

A. GENERAL:

1. THE STRUCTURAL DRAWINGS FOR THIS PROJECT ARE NOT ISSUED FOR BID UNLESS THE INDIVIDUAL SHEETS ARE IDENTIFIED AS "ISSUED FOR BID".
2. THE STRUCTURAL DRAWINGS FOR THIS PROJECT ARE NOT ISSUED FOR CONSTRUCTION UNLESS THE INDIVIDUAL SHEETS ARE IDENTIFIED AS "ISSUED FOR CONSTRUCTION".
3. U.L. FIRE RESISTANCE RATING RESTRAINT CLASSIFICATION:
 - a. ALL STRUCTURAL FRAMING IS "RESTRAINED" EXCEPT AS INDICATED IN NOTE "D".
 - b. THE FOLLOWING FRAMING IS "UNRESTRAINED":
 1. STEEL JOISTS IN END BAYS ON ROOFS SUPPORTING ROOF DECK

B. CODES AND STANDARDS:

1. THE FOLLOWING CODES AND STANDARDS, INCLUDING ALL SPECIFICATIONS REFERENCED WITHIN, SHALL APPLY TO THE DESIGN, CONSTRUCTION, QUALITY CONTROL AND SAFETY OF ALL WORK PERFORMED ON THE PROJECT. USE THE VERSION REFERENCED IN THE BUILDING CODE UNLESS NOTED OTHERWISE.
 - a. BUILDING CODE: 2015 INTERNATIONAL BUILDING CODE
 - b. "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES", ASCE 7-10, AMERICAN SOCIETY OF CIVIL ENGINEERS.
 - c. "STEEL CONSTRUCTION MANUAL", AMERICAN INSTITUTE OF STEEL CONSTRUCTION, FIFTEENTH EDITION, 2017, INCLUDING ALL SPECIFICATIONS AND CODES IN PART 16.
 - d. "DETAILING FOR STEEL CONSTRUCTION", AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
 - e. "STRUCTURAL WELDING CODE - STEEL", AWS D1.1 "STRUCTURAL WELDING CODE - REINFORCING STEEL", AWS D1.4 "STRUCTURAL WELDING CODE - STAINLESS STEEL", AWS D1.6 "STRUCTURAL WELDING CODE - SHEET STEEL", AWS D1.3
 - f. "STANDARD FOR COLD-FORMED STEEL FRAMING - GENERAL PROVISIONS", AISI S200, AMERICAN IRON AND STEEL INSTITUTE.

C. DESIGN LOADS:

1. THE FOLLOWING DESIGN LOADS AND INFORMATION ARE AS REQUIRED BY THE EQUIPMENT VENDORS:

REFER TO EQUIPMENT VENDOR DRAWINGS

D. MATERIALS:

1. THE FOLLOWING ASTM STANDARDS AND DESIGN STRESSES SHALL BE USED FOR THE APPROPRIATE MATERIALS USED IN THE CONSTRUCTION OF THIS PROJECT.
2. STRUCTURAL STEEL:

W SHAPES & CHANNELS	ASTM A992 Fy = 50 KSI
ANGLES, PLATES & BARS	ASTM A36 (Fy = 36 KSI) U.N.O. ASTM A 572, GR 50 WHERE INDICATED
SQUARE & RECTANGULAR HSS'S	ASTM A500, GRADE "C" Fy = 50 KSI ASTM F3125 GRADES A325 & F1852 TYP, UNO; ASTM F3125 GRADES A490 & F2280 WHERE INDICATED OR REQUIRED FOR STRENGTH.
HIGH STRENGTH BOLTS	GRADE A325 & F1852 BOLTS MAY BE USED INTERCHANGEABLY. GRADE A490 & F2280 BOLTS MAY BE USED INTERCHANGEABLY.
WELDING ELECTRODES	AWS A5.1 OR A5.5, E70XX
COLD FORMED STEEL FRAMING MEMBERS:	ASTM A446 GALVANIZED

E. CONSTRUCTION:

1. GENERAL:
 - a. THE CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY. THE CONTRACTOR AND ALL SUBCONTRACTORS SHALL REVIEW THE STRUCTURAL CONTRACT DOCUMENTS AND SHALL NOTIFY THE STRUCTURAL ENGINEER OF ANY CONFLICTS BETWEEN THOSE DOCUMENTS AND ANY SAFETY REGULATIONS. SUCH REVIEW AND NOTIFICATION SHALL OCCUR PRIOR TO PRODUCTION OF SHOP DRAWINGS.
 - b. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING ALLOWABLE CONSTRUCTION LOADS, FOR PROTECTING THE COMPLETED STRUCTURAL FRAMING FROM DAMAGE DUE TO TEMPORARY CONSTRUCTION LOADINGS, FOR DETERMINING SEQUENCES OF CONSTRUCTION, AND FOR DETERMINATION, DESIGN AND INSTALLATION OF ALL FALSEWORK, FORMWORK, STAGING, TEMPORARY BRACING, SHEETING AND SHORING NECESSARY FOR CONSTRUCTION.
 - c. REPRODUCTION OF THE STRUCTURAL DRAWINGS FOR USE IN PREPARATION OF SHOP DRAWINGS IS PROHIBITED. SHOP DRAWINGS SO PRODUCED WILL BE REJECTED.
 - d. ALL SUBMITTALS, INCLUDING SHOP DRAWINGS SHALL BE SUBMITTED ELECTRONICALLY IN PDF FORMAT.
 - e. SUBMIT SHOP DRAWINGS 15 BUSINESS DAYS (MINIMUM) PRIOR TO DATE THAT RETURNED SHOP DRAWINGS ARE REQUIRED. SHOP DRAWINGS SHALL BEAR THE CONTRACTOR'S STAMP OF APPROVAL WHICH SHALL CONSTITUTE CERTIFICATION THAT HE HAS VERIFIED ALL FIELD MEASUREMENTS, CONSTRUCTION CRITERIA, MATERIALS AND SIMILAR DATA AND HAS CHECKED EACH DRAWING FOR COMPLETENESS, COORDINATION AND COMPLIANCE WITH THE CONTRACT DOCUMENTS.
 - f. COSTS OF INVESTIGATION AND/OR REDESIGN DUE TO CONTRACTOR ERRORS WILL BE AT THE CONTRACTOR'S EXPENSE.
 - g. CONTRACTOR SHALL REFER TO ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR SIZE AND LOCATIONS OF OPENINGS, SLEEVES, AND CONCRETE HOUSEKEEPING PADS.
 - h. SEE ARCHITECTURAL DWGS. AND SPECIFICATIONS FOR FINISHES AND FIREPROOFING.
 - i. TOPS OF ALL MASONRY PARTITION WALLS SHALL BE CONNECTED TO THE UNDERSIDE OF THE STRUCTURAL FRAMING PER THE DETAILS PROVIDE ON THE STRUCTURAL DRAWINGS. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF ALL SUCH WALLS.
 - j. PROVIDE SLIP CONNECTIONS BETWEEN UNDERSIDE OF FLOOR FRAMING AND TOPS OF ALL PARTITION WALLS THAT CONNECT TO THE UNDERSIDE OF THE STRUCTURAL FRAMING. SLIP CONNECTIONS SHALL PERMIT VERTICAL DIFFERENTIAL DEFLECTION TO OCCUR BETWEEN THE PARTITION WALLS AND STRUCTURAL FRAMING WHILE BRACING THE TOP OF THE WALLS FOR THE CODE SPECIFIED LATERAL LOAD. MAGNITUDE OF ANTICIPATED DIFFERENTIAL DEFLECTION = $L/240$ (WHERE L= SPAN OF FLOOR FRAMING MEMBER ABOVE.)
2. CONNECTIONS:
 - a. ALL STRUCTURAL STEEL CONNECTIONS (OTHER THAN THOSE CONNECTIONS IDENTIFIED AS "FULLY DESIGNED") AND MEMBER REINFORCEMENT AT THE CONNECTIONS SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER WORKING FOR THE FABRICATOR IN ACCORDANCE WITH AISC 303-16, SECTIONS 3.1.1 AND 3.1.2, OPTION 3B. THAT ENGINEER SHALL BE LICENSED IN THE JURISDICTION IN WHICH THE PROJECT IS LOCATED.

- a. CONTRACTOR IS RESPONSIBLE FOR DESIGN OF THE FOLLOWING ITEMS INCLUDING DESIGN OF THE CONNECTIONS AND EMBEDDED STEEL CONNECTION ELEMENTS (EMBEDS) OF EACH TO THE SUPPORTING STRUCTURAL FRAMING:
 - NON-BEARING METAL STUD PARTITION WALLS

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND DESIGN CALCULATIONS FOR EACH ITEM. DESIGN CALCULATIONS SHALL BE SIGNED AND SEALED BY THE CONTRACTOR'S LICENSED ENGINEER(S) WHO SHALL BE REGISTERED IN THE PROJECT'S JURISDICTION. THE LICENSED ENGINEER(S) IN RESPONSIBLE CHARGE OF DESIGN FOR THE ITEMS LISTED ABOVE SHALL REVIEW THE SHOP DRAWINGS AND ERECTION DRAWINGS FOR THE ELEMENTS THEN DESIGN AND CONFIRM IN WRITING WITH A SIGNED AND SEALED LETTER THAT THOSE DRAWINGS PROPERLY INCORPORATE THEIR DESIGN.
2. SHOP DRAWINGS AND CALCULATIONS SHALL SHOW LOCATIONS AND MAGNITUDES OF LOADS IMPOSED ON STRUCTURE AT THE CONNECTIONS.
3. CONTRACTOR SHALL DESIGN AND FURNISH ALL EMBEDS AND HARDWARE NEEDED FOR CONNECTION OF THESE ITEMS TO THE STRUCTURAL FRAMING. CONNECTIONS TO CONCRETE SHALL BE DESIGNED IN ACCORDANCE WITH ACI 318, ASSUMING THAT ANCHOR REINFORCEMENT AND SUPPLEMENTARY REINFORCING STEEL ARE NOT PRESENT. EMBEDS SHALL BE DESIGNED AND DETAILED TO AVOID INTERFERENCE WITH REINFORCING STEEL AND OTHER ITEMS IN THE CONCRETE. IF INTERFERENCES BETWEEN EMBEDS AND ITEMS IN THE CONCRETE OCCUR DURING CONSTRUCTION, THE CONTRACTOR SHALL NEITHER ALTER THE EMBEDS NOR MOVE ANYTHING IN THE CONCRETE UNLESS SPECIFICALLY AUTHORIZED BY THE ENGINEER OF RECORD.
- a. IF DIFFERENCES OCCUR WITHIN OR BETWEEN THE DRAWINGS AND SPECIFICATIONS REGARDING MATERIALS, SIZES, STRENGTHS OR QUANTITIES, THEN THE BETTER MATERIAL, HIGHER STRENGTH, LARGER SIZE AND GREATER QUANTITY INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- b. REINFORCING STEEL IN EXISTING CONCRETE SHALL BE LOCATED PRIOR TO INSTALLATION OF NEW OPENINGS OR CORING OF HOLES IN THE CONCRETE. REINFORCING STEEL MAY NOT BE CUT WITHOUT APPROVAL FROM THE ENGINEER.
- c. THE EXACT WEIGHTS, DIMENSIONS AND LOCATIONS OF ALL MECHANICAL UNITS SUPPORTED ON STRUCTURAL STEEL FRAMING SHALL BE DETERMINED AND COORDINATED BY THE CONTRACTOR PRIOR TO DETAILING THE STRUCTURAL STEEL FRAMING SUPPORTING THOSE UNITS. IF THE UNIT WEIGHTS ARE GREATER THAN THE WEIGHTS SHOWN ON THE STRUCTURAL DRAWINGS THE STRUCTURAL ENGINEER SHALL BE NOTIFIED PRIOR TO DETAILING THE STRUCTURAL STEEL. UNIT WEIGHTS, DIMENSIONS AND LOCATIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE APPROXIMATE ONLY AND SHALL NOT BE USED FOR DETAILING THE STRUCTURAL STEEL.
- d. DIMENSIONS MAY NOT BE SCALED FROM THE DRAWINGS.

- e. ALL CONSTRUCTION IS NEW UNLESS IDENTIFIED AS EXISTING ("E"). THE CONTRACTOR SHALL VERIFY ALL EXISTING BUILDING INFORMATION AND SHALL NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER OF ANY DISCREPANCIES PRIOR TO FABRICATION OF ANY STRUCTURAL COMPONENT. UNLESS INDICATED OTHERWISE, NEW SLABS ARE TO BE AT THE SAME ELEVATIONS AS ADJACENT EXISTING SLABS. FOUNDATION ELEVATIONS OR COLUMN LENGTHS SHALL BE ADJUSTED WITH THE APPROVAL OF THE STRUCTURAL ENGINEER TO ACHIEVE MATCHING SLAB ELEVATIONS.

- f. TYPICAL DETAILS ARE SHOWN ON THE STRUCTURAL DRAWINGS ON SHEETS TITLED "TYPICAL DETAILS". THE TYPICAL DETAILS INDICATE STRUCTURAL REQUIREMENTS OCCURRING THROUGHOUT THE STRUCTURE AT LOCATIONS IDENTIFIED BY THE DETAIL TITLES. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THESE DETAILS, PROVIDING AND INSTALLING THE INDICATED STRUCTURAL DETAILS AND COMPONENTS INDICATED IN THE DETAILS, AND CONFORMING TO ALL OTHER REQUIREMENTS INDICATED ON THE DETAILS AT ALL LOCATIONS WHERE THE DETAILS APPLY.
9. INFORMATION SHOWN ON THE SECTIONS AND DETAILS IS THAT WHICH IS REQUIRED TO CONVEY THE PURPOSE FOR WHICH THE SECTIONS AND DETAILS WERE PROVIDED. THE CONTRACTOR IS RESPONSIBLE FOR REFERRING ELSEWHERE ON THE CONTRACT DOCUMENTS FOR ALL OTHER INFORMATION WHICH MAY BE OCCURRING IN THE SECTIONS OR DETAILS, BUT WHICH IS NOT SHOWN.

4. INSPECTION AND TESTING:

- a. THE OWNER WILL ENGAGE A TESTING AGENCY TO PROVIDE SERVICES AS INDICATED BELOW AND SUBMIT REPORTS.
- b. STRUCTURAL STEEL:
 1. THE TESTING AGENCY SHALL:
 - VISUALLY INSPECT ALL WELDS, BOLTED CONNECTIONS AND SHEAR STUDS.
 - MONITOR THE INSTALLATION OF ALL BOLTS INCLUDING PRE-TENSIONING TO VERIFY THAT ALL BOLTS ARE PROPERLY INSTALLED AND PRE-TENSIONED.
 - PERFORM ULTRASONIC TESTS ON ALL FULL PENETRATION GROOVE WELDS AND ON 50% OF ALL PARTIAL PENETRATION GROOVE WELDS.
 - PERFORM MAGNETIC PARTICLE TESTS ON 10% OF ALL FIELD FILLET WELDS.
 - TEST ALL WELDS WHERE VISUAL EXAMINATION INDICATES AN UNUSUAL CONDITION AND/OR POOR QUALITY.
 - FOLLOW TESTING PROCEDURES IN ACCORDANCE WITH THE AWS CODE.

F. STRUCTURAL STEEL:

1. GENERAL:
 - a. THE GENERAL CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF ANY FABRICATION OR ERECTION ERRORS OR DEVIATIONS AND RECEIVE WRITTEN APPROVAL BEFORE ANY FIELD CORRECTIONS ARE MADE.
 - b. WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE AWS "STRUCTURAL WELDING CODE - STEEL", ANS/AWS D1.1 AND AISC REQUIREMENTS; STRUCTURAL STEEL THAT IS DAMAGED DURING WELDING SHALL BE REPLACED OR REPAIRED IN A MANNER THAT IS ACCEPTABLE TO THE STRUCTURAL ENGINEER.
 - c. WELDERS SHALL HAVE CURRENT EVIDENCE OF PASSING THE APPROPRIATE AWS QUALIFICATION TESTS. THE ENGINEER MAY REQUEST SUCH EVIDENCE AT ANY TIME DURING THE PROJECT.
 - d. GAS CUTTING TORCHES SHALL NOT BE USED TO CORRECT FABRICATION ERRORS WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER.
 - e. ALL STEEL INDICATED TO BE GALVANIZED SHALL BE HOT-DIP GALVANIZED. "GALV" INDICATES HOT-DIP GALVANIZED STEEL. BOLTS CONNECTING GALVANIZED FRAMING SHALL BE HOT-DIP GALVANIZED. OTHER STEEL ELEMENTS BOLTED OR WELDED TO GALVANIZED FRAMING SHALL BE HOT-DIP GALVANIZED.
 - f. ALL STRUCTURAL STEEL (INCLUDING BOLTS AND OTHER HARDWARE) EXPOSED TO WEATHER OR LOCATED IN UNHEATED SPACES SHALL BE HOT DIP GALVANIZED.
 - g. ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY APPLYING AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH THE REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL CONTAIN 95% ZINC BY WEIGHT. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NO LESS THAN THE COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
 - h. ALL DAMAGED FACTORY PRIMED OR FACTORY FINISHED PAINTED SURFACES SHALL BE REPAIRED WITH IDENTICAL PAINT. THE TOUCH-UP REPAIR PAINT SHALL BE APPLIED IN A MANNER SUCH THAT THE REPAIR IS NOT VISIBLE FROM A DISTANCE OF SIX FEET.
 - i. BOLTS AND FIELD WELDS INSTALLED ON FACTORY FINISH-PAINTED STRUCTURAL STEEL SHALL BE FIELD PAINTED WITH THE SAME PAINT AS THE FIELD PAINTED STEEL SHALL BE APPLIED IN A MANNER SUCH THAT IT CAN NOT BE DIFFERENTIATED FROM THE FACTORY FINISH-PAINTED STRUCTURAL STEEL FROM A DISTANCE OF SIX FEET.
2. CONNECTIONS:
 - a. ALL STRUCTURAL STEEL CONNECTIONS (OTHER THAN THOSE CONNECTIONS IDENTIFIED AS "FULLY DESIGNED") AND MEMBER REINFORCEMENT AT THE CONNECTIONS SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER WORKING FOR THE FABRICATOR IN ACCORDANCE WITH AISC 303-16, SECTIONS 3.1.1 AND 3.1.2, OPTION 3B. THAT ENGINEER SHALL BE LICENSED IN THE JURISDICTION IN WHICH THE PROJECT IS LOCATED.

- b. CONNECTIONS AND MEMBER REINFORCEMENT AT THE CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE REACTIONS, MOMENTS AND AXIAL FORCES SPECIFIED OR INDICATED ON THE DRAWINGS.
- c. WHERE SPECIFIC CONNECTION TYPES, DETAILS, CONFIGURATIONS OR CONNECTION DESIGN LIMITATIONS ARE INDICATED, THE CONNECTIONS SHALL BE DESIGNED AND DETAILED IN ACCORDANCE WITH THOSE REQUIREMENTS. WHERE SPECIFIC SIZES, QUANTITIES AND DIMENSIONS OF BOLTS, WELDS AND PLATES ARE INDICATED, THOSE ARE MINIMUM PERMITTED SIZES, QUANTITIES AND DIMENSIONS. THE CONNECTION STRENGTH OF ALL CONNECTIONS SHALL BE DETERMINED BY THE FABRICATOR'S CONNECTION DESIGN ENGINEER AND THE CONNECTION DETAIL SHALL MODIFIED IF REQUIRED TO PROVIDED THE REQUIRED STRENGTH.
- d. CONNECTION DESIGN RESPONSIBILITY SHALL INCLUDE CALCULATION OF MEMBER STRENGTH AT CONNECTIONS CONSIDERING THE EFFECTS OF COPES, BOLT HOLES, CONNECTION ECCENTRICITY, AND CONNECTION GEOMETRY, AND SHALL CONSIDER ALL LIMIT STATES INCLUDING BUT NOT LIMITED TO REVIEW OF GROSS SHEAR, NET SHEAR, BLOCK SHEAR, WEB TEAR-OUT, BEARING, FLEXURAL STRENGTH, LOCAL BUCKLING, TENSILE STRENGTH THROUGH BOTH THE NET AND GROSS SECTIONS, COMPRESSIVE STRENGTH AND DUCTILITY. DESIGN OF CONNECTIONS SHALL BE IN ACCORDANCE WITH RECOGNIZED PUBLISHED METHODS SUCH AS THOSE PUBLISHED IN THE AISC "ENGINEERING JOURNAL", THE AISC 15TH EDITION STEEL CONSTRUCTION MANUAL AND THE AISC STEEL CONSTRUCTION MANUAL DESIGN EXAMPLES. CONNECTION DESIGN SHALL CONSIDER TRANSFER FORCES THROUGH CONNECTED AND CONNECTING MEMBERS. CONNECTION DESIGN RESPONSIBILITY SHALL INCLUDE ANALYSIS AND DESIGN OF PLATES, BRACKETS, STRUTS, STIFFENER PLATES, GUSSET PLATES AND OTHER ELEMENTS TO TRANSFER FORCES INTO AND BETWEEN MEMBERS. MANUAL CALCULATIONS SHALL BE SUBMITTED FOR EACH CONNECTION TYPE TO VERIFY THAT CONNECTIONS DESIGNED USING COMPUTER SOFTWARE CONSIDER ALL LIMIT STATES AND PRODUCE RESULTS IDENTICAL TO THE MANUAL CALCULATIONS.
- e. BEAM SHEAR CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE FACTORED-LOAD LEVEL SHEAR REACTIONS INDICATED ON DRAWINGS, EXCEPT THAT NO CONNECTION SHALL BE DETAILED TO SUPPORT LESS THAN 15 KIPS (FACTORED). BEAM WEB SHEAR CONNECTIONS SHALL BE DETAILED SO THAT THE LENGTHS OF THE CONNECTION PLATES OR ANGLES ARE NO LESS THAN ONE-HALF OF THE T₁ DIMENSION OF THE SUPPORTED BEAMS. WHERE REACTIONS ARE NOT SHOWN, CONNECTIONS SHALL BE DETAILED TO SUPPORT THE FACTORED-LOAD LEVEL REACTIONS INDICATED IN THE TABLE BELOW:

BEAM SIZE	Ru
W8	15k
W10	15k
W12	20k
W14	30k
W16	40k
W18	50k

BEAM SIZE	Ru
W21	70k
W24	90k
W27	110k
W30	150k
W36	170k

- f. THE FOLLOWING TYPES OF SHEAR CONNECTIONS ARE PERMITTED (U.N.O.):
 - DOUBLE-ANGLE CONNECTIONS
 - SINGLE-ANGLE CONNECTIONS
 - SINGLE-PLATE CONNECTIONS
 - SHEAR END-PLATE CONNECTIONS
 - BENT PLATE SHEAR CONNECTIONS
9. THE CONTRACTOR SHALL SUBMIT TABLES FOR ALL SHEAR CONNECTIONS USED ON THE PROJECT SHOWING USABLE SHEAR STRENGTH FOR ALL CONNECTION CONFIGURATIONS CONSIDERING BEAM SIZE, BOLT SIZE, TYPE AND QUANTITY, CONNECTION GEOMETRY, WELD SIZES, EDGE DISTANCES, ECCENTRICITIES AND COPE DIMENSIONS.
- h. CONNECTIONS IDENTIFIED AS BEING "FULL DEPTH" CONNECTIONS INDICATE SHEAR CONNECTIONS DESIGNED AND DETAILED FOR THE FULL DEPTH OF THE BEAM WEB WITH BOLTS AT 3" ON CENTER.
- i. MINIMUM BEAM-TO-COLUMN CONNECTION REQUIREMENTS: SQUARE BEAM-TO-COLUMN CONNECTIONS SHALL BE FULL DEPTH DOUBLE ANGLE CONNECTIONS. U.N.O.; FULL DEPTH SINGLE ANGLE CONNECTIONS MAY BE USED WHERE BEAMS FRAME TO BOTH SIDES OF W SHAPE COLUMN WEBS; PROVIDE OTHER CONNECTIONS WHERE SPECIFIED OR DETAILED. SKEWED BEAM-TO-COLUMN CONNECTIONS SHALL BE DETAILED FOR THE REACTIONS INDICATED AND SHALL BE DETAILED FOR FULL DEPTH OF BEAM U.N.O.
- j. MOMENT CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE FACTORED-LOAD LEVEL MOMENTS INDICATED ON THE DRAWINGS. WHERE NO MOMENTS ARE INDICATED, THE CONNECTIONS SHALL BE DESIGNED TO SUPPORT 75 PERCENT OF THE FULL PLASTIC MOMENT STRENGTH OF THE MEMBER. MOMENT CONNECTIONS SHALL BE DESIGNED AS FULLY RESTRAINED MOMENT CONNECTIONS.
- k. STRUCTURAL STEEL CONNECTIONS SHALL BE MADE WITH WELDS OR WITH A325 OR A490 HIGH STRENGTH BOLTS. ALL BOLTS, NUTS AND WASHERS SHALL BE REJECTED.

1. UNLESS NOTED OTHERWISE, ALL BOLTS SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED IN THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS" (RCS-C SPECIFICATION).
 - m. EXCEPT WHERE SLIP-CRITICAL BOLTS ARE OTHERWISE REQUIRED, PRE-TENSIONED BOLTS SHALL BE USED IN BEAM-TO-COLUMN CONNECTIONS, BOLTED COLUMN SPLICES, BRACED FRAMES, MOMENT FRAMES, DRAG STRUTS, IN CONNECTIONS WITH GROUP "B" (A490) BOLTS IN TENSION, GROUP "A" (A325) BOLTS SUBJECT TO TENSILE FATIGUE, AND OTHER LOCATIONS SPECIFIED IN AISC 360-16 SECTION J3.1 AND RCS-C SPECIFICATION SECTION 4.2.
 - m. SLIP-CRITICAL BOLTED CONNECTIONS SHALL BE USED IN CONNECTIONS WITH OVERIZED HOLES, CONNECTIONS WITH SLOTTED HOLES, EXCEPT WHERE APPLIED LOADS ARE APPROXIMATELY PERPENDICULAR (WITHIN 80 TO 100 DEGREES) TO THE LONG DIRECTION OF THE SLOT, JOINTS SUBJECT TO FATIGUE LOADING WITH LOAD REVERSAL, AND OTHER LOCATIONS SPECIFIED IN AISC 360-16, SECTION J3.1 AND RCS-C SPECIFICATION SECTION 4.3.
 - o. MAXIMUM PERMITTED CONNECTION ECCENTRICITY IN SHEAR CONNECTIONS = $3 \sqrt{U.N.O.}$
 - p. WELDS IN SHEAR CONNECTIONS SHALL BE CONTINUOUS.
 - q. SINGLE PLATE SHEAR CONNECTIONS SHALL BE DESIGNED AND DETAILED IN ACCORDANCE WITH THE PROCEDURE DELINEATED IN THE AISC "STEEL CONSTRUCTION MANUAL".
 - r. SINGLE-PLATE SHEAR CONNECTIONS WITH $e > 3.5"$, AND FEWER THAN 6 BOLTS IN ONE COLUMN SHALL BE DESIGNED WITH SLIP-CRITICAL BOLTS. SINGLE-PLATE SHEAR CONNECTIONS WITH $e > 7"$, AND 6 OR FEWER BOLTS IN TWO COLUMNS SHALL BE DESIGNED WITH SLIP-CRITICAL BOLTS. ALL OTHER SINGLE-PLATE SHEAR CONNECTIONS MAY BE DESIGNED USING BEARING BOLT SHEAR STRENGTHS. BOLTS IN ALL SINGLE-PLATE SHEAR CONNECTIONS WITH $e > 3.5"$ SHALL BE PRE-TENSIONED.
 - s. THE FACTORED-LOAD LEVEL REACTIONS FOR WHICH THE CONNECTIONS MUST BE DESIGNED AND THE USABLE CONNECTION STRENGTH OF THE CONNECTIONS SHALL BE INDICATED ON THE SHOP DRAWING PIECE DRAWINGS AS FOLLOWS:

$$R_u = \phi R_n + \phi Q_u$$

- t. A325 AND A490 BOLTS IDENTIFIED AS "SC" (SLIP-CRITICAL) SHALL BE PRE-TENSIONED IN ACCORDANCE WITH ONE OF THE APPROVED METHODS SPECIFIED IN AISC'S "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS". FAYING SURFACES IN SLIP-CRITICAL CONNECTIONS SHALL BE CLASS "A" SURFACES UNLESS NOTED OTHERWISE.
- u. BOLTED CONNECTIONS IN GALVANIZED STEEL FRAMING SHALL BE MADE WITH A325 GALVANIZED BOLTS, NUTS AND WASHERS.
- v. BEAM AND GIRDER CONNECTIONS AND COLUMN SPLICES SHALL BE DESIGNED TO MEET THE IBC REQUIREMENTS FOR STRUCTURAL INTEGRITY.
 1. BEAM AND GIRDER CONNECTIONS SHALL BE DESIGNED TO HAVE A MINIMUM NOMINAL AXIAL TENSILE STRENGTH EQUAL TO 0.667 x REQUIRED VERTICAL SHEAR STRENGTH. THE VERTICAL SHEAR FORCE AND AXIAL TENSILE FORCE NEED NOT BE CONSIDERED TO ACT SIMULTANEOUSLY. THE FOLLOWING CONNECTION TYPES ARE PROHIBITED ON BEAMS AND GIRDERS: - SINGLE & DOUBLE ANGLE CONNECTIONS WELDED TO THE SUPPORTING MEMBER. - BENT PLATE CONNECTIONS WELDED TO THE SUPPORTING MEMBER.
 2. COLUMN SPLICES SHALL HAVE A TENSILE STRENGTH CAPACITY SUFFICIENT TO SUPPORT THE DEAD & LIVE LOAD TRIBUTARY TO THE COLUMN BETWEEN THE SPLICE AND THE SPLICE OR BASE IMMEDIATELY BELOW. REFER TO THE COLUMN SCHEDULE FOR REQUIRED TENSILE STRENGTH OF COLUMN SPLICE CONNECTIONS.
- w. STRUCTURAL STEEL CONNECTIONS SHALL BE DESIGNED AND DETAILED TO MEET THE SECTION BC 2112 NVC BUILDING CODE REQUIREMENTS FOR STRUCTURAL INTEGRITY.

3. HSS AND PIPE FRAMING:

- a. OPEN ENDS ON ALL HSS AND PIPE MEMBERS EXPOSED TO WEATHER, OR ARCHITECTURALLY EXPOSED TO VIEW, OR WITH THE END OF THE HSS/PIPE BEARING PERPENDICULAR ON SUPPORTING FRAMING SHALL BE CLOSED OFF WITH 3/8" THICK CLOSURE PLATES. INSERT PLATES INTO OPEN ENDS AND WELD WITH 3/16" CONTINUOUS ALL-AROUND FILLET WELDS, UNO. WHERE HSS/PIPE IS ARCHITECTURALLY EXPOSED TO VIEW, INSTALL PLATES FLUSH TO A BEVELLED END OF HSS/PIPE WITH AN ALL-AROUND 3/16" PARTIAL JOINT PENETRATION GROOVE WELD AND GRIND WELD AND PLATE FLUSH TO PERIMETER OF HSS/PIPE.

G. UNISTRUT FRAMING

1. GENERAL:
 - a. ALL MEMBERS DESIGNATED AS BEING UNISTRUT SHALL BE DESIGNED AND SUPPLIED BY UNISTRUT CORPORATION OR AS AN APPROVED EQUAL DESIGNED AND PROVIDED IN WRITING BY THE ARCHITECT OR ENGINEER OF RECORD.
 - b. SECTION PROPERTIES, STEEL GRADES AND ALLOWABLE MOMENTS SHALL CONFORM TO THAT INDICATED IN UNISTRUT CORPORATION GENERAL ENGINEERING CATALOG OR AN APPROVED EQUAL.
 - c. ALL BOLTS IN UNISTRUT SHALL CONFORM TO ASTM A 325. CORPORATION GENERAL ENGINEERING CATALOG.
 - d. WELDING OR SPLICING OF UNISTRUT FRAMING IS PROHIBITED.
 - e. DESIGN AND FABRICATION OF "SPECIAL UNISTRUT PIECES" SHALL BE OF SAME MATERIALS, QUALITY AND CONSTRUCTION OF TYPICAL UNISTRUT CORPORATION FRAMING OR AN APPROVED EQUAL MANUFACTURER'S FRAMING.
 - f. ALL EXPOSED UNISTRUT FRAMING MUST BE SHOP PAINTED WHITE. ANY BLEMISHES ON UNISTRUT AS A RESULT OF SHIPPING OR INSTALLATION SHALL BE PAINTED WITH PAINT MATCHING COLOR AND TYPE. ALL EXPOSED INFILL CLIPS MUST ALSO BE PAINTED WHITE.
 - g. PROVIDE WHITE CAPS AT ALL OPEN AND CUT ENDS.
 - h. MATERIAL AND INSTALLATION SHALL BE PROVIDED BY A QUALIFIED VENDOR, WITH AT LEAST FIVE (5) YEARS EXPERIENCE IN THE MANUFACTURE AND INSTALLATION OF ADJUSTABLE METAL FRAMING SUPPORTS. VENDOR SHALL DEMONSTRATE EXPERIENCE OF PROJECTIONS OF SIMILAR SCOPE AND SIZE AND SHALL MAINTAIN A CONTINUING QUALITY ASSURANCE PROGRAM FOR BOTH ITS MATERIAL AND INSTALLATION CREWS.
 - i. VENDOR SHALL PROVIDE THE SINGLE RESPONSIBILITY FOR MATERIALS AND WORKMANSHIP, AND SHALL PROVIDE A WARRANTY PERIOD OF TWO (2) YEARS FROM DATE OF ACCEPTANCE BY ARCHITECT/OWNER.
 - j. ALL MATERIALS SHALL BE PROTECTED FROM CORROSION WITH A FACTORY APPLIED FINISH.
 - k. ALL MATERIALS SHALL BE STAMPED AND IDENTIFIABLE BY MANUFACTURER AND PART NUMBER (WHERE APPROPRIATE). MATERIALS THAT APPEAR DAMAGED, DISTRESSED, UNIDENTIFIABLE OR RUSTED SHALL NOT BE USED AND WILL NOT BE ACCEPTED.
 - l. THE CONTRACTOR SHALL MAKE FIELD MEASUREMENTS TO ASSURE THAT THE MEDICAL SUPPORT CAN BE INSTALLED ACCORDING TO PLANS, AND WITHOUT INTERFERENCE WITH STRUCTURAL FRAMING, MECHANICAL SYSTEMS, PLUMBING OR OTHER OBSTRUCTIONS. ANY INTERFERENCES SHALL BE REPORTED TO THE ARCHITECT.
 - m. THE CONTRACTOR SHALL ASSURE THAT THE SUPPORT SYSTEM IS INSTALLED IN A TIMELY AND PRACTICAL SEQUENCE, AHEAD OF ANY EXTENSIVE ELECTRICAL, MECHANICAL OR HVAC WORK IN THE AREA, AND PRIOR TO ANY CEILING FIRMING OR ROOM FINISHES.
 - n. ANY CHANGES OR MODIFICATIONS FOR APPROVED SHOP DRAWINGS SHALL REQUIRE APPROVAL FROM THE ARCHITECT AND ENGINEER AND SHALL BE NOTED ON THE FINAL DRAWINGS.
2. SUBMITTALS
 - a. PRODUCT DATA: FOR EACH TYPE OF MANUFACTURED MATERIAL AND PRODUCT INDICATED. PRODUCT DATA SHALL INCLUDE MATERIAL SECTION PROPERTIES FOR ALL UNISTRUT FRAMING MEMBERS.
 - b. SHOP DRAWING DETAILING FABRICATION O UNISTRUT FRAMING COMPONENTS.
 - i. INDICATE TYPE, SIZE AND LENGTH OF BOLTS.
 - ii. CLEARLY INDICATE ALL MEMBERS AND CONNECTIONS AND NOTE SPECIAL QUALITY, TOLERANCE, SURFACE PREPARATION AND PAINTING REQUIREMENTS.

H. SPECIAL INSPECTIONS AND TESTS: (IBC 2015)

1. SPECIAL INSPECTIONS AND TESTS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 17 OF THE IBC 2015 BUILDING CODE. THE SPECIAL INSPECTIONS AND TESTING WILL BE PERFORMED BY AN INDEPENDENT INSPECTION AGENCY HIRED BY THE OWNER. ALL INSPECTIONS AND TESTING SHALL BE DOCUMENTED WITH WRITTEN REPORTS. COPIES OF THOSE REPORTS SHALL BE SUBMITTED TO THE OWNER, ARCHITECT, STRUCTURAL ENGINEER AND BUILDING OFFICIAL.
 - a. STEEL CONSTRUCTION: IBC SECTION 1705.2
 1. STRUCTURAL STEEL: IBC SECTION 1705.2.1 AND AISC 360, CHAPTER N

STRUCTURAL DRAWING LIST		08/20/2021 - SCHEMATIC DESIGN ISSUE - N/C	10/04/2021 - ISSUE FOR BID - N/C
DWG. NO.	DRAWING TITLE		
S-001	GENERAL NOTES / DRAWING LIST	•	•
S-201	LEVEL 1	•	•
S-202	ROOF LEVEL	•	•
S-300	DETAILS	•	•

ABBREVIATIONS USED ON STRUCTURAL DRAWINGS

A.F.F. ADD'L L ARCH.	ABOVE FINISHED FLOOR ADDITIONAL ANGLE ARCHITECTURAL / ARCHITECT
BET. BSMT. BM. BRG. B.S. B or BOT. BB B.O.D. BLDG.	BETWEEN BASEMENT BEAM BEARING BOTH SIDES BOTTOM BOTTOMMOST BOTTOM BOTTOM OF DECK BUILDING
CANT. C.I.P. CFS CL CLR. COL. CONC. CMU CONN. CONST. CONT. C.J. C.Y.	CANTILEVER CAST-IN-PLACE COLD-FORMED STEEL CENTER LINE CLEAR COLUMN CONCRETE CONCRETE MASONRY UNIT CONNECTION CONSTRUCTION CONTINUOUS CONTROL JOINT CUBIC YARD
D, or DP. DET. DIA. DIM. DIR. DO or (*) DBL. DN. DWG.	DEEP / DEPTH DETAIL DIAMETER DIMENSION DIRECTION DITTO DOUBLE DOWN DRAWING or DRAWINGS
EA. E.E. E.F. EACH W. E.O.D. E.O.S. E.L. EMBED. EQ. (E) E.J.	EACH EACH END EACH FACE EACH WAY EDGE OF DECK EDGE OF SLAB ELEVATION EMBEDMENT EQUAL EXISTING EXPANSION JOINT
F.S. FT. FIN. FL. FTG. F.L. fk	FAR SIDE FEET FINISH or FINISHED FLOOR FOOTING FULL LENGTH FOOT-KIPS
GALV. GA.	GALVANIZED GAUGE or GAGE
HGR. HT. H.P. HK. H or HOR.	HANGER HEIGHT HIGH POINT HOOK HORIZONTAL
IN. I.D. INT. INV.	INCHES INSIDE DIAMETER INTERIOR INVERT
JT. k L.W. L.F. LG. LH. LLV LSH L.W. L.P. LVL LSL	JOINT KIPS LIGHT WEIGHT LINEAR FOOT LONG LONG LEG HORIZONTAL LONG LEG VERTICAL LONG SIDE HORIZONTAL LONG WAY LOW POINT LAMINATED VENEER LUMBER LAMINATED STRAND LUMBER
M.O. MECH. M.E.P. MIN. N.S. N.T.S. NO. or # N.W.	MASONRY OPENING MECHANICAL MECHANICAL, ELECTRICAL AND PLUMBING MINIMUM NEAR SIDE NOT TO SCALE NUMBER NORMAL WEIGHT
O.C. OPNG. O.D. O.F. O.F.B.	ON CENTER OPENING OUTSIDE DIAMETER OUTSIDE FACE OUTSIDE FACE OF BRICK
PERP. PC. PL. P.T. P.L.F. PSI PSF PSL	PERPENDICULAR PRECAST PLATE POST-TENSIONED POUNDS PER LINEAR FOOT POUNDS PER SQUARE INCH POUNDS PER SQUARE FOOT PARALLEL STRAND LUMBER
REINF. REM. REQ'D. R.D.	REINFORCING or REINFORCE REMAINDER REQUIRED ROOF DRAIN
SCHED. SECT. S.W. SIM. S.O.G. SL. SP. SQ. STD. STL. STIFF. STRUCT. S.S.O.G. SYM.	SCHEDULE SECTION SHORT WAY SIMILAR SLAB ON GRADE SLOPED SPACES SQUARE STANDARD STEEL STIFFENER STRUCTURAL STRUCTURAL SLAB ON GRADE SYMMETRICAL
TEMP. TOP T&B T.L.S. T.O.B. TOP OF CONCRETE T.O.C. T.O.S. T.O.W. TT TRANS. TYP.	TEMPORARY/TEMPERATURE TOP TOP & BOTTOM TENSION LAP SPLICE TOP OF BEAM TOP OF CONCRETE TOP OF STEEL TOP OF WALL TOPMOST TOP TRANSVERSE TYPICAL
U.N.O. V.I.F. V or VERT.	UNLESS NOTED OTHERWISE VERIFY IN FIELD VERTICAL
W.W.F. W.W.R. W/ W.P.	WELDED WIRE FABRIC WELDED WIRE REINFORCEMENT WITH WORK POINT

Gensler

LORING

THE HARMAN GROUP

MER

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Date	Description
10/04/2021	ISSUE FOR BID

Project Name
INTERVENTIONAL RADIOLOGY - TARRYTOWN

Project Number
THG 221093.00

Description
GENERAL NOTES / DRAWING LIST

Scale
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S-001

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INTERVENTIONAL RADIOLOGY - TARRYTOWN

Project Number

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Description

LEVEL 1

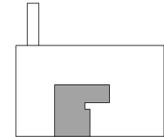
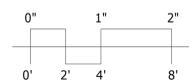
Scale

1/4" = 1'-0"

S-201



LEVEL 1
1/4" = 1'-0"



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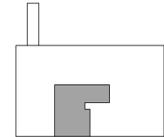
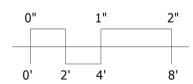
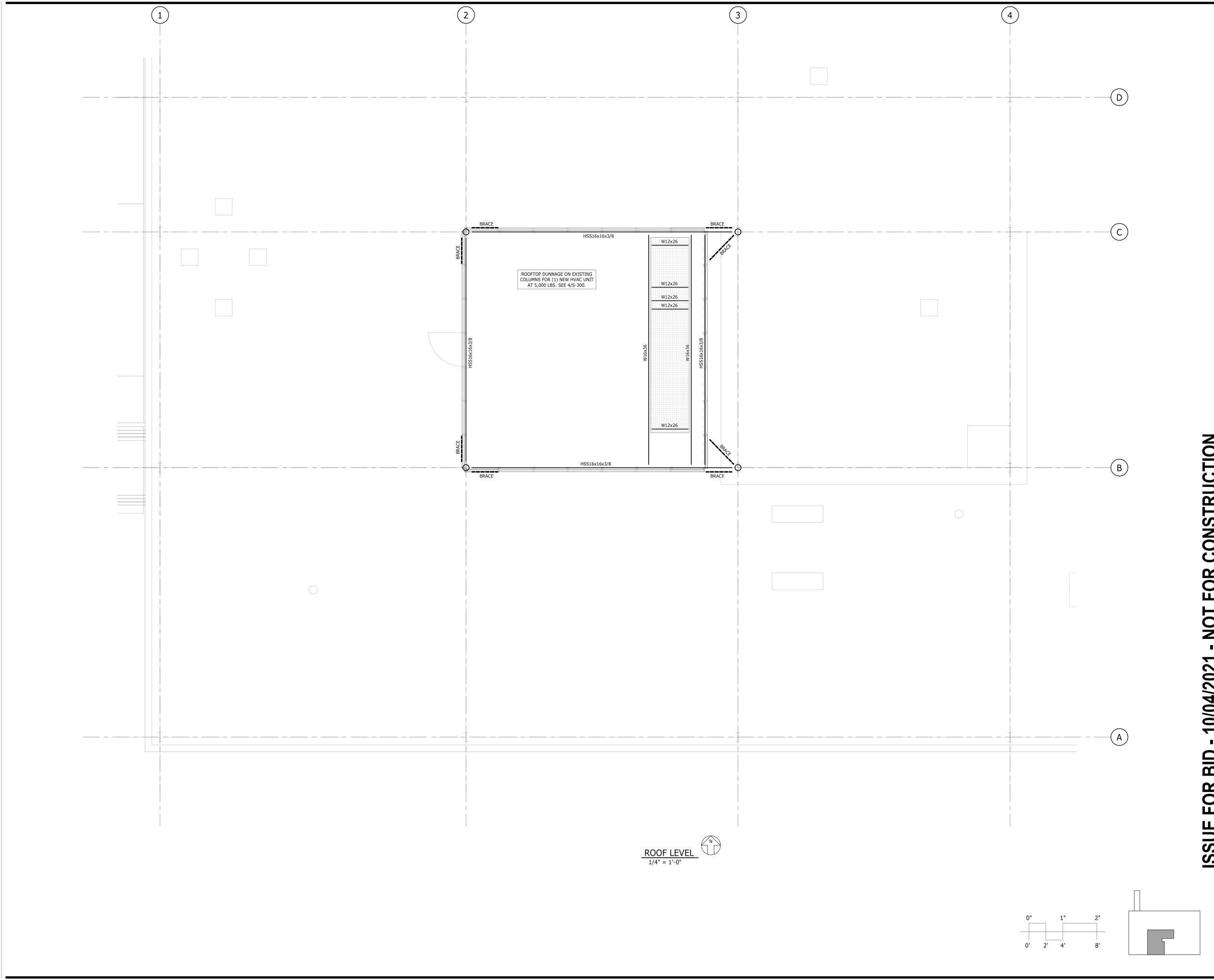
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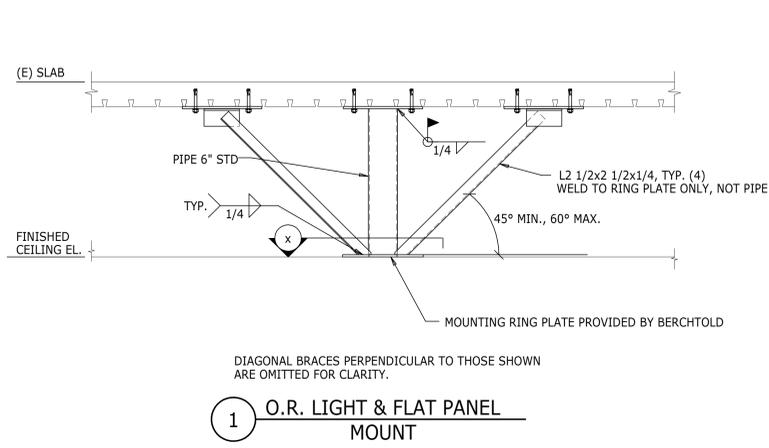
ROOF LEVEL

Scale

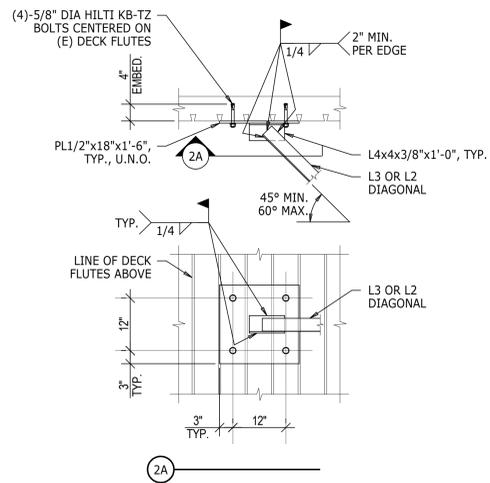
1/4" = 1'-0"

S-202





1 O.R. LIGHT & FLAT PANEL MOUNT

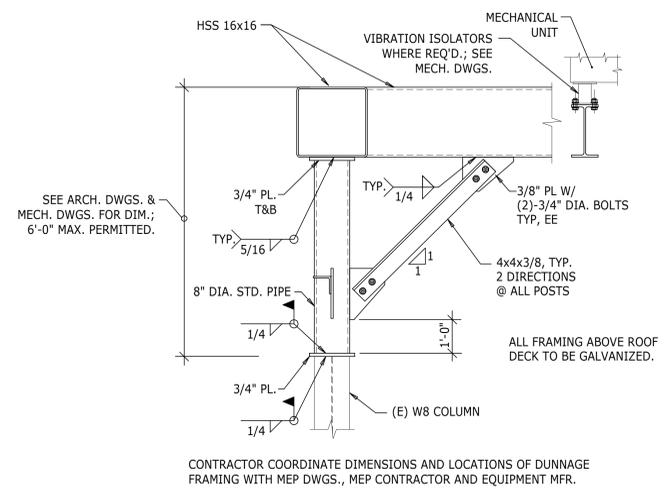


2 TYPICAL CONNECTION TO (E) SLAB

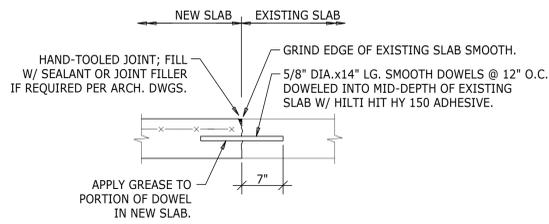
EQUIPMENT MOUNTING PLATE SCHEDULE	
MOUNTING PLATE	TYPE C
SUPPLIED BY:	BERCHTOLD
INSTALLED BY:	STEEL CONTRACTOR

NOTE: STEEL CONTRACTOR TO CONFIRM ALL MOUNTING PLATE DIMENSIONS PRIOR TO DETAILING OR FABRICATION. SEE GENERAL NOTES SHEET FOR EQUIPMENT SCHEDULE.

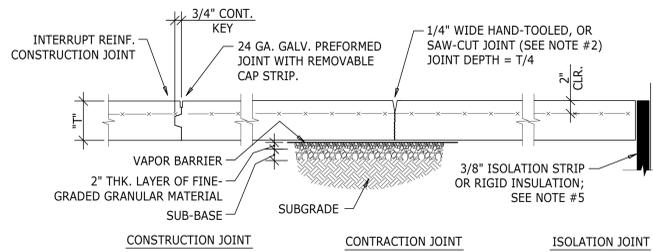
3 MOUNTING PLATE SCHEDULE



4 ROOFTOP DUNNAGE FRAMING

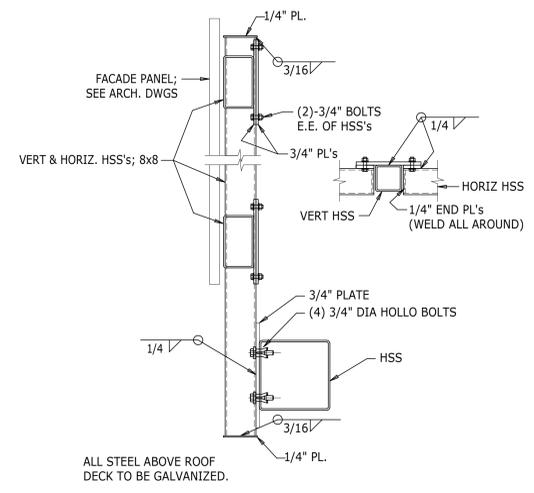


5 NEW SLAB-ON-GRADE CONNECTION TO EXISTING SLAB-ON-GRADE



NOTES:
 1. CONTRACTION JOINTS SHALL BE INSTALLED EITHER BY HAND TOOLING, OR BY SAW-CUTTING USING A "SOFF-CUT" ULTRA EARLY ENTRY DRY-CUT SAW OR AN APPROVED EQUAL; JOINTS SHALL BE INSTALLED IMMEDIATELY UPON COMPLETION OF FINISHING OPERATIONS.
 2. REFER TO SPECIFICATIONS AND ARCHITECTURAL DRAWINGS FOR JOINT SEALANT REQUIREMENTS (IF ANY).
 3. REFER TO SPECIFICATIONS FOR REQUIREMENTS FOR FINE-GRADED GRANULAR MATERIAL AND VAPOR BARRIER (WHERE OCCURRING).
 4. REFER TO GEOTECHNICAL REPORT FOR REQUIREMENTS FOR SUB-BASE MATERIAL.
 5. SEE ARCHITECTURAL DRAWINGS FOR LOCATION, EXTENT, TYPE AND THICKNESS OF RIGID INSULATION WHERE REQUIRED.

6 SLAB-ON-GRADE CONSTRUCTION



7

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