



PALANISAMI & ASSOCIATES, INC.
CONSULTING ENGINEERS

BID DOCUMENTS

PROJECT: LIBRARY PARKING RAMP - VEHICLE BARRIERS

Duluth, Minnesota

PAI Project No. 14118

DATE: September 16, 2014

OWNER: The City of Duluth

STRUCTURAL ENGINEER: **PALANISAMI & ASSOCIATES, INC.**
306 W. Superior Street Suite 604
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218 820-7534

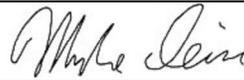
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PAI PROJECT MANAGER: Mike Deiss, P.E.
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CERTIFICATION

I hereby certify that this plan, specifications, or report was prepared by me or under my direct supervision and that I am a licensed Professional Engineer under the laws of the State of

Minnesota



Michael L. Deiss, P.E.

Reg. No. 26604

Date: September 16, 2014

LIBRARY PARKING RAMP-VEHICLE BARRIERS

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05 12 00 – STRUCTURAL STEEL

PART ONE - GENERAL

1.01 SECTION INCLUDES

- A. Bidding Requirements, Conditions of the Contract and pertinent portions of Sections in Division One of these Specifications apply to the Work of this Section as fully as though repeated herein.
- B. The Work to be done under this Section includes all labor materials, services and equipment necessary to the proper completion of all structural steel and miscellaneous steel framing and components as shown on the drawings and as specified herein.

1.02 QUALITY ASSURANCE

- A. Reference Specifications
 1. American Institute of Steel Construction (AISC) "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings," adopted November 1, 1978.
 2. AISC "Code of Standard Practice", adopted September 1, 1976.
 3. American Welding Society (AWS) "Structural Welding Code", D1.1-86.
 4. AASHTO

1.03 QUALITY CONTROL

- A. All shop and field welding shall be done by personnel qualified according to Section 5 of the AWS D1.1-83.

1.04 SUBMITTALS

- A. Shop Drawings
 1. Prepare complete shop and setting drawings based on current AISC Specifications for approval by Architect/Engineer prior to fabricating the work.
 2. Shop drawings shall include all information necessary for the fabrication of the component parts of the structure. They shall indicate size and weight of members, type and location of shop and field connections, the welding symbols used on shop drawings shall be as adopted by the American Welding Society.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store off ground in manner that will prevent rust damage. Repair or replace all damaged steel to "as fabricated" condition.

1.06 MEASUREMENTS

- A. The Contractor shall verify all dimensions given on the drawings and shall make such field measurements as are necessary to lay out the work properly and assure proper fit and proper elevations.
- B. The Contractor shall be fully responsible for accuracy of all measurements and laying out of all the work.

1.07 DAMAGE TO MATERIALS

- A. The Contractor shall use care in storing, handling and erecting all materials and shall support same properly at all times to insure that no piece will be bent, twisted or otherwise injured. Material damage due to carelessness of the Contractor shall be corrected at the Contractor's expense, to the approval of the Architect/Engineer before being erected.

PART TWO - PRODUCTS

2.01 MATERIALS

- A. W-Shapes: A992 Grade 50.
Structural Steel Angles, Plates, Channels: ASTM A36 or as noted on drawings.
- C. Welding Electrodes and Fluxes: Conform to AISC 1.4.5 and its referenced AWS Specifications, except see Section 1.03 of these specifications for quality control.
- D. Threaded Rod: ASTM F1554 Grade 36.
- E. Nuts: ASTM A536A
- F. Washers: F436.
- G. All steel fabrications, bolts, threaded rods, nuts, and washers shall be hot-dipped galvanized per ASTM A123 and section 2.03.
- H. Guardrail: W-beam guardrail per AASHTO Specification M-180, Class B - 10 gauge (0.135" nominal thickness), Type 2 zinc-coated 3.6 oz./SF, furnished in standard 12'-6" or 25'-0" lengths. End treatments meeting same specification as shown on the drawings.
- I. Galvanizing repair paint: High zinc dust content paint for re-galvanizing welds in galvanized steel, 90 percent zinc dust by weight. Sherwin-Williams, Zinc Clad 5 or equivalent product approved prior to bid.
- J. High-strength threaded fasteners: Heavy hexagon structural bolts and nuts, hardened washers; quenched and tempered medium-carbon steel bolts, nuts, and washers, complying with ASTM A325. Where indicated as galvanized, provide units that are hot-dip galvanized per ASTM A153.

2.02 FABRICATION

- A. Fabricate structural steel in accordance with Section 1.23 "AISC" reference specifications.
- B. No substitution of section or modification of detail shall be made except upon written approval of the Structural Engineer. Sections shall be full length pieces between connections or splices indicated on the drawings. No built-up lengths will be permitted. No warped or damaged sections shall be used.
- C. Do bracing, blocking, cutting, fitting, drilling, tapping, welding, punching, etc., as may be required to complete work and to join work of others. Weld clip angles and plates to beams and punch holes for fastening work of other trades as shown on drawings.
- E. Furnish all steel shown on structural drawings unless noted otherwise.

2.03 HOT-DIPPED GALVANIZED STEEL

- A. All exposed steel including all fasteners, bolts, nuts, washers, etc. designated as galvanized on the drawings shall be hot-dipped galvanized per the following reference standards:
 - 1. American Society for Testing and Materials (ASTM):
 - A 123 / A 123M Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - A 143 Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 - A 153 / A 153M Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - A 384 Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
 - A 385 Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
 - A 780 Repair of Damaged Hot-Dip Galvanized Coatings
- B. Fabrication Requirements:
 - 1. Fabricate structural steel in accordance with Class I, II, III guidelines as described in AGA's Recommended Details for Galvanized Structures.

2. Fabrication practices for products to be in accordance with the applicable portions of ASTM A 143, A 384, and A 385, except as specified herein. Avoid fabrication techniques that could cause steel distortion or embrittlement.
3. The Fabricator and Contractor shall notify the Engineer and hot-dip galvanizer regarding potential concerns, including handling issues, during the galvanizing process that may require design modification before fabrication proceeds.
4. Remove all welding slag, splatter, anti-splatter compounds and burrs prior to delivery.
5. Provide holes and/or lifting lugs to allow for handling during galvanizing.
6. Avoid unsuitable marking paints. Consult with the galvanizer about removal of grease, oil, paint and other deleterious material prior to fabrication.
7. Remove by blast-cleaning, or other methods, surface contaminants and coatings that are not removable by the normal chemical cleaning process in the galvanizing operation.
8. Surface Preparation: Pre-clean steel work in accordance with accepted methods to produce an acceptable surface for quality hot-dip galvanizing.

C. Coating Application

1. Galvanize steel members, fabrications and assemblies after fabrication by the hot-dip process in accordance with ASTM A 123 / 123M.
2. Galvanize bolts, nuts, washers and iron and steel hardware components in accordance with ASTM A 153 / 153M.
3. Safeguard products against steel embrittlement in conformance with ASTM A 143.
4. Handle all articles to be galvanized in such a manner as to avoid any mechanical damage and to minimize distortion.

D. Coating Requirements

1. Conform to paragraph 6.1 of ASTM A 123 / 123M, Table 1 of ASTM A 153 / 153M.
2. Surface Finish: Continuous, adherent, as smooth and evenly distributed as possible and free from any defect detrimental to the stated end use of the coated article.
3. Adhesion: Withstand normal handling consistent with the nature and thickness of the coating and normal use of the article.

E. Tests

1. Inspection and testing of hot-dip galvanized coatings shall be done under the guidelines provided in the AGA publication Inspection of Products Hot-dip Galvanized After Fabrication.
2. Include visual examination and tests in accordance with ASTM A 123 / 123M, A 153 / 153M to determine the thickness of the zinc coating on the metal surface.
3. Furnish notarized Certificate of Compliance with ASTM standards and specifications herein listed. The Certificate must be signed by the galvanizer and contain a detailed description of the material processed. The Certificate shall include information as to the ASTM standard used for the coating.

F. Repair of Damaged Coating

1. The maximum area to be repaired is defined in accordance with ASTM A 123 / 123M, section 6.2, current edition.
2. The maximum area to be repaired in the field shall be determined in advance by mutual agreement between parties.
3. Repair areas damaged by welding, flame cutting or during handling, transport or erection by one of the approved methods in accordance with ASTM A 780 whenever damage exceeds 3/16" in width. Minimum thickness requirements for the repair are those described in ASTM A123 / 123M, Section 6.2, current edition.

3.01 ERECTION

- A. Erect steel members to the tolerances outlined in the AISC Code of Standard Practice.
- B. Provide temporary support of Structural Steel in accordance with AISC Code of Standard Practice and have temporary support in place until final support is constructed.
- C. Contact surfaces shall be free from dirt, oil, loose scale, burrs, pits, paint and other defects that would prevent solid seating of parts.
- D. Cutting of steel or enlargement of holes shall not be permitted without approval of the Structural Engineer.
- E. Shim and level base plates and bearing plates to be grouted with steel shims or leveling nuts and washers.
- F. Field welding shall conform to AISC 1.4.5 and is referenced AWS Specifications, except see Section 1.03 of these specifications for quality control. Do no welding below 0 degrees F. Pre-heat material to be welded and maintain interpass temperatures as required. All field welding shall be done by welders certified for the applicable welding position.

END OF SECTION

07 92 00 - SEALANT

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. The Conditions of the Contract and Division 1 as indexed apply to this Section.
- B. Work in this Section shall include, but not be limited to, furnishing all materials, labor and equipment necessary to remove existing sealant, prepare joints and install sealant for new and existing floor cracks, expansion and control joints (vertical and horizontal), and cove sealant, between similar and dissimilar materials (concrete, masonry, and metal), as indicated on the drawings. The work also includes protecting existing signage, structures, etc., inside the work zones, and protecting adjacent areas from damage during the removal and installation process.

1.02 RELATED WORK

- A. Section 03 74 00 – Concrete Repair

1.03 QUALITY ASSURANCE

- A. Joint sealants are required to establish and maintain waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging indicated for each application. The work shall be done by a Contractor with a minimum of five years experience and who has successfully completed at least five jobs of similar scope in the past five years.

1.04 SUBMITTALS

- A. Submit the following:
 - 1. Manufacturer's Literature: Materials description, standard color charts and installation instructions for each compound and filler.
 - 2. Samples: Samples of each compound and filler for color selection.
 - 3. Written certification that all sealant and primers are compatible with the concrete, patch materials, sealers and traffic deck coatings specified.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Handle and store sealant material at the job site in such a manner as to prevent damage. Packaged material shall be in original containers with seals unbroken and labels intact until time of use. Wrapped or bundled material shall bear the name of the manufacturer and the product. Damaged or otherwise unsuitable material, when so ascertained, shall be immediately removed from the job site.

1.06 WARRANTY

- A. Contractor shall submit a written warranty, signed by the manufacturer and installer, that all installed sealant will remain in serviceable, water tight adhesive condition for a period of three (3) years from completion of the project. Any defects during the warranty period shall be rectified by Contractor without extra cost.

PART 2 - PRODUCTS

2.01 ACCEPTABLE PRODUCTS

- A.
 - 1. Multi-Component Non-sag Polyurethane Sealant:
 - SikaFlex-2C NS of SIKA
 - Sonolastic NP2 of Sonneborn
 - or equivalent product submitted by bidder and approved by Engineer prior to bid
 - 2. Multi-Component Self-Leveling Polyurethane Sealant:
 - SikaFlex 2C SL of SIKA
 - Sonolastic SL 2 of Sonneborn

or equivalent product submitted by bidder and approved by Engineer prior to bid

- B. Joint Primers: Provide the type recommended by the sealant manufacturer for the substrates indicated where required for proper sealant adhesion or as shown on the contract documents. All surfaces to receive sealant shall be primed.
- C. Plastic Foam Joint Filler (Backer Rod): Flexible open cell or non-gassing closed cell polyethylene foam as recommended by the sealant manufacturer.
- D. Bond Breaker Type: Polyethylene tape or other plastic tape as recommended by the sealant manufacturer for preventing sealant from adhering to surfaces which will result in the sealant joint failure.
- E. Cleaners: Provide non staining, chemical cleaners of the type recommended by the sealant manufacturer. Cleaners shall not affect sealant bond or be harmful to adjacent materials.

PART 3 - EXECUTION

3.01 INSPECTION

- A. The installer must examine the existing floor cracks, control joints, juncture of new concrete surface with old concrete surface, and all other locations in which sealant work is to be performed.
- B. Notify the Engineer in writing of conditions detrimental to proper execution of work. Proceed with work only after all detrimental conditions are corrected.

3.02 PREPARATION

- A. Clean the joint surfaces by sand-blasting or other method acceptable to the product manufacturer. Except as otherwise approved by the manufacturer, sealant shall not be applied to joint surfaces previously treated with paint, lacquer, sealer, curing compound, water repellent or other coatings, unless coatings have been entirely removed.
- C. Prime surfaces in accordance with the instructions of the sealant manufacturer.
- D. Install bond breakers in locations and of type recommended by the sealant manufacturer to prevent bond of sealant to surfaces where such bond might impair the performance of the sealant.

3.03 INSTALLATION

- A. Install all materials in accordance with the manufacturer's instructions.
 - 1. Sealant shall not be installed below a temperature of 40⁰ degrees F. unless specifically permitted in writing by the manufacturer.
 - 2. Confine the sealant to the joints. Use masking tape to prevent staining of adjoining surfaces or spillage and migration of compound out of the joints. Tool surface to shape shown or, if none is shown, to flush or slightly concave surfaces. Remove excess compound and clean adjoining surfaces.

3.04 PROTECTION

- A. Protect joint sealant during and after curing period from contact with debris and from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealant, and reseal joints with new material.

3.05 CLEANING

- A. Clean off excess sealant adjacent to joints as work progresses by methods and cleaning materials approved by sealant manufacturers.

END OF SECTION

10 14 53 – TRAFFIC DELINEATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Conditions of the Contract and Division 1 as indexed apply to this section.
- B. Work in this Section shall include furnishing all materials, labor and equipment necessary to complete work shown in the drawings and specified herein.

1.02 QUALITY ASSURANCE

- A. Visually inspect all material and equipment prior to installation.
- B. Store all material offsite until systems are ready for insulation.

1.03 SUBMITTALS

- A. Provide manufacturer's data sheets.

PART 2 - MATERIALS

2.01 REFLECTIVE TRAFFIC DELINEATION STRIPS:

- A. Acceptable manufacturer and model:
 - a. Linear Delineation System (LDS) Series 340 by 3M. Color: Yellow. Width: 1 1/2". Length: 34" per panel. Installation system: Self-adhesive strips.
 - b. or equivalent product submitted by bidder and approved by Engineer prior to bid.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Follow all manufacturer's recommendations for installation.
- B. Refer to drawings for further installation instructions.
- C. Strips shall be installed with uniform spacing of 18" between strips typically.
- D. All guardrail is to receive reflective strips.

END OF SECTION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

Michael J. Dem...

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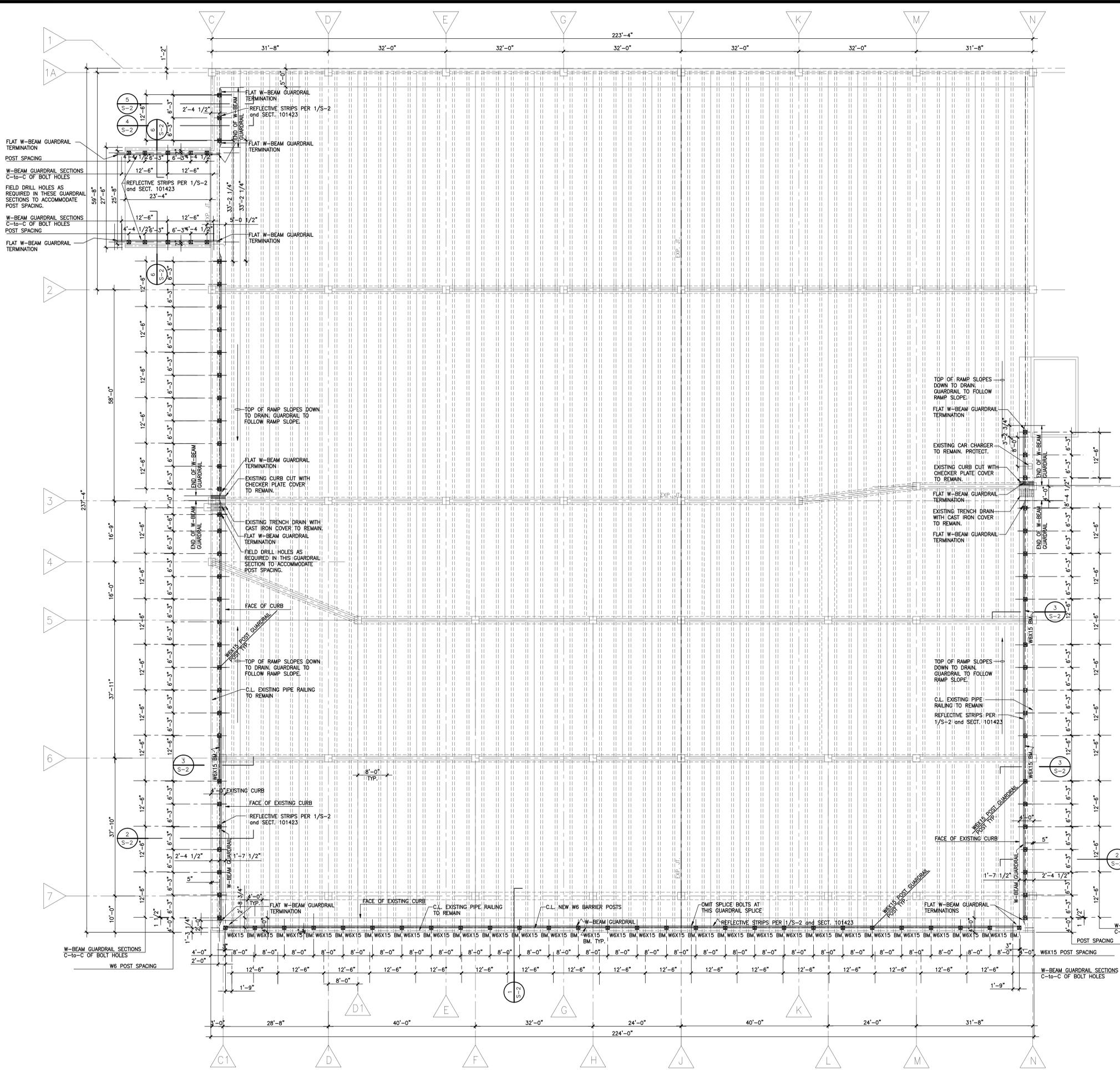
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S-1

- NOTES:
- CONTRACTOR SHALL ARRANGE ACCESS TO BOTH UPPER AND LOWER LEVELS WITH CITY OF DULUTH.
 - CITY SHALL SPECIFY NUMBER OF PARKING SPACES THAT MAY BE BLOCKED AT ANY ONE TIME.
 - RAILROAD CARS AT LOWER LEVEL SHALL BE PROTECTED AT ALL TIMES FROM DAMAGE AND FALLING DEBRIS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANUP OF RAILROAD CARS AS DIRECTED BY THE CITY AND DEPOT.
 - ALL NEW STEEL MEMBERS, BEAMS, POSTS, ANGLES, PLATES, BOLTS, THREADED RODS, NUTS AND WASHERS SHALL BE HOT DIPPED GALVANIZED.
 - CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS.

- GENERAL NOTES:
- All construction shall be done in accordance with the INTERNATIONAL BUILDING CODE, 2006 Edition, as amended by MINNESOTA STATE BUILDING CODE, (2007 edition), unless noted otherwise.
 - Contractor shall verify all dimensions and conditions on site before construction is begun. All observed discrepancies shall be reported immediately to the Architect.

- STRUCTURAL STEEL NOTES:
- All structural steel work shall be done in accordance with the specifications and detailing practices outlined in the AISC MANUAL OF STEEL CONSTRUCTION, 3rd edition 2001 (LRFD).
 - Structural Steel Fabricator is responsible for design of member connections, except for those detailed on plans. Except when member end reactions are indicated on plans, connections shall be designed to support the maximum uniform load of the member of the specified span. Shop drawings shall be reviewed and certified by a professional engineer registered in the state where the project is located.
 - All bolted connections shall be made with ASTM A325 bolts (unless noted otherwise on plans), according to the AISC SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 or A490 BOLTS. Minimum bolt diameter shall be 3/4". Bolted connections shall be bearing type with threads included in the shear plane.
 - All welding shall be done by qualified welders in accordance with the AISC specifications and A.W.S. Codes, latest editions. Use E70XX electrodes.
 - Field cutting and field modifications of the structural steel shall not be made without specific prior approval of the Engineer.

- EXISTING CONDITIONS:
- The general contractor shall field verify all sizes, dimensions, elevations, etc. of elements of the existing structure which abut, is adjacent to, or related to the proposed construction.
 - All dimensions involving new work tying into or governed by existing construction shall be field verified.
 - The general contractor and furnished to subcontractors prior to fabrication of any material. The verified dimension shall appear and be noted as such on the first shop drawing submittal.
 - The general contractor shall use caution and take any and all necessary measures to protect the existing structure during demolition and construction work.
 - The contractor is solely responsible for means and methods of executing the work.
 - The contractor shall notify the architect-engineer immediately of any discrepancies between the construction documents and actual field conditions.
 - These drawings have been prepared based on field measurements. The actual construction details may be different and any such deviation shall be brought to this engineer's attention.



DATE	9/16/14
DRAWN	MD
CHECKED	MD

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Michael J. ...

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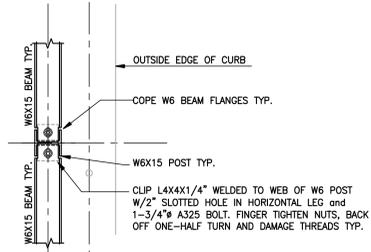
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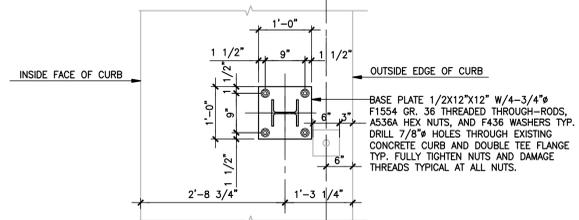
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1B PLAN VIEW
SCALE: 3/4" = 1'-0"

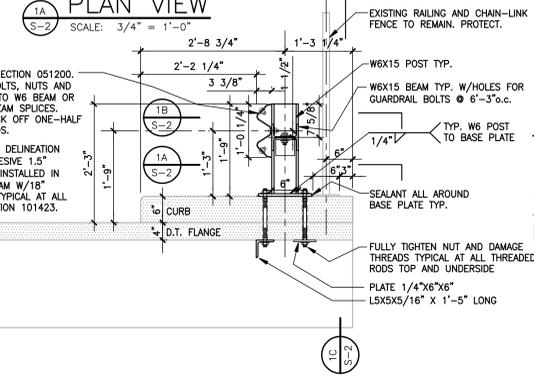
NOTE: ALL NEW STEEL MEMBERS, POSTS, ANGLES, PLATES, BOLTS, THREADED RODS, NUTS AND WASHERS SHALL BE HOT-DIPPED GALVANIZED PER SECTION 051200.



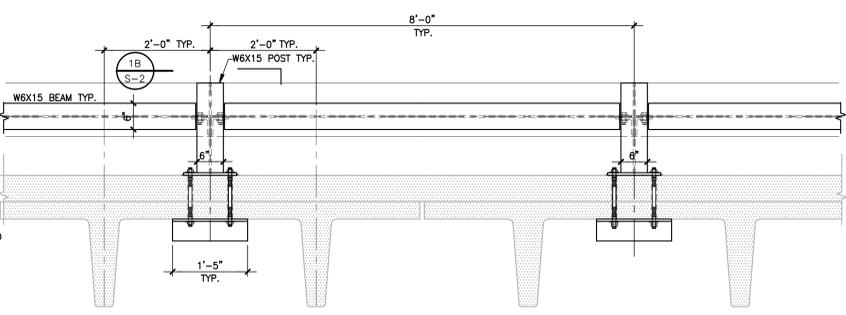
1A PLAN VIEW
SCALE: 3/4" = 1'-0"

W-BEAM GUARDRAIL PER SECTION 051200, W/5/8" BUTTON HEAD BOLTS, NUTS AND WASHERS AT ATTACHMENT TO W6 BEAM OR POST AND AT BEAM-TO-BEAM SPLICES. FINGER TIGHTEN NUTS, BACK OFF ONE-HALF TURN AND DAMAGE THREADS.

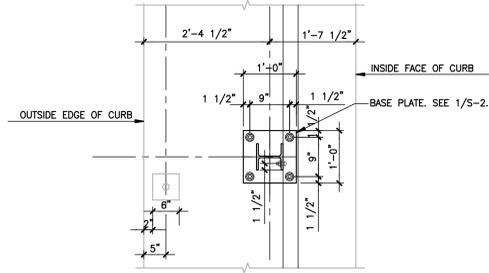
REFLECTIVE STRIPS: LINEAR DELINEATION SYSTEM BY 3M. SELF-ADHESIVE 1.5" WIDE X 34" LONG STRIPS INSTALLED IN CENTER GROOVE OF W-BEAM W/18" SPACES BETWEEN STRIPS TYPICAL AT ALL NEW GUARDRAIL PER SECTION 101423.



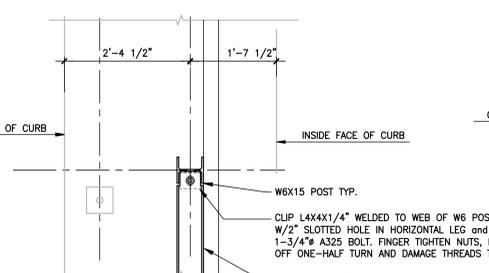
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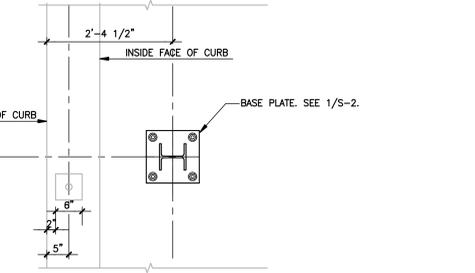
1C SECTION
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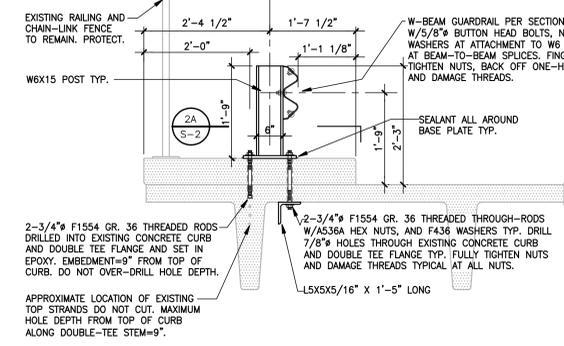
2A PLAN VIEW
SCALE: 3/4" = 1'-0"



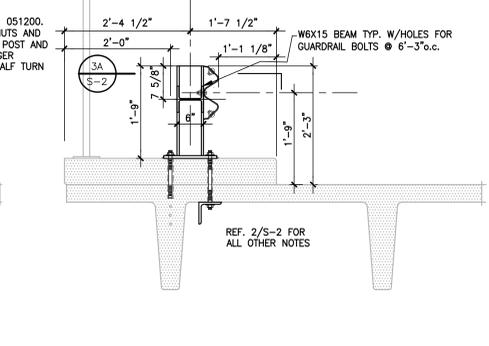
3A PLAN VIEW
SCALE: 3/4" = 1'-0"



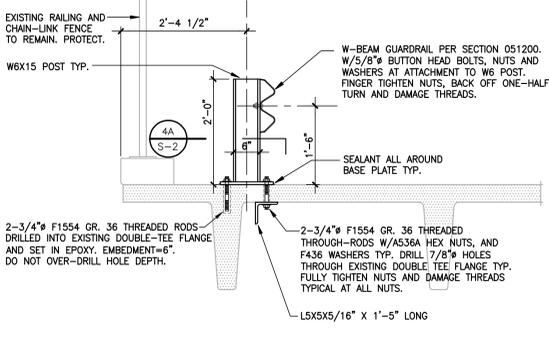
4A PLAN VIEW
SCALE: 3/4" = 1'-0"



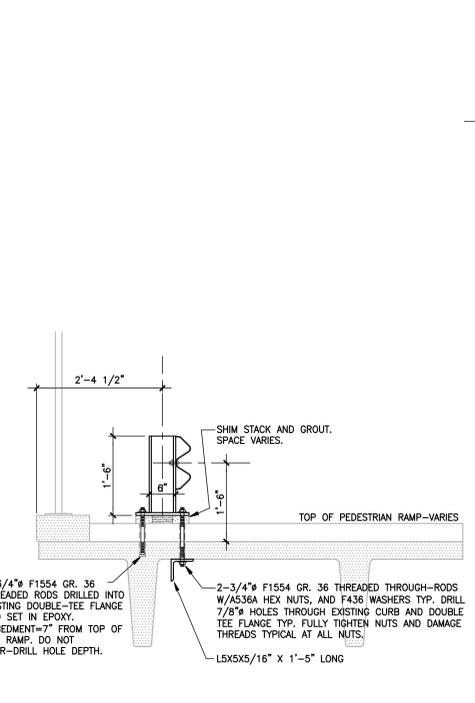
2 SECTION
SCALE: 3/4" = 1'-0"



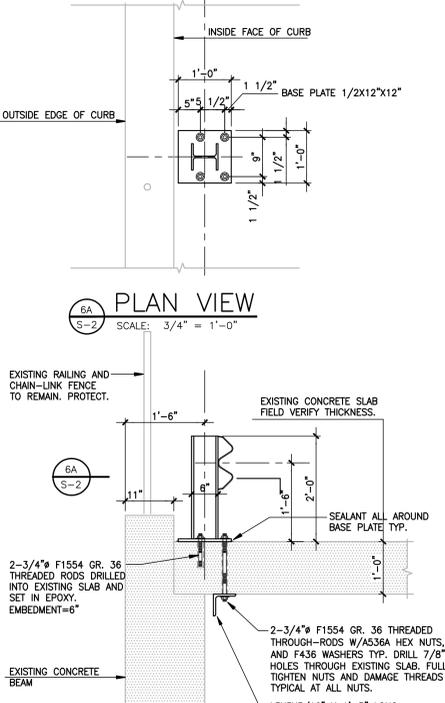
3 SECTION
SCALE: 3/4" = 1'-0"



4 SECTION
SCALE: 3/4" = 1'-0"



5 SECTION
SCALE: 3/4" = 1'-0"



6 SECTION
SCALE: 3/4" = 1'-0"