Structural Engineering Guidelines

Items Needed for Engineering Design:

1. Geotechnical Report
2. Site Location

For Stamped Engineering Drawings Contact:

Your Local Structural Engineer
or

MKM & Associates Structural Engineering
441 College Avenue
Santa Rosa, California 95401
(707) 578-8185
info@mkmassociates.com
mkmassociates.com

MKM & Associates
structural engineering

Sample Water Fence Details

PLANS ARE EXAMPLES & NOT INTENDED FOR CONSTRUCTION USE

Job	140328
Date	7/27/15
PE —	1 of 5

ITEMS NEEDED FOR ENGINEERING DESIGN:
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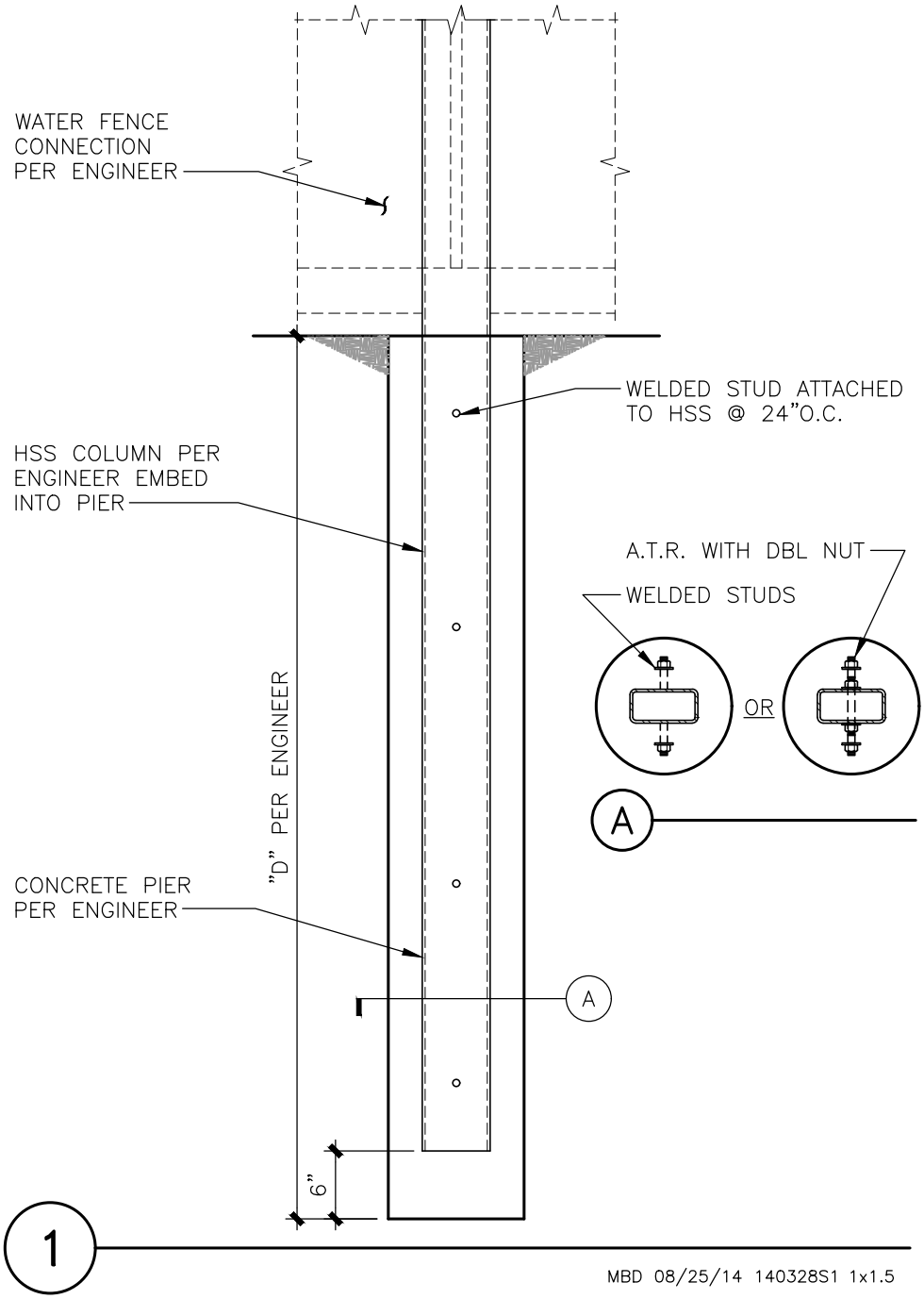
2. SITE LOCATION

FOR STAMPED ENGINEERING DRAWINGS CONTACT:

MKM & Associates
441 College Ave
Santa Rosa, CA 95401
Phone: 707-578-8185



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GENERAL

1. **MKM IS ONLY RESPONSIBLE WHEN OWNER PROVIDES INFORMATION FOR VALUES NOTED WITH "??" IN "DESIGN CRITERIA" SECTION. THESE SHALL BE SUPPLIED FOR EACH SITE, BASED UPON SITE SPECIFIC VALUES, MKM SHALL DETERMINE PIER DEPTH & POST SIZE. MKM IS NOT RESPONSIBLE WHERE DESIGN AS SHOWN ON THIS DRAWING IS FOLLOWED.**
2. All work shall be in conformance with the 2013 California Building Code (CBC) as adopted by the local governing agency, and any applicable local ordinances.
3. All conditions and dimensions shown on the plans shall be verified by the Contractor, any discrepancies that require clarification or revisions shall be brought to the attention of the Architect/Engineer before commencing with the work.
4. Contractor shall provide the requirements of all structural detail callouts denoted as "TYPICAL" or "TYP" at specifically noted conditions and at all like conditions throughout the project, unless otherwise noted. All details on detail sheets titled as "TYPICAL", and not directly referenced on plans, shall be incorporated at occurring locations throughout the project. Requirements of details not denoted or titled as "TYPICAL" shall be provided at the specific location shown on the plan and adjacent areas as applicable. Requirements of details denoted as "SIMILAR" or "SIM" shall be provided with differences as indicated or implied on referenced details and plans.
5. Details may be depicted diagrammatically. For example, roof pitches, floor/roof/wall thicknesses, framing members, etc., may differ in scale from actual proposed conditions. Details shall be understood in context with other drawings conveying structural and architectural design intent.
6. Structural design or review of temporary shoring, additional reinforcing, bracing, formwork, scaffolding, erection methods, etc. required for proper construction of the project shall be the responsibility of the Contractor.
7. See Architectural Drawings for wall locations and dimensions, unless otherwise noted. Drawings shall not be scaled.
8. See Architectural Drawings for all flashing, waterproofing, finishes and venting requirements.
9. Refer to architectural plans for finish floor elevations, floor depressions, openings, slopes, drains, curbs, pads, embedded items, non–bearing partitions, stairs, etc. Refer to civil, mechanical and electrical plans for utilities, sleeves, pipes, ducts, equipment, etc.
10. Shop drawings are an aid for field placement and are superseded by the structural drawings. It shall be the responsibility of the General Contractor to make certain that all construction is in full agreement with the latest approved contract documents.
11. Dimensions, unless otherwise shown, are to centerline of columns and beams, or to the face of concrete surfaces and rough framing.
12. All referenced publications shall be the latest edition, unless otherwise noted.
13. The contract structural drawings and specifications represent the finished structure, and, except where specifically shown, do not indicate the method or means of construction. The Contractor shall supervise and direct the work and shall be solely responsible for all construction means, methods, procedures, techniques, safety and sequence.

5100 140328S1 1/1/14

DESIGN CRITERIA

1. LATERAL LOADS **(Values below shall be site specific)**
   A. Wind (Analytical Method):
      Ultimate Design Wind Speed: V_{ult} = ??? mph
      Nominal Design Wind Speed: V_{asd} = ??? mph
      Exposure Category = "???"
      Risk Category = II
      Design Pressures – See Structural Calculations
   B. Earthquake (Equivalent Lateral Force Procedure):
      Mapped Spectral Response Accelerations, S_S = ???, S_1 = ???
      Site Class = "???"
      Spectral Response Coefficients, S_{DS} = ???, S_{D1} = ???
      Risk Category = "II"
      Seismic Design Category (CBC), SDC = "???"
      Response Modification Factor, R = ???
      Seismic Response Coefficient, C_S = ??? (Strength Level)
      Additional design parameters – See Structural Calculations

5104 140328S1 1/1/14

FOUNDATIONS/SITE WORK

1. Foundation design is based on values as set forth in section 1810.3.3.1.4 and TABLE 1806.2 in the CBC. Assume class 5 soil with allowable soil bearing pressure of 1500 psf with a constant expansion index less than 20.
2. All footing excavations shall be neat. Over–excavations shall be filled with concrete. All loose soils shall be removed from excavations prior to placement of concrete. Wet trenches immediately before placing concrete.
   Drilled Piers – Allowable Skin Friction
   a. DL + LL = 250 psf
   b. DL + LL + Wind/Seismic = 330 psf
   c. Passive pressure = 200 pcf on 2 pier diameters
3. MKM & Associates has not reviewed soil conditions of the building site and is not responsible for general site stability or soil suitability for the proposed project. A review by a Geotechnical Engineer or geologist may be desirable by the owner.

5110 140328S1 1/1/14

CONCRETE AND REINFORCEMENT

1. MATERIALS
   A. Concrete shall meet the following requirements:

	28-Day Strength	Slump	Max Agg	Max Ratio H20/Cement	Admixtures
FOUNDATIONS	2500 psi	4"±1"	1-1/2"	0.65	N/A

   NOTES:
   1. All concrete shall be sampled and tested by a qualified technician in accordance with ACI 318-11, 5.6. Exception: When approved by the Building Official, special inspection or testing is not required when the total quantity of a given class of concrete is less than 50 cubic yards.
   2. Portland cement shall conform to ASTM C150, Type II.
   3. Concrete cementitious material shall contain no more than 30%, by weight, of fly ash (ASTM C618, Type C or F) and/or slag (ASTM C989).
   4. Provide mix design to Architect/Engineer for review prior to ordering.
   5. Above table assumes no admixtures. Admixture dosage requirements depend on job conditions at the time of concrete placement.

   B. Reinforcing steel shall conform to ASTM A615, (including supplement S1), grade 60 for #5 bars and larger and grade 40 for #4 bars and smaller. Steel shall be kept clean and free of rust scales.
   B. Reinforcing steel shall conform to ASTM A615/A706 or A706, (including supplement S1), grade 60 for #5 bars and larger and grade 40 for #4 bars and smaller. Steel shall be kept clean and free of rust scales.
   C. Reinforcing to be welded shall be ASTM A706, grade 60
      1. Electrodes for welding reinforcing shall be as specified below SMAW: E90XX low hydrogen
   D. Smooth dowels shall be new plain billet steel conforming to ASTM A615 (including supplement S1), grade 40 for 1/2" diameter, grade 60 for 5/8" diameter and larger.
   E. High-strength, non-shrink grout shall be Master Builders "MasterFlow 100".

STEEL

1. MATERIALS
   A. Steel W and WT–shapes shall conform to ASTM A992.
   B. Steel M, S, HP, MT and ST–shapes, structural plates, bars, angles and channels shall conform to ASTM A36 or ASTM A572, GR50.
   C. Rectangular, square and round HSS shapes shall conform to ASTM A500, grade B.
   D. Steel pipes shall conform to ASTM A53, grade B.
   E. A307 bolts shall be used unless otherwise noted and where specifically indicated on the drawings. A307 bolts shall conform to ASTM A307 grade A, "Standard Specification for Carbon Steel Externally Threaded Standard Fasteners".
   E. Bolts shall be high–strength, refer to "HIGH STRENGTH BOLTS" Section.
   F. Anchor rods shall conform to ASTM F1554, grade 36, unless otherwise noted.
   G. Weld metal shall match base metal per AWS requirements. Electrodes for welding shall be as specified below:
      1. Electrodes for structural steel:
         a. SMAW: E70XX low hydrogen.
         b. FCAW: E7XT–X (except –2, –3, –10, –GS) (AWS A5.20).
         c. All complete–joint–penetration groove welds used in the Seismic Force Resisting System shall be "Demand Critical Welds" and shall be made with filler materials meeting the requirements specified in AWS D1.8/D1.8M clause 6.3.
      2. Electrodes for concrete reinforcing steel: Electrodes, welding and preheating of reinforcing shall conform to CBC Standard 19–1 and AWS D1.4 latest edition.
      3. Electrodes for sheet metal less than 1/8" thick: Electrodes and welding shall comply with AWS D1.3 latest edition.
   H. All steel exposed to wet conditions shall be hot dipped galvanized.
2. INSTALLATION
   A. All work shall be in conformance with AISC, "Specification for Structural Steel Buildings", latest edition.
   B. A307 bolts shall be tightened with an impact wrench to a snug tight condition. The snug–tight condition is defined as the tightness attained by a few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench.
   C. All structural steel and reinforcing steel welding shall be done in accordance with AWS, latest edition, and shall have special inspection. See "SPECIAL INSPECTION" Section.
   D. All shop and field welders shall be certified according to AWS procedures for the welding process and welding position used.

5230 140328S1 1/24/14