STRUCTURAL GENERAL NOTES

DESIGN LOADS AND GOVERNING BUILDING CODE

Code: International Building Code (IBC) – 2009 Edition with Denver Amendments

Roof: Snow.....25 psf
- Exposure Factor, Ce.....1.0
- Importance Factor, I.....1.0
- Thermal Factor, Ct.....1.0

Floor: Exit Facilities.....100 psf
Public Spaces.....100 psf

Wind: Basic Wind Speed.....90 MPH (3-Second Gust)
Importance Factor, I.....1.0
Exposure.....B
Internal Pressure Coefficient, GCpi.....±0.18

Seismic: Seismic Design Category.....B
Risk Category.....II
Mapped Spectral Response Coefficient, Ss.....0.218
Mapped Spectral Response Coefficient, S1.....0.056
Site Class.....D
Elevator Shaft Outside Wall Seismic-Force-Resisting-System.....Steel Systems Not Specifically Detailed for Seismic Resistance
Elevator Shaft Outside Wall Response Modification Coefficient (R).....3
Design Base Shear of Elevator Shaft Outside Wall.....2.01 kips (Service Level)
Analysis Procedure.....Equivalent Lateral Force Procedure

Deflection: Roof:
- Live Load:.....L/240
- Total Load:.....L/180

GENERAL CONSTRUCTION NOTES

- The Structural Contract Documents are intended to be used in conjunction with the plans of all other disciplines working on the project. The contractor is responsible for the coordination of all required information indicated on the Structural Contract Documents and incorporating these requirements into the shop drawings of all other disciplines prior to submittal to Anchor Engineering, Inc.
- Information provided within the Structural Contract Documents is subject to all requirements specified within the governing building code. The contractor shall be familiar with all portions of the governing building code that impact the type of construction being performed. For conditions where the Structural Contract Documents conflict with the governing building code, the more stringent requirements shall apply. The contractor shall keep a copy of the governing building code on site at all times during the construction phase of the project for reference. Anchor Engineering, Inc. shall be notified of any modifications resulting from a more stringent code requirement prior to construction for verification and coordination.
- Modifications to the Structural Contract Documents due to conditions at the site that are unknown or concealed at the time of design do not fall within the original scope of work of the project. Required modifications shall be performed as additional services as outlined in the project contract. The Engineer shall be notified in writing by an (RFI) to provide recommendations for resolution of the modification requested.
- Dimensions and elevations indicated on the Structural Contract Documents shall be coordinated by the contractor with all other disciplines prior to the beginning of construction. Discrepancies shall be brought to the attention of the Architect. Scaling of the Structural Contract Documents is not permitted.
- The contractor shall verify field conditions including existing utilities, sub-grade and above grade conditions which may interfere with construction and notify the applicable disciplines for modifications as required.
- In the event of discrepancies btwn. project specifications, general notes, plans & details, the most stringent req'm. shall apply unless approved in writing.
- Coordinate all openings through roof, floors, and walls with the appropriate disciplines. The penetration of structural members, unless specifically indicated on the Structural Contract Documents is not permitted without the review and consent of Anchor Engineering, Inc. including Post Tensioned slab on grade and all elevated slab construction. Openings and penetrations brought to the attention of the Engineer after the Structural Contract Documents are submitted to the city for review shall be subject to the requirements outlined in the Shop Drawings and Submittals section of the general notes.
- All items embedded into concrete or masonry shall be positively secured against the hydraulic forces from concrete placement or incidental contact from tools or equipment during concrete placement. The special inspector shall verify all embedded items are secured prior to placement of concrete.
- Unless specifically detailed &/or specified on the Structural Contract Documents, stairs, balusters, half-walls & railings for decks, balconies, awnings, sun shades and walkways as well as site retaining walls and improvements have not been designed by Anchor Engineering, Inc. Design & construction of these elements, when not expressly shown on the Structural Contract Documents, are the responsibility of the general contractor. These elements are considered design-build and the general contractor shall submit plans & calculations, sealed & signed by a professional engineer licensed in the state where the work is being performed.
- Provide Special Inspections per Chapter 17 of the governing building code as required by the local jurisdiction.

EXISTING CONSTRUCTION

- Preparation of the Structural Contract Documents is based on available existing construction documents and site observations of exposed conditions. Actual field conditions exposed during construction and found to conflict with the Structural Contract Documents shall be brought to the attention of the Architect.
- Prior to the construction phase of the project, the contractor shall become familiar with the existing structure and all aspects that may influence the construction process.
- It shall be the responsibility of the contractor to provide all erection and bracing requirements necessary to provide a safe working environment and to protect the portions of the existing structure that are to remain from damage during demolition and new construction. Refer to the Structural Erection and Bracing Requirements section of the general notes for additional information.
- Dimensions and elevations shall be field verified by the contractor prior to fabrication and construction in order to ensure the proper alignment and fit-up of new construction with existing conditions. Discrepancies shall be brought to the attention of the Architect & Engineer for resolution prior to the continuation of work. All elevations indicated of drawings are base upon a datum. Verify datum indicated on structural drawings, Re: civil drawings for actual in site elevations.
- Operations and procedures for welding to existing members shall account for and eliminate the possibility of member liquefaction.
- The Architect shall be contacted in the event of uncovered elements found during the project that appear to be unsound or otherwise structurally deficient.

FOUNDATION DESIGN (Footings on Geopiers)

- The foundation design is based on a geotechnical investigation report #25155132 by Terracon Consultants, Inc. dated September 29, 2015. A copy of this soils report is available for review at the Structural Engineer's office or the Architect's office.
- Helical Piers:
  a. Minimum Penetration into Bedrock..... As Required for Torque
  b. Minimum Length of Helical Pier..... 25 feet
- Bottom of drilled pier elevations shown on the drawings are for bidding purposes only. Actual elevations may vary to provide minimum penetration and minimum length.
- Pre-drilling may be required if it is found that the minimum 25 feet installation depth can not be reached.
- 4" continuous void form shall be provided under the grade beams between drilled piers.
- A qualified soils engineer shall observe the excavations and soil preparation to verify the bearing stratum will provide adequate bearing capacity.
- Foundation walls have been designed for an equivalent at-rest fluid pressure of 85 pcf as indicated in the geotechnical report. Pressure values assume Contractor provides adequate de-watering measures for site & Granular type backfill (as defined in the Geotech. Report).

REINFORCED CONCRETE

- Design is based on "Building Code Requirements for Reinforced Concrete" (ACI 318 – Latest Edition). Concrete work shall conform to "Specifications for Structural Concrete for Buildings" (ACI 301 – Latest Edition). Hot and cold weather shall be in conformance with ACI 305 and ACI 306 respectively.
- Cement Type shall be as indicated in mix design matrix below, Portland Cement, conforming to ASTM C150.

CONCRETE MIX DESIGN MATRIX

INTENDED USE OF CONCRETE	28-DAY COMP. STRENGTH, PSI	MAX. W/C RATIO	CEMENT TYPE	MINIMUM AIR CONTENT	NOTES
ALL CONCRETE	4000	.50	I / II	6% ± 1½%	–

- Aggregate size shall not exceed 3/4"
- Chloride admixtures shall not be used.
- Concrete mix designs shall be submitted to the structural engineer for approval prior to construction. Pouring conc. before the mix designs have been approved by the structural engineer is at the Contractor's risk. The contractor shall bear the cost, if necessary, to remove & replace the unacceptable conc.
- Please note that air entrainment may be used for interior concrete but may result in finishing complications.
- Fly ash shall conform to ASTM specification C618, class C or class F. Fly ash shall not exceed 20% of the total weight of cementitious material.
- Slabs and grade beams shall not have cold joints in a horizontal plane. Where stop in concrete placement is necessary at a point other than shown on these drawings, contact the Structural Engineer for direction. Vertical construction joints within grade beams shall be made within the center third of the span between supports. Horizontal shear keys or a roughened surface shall be provided. All reinforcing shall be continuous through construction joints.
- Reinforcing Bars shall conform to ASTM A615 or ASTM A706. All bars shall be Grade 60.
- Bars to be welded shall conform to ASTM A706. Detailing, fabrication, and placement of reinforcing steel shall be in accordance with the "Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI 315 – latest ed.)". No splices of reinforcement shall be made and no welding to reinforcing shall be permitted except as shown or as approved by the Structural Engineer. Any welding of reinforcing thus approved shall be done by certified welders in strict conformance to the "AWS Structural Welding Code – Reinforcing Steel" of the American Welding Society (AWS D1.4 latest ed.). "Tack" welding of/to reinforcing will not be permitted under any circumstances. Minimum length of lapped splices shall be Class B tension splices as indicated in the reinforcing bar splice schedule on this sheet, unless noted otherwise. Make all bars continuous at corners/intersections or provide corner bars of equal size. Welded wire mesh shall be lapped one full mesh at sides and one full mesh plus 2" at the ends but not less than 6" and shall be wire tied.
- Reinforcing bar extending from surface of cured concrete shall not be twisted or field bent in order to achieve correct alignment. Contact Anchor Engineering for repair at all locations where reinforcing bar hooks or extensions are not placed with correct orientation or where bars are twisted inadvertently.
- Where continuous bars in beams/grade beams, & walls must be spliced, slice top bars at mid-span and splice bottom bars over supports.
- No lapped splices in columns shall be permitted when larger bar is #14 or #18 except to smaller bars of equal or greater total area when in compression.
- Unless noted otherwise on plan or in details, concrete protection for reinforcement in cast-in-place concrete shall be as follows:
  a. Concrete cast against and permanently exposed to earth..... 3"
  b. Formed surfaces exposed to earth or weather:
     - #6 through #11 bars..... 2"
     - #5 bar, W31 or D31 wire, and smaller..... 1½"
  c. Concrete not exposed to weather or in contact with ground:
     - Slabs, walls, joists: #11 bar and smaller ..... 1"
     - Beams: Primary Reinforcement..... 1½"
     - Stirrups, ties, spirals..... 1½"
     - Columns: Primary Reinforcement..... 2
     - Ties/Spirals..... 1½"
- Provide (2) #5 bars, one each face, with 2'-0" projection on all sides of openings in concrete, unless noted otherwise.
- Provide #3 stirrup support bars in beams if no other longitudinal reinforcement is provided.
- Slabs-on-grade shall be reinforced with a minimum of ASTM 185 or ASTM 497, 70 ksi 6x6-W2.1xW2.1 W.W.M. for up to 5" thick slabs and 6x6-W2.9xW2.9 W.W.M. for 6" slabs u.n.o. W.W.M. shall be lapped one full mesh at sides and one full mesh plus 2" at the ends but not less than 6" and shall be wire tied.
- Topping slabs on steel deck shall be reinforced with ASTM 185 or ASTM 497, 70 ksi W.W.M. unless noted otherwise. Polypropylene fibers may not be used as an acceptable alternative for W.W.M.
- Provide a ¾" chamfer on all exposed corners of concrete walls and columns unless noted otherwise.
- Contractor to allow for 20 feet of #5 rebar to be used at the discretion of the Engineer of Record. Bar not used for construction shall be returned to supplier and the returned bar cost shall be credited back to the owner.

STRUCTURAL STEEL

- Structural steel shall be detailed, fabricated, and erected in conformance with the AISC Specification and the Code of Standard Practice, latest editions.
- Rolled structural steel shapes shall conform to the following specifications:
  a. W Shapes..... ASTM A992, 50 ksi
  b. Channels, Angles, & Plates..... ASTM A36, 36 ksi (U.N.O. in plans)
  c. Pipe Shapes..... ASTM A53, Grade B
  d. Structural Tubing (TS/HSS)..... ASTM A500, Grade B, 46 ksi yield
- Connections made under shop conditions shall be welded or bolted with ASTM A325 high strength bolts, type X or N. Welds shall be made with AWS A5.1 or A5.5 class E70XX electrodes or equivalent submerged arc and follow all requirements of AWS D1.1.
- Design of all steel connections unless specifically detailed shall be the responsibility of the steel fabricator. Field bolted connections shall be bearing type with ¾" diameter A325-N bolts, unless noted otherwise. All connections where reactions are not indicated on plan shall support 60% of the total uniform load capacity in bending for each beam and span as shown in the AISC uniform load constant tables. Connections shall generally follow those as found in AISC "Steel Construction Manual" Thirteenth Edition.
- All welds shall be performed by an AWS certified welder.
- Minimum fillet weld sizes shall conform to AISC requirements.
- Anchor bolts shall conform to ASTM F1554, 36 ksi unless noted otherwise.
- Headed anchor studs (H.A.S.) shall conform to ASTM A108 with a minimum tensile strength of 60,000 psi. Deformed anchor studs (D.A.S.) shall be ASTM A706 with a minimum tensile strength of 60,000 psi
- Structural steel members shall as a minimum be coated with SSPC 15-68, Type 1 (Red Oxide) paint. Structural steel exposed to weather shall be Hot-Dipped Galvanized in accordance with ASTM A153. Coatings damaged due to shipping, erection, welding or bolting shall be repaired in a manner that will provide a corrosion resistance equivalent or better than that provided in shop.
- Steel in contact with earth shall be coated with (2) layers of a bituminous paint unless noted otherwise.

LIGHT GAGE STRUCTURAL STEEL FRAMING

- Light gage steel framing materials shall conform to the Steel Stud Manufacturers Association (SSMA) guidelines as well as the following specifications:
  1. Steel studs and joists unless noted otherwise on plan:
     a. 98, 68 and 54 mils..... ASTM A1003, ST50L, Minimum Yield = 50 ksi
     b. 43 and 33 mils..... ASTM A1003, ST33L, Minimum Yield = 33 ksi
  2. Track, bridging, and closures, and accessories unless noted otherwise on plan:
     a. All..... ASTM A1003, ST33L, Minimum Yield = 33 ksi
- Unless otherwise shown, "Cee" studs shall have 1⅝" flanges w/ ½" return lips, track shall be "deep leg" w/ 1⅝" flanges. Refer to plans for add'l. information.
- Tracks shall be securely anchored to the supporting structure as shown on the plans. At track butt joints, abutting pieces of track shall be securely anchored to a common structural element, or they shall be butt welded or spliced together. Temporary bracing shall be provided until erection is completed. Handling and lifting of prefabricated frame panels shall be done in a manner as to not cause distortion in any member.
- Splices in axially loaded studs shall not be permitted unless approved by structural engineer.
- Light gage steel framing components shall be connected together using #10 TEK self-drilling screws or welds and procedures conforming to the AWS specification for welding sheet steel in structures. E70 or E60 electrodes may be used.
- All studs at openings and at ends of x-bracing straps shall be welded together with ⅛" fillet welds x 2" long at 12" o.c. each side unless otherwise noted.
- Provide "sill seal" material, match stud wall width, under all outside bottom tracks.
- Provide flat washer under each anchor bolt nut for bottom track anchorage.
- Bridging shall be provided per the recommendations of the manufacturer. Bridging between horizontal members shall not exceed a maximum of 8'-0" on center and bridging between vertical members shall not exceed a maximum of 5'-0" on center.
- All light gage studs/framing members are to be designed by a specialty contractor licensed to practice engineering in the state of Colorado.
  - Wind speed and exposure given in these general notes shall be used with the 2009 IBC and ASCE 7-05 to determine wall pressures.
  - Light gage low roofs (up to 6'-0" projection from building) shall be designed for self weight plus 15 psf Dead Load and 25 psf Snow Load.
  - Wall studs should be designed to support low roofs where required.
  - Max. wall stud Δ = L/600.
  - All connections from the light gage framing to the concrete or steel structure are the responsibility of the specialty contractor.
  - Shop drawings and calculations bearing the seal of the engineer shall be submitted to our office for review prior to construction.

SHOP DRAWINGS AND SUBMITTALS

- Review of shop drawings by the Structural Engineer is to establish general conformance of the shop drawings with the Structural Contract Documents. No responsibility is assumed by the Structural Engineer for correctness, dimensions or details. All minimum conditions and requirements specified on the Structural Contract Documents or in the governing building code and referenced standards shall be met regardless of the information indicated on the shop drawings. The contractor bears sole responsibility for errors, omissions and code requirements associated with the shop drawings and the application of the information therein.
- Construction Documents are copyrighted and shall not be reproduced for use as erection plans or shop details.
- All shop and erection drawings shall be checked and stamped by the General Contractor prior to submission for Engineer's review. Unchecked submittals will be returned without review. Furnish one (1) print of shop and erection drawings for Concrete Reinforcing Steel, Structural Steel, Steel Deck plans for Structural Engineer to review prior to fabrication.
- Submit in a timely manner to permit ten (10) working days for review by Structural Engineer.
- Requests for the modification of plans or specifications shall be submitted in writing. Shop drawings, submitted for review do not constitute "in writing" unless specific suggested changes are clearly marked. In any event, such changes by means of the shop drawing submittal or request for information process become the responsibility of the one initiating such change and shall compensate Anchor Engineering, Inc. for time and expense incurred for making the desired modifications.
- The contractor shall allow for adequate time for the review, design and detailing of requested modifications or repairs in the construction schedule.
- Review of shop drawings by the Engineer of Record is a courtesy and does not relieve the supplier of requirements indicated in the Structural Contract Documents unless specifically noted otherwise in writing by the reviewing engineer.

STRUCTURAL OBSERVATIONS

- Structural engineer shall make periodic observations of the construction during placement of foundation and erection of structural framing. The purpose of the observations shall be to become generally familiar with the quality of work of the contractor in order to determine general conformance with the contract documents. Such observations shall not replace required inspections by the governing authorities or serve as "special inspections" as may be required by Chapter 17 of the governing building code.
- The contractor shall notify the structural engineer at the following stages of construction so that these observations may be made:
  a. Prior to placing foundation concrete (after reinforcement placement).
  b. During erection of each level of structural framing.
  c. After roof deck has been placed and connected (before roofing operations).
  d. After completion of all structural framing erection (including permanent bracing).
- Notification for observation shall be given to the structural engineer at least 24 hours prior to the time the observation is needed. The structural engineer may not make observations at each notification and lack of observation shall not stop progress of construction nor shall the observation indicate owner's acceptance of all work related to the observation.

STRUCTURAL ERECTION AND BRACING REQUIREMENTS

- The structural drawings illustrate the completed structure with elements in their final positions, properly supported and braced. These construction documents contain typical and representative details to assist the contractor. Details shown apply at all similar conditions unless otherwise indicated. Although due diligence has been applied to make the drawings as complete as possible, not every detail is illustrated, nor is every exceptional condition addressed. All proprietary connections shall be installed in accordance with the manufacturers' recommendations. All work shall be accomplished in a workmanlike manner and in accordance with the governing building code and ordinances.
- The general contractor is responsible for coordination of all work, including layout and dimension verification, materials coordination, shop drawing review, and the work of subcontractors. Any discrepancies or omissions discovered in the course of the work shall be immediately reported to the architect for resolution. Continuation of work without notification of discrepancies relieves the architect and engineer from all consequences.
- Unless otherwise specifically indicated, the Structural Contract Documents do not describe means, methods, techniques or sequences of construction. The Contractor, in the proper sequence, shall provide proper shoring and bracing as may be required during construction and is responsible for the procurement of all engineering services required to achieve the final completed structure. The contractor, in the proper sequence, shall perform or supervise all work necessary to achieve the final completed structure, and to protect the structure, workmen, and others during construction. Such work shall include, but not be limited to, bracing, shoring for construction equipment, shoring for excavation, formwork, scaffolding, safety devices and programs of all kinds, support and bracing for cranes and other erection equipment and the dynamic effects of thermal variations on structural elements and connections during construction. Do not backfill against basement or retaining walls until supporting slabs and floor framing are in place and securely anchored, unless adequate bracing is provided. The structural steel frame is "non-self-supporting" per AISC Code of Standard Practice. Temporary bracing shall remain in place until all floors, walls, roofs and any other supporting elements are in place. The architect and engineer bear no responsibility for the above items, and observation visits to the site do not in any way include inspection of them.
- Where periodic or continuous inspection is required by these documents, governing building code or local ordinance, the owner shall employ an independent inspector certified in the particular area of concern. The inspector shall be responsible to, and report to, the architect and building department.

DEFERRED SUBMITTALS

- Unless specifically detailed herein and/or specified on the structural contract documents, the following items have not been designed by Anchor Engineering, Inc. Design and Construction of these elements, when not expressly shown on the structural contract documents, are the responsibility of the General Contractor. These elements are considered design-build and the General Contractor shall submit plans and calculations to our office for review. The plans and calculations must be sealed and signed by a Professional Engineer licensed in the state where the work is being performed.

  a. Light-Gage Steel (Cold Formed Steel) Construction
  b. Storefront/Curtain Wall

TYPICAL FOUNDATION PLAN NOTES

- Re: Civil Plans for top of first floor slab elevation (elevations indicated on structural sheets are reference elevations only).
- Re: Soils report for sub grade preparation.
- Broom finish all concrete in entryways & patios.
- Reinforce all slab on grade with 6 x 6 – W1.4 x W1.4 W.W.F. unless noted otherwise.

SPECIAL INSPECTION REQUIREMENTS

- A special inspector shall be engaged to make special inspections of the construction work as outlined below in conformance with the provisions of chapter 17 of the governing building code.
- Special inspections shall be performed by an independent, established and recognized agency approved by the building official as demonstrating competence in performing the required special inspections.
- The special inspector shall have experience in the inspection of the particular type of construction or operation for which the special inspection is being performed.
- The inspecting agency shall keep records of all inspections performed. A copy of all inspection reports shall be provided to the building official as well as to Anchor Engineering, Inc..
- Inspection reports shall specify that work inspected was completed in full conformance to the most recent approved Structural Contract Documents. Any discrepancies with the Structural Contract Documents shall be brought to the immediate attention of the contractor for correction. All required structural corrections/modifications shall be submitted to Anchor Engineering, Inc. and adequate time shall be allotted for by the contractor for review and response. Costs incurred due to required corrections, modifications and time delays shall be the sole responsibility of the contractor.
- A final report shall be issued by the inspection agency to the building department as well as Anchor Engineering, Inc. stipulating that all inspected items are in conformance with the Structural Contract Documents or with additional documentation provided by the building department or Anchor Engineering, Inc.. All Structural Contract Documents used in the special inspection process shall be identified and itemized, including dates of issue.
- Inspection reports shall include the names of personnel on site during inspection.
- The following work shall be inspected by the special inspector:

  Soils:
  1. The Special Inspector shall perform periodic inspections to verify materials below shallow foundations are adequate to achieve the design bearing capacity as specified in the geotechnical report.
  2. The Special Inspector shall perform periodic inspections to verify excavations are extended to proper depth and have reached proper material as specified in the geotechnical report.
  3. The Special Inspector shall perform periodic inspections to classify and test compacted fill materials.
  4. The Special Inspector shall perform continuous inspections during placement and compaction of compacted fill to verify use of proper materials, densities, and lift thickness as specified in the geotechnical report.
  5. The Special Inspector shall perform periodic inspections prior to placement of compacted fill to verify that the site has been prepared properly as specified in the geotechnical report.
  6. The Special Inspector shall perform any other inspections required by the geotechnical engineer.

  Concrete:
  1. Placement of Reinforcement – Special inspection need not be continuous but must be done once placement is completed and prior to closing the forms. Items to be checked include bar size, grade, quantities, locations, spacing, bend radius, hook length, clear cover, lap splice locations, lap splice length, field bends and couplers. Bars should be clean and free of mud and excessive rust and must have proper concrete coverage. Weldability of steel reinforcing bar other than ASTM A706 shall be determined where required.
  2. Concrete Placement – The special inspector shall be present during concrete placement operations. Items to be checked include that the proper mix design is supplied, excess water is not added at site and concrete or contractors placing the concrete do not displace reinforcement, post-tension strands or embedded items. Additional items include manner of placement, consolidation by mechanical vibration, prevention of cold joints, proper location and configuration of vertical construction joints and proper curing procedures for cold or hot weather concreting. At the time samples are taken for compression tests, concrete slump, air content and temperature shall be determined and noted.
  3. Embedded Items – Special inspection shall be done on a continuous basis for anchor bolts, studs and embed plates. Items to be checked are proper anchor diameters, embedment lengths, spacing between anchors, edge distances, embed plate locations, concrete consolidation around anchors, and securing of embedded items against the hydraulic forces from concrete placement.

  Steel:
  1. Steel fabrication shall be performed by a registered fabricator who is approved to perform such work without special inspection.
  2. Once the fabrication is complete, a certificate of compliance shall be issued by the approved fabricator to the building official and Anchor Engineering, Inc. stating that the work was completed in accordance with the most recent approved Structural Contract Documents and shall identify and itemize the documents applicable to the work as well as the associated dates thereof.
  3. Items listed below shall be inspected in the field shall have special inspection to verify compliance with Structural Contract Documents. Items include bracing, stiffening, member location and proper application of joint details provided or approved by Anchor Engineering, Inc. at each connection.

  Welding:
  1. Materials, welding procedures and qualifications of welders shall be verified prior to the commencement of work.
  2. All welding shall receive continuous special inspection unless covered by item "3" below.
  3. The following items need not be continuously inspected but shall be visually inspected after completion of the work:
     a. Single-pass fillet welds not exceeding 5/16-inch in size.
     b. Floor and roof deck welding.
     c. Welded studs when used for structural diaphragm or composite systems.
     d. Welded sheet steel for cold-formed steel framing members such as studs & joists.
     e. Welding of stairs and railing systems.
     f. Welding done in an approved fabricator's shop in accordance with the governing building code.
  4. Items to be checked are the certification of the welders, welding procedures and materials, visual inspection of weld size, length, quality, quantity and spacing.
  5. Welding inspection and inspector qualifications shall be in compliance with AWS D1.1.

  High-Strength Bolts:
  1. High strength bolts, nuts, washers, paint, bolted parts and installation and tightening shall be verified by the special inspector.
  2. It shall be determined that all plies of connected material have been drawn together and properly snugged.
  3. Slip critical bolt installation (where indicated only):
     a. Periodic special inspection may be used provided the turn-of-nut with matchmarking techniques, direct tension indicator or alternate design fastener (twist-off bolt) methods are used. Continuous special inspection shall be provided otherwise.
     b. Preinstallation testing and calibration procedures shall be observed.
     c. Bolt installation shall be monitored to verify the proper installation procedure.
     d. At locations where a "Class B" faying surface is specified, special inspection shall be provided to verify surface is maintained.
  4. Snug tight bolt installation:
     a. Periodic special inspection required.

  Foundation:
  1. Bearing strata and Geopiers – Special inspection shall be provided per the recommendations of the Geotechnical Engineer and/or Geopier Specialty Engineer.
  2. Footings/Mats and Reinforcing – Refer to the "Concrete" special inspection section for requirements.

MATERIALS TESTING REQUIREMENTS

CAST IN PLACE CONCRETE:
- Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
  1. Testing Frequency: Obtain one sample for each day's pour of each concrete mixture exceeding 5 cu. yd., and not less than one sample for each 100 cu. yd. or fraction thereof.
  2. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  3. Slump: ASTM C 143/C 143M; one test at point of placement for each sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
  4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each sample, but not less than one test for each day's pour of each concrete mixture.
  5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
  6. Compressive-Strength Tests: mold the cylinders per ASTM C31 and test the cylinders per ASTM C39.
     a. Provide a minimum of four 6x12 (or five 4x8) cylinders from each sample taken. More cylinders may be taken at Contractor's option or for determination of compressive strength for stressing operations.
     b. Cylinders for compressive-strength tests (other than for stressing operations) are laboratory-cured unless noted otherwise.
     c. Test one cylinder at 7 days and two 6x12 (or three 4x8) cylinders at 28 days. Hold one cylinder in reserve.
     d. A 28-day compressive-strength test shall be the average compressive strength from a set of two 6x12 (or three 4x8) cylinders obtained from same sample and tested at an age of 28 days.
  8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
  9. Test results shall be reported in writing to Engineer, Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
  10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete with remaining cylinder specimens after 28 day tests are conducted, cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
  11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
  12. Correct deficiencies in the work that test reports and inspections indicate does not comply with the Contract Documents.
- Measure floor and slab flatness within 48 hours of finishing.

WELDING:
1. Partial and complete joint penetration welds shall have magnetic particle inspection in accordance with ASTM E709 performed on root pass and on finished weld.

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DEC 16 2015

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PROJECT NUMBER 150373
DRAWN LD
CHECKED RMS

ISSUE
10.07.15 FDN. PERMIT SET
10.14.15 PERMIT SET
02.26.16 BID

REVISIONS
1 12.16.15 FDN. B.D. RESP.

ANCHOR ENGINEERING, Inc.
Richard M. Schauppner, P.E., S.E.
PROFESSIONAL ENGINEER
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Denver, CO 80211 FAX (303) 830-9133

DESIGNED BY- RMS REVIEWED BY- RMS
DRAWN BY- LD JOB NO.: 150373

GENERAL NOTES

S1.0

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STRUCTURAL PLOT DATE: 12.16.2015

REBAR SPLICE LENGTHS, IN.
CLASS 'B' TENSION SPLICES f'c = 4000 PSI

	CONC. COVER = 1"		CONC. COVER = 1½"		CONC. COVER = 2"	
BAR SIZE	TOP	BOTTOM	TOP	BOTTOM	TOP	BOTTOM
#3	16	16	16	16	16	16
#4	20	16	20	16	20	16
#5	29	22	24	19	24	19
#6	40	31	29	22	29	22
#7	64	50	48	37	42	33
#8	80	62	60	47	48	37
#9	98	76	74	57	60	46
#10	119	92	91	70	74	57
#11	141	108	109	84	89	68

REBAR SPLICE LENGTHS, IN.
CLASS 'B' TENSION SPLICES f'c = 5000 PSI

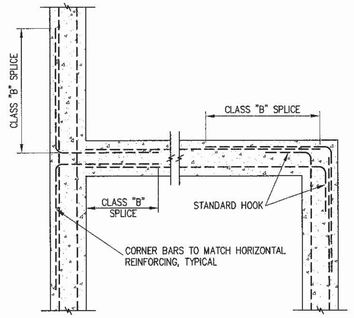
	CONC. COVER = 1"		CONC. COVER = 1½"		CONC. COVER = 2"	
BAR SIZE	TOP	BOTTOM	TOP	BOTTOM	TOP	BOTTOM
#3	16	16	16	16	16	16
#4	20	16	20	16	20	16
#5	26	20	22	17	22	17
#6	36	27	26	20	26	20
#7	58	44	43	33	38	29
#8	72	56	54	42	43	33
#9	88	68	66	51	53	41
#10	106	82	81	63	66	51
#11	126	97	97	75	79	61

NOTES:
1. SPLICE LENGTHS ARE BASED ON ACI 318-08, PARAGRAPH 12.2.
2. SPLICE LENGTHS ARE 1.3 x BASIC DEVELOPMENT LENGTH.
3. IT IS ASSUMED REBAR CENTER-TO-CENTER SPACING > 2x(COVER +½ BAR DIA.).
4. IT IS ASSUMED REBARS ARE UNCOATED (NOT EPOXY-COATED).
5. VERTICAL REBARS USE SAME SPLICE LENGTH AS BOT. REBARS.
6. TOP BAR LENGTHS ARE SPECIFIED FOR HORIZ. REINF. SO PLACED THAT MORE THAN 12 IN. OF FRESH CONC. IS CAST IN MEMBER BELOW THE SPLICE.
7. SPLICE LENGTHS FOR REBARS w/ DIFFERENT SIZES SHALL BE BASED ON THE SPLICE LENGTH FOR THE SMALLER SIZE REBAR.

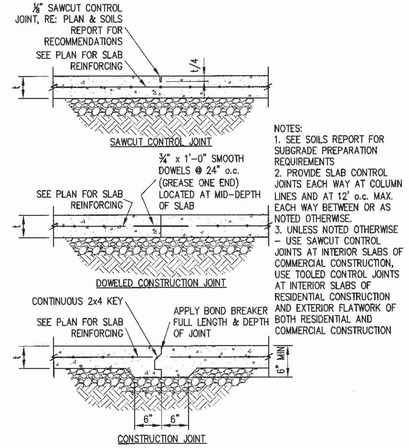
REBAR MARK CONVERSION
"Soft Metrification"

BAR SIZE DESIGNATION		BAR DIAMETER	
U.S.	SI	in.	mm
#3	#10	.375	9.5
#4	#13	.500	12.7
#5	#16	.625	15.9
#6	#19	.750	19.1
#7	#22	.875	22.2
#8	#25	1.000	25.4
#9	#29	1.128	28.7
#10	#32	1.270	32.3
#11	#36	1.410	35.8

U.S. GRADE 60 = SI GRADE 420 (4)
U.S. GRADE 40 = SI GRADE 300



TYPICAL WALL INTERSECTIONS
1 TYPICAL DETAIL
3/4" = 1'-0"



NOTES:
1. SEE SOILS REPORT FOR SUBGRADE PREPARATION REQUIREMENTS
2. PROVIDE SLAB CONTROL JOINTS EACH WAY AT COLUMN LINES AND AT 12' o.c. MAX. EACH WAY BETWEEN OR AS NOTED OTHERWISE.
3. UNLESS NOTED OTHERWISE – USE SAWCUT CONTROL JOINTS AT INTERIOR SLABS OF COMMERCIAL CONSTRUCTION, USE TOOLED CONTROL JOINTS AT INTERIOR SLABS OF RESIDENTIAL CONSTRUCTION AND EXTERIOR FLATWORK OF BOTH RESIDENTIAL AND COMMERCIAL CONSTRUCTION

TYPICAL SLAB ON GRADE JOINTS
2 TYPICAL DETAIL
3/4" = 1'-0"

GREY WOLF ARCHITECTURE
ARCHITECTURE PLANNING INTERIOR DESIGN
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SCHEDULES & TYPICAL SECTIONS

S1.1

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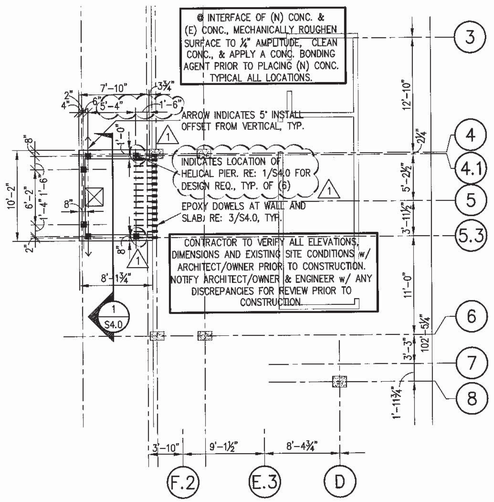
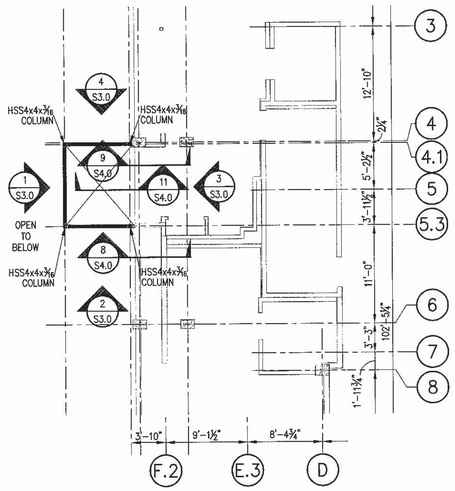
STRUCTURAL PLOT DATE: 12.16.2015



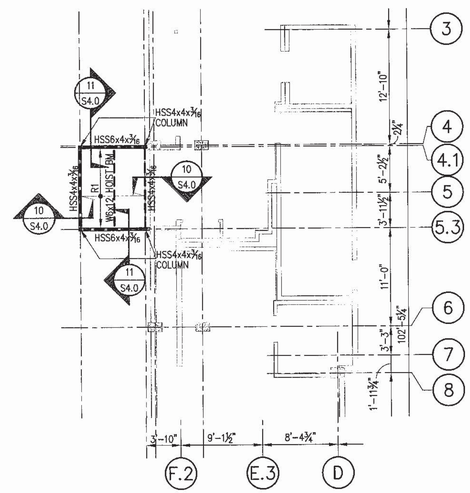
1 FOUNDATION PLAN

NOTES: 1/8" = 1'-0"



2 FLOOR FRAMING PLAN

NOTES: 1/8" = 1'-0"



3 ROOF FRAMING PLAN

NOTES: 1/8" = 1'-0"

STRUCTURAL PLOT DATE: 12.16.2015

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FOUNDATION & FRAMING PLANS

S2.0

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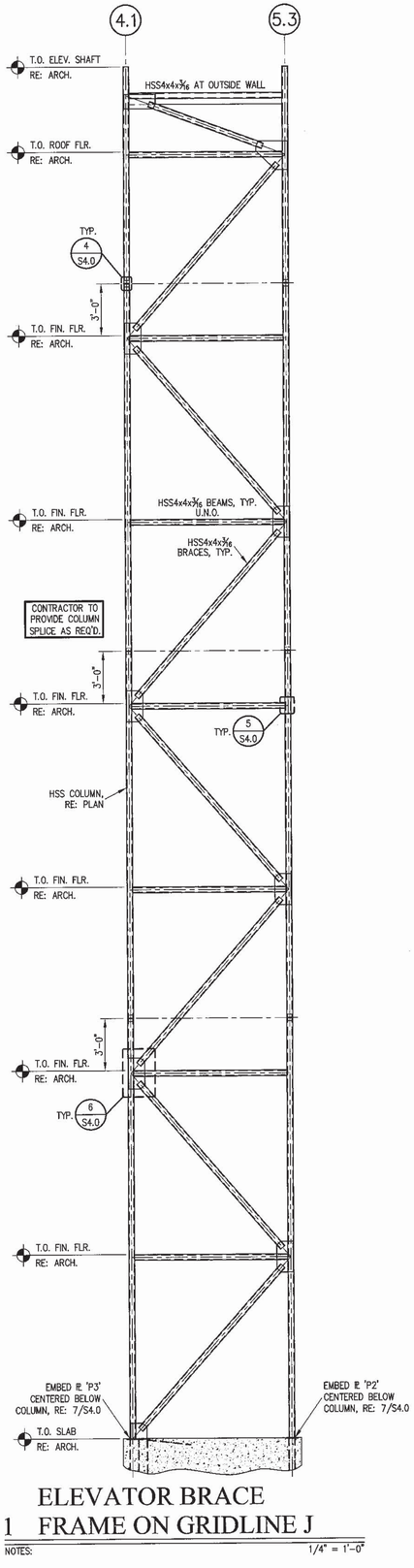
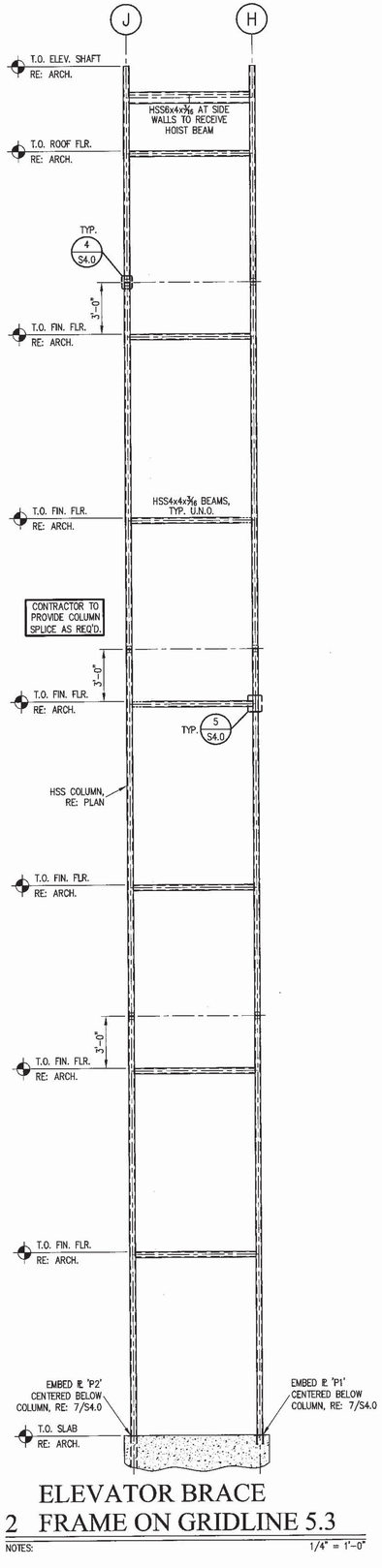


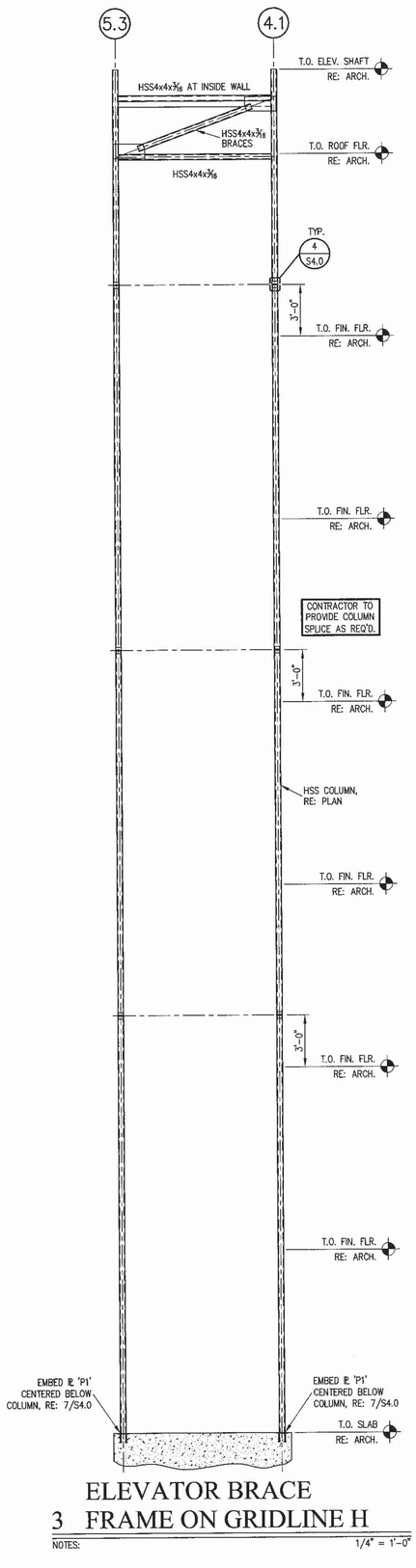
ELEVATOR BRACE
1 FRAME ON GRIDLINE J

NOTES: 1/4" = 1'-0"



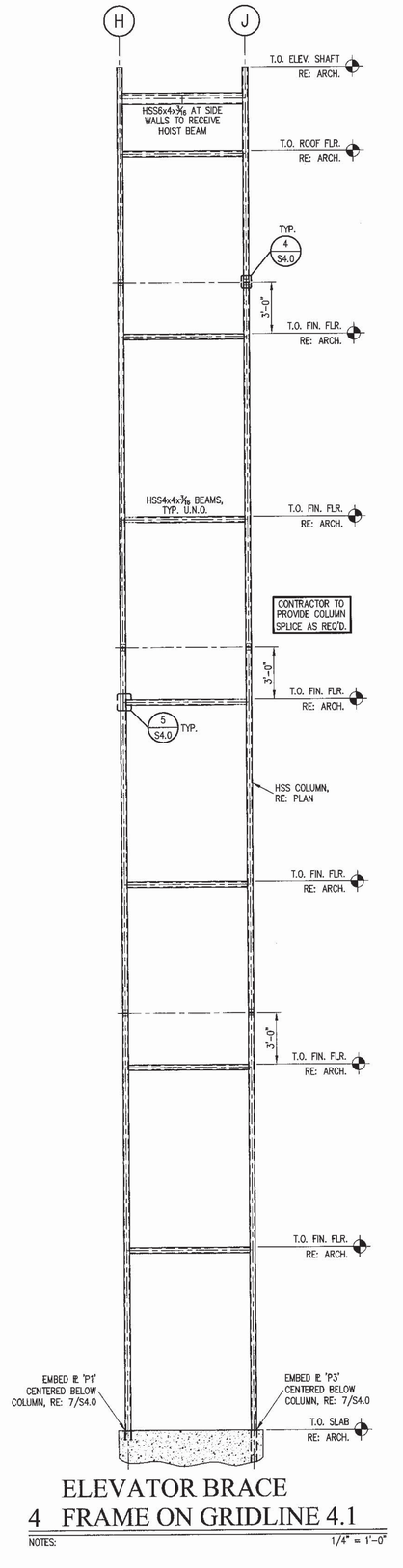
ELEVATOR BRACE
2 FRAME ON GRIDLINE 5.3

NOTES: 1/4" = 1'-0"



ELEVATOR BRACE
3 FRAME ON GRIDLINE H

NOTES: 1/4" = 1'-0"



ELEVATOR BRACE
4 FRAME ON GRIDLINE 4.1

NOTES: 1/4" = 1'-0"

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ELEVATIONS

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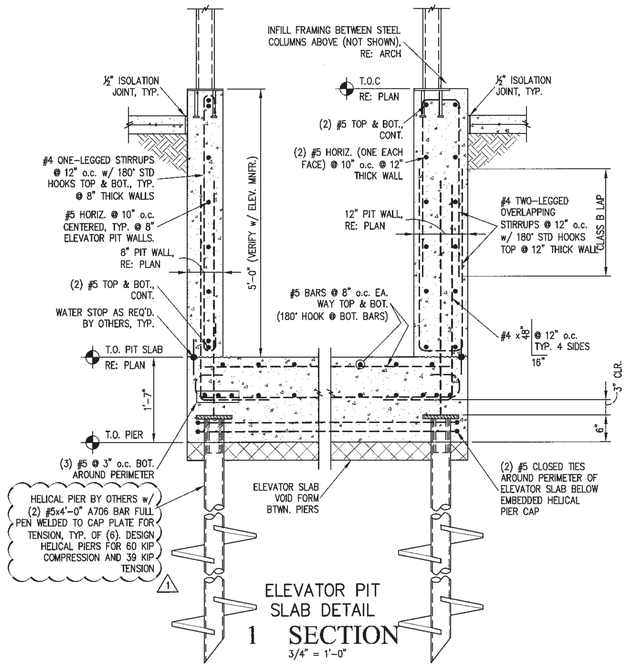
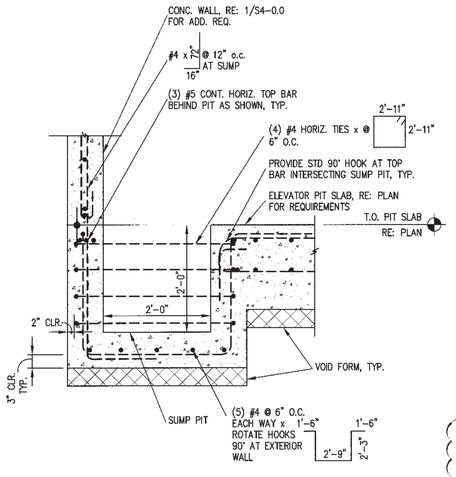
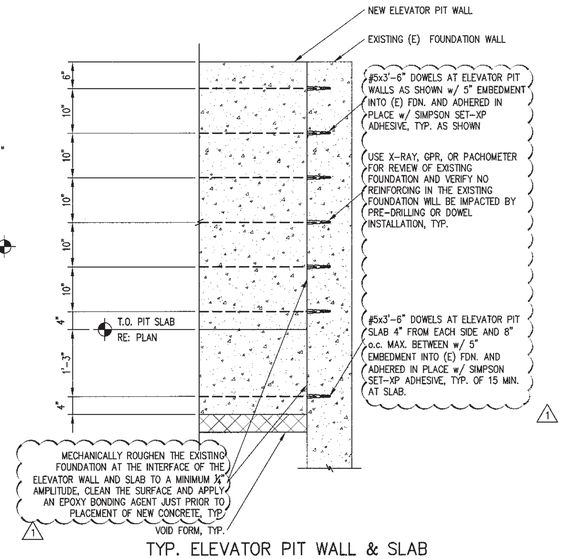


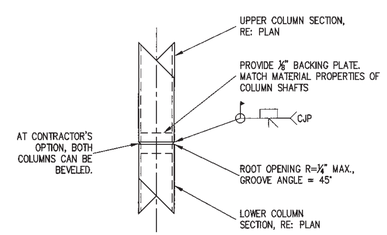
ELEVATOR PIT SLAB DETAIL
1 SECTION
3/4" = 1'-0"



TYPICAL ELEVATOR SUMP PIT
2 SECTION
3/4" = 1'-0"

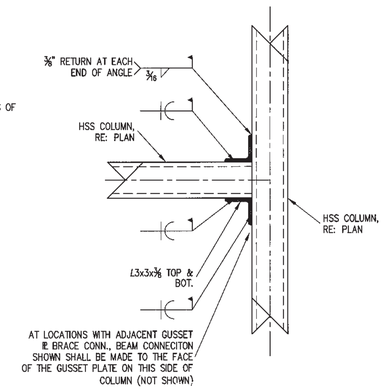


TYP. ELEVATOR PIT WALL & SLAB CONN. TO (E) FOUNDATION
3 SECTION
3/4" = 1'-0"

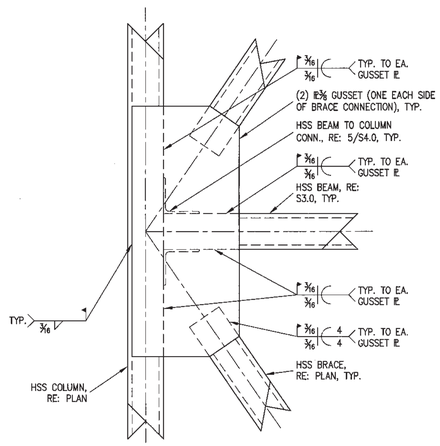


TYPICAL PREQUALIFIED COMPLETE JOINT PENETRATION WELDED COLUMN SPLICE CONNECTION

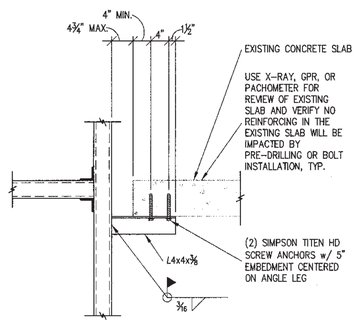
4 SECTION
1 1/2" = 1'-0"



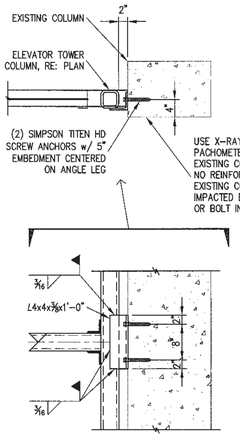
5 SECTION
1 1/2" = 1'-0"



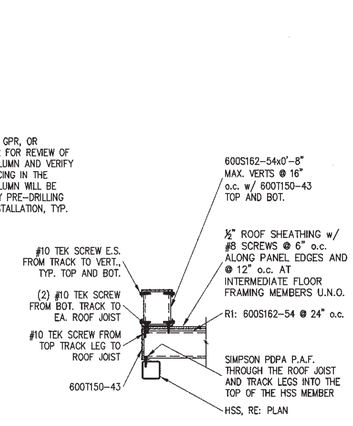
6 SECTION
1 1/2" = 1'-0"



8 SECTION
3/4" = 1'-0"



9 SECTION
3/4" = 1'-0"



10 SECTION
3/4" = 1'-0"

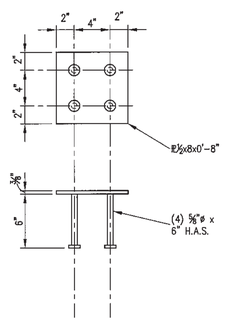


PLATE P1

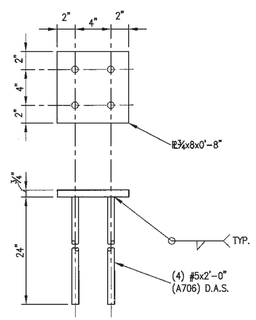


PLATE P2

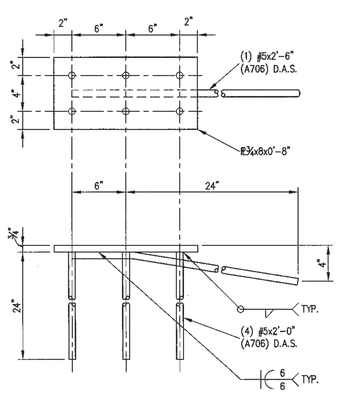
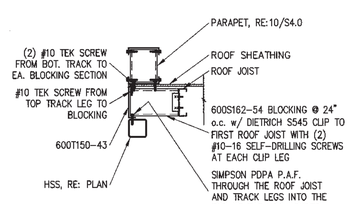
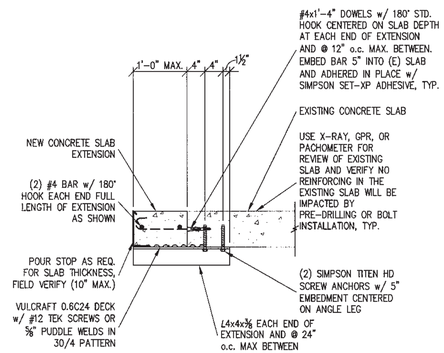


PLATE P3

TYP. EMBED PLATES
7 SECTION
1 1/2" = 1'-0"



11 SECTION
3/4" = 1'-0"



TYPICAL SLAB EXTENSION AT ELEVATOR DOOR
12 SECTION
3/4" = 1'-0"

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