APPROXIMATE QUANTITIES

<table>
<thead>
<tr>
<th>AREA DESCRIPTION</th>
<th>QUANTITY</th>
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</thead>
<tbody>
<tr>
<td>APPROX. AREA OF APPROACH SLAB</td>
<td>0.2 SF</td>
</tr>
</tbody>
</table>

GENERAL NOTES

1. PLATE BARS B & C ARE WELDED TO PANEL 1/2" N.D. SPA, 3" UNG SPA.
2. OTHER BARS ARE AS REQUIRED.
3. FOR CONTRACTORS INFORMATION ONLY. SEE SHEET QUANTITIES.
4. NOT REQUIRED.
### Table of Elastomeric Bearing Pad Dimensions

<table>
<thead>
<tr>
<th>Pad Type</th>
<th>L</th>
<th>T</th>
<th>W</th>
<th>H</th>
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</thead>
<tbody>
<tr>
<td>Laminated</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
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<tr>
<td>Shallow</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
</tr>
</tbody>
</table>

Pads shown are applicable for the following conditions:

1. All one, two, and three span units where the minimum span length is not less than 25% and the maximum span is not more than 50%.
2. Slopes less than or equal to 1:6.

**NOTES TO DESIGN ENGINEER**

A. This drawing is to be used as a general guide only for the construction of elastomeric bearing pads. Final design is subject to the approval of the County Engineer.

B. The design shown is acceptable only for the design situation shown in the drawing. It is recommended that the design be reviewed to meet the specific conditions of the project.

C. The design shown shall be in accordance with the American National Standards Institute (ANSI) bearing pad design criteria.

D. The design shown shall be in accordance with the American National Standards Institute (ANSI) bearing pad design criteria.

E. The design shown shall be in accordance with the American National Standards Institute (ANSI) bearing pad design criteria.

F. **GENERAL NOTES**

   a. Shop drawings for approval are required for all bearings, which identify the manufacturer and the materials of the bearings.
   b. The shop drawings shall be submitted to the County Engineer for approval.
   c. The shop drawings shall be submitted to the County Engineer for approval.
   d. The shop drawings shall be submitted to the County Engineer for approval.

---

**Elastomeric Bearing Placement Diagrams**

- Place one bearing at median station beam end.
- Place two bearings at both station beam ends.

**Laminated Bearing Pad**

1. Maximum and minimum layer thicknesses should be noted for laminated only or tapered laminations.
2. **BEARINGTYPE** shall be indicated on all pads. For tapered pads, **BEARING TYPE** shall be located on the top side. The manufacturer shall include the value of "H" (dimension of layer "H" and "H" inches). The values may be:
   - E200 (60 x 6"
   - E300 (15 x 12"
   - E400 (15 x 18"
   - E500 (15 x 24"
   - E600 (15 x 30"
   - E700 (15 x 36"
   - E800 (15 x 42"
   - E900 (15 x 48"
3. Fabricated pad top surface shall not be shaved and cleaned by means of a hand tool.
4. **Location** of bearing pad base shall be marked and labeled.

---

**Harris County Engineering Department**
### Designed Beams (Straight Strands)

<table>
<thead>
<tr>
<th>Structure</th>
<th>Beam No.</th>
<th>Beam Type</th>
<th>Span</th>
<th>Diam. (in)</th>
<th>Spacing (in)</th>
<th>Strands</th>
<th>Number of Strands (Stranded)</th>
<th>Strands (Unstranded)</th>
<th>Comment</th>
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</thead>
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<th>Beam Type</th>
<th>Span</th>
<th>Diam. (in)</th>
<th>Spacing (in)</th>
<th>Strands</th>
<th>Number of Strands (Stranded)</th>
<th>Strands (Unstranded)</th>
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<td></td>
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</tbody>
</table>

### Optional Design

- Based on the following allowable stresses (ksi):
  - Compression: 0.65 ksi
  - Tension: 0.24 ksi/V

- Optional designs must likewise conform.

### General Notes
- Designed according to ACI/ASCE 318-05 Specifications.
- See Harris County Specification 439 for Casting, Finishing, and Inspection of Strands, Finestand, Concrete Slabs, and Slab Beams.

**Notes to Design Engineer**

1. This design is for the benefit of the design engineer and may not be used for construction purposes without the written approval of the architect or the engineer.

**Design Engineer**

- This design is based on the Texas Department of Transportation (TxDOT) Specifications and is subject to change without notice.

### Harris County Engineering Department

- Located at:
  - 1200 Main Street
  - Houston, TX 77002

- Phone: (713) 615-9999

- Fax: (713) 615-9999

- Website: www.harriscounty.org
HARRIS COUNTY
ENGINEERING DEPARTMENT

BILL OF REINFORCING STEEL

<table>
<thead>
<tr>
<th>BAR NO.</th>
<th>SIDE</th>
<th>LENGTH</th>
<th>WEIGHT</th>
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<td>#1</td>
<td>30 ft-1&quot;</td>
</tr>
<tr>
<td>E</td>
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<td>#1</td>
<td>2-2&quot;</td>
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<tr>
<td>T</td>
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<td>U</td>
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<td>7-4&quot;</td>
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<tr>
<td>AMI</td>
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<td>13-4&quot;</td>
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SECTION

TYPE 1 - TRAFFIC RAIL SIDE

TYPE 2 - COMBINATION RAIL SIDE

WINGWALL ELEVATION

EARWALL DETAIL

FILING EMBEDMENT DETAIL

NOTES TO ENGINEER

1. RADIUS AS REQUIRED TO MAINTAIN 3/8" FEATHER GRADE.
2. STRESSING TENDONS RIGID MATERIAL BETWEEN BEAM AND WINGWALL.
3. WINGWALL DO NOT BEAD AMT AN APPROVED MATERIAL FOR FACE OF WINGWALL TO BE CAST WITH VERTICAL SIDE OF BEAM.
4. DO NOT CAST EARWALLS UNTIL BEAMS ARE ERECTED IN IN FINAL POSITIONS.

HARRIS COUNTY ENGINEERING DEPARTMENT

DESIGN GUIDELINES

FOR INTERIOR REVIEW ONLY
DRAINAGE INCLUSION, WORK COMPLETION, DETAIL, OR PRINCIPAL ENGINEER WORKING DRAWINGS IN EXHIBIT "H"

DESIGNER, ENGINEER, WORKING DRAWINGS 5/27/03

REVIEWER

PILING EMBEDMENT DETAIL

TOP OF PILING FOR PAYMENT

HALF BOULEVARD, O' SKIN (2 OF 2)

ASPH-D

DATE: 5/27/03

PAGE NO.: 5/12
### Bill of Reinforcing Steel

<table>
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<tr>
<td>D</td>
<td>14</td>
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<td>E</td>
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</tr>
<tr>
<td>F</td>
<td>1</td>
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</table>

**Estimated Quantities**

**Reinforcing Steel:**
- **LB:** 2,200
- **CFT:** 8.5

### Design Guidelines
1. **Notes to Design Engineer:**
   - **Notes to Design Engineer:**
     - All reinforcing steel shall be ASTM A615 Grade 60.
     - All staff shall be AASHTO Type II.
     - All concrete shall be Type I or Type III.
     - All prestressing strands shall be Type 1 Pre-Stressed Strand.
     - All concrete shall be placed with proper curing and curing practices.
     - All structural elements shall be designed to carry the required loads and stresses.

### Interior Bent Notes
1. **Interior Bent Notes:**
   - All reinforcing steel shall be ASTM A615 Grade 60.
   - All prestressing strands shall be Type 1 Pre-Stressed Strand.
   - All concrete shall be Type I or Type III.
   - All structural elements shall be designed to carry the required loads and stresses.

### Exterior Bent Notes
1. **Exterior Bent Notes:**
   - All reinforcing steel shall be ASTM A615 Grade 60.
   - All prestressing strands shall be Type 1 Pre-Stressed Strand.
   - All concrete shall be Type I or Type III.
   - All structural elements shall be designed to carry the required loads and stresses.

### General Notes
1. **General Notes:**
   - All reinforcing steel shall be ASTM A615 Grade 60.
   - All prestressing strands shall be Type 1 Pre-Stressed Strand.
   - All concrete shall be Type I or Type III.
   - All structural elements shall be designed to carry the required loads and stresses.

---

**HARRIS COUNTY ENGINEERING DEPARTMENT**

**Design: SLAB BEAM - PILING**

**Date:** 8/3/17

**Prepared By:**

**Reviewed By:**

**Checked By:**

**Project Manager:**

**Project Engineer:**

**Construction Inspector:**

**Quality Control:**

**Printed By:**

**Scale:** 1/4" = 1'-0"

**Drawing Number:**

**Edition:**

**Revision:**

**Status:**

**Security:**

**Confidentiality:**

---

**Notes to Contractor:**

1. **Notes to Contractor:**
   - All reinforcing steel shall be ASTM A615 Grade 60.
   - All prestressing strands shall be Type 1 Pre-Stressed Strand.
   - All concrete shall be Type I or Type III.
   - All structural elements shall be designed to carry the required loads and stresses.

---

**Notes to Foreman:**

1. **Notes to Foreman:**
   - All reinforcing steel shall be ASTM A615 Grade 60.
   - All prestressing strands shall be Type 1 Pre-Stressed Strand.
   - All concrete shall be Type I or Type III.
   - All structural elements shall be designed to carry the required loads and stresses.

---

**Notes to Field:**

1. **Notes to Field:**
   - All reinforcing steel shall be ASTM A615 Grade 60.
   - All prestressing strands shall be Type 1 Pre-Stressed Strand.
   - All concrete shall be Type I or Type III.
   - All structural elements shall be designed to carry the required loads and stresses.

---

**Notes to Inspector:**

1. **Notes to Inspector:**
   - All reinforcing steel shall be ASTM A615 Grade 60.
   - All prestressing strands shall be Type 1 Pre-Stressed Strand.
   - All concrete shall be Type I or Type III.
   - All structural elements shall be designed to carry the required loads and stresses.

---

**Notes to Superintendent:**

1. **Notes to Superintendent:**
   - All reinforcing steel shall be ASTM A615 Grade 60.
   - All prestressing strands shall be Type 1 Pre-Stressed Strand.
   - All concrete shall be Type I or Type III.
   - All structural elements shall be designed to carry the required loads and stresses.

---

**Notes to Owner:**

1. **Notes to Owner:**
   - All reinforcing steel shall be ASTM A615 Grade 60.
   - All prestressing strands shall be Type 1 Pre-Stressed Strand.
   - All concrete shall be Type I or Type III.
   - All structural elements shall be designed to carry the required loads and stresses.
### BILL OF REINFORCING STEEL

<table>
<thead>
<tr>
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<td>#4</td>
<td>12'-6&quot;</td>
<td>143</td>
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</tbody>
</table>

**ESTIMATED QUANTITIES**

- **Reinforcing Steel**: 2,357
- **Class by Concrete**: C7 19.0

### NOTES TO ENGINEER

1. Increase as required to maintain 2.5" flush finished grade.
2. Placement of reinforcing bars material between (beam and approach, where 1/2" thick and an approved concrete fiber patch be cast near control joint of slab.
3. Rebar shall extend to end of beam, top of curb, or section end.

### DESIGN GUIDELINES

- **Slab Beam - Piling**
  - **Asph 30 Half Boulevard, 30° Skew (2 of 2)**

### HARRIS COUNTY ENGINEERING DEPARTMENT
TYPICAL TRANSVERSE SECTION

TABLE OF VARIABLE VALUES

<table>
<thead>
<tr>
<th>SPAN LENGTH</th>
<th>BEAM TYPE</th>
<th>DEAD LOAD REDUCTION</th>
<th>SECTION EDITING</th>
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NOTES TO ENGINEER

1. BRIDGE SLAB IS CONTINUOUS OVER INTERSECTING PENDS. BARS "T" SHALL BE CONTINUOUS THROUGH JOINT.
2. CONCRETE BEAMS ARE CAST IN ONE PIECE. JOINTS SHALL BE CAST IN TWO PIECES.
3. REINFORCING STEEL VOLUME IS BASED ON AN APPROXIMATE FACTOR OF 3.6 LBS PER SQUARE FOOT OF SLAB.
4. REINFORCING STEEL VOLUME IS BASED ON AN APPROXIMATE FACTOR OF 3.8 LBS PER SQUARE FOOT OF SLAB.
5. JOINTS SHALL BE CAST IN TWO PIECES. JOINTS SHALL BE CAST IN TWO PIECES.
6. JOINTS SHALL BE CAST IN TWO PIECES. JOINTS SHALL BE CAST IN TWO PIECES.
7. PROVIDE BRIEF DRAWINGS TO TOP OF BRIDGE SLAB WHERE REBAR EXHIBITS OR CURB AREA IS REQUIRED.
8. PROVIDE BRIEF DRAWINGS TO TOP OF BRIDGE SLAB WHERE REBAR EXHIBITS OR CURB AREA IS REQUIRED.
HARRIS COUNTY
ENGINEERING DEPARTMENT

BILL OF REINFORCING STEEL

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<th>BAR NO.</th>
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REINFORCING STEEL

ESTIMATED QUANTITIES

REINFORCING STEEL

LBS

NOTES TO DESIGN ENGINEER

1. These drawings are considered to be FOR INFORMATION ONLY until a full set of working drawings is issued. They are intended to be a framework for the design engineer to develop specific construction details.

2. It is the responsibility of the design engineer to verify the completeness and accuracy of all drawings and specifications for their intended use.

3. The design engineer shall determine the appropriate use of materials and methods for the construction project requirements.

4. The design engineer shall consult with the structural engineer for guidance on critical design issues and for preparing the necessary shop drawings.

5. The design engineer shall be familiar with the latest edition of the ACI Code and shall refer to it in preparing the shop drawings.

6. The design engineer shall be familiar with the latest edition of the AASHTO Design Criteria and shall refer to it in preparing the shop drawings.

7. The design engineer shall be familiar with the latest edition of the AASHTO Design Criteria and shall refer to it in preparing the shop drawings.

8. The design engineer shall be familiar with the latest edition of the AASHTO Design Criteria and shall refer to it in preparing the shop drawings.

9. The design engineer shall be familiar with the latest edition of the AASHTO Design Criteria and shall refer to it in preparing the shop drawings.

10. The design engineer shall be familiar with the latest edition of the AASHTO Design Criteria and shall refer to it in preparing the shop drawings.

INTERIOR BENT NOTES

1. Design to include permanent provisions for future extensions.

2. All concrete shall be Class B, 3000 psi #

3. All reinforcing steel shall be ASTM A615 Grade 60 steel.

4. All reinforcing steel shall be ASTM A615 Grade 60 steel.

5. Cracking potential due to construction work.

6. Consideration shall be given to future expansion of the structure.

7. Consideration shall be given to future expansion of the structure.

8. Consideration shall be given to future expansion of the structure.

9. Consideration shall be given to future expansion of the structure.

10. Consideration shall be given to future expansion of the structure.

NOTES TO ENGINEER

DESIGN GUIDELINES

FOR INTERIM REVIEW ONLY

REINFORCING STEEL

REFERENCES

SLAB BEAM - PILING

DESIGNER

DATE REVIEW

ENGINEER

DATE REVIEW

ARCHITECT

DATE REVIEW

FOR INTERIM REVIEW ONLY

REINFORCING STEEL

REFERENCE

SLAB BEAM - PILING

ENGINEER

DATE REVIEW
TABLE OF ESTIMATED QUANTITIES

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<th>GLASS CONCRETE</th>
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</table>

1. Slab thickness is continuous over interior bays. Slab T shall be continuous through joint.
2. Shear connection details shall be used.
3. Reinforcing steel weight is based on an approximate factor of 0.6 lbs per square foot of slab.
4. Fabricator shall adjust beam length for beam slopes as required.
5. Cap beam is based on nominal beam weight.
6. Connector plates are required on precast beam items.
7. Material shall be of AASHTO M-907, C class concrete, par inclusion, high modulus, silicon rubber sealant.
8. Manufacturer shall provide flashings to the top of precast slab and provide offset at beam and precast manufacturers.

NOTES TO ENGINEER

- The engineer shall determine section depth based on theoretical.
- Shear calculations, slab deflection, and beam deflection of cast-in-place slab and the effect of vertical curve.
- The engineer shall determine bridge curb height.

HARRIS COUNTY ENGINEERING DEPARTMENT

DESIGN GUIDELINES

ENGINEER NAME: [Signature]
ENGINEER NUMBER: [Number]
DATE: [Date]
PROJECT NUMBER: [Project Number]
BLOCKOUT, INTERIOR DIAPHRAGM AND DRAIN DETAILS

(Shown to scale)

1. Bars 2 are required for beams topped with a cast-in-place concrete slab only.
2. Place drain holes (1.5" dia PVC slip 40 pipe) as shown in all beam and column
   connections (side slab or interior diaphragms). The "Thick Splice" splice detail
   and "Thick Splice" column splice are not required if the cast-in-place Expanded
   Polyethylene (EP) sheath is used.
3. Blockouts are required at ends of all beams. Extend beam reinforcement into blockouts.
4. Cut as required to maintain one inch clear between bars.
5. Dimensions will vary slightly with shear. Adjust as necessary.

HARRIS COUNTY
ENGINEERING DEPARTMENT
BLOCKOUT, INTERIOR DIAPHRAGM AND DRAIN DETAILS

(Blockout 30" above)

**Notes:**

1. Bars Z are required for beams topped with a cast-in-place concrete slab only.
2. Place drain holes 1" (see PVC Sub. 40 Pipe) as shown in all beam void spaces including each side of interior diaphragms. See “Blockout, Interior Diaphragms, and Civil Details”. Drain holes are not required if the void is formed with Expanded Polystyrene (XPS).
3. Blocks are required at ends of all beams. Extend beam reinforcement into blockouts.
4. Cut as required to maintain a true girder between bars.
5. Dimensions will vary slightly with draw. Adjust as necessary.

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**HARRIS COUNTY ENGINEERING DEPARTMENT**

**FOR INTERIM REVIEW ONLY**

**DRAINAGE**

** concrete block details (type B2B) (3 of 3)**

**DESIGNER**

**SPECIFICAN**

**DRAINAGE**

** concrete block details (type B2B) (3 of 3)**

**DESIGNER**

**SPECIFICAN**
BLOCKOUT, INTERIOR DIAPHRAGM AND DRAIN DETAILS

1. Sides Z are required for beams capped with a cast-in-place concrete slab only.
2. Hole drill holes (3") Cul PVC 8 ft. 60 Pipe) are shown in all beam voids. Steel pipes must be placed in voids and drilled holes. Steel pipes are not required if void is filled with Expanded Polystyrene foam.
3. Blockouts required on ends of all beams. Extend beam reinforcement into blockouts.
4. Cut out required to maintain one inch clear between joists.
5. Diameter will vary slightly with skew. Adjust as necessary.
BLOCKOUT, INTERIOR DIAPHRAGM AND DRAIN DETAILS

(Bottom view shown)

- Bars 2 are required for beams topped with a cast-in-place concrete slab only.
- Place drain hoses (1" dia. PVC 30 ft long) as shown in all beam void chambers. drags shall not exceed the beam depth. Drain hose shall be formed with Expanded Polyethylene (PE) and connected to the drainage system.
- All individual drain hose runs shall be connected to the drainage system. If the drainage hose run is longer than 30 ft, they may be separated into segments.
- Bars 2 are required for beams topped with a cast-in-place concrete slab only.
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NOTES TO DESIGN ENGINEER:

A. All drawings are coordinated to the nearest 1/8" (0.3125") and should be reviewed by the structural engineer to verify the structural integrity of the design.
B. The design engineer is responsible for checking the design against specific project requirements and verifying the adequacy of the foundation design.
C. The design engineer shall review the design calculations and verify the accuracy of the foundation design.
D. The design engineer shall review the design calculations and verify the accuracy of the foundation design.
E. The design engineer shall review the design calculations and verify the accuracy of the foundation design.

ABUTMENT NOTES:

1. Designed according to adopted standards and specifications.
2. Concrete shall be of class C7 and shall be in accordance with the latest edition of the Concrete Specifications伟大混凝土
3. Unless otherwise noted, concrete shall be the standard C7 concrete.
4. Reinforcement shall be of the standard 6D bars.
5. Dimensions relating to reinforcement shall be as provided by the manufacturer.
6. See foundation details for additional information.
7. Max. calculated foundation load: 4 kips per ft.

ADDITIONAL ALIASES:

A. An additional 5' of M bars for the 25' and 25' span shall be placed. The additional 5' of M bars shall be placed on the 25' span for the 25' span.
B. A set of 6' for each span shall be required for the 25' span. A set of 6' for each span shall be required for the 25' span.
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NOTES TO ENGINEER:
A. THESE DRAWINGS ARE CONSTRUCTED TO BE Drawings and not to scale. It is the responsibility of the Design Engineer to verify the completeness and accuracy of the information shown and to adjust according to specific project requirements.
B. THE DESIGN ENGINEER SHALL INCHURSE ONLY THE MATERIALS SHOWN THEREON. THE DESIGN ENGINEER'S SIGNATURE SHALL APPEAR ON ALL DRAWINGS.
C. THE DESIGN ENGINEER SHALL CONSULT THE HARRIS COUNTY CODES, SERIES, AND SPECIFICATIONS FOR INFORMATION CONCERNING THE DESIGN GUIDELINE DRAWINGS.
D. THE DESIGN ENGINEER SHALL INCLUDE THESE NOTES ON THE SHEET WITH THE DESIGNER'S SIGNATURE AND CERTIFICATE OF COMPLETION.

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ABUTMENT NOTES:
1. DIMENSIONS ARE ACCORDING TO ASHRAE UNID SPECIFICATIONS.
2. ALL CONCRETE SHALL BE D63 200 50.519.
3. ALL MASONRY SHALL BE HARRIS COUNTY SPECIFICATION 4084 FOR STRUCTURAL CONCRETE.
4. ALL EXPOSED CONCRETE SHALL BE CHIPPED." UNLESS OTHERWISE NOTED.
5. ALL STEEL PLATES SHALL BE HOT ROLLED SHEET.
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