

GENERAL STRUCTURAL NOTES

BUILDING CODES

- A. THE 2015 INTERNATIONAL BUILDING CODE (IBC) AND ALL SUBSEQUENT SUPPLEMENTS
- B. GOVERNING BUILDING CODE

DESIGN LOADS

- A. LOADING FROM BRIDGE PER ABUTMENT (FROM CONTECH, FOR 120'-0" X 12'-0" PEDESTRIAN BRIDGE, DRAWINGS DATED 10/12/2015)
 1. DEAD LOAD = 70,350 LBS
 2. LIVE LOAD = 64,800 LBS
 3. VEHICLE LOAD = 20,000 LBS X 1.3 (IMPACT) = 26,000 LBS
 4. WIND LOAD
 - a. UPLIFT = 24,000 LBS
 - b. DOWNWARD = 14,150 LBS
 - c. HORIZONTAL LOAD = 18,200 LBS
 5. THERMAL LONGITUDINAL LOAD = 10,560 LBS

- B. LATERAL EARTH PRESSURE - DESIGN BASED UPON THE FOLLOWING PARAMETERS:
 1. DRAINED SOIL DENSITY = 125 PCF
 2. INTERNAL FRICTION ANGLE = 30 DEGREES
 3. VEHICLE SURCHARGE = 250 PSF

- C. SNOW LOAD DESIGN CRITERIA:

| | |
|--|--------|
| GROUND SNOW LOAD (P _g): | 35 PSF |
| FLAT ROOF SNOW LOAD (P _f): | 30 PSF |
| EXPOSURE FACTOR (C _e): | 0.9 |
| IMPORTANCE FACTOR (I): | 1.0 |
| THERMAL FACTOR (C _t): | 1.2 |

- D. WIND LOAD DESIGN CRITERIA (LOADS PROVIDED BY CONTECH, FOR 120'-0" X 12'-0" PEDESTRIAN BRIDGE):

| | |
|------------------|---------|
| BASIC WIND SPEED | 115 MPH |
| WIND EXPOSURE | C |

E. SEISMIC LOAD DESIGN CRITERIA:

- EQUIVALENT LATERAL FORCE PROCEDURE:
- | | |
|---|--------------------------|
| RISK CATEGORY | II |
| IMPORTANCE FACTOR (I _e): | 1.0 |
| MAPPED SPECTRAL RESPONSE ACCELERATIONS: | 0.11g (S _s) |
| | 0.051 (S ₁) |
| SOIL SITE CLASS: | E |
| DESIGN SPECTRAL RESPONSE COEFFICIENTS: | 0.196 (S _{ps}) |
| | 0.119 (S _{pl}) |
- SEISMIC DESIGN CATEGORY: B
 SEISMIC RESISTING SYSTEM: ORDINARY REINFORCED CONCRETE SHEAR WALLS
 DESIGN BASE SHEAR (V): 5.14 KIPS
 SEISMIC RESPONSE COEFFICIENT (C_s): 0.049
 RESPONSE MODIFICATION FACTOR (R): 4.0

CONCRETE

- A. CODES AND STANDARDS:
 1. ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"
 2. ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"
 3. ACI 117 "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS"
 4. ACI 305 "RECOMMENDED PRACTICE FOR HOT WEATHER CONCRETING"
 5. ACI 306 "RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING"
 6. ACI 347 "RECOMMENDED PRACTICE FOR CONCRETE FORM WORK"
 7. ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT"
 8. CRSI "MANUAL OF STANDARD PRACTICE"
- B. REINFORCING MATERIALS:
 1. STEEL REINFORCEMENT: ASTM A 615, GRADE 60, DEFORMED
- C. CONCRETE MATERIALS:
 1. PORTLAND CEMENT: ASTM C 150, TYPE III
 2. FLY ASH: ASTM C 618, CLASS F
 3. GROUND GRANULATED BLAST FURNACE SLAG: ASTM C 989, GRADE 120
 4. NORMAL WEIGHT AGGREGATES: ASTM C 33
 - a. MAXIMUM COARSE AGGREGATE SIZE: 1 INCH NOMINAL
 - b. FINE AGGREGATE SHALL BE FREE OF MATERIAL WITH DELETERIOUS REACTIVITY TO ALKALI IN CEMENT.
 5. LIGHT WEIGHT AGGREGATES: ASTM C 330, 1 INCH NOMINAL MAXIMUM AGGREGATE SIZE
 6. WATER: ASTM C 94, POTABLE
- D. ADMIXTURES:
 1. AIR ENTRAINMENT: ASTM C 260
 2. WATER-REDUCER: ASTM C 494
 3. SILICA FUME: ASTM C 1240
 4. NO ADMIXTURES CONTAINING CALCIUM CHLORIDE SHALL BE PERMITTED.

F. PROPORTION NORMAL WEIGHT CONCRETE MIXES AS FOLLOWS:

| LOCATION | 28 DAY STRENGTH (f' _c) | W/C RATIO | SLUMP LIMIT | AIR CONTENT |
|----------|------------------------------------|-----------|-------------|-------------|
| WALLS | 4500 PSI | 0.45 | 4" ± 1" | 6.0% ± 1.5% |
| FOOTING | 4500 PSI | 0.45 | 4" ± 1" | 6.0% ± 1.5% |

- G. ALL CONCRETE MIX DESIGNS, INCLUDING CEMENT CONTENT, WATER CEMENT RATIO, FINE AND COARSE AGGREGATE CONTENT AND ALL ADMIXTURES, SHALL BE REVIEWED BY ENGINEER PRIOR TO PLACING FIRST CONCRETE.

- H. ALL CONCRETE SHALL BE SAMPLED AND TESTED BY THE TESTING AGENCY. THE CONTRACTOR SHALL NOTIFY THE TESTING AGENCY 48 HOURS PRIOR TO THE PLACING OF ANY CONCRETE.

- I. THE CONCRETE STRUCTURE SHALL NOT SUPPORT THE DESIGN LIVE LOAD FOR A MINIMUM OF 28 DAYS AND ALL SHORING AND RESHORING REQUIRED TO SUPPORT THE CONCRETE STRUCTURE DURING CONSTRUCTION SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR. SHOP DRAWINGS, SIGNED AND SEALED BY A REGISTERED ENGINEER IN THE STATE OF MARYLAND, SHALL BE SUBMITTED FOR REVIEW. SHOP DRAWINGS SHALL INDICATE THE TYPE, EXTENT, SIZE, AND LOCATION OF ALL SHORING AND RESHORING AS WELL AS THE SEQUENCE OF CONSTRUCTION.

- J. MINIMUM COVER FOR ALL REINFORCING SHALL BE AS FOLLOWS UNLESS OTHERWISE INDICATED:

| | |
|-------------|----------|
| FOUNDATIONS | 3 INCHES |
| WALLS | 2 INCHES |

STRUCTURAL AND MISCELLANEOUS STEEL

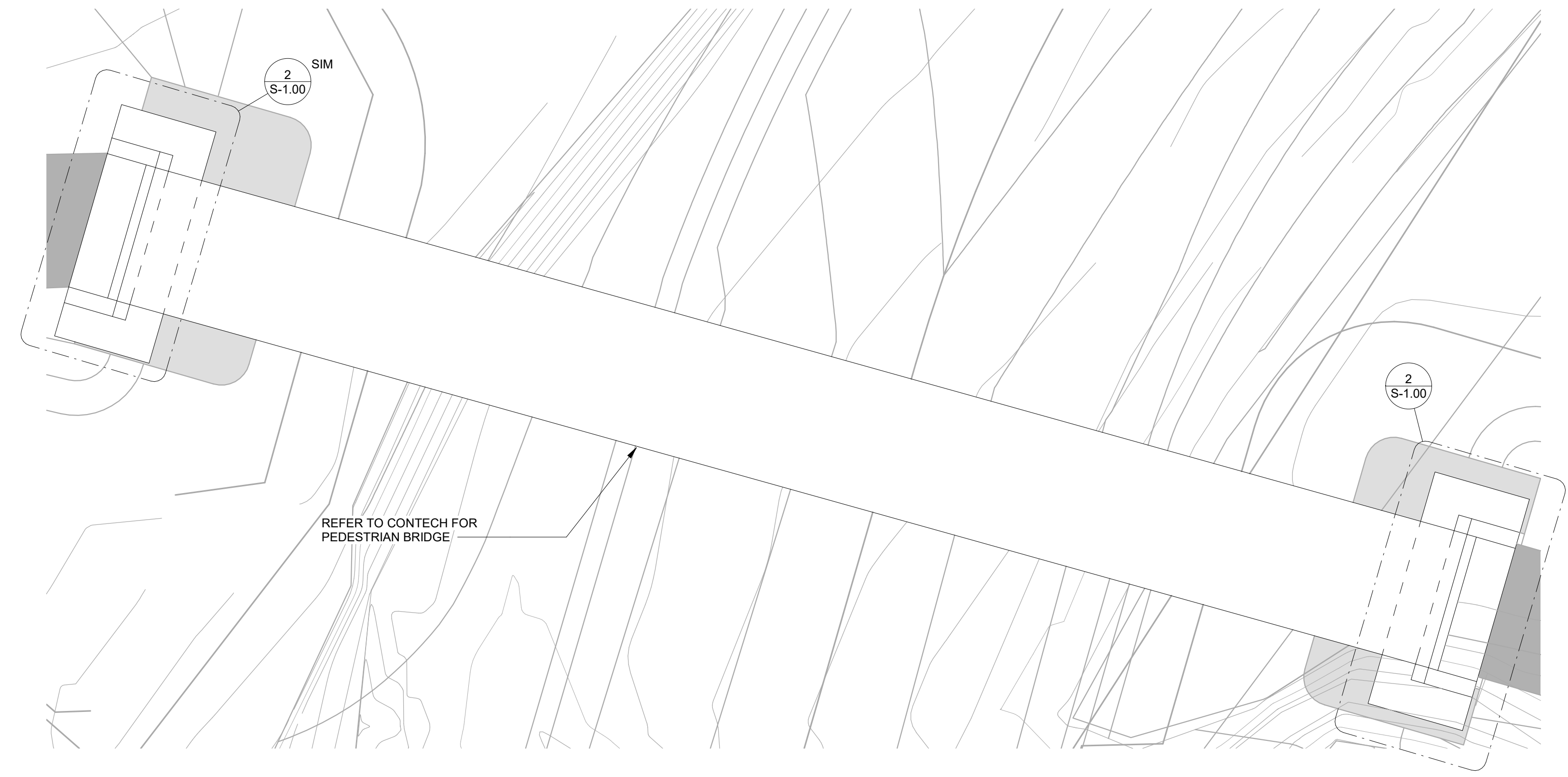
- A. CODES AND STANDARDS:
 1. AISC "STEEL CONSTRUCTION MANUAL", 14TH EDITION.
 2. AISC 303 "CODE OF STANDARD PRACTICE FOR BUILDINGS AND BRIDGES"
 3. AISC 360 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS"
 4. AWS D1.1 "STRUCTURAL WELDING CODE"
 5. AISC "SPECIFICATION FOR ARCHITECTURALLY EXPOSED STRUCTURAL STEEL"
- B. SUBMITTALS:
 1. SHOP DRAWINGS INDICATING THE SIZES, EXTENT, AND LOCATION OF ALL STRUCTURAL AND MISCELLANEOUS STEEL FRAMING INCLUDING ALL CONNECTIONS, FASTENERS, AND BEARINGS.
- C. MATERIALS:
 1. PLATES: ASTM A 36
 2. GALVANIZE: HOT-DIP ZINC COATING, ASTM A 123
- D. CONNECTIONS:
 1. WELDED CONNECTIONS: E70XX ELECTRODES
- E. INSPECTIONS BY INDEPENDENT INSPECTION AGENCY:
 1. WELDED CONNECTIONS: VISUAL INSPECTION, TESTING AND INSPECTION PER AWS D1.1
 2. VERIFY, WITH ERECTOR PRESENT, ELEVATIONS OF CONCRETE AND MASONRY BEARING SURFACES AND LOCATIONS OF ANCHOR BOLTS AND OTHER EMBEDDED ITEMS.
- F. INSTALLATION
 1. ALL SHOP AND FIELD WELDS SHALL BE PERFORMED BY CERTIFIED WELDERS. WELDS SHALL DEVELOP THE FULL STRENGTH OF MATERIALS BEING WELDED UNLESS OTHERWISE INDICATED.
 2. THE CONTRACTOR SHALL NOT SPLICE OR CUT OPENINGS IN STEEL MEMBERS NOT SHOWN ON CONTRACT DRAWINGS WITHOUT THE PERMISSION OF THE STRUCTURAL ENGINEER.

STEEL PILE FOUNDATIONS

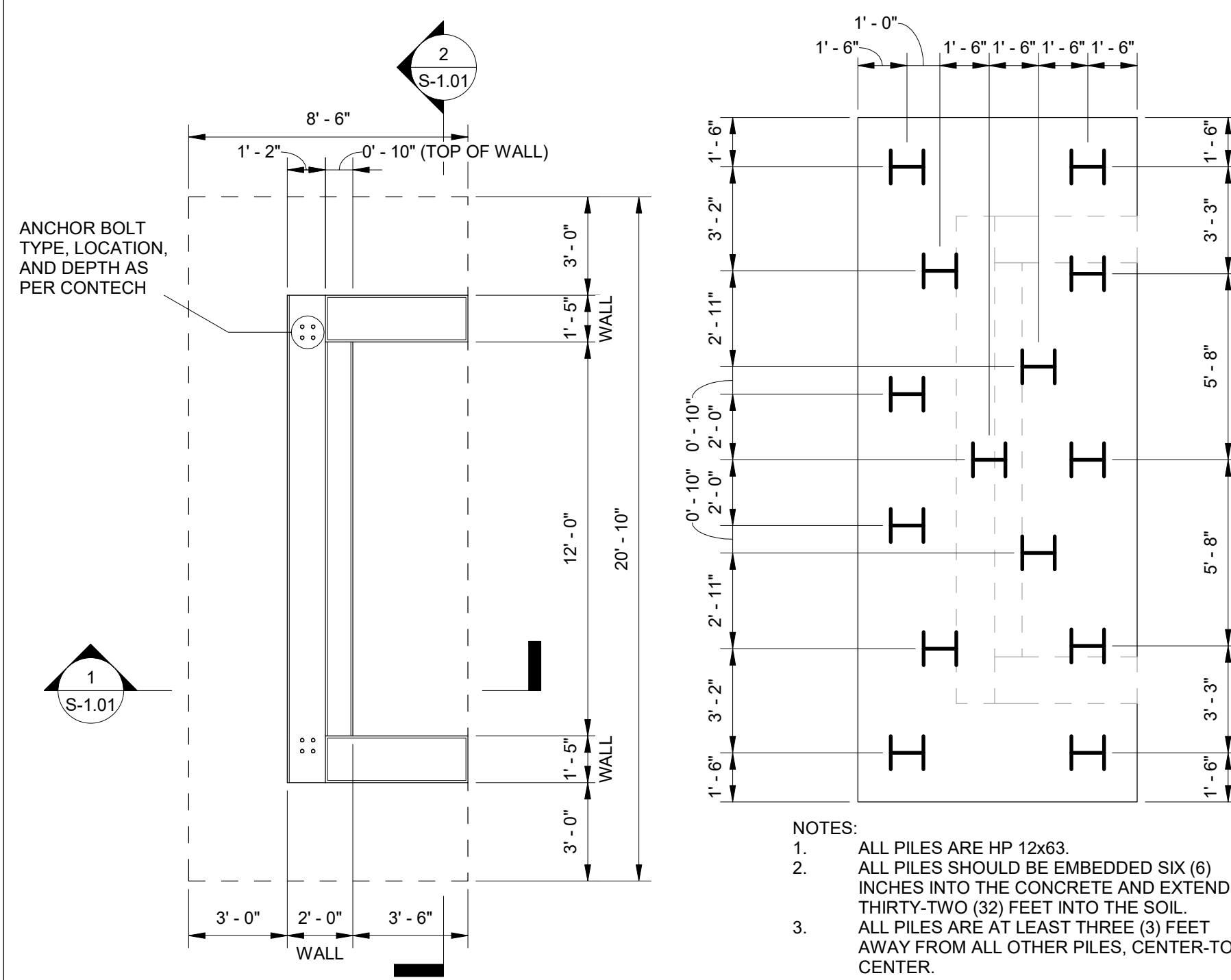
- A. REFER TO "STRUCTURAL STEEL" AND "CAST IN PLACE CONCRETE" FOR APPLICABLE CODES AND STANDARDS.
- B. REFER TO PROJECT GEOTECHNICAL REPORT BY KCI TECHNOLOGIES, INC. AND DATED AUGUST 2018 FOR SITE PREPARATION AND RECOMMENDATIONS.
- C. MATERIALS:
 1. STRUCTURAL STEEL H-PILES: ASTM A 572, GRADE 60
- D. ALL STEEL PILES SHALL BE STEEL H PILES.

| PILE SIZE | FACTORED AXIAL CAPACITY | MAX SHEAR CAPACITY |
|------------|-------------------------|--------------------|
| HP 12 x 63 | 50 KIPS | 12 KIPS |

 1. FACTORED AXIAL CAPACITY IS BASED ON A FACTOR OF SAFETY, F.S.=2.0.
- E. PROVIDE PILES OF SUFFICIENT LENGTH TO DEVELOP SPECIFIED BEARING VALUE AS INDICATED.
- F. H-PILES SHALL BE DRIVEN TO A SAFE BEARING CAPACITY OF 65 TONS OR AT LEAST TO THE ESTIMATED TIP ELEVATION OR ABSOLUTE REFUSAL TO ACHIEVE THE REQUIRED AXIAL CAPACITY. ABSOLUTE REFUSAL IS DEFINED AS 20 BLOWS PER INCH OF DRIVING OR WHERE NO MEASURABLE NET PENETRATION UNDER HAMMER BLOW IS RECORDED. PILE DRIVING SHALL NOT EXCEED 65 TONS PER BLOW.
- G. CONSTRUCTION TOLERANCES:
 1. PERMISSIBLE VARIATION OF CENTER OF PILE NOT MORE THAN 3 INCHES OF PLAN LOCATION, MEASURED AT THE GROUND SURFACE.
 2. PILES OUT OF PLUMB NOT MORE THAN 1 INCH PER 40 FEET OF DEPTH.
 3. IF TOLERANCES ARE EXCEEDED, CONTRACTOR SHALL PROVIDE CORRECTIVE CONSTRUCTION TO COMPENSATE FOR EXCESSIVE ECCENTRICITY AS APPROVED BY ENGINEER.

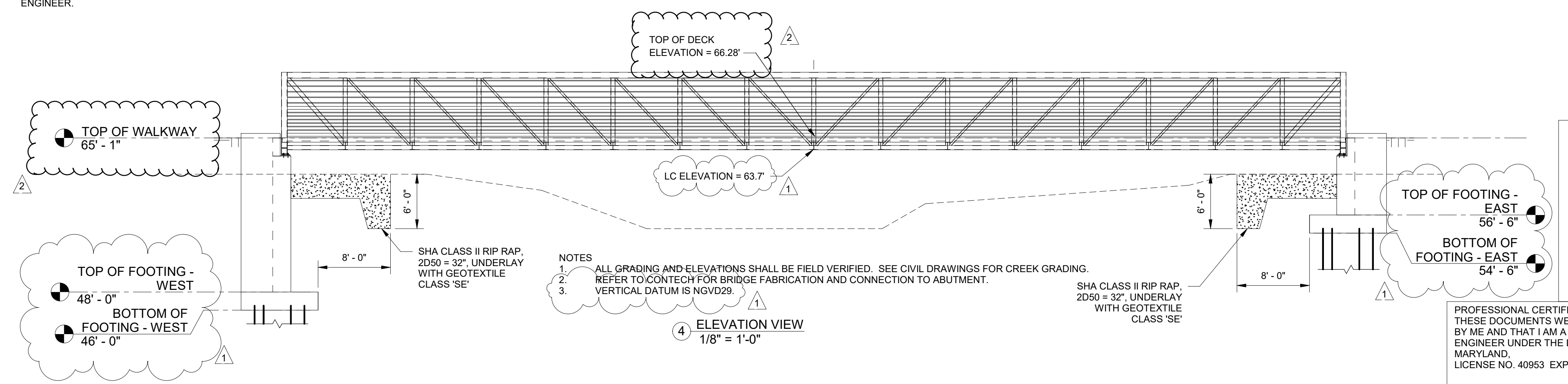


1 PEDESTRIAN BRIDGE PLAN VIEW
1/8" = 1'-0"



2 ABUTMENT PLAN VIEW
1/4" = 1'-0"

3 ABUTMENT PILE LAYOUT
1/4" = 1'-0"



4 ELEVATION VIEW
1/8" = 1'-0"

FOR REVIEW ONLY, NOT FOR CONSTRUCTION



PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 40953 EXP. DATE: 07/21/2021

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| REVISIONS | | DATE | BY |
|-----------|----------|----------------------------|----------------|
| NO. | DATE | DESCRIPTION | SCALE AS SHOWN |
| 1 | 5/1/2020 | REVISED FOOTING ELEVATIONS | CTK |
| 2 | 8/6/2020 | REVISED BRIDGE ELEVATIONS | AKI |

DESIGNED BY: NAM
 CHECKED BY: PDB

HENSON CREEK BRIDGE REPAIR
 1641 Tucker Road, Ft. Washington, MD 20744
STRUCTURAL NOTES AND PLAN VIEW

ELECTION DISTRICT - 12
 PRINCE GEORGE'S COUNTY, MARYLAND (20744)

DRAWING NO. **S-1.00**
 SHEET 28 OF 30
 KCI JOB NUMBER 271801182