND NOTIFY CONTECH ENGINEER PRIOR TO REMOVING CABLES TIES/RODS.
10. IF CAST-IN-PLACE CONCRETE PORTION OF FOUNDATION IS TO BE PLACED PRIOR TO SETTING OF ARCH UNITS, HEADWALLS OR WINGWALLS, CAST-IN-PLACE CONCRETE SHALL REACH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI BEFORE PRECAST ARCH UNITS, HEADWALLS AND WINGWALLS ARE SET.
11. FOUNDATION CONCRETE SHALL REACH ITS FULL DESIGN STRENGTH BEFORE BACKFILLING OF ARCH UNITS MAY COMMENCE.

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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS

1. DESCRIPTION
   1.1. TYPE - THIS WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTING A CON/SPAN® BRIDGE SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON THE PLANS OR AS ESTABLISHED BY THE ENGINEER. IN SITUATIONS WHERE TWO OR MORE SPECIFICATIONS APPLY TO THIS WORK, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.
   1.2. DESIGNATION - PRECAST REINFORCED CONCRETE CON/SPAN® BRIDGE UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY SPAN AND RISE. PRECAST REINFORCED CONCRETE WINGWALLS AND HEADWALLS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT, AND DEFLECTION ANGLE. PRECAST REINFORCED CONCRETE EXPRESS™ FOUNDATION UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT AND WIDTH.

2. DESIGN
   2.1. SPECIFICATIONS - THE PRECAST ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" 17TH EDITION, ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002. A MINIMUM OF ONE FOOT OF COVER ABOVE THE CROWN OF THE BRIDGE UNITS IS REQUIRED IN THE INSTALLED CONDITION. (UNLESS NOTED OTHERWISE ON THE SHOP DRAWINGS AND DESIGNED ACCORDINGLY.)

3. MATERIALS
   3.1. CONCRETE - THE CONCRETE FOR THE PRECAST ELEMENTS SHALL BE AIR-ENTRAINED WHEN INSTALLED IN AREAS SUBJECT TO FREEZE-THAW CONDITIONS, COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGREGATES, ADMIXTURES AND WATER. AIR-ENTRAINED CONCRETE SHALL CONTAIN 6 ± 2 PERCENT AIR. THE AIR- ENTRAINING ADMIXTURE SHALL CONFORM TO AASHT0 M154. THE MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE AS SHOWN ON THE SHOP DRAWINGS.
      3.1.1. PORTLAND CEMENT - SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATIONS C150-TYPE I, TYPE II, OR TYPE III CEMENT.
      3.1.2. COARSE AGGREGATE - SHALL CONSIST OF STONE HAVING A MAXIMUM SIZE OF 1 INCH. AGGREGATE SHALL MEET REQUIREMENTS FOR ASTM C33.
      3.1.3. WATER REDUCING ADMIXTURE - THE MANUFACTURER MAY SUBMIT, FOR APPROVAL BY THE ENGINEER, A WATER-REDUCING ADMIXTURE FOR THE PURPOSE OF INCREASING WORKABILITY AND REDUCING THE WATER REQUIREMENT FOR THE CONCRETE.
      3.1.4. CALCIUM CHLORIDE - THE ADDITION TO THE MIX OF CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE WILL NOT BE PERMITTED.
      3.1.5. MIXTURE - THE AGGREGATES, CEMENT AND WATER SHALL BE PROPORTIONED AND MIXED IN A BATCH MIXER TO PRODUCE A HOMOGENEOUS CONCRETE MEETING THE STRENGTH REQUIREMENTS OF THIS SPECIFICATION. THE PROPORTION OF PORTLAND CEMENT IN THE MIXTURE SHALL NOT BE LESS THAN 564 POUNDS (6 SACKS) PER CUBIC YARD OF CONCRETE.
   3.2. STEEL REINFORCEMENT
      3.2.1. THE MINIMUM STEEL YIELD STRENGTH SHALL BE 60,000 PSI, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS.
      3.2.2. ALL REINFORCING STEEL FOR THE PRECAST ELEMENTS SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE DETAILED SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER.
      3.2.3. REINFORCEMENT SHALL CONSIST OF WELDED WIRE FABRIC CONFORMING TO ASTM SPECIFICATION A 185 OR A 497, OR DEFORMED BILLET STEEL BARS CONFORMING TO ASTM SPECIFICATION A 615, GRADE 60. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS.
   3.3. STEEL HARDWARE
      3.3.1. BOLTS AND THREADED RODS FOR WINGWALL CONNECTIONS SHALL CONFORM TO ASTM A 307. NUTS SHALL CONFORM TO AASHTO M292 (ASTM A194) GRADE 2H. ALL BOLTS, THREADED RODS AND NUTS USED IN WINGWALL CONNECTIONS SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.2. STRUCTURAL STEEL FOR WINGWALL CONNECTION PLATES AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709) GRADE 36 AND SHALL BE HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.3. INSERTS FOR WINGWALLS SHALL BE 1" DIAMETER TWO-BOLT PRESET WINGWALL ANCHORS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700 AND SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.4. FERRULE LOOP INSERTS SHALL BE F-64 FERRULE LOOP INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
      3.3.5. HOOK BOLTS USED IN ATTACHED HEADWALL CONNECTIONS SHALL BE ASTM A307.
      3.3.6. INSERTS FOR DETACHED HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL, EXPANDED COIL INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700. COIL RODS AND NUTS USED IN HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL. WASHERS USED IN HEADWALL CONNECTIONS SHALL BE EITHER AISI TYPE 304 STAINLESS STEEL PLATE WASHERS OR AASHTO M270 (ASTM A709) GRADE 36 PLATE WASHERS HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.7. MECHANICAL SPLICES OF REINFORCING BARS SHALL BE MADE USING THE DOWEL BAR SPLICER SYSTEM AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700, AND SHALL CONSIST OF THE DOWEL BAR SPLICER (DB-SAE) AND DOWEL-IN (DI).

4. MANUFACTURE OF PRECAST ELEMENTS - SUBJECT TO THE PROVISIONS OF SECTION 5, BELOW, THE PRECAST ELEMENT DIMENSION AND REINFORCEMENT DETAILS SHALL BE AS PRESCRIBED IN THE PLAN AND SHOP DRAWINGS PROVIDED BY THE MANUFACTURER.
   4.1. FORMS - THE FORMS USED IN MANUFACTURE SHALL BE SUFFICIENTLY RIGID AND ACCURATE TO MAINTAIN THE REQUIRED PRECAST ELEMENT DIMENSIONS WITHIN THE PERMISSIBLE VARIATIONS GIVEN IN SECTION 5 OF THESE SPECIFICATIONS. ALL CASTING SURFACES SHALL BE OF A SMOOTH MATERIAL.
   4.2. PLACEMENT OF REINFORCEMENT
      4.2.1. PLACEMENT OF REINFORCEMENT IN PRECAST BRIDGE UNITS - THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MINIMUM. THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 1½" MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING SINGLE OR MULTIPLE LAYERS OF WELDED WIRE FABRIC (NOT TO EXCEED 3 LAYERS), SUPPLEMENTED WITH A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS, WHEN NECESSARY. WELDED WIRE FABRIC SHALL BE COMPOSED OF CIRCUMFERENTIAL AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE BRIDGE UNIT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW. THE ENDS OF THE LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL BE NOT MORE THAN 3" AND NOT LESS THAN 1½" FROM THE ENDS OF THE BRIDGE UNIT.
      4.2.2. BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL REINFORCING STEEL FOR THE CORNERS OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROXIMATELY EQUAL TO THE CONFIGURATION OF THE BRIDGE'S OUTSIDE CORNER.
      4.2.3. PLACEMENT OF REINFORCEMENT FOR PRECAST WINGWALLS AND HEADWALLS - THE COVER OF CONCRETE OVER THE LONGITUDINAL AND TRANSVERSE REINFORCEMENT SHALL BE 2" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 1½" NOR MORE THAN 3". REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC, OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
      4.2.4. PLACEMENT OF REINFORCEMENT FOR PRECAST FOUNDATION UNITS - THE COVER OF CONCRETE OVER THE BOTTOM REINFORCEMENT SHALL BE 3 INCHES MINIMUM. THE COVER OF CONCRETE FOR ALL OTHER REINFORCEMENT SHALL BE 2 INCHES MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 2 INCHES NOR MORE THAN 3 INCHES. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC OR A SINGLE LAYER OF DEFOREMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
   4.3. LAPS, WELDS, SPACING
      4.3.1. LAPS, WELDS, AND SPACING FOR PRECAST BRIDGE UNITS - TENSION SPLICES IN THE CIRCUMFERENTIAL REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.2 AND 5.11.6.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.1 AND 5.11.6.1. THE OVERLAP OF WELDED WIRE FABRIC SHALL BE MEASURED BETWEEN THE OUTER-MOST LONGITUDINAL WIRES OF EACH FABRIC SHEET. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.1 FOR SPLICES OTHER THAN TENSION SPLICES, THE OVERLAP SHALL BE A MINIMUM OF 1'-0" FOR WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS. THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL DISTRIBUTION STEEL FOR EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
      4.3.2. LAPS, WELDS, AND SPACING FOR PRECAST WINGWALLS, HEADWALLS AND FOUNDATIONS - SPLICES IN THE REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.2 AND 5.11.6.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.1 AND 5.11.6.1. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.1. THE SPACING CENTER-TO-CENTER OF THE WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 8".
   4.4. CURING - THE PRECAST CONCRETE ELEMENTS SHALL BE CURED FOR A SUFFICIENT LENGTH OF TIME SO THAT THE CONCRETE WILL DEVELOP THE SPECIFIED COMPRESSIVE STRENGTH IN 28 DAYS OR LESS. ANY ONE OF THE FOLLOWING METHODS OF CURING OR COMBINATIONS THERE OF SHALL BE USED:
      4.4.1. STEAM CURING - THE PRECAST ELEMENTS MAY BE LOW-PRESSURE STEAM CURED BY A SYSTEM THAT WILL MAINTAIN A MOIST ATMOSPHERE.
      4.4.2. WATER CURING - THE PRECAST ELEMENTS MAY BE WATER CURED BY ANY METHOD THAT WILL KEEP THE SECTIONS MOIST.
      4.4.3. MEMBRANE CURING - A SEALING MEMBRANE CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION C309 MAY BE APPLIED AND SHALL BE LEFT INTACT UNTIL THE REQUIRED CONCRETE COMPRESSIVE STRENGTH IS ATTAINED. THE CONCRETE TEMPERATURE AT THE TIME OF APPLICATION SHALL BE WITHIN +/- 10 DEGREES F OF THE ATMOSPHERIC TEMPERATURE. ALL SURFACES SHALL BE KEPT MOIST PRIOR TO THE APPLICATION OF THE COMPOUNDS AND SHALL BE DAMP WHEN THE COMPOUND IS APPLIED.
   4.5. STORAGE, HANDLING & DELIVERY
      4.5.1. STORAGE - PRECAST CONCRETE BRIDGE ELEMENTS SHALL BE LIFTED AND STORED IN "AS-CAST" POSITION. PRECAST CONCRETE HEADWALL AND WINGWALL UNITS ARE CAST, STORED AND SHIPPED IN A FLAT POSITION. THE PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER TO PREVENT CRACKING OR DAMAGE. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE. THE UNITS SHALL NOT BE MOVED UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED A MINIMUM OF 2500 PSI, AND THEY SHALL NOT BE STORED IN AN UPRIGHT POSITION.
      4.5.2. HANDLING - HANDLING DEVICES SHALL BE PERMITTED IN EACH PRECAST ELEMENT FOR THE PURPOSE OF HANDLING AND SETTING. SPREADER BEAMS MAY BE REQUIRED FOR THE LIFTING OF PRECAST CONCRETE BRIDGE ELEMENTS TO PRECLUDE DAMAGE FROM BENDING OR TORSION FORCES.
      4.5.3. DELIVERY - PRECAST CONCRETE ELEMENTS MUST NOT BE SHIPPED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, OR AS DIRECTED BY THE DESIGN ENGINEER. PRECAST CONCRETE ELEMENTS MAY BE UNLOADED AND PLACED ON THE GROUND AT THE SITE UNTIL INSTALLED. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE.
   4.6. QUALITY ASSURANCE - THE PRECASTER SHALL DEMONSTRATE ADHERENCE TO THE STANDARDS SET FORTH IN THE NPCA QUALITY CONTROL MANUAL. THE PRECASTER SHALL MEET EITHER SECTION 4.6.1 OR 4.6.2
      4.6.1. CERTIFICATION - THE PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRODUCTS COVERED BY THIS SPECIFICATION.
      4.6.2. QUALIFICATIONS, TESTING AND INSPECTION
         4.6.2.1. THE PRECASTER SHALL HAVE BEEN IN THE BUSINESS OF PRODUCING PRECAST CONCRETE PRODUCTS SIMILAR TO THOSE SPECIFIED FOR A MINIMUM OF THREE YEARS. HE SHALL MAINTAIN A PERMANENT QUALITY CONTROL DEPARTMENT OR RETAIN AN INDEPENDENT TESTING AGENCY ON A CONTINUING BASIS. THE AGENCY SHALL ISSUE A REPORT, CERTIFIED BY A LICENSED ENGINEER, DETAILING THE ABILITY OF THE PRECASTER TO PRODUCE QUALITY PRODUCTS CONSISTENT WITH INDUSTRY STANDARDS.
         4.6.2.2. THE PRECASTER SHALL SHOW THAT THE FOLLOWING TESTS ARE PERFORMED IN ACCORDANCE WITH THE ASTM STANDARDS INDICATED. TESTS SHALL BE PERFORMED AS INDICATED IN SECTION 6 OF THESE SPECIFICATIONS.
            4.6.2.2.1. AIR CONTENT: C231 OR C173
            4.6.2.2.2. COMPRESSIVE STRENGTH: C31,C39,C497
         4.6.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH® ENGINEERED SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST.
         4.6.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS COVERED BY THIS SPECIFICATION ARE BEING MANUFACTURED.
      4.6.3. DOCUMENTATION - THE PRECASTER SHALL SUBMIT PRECAST PRODUCTION REPORTS TO CONTECH® ENGINEERED SOLUTIONS AS REQUIRED.

5. PERMISSIBLE VARIATIONS
   5.1. BRIDGE UNITS
      5.1.1. INTERNAL DIMENSIONS - THE INTERNAL DIMENSION SHALL VARY NOT MORE THAN 1% FROM THE DESIGN DIMENSIONS NOR MORE THAN 1½" WHICHEVER IS LESS.
      5.1.2. SLAB AND WALL THICKNESS - THE SLAB AND WALL THICKNESS SHALL NOT BE LESS THAN THAT SHOWN IN THE DESIGN BY MORE THAN ¼". A THICKNESS MORE THAN THAT REQUIRED IN THE DESIGN SHALL NOT BE CAUSE FOR REJECTION.
      5.1.3. LENGTH OF OPPOSITE SURFACES - VARIATIONS IN LAYING LENGTHS OF TWO OPPOSITE SURFACES OF THE BRIDGE UNIT SHALL NOT BE MORE THAN ½" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.
      5.1.4. LENGTH OF SECTION - THE UNDERRUN IN LENGTH OF A SECTION SHALL NOT BE MORE THAN ½" IN ANY BRIDGE UNIT.
      5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR BE LESS THAN 1" FOR THE INSIDE CIRCUMFERENTIAL STEEL AS MEASURED TO THE EXTERNAL OR INTERNAL SURFACE OF THE BRIDGE. THESE TOLERANCES OR COVER REQUIREMENTS DO NOT APPLY TO MATING SURFACES OF THE JOINTS.
      5.1.6. AREA OF REINFORCEMENT - THE AREAS OF STEEL REINFORCEMENT SHALL BE THE DESIGN STEEL AREAS AS SHOWN IN THE MANUFACTURER'S SHOP DRAWINGS. STEEL AREAS GREATER THAN THOSE REQUIRED SHALL NOT BE CAUSE FOR REJECTION. THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCEMENT SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCEMENT.
   5.2. WINGWALLS & HEADWALLS
      5.2.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.2. LENGTH/HEIGHT OF WALL SECTIONS - THE LENGTH AND HEIGHT OF THE WALL SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.2.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.
   5.3. FOUNDATION UNITS
      5.3.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.3.2. LENGTH/ HEIGHT/WIDTH OF FOUNDATION SECTIONS - THE LENGTH, HEIGHT AND WIDTH OF THE FOUNDATION UNITS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.3.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.3.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.

6. TESTING/ INSPECTION
   6.1. TESTING
      6.1.1. TYPE OF TEST SPECIMEN - CONCRETE COMPRESSIVE STRENGTH SHALL BE DETERMINED FROM COMPRESSION TESTS MADE ON CYLINDERS OR CORES. FOR CYLINDER TESTING, A MINIMUM OF 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. EACH ELEMENT SHALL BE CONSIDERED SEPARATELY FOR THE PURPOSE OF TESTING AND ACCEPTANCE.
      6.1.2. COMPRESSION TESTING - CYLINDERS SHALL BE MADE AND TESTED AS PRESCRIBED BY THE ASTM C39 SPECIFICATION. CYLINDERS SHALL BE CURED IN THE SAME ENVIRONMENT AS THE BRIDGE ELEMENTS. CORES SHALL BE OBTAINED AND TESTED FOR COMPRESSIVE STRENGTH IN ACCORDANCE WITH THE PROVISIONS OF THE ASTM C42 SPECIFICATION.
      6.1.3. ACCEPTABILITY OF CYLINDER TESTS - WHEN THE AVERAGE COMPRESSIVE STRENGTH OF ALL CYLINDERS TESTED IS EQUAL TO OR GREATER THAN THE DESIGN COMPRESSIVE STRENGTH, AND NOT MORE THAN 10% OF THE CYLINDERS TESTED HAVE A COMPRESSIVE STRENGTH LESS THAN THE DESIGN CONCRETE STRENGTH, AND NO CYLINDER TESTED HAS A COMPRESSIVE STRENGTH LESS THAN 80% OF THE DESIGN COMPRESSIVE STRENGTH, THEN THE ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA, THE ACCEPTABILITY OF THE PRECAST ELEMENTS SHALL BE A SMOOTH STEEL FORM OR TROWELED SURFACE. TRAPPED AIR POCKETS CAUSING SURFACE DEFECTS SHALL BE CONSIDERED AS PART OF A SMOOTH, STEEL FORM FINISH.
      6.1.4. ACCEPTABILITY OF CORE TESTS - THE COMPRESSIVE STRENGTH OF THE CONCRETE IN A BRIDGE ELEMENT IS ACCEPTABLE WHEN THE AVERAGE CORE TEST STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH. WHEN THE COMPRESSIVE STRENGTH OF A CORE TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN MAY BE RE-CORED. WHEN THE COMPRESSIVE STRENGTH OF THE RE-CORE IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH, THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THAT BRIDGE ELEMENT IS ACCEPTABLE.
         6.1.4.1. WHEN THE COMPRESSIVE STRENGTH OF ANY RECORE IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN SHALL BE REJECTED.
         6.1.4.2. PLUGGING CORE HOLES - THE CORE HOLES SHALL BE PLUGGED AND SEALED BY THE MANUFACTURER IN A MANNER SUCH THAT THE ELEMENTS WILL MEET ALL OF THE TEST REQUIREMENTS OF THIS SPECIFICATION. PRECAST ELEMENTS SO SEALED SHALL BE CONSIDERED SATISFACTORY FOR USE.
         6.1.4.3. TEST EQUIPMENT - EVERY MANUFACTURER FURNISHING PRECAST ELEMENTS UNDER THIS SPECIFICATION SHALL FURNISH ALL FACILITIES AND PERSONNEL NECESSARY TO CARRY OUT THE TEST REQUIRED.
   6.2. INSPECTION - THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.

7. JOINTS
   THE BRIDGE UNITS SHALL BE PRODUCED WITH FLAT BUTT ENDS. THE ENDS OF THE BRIDGE UNITS SHALL BE SUCH THAT WHEN THE SECTIONS ARE LAID TOGETHER THEY WILL MAKE A CONTINUOUS LINE WITH A SMOOTH INTERIOR FREE OF APPRECIABLE IRREGULARITIES, ALL COMPATIBLE WITH THE PERMISSIBLE VARIATIONS IN SECTION 5, ABOVE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

8. WORKMANSHIP/ FINISH
   THE BRIDGE UNITS, WINGWALLS, HEADWALLS AND FOUNDATION UNITS SHALL BE SUBSTANTIALLY FREE OF FRACTURES. THE ENDS OF THE BRIDGE UNITS SHALL BE NORMAL TO THE WALLS AND CENTERLINE OF THE BRIDGE SECTION, WITHIN THE LIMITS OF THE VARIATIONS GIVEN IN SECTION 5, ABOVE, EXCEPT WHERE BEVELED ENDS ARE SPECIFIED. THE FACES OF THE WINGWALLS AND HEADWALLS SHALL BE PARALLEL TO EACH OTHER, WITHIN THE LIMITS OF VARIATIONS GIVEN IN SECTION 5, ABOVE. THE SURFACE OF THE PRECAST ELEMENTS SHALL BE A SMOOTH STEEL FORM OR TROWELED SURFACE. TRAPPED AIR POCKETS CAUSING SURFACE DEFECTS SHALL BE CONSIDERED AS PART OF A SMOOTH, STEEL FORM FINISH.

9. REPAIRS
   PRECAST ELEMENTS MAY BE REPAIRED, IF NECESSARY, BECAUSE OF IMPERFECTIONS IN MANUFACTURE OR HANDLING DAMAGE AND WILL BE ACCEPTABLE IF, IN THE OPINION OF THE PURCHASER, THE REPAIRS ARE SOUND, PROPERLY FINISHED AND CURED, AND THE REPAIRED SECTION CONFORMS TO THE REQUIREMENTS OF THIS SPECIFICATION.

10. REJECTION
    THE PRECAST ELEMENTS SHALL BE SUBJECT TO REJECTION ON ACCOUNT OF ANY OF THE SPECIFICATION REQUIREMENTS. INDIVIDUAL PRECAST ELEMENTS MAY BE REJECTED BECAUSE OF ANY OF THE FOLLOWING:
    10.1. FRACTURES OR CRACKS PASSING THROUGH THE WALL, EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED ONE HALF THE THICKNESS OF THE WALL.
    10.2. DEFECTS THAT INDICATE PROPORTIONING, MIXING, AND MOLDING NOT IN COMPLIANCE WITH SECTION 4 OF THESE SPECIFICATIONS.
    10.3. HONEYCOMBED OR OPEN TEXTURE.
    10.4. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.

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CON/SPAN® BRIDGE SYSTEMS
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FABRICATION DRAWING

NW 253RD AVE.
STA.55+74

HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/29/2013
DESIGNED: JAL	DRAWN: JA	
CHECKED: DM	APPROVED: PAC	
SHEET NO.: S17 OF S18		

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS (CONT'D)

11. MARKING
EACH BRIDGE UNIT SHALL BE CLEARLY MARKED BY WATERPROOF PAINT. THE FOLLOWING SHALL BE SHOWN ON THE INSIDE OF THE VERTICAL LEG OF THE BRIDGE SECTION:
BRIDGE SPAN x BRIDGE RISE
DATE OF MANUFACTURE
NAME OR TRADEMARK OF THE MANUFACTURER

12. INSTALLATION PREPARATION
TO ENSURE CORRECT INSTALLATION OF THE PRECAST CONCRETE BRIDGE SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN FORMING THE SUPPORT AREAS FOR BRIDGE UNITS, HEADWALL, AND WINGWALL ELEMENTS. EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.

12.1. FOOTINGS
DO NOT OVER EXCAVATE FOUNDATIONS UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.

THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE BEARING CAPACITY MEETS OR EXCEEDS THE FOOTING DESIGN REQUIREMENTS, PRIOR TO THE CONTRACTOR POURING OF THE FOOTINGS.

THE BRIDGE UNITS AND WINGWALLS SHALL BE INSTALLED ON EITHER PRECAST OR CAST-IN-PLACE CONCRETE FOOTINGS. THE SIZE AND ELEVATION OF THE FOOTINGS SHALL BE AS DESIGNED BY THE ENGINEER. A KEYWAY SHALL BE FORMED IN THE TOP SURFACE OF THE BRIDGE FOOTING AS SPECIFIED ON THE PLANS. NO KEYWAY IS REQUIRED IN THE WINGWALL FOOTINGS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

THE FOOTINGS SHALL BE GIVEN A SMOOTH FLOAT FINISH AND SHALL REACH A COMPRESSIVE STRENGTH OF 2,000 PSI BEFORE PLACEMENT OF THE BRIDGE AND WINGWALL ELEMENTS. BACKFILLING SHALL NOT BEGIN UNTIL THE FOOTING HAS REACHED THE FULL DESIGN COMPRESSIVE STRENGTH.

THE FOOTING SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN TESTED WITH A 10'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN ¼" IN 10'-0".

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOOTING PRIOR TO PLACING THE PRECAST FOOTING.

THE FOUNDATIONS FOR PRECAST CONCRETE BRIDGE ELEMENTS AND WINGWALLS MUST BE CONNECTED BY REINFORCEMENT TO FORM ONE MONOLITHIC BODY. EXPANSION JOINTS SHALL NOT BE USED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE FOUNDATIONS PER THE PLANS AND SPECIFICATIONS.

13. INSTALLATION
13.1. GENERAL - THE INSTALLATION OF THE PRECAST CONCRETE ELEMENTS SHALL BE AS EXPLAINED IN THE PUBLICATION CON/SPAN BRIDGE SYSTEMS INSTALLATION HANDBOOK.
13.1.1. LIFTING - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A CRANE OF THE CORRECT LIFTING CAPACITY IS AVAILABLE TO HANDLE THE PRECAST CONCRETE UNITS. THIS CAN BE ACCOMPLISHED BY USING THE WEIGHTS GIVEN FOR THE PRECAST CONCRETE COMPONENTS AND BY DETERMINING THE LIFTING REACH FOR EACH CRANE UNIT. SITE CONDITIONS MUST BE CHECKED WELL IN ADVANCE OF SHIPPING TO ENSURE PROPER CRANE LOCATION AND TO AVOID ANY LIFTING RESTRICTIONS. THE LIFT ANCHORS OR HOLES PROVIDED IN EACH UNIT ARE THE ONLY MEANS TO BE USED TO LIFT THE ELEMENTS. THE PRECAST CONCRETE ELEMENTS MUST NOT BE SUPPORTED OR RAISED BY OTHER MEANS THAN THOSE GIVEN IN THE MANUALS AND DRAWINGS WITHOUT WRITTEN APPROVAL FROM CONTECH® ENGINEERED SOLUTIONS.
13.1.2. CONSTRUCTION EQUIPMENT WEIGHT RESTRICTIONS - IN NO CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD (HS20 OR HS25) BE PERMITTED OVER THE BRIDGE UNITS UNLESS APPROVED BY CONTECH® ENGINEERED SOLUTIONS.
13.1.2.1. IN THE IMMEDIATE AREA OF THE BRIDGE UNITS, THE FOLLOWING RESTRICTIONS FOR THE USE OF HEAVY CONSTRUCTION MACHINERY DURING BACKFILLING OPERATIONS APPLY:
- NO CONSTRUCTION EQUIPMENT SHALL CROSS THE BARE PRECAST CONCRETE BRIDGE UNIT.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 4" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 10 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 1'-0" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 30 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED THE DESIGN COVER, OR 2'-0" MINIMUM, OVER THE CROWN OF THE PRECAST CONCRETE BRIDGE, CONSTRUCTION EQUIPMENT WITHIN THE DESIGN LOAD LIMITS FOR THE ROAD MAY CROSS THE PRECAST CONCRETE BRIDGE.

13.2. LEVELING PAD/SHIMS - THE BRIDGE UNITS AND WINGWALLS SHALL BE SET ON HARDBOARD SHIMS CONFORMING TO ASTM D1037 OR PLASTIC SHIMS (DAYTON SUPERIOR P-80, P-81 OR APPROVED EQUAL) MEASURING 5" x 5", MINIMUM, UNLESS SHOWN OTHERWISE ON THE PLANS. A MINIMUM GAP OF ½" SHALL BE PROVIDED BETWEEN THE FOOTING AND THE BOTTOM OF THE BRIDGE'S VERTICAL LEGS OR THE BOTTOM OF THE WINGWALL. ALSO, A SUPPLY OF ½", ½" AND ⅛" THICK HARDBOARD OR PLASTIC SHIMS FOR VARIOUS SHIMMING PURPOSES SHALL BE ON SITE.
13.3. PLACEMENT OF BRIDGE UNITS - THE BRIDGE UNITS SHALL BE PLACED AS SHOWN ON THE ENGINEER'S PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

13.4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE STRUCTURE SPAN DURING ALL PHASES OF INSTALLATION. DUE TO THE ARCH SHAPE, BRIDGE ELEMENTS WILL TEND TO SPREAD UNDER SELF-WEIGHT. IT IS IMPERATIVE THAT ANY LATERAL SPREADING OF THE BRIDGE ELEMENTS BE AVOIDED DURING AND AFTER THEIR PLACEMENT. GENERALLY, HORIZONTAL CABLE TIES OR TIE RODS ARE SHIPPED IN THE LARGER BRIDGE ELEMENTS TO ASSIST IN PREVENTING THIS SPREADING. CABLE TIES/TIE RODS SHALL NOT BE REMOVED UNTILL BRIDGE UNITS ARE GROUTED AND GROUT HAS CURED. IT IS RECOMMENDED THAT TEMPORARY HARDWOOD BLOCKS BE USED IN CONJUNCTION WITH THE CABLE TIES/TIE RODS TO MAINTAIN SPAN. IF, HOWEVER, DUE TO SITE RESTRICTIONS, THESE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO PLACEMENT OF THE BRIDGE ELEMANTS, THE CONTRACTOR MUST NOTIFY CONTECH (MANUFACTURER) AND REQUEST A SUGGESTED INSTALLATION PROCEDURE.

IN ADDITION, IF THE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO SETTING ARCH UNITS, THE FOLLOWING QUALITY CONTROL PROCEDURE MUST BE FOLLOWED:
1) FIND "MEASURED SPAN" UPON ARCH UNIT'S DELIVERY TO SITE, PRIOR TO LIFTING FROM TRUCK AND REMOVING CABLE TIES/TIE RODS. "MEASURED SPAN" SHALL BE THE AVERAGE OF (3) SPAN MEASUREMENTS ALONG THE LAY LENGTH OF THE ARCH UNIT.
2) AFTER SETTING OF BRIDGE UNIT ON THE FOUNDATION, VERIFY THE SPAN. THIS "INSTALLED SPAN MEASUREMENT" SHALL NOT EXCEED THE MAXIMUM OF:
A) THE NOMINAL SPAN +½" OR
B) THE "MEASURED SPAN"
IF THE "INSTALLED SPAN MEASUREMENT" EXCEEDS THIS AMOUNT, THE ARCH UNIT SHALL BE LIFTED AND RE-SET UNTIL THE "INSTALLED SPAN MEASUREMENT" MEETS THE LIMITS.

13.5. PLACEMENT OF WINGWALLS, HEADWALLS AND FOUNDATION UNITS - THE WINGWALLS, HEADWALLS AND FOUNDATIONS SHALL BE PLACED AS SHOWN ON THE PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE.
13.6. WATERPROOFING/JOINT PROTECTION AND SUBSURFACE DRAINAGE
13.6.1. EXTERNAL PROTECTION OF JOINTS - THE BUTT JOINT MADE BY TWO ADJOINING BRIDGE UNITS SHALL BE COVERED WITH A ⅛" x 13⅜" PREFORMED BITUMINOUS JOINT SEALANT AND A MINIMUM OF A 9" WIDE JOINT WRAP. THE SURFACE SHALL BE FREE OF DIRT BEFORE APPLYING THE JOINT MATERIAL. A PRIMER COMPATIBLE WITH THE JOINT WRAP TO BE USED SHALL BE APPLIED FOR A MINIMUM WIDTH OF 9" ON EACH SIDE OF THE JOINT. THE EXTERNAL WRAP SHALL BE CS212 BY CONCRETE SEALANTS INC., EZ-WRAP RUBBER BY PRESS-SEAL GASKET CORPORATION, SEAL WRAP BY MAR MAC MANUFACTURING CO. INC. OR APPROVED EQUAL. THE JOINT SHALL BE COVERED CONTINUOUSLY FROM THE BOTTOM OF ONE BRIDGE SECTION LEG, ACROSS THE TOP OF THE BRIDGE AND TO THE OPPOSITE BRIDGE SECTION LEG. ANY LAPS THAT RESULT IN THE JOINT WRAP SHALL BE A MINIMUM OF 6" LONG WITH THE OVERLAP RUNNING DOWNHILL.
13.6.2. IN ADDITION TO THE JOINTS BETWEEN BRIDGE UNITS, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE HEADWALL SHALL ALSO BE SEALED AS DESCRIBED ABOVE. IF PRECAST WINGWALLS ARE USED, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE WINGWALL SHALL BE SEALED WITH A 2'-0" STRIP OF FILTER FABRIC. ALSO, IF LIFT HOLES ARE FORMED IN THE BRIDGE UNITS, THEY SHALL BE PRIMED AND COVERED WITH A 9" x 9" SQUARE OF JOINT WRAP.
13.6.3. DURING THE BACKFILLING OPERATION, CARE SHALL BE TAKEN TO KEEP THE JOINT WRAP IN ITS PROPER LOCATION OVER THE JOINT.
13.6.4. SUBSOIL DRAINAGE SHALL BE AS DIRECTED BY THE ENGINEER.

13.7. GROUTING
13.7.1. GROUTING SHALL NOT BE PERFORMED WHEN TEMPERATURES ARE EXPECTED TO GO BELOW 35° FOR A PERIOD OF 72 HOURS. FILL THE BRIDGE-FOUNDATION KEYWAY WITH CEMENT GROUT (PORTLAND CEMENT AND WATER OR CEMENT MORTAR COMPOSED OF PORTLAND CEMENT, SAND AND WATER) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI. VIBRATE AS REQUIRED TO ENSURE THAT THE ENTIRE KEY AROUND THE BRIDGE ELEMENT IS COMPLETELY FILLED. IF BRIDGE ELEMENTS HAVE BEEN SET WITH TEMPORARY TIES (CABLES, BARS, ETC.) GROUT MUST ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI BEFORE TIES MAY BE REMOVED.
13.7.2. ALL GROUT SHALL HAVE A MAXIMUM AGGREGATE SIZE OF ¼".
13.7.3. LIFTING AND ERECTION ANCHOR RECESSES SHALL BE FILLED WITH GROUT.
13.7.4. AFTER GROUT HAS REACHED ITS DESIGN STRENGTH THE TEMPORARY HARDWOOD WEDGES SHALL BE REMOVED AND THEIR HOLES FILLED WITH GROUT.

13.8. BACKFILL
13.8.1. DO NOT PERFORM BACKFILLING DURING WET OR FREEZING WEATHER.
13.8.2. NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURAL ELEMENTS UNTIL THEY HAVE BEEN APPROVED BY THE ENGINEER.
13.8.3. BACKFILL SHALL BE CONSIDERED AS ALL REPLACED EXCAVATION AND NEW EMBANKMENT ADJACENT TO THE PRECAST CONCRETE ELEMENTS. THE PROJECT CONSTRUCTION AND MATERIAL SPECIFICATIONS, WHICH INCLUDE THE SPECIFICATIONS FOR EXCAVATION FOR STRUCTURES AND ROADWAY EXCAVATION AND EMBANKMENT CONSTRUCTION, SHALL APPLY EXCEPT AS MODIFIED IN THIS SECTION.
13.8.4. BACKFILL ZONES:
- IN-SITU SOIL
- ZONE A: CONSTRUCTED EMBANKMENT OR OVERFILL.
- ZONE B: FILL THAT IS DIRECTLY ASSOCIATED WITH PRECAST CONCRETE BRIDGE INSTALLATION.
- ZONE C: ROAD STRUCTURE.

13.8.5. REQUIRED BACKFILL PROPERTIES
13.8.5.1. IN-SITU SOIL - NATURAL GROUND IS TO BE SUFFICIENTLY STABLE TO ALLOW EFFECTIVE SUPPORT TO THE PRECAST CONCRETE BRIDGE UNITS. AS A GUIDE, THE EXISTING NATURAL GROUND SHOULD BE OF SIMILAR QUALITY AND DENSITY TO ZONE B MATERIAL FOR MINIMUM LATERAL DIMENSION OF ONE BRIDGE SPAN OUTSIDE OF THE BRIDGE FOOTING.
13.8.5.2. ZONE A - ZONE A REQUIRES FILL MATERIAL WITH SPECIFICATIONS AND COMPACTING PROCEDURES EQUAL TO THAT FOR NORMAL ROAD EMBANKMENTS.
13.8.5.3. ZONE B - GENERALLY, SOILS SHALL BE REASONABLY FREE OF ORGANIC MATTER, AND, NEAR CONCRETE SURFACES, FREE OF STONES LARGER THAN 3" IN DIAMETER SEE CHARTS FOR DETAILED DESCRIPTIONS OF ACCEPTABLE SOILS.
13.8.5.4. ZONE C - ZONE C IS THE ROAD SECTION OF GRAVEL, ASPHALT OR CONCRETE BUILT IN COMPLIANCE WITH LOCAL ENGINEERING PRACTICES.
13.8.5.5. GEOTECHNICAL ENGINEER SHALL REVIEW GRADATIONS OF ALL INTERFACING MATERIALS AND, IF NECESSARY, RECOMMEND GEOTEXTILE FILTER FABRIC (PROVIDED BY CONTRACTOR)

13.8.6. PLACING AND COMPACTING BACKFILL
DUMPING FOR BACKFILLING IS NOT ALLOWED ANY NEARER THAN 3'-0" FROM THE BRIDGE LEG.

THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL ON OPPOSITE SIDES OF THE BRIDGE MUST NOT EXCEED 2'-0".

THE FILL BEHIND WINGWALLS MUST BE PLACED AT THE SAME TIME AS THAT OF THE BRIDGE FILL. IT MUST BE PLACED IN PROGRESSIVELY PLACED HORIZONTAL LAYERS NOT EXCEEDING 8" PER LAYER.

THE BACKFILL OF ZONE B SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% OF THE STANDARD PROCTOR, AS REQUIRED BY AASHTO T-99.

SOIL WITHIN 1'-0" OF CONCRETE SURFACES SHALL BE HAND-COMPACTED. ELSEWHERE, USE OF ROLLERS IS ACCEPTABLE. IF VIBRATING ROLLER-COMPACTORS ARE USED, THEY SHALL NOT BE STARTED OR STOPPED WITHIN ZONE B AND THE VIBRATION FREQUENCY SHOULD BE AT LEAST 30 REVOLUTIONS PER SECOND.

THE BACKFILL MATERIAL AND COMPACTING BEHIND WINGWALLS SHALL SATISFY THE CRITERIA FOR THE BRIDGE BACKFILL, ZONE B.

BACKFILL AGAINST A WATERPROOFED SURFACE SHALL BE PLACED CAREFULLY TO AVOID DAMAGE TO THE WATERPROOFING MATERIAL.

13.8.7. BRIDGE UNITS
FOR FILL HEIGHTS OVER 12 FEET (AS MEASURED FROM TOP CROWN OF BRIDGE TO FINISHED GRADE), NO BACKFILLING MAY BEGIN UNTIL A BACKFILL COMPACTION TESTING PLAN HAS BEEN COORDINATED WITH AND APPROVED BY CONTECH® ENGINEERED SOLUTIONS.

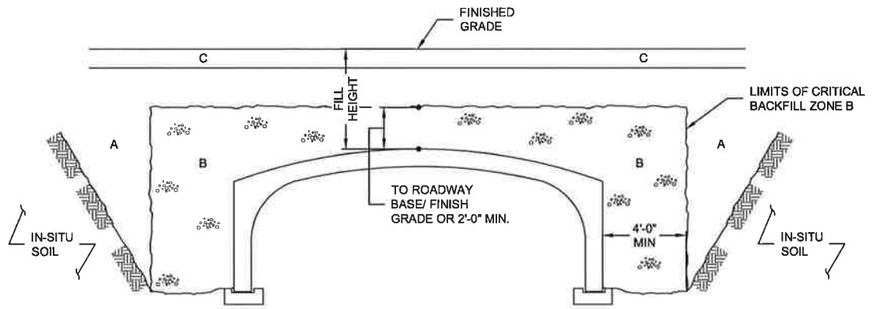
13.8.8. WINGWALLS
BACKFILL IN FRONT OF WINGWALLS SHALL BE CARRIED TO GROUND LINES SHOWN IN THE PLANS.

13.8.9. MONITORING
THE CONTRACTOR SHALL CHECK SETTLEMENTS AND HORIZONTAL DISPLACEMENT OF FOUNDATION TO ENSURE THAT THEY ARE WITHIN THE ALLOWABLE LIMIT PROVIDED BY THE ENGINEER. THESE MEASUREMENTS SHOULD GIVE AN INDICATION OF THE SETTLEMENTS AND DEFORMATIONS ALONG THE LENGTH OF THE FOUNDATIONS.

THE FIRST MEASUREMENT SHOULD TAKE PLACE AFTER THE ERECTION OF ALL PRECAST BRIDGE SYSTEM ELEMENTS, A SECOND AFTER COMPLETION OF BACKFILLING, AND A THIRD BEFORE OPENING OF THE BRIDGE TO TRAFFIC. FURTHER MEASUREMENTS MAY BE MADE ACCORDING TO LOCAL CONDITIONS.

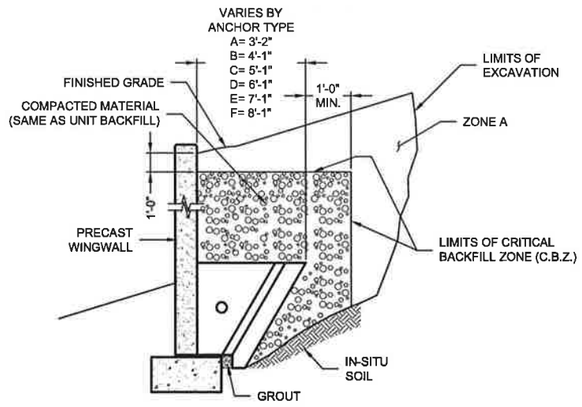
ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

TYPICAL USCS MATERIALS	AASHTO GROUP	AASHTO SUBGROUP	PERCENT PASSING US SIEVE NO.			CHARACTER OF FRACTION PASSING NO. 40 SIEVE		SOIL DESRIPTION
			#10	#40	#200	LIQUID LIMIT	PLASTICITY INDEX	
GW, GP, SP	A1	A-1a	50 MAX	30 MAX	15 MAX		6 MAX	LARGELY GRAVEL BUT CAN INCLUDE SAND AND FINES
GM, SW, SP, SM		A-1b		50 MAX	25 MAX		6 MAX	GRAVELLY SAND OR GRADED SAND, MAY INCLUDE FINES
GM, SM, ML, SP, GP	A2	A-2-4			35 MAX	40 MAX	10 MAX	SANDS, GRAVELS WITH LOW-PLASTICITY SILT FINES
SC, GC, GM		A-2-5			35 MAX	41 MIN	10 MAX	SANDS, GRAVELS WITH PLASTIC SILT FINES
SP, SM, SW	A3			51 MIN	10 MAX		NON-PLASTIC	FINE SANDS
ML, SM, SC	A4				36 MIN	40 MAX	10 MAX	LOW-COMPRESSIBILTY SILTS

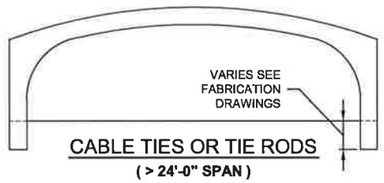


SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE ZONE B
≤ 24'-0"	≥ 12'-0"	A1, A3
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4
> 24'-0"	ALL	A1, A3

BACKFILL REQUIREMENTS



WALL BACKFILL REQUIREMENTS



CABLE TIES OR TIE RODS
(> 24'-0" SPAN)

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NW 253RD AVE.
STA.55+74

HILLSBORO, OREGON

PROJECT No.:	SEQ. No.:	DATE:
478306	030	8/29/2013
DESIGNED: JAL		DRAWN: JA
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SHEET NO.: S18 OF S18		

GEODESIGN INC

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

NW 253rd Avenue from NW Evergreen Road to Meek Road
Portland, Oregon

For
Mackenzie
August 28, 2013

GeoDesign Project: Hillsboro-21-01-01

GEODESIGN INC

August 28, 2013

Mackenzie
1515 SE Water Avenue, Suite 100
Portland, OR 97293

Attention: Mr. Ralph Henderson

Report of Geotechnical Engineering Services
NW 253rd Avenue from NW Evergreen Road to Meek Road
Hillsboro, Oregon
GeoDesign Project: Hillsboro-21-01-01

GeoDesign, Inc. is pleased to submit our report for the proposed NW 253rd Avenue alignment improvements from NW Evergreen Road to NW Meek Road. Our services for this project were conducted in accordance with the scope contained in the agreement between Mackenzie and GeoDesign, Inc. dated January 3, 2013.

We appreciate the opportunity to be of continued service to you. Please contact us if you have questions regarding this report.

Sincerely,

GeoDesign, Inc.

Krey D. Younger, P.E., G.E.
Associate Engineer

George Saunders, P.E., G.E.
Principal Engineer

cc: Mr. Charlie Shell, City of Hillsboro (via email only)
Ms. Megan Goplin, Mackenzie (via email only)

VCL:KDY:GPS:kt
Attachments
One copy submitted (via email only)
Document ID: Hillsboro-21-01-01-082813-geor.docx

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1.0 INTRODUCTION

GeoDesign, Inc. is pleased to present this report summarizing geotechnical engineering recommendations for the proposed NW 253rd Avenue alignment from NW Evergreen Road to NW Meek Road in Hillsboro, Oregon. The approximate location of the site is shown on Figure 1.

Based on our discussions with Mackenzie and review of preliminary information available at the time of this report, we understand that the new road alignment will be approximately 5,500 feet long. The current alignment of NW 253rd Avenue consists of a gravel roadway that extends approximately 2,700 feet north of NW Evergreen Road. We understand that the gravel roadway will be widened, extended to the north approximately 2,800 feet, and the surface will be paved with PCC. The new roadway will accommodate two lanes of traffic. We anticipate the new roadway will be built close to existing grades; therefore, minimal grading will be necessary. We understand that this project will not include signal poles.

At two locations the road will cross existing drainage channels. The first approximately 3,700 feet north of NW Evergreen Road, at approximately Station 47+00, and the second approximately 4,400 feet north of NW Evergreen Road, at approximately Station 55+50. At the time of this report, we understand that the drainage channel crossings will be arch culverts.

For your reference, definitions of all acronyms used herein are defined at the end of this document.

2.0 PURPOSE AND SCOPE

The purpose of our geotechnical engineering services was to explore subsurface conditions and provide geotechnical engineering recommendations for design and construction of the proposed roadway alignment. The specific scope of our services is summarized as follows:

- Reviewed readily available published geologic data and our in-house files for existing information on subsurface conditions in the project vicinity.
- Coordinated and managed the field investigation, including locating utilities, site access authorizations, access preparation, and scheduling of contractors and GeoDesign's staff.
- Completed 11 borings (B-1 through B-11) to depths ranging between 9.0 and 26.5 feet BGS.
- Obtained soil samples for laboratory testing, and maintained a log of encountered soil and groundwater conditions in each exploration.
- Completed the following laboratory tests on select samples obtained from the explorations:
  - Thirteen moisture content determinations in general accordance with ASTM D 2216
  - Two Atterberg limits determinations in general accordance with ASTM D 4318
- Provided recommendations for site preparation and grading, including temporary and permanent slopes, fill placement criteria, suitability of on-site soil for fill, subgrade preparation, and recommendations for wet weather construction.

- Provided geotechnical recommendations for pavement design utilizing the recommendations in the "210 Street Design" section of the draft 2012 City of Hillsboro Design standards, including sub-base, base course, and AC or PCC thickness.
- Prepared this engineering report that presents our findings, conclusions, and recommendations.

3.0 SITE CONDITIONS

3.1 SURFACE CONDITIONS

The site is surrounded by agricultural and residential developments. A section of NW 253rd Avenue is an existing gravel roadway that extends north approximately 2,700 feet from NW Evergreen Road. The proposed alignment to the north consists primarily of agricultural land. The ground surface elevation is relatively level along the proposed alignment, with elevations ranging from approximately 185 to 207 feet.

3.2 SUBSURFACE CONDITIONS

3.2.1 General

We completed 11 borings (B-1 through B-11) to depths ranging between 9.0 and 26.5 feet BGS. The approximate locations of our explorations are shown on Figure 2. A copy of the exploration logs is provided in Appendix A.

3.2.2 Soil

In general, the subsurface conditions consist of soft to stiff clay and silt varying with minor sand and stratified beds of loose to medium dense, silty sand. We observed a 2- to 4-inch-thick root zone and a 15- to 16-inch-thick tilled (cultivated) zone where vegetation was present.

Laboratory testing of selected samples of the silt, clay, and sand indicates moisture contents generally between 29 and 51 percent. The results of the testing are included in Appendix A.

3.2.3 Groundwater

Groundwater seepage was encountered at depths ranging between 2 and 7.5 feet BGS during our explorations. Based on our review of water well logs on file with OWRD and projects completed in the site vicinity, groundwater was generally encountered at depths ranging between approximately 8 and 15 feet BGS. The depth to groundwater may fluctuate in response to seasonal changes, prolonged rainfall, changes in surface topography, and other factors not observed in this study.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on our site reconnaissance, explorations, laboratory testing, and analyses, it is our opinion that the subsurface conditions at the site are suitable for the proposed roadway alignment, provided the site is prepared as recommended in this report. The following sections discuss geotechnical design considerations for the proposed development.

- There is a thick tilled (cultivated) zone at the ground surface over the majority of the site due to the past agricultural activities. This material is generally soft or loose and contains organics. In general, the material exhibits low and highly variable strength and generally does not provide consistent subgrade support for pavement. We recommend that the tilled zone be removed or scarified and compacted as recommended for structural fill.
- The subgrade should be protected from traffic in accordance with the "Wet Weather/Wet Soil Grading" section of this report.

4.1 SITE PREPARATION

4.1.1 Stripping and Grubbing

The existing root zone and organic material should be stripped and removed from the site in all proposed structural fill, pavement, and improvement areas and for a 5-foot margin around such areas. Based on our explorations, we anticipate a general stripping depth of approximately 3 to 4 inches over the vegetated areas of the site. Greater stripping depths may be required to remove localized zones of loose or organic soil, and the actual stripping depth should be based on field observations at the time of construction. Stripped material should be transported off site for disposal or used in landscaped areas.

Following stripping and grubbing, the subgrade should be compacted to at least 95 percent of AASHTO T-99.

4.1.2 Tilled Zone

A 15- to 16-inch-thick tilled (cultivated) zone was observed adjacent to the existing NW 253rd Avenue roadway or in the explorations performed in the proposed alignment to the north. The tilled zone material consists of native silt or clay soil; however, through years of cultivation, the tilled zone includes a slightly higher organic content and lower densities. When wet, the soil is likely to exhibit very low strength and generally does not provide adequate pavement subgrade support.

Within all proposed structural fill, pavement, and improvement areas; for a 5-foot margin beyond such areas; and where less than 16 inches of cut is required, we recommend that the top 16 inches of the stripped subgrade be removed and replaced with structural fill or scarified and compacted to a depth of 18 inches (in two lifts) as recommended for structural fill. As discussed in the "Structural Fill" section of this report, the native silt or clay can be sensitive to small changes in moisture content and will be difficult, if not impossible, to compact adequately during wet weather. While scarification and compaction of the subgrade is the best option for subgrade improvement, it will likely only be possible during extended dry periods and following moisture conditioning of the soil. As discussed further on in this report, cement amendment is an option for conditioning the soil for use as structural fill during periods of wet weather or when drying the soil is not an option.

4.1.3 Subgrade Evaluation

A member of our geotechnical staff should observe the exposed subgrade after stripping and site cutting have been completed to determine if there are additional areas of unsuitable or unstable soil. In addition to compaction testing of the subgrade, our representative should observe a proofroll with a fully loaded dump truck or similarly heavy rubber-tire construction

equipment to identify soft, loose, or unsuitable areas. Areas that appear to be too wet and soft to support proofrolling equipment should be evaluated by probing and prepared in accordance with the recommendations for wet weather construction presented in the following section of this report.

4.1.4 Wet Weather/Wet Soil Grading

Trafficability of the site will be difficult during or after extended wet periods or when the moisture content of the surface soil is more than a few percentage points above optimum. We anticipate the existing subgrade will be wet following demolition of the existing gravel pavement areas. When wet, the silt and clay at the site are easily disturbed and may provide inadequate support for construction equipment. Proofrolling of the subgrade should not be performed during wet weather or if wet ground conditions exist. Instead, the subgrade should be evaluated by probing. Soil that has been disturbed during site preparation activities, or soft or loose zones identified during probing, should be removed and replaced with compacted structural fill.

The use of granular haul roads and staging areas will be necessary for support of construction traffic during the rainy season or when the moisture content of the surficial soil is more than a few percentage points above the optimum moisture content. The aggregate base thickness for pavement areas is intended to support post-construction design traffic loads. This design aggregate base thickness may not support construction traffic or pavement construction when the subgrade soil is wet. Accordingly, if construction is planned for periods when the subgrade soil is wet, staging and haul roads with increased thicknesses of aggregate base will be required. The amount of staging and haul road areas as well as the required thickness of granular material will vary with the contractor's sequencing of a project and type/frequency of construction equipment. Generally, an 8- to 12-inch-thick mat of granular material is sufficient for light staging areas but is generally not expected to be adequate to support heavy equipment or truck traffic. Assuming the same subgrade assumption, the granular mat for haul roads and areas with repeated heavy construction traffic typically needs to be increased to between 16 and 18 inches.

The granular haul road material should be placed in one lift over the prepared, undisturbed subgrade and compacted using a smooth-drum, non-vibratory roller. The granular material should meet the specifications for stabilization material, imported granular material, or pavement aggregate base in the "Materials" section of this report. In addition, a geotextile fabric should be placed as a barrier between the subgrade and granular material in areas of repeated construction traffic. The geotextile should meet the requirements provided in the "Materials" section of this report.

As an alternative to thickened crushed rock sections, haul roads and utility work zones may be constructed using cement-amended subgrade overlain by a crushed rock wearing surface. If this approach is used, the thickness of granular material in staging areas and along haul roads can typically be reduced to between 6 and 10 inches. This recommendation is based on an assumed minimum unconfined compressive strength of 100 psi for subgrade amended to a depth of 12 to 16 inches. The actual thickness of the amended material and imported granular material will depend on the contractor's means and methods and, accordingly, should be the contractor's responsibility. Cement amendment is discussed in the "Materials" section of this report.

4.2 TRENCH EXCAVATIONS

If utilities are installed along the road alignment, we anticipate trench cuts should stand near vertical to a depth of approximately 4 feet in the silt or clay provided groundwater seepage is not observed in the sidewalls. However, groundwater seepage was encountered at depths ranging between 2 and 7.5 feet BGS during our explorations; therefore, we anticipate that utility trench excavations may result in sloughing. If sloughing occurs, the sidewalls should be flattened or shored.

Trench dewatering will be required to maintain dry working conditions if the invert elevations of the proposed utilities encounter groundwater. Given the predominately soft to medium stiff nature of the silt and clay, as well as the variable sand content, pumping from sumps located within the trench may result in excessive sloughing, caving, or running conditions, and dewatering by well points may be required. If groundwater is present at the base of utility excavations, we recommend placing stabilization material at the base of the excavation meeting the requirements indicated in the "Structural Fill" section of this report. The material should be free of organic matter and other deleterious material and should be placed in one lift and compacted until "well keyed."

While we have described certain approaches to the trench excavation, it is the contractor's responsibility to select the excavation and dewatering methods, to monitor the trench excavations for safety, and to provide shoring required to protect personnel and adjacent improvements. All trench excavations should be in accordance with applicable OSHA and state regulations.

Trench backfill for the utility pipe base, pipe zone, and general backfill should meet the requirements provided in the "Materials" section of this report.

5.0 TEMPORARY AND PERMANENT SLOPES

5.1 TEMPORARY SLOPES

Based on soil conditions encountered during our explorations, temporary slopes of 1½H:1V may be used to vertical depths of 10 feet or less provided groundwater seepage is not encountered and groundwater remains below the base of the excavation. At this inclination, the slopes with soft material or higher sand content may ravel and require some ongoing repair. If seepage is encountered, it may be necessary to flatten the slopes to protect the surface from raveling or provide dewatering. All cut slopes should be protected from erosion by covering them with plastic sheeting or other stabilizing cover during the rainy season. If sloughing or instability is observed, the slope may need to be flattened or the cut supported by shoring.

5.2 PERMANENT SLOPES

We understand that no significant slopes are planned for the site. Permanent cut and fill slopes up to 10 feet tall may be built to a gradient as steep as 2H:1V. Slopes that will be maintained by mowing should not be constructed steeper than 3H:1V. Newly constructed fill slopes should be over-built by at least 12 inches and then trimmed back to the required slope to maintain a firm face.

Access roads and pavements should be located at least 5 feet from the top of cut and fill slopes. Slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face of the slope.

6.0 CULVERT FOUNDATION RECOMMENDATIONS

6.1 GENERAL

Based on information provided by Mackenzie, we understand the drainage channel crossings will be precast arch culverts with a span width of approximately 14.5 feet. We understand the base of the culverts will be approximately 10 to 12 feet below the proposed roadway surface at Station 47+00 and approximately 12 to 14 feet below the proposed roadway surface at Station 55+50. Based on our explorations, it is our opinion that the proposed culverts can be supported on conventional concrete shallow footings provided the subgrade is prepared as recommended in the "Site Preparation" section of this report.

6.2 DIMENSIONS AND CAPACITIES

Based on soil conditions encountered in explorations on site, we recommend using an allowable bearing pressure of 2,500 to 3,000 psf for foundations resting on a minimum 12-inch-thick layer of stabilization material bearing on firm native soil. Total post-construction settlement should be less than 1 and 1½ inches for 2,500 and 3,000 psf, respectively, with differential settlement of approximately half the total across the span of the culvert. We also recommend using an internal friction angle of 28 to 30 degrees during analysis for the culverts.

The minimum 12-inch-thick layer of stabilization material should extend laterally at least 1 foot beyond the outer edges of the culvert foundations and at least 2 feet beyond the edges of the headwall foundation. The stabilization material should be fully enveloped (top, sides, and bottom) by a layer of stabilization geotextile. The stabilization material and geotextile should meet the criteria outlined in the "Materials" section of this report.

The footings should be a minimum of 24 inches wide and embedded a minimum of 18 inches below the subgrade or 12 inches below the scour depth. The recommended allowable bearing pressure applies to the total of dead plus long-term live loads and may be doubled for short-term loads, such as those resulting from wind or seismic forces. The culvert, weight of the overlying soil, and foundation elements should be included when sizing the foundations.

6.3 RESISTANCE TO SLIDING

Lateral loads on footings can be resisted by passive earth pressure on the sides of the structures and by friction on the base of the footings. An allowable passive earth pressure of 150 pcf may be used for footings confined by native soil and new structural fill beneath the water table. For footings in contact with native soil or crushed rock, a coefficient of friction equal to 0.4 may be used when calculating resistance to sliding.

6.4 CONSTRUCTION CONSIDERATIONS

All footing subgrades should be evaluated by qualified personnel to confirm suitable bearing conditions. Observations should also confirm that loose or soft material, organics, unsuitable

fill, and softened subgrades (if present) have been removed. Localized deepening of footing excavations may be required to penetrate any deleterious material.

7.0 PAVEMENT DESIGN

7.1 GENERAL

We understand that the City of Hillsboro (City) has requested a PCC pavement for the main travel lanes and AC pavement for connections to NW Meek Road and NW Evergreen Road. Pavement design and specifications should be in general accordance with the "210 Street Design" section of the draft 2012 City of Hillsboro Design standards. Our pavement design recommendations are based on the draft City of Hillsboro Design standards, our field explorations, and traffic information provided to us by the City and Mackenzie.

7.2 ESAL CALCULATION

Our ESAL calculations are based on the City's recommended ESAL factors, traffic information provided by the City, and our assumptions. Traffic information provided by the City includes estimated average daily traffic and an estimated 2 percent trucks from 2014 through 2050. To calculate ESAL values, we assumed a distribution of heavy vehicles for FHWA classifications 4 through 13, with the assumption that transit buses will not utilize NW 253rd Avenue.

Based on our discussions with the project team, we understand that future plans include industrial facilities on this stretch of NW 253rd Avenue. In addition, we assumed a truck distribution based on the assumption that the majority of the industrial traffic will primarily be truck- and trailer-type vehicles. Our assumed heavy vehicle distribution is 15 percent of the heavy trucks for FHWA classes 8 through 12 and 5 percent for FHWA classes 4 through 7 and 13. Our resulting pavement design loading is 2.5 million flexible and 3.5 million rigid pavement ESALs for a 40-year design period.

7.3 PCC PAVEMENT SECTION

A summary of our PCC pavement design calculations is provided in Appendix B. The summary results include input variables and verification results for PCC design in general accordance with the draft City of Hillsboro Design standards and the 1998 AASHTO rigid design supplemental with the exception that joint faulting analysis was conducted for a 30-year design period.

Our resulting PCC pavement section is as follows:

- 9.0 inches of PCC
- 4.0 inches of aggregate base
- 14.0 inches of cement-amended subgrade
- 1¼-inch dowels, 18 inches long, 12 inches on centers
- Maximum joint spacing of 16 feet transverse and longitudinal

Joint construction, aspect ratio, and other pertinent jointing criteria are covered in Section 210.7 of the draft City of Hillsboro Design standards. PCC should be Class 4000 ¾ Paving Concrete with a minimum 28-day flexural strength of 650 psi.

The recommendation for cement-amended subgrade is based on the silt to clay nature of the subgrade, the high moisture content, and the soil agricultural zone. In addition, stabilized soil is also recommended based on the joint faulting analysis. Additional information on cement amendment construction is provided in the "Materials" section of this report.

7.4 AC PAVEMENT SECTION

A summary of our AC pavement design calculations is provided in Appendix C. The results are based on the draft City of Hillsboro Design standards and the 1993 AASHTO pavement design guide. Our design sections are provided below with cement-treated subgrade and without cement-treated subgrade. For cement-treated designs, the cement-treated section was calculated as a sub-base.

Our resulting AC pavement section is as follows:

- 10.0 inches AC
- 12.0 inches aggregate base
- Subgrade geotextile

Our resulting AC pavement section with cement-treated base is as follows:

- 10.0 inches AC
- 4.0 inches aggregate base
- 14.0 inches cement-treated subgrade

Additional information on cement amendment construction is provided in the "Materials" section of this report. The 3.0-inch-thick aggregate base layer can be omitted if the AC thickness is increased by 0.5 inch; however, the 3.0-inch-thick aggregate base layer has the added benefit of increasing drainage at the base of the AC as well as providing protection to the cement-treated subgrade during construction.

The AC should be Level 3, ½-inch, dense MHMAC according to OSSC 00744 (Minor Hot Mixed Asphalt Concrete) and compacted to 91 percent of the maximum specific gravity, as determined by AASHTO T-209. Minimum lift thickness is 2.0 inches for ½-inch MHMAC. Maximum lift thickness is 3.0 inches of ½ inch MHMAC. Asphalt binder should be performance graded and conform to PG 64-22 or better. If approved by the City, the AC may also be designed as a warm mix.

8.0 MATERIALS

8.1 STRUCTURAL FILL

8.1.1 General

Fill should only be placed over a subgrade that has been prepared in conformance with the "Site Preparation" section of this report. All material used as structural fill should be free of organic matter or other unsuitable material. The material should meet the specifications provided in OSSC 00330 (Earthwork), depending on the application. Unless otherwise indicated, all structural

fill should have a maximum particle size of 4 inches. A brief characterization of some of the acceptable materials and our recommendations for their use as structural fill is provided below.

A submittal should be made for each material prior to the start of construction. Each submittal should include the test information necessary to evaluate the degree to which the material's properties comply with the properties that were recommended or specified. The geotechnical engineer and other appropriate members of the design team should review each submittal.

8.1.2 On-Site soil

The near-surface native silt and silty soil are suitable for use as structural fill provided they meet the requirements provided in OSSC 00330.12 (Borrow Material). Based on laboratory test results, the moisture content of the on-site silty soil was significantly above optimum at the time of our exploration. We anticipate that significant moisture conditioning will be required to dry the soil to a moisture content near optimum. This will require an extended period of dry weather, typically experienced between early July and mid-October. When used as structural fill, the on-site silty soil should be placed in lifts with a maximum uncompacted thickness of 8 inches and compacted to not less than 92 percent of the maximum dry density, as determined by AASHTO T-99.

When used as structural fill, the on-site silt or clay should be placed in lifts with a maximum uncompacted thickness of 6 to 8 inches and compacted to not less than 92 percent of the maximum dry density, as determined by AASHTO T-99.

8.1.3 Imported Granular Material

Imported granular material used for structural fill should be pit- or quarry-run rock, crushed rock, or crushed gravel and sand and should meet the requirements set forth in OSSC 00330.14 (Selected Granular Backfill) and OSSC 00330.15 (Selected Stone Backfill). Imported granular material should be fairly well graded between coarse and fine material, have less than 5 percent by dry weight passing the U.S. Standard No. 200 Sieve, and have at least two mechanically fractured faces.

When used as structural fill, imported granular material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by AASHTO T-99.

8.1.4 Pavement Aggregate Base

Imported granular material used as base rock for pavements should consist of ¾- or 1-inch-minus material meeting the requirements in OSSC 00641 (Aggregate Subbase, Base, and Shoulders), with the exception that the aggregate should have less than 5 percent by dry weight passing the U.S. Standard No. 200 Sieve and at least two mechanically fractured faces. The imported granular material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by AASHTO T-99.

8.1.5 Trench Backfill

Trench backfill for the utility pipe base and pipe zone should consist of crushed, well-graded, granular material with a maximum particle size of 1 inch and less than 5 percent by dry weight passing the U.S. Standard No. 200 Sieve and should meet OSSC 00405.14 (Trench Backfill, Class B). The material should be free of roots, organic matter, and other unsuitable material. Backfill for the pipe base and pipe zone should be compacted to at least 90 percent of the maximum dry density, as determined by AASHTO T-99, or as recommended by the pipe manufacturer.

Within building, pavement, and other structural areas, trench backfill placed above the pipe zone should consist of imported granular material as specified above. The backfill should be compacted to at least 92 percent of the maximum dry density, as determined by AASHTO T-99, at depths greater than 2 feet below the finished subgrade and 95 percent of the maximum dry density, as determined by AASHTO T-99, within 2 feet of finished subgrade. In all other areas, trench backfill above the pipe zone should be compacted to at least 92 percent of the maximum dry density, as determined by AASHTO T-99.

8.1.6 Stabilization Material

Stabilization material should consist of pit- or quarry-run rock, crushed rock, or crushed gravel and sand, and should meet the requirements set forth in OSSC 00330.14 (Selected Granular Backfill) and OSSC 00330.15 (Selected Stone Backfill), consist of 4- to 6-inch-minus material, and have less than 5 percent by dry weight passing the U.S. Standard No. 4 Sieve. The material should be free of organic matter and other deleterious material. Stabilization material should be placed in one lift and compacted to a firm condition.

8.1.7 Cement Amendment

As an alternative to the use of imported granular material for wet weather subgrade improvement or structural fill, an experienced contractor should be able to amend the on-site soil with portland cement to obtain suitable support properties. If successfully executed, cement-amended subgrade can also be utilized as a sub-base layer in the pavement section, thereby reducing the overlying base rock and pavement section.

Successful use of soil amendment depends on the use of correct mixing techniques, soil moisture content, and amendment quantities. We recommend a target strength for cement-amended soil of 100 psi. The amount of cement used to achieve this target generally varies with moisture content and soil type. It is difficult to predict field performance of soil to cement amendment due to variability in soil response, and we recommend laboratory testing near the time of construction to confirm expectations. However, for preliminary design purposes, we recommend 7 to 8 percent cement by weight of dry soil due to high moisture contents, clay content, and the agricultural zone. A contract allowance for additional cement is recommended for adjustments based on field observations and performance.

Typically, a minimum curing of four days is required between treatment and construction traffic access. The amended surface should be protected from abrasion by placing a minimum of 3 inches aggregate base as a construction platform. As discussed in the "Pavement Design" and "Wet Weather/Wet Soil Grading" sections of this report, thicker layers of aggregate base may be

required for staging and haul roads. The base can become contaminated with soil during construction. Contaminated base should be removed and replaced with clean rock in pavement areas, such that the minimum thickness of free-draining base at the surface is 4 inches.

Portland cement-amended soil is hard and has low permeability. Therefore, this soil does not drain well nor is it suitable for planting. Future planted areas should not be cement amended, if practical, or accommodations should be planned for drainage and planting.

8.2 GEOTEXTILE FABRIC

8.2.1 Subgrade Geotextile Fabric

A subgrade geotextile fabric should be placed as a barrier between the subgrade and granular material in staging areas, haul road areas, or in areas of repeated construction traffic. The geotextile should have a minimum Mullen burst strength of 250 psi for puncture resistance and an AOS between U.S. Standard No. 70 and No. 100 Sieves.

8.2.2 Drainage Geotextile Fabric

Drain rock and other granular material used for subsurface drains should be wrapped in a geotextile fabric that meets the specifications provided in OSSC 00350 (Geosynthetic Installation) and OSSC 02320 (Geosynthetics) for drainage geotextiles.

9.0 OBSERVATION OF CONSTRUCTION

Satisfactory earthwork and pavement performance depends to a large degree on the quality of construction. Sufficient observation of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to determine if subsurface conditions change significantly from those anticipated.

We recommend that GeoDesign be retained to observe earthwork activities, including stripping; proofrolling of the subgrade and repair of soft areas; performing laboratory compaction and field moisture-density tests; observing final proofrolling of the pavement subgrade and base rock; asphalt placement and compaction; and the placing, mixing, and compacting of any cement amended subgrade.

10.0 LIMITATIONS

We have prepared this report for use by the Mackenzie, the City of Hillsboro, and the design and construction team for the proposed project. The report can be used for bidding or estimating purposes, but our report, conclusions, and interpretations should not be construed as warranty of the subsurface conditions and are not applicable to other sites.

Soil explorations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect soil strata or water level variations that may exist between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, re-evaluation will be necessary.

The site development plans and design details were not finalized at the time this report was prepared. When the design has been finalized and if there are changes in the site grades or location, configuration, design loads, or type of construction for the buildings, the conclusions and recommendations presented may not be applicable. If design changes are made, we should be retained to review our conclusions and recommendations and to provide a written evaluation or modification.

The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences or procedures, except as specifically described in our report for consideration in design.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

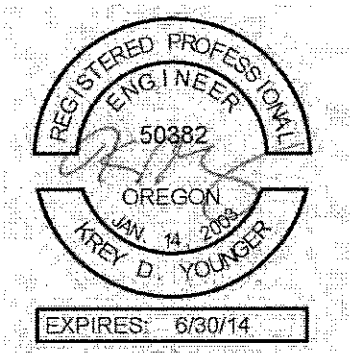
♦ ♦ ♦

We appreciate the opportunity to be of continued service to you. Please call if you have questions concerning this report or if we can provide additional services.

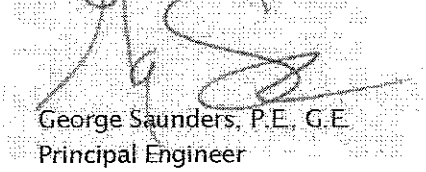
Sincerely,

GeoDesign, Inc.

Viola C. Lai, P.E., G.E.
Project Engineer

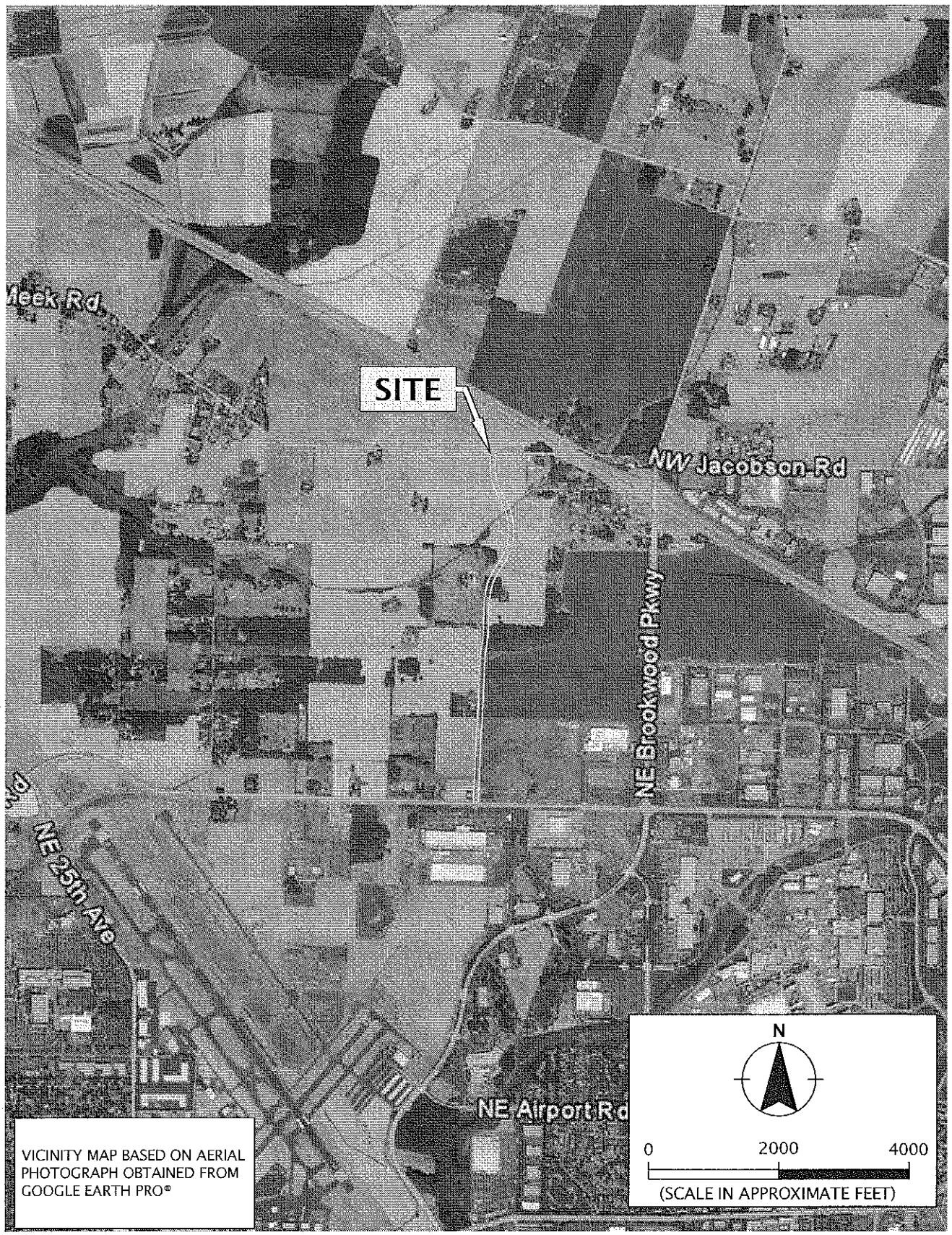


Krey D. Younger, P.E., G.E.
Associate Engineer



George Saunders, P.E., G.E.
Principal Engineer

FIGURES

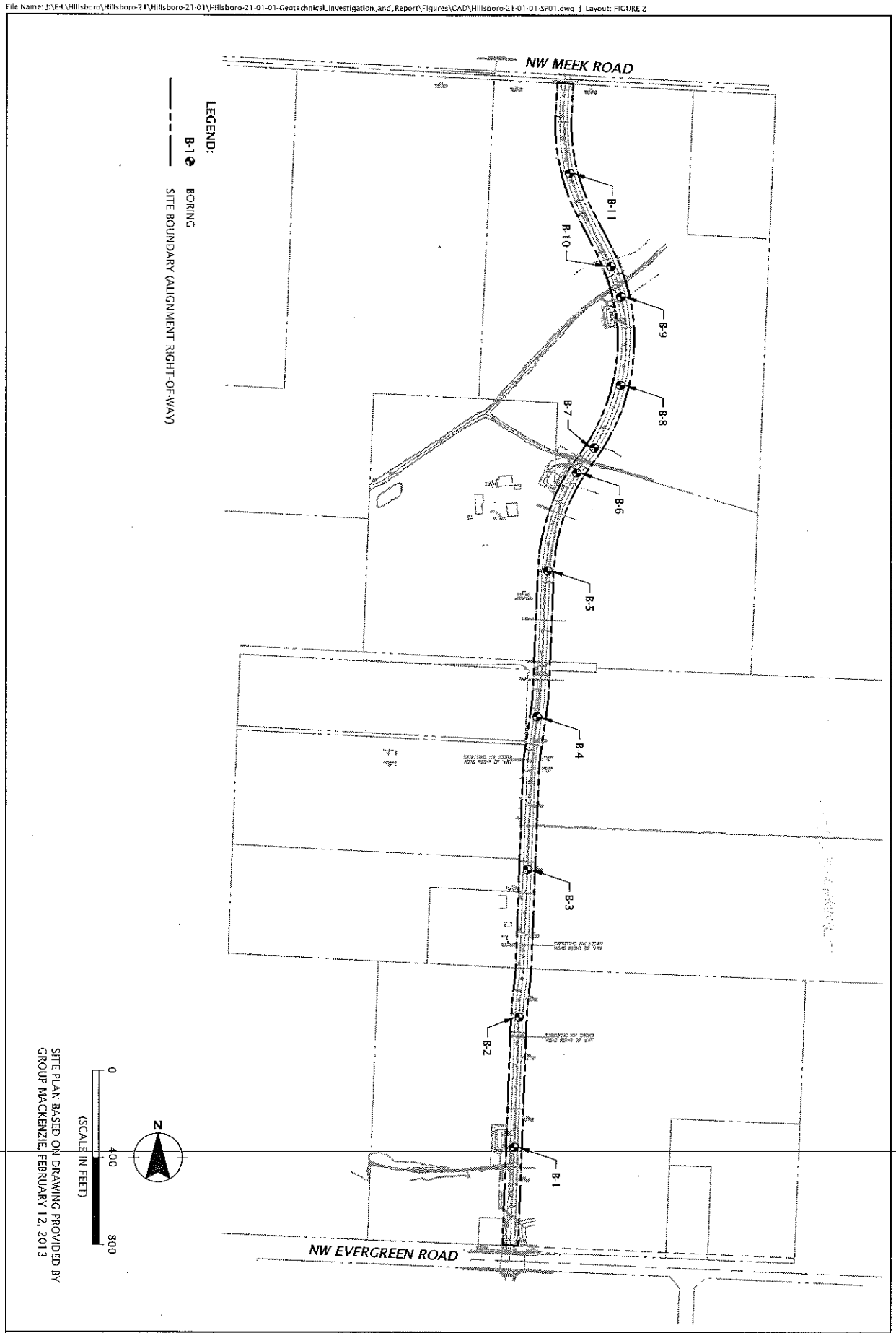


VICINITY MAP BASED ON AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO®

GEODESIGN INC
15575 SW Sequoia Parkway - Suite 100
Portland OR 97224
Off 503.968.8787 Fax 503.968.3068

HILLSBORO-21-01-01	VICINITY MAP	
AUGUST 2013	253RD AVENUE FROM EVERGREEN TO MEEK HILLSBORO, OR	FIGURE 1

Printed By: mmiller | Print Date: 8/28/2013 2:39:20 PM .
File Name: J:\E-L\Hillsboro\Hillsboro-21\Hillsboro-21-01\Hillsboro-21-01-01-Geotechnical_Investigation_and_Report\Figures\CAD\Hillsboro-21-01-01-SP01.dwg | Layout: FIGURE 2



GeoDesign Inc 15575 SW Sequoia Parkway - Suite 100 Portland OR 97224 Off 503.968.8787 Fax 503.968.8068	HILLSBORO-21-01-01	SITE PLAN
	AUGUST 2013	253RD AVENUE FROM EVERGREEN TO MEEK HILLSBORO, OR — FIGURE 2

APPENDIX A

APPENDIX A

FIELD EXPLORATIONS

GENERAL

We explored the existing subsurface conditions along the proposed alignment by completing 11 borings (B-1 through B-11) to depths ranging between 9.0 and 26.5 feet BGS. The borings were drilled on January 10 and 11, 2013 by Dan J. Fischer Excavating, Inc. of Forest Grove, Oregon. A member of our geotechnical staff observed the explorations. We obtained representative samples of the various soil encountered in the explorations. Classifications and sampling intervals are shown on the exploration logs included in this appendix.

The approximate locations of our explorations are shown on Figure 2. The locations of the explorations were determined in the field by pacing from existing site features. This information should be considered accurate only to the degree implied by the methods used.

SOIL SAMPLING

A member of our geotechnical staff observed the explorations. We obtained representative samples of the various soil encountered in the explorations for geotechnical laboratory testing. Classifications and sampling intervals are presented on the exploration logs included in this appendix.

Soil samples were obtained from the borings using SPT sampling methods. SPTs were performed in general conformance with ASTM D 1586. The sampler was driven with a 140-pound hammer free-falling 30 inches. The number of blows required to drive the sampler 1 foot, or as otherwise indicated, into the soil is shown adjacent to the sample symbols on the exploration logs. Disturbed samples were obtained from the split barrel for subsequent classification and index testing.

SOIL CLASSIFICATION

The soil samples were classified in accordance with the "Exploration Key" (Table A-1) and "Soil Classification System" (Table A-2), which are included in this appendix. The exploration logs indicate the depths at which the soil or its characteristics change, although the change could be gradual. A horizontal line between soil types indicates an observed (visual or drill action) change. If the change occurred between sample locations and was not observed or obvious, the depth was interpreted and the change is indicated using a dashed line. Classifications and sampling intervals are presented on the exploration logs included in this appendix.

LABORATORY TESTING

CLASSIFICATION

The soil samples were classified in the laboratory to confirm field classifications. The laboratory classifications are presented on the exploration logs if those classifications differed from the field classifications.

MOISTURE CONTENT

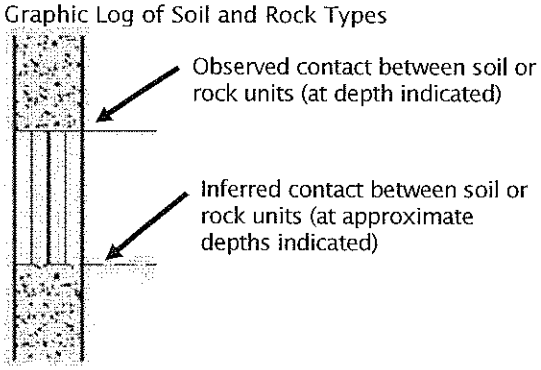
The natural moisture content of selected soil samples was determined in general accordance with ASTM D 2216. The natural moisture content is a ratio of the weight of the water to soil in a test sample and is expressed as a percentage. The test results are presented on the exploration logs included in this appendix.

ATTERBERG LIMITS TESTING

The Atterberg limits (plastic and liquid limits) were performed on selected samples in accordance with ASTM D 4318. The plastic limit is defined as the moisture content where the soil becomes brittle. The liquid limit is defined as the moisture content where the soil begins to act similar to a liquid. The plasticity index is the difference between the liquid and plastic limits. The test results are presented in this appendix.

SYMBOL	SAMPLING DESCRIPTION
	Location of sample obtained in general accordance with ASTM D 1586 Standard Penetration Test with recovery
	Location of sample obtained using thin-wall Shelby tube or Geoprobe® sampler in general accordance with ASTM D 1587 with recovery
	Location of sample obtained using Dames & Moore sampler and 300-pound hammer or pushed with recovery
	Location of sample obtained using Dames & Moore and 140-pound hammer or pushed with recovery
	Location of sample obtained using 3-inch-O.D. California split-spoon sampler and 140-pound hammer
	Location of grab sample
	Rock coring interval
	Water level during drilling
	Water level taken on date shown

Graphic Log of Soil and Rock Types



GEOTECHNICAL TESTING EXPLANATIONS

ATT	Atterberg Limits	PP	Pocket Penetrometer
CBR	California Bearing Ratio	P200	Percent Passing U.S. Standard No. 200 Sieve
CON	Consolidation		
DD	Dry Density	RES	Resilient Modulus
DS	Direct Shear	SIEV	Sieve Gradation
HYD	Hydrometer Gradation	TOR	Torvane
MC	Moisture Content	UC	Unconfined Compressive Strength
MD	Moisture-Density Relationship	VS	Vane Shear
OC	Organic Content	kPa	Kilopascal
P	Pushed Sample		

ENVIRONMENTAL TESTING EXPLANATIONS

CA	Sample Submitted for Chemical Analysis	ND	Not Detected
P	Pushed Sample	NS	No Visible Sheen
PID	Photoionization Detector Headspace Analysis	SS	Slight Sheen
		MS	Moderate Sheen
ppm	Parts per Million	HS	Heavy Sheen

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EXPLORATION KEY

TABLE A-1

RELATIVE DENSITY - COARSE-GRAINED SOILS

Relative Density	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)
Very Loose	0 - 4	0 - 11	0 - 4
Loose	4 - 10	11 - 26	4 - 10
Medium Dense	10 - 30	26 - 74	10 - 30
Dense	30 - 50	74 - 120	30 - 47
Very Dense	More than 50	More than 120	More than 47

CONSISTENCY - FINE-GRAINED SOILS

Consistency	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)	Unconfined Compressive Strength (tsf)
Very Soft	Less than 2	Less than 3	Less than 2	Less than 0.25
Soft	2 - 4	3 - 6	2 - 5	0.25 - 0.50
Medium Stiff	4 - 8	6 - 12	5 - 9	0.50 - 1.0
Stiff	8 - 15	12 - 25	9 - 19	1.0 - 2.0
Very Stiff	15 - 30	25 - 65	19 - 31	2.0 - 4.0
Hard	More than 30	More than 65	More than 31	More than 4.0

PRIMARY SOIL DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOILS (more than 50% retained on No. 4 sieve)	GRAVEL (more than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVELS (< 5% fines)	GW or GP	GRAVEL
		GRAVEL WITH FINES (≥ 5% and ≤ 12% fines)	GW-GM or GP-GM	GRAVEL with silt
			GW-GC or GP-GC	GRAVEL with clay
		GRAVELS WITH FINES (> 12% fines)	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND (50% or more of coarse fraction passing No. 4 sieve)	CLEAN SANDS (<5% fines)	SW or SP	SAND
		SANDS WITH FINES (≥ 5% and ≤ 12% fines)	SW-SM or SP-SM	SAND with silt
			SW-SC or SP-SC	SAND with clay
		SANDS WITH FINES (> 12% fines)	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS (50% or more passing No. 200 sieve)	SILT AND CLAY	Liquid limit less than 50	ML	SILT
			CL	CLAY
			CL-ML	silty CLAY
			OL	ORGANIC SILT or ORGANIC CLAY
		Liquid limit 50 or greater	MH	SILT
			CH	CLAY
			OH	ORGANIC SILT or ORGANIC CLAY
HIGHLY ORGANIC SOILS			PT	PEAT

MOISTURE CLASSIFICATION

Term	Field Test
dry	very low moisture, dry to touch
moist	damp, without visible moisture
wet	visible free water, usually saturated

ADDITIONAL CONSTITUENTS

Secondary granular components or other materials such as organics, man-made debris, etc.

Percent	Silt and Clay In: Fine-Grained Soils	Silt and Clay In: Coarse-Grained Soils	Percent	Sand and Gravel In: Fine-Grained Soils	Sand and Gravel In: Coarse-Grained Soils
< 5	trace	trace	< 5	trace	trace
5 - 12	minor	with	5 - 15	minor	minor
> 12	some	silty/clayey	15 - 30	with	with
			> 30	sandy/gravelly	Indicate %

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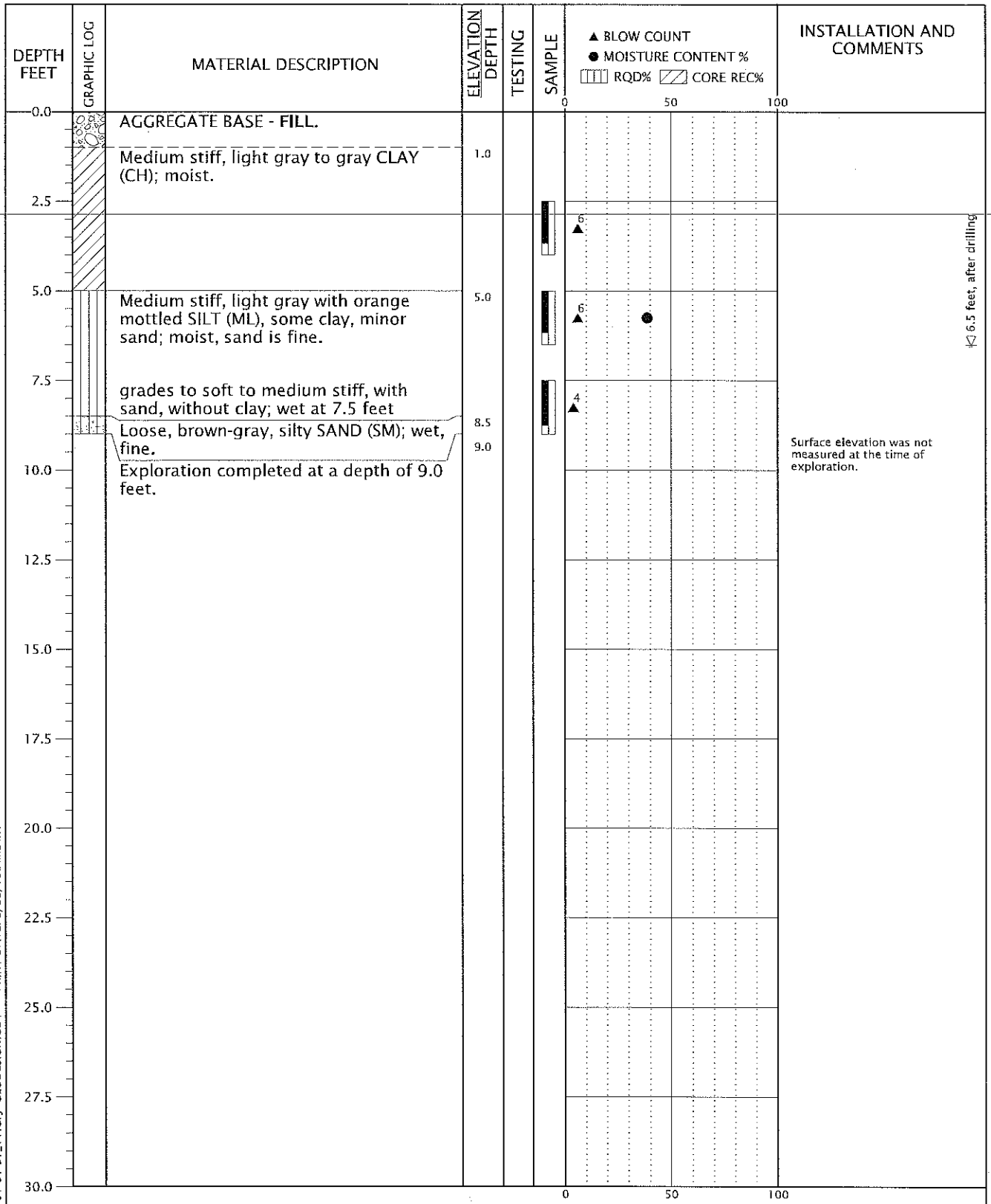
SOIL CLASSIFICATION SYSTEM

TABLE A-2



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: JGH COMPLETED: 01/10/13

BORING METHOD: solid-stem auger (see report text) BORING BIT DIAMETER: 4-inch

BORING LOG HILLSBORO-21-01-01-B1_11.GPJ GEODESIGN.GDT PRINT DATE: 8/28/13:AMD:KT

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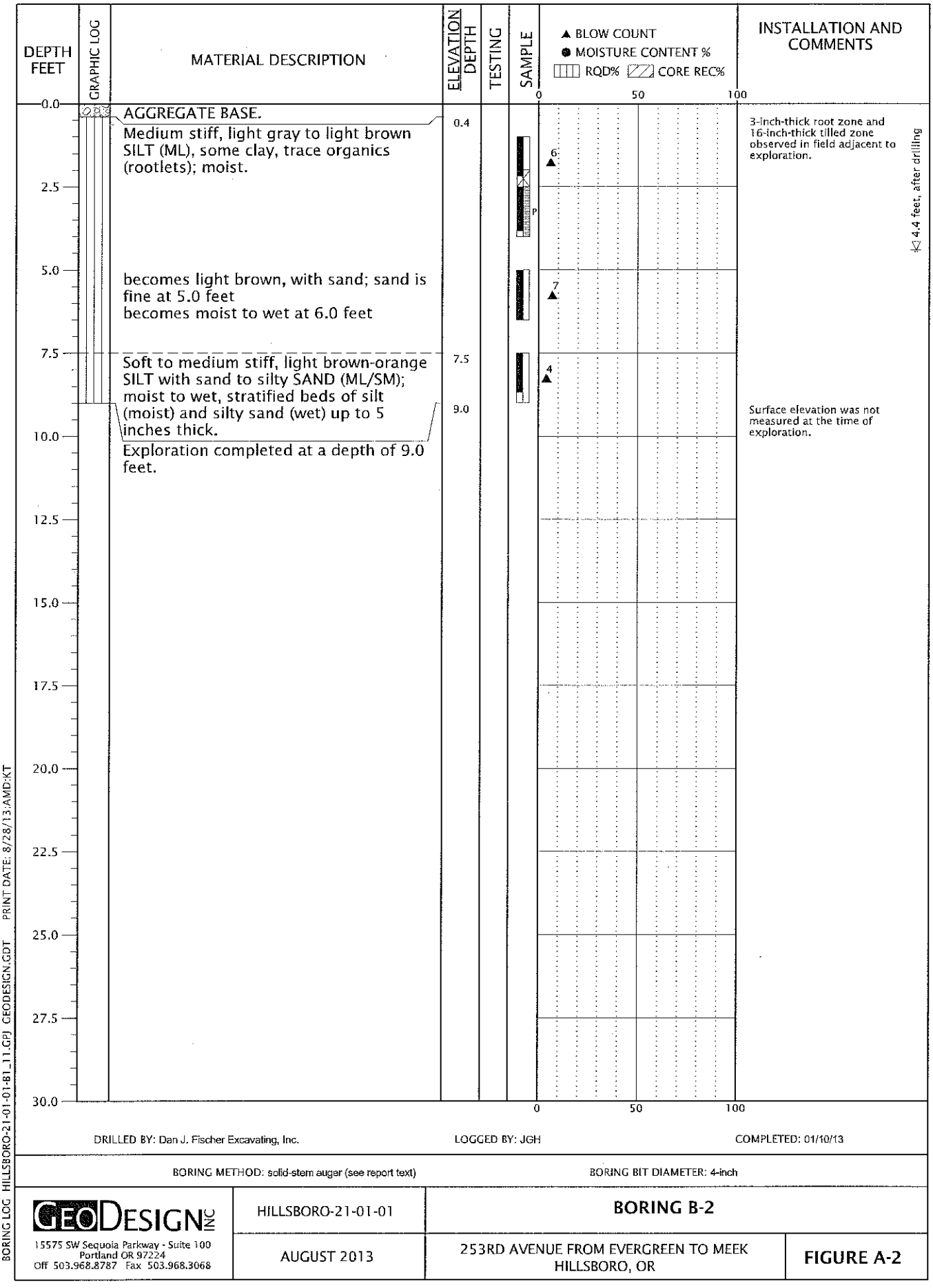
	HILLSBORO-21-01-01	**BORING B-1**
	AUGUST 2013	253RD AVENUE FROM EVERGREEN TO MEEK HILLSBORO, OR

FIGURE A-1



BORING LOG HILLSBORO-21-01-01-B1_11.GPJ GEODESIGN.GDT PRINT DATE: 8/28/13:AMD:KT

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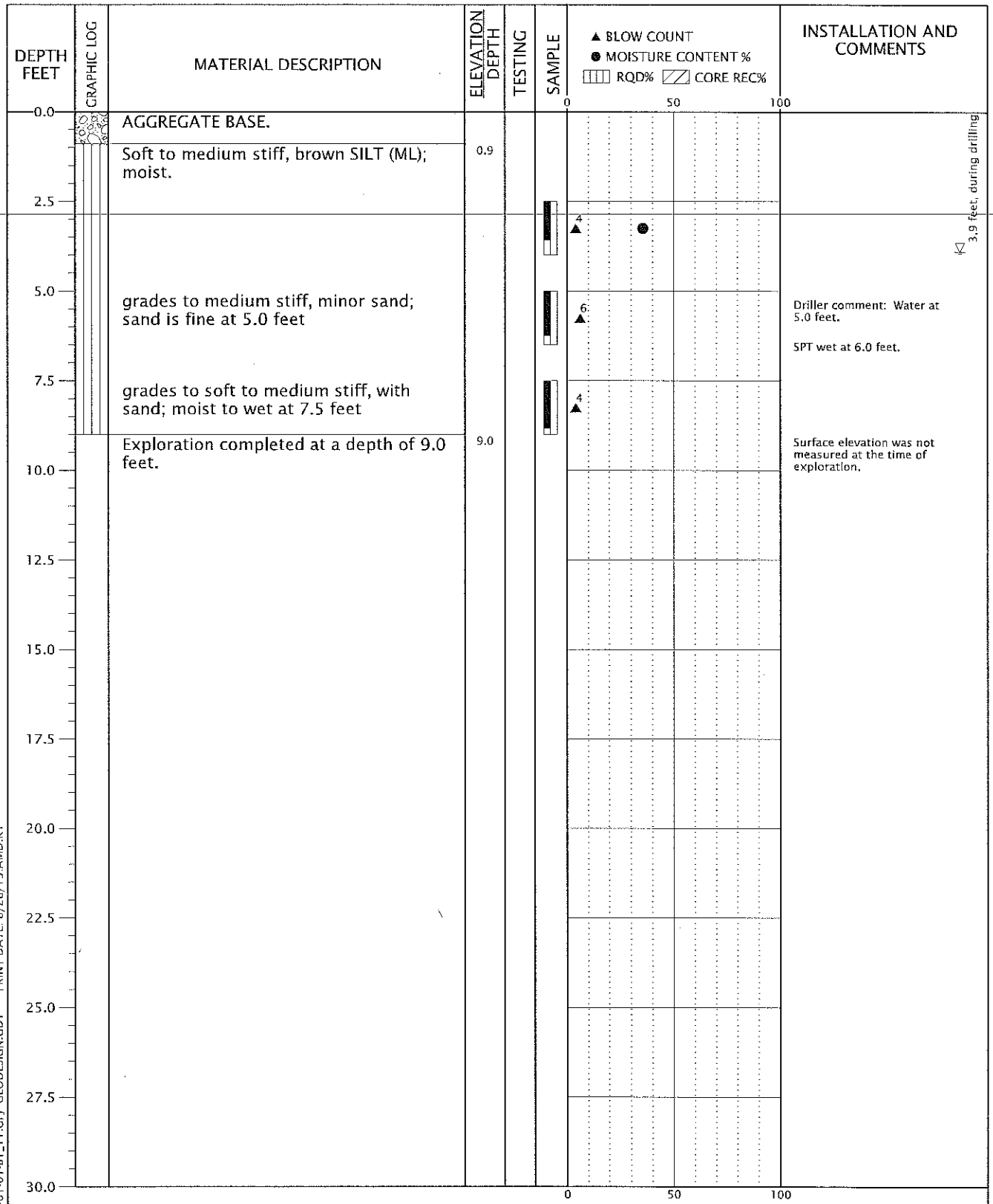
AUGUST 2013

BORING B-2

253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR

FIGURE A-2



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: JGH COMPLETED: 01/10/13

BORING METHOD: solid-stem auger (see report text) BORING BIT DIAMETER: 4-inch

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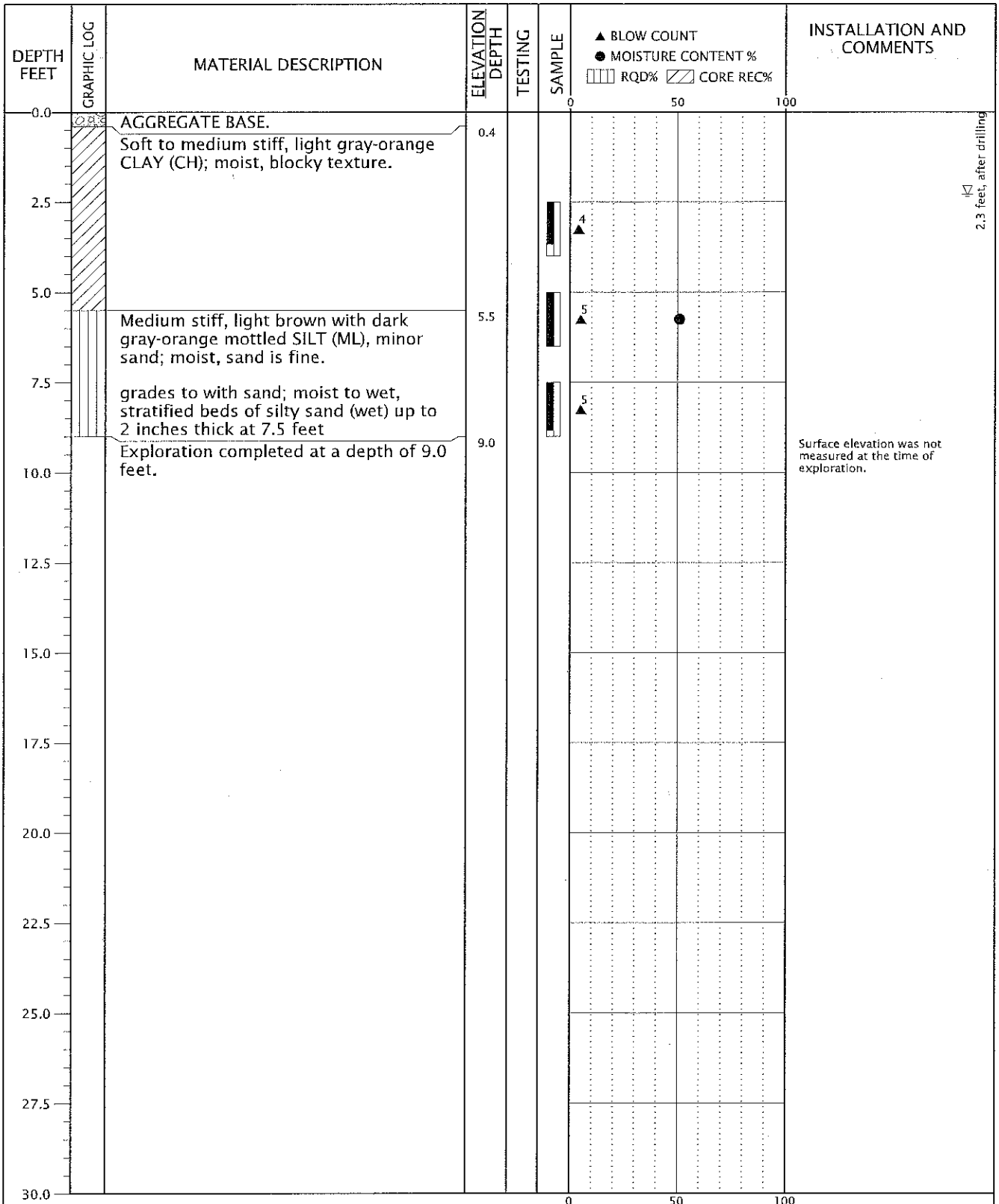
HILLSBORO-21-01-01

BORING B-3

AUGUST 2013

253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR

FIGURE A-3



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: JGH COMPLETED: 01/10/13

BORING METHOD: solid-stem auger (see report text) BORING BIT DIAMETER: 4-inch

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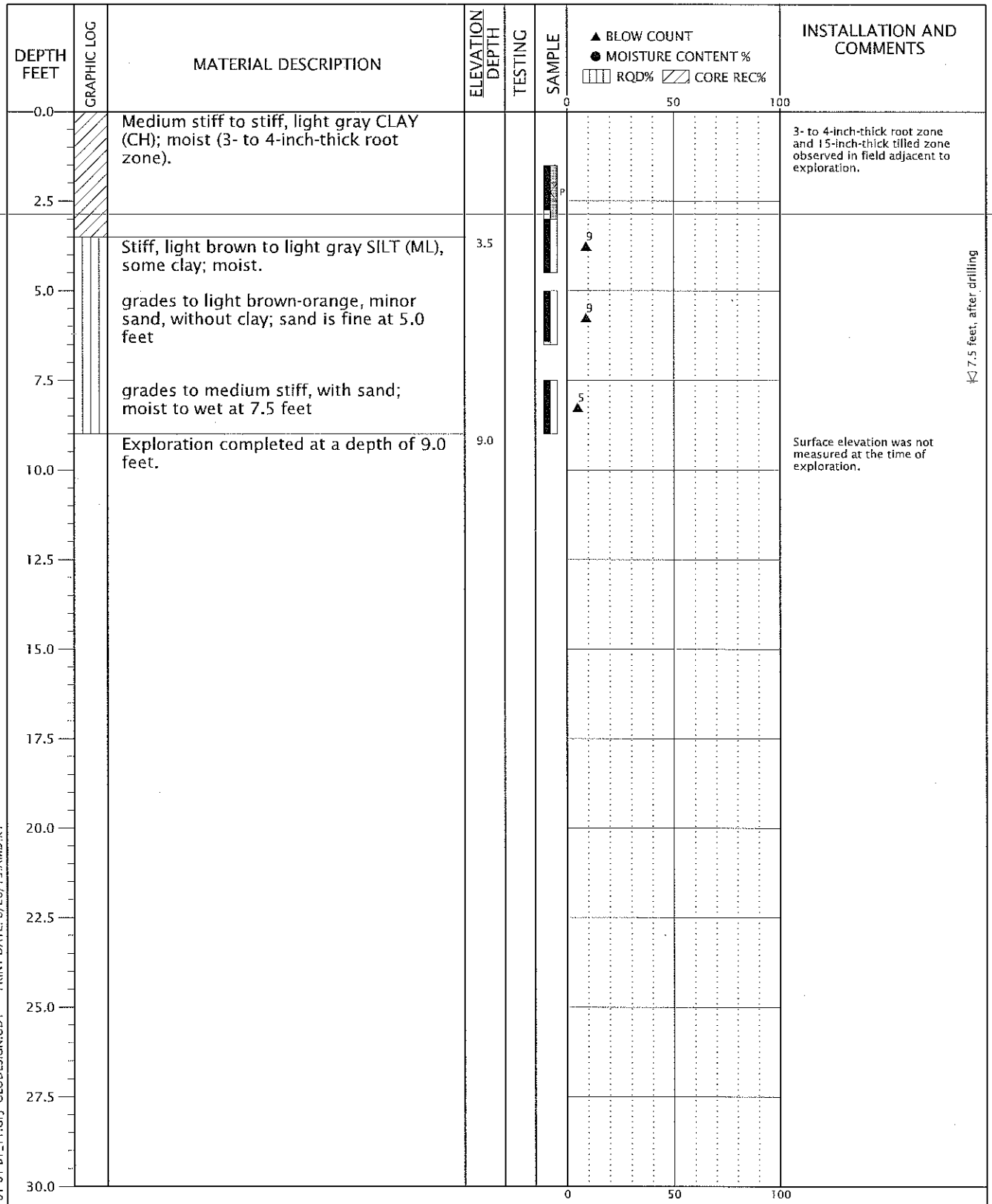
BORING B-4

253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR

FIGURE A-4

BORING LOG HILLSBORO-21-01-01-B1_11.GPJ GEODESIGN.GDT PRINT DATE: 8/28/13:AMD:KT



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: JGH COMPLETED: 01/10/13

BORING METHOD: solid-stem auger (see report text) BORING BIT DIAMETER: 4-inch

BORING LOG HILLSBORO-21-01-01-B1_11.GPJ GEODESIGN.GDT PRINT DATE: 8/28/13:AMD:KT

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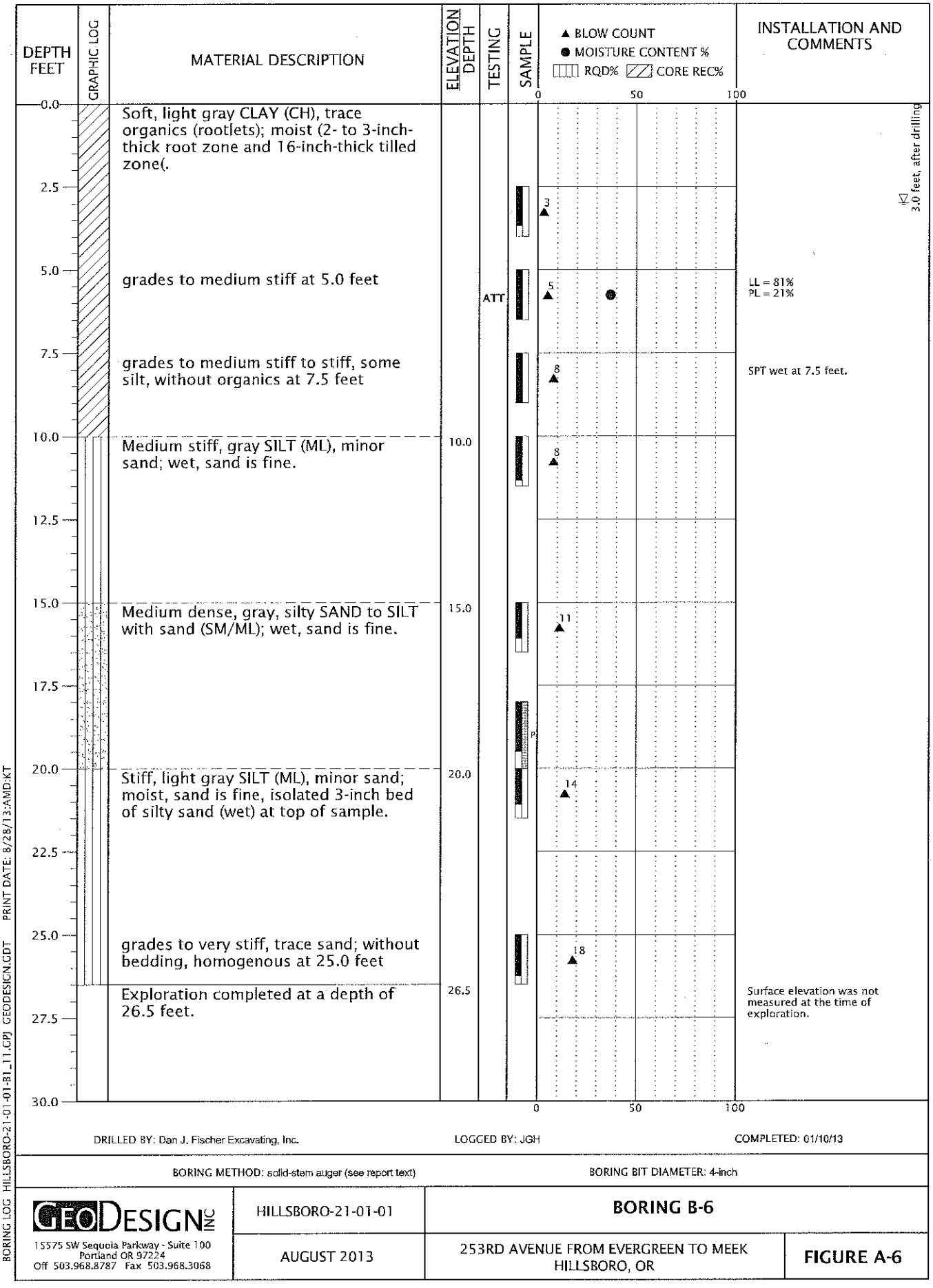
BORING B-5

AUGUST 2013

253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR

FIGURE A-5



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BORING METHOD: solid-stem auger (see report text) BORING BIT DIAMETER: 4-inch

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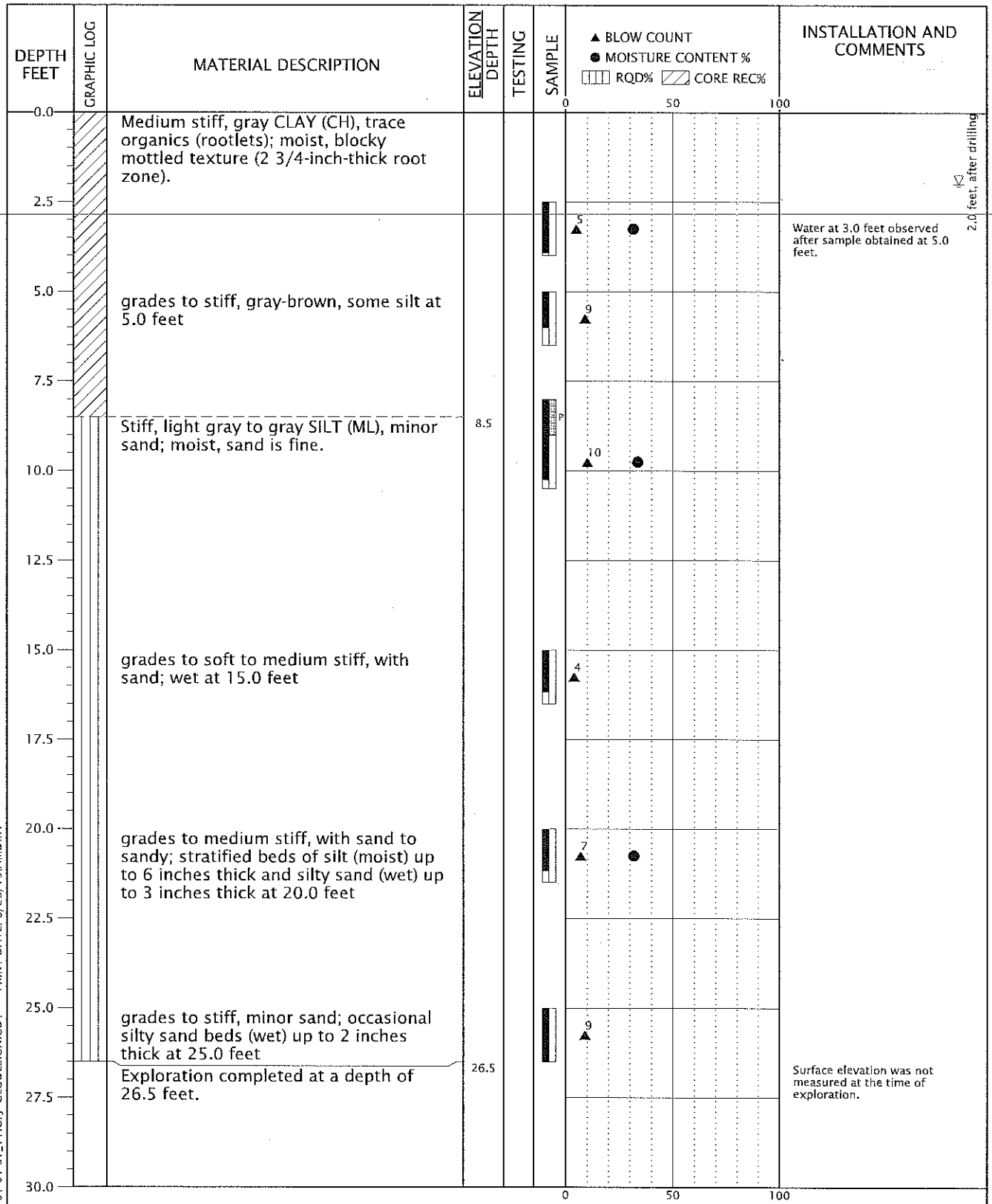
BORING B-6

253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR

FIGURE A-6

BORING LOG HILLSBORO-21-01-01-B1_11.GPJ GEODESIGN.GDT PRINT DATE: 8/28/13:AMD:KT



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: JGH COMPLETED: 01/11/13

BORING METHOD: solid-stem auger (see report text) BORING BIT DIAMETER: 4-inch

BORING LOG HILLSBORO-21-01-01-B1_11.GPJ GEODESIGN.CDT PRINT DATE: 8/28/13:AMD:KT

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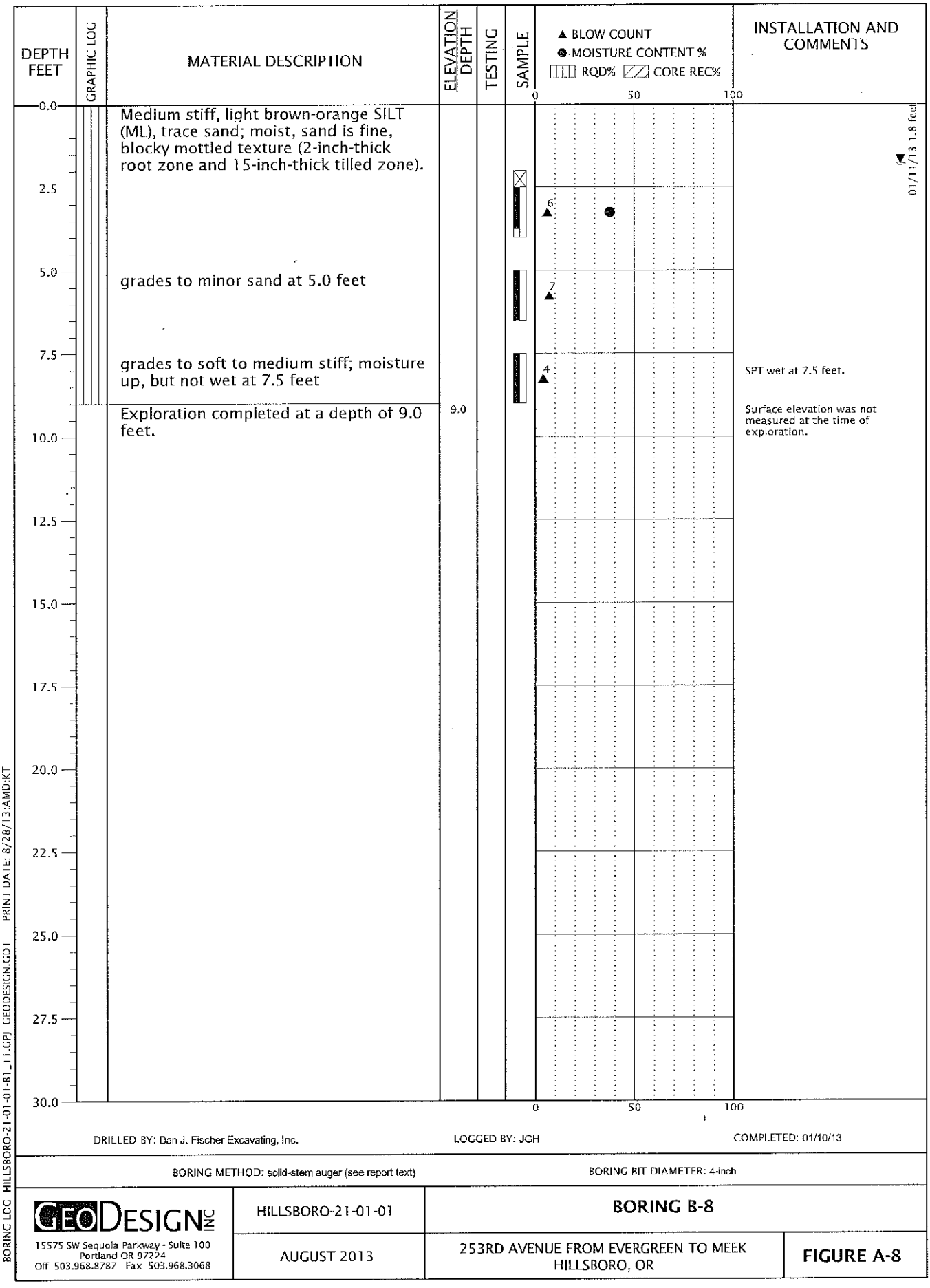
HILLSBORO-21-01-01

BORING B-7

AUGUST 2013

253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR

FIGURE A-7


DEPTH FEET
GRAPHIC LOG
MATERIAL DESCRIPTION
ELEVATION DEPTH
TESTING
SAMPLE
▲ BLOW COUNT
● MOISTURE CONTENT %
RQD% CORE REC%
0
50
100
INSTALLATION AND COMMENTS
Medium stiff, light brown-orange SILT (ML), trace sand; moist, sand is fine, blocky mottled texture (2-inch-thick root zone and 15-inch-thick tilled zone).
grades to minor sand at 5.0 feet
grades to soft to medium stiff; moisture up, but not wet at 7.5 feet
Exploration completed at a depth of 9.0 feet.
9.0
6
7
4
01/11/13 1.8 feet
SPT wet at 7.5 feet.
Surface elevation was not measured at the time of exploration.
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
22.5
25.0
27.5
30.0
DRILLED BY: Dan J. Fischer Excavating, Inc.
LOGGED BY: JGH
COMPLETED: 01/10/13
BORING METHOD: solid-stem auger (see report text)
BORING BIT DIAMETER: 4-inch
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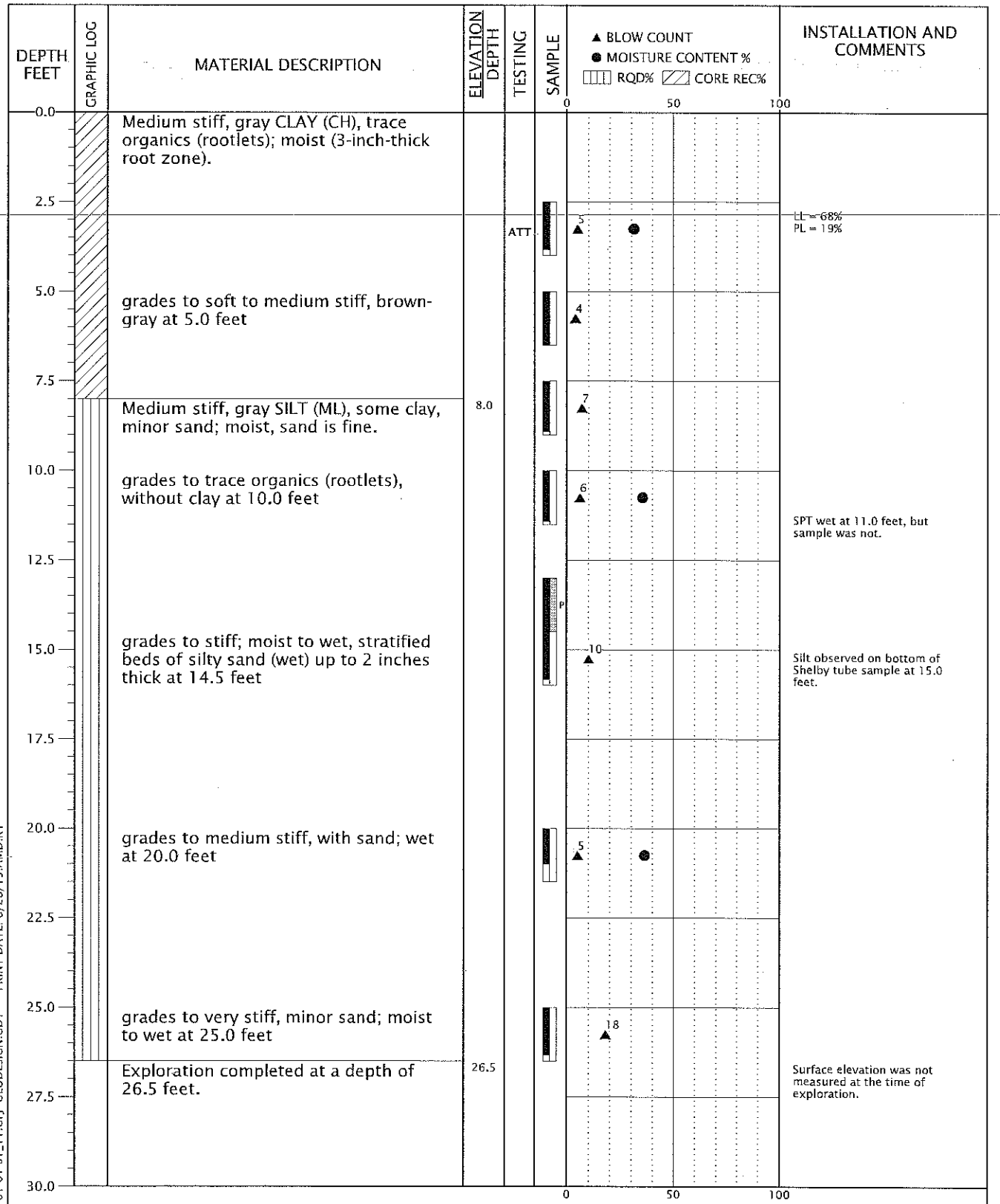
HILLSBORO-21-01-01
BORING B-8
AUGUST 2013
253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR
FIGURE A-8
BORING LOG HILLSBORO-21-01-01-B1_11.GPJ GEODESIGN.GDT PRINT DATE: 8/28/13:AMD:KT



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: JGH COMPLETED: 01/11/13

BORING METHOD: solid-stem auger (see report text) BORING BIT DIAMETER: 4-inch

BORING LOG HILLSBORO-21-01-01-B1_11.GPJ GEODESIGN.GDT PRINT DATE: 8/28/13:AMD:KT

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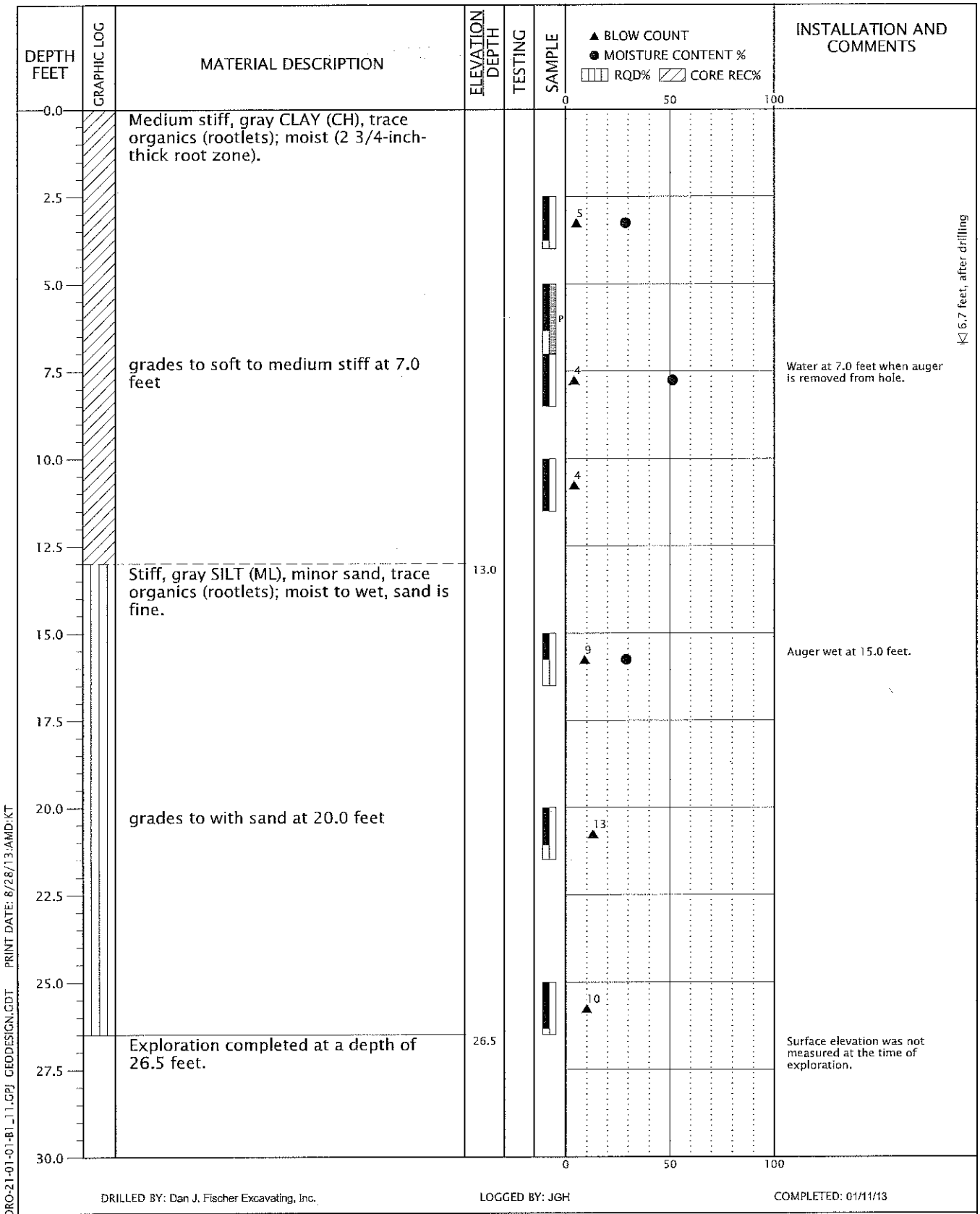
BORING B-9

AUGUST 2013

253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR

FIGURE A-9



BORING LOG HILLSBORO-21-01-01-B1_11.GPJ GEDDESIGN.GDT PRINT DATE: 8/28/13:AMD:KT

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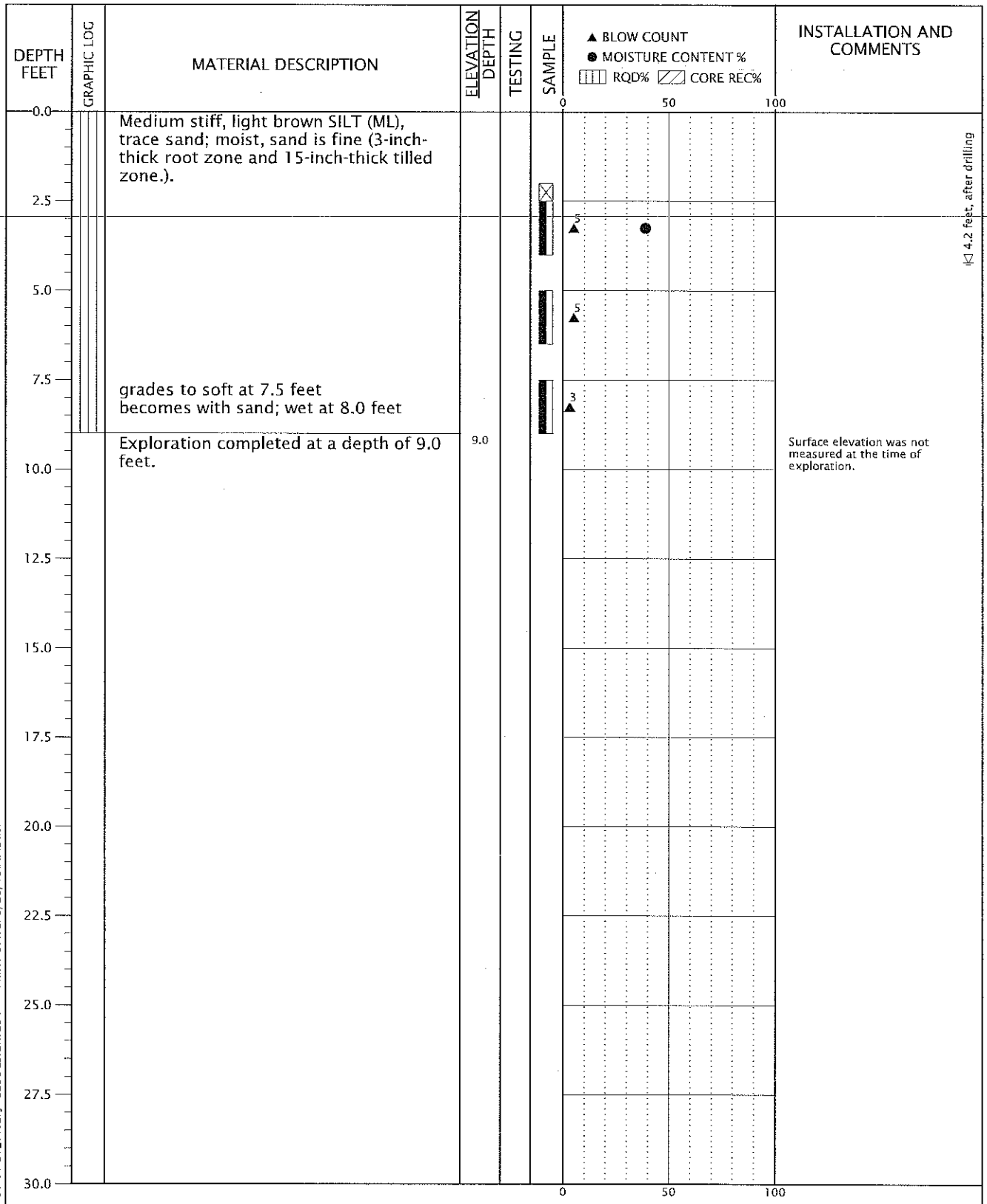
HILLSBORO-21-01-01

AUGUST 2013

BORING B-10

253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR

FIGURE A-10



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: JGH COMPLETED: 01/11/13

BORING METHOD: solid-stem auger (see report text) BORING BIT DIAMETER: 4-inch

BORING LOG HILLSBORO-21-01-01-B1_11.GPJ GEODESIGN.GDT PRINT DATE: 8/28/13:AMD:KT

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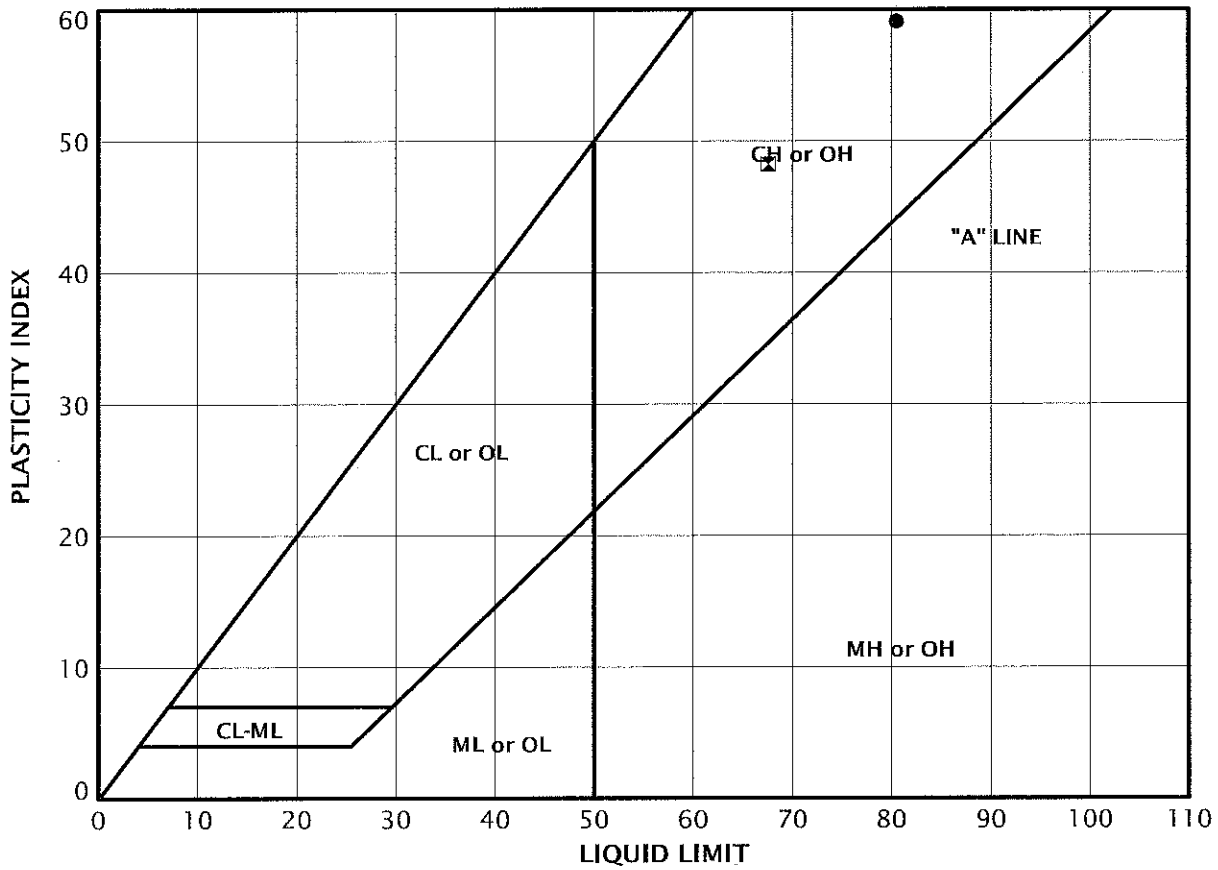
BORING B-11

253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR

FIGURE A-11



KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
●	B-6	5.0	37	81	21	60
⊠	B-9	2.5	31	68	19	49

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HILLSBORO-21-01-01

ATTERBERG LIMITS TEST RESULTS

AUGUST 2013

253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR

FIGURE A-12

SAMPLE INFORMATION			MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)			GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT (PERCENT)	PLASTIC LIMIT (PERCENT)	PLASTICITY INDEX (PERCENT)
B-1	5.0		39							
B-3	2.5		35							
B-4	5.0		51							
B-6	5.0		37					81	21	60
B-7	2.5		32							
B-7	9.0		34							
B-7	20.0		32							
B-8	2.5		38							
B-9	2.5		31					68	19	49
B-9	10.0		35							
B-9	20.0		36							
B-10	2.5		29							
B-10	7.0		51							
B-10	15.0		29							
B-11	2.5		39							

LAB SUMMARY HILLSBORO-21-01-01-B1_11.GPJ GEODESIGN.GDT PRINT DATE: 8/28/13:KT

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HILLSBORO-21-01-01

AUGUST 2013

SUMMARY OF LABORATORY DATA

253RD AVENUE FROM EVERGREEN TO MEEK
HILLSBORO, OR

FIGURE A-13

APPENDIX B

APPENDIX B

PCC PAVEMENT DESIGN INPUTS AND RESULTS

Pavement Type	JPCP	
18-Kip ESALs Over Initial Performance Period (million)	3.5	million
Initial Serviceability	4.5	
Terminal Serviceability	2.5	
28-Day Mean PCC Modulus of Rupture	650	psi
Elastic Modulus of Slab	3,600,000	psi
Elastic Modulus of Base	25,000	psi
Mean Effective k-Value	50	psi/inch
Reliability Level	90	%
Overall Standard Deviation	0.4	
Calculated Design Thickness	**8.77**	inch

Temperature Differential

Mean Annual Wind Speed	7.9	mph
Mean Annual Air Temperature	53.6	°F
Mean Annual Precipitation	36.3	inch
Maximum Positive Temperature Differential	**7.26**	°F

30-Year Faulting

Doweled

Dowel Diameter	1.25	inch
Drainage Coefficient	0.80	
Cement-Stabilized Base		
Average Fault for Design Years with Design Inputs	**0.06**	inch
Criteria Check	**PASS**	

APPENDIX C

APPENDIX C

AC PAVEMENT DESIGN INPUTS AND RESULTS

Pavement Type	AC	
18-Kip ESALs Over Initial Performance Period (million)	2.5	million
Initial Serviceability	4.2	
Terminal Serviceability	2.5	
New Asphalt Concrete Layer Coefficient	0.42	
New Aggregate Base Layer Coefficient	0.10	
New Aggregate Base Drainage Coefficient	1.0	
Cement-Treated Sub base Layer Coefficient	0.08	
Elastic Modulus of Aggregate Base	20,000	psi
Subgrade Resilient Modulus	3,500	psi
Reliability Level	90	%
Overall Standard Deviation	0.45	
Calculated Required Structural Number	**5.35**	
Calculated Minimum AC Thickness for Fatigue	**6.79**	inches

ACRONYMS

ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
AC	asphalt concrete
AOS	apparent opening size
ASTM	American Society for Testing and Materials
BGS	below the ground surface
ESAL	equivalent single-axle load
FHWA	Federal Highway Administration
H:V	horizontal to vertical
MHMAC	minor hot mix asphalt concrete
mph	miles per hour
OSHA	Occupational Safety and Health Administration
OSSC	Oregon Standard Specifications for Construction (2008)
OWRD	Oregon Water Resources Department
PCC	portland cement concrete
pcf	pounds per cubic foot
psf	pounds per square foot
psi	pounds per square inch
SPT	standard penetration test

GEODESIGN INC

Memorandum

To:	Ralph Henderson, P.E.	From:	Krey D. Younger, P.E., G.E.
Company:	Mackenzie	Date:	April 29, 2015
Address:	1515 SE Water Avenue, Suite 100 Portland, OR 97293		

cc:	Charlie Shell, City of Hillsboro (via email only)

GDI Project:	Hillsboro-21-01
RE:	Addendum 1 NW 253rd Avenue from NW Evergreen Road to Meek Road Review of the 100 Percent Design Plan and Profile

INTRODUCTION

The purpose of this addendum is to provide information related to the pavement section and grades as shown on the 100 percent design plan and profile files provided by Mackenzie. We completed our geotechnical report[1] for the project on August 28, 2013.

BACKGROUND

For reference, the design pavement section listed in our geotechnical report is based on the current version of the City of Hillsboro Design and Construction standards Section 215 (City standards), latest edition as of April, 29 2015. The pavement section and cement-amended subgrade is constrained by joint faulting requirements and the need for a "stabilized base" pursuant to the City standards design life and the 1998 AASHTO pavement design supplemental. The pavement recommended in our geotechnical report (Section 7.3) is as follows:

- 9.0 inches of portland cement concrete (PCC)
- 4.0 inches of aggregate base
- 14.0 inches of cement-amended subgrade
- 1¼-inch dowels, 18 inches long, 12 inches on centers
- Maximum joint spacing of 16 feet transverse and longitudinal

Another option for a "stabilized base" is to use asphalt concrete (AC) as a layer beneath the PCC as shown in the City standards.

- 9.0 inches of PCC (1¼-inch dowels, 18 inches long, 12 inches on centers)
- 4.0 inches of Level 2, ½-inch dense AC pavement
- 4.0 inches of aggregate base

[1] GeoDesign, Inc. *Report of Geotechnical Engineering Services; NW 253rd Avenue from NW Evergreen Road to Meek Road; Hillsboro, Oregon,* dated August 28, 2013. GeoDesign Project: Hillsboro-21-01-01

- 18.0 inches of stabilization aggregate
- Maximum joint spacing of 16 feet transverse and longitudinal

We are aware that the City is interested in re-using as much of the existing gravel road on the south side of the project as possible. In all conditions, it is our opinion that using cement to stabilize the base/subgrade will be the most efficient construction method and that the existing roadbed should be incorporated into the amendment section where applicable. In addition, as indicated in our geotechnical report, the amount of cement needed for adequate amendment may be increased due to factors such as moisture or agriculturally modified soil. Regardless of the "stabilized base" condition selected, subgrade evaluation according to City standards and our report Section 4.1.3 is recommended.

PLAN AND PROFILE COMMENTS

We compared the plan and profile information to the pavement design and considered the following factors:

- Design pavement section
- Cut or fill conditions along the alignment
- Conditions at existing grades

Our comments below are based on grouping based on existing grade and cut/fill conditions. Our comments include the relevant stations from the 100 percent plan and profile, the at-grade condition on the west and east sides of the road, and the approximate cut and fill and grade condition at the centerline. Stations listed should be considered approximate.

Station 10+00 to Station 17+50 (old 253rd gravel road mostly on east side of new alignment)

- Edge Condition West: Road over old ditch line. Ditch will need to be filled. Width varies. Edge may encroach on or be near agricultural zones.
- Centerline Condition: Fill of between 2 and 3 feet.
- Edge Condition East: Edge of PCC paving is near the edge of current gravel road.
- Cement amendment of fill recommended to meet "stabilized base" condition.

Station 17+50 to Station 21+50 (old 253rd gravel road mostly on east side of new alignment, limited fill)

- Edge Condition West: Road over old ditch. Ditch will need to be filled. Width varies. Edge may encroach on or be near agricultural zones.
- Centerline Condition: Fill of approximately 1 to 2 feet. Current grade is near future subgrade elevation.
- Edge Condition East: Edge of PCC paving is near the edge of current gravel road.
- Cement amendment recommended for ease of construction, to remove any defects, and to help bridge across edge conditions at ditch. Existing road grade can be incorporated into cement amendment. May require removal of larger (3 inches plus) material.

Station 21+50 to Station 33+50 (old 253rd gravel road mostly on west side of new alignment, cut limited)

- Edge Condition West: Edge of PCC paving is near the edge of current gravel road.
- Centerline Condition: Future paving grade is near current existing grade. Will require cut to get to subgrade depth.
- Edge Condition East: Edge of PCC paving is outside of old ditch. Ditch will need to be filled. Edge may encroach on or be near agricultural zones.
- Cement amendment recommended to reduce total excavation quantities and to help bridge difference between potential gravel that may remain after cut in old roadbed and differing edge conditions to east.

Station 33+50 to Meek Road (alignment shifts off old gravel surface and into agricultural/disturbed conditions; two channels requiring filling shown within this section)

- Edge Condition West: Variable, agricultural assumed.
- Centerline Condition: Future paving grade is near current existing grade. Will require cut to get to subgrade depth.
- Edge Condition East: Variable, agricultural assumed.
- Cement amendment recommended due to agricultural conditions and to reduce total excavation amount.

Fill channel 1:

Station 44+50 to Station 49+00

- Creek Crossing: Fill conditions variable. Cement amendment at top of fill recommended.

Fill channel 2:

Station 53+00 to Station 60+00

- Creek Crossing: Fill conditions variable. Cement amendment at top of fill recommended.

KDY:GPS:kt

One copy submitted (via email only)

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