

# NTU ENVIRONMENTAL LAB CHINLE

CHINLE, APACHE COUNTY, AZ  
EARLY DESIGN PACKAGE #1 CIVIL/STRUCTURAL/PLUMBING  
JANUARY 20, 2023



Early Work Package 1  
1.20.23 Plans  
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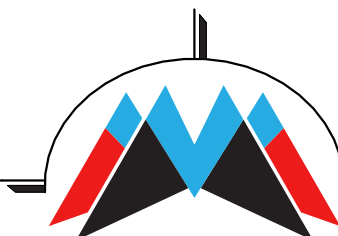
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LAB CHINLE

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CIVIL/STRUCTURAL/PLUMBING

JANUARY 20, 2023

DYRON MURPHY ARCHITECTS, P.C.



4505 Montbel Place NE, Albuquerque, New Mexico 87107

ARCHITECT

Revision Schedule

#	Date	Description
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PROJECT NUMBER	DRAWN BY	PROJ MGR
Project #	Author	Designer

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Sheet Title

TITLE SHEET & DRAWING  
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Sheet Number

G001

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## GENERAL NOTES

### MATERIALS AND WORKMANSHIP

THE MATERIALS AND WORKMANSHIP SHALL BE DONE IN ACCORDANCE WITH THE FOLLOWING CURRENT SPECIFICATIONS. THESE PLANS AND GENERALLY ACCEPTED GOOD CONSTRUCTION PRACTICES. IN THE EVENT OF A CONFLICT BETWEEN THE SPECIFICATIONS AND THE PLANS, THE PLANS WILL TAKE PRECEDENCE. IN THE ABSENCE OF CONFLICT BETWEEN THE SPECIFICATIONS AND THE PLANS, THE PLANS SUPPLEMENT AND ADD TO THE SPECIFICATIONS. LATEST EDITION MEANS THE MOST RECENT SPECIFICATION OR STANDARD IN EFFECT AS OF THE DATE OF THE ENGINEER'S SEAL ON THESE PLANS.

### PROJECT SPECIFICATIONS

MARICOPA ASSOCIATION OF GOVERNMENTS, "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", LATEST EDITION (MAG SPECIFICATIONS).

U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (MUTCD).

INTERNATIONAL BUILDING CODE (IBC), LATEST EDITION (UNLESS SPECIFIED OTHERWISE BY THE OWNER).

AMERICAN WATER WORKS ASSOCIATION (AWWA), "STANDARDS", SECTIONS C AND D, LATEST EDITION.

NAVAJO TRIBAL UTILITY AUTHORITY (NTUA), TECHNICAL SPECIFICATIONS FOR MATERIALS AND WORKMANSHIP FOR WATER AND WASTEWATER FACILITIES, LATEST EDITION.

IF TWO OR MORE GIVEN SPECIFICATIONS DIFFER IN CONTENT, THE MORE RESTRICTIVE OR STRINGENT STANDARD OR SPECIFICATION, IN THE OPINION OF THE ENGINEER, WILL GOVERN.

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN COPIES OF THE ABOVE STANDARDS, SPECIFICATIONS AND DETAILS, AS WELL AS ALL OTHER STANDARDS AND SPECIFICATIONS WHICH MAY BE NECESSARY TO COMPLETE AND ACCURATELY INTERPRET THESE PLANS. THIS REQUIREMENT EXTENDS TO ANY STANDARDS, DETAILS OR SPECIFICATIONS REFERENCED BY THE CONSTRUCTION DOCUMENTS AND NOT INCLUDED IN THE LIST ABOVE. THE CONTRACTOR AS STATED HEREIN SHALL MEAN THE GENERAL CONTRACTOR AND HIS ASSOCIATED SUBCONTRACTORS. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION AND PERFORMANCE OF THE WORK OF ALL OF HIS SUBCONTRACTORS AND SUPPLIERS.

SITE WORK INCLUDES BUT NOT LIMITED TO: SITE CLEARING, GRUBBING, DEMOLITION, DEBRIS REMOVAL FROM THE SITE, IMPORT AND/OR EXPORT OF SOILS AND OTHER MATERIALS TO AND FROM THE SITE, BORROW MATERIALS, TEMPORARY SOILS MATERIAL, STOCKPILING, CUT AND FILL, SLOPES, SOIL AND BANK STABILIZATION AND PROTECTION, EROSION, RELOCATIONS, STRUCTURE EXCAVATIONS, TRENCHING, ALL BACKFILLING, SITE GRADING, PAVING, PIPING, UTILITY LINE AND STORM DRAINAGE CONSTRUCTION, SITE CONCRETE WORK, EROSION CONTROL, DUST CONTROL AND OTHER MISCELLANEOUS SITE WORK STRUCTURES AND ITEMS INDICATED ON THE PLANS AND THE CONTRACT DOCUMENTS. ALL GRUBBING AND WASTE MATERIAL SHALL BE REMOVED FROM THE SITE PER THE DIRECTION OF THE OWNER OR HIS REPRESENTATIVE. THE USE OF EXPLOSIVES WILL NOT BE PERMITTED.

THE ENGINEER WILL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OR FOR SAFETY PRECAUTIONS OR PROGRAMS UTILIZED IN CONNECTION WITH THE WORK, AND WILL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE ENGINEER IS NOT RESPONSIBLE FOR COORDINATING THE UTILITIES, POWER POLES, ETC.

SHOP DRAWINGS SHALL BE PROVIDED BY THE CONTRACTOR PER PROJECT SPECIFICATIONS.

THE ENGINEER MAY ORDER ANY OR ALL MATERIALS USED IN THE WORK TO BE TESTED ACCORDING TO AASHTO AND ASTM STANDARDS. THE CONTRACTOR SHALL, AT HIS EXPENSE, SUPPLY CERTIFICATES OR RESULTS OF TESTING.

ALL WORK AND MATERIALS NOT CONFORMING TO SPECIFICATIONS OR PERFORMED WITHOUT THE CONSENT OF THE OWNER OR HIS AUTHORIZED REPRESENTATIVE WILL BE SUBJECT TO REJECTION BY THE OWNER AND/OR ENGINEER AND REPLACED AT THE CONTRACTOR'S EXPENSE.

THE CONTRACTOR SHALL GUARD AGAINST DAMAGE DURING CONSTRUCTION TO ADJACENT PROPERTIES, FENCES, WALLS AND UTILITY EQUIPMENT.

THE CONTRACTOR SHALL SUBMIT CAREFULLY DOCUMENTED AND CONSIDERED WRITTEN PROPOSALS FOR ADDITIONAL WORK OR ALTERNATE MATERIALS TO THE ENGINEER FOR APPROVAL. NO WORK ON ADDITIONAL WORK ITEMS SHALL BE PERFORMED UNTIL WRITTEN APPROVAL IS GRANTED BY THE OWNER. ANY WORK PERFORMED WITHOUT THE KNOWLEDGE AND APPROVAL OF THE OWNER OR HIS REPRESENTATIVE IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

UNDERGROUND UTILITY LOCATIONS, AS SHOWN ON THESE PLANS, WERE DETERMINED FROM FIELD MEASUREMENTS, CONSTRUCTION PLANS, RECORD PLANS, OR UTILITY MAPS FURNISHED BY OTHERS. LOCATIONS OF UNDERGROUND UTILITIES ARE TO BE REGARDED AS APPROXIMATE ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ESTABLISH IN THE FIELD THE ACTUAL LOCATIONS OF ALL UNDERGROUND LINES WHICH MAY IN ANY WAY AFFECT THE WORK.

COMPENSATION FOR UTILITY RELOCATIONS AND ADJUSTMENTS SHALL NOT INCLUDE ANY COSTS FOR REPAIR TO THE UTILITY DAMAGED BY THE CONTRACTOR OR HIS SUBCONTRACTOR(S). THE CONTRACTOR IS NOT RELIEVED OF THE RESPONSIBILITY FOR DETERMINING THE LOCATION OF ALL UTILITIES AFFECTING THE WORK.

THE CONTRACTOR SHALL NOT BE RELIEVED OF RESPONSIBILITY FOR MAKING COMPLETE AND ACCURATE ON-SITE DETERMINATIONS OF THE LOCATIONS OF ALL UTILITIES, STRUCTURES AND FIELD CONDITIONS, WHICH MAY AFFECT THE PROGRESS OF THE WORK.

WHERE PLANS CALL FOR CONNECTING NEW STRUCTURES TO EXISTING UNDERGROUND PIPES OR STRUCTURES, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE, AT THE TIME OF CONSTRUCTION, EXACT SIZES, TYPES AND LOCATIONS OF EXISTING UNDERGROUND IMPROVEMENTS AND TO FURNISH MATERIALS AS NEEDED TO MAKE THE REQUIRED CONNECTIONS.

ALL IMPROVEMENTS SHALL BE CONSTRUCTED BY CONTRACTORS LICENSED BY THE ARIZONA STATE REGISTER OF CONTRACTORS, WITH A CLASS OF LICENSE(S) FOR THE SPECIFIC WORK BEING PERFORMED (UNLESS OTHERWISE SPECIFIED BY THE OWNER).

THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION METHODS, SEQUENCING, AND SAFETY DURING CONSTRUCTION.

THE CONTRACTOR IS REQUIRED TO COMPLY WITH ALL TRIBAL, STATE AND FEDERAL LAWS AND REGULATIONS APPLICABLE TO THE CONSTRUCTION OF THIS PROJECT.

NO EXISTING SURVEY MONUMENTS SHALL BE REMOVED OR DISTURBED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE FINANCIALLY RESPONSIBLE FOR COSTS TO REESTABLISH MONUMENTS OR CONTROLS REMOVED WITHOUT PRIOR NOTICE AND APPROVAL.

### PERMITS

CONTRACTOR SHALL OBTAIN ALL PERMITS AT HIS OWN EXPENSE FROM LOCAL COUNTY, STATE, FEDERAL AND TRIBAL AGENCIES AND AIR POLLUTION CONTROL AUTHORITIES PRIOR TO BEGINNING CONSTRUCTION.

REQUIRED PERMITS SHALL BE SECURED BY THE CONTRACTOR FROM THE APPROPRIATE AGENCIES. FEDERAL PERMITS, UTILITY AUTHORITIES AND OTHER PERMITS MAY BE REQUIRED. PRIOR TO CONSTRUCTION THE APPROPRIATE AGENCIES SHALL BE NOTIFIED BY THE CONTRACTOR AS REQUIRED BY THE PERMITS.

## PAVING AND CONCRETE WORK

ALL PAVING IS TO BE IN ACCORDANCE WITH SPECIFICATIONS SECTIONS AND ANY OTHER SECTION OR OTHER SPECIFICATION REFERENCED THEREIN OR REFERENCED ON PLANS.

SUBGRADE PREPARATION - SPECIFICATION AND GEOTECHNICAL REPORT

UNTREATED AGGREGATE BASE (ABG) - SPECIFICATION SECTION 31 2000 AND GEOTECHNICAL REPORT

CONCRETE CURBS & OUTLETS, SIDEWALKS, SIDEWALK RAMP, DRIVEWAYS - SPECIFICATION SECTION 32 1313

ASPHALT PAVEMENT - SPECIFICATION SECTION 32 1216

### GRADING AND EARTHWORK

ALL GRADING AND EARTHWORK SHALL BE PER GEOTECHNICAL ENGINEERING REPORT, PROJECT SPECIFICATIONS OR ANY OTHER SPECIFICATION REFERENCED THEREIN OR REFERENCED ON PLANS.

SITE CLEARING - SECTION 31 1000

EARTH MOVING - SECTION 31 2000

ERRATA - SECTION 31 3700

ASPHALT PAVING - SECTION 32 1216

CONCRETE PAVING - SECTION 32 1313

CONCRETE PAVING JOINT SEALANTS - SECTION 32 1373

PARKING SAFETY CURB - SECTION 32 1713

SITE UTILITIES - SECTION 33 0000

STORM UTILITY DRAINAGE PIPING - SECTION 33 4100

CONTRACTOR SHALL VERIFY FROM SOLS REPORT RECOMMENDATIONS THE DEGREE OF DIFFICULTY REQUIRED FOR TRENCHING AND EXCAVATION WORK BASED ON DEPTH AND TYPES OF MATERIALS TO BE ENCOUNTERED.

WATER SOURCE. THE CONTRACTOR SHALL MAKE THE NECESSARY ARRANGEMENTS FOR OBTAINING ALL WATER REQUIRED FOR SOIL COMPACTION, DRINKING PURPOSES AND DUST CONTROL, WITH NAVAJO NATION WATER CODE ADMINISTRATION.

TOPSOIL THAT WILL BE AFFECTED BY ROUGH GRADING OR EXCAVATION SHALL BE STOCKPILED ON THE SITE SEPARATELY AND SHALL NOT BE USED FOR FILL, BUT SHALL BE CONSERVED AND USED FOR FINE AND FINISH GRADING.

THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AWAY FROM ALL WALLS AND FOUNDATIONS. ALL STORM DRAINS, DRAIN LINES, OVERFLOWS, OUTLETS, AND/OR OTHER DRAINAGE TYPE OUTLETS WHICH CONDUCT MOISTURE NEAR THE STRUCTURES SHALL BE POSITIVELY DRAINED AWAY FROM THE STRUCTURE. NO WATER SHALL BE PERMITTED TO POND NEAR STRUCTURES OR FOUNDATIONS. ALL DRAINAGE SHALL BE CHANNELIZED AND SHALL BE DIRECTED AWAY FROM THE BUILDING STRUCTURE AT A MINIMUM 5% FOR 10 FT.

SUBGRADE PREPARATION: IF THE NATURAL SUBGRADE IS LESS THAN THE REQUIRED DENSITY, IT SHALL BE SCARIFIED AND COMPACTED TO A MINIMUM DEPTH AS NOTED IN THE PROJECT SOLS REPORT IMMEDIATELY PRIOR TO PLACING SUBSEQUENT FILL MATERIAL THEREON. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE AND REPAIR OF DAMAGE TO PREPARED SUBGRADE CAUSED BY CONTRACTORS OPERATIONS OR PUBLIC TRAFFIC. NO MATERIALS SHALL BE PLACED UPON THE PREPARED SUBGRADE UNTIL IT MEETS THE SPECIFIED REQUIREMENTS. SUBGRADE COMPACTION INCLUDES SUBGRADE UNDER DRIVEWAY, CURB, SIDEWALKS, SHOULDERS AND FILL SLOPES. SUBGRADE TOLERANCES SHALL BE AS SPECIFIED IN PROJECT SPECIFICATIONS AND THE PROJECT SOLS REPORT. OPEN LANDSCAPED AREAS SHALL BE GRADED TO 1/4" - 0.00 FEET.

EARTH FILL: AREAS TO BE FILLED SHALL BE LEVELLED TO PROVIDE A LEVEL BASE TO SUPPORT FILL MATERIALS. SUBGRADE AND SUBBASE REQUIRING FILL MATERIAL SHALL BE SCARIFIED MOISTENED AND COMPACTED PRIOR TO PLACING FILL. ALL FILL, SUBGRADE AND SUBBASE MATERIALS SHALL BE COMPACTED TO SPECIFIED DENSITIES AT OR NEAR OPTIMUM MOISTURE CONTENTS AS VERIFIED AND RECOMMENDED BY THE SOLS ENGINEER. PLACE FILL IN HORIZONTAL LIFTS NOT EXCEEDING EIGHT INCHES IN LOOSE THICKNESS BEFORE UNLESS OTHERWISE DIRECTED IN GEOTECHNICAL REPORT OR COMPACTION. SLOPED SURFACES SHALL BE PLowed, STEPPED, AND REMOVED SO THAT THE FILL MATERIAL WILL BOND WITH THE EXISTING MATERIAL. SEE PROJECT SPECIFICATIONS AND THE PROJECT SOLS REPORT.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE SOLS ENGINEER FOR SCHEDULING OF COMPACTION TESTING. THE FREQUENCY OF DENSITY AND MOISTURE TESTS REQUIRED FOR ADEQUATE CONTROL SHALL BE THE RESPONSIBILITY OF THE SOLS ENGINEER WHO SHALL CERTIFY TO THE OWNER, ENGINEER AND CONTRACTOR AT PROJECT END THAT THE FILL IS COMPACTED PER THESE PLANS AND SPECIFICATIONS. COMPACTION SHALL BE ACHIEVED BY MECHANICAL MEANS. IN NO CASE SHALL STRUCTURE BACKFILLING BE FLOOD WATER SETTLED.

ALL SLOPE CONSTRUCTION AND ROADWAY EXCAVATION SHALL CONFORM TO THE REQUIREMENTS OF PROJECT SPECIFICATIONS AND IBC. CUT AND FILL SLOPES SHALL BE AS INDICATED ON THE PLANS. SHALL BE PROVIDED WITH THE APPROPRIATE BRUSH OR BENTONITE AS SPECIFIED IN THE REFERENCE DOCUMENTS AND INDICATED ON THE PLANS. ALL FILL SLOPES SHALL BE COMPACTED AS EACH LIFT OF FILL MATERIAL IS PLACED. ALL CUT AND FILL SLOPES SHALL BE UNIFORMLY GRADED TO LINES AND GRADES INDICATED. TOPS OF ALL CUT SLOPES SHALL BE ROUNDED AND ALL UNSTABLE AND LOOSE MATERIAL AT TOP OF SLOPE SHALL BE REMOVED.

UNLESS OTHERWISE SPECIFIED, COMPACT TO THE FOLLOWING SPECIFIED PERCENT OF MAXIMUM DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM D698, PROJECT SPECIFICATIONS, AND PROJECT SOLS REPORT. MINIMUM PERCENT COMPACTION SUBGRADE SOIL OR AS DIRECTED IN THE PROJECT SOLS REPORT:

- PAVED AREAS (PAVEMENTS, SIDEWALKS, & PADS) - 95%
- EARTH FILL:
  - AGGREGATE BASE COURSE - 100%
  - BACKFILL AROUND STRUCTURES - 90%
  - BACKFILL FOR UTILITY TRENCHES (PER NTUA TECHNICAL SPECIFICATIONS).
  - BACKFILL FOR TRENCHES WITHIN 10' OF STRUCTURES AND WALLS SHALL BE COMPACTED TO 90% UNLESS DIRECTED OTHERWISE BY ENGINEER.

WATERING: CAREFULLY WATER EARTH FILL DURING PLACING BY MEANS OF A FINE SPRAY OR OTHER APPROVED METHOD, SO THAT EACH LAYER IS THOROUGHLY AND UNIFORMLY WETTED. MOISTURE CONTENT OF THE MATERIAL SHALL BE CAREFULLY CONTROLLED AT ALL TIMES AND CHECKED AT PROPER INTERVALS TO INSURE CORRECT MOISTURE FOR COMPACTION SEE THE PROJECT SPECIFICATIONS AND THE PROJECT SOLS REPORT.

TRENCHES: BACKFILLING TRENCHES SHALL PROGRESS AS RAPIDLY AS THE CONSTRUCTION AND TESTING OF THE WORK PERMIT. TRENCH BACKFILL FOR WATER, SEWER, AND UTILITY LINES SHALL CONFORM TO NTUA TECHNICAL SPECIFICATIONS.

MAINTENANCE AND PROTECTION: THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE, CLEANING AND PROTECTION OF ALL CONSTRUCTION WORK UNTIL FINAL COMPLETION, APPROVAL OF PROJECT AND ACCEPTANCE BY OWNER, ENGINEER AND GOVERNING AUTHORITY. SETTLEMENT OF WASHING THAT OCCURS IN GRADED, TOPSOIL OR BACKFILLED AREAS PRIOR TO ACCEPTANCE OF THE WORK SHALL BE REPAIRED AND GRADING RE-ESTABLISHED TO THE REQUIRED ELEVATIONS AND SLOPES.

### EROSION CONTROL

THE SITE OPERATOR (CONTRACTOR) SHALL MAINTAIN AND MANAGE THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP), FILE THE NOTICE OF INTENT, IMPLEMENT THE REQUIREMENTS OF SWPPP, AND FILE THE NOTICE OF TERMINATION. THE CONTRACTOR SHALL MINIMIZE POLLUTANTS IN STORMWATER DISCHARGES USING BEST MANAGEMENT PRACTICES (BMP'S) FOR EROSION CONTROL.

### MATERIAL TESTING STANDARDS

ALL TESTING SHALL BE PER SPECIFICATIONS AND NTUA TECHNICAL SPECIFICATIONS.

### WATER AND SEWER NOTES

CONTRACTOR SHALL NOTIFY LOCAL DISTRICT OFFICE PRIOR TO EXCAVATING WATER AND/OR WASTEWATER UTILITIES.

CONTRACTOR SHALL OBTAIN APPROVED PERMISSION TO TAP FOR PRIOR TO TAPPING EXISTING WATER MAIN AND WASTEWATER MAIN.

ALL WATER AND WASTEWATER MAIN LINES SHALL BE PRESSURED TESTED PER N.T.U.A. TECHNICAL SPECIFICATIONS.

ALL WATER AND WASTEWATER MAINS AND SERVICE LINES SHALL MEET ALL HORIZONTAL AND SEPARATION REQUIREMENTS PER N.T.U.A. TECHNICAL SPECIFICATIONS.

WASTEWATER SEWER SERVICE LINES SHALL HAVE ONE-WAY CLEANOUTS AT EVERY BEND.

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT NTUA TECHNICAL SPECIFICATIONS AND DETAILS. ADDITIONS, PER AWWA STANDARDS AND SPECIFICATIONS.

WATER SERVICE LINES - SECTION TP 3.08

TRENCHING EXCAVATION, BACKFILLING AND COMPACTION - SECTION TP 1.0

WATERLINE TESTING - SECTION TP 3.09

WATER DISINFECTION - SECTION TP 3.10

WATER THROUSTROCKING - SECTION TP 3.05

FIRE HYDRANT ASSEMBLY - SECTION TP 3.03

SEWER PIPE INSTALLATION - SECTION TP 4.04

MANHOLE INSTALLATION - SECTION TP 4.05

SEWER SERVICE INSTALLATIONS - SECTION TP 4.07

SEWER LINE TESTING - SECTION TP 4.08

## NTUA WATER AND WASTEWATER GENERAL NOTES:

- ALL MATERIALS AND WORKMANSHIP SHALL COMPLY WITH THE N.T.U.A. TECHNICAL SPECIFICATIONS FOR MATERIALS AND WORKMANSHIP FOR WATER AND WASTEWATER FACILITIES, SEPTEMBER 2008.
- CONTRACTOR SHALL OBTAIN APPROVED PERMISSION TO TAP (PTT) FORM PRIOR TO TAPPING EXISTING WATER AND SEWER MAIN.
- CONTRACTOR SHALL COORDINATE WITH N.T.U.A. PRESENT AT THE SITE TO VERIFY LOCATION, DEPTH, SIZE AND TYPE OF UNDERGROUND UTILITIES.
- CONTRACTOR TO COORDINATE WITH N.T.U.A. REGARDING WATER SHUT OFF WITH AT LEAST 3 DAYS ADVANCE NOTICE. TO ISOLATE LINES(S), TO NOTIFY AFFECTED CUSTOMERS AND TO MINIMIZE OUTAGE TIME PRIOR TO CONNECTION OF NEW WATER SERVICE.
- UNLESS OTHERWISE DIRECTED, ONLY AUTHORIZED N.T.U.A. STAFF WILL BE ALLOWED TO CLOSE/OPEN WATER VALVES FOR ANY CONNECTIONS TO EXISTING LINES AND FOR THE USAGE OF WATER.
- ROUGH GRADING SHALL BE COMPLETED WITHIN 1/10 OF A FOOT OF PLAN GRADE PRIOR TO INSTALLING WATER AND WASTEWATER UTILITIES.
- COORDINATE WITH LOCAL UTILITY PROVIDERS FOR ANY REMOVAL OF EXISTING FACILITIES PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL PROTECT EXISTING UTILITIES IN PLACE. CONTRACTOR SHALL RESTORE AT OWN EXPENSE ANY DAMAGE TO EXISTING UTILITIES.
- ALL WATER MAINS SHALL BE POLYVINYL CHLORIDE (PVC) PRESSURE PIPE WITH A MINIMUM OF 200 PSI PRESSURE CLASS UNLESS SPECIFIED OTHERWISE.
- ALL FITTINGS AND VALVES 4" OR GREATER IN SIZE SHALL BE MADE FROM DUCTILE IRON FURNISHED WITH MECHANICAL JOINT ENDS AND SHALL HAVE A PRESSURE RATING OF 300 PSI. ALL 4" AND SMALLER SHALL HAVE MEDALUG MECHANICAL RESTRAINT WITH CONCRETE THRUST BLOCK, STD DTL. WS-19. POLYETHYLENE WRAPPING (8 MILS MINIMUM THICKNESS) IN ACCORDANCE WITH AWWA STANDARD C-105) SHALL BE INSTALLED AROUND DUCTILE IRON PIPES, FITTINGS, AND VALVES. FIRE HYDRANT BARRELS AND ROGS AND CLAMPS.
- A WARNING/DETECTABLE MARKING TAPE SHALL BE INSTALLED AT 12" MINIMUM AND 18" MAXIMUM ABOVE THE WATER AND SEWER PIPE. MARKING TAPE SHALL CONSIST OF ONE LAYER OF ALUMINUM FOL LAMINATED BETWEEN TWO COLORED LAYERS OF INERT PLASTIC FILM. THE LAMINATION BOND SHOULD BE STRONG ENOUGH THAT THE LAYERS CANNOT BE SEPARATED BY HAND. TAPE SHALL BE A MINIMUM OF 5 MILS THICK AND 6 INCHES WIDE. TAPE SHALL BEAR A CONTINUOUS, PRINTED MESSAGE EVERY 16 TO 36 INCHES. MARKING OF THE INSTALLATION BURIED BELOW. TAPE SHALL BE TERRA TAPE, UNITEC, OR AS APPROVED BY N.T.U.A.
- DEFLECTION (VERTICAL OR HORIZONTAL) OF PIPES IS PERMITTED AND SHALL CONFORM TO AMERICAN WATER WORKS ASSOCIATION (AWWA) JOINT DEFLECTION FOR AWWA PRESSURE PIPE AND AT BOX OF MANUFACTURER'S RECOMMENDED MAXIMUM DEFLECTION, WHICHEVER IS MORE STRINGENT. A COPY OF THE MANUFACTURER'S RECOMMENDATION SHALL BE SUBMITTED TO N.T.U.A.
- PIPES SHALL NOT BE BACKFILLED (INCLUDING BEDDING MATERIAL ABOVE THE SPRING LINE OF THE PIPE) UNTIL THE CONSTRUCTION HAS BEEN INSPECTED AND APPROVED FOR BACKFILLING BY A N.T.U.A. REPRESENTATIVE.
- CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS OF ALL UTILITIES TO OWNER AND N.T.U.A. IN HARD COPY AND DIGITAL FORMAT.
- HYDROSTATIC TESTING, FLUSHING AND CHLORINATION SHALL BE CONDUCTED IN ACCORDANCE WITH N.T.U.A. TECHNICAL SPECIFICATIONS FOR MATERIALS AND WORKMANSHIP FOR WATER AND WASTEWATER FACILITIES, SEPTEMBER 2008) SHALL BE COORDINATED WITH N.T.U.A. AT LEAST 3 DAYS IN ADVANCE. N.T.U.A. REPRESENTATIVE SHALL BE PRESENT TO RECORD THE INFORMATION AND CERTIFY THE TESTING.
- UTILITY CONSTRUCTION ACCEPTANCE AND UTILITY TRANSFER: CONTRACTOR SHALL SCHEDULE A FINAL OR PRE-FINAL INSPECTION WITH N.T.U.A. NO ENGINEERING AND LOCAL DISTRICT OFFICE, OWNER AND GENERAL CONTRACTOR AT THE END OF CONSTRUCTION. DOCUMENTS SHALL BE PROVIDED BY THE CONTRACTOR AS FOLLOWS: AS-BUILT DRAWING, APPROVED P.T.T. HYDROSTATIC TESTING RESULTS, BACTERIOLOGICAL TESTING RESULTS, MATERIALS SUBMITTALS AND COST OF PLANT. PLEASE FOLLOW THE N.T.U.A. TECHNICAL SPECIFICATIONS FOR MATERIALS AND WORKMANSHIP FOR WATER AND WASTEWATER FACILITIES, SEPTEMBER 2008, SECTION TP 5.0. BY THE CONTRACTOR/ENGINEER SHALL PROVIDE WARRANTY ON ALL NEW WATER AND WASTEWATER FACILITIES AGAINST DEFECTS IN MATERIALS, WORKMANSHIP AND FOR ANY DESIGN DEFICIENCIES, ERRORS AND OMISSIONS FOR THE PERIOD OF ONE YEAR WHEN THE FACILITIES WERE INSPECTED, ACCEPTED AND APPROVED.
- PROVIDE 10 FT. MINIMUM HORIZONTAL SEPARATION IN SEPARATE TRENCHES BETWEEN THE WATER AND SEWER SERVICES. PROVIDE 5 FT. MIN. HORIZONTAL SEPARATION BETWEEN THE SEWER SERVICES AND OTHER UTILITIES. IF SEWER SERVICES CROSSES OTHER SERVICES SEE N.T.U.A. CROSSING POLICY, OR CONTACT N.T.U.A. HEADQUARTERS ENGINEERING.
- ALL SEWER PIPES SHALL BE MADE OF MATERIAL CONFORMING TO REQUIREMENTS OF ASTM D3798, TYPE 1, GRADE 1 FOR RIGID POLYVINYL CHLORIDE COMPOUNDS. ALL SEWER PIPES AND FITTINGS SHALL BE AT LEAST 30#-35, TYPE PSW WITH ELECTROMETRIC GASKET JOINTS MEETING THE REQUIREMENTS OF ASTM D 3034. SERVICE CONNECTIONS TO NEW SEWER MAINS SHALL BE WYE FITTINGS.
- SEWER CLEANOUPS ARE REQUIRED ON ALL BENDS IN EXCESS OF 45 DEGREES AS PER PLUMBING CODE ADOPTED BY THE NAVAJO NATION. MOODY MATERIAL LIST ACCORDINGLY AFTER CONSULTING WITH N.T.U.A. HEADQUARTERS ENGINEERING.
- ADDITIONAL SEWER CLEANOUPS ARE REQUIRED ON SEWER SERVICES LONGER THAN 50 FT. AS PER UNIFORM PLUMBING CODE ADOPTED BY THE NAVAJO NATION. MOODY MATERIAL LIST ACCORDINGLY AFTER CONSULTING WITH N.T.U.A. HEADQUARTERS ENGINEERING. EACH ADDITIONAL CLEANOUP IS AT THE CUSTOMER'S EXPENSE. INSTALL AT LEAST ONE CLEANOUP AS REQUIRED. IF CUSTOMER REQUESTS FEWER AND REALIZED THAT IT VIOLATES NAVAJO TRIBAL CODE, THEN INSTALL PER THE CUSTOMER'S REQUEST AND NOTE ON THE INDIVIDUAL AS-BUILT N.T.U.A. RECOMMENDS THAT CLEANOUPS BE SPACED NO MORE THAN 100'.
- THE CONTRACTOR/ENGINEER SHALL PROVIDE WARRANTY ON ALL NEW WATER AND WASTEWATER FACILITIES AGAINST DEFECTS IN MATERIALS, WORKMANSHIP AND FOR ANY DESIGN DEFICIENCIES, ERRORS AND OMISSIONS FOR THE PERIOD OF ONE YEAR WHEN THE FACILITIES WERE INSPECTED, ACCEPTED AND APPROVED.
- BACKFILL IS TO BE HAND TAMPED (NO MECHANICAL) AND COMPACTED IN 6 INCH LAYERS FOR AT LEAST 12 IN. ABOVE PVC PIPE. INSTALL PER ASTM D-2321 AND UNIFORM PLUMBING CODE ADOPTED BY NAVAJO NATION.
- NEW SEWER MAIN SHALL BE INSTALLED WITH 42" OF MINIMUM COVER PER STANDARD DETAIL WWS-10, UNLESS OTHERWISE INDICATED ON THESE PLANS.
- ALL NEWLY CONSTRUCTED LINES ARE REQUIRED TO BE CLAMPED AND TESTED FOR EXFILTRATION. TESTING IS TO BE CONDUCTED WITH NAVAJO AREA STANDARDS AND CONSTRUCTION REQUIREMENTS TP 4.08. THE ENGINEER IS REQUIRED TO COMPLETE THE CERTIFICATION FORMS AS APPROPRIATE. THE COMPLETED FORMS ARE TO BE FORWARDED BY THE ENGINEER TO THE N.T.U.A. HEADQUARTER, SPECIAL PROJECT DEPARTMENT, FOR REVIEW AND APPROVAL. A LETTER OF ACCEPTANCE OF THE TEST RESULTS WILL BE FORWARDED FROM THE N.T.U.A. HEADQUARTERS TO THE DISTRICT.

## PUBLIC UTILITIES

WATER - NAVAJO TRIBAL UTILITY AUTHORITY

ELECTRIC - NAVAJO TRIBAL UTILITY AUTHORITY

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WASTE DISPOSAL - NAVAJO NATION SANITATION

## TOPOGRAPHIC SURVEYOR

TOPOGRAPHIC SURVEY PREPARED BY SOUDER, MILLER & ASSOCIATES, INC. CONTACT: (928) 428-9141, CONTACT SURVEYOR FOR HORIZONTAL CONTROL INFORMATION.

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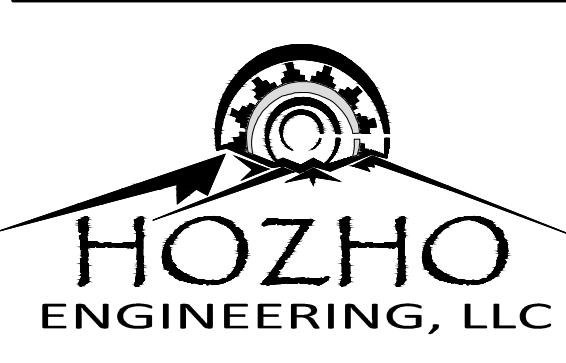
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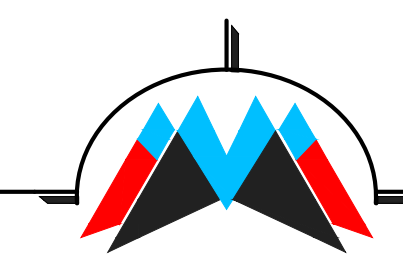
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GENERAL NOTES



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CONSTRUCTION NOTES

1. CONSTRUCT ASPHALT PAVEMENT PER DETAIL "A" ON DETAIL SHEET C600.
2. INSTALL DETECTABLE WARNING STRIP PER DETAIL "B" ON DETAIL SHEET C600.
3. CONSTRUCT CONCRETE SIDEWALK PER DETAIL "C" ON DETAIL SHEET C600.
4. CONSTRUCT CONCRETE SIDEWALK ALONG CURB PER DETAIL "D" ON DETAIL SHEET C600.
5. CONSTRUCT CONCRETE CURB RAMP PER DETAIL "E" ON DETAIL SHEET C600.
6. INSTALL 4" SOLID WHITE LINE.
7. INSTALL ACCESSIBLE PARKING PER DETAIL "F" ON DETAIL SHEET C600.
8. INSTALL PRECAST SAFETY CURB PER DETAIL "G" ON DETAIL SHEET C600.
9. CONSTRUCT CONCRETE VALLEY GUTTER AND APRON PER DETAIL "H" ON DETAIL SHEET C600.
10. CONSTRUCT ASPHALT PAVEMENT EDGE PER DETAIL "I" ON DETAIL SHEET C600.
11. CONSTRUCT SINGLE VERTICAL CURB, TYPE "A", PER DETAIL "M" ON DETAIL SHEET C600.
12. CONSTRUCT ASPHALT PAVEMENT PER DETAIL "N" ON DETAIL SHEET C600.
13. CONSTRUCT ASPHALT PAVEMENT PER DETAIL "O" ON DETAIL SHEET C600.
14. CONSTRUCT ASPHALT PAVEMENT PER DETAIL "P" ON DETAIL SHEET C600.
15. SAWCUT, REMOVE AND DISPOSE OF EXISTING CONCRETE CURB AND GUTTER.
16. SAWCUT, REMOVE AND DISPOSE OF EXISTING ASPHALT PAVEMENT.
17. REMOVE AND DISPOSE OF CURB INLET CATCH BASIN ENTIRELY. REMOVE AND DISPOSE OF EXISTING STORM PIPE AS NEEDED TO COMPLETE WORK. REMAINING STORM PIPE SHALL BE CAPED OFF AND ABANDONED IN PLACE. CAP SHALL BE APPROVED BY ENGINEER.
18. CONSTRUCT 3' WIDE CONCRETE VALLEY GUTTER PER DETAIL "A" ON DETAIL SHEET C600.
19. CONSTRUCT CURB AND GUTTER PER DETAIL "N" ON DETAIL SHEET C600.

REFERENCE NOTES

1. NEW BUILDING  
REFER TO ARCHITECTURAL & STRUCTURAL PLAN
2. TRASH ENCLOSURE  
REFER TO ARCHITECTURAL PLAN



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Revision Number	Revision Date	Revision Description
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PROJECT NUMBER 22010	DRAWN BY HOZHO	PROJ MGR AW
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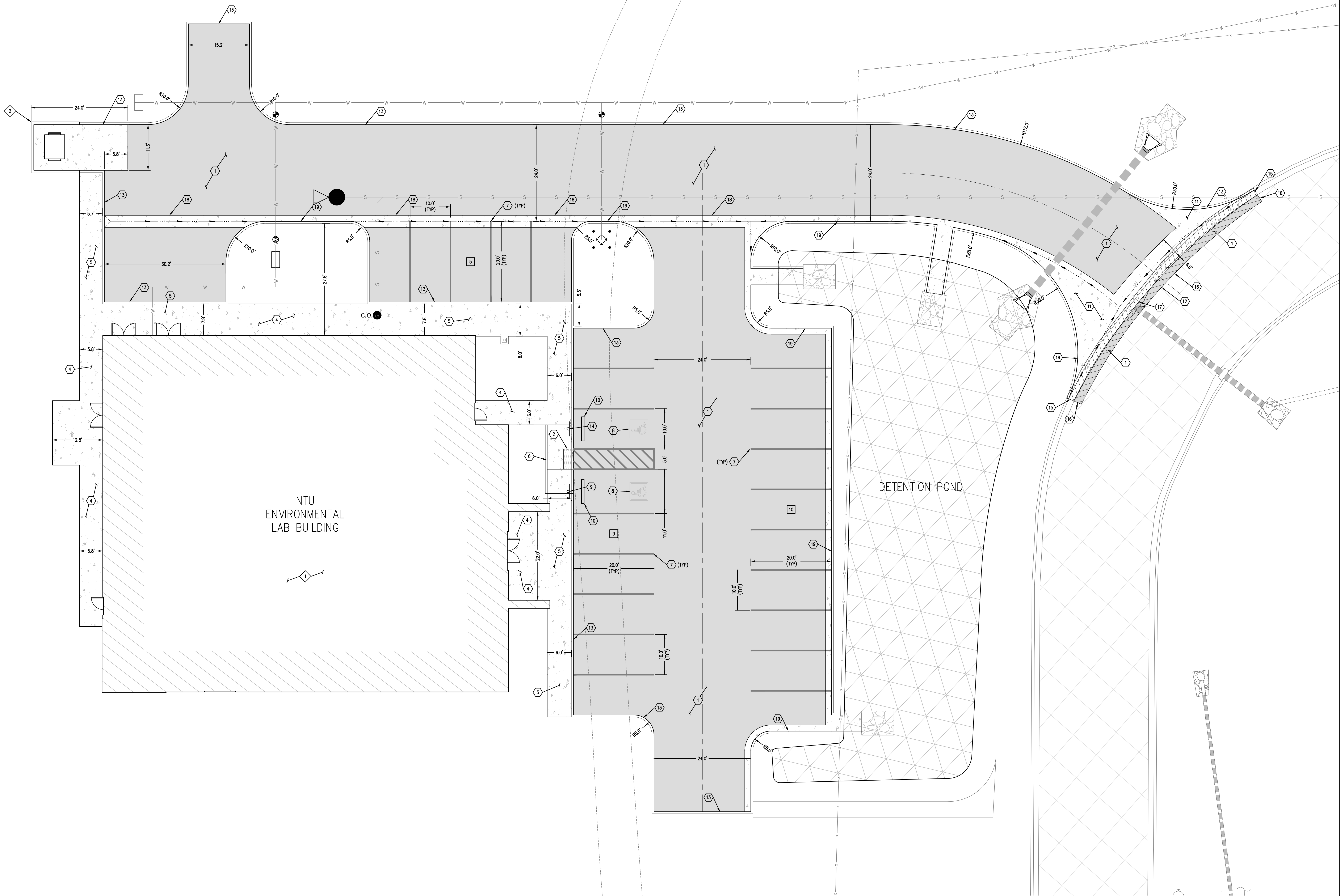
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Sheet Number

CIVIL SITE PLAN

C200

Sequence of



- LEGEND**
- BOUNDARY LINE
  - W--- PROPOSED WATER LINE
  - W-F--- PROPOSED WATER FIRE LINE
  - S--- PROPOSED SEWER MAIN
  - UGE--- PROPOSED UNDERGROUND ELECTRIC
  - X--- PROPOSED FENCE
  - GAS--- PROPOSED GAS LINE
  - W--- EXISTING WATER LINE
  - S--- EXISTING SEWER MAIN
  - X--- EXISTING FENCE
  - OHE--- EXISTING OVERHEAD ELECTRIC
  - UGE--- EXISTING UNDERGROUND ELECTRIC
  - TELECOM--- EXISTING TELECOMMUNICATIONS LINE
  - GATE VALVE--- PROPOSED GATE VALVE
  - GATE VALVE--- EXISTING GATE VALVE
  - WATER METER--- WATER METER
  - CURB STOP--- CURB STOP
  - DOMESTIC STOP--- DOMESTIC STOP
  - CLEANOUT--- CLEANOUT
  - EXISTING CLEANOUT--- EXISTING CLEANOUT
  - PROPOSED SEWER MANHOLE--- PROPOSED SEWER MANHOLE
  - EXISTING SEWER MANHOLE--- EXISTING SEWER MANHOLE
  - FIRE HYDRANT--- FIRE HYDRANT

PAVING HATCH LEGEND

- ASPHALT PAVEMENT AREAS
- CONCRETE AREAS
- EXISTING ASPHALT TO REMAIN
- REMOVAL LIMITS

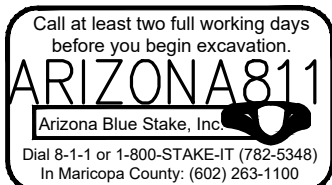
PARKING STALL LEGEND

- PARKING STALL COUNT

0 5 10 20  
1" = 10' FEET



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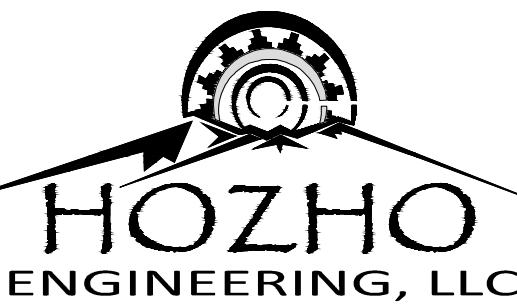
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GENERAL GRADING AND DRAINAGE NOTES

- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL QUANTITIES INCLUDING EXCAVATION, BORROW, EMBANKMENT, SHRINK OR SWELL, GROUND COMPACTION, HALL, AND ANY OTHER ITEMS PRIOR TO CONSTRUCTION TO COMPLETE THE GRADING TO THE ELEVATIONS SHOWN ON THE PLANS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE ENGINEER OF ANY MAJOR DISCREPANCIES PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL AND MECHANICAL PLANS AND SPECIFICATIONS FOR BUILDING DIMENSIONS AND ACTUAL LOCATIONS OF ALL UTILITIES ENTERING THE BUILDING INCLUDING SANITARY SEWER, LATERALS, DOMESTIC WATER, ELECTRIC, TELEPHONE, AND GAS SERVICES.
- ELEVATIONS REFERRED TO HEREIN ARE DESIGN ELEVATIONS ONLY. ANY FIELD DESIGN CHANGES PROPOSED BY THE CONTRACTOR SHALL REQUIRE PRIOR WRITTEN APPROVAL BY THE ARCHITECT, OWNER OR OWNER'S REPRESENTATIVE.
- EARTHWORK SHALL CONFORM TO PROJECT SPECIFICATIONS AND GEOTECHNICAL ENGINEERING REPORT PREPARED BY GEOMAT, INC. (INCLUDED IN THE SPECIFICATIONS).
- DRAINAGE DITCHES/SWALES LOCATED AROUND THE HOUSING UNITS SHALL BE GRADED TO DRAIN AND DISCHARGE AWAY FROM THE HOUSING UNITS. ALL AREAS BEYOND DITCHES/SWALES GRADING SHALL REMAIN INTACT.
- PROPOSED UNPAVED FINISHED GRADES ADJACENT TO THE HOUSING FOUNDATIONS SHALL SLOPE AWAY FROM THE UNIT FOUNDATION AT A 5% MINIMUM SLOPE FOR A MINIMUM DISTANCE OF 10 FT.
- PROPOSED ROOF DRAIN DOWNSPOUT LOCATIONS SHALL HAVE A SPLASH PAD WITH ADDITIONAL RIPRAP APRON/SWALE EXTENDING FROM THE SPLASH PAD TO THE ADJACENT TOE OF SLOPE. DISCHARGE FROM THE DOWNSPOUTS SHALL DRAIN AWAY FROM THE HOUSING UNITS TO ADJACENT DOWNSLOPE DITCHES/SWALES.
- ANY UTILITY ADJUSTMENTS SHALL BE IN ACCORDANCE WITH N.T.U.A. SPECIFICATIONS.
- THE CONTRACTOR SHALL FIELD VERIFY ALL FINISH FLOOR ELEVATIONS.
- FINISH GRADING SHALL BE UNIFORM AND SMOOTH PER THE PROJECT SPECIFICATIONS.
- IMPORTED MATERIAL SHALL BE TESTED IN CONFORMANCE WITH THE GEOTECHNICAL REPORT AND PROJECT SPECIFICATIONS.

CONSTRUCTION NOTES

- CONSTRUCT CONCRETE SPILLWAY AND RIPRAP PER DETAIL "B" ON DETAIL SHEET 0001.
- INSTALL 18" H.D.P.E. N-12 PIPE WITH WATERTIGHT JOINTS.
- INSTALL H.D.P.E. END SECTION AND RIPRAP PER DETAIL "C" ON DETAIL SHEET 0001. END SECTION TO MATCH CORRESPONDING CULVERT DIAMETER.



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GRADING & DRAINAGE  
PLAN

C300

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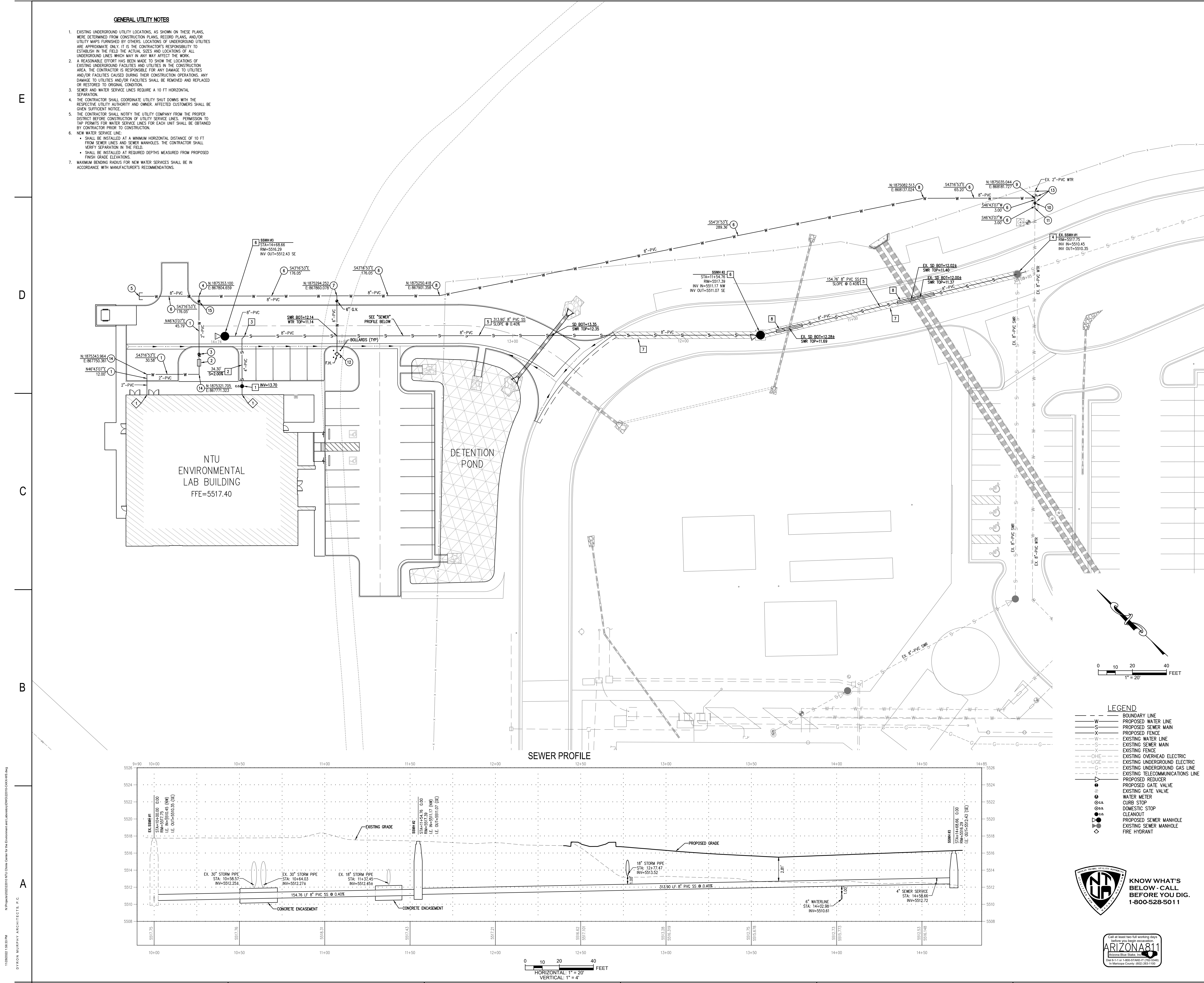
C

B

A

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GENERAL UTILITY NOTES

- EXISTING UNDERGROUND UTILITY LOCATIONS, AS SHOWN ON THESE PLANS, WERE DETERMINED FROM CONSTRUCTION PLANS, RECORD PLANS, AND/OR UTILITY MAPS FURNISHED BY OTHERS. LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ESTABLISH IN THE FIELD THE ACTUAL SIZES AND LOCATIONS OF ALL UNDERGROUND LINES WHICH MAY IN ANY WAY AFFECT THE WORK.
- A REASONABLE EFFORT HAS BEEN MADE TO SHOW THE LOCATIONS OF EXISTING UNDERGROUND FACILITIES AND UTILITIES IN THE CONSTRUCTION AREA. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO UTILITIES AND/OR FACILITIES CAUSED DURING THEIR CONSTRUCTION OPERATIONS. ANY DAMAGE TO UTILITIES AND/OR FACILITIES SHALL BE REMOVED AND REPLACED OR RESTORED TO ORIGINAL CONDITION.
- SEWER AND WATER SERVICE LINES REQUIRE A 10 FT HORIZONTAL SEPARATION.
- THE CONTRACTOR SHALL COORDINATE UTILITY SHUT DOWNS WITH THE RESPECTIVE UTILITY AUTHORITY AND OWNER. AFFECTED CUSTOMERS SHALL BE GIVEN SUFFICIENT NOTICE.
- THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANY FROM THE PROPER DISTRICT BEFORE CONSTRUCTION OF UTILITY SERVICE LINES. PERMISSION TO TAP PERMITS FOR WATER SERVICE LINES FOR EACH UNIT SHALL BE OBTAINED BY CONTRACTOR PRIOR TO CONSTRUCTION.
- NEW WATER SERVICE LINE.
  - SHALL BE INSTALLED AT A MINIMUM HORIZONTAL DISTANCE OF 10 FT FROM SEWER LINES AND SEWER MANHOLES. THE CONTRACTOR SHALL VERIFY SEPARATION IN THE FIELD.
  - SHALL BE INSTALLED AT REQUIRED DEPTHS MEASURED FROM PROPOSED FINISH GRADE ELEVATIONS.
- MAXIMUM BENDING RADIUS FOR NEW WATER SERVICES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

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WATER NOTES

- INSTALL 2" PVC (SDR-21, 200 PSI) WATER SERVICE LINE PER N.T.U.A. STD. DETAILS "WS-10", "WS-2", AND "WS-2A" ON DETAIL SHEET C610.
- INSTALL 2" BACKFLOW PREVENTER WITH HEATING ENCLOSURE AND DETECTOR PER N.T.U.A. STD. DETAILS "WS-22" AND "WS-22A" ON DETAIL SHEET C611.
- INSTALL 2" WATER METER PER N.T.U.A. STD. DETAILS "WS-2" AND "WS-2A" ON DETAIL SHEET C610.
- INSTALL 8"x2" DUCTILE IRON TEE WITH MU MEGALUG RESTRAINT AND THRUST BLOCK PER N.T.U.A. STD. DETAILS "WS-16", "WS-19", AND "WS-19A" ON DETAIL SHEET C610.
- INSTALL 8" DUCTILE IRON END CAP WITH THRUST BLOCK PER N.T.U.A. STD. DETAILS "WS-19" AND "WS-19A" ON DETAIL SHEET C610.
- INSTALL 8" PVC (SDR-21, 200 PSI) WATER MAIN LINE PER N.T.U.A. TRENCH DETAIL "WS-15" ON DETAIL SHEET C610.
- INSTALL 8"x6" DUCTILE IRON TEE WITH MU MEGALUG RESTRAINT AND THRUST BLOCK PER N.T.U.A. STD. DETAILS "WS-16", "WS-19", AND "WS-19A" ON DETAIL SHEET C610.
- INSTALL 8"x11.25" DUCTILE IRON BEND WITH MU MEGALUG RESTRAINT AND THRUST BLOCK PER N.T.U.A. STD. DETAILS "WS-19" AND "WS-19A" ON DETAIL SHEET C610.
- INSTALL 8"-90° DUCTILE IRON BEND WITH MEGALUG RESTRAINT AND THRUST BLOCK PER N.T.U.A. STD. DETAILS "WS-19" AND "WS-19A" ON DETAIL SHEET C610.
- INSTALL 8" GATE VALVE WITH MU MEGALUG RESTRAINT AND THRUST BLOCK PER N.T.U.A. STD. DETAIL "WS-16" ON DETAIL SHEET C610.
- CONNECT TO EXISTING 8" WATER LINE.
- INSTALL FIRE HYDRANT WITH 6" PIPE, 6" GATE VALVE, AND BOLLARDS PER N.T.U.A. STD. DETAILS "WS-12" AND "WS-12A" ON DETAIL SHEET C611.
- REMOVE EXISTING 8"x2" REDUCER, 2" WATER SERVICE LINE, AND 2" FLUSH VALVE.
- INSTALL 2"-90° DUCTILE IRON BEND WITH MEGALUG RESTRAINT AND THRUST BLOCK PER N.T.U.A. STD. DETAILS "WS-19" AND "WS-19A" ON DETAIL SHEET C610.
- INSTALL 2" GATE VALVE WITH MU MEGALUG RESTRAINT AND THRUST BLOCK PER N.T.U.A. STD. DETAILS "WS-2" AND "WS-2A" ON DETAIL SHEET C610.

SEWER NOTES

- INSTALL 4" TWO-WAY SEWER CLEANOUT PER N.T.U.A. STD. DETAILS "WS-1" AND "WS-1A" ON DETAIL SHEET C620.
- INSTALL 4" SDR-35 PVC SEWER SERVICE LINE PER N.T.U.A. STD. DETAILS "WS-1", "WS-1A", AND "WS-1B" ON DETAIL SHEET C620.
- INSTALL 4"x8" WYE TO CONNECT TO 8" SEWER LINE PER N.T.U.A. STD. DETAILS "WS-1" AND "WS-1A" ON DETAIL SHEET C620.
- CONNECT TO EXISTING N.T.U.A. SEWER LINE. CONTRACTOR SHALL VERIFY EXACT LOCATION & INVERT OF N.T.U.A. SEWER LINE PRIOR TO CONSTRUCTION. NOTIFY OWNER'S AGENT OF ANY DISCREPANCIES.
- INSTALL 8" SDR-28 PVC SEWER MAIN LINE PER N.T.U.A. TRENCH DETAIL "WS-10" ON DETAIL SHEET C620.
- CONSTRUCT 4" DIAMETER SEWER MANHOLE PER N.T.U.A. STD. DETAILS "WS-4", "WS-5", AND "WS-5A" ON DETAIL SHEET C620.
- SAWCUT, REMOVE, AND DISPOSE OF EXISTING PAVEMENT. CONSTRUCT PAVEMENT REPLACEMENT.
- CONSTRUCT CONCRETE ENCASEMENT PER N.T.U.A. STD. DETAIL "WS-9" ON DETAIL SHEET C620.

REFERENCE NOTES

- CONNECT TO BUILDING SUB. SEE PLUMBING PLANS FOR CONTINUATION. CONTRACTOR SHALL VERIFY EXACT LOCATION & INVERT WITH PLUMBING PLANS PRIOR TO CONSTRUCTION. NOTIFY OWNER'S AGENT OF ANY DISCREPANCIES.

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LEGEND

---	BOUNDARY LINE
W	PROPOSED WATER LINE
S	PROPOSED SEWER MAIN
X	PROPOSED FENCE
W	EXISTING WATER LINE
S	EXISTING SEWER MAIN
X	EXISTING FENCE
OH-E	EXISTING OVERHEAD ELECTRIC
UG-E	EXISTING UNDERGROUND ELECTRIC
G	EXISTING UNDERGROUND GAS LINE
T	EXISTING TELECOMMUNICATIONS LINE
●	PROPOSED GATE VALVE
●	EXISTING GATE VALVE
●	WATER METER
●	CURB STOP
●	DOMESTIC STOP
●	CLEANOUT
●	PROPOSED SEWER MANHOLE
●	EXISTING SEWER MANHOLE
●	FIRE HYDRANT

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**WATER & SEWER PLAN**

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Revision Number	Revision Date	Revision Description

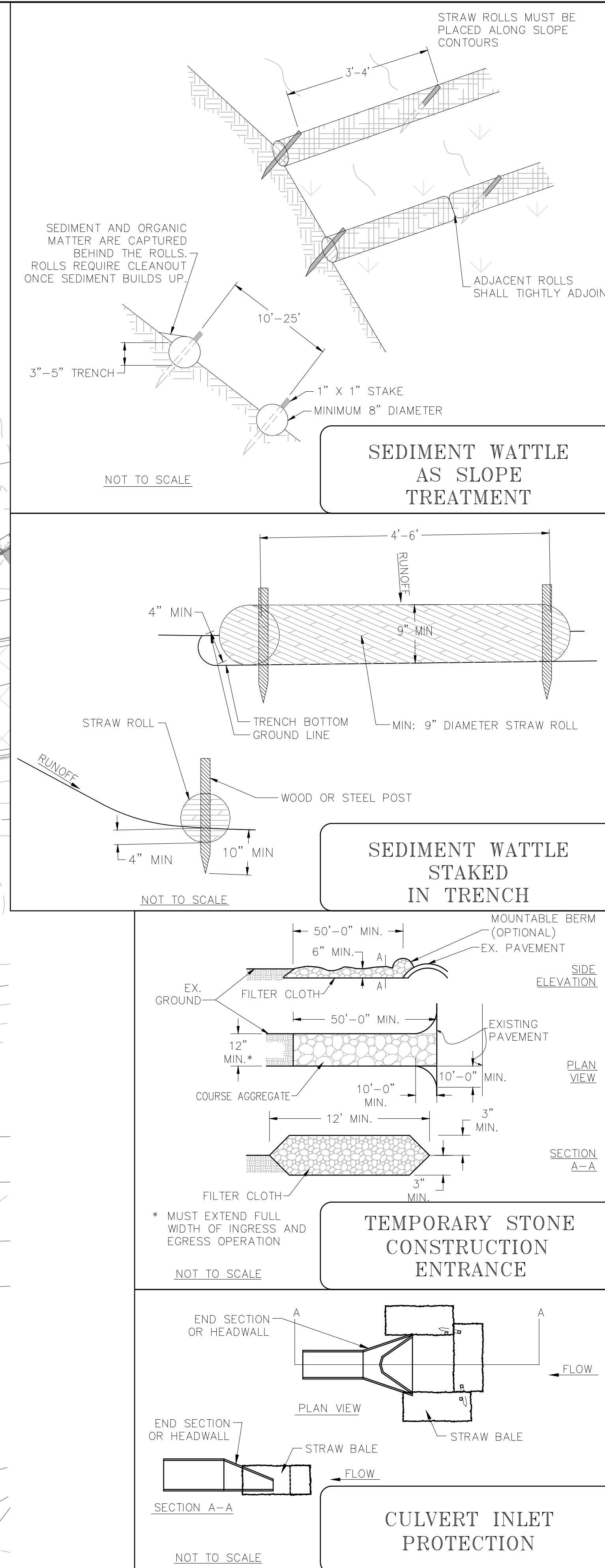
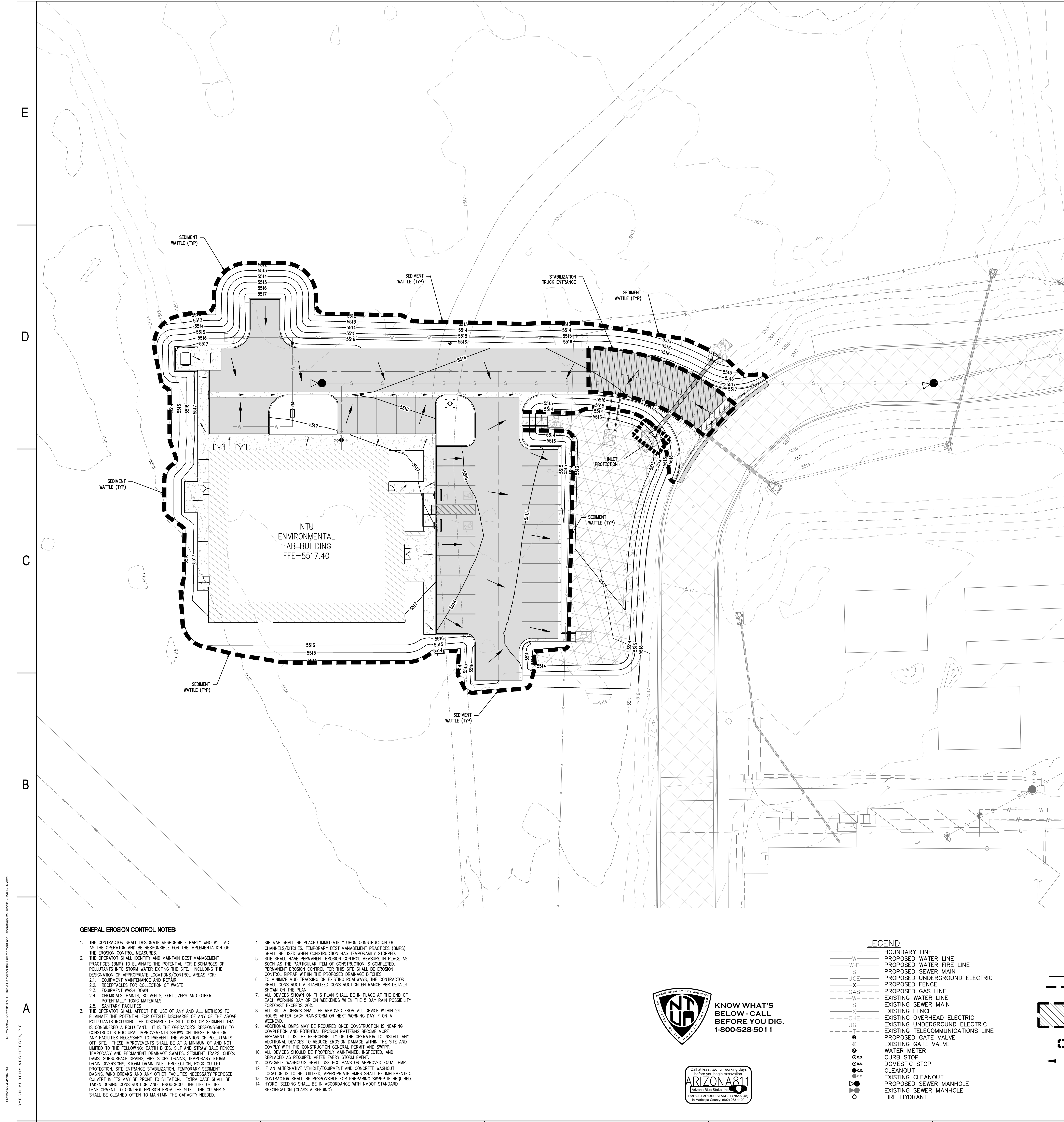
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GENERAL EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL DESIGNATE RESPONSIBLE PARTY WHO WILL ACT AS THE OPERATOR AND BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE EROSION CONTROL MEASURES.
2. THE OPERATOR SHALL IDENTIFY AND MAINTAIN BEST MANAGEMENT PRACTICES (BMP) TO ELIMINATE THE POTENTIAL FOR DISCHARGES OF POLLUTANTS INTO STORM WATER EXITING THE SITE, INCLUDING THE DESIGNATION OF APPROPRIATE LOCATIONS/CONTROL AREAS FOR:
  - 2.1. EQUIPMENT MAINTENANCE AND REPAIR
  - 2.2. RECEIPTS/LOGS FOR COLLECTION OF WASTE
  - 2.3. EQUIPMENT WASH DOWN
  - 2.4. CHEMICALS, PAINTS, SOLVENTS, FERTILIZERS AND OTHER POTENTIALLY TOXIC MATERIALS
  - 2.5. SANITARY FACILITIES
3. THE OPERATOR SHALL AFFECT THE USE OF ANY AND ALL METHODS TO ELIMINATE THE POTENTIAL FOR OFFSITE DISCHARGE OF ANY OF THE ABOVE POLLUTANTS INCLUDING THE DISCHARGE OF SILT, DUST OR SEDIMENT THAT IS CONSIDERED A POLLUTANT. IT IS THE OPERATOR'S RESPONSIBILITY TO CONSTRUCT STRUCTURAL IMPROVEMENTS SHOWN ON THESE PLANS OR ANY FACILITIES NECESSARY TO PREVENT THE MIGRATION OF POLLUTANTS OFF SITE. THESE IMPROVEMENTS SHALL BE AT A MINIMUM OF AND NOT LIMITED TO THE FOLLOWING: EARTH DICES, SILT AND STRAW BALE FENCES, TEMPORARY AND PERMANENT DRAINAGE SWALES, SEDIMENT TRAPS, CHECK DAMS, SUBSURFACE DRAINS, PIPE SLOPE DRAINS, TEMPORARY STORM DRAIN OVERSPILLS, STORM DRAIN INLET PROTECTION, ROCK OUTLET PROTECTION, SITE ENTRANCE STABILIZATION, TEMPORARY SEDIMENT BASINS, AND BREAKS AND ANY OTHER FACILITIES NECESSARY. PROPOSED CULVERT INLETS MAY BE PRONE TO SILTATION. EXTRA CARE SHALL BE TAKEN DURING CONSTRUCTION AND THROUGHOUT THE LIFE OF THE DEVELOPMENT TO CONTROL EROSION FROM THE SITE. THE CULVERTS SHALL BE CLEANED OFTEN TO MAINTAIN THE CAPACITY NEEDED.
4. RIP RAP SHALL BE PLACED IMMEDIATELY UPON CONSTRUCTION OF CHANNELS/DITCHES. TEMPORARY BEST MANAGEMENT PRACTICES (BMPs) SHALL BE USED WHEN CONSTRUCTION HAS TEMPORARILY STOPPED.
5. SITE SHALL HAVE PERMANENT EROSION CONTROL MEASURE IN PLACE AS SOON AS THE PARTICULAR ITEM OF CONSTRUCTION IS COMPLETED. PERMANENT EROSION CONTROL FOR THIS SITE SHALL BE EROSION CONTROL RIPRAP WITHIN THE PROPOSED DRAINAGE DITCHES.
6. TO MINIMIZE MUD TRACKING ON EXISTING ROADWAYS, THE CONTRACTOR SHALL CONSTRUCT A STABILIZED CONSTRUCTION ENTRANCE PER DETAILS SHOWN ON THE PLAN.
7. ALL DEVICES SHOWN ON THIS PLAN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY OR ON WEEKENDS WHEN THE 5 DAY RAIN POSSIBILITY FORECAST EXCEEDS 20%.
8. ALL SILT & DEBRIS SHALL BE REMOVED FROM ALL DEVICE WITHIN 24 HOURS AFTER EACH RAINSTORM OR NEXT WORKING DAY IF ON A WEEKEND.
9. ADDITIONAL BMPs MAY BE REQUIRED ONCE CONSTRUCTION IS NEARING COMPLETION AND POTENTIAL EROSION PATTERNS BECOME MORE APPARENT. IT IS THE RESPONSIBILITY OF THE OPERATOR TO INSTALL ANY ADDITIONAL DEVICES TO REDUCE EROSION DAMAGE WITHIN THE SITE AND COMPLY WITH THE CONSTRUCTION GENERAL PERMIT AND SWPPP.
10. ALL DEVICES SHOULD BE PROPERLY MAINTAINED, INSPECTED, AND REPLACED AS REQUIRED AFTER EVERY STORM EVENT.
11. CONCRETE WASHOUTS SHALL USE ECO PANS OR APPROVED EQUAL BMP.
12. IF AN ALTERNATIVE VEHICLE/EQUIPMENT AND CONCRETE WASHOUT LOCATION IS TO BE UTILIZED, APPROPRIATE BMPs SHALL BE IMPLEMENTED.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING SWPPP IF REQUIRED.
14. HYDRO-SEEDING SHALL BE IN ACCORDANCE WITH MIDDOT STANDARD SPECIFICATION (CLASS A SEEDING).

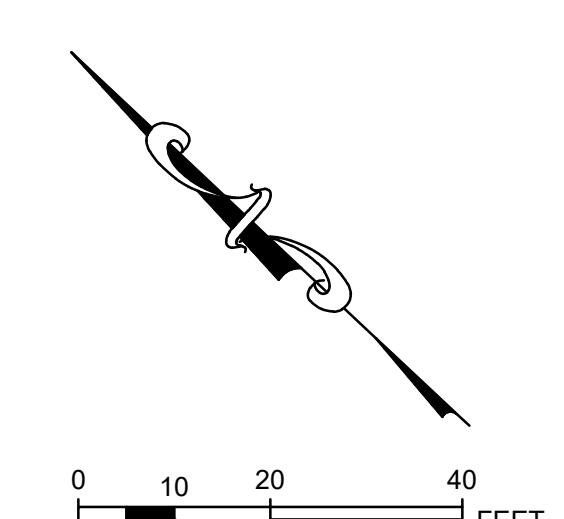


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- LEGEND**
- BOUNDARY LINE
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  - S- EXISTING SEWER MAIN
  - X- EXISTING OVERHEAD ELECTRIC
  - OH- EXISTING UNDERGROUND ELECTRIC
  - T- EXISTING TELECOMMUNICATIONS LINE
  - F- PROPOSED GATE VALVE
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  - ⊗ WATER METER
  - ⊗ CURB STOP
  - ⊗ DOMESTIC STOP
  - ⊗ CLEANOUT
  - ⊗ EXISTING CLEANOUT
  - ⊗ PROPOSED SEWER MANHOLE
  - ⊗ EXISTING SEWER MANHOLE
  - ⊗ FIRE HYDRANT

- LEGEND**
- SEDIMENT WATTLE
  - STABILIZATION TRUCK ENTRANCE
  - INLET PROTECTION
  - FLOW LINE



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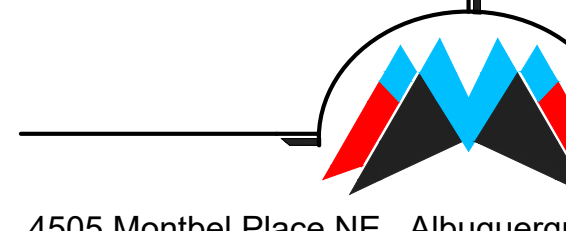
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EROSION CONTROL PLAN

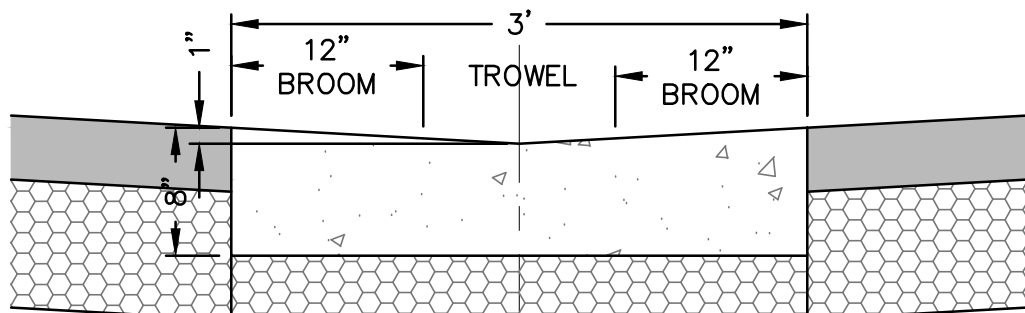






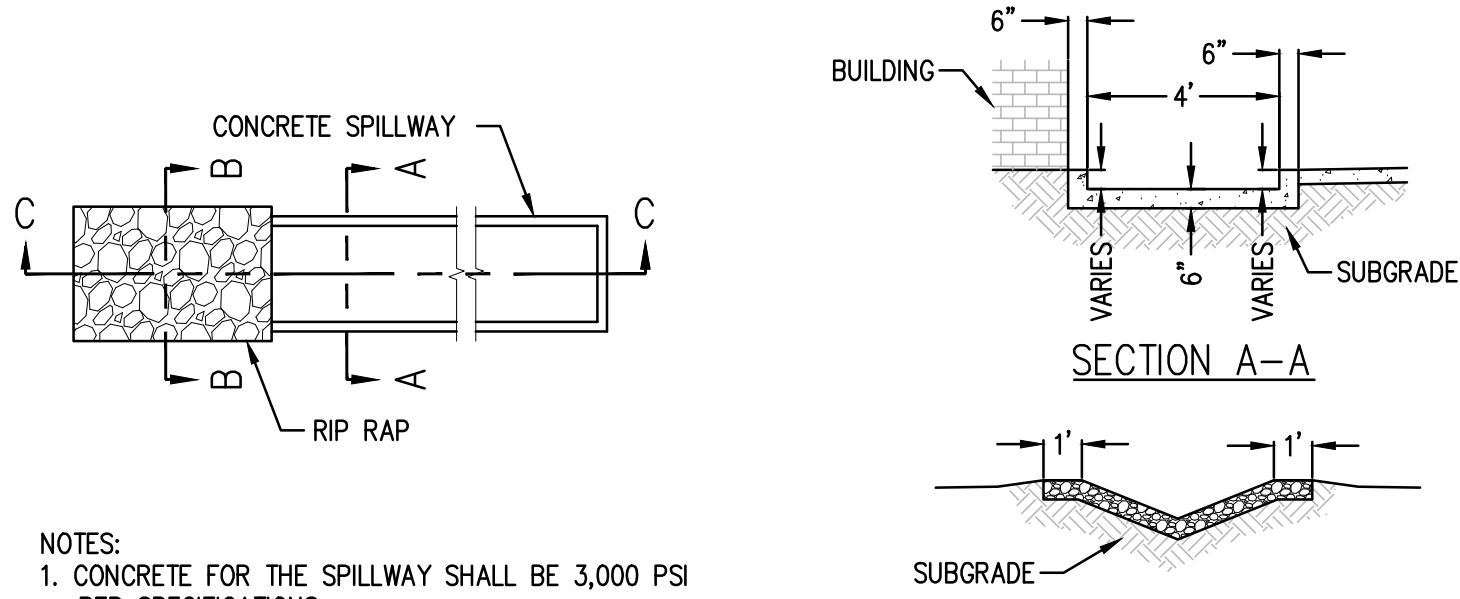
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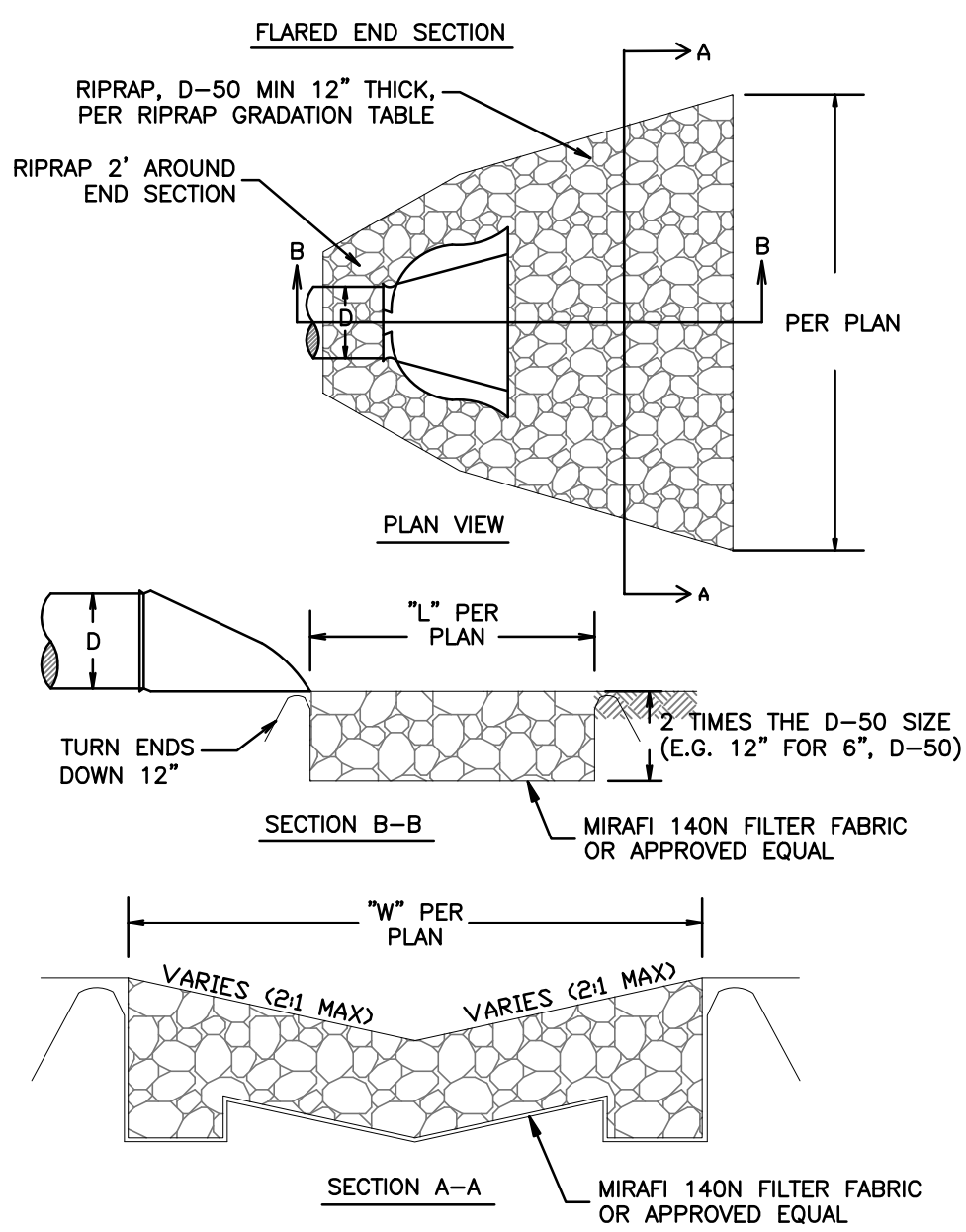
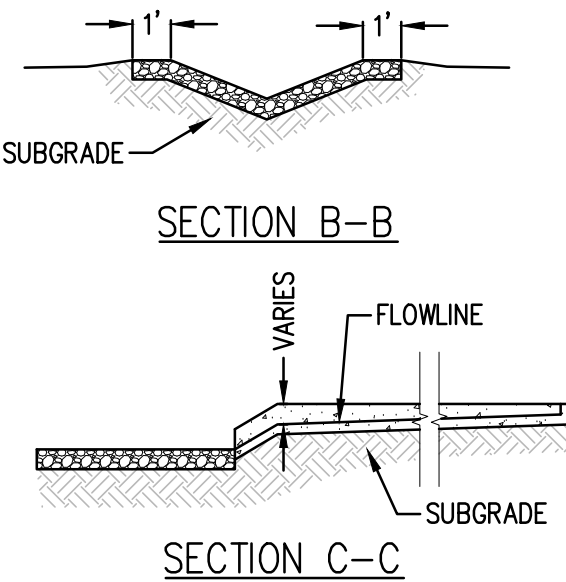
- NOTES:
1. CONCRETE SHALL BE 3000 PSI AND SHALL CONFORM TO SPECIFICATIONS.
  2. EITHER CONSTRUCTION JOINT OR CONTRACTION JOINT IS REQUIRED AT CENTERLINE OF STREET.
  3. A SEPARATE CONCRETE PAD IS REQUIRED AT ALL EXPANSION JOINTS AND ALL CONSTRUCTION JOINTS.
  4. EXPANSION JOINTS SHALL CONFORM TO SPECIFICATIONS.

DETAIL A  
3' WIDE CONCRETE VALLEY GUTTER  
NTS



- NOTES:
1. CONCRETE FOR THE SPILLWAY SHALL BE 3,000 PSI PER SPECIFICATIONS.
  2. RIPRAP SHALL BE D50=6", 12" THICK MIN.
  3. SUBGRADE PREPARATION PER GEOTECHNICAL RECOMMENDATIONS.

DETAIL B  
SPILLWAY DETAIL  
NTS



RIPRAP GRADATION TABLE		D-50 CLASS RIPRAP, INCHES							
PERCENT PASSING	SIZE	6	9	12	18	24	36	30	
100 to 90	2.0 D-50	12	18	24	36	48	72	60	
85 to 70	1.5 D-50	9	14	18	27	36	54	45	
50 to 30	1.0 D-50	6	9	12	18	24	36	30	
15 to 5	0.67 D-50	4	6	8	12	16	24	20	
5 to 0	0.33 D-50	2	3	4	6	8	12	10	

RIPRAP  
-RIPRAP SHALL HAVE A BULK SPECIFIC GRAVITY OF 2.4 OR GREATER (PER ASTM C127) AND ALL ROCK SHALL BE ANGULAR  
-RIPRAP SHALL BE BETWEEN 3-INCHES AND 12-INCHES IN DIAMETER, WITH 50% (BY WEIGHT) LARGER THAN 6-INCHES IN DIAMETER UNLESS OTHERWISE SPECIFIED BY THE CITY ENGINEER

DETAIL C  
CULVERT OUTLET RIPRAP  
NTS

C

B

A

## NTU ENVIRONMENTAL LAB CHINLE

CHINLE, APACHE COUNTY, AZ

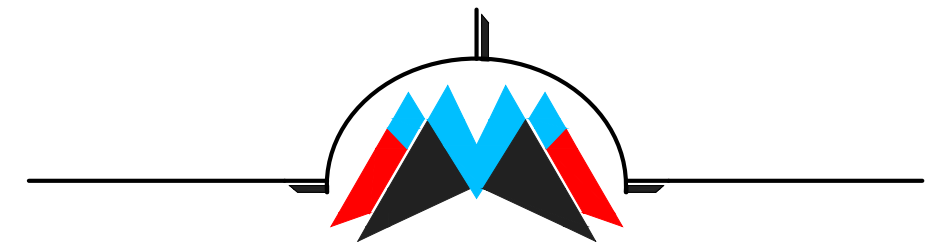
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#### GENERAL NOTES FOR WATER SERVICE

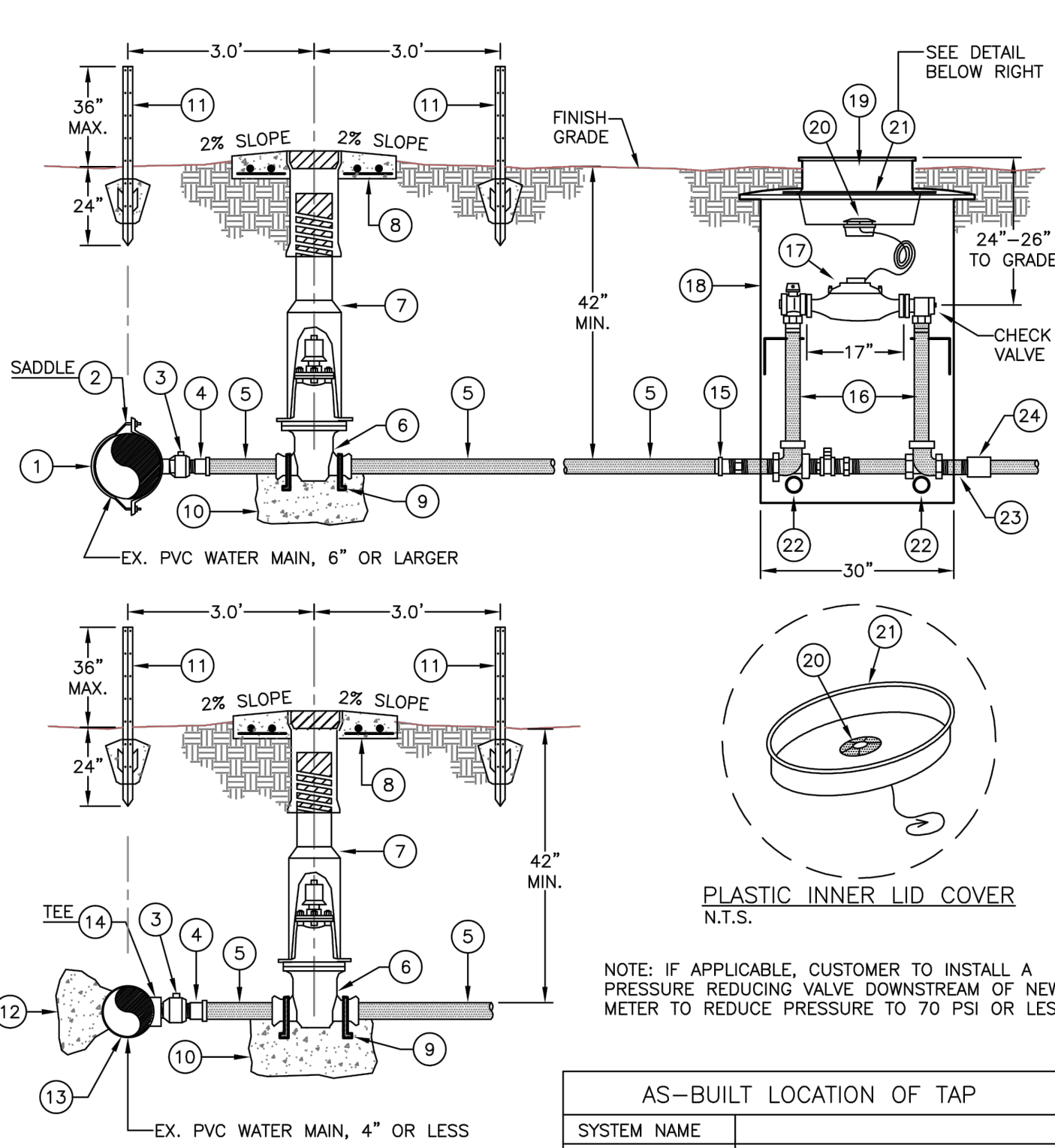
- PROVIDE 10 FEET MINIMUM HORIZONTAL SEPARATION IN SEPARATE TRENCHES, BETWEEN SEWER AND WATER SERVICES BEYOND THE BUILDING PLUMBING, TO THE TAP LOCATION. PROVIDE 5 FEET MINIMUM HORIZONTAL SEPARATION BETWEEN SEWER SERVICE AND ALL OTHER UTILITIES. FOR SEWER AND WATER CROSSINGS, PROVIDE A MINIMUM OF 12-INCH VERTICAL CLEARANCE BETWEEN PIPE OUTSIDE DIAMETER (O.D.) TO PIPE O.D. IF SEWER SERVICE CROSSES OTHER UTILITIES, ALL STIPULATIONS FOR THE OTHER UTILITY MUST BE MET.
- BUILDING PLUMBING: WATER AND SEWER SERVICES TO BE INSTALLED IN ACCORDANCE WITH NTUA STANDARDS AND TECHNICAL SPECIFICATIONS.
- WATER SERVICE LATERALS SHALL HAVE A MINIMUM COVER OF 36" AND SHALL BE INSTALLED IN CONFORMANCE WITH NTUA STANDARDS AND TECHNICAL SPECIFICATIONS.
- TAP SADDLES SHALL BE SINGLE STRAP, BAND TYPE SIZED FOR STEEL PIPE O.D., ON PVC PIPE. TAP SADDLES SHALL BE DOUBLE STRAP, BAND TYPE FOR D.I., A.C., AND/OR C-900 PIPE. FOR 2" PIPING, A 2" x 1" CLASS 200, PVC TEE SHALL BE USED. CONTACT NTUA HEADQUARTERS CIVIL ENGINEERING DEPARTMENT ON PIPING SMALLER THAN 2".
- PROVIDE THE AS-BUILT SWING TIE INFORMATION FOR THE TAP POINT AND OTHER APPURTENANCES INSTALLED, ON SHEET 7 OF 8.
- THE WATER METER SHALL BE CENTERED INSIDE THE METER CAN AND SET A MAXIMUM OF 24" BELOW THE TOP OF GRADE.
- THE METER CAN SHALL BE LOCATED JUST BEYOND THE SIDEWALK/BACK OF CURB, BEFORE THE PROPERTY LINE, OR WITH OWNER'S PERMISSION A MINIMUM OF 10.0' FROM THE BUILDING.
- WATER SERVICE LINES ARE LIMITED TO A MAXIMUM OF 200.0'. IF THE PRESSURE AT THE HOME SITE IS ABOVE 70 PSI, INSTALL THE APPROPRIATE TANDEM COPPERSETER WITH AN INDIVIDUAL PRV. (ITEM 8a FROM THE MATERIAL LIST; FOR 5/8" x 3/4" METER: SHEET 3 OF 8 AND FOR 1" METER: SHEET 4 OF 8).
- USE UTILITY MARKER TEE POSTS WHERE APPROPRIATE, PER NTUA STD. DTL. WS-13.
- SUBMIT CONSTRUCTION COST (COST OF PLANT) OF NEW INSTALLATIONS UP TO AND INCLUDING THE METER POINT. INDICATE AS FOLLOWS:  
A. MATERIAL COST  
B. LABOR COST  
C. EQUIPMENT COST  
D. TOTAL CONSTRUCTION COST  
THE COST SHALL BE SHOWN ON SHEET 5 OF 5 OF THE TRANSFER AGREEMENT.
- SHEETS 3 OF 8 AND 4 OF 8 ARE FOR RESIDENTIAL INSTALLATIONS ONLY. FOR ALL OTHER PROJECTS, SUBMIT 2 PLAN SETS OF PROPOSED DRAWINGS AND 4 PLAN SETS OF COMPLETE AS-BUILT DRAWINGS ALONG WITH THE FINAL TRANSFER PACKAGE.
- IF THERE IS A CONFLICT BETWEEN THESE STANDARD DETAILS FOR WATER AND ANY OTHER SECTION OF THE DETAILS AND/OR THE APPROVED PLANS, THEN THE MORE STRINGENT, AS DETERMINED BY THE NAVAJO TRIBAL UTILITY AUTHORITY (NTUA), SHALL APPLY.

SHEET 5 OF 8

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DATE: 06/20/2017	
SCALE: AS SHOWN	
FOR TENDER: 2017 SEE IN IN TO METER	
DETAIL NO.: WS-14	

NAVAJO TRIBAL UTILITY AUTHORITY ENGINEERING & CONSTRUCTION OPERATIONS DIVISION	GENERAL NOTES FOR WATER SERVICE
NTUA HEADQUARTERS	PT. DEERLAKE, AZ

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SHEET 1 OF 2

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SCALE: AS SHOWN	
FOR TENDER: 2017 SEE IN IN TO METER	
DETAIL NO.: WS-2	

NAVAJO TRIBAL UTILITY AUTHORITY ENGINEERING & CONSTRUCTION OPERATIONS DIVISION	2" WATER SERVICE W/ 2" METER
NTUA HEADQUARTERS	PT. DEERLAKE, AZ

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#	QTY	MATERIAL LIST DESCRIPTION
1	-	EX. PVC WATER MAIN, 6" OR LARGER
2	1	SADDLE, BRASS, 2" FIPT TAP x APPROPRIATE LINE SIZE, TYPE, AND PRESSURE RATING FOR EX. WATER MAINS 6" AND LARGER
3	1	2" CORPORATION STOP, MIPT x FIPT
4	1	ADAPTER, PVC, SDR-21, 2" GASKET x 2" MIPT
5	A.R.	2" PIPE, PVC, SDR-21, 200 PSI, BELL & SPIGOT
6	1	2" GATE VALVE, RESILIENT SEAT WEDGE, N.R.S., R.H.T., 2" OPERATING NUT, 200 PSI RATED WORKING PRESSURE
7	1	VALVE BOX, 2-PIECE SCREW TYPE, 5-1/4" SHAFT W/ CAST IRON DROP LID
8	A.R.	CONCRETE COLLAR, 24" x 24" x 4" THICK, W/ #4 REBAR, E.W.O.C., INSCRIBED W/ LINE SIZE, TYPE OF PIPE, AND DIRECTION OF FLOW W/ ARROW
9	A.R.	#4 REBAR, CUT & SHAPE AS NEEDED
10	A.R.	CONCRETE ANCHOR BLOCK, 1.5 CF MIN. (DO NOT COVER JOINTS OR BOLTS)
11	A.R.	5" STEEL TEE POST, PAINTED BLUE OR BLUE CARSONITE MARKER POST W/ PROPER WARNING DECAL
12	A.R.	CONCRETE THRUST BLOCK, 1.5 CF MIN. (DO NOT COVER JOINTS OR BOLTS)
13	-	EX. PVC WATER MAIN, 4" OR LESS
14	1	TEE, 4" M.J. x 2" FIPT TAP (SEE FIG. 2-1) OR 2" TEE, PVC, SDR-21
15	1	ADAPTER, PVC, SDR-21, 2" GASKET x 2" FIPT
16	1	2" COPPERSETER WITH CHECK VALVE AND 2 BOLT FLANGE
17	1	2" METER, ELSTER AMCO C700, POSITIVE DISPLACEMENT, GALLONS, 2-BOLT FLANGE, COMPLETE W/ EA. MODULE FOR AMI METERING TECHNOLOGY
18	1	METER PIT, PLASTIC, 30" DIA. x 36" HT.
19	1	MONITOR COVER WITH INNER FROST LID FOR THE METER PIT. NOTE: IN PAVED OR HARDCAPPED AREAS, MONITOR COVER SHALL BE FLUSH W/ FINISH GRADE WITH A TRAFFIC RATED CONC. COLLAR
20	1	EA. MODULE FOR AMI METERING TECHNOLOGY
21	1	PLASTIC INNER COVER LID & HOUSING UNIT FOR EA. MODULE. (#W3BPD STYLE)
22	2	1/2" DIA. STABILIZER BRACE, 18" LONG, PVC PIPE, SCH. 40
23	1	ADAPTER, 2" FIPT x LINE SIZE & TYPE
24	2	NIPPLE, BRASS, 2" x 8"

#### GENERAL NOTES:

- A.R. = AS REQUIRED
- ASSEMBLE AND INSTALL AS ONE UNIT.
- WATER METER SERIAL NUMBER:

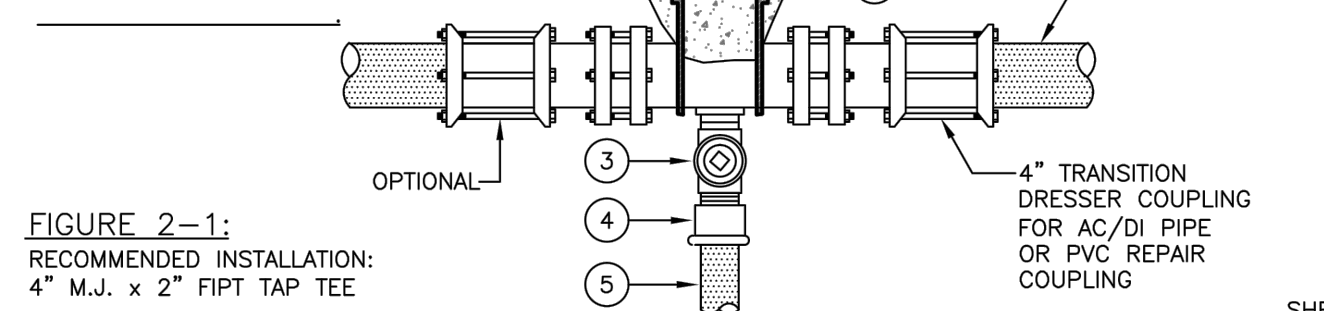


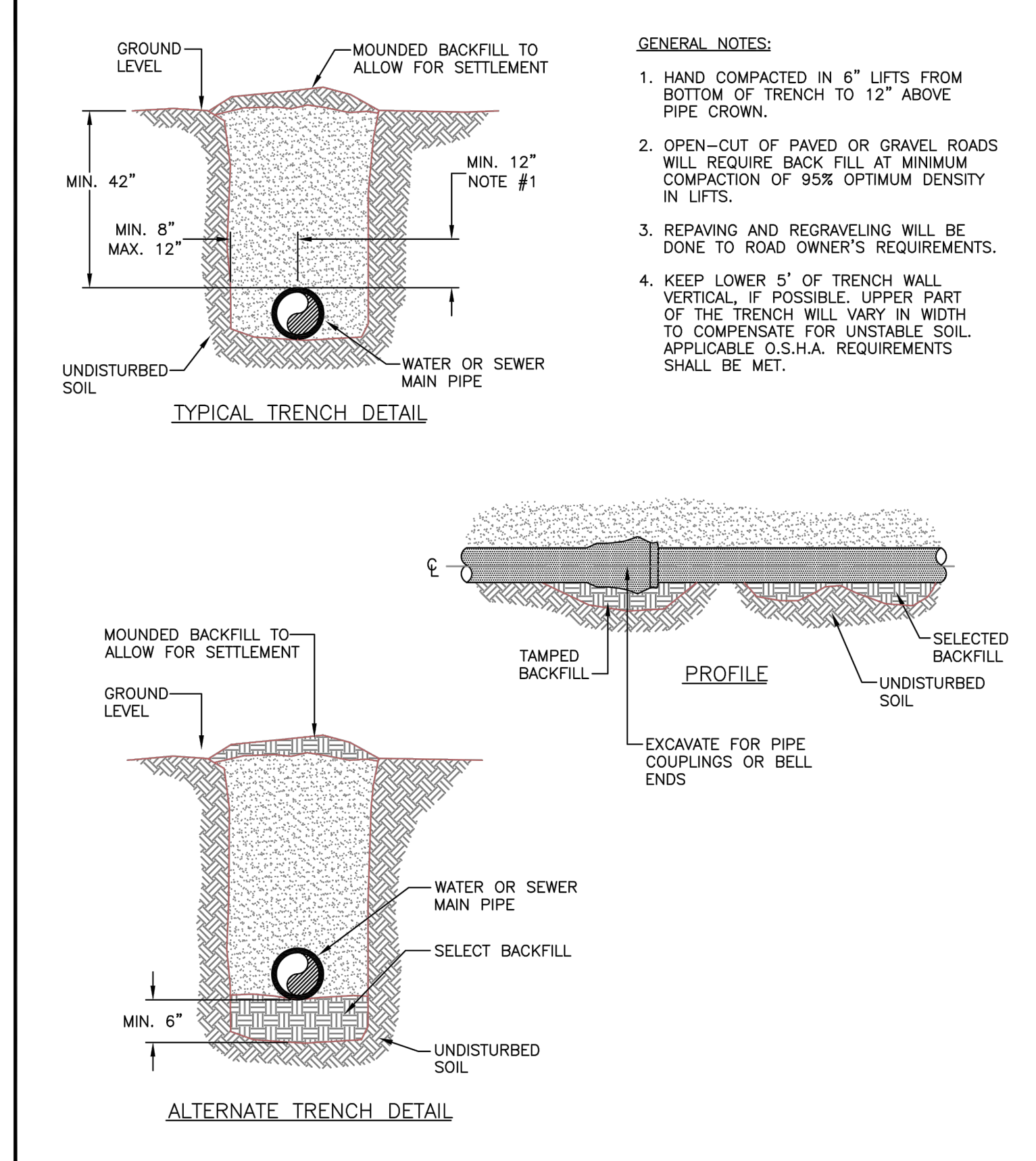
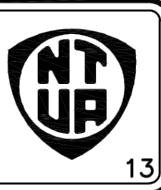
FIGURE 2-1:  
RECOMMENDED INSTALLATION:  
4" M.J. x 2" FIPT TAP TEE

SHEET 2 OF 2

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SCALE: AS SHOWN	
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DETAIL NO.: WS-2a	

NAVAJO TRIBAL UTILITY AUTHORITY ENGINEERING & CONSTRUCTION OPERATIONS DIVISION	MATERIAL LIST: 2" WATER SERVICE W/ 2" METER
NTUA HEADQUARTERS	PT. DEERLAKE, AZ

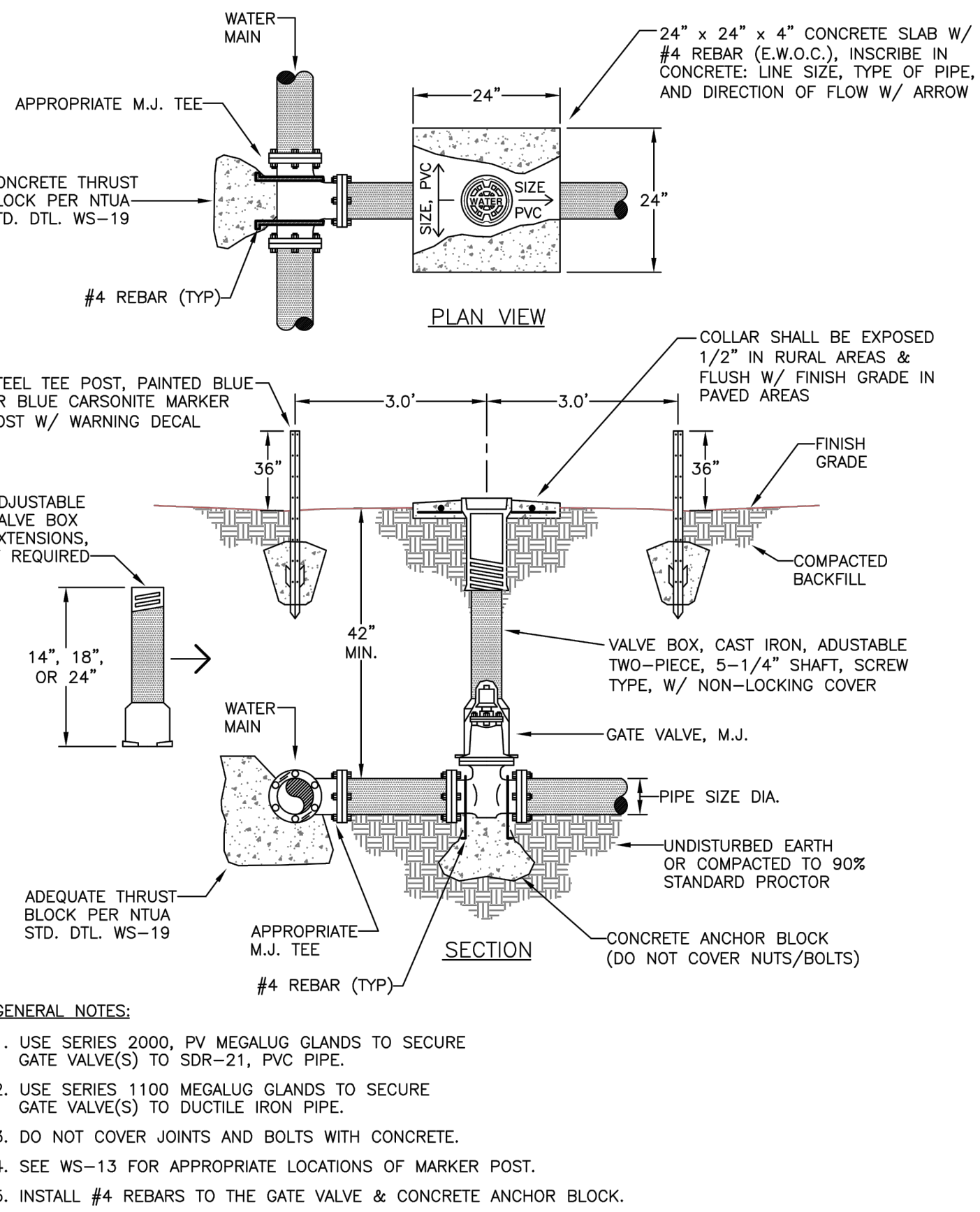
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DETAIL NO.: WS-15	

NAVAJO TRIBAL UTILITY AUTHORITY ENGINEERING & CONSTRUCTION OPERATIONS DIVISION	STANDARD TRENCH DETAIL
NTUA HEADQUARTERS	PT. DEERLAKE, AZ

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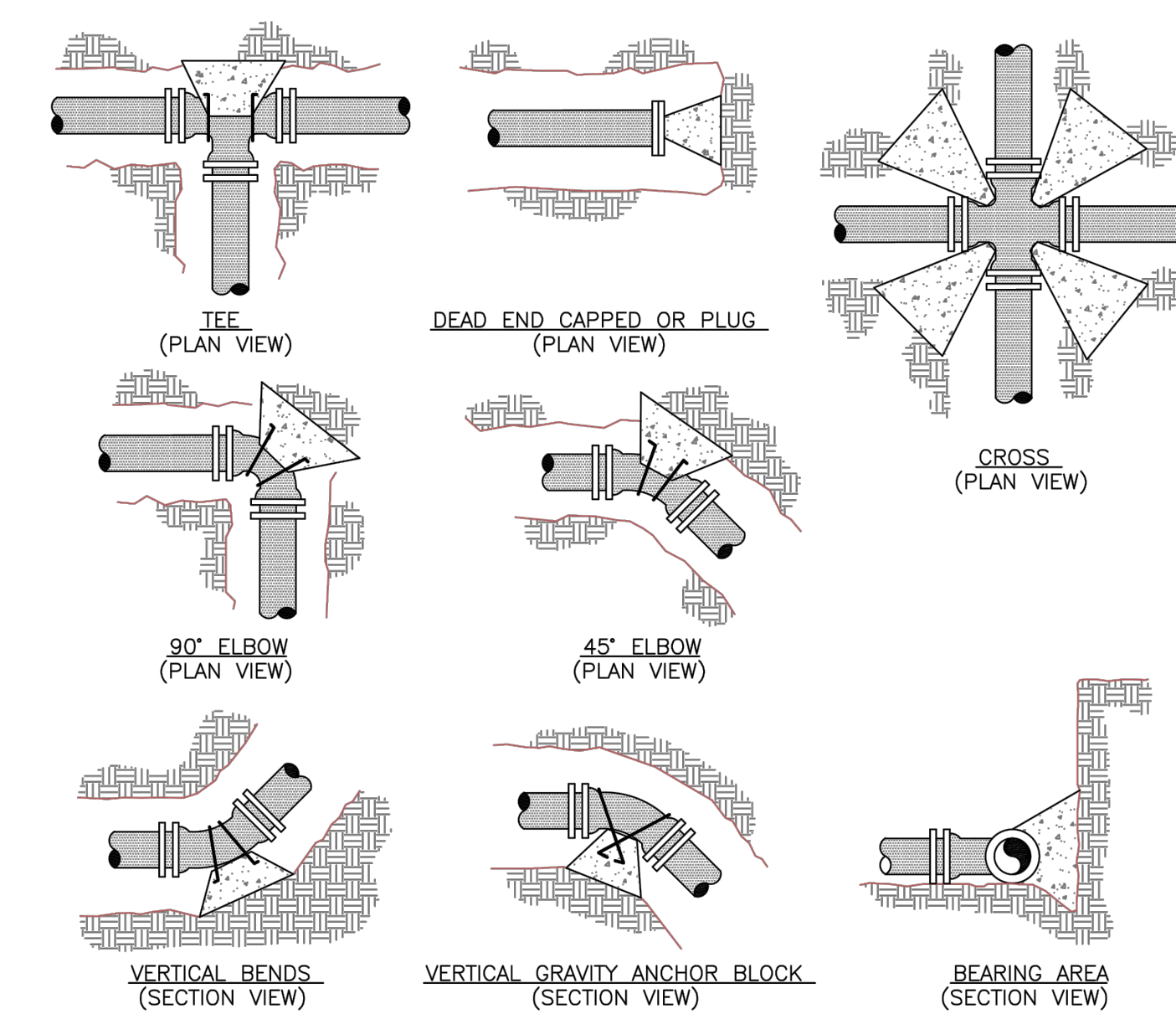
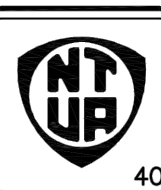
#### GENERAL NOTES:

- USE SERIES 2000, PV MEGALUG GLANDS TO SECURE GATE VALVE(S) TO SDR-21, PVC PIPE.
- USE SERIES 1100 MEGALUG GLANDS TO SECURE GATE VALVE(S) TO DUCTILE IRON PIPE.
- DO NOT COVER JOINTS AND BOLTS WITH CONCRETE.
- SEE WS-13 FOR APPROPRIATE LOCATIONS OF MARKER POST.
- INSTALL #4 REBARS TO THE GATE VALVE & CONCRETE ANCHOR BLOCK.

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DETAIL NO.: WS-16	

NAVAJO TRIBAL UTILITY AUTHORITY ENGINEERING & CONSTRUCTION OPERATIONS DIVISION	WATER MAINLINE TAP W/ GATE VALVE
NTUA HEADQUARTERS	PT. DEERLAKE, AZ

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PIPE SIZE	TEE & PLUG	90° ELBOW	45° OR 22 1/2° ELBOW	CROSS
2"	0.5	0.5	0.5	0.5
4"	1.5	2.0	1.5	1.0
6"	3.0	4.5	2.5	2.0
8"	5.0	7.5	4.0	4.0
10"	8.0	11.0	6.5	5.5
12"	11.0	15.5	9.0	8.0
14"	15.0	21.0	12.0	10.5
16"	19.0	27.0	15.5	13.5
18"	24.0	34.0	19.0	17.0

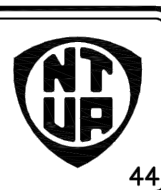
- NOTES:
- DO NOT COVER GASKETED JOINTS AND NUTS/BOLTS.
  - PRESSURE TESTING SHALL NOT COMMENCE UNTIL THE CONCRETE HAS SET A MINIMUM OF 48 HRS., UNLESS OTHERWISE SPECIFIED.
  - #4 REBARS AS SHOWN.

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NAVAJO TRIBAL UTILITY AUTHORITY ENGINEERING & CONSTRUCTION OPERATIONS DIVISION	CONCRETE THRUST BLOCK DETAILS
NTUA HEADQUARTERS	PT. DEERLAKE, AZ

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CONCRETE THRUST BLOCK CHART (ALSO TO BE USED IN UNSTABLE TRENCH CONDITIONS)					
RESULTANT THRUST IN POUNDS OF FITTINGS AT 100 PSI WATER PRESSURE					
TOTAL POUNDS					
PIPE SIZE	DEAD END	90° ELBOW	45° ELBOW	22 1/2° ELBOW	11 1/4° ELBOW
3"	1,232	1,742	943	481	241
4"	1,810	2,559	1,385	706	355
6"	3,739	5,298	2,862	1,459	733
8"	6,433	9,097	4,923	2,510	1,261
10"	9,677	13,685	7,406	3,776	1,897
12"	13,685	19,353	10,474	5,340	2,683
14"	18,385	26,001	14,072	7,174	3,604
16"	23,799	33,628	18,199	9,278	4,661
18"	29,865	42,235	22,858	11,653	5,855
20"	36,644	51,822	28,046	14,298	7,163
24"	52,279	73,934	40,013	20,398	10,249
30"	80,425	113,738	61,554	31,380	15,766
36"	115,209	162,931	88,177	44,952	22,585
42"	155,528	219,950	119,036	60,684	30,489
48"	202,683	286,637	155,127	79,083	39,733
54"	260,214	367,999	199,160	101,531	51,011
60"	298,121	421,606	228,172	116,321	58,442
64"	338,707	479,004	259,235	132,157	66,398

#### GENERAL NOTES:

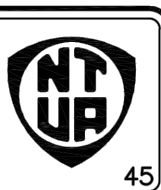
- THE THRUST (IN TOTAL POUNDS) IN THE CHART IS BASED ON DUCTILE IRON OUTSIDE DIAMETER PIPE DIMENSION. SURGES SHOULD BE CONSIDERED AT TWICE THE NORMAL OPERATING PRESSURE. THE VOLUME OF THE GRAVITY THRUST BLOCK IS BASED ON CONCRETE AT 150 LBS./FT<sup>3</sup>.
- TO OBTAIN VOLUME OF CONCRETE REQUIRED, USE:  
VOLUME OF CONCRETE (CF) = THRUST (LBS.) x SYSTEM PRESSURE (PSI)/100 PSI // 150 LBS./CF  
E.G.: CALCULATE THE VOLUME OF THE GRAVITY THRUST BLOCK FOR AN 8" x 45° BEND AT AN OPERATING PRESSURE OF 80 PSI.  
ANSWER: 4923 LBS x 160 PSI / 100 PSI DIVIDED BY 150 LBS / CUBIC FT = 52.5 CUBIC FT OR 2 CUBIC YARDS.

SHEET 2 OF 2

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NAVAJO TRIBAL UTILITY AUTHORITY ENGINEERING & CONSTRUCTION OPERATIONS DIVISION	CONCRETE THRUST BLOCK CHART
NTUA HEADQUARTERS	PT. DEERLAKE, AZ

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## NTU ENVIRONMENTAL LAB CHINLE

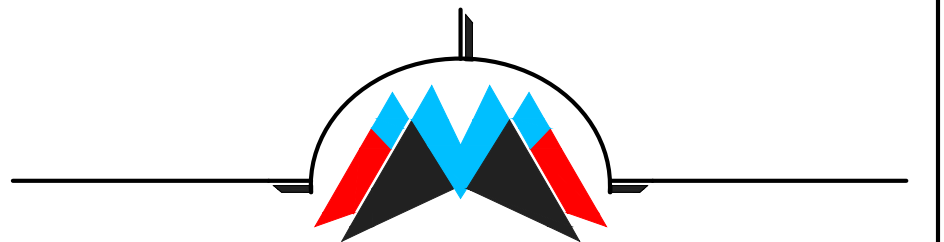
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Revision Number	Revision Date	Revision Description

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WATER DETAILS



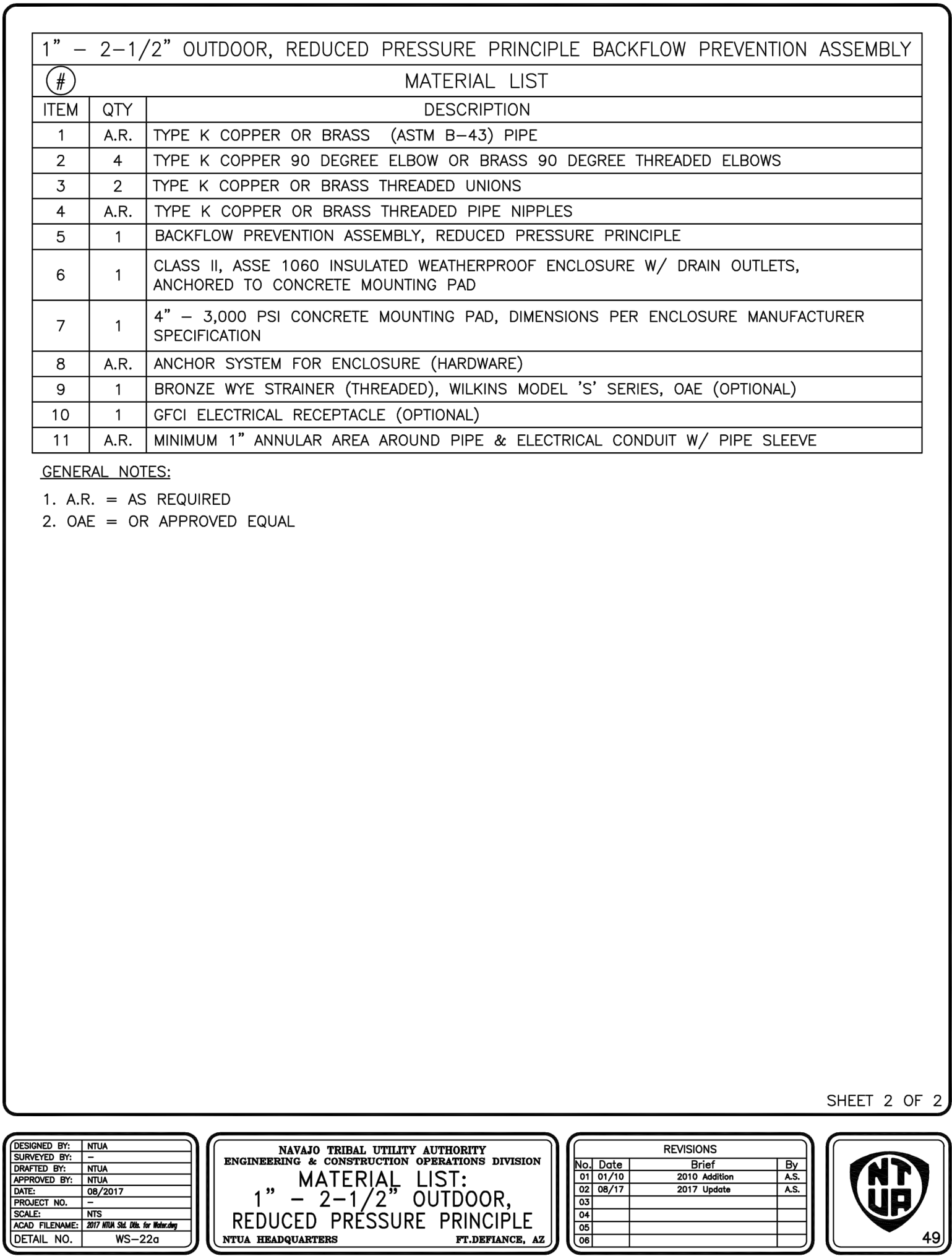
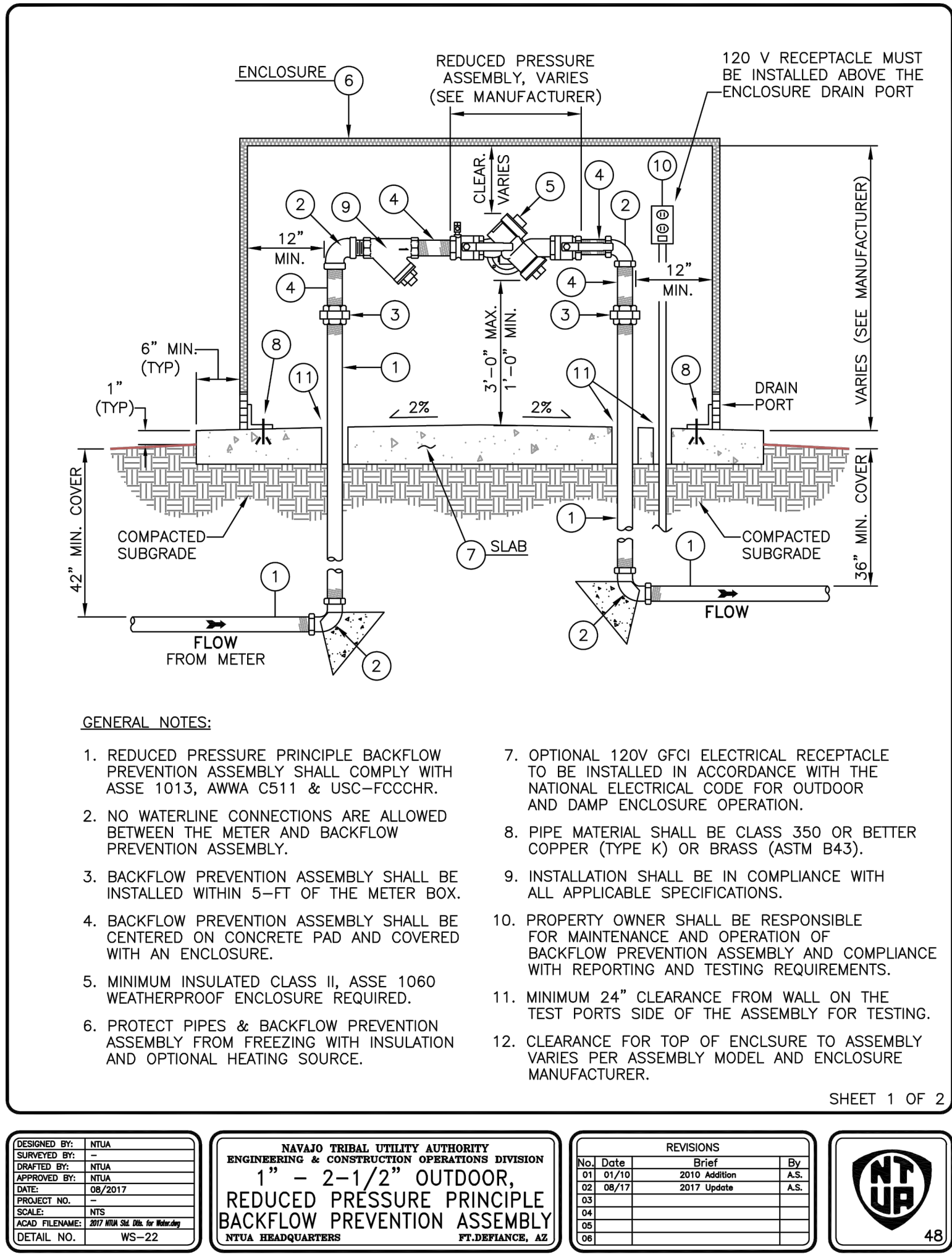
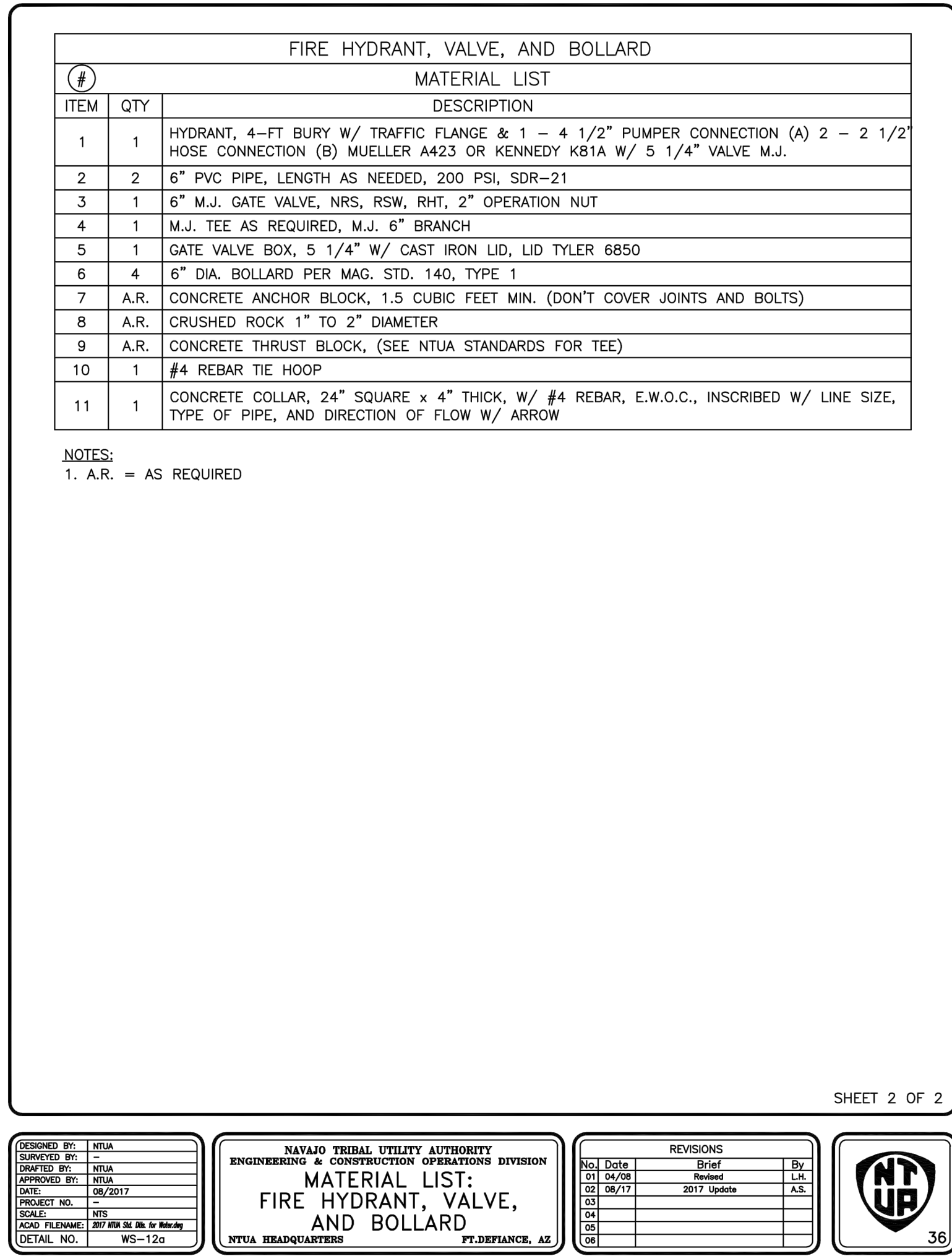
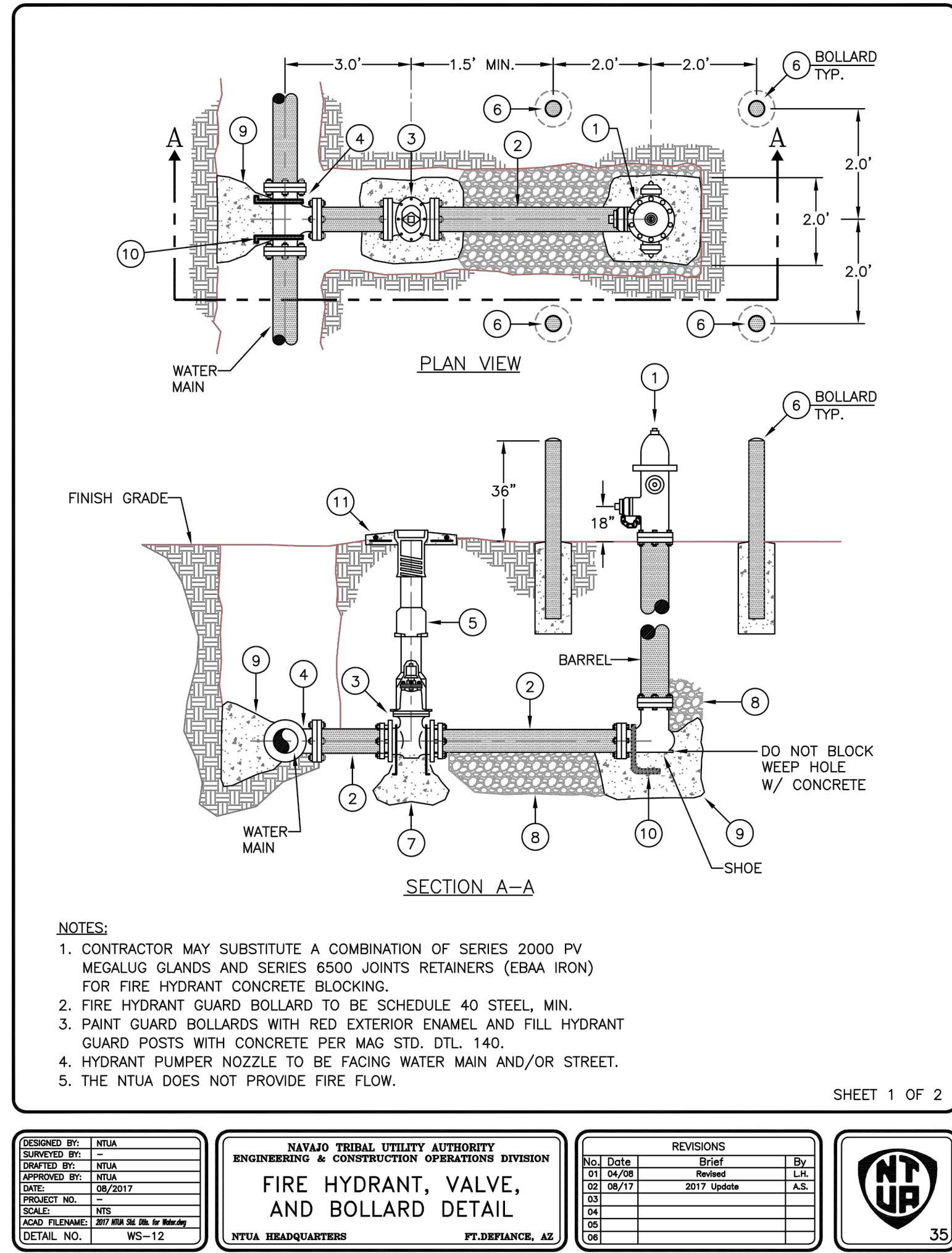
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# NTU ENVIRONMENTAL LAB CHINLE

CHINLE, APACHE COUNTY, AZ

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JANUARY 20, 2023



DYRON MURPHY ARCHITECTS, P.C.



4505 Montbel Place NE, Albuquerque, New Mexico 87107

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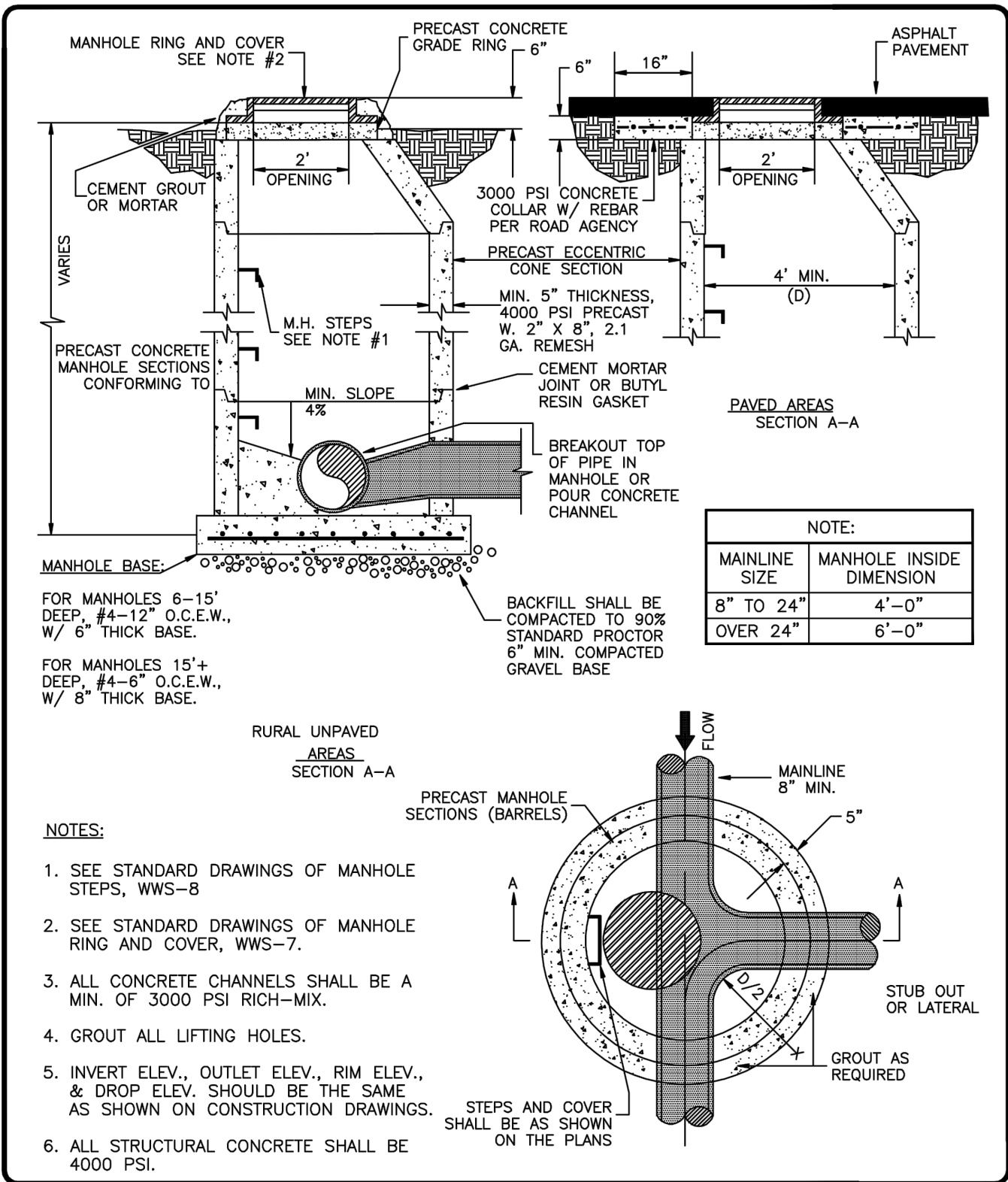
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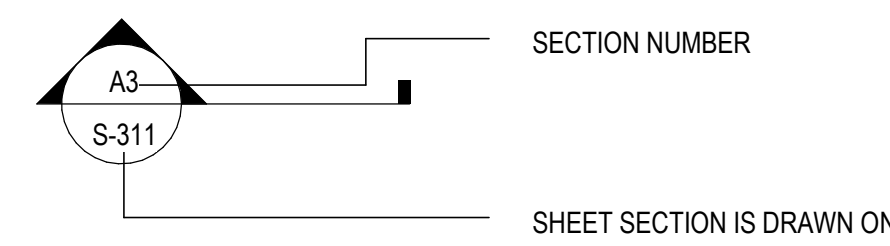


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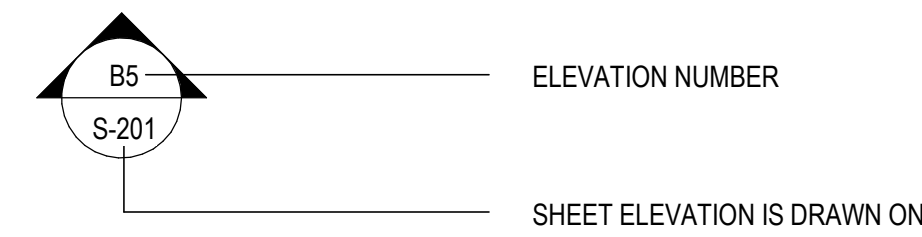


STRUCTURAL GRAPHIC SYMBOLS

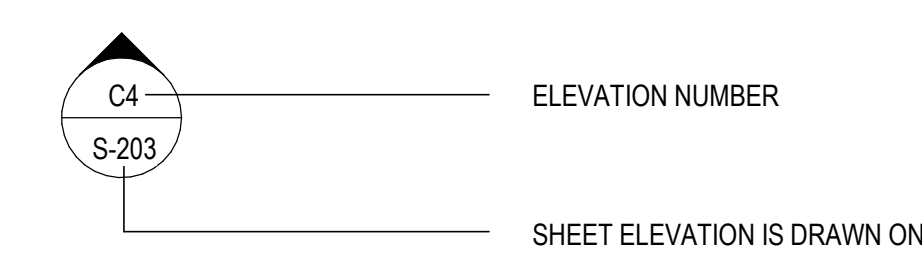
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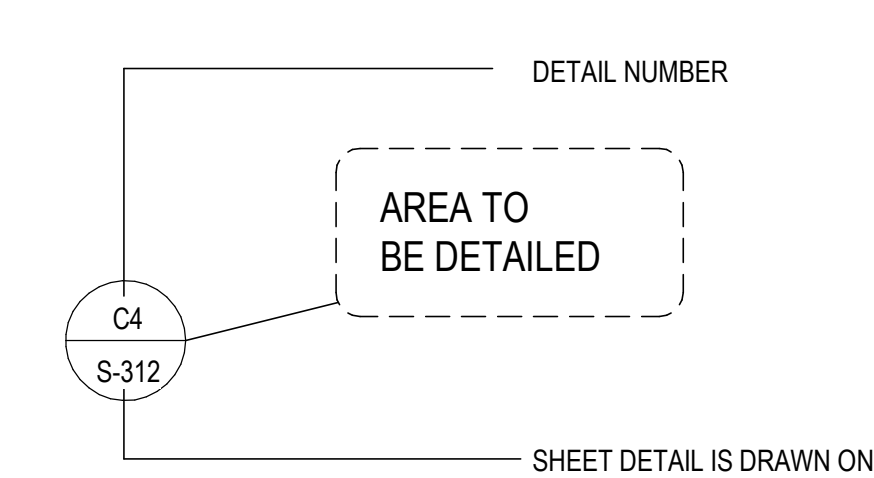
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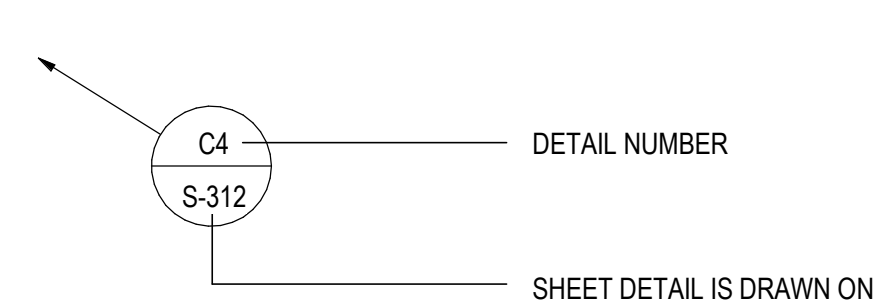
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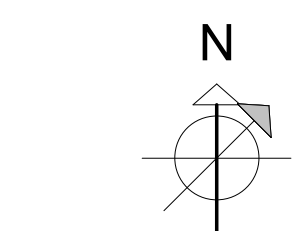
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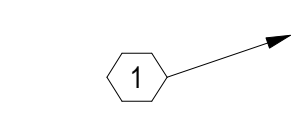
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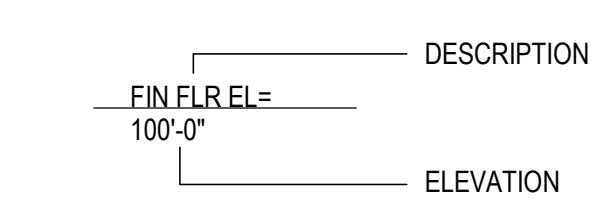
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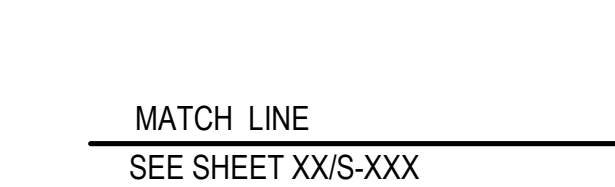
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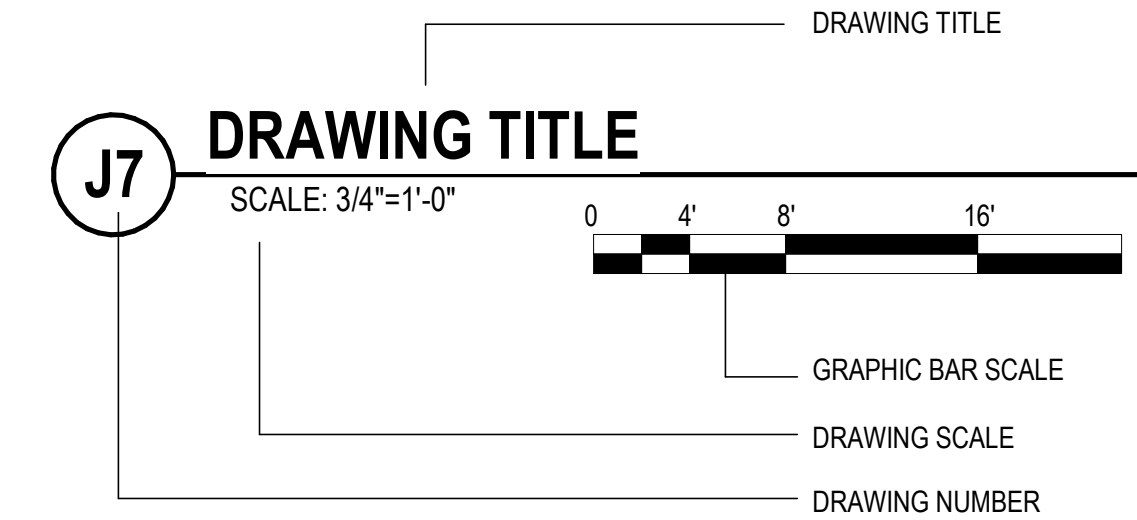
ELEVATION TARGET SYMBOL



MATCH LINE SYMBOL



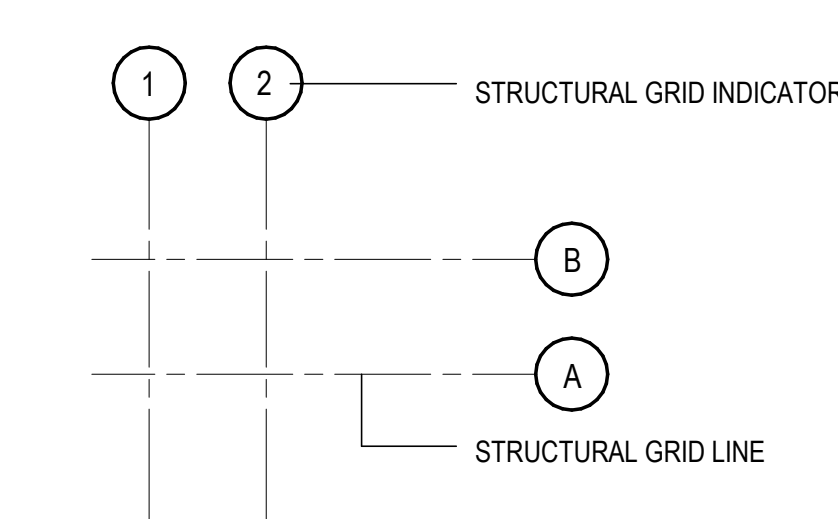
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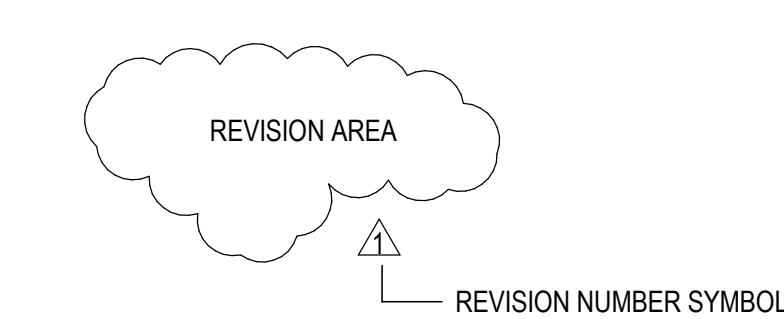
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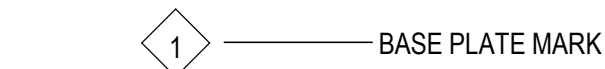
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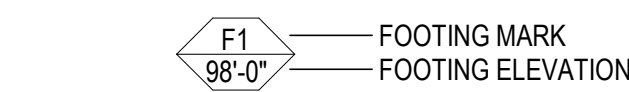
REVISION INDICATOR SYMBOL



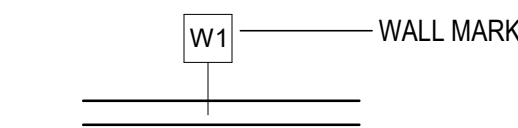
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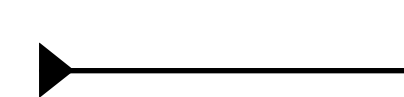
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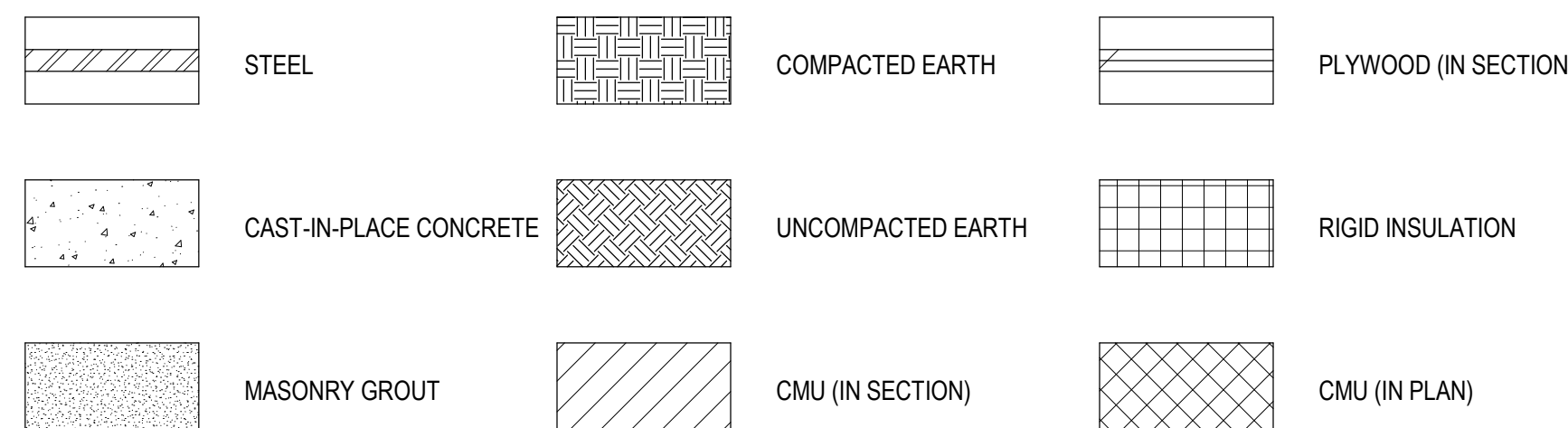
WALL MARK SYMBOL



MOMENT CONNECTION SYMBOL



STRUCTURAL MATERIALS LEGEND



ABBREVIATIONS

A/E	ARCHITECT/ENGINEER
AB	ANCHOR BOLT
ABAN	ABANDON
ABBRV	ABBREVIATION
AC	ASPHALTIC CONCRETE
ACI	AMERICAN CONCRETE INSTITUTE
ACP	ASPHALTIC CONCRETE PAVING
ACR	ACROSS
ACST	ACOUSTIC
AD	AREA DRAIN
ADA	AMERICANS WITH DISABILITIES ACT
ADDL	ADDITIONAL
ADDM	ADJACENT/ADJOINING
ADJ	ADJACENT
ADMIN	ADMINISTRATION
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFS	ABOVE FINISHED SLAB
AGGR	AGGREGATE
AHR	ANCHOR
AIA	AMERICAN INSTITUTE OF ARCHITECTS
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
AITC	AMERICAN INSTITUTE OF TIMBER CONSTRUCTION
ALUMT	ALIGNMENT
ALT	ALTERNATE, ALTERNATIVE
ALUM	ALUMINUM
AMT	AMOUNT
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APA	AMERICAN PLYWOOD ASSOCIATION
APPD	APPROVED
APPROX	APPROXIMATE
APPX	APPENDIX
AR	AS REQUIRED
ARCH	ARCHITECT
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASPH	ASPHALT
ASI	ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS
ASSN	ASSOCIATION
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATCH	ATTACHMENT
ATTN	ATTENTION
AWS	AMERICAN WELDING SOCIETY
AZ	AZIMUTH
B&F	BELL AND FLANGE
BAL	BALANCE
B/B	BACK TO BACK
BC	BOTTOM CHORD
BD	BOARD
BDRY	BOUNDARY
BEV	BEVEL
BFF	BELOW FINISH FLOOR
BKG	BACKGROUND
BKGD	BACKGROUND
BLD	BUILD
BLDG	BUILDING
BLK	BLOCKBLOCKING
BLT	BUILT
BLVD	BOULEVARD
BLW	BELOW
BM	BEAM
BO	BOTTOM OF
BOS	BOTTOM FACE OF STEEL
BOT	BOTTOM
B PL	BASE PLATE
BRCG	BRACING
BRDG	BRIDGING
BRG	BEARING
BRG PL	BEARING PLATE
BS	BOTH SIDES
BSMT	BASEMENT
BT WLD	BUTT WELD
BTWN	BETWEEN
C	CHANNEL
C/C	CENTER TO CENTER
CAM	CAMBER
CAN	CANOPY
CD	CONSTRUCTION DOCUMENTS, CONTRACT DOCUMENTS
CEM	CEMENT
CHFR	CHAMFER
CHKD	CHECKED/CHECKERED
CI	CAST IRON
CIP	CAST-IN-PLACE
CJ	CONSTRUCTION JOINT
CJ	CONTRACTION JOINT
CJ	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR
cm	CENTIMETER
CMU	CONCRETE MASONRY UNIT
CO	COMPANY
COA	CITY OF ALBUQUERQUE
COL	COLUMN
COM	COMMON
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS, CONTINUE
CONTR	CONTRACTOR
COORD	COORDINATE
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CSI	CONSTRUCTION SPECIFICATIONS INSTITUTE
CTR	CENTER
CTRL	CONTROL
CU	CUBIC
CU YD	CUBIC YARD
D	DEEP, DEPTH
D-B	DESIGN-BUILD
DAT	DATUM
DBL	DOUBLE
DEG	DEGREE
DEL	DELETE
DEMO	DEMOLITION
DET	DETAIL
DEV	DEVELOPMENT
DTG	DRAFTING
DIA	DIAMETER
DIAG	DIAGONAL
DIFF	DIFFERENCE, DIFFERENTIAL
DIM	DIMENSION
DIST	DISTANCE
DIV	DIVIDE
DJ	DOUBLE JOIST
DL	DEAD LOAD
DOC	DOCUMENT
DOUG FIR	DOUGLAS FIR
DSGN	DESIGN
DWG	DRAWING
DWLDWLS	DOWELS
E	EAST, MODULUS OF ELASTICITY
EA	EACH
EE	EACH END
EF	EACH FACE
EIFS	EXTERIOR INSULATION AND FINISH SYSTEM
EJ	EXPANSION JOINT
EL	ELEVATION
ELAST	ELASTOMERIC
ELEC	ELECTRIC
ELEM	ELEMENTARY
ELEV	ELEVATOR
EMBED	EMBEDDED / EMBEDMENT
ENCL	ENCLOSURE
ENGR	ENGINEER
EOS	EDGE OF SLAB
EPA	ENVIRONMENTAL PROTECTION AGENCY
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ESCAL	ESCALATOR
ESMT	EASEMENT
EST	ESTIMATE

ABBREVIATIONS

ETC	ET CETERA
EW	EACH WAY
EX	EXAMPLE
EXC	EXCAVATE
EXCL	EXCLUDE
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
F/F	FACE TO FACE
FAB	FABRIC
FACIL	FACILITY
FB	FLAT BAR
FD	FLOOR DRAIN
FDTN	FOUNDATION
FF	FAR FACE
FF EL	FINISH FLOOR ELEVATION
FIN GR	FINISH GRADE
FH	FLAT HEAD
FIN	FINISH
FIN FLR	FINISH FLOOR
FLG	FLANGE
FLR	FLOOR
FLR SK	FLOOR SINK
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF SLAB
FOS	FACE OF STUD
FOW	FACE OF WALL
FR	FRAME
FRMG	FRAMING
FS	FAR SIDE
FSTNR	FASTENER
FT	FOOT / FEET
FT/LB	FOOT/POUND
FT/LBF	FOOT/POUND FORCE
FTG	FOOTING
FUT	FUTURE
G	GIRDER
GAGE	GAGE
GALV	GALVANIZED
GALV STL	GALVANIZED STEEL
GR BM	GRADE BEAM
GC	GENERAL CONTRACTOR
GEN	GENERAL
GLU LAM	GLUED LAMINATED WOOD
GLZ	GLAZING
GOVT	GOVERNMENT
GRTG	GRATING
GT	GROUT
H	HIGH
HAS	HEADED ANCHOR STUD
HC	HOLLOW-CORE
HCP	HANDICAPPED
HD	HEAVY DUTY
HGR	HANGER
HLDN	HOLDOWN
HORIZ	HORIZONTAL
HS	HIGH STRENGTH
HSKPG	HOUSEKEEPING
HSS	HOLLOW STRUCTURAL SECTIONS
HST	HOIST
HT	HEIGHT
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IF	INSIDE FACE
IFS	INSIDE FACE OF STUD
IN	INCH
INCL	INCLUDED
INFO	INFORMATION
IN-LB	INCH-POUND
IN-LBF	INCH-POUND FORCE
INSTL	INSTALL
INSUL	INSULATION
INT	INTERIOR
IR	INSIDE RADIUS
K	KIP
K	THOUSAND
KB	KNEE BRACE
KCJ	KEYED CONTROL JOINT
KIP	THOUSAND POUNDS
KIP FT	THOUSAND FOOT/POUNDS
KLF	KIPS PER LINEAL FOOT
KO	KNOCK OUT
KOP	KNOCK OUT PANEL
KSF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH
L	ANGLE
LAM	LAMINATE
LATL	LATERAL
LBF	POUND-FORCE
LBR	LUMBER
LBS	POUND
LD BRG	LOAD BEARING
LF	LINEAR FEET (FOOT)
LIN	LINEAR
LL	LIVE LOAD
LLBB	LONG LEG BACK TO BACK
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LT GA	LIGHT GAGE
LT WT	LIGHT WEIGHT
LVR	LOUVER
LWC	LIGHTWEIGHT CONCRETE
M	MOMENT
MAINT	MAINTENANCE
MATL	MATERIAL
ME	METAL DECK
ME	MECHANICAL ENGINEER
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
ML	MICRO-LAMINATED
ML	MONOLITHIC
MW	MASONRY OPENING
MS	MACHINE SCREW
MSL	MEAN SEA LEVEL
MTL	METAL
N	NORTH
NA	NOT APPLICABLE
NF	NEAR FACE
NIC	NOT IN CONTRACT
NM	NEW MEXICO
NO	NUMBER
NOM	NOMINAL
NS	NEAR SIDE
NTS	NOT TO SCALE
OIO	OUT TO OUT
OIA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OFS	OUTSIDE FACE OF STUD
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
OPT	OPTIONAL
OR	OUTSIDE RADIUS
PAR	PARALLEL, PARAPET
PART	PARTIAL
PC	PIECE, PORTLAND CEMENT
PCC	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PCI	PRECAST/PRESTRESSED CONCRETE INSTITUTE
PED	PEDESTAL
PEN	PENETRATE
PERIM	PERIMETER
PERP	PERPENDICULAR

ABBREVIATIONS

PH	PHASE
PIL	PILASTER
PL	PLATE
PLAT	PLATFORM
PLBG	PLUMBING
PLF	POUNDS PER LINEAR FOOT
PLM	PARALLAM
PLYWD	PLYWOOD
POS	POSITION
PP	PANEL POINT
PRCST	PRECAST
PREFAB	PREFABRICATE
PRELIM	PRELIMINARY
PREV	PREVIOUS
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POST-TENSIONED
PT CONC	POST-TENSIONED CONCRETE
PTN	PARTITION
PVG	PAVING
QTY	QUANTITY
QUAD	QUADRANT
R	RADIUS, RISER
RC	REINFORCED CONCRETE
RD	ROAD, ROOF DRAIN
REC	RECESSED
REF	REFERENCE
REINF	REINFORCE/REINFORCEMENT
REPL	REPLACE
REQ	REQUIRED
REQD	REQUIRED
REV	REVISION
RGD INS	RIGID INSULATION
RFI	REQUEST FOR INFORMATION
RND	ROUND
RO	ROUGH OPENING
ROT	RIGHT
RVL	REVEAL
S	SOUTH
SCHEM	SCHEMATIC
SCHED	SCHEDULE
SD	SHOP DRAWINGS
SDI	STEEL DECK INSTITUTE
SDL	SADDLE
SE	STRUCTURAL ENGINEER
SECT	SECTION
SQ	SQUARE FEET (FOOT)
SHT	SHEET, SHAFT
SHTHG	SHEATHING
SIM	SIMILAR
SJ	STEEL JOIST INSTITUTE
SLNT	SEALANT
SM	SMOOTH
SP	SUMP PIT
SPA	SPACE/SPACES
SPEC	SPECIFICATION
SPRT	SUPPORT
SQ	SQUARE
SQ IN	SQUARE INCH
SQ YD	SQUARE YARD
SSPC	STRUCTURAL STEEL PAINTING COUNCIL
ST	STAIRS
STAG	STAGGERED
STD	STANDARD
STIF	STIFFENER
STIR	STIRRUP
STAG	STAGGERED
STD	STANDARD
STIF	STIFFENER
STIR	STIRRUP
STL	STEEL
STL LNTL	STEEL LINTEL
STL	JST STEEL JOIST
STL PL	STEEL PLATE
STL RF OK	STEEL ROOF DECK
STR	STRINGERS
STRUCT	STRUCTURAL
SUB	SUBSTITUTE
SUF	SUFFICIENT
SUP	SUPPLEMENTARY
SUPPL	SUPPLEMENT
SYM	SYMBOL
SYMM	SYMMETRICAL
SYS	SYSTEM
T	TREAD
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TAN	TANGENT
TB	THRU BOLT
TEMP	TEMPORARY
THD	THREAD
THK	THICKNESS
THRU	THROUGH
TJ	TRUSS JOIST INSTITUTE
TO	TOP OF
TOB	TOP OF BEAM
TOC	TOP OF CONCRETE
TOC FTG	TOP OF CONCRETE FOOTING
TOC WALL	TOP OF CONCRETE WALL
TOF	TOP OF FOOTING
TOG	TOP OF GRATE
TOJ	TOP OF JOIST
TOL	TOLERANCE
TOM	TOP OF MASONRY
TOP	TOP OF PARAPET
TOS	TOP OF SLAB
TOS	TOP OF STEEL
TOW	TOP OF WALL
TRANS	TRANSVERSE
TRNBKL	TURNBUCKLE
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UNO	UNLESS NOTED OTHERWISE
VAR	VARIABLE
VERT	VERTICAL
VIF	VERIFY IN FIELD
VNR	VEENER
VR	VAPOR RETARDER
VREY	VERIFY
W	WEST, WIDE
W	WITH
W/O	WITHOUT
WBL	WOOD BLOCKING
WD	WOOD
WF	WIDE FLANGE
WF BM	WIDE FLANGE BEAM
NL	WIND LOAD
WLD	WELDED
WM	WIRE MESH
WP	WATERPROOFING
WSCT	WAINSCOT
WT	WEIGHT
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
XXH	CROSS BRACING
YD	DOUBLE EXTRA HEAVY YARD

NTU ENVIRONMENTAL LAB CHINLE

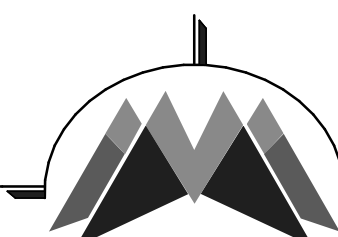
CHINLE, APACHE COUNTY, AZ

EARLY DESIGN PACKAGE #1  
CIVIL/STRUCTURAL/PLUMBING

JANUARY 20, 2023



DYRON MURPHY ARCHITECTS, P.C.



4505 Montbel Place NE, Albuquerque, New Mexico 87107

Revision Schedule	
#	Description

PROJECT NUMBER	DRAWN BY	PROJ MGR
M97193	THF	DF
RVT FILE		
C:\Revit Projects\NTU Environmental Chinle Lab_R22_STRUCT_1\Figues.rvt		

Sheet Number

S-001

Sequence of

ABBREVIATIONS AND  
LEGEND



GENERAL STRUCTURAL NOTES		GENERAL STRUCTURAL NOTES		GENERAL STRUCTURAL NOTES		GENERAL STRUCTURAL NOTES	
<b>CODES AND MANUALS:</b>  IBC-18 INTERNATIONAL BUILDING CODE 2018 ASCE/SEI 7-16 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES AISC 360-16 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS AISC 341-16 SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS AISC MANUAL OF STEEL CONSTRUCTION 15TH EDITION SDI DIAPHRAGM DESIGN MANUAL, 4TH EDITION SDI RD-17 STANDARD FOR STEEL ROOF DECK AISI S100-16 NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS AISI S202-15 NORTH AMERICAN STANDARD FOR COLD-FORMED STEEL FRAMING – STANDARD PRACTICE FOR COLD FORMED STEEL FRAMING AISI S240-15 NORTH AMERICAN STANDARD FOR COLD-FORMED STEEL FRAMING – STRUCTURAL FRAMING AISI S400-15 NORTH AMERICAN STANDARD FOR COLD-FORMED STEEL FRAMING – SEISMIC DESIGN WITH 2016 SUPPLEMENT ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AWS D1.1-10 STRUCTURAL WELDING CODE – STEEL AWS D1.3-08 STRUCTURAL WELDING CODE – SHEET STEEL AWS D1.4-17 STRUCTURAL WELDING CODE – REINFORCING STEEL  <b>DESIGN CRITERIA:</b>  VERTICAL:  LIVE LOAD FLOOR 80 PSF STAIRS AND EXIT-WAYS* 100 PSF MINIMUM CONCENTRATED LOAD 300 LBS ADDITIONAL SUPERIMPOSED LOADS PARTITIONS 15 PSF SUSPENDED EQUIPMENT 10 PSF CONCENTRATED LOAD 2000 LBS (PER IBC 1607.4)  ROOF LIVE LOAD: LR = 20'R1'R2 20 PSF REDUCTION FACTOR BASED ON TRIB AREA R1=1.0 REDUCTION FACTOR BASED ON ROOF SLOPE R2=1.0  SNOW LOAD GROUND SNOW LOAD PG=10 PSF FLAT ROOF SNOW LOAD** PF=15 PSF SNOW EXPOSURE FACTOR CE=1.0 SNOW LOAD IMPORTANCE FACTOR IS=1.0 THERMAL FACTOR CT=1.0 **INCLUDES 5 PSF RAIN-ON SNOW SURCHARGE LOAD  HORIZONTAL:  WIND ULTIMATE DESIGN WIND SPEED 102 MPH RISK CATEGORY II EXPOSURE C INTERNAL PRESSURE COEFFICIENT GCPI = 0.18 NATURAL FREQUENCY 1.012X / 1.046Y STRUCTURE IS RIGID  SEISMIC SEISMIC IMPORTANCE FACTOR IE = 1.0 MAPPED SPECTRAL RESPONSE ACCELERATIONS SHORT PERIOD SS=0.152G 1 SECOND PERIOD S1=0.049G SITE CLASS D SPECTRAL RESPONSE COEFFICIENTS SHORT PERIOD SDS=0.162G 1 SECOND PERIOD SD1=0.078G SEISMIC DESIGN CATEGORY B BASIC SEISMIC FORCE RESISTING SYSTEM: STEEL SYSTEMS NOT SPECIFICALLY DESIGNED FOR SEISMIC RESISTANCE SEISMIC RESPONSE COEFFICIENT CS=0.054 RESPONSE MODIFICATION FACTOR R = 3 DESIGN BASE SHEAR V = 0.054W ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE  ALLOWABLE SOIL BEARING PRESSURE = 2500 PSF  FROST DEPTH = 30 INCHES  FUTURE BUILDING EXPANSION: NONE  <b>GENERAL:</b>  STRUCTURAL DRAWINGS ARE NOT STAND-ALONE DOCUMENTS AND ARE INTENDED TO BE USED IN CONJUNCTION WITH CIVIL, ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND DRAWINGS FROM OTHER DISCIPLINES. THE CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS INTO THE SHOP DRAWINGS AND FIELD WORK.  COORDINATE DIMENSIONS OF ALL OPENINGS, DEPRESSIONS, BLOCKOUTS, ETC. WITH ARCHITECTURAL DRAWINGS, DRAWINGS FROM OTHER DISCIPLINES, PROJECT SHOP DRAWINGS, AND FIELD CONDITIONS PRIOR TO SHOP DRAWING SUBMITTAL. THE STRUCTURAL DRAWINGS ONLY REPRESENT A PORTION OF THE REQUIREMENTS FOR THE PROJECT.  SEE ARCHITECTURAL PLANS FOR INTERIOR NON-BEARING PARTITION WALLS. PARTITION FRAMING SHALL BE CONNECTED TO THE PRIMARY STRUCTURE TO ALLOW FOR VERTICAL LIVE LOAD DEFLECTIONS OF SPAN/360 FOR FLOOR FRAMING AND SPAN/240 FOR ROOF FRAMING.  CONTRACTOR'S CONSTRUCTION AND/OR ERECTION SEQUENCES SHALL RECOGNIZE AND CONSIDER THE EFFECTS OF THERMAL MOVEMENTS OF STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PERIOD.  THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD.  SHOP DRAWINGS SHALL BE FURNISHED AND REVIEWED BEFORE ANY FABRICATION OR ERECTION IS STARTED. THE CONTRACTOR SHALL REVIEW AND APPROVE SHOP DRAWINGS PRIOR TO SUBMITTAL TO THE ARCHITECT FOR REVIEW. POORLY EXECUTED SHOP DRAWINGS WILL BE REJECTED AND SHALL BE RESUBMITTED.  THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SAFE AND ADEQUATE SHORING FOR ALL PARTS OF THE STRUCTURE DURING CONSTRUCTION.  TEMPORARY PROVISIONS SHALL BE MADE FOR STRUCTURAL STABILITY DURING CONSTRUCTION. THE STRUCTURE SHOWN ON THE DRAWINGS HAS BEEN DESIGNED FOR STABILITY UNDER FINAL CONFIGURATION.  NOTCHING OR CUTTING ANY STRUCTURAL MEMBER IN THE FIELD IS PROHIBITED.  THE CONTRACTOR SHALL VERIFY THE SIZE AND LOCATION OF FOUNDATIONS UNDER MECHANICAL AND ELECTRICAL EQUIPMENT AS REQUIRED. NO CONCRETE PADS SHALL BE LOCATED ON ROOF UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.  BACKFILL SHALL NOT BE PLACED BEHIND RETAINING WALLS UNTIL CONCRETE HAS ATTAINED 100 PERCENT OF DESIGN STRENGTH.  BACKFILL SHALL NOT BE PLACED BEHIND BASEMENT WALLS UNTIL THE CONCRETE HAS ATTAINED 100 PERCENT OF DESIGN STRENGTH AND THE ELEVATED FLOOR PROVIDING LATERAL SUPPORT AT THE TOP OF THE WALL IS COMPLETELY CONSTRUCTED, OR TEMPORARY BRACING/SHORING OF THE WALL IS PROVIDED. DESIGN OF ANY TEMPORARY WALL BRACING/SHORING IS THE RESPONSIBILITY OF THE CONTRACTOR.  REMOVAL OF FORMS AND SHORING SHALL BE IN ACCORDANCE WITH ACI 347. WHERE CONCRETE MUST SUPPORT SUPERIMPOSED LOADS PRIOR TO ATTAINING THE SPECIFIED DESIGN STRENGTH, RE-SHORE CONCRETE IN ACCORDANCE WITH ACI 347. RESHORING SHALL NOT BE REMOVED SOONER THAN 28 DAYS FROM THE DATE OF POUR OR UNTIL CONCRETE HAS ATTAINED THE SPECIFIED DESIGN STRENGTH.  THE CONTRACTOR SHALL SUBMIT FOR PRIOR APPROVAL THE END OF POUR LOCATIONS FOR CONCRETE GRADE BEAMS, CONCRETE COLUMNS, AND CONCRETE BEAMS.		<p>THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADHERING TO ALL APPLICABLE STANDARDS SET FORTH BY OSHA, INCLUDING THE FOLLOWING REQUIREMENTS FROM STANDARDS- 29 CFR, SECTION 1926, SUBPART R:</p> <p>A. THE STEEL ERECTION CONTRACTOR SHALL NOT ERECT STEEL, UNLESS THEY HAVE RECEIVED WRITTEN NOTIFICATION FROM THE CONTRACTOR THAT THE CONCRETE IN THE FOOTINGS, PIERS AND WALLS OR THE MORTAR IN THE MASONRY PIERS AND WALLS HAS ATTAINED, ON THE BASIS OF AN APPROPRIATE ASTM STANDARD TEST METHOD OF FIELD-CURED SAMPLES, EITHER 75 PERCENT OF THE INTENDED MINIMUM COMPRESSIVE DESIGN STRENGTH OR SUFFICIENT STRENGTH TO SUPPORT THE LOADS IMPOSED DURING STEEL ERECTION.</p> <p>PROVIDE STRUCTURAL ENGINEER A COPY OF WRITTEN NOTIFICATION WHEN IT IS PROVIDED TO THE STEEL ERECTOR.</p> <p>B. ANCHOR RODS (ANCHOR BOLTS) SHALL NOT BE REPAIRED, REPLACED OR FIELD-MODIFIED WITHOUT THE APPROVAL OF THE PROJECT STRUCTURAL ENGINEER OF RECORD.</p> <p>PRIOR TO ERECTION OF COLUMNS, THE CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO THE STEEL ERECTOR IF THERE HAS BEEN ANY REPAIR, REPLACEMENT OR MODIFICATION OF THE ANCHOR RODS (ANCHOR BOLTS).</p> <p>PROVIDE STRUCTURAL ENGINEER A COPY OF WRITTEN NOTIFICATION WHEN IT IS PROVIDED TO THE STEEL ERECTOR.</p> <p>C. NO MODIFICATION THAT AFFECTS THE STRENGTH OF A STEEL JOIST OR STEEL JOIST GIRDER SHALL BE MADE WITHOUT THE APPROVAL OF THE PROJECT STRUCTURAL ENGINEER OF RECORD.</p> <p>D. METAL DECKING HOLES AND OPENINGS SHALL NOT BE CUT UNTIL IMMEDIATELY PRIOR TO BEING PERMANENTLY FILLED WITH THE EQUIPMENT OR STRUCTURE OR SHALL BE IMMEDIATELY COVERED.</p> <p>PROTECTION: PROPER PRECAUTIONS SHALL BE TAKEN AT ALL TIMES TO PROTECT VEHICULAR AND PEDESTRIAN TRAFFIC FROM ANY DAMAGE OR INJURY WHICH MAY BE CAUSED, EITHER DIRECTLY OR INDIRECTLY, BY THE WORK INCLUDED ON THESE DRAWINGS. SUCH PRECAUTIONS SHALL INCLUDE THE ERECTION AND MAINTENANCE OF FENCES, BARRICADES, RAILINGS, GUARDS, SIGNS, COVERINGS, LIGHTS, AND OTHER PRECAUTIONS AS MAY BE REQUIRED. IF AT ANY TIME, IN THE OPINION OF THE OWNER OR THE OWNER'S REPRESENTATIVE, PROPER PRECAUTIONS ARE NOT BEING TAKEN TO SECURE THIS PROTECTION, THE CONTRACTOR SHALL AT NO ADDITIONAL COST TO THE OWNER, INSTALL AND MAINTAIN SUCH ADDITIONAL PROTECTION AS MAY BE DIRECTED BY THE OWNER.</p> <p>POLLUTION CONTROLS: USE WATER SPRINKLING, TEMPORARY ENCLOSURES, AND OTHER SUITABLE METHODS TO LIMIT DUST AND DIRT RISING AND SCATTERING IN THE AIR TO LOWEST PRACTICAL LEVEL. COMPLY WITH GOVERNING REGULATIONS PERTAINING TO ENVIRONMENTAL PROTECTION.</p> <p><b>TYPICAL DETAIL SHEETS:</b></p> <p>THE S-500 AND S-700 SERIES SHEETS IN THESE DRAWINGS CONTAIN TYPICAL STRUCTURAL DETAILS FOR VARIOUS BUILDING MATERIALS. SOME OF THESE DETAILS MAY NOT BE PART OF THIS PROJECT.</p> <p>THE TYPICAL DETAILS SHALL BE USED WHEN SPECIFIC DETAILS ARE NOT REFERENCED ON THE DRAWINGS. THE APPROPRIATE CONDITIONS FOR USE OF THE TYPICAL DETAILS ARE REFERENCED IN THEIR TITLES.</p> <p><b>DRAWINGS:</b></p> <p>DO NOT SCALE DRAWINGS.</p> <p>WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN. DETAILS ON DRAWINGS TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. DETAILS NOTED "TYPICAL" APPLY TO ALL SIMILAR CONDITIONS, WHERE NO SPECIFIC DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ELSEWHERE ON THE PROJECT.</p> <p><b>FAST-TRACK/PHASED CONSTRUCTION:</b></p> <p>THE STRUCTURAL PORTION OF THIS PROJECT IS BEING DESIGNED, BID, PERMITTED, AND CONSTRUCTED PRIOR TO THE COMPLETION OF ARCHITECTURAL, ENGINEERING, AND OTHER DESIGN TEAM CONSTRUCTION DOCUMENTS. THE OWNER, ARCHITECT, AND CONTRACTOR SHALL BE AWARE THAT THIS ACCELERATED STRUCTURAL SCHEDULE CREATES INHERENT RISK OF FUTURE CHANGES DUE TO DESIGN COORDINATION WITH OTHER DISCIPLINES. WHILE EVERY EFFORT HAS BEEN MADE TO MINIMIZE THESE CHANGES, THE RISK OF ADDED COSTS DUE TO THESE CHANGES SHALL BE UNDERSTOOD AND ACCEPTED BY ALL PARTIES.</p> <p>DRAWINGS THAT DO NOT HAVE AN ENGINEERING SEAL BY THE STRUCTURAL ENGINEER OF RECORD OR NOT LABELED AS CONSTRUCTION DRAWINGS ARE PRELIMINARY AND SUBJECT TO CHANGE. IF THESE DOCUMENTS ARE BEING USED FOR PRICING, BIDDING, STEEL MILL ORDER, OR PREPARATION OF SHOP DRAWINGS, THE CONTRACTOR SHALL ANTICIPATE FUTURE DRAWING REVISIONS THAT MAY AFFECT THIS WORK OR INCREASE CONSTRUCTION COSTS. THE STRUCTURAL ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY CHANGE ORDER COSTS INCURRED DUE TO THESE DRAWING REVISIONS, AND THE CONTRACTOR SHALL CONSIDER THESE ANTICIPATED COSTS IN ANY BIDS OR PRICE GUARANTEES TO THE OWNER.</p> <p>USE THE MOST CURRENT SET OF DRAWINGS IN PREPARATION OF ALL SUBMITTALS. ALL SUBMITTALS SHALL LIST THE DATE OF THE DRAWINGS USED TO PREPARE THE SUBMITTAL. SUBMITTALS PREPARED FROM OUTDATED DRAWINGS MAY BE REJECTED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING THE LATEST SET OF CONSTRUCTION DRAWINGS AND DISTRIBUTING TO THE APPROPRIATE PARTIES.</p> <p><b>CAST-IN-PLACE CONCRETE:</b></p> <p>ALL CONCRETE SHALL CONFORM TO THE SPECIFICATIONS FOR STRUCTURAL CONCRETE, ACI 301-10.</p> <p>ALL EXPOSED EDGES OF CONCRETE SHALL HAVE A 3/4" CHAMFER UNLESS NOTED OTHERWISE.</p> <p>NORMALWEIGHT CONCRETE:</p> <p>A. FC = 4500 PSI @ 28 DAYS – ALL CONCRETE EXPOSED TO FREEZE/THAW CYCLES AND OCCASIONAL MOISTURE, INCLUDING CONCRETE FLAT WORK, EXPOSED BUILDING STEM WALLS, SITE WALLS, ETC... EXTERIOR CONCRETE SHALL MEET EXPOSURE CATEGORY AND CLASS F1 ACCORDING TO ACI 318 TABLE 19.3.1.1.</p> <p>B. FC = 3000 PSI @ 28 DAYS – ALL INTERIOR CONCRETE (I.E. FOOTINGS, PEDESTALS, TIE BEAMS, GRADE BEAMS, INTERIOR RETAINING WALLS, ETC.).</p> <p>C. FC = 3000 PSI @ 28 DAYS – ALL INTERIOR SLABS ON GRADE, UNLESS NOTED OTHERWISE.</p> <p>D. FC = 3500 PSI @ 28 DAYS – ALL CONCRETE FILL OVER METAL DECK, UNLESS NOTED OTHERWISE.</p> <p>E. FC = 4000 PSI @ 28 DAYS – ALL CAST-IN-PLACE CONCRETE COLUMNS AND ELEVATED BEAMS.</p> <p>F. FC = 5000 PSI @ 28 DAYS – ALL ELEVATED CAST-IN-PLACE SLABS.</p> <p>G. FC = 4000 PSI @ 28 DAYS – ALL SLABS ON GRADE AND ELEVATED SLABS TO RECEIVE POLISHED CONCRETE FINISH.</p> <p>CONCRETE MIX DESIGNS (INCLUDING AIR CONTENT, WATER TO CEMENT RATIOS, AND OTHER CRITERIA) SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN ACI 318 TABLE 19.3.2.1, BASED ON THE EXPOSURE CATEGORIES AND CLASSES DEFINED IN ACI 318 TABLE 19.3.1.1. USE AIR ENTRAINING ADMIXTURE IN ALL EXTERIOR CONCRETE. AIR CONTENT IN FIRE RATED SLABS SHALL ALSO COMPLY WITH THE REQUIREMENTS IN THE SPECIFIED UL LISTING.</p> <p>COLD WEATHER CONCRETING: PROTECT CONCRETE WORK FROM PHYSICAL DAMAGE OR REDUCED STRENGTH CAUSED BY FROST, FREEZING OR LOW TEMPERATURES. COMPLY WITH ACI 306.1.</p> <p>HOT WEATHER CONCRETING: WHEN HOT WEATHER CONDITIONS EXIST THAT WOULD IMPAIR THE QUALITY AND STRENGTH OF THE CONCRETE, REDUCE DELIVERY TIME OF READY-MIX CONCRETE, LOWER THE TEMPERATURE OF MATERIALS, OR ADD RETARDER TO ENSURE THAT THE CONCRETE IS PLASTIC. RE-TEMPERING WITH WATER IS NOT ALLOWED. COMPLY WITH ACI 305R.</p> <p>SLAB CURING: ALL INTERIOR CONCRETE SLABS, EXCEPT EXPOSED INTEGRALLY COLORED SLABS, ARE TO BE CURED WITH A MOISTURE RETAINING COVER FOR THE FIRST 7 DAYS (MINIMUM) AFTER PLACEMENT.</p> <p>[THE CONTRACTOR SHALL NOT CAST FOUNDATIONS AGAINST EXCAVATED VERTICAL SIDE SURFACES.]</p> <p>[THE CONTRACTOR IS ALLOWED TO CAST FOUNDATIONS AGAINST EXCAVATED SOIL SURFACES, PROVIDED THE FOLLOWING IS ADHERED TO:</p> <p>A. THE SIDE SLOPES OF THE EXCAVATION SHALL BE ABLE TO MAINTAIN VERTICAL SLOPE WITHOUT SOIL SLOUGHAGE.</p> <p>B. THE BOTTOM WIDTH OF THE EXCAVATION SHALL BE ONE INCH WIDER MINIMUM ON EACH SIDE THAN THE SPECIFIED FOOTING WIDTH.</p> <p>C. THE SIDE WALLS OF THE EXCAVATION SHALL BE BATTERED A MINIMUM OF ONE INCH HORIZONTAL TO TWELVE INCHES VERTICAL.</p> <p>D. IF SANDY OR LOOSE MATERIALS ARE ENCOUNTERED, THE FOOTING MUST BE FORMED.</p> <p>E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF ANY SOIL SLOUGHAGE FROM THE WET CONCRETE DURING THE CASTING OPERATION.</p> <p>F. THE CONTRACTOR AGREES TO REMOVE AND RECAST ANY FOOTING WHERE THE ABOVE CONDITIONS ARE NOT MET.]</p> <p>EXPOSED SITE WALLS, RETAINING WALLS, AND STEM WALLS GREATER THAN 30 FEET IN LENGTH SHALL HAVE CONTROL JOINTS INSTALLED AT THE FOLLOWING MAXIMUM SPACING:</p> <p>12'-0" ON CENTER FOR WALLS 6'-0" MAXIMUM HEIGHT 18'-0" ON CENTER FOR WALLS 10'-0" MAXIMUM HEIGHT 20'-0" ON CENTER FOR WALLS GREATER THAN 10'-0" IN HEIGHT</p> <p>ALL CONCRETE EXPOSED TO GROUND SHALL BE MANUFACTURED WITH PORTLAND CEMENT TYPE I OR TYPE V.</p> <p>SEE SHEET S-701 FOR TYPICAL CONCRETE DETAILS.</p>		<p><b>POLISHED CONCRETE FLOORS:</b></p> <p>PRIOR TO PLACEMENT OF THE CONCRETE SLABS TO RECEIVE A POLISHED FINISH, THE CONTRACTOR, ARCHITECT, AND ENGINEER SHALL MEET TO DISCUSS THE PROCESS AND CLARIFY THE EXPECTATIONS FOR THE POLISHED CONCRETE FLOORS. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING THIS MEETING.</p> <p>EACH CONCRETE MIX INGREDIENT OF THE POLISHED FLOORS SHALL BE FROM THE SAME SOURCE, FROM THE SAME RESPECTIVE BATCH, AND EACH DELIVERED TO THE CONCRETE PRODUCER IN ONE DELIVERY.</p> <p>AGGREGATE IN POLISHED CONCRETE SLABS SHALL BE NON-POROUS.</p> <p>INCLUSION OF ADMIXTURES, PLASTICIZERS, SLAG, FLY ASH, OR OTHER PRODUCTS REPLACING PORTIONS OF THE PORTLAND CEMENT IN THE CONCRETE MIX SHALL NOT BE USED UNLESS APPROVED BY THE ENGINEER OF RECORD. ANY APPROVED ADMIXTURES SHALL NOT BE CALCIUM CHLORIDE BASED, AND THEIR VOLUME SHALL NOT EXCEED 20% OF THE PORTLAND CEMENT VOLUME.</p> <p>POLISHED CONCRETE FLOORS SHALL BE CURED WITH A MOISTURE RETAINING COVER IN ACCORDANCE WITH ACI308R-01. THE SLAB SHALL REMAIN CONTINUOUSLY COVERED DURING THIS TIME TO MAINTAIN THE MOISTURE IN THE SLAB. CURING COMPOUNDS ARE NOT ALLOWED IN POLISHED CONCRETE FLOORS.</p> <p>SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR THE FLOOR SHINE AND AGGREGATE EXPOSURE REQUIREMENTS.</p> <p>FLOOR FLATNESS (FF NUMBER) OF POLISHED CONCRETE FLOORS SHALL HAVE A MINIMUM OVERALL VALUE OF 50, AND A MINIMUM LOCAL VALUE OF 35 WHEN TESTED IN ACCORDANCE WITH ASTM E1155.</p> <p>FLOOR LEVELNESS (FL NUMBER) OF POLISHED CONCRETE FLOORS SHALL HAVE A MINIMUM OVERALL VALUE OF 30, AND A MINIMUM LOCAL VALUE OF 20 WHEN TESTED IN ACCORDANCE WITH ASTM E1155.</p> <p>CONTRACTOR SHALL CREATE A MOCKUP OF THE POLISHED FLOOR PRIOR TO POLISHING THE BUILDING SLAB. THE MOCKUP SHALL BE AT LEAST 4 FEET SQUARE.</p> <p><b>REINFORCING STEEL:</b></p> <p>ALL REINFORCING STEEL SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-14), AND DETAILS AND DETAILING OF CONCRETE REINFORCEMENT (ACI 315-99).</p> <p>ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60, EXCEPT STIRRUPS, TIES AND INDICATED FIELD-BENT BARS, WHICH SHALL CONFORM TO ASTM A615 GRADE 40.</p> <p>ALL WELDED WIRE FABRIC SHALL BE DEFORMED AND SHALL CONFORM TO ASTM A479. PROVIDE IN FLAT SHEETS ONLY.</p> <p>TENSION AND COMPRESSION LAPS IN REINFORCING SHALL CONFORM TO THE LAP SPICE SCHEDULE ON SHEET S-601 AND BE IN ACCORDANCE WITH ACI 318, CHAPTER 12, UNLESS NOTED OTHERWISE.</p> <p>ALL HORIZONTAL REINFORCING IN FOOTINGS, WALLS AND BEAMS SHALL BE CONTINUOUS AROUND CORNERS OR HAVE BENT (CORNER) BARS OF THE SAME SIZE AND SPACING AS THE HORIZONTAL BARS AND LAP 30 BAR DIAMETERS (18" MINIMUM).</p> <p>CONCRETE COVER FOR REINFORCING SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED:</p> <p>A. CONCRETE FOR FOUNDATIONS CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"</p> <p>B. CONCRETE CAST AGAINST FORMS BUT EXPOSED TO EARTH OR WEATHER:</p> <p>1. BARS LARGER THAN NO. 5: 2"</p> <p>2. BARS NO. 5 OR SMALLER: 1 1/2"</p> <p>C. CONCRETE NOT EXPOSED TO WEATHER OR NOT IN CONTACT WITH GROUND:</p> <p>1. COLUMNS, GIRDERS AND BEAMS: 1 1/2"</p> <p>2. STRUCTURAL SLABS, WALLS AND JOISTS (NO. 11 AND SMALLER): 3/4"</p> <p>D. CONCRETE SLAB-ON-GRADE: 1 1/2" FROM TOP OF SLAB</p> <p>E. STRUCTURAL CONCRETE SLABS ON METAL DECK: 1" FROM TOP OF SLAB</p> <p>FORM TIES SHALL BE EITHER OF THE THREADED OR SNAP-OFF TYPE SO THAT NO METAL WILL BE LEFT WITHIN 1 INCH OF THE SURFACE OF THE WALL. FOLLOWING REMOVAL OF FORM TIES, RECESSES ARE TO BE CAREFULLY FILLED AND POINTED WITH MORTAR.</p> <p>REINFORCING SHALL NOT BE TACK WELDED OR WELDED IN ANY MANNER UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL PLANS.</p> <p>BAR SUPPORTS AND SPACERS FOR REINFORCING SHALL BE PROVIDED IN ACCORDANCE WITH ACI 315-99. REINFORCING SHALL BE SECURELY TIED TO SUPPORTS.</p> <p>CHAIRS WITH 22 GAGE SAND PLATES OR PRECAST BLOCKS SHALL BE PROVIDED FOR ALL REINFORCING OF CONCRETE IN CONTACT WITH GRADE.</p> <p>DECK CHAIRS SHALL BE PROVIDED FOR ALL WELDED WIRE FABRIC IN SLABS OVER METAL DECK.</p> <p><b>POST INSTALLED ANCHORS:</b></p> <p>THE STRUCTURAL DESIGN IS BASED ON THE POST INSTALLED ANCHORING SYSTEMS NOTED BELOW. SINCE ANCHOR CAPACITIES VARY BY MANUFACTURER, THE CONTRACTOR SHALL USE ONLY THE SYSTEMS NOTED BELOW UNLESS AN ALTERNATE IS APPROVED BY THE ENGINEER OF RECORD. ALTERNATE ANCHORING SYSTEMS MAY REQUIRE RE-DESIGN TO VERIFY ANCHOR QUANTITIES, SPACING, AND EMBED DEPTHS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL CONSTRUCTION AND RE-DESIGN COSTS ASSOCIATED WITH THE ALTERNATE ANCHORING SYSTEM.</p> <p>ALL ADHESIVE (EPOXY OR ACRYLIC) FOR POST INSTALLED ANCHORS AND/OR REBAR INTO CONCRETE SHALL BE HILTI HIT-RE 500 V3 OR HIT-HY 200 EPOXY ADHESIVE ANCHORING SYSTEM. INSTALLATION SHALL BE PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.</p> <p>ALL ADHESIVE (EPOXY OR ACRYLIC) FOR POST INSTALLED ANCHORS AND/OR REBAR INTO GROUT FILLED MASONRY SHALL BE HILTI HIT HY 270 ADHESIVE ANCHORING SYSTEM. INSTALLATION SHALL BE PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.</p> <p>ALL ADHESIVE (EPOXY OR ACRYLIC) FOR POST INSTALLED ANCHORS AND/OR REBAR INTO HOLLOW MASONRY AND/OR BRICK SHALL BE HILTI HIT HY 270 ADHESIVE ANCHORING SYSTEM. INSTALLATION SHALL BE PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.</p> <p>ALL POST INSTALLED MECHANICAL ANCHORS INTO CONCRETE SHALL BE HILTI KWIK BOLT TZ EXPANSION ANCHOR. INSTALLATION SHALL BE PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.</p> <p>ALL POST INSTALLED MECHANICAL ANCHORS INTO GROUT FILLED MASONRY SHALL BE HILTI KWIK BOLT TZ EXPANSION ANCHOR. INSTALLATION SHALL BE PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.</p> <p>ALL POST INSTALLED MECHANICAL SCREW ANCHORS INTO CONCRETE SHALL BE HILTI KWIK HUZ EZ (KH-EZ) SCREW ANCHOR. INSTALLATION SHALL BE PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.</p> <p>ALL POST INSTALLED MECHANICAL SCREW ANCHORS INTO GROUT FILLED MASONRY SHALL BE HILTI KWIK HUZ-EZ (KH-EZ) SCREW ANCHOR. INSTALLATION SHALL BE PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.</p> <p>ANCHOR LENGTHS SHOWN FOR ATTACHMENT TO CONCRETE AND/OR MASONRY ARE REQUIRED EMBEDMENT LENGTHS. THE CONTRACTOR SHALL PROVIDE ANCHORS WITH ADDITIONAL LENGTH TO FACILITATE THE REQUIRED CONNECTION.</p> <p>SUBMIT ALL PROPOSED ANCHORING SYSTEMS INCLUDING ICC-ES REPORTS TO STRUCTURAL ENGINEER FOR REVIEW PRIOR TO INSTALLATION. THE ICC-ES FORMS SHALL MEET THE REQUIREMENTS OF THE IBC REFERENCED IN THESE NOTES.</p> <p>ALL POST-INSTALLED ANCHORS SHALL BE INSTALLED WITH SPECIAL INSPECTION AS DICTATED BY THE RESPECTIVE PRODUCTS' ICC-ES EVALUATION SERVICE REPORT</p> <p>THE CONTRACTOR SHALL ARRANGE AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING, UNLESS ALL PERSONNEL INSTALLING ANCHORS ARE CERTIFIED IN ACCORDANCE WITH ACHCRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM, OR EQUIVALENT APPROVED BY THE ENGINEER OF RECORD.</p> <p>INSTALLATION OF ADHESIVE ANCHORS IN HORIZONTAL TO VERTICALLY OVERHEAD ORIENTATION SHALL BE CONTINUOUSLY INSPECTED DURING INSTALLATION BY AN INSPECTOR SPECIALLY APPROVED FOR THAT PURPOSE BY THE BUILDING OFFICIAL. INSTALLATION SHALL BE DONE BY A CERTIFIED ADHESIVE ANCHOR INSTALLER (AAI) AS CERTIFIED THROUGH ACHCRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM, OR EQUIVALENT. PROOF OF CURRENT CERTIFICATION SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO COMMENCEMENT OF INSTALLATION, AND INSPECTION REPORTS SHALL BE PROVIDED TO THE ENGINEER OF RECORD AND THE BUILDING OFFICIAL.</p>		<p><b>STRUCTURAL AND MISCELLANEOUS STEEL:</b></p> <p>ALL STRUCTURAL STEEL SHALL BE DETAILED AND FABRICATED IN ACCORDANCE WITH THE AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS".</p> <p>ALL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992, GRADE 50, UNLESS NOTED OTHERWISE.</p> <p>ALL MISCELLANEOUS STEEL MEMBERS, SUCH AS CHANNELS, ANGLES, FLAT BARS, AND PLATES SHALL CONFORM TO ASTM A36 UNLESS NOTED OTHERWISE.</p> <p>ALL RECTANGULAR AND SQUARE STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE C, FY = 50 KSI.</p> <p>ALL ROUND STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE B, FY = 42 KSI OR ASTM 1085, GRADE B, FY = 50 KSI.</p> <p>ALL STRUCTURAL PIPE SHALL CONFORM TO ASTM A53, TYPE E OR S, GRADE B, FY = 35 KSI.</p> <p>BOLTS SHALL CONFORM TO ASTM A325N TENSION CONTROL BOLTS UNLESS NOTED OTHERWISE, WITH SIZES AS SHOWN ON THE DRAWINGS. WHERE CLEARANCE WITHIN A CONNECTION DOES NOT PERMIT THE USE OF TENSION CONTROL BOLTS, STANDARD A325N BOLTS SHALL BE USED AND INSPECTED IN ACCORDANCE WITH THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS".</p> <p>ALL BOLTS SHALL BE INSTALLED IN A SNUG TIGHT CONDITION EXCEPT AT MOMENT CONNECTIONS, BRACED FRAME CONNECTIONS, AND AT CONNECTIONS DETAILED WITH A325SC BOLTS. AT THESE LOCATIONS, THE BOLTS SHALL BE TIGHTENED SO AS TO SHEAR THE SPLINE OFF THE BOLT.</p> <p>ANCHOR BOLTS EMBEDDED IN CONCRETE SHALL BE ASTM F1554 GRADE 36 THREADED RODS WITH DOUBLE NUTS. PROVIDE FLAT WASHERS BETWEEN NUTS AND BASEPLATE SURFACES. ANCHOR BOLT LENGTHS SHOWN FOR ATTACHMENT TO CONCRETE AND/OR MASONRY ARE REQUIRED EMBEDMENT LENGTHS. THE CONTRACTOR SHALL PROVIDE ANCHOR BOLTS WITH ADDITIONAL BOLT LENGTH TO FACILITATE THE REQUIRED CONNECTION.</p> <p>ANCHOR BOLT FLAT WASHERS SHALL BE PROVIDED IN ACCORDANCE WITH TABLE 14-2 OF AISC 360, AISC MANUAL OF STEEL CONSTRUCTION LATEST EDITION.</p> <p>ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE LATEST STANDARDS OF THE AWS STRUCTURAL WELDING CODE.</p> <p>ALL BOLT HOLES THAT ARE REQUIRED TO BE FIELD DRILLED SHALL BE DRILLED WITH A MAG DRILL. FLAME CUTTING OF HOLES OR ENLARGING OF MISALIGNED HOLES WILL NOT BE ALLOWED.</p> <p>HEADED CONCRETE ANCHORS AND SHEAR CONNECTORS SHALL BE MADE FROM STEEL CONFORMING TO ASTM A108 AND MEET THE MECHANICAL PROPERTIES OF TYPE B, AS REQUIRED BY CHAPTER 7 OF AWS D1.1 "STRUCTURAL WELDING CODE-STEEL", LATEST EDITION. STRUCTURAL STEEL TO RECEIVE SHEAR CONNECTORS SHALL BE FREE OF PAINT. WELDING PREQUALIFICATION REQUIRED.</p> <p>PROVIDE A SLIDE BEARING CONNECTION FOR STEEL BEAMS BEARING ON MASONRY WALLS UNLESS NOTED OTHERWISE. SEE SHEET [S-521] FOR TYPICAL CONNECTION DETAIL. SEE SHEET [S-741] FOR TYPICAL STEEL DETAILS.</p> <p><b>STEEL DECK:</b></p> <p>ALL STEEL DECK SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST EDITION OF THE STEEL DECK INSTITUTE SPECIFICATIONS.</p> <p>SEE PLANS FOR STEEL DECK TYPE, GAGE, FINISH AND CONNECTIONS.</p> <p>PROVIDE A MINIMUM OF 1 1/2" BEARING FOR ALL STEEL DECK.</p> <p>ALL SPLICES AND LAPS SHALL BE A MINIMUM OF 2" IN LENGTH AND SHALL BE LOCATED DIRECTLY ABOVE SUPPORTS.</p> <p>ALL DECKING SHALL BE CONTINUOUS OVER TWO OR MORE SPANS.</p> <p><b>COLD-FORMED METAL FRAMING (43 MILS OR HEAVIER):</b></p> <p>ALL COLD-FORMED METAL FRAMING SHALL CONFORM TO THE LATEST EDITION OF AISI STANDARD S100 "NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS".</p> <p>WALLS SHALL BE PROVIDED WITH MANUFACTURER'S STANDARD BRIDGING: (EITHER WELDED 2 1/2" x 43 MILS STUD OR CLIPPED COLD-ROLLED CHANNEL 1 1/2" x 54 MILS). PROVIDE BRIDGING AT 4'-0" ON CENTER MAXIMUM FOR LOAD BEARING WALLS AND EXTERIOR WALLS.</p> <p>PROVIDE ALL MISCELLANEOUS ACCESSORIES AND FOLLOW ERECTION PROCEDURES AS PER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS UNLESS NOTED OTHERWISE.</p> <p>COLD-FORMED METAL FRAMING SHALL MEET THE MINIMUM PROPERTIES AS SHOWN IN THE STEEL STUD MANUFACTURERS ASSOCIATION (SSMA) SPECIFICATIONS.</p> <p>ALL TRACK SHALL BE ANCHORED TO CONCRETE WITH 1/2" DIAMETER x 3 1/2" EMBED EXPANSION ANCHORS SPACED AT 4'-0" ON CENTER UNLESS SHOWN OTHERWISE ON PLANS.</p> <p>SECURE STUDS TO TOP AND BOTTOM TRACKS BY WELDING AT BOTH INSIDE AND OUTSIDE FLANGES OR WITH A MINIMUM OF 1-#10 SELF-DRILLING SCREW PER LOCATION UNLESS NOTED OTHERWISE.</p> <p>ALL COMPONENTS OF BUILT-UP STUD SECTIONS, INCLUDING COLUMNS, JAMBS, HEADERS, ETC. SHALL BE WELDED TOGETHER UTILIZING 1/8" FILLET WELDS, 1" LONG AT 12" OC OR MECHANICALLY FASTENED WITH #10 SELF-DRILLING SCREWS AT 12" OC ALONG THE FULL LENGTH OF EACH FLANGE TO FLANGE CONNECTION.</p> <p>FASTEN WELD CLIPS TO STUDS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND LOAD DATA TO PROVIDE AN ALLOWABLE LOAD OF [700# MINIMUM] IN THE HORIZONTAL DIRECTION AND [700# MINIMUM] IN THE VERTICAL DIRECTION. SEE SHEET [S-731] FOR TYPICAL WELD CLIP DETAIL.</p> <p>FASTEN SLIDE CLIPS TO STUDS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND LOAD DATA TO PROVIDE AN ALLOWABLE LOAD OF [700# MINIMUM] IN THE HORIZONTAL DIRECTION. SEE SHEET [S-731] FOR TYPICAL SLIDE CLIP DETAIL.</p> <p>SEE SHEET S-731 FOR TYPICAL COLD-FORMED DETAILS.</p>	

NTU ENVIRONMENTAL  
LAB CHINLE

CHINLE, APACHE COUNTY, AZ

EARLY DESIGN PACKAGE #1  
CIVIL/STRUCTURAL/PLUMBING

JANUARY 20, 2023







## JANUARY 20, 2023

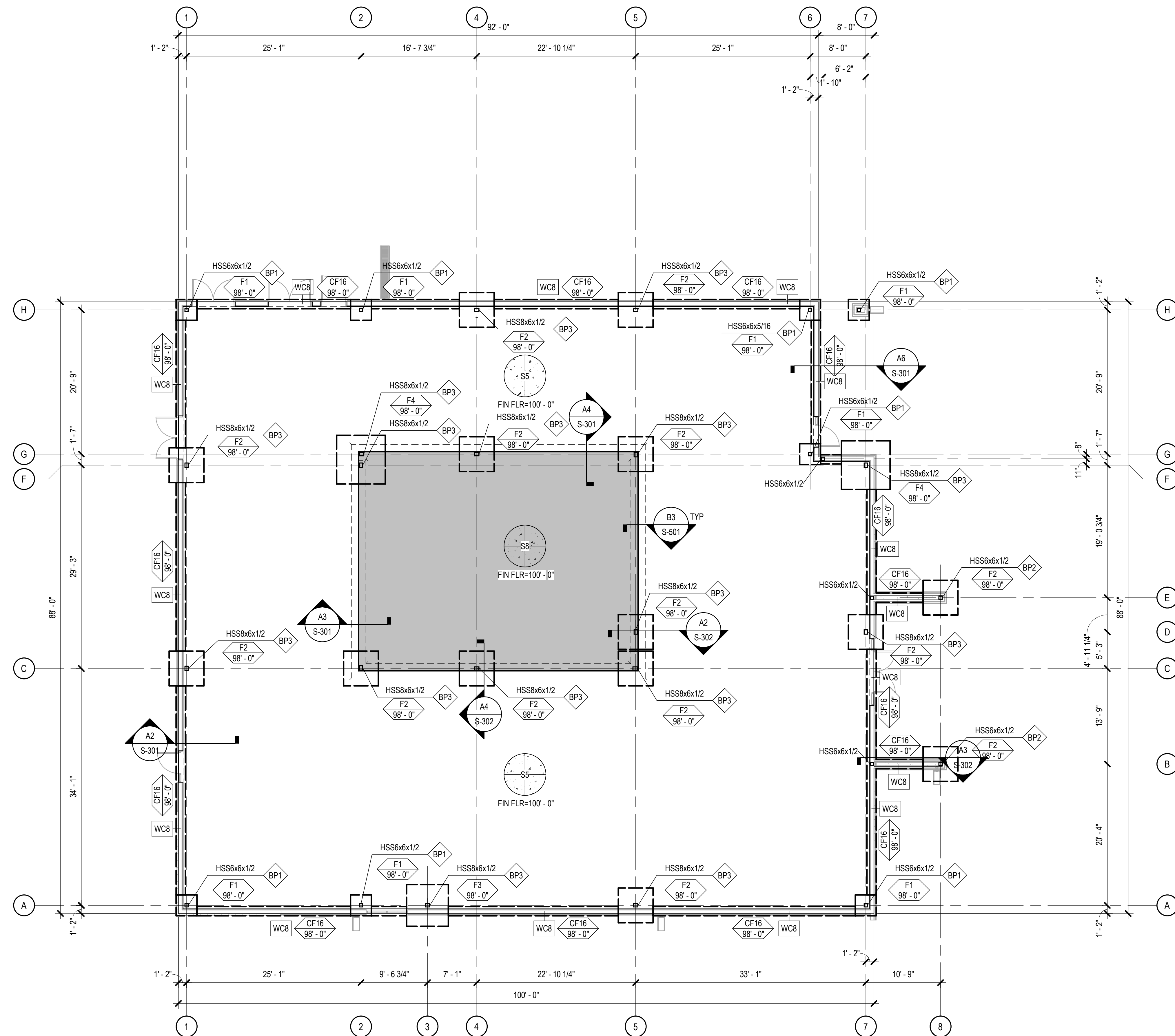
1. SOME SHEET KEYNOTES MAY NOT APPLY TO THIS SHEET.
2. REFERENCE FINISH FLOOR ELEVATION 100'-0" = MEAN SEA FINISH FLOOR ELEVATION. SEE CIVIL DRAWINGS.
3. NOTE TO CONTRACTOR: ENLARGED SLAB BLOCKOUTS MAY BE REQUIRED AT FRAME COLUMNS FOR BRACED FRAME GUSSET PLATE CLEARANCE.
4. NOTE TO ERECTOR: LATERAL STABILITY OF THE STEEL FRAME IS DEPENDENT UPON THE MOMENT FRAMES. THE ERECTOR SHALL PROVIDE TEMPORARY BRACING OF THE STEEL FRAME IN ACCORDANCE WITH SECTION 7.10 OF THE AISC CODE OF STANDARD PRACTICES.
5. PROVIDE BLOCKOUTS AT ALL COLUMNS UNLESS NOTED OTHERWISE.
6. DIMENSIONS ARE TO THE FACE OF CONCRETE, STUD, OR GRID LINES, UNLESS NOTED OTHERWISE.
7. SEE ARCHITECTURAL DRAWINGS FOR MASONRY DIMENSIONS NOT SHOWN.
8. PROVIDE SLAB JOINTS AT 10'-0" ON CENTER MAXIMUM. THE AREA OF THE CONTROL JOINT SHALL NOT EXCEED A 2:1 RATIO. CONTROL JOINTS SHALL BE LOCATED AT COLUMN LINES. WITH THE LAYOUT PROVIDED, AT RE-ENTRANT CORNERS THAT DO NOT HAVE CONTROL JOINTS, PROVIDE 2 #4 X 3'-0" DIAGONAL TO THE RE-ENTRANT CORNER.
9. STRUCTURAL, COLD FORMED METAL STUDS SHALL BE 600S162-43 AT 16" ON CENTER UNLESS NOTED OTHERWISE.
10. SEE SHEET S-501 FOR TYPICAL FOUNDATION SECTIONS AND DETAILS.
11. SEE SHEET S-701 THRU S-741 FOR TYPICAL DETAILS.
12. SEE SHEET S-601 FOR SCHEDULES.

1. FLOOR DRAIN, SLOPE SLAB TO DRAIN 1/8" PER FOOT. COORDINATE EXACT SIZE AND LOCATION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.



Sequence of

# FOUNDATION PLAN



**A4 FOUNDATION PLAN**  
SCALE: 1/8" = 1'-0"



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JANUARY 20, 2023

GENERAL SHEET NOTES

- SOME SHEET KEYNOTES MAY NOT APPLY TO THIS SHEET.
- NOTE TO ERECTOR: LATERAL STABILITY OF THE STEEL FRAME IS DEPENDENT UPON THE MOMENT FRAMES. THE ERECTOR SHALL PROVIDE TEMPORARY BRACING OF THE STEEL FRAME IN ACCORDANCE WITH SECTION 7.10 OF THE AISC CODE OF STANDARD PRACTICES.
- DIMENSIONS ARE TO THE FACE OF STUD OR GRID LINES, UNLESS NOTED OTHERWISE.
- SEE ARCHITECTURAL DRAWINGS FOR MASONRY DIMENSIONS NOT SHOWN.
- BEAMS ARE EQUALLY SPACED BETWEEN COLUMNS, UNLESS NOTED OTHERWISE.
- STRUCTURAL COLD FORMED METAL STUDS SHALL BE [60S]62-43] AT [16"] ON CENTER UNLESS NOTED OTHERWISE.
- SEE SHEET S-501 FOR TYPICAL ROOF FRAMING SECTIONS.
- SEE SHEET S-701 THRU S-742 FOR TYPICAL DETAILS.
- SEE SHEET S-601 FOR SCHEDULES.

SHEET KEYNOTES

- MECHANICAL UNIT. COORDINATE EXACT SIZE AND LOCATION WITH MECHANICAL DRAWINGS.



DYRON MURPHY ARCHITECTS, P.C.



4505 Montbel Place NE, Albuquerque, New Mexico 87107

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Revision Schedule		
#	Date	Description

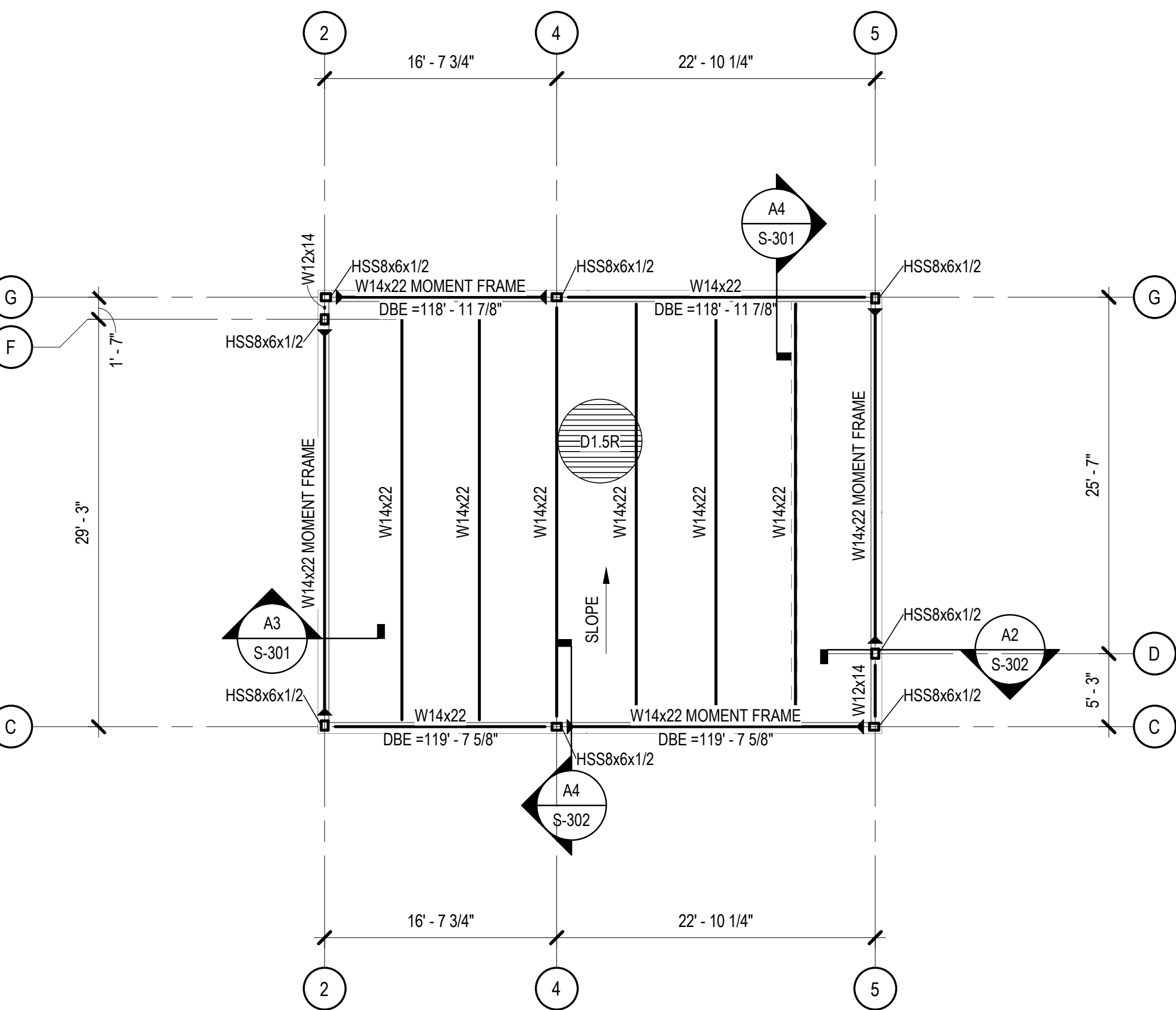
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M97193	THF	DF
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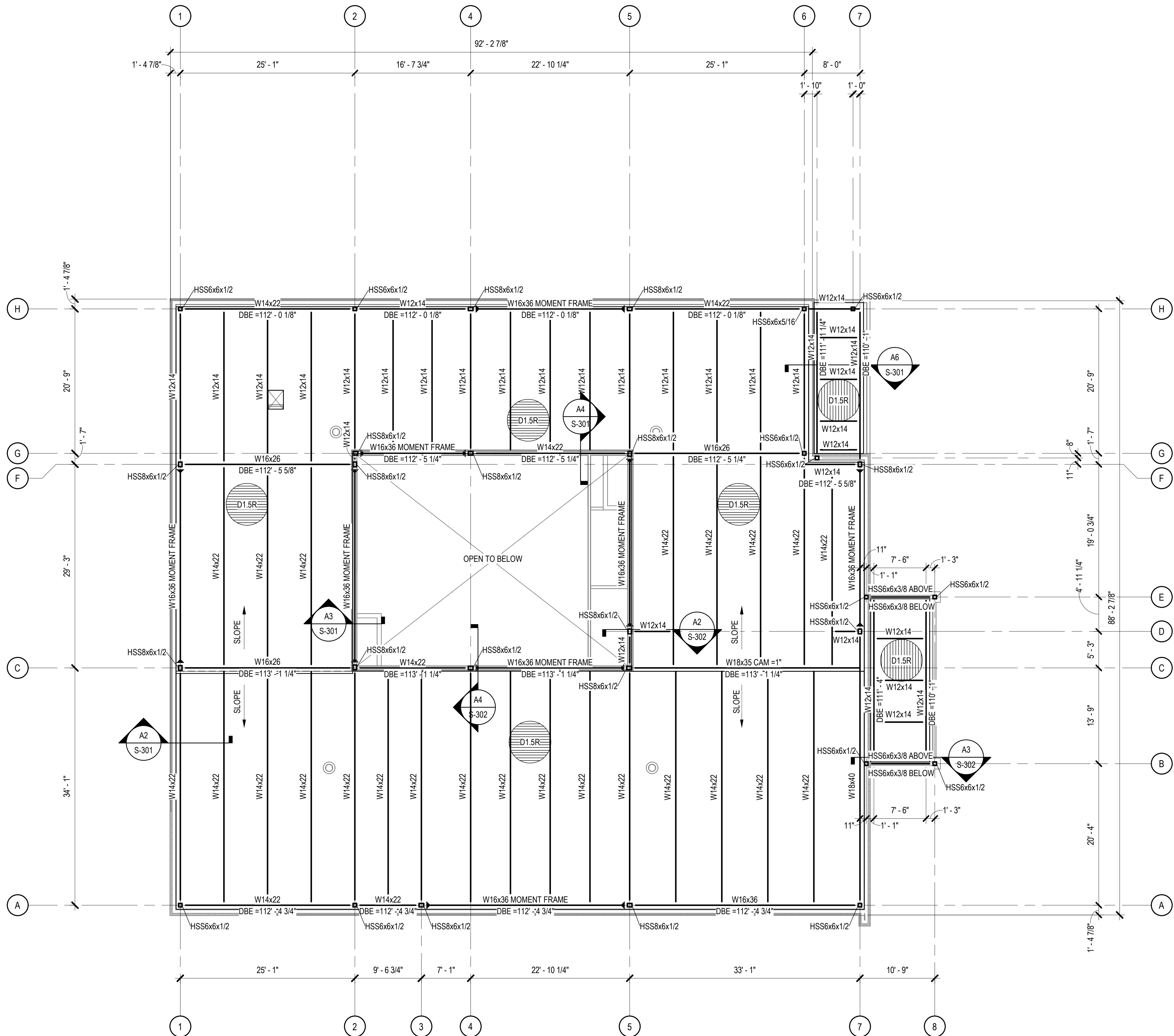
S-121

Sequence of

LOW ROOF AND HIGH  
ROOF FRAMING PLAN



**B6** HIGH ROOF FRAMING PLAN  
SCALE: 1/8" = 1'-0"



**A4** ROOF FRAMING PLAN  
SCALE: 1/8" = 1'-0"

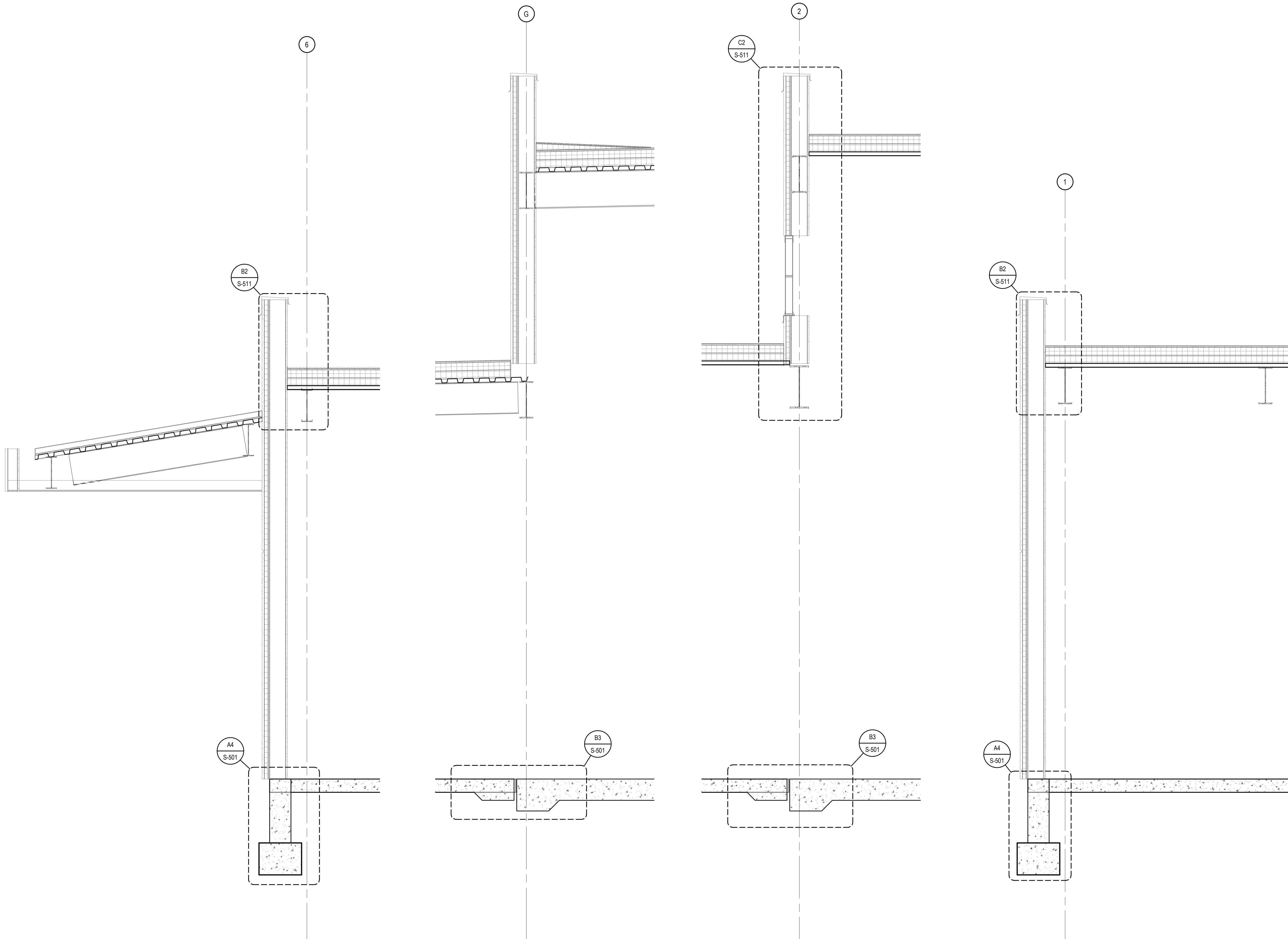


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**A6** WALL SECTION  
SCALE: 3/4" = 1'-0"

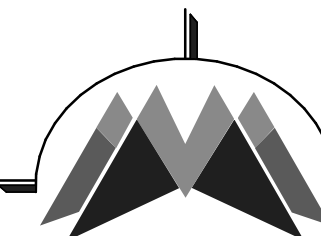
**A4** WALL SECTION  
SCALE: 3/4" = 1'-0"

**A3** WALL SECTION  
SCALE: 3/4" = 1'-0"

**A2** WALL SECTION  
SCALE: 3/4" = 1'-0"



DYRON MURPHY ARCHITECTS, P.C.



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**S-301**

Sequence of

WALL SECTIONS

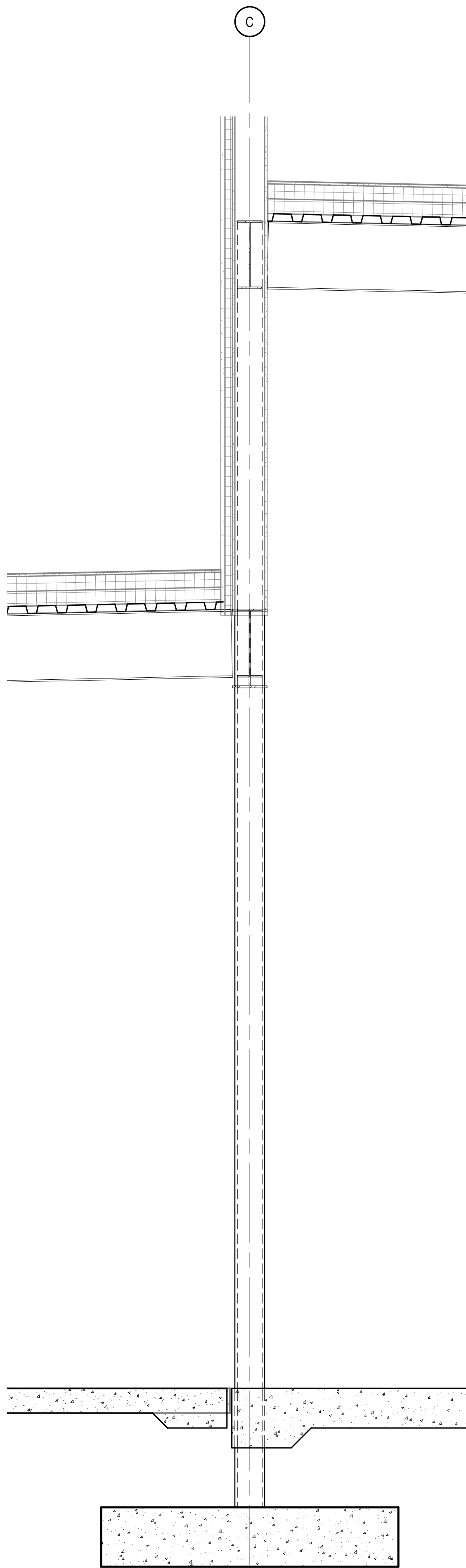


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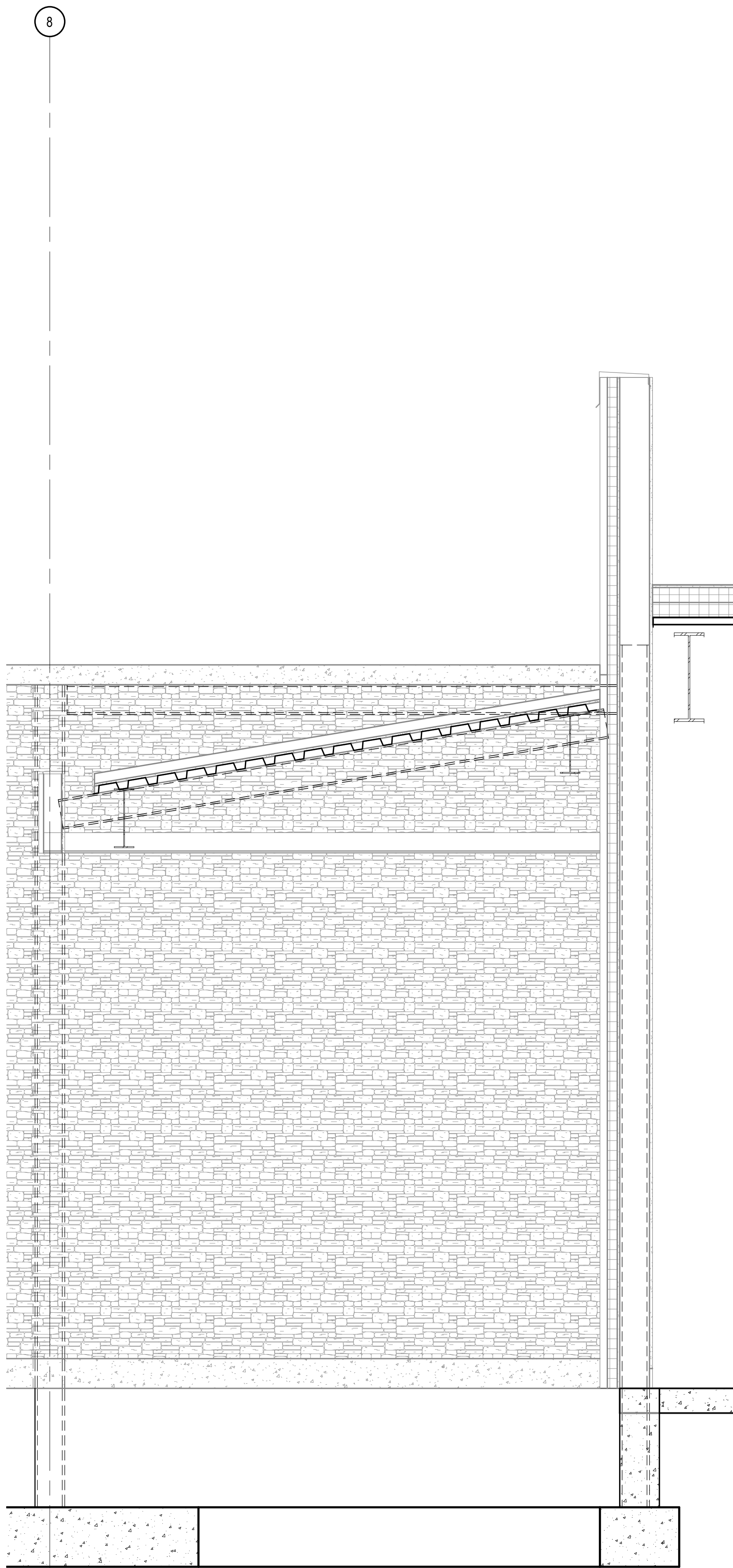
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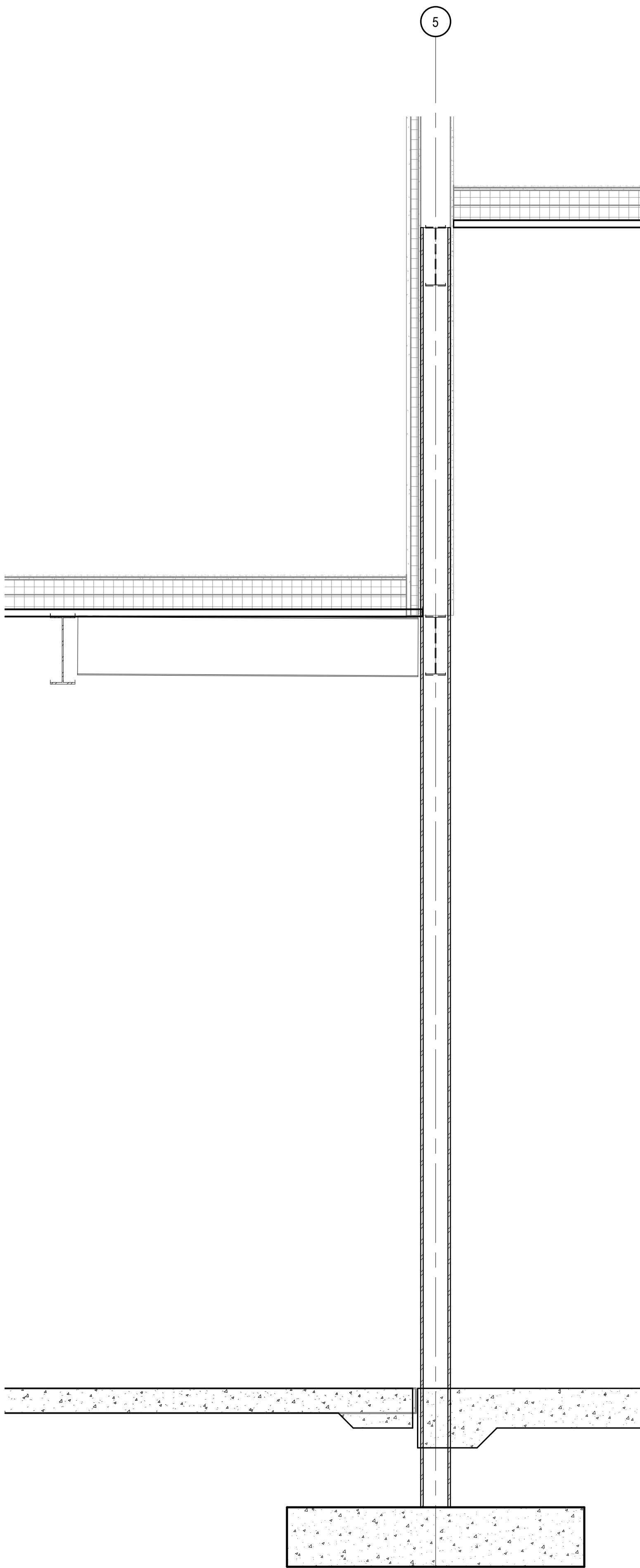
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**A4** WALL SECTION  
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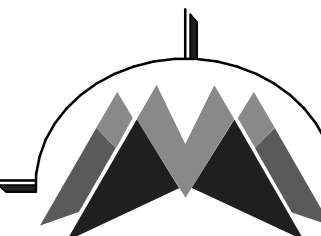
**A3** WALL SECTION  
SCALE: 3/4" = 1'-0"



**A2** WALL SECTION  
SCALE: 3/4" = 1'-0"



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**S-302**

Sequence of

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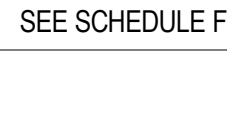


## JANUARY 20, 2023

SCALE: 3/4" = 1'-0"

SCALE: 3/4" = 1'-0"

SCALE: 3/4" = 1'-0"



SCALE: 3/4" = 1'-0"

SCALE: 3/4" = 1'-0"

SCALE: 3/4" = 1'-0"



AT DOORWAY/OPENING



AT STUDWALL

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sequence of

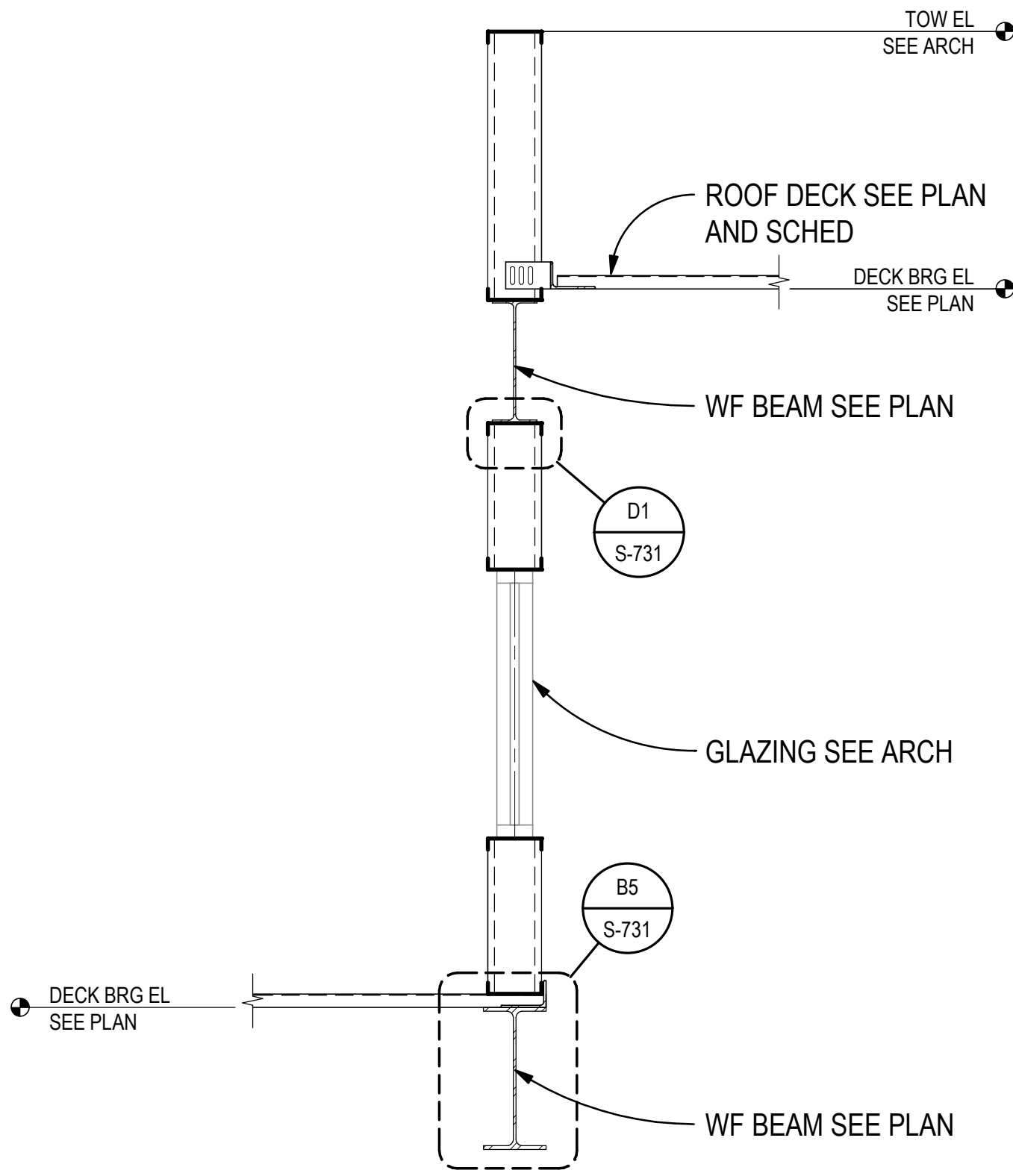
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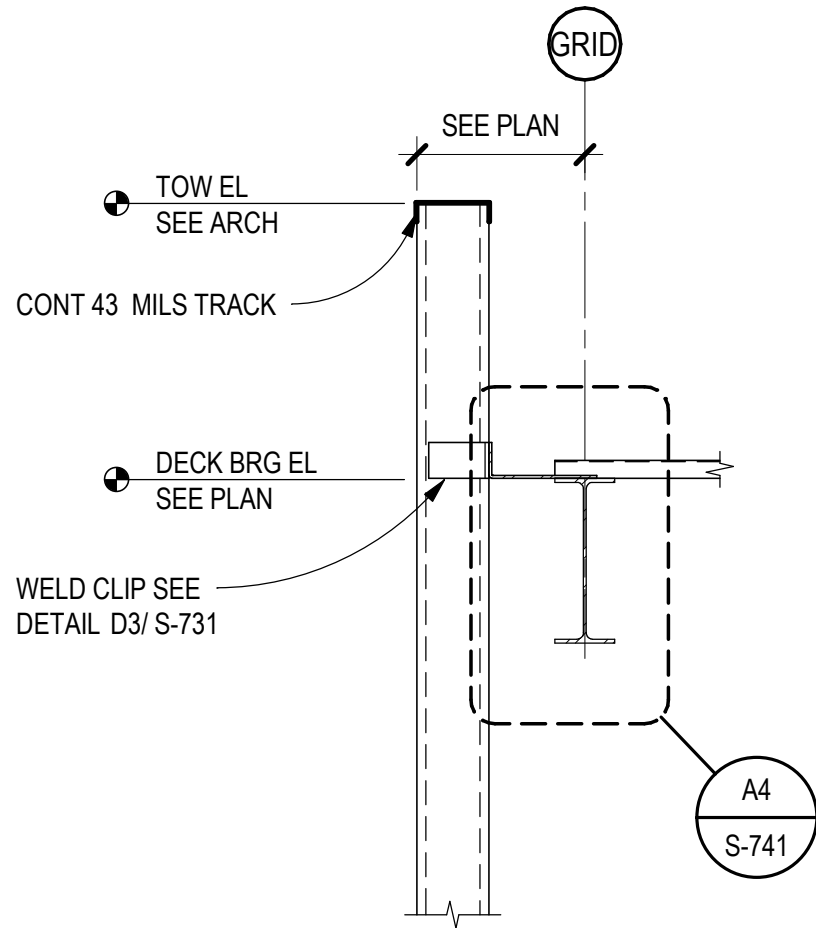
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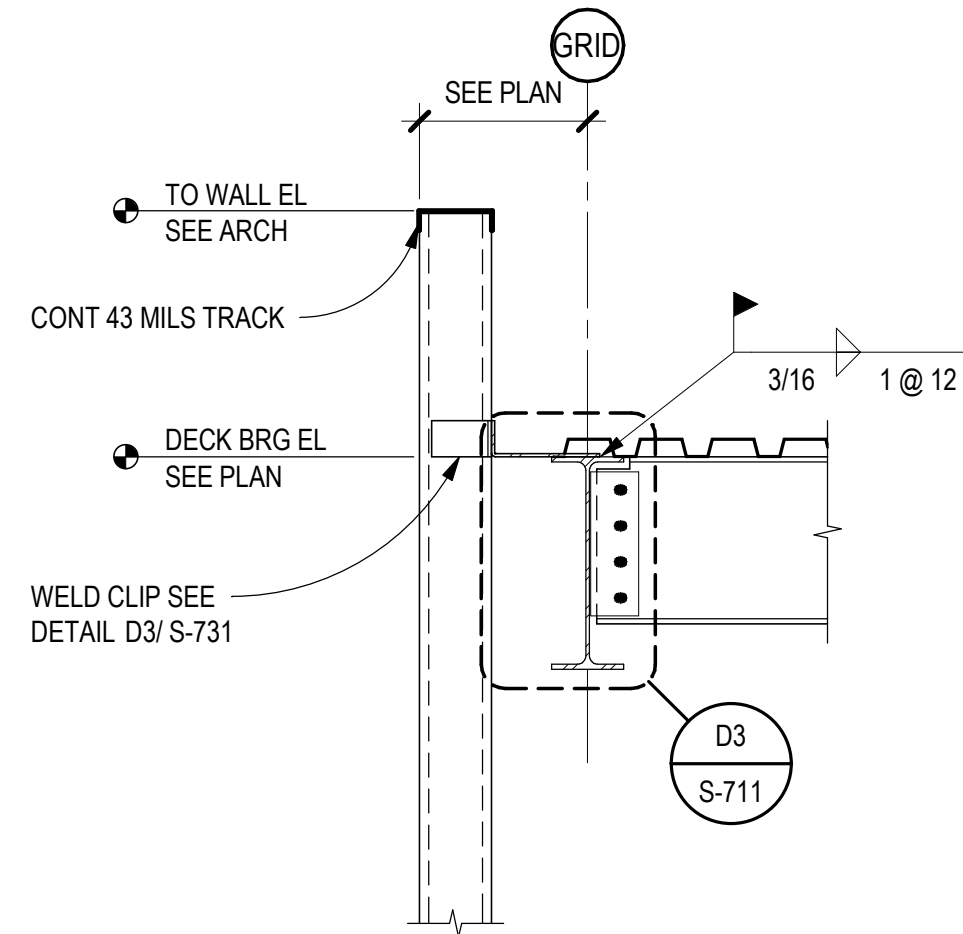
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**C2** FRAMING SECTION @ ROOF STEP  
SCALE: 3/4" = 1'-0"



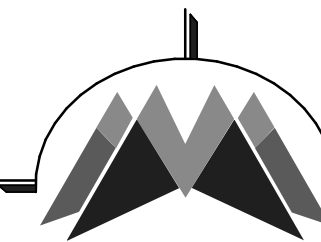
**B2** ROOF FRAMING SECTION  
SCALE: 3/4" = 1'-0"



**A2** ROOF FRAMING SECTION  
SCALE: 3/4" = 1'-0"



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Sheet Number

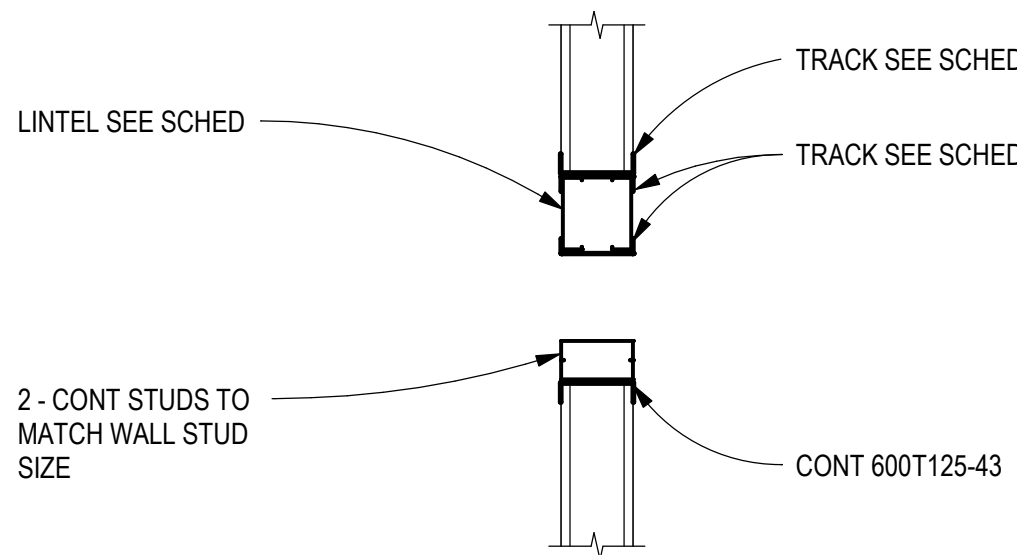
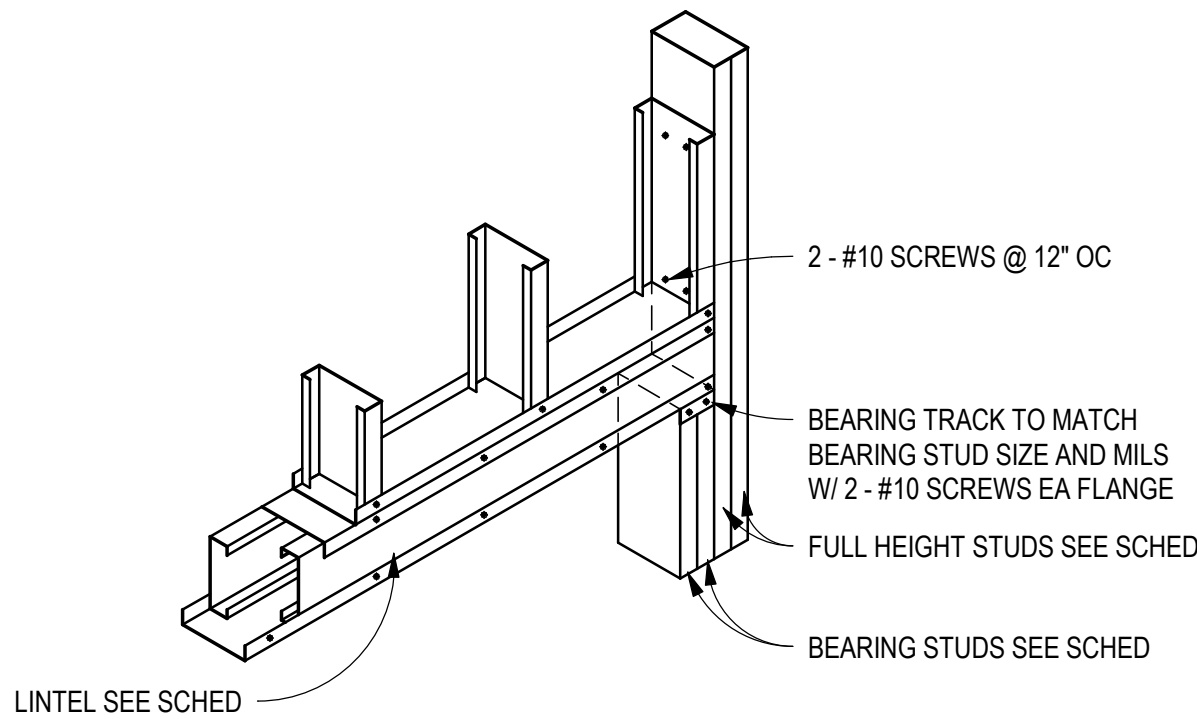
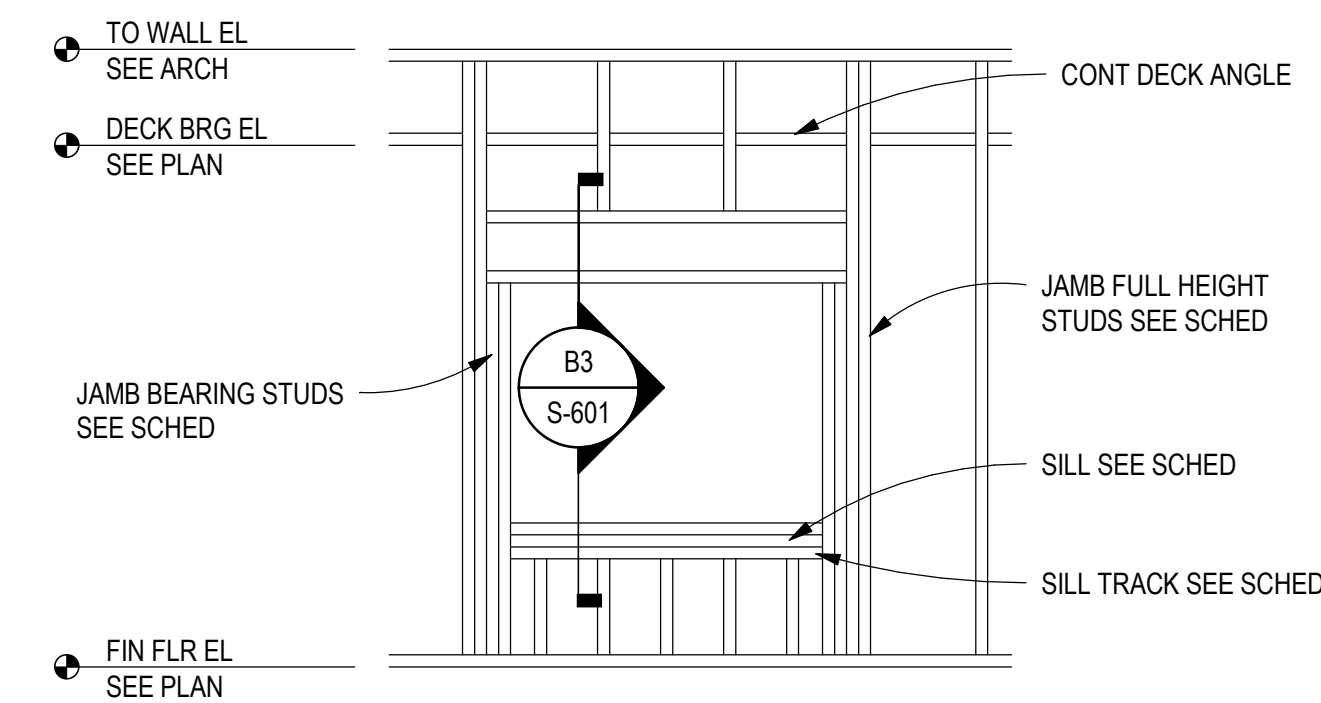
S-511

Sequence of

FRAMING SECTIONS AND  
DETAILS



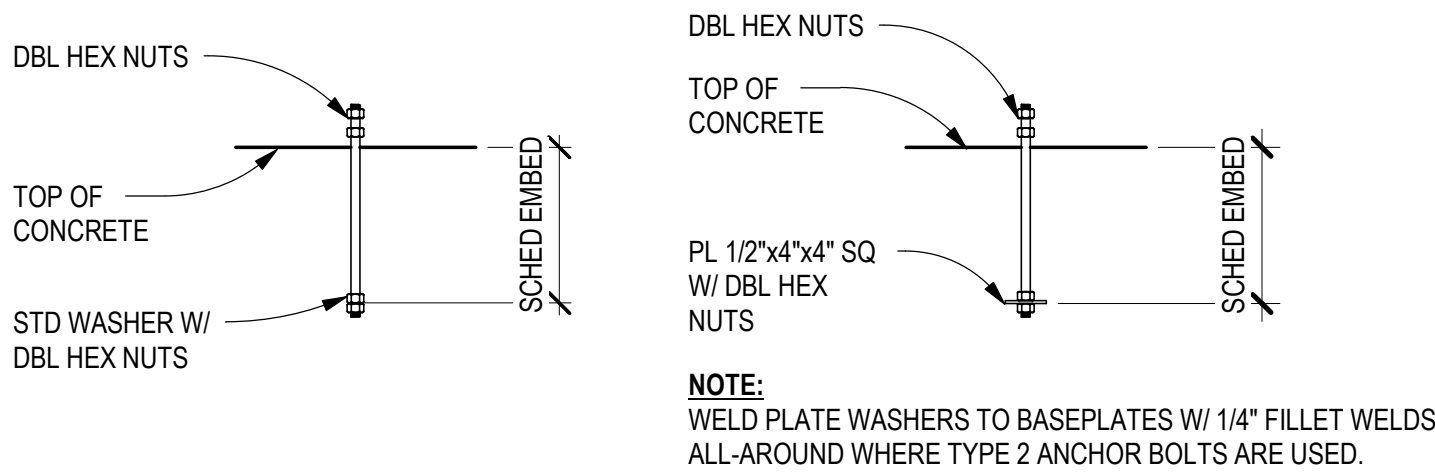
COLD-FORMED LINTEL SCHEDULE				
SPAN	SIZE	STUDS AT BEARING	FULL HEIGHT STUDS	TRACK
0'-0" - 3'-0"	2-600S162-43	1-600S162-43	1-600S162-43	CONT 600T125-43
3'-1" - 6'-0"	2-600S162-43	2-600S162-43	2-600S162-43	CONT 600T125-43
6'-1" - 9'-0"	2-600S162-54	2-600S162-43	2-600S162-43	CONT 600T125-54
9'-1" - 11'-0"	2-600S162-54	2-600S162-43	2-600S162-43	CONT 600T125-54



**B3** TYPICAL COLD-FORMED LINTEL  
SCALE: 3/4" = 1'-0"

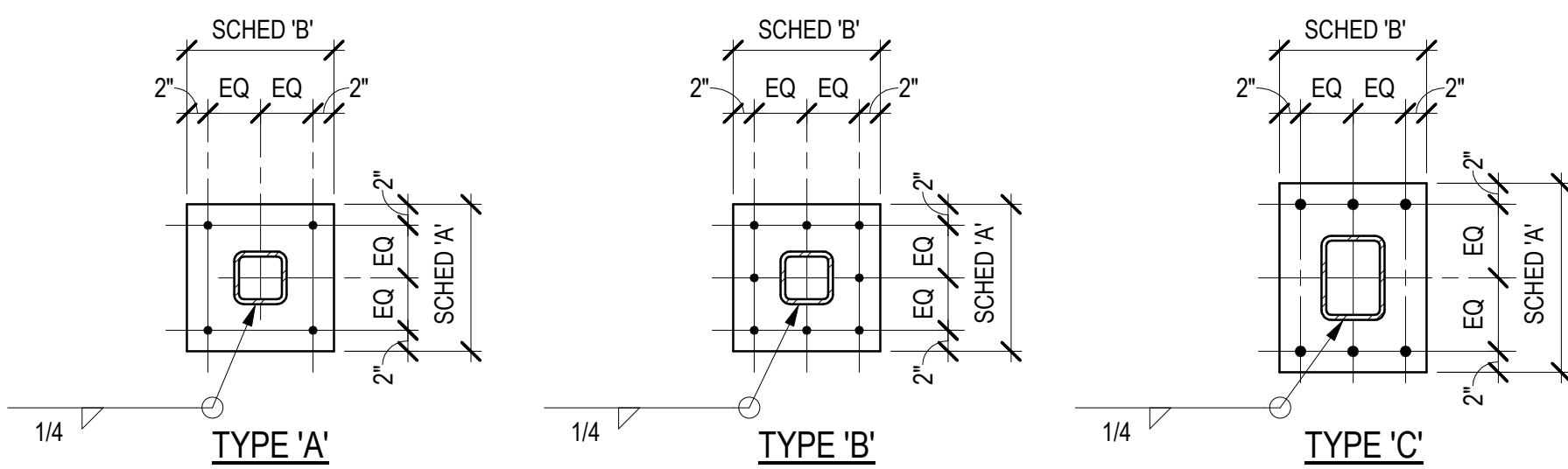
BASE PLATE				ANCHOR BOLTS	
MARK	TYPE	SIZE "T"x"A"x"B"	MATERIAL	F1554 ANCHOR BOLTS	TYPE
BP1	A	3/4" x 12" x 1'-0"	A36	4 - 3/4" DIA x 8"	1
BP2	B	3/4" x 14" x 1'-2"	A36	8 - 3/4" DIA x 8"	2
BP3	C	1" x 18" x 1'-2"	A36	6 - 1" DIA x 8"	2

NOTE: ALL BASEPLATES TO RECEIVE 3" OF NON-SHRINK GROUT



ANCHOR BOLT TYPE 1

ANCHOR BOLT TYPE 2



SLAB-ON-GRADE SCHEDULE					
MARK	THICKNESS	SLAB MATL	REINFORCING	BEARING STRATA	COMMENTS
S5	5"	NORMAL WEIGHT CONC	#4 @ 18" OC EACH WAY	15 MIL VAPOR RETARDER OVER SUBGRADE PER GEN STRUCT NOTES	
S8	8"	NORMAL WEIGHT CONC	#4 @ 12" OC EACH WAY TOP & BOT	15 MIL VAPOR RETARDER OVER SUBGRADE PER GEN STRUCT NOTES	

WALL SCHEDULE				
MARK	WALL	REINFORCING		COMMENTS
		VERTICAL	HORIZONTAL	
WC8	8" CONC	#4 @ 12" OC	#4 @ 12" OC	

SPOT FOOTING SCHEDULE					
MARK	WIDTH	SIZE LENGTH	DEPTH	REINFORCING	COMMENTS
F1	3'-0"	3'-0"	1'-0"	5 - #5 EA WAY TOP & BOT	STD HOOK AT ENDS OF ALL BARS
F2	5'-0"	5'-0"	1'-0"	5 - #5 EA WAY TOP & BOT	STD HOOK AT ENDS OF ALL BARS
F3	6'-0"	6'-0"	1'-0"	6 - #5 EA WAY TOP & BOT	STD HOOK AT ENDS OF ALL BARS
F4	7'-0"	7'-0"	1'-0"	6 - #5 EA WAY TOP & BOT	STD HOOK AT ENDS OF ALL BARS

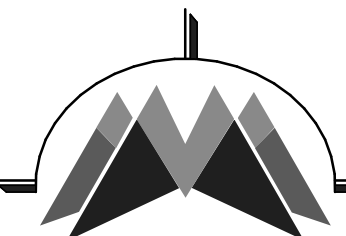
CONTINUOUS FOOTING SCHEDULE				
MARK	SIZE		REINFORCING	
	WIDTH	DEPTH	CONTINUOUS	TRANSVERSE
CF16	1'-4"	1'-0"	3 - #4 BOT	#5 @ 12" OC

DECK SCHEDULE							
MARK	METAL DECK				DECK ATTACHMENTS		
	DECK	TYPE	GAGE	FINISH	ATTACH PERP TO RIBS	ATTACH PARALLEL TO RIBS	ATTACH SIDELAPS
D1.5R	1 1/2"	B	20	G60 GALVANIZED	4-5/8" DIA PUDDLE WELDS PER 36" WIDE SHEET	5/8" DIA PUDDLE WELDS @ 12" OC	#10 SCREWS @ 12" OC
							TOTAL SLAB / DECK THICKNESS
							1 1/2"
							COMMENTS

REINFORCING LAP SPICE SCHEDULE								
REINFORCEMENT TYPE	#6 AND SMALLER (NUMBER OF BAR DIAMETERS)			#7 AND LARGER (NUMBER OF BAR DIAMETERS)			MINIMUM LENGTH (IN)	COMMENTS
	3000 PSI	4000 PSI	5000 PSI	3000 PSI	4000 PSI	5000 PSI		
CONTINUOUS WALL FOOTINGS AND HORIZONTAL REINFORCEMENT IN SITE WALLS AND STEM WALLS	30	30	30	30	30	30	18	
CONCRETE WALLS: ALL VERTICAL REINFORCEMENT	57	50	45	72	62	56	12	
CONCRETE WALLS: ALL HORIZONTAL REINFORCEMENT, EXCLUDING SITE WALLS AND STEM WALLS	75	65	58	93	81	72	12	
CONCRETE COLUMNS	57	50	45	72	62	56	12	
TOP FLEXURAL REINFORCEMENT, INCLUDING BEAMS, GRADE BEAMS, AND COMBINED FOOTING COLUMNS	75	65	58	93	81	72	12	
BOTTOM FLEXURAL REINFORCEMENT, INCLUDING BEAMS, GRADE BEAMS, AND COMBINED COLUMN FOOTINGS	57	50	45	72	62	56	12	
MINIMUM EMBEDMENT OF STANDARD HOOKS INTO CONCRETE BASE	22	19	17	22	19	17	6	ALLOWED FOR BARS LARGER THAN #11
SLABS-ON-GRADE		30			30		12	
SLABS OVER METAL DECK		30			30		6	WELDED WIRE FABRIC MINIMUM LAP LENGTH = 6 INCHES
ALL CMU LAPS UNLESS NOTED OTHERWISE		48			48		18	
NOTES: 1. LAP SPICES SHALL NOT BE PERMITTED FOR BARS LARGER THAN #11 IN CONCRETE OR #9 IN MASONRY. SUCH SPICES SHALL USE APPROVED MECHANICAL CONNECTIONS 2. LAP SPICES FOR BUNDLED BARS SHALL BE IN ACCORDANCE WITH ACI 318 3. LAP LENGTHS FOR LIGHTWEIGHT CONCRETE SHALL BE INCREASED BY 33% 4. LAP LENGTHS FOR EPOXY COATED BARS SHALL BE INCREASED BY 50% 5. FOR INTERMEDIATE OR LARGER VALUES OF F <sub>c</sub> , USE THE CLOSEST LOWER VALUE IN THE TABLE. DO NOT INTERPOLATE								



DYRON MURPHY ARCHITECTS, P.C.



4505 Montbel Place NE, Albuquerque, New Mexico 87107

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M97193	THF	DF

RVT FILE  
C:\Revit Projects\NTU Environmental Chinle  
Lab\_R22\_STRUCT\_Ifregue.rvt

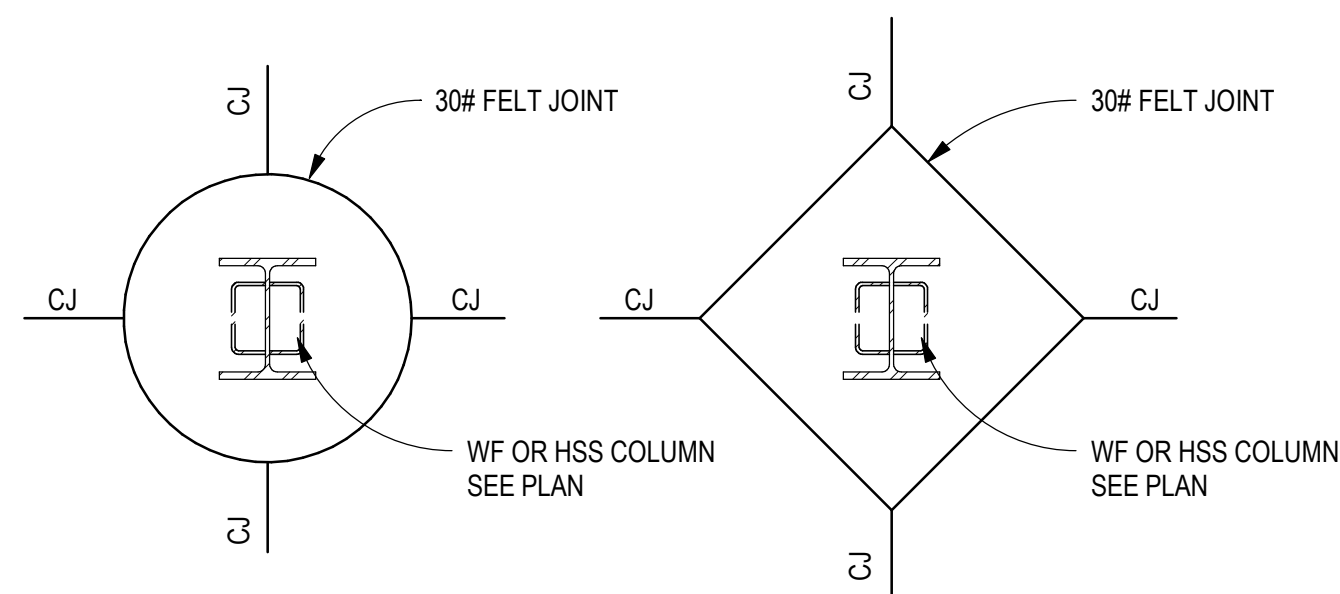
Sheet Number

S-601

Sequence of

SCHEDULES

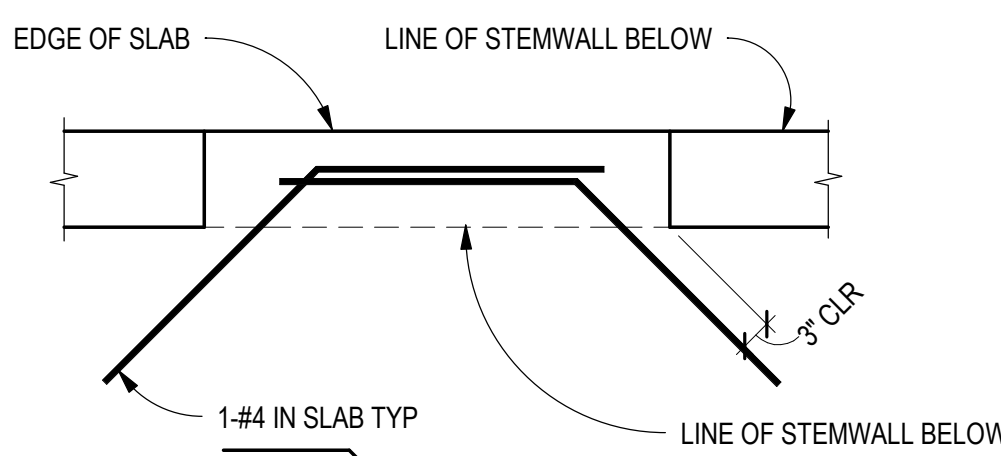




NOTE: CONTRACTOR'S OPTION FOR TYPE TO BE USED. PLACE BLOCKOUTS AT ALL COLUMNS.

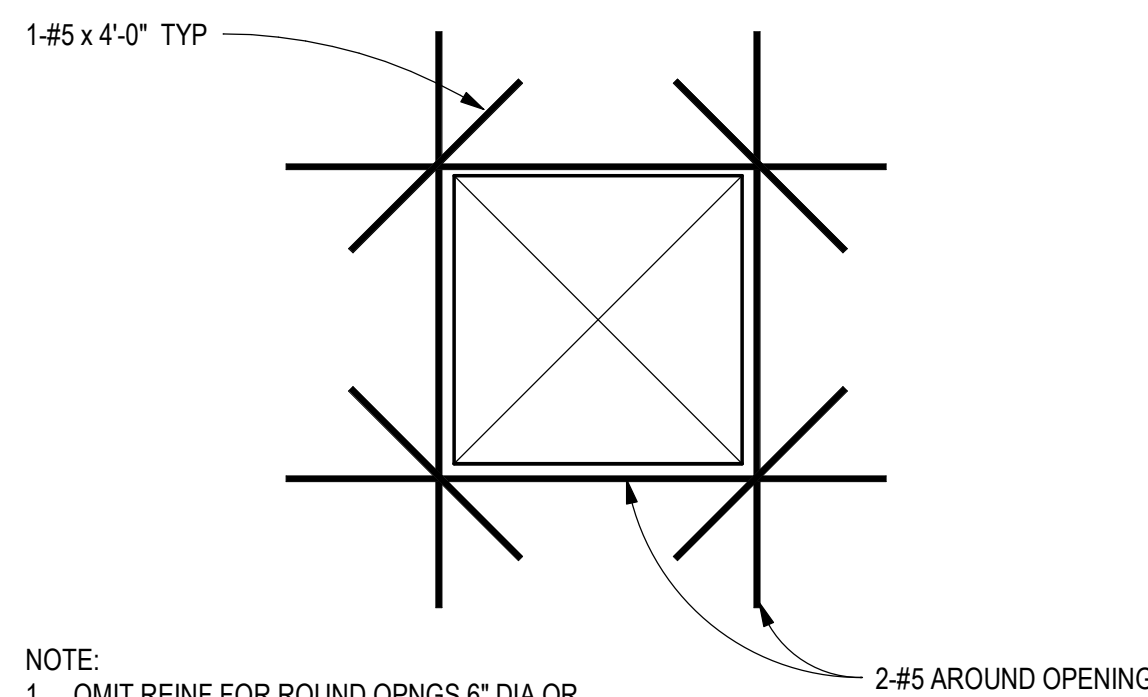
NOTE: ENLARGED BLOCKOUTS MAY BE REQUIRED AT BRACED FRAME LOCATIONS FOR GUSSET PLATE CLEARANCE.

**E5** TYPICAL COLUMN BLOCKOUT  
SCALE: NTS



PLAN

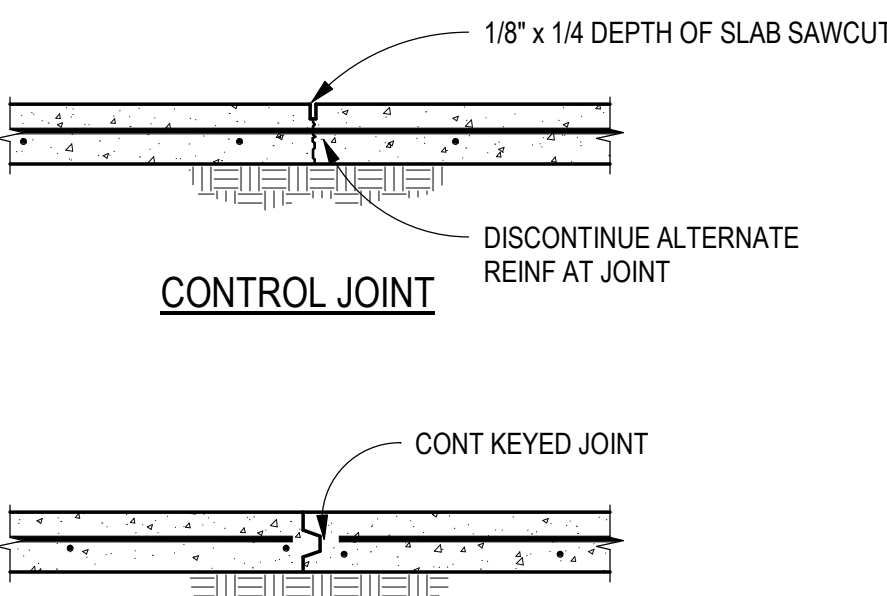
**E4** TYPICAL SLAB REINF AT OPNG  
SCALE: NTS



NOTE:  
1. OMIT REINF FOR ROUND OPNGS 6" DIA OR LESS AND RECTANGULAR OPNGS 4" OR LESS  
2. PROVIDE BARS SHOWN ON EACH FACE AT WALL WITH DOUBLE MAT REINF

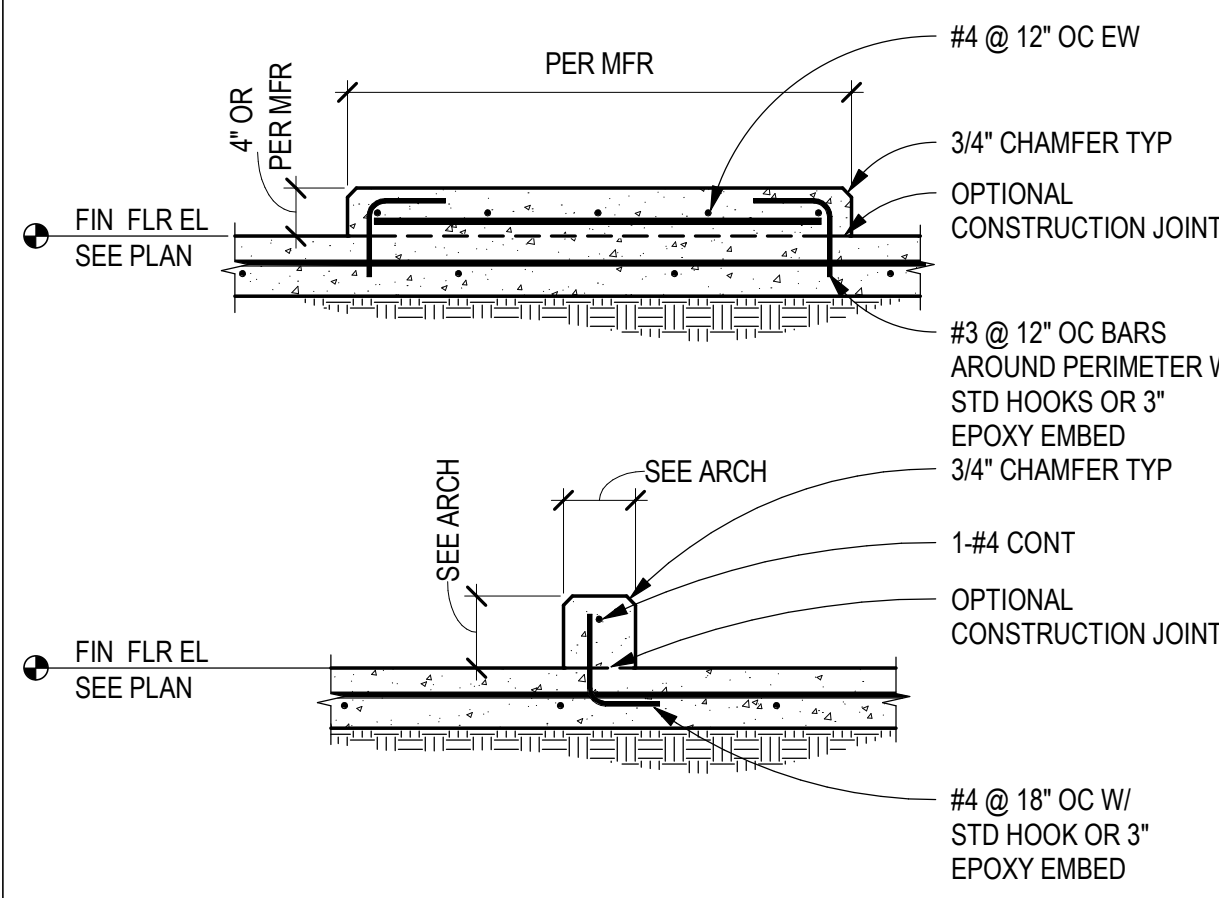
**E3** TYPICAL OPNG IN CONC WALL  
SCALE: NTS

NOTE: AT CONTRACTOR'S OPTION A PLASTIC JOINT FORMER MAY BE INSTALLED INSTEAD OF THE SAWCUT

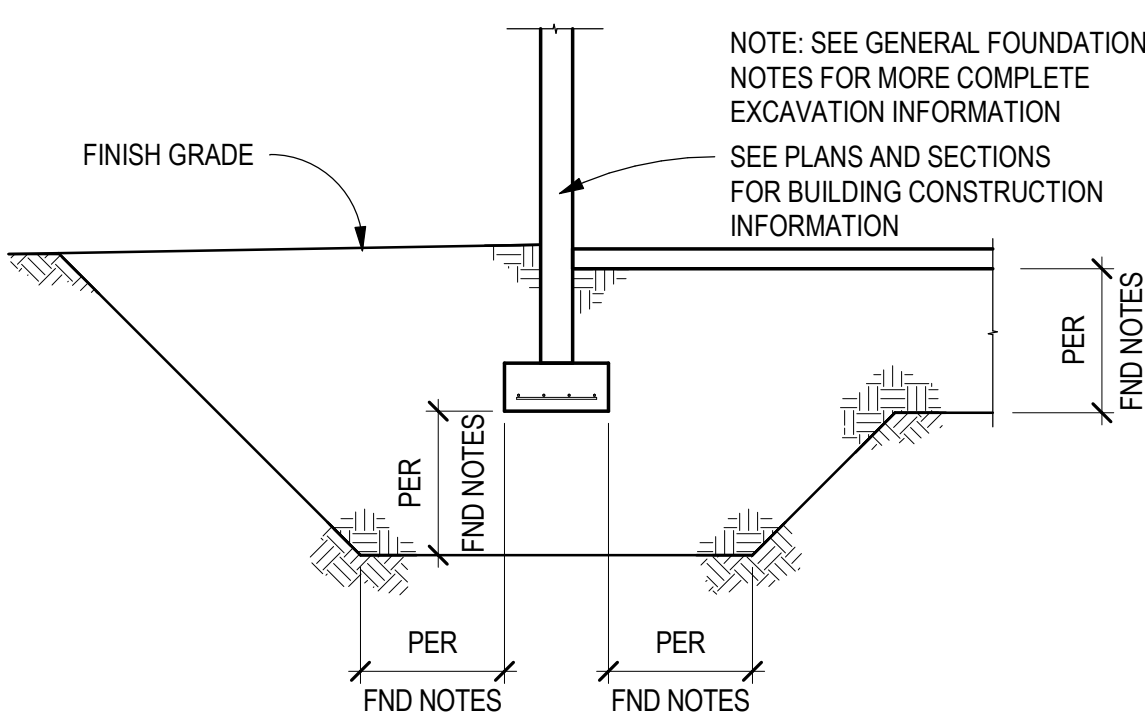


CONSTRUCTION JOINT

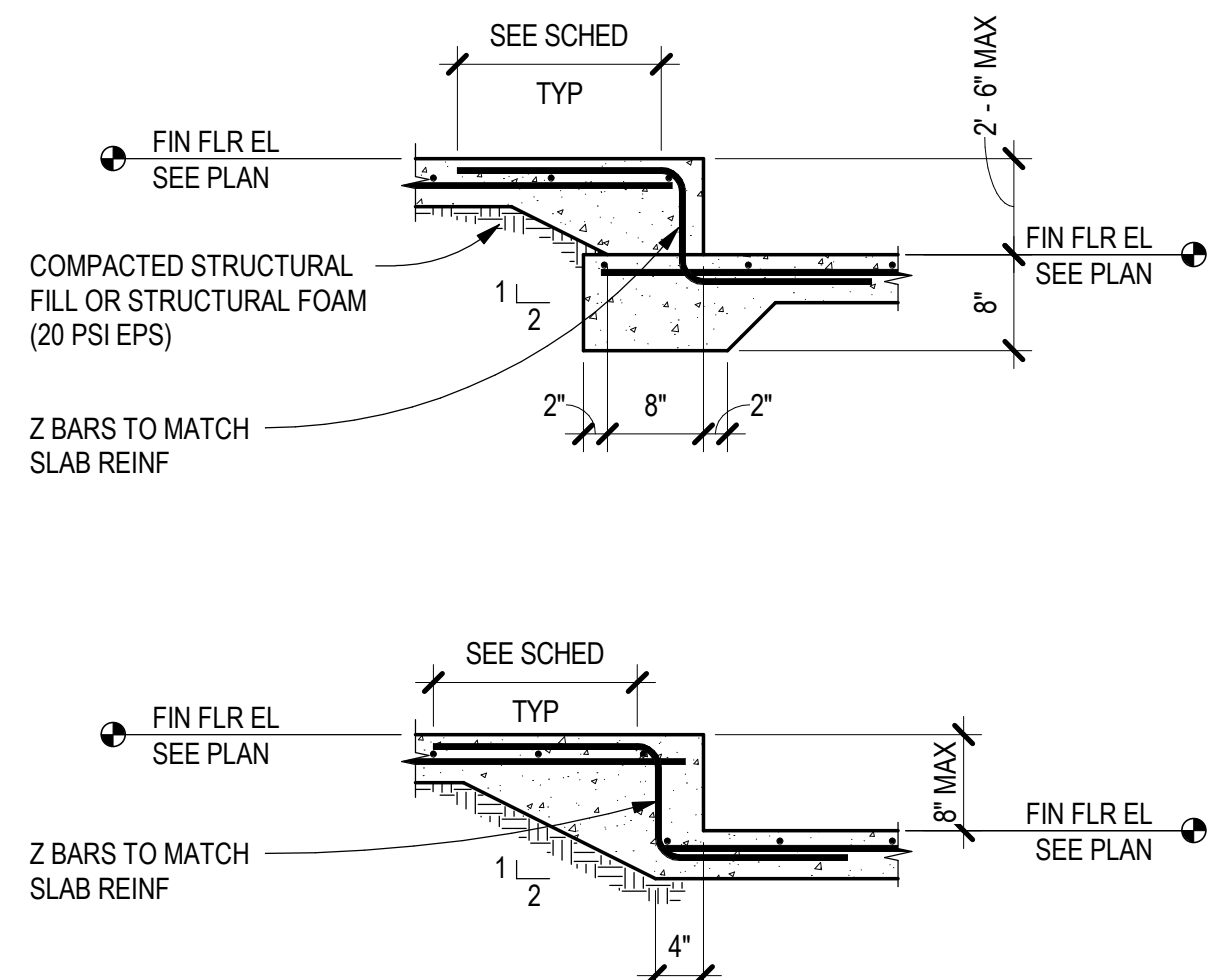
**E2** TYPICAL SLAB JOINT  
SCALE: NTS



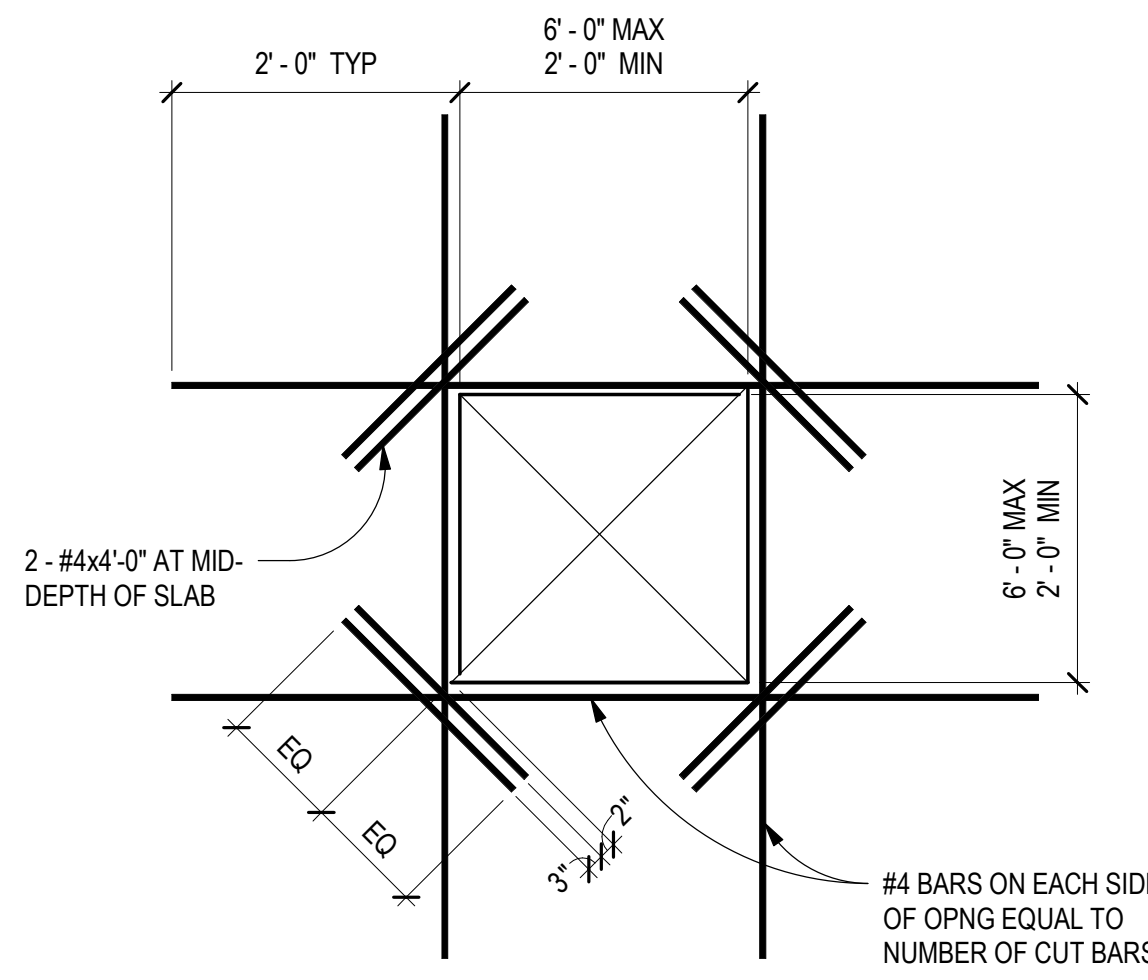
**C6** TYPICAL CURB AND PAD  
SCALE: 3/4" = 1'-0"



**C5** TYPICAL FND EXCAVATION DETAIL  
SCALE: NTS

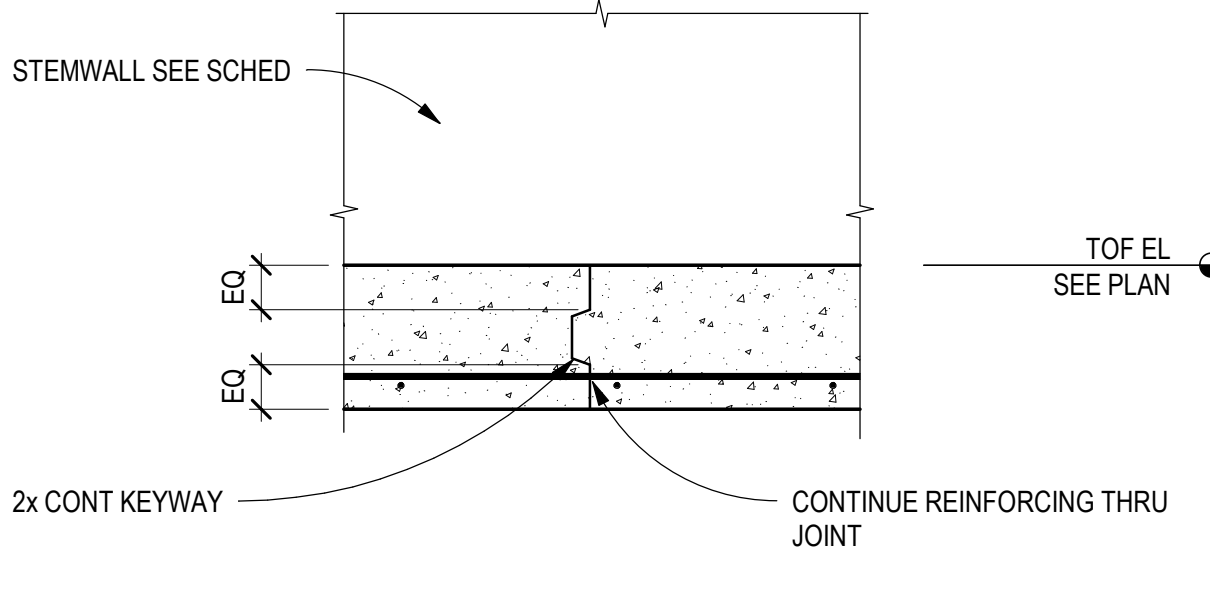


**E6** TYPICAL DEPRESSED SLAB  
SCALE: 3/4" = 1'-0"

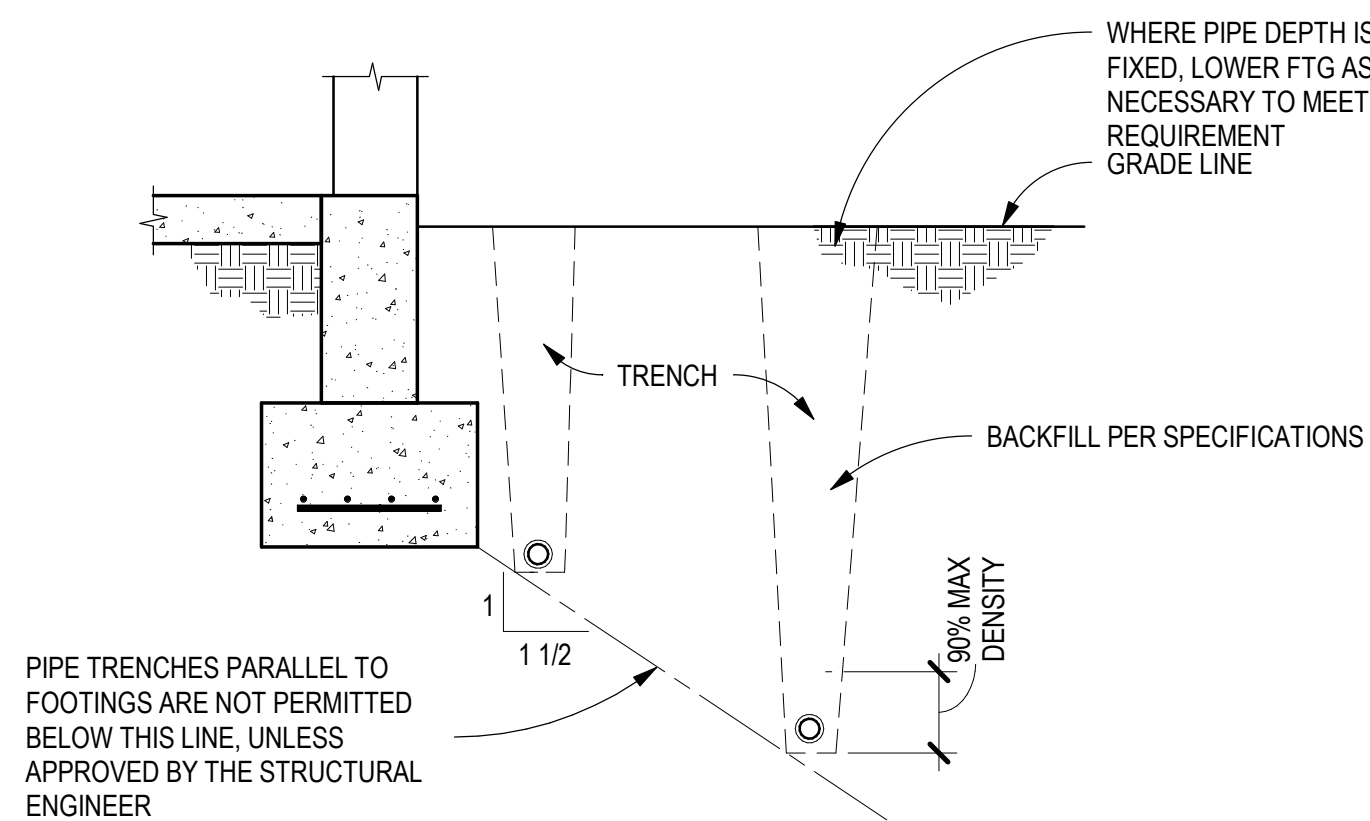


PLAN

**C3** TYPICAL OPNG IN SLAB-ON-GRADE  
SCALE: NTS



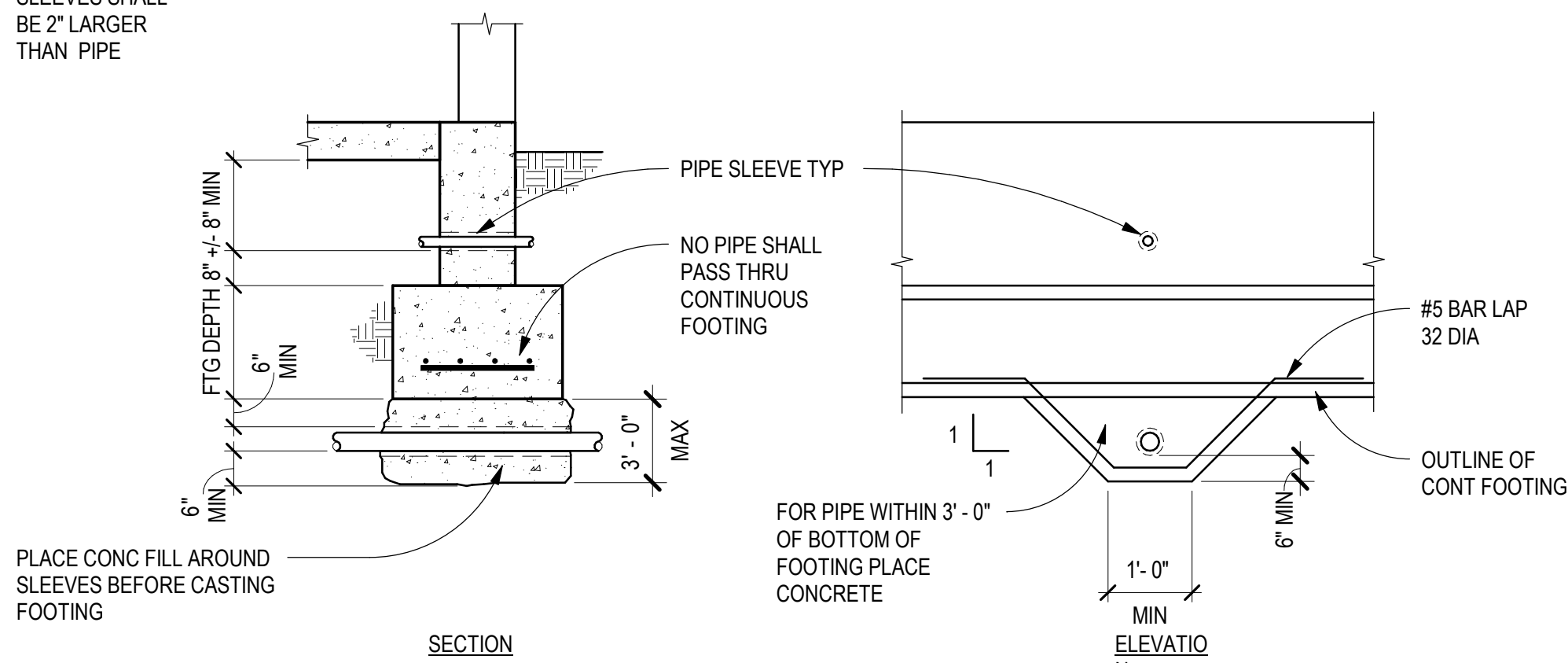
**C2** TYPICAL CONT FTG BULKHEAD  
SCALE: NTS



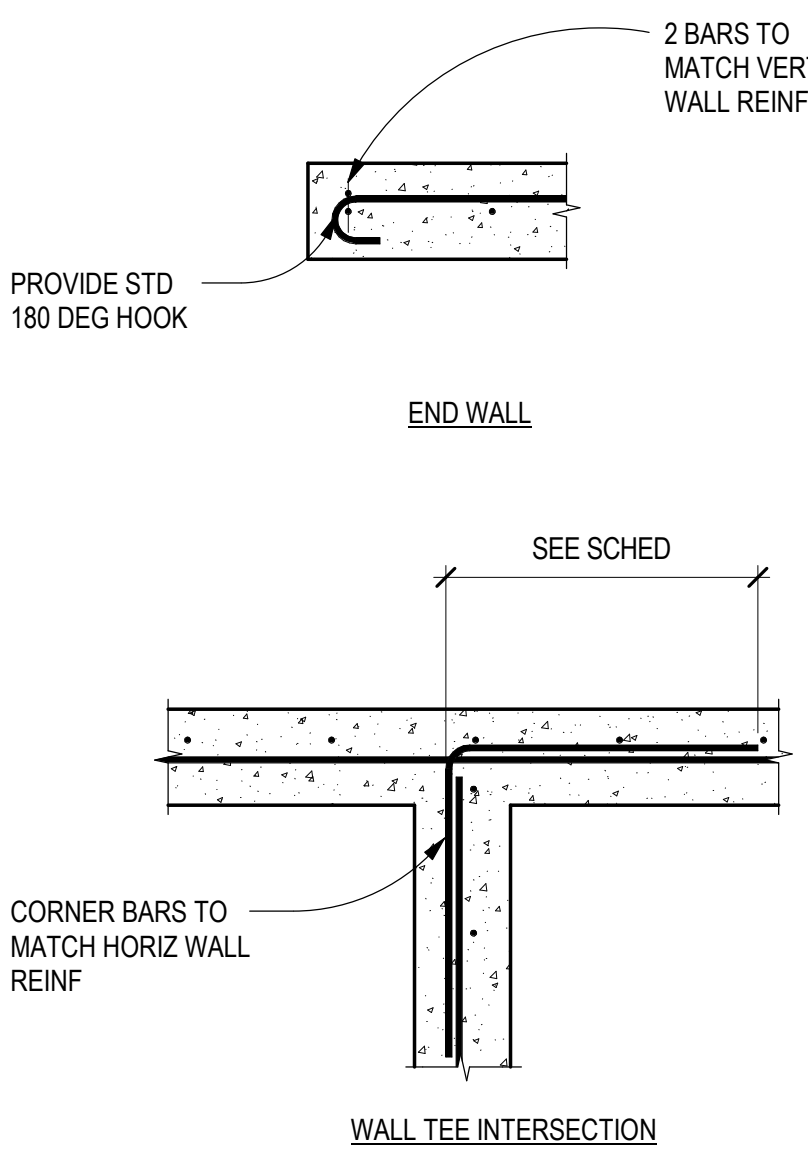
PIPE AND TRENCHES PARALLEL TO FOOTINGS

NOTES:  
1. FOR PIPES MORE THAN 3'-0" BELOW BOTTOM OF FTG USE COMPACTED FILL PER SPECIFICATIONS.  
2. TRENCHES AND PIPES ARE NOT PERMITTED BELOW COLUMN FTGS

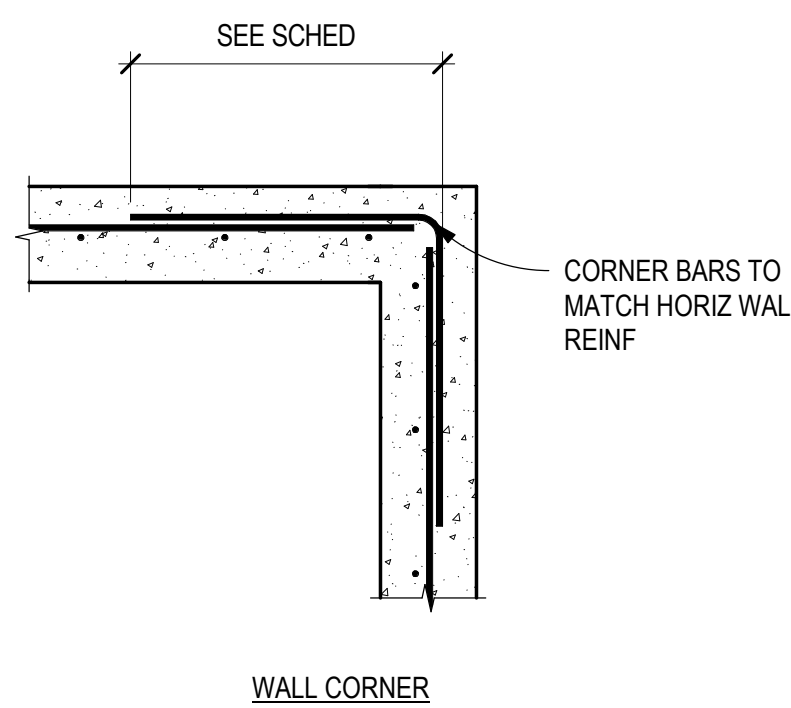
NOTE: ALL PIPE SLEEVES SHALL BE 2" LARGER THAN PIPE



**A6** TYPICAL PIPE PENETRATION AND TRENCH DETAILS  
SCALE: NTS



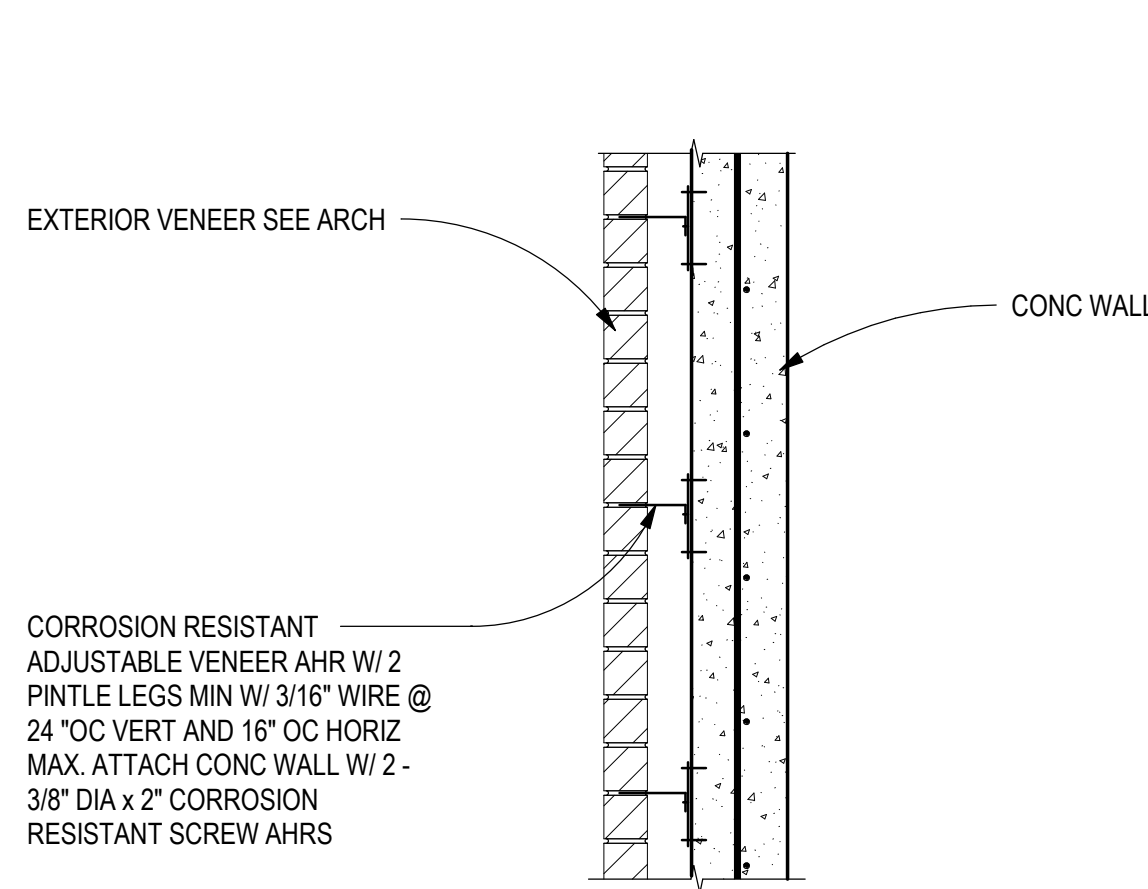
WALL TEE INTERSECTION



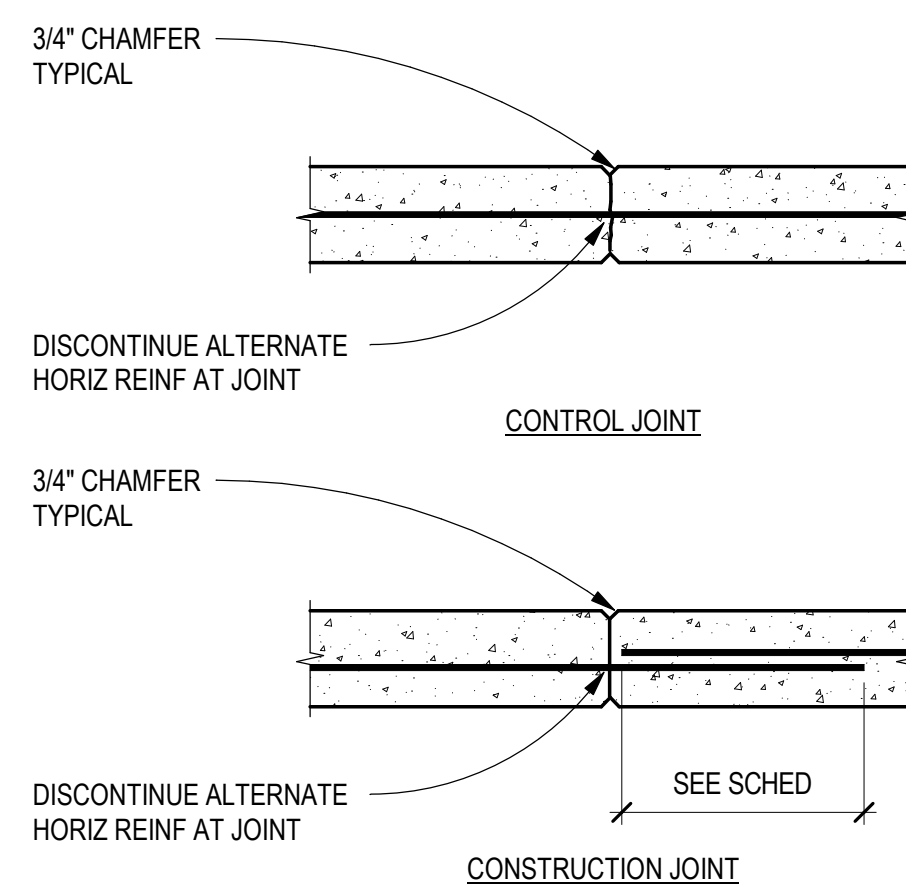
WALL CORNER

NOTE: REINFORCING SHOWN ON FOUNDATION SECTIONS AND SPECIFICALLY REFERENCED DETAILS SHALL TAKE GOVERN OVER REINFORCING IN STANDARD DETAILS.

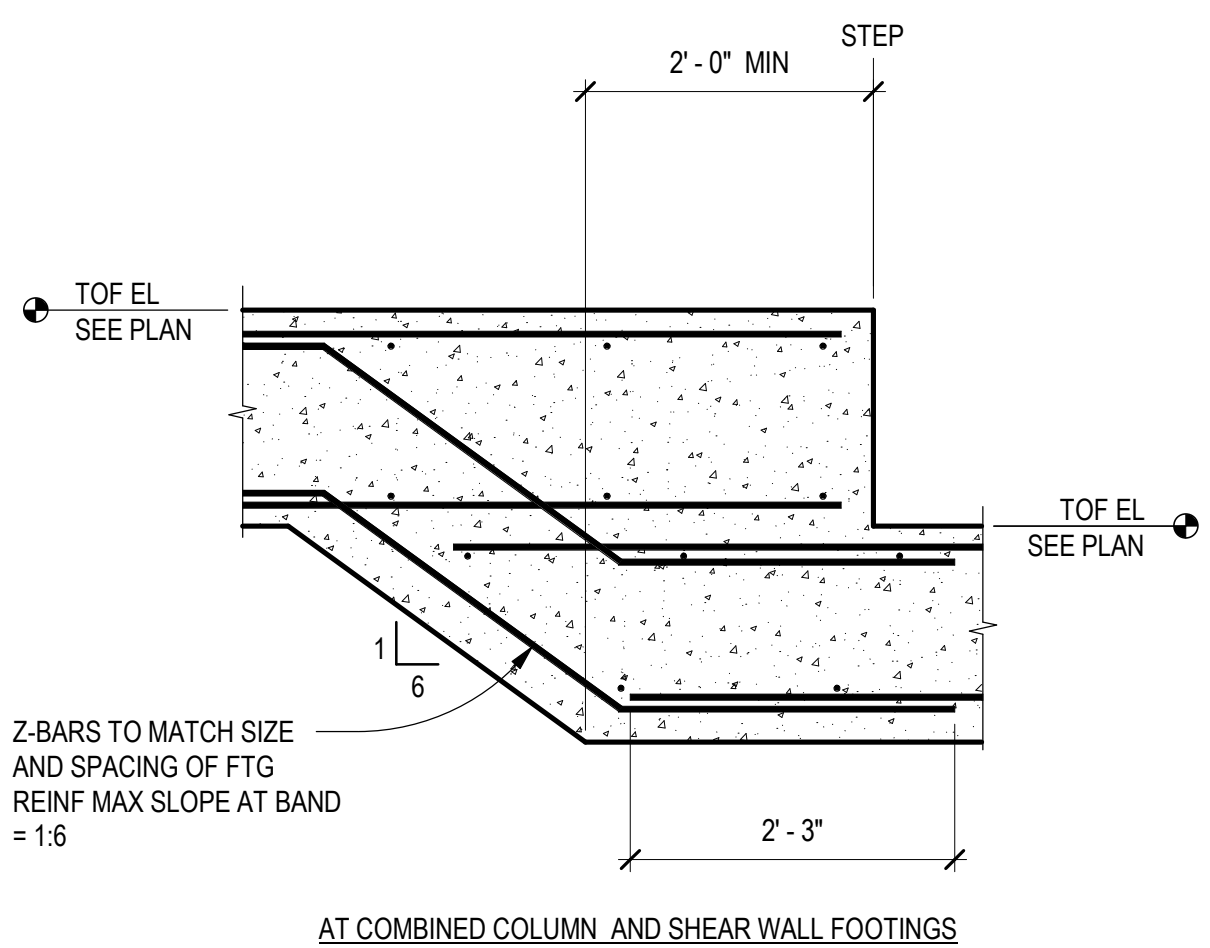
**A4** TYPICAL SINGLE MAT WALL REINF  
SCALE: NTS



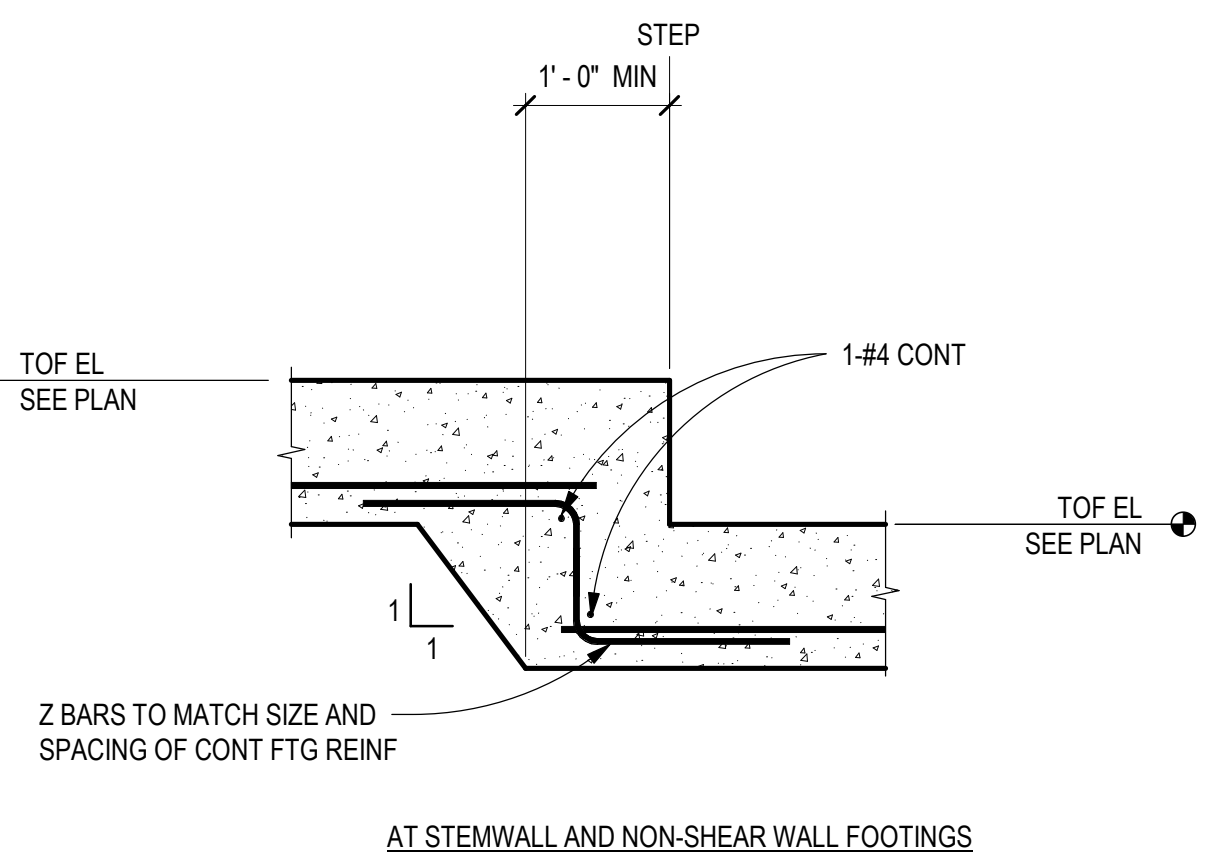
**B3** TYPICAL VENEER TO CONC WALL  
SCALE: NTS



**A3** TYPICAL WALL JOINT DETAIL  
SCALE: NTS



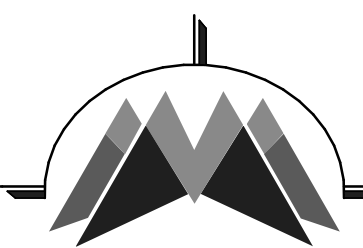
AT COMBINED COLUMN AND SHEAR WALL FOOTINGS



**A2** TYPICAL STEPPED FOOTING DETAIL  
SCALE: NTS



DYRON MURPHY ARCHITECTS, P.C.



4505 Montbel Place NE, Albuquerque, New Mexico 87107

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M97193	THF	DF
RVT FILE C:\Revit Projects\NTU Environmental Chinle Lab_R22_STRUCT_Itigue.rvt		

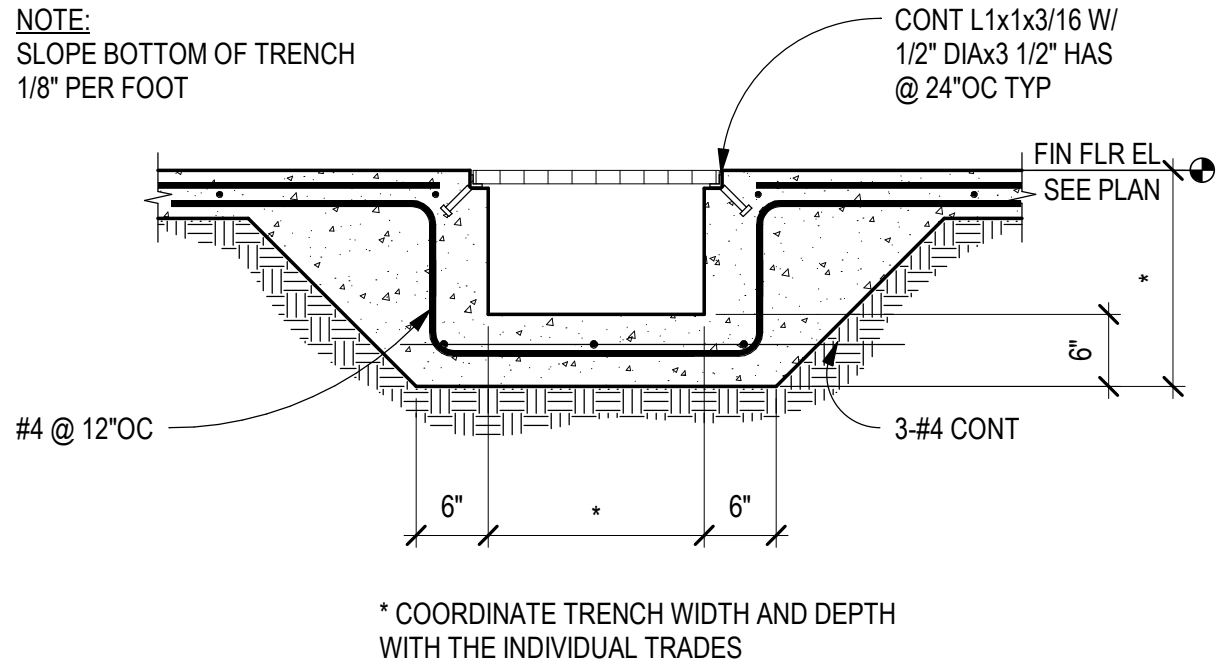
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**S-701**

Sequence of

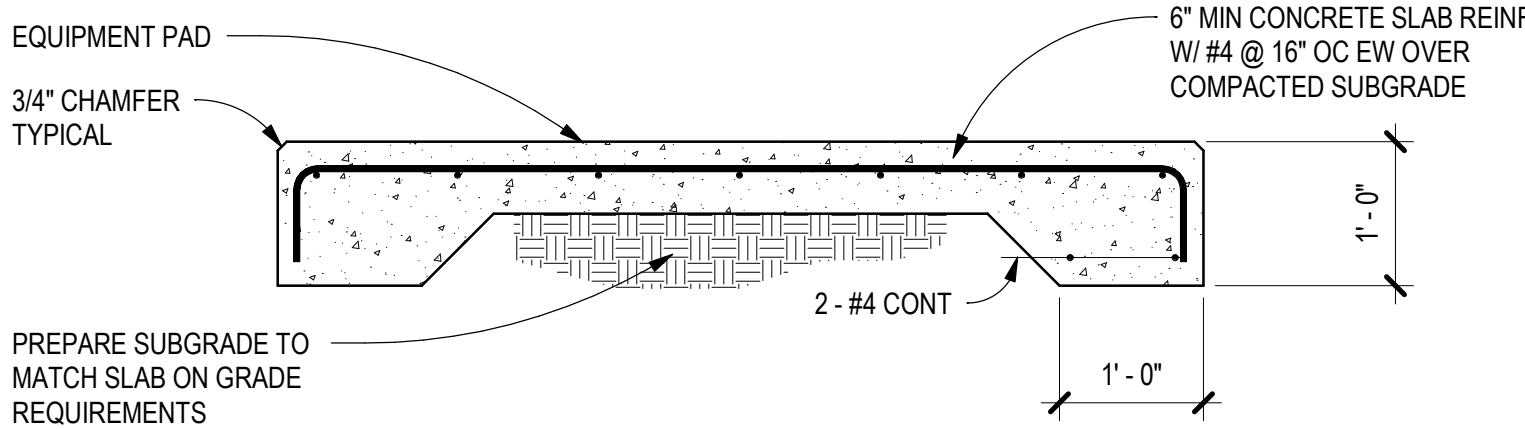
TYPICAL CONCRETE  
DETAILS



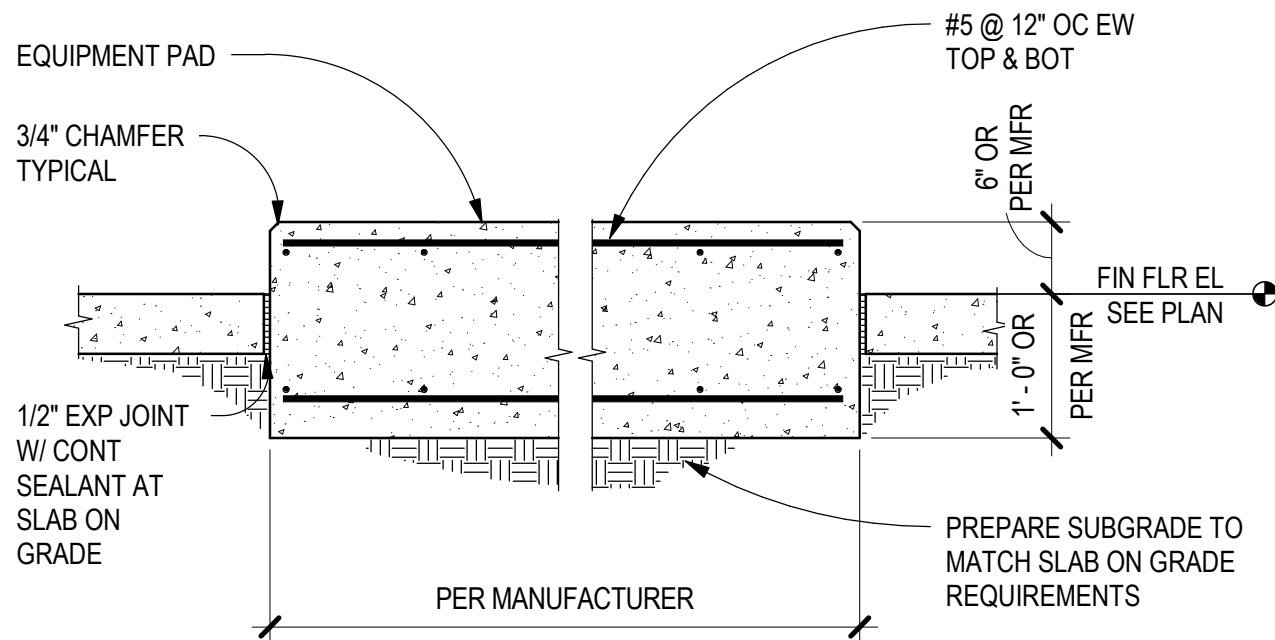


**E2** TYPICAL TRENCH SECTION  
SCALE: 3/4" = 1'-0"

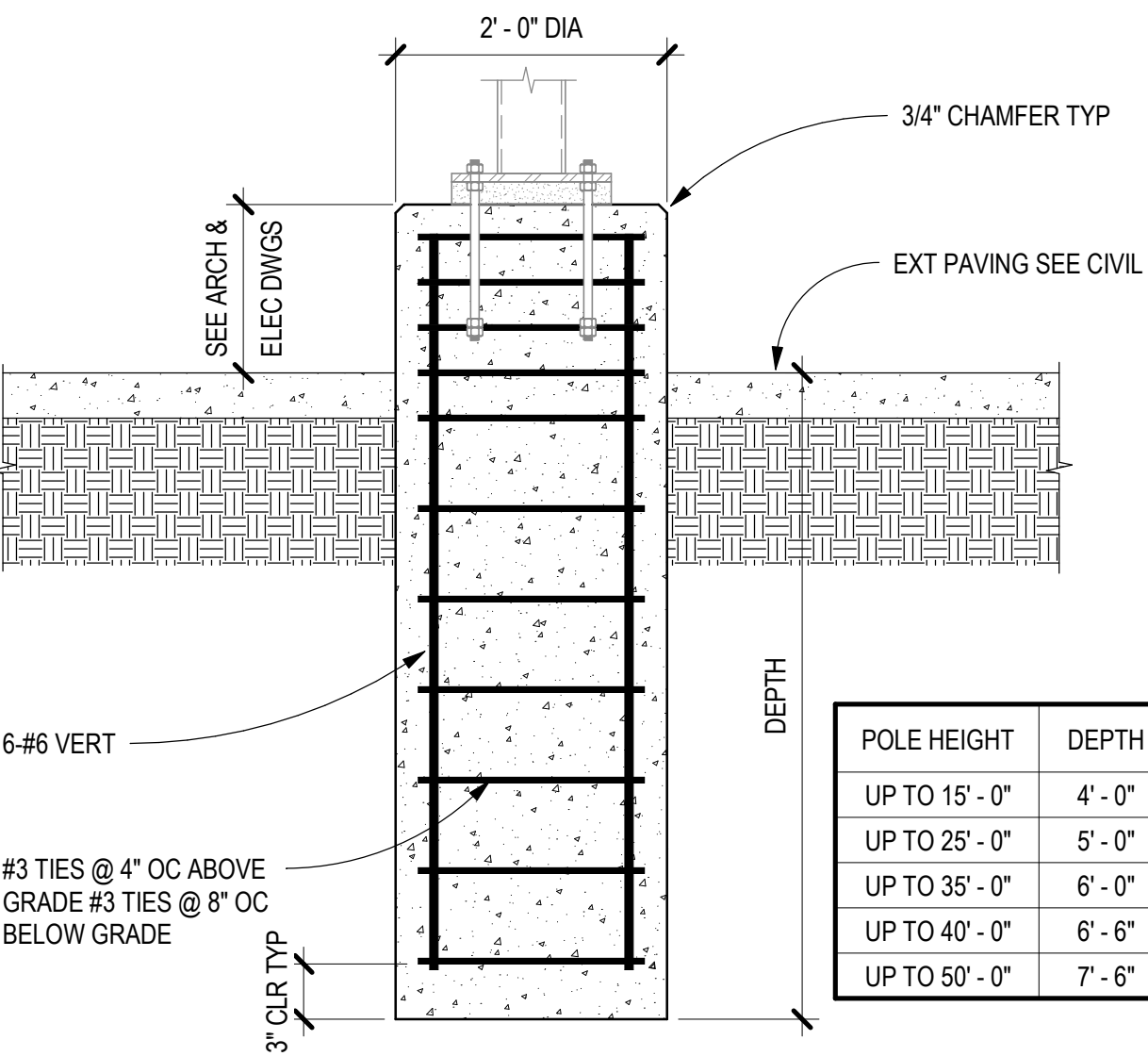
- NOTES:
1. SEE CIVIL, ARCHITECTURAL, AND MEP DRAWINGS FOR LOCATION AND SIZES OF EXTERIOR EQUIPMENT PADS.
  2. PREPARE SLAB SUBGRADES TO SEE CIVIL.
  3. SLAB CONTROL JOINTS TO MATCH INTERIOR SLAB CONTROL JOINT REQUIREMENTS.
  4. CONTRACTOR TO COORDINATE EQUIPMENT ATTACHMENT WITH MANUFACTURER.
  5. CONTRACTOR TO COORDINATE THICKNESS OF SLAB WITH THE MANUFACTURER.



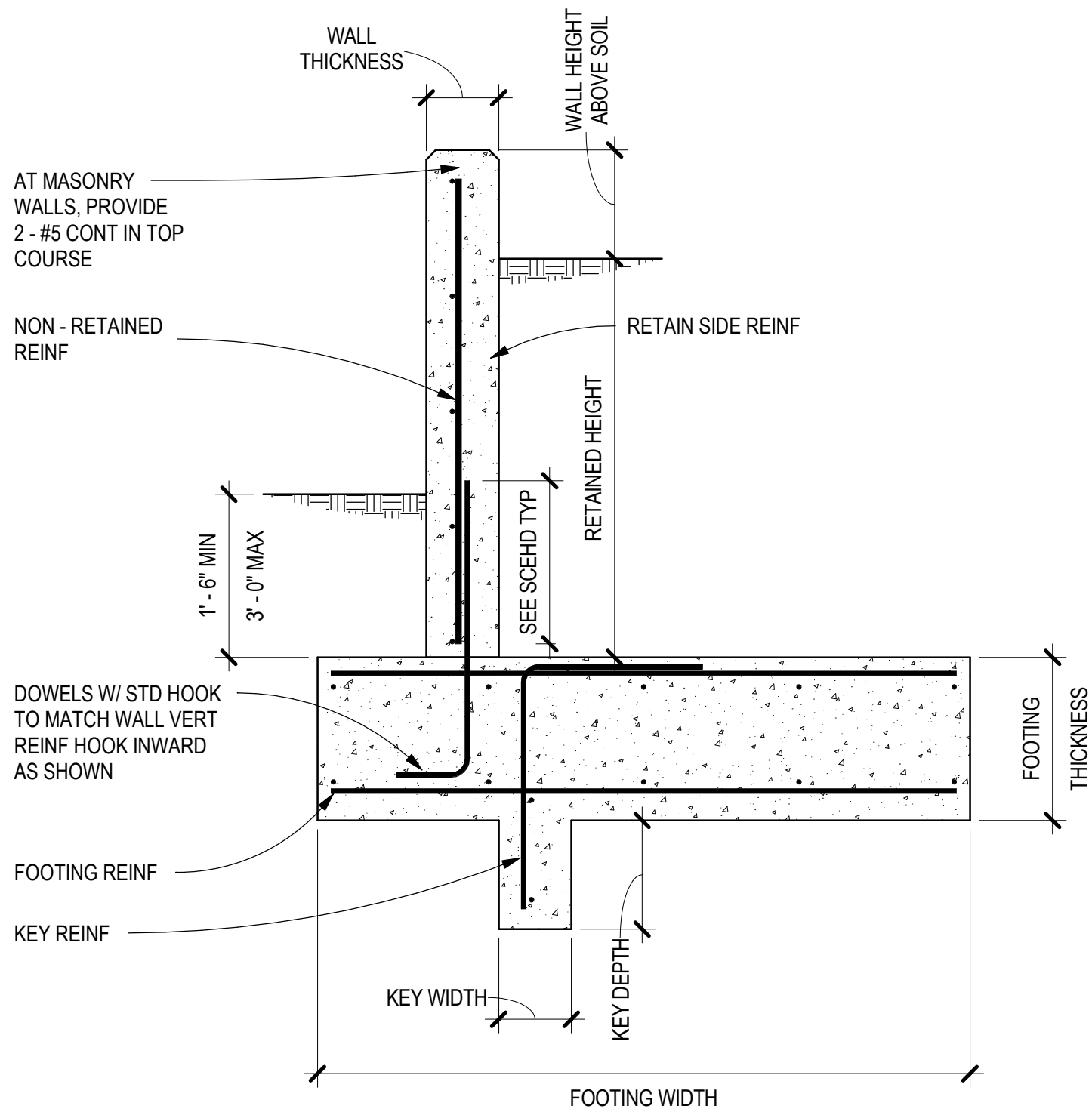
**C2** ISOLATED EQUIPMENT PAD  
SCALE: 3/4" = 1'-0"



**B2** INT ISOLATED EQUIPMENT PAD  
SCALE: 3/4" = 1'-0"



**A2** LIGHT/ FLAG POLE BASE DETAIL  
SCALE: 3/4" = 1'-0"

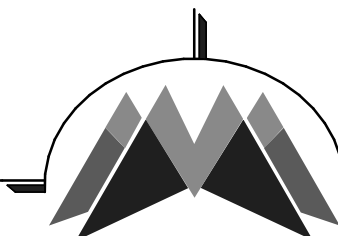


RETAINED HEIGHT	WALL MATERIAL	MAX WALL HEIGHT ABOVE SOIL	WALL THICKNESS	VERTICAL RETAIN SIDE REINFORCING	VERTICAL NON- RETAIN SIDE REINFORCING	HORIZONTAL REINFORCEMENT	FOOTING WIDTH	FOOTING THICKNESS	TOE WIDTH	FOOTING THICKNESS	FOOTING REINFORCING	KEY DEPTH	KEY WIDTH	KEY REINFORCING
UP TO 3'-0"	MASONRY	6'-0"	0'-8"	#4 @ 16" OC (CENTERED IN WALL)	NONE	2-#5 @ 48" OC	3'-6"	1'-6"	1'-5"	1'-6"	4-#4 CONT TOP & BOT & #4 @ 18" OC TRANS TOP & BOT	NONE	NONE	NONE
UP TO 3'-0"	CONCRETE	6'-0"	0'-8"	#5 @ 12" OC (CENTERED IN WALL)	NONE	#4 @ 12" OC	3'-6"	1'-6"	1'-5"	1'-6"	4-#4 CONT TOP & BOT & #4 @ 18" OC TRANS TOP & BOT	NONE	NONE	NONE

**A4** SITE WALL DETAIL  
SCALE: 3/4" = 1'-0"



DYRON MURPHY ARCHITECTS, P.C.



4505 Montbel Place NE, Albuquerque, New Mexico 87107

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RVT FILE  
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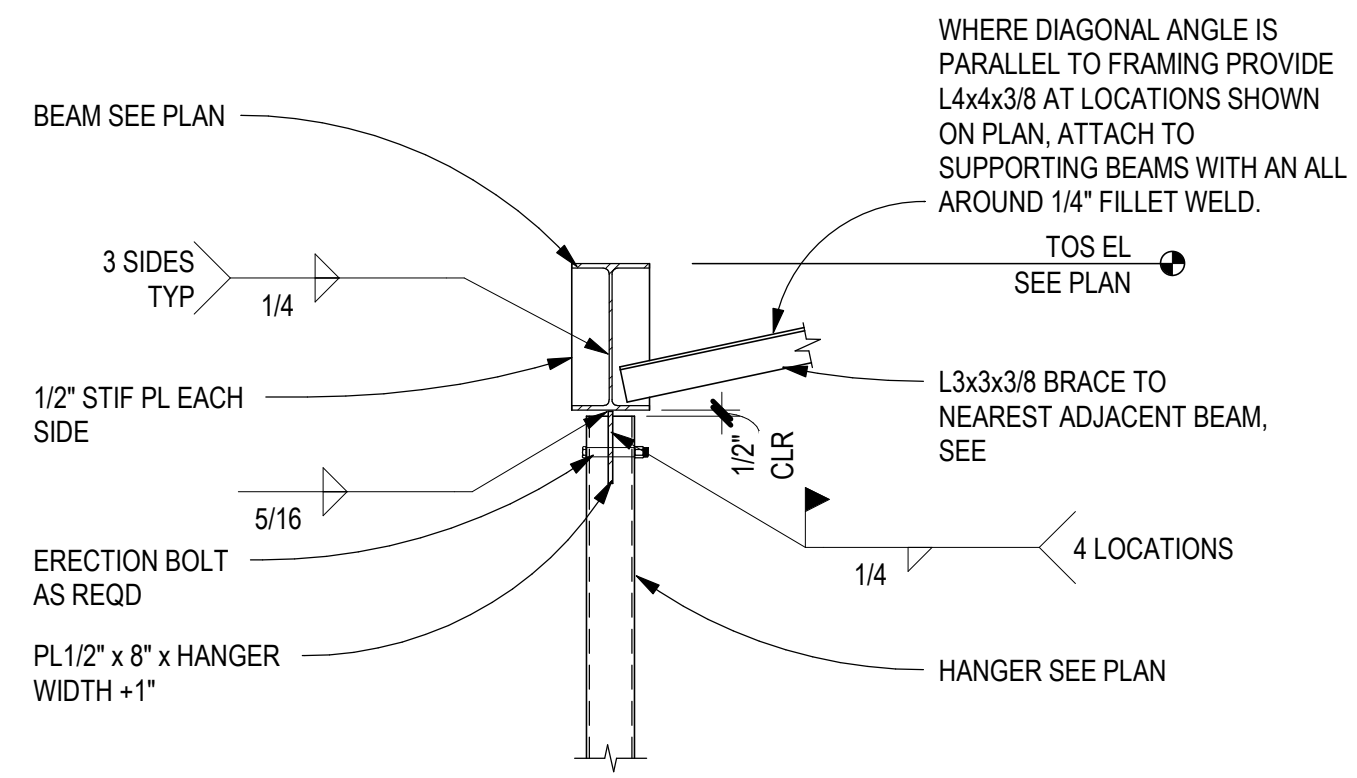
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TYPICAL CONCRETE  
DETAILS

Sheet Number

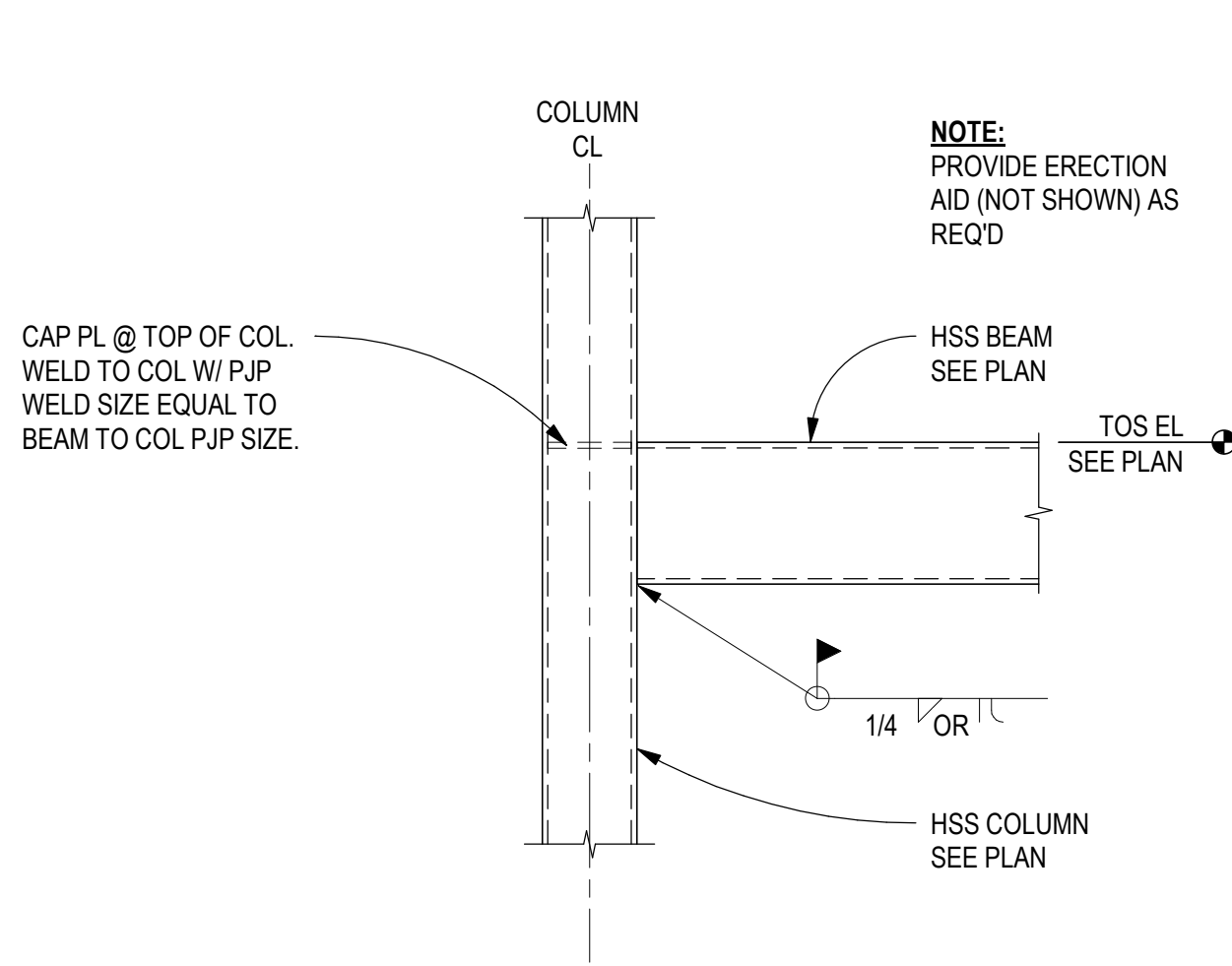
S-702

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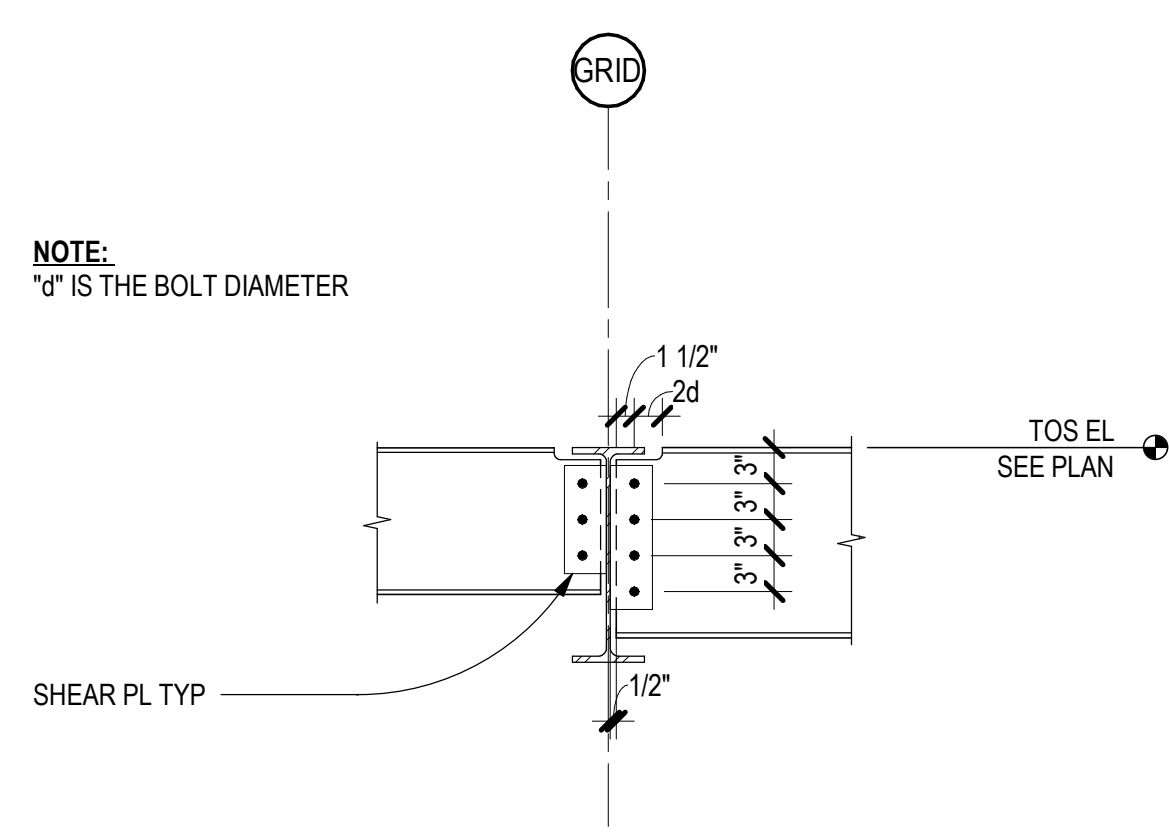




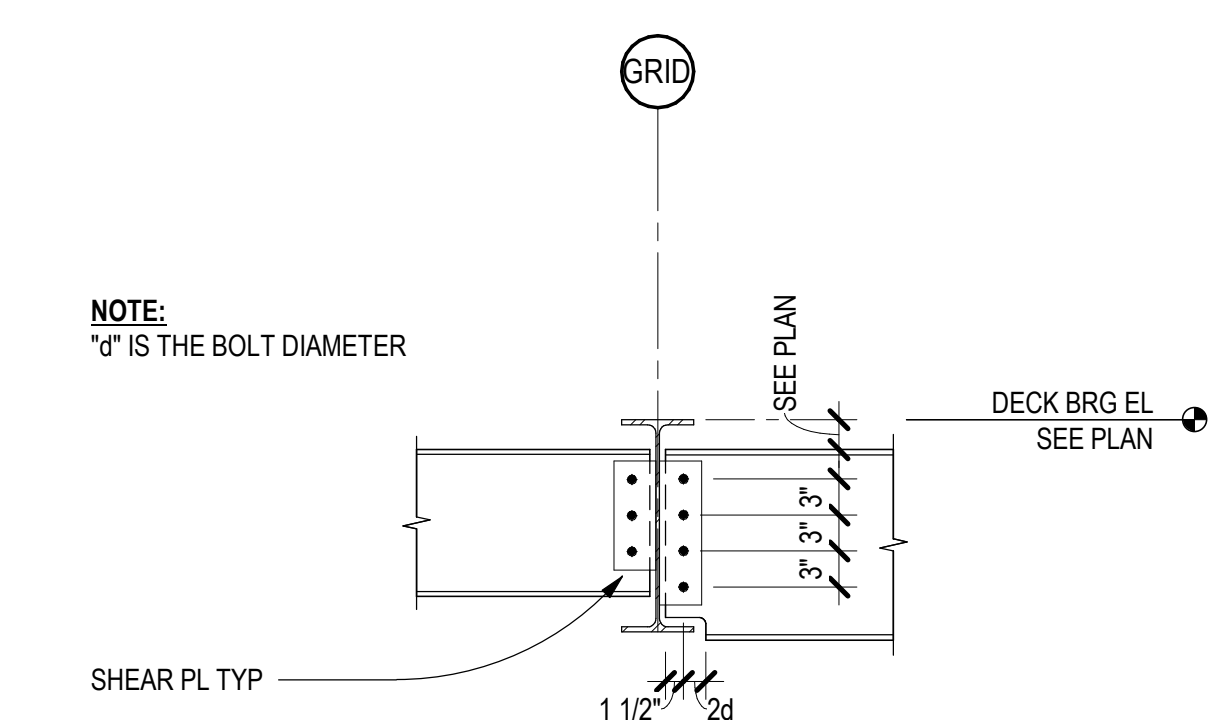
**D5 HSS HANGER TO BEAM**  
SCALE: 3/4" = 1'-0"



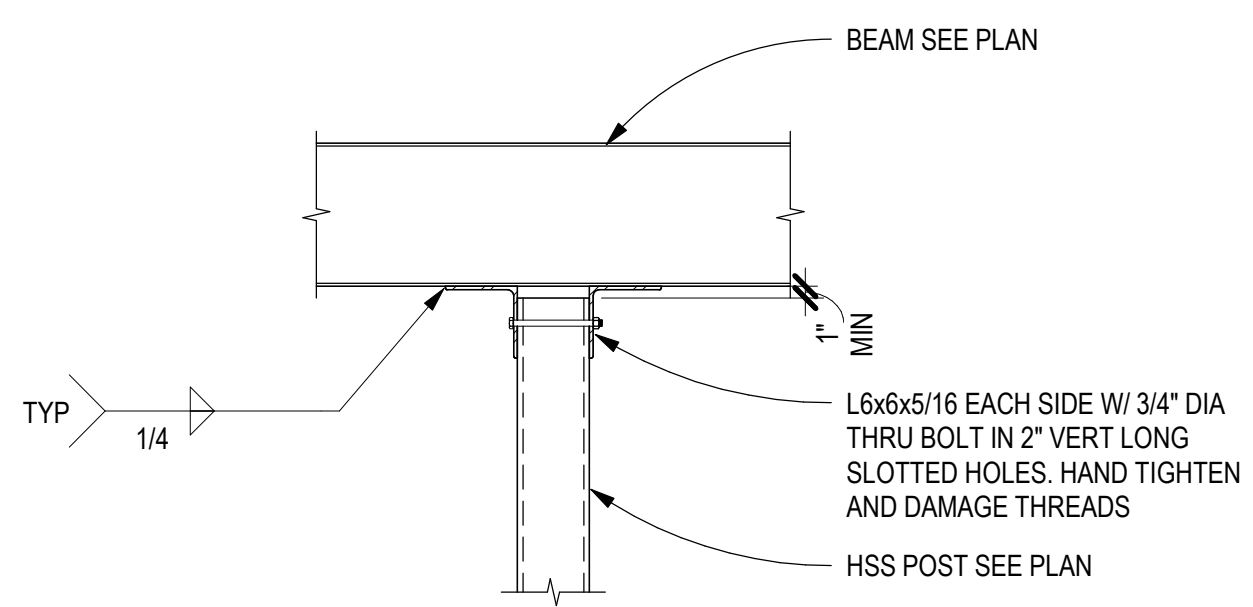
**D4 HSS BEAM TO HSS COLUMN**  
SCALE: 3/4" = 1'-0"



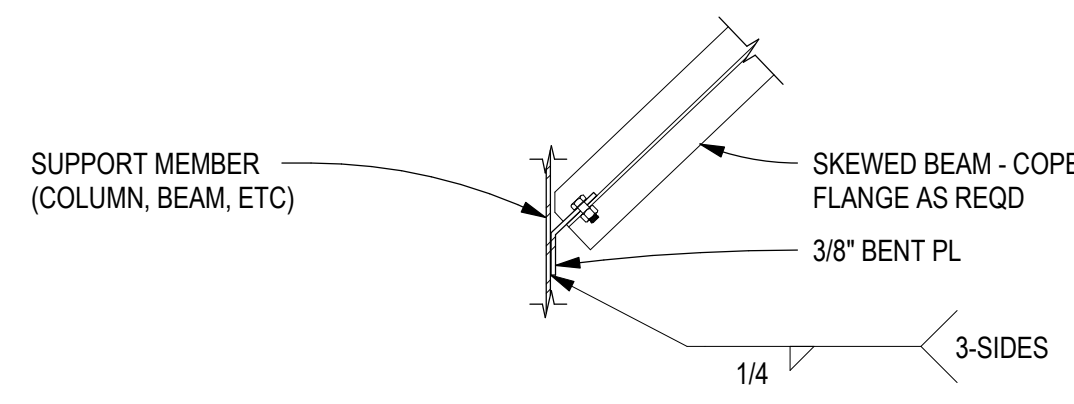
**D3 BEAM TO GIRDER CONN - SIMPLE**  
SCALE: 3/4" = 1'-0"



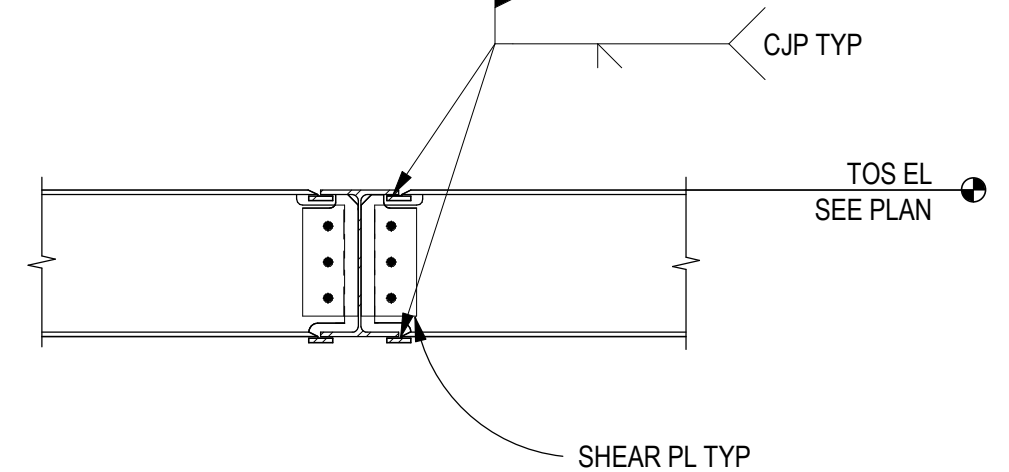
**D2 BEAM TO BEAM CONNECTION**  
SCALE: 3/4" = 1'-0"



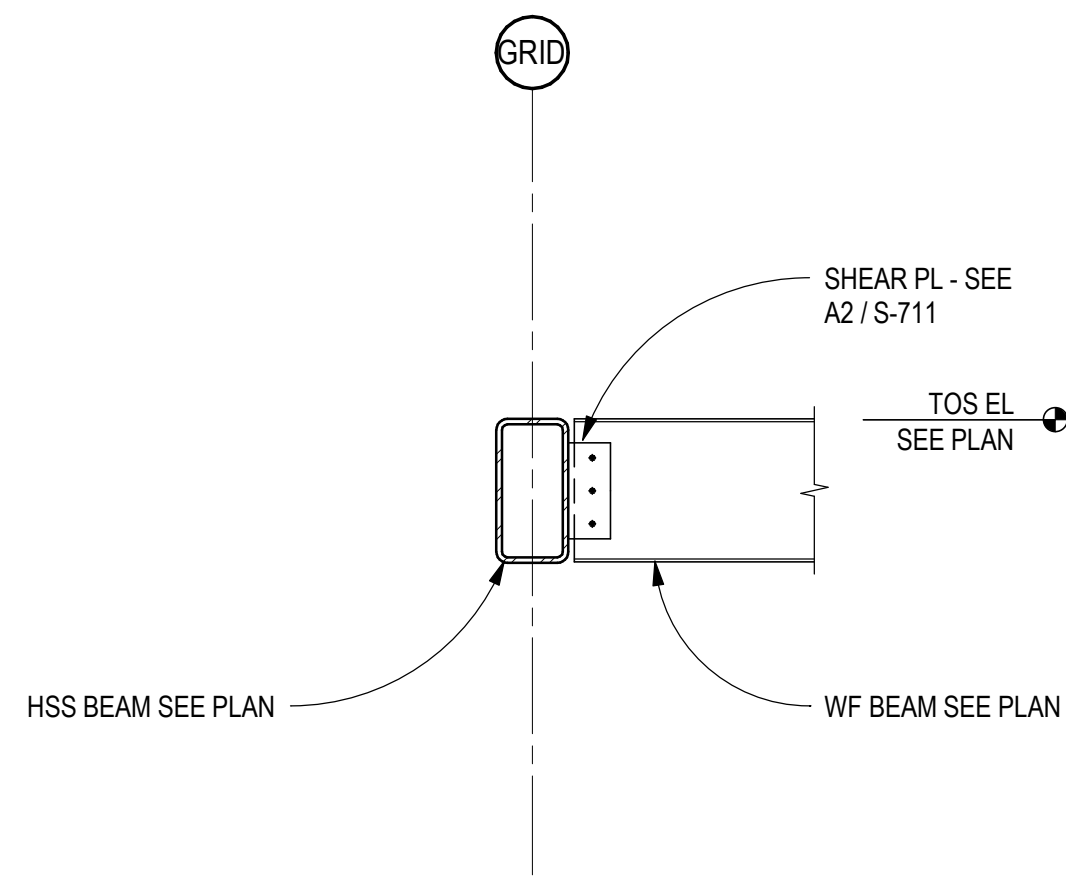
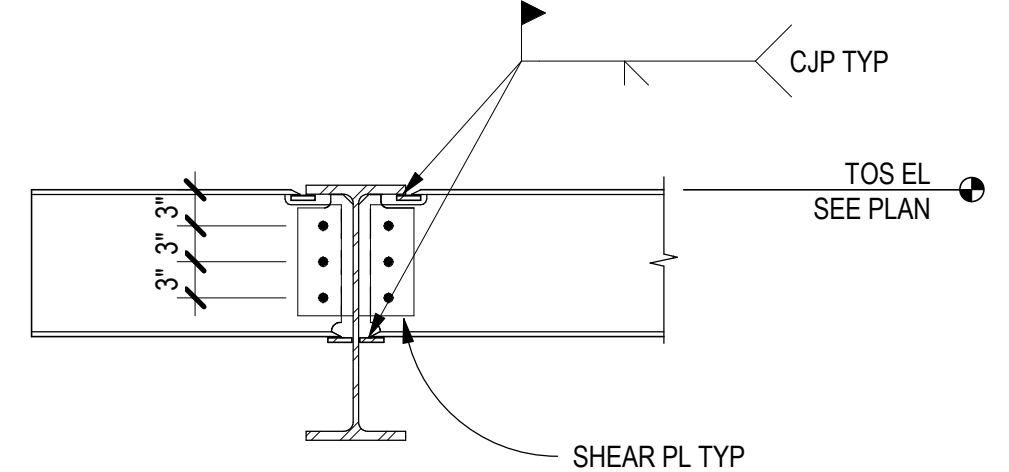
**C5 HSS POST TO BEAM**  
SCALE: 3/4" = 1'-0"



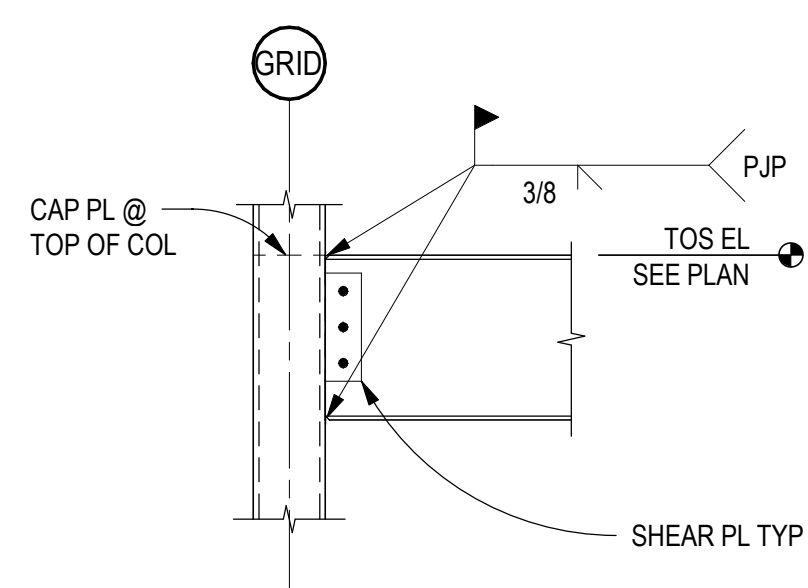
**C4 SKEWED SHEAR PL - ALTERNATE**  
SCALE: 3/4" = 1'-0"



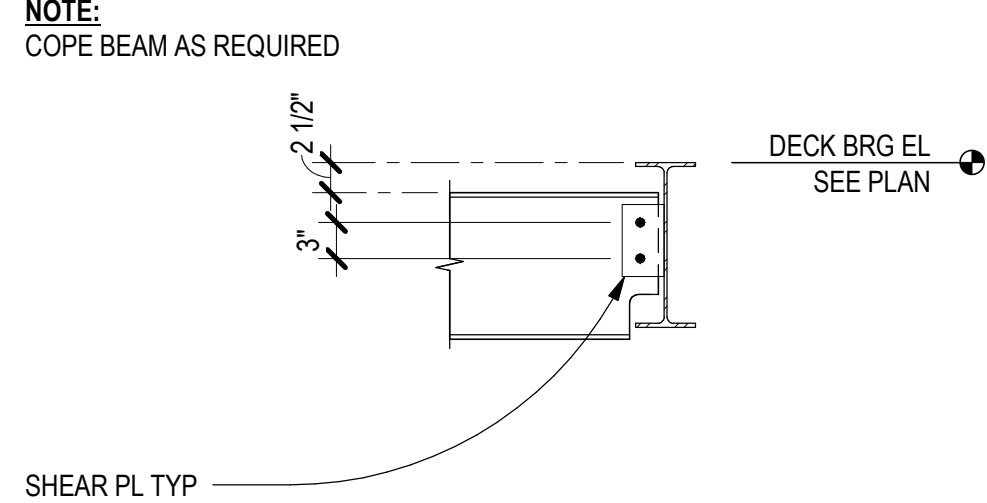
**C3 BEAM TO GIRDER - FIXED**  
SCALE: 3/4" = 1'-0"



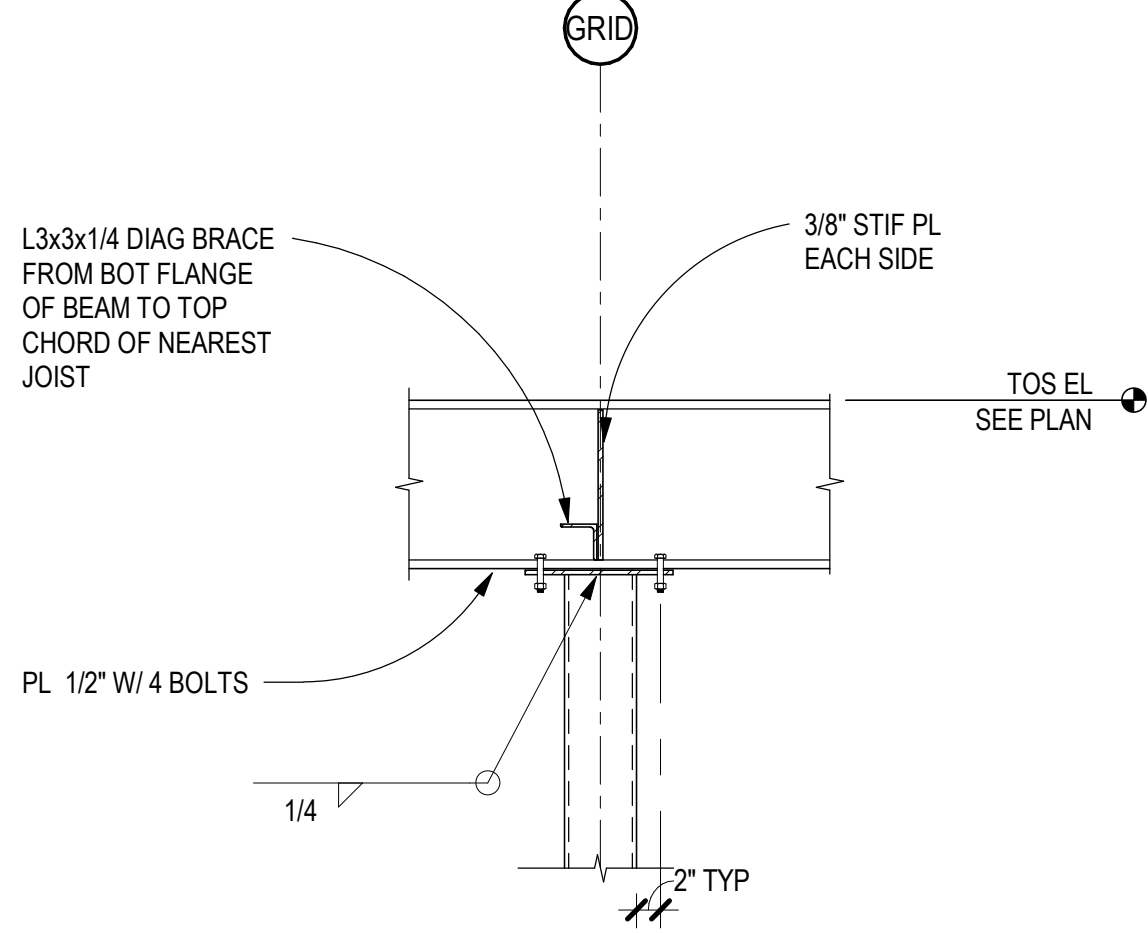
**B6 WF BEAM TO HSS GIRDER CONN**  
SCALE: 3/4" = 1'-0"



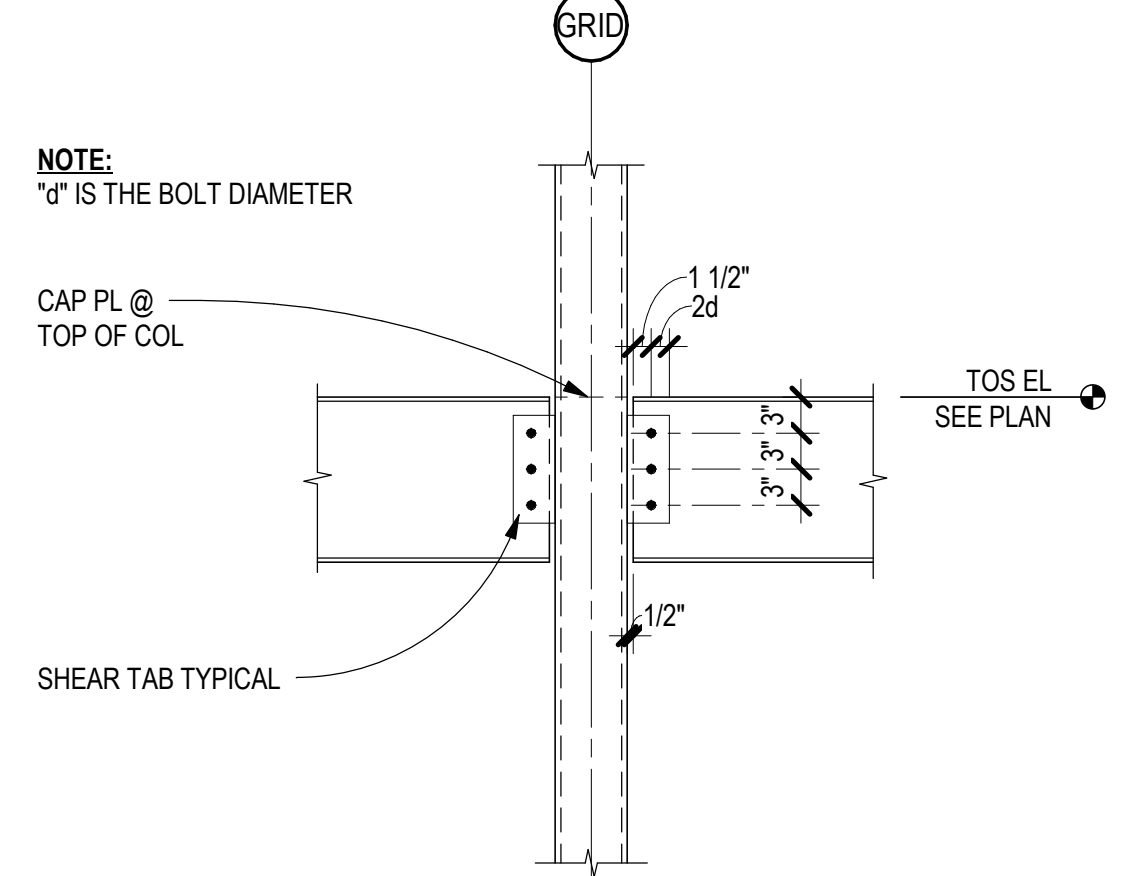
**B5 BEAM TO HSS COL - FIXED**  
SCALE: 3/4" = 1'-0"



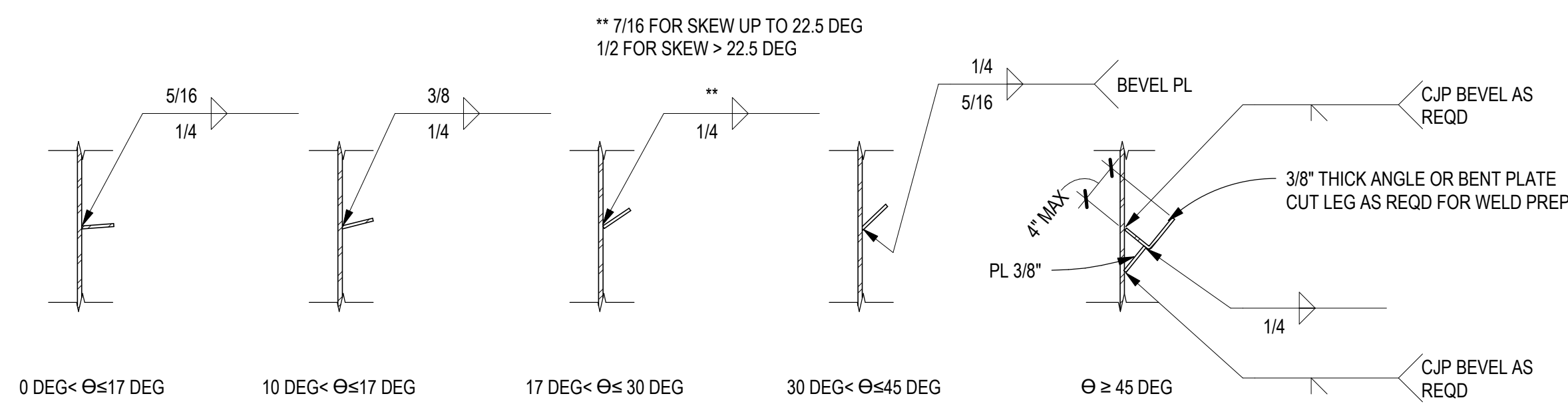
**B4 BEAM TO BEAM CONN**  
SCALE: 3/4" = 1'-0"



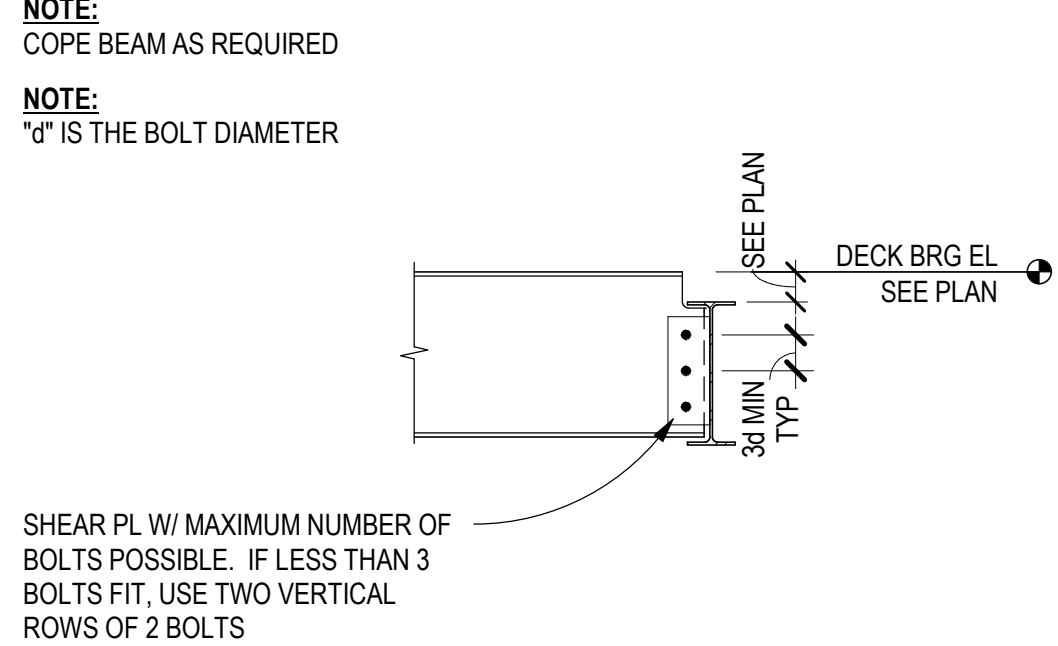
**B3 BEAM OVER HSS COLUMN CONN**  
SCALE: 3/4" = 1'-0"



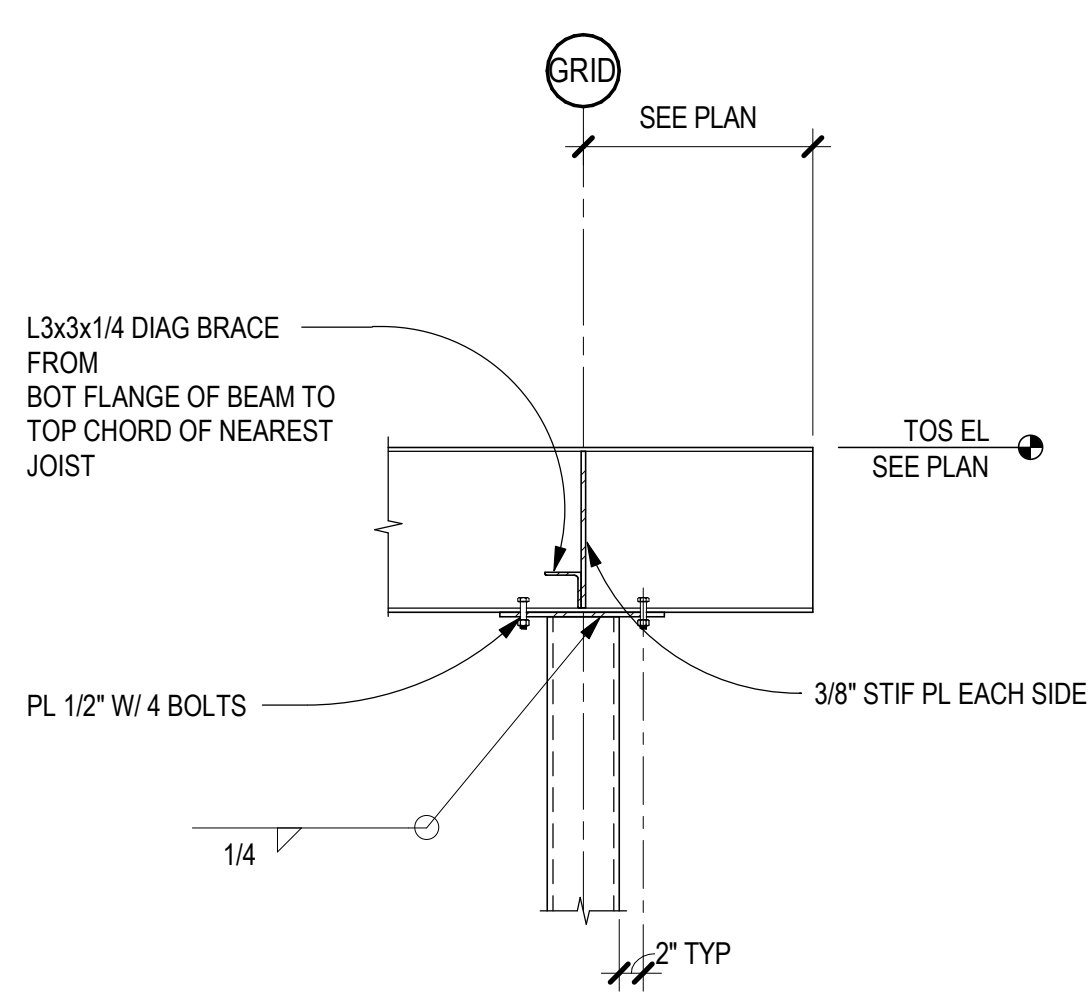
**B2 BM TO HSS COL - SIMPLE**  
SCALE: 3/4" = 1'-0"



**A6 SKEWED SHEAR PLATE CONN**  
SCALE: 3/4" = 1'-0"



**A4 HIGH BEAM TO GIRDER CONN**  
SCALE: 3/4" = 1'-0"

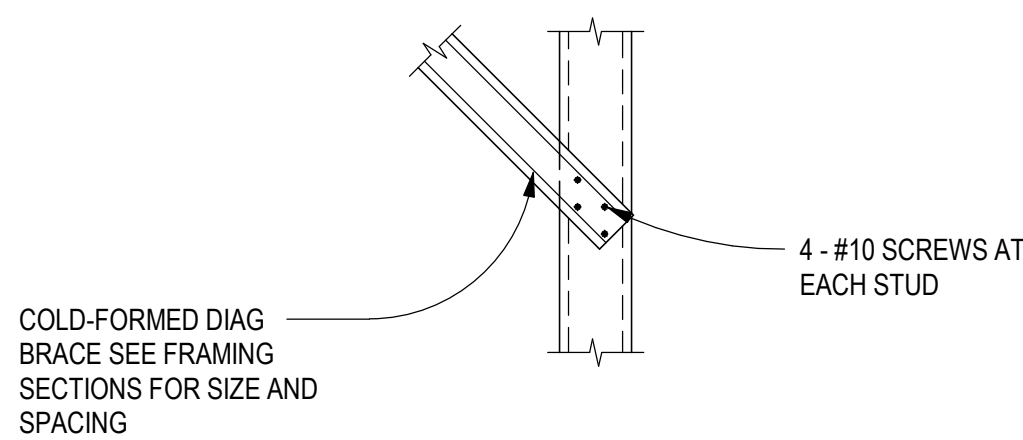


**A3 BEAM OVER COLUMN CONN**  
SCALE: 3/4" = 1'-0"

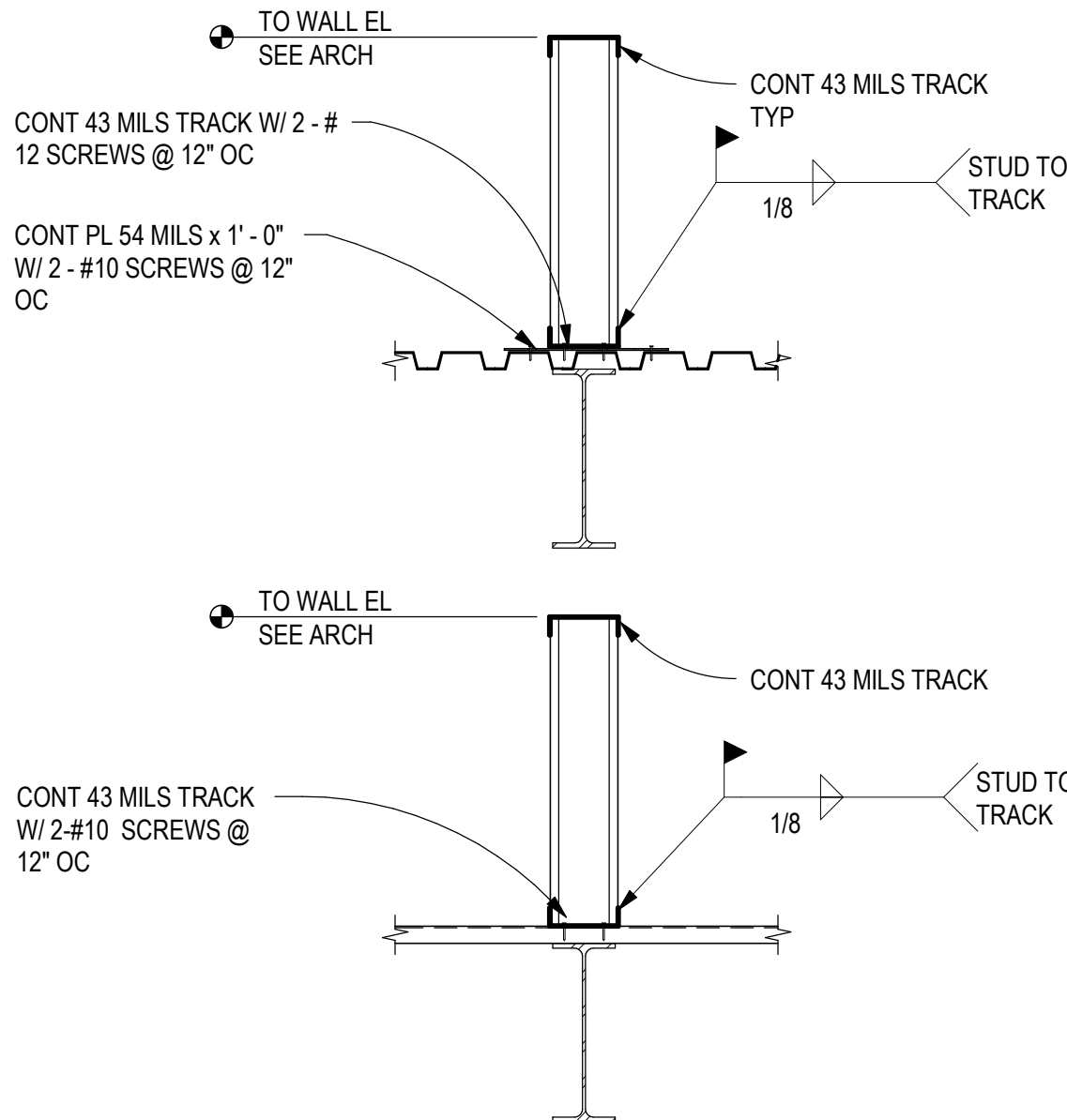
- ALL BOLTS SHALL BE A325N 3/4" DIA IN STANDARD HOLES UNLESS NOTED OTHERWISE.
- ALL SHEAR PLATES SHALL BE PL 5/16" WELDED TO THE SUPPORTING MEMBER WITH 1/4" FILLET WELDS ON BOTH SIDES UNLESS NOTED OTHERWISE.
- BOLT QUANTITIES FOR EACH CONNECTION SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:
  - 2 @ W8, W10
  - 3 @ W12, W14
  - 4 @ W16
  - 5 @ W18, W21
  - 6 @ W24
  - 7 @ W27
  - 8 @ W30
  - 9 @ W33
  - 10 @ W36
  - 11 @ W40
  - 12 @ W44
- PROVIDE 1/4" CAP PL AT TOP OF ALL HSS/PIPE COLUMNS AND 1/2" CAP PL @ TOP OF ALL WF COLUMNS UNO.
- PROVIDE 1/4" END PLATE AT ALL EXPOSED HSS MEMBERS UNO.
- DIMENSIONS SHOWN FOR SIMPLE CONNECTIONS APPLY TO SIMILAR CONNECTIONS UNO.

**A2 STEEL CONNECTION NOTES**  
SCALE: 12" = 1'-0"

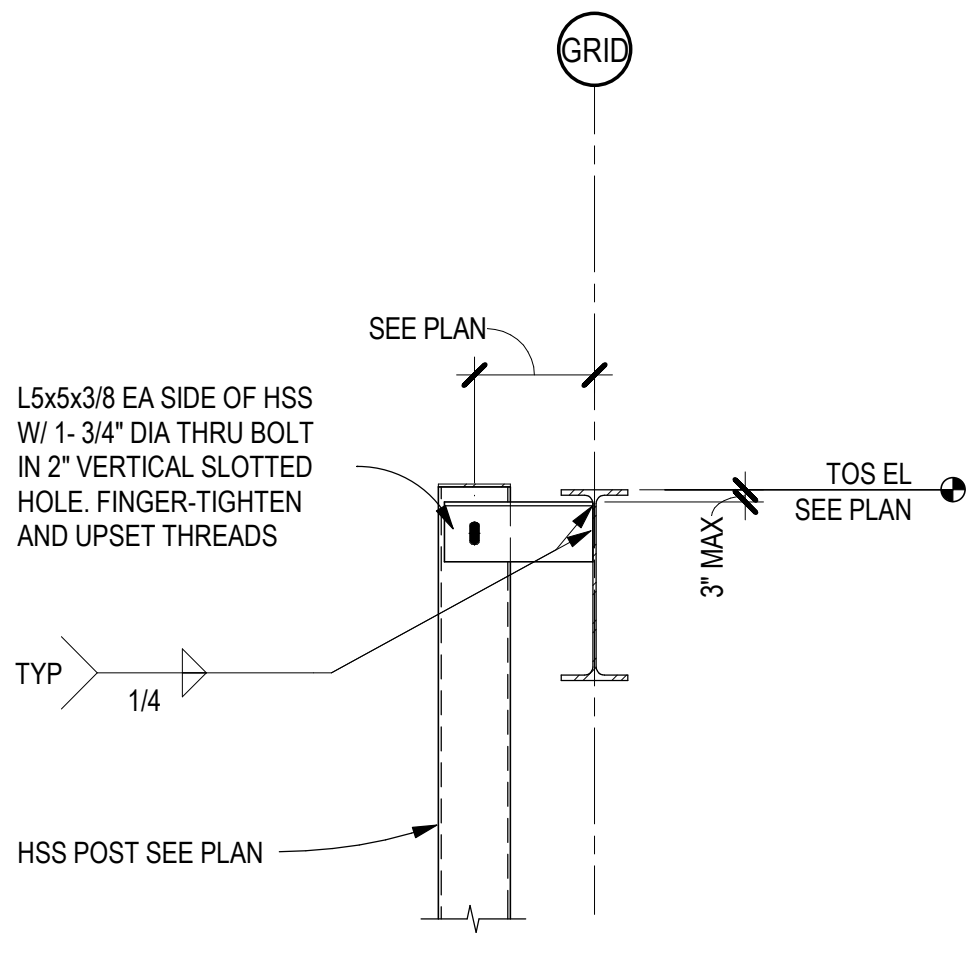




**D5** TYPICAL DIAG STUD LAP DETAIL  
SCALE: 3/4" = 1'-0"

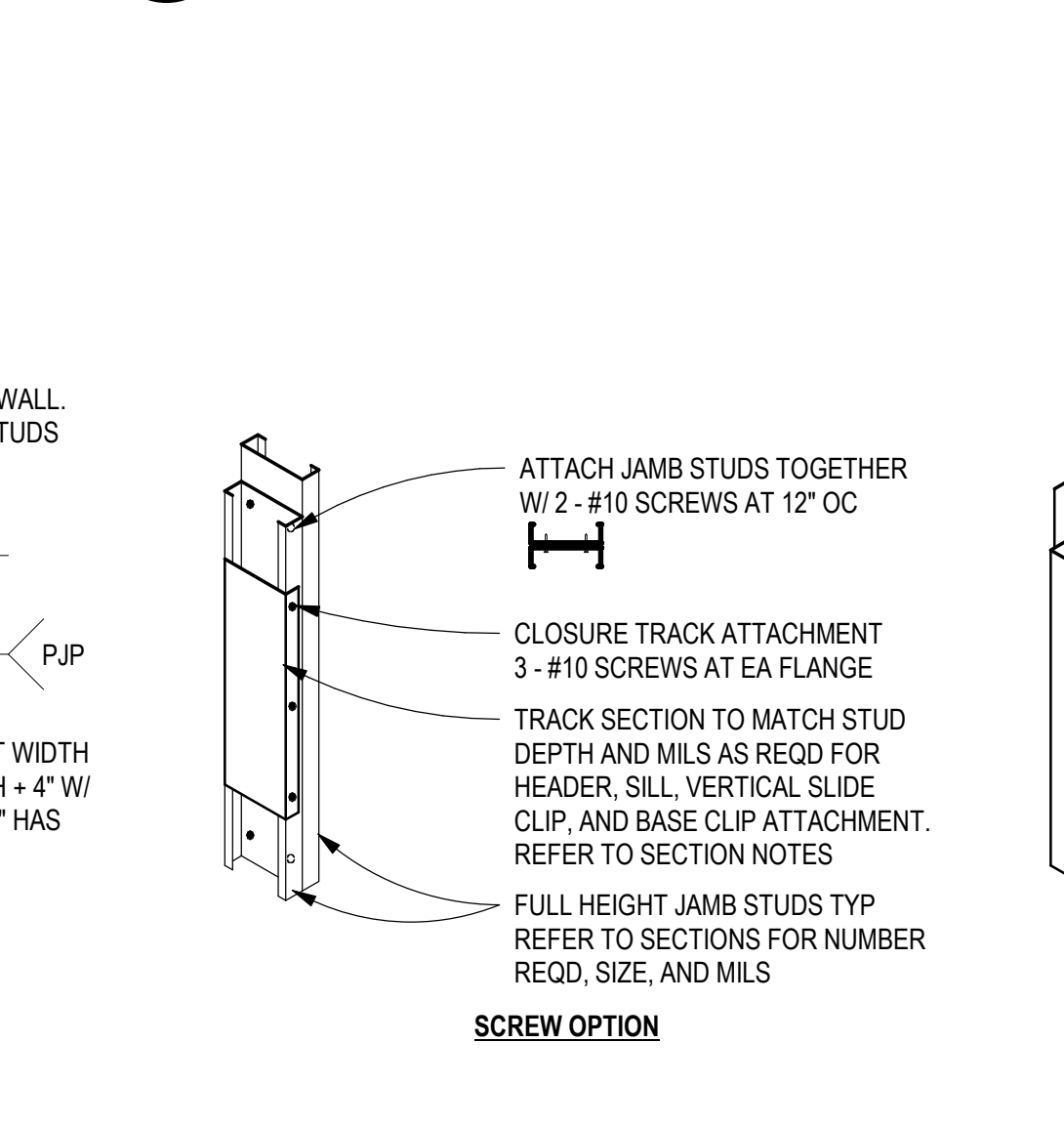


**C5** TYPICAL PARAPET TO DECK  
SCALE: 3/4" = 1'-0"



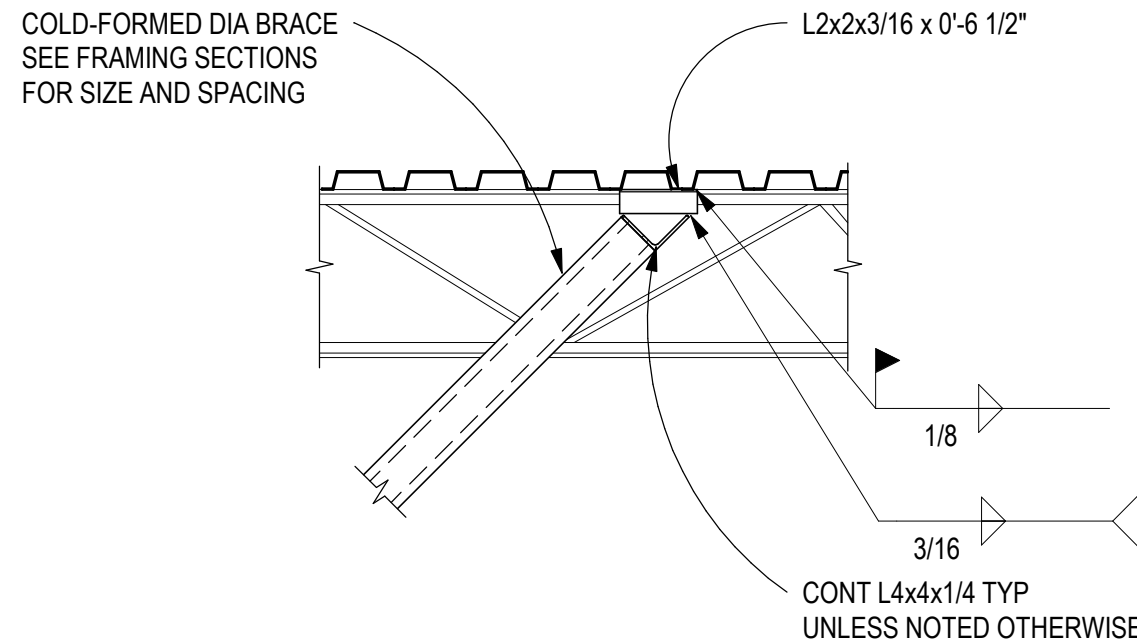
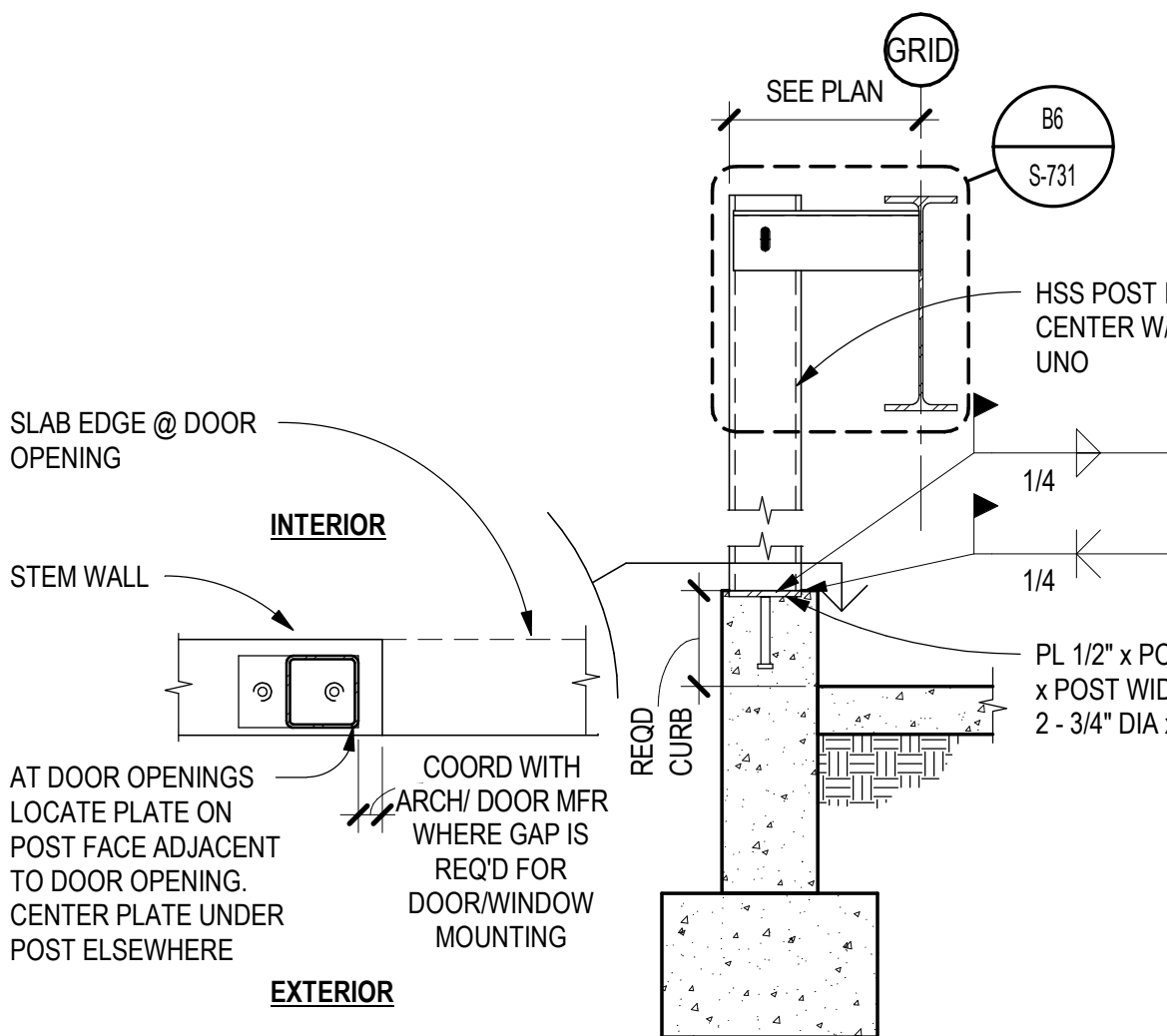
**B6** TYPICAL POST TO ROOF BEAM CONN  
SCALE: 3/4" = 1'-0"

**B5** TYPICAL STUD AT METAL DECK  
SCALE: 3/4" = 1'-0"

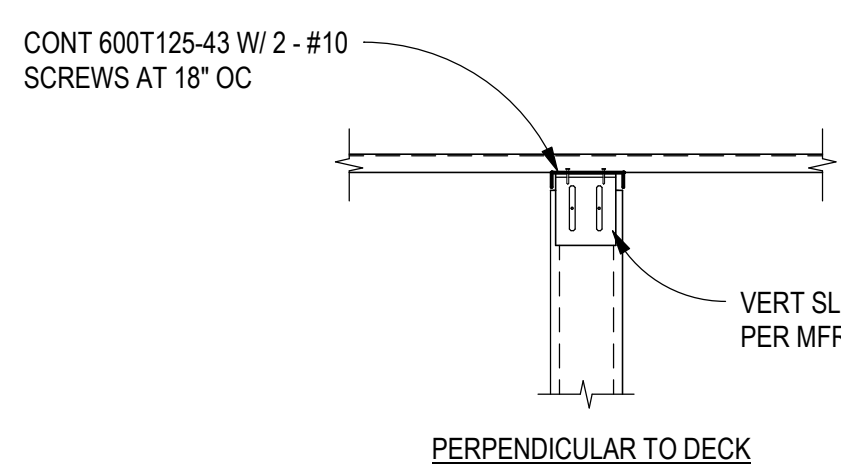


**A5** TYPICAL STUD JAMB ATTACHMENT DETAILS  
SCALE: NTS

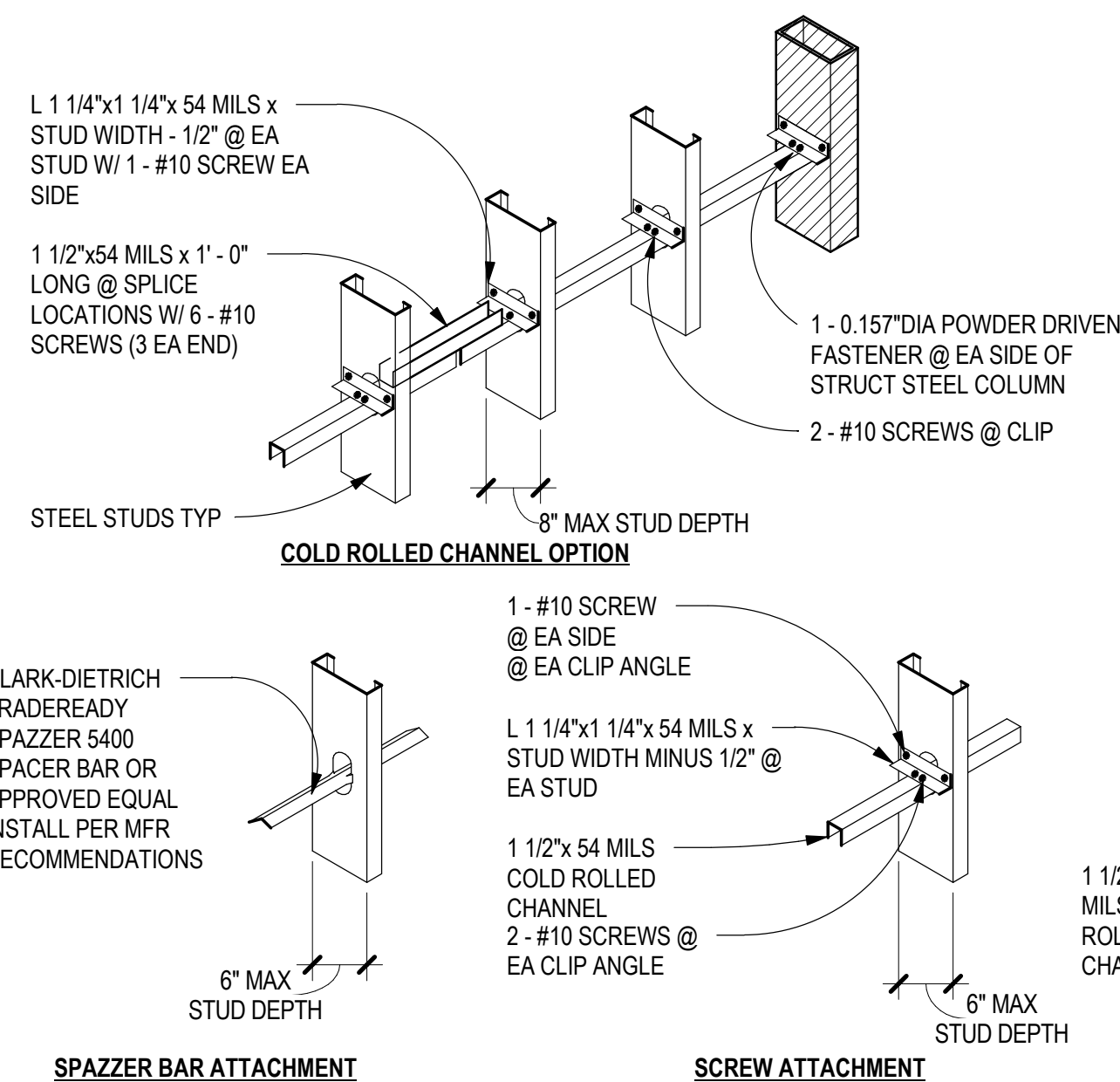
**A6** HSS POST IN EXTERIOR WALL DETAIL  
SCALE: 3/4" = 1'-0"



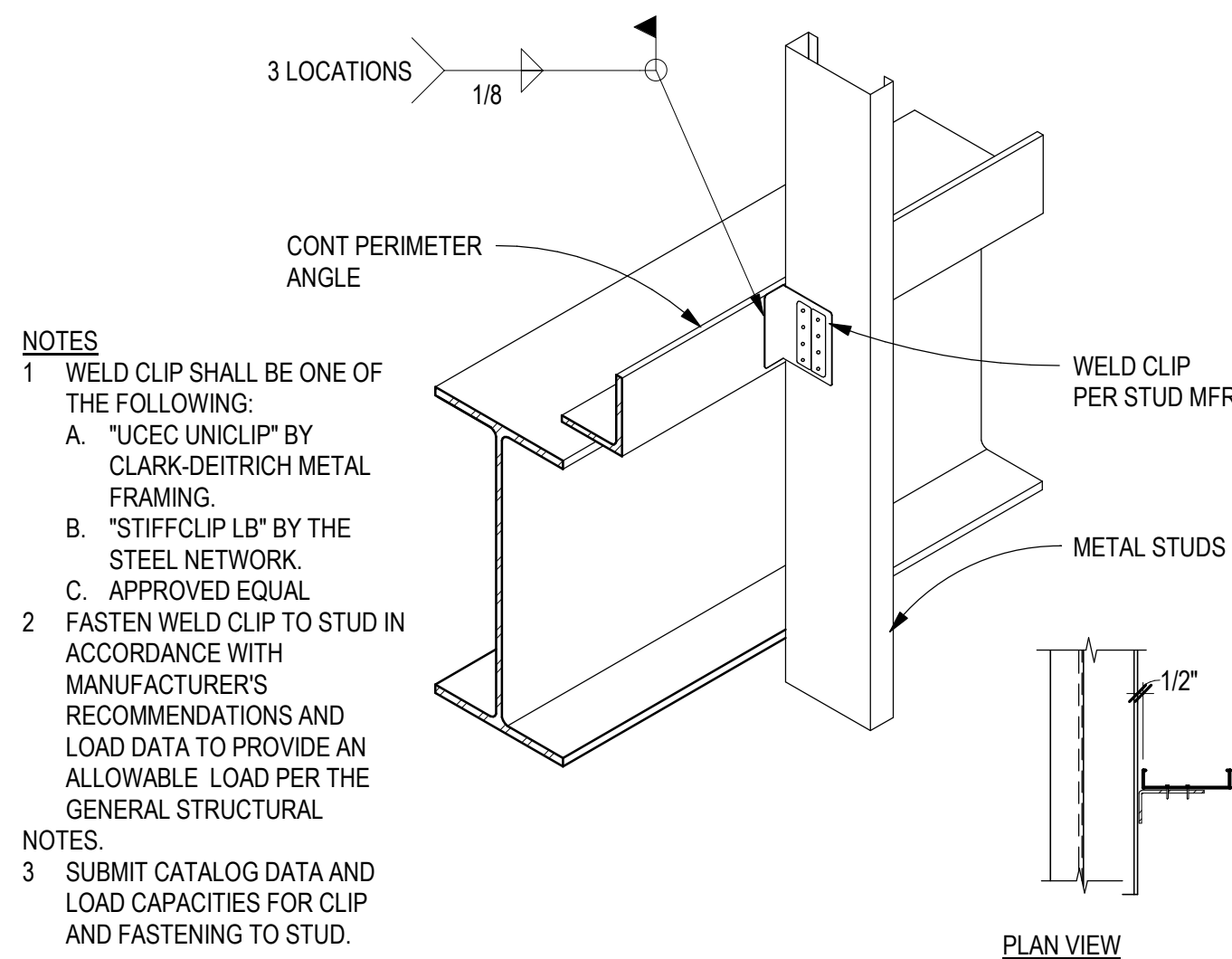
**D4** TYPICAL DIAG BRACE TO DECK  
SCALE: 3/4" = 1'-0"



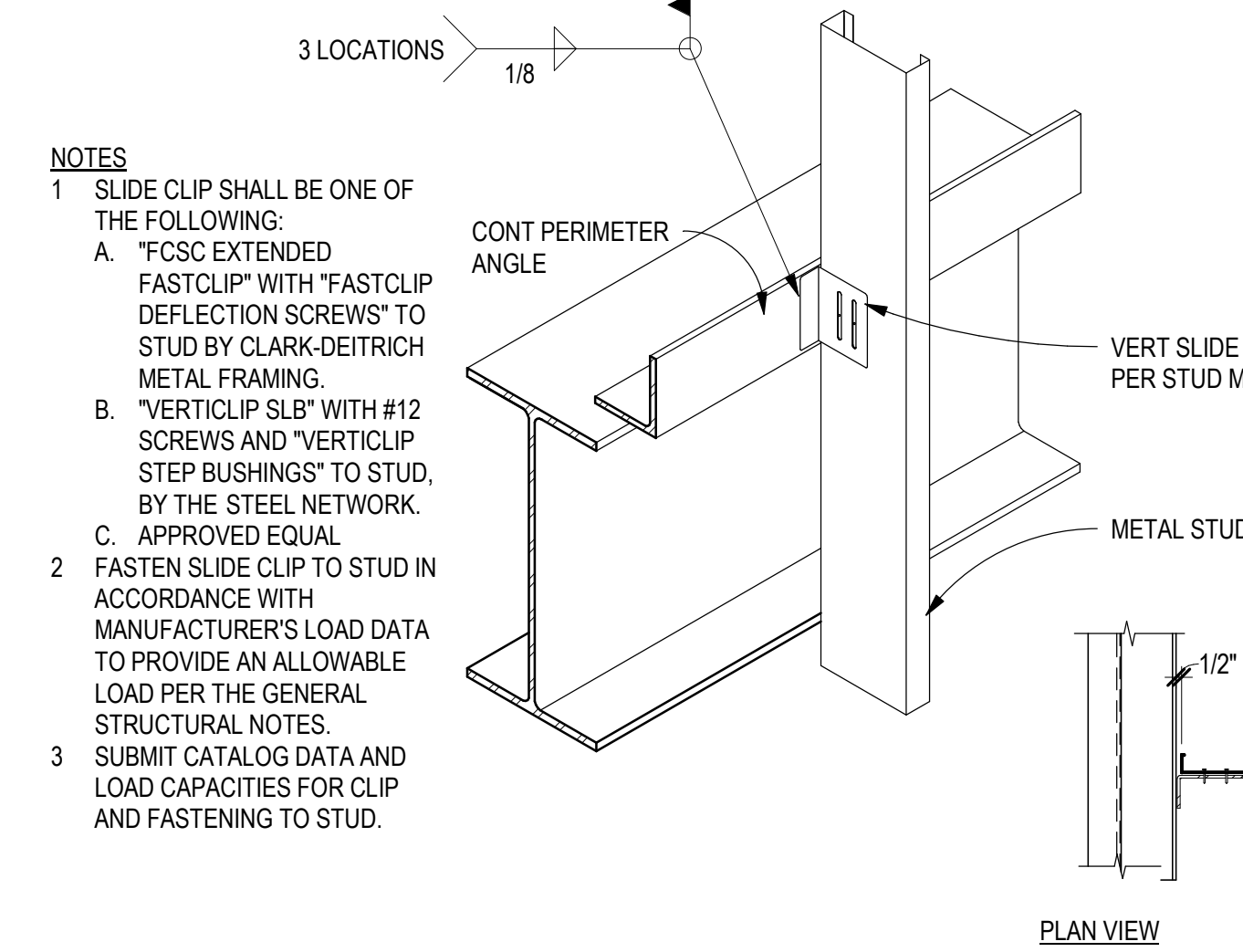
**C4** TYPICAL SLIP TRACK ASSEMBLY  
SCALE: NTS



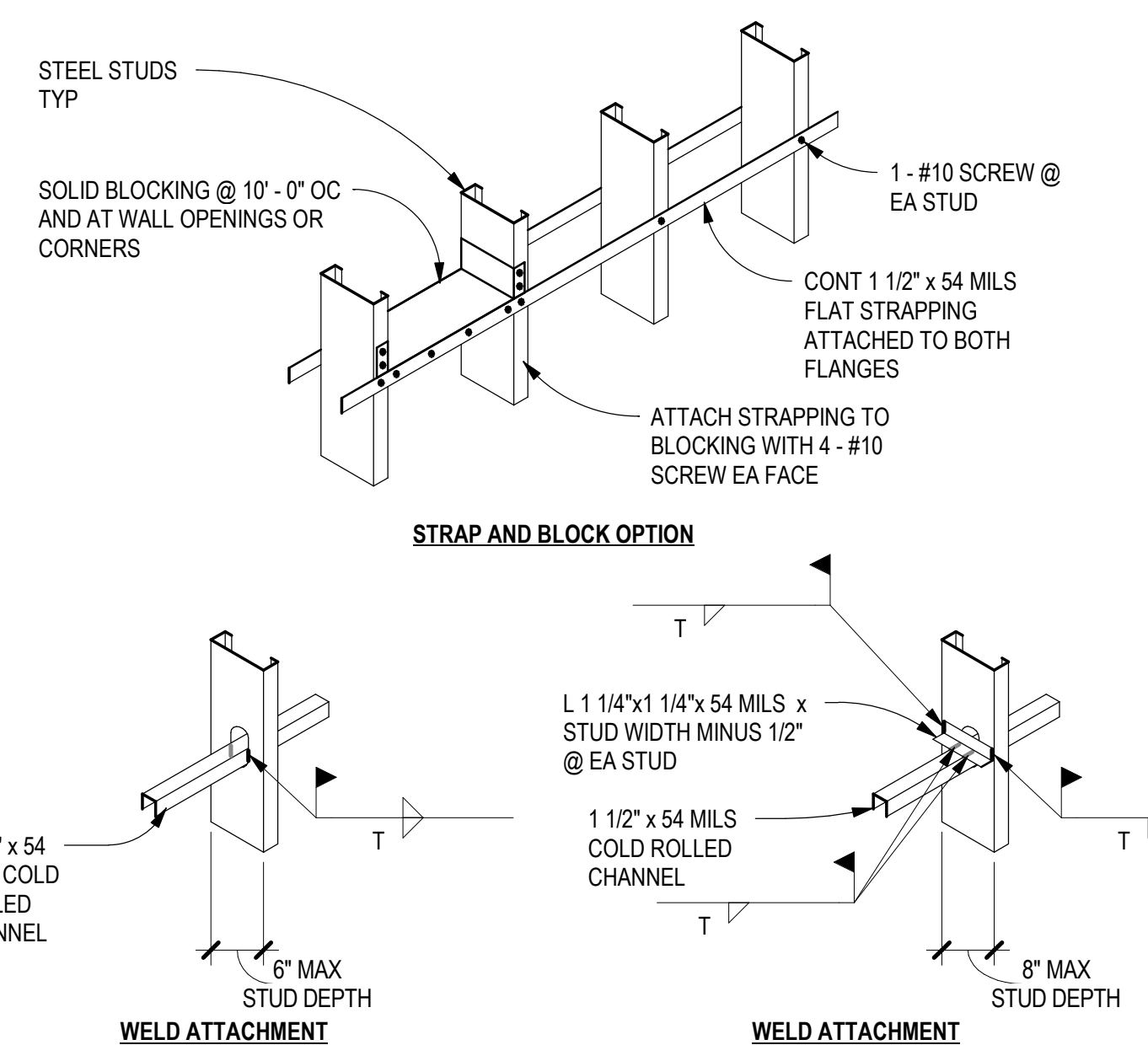
**B4** TYPICAL BRIDGING DETAILS  
SCALE: NTS



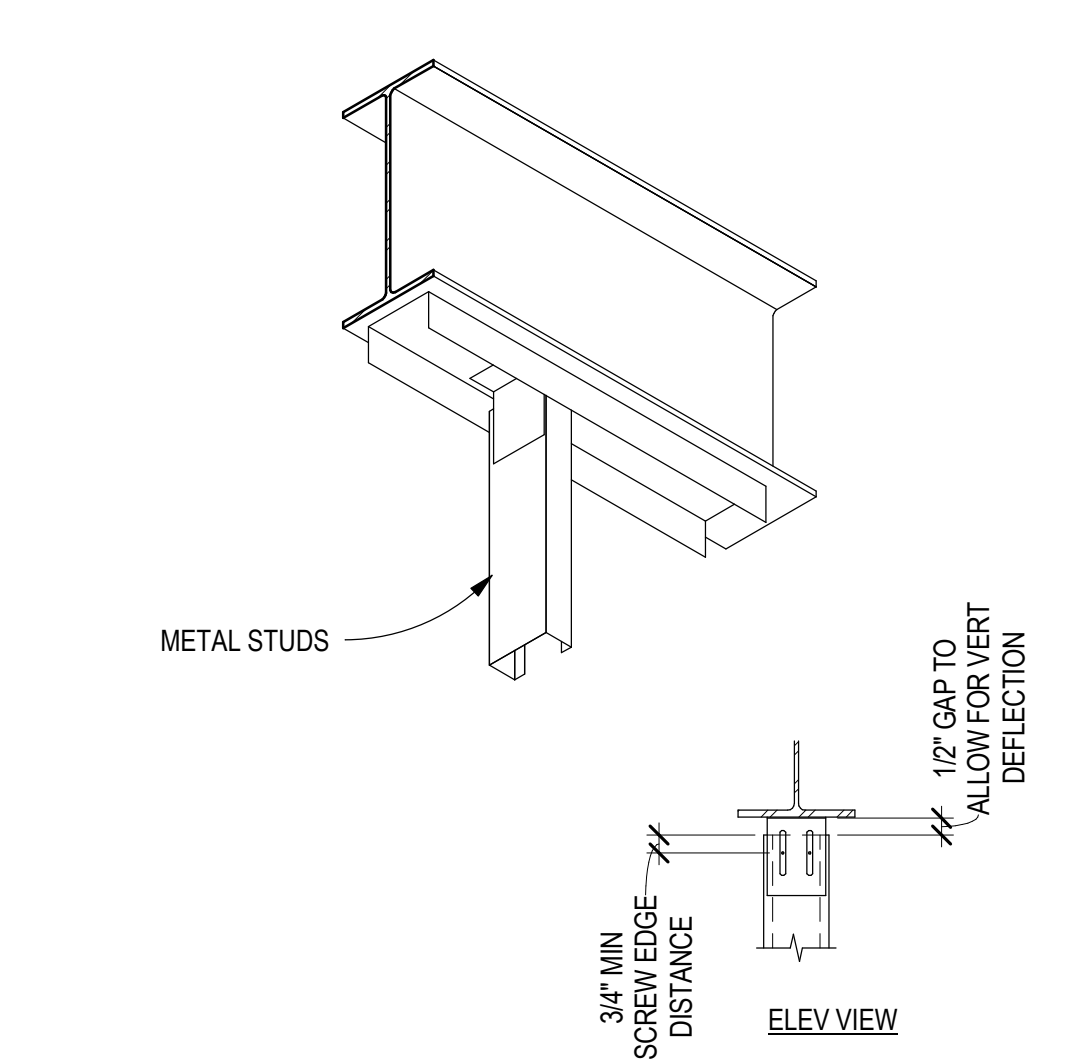
**D3** TYPICAL WELD CLIP  
SCALE: NTS



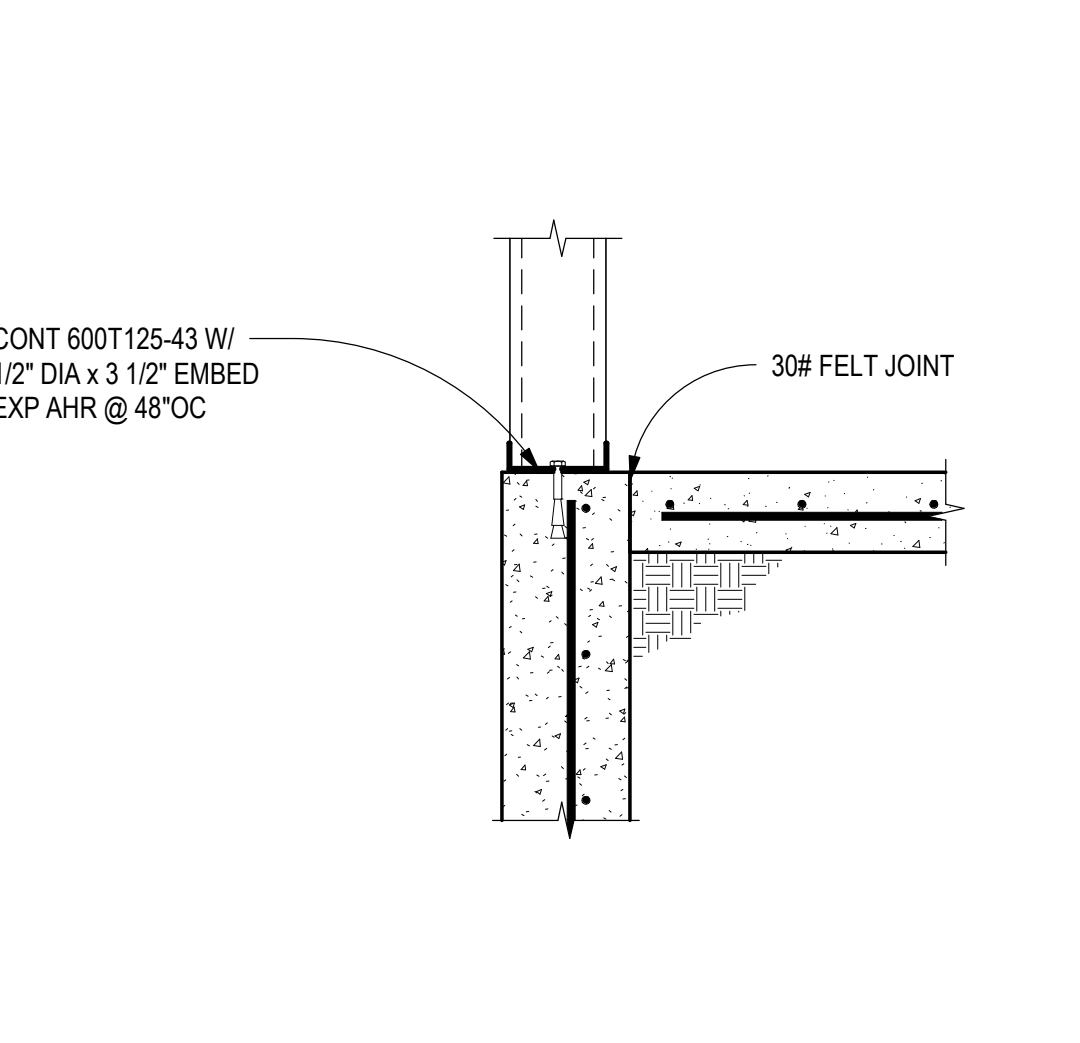
**C3** TYPICAL VERTICAL SLIDE CLIP  
SCALE: NTS



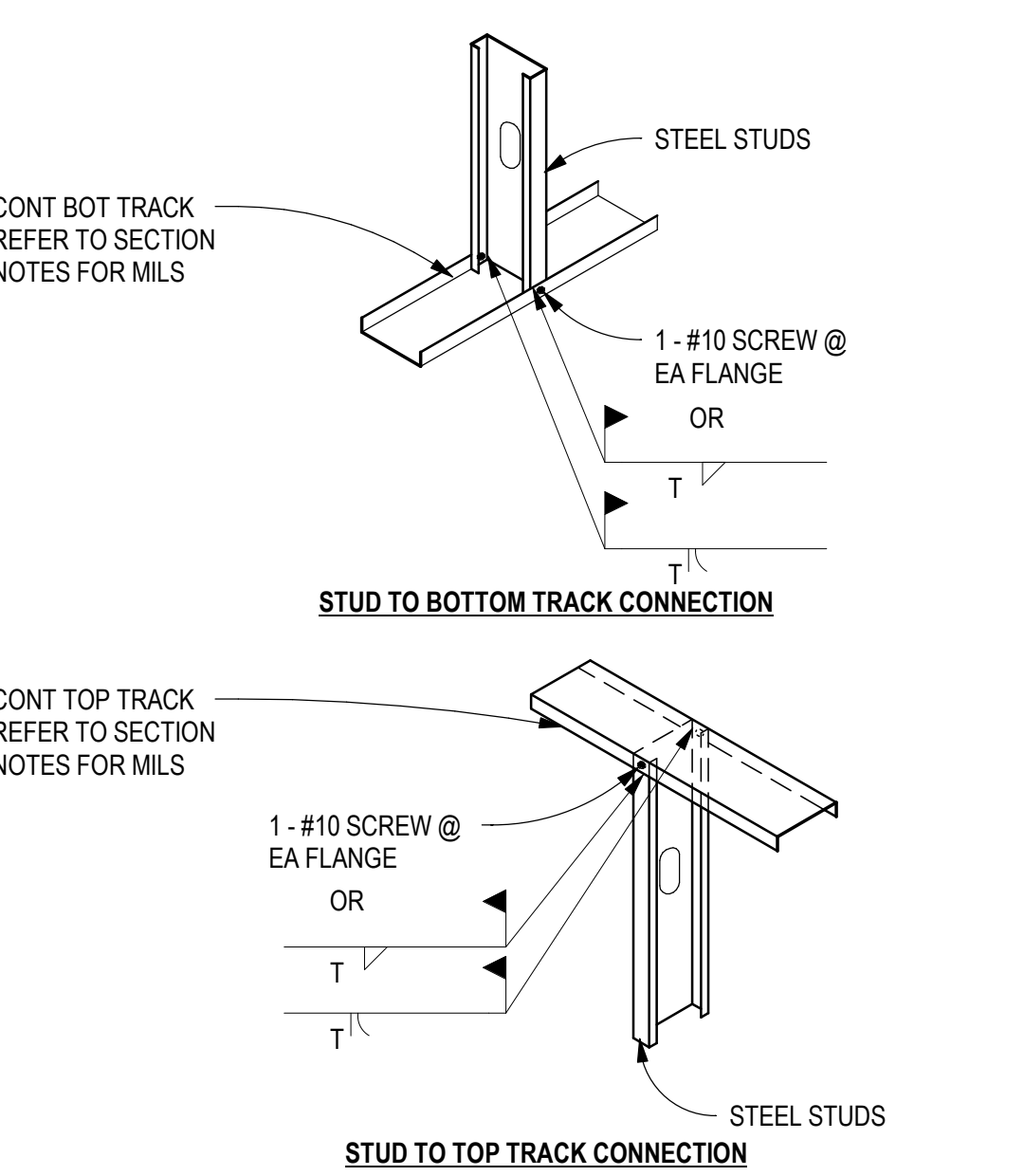
**B3** TYPICAL STUDS TO TRACK DETAIL  
SCALE: NTS



**D1** TYPICAL SLIP TRACK ASSEMBLY  
SCALE: NTS



**C1** TYPICAL STUDS AT STEMWALL  
SCALE: 1" = 1'-0"



**B1** TYPICAL STUDS TO TRACK DETAIL  
SCALE: NTS

MILS TO GAGE CONVERSION CHART	
MILS	GAUGE
33 MILS	20 GAUGE
43 MILS	18 GAUGE
54 MILS	16 GAUGE
68 MILS	14 GAUGE
97 MILS	12 GAUGE

MEMBER WEB IN INCHES (IE - 600 = 6") (IE - 362 = 3 5/8") (IE - 250 = 2 1/2")	MEMBER THICKNESS IN MILS
MEMBER TYPE S = STUD T = TRACK	GRADE OF STEEL (ONLY SHOWN WHEN MEMBER IS 50 KSI)
600S162-43 (50 KSI)	FLANGE WIDTH OF MEMBER IN INCHES (IE - 162 = 1 5/8") (IE - 200 = 2")

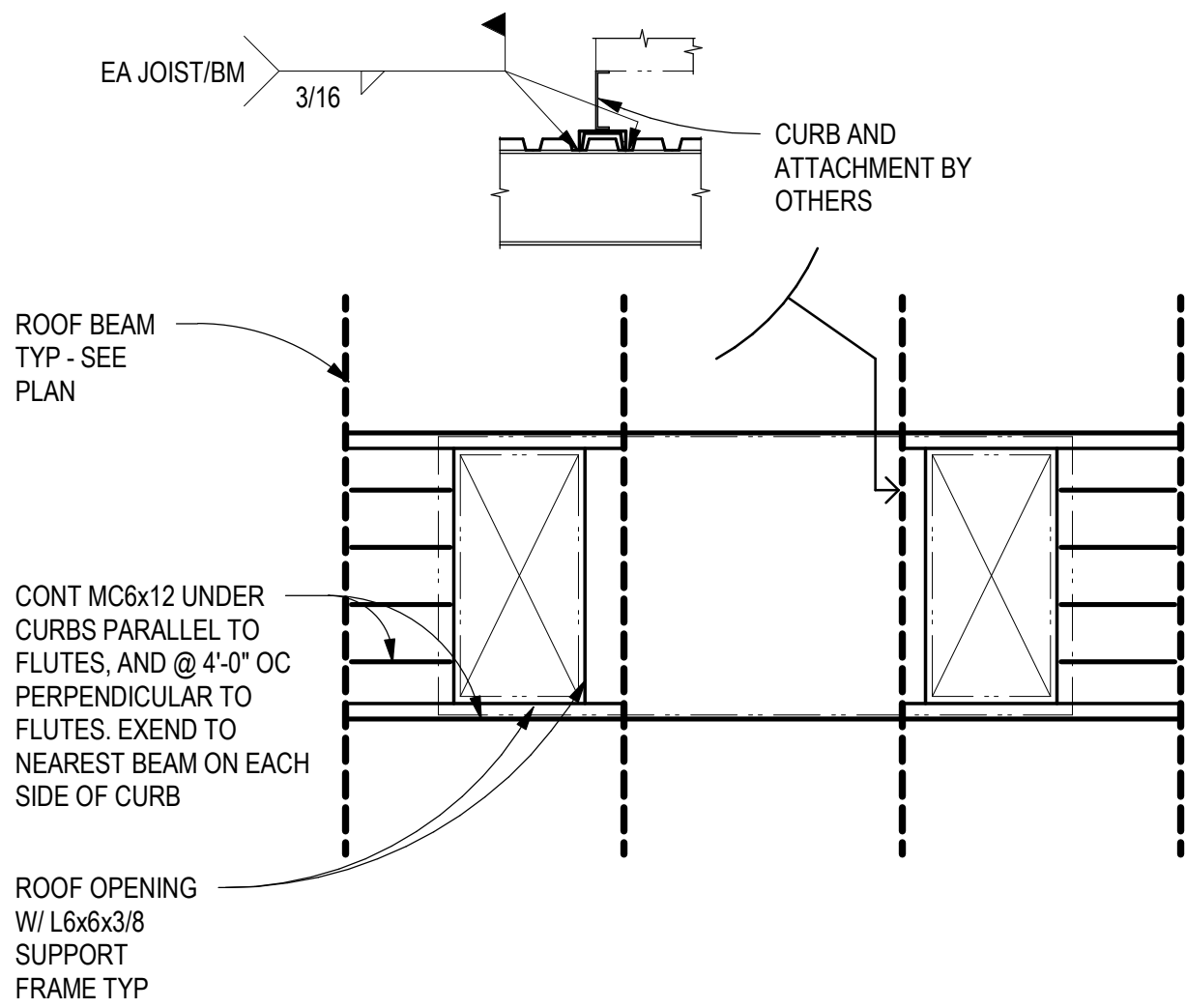
**A2** TYPICAL COLD-FORMED MEMBER DESIGNATION  
SCALE: NTS



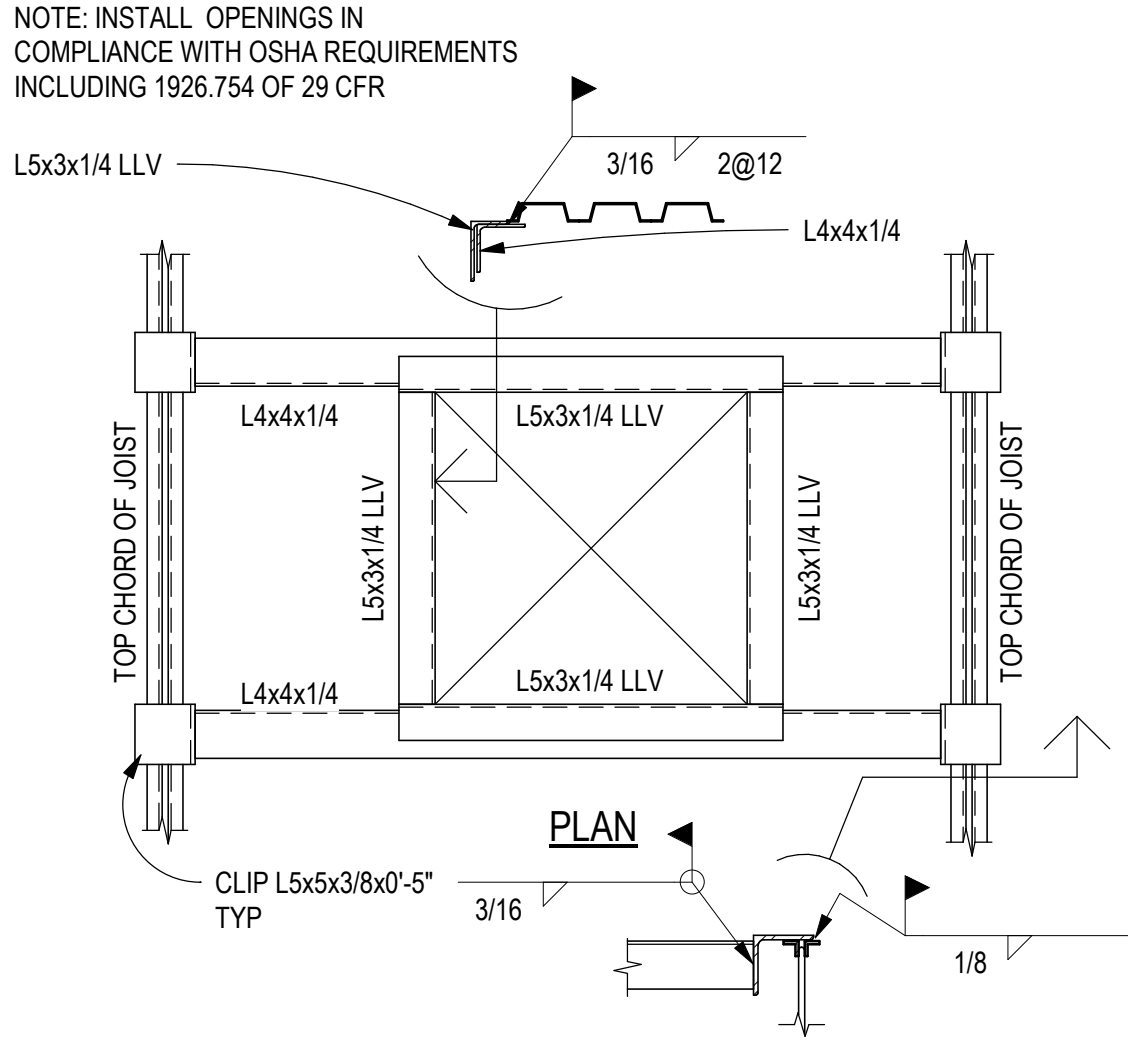
NTU ENVIRONMENTAL  
LAB CHINLE

CHINLE, APACHE COUNTY, AZ

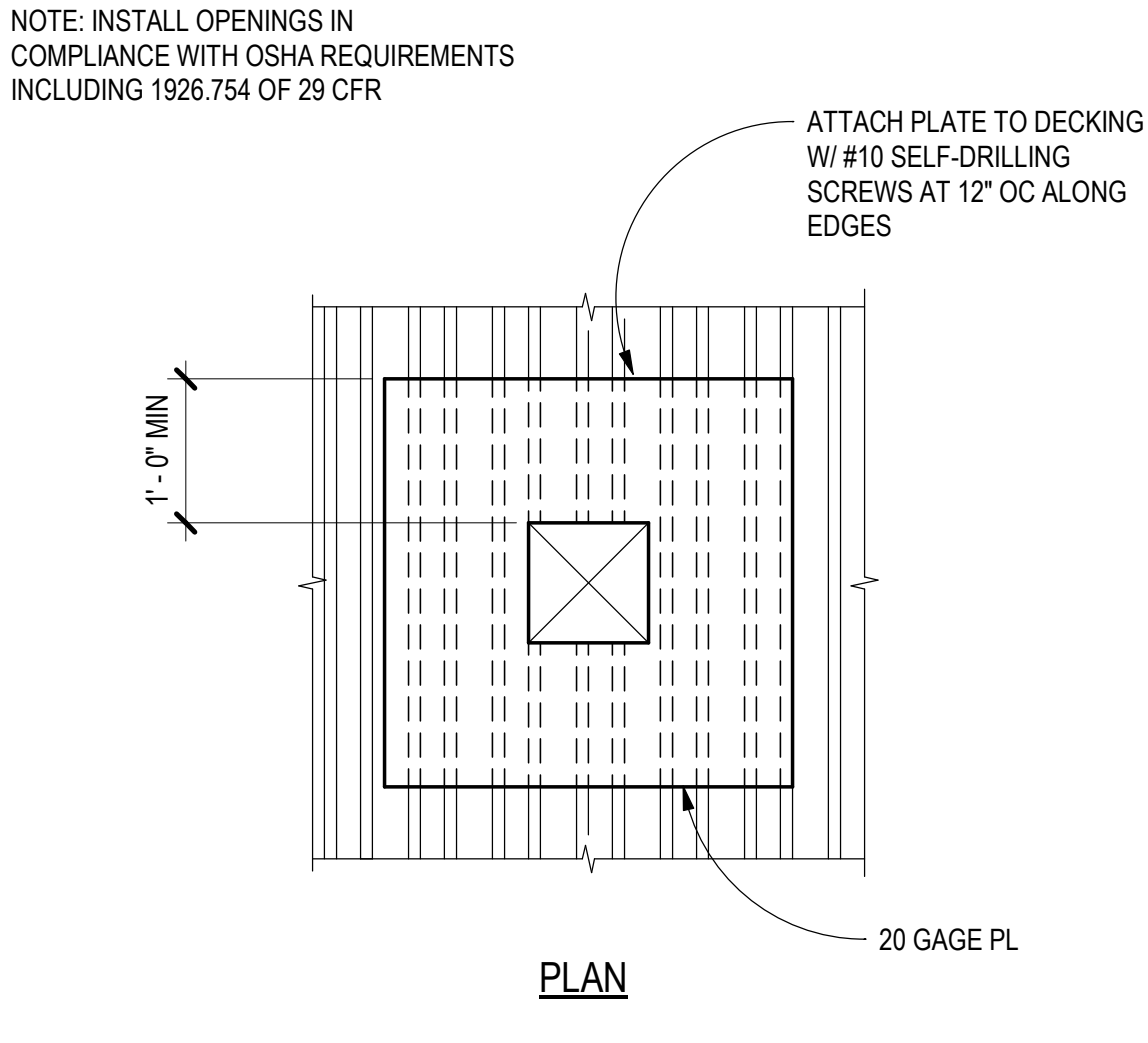
EARLY DESIGN PACKAGE #1  
CIVIL/STRUCTURAL/PLUMBING  
JANUARY 20, 2023



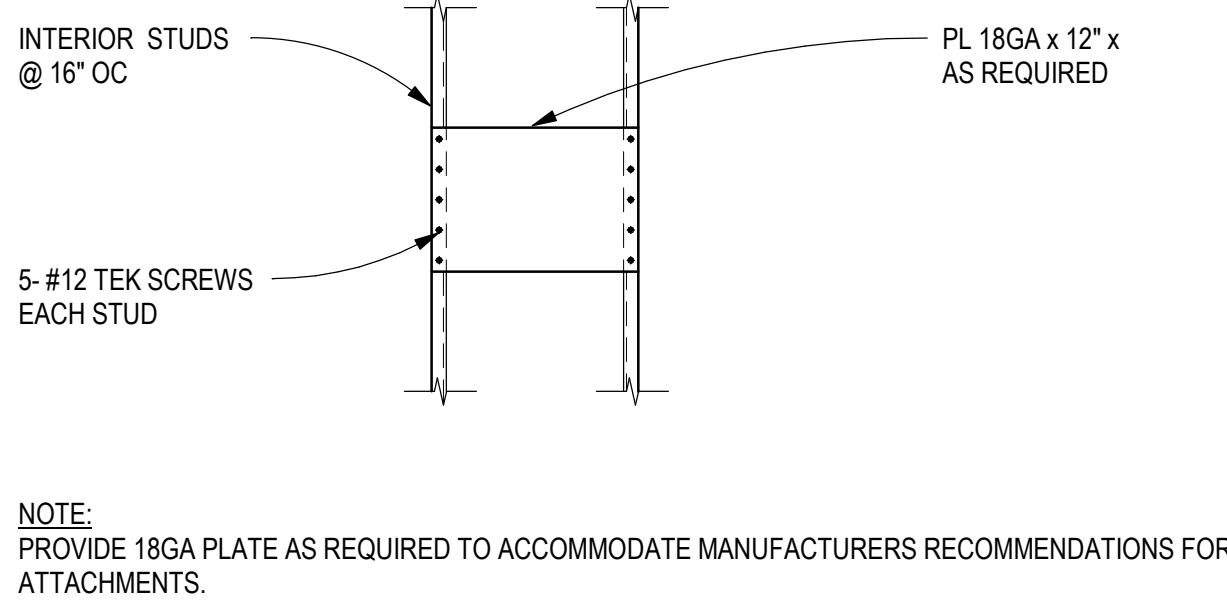
**E4 AHU/ MAU SUPPORT DETAIL**  
SCALE: 1/2" = 1'-0"



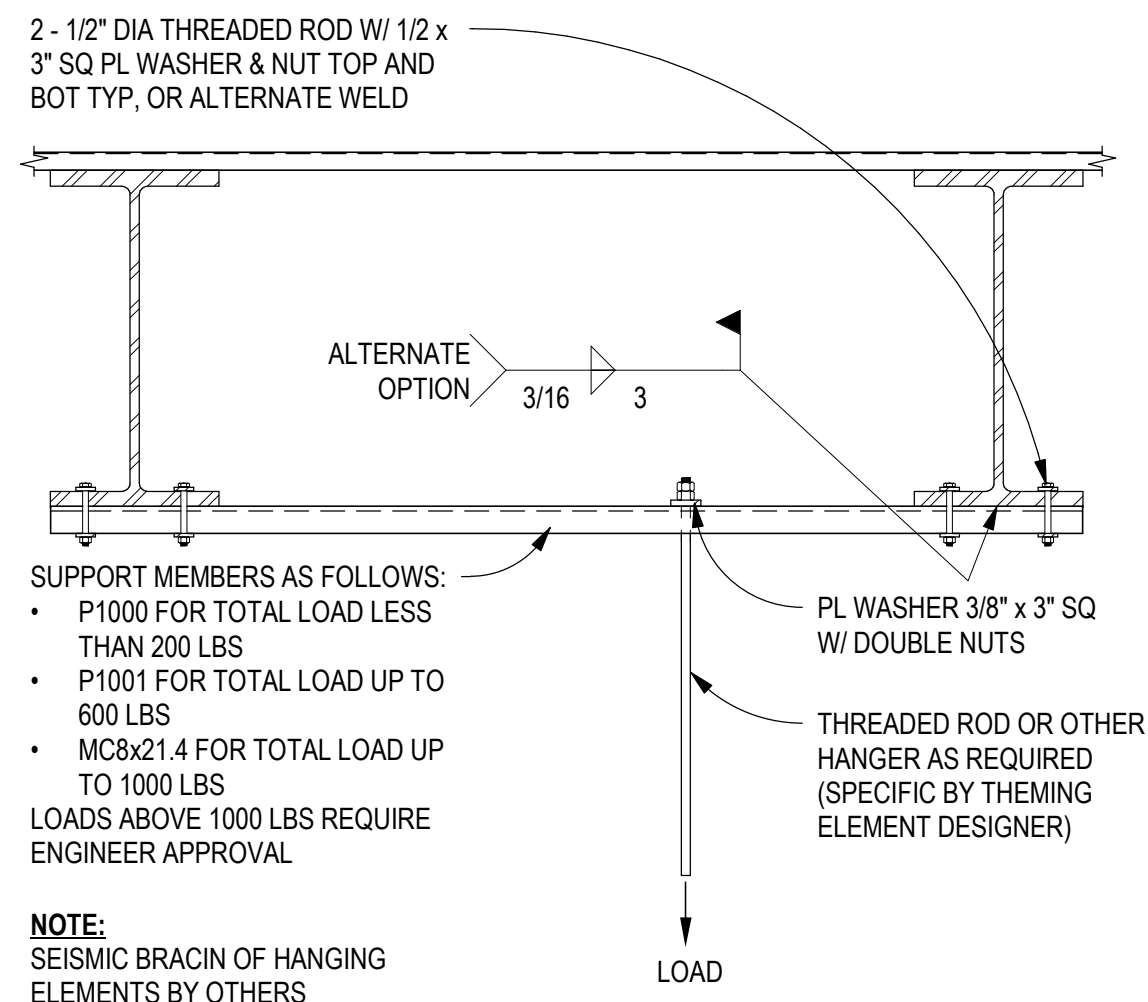
**E3 TYPICAL ROOF OPENING > 12"**  
SCALE: 3/4" = 1'-0"



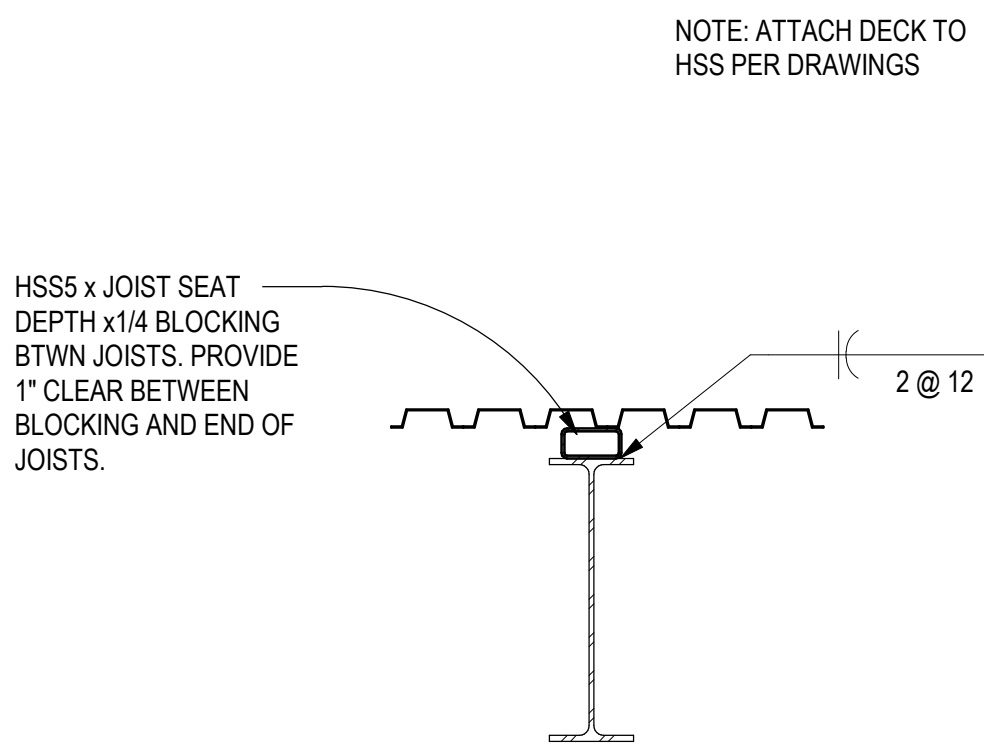
**E2 TYPICAL ROOF OPENING 0"-12"**  
SCALE: 3/4" = 1'-0"



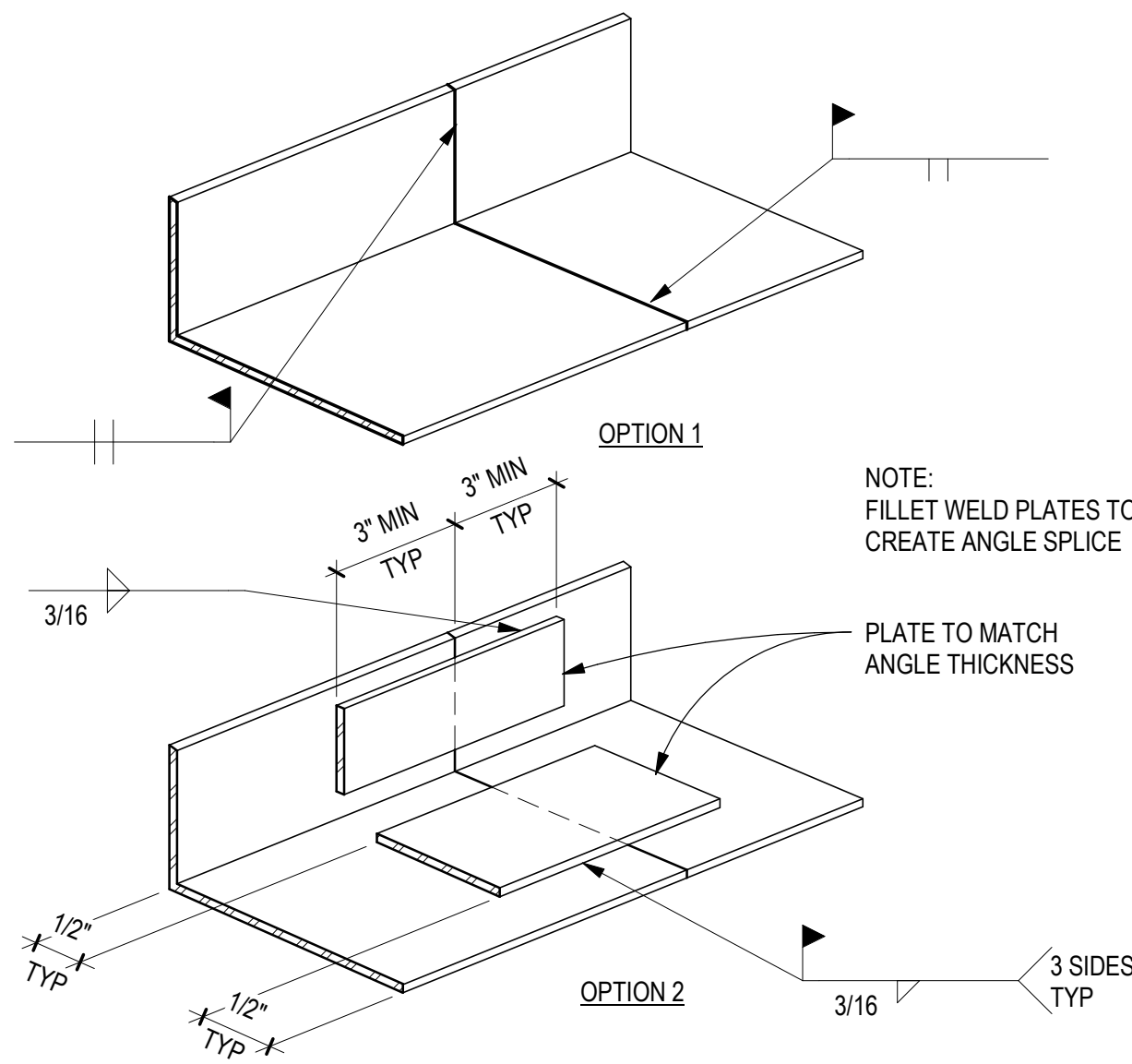
**C5 LG WALL MOUNTING DTL 80 LBS MAX**  
SCALE: 3/4" = 1'-0"



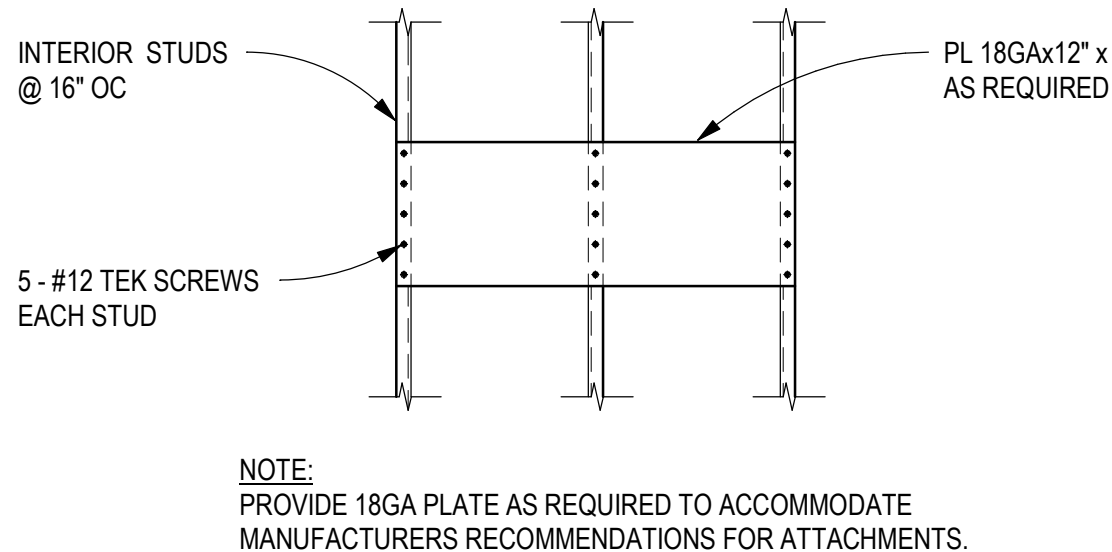
**C4 THREADED ROD SUPPORT**  
SCALE: 3/4" = 1'-0"



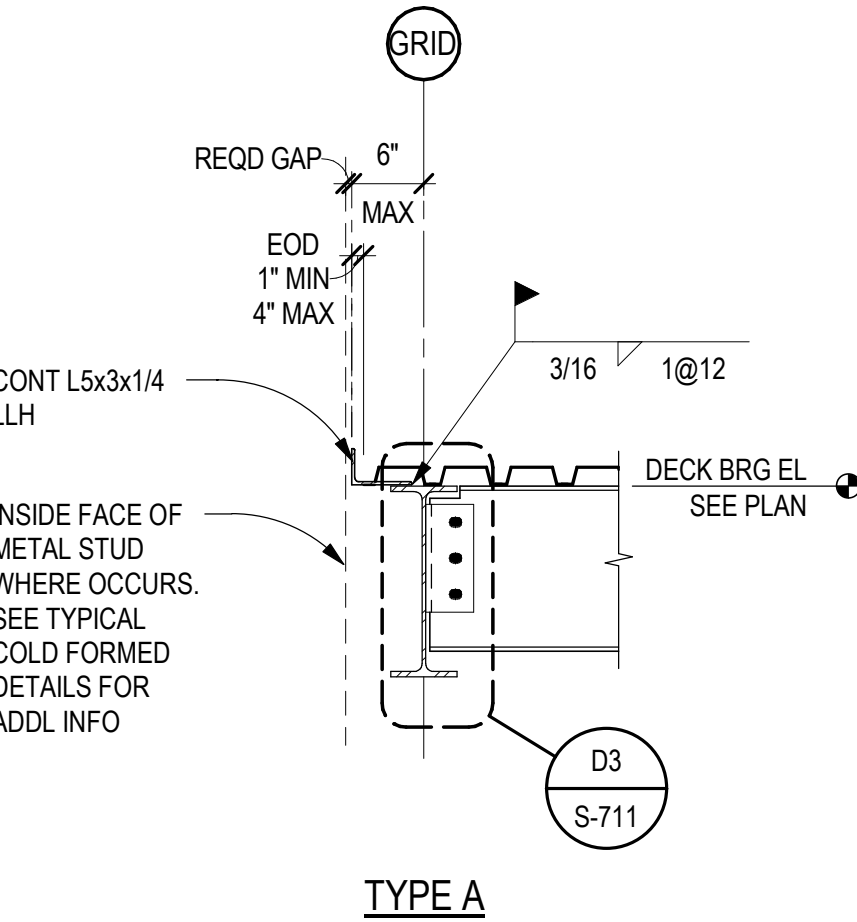
**C3 TYPICAL HSS BLOCKING DETAIL**  
SCALE: 3/4" = 1'-0"



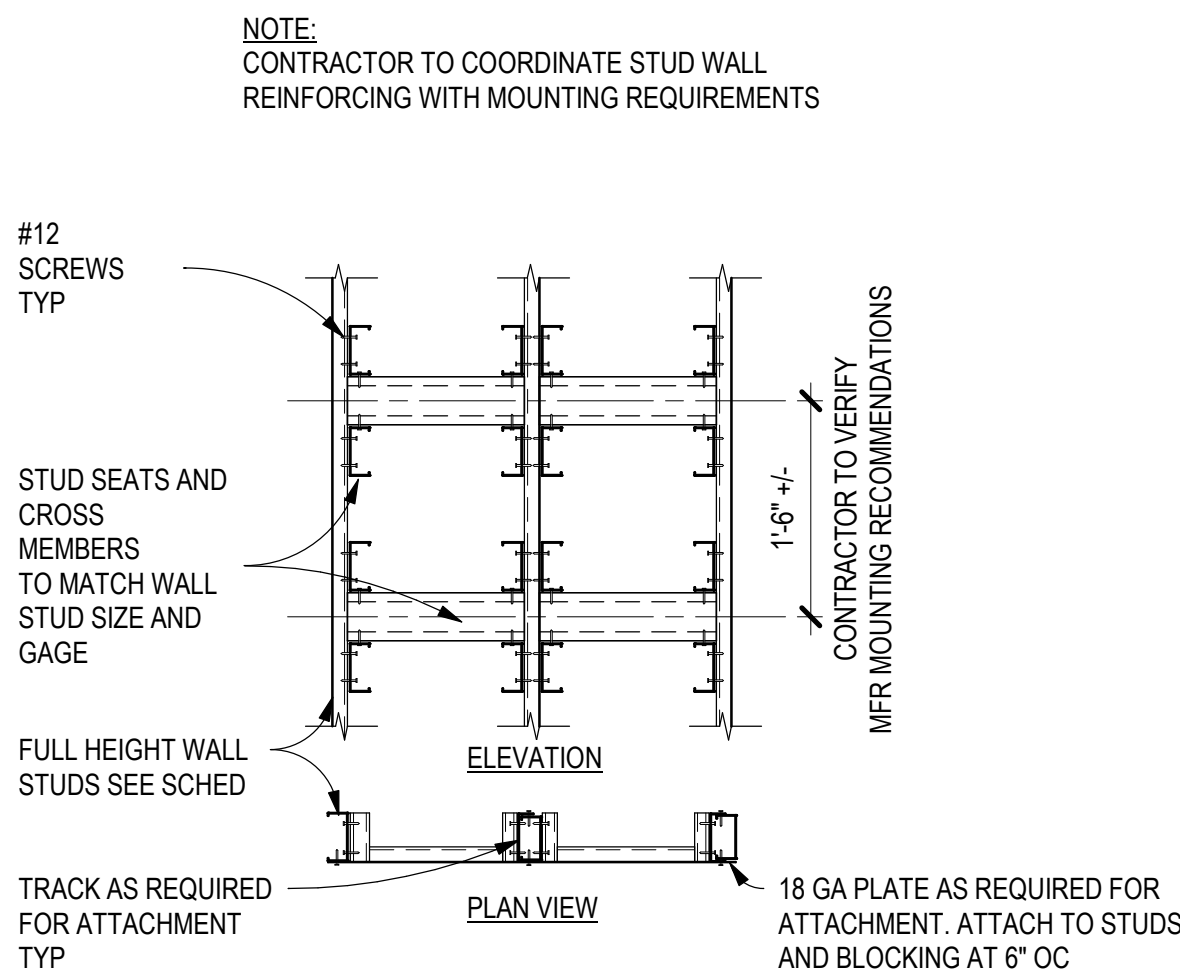
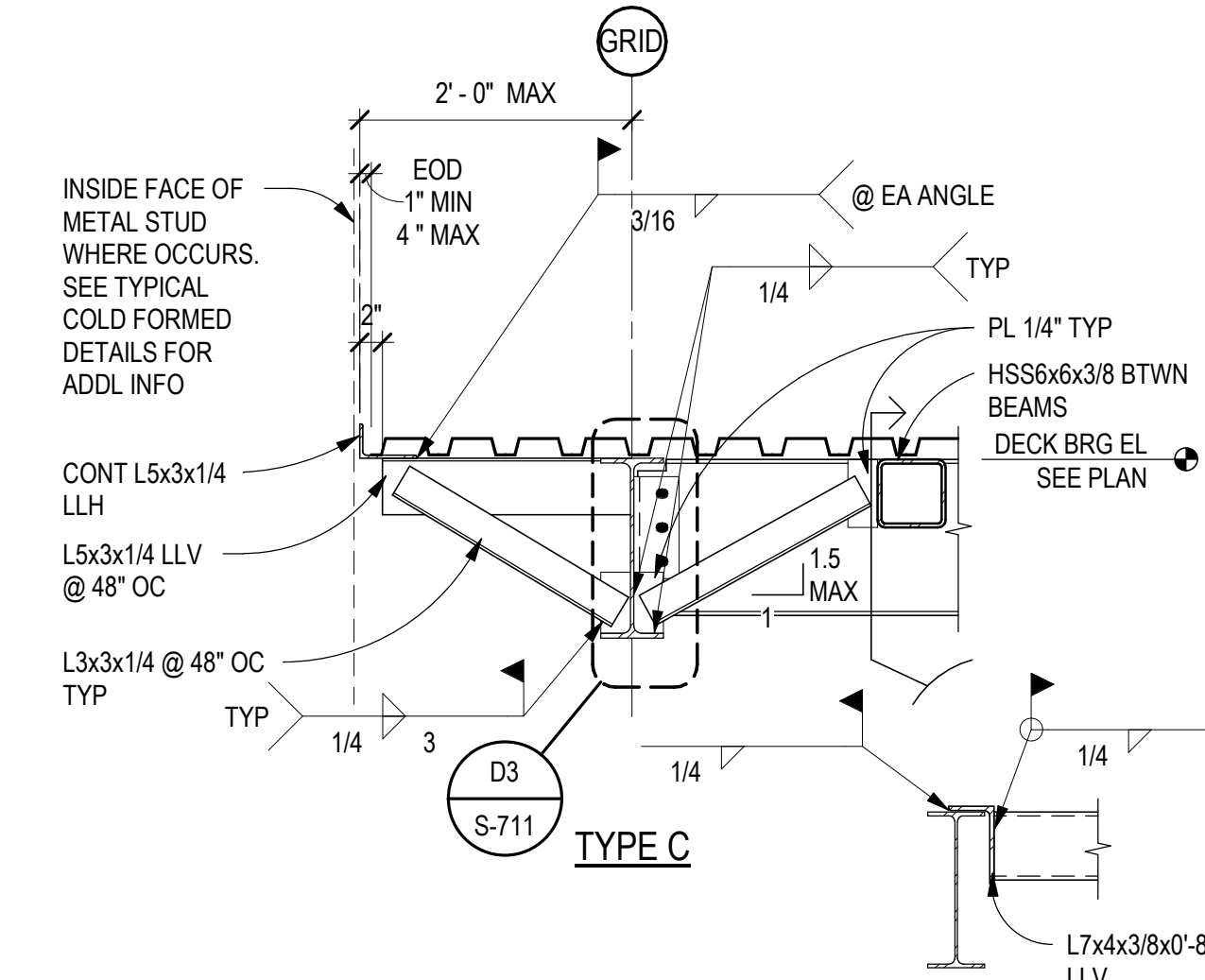
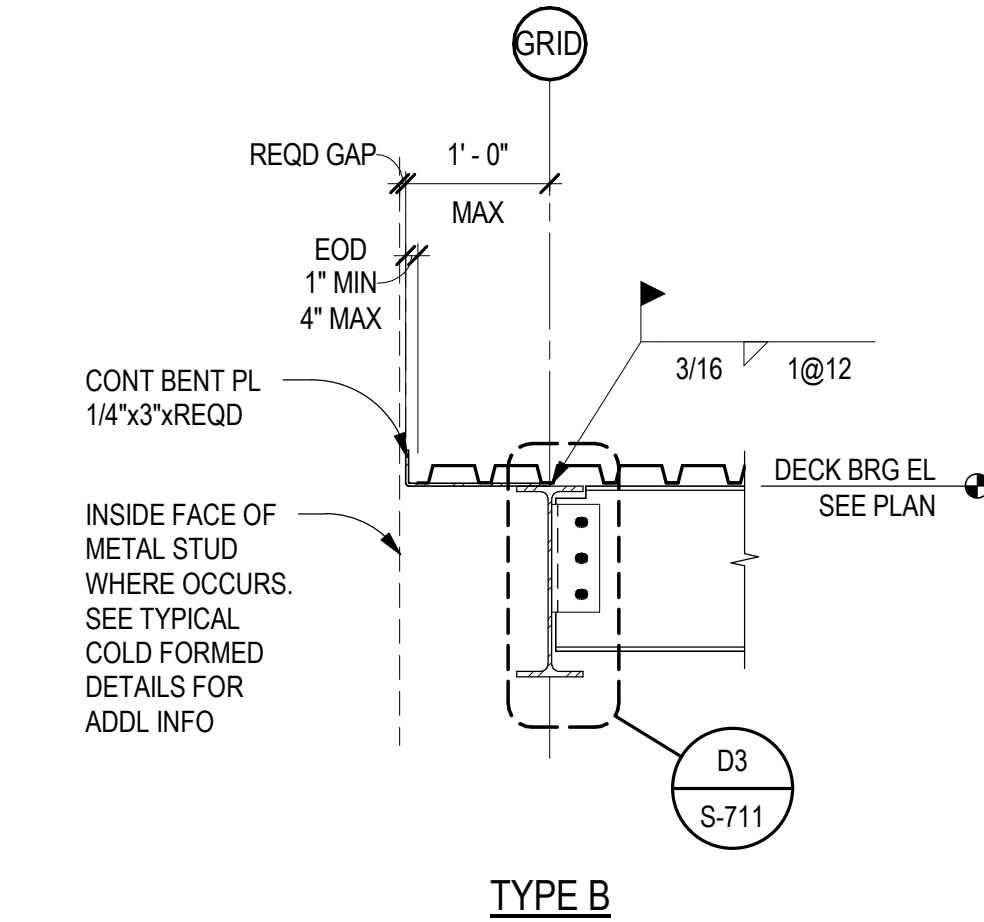
**C2 TYPICAL PERIMETER ANGLE SPLICE**  
SCALE: 3/4" = 1'-0"



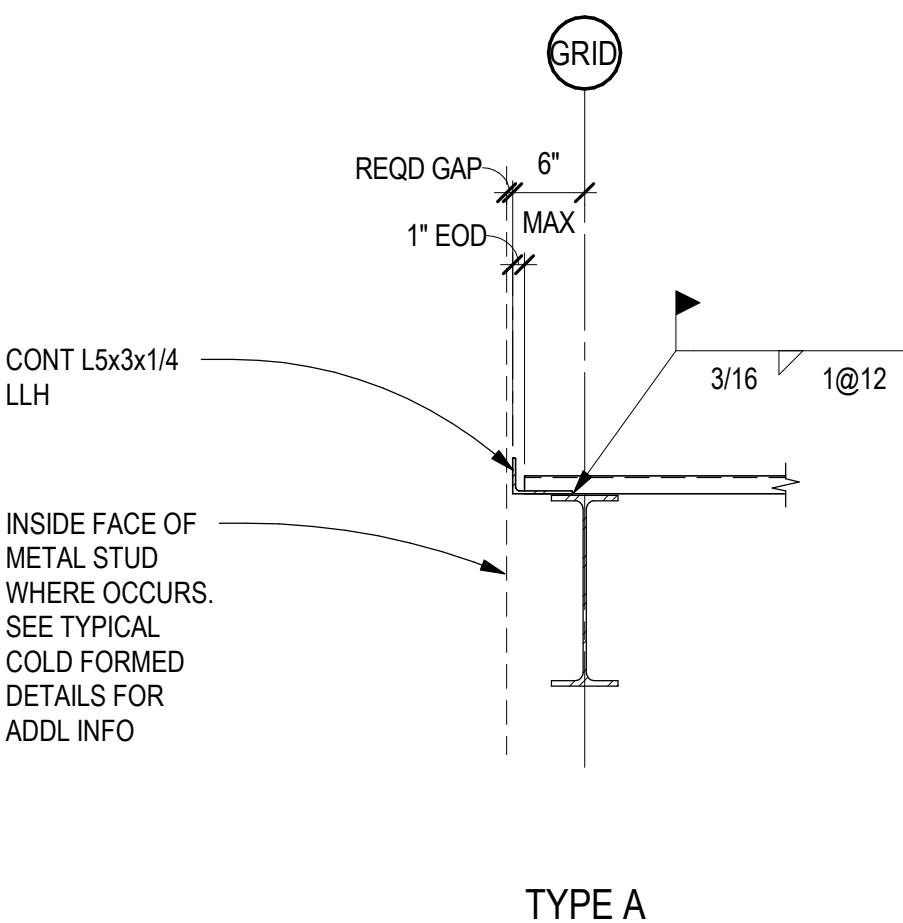
**B5 LG WALL MOUNTING DTL 150 LBS MAX**  
SCALE: 3/4" = 1'-0"



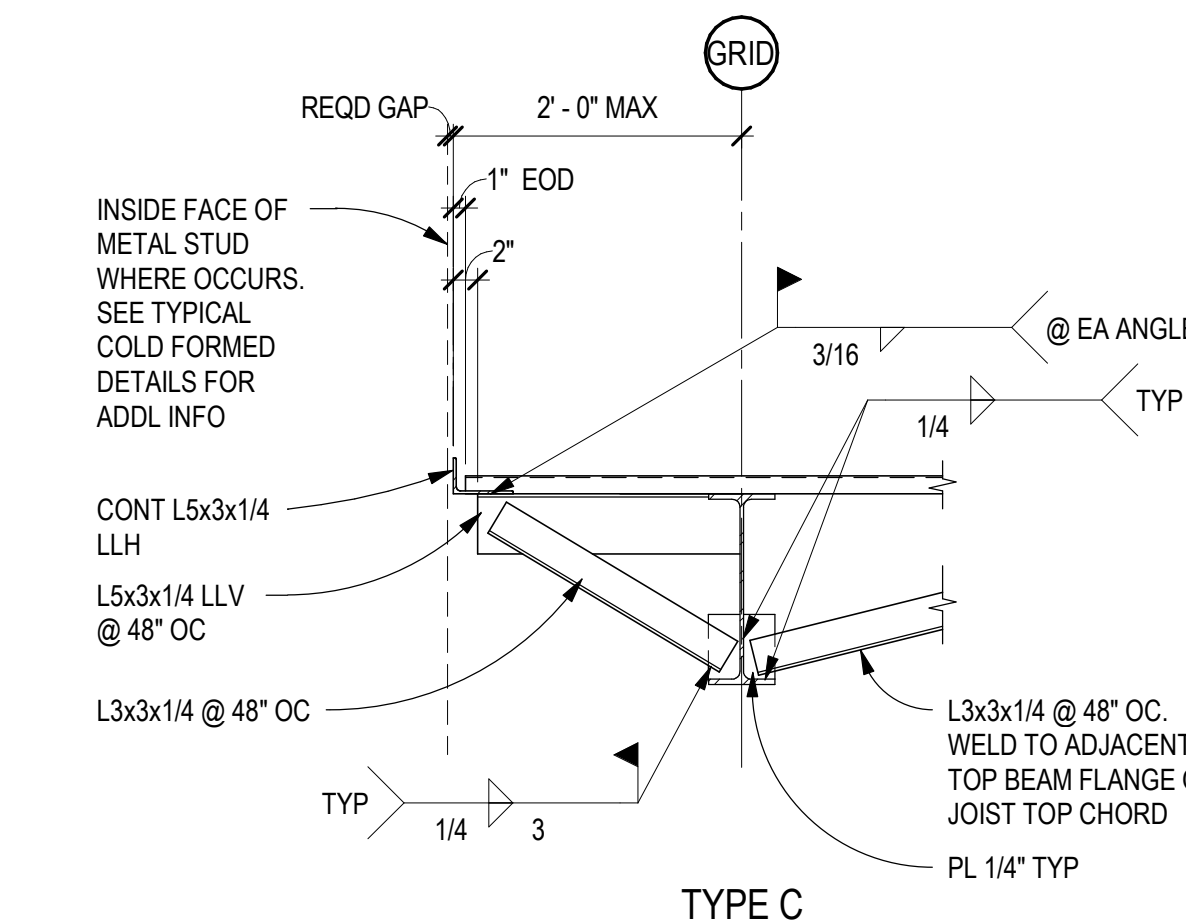
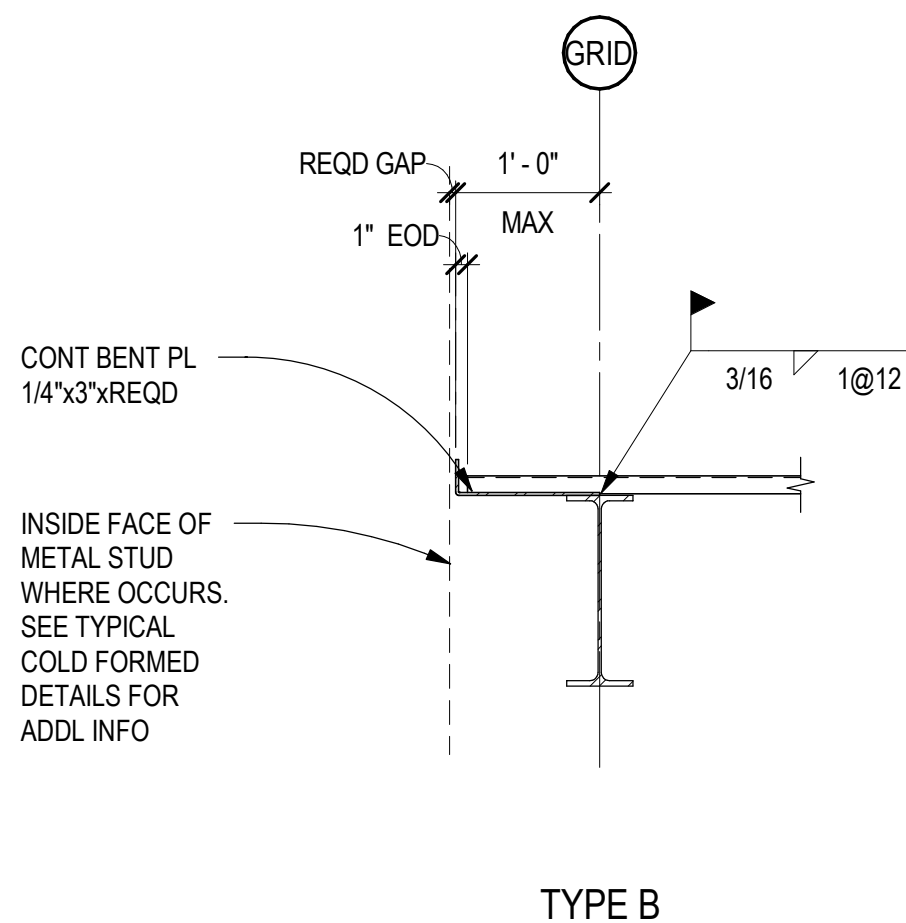
**B4 TYPICAL DECK EDGE AT NON-BEARING BEAM**  
SCALE: 3/4" = 1'-0"



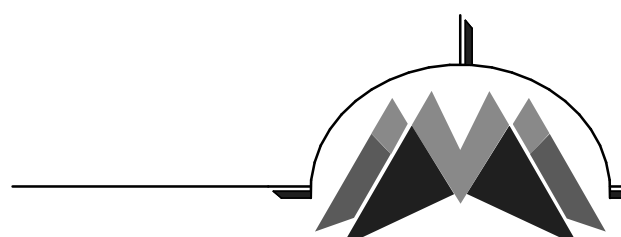
**A5 WALL MOUNTING DTL 500 LBS MAX**  
SCALE: 3/4" = 1'-0"



**A4 TYPICAL ROOF DECK EDGE AT NON-BEARING BEAM**  
SCALE: 3/4" = 1'-0"



DYRON MURPHY ARCHITECTS, P.C.



4505 Montbel Place NE, Albuquerque, New Mexico 87107

Revision Schedule		
#	Date	Description

PROJECT NUMBER	DRAWN BY	PROJ MGR
M97193	THF	DF
RVT FILE		
C:\Revit Projects\NTU Environmental Chinle		
Lab_R22_STRUCT_Ifregue.rvt		

Sheet Number

**S-741**

Sequence of

TYPICAL MISC STEEL  
DETAILS