

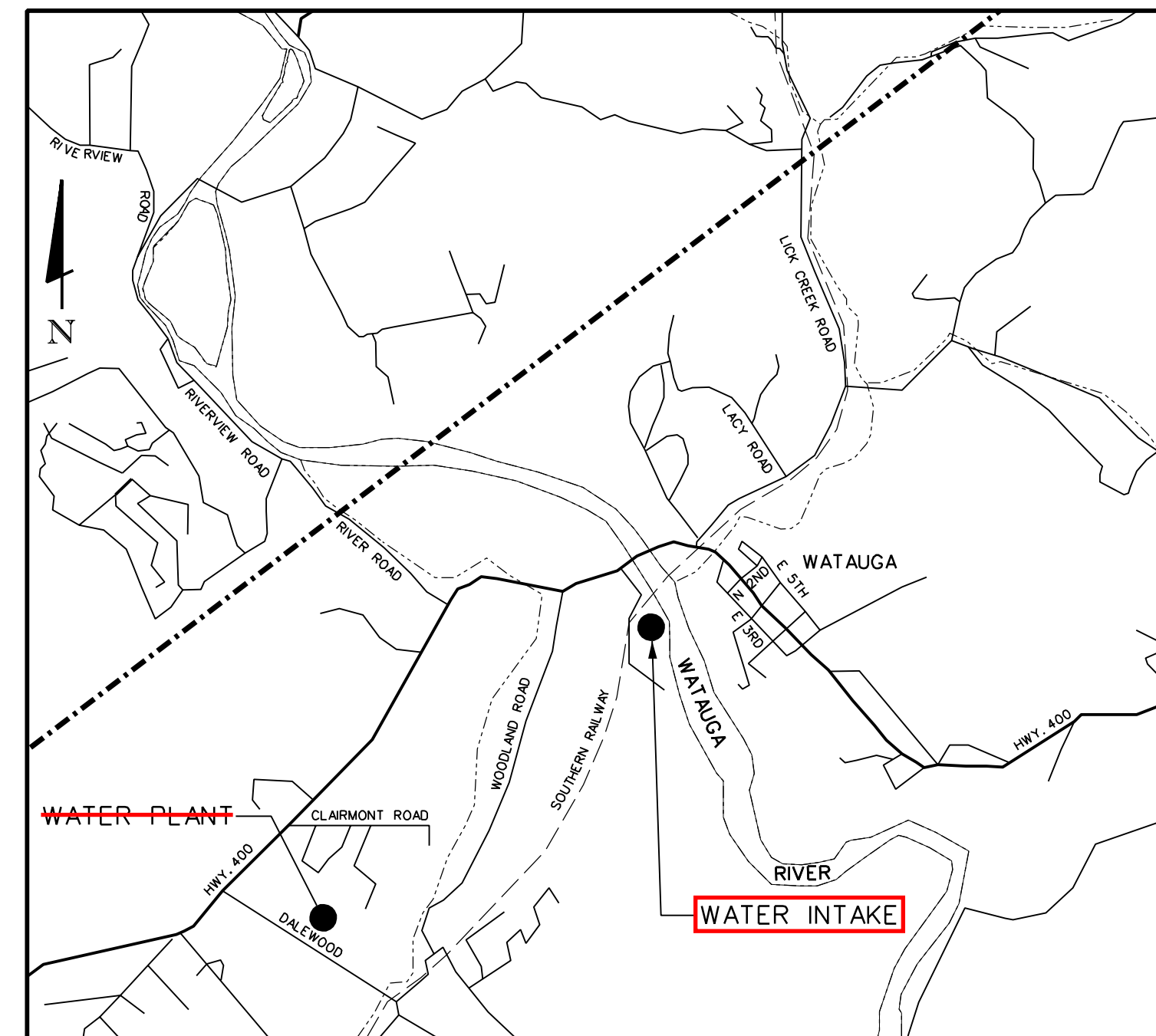
# CITY OF JOHNSON CITY WATAUGA WATER TREATMENT PLANT 1998 EXPANSION AND IMPROVEMENTS

CITY COMMISSIONERS

BOB MAY - MAYOR  
VANCE W. CHEEK JR. - VICE MAYOR  
DAN MAHONEY - COMMISSIONER  
PETER A. PADUCH - COMMISSIONER  
P.C. SNAPP - COMMISSIONER

CITY STAFF

JOHN CAMPBELL - CITY MANAGER  
TOM WITHERSPOON - DIRECTOR OF WATER & SEWER SERVICES  
GORDON COX - SUPERINTENDENT OF WATER & WASTE WATER TREATMENT  
JIM SIPE - PROJECT MANAGER



VICINITY MAP

**FOR REFERENCE ONLY**

**FOR THE PURPOSE OF BIDDING  
HVAC REPLACEMENT IN EXISTING  
RAW WATER INTAKE BUILDING**

**9/1/22**

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SET NO:

FILE NO: 15784-20

RECORD DRAWING  
05/23/03

SUBMITTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

SUBMITTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

DATE ISSUED: ISSUE FOR CONSTRUCTION  
OCTOBER 1999

**Barge  
Waggoner  
Sumner and  
Cannon, Inc.**

ENGINEERS-ARCHITECTS-PLANNERS  
LANDSCAPE ARCHITECTS-SURVEYORS

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**LEGEND**

DUCTILE IRON PIPE	D.I.P.
CAST IRON PIPE	C.I.P.
CONCRETE PIPE	C.P.
REINFORCED CONCRETE PIPE	R.C.P.
FLANGED JOINT	FLG
MECHANICAL JOINT	MJ
PLAIN END	PE
RESTRAINED JOINT	RJ
FIRE HYDRANT	F.H.
INVERT ELEVATION	I.E.
HORIZONTAL COORDINATES	N- 1234.56 E- 1234.56
COPPER	Cu
PHOSPHATE	Ph
FLUORIDE	FL
CAUSTIC	NaOH
POLYALUMINUM CHLORIDE	PAX
POLYVINYL CHLORIDE	PVC
EXISTING MANHOLE	
CATCH BASIN	
BENCH MARK	
BORE HOLE	
EXISTING WATER VALVE	
POWER POLE	
CLEAN-OUT	C.O.
UNION	

**VALVE NUMBERING**

V (TYPE) (OPERATOR) (CONNECTION)  
EXAMPLE: V152 - BUTTERFLY VALVE, NUT OPERATOR, MECHANICAL JOINT

NUMBER	TYPE	OPERATOR	CONNECTION
1	BUTTERFLY	CYLINDER	FLANGED
2	CHECK	ELECTRIC	MECHANICAL JOINT
3	GATE	HANDWHEEL	PUSH ON
4	BALL	LEVER	RESTRAINED
5	PLUG	NUT	THREADED
6	SPECIAL	OTHER	VICTAULIC
7		SPRING	TRUE UNION
8		WEIGHT & LEVER	

**EQUIPMENT NUMBERING**

EQUIPMENT NUMBER= (LETTER - EQUIPMENT TYPE) (NUMBER - STRUCTURE / PROCESS CODE) (TWO NUMBERS - UNIQUE EQUIPMENT DESIGNATION NUMBER)  
EXAMPLE: P101 - PUMP, RAW WATER INTAKE, NO. 01

STRUCTURE / PROCESS	
NUMBER	TYPE
1	RAW WATER INTAKE
2	MIXING, FLOCCULATION & SETTLING
3	FILTRATION
4	CLEARWELL / HIGH SERVICE PUMPING
5	CHEMICAL STORAGE AND FEED
6	ELECTRICAL POWER/EMERGENCY POWER
7	SCADA
8	NOT ASSIGNED
9	MISCELLANEOUS

EQUIPMENT TYPE	
LETTER	TYPE
A	AIR CONDITIONER
C	AIR COMPRESSOR
E	EQUIPMENT (MISC.)
F	FAN
G	GENERATOR, GATE
H	HEATER
L	LOUVER
M	MOTOR (MISC.)
P	PUMP, PAC EQUIPMENT
S	SCREEN, STRAINER, SCALE
T	TANK
V	VALVE

**GENERAL NOTES**

- LOCATION OF EXISTING UTILITIES, PUBLIC OR PRIVATE, ARE APPROXIMATE ONLY. ALL UTILITIES MAY NOT BE SHOWN ON THESE PLANS. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES WITHIN THE PROJECT LIMITS AND COORDINATE EXCAVATION REQUIRED AROUND THESE UTILITIES WITH THE RESPECTIVE OWNER. THE CONTRACTOR MUST GIVE ADEQUATE NOTICE TO ALL UTILITY OWNERS PRIOR TO EXCAVATION (AS DEFINED BY UTILITY OWNER). CONTRACTOR IS TO CALL TENNESSEE ONE-CALL SYSTEM, INC. AT 1-800-351-1111 BEFORE STARTING EXCAVATION.
- IN THE EVENT OF DAMAGE TO EXISTING UTILITIES, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL REPAIRS AND RELATED EXPENSE.
- AFTER COMPLETING EACH SECTION OF WATER AND SEWER LINE, CONTRACTOR SHALL REMOVE ALL DEBRIS, CONSTRUCTION MATERIALS AND EQUIPMENT FROM THE SITE OF WORK, GRADE AND SMOOTH OVER THE SURFACE OF BOTH SIDES OF THE LINE, AND SEED & MULCH THE AFFECTED AREAS. THE ENTIRE RIGHT-OF-WAY AND/OR EASEMENT MUST BE PLACED IN A CLEAN, NEAT, SERVICEABLE CONDITION, IN A TIMELY MANNER.
- ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- DURING CONSTRUCTION THE CONTRACTOR SHALL PROVIDE TEMPORARY TRAFFIC CONTROL MEASURES TO INSURE SAFETY AT ALL TIMES FOR EMPLOYEES, RESIDENTS, AND MOTORISTS.
- ALL CONSTRUCTION MUST CONFORM WITH THE PROJECT PLANS AND SPECIFICATIONS, AS WELL AS THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION, THE CITY OF JOHNSON CITY AND OTHER RELATED GOVERNMENT AGENCY(S) REQUIREMENTS.
- A MINIMUM COVER OF 36" SHALL BE MAINTAINED OVER ALL NEW WATER AND SEWER LINES UNLESS NOTED OTHERWISE ON THE PLANS.
- ALL VALVES SHALL INCLUDE VALVE BOX AND BLOCKING. ALL BENDS SHALL INCLUDE THRUST BLOCKING.
- THE CONTRACTOR SHALL FOLLOW ALL OSHA REGULATIONS PERTAINING TO CONSTRUCTION OPERATIONS.
- BURIED VALVES SHOWN AS RESTRAINED JOINT (RJ) SHALL BE MECHANICAL JOINT WITH MEGALUG SERIES 1100.
- ALL ABOVE GROUND PIPING SHALL BE IDENTIFIED AS SPECIFIED IN SPECIFICATION SECTION 15190. IDENTIFICATION SHALL INCLUDE NAME, DIRECTION AND COLOR CODE.

**RECORD DRAWING**  
05/23/03

**Barge Waggoner Sumner and Cannon, Inc.**  
 Engineers, Architects, Planners,  
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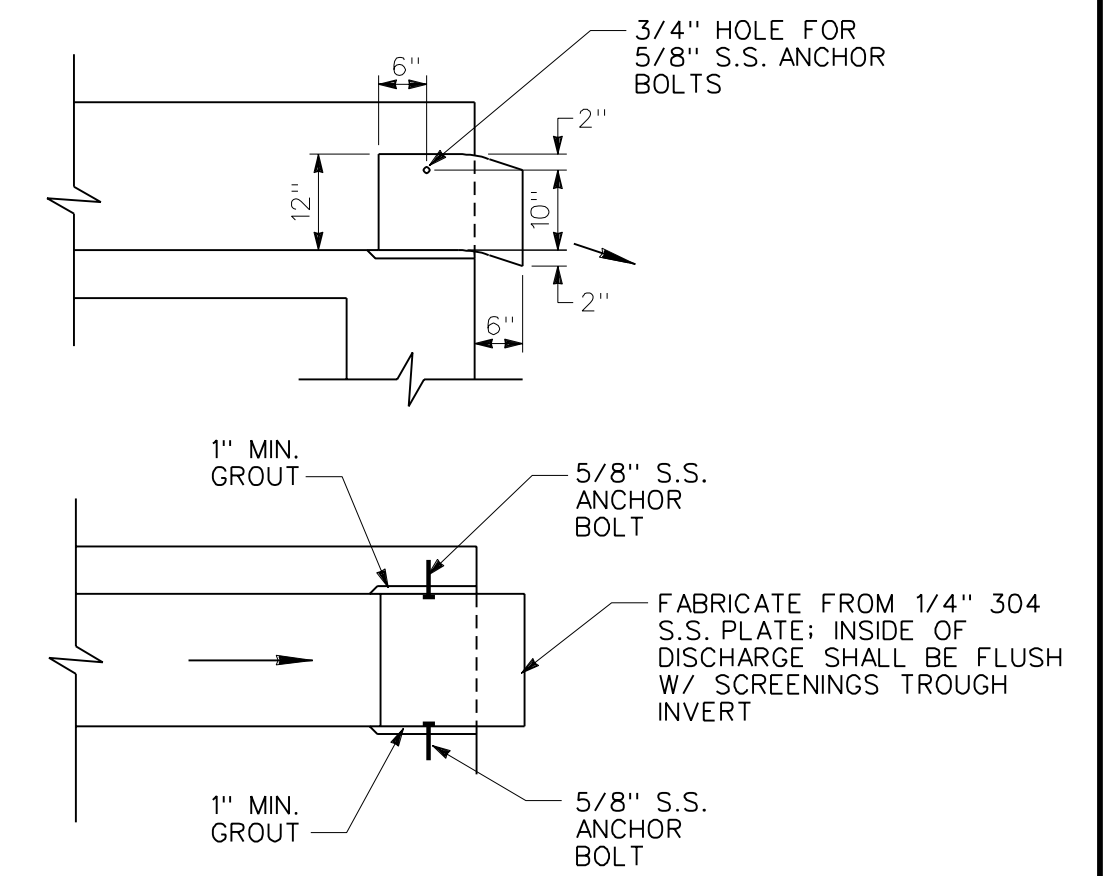
**SHEET INDEX & LEGENDS**  
 CITY OF JOHNSON CITY  
 WATAUGA WATER TREATMENT PLANT  
 1998 EXPANSION AND IMPROVEMENTS

DR.	CHK.	DATE	DESCRIPTION
SEE	DLH	11-20-98	ORIGINAL ISSUE
RWB	DLH	05-23-03	RECORD DRAWINGS

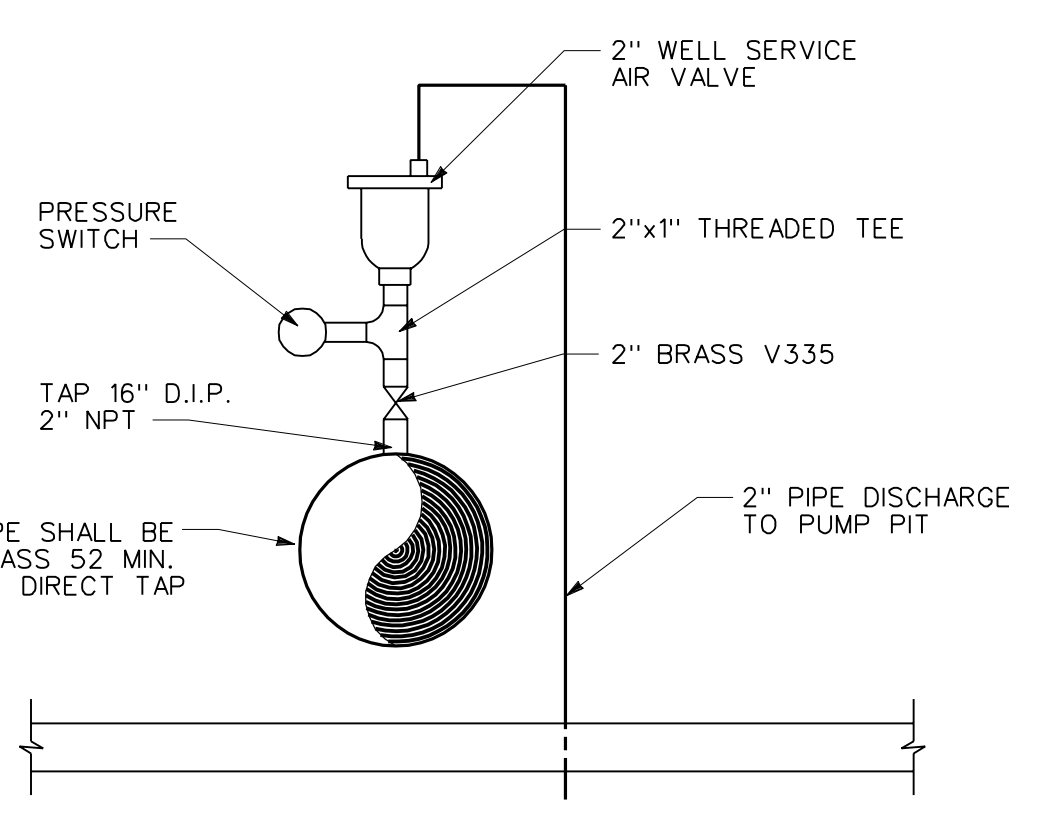
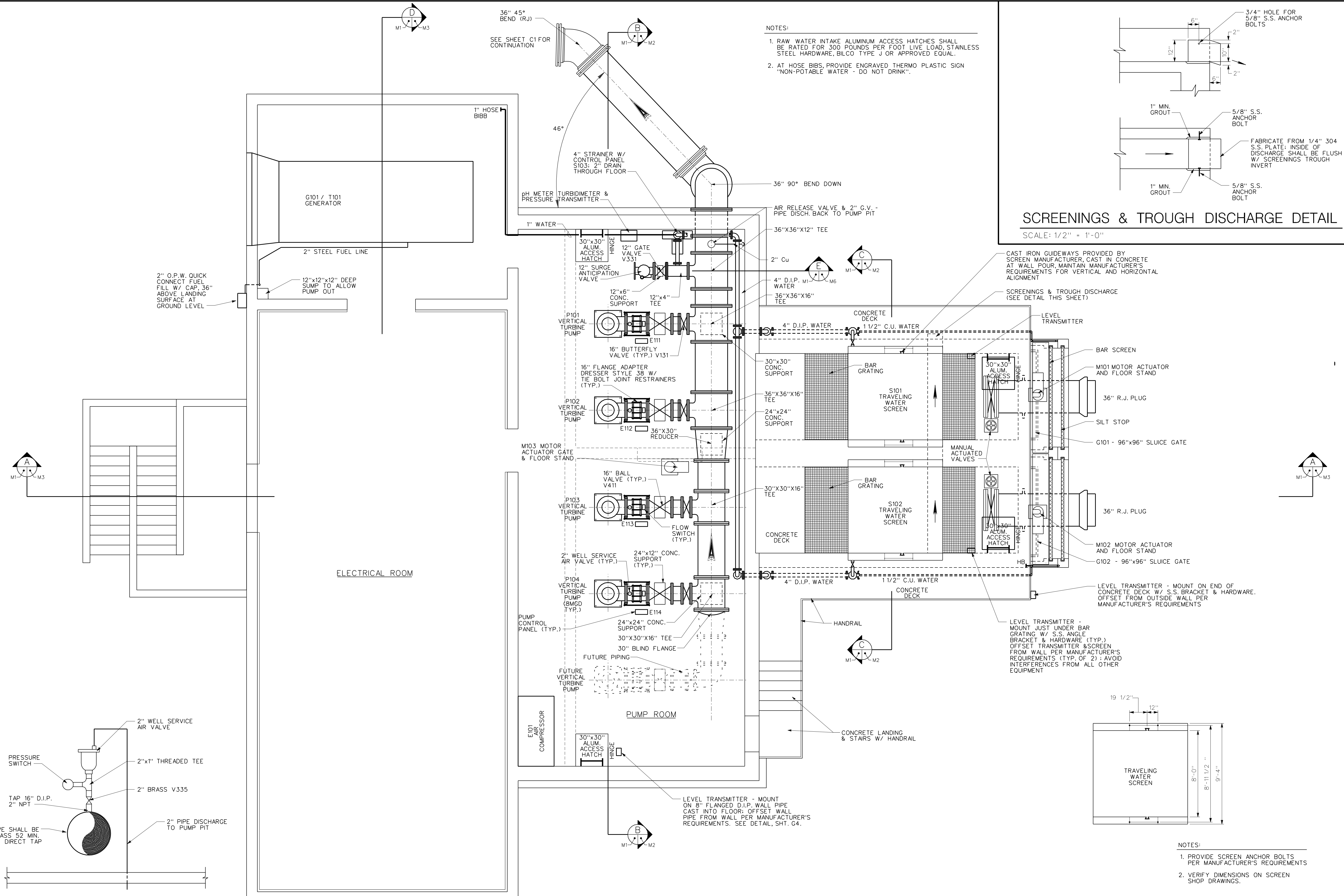
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FILE NO. 15784-20



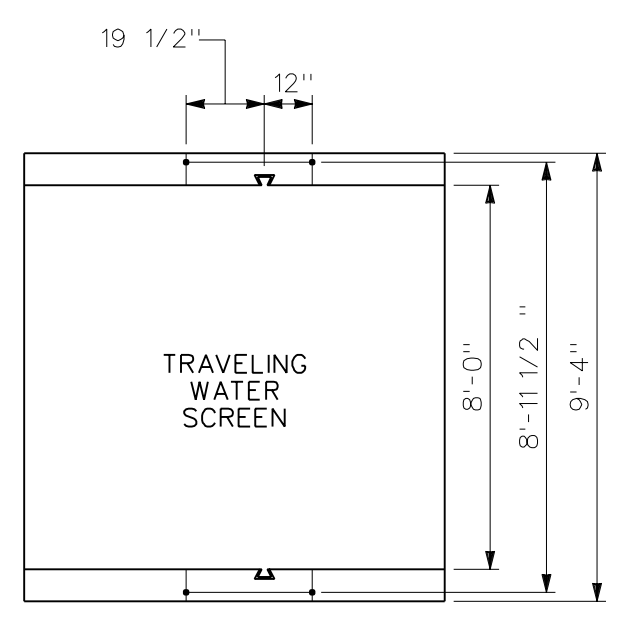
- NOTES:**
1. RAW WATER INTAKE ALUMINUM ACCESS HATCHES SHALL BE RATED FOR 300 POUNDS PER FOOT LIVE LOAD, STAINLESS STEEL HARDWARE, BILCO TYPE "J" OR APPROVED EQUAL.
  2. AT HOSE BIBS, PROVIDE ENGRAVED THERMO PLASTIC SIGN "NON-POTABLE WATER - DO NOT DRINK".



**SCREENINGS & TROUGH DISCHARGE DETAIL**  
 SCALE: 1/2" = 1'-0"



**2" WELL SERVICE AIR VALVE DETAIL**  
 SCALE: 3/4" = 1'-0"



**TRAVELING SCREEN ANCHOR BOLT DETAIL**  
 SCALE: 1/4" = 1'-0"

- NOTES:**
1. PROVIDE SCREEN ANCHOR BOLTS PER MANUFACTURER'S REQUIREMENTS
  2. VERIFY DIMENSIONS ON SCREEN SHOP DRAWINGS.



**RAW WATER INTAKE - UPPER PLAN**  
 CITY OF JOHNSON CITY  
 WATAUGA WATER TREATMENT PLANT  
 1998 EXPANSION AND IMPROVEMENTS

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RWB	DLH	05-23-03	RECORD DRAWINGS

**RECORD DRAWING**  
 05/23/03

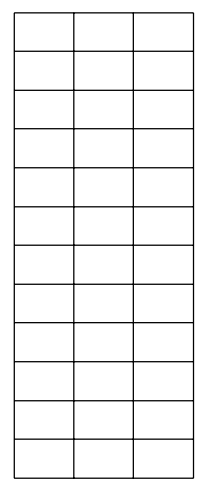
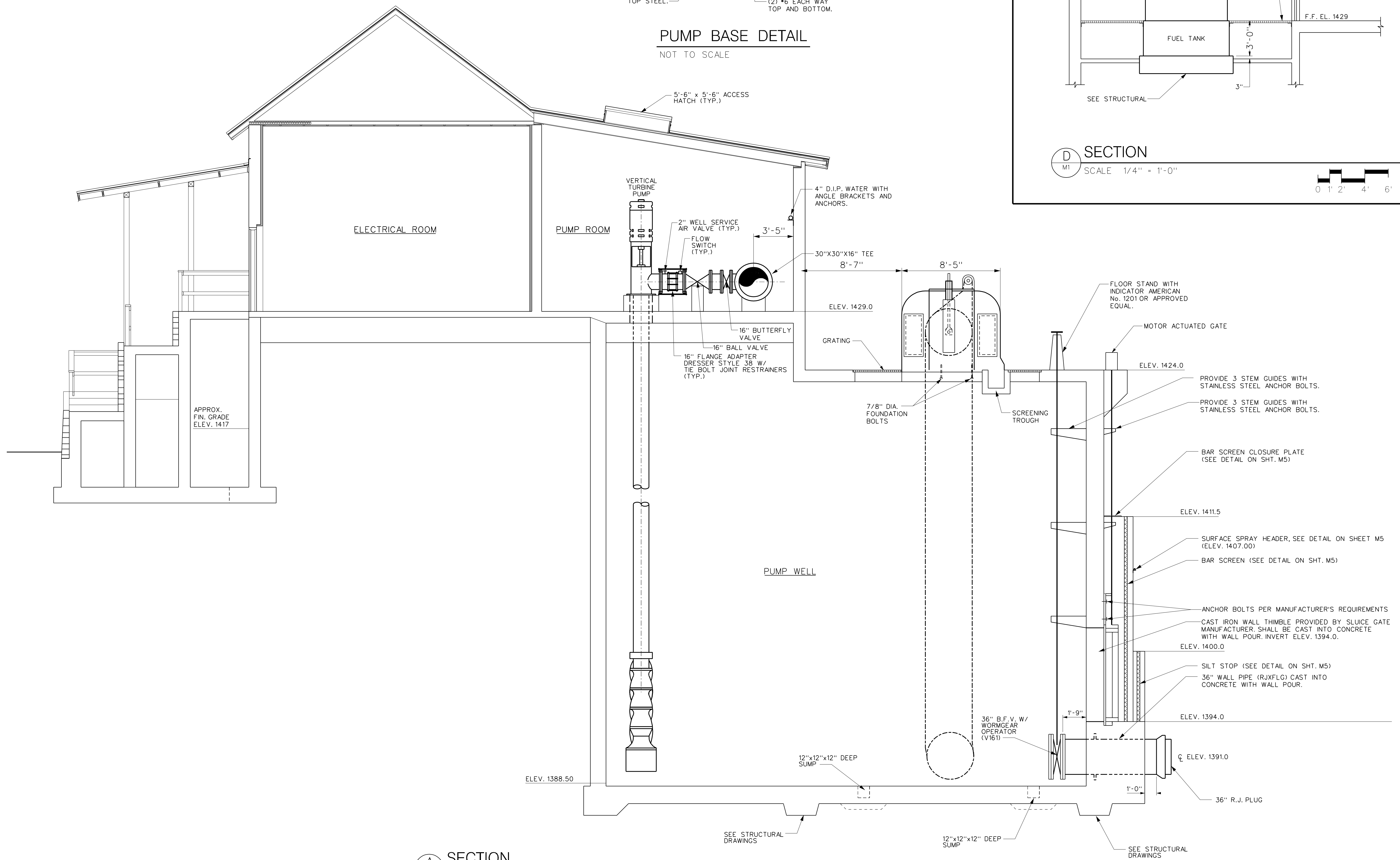
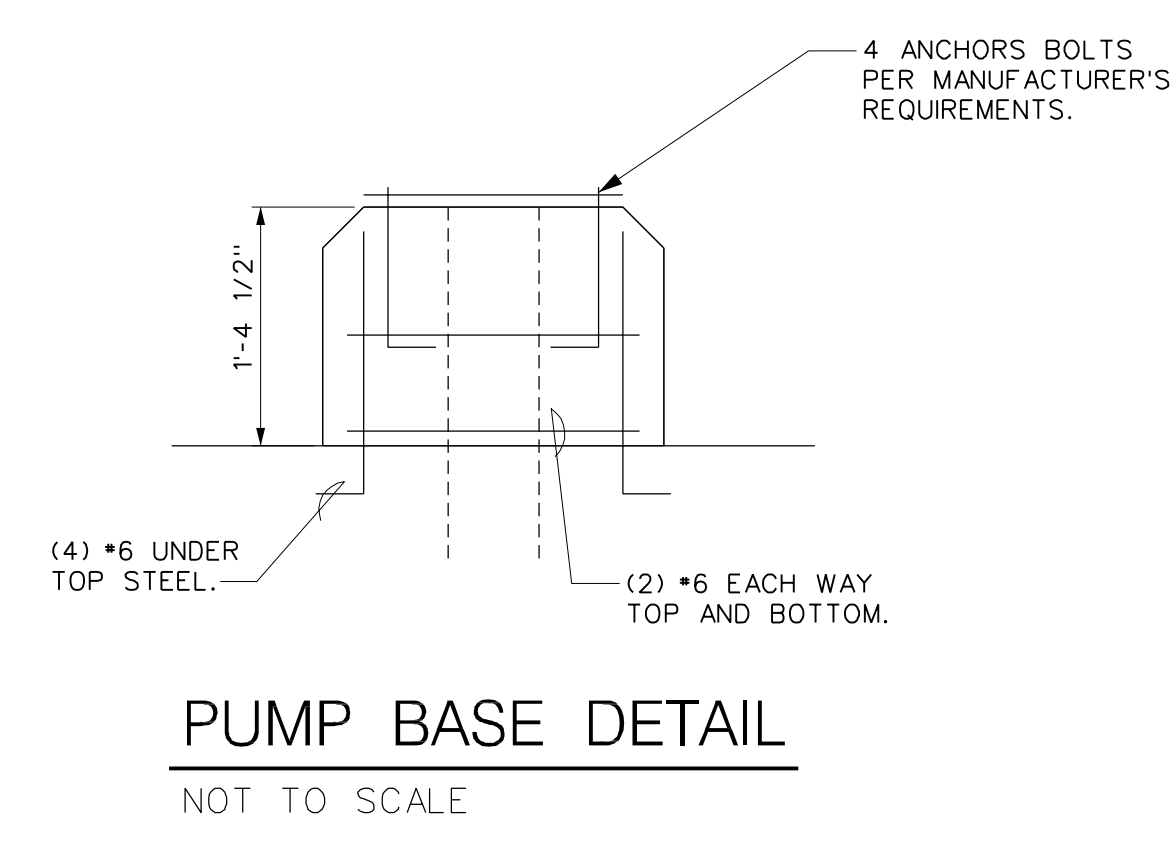
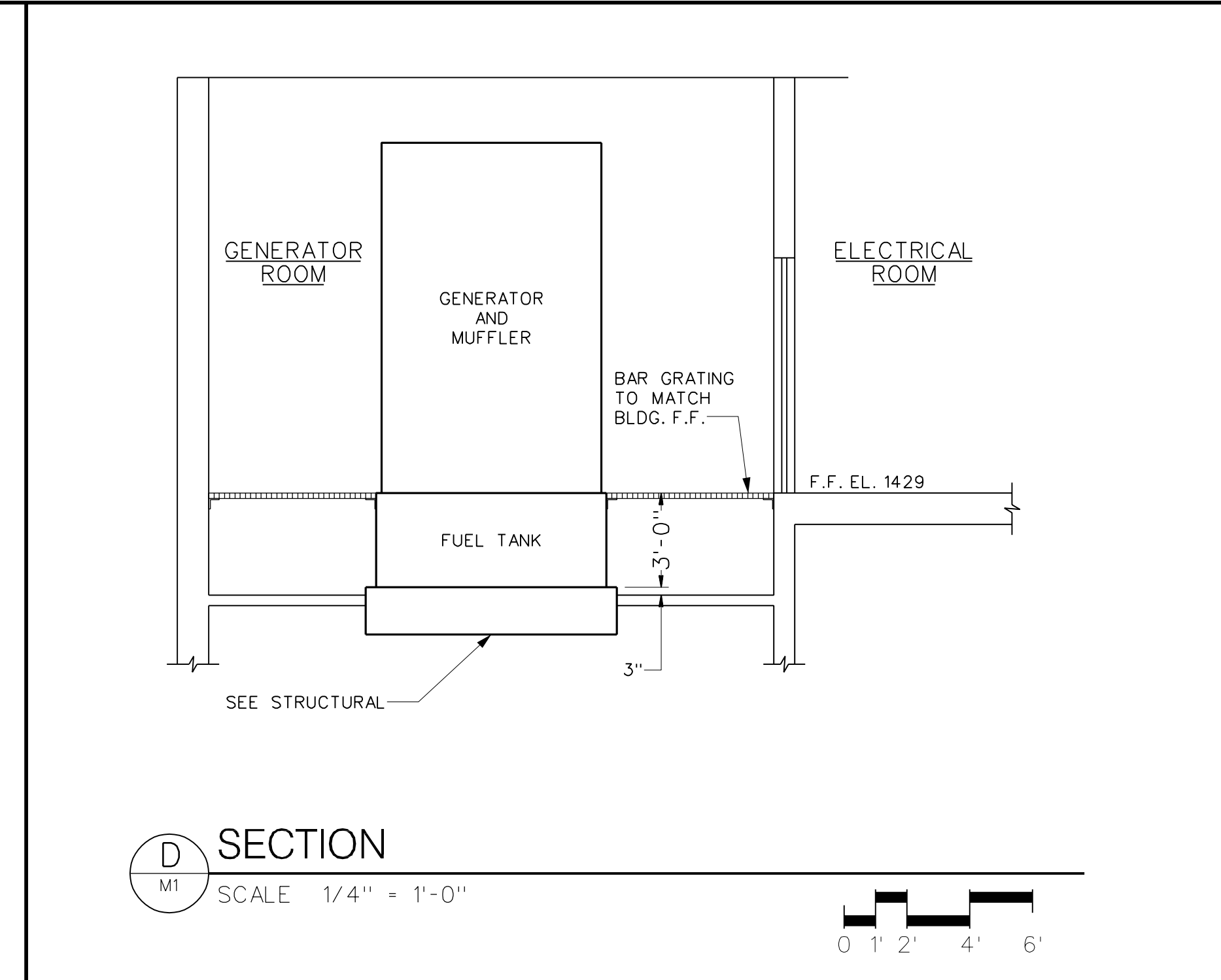
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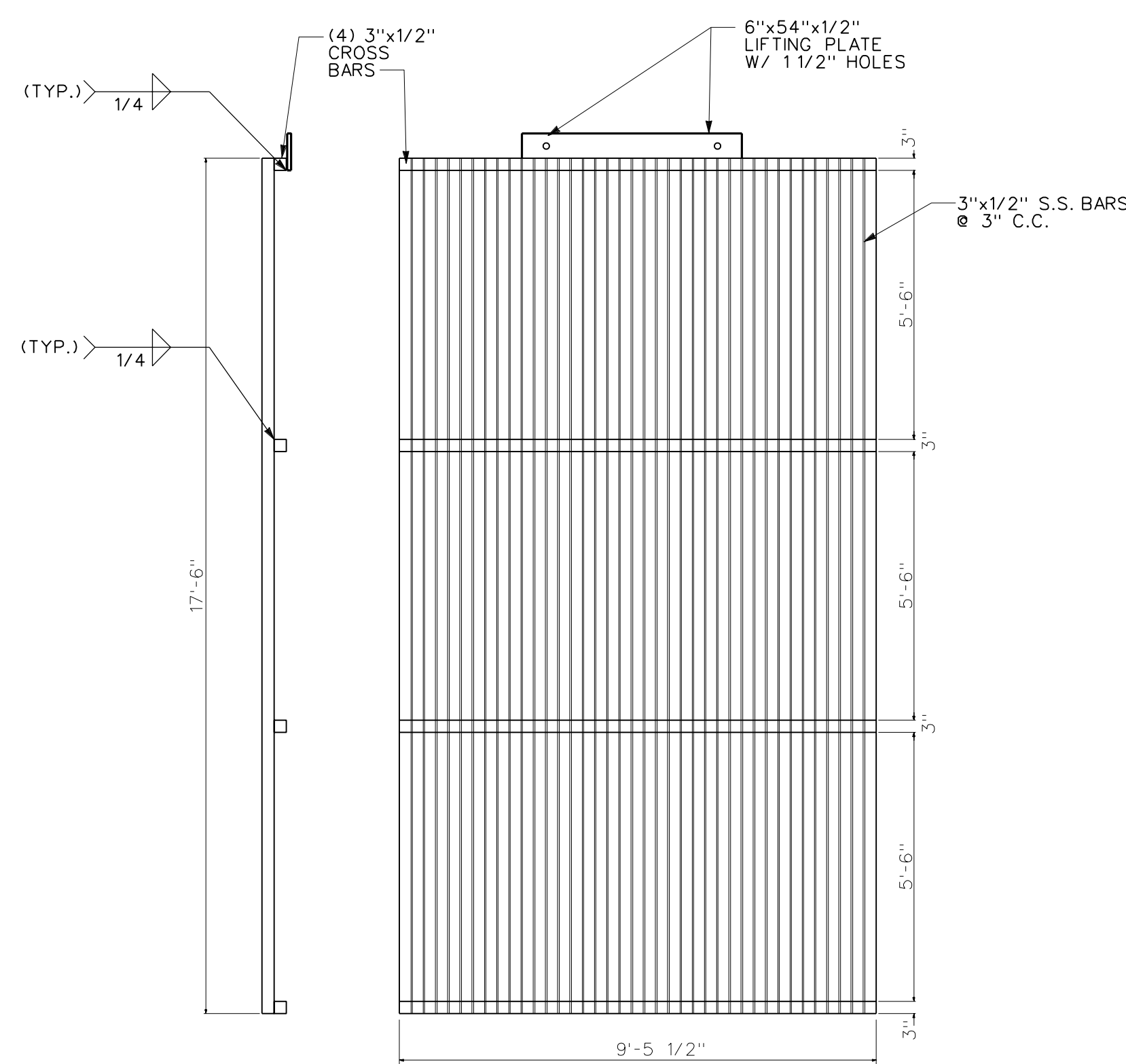


RAW WATER INTAKE - SECTIONS  
 CITY OF JOHNSON CITY  
 WATAUGA WATER TREATMENT PLANT  
 1998 EXPANSION AND IMPROVEMENTS

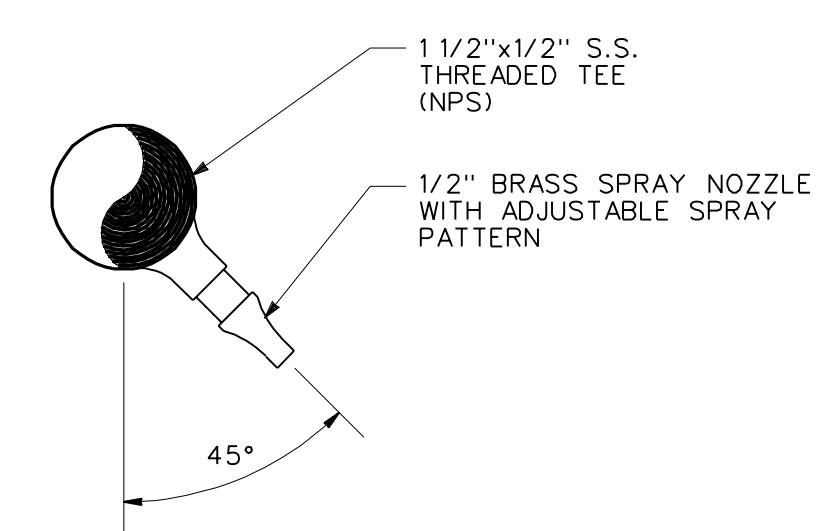
DR.	CHK.	DATE	DESCRIPTION
SEE	D/LH	11-20-98	ORIGINAL ISSUE
RWB	D/LH	05-23-03	RECORD DRAWINGS



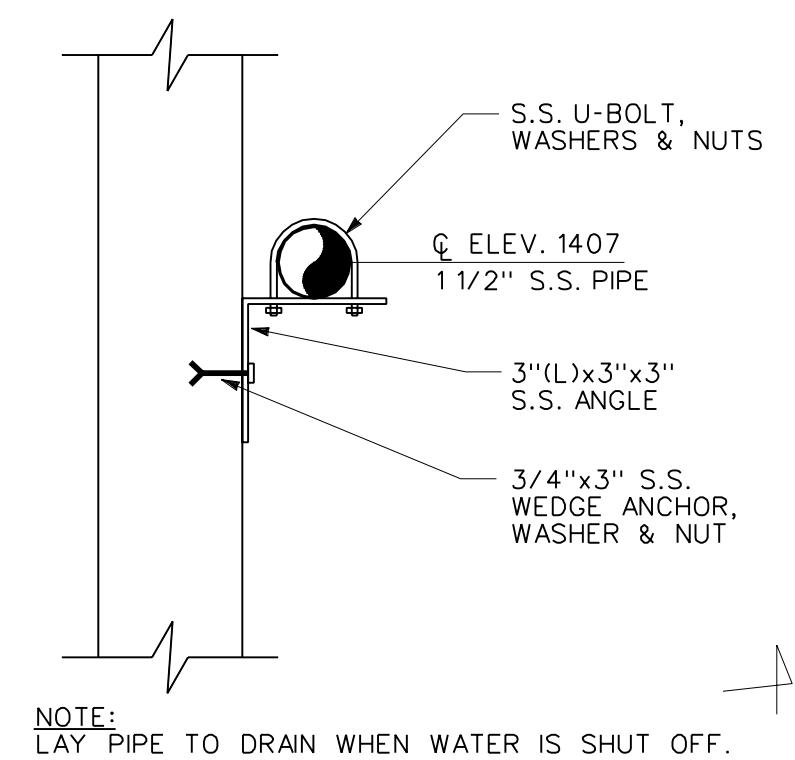
**RECORD DRAWING**  
 05/23/03



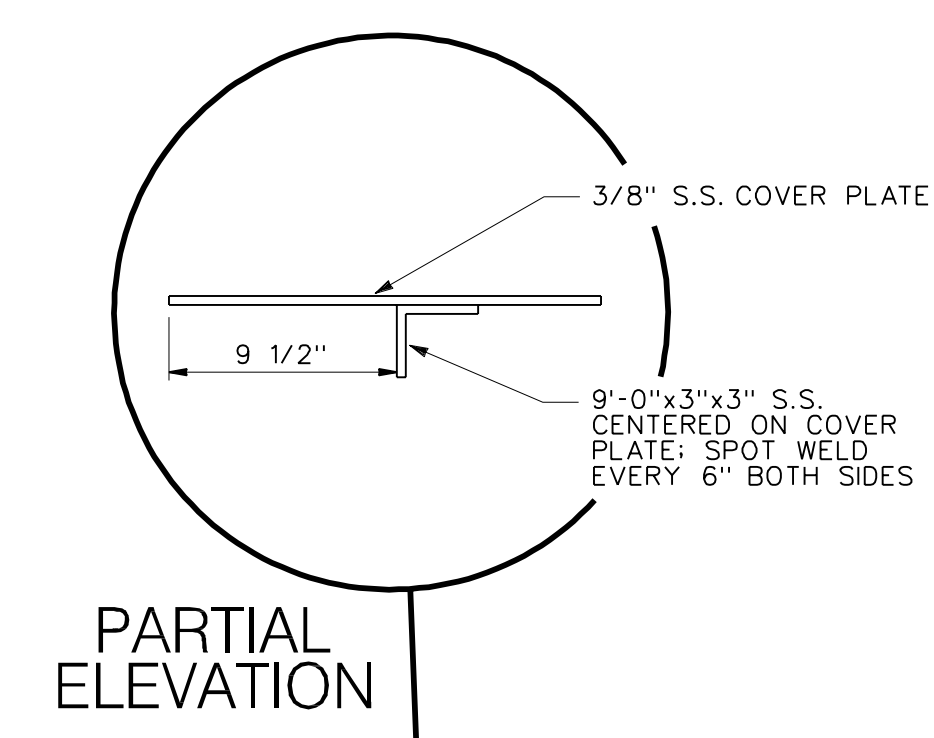
**BAR SCREEN DETAIL (TYP. OF 2)**  
 SCALE: 3/8" = 1'-0"



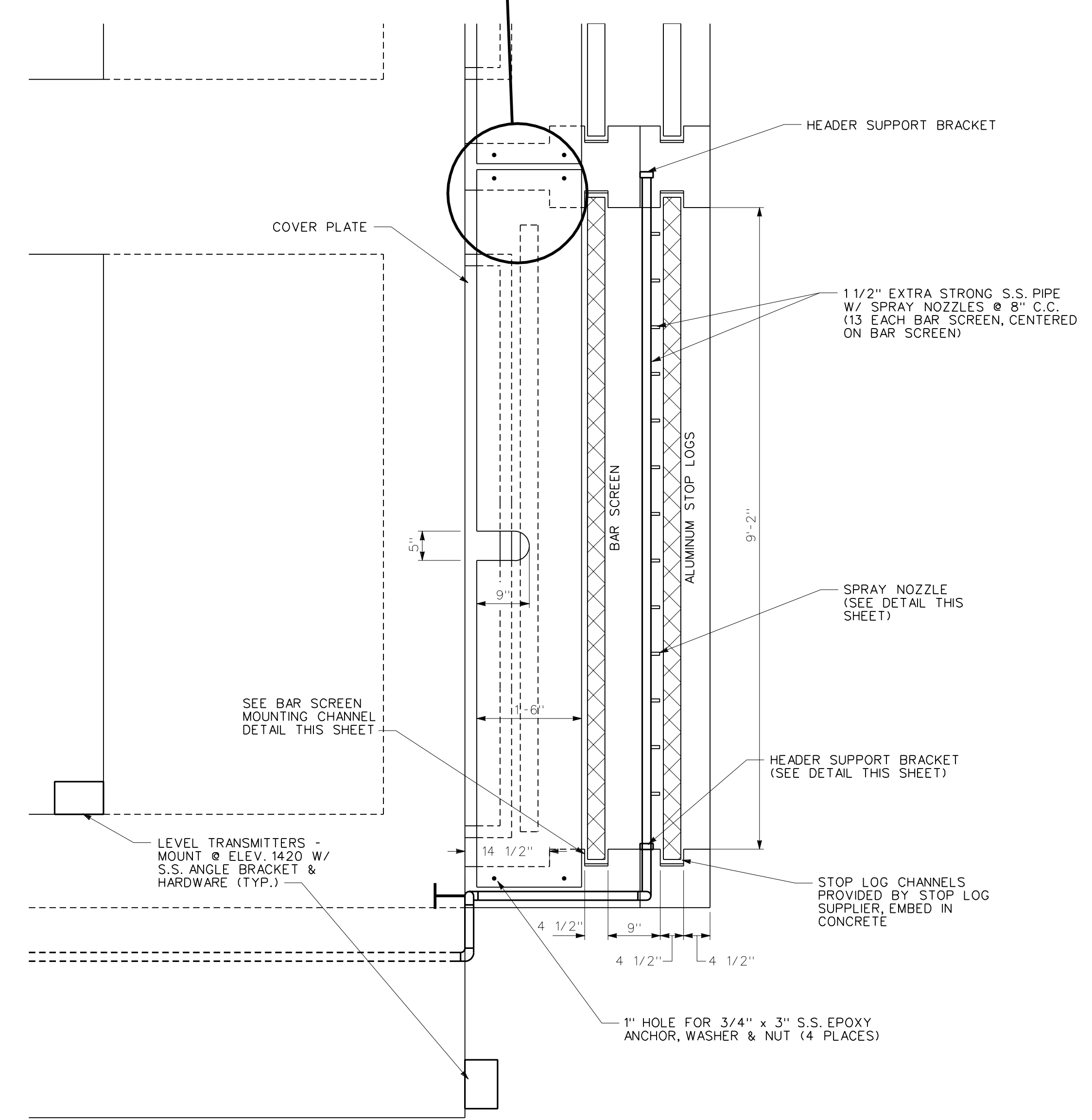
**SPRAY NOZZLES DETAIL**  
 NOT TO SCALE



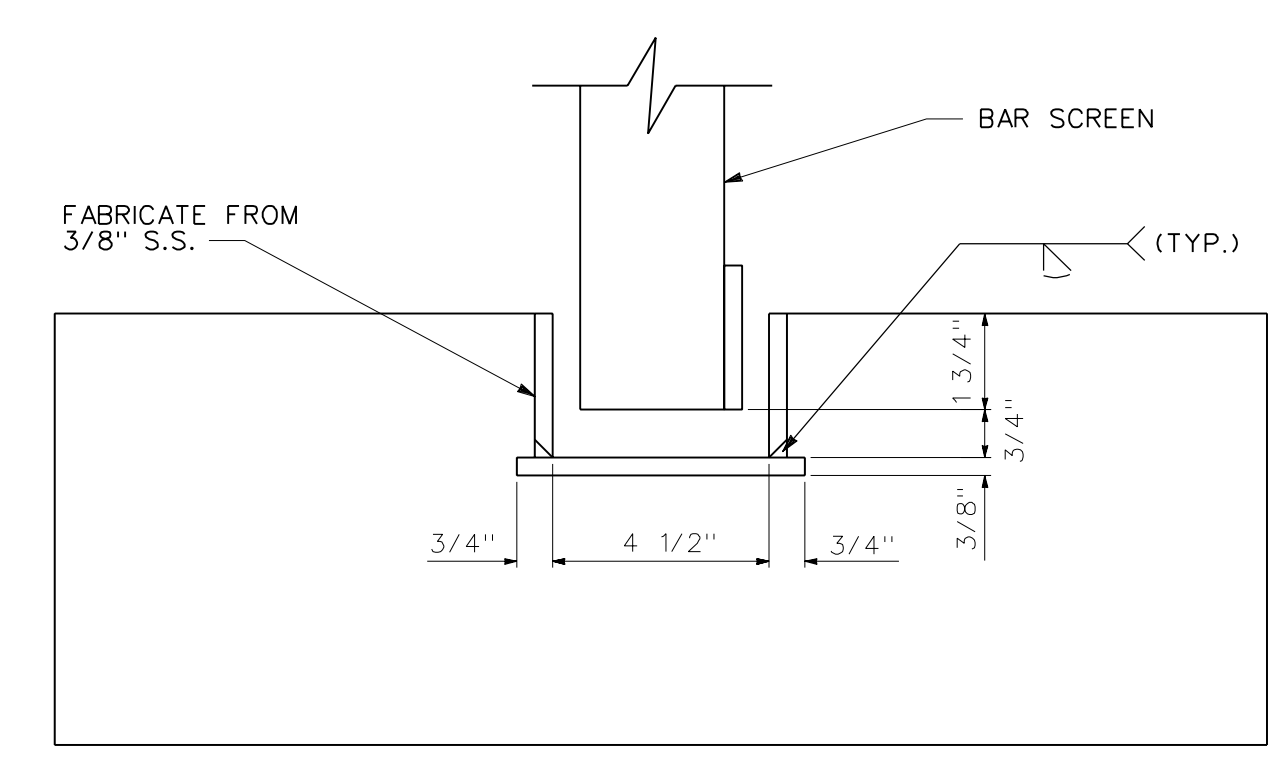
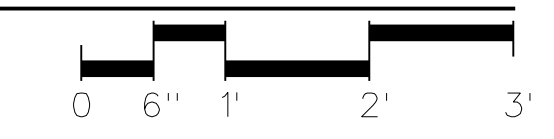
**HEADER SUPPORT BRACKET DETAIL**  
 NOT TO SCALE



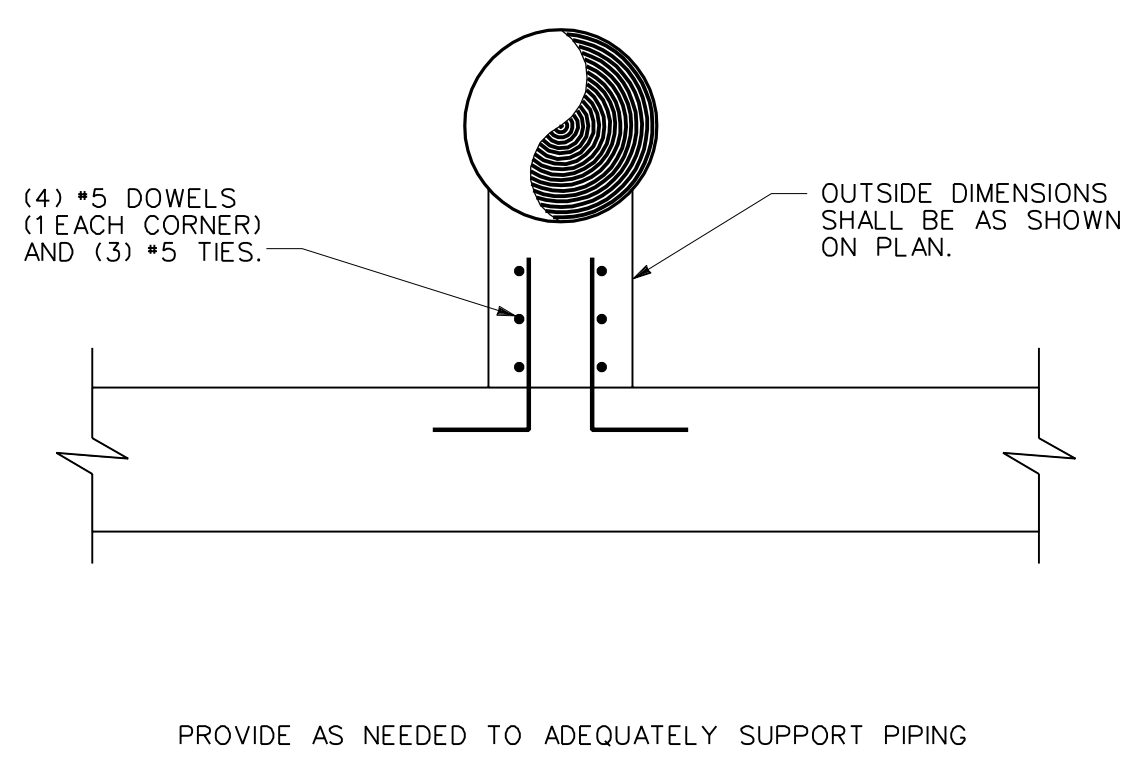
**PARTIAL ELEVATION**



**INTAKE SLUICE GATE, BAR SCREEN & STOP LOG PLAN**  
 SCALE 3/4" = 1'-0"



**BAR SCREEN MOUNTING CHANNEL DETAIL**  
 SCALE 3" = 1'-0"



**CONCRETE PIPE SUPPORTS DETAIL**  
 NOT TO SCALE

**RAW WATER INTAKE - EQUIPMENT DETAILS**  
 CITY OF JOHNSON CITY  
 WATAUGA WATER TREATMENT PLANT  
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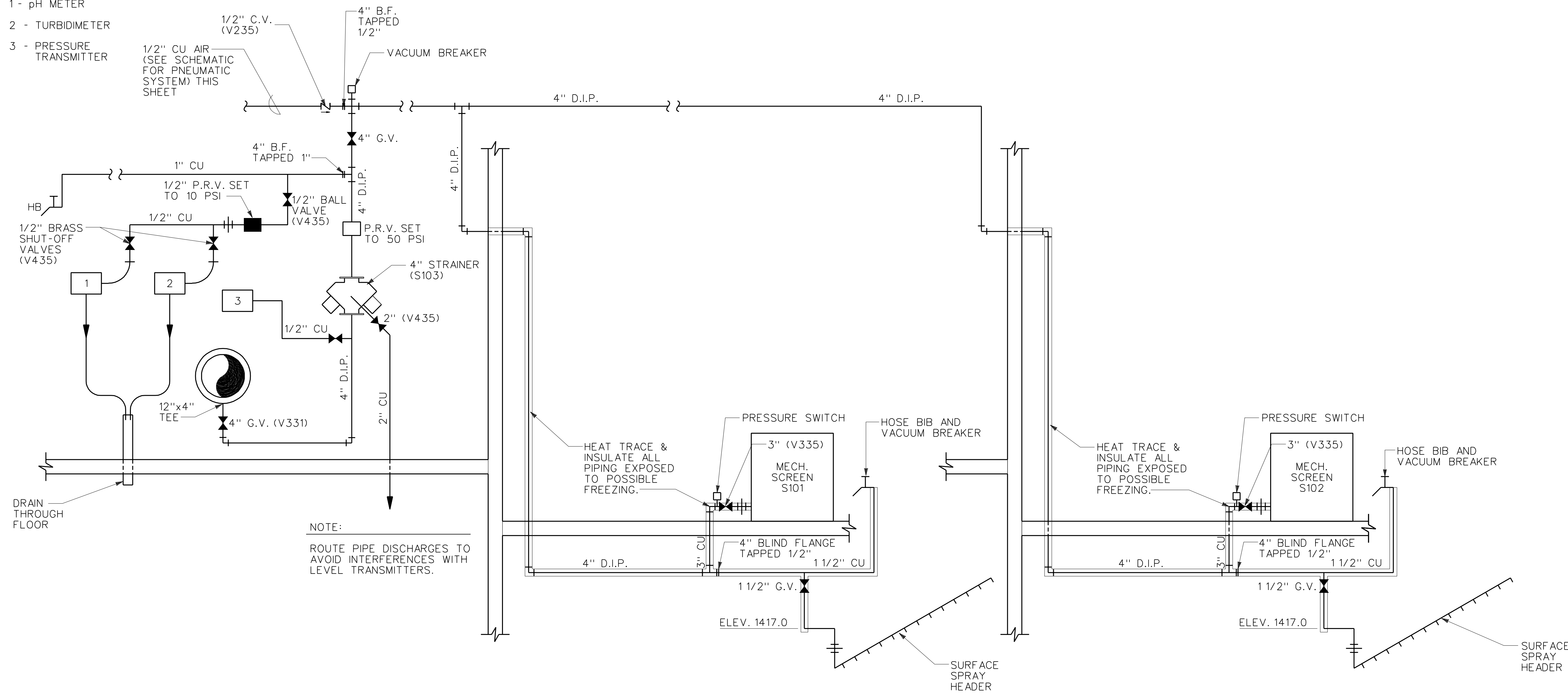
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**RECORD DRAWING**  
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**M5**  
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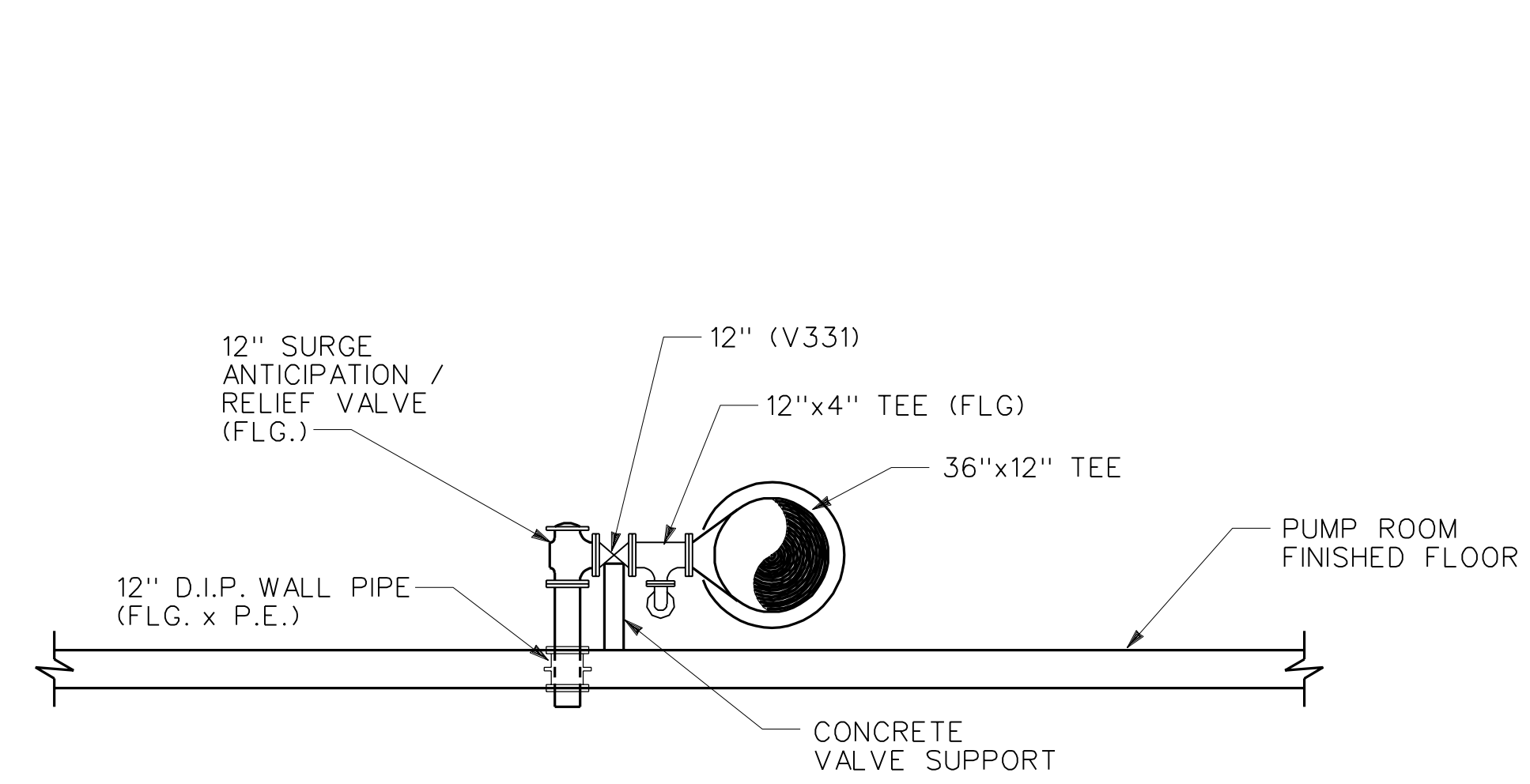
- 1 - pH METER
- 2 - TURBIDIMETER
- 3 - PRESSURE TRANSMITTER



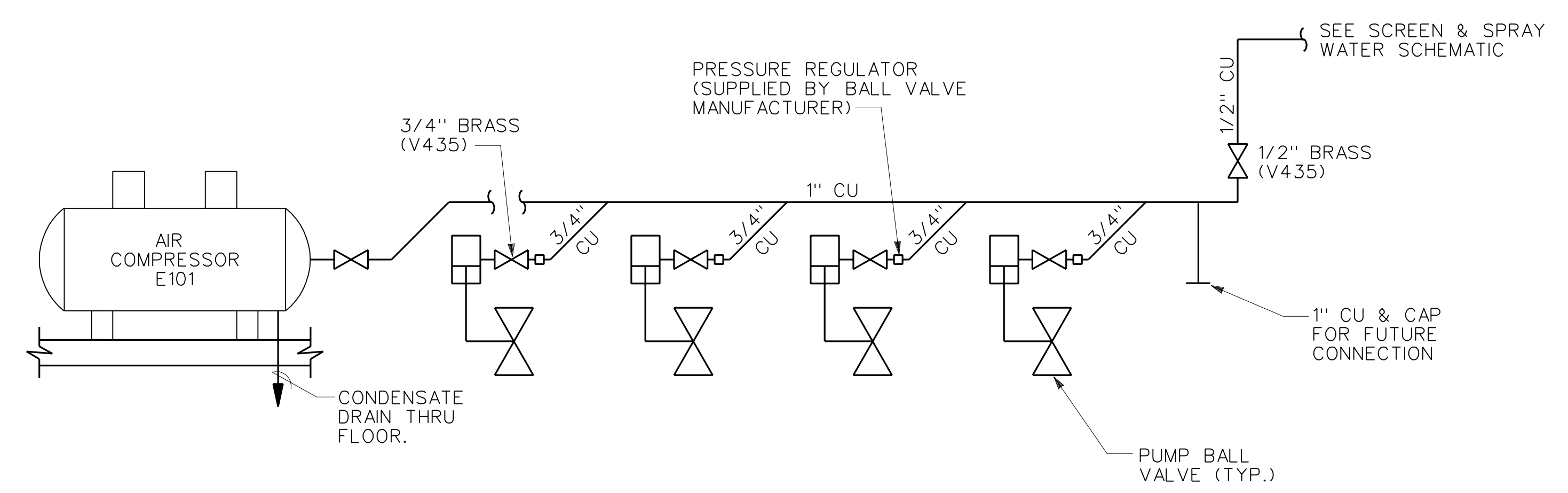
NOTE:  
ROUTE PIPE DISCHARGES TO AVOID INTERFERENCES WITH LEVEL TRANSMITTERS.

### SCREEN & SPRAY WATER SCHEMATIC

- NOT TO SCALE
- NOTES:
1. SURFACE SPRAY SYSTEM SHALL BE SHUT OFF AND BLOWN OUT IF TAKEN OUT OF SERVICE BELOW 32°F OR ANY TIME TEMPERATURES ARE BELOW 20°F.
  2. WATER LINES SHALL BE INSTALLED TO ALLOW THEM TO DRAIN TO SURFACE SPRAY HEADER IF WATER IS TURNED OFF.



**E** SURGE VALVE PIPING - PARTIAL SECTION  
SCALE: 1/4" = 1'-0"



CHECK VALVE PNEUMATIC SYSTEM - SCHEMATIC  
NOT TO SCALE

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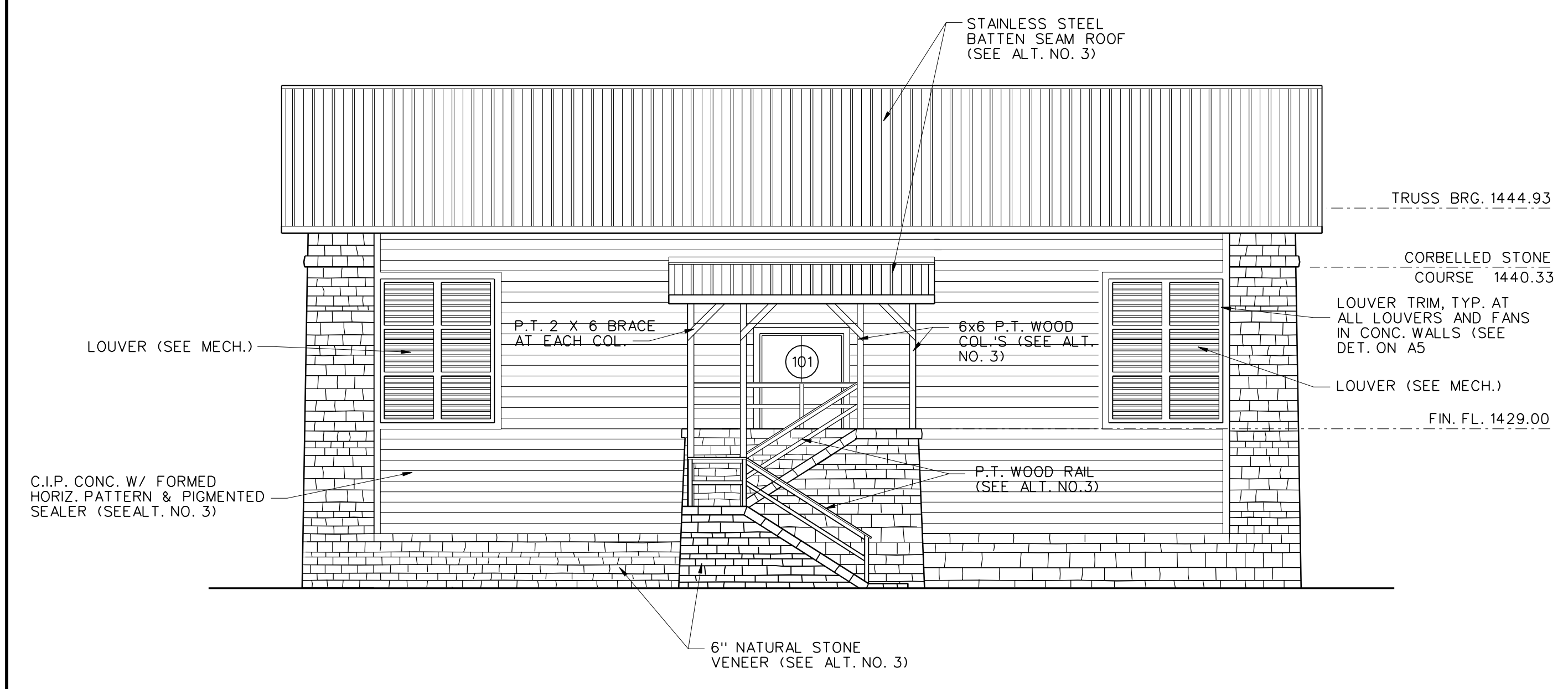
RAW WATER INTAKE - EQUIPMENT DETAILS

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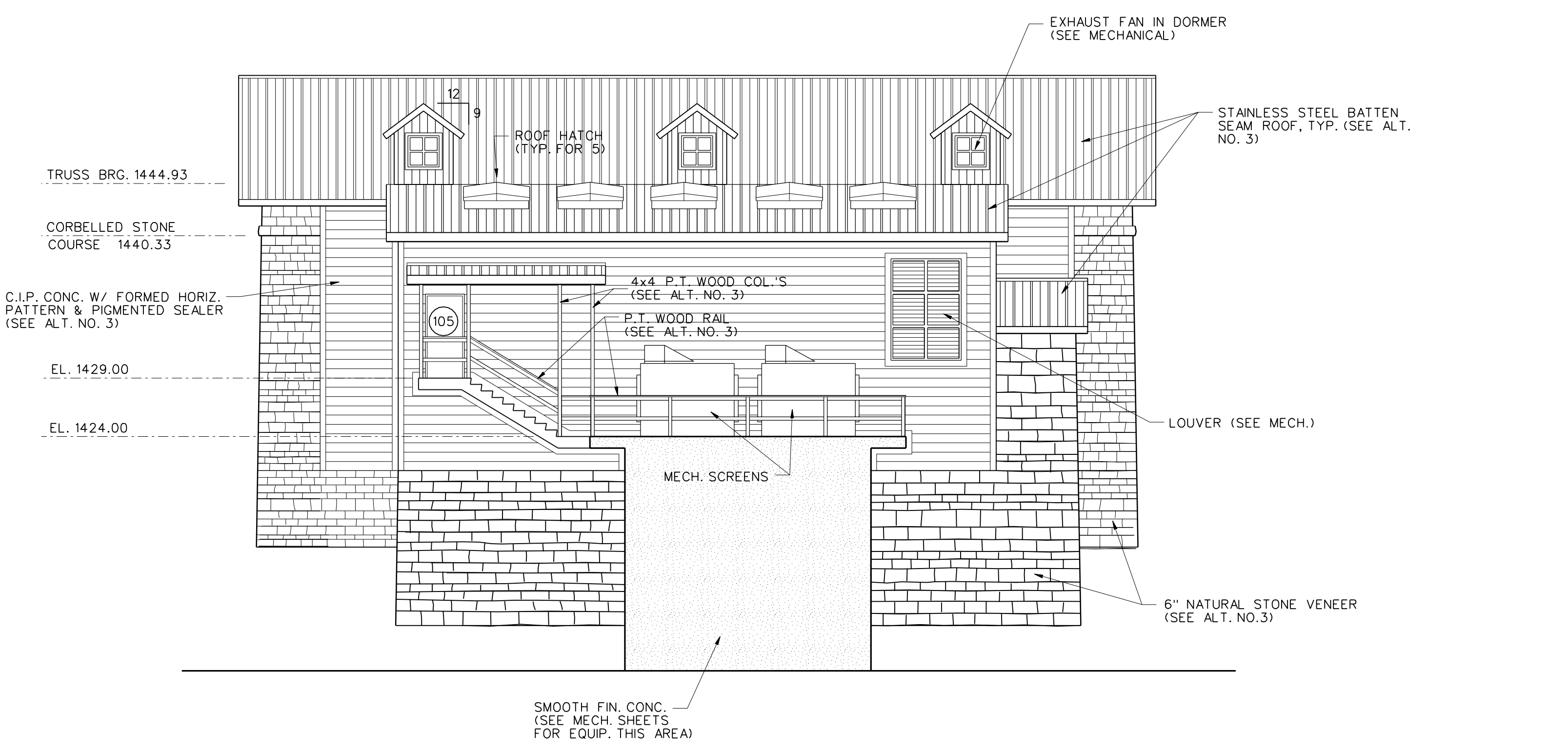
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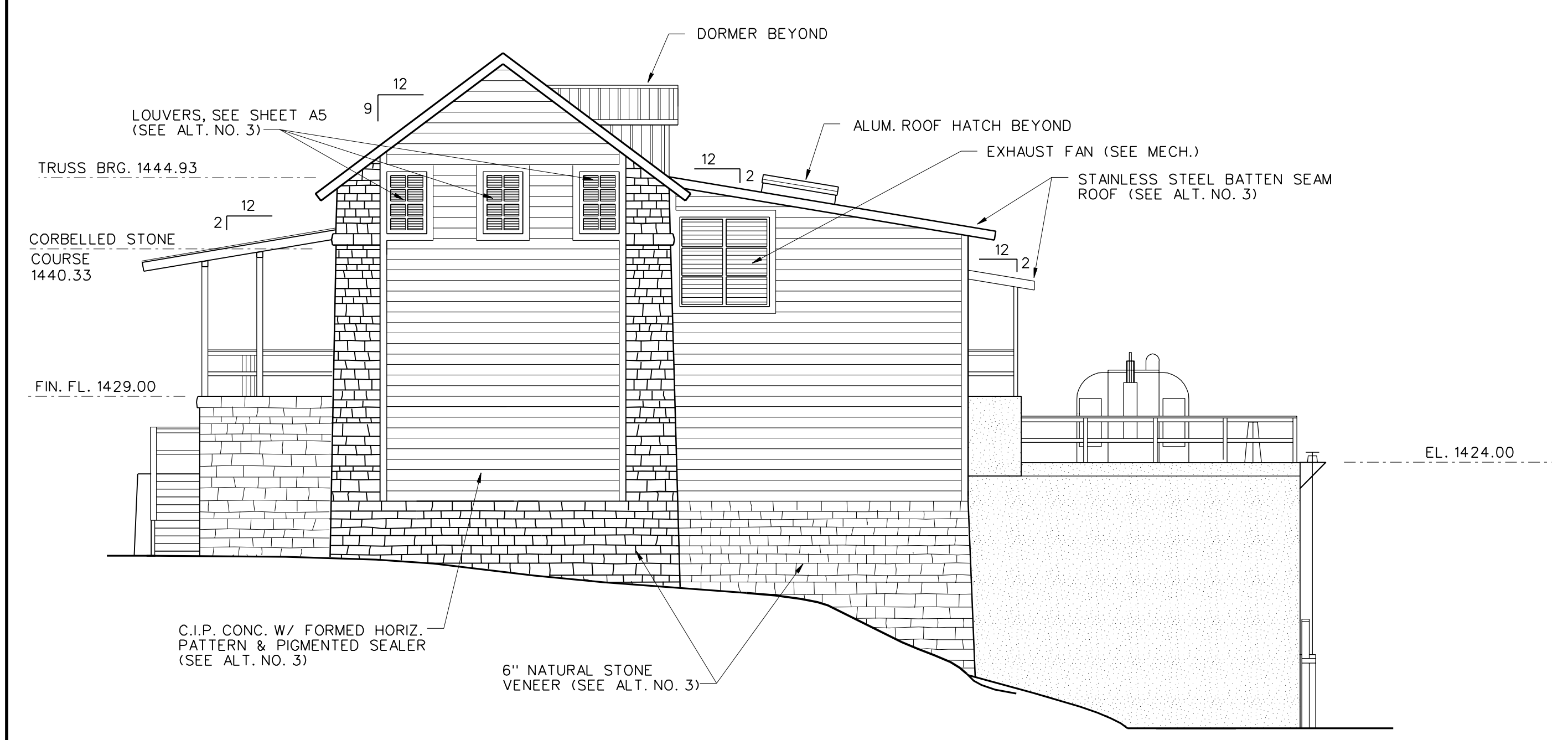
**RAW WATER INTAKE – WEST ELEVATION**

SCALE 1/8" = 1'-0"



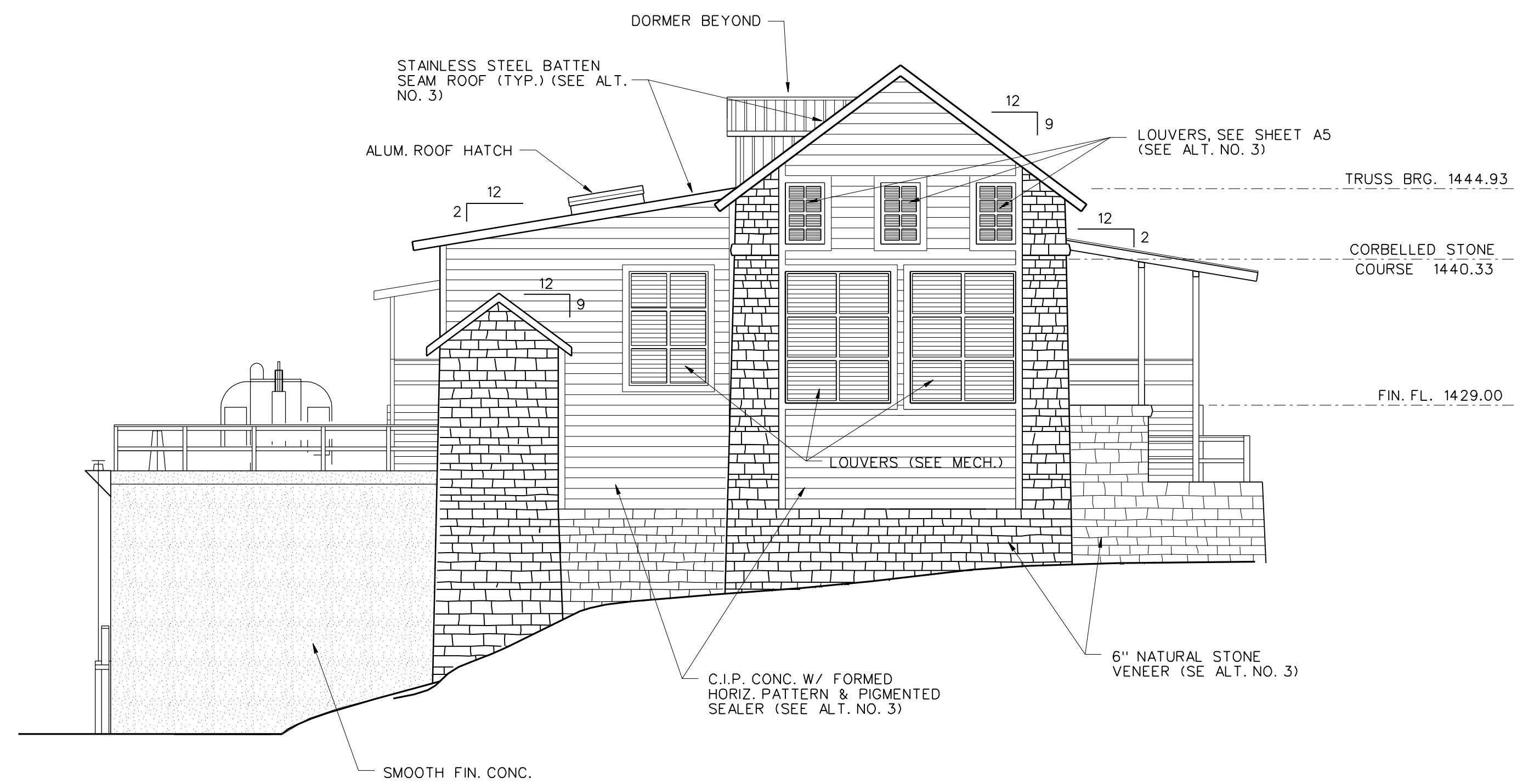
**RAW WATER INTAKE – EAST ELEVATION**

SCALE 1/8" = 1'-0"



**RAW WATER INTAKE – SOUTH ELEVATION**

SCALE 1/8" = 1'-0"



**RAW WATER INTAKE – NORTH ELEVATION**

SCALE 1/8" = 1'-0"

RAW WATER INTAKE – ELEVATIONS

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RWB	DLH	05-23-03	RECORD DRAWINGS
		11-20-98	ORIGINAL ISSUE

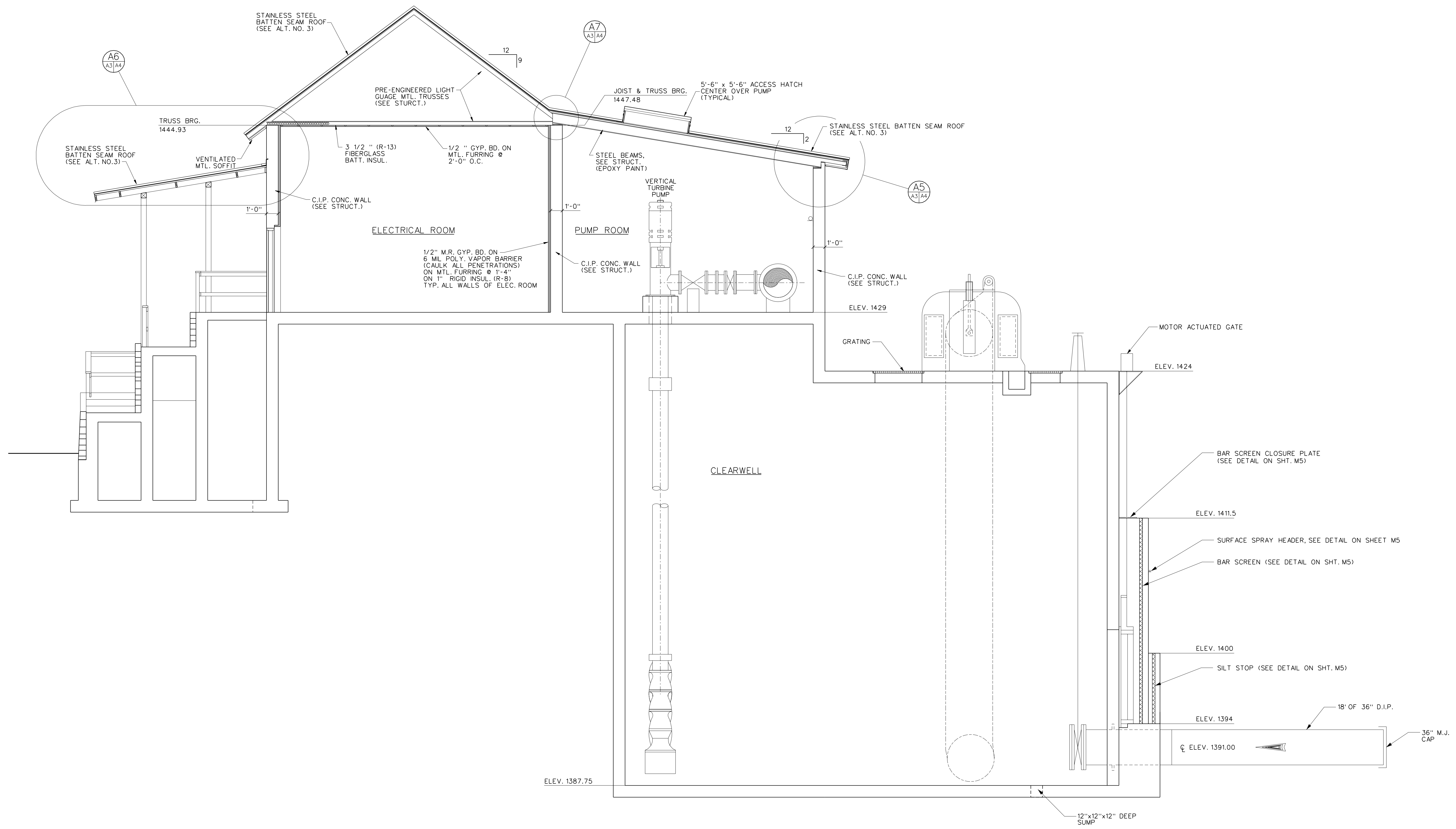
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**A2**

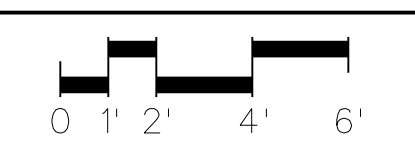
FILE NO. 15784-20

RAW WATER INTAKE - SECTIONS

CITY OF JOHNSON CITY  
 WATAUGA WATER TREATMENT PLANT  
 1998 EXPANSION AND IMPROVEMENTS



**A1 SECTION**  
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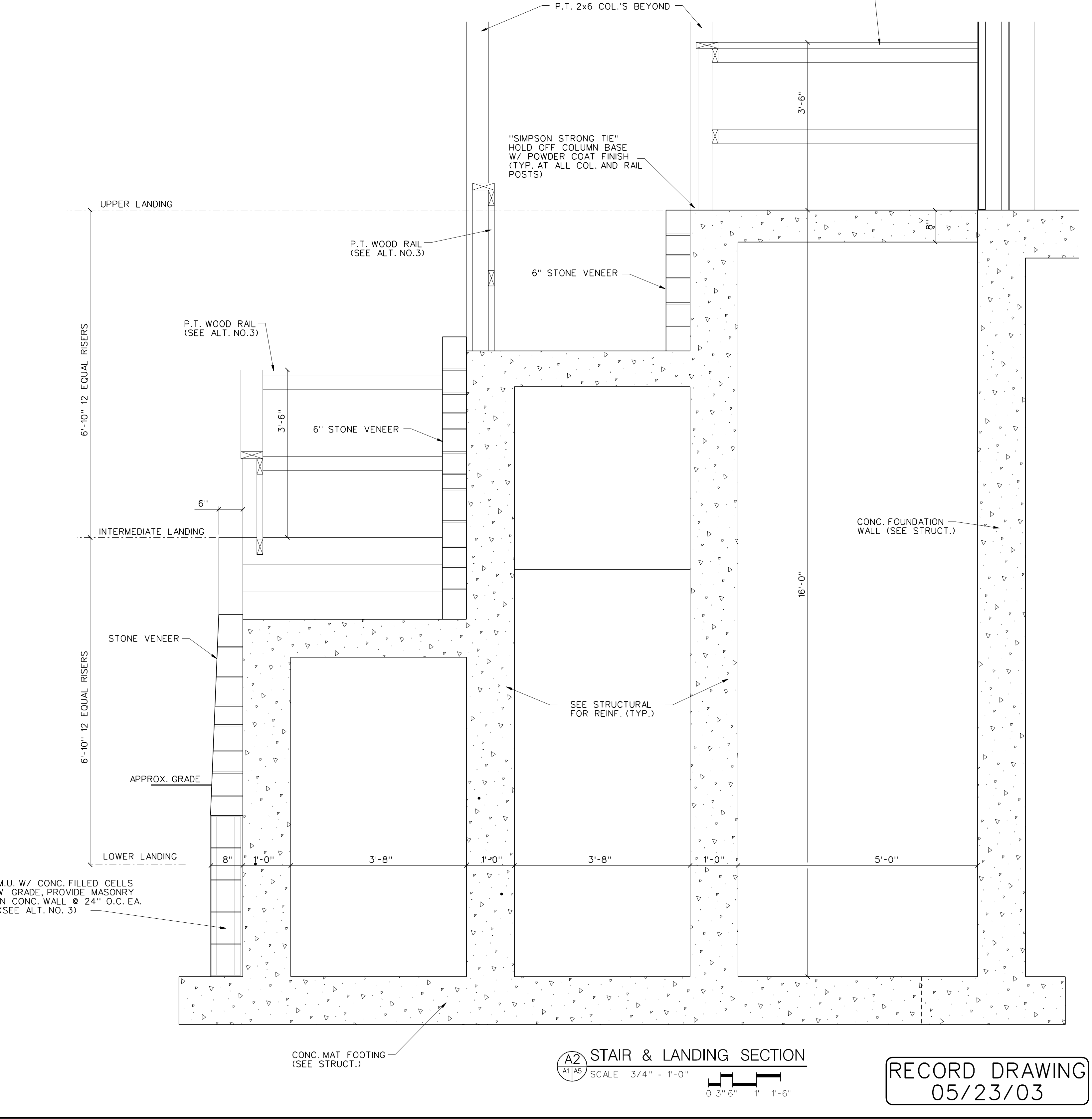
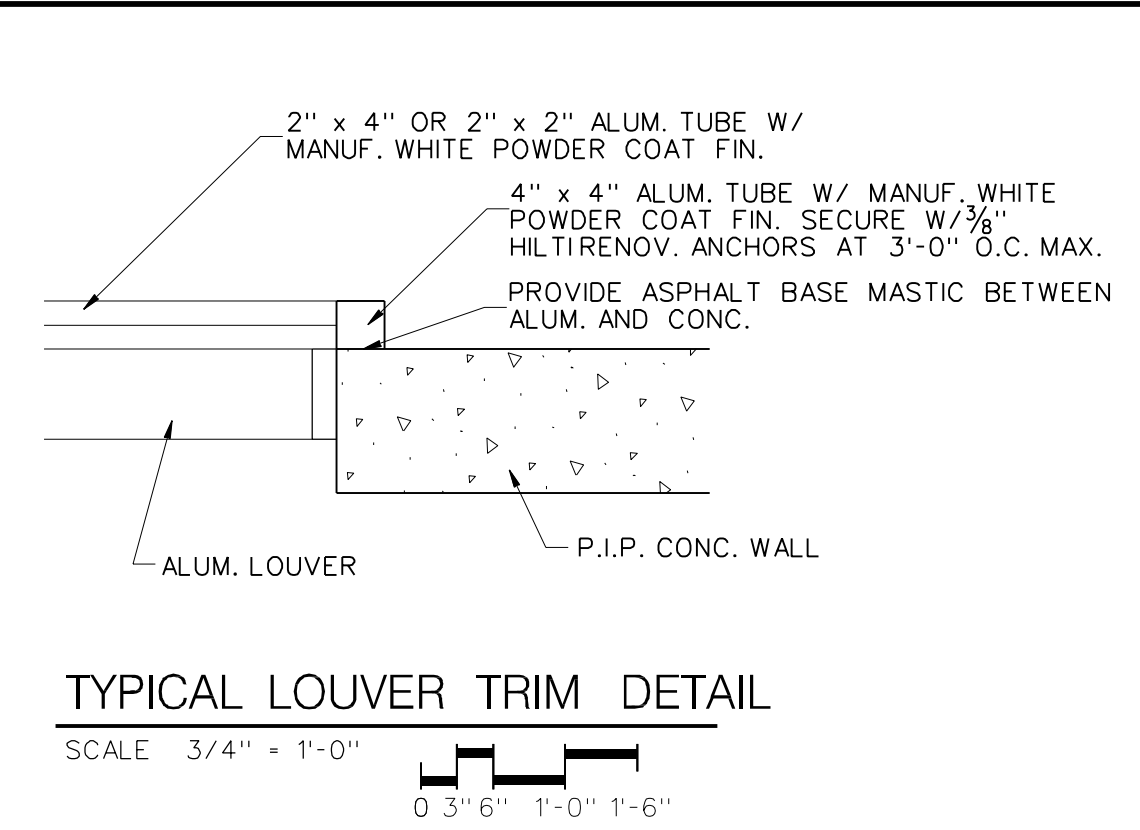
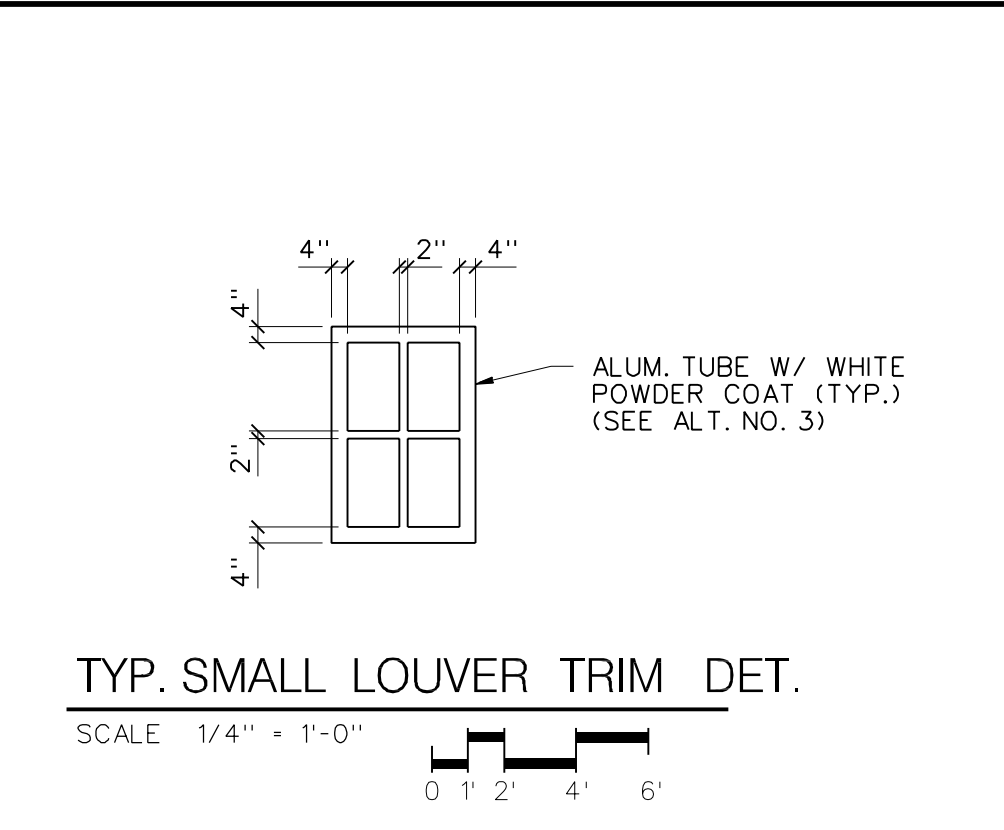
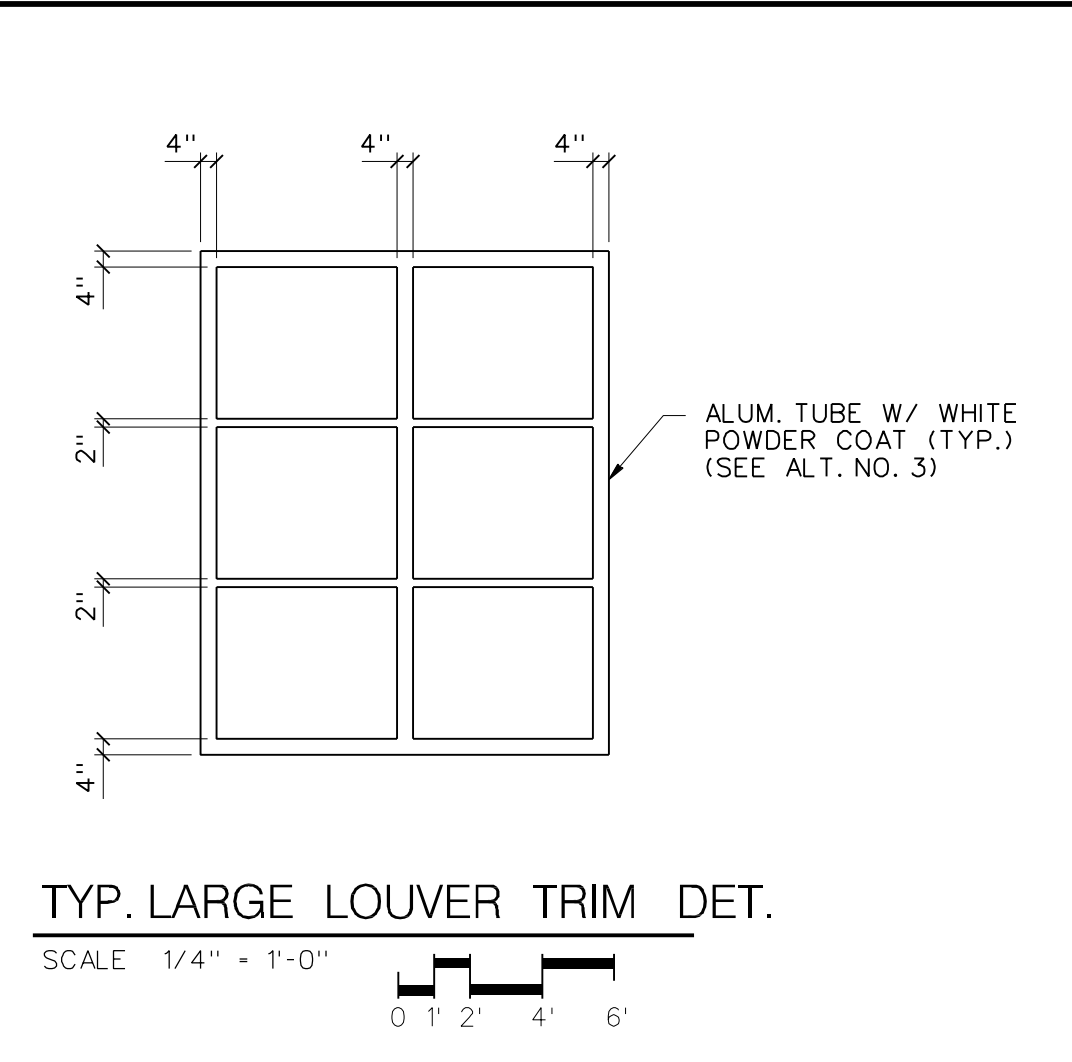
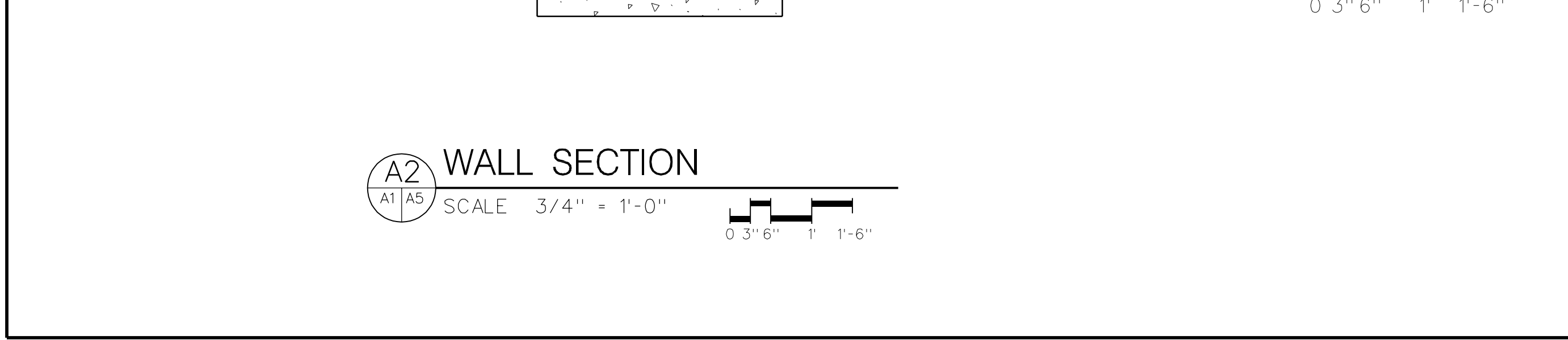
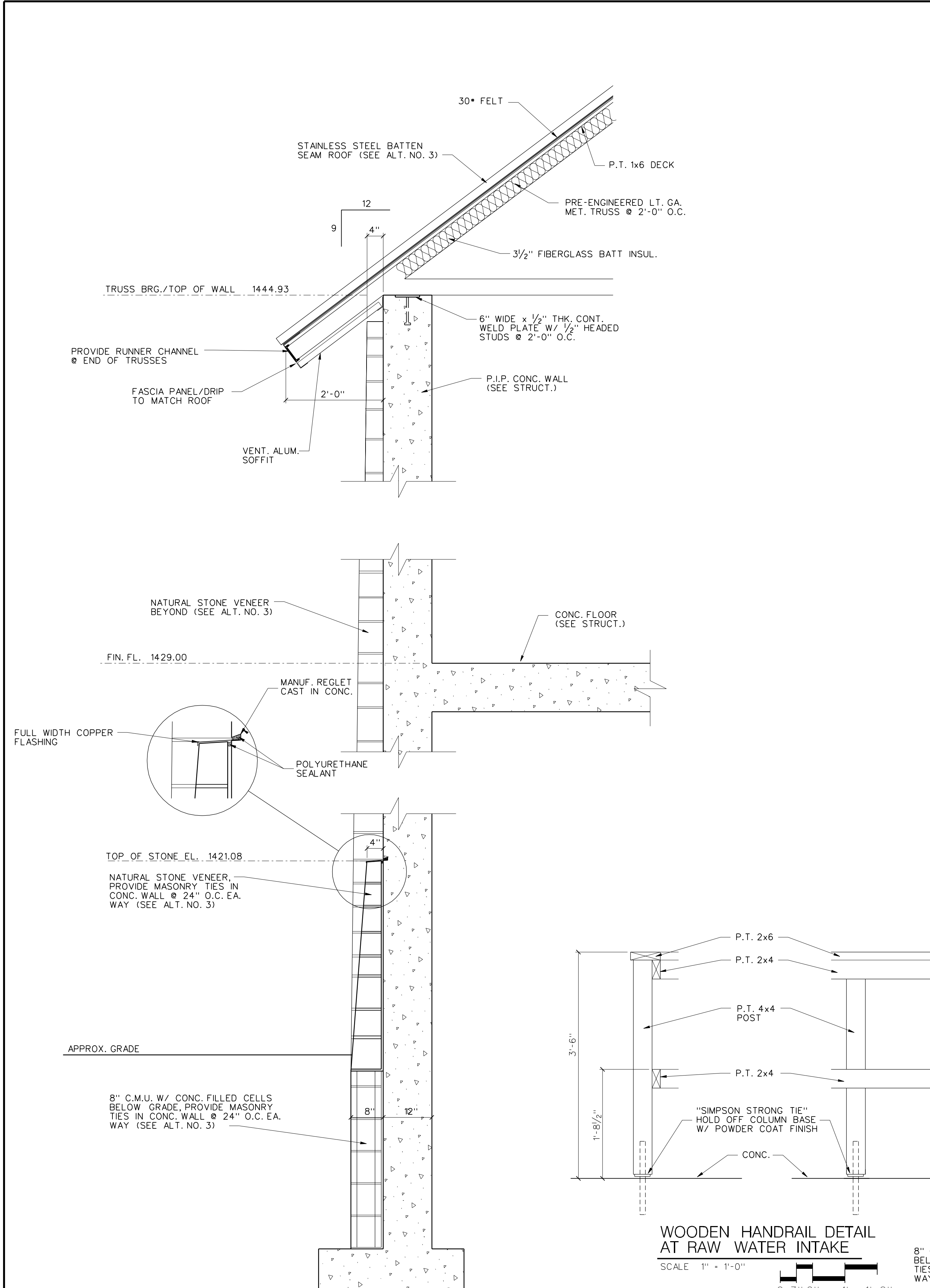


**RECORD DRAWING**  
 05/23/03

DR.	CHK.	DATE	DESCRIPTION
SEE	DLH	11-20-98	ORIGINAL ISSUE
RWB	DLH	05-23-03	RECORD DRAWINGS

**A3**  
 FILE NO. 15784-20





RAW WATER INTAKE DETAILS

CITY OF JOHNSON CITY  
WATAUGA WATER TREATMENT PLANT  
1998 EXPANSION AND IMPROVEMENTS

DR.	CHK.	DATE	DESCRIPTION
RWB	DLH	05-23-03	RECORD DRAWINGS
		11-20-98	ORIGINAL ISSUE

RECORD DRAWING  
05/23/03

**GENERAL NOTES**

- 1.01 ALL CONSTRUCTION SHALL CONFORM TO THE STANDARD BUILDING CODE, 1994 EDITION. REFERENCE TO OTHER STANDARD SPECIFICATIONS OR CODES SHALL MEAN THE LATEST STANDARD OR CODE ADOPTED AND PUBLISHED UNLESS SPECIFIED OTHERWISE.
- 1.02 DRAWINGS SHOW TYPICAL AND CERTAIN SPECIFIC CONDITIONS ONLY. FOR DETAILS NOT SPECIFICALLY SHOWN, PROVIDE DETAILS SIMILAR TO THOSE SHOWN.
- 1.03 VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS BEFORE STARTING WORK. NOTIFY STRUCTURAL ENGINEER OF ANY DISCREPANCY.
- 1.04 NOTIFY THE STRUCTURAL ENGINEER IN WRITING OF CONDITIONS ENCOUNTERED IN THE FIELD CONTRADICTORY TO THOSE SHOWN ON THE STRUCTURAL CONTRACT DOCUMENTS.
- 1.05 THE STRUCTURE IS DESIGNED FOR A COMPLETED CONDITION ONLY, AND THEREFORE REQUIRES TEMPORARY SUPPORT BRACING DURING CONSTRUCTION, SHORING, TEMPORARY SUPPORTS, ETC. IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- 1.06 COORDINATE AND VERIFY FLOOR AND ROOF OPENING SIZES AND LOCATIONS WITH MECHANICAL, ELECTRICAL, PLUMBING, ENVIRONMENTAL AND CIVIL DOCUMENTS. NOTIFY STRUCTURAL ENGINEER OF ANY CONFLICT AND/OR OMISSION. CONTRACTOR SHALL MAKE NO DEVIATION FROM DESIGN DRAWINGS WITHOUT WRITTEN APPROVAL OF THE ARCHITECT.
- 1.07 REVIEW OF SUBMITTALS AND/OR SHOP DRAWINGS BY THE STRUCTURAL ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO REVIEW AND CHECK SHOP DRAWINGS BEFORE SUBMITTAL TO THE STRUCTURAL ENGINEER. THE CONTRACTOR REMAINS SOLELY RESPONSIBLE FOR ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF SHOP DRAWINGS AS THEY PERTAIN TO MEMBER SIZES, DETAILS, ASSEMBLY REQUIREMENTS, AND DIMENSIONS SPECIFIED IN THE CONTRACT DOCUMENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES OF CONSTRUCTION.
- 1.08 STRUCTURAL DESIGN DATA:  

<b>LIVE LOADS:</b>	
FLOORS:	250.0 psf
ROOF:	20.0 psf
<b>DEAD LOADS:</b>	
ROOF:	20.0 psf
FLOOR :	100.0 psf
WIND LOADS: (BASED ON REQUIREMENTS ASCE 7)	
BASIC WIND SPEED	70 MPH
EXPOSURE	C
IMPORTANCE FACTOR	1.07

EARTHQUAKE: BASED THE PROCEDURES IN THE 1997 SBC FOR REINFORCED CONCRETE SHEAR WALL STRUCTURE WITH THE FOLLOWING CHARACTERISTICS:  

PEAK VELOCITY ACCELERATION	0.10
PEAK ACCELERATION	0.10
SEISMIC HAZARD GROUP	III
PERFORMANCE CATEGORY	C
SOIL PROFILE TYPE	1.0
RESPONSE MODIFICATION FACTOR	4.5
DEFLECTION AMPLIFICATION FACTOR	4.0

**FOUNDATION NOTES**

- 2.01 ALL FOUNDATION CONSTRUCTION FOR THE RAW WATER INTAKE STRUCTURE SHALL BE BASED ON THE REQUIREMENTS OF THE REPORT ON GEOTECHNICAL EXPLORATION PREPARED BY S&ME AND DATED JUNE 4, 1998. IN ADDITION THE DATA PRESENTED IN THE ADDENDUM TO THE REPORT DATED JULY 8, 1998 SHALL BE INCORPORATED.
- 2.02 ALL FOUNDATION CONSTRUCTION FOR ADDITIONS TO THE CHEMICAL BUILDING AND THE HIGH SERVICE PUMP BUILDING SHALL BE BASED ON THE REQUIREMENTS OF THE REPORT ON SUBSURFACE EXPLORATION PREPARED BY LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC. DATED APRIL 30, 1998. IN ADDITION THE DATA PRESENTED IN THE ADDITIONS TO THE REPORT DATED AUG. 20, 1998 SHALL BE INCORPORATED.
- 2.03 FOUNDATION DESIGN DATA:  

<b>ALLOWABLE BEARING PRESSURE:</b>	
RAW WATER INTAKE ON ROCK FILL	20,00 psf
RAW WATER INTAKE ON FILL	4,00 psf
HIGH SERVICE PUMP BUILDING ON ROCK FILL	10,000 psf
HIGH SERVICE PUMP BUILDING ON SOIL	3,000 psf
CHEMICAL BUILDING ON FILL	3,000 psf

**LATERAL SOIL LOADS:**  

LATERAL SOIL PRESSURE FLEXIBLE WALLS	40 psf
LATERAL SOIL PRESSURE ON RIGID WALLS	78 psf
- 2.04 THE DESIGN OF FOUNDATIONS, RETAINING WALLS AND SLAB ON GRADE IS BASED ON THE CRITERIA ESTABLISHED IN THE REPORT OF GEOTECHNICAL INVESTIGATION.
- 2.05 GENERAL CONTRACTOR SHALL VERIFY CONDITION AND/OR ADEQUACY OF ALL SUBGRADE, FILLS, AND BACKFILLS BEFORE PLACEMENT OF FOUNDATIONS, FOOTINGS, SLABS, WALLS, FILLS, BACKFILLS, ETC. ALL FOOTINGS SHALL REST EITHER ON UNDISTURBED SOIL OR NEWLY PLACED STRUCTURAL FILL. REFER TO GEOTECHNICAL INVESTIGATION REPORT FOR STRUCTURAL FILL PLACEMENT REQUIREMENTS. A MANUALLY OPERATED VIBRATOR SLED OR TAMPER SHOULD BE USED TO DENSIFY ANY SOILS IN THE BOTTOM OF THE FOOTING TRENCHES LOOSENED DURING THE EXCAVATION OPERATION.
- 2.06 SIDES OF THE FOUNDATIONS SHALL BE FORMED UNLESS CONDITIONS PERMIT EARTH FORMING. FOUNDATIONS POURED AGAINST THE EARTH REQUIRE THE FOLLOWING PRECAUTIONS. SLOPE SIDES OF EXCAVATIONS AS APPROVED BY THE GEOTECHNICAL ENGINEER AND CLEAN UP SLOUGHING BEFORE AND DURING CONCRETE PLACEMENT.
- 2.07 CONTRACTOR IS RESPONSIBLE FOR ADEQUATELY PROTECTING ALL EXCAVATION SLOPES.
- 2.08 WHERE FOOTING STEPS ARE NECESSARY, THEY SHALL BE NO STEEPER THAN ONE VERTICAL TO TWO HORIZONTAL.
- 2.09 BASEMENT WALLS (WALLS SUPPORTED AT THE TOP AND BOTTOM) REQUIRE THE FOLLOWING PRECAUTION. DO NOT BACKFILL AGAINST THE WALL BEFORE THE SLABS AT TOP AND BOTTOM ARE CAST AND REACHED 80% OF DESIGN STRENGTH UNLESS ADEQUATE BRACING IS PROVIDED. IN NO CASE SHALL BULLDOZERS OR OTHER HEAVY EQUIPMENT BE PERMITTED CLOSER THAN 8'-0" FROM ANY FOUNDATION WALL.
- 2.10 REFER TO FOUNDATION PLAN FOR SLAB ON GRADE THICKNESS AND REINFORCING UNLESS NOTED OTHERWISE. SLAB-ON-GRADE SHALL BE MINIMUM 4" THICK, PLACED ON COMPACTED SUBGRADE. REINFORCED WITH #6 W/4"X14" W/6" IN FLAT SHEETS. PROVIDE POSITIVE SUPPORT AT MIDDLE OF SLAB. LAP MESH (3) CROSS WIRES AT SPLICES. PROVIDE CONTROL OR CONSTRUCTION JOINTS AS SHOWN ON FOUNDATION PLAN OR AT CONTRACTORS OPTION ALTERNATE SLAB JOINT LOCATIONS WITH EITHER CONTROL OR CONSTRUCTION JOINTS AT COLUMN LINE LOCATIONS AND AT INTERMEDIATE LINES SUCH THAT EACH SLAB PANEL DOES NOT EXCEED 400 SQUARE FEET.

**REINFORCED CONCRETE**

- 3.01 ALL CONCRETE WORK SHALL CONFORM TO ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS. DESIGN IS BASE ON ACI 318, BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
- 3.02 UNLESS NOTED OTHERWISE, ALL CONCRETE SHALL BE NORMAL WEIGHT AND HAVE THE FOLLOWING MINIMUM 28 DAY COMPRESSIVE STRENGTHS.  

FOUNDATIONS	4000 PSI
RETAINING WALLS	4000 PSI
SLAB ON GRADE	4000 PSI
SECOND LEVEL FLOOR SLAB	4000 PSI CONC.

ALL EXTERIOR CONCRETE SHALL HAVE 3% - 6% ENTRAINED AIR, U.N.O.
- 3.03 THE PROPOSED MATERIALS AND MIX DESIGN SHALL BE FULLY DOCUMENTED AND REVIEWED BY A TESTING LABORATORY. RESPONSIBILITY FOR OBTAINING THE REQUIRED DESIGN STRENGTH IS THE CONTRACTOR'S. CONCRETE PROPORTIONS SHALL BE ESTABLISHED ON THE BASIS OF FIELD EXPERIENCE AND/OR TRIAL MIXTURES WITH MATERIALS TO BE EMPLOYED IN ACCORDANCE WITH ACI 318 AND 301.
- 3.04 USE OF CALCIUM CHLORIDE, CHLORIDE IONS, OR OTHER SALTS IN CONCRETE IS NOT PERMITTED.
- 3.05 HORIZONTAL CONSTRUCTION JOINTS ARE PERMITTED ONLY WHERE INDICATED. CONSTRUCTION JOINTS SHALL BE THOROUGHLY ROUGHENED BY MECHANICAL MEANS AND CLEANED. CONTRACTOR SHALL SUBMIT DRAWINGS SHOWING INTENDED POURING SEQUENCE AND LOCATION OF CONSTRUCTION JOINTS TO THE DESIGN ENGINEER FOR REVIEW. PROPOSED METHODS MUST BE ACCEPTABLE TO THE DESIGN ENGINEER BEFORE USE.
- 3.06 CHAMFER OR ROUND ALL EXPOSED CORNERS MINIMUM 3/4".
- 3.07 DETAIL CONCRETE REINFORCEMENT AND ACCESSORIES IN ACCORDANCE WITH ACI 315 DETAILING MANUAL. SUBMIT SHOP DRAWINGS AND APPROVAL SHOWING ALL FABRICATION DIMENSIONS AND LOCATIONS FOR PLACING REINFORCING STEEL AND ACCESSORIES. DO NOT BEGIN FABRICATION UNTIL SHOP DRAWINGS ARE COMPLETED AND REVIEWED. WRITTEN DESCRIPTION OF REINFORCEMENT WITHOUT ADEQUATE SECTIONS, ELEVATIONS, AND DETAILS IS NOT ACCEPTABLE.
- 3.08 DETAIL ALL CONCRETE WALLS AND BEAMS ON THE SHOP DRAWINGS IN ELEVATION UNLESS SPECIFICALLY APPROVED OTHERWISE. THE USE OF STRUCTURAL DRAWINGS FOR SHOP DRAWING PURPOSES SHALL NOT BE PERMITTED.
- 3.09 REINFORCING STEEL SHALL CONFORM TO ASTM A615 EPOXY COATED, GRADE 60 UNLESS NOTED OTHERWISE.
- 3.10 WELDED WIRE FABRIC (MESH) SHALL CONFORM TO ASTM A185 EPOXY COATED AND SHALL BE PROVIDED IN FLAT SHEETS (ROLLS NOT PERMITTED). LAP EDGES 3 CROSS WIRES MINIMUM.
- 3.11 TIE ALL REINFORCING STEEL AND EMBEDMENT SECURELY IN PLACE PRIOR TO PLACING CONCRETE. PROVIDE SUFFICIENT SUPPORTS TO MAINTAIN THE POSITION OF REINFORCEMENT WITHIN SPECIFIED TOLERANCE DURING ALL CONSTRUCTION ACTIVITIES. "STICKING" DOWELS INTO WET CONCRETE IS NOT PERMITTED.
- 3.12 PROVIDE CONTINUOUS REINFORCEMENT WHEREVER POSSIBLE. SPLICE ONLY AS SHOWN OR APPROVED. STAGGER SPLICE WHERE POSSIBLE. USE FULL TENSION SPLICE (CLASS "B") UNLESS NOTED OTHERWISE. DOWELS SHALL MATCH THE SIZE AND SPACING OF THE SPECIFIED REINFORCEMENT AND SHALL BE LAPPED WITH FULL TENSION SPLICES (CLASS "B") UNLESS NOTED OTHERWISE. TERMINATE BARS WITH STANDARD HOOKS.
- 3.13 REINFORCING STEEL SHALL HAVE THE FOLLOWING CONCRETE COVER UNLESS NOTED OTHERWISE.  

CONCRETE AGAINST EARTH (NOT FORMED)	3"
FORMED CONCRETE EXPOSED TO EARTH OR WEATHER	2"
#6 THROUGH #18 BARS	1 1/2"
#5 BARS AND SMALLER	1 1/2"

COVER FOR TOP BARS IN CONCRETE FOOTINGS TO BE AS PER FORMED CONCRETE EXPOSED TO EARTH AND WEATHER.

CONCRETE NOT EXPOSED TO EARTH OR WEATHER	1"
SLABS AND WALLS	1 1/2"
BEAMS (STIRRUPS) AND COLUMNS (TIES)	1 1/2"
- 3.14 DO NOT PLACE PIPES OR DUCTS EXCEEDING ONE-THIRD OF THE SLAB OR WALL THICKNESS THROUGH THE SLAB OR WALL UNLESS SPECIFICALLY SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
- 3.15 DO NOT WELD OR TACK WELD REINFORCING STEEL UNLESS APPROVED OR DIRECTED BY THE STRUCTURAL ENGINEER.
- 3.16 THE DESIGN AND CONSTRUCTION OF FORMS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS :  

A. FORMS SHALL CONFORM TO SHAPE, FORM AND LINES ON DRAWINGS.
B. ADEQUATE BRACING SHALL BE USED.
C. FORMS SUPPORTED ON GROUND SHALL HAVE ADEQUATE MUDSILLS.
D. QUALIFIED WORKMEN SHALL CONSTANTLY OBSERVE AND ADJUST, AS REQUIRED, ALL SHORES DURING CONCRETE PLACING.
E. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE ADEQUATE DESIGN AND CONSTRUCTION OF ALL FORMS.
F. SPECIAL ATTENTION IS DIRECTED TO THE REQUIREMENT THAT THE CONTRACTOR MUST ADJUST THE SHORING, USING SURVEYING INSTRUMENTS, DURING AND IMMEDIATELY AFTER PLACING OF CONCRETE FOR SLABS. THIS ADJUSTMENT MUST NOT BE ATTEMPTED AFTER THE INITIAL SET OF CONCRETE.
- 3.17 SHORING SHALL REMAIN IN PLACE UNTIL CONCRETE HAS ATTAINED 75% OF ITS 28 DAY STRENGTH.
- 3.18 ALL REINFORCING STEEL PLACEMENT SHALL BE REVIEWED BY THE GENERAL CONTRACTOR, FOR COMPLIANCE WITH APPROVED SHOP DRAWINGS AND THE REQUIREMENTS OF THE SPECIFICATIONS.
- 3.19 FOR MISC. CONCRETE PADS NOT SHOWN ON THE STRUCTURAL DRAWINGS, SEE MECHANICAL, ELECTRICAL AND ENVIRONMENTAL DRAWINGS.

**STRUCTURAL STEEL, STEEL JOIST, STEEL DECK**

- 5.01 STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED ACCORDING TO AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, LATEST EDITION.
- 5.02 SUBMIT SHOP DRAWING PREPARED IN ACCORDANCE WITH AISC MANUAL, DETAILING FOR STEEL CONSTRUCTION, LATEST EDITION. DO NOT BEGIN FABRICATION UNTIL SHOP DRAWINGS ARE COMPLETED AND REVIEWED. THE USE OF STRUCTURAL DRAWINGS FOR SHOP DRAWINGS PURPOSES SHALL NOT BE PERMITTED.
- 5.03 STRUCTURAL STEEL SHALL CONFORM TO ASTM A36, OR ASTM A572 AS NOTED ON THE DRAWINGS.
- 5.04 STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE B, F.Y - 46 KSI, UNLESS NOTED OTHERWISE.
- 5.05 STEEL PIPE SHALL CONFORM TO ASTM A501 OR ASTM A53, TYPE E OR S, GRADE B.
- 5.06 BOLTS SHALL CONFORM TO ASTM A325 BEARING TYPE, MINIMUM 3/4 INCH DIAMETER, U.N.O. BOLTS SHALL BE TIGHTENED USING LEJUENE TENSION CONTROL BOLTS IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.
- 5.07 ANCHOR BOLTS SHALL CONFORM TO ASTM A307, UNLESS NOTED OTHERWISE. STEEL FABRICATOR SHALL SUPPLY ANCHOR BOLT LOCATION DRAWINGS. REFER TO BASE PLATE DETAILS FOR BOLT REQUIREMENTS.
- 5.08 USE PRE-QUALIFIED WELDED JOINTS AS PER AISC AND AWS D1.1, STRUCTURAL WELDING CODE. USE ONLY CERTIFIED WELDERS, ALL ELECTRODES SHALL CONFORM TO AWS A5, GRADE E70XX. BARE ELECTRODE AND GRANULAR FLUX SHALL CONFORM TO AWS A5, F70 AWS FLUX CLASSIFICATION.
- 5.09 CUTS, BOLTS, COPING, ETC. REQUIRED FOR WORK OR OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS AND MADE IN THE SHOP. CUTS OR BURNING HOLES IN STRUCTURAL STEEL MEMBERS IN THE FIELD SHALL NOT BE PERMITTED, UNLESS PRIOR APPROVAL IS GIVEN BY THE DESIGN ENGINEER.
- 5.10 SHOP CONNECTIONS NOT SPECIFICALLY DETAILED ON THE DRAWINGS SHALL BE WELDED.
- 5.11 THE STRUCTURAL STEEL CONTRACTOR SHALL PROVIDE FRAMING AROUND OPENINGS IN FLOOR AND ROOF SLAB AS INDICATED IN THE MECHANICAL AND ARCHITECTURAL DRAWINGS.
- 5.12 STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND DRAWINGS RELATED TO OTHER TRADES. CONTRACTOR SHALL BE RESPONSIBLE TO CHECK AND COORDINATE DIMENSIONS, CLEARANCES, ETC. WITH THE WORK OF OTHER TRADES.
- 5.13 THE STRUCTURAL STEEL CONTRACTOR SHALL PROVIDE WEB REINFORCEMENT AT OPENINGS IN STEEL BEAMS AND GIRDERS FOR MECHANICAL AND ELECTRICAL PENETRATIONS AND AS INDICATED IN MECHANICAL AND ELECTRICAL DRAWINGS. WEB REINFORCEMENT SHALL NOT BE PROVIDED FOR WEB OPENINGS LESS THAN 4" OR 3" x 3". ONE WEB OPENING MAXIMUM PER BEAM WITHOUT WEB REINFORCEMENT. WEB OPENINGS ARE NOT PERMITTED IN BEAMS LESS THAN 14" DEEP, U.N.O.
- 5.14 STRUCTURAL STEEL CONTRACTOR SHALL COORDINATE THE BOTTOM OF BASE PLATE ELEVATION WITH THE TOP OF CONCRETE ELEVATION. IN CASE OF CONFLICT, THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF ANY DISCREPANCY.
- 5.15 PAINT STRUCTURAL STEEL IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. DO NOT PAINT STEEL SURFACES TO BE ENCASED IN CONCRETE OR RECEIVE SPRAYED ON FIREPROOFING. CONNECTIONS DESIGNATED AS SLIP CRITICAL, OR TO BE WELDED, STEEL SURFACES RECEIVING AUTOMATICALLY WELDED SHEAR CONNECTOR STUDS IN THE FIELD SHALL NOT BE PAINTED.

**ROCK ANCHOR NOTES**

- 6.01 ROCK ANCHOR HOLES SHALL BE INSPECTED BY A REGISTERED SOILS ENGINEER USING A STEEL FEELER ROD TO ASSESS THE ROCK CONTINUITY (I.E. SUSPENDED BOULDER OR CONTINUOUS ROCK) BEFORE GROUTING ANCHORS.
  - 6.02 ROCK ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S DRAWINGS AND WRITTEN INSTRUCTIONS. THE INSTALLATION SHALL BE WITNESSED AND APPROVED BY A REGISTERED SOILS ENGINEER.
  - 6.03 ROCK ANCHORS SHALL BE CENTERED IN THE DRILLED HOLES USING CENTRALIZERS FURNISHED BY THE ANCHOR MANUFACTURER.
  - 6.04 ROCK ANCHORS SHALL BE GROUTED IN PLACE USING GROUT TUBES EXTENDING TO THE BOTTOM OF THE ANCHOR. GROUT SHALL HAVE A COMPRESSIVE STRENGTH OF 4,000 PSI IN 7 DAYS.
  - 6.05 ROCK ANCHORS SHALL BE COATED WITH AN EPOXY RESIN, SCOTCH KOTE 213, OR EQUAL, APPLIED TO A MINIMUM THICKNESS OF 5 MILS.
  - 6.06 THE ROCK ANCHOR INSTALLATION SHALL BE PERFORMED BY A FIRM THAT CAN DEMONSTRATE EXPERIENCE IN CONSTRUCTING TO SIMILAR ROCK ANCHOR INSTALLATIONS.
  - 6.07 THE CONTRACTOR SHALL SUBMIT ROCK ANCHOR INSTALLATION AND PROOF LOAD TEST PROCEDURES FOR REVIEW.
- BUILDING FOUNDATION ROCK ANCHOR NOTES**
- 6.08 ROCK ANCHOR RODS SHALL BE WILLIAMS EPOXY COATED ALL-THREAD-BAR, 1 1/4" NOMINAL DIAMETER WITH A 150 KSI ULTIMATE STRENGTH AS MANUFACTURED BY WILLIAMS FROM ENGINEERING OR APPROVED EQUIVALENT BARS SHALL BE ALL-THREAD CONFORMING TO ASTM A722-88. A FULL STRENGTH THREADED COUPLING WILL BE USED TO CONNECT THE ALL-THREAD-BAR TO A THREADED #8 REINFORCING ROD. ROD CONFIGURATION AS INDICATED ON THE DRAWINGS.
  - 6.09 ROCK ANCHOR EMBEDMENT DEPTH SHALL BE A MINIMUM OF 12 FEET IN A 4.0 INCH DIAMETER HOLE.
  - 6.10 PRIOR TO SLAB PLACEMENT, EACH ROCK ANCHOR SHALL BE PROOF LOADED TO 40 KIPS. THE COAXIAL LOADING METHOD SHALL BE APPLIED IN ACCORDANCE WITH "SUGGESTED METHOD FOR ROCK ANCHORAGE TESTING", INTERNATIONAL JOURNAL OF ROCK MECHANICS, 1985, VOL. 22. THE PROOF LOAD SHALL BE HELD FOR A MINIMUM OF FIVE MINUTES. THE ANCHORAGE IS ACCEPTABLE PROVIDED THE LOSS OF LOAD OR DISPLACEMENT DOES NOT EXCEED 1/4 5 MINUTES AFTER THE PROOF LOAD IS ATTAINED. A GEOTECHNICAL ENGINEER SHALL WITNESS AND APPROVE THE PROOF LOAD TESTS AND SUBMIT A REPORT DOCUMENTING THE RESULTS OF THE PROOF LOAD TEST. THE COST TO PERFORM THE PROOF LOAD TEST OF EACH ANCHOR SHALL BE PAID BY THE CONTRACTOR.

**MICROPILE NOTES**

- 7.01 THE MICROPILES SHALL BE MINIMUM 7" OUTSIDE DIAMETER API GRADE N 80 STEEL WITH A MINIMUM WALL THICKNESS OF 0.5 INCHES. SEE SPECIFICATIONS.
- 7.02 THE PILES SHALL EXTEND DOWNWARD TO COMPETENT ROCK AND PENETRATE A MINIMUM OF 11 FEET AND BE SOCKETED A MINIMUM OF 2 FEET AT TIP. THE PILES SHALL BE EXTENDED AT LEAST 6" INTO GRADE BEAM UNLESS OTHERWISE DIRECTED. INITIAL CUTOFF ELEVATION SHALL BE DETERMINED IN THE FIELD.
- 7.03 EACH PILE SHALL USE #8 DEFORMED BAR (ASTM 615) INSTALLED THE ENTIRE LENGTH OF THE MICROPILE AND THE BAR SHALL EXTEND AT LEAST 8 INCHES ABOVE THE CUTOFF ELEVATION OF THE MICROPILE.
- 7.04 EACH PILE SHALL BE FILLED WITH A CEMENT-SAND-WATER GROUT MIXTURE HAVING A MINIMUM COMPRESSIVE STRENGTH OF 4000 psi AT 28 DAYS.
- 7.05 REFER TO THE FINAL GEOTECHNICAL REPORT FOR SUPPLEMENTAL BORINGS AT THE WATAUGA RIVER RAW WATER INTAKE BY MUESER RUTLEDGE CONSULTING ENGINEERS, DATED MAY 5, 2000.
- 7.06 NO MODIFICATION OF TH PILE LAYOUT SHOWN ON THE DRAWINGS SHALL BE ALLOWED.
- 7.07 THE PILES SHALL BE INSTALLED FROM A WORKING PLATFORM WHICH IS APPROXIMATELY (3) FEET ABOVE THE RIVER ELEVATION.

**Barge Waggoner Summer and Cannon, Inc.**  
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 Landscape Architects and Surveyors

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**STRUCTURAL NOTES**

**CITY OF JOHNSON CITY  
 WATAUGA WATER TREATMENT PLANT  
 1998 EXPANSION AND IMPROVEMENTS**

DR.	CHK.	DATE	DESCRIPTION
CADD	ANW	11-20-98	ORIGINAL ISSUE
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**RECORD DRAWING  
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**S1**

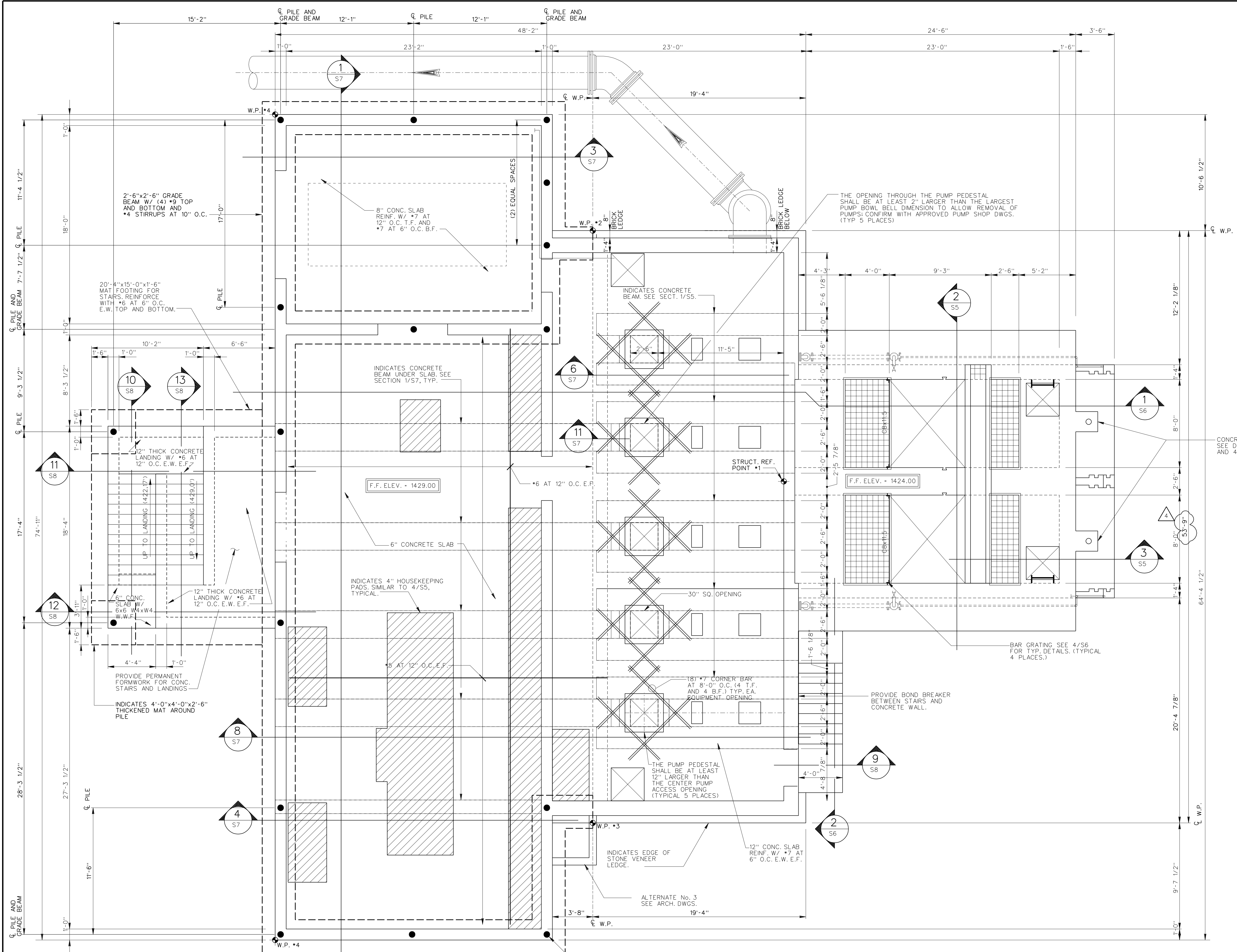
FILE NO. 15784-20





RAW WATER INTAKE - UPPER LEVEL FOUNDATION PLAN

CITY OF JOHNSON CITY  
 WATAUGA WATER TREATMENT PLANT  
 1998 EXPANSION AND IMPROVEMENTS

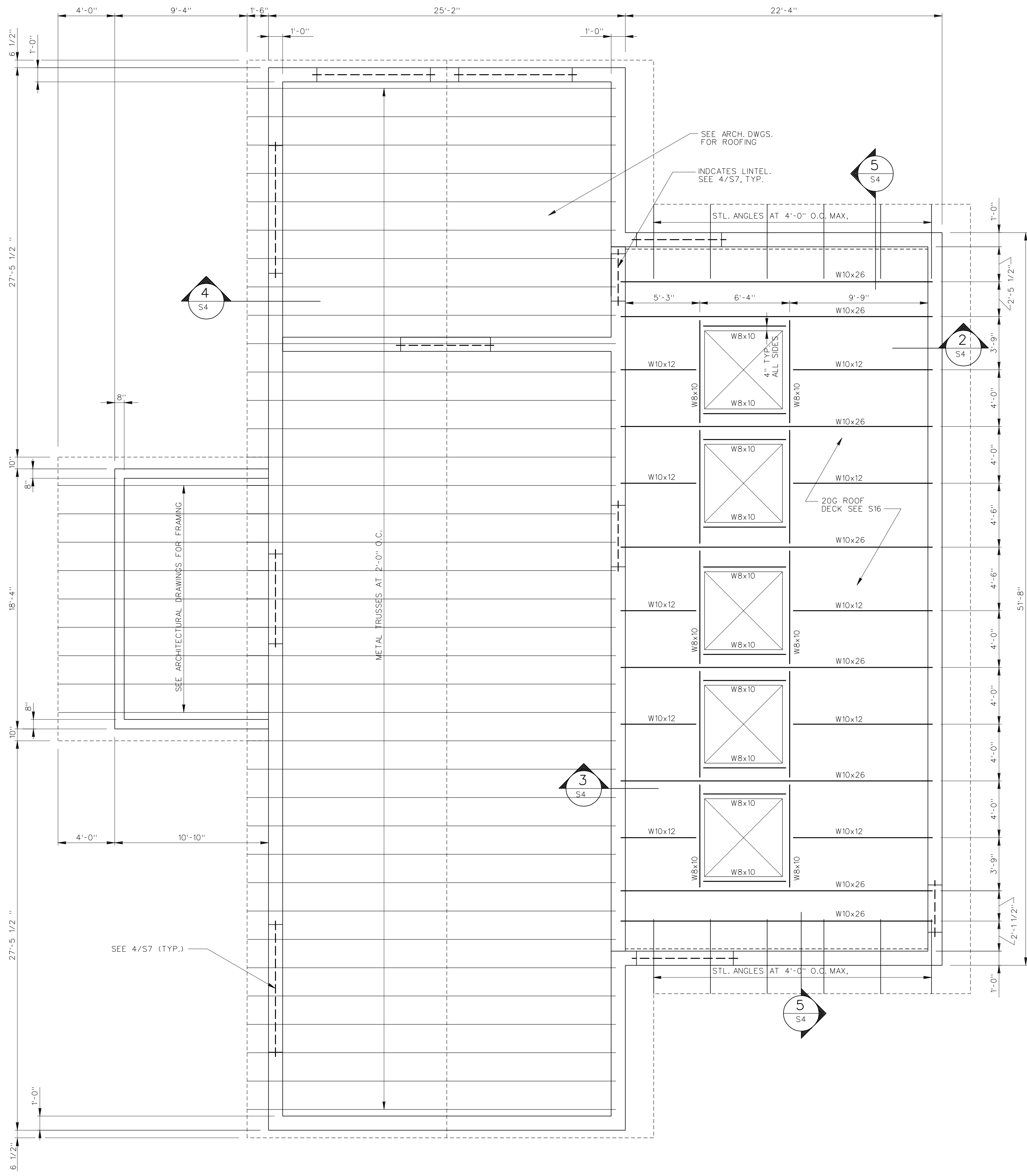


**1** UPPER LEVEL FOUNDATION PLAN  
 S3 SCALE: 1/4" = 1'-0"

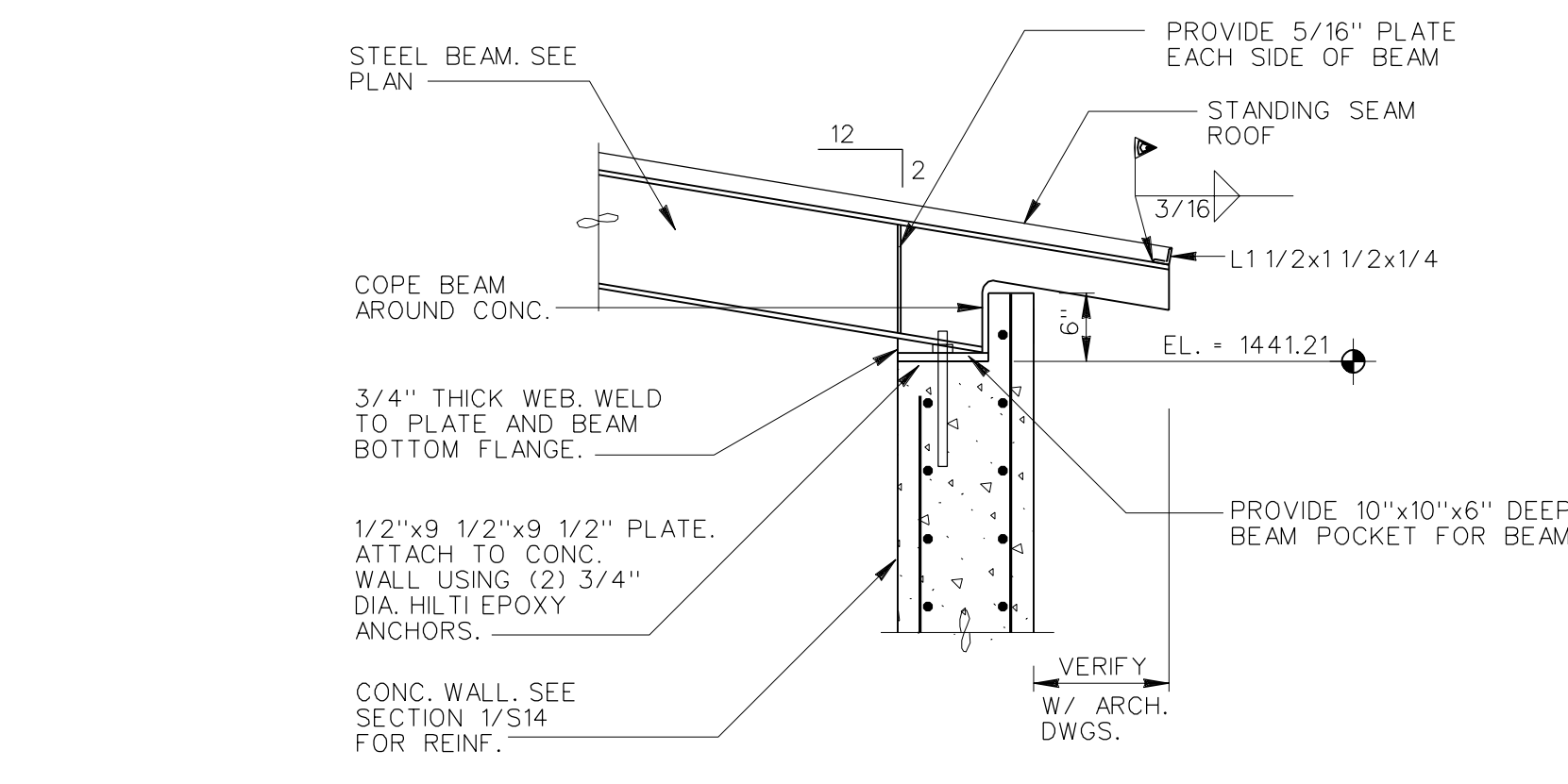
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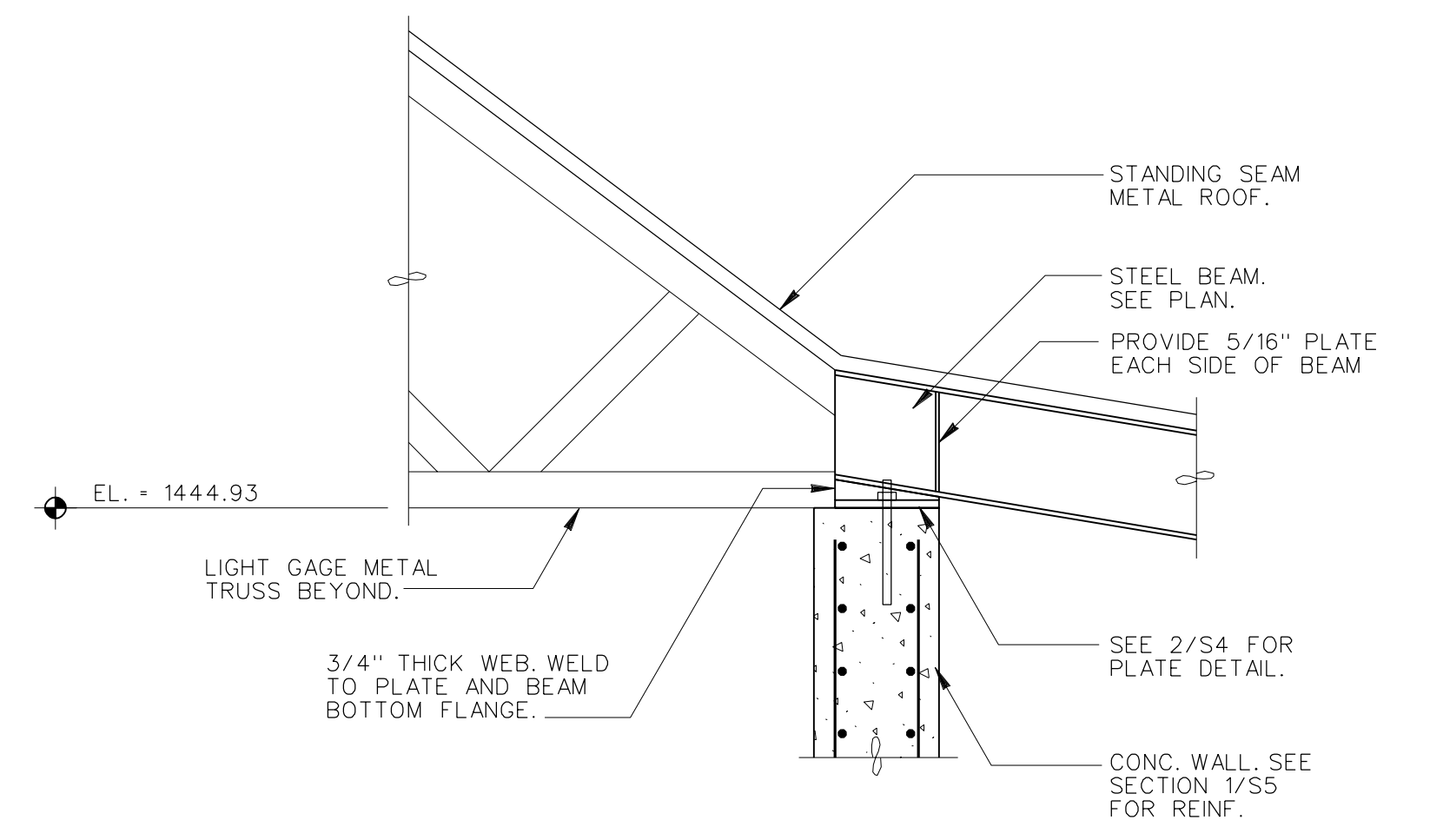
**S3**  
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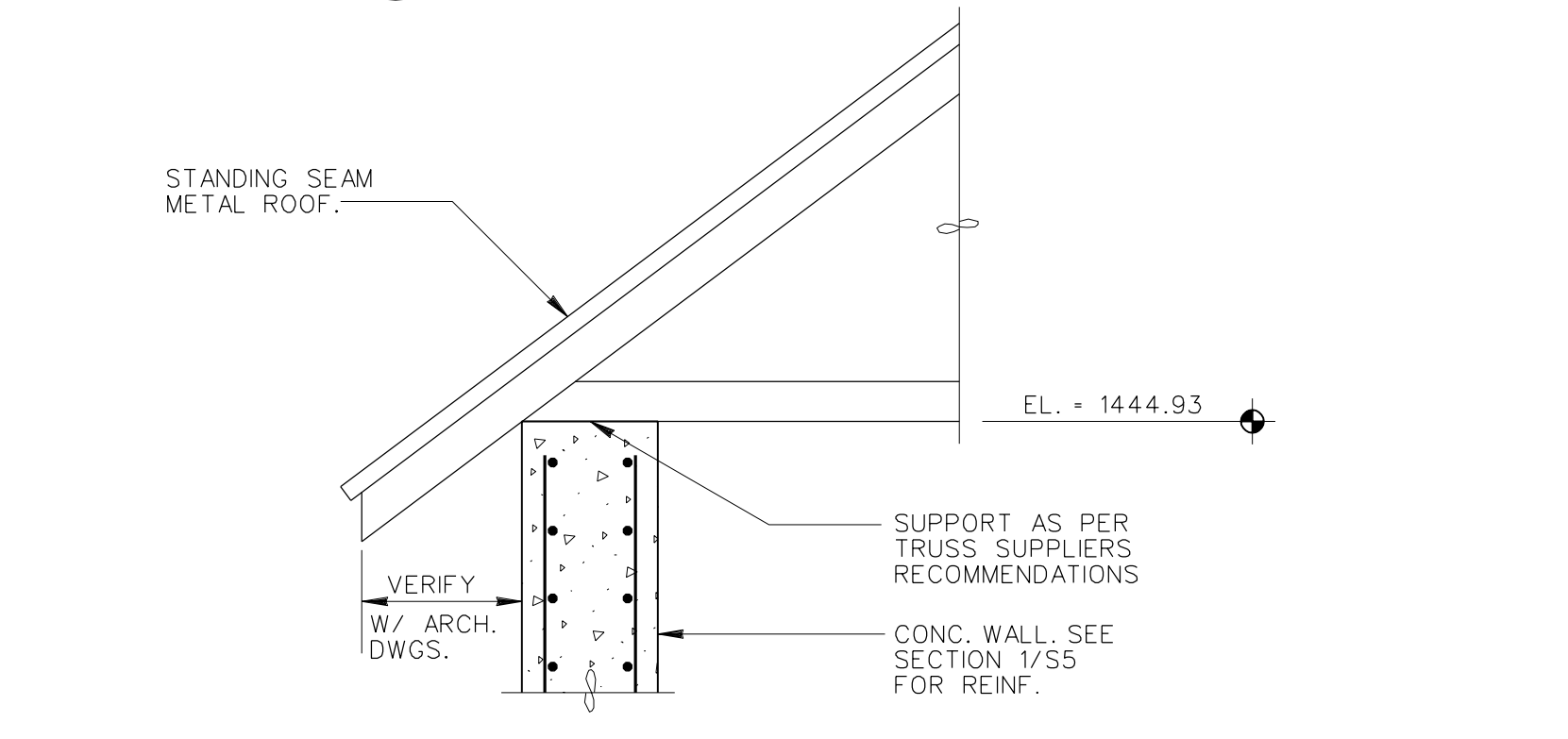
**1** ROOF FRAMING PLAN  
S4 SCALE : 1/4" = 1'-0"



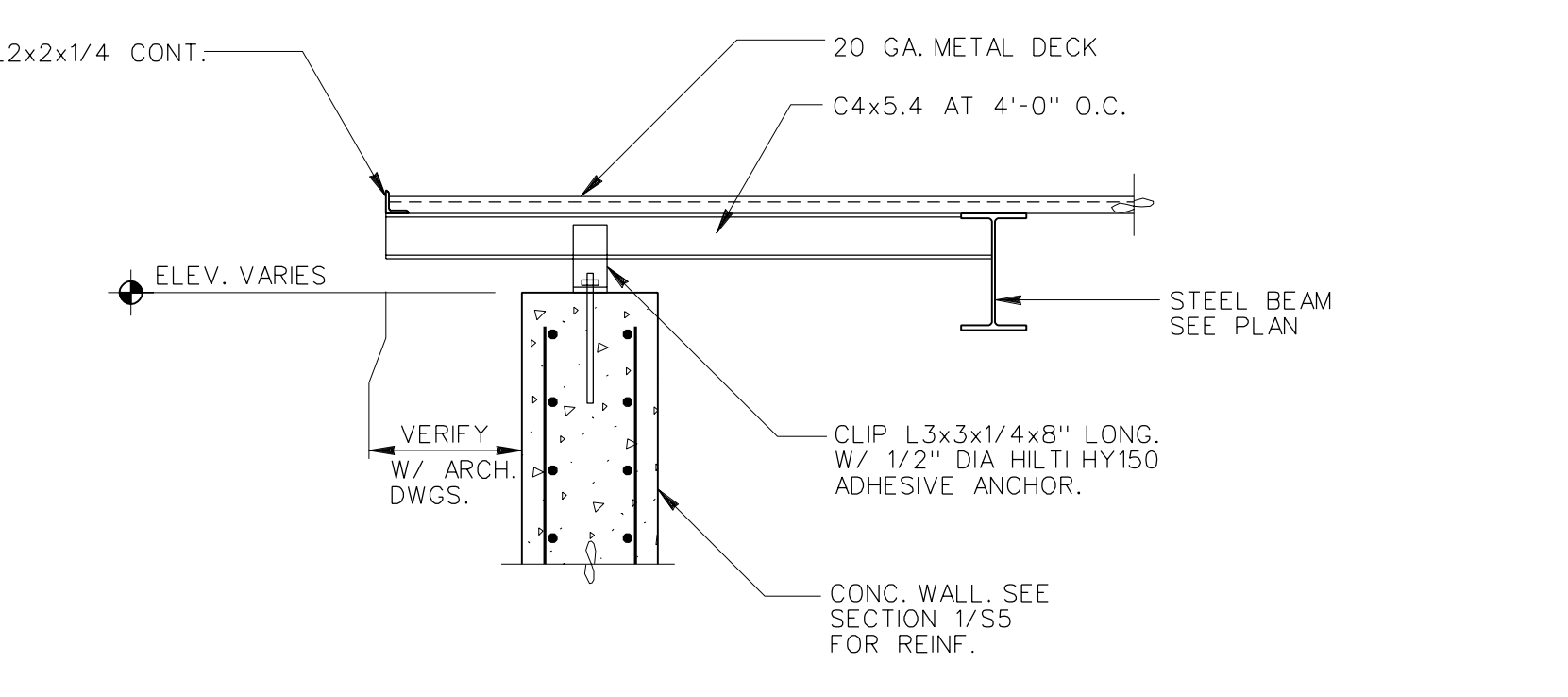
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S4 SCALE : 3/4" = 1'-0"



**3** SECTION  
S4 SCALE : 3/4" = 1'-0"



**4** SECTION  
S4 SCALE : 3/4" = 1'-0"

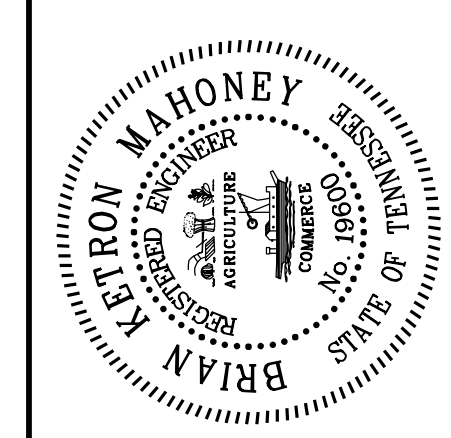


**5** SECTION  
S4 SCALE : 3/4" = 1'-0"

DR.	CHK.	DATE	DESCRIPTION
CADD	ANW	11-20-98	ORIGINAL ISSUE
RWB	DLH	05-23-03	RECORD DRAWINGS

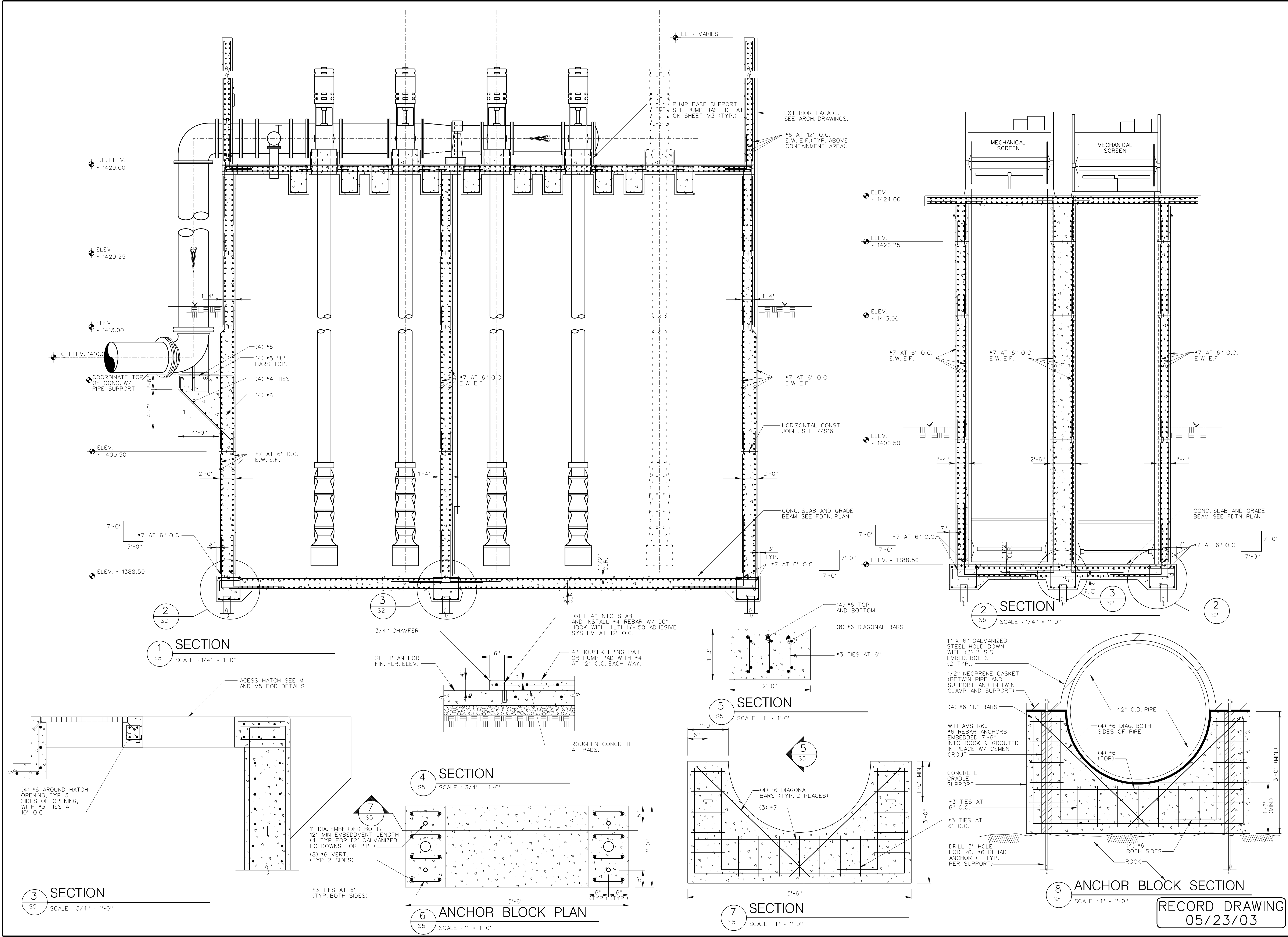
RECORD DRAWING  
05/23/03

**S4**  
FILE NO. 15784-20



RAW WATER INTAKE - SECTIONS AND DETAILS

CITY OF JOHNSON CITY  
 WATAUGA WATER TREATMENT PLANT  
 1998 EXPANSION AND IMPROVEMENTS

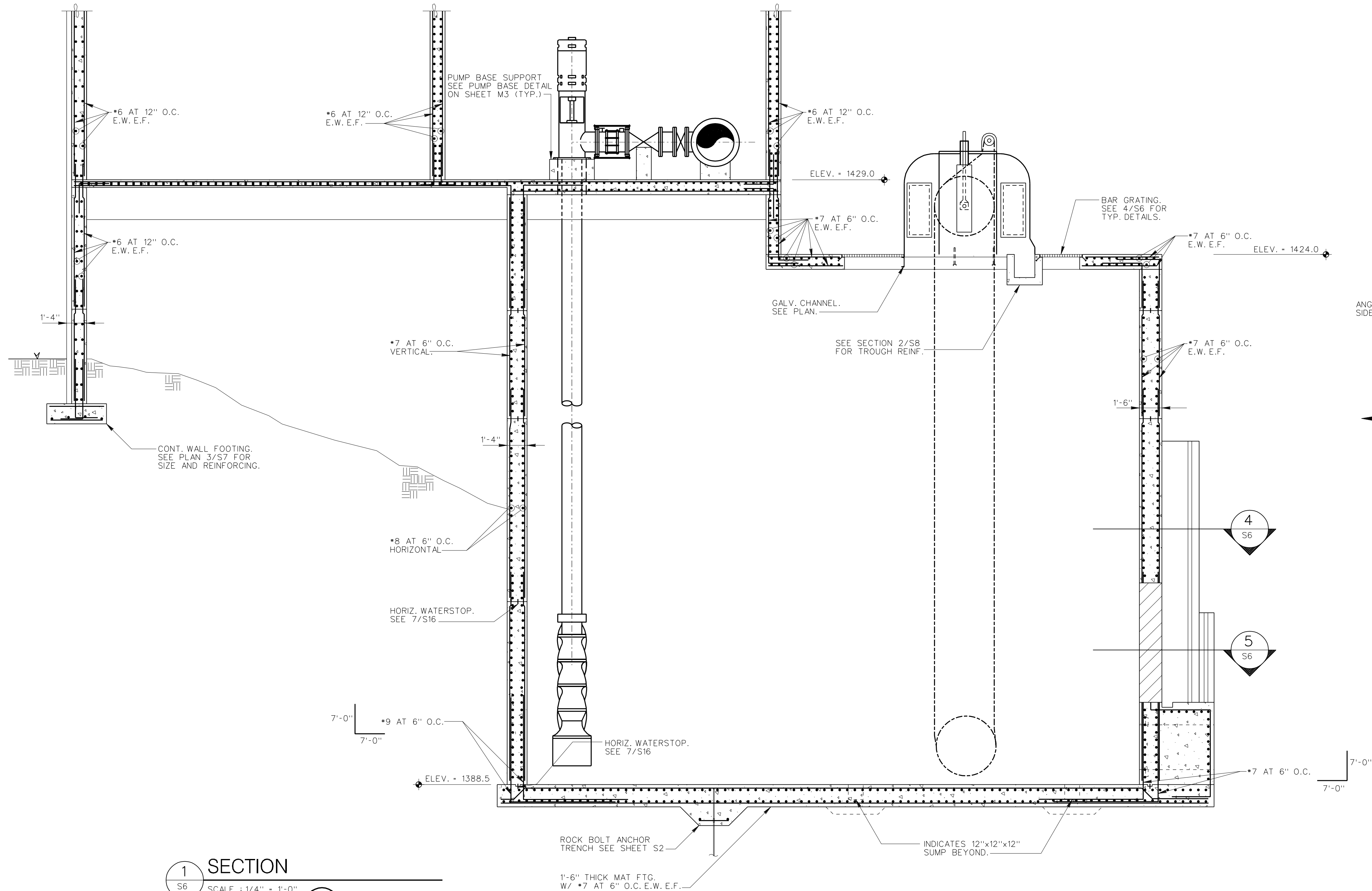


**RECORD DRAWING**  
 05/23/03

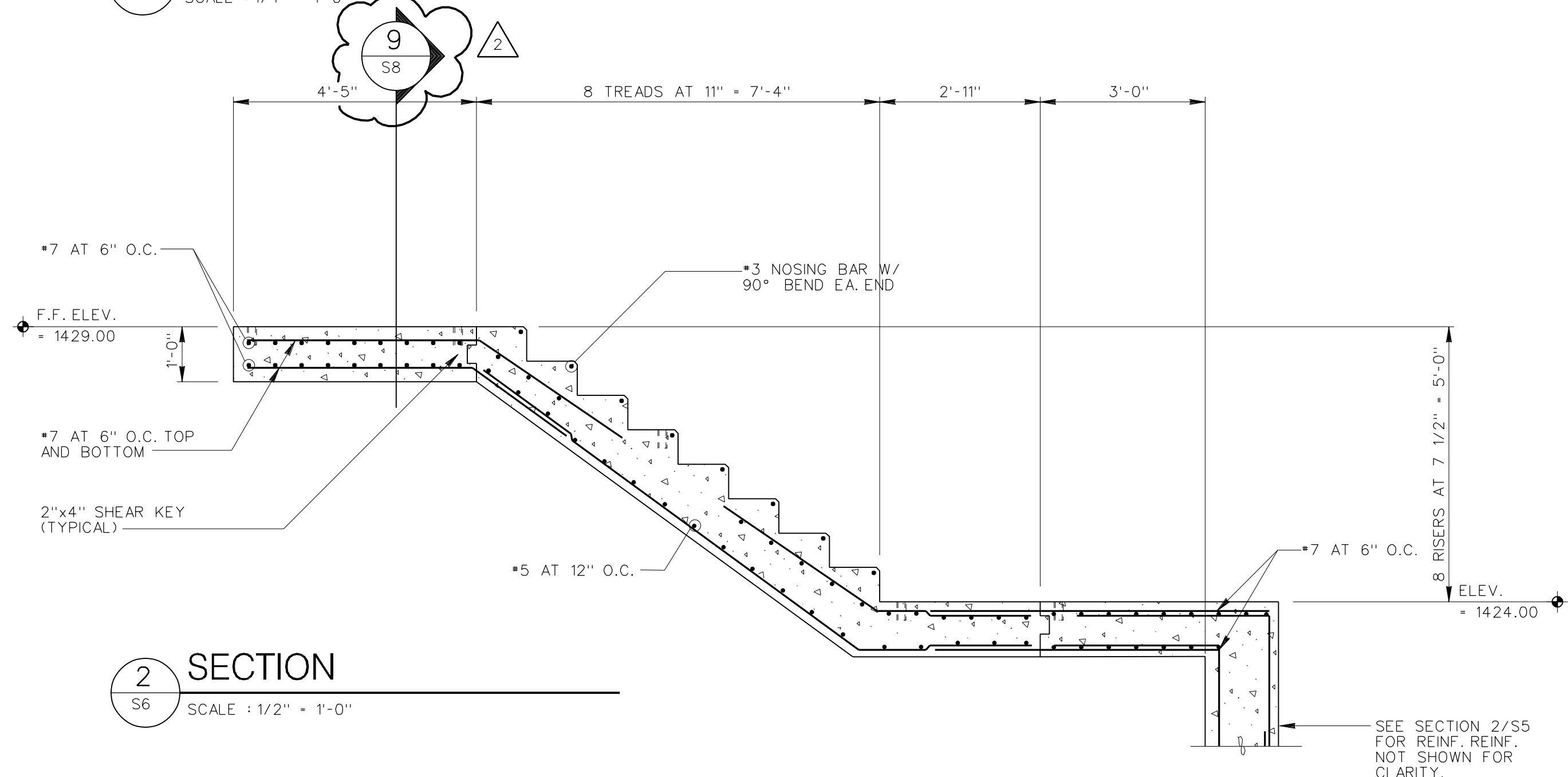
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CADD	ANW	11-20-98	ORIGINAL ISSUE
RWB	DLH	05-23-03	RECORD DRAWINGS

**S5**

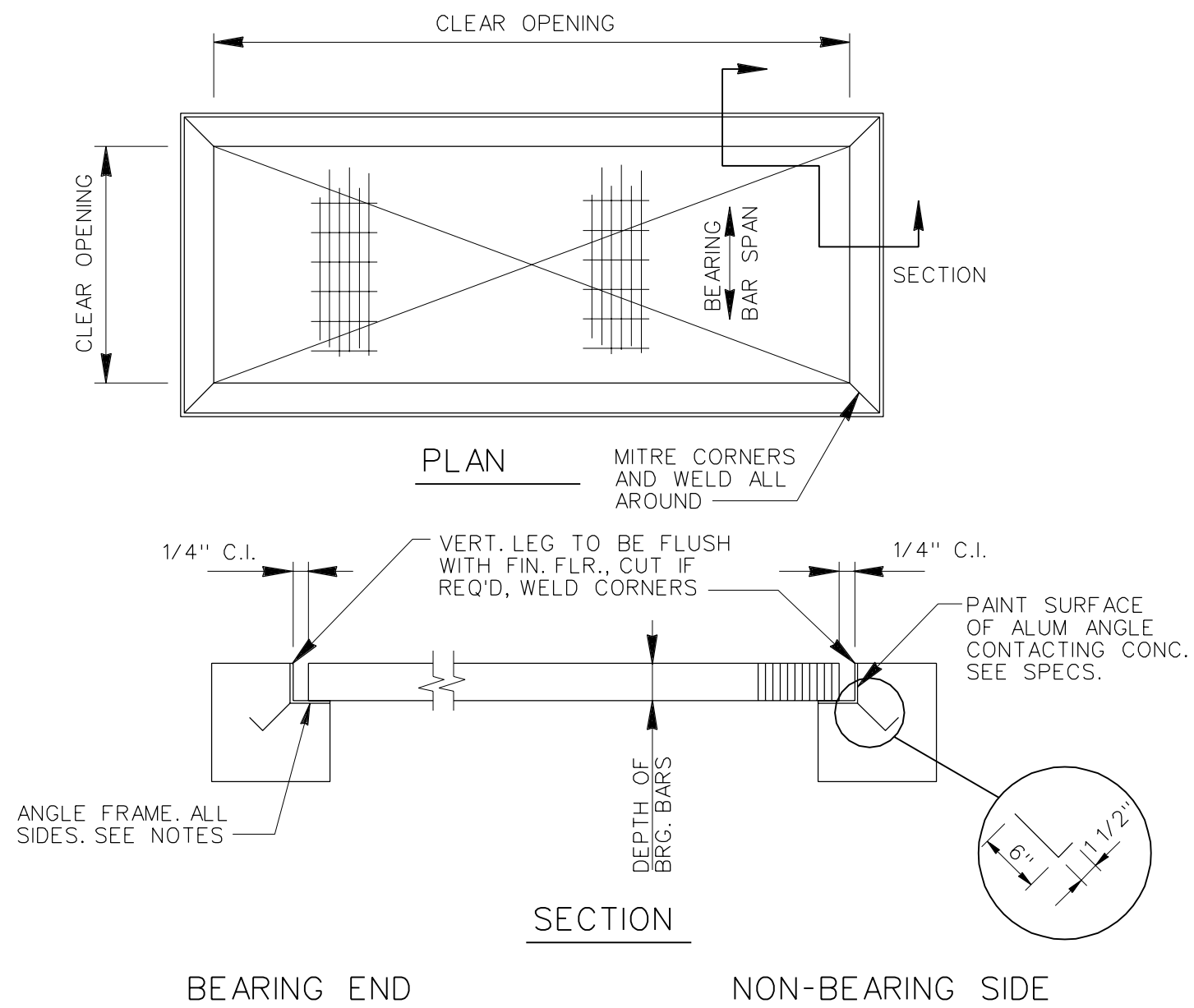
FILE NO. 15784-20



**1 SECTION**  
S6 SCALE: 1/4" = 1'-0"



**2 SECTION**  
S6 SCALE: 1/2" = 1'-0"

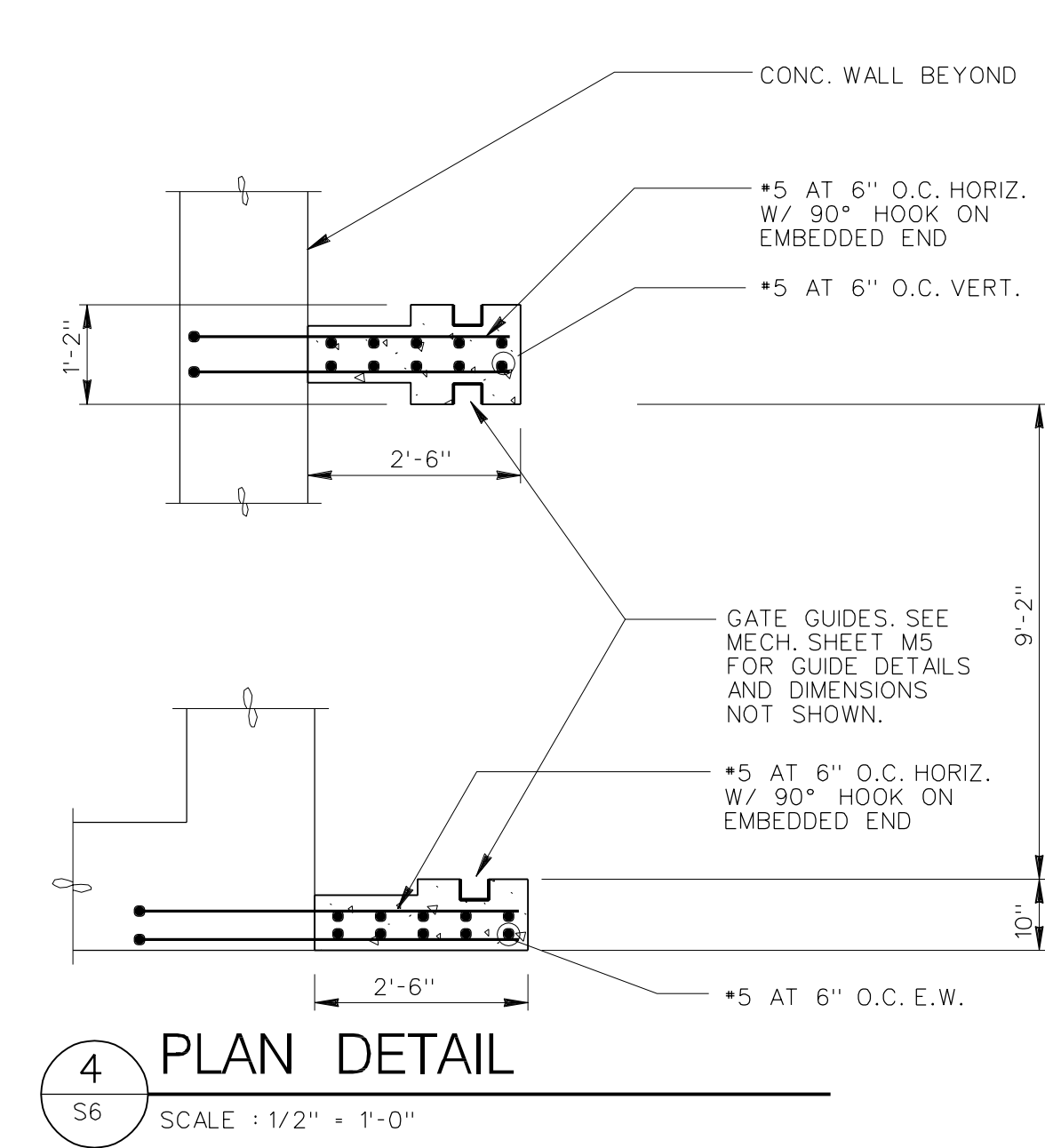


**GRATING NOTES**

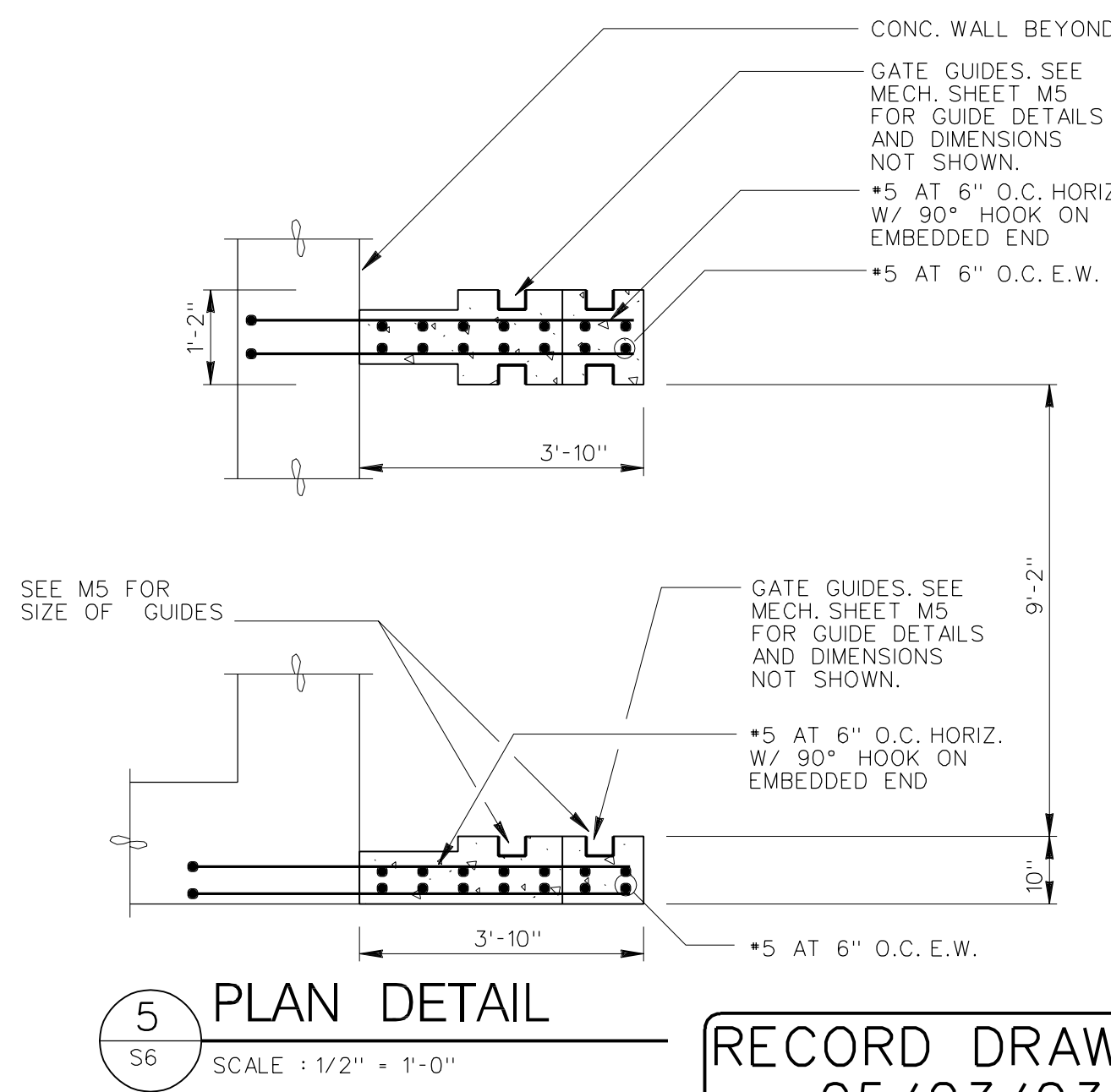
INDICATES DIRECTION OF GRATING BEARING BARS. GRATING SHALL BE 1 1/2" DEEP ALUMINUM PLANK GRATING AS MANUFACTURED BY KERRIGAN, IRVING OR EQUAL. MANUFACTURER'S TRANSVERSE BAR PATTERN SHALL BE MAINTAINED. BAND ALL OPENINGS AND ENDS. BAND INTO 18" WIDE SECTIONS. GRATING SHALL BEAR IN (4) SIDED ALUMINUM L FRAMES 2"x1 3/4"x1/4" WITH ALUMINUM PLATE.

NOTE: GRATING SUPPLIER TO PROVIDE SADDLE CLIPS TO HOLD GRATING IN PLACE. ALL GRATING TO BE CLEAR OF ANY EQUIPMENT. VERIFY WITH EQUIPMENT SUPPLIERS.

**3 TYPICAL GRATING DETAILS**  
S6 NOT TO SCALE



**4 PLAN DETAIL**  
S6 SCALE: 1/2" = 1'-0"



**5 PLAN DETAIL**  
S6 SCALE: 1/2" = 1'-0"

**RECORD DRAWING**  
05/23/03

RAW WATER INTAKE - SECTIONS AND DETAILS

CITY OF JOHNSON CITY  
WATAUGA WATER TREATMENT PLANT  
1998 EXPANSION AND IMPROVEMENTS

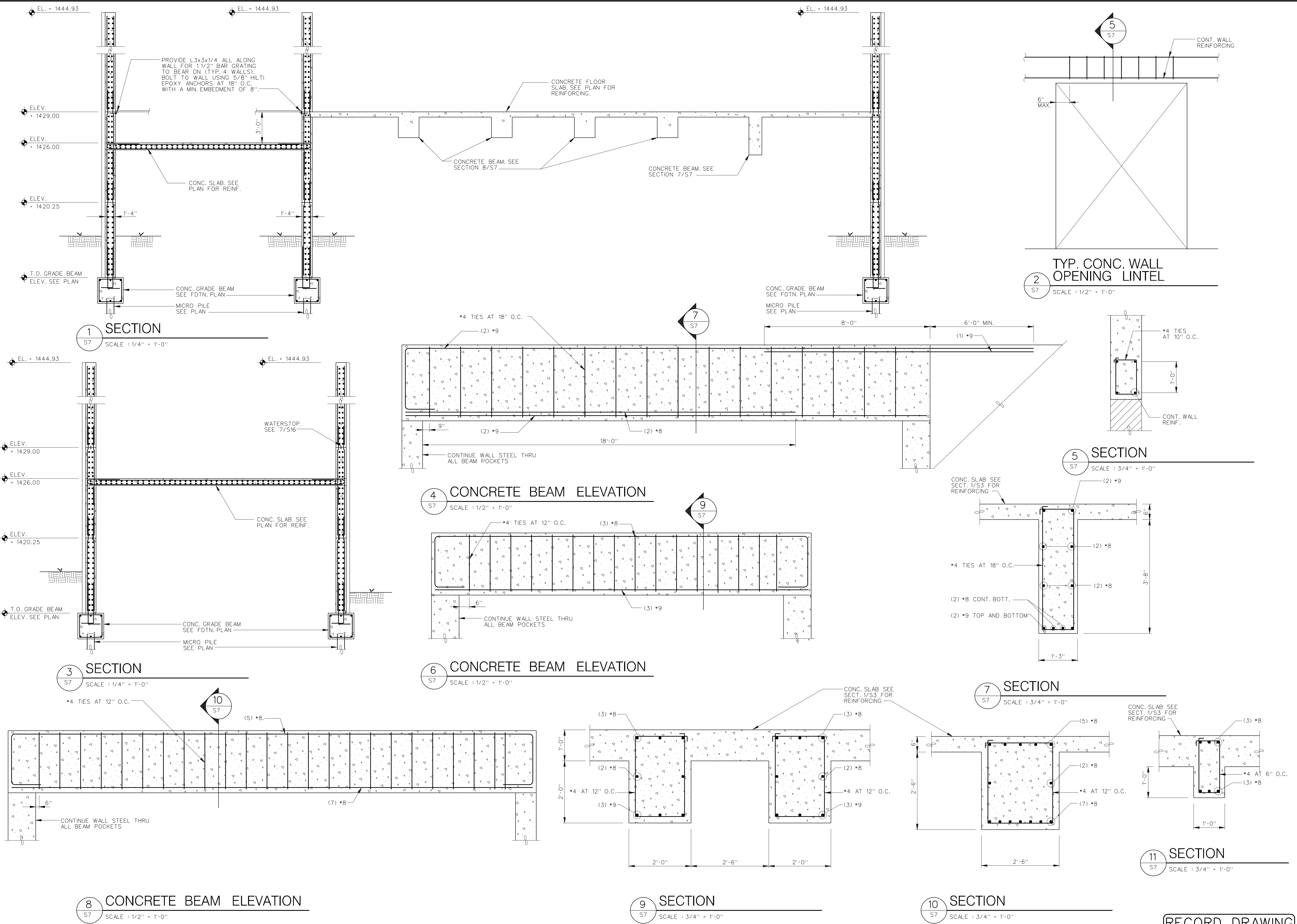
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RWB	DLH	05-23-03	RECORD DRAWINGS

**S6**  
FILE NO. 15784-20

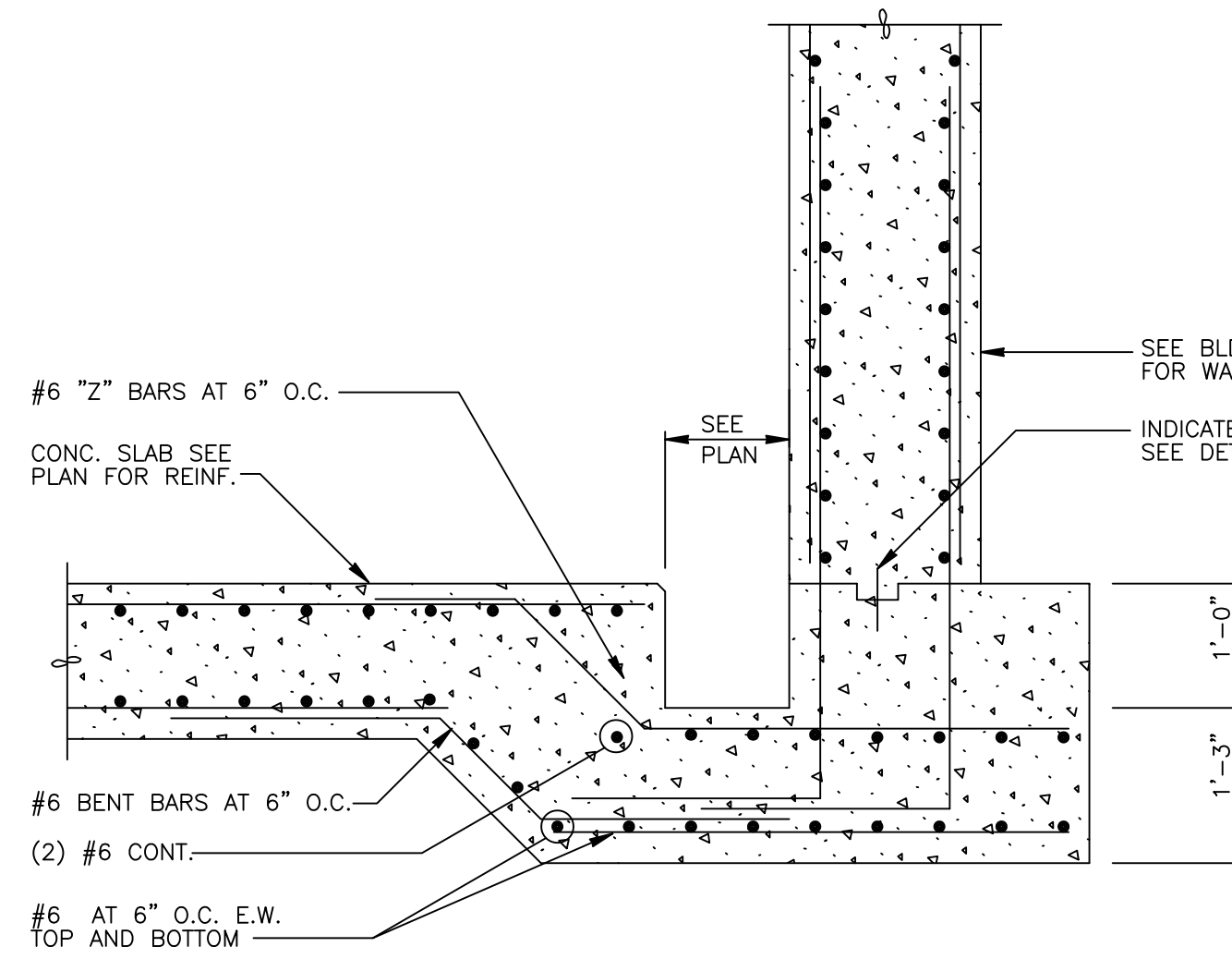
**Barge Waggoner Summer and Cannon, Inc.**  
Engineers, Architects, Planners,  
Landscape Architects and Surveyors

SUITE 2400 FIRST TENNESSEE PLAZA  
KNOXVILLE, TENNESSEE 37929  
PHONE: (423) 637-2810  
FAX: (423) 637-8554

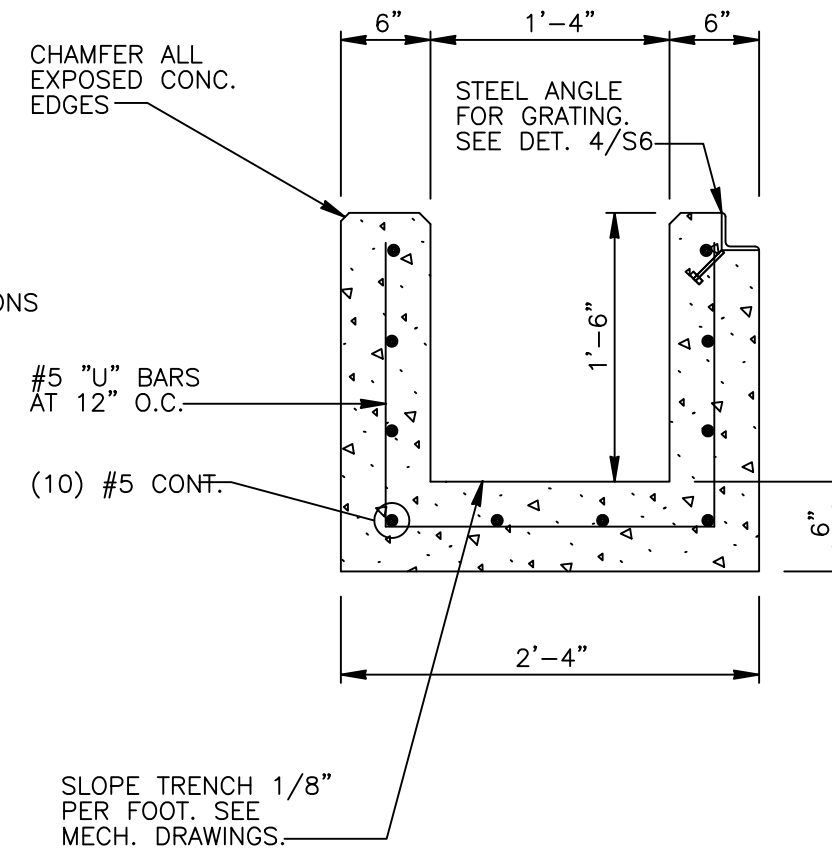
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CADD	ANW	11-20-98	ORIGINAL ISSUE
RWB	DLH	05-23-03	RECORD DRAWINGS



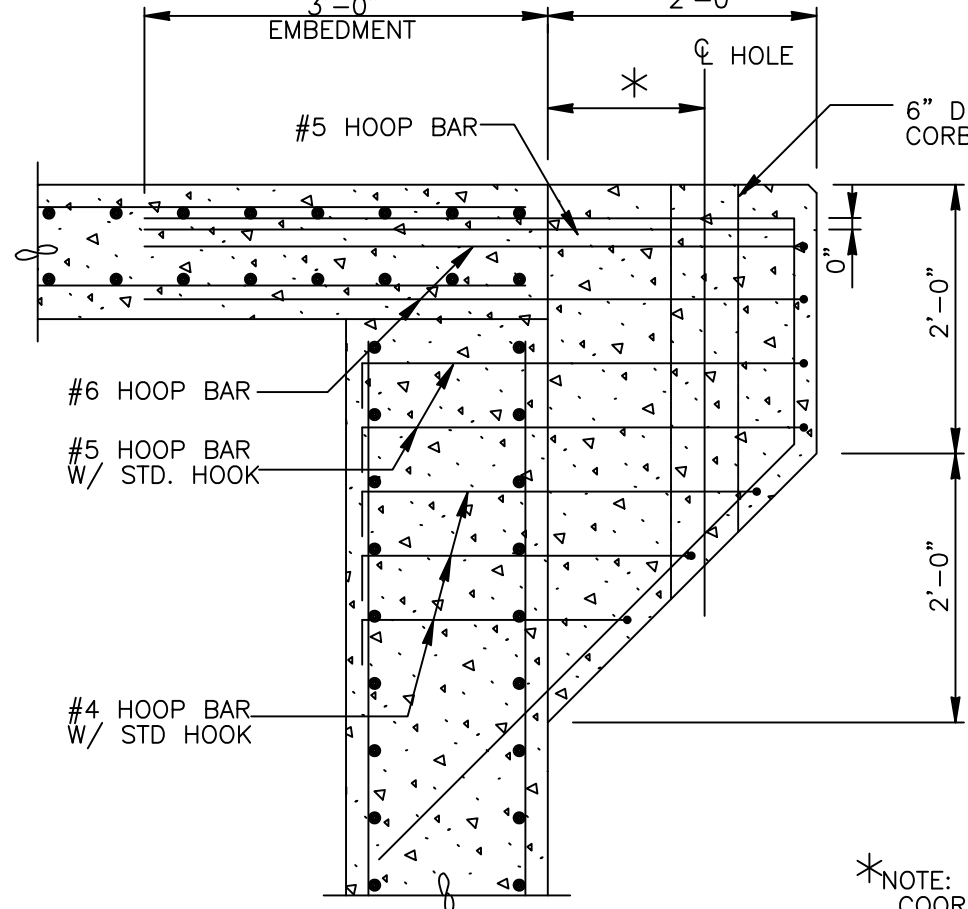
**RECORD DRAWING**  
 05/23/03



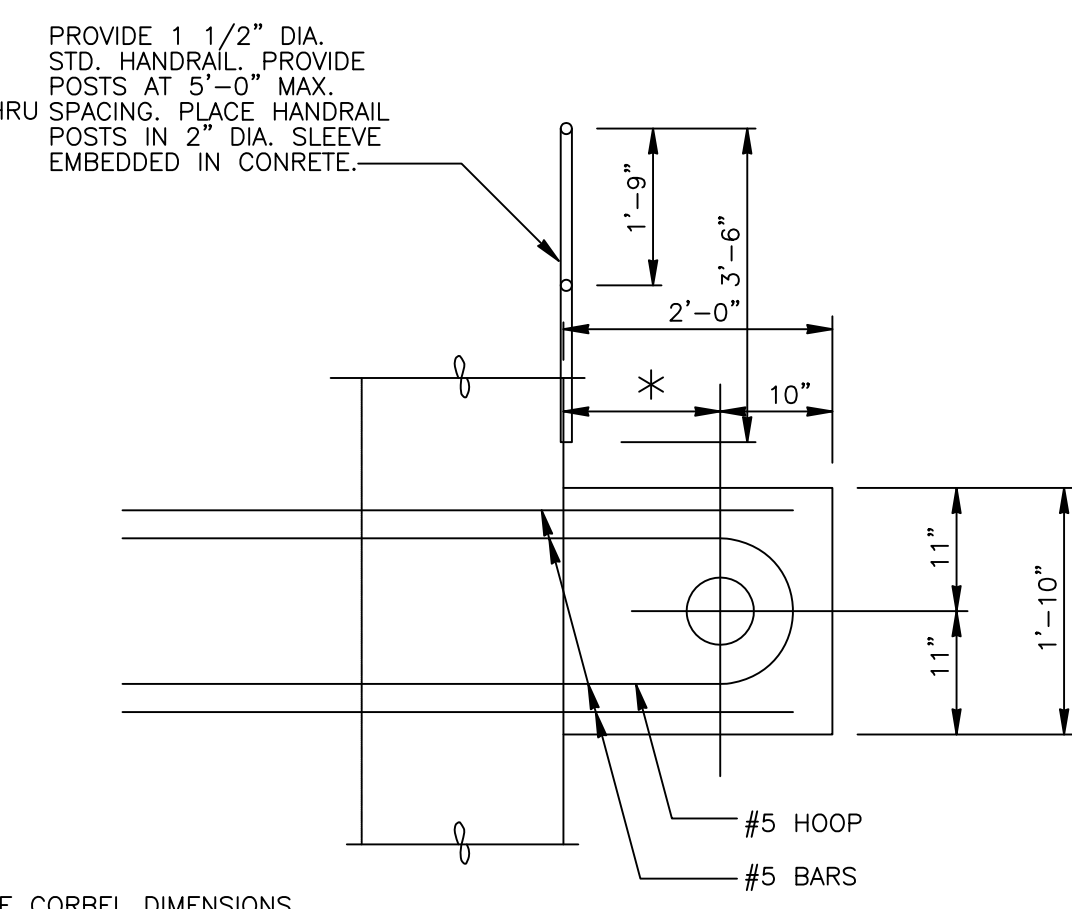
1 SECTION THRU SUMP  
S8 SCALE : 3/4" = 1'-0"



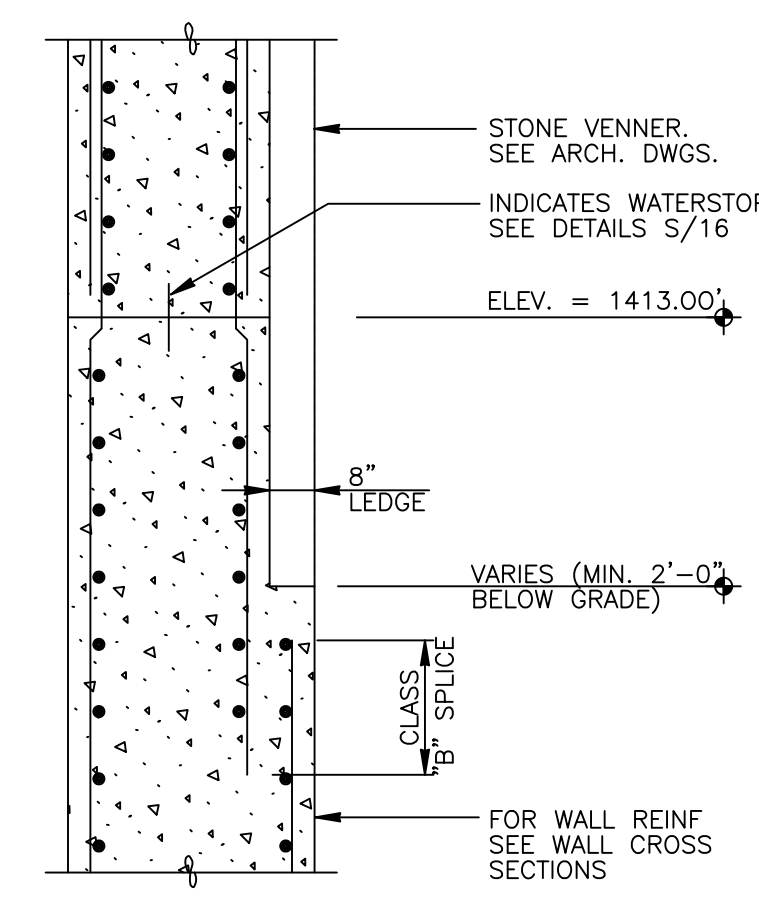
2 SECTION THRU TROUGH  
S8 SCALE : 1" = 1'-0"



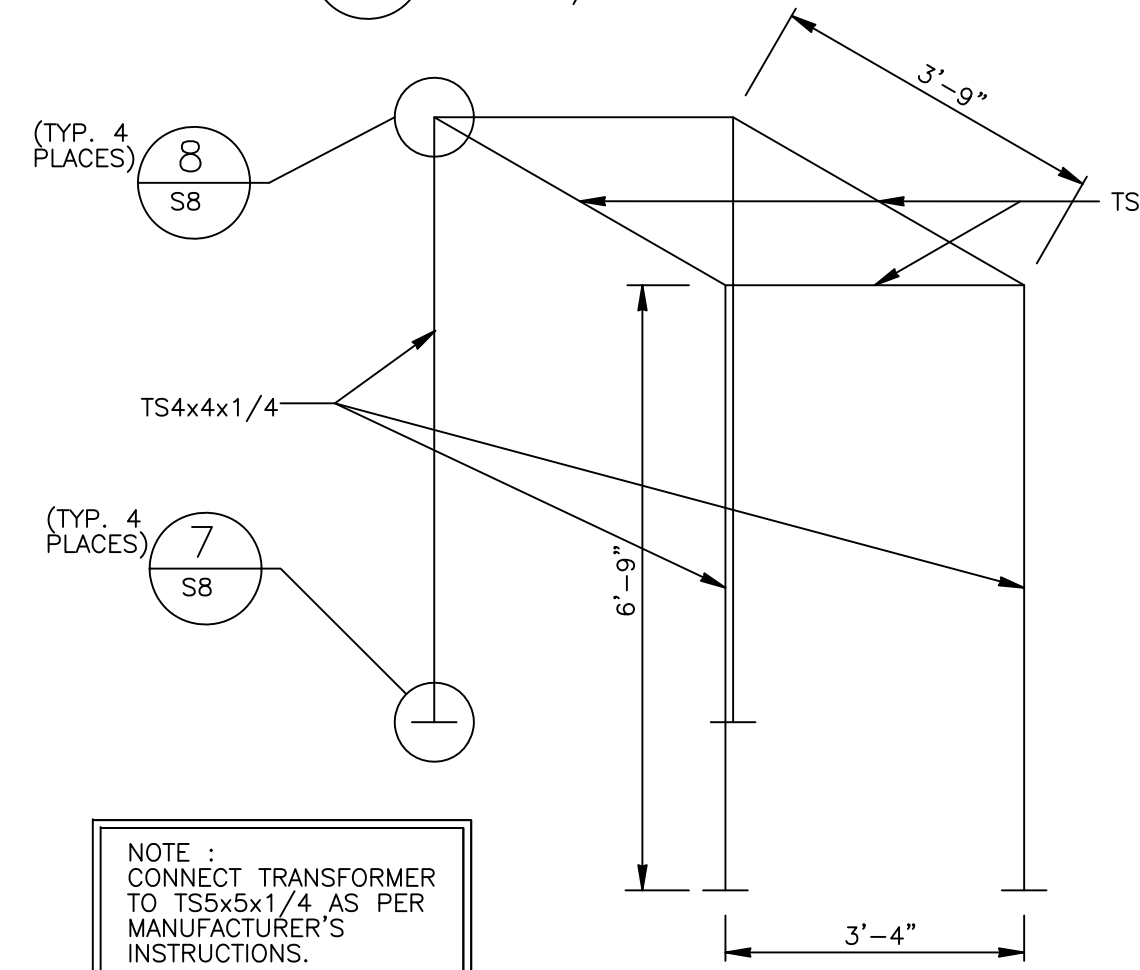
3 SECTION THRU CORBLE  
S8 SCALE : 3/4" = 1'-0"



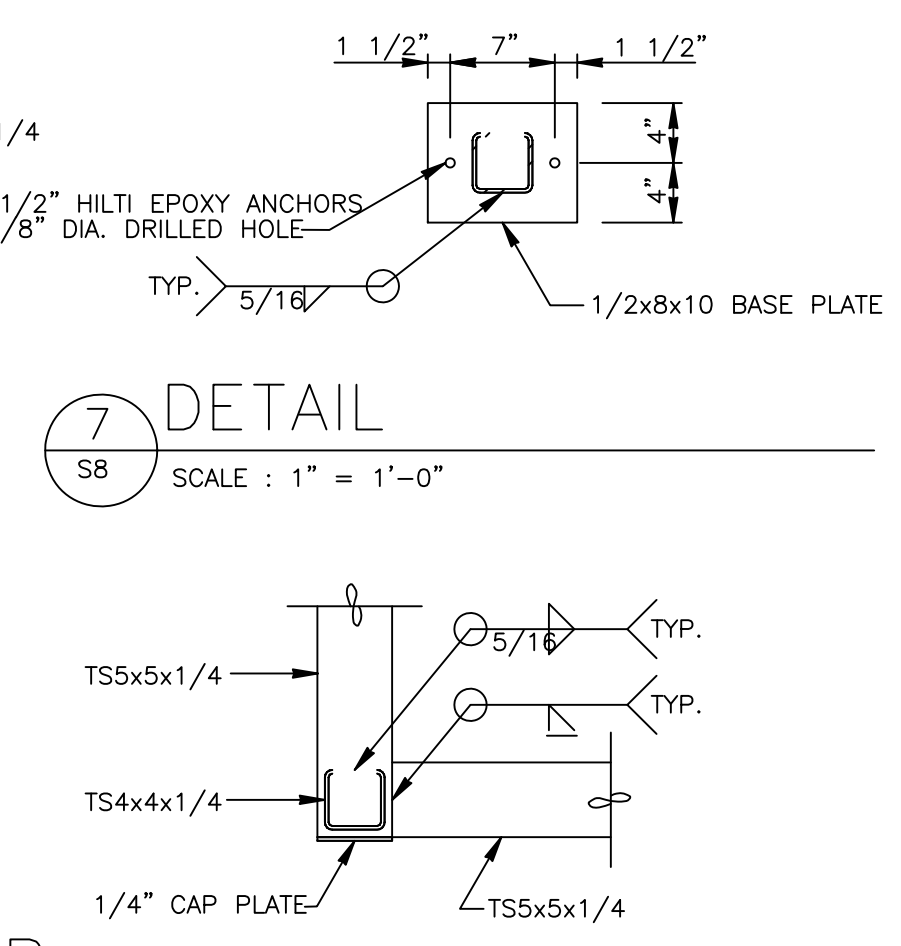
4 CORBEL PLAN  
S8 SCALE : 3/4" = 1'-0"



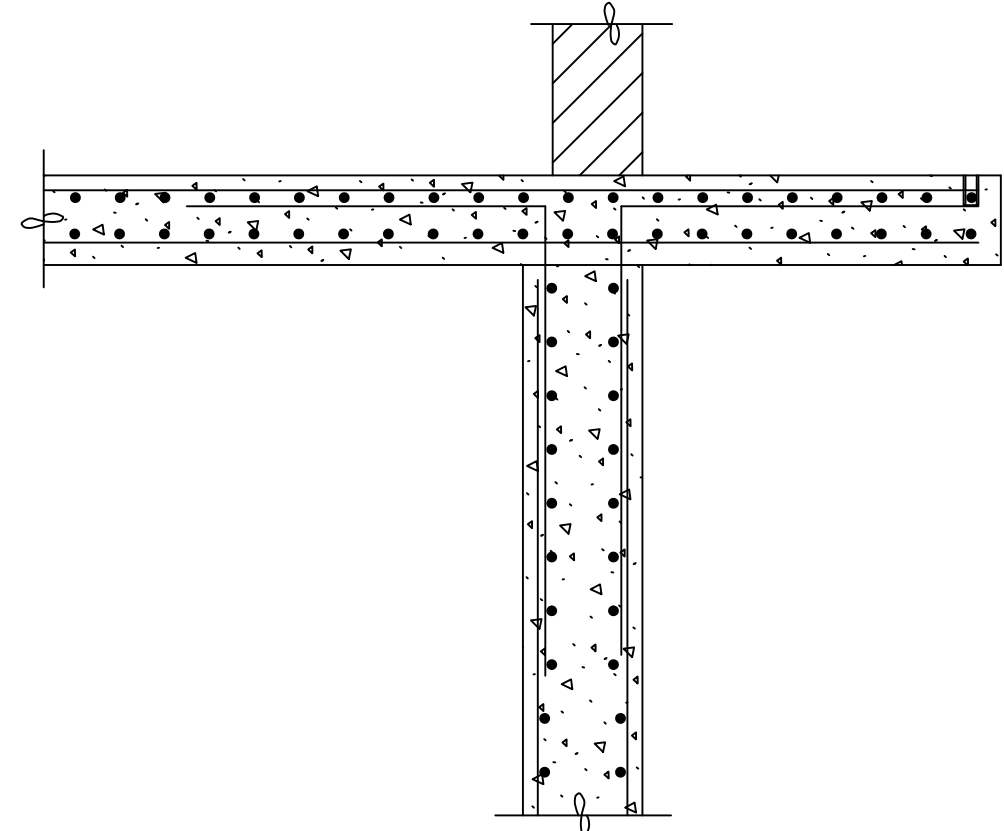
5 SECTION AT FACADE LEDGE  
S8 NOT TO SCALE



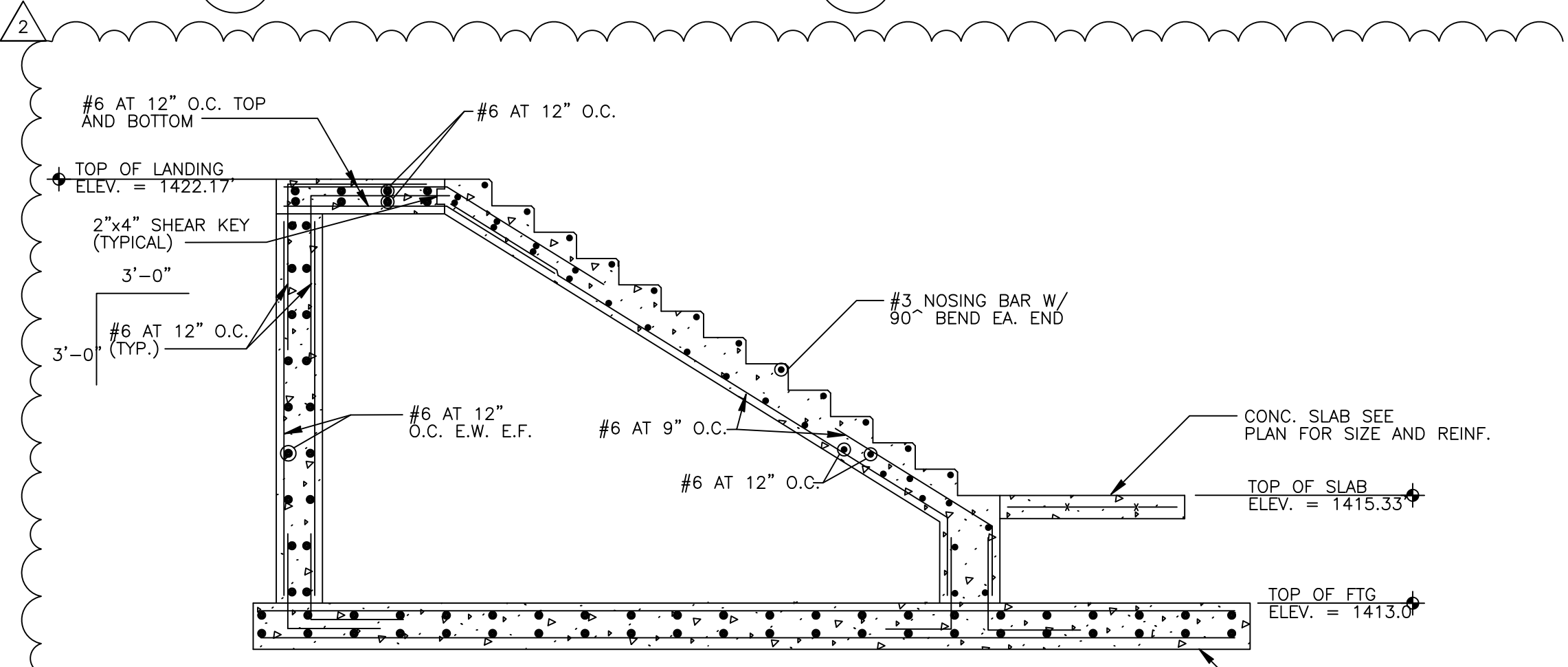
6 ISOLATION TRANSFORMER SUPPORTS (2 REQUIRED)  
S8 SCALE : 1/2" = 1'-0"



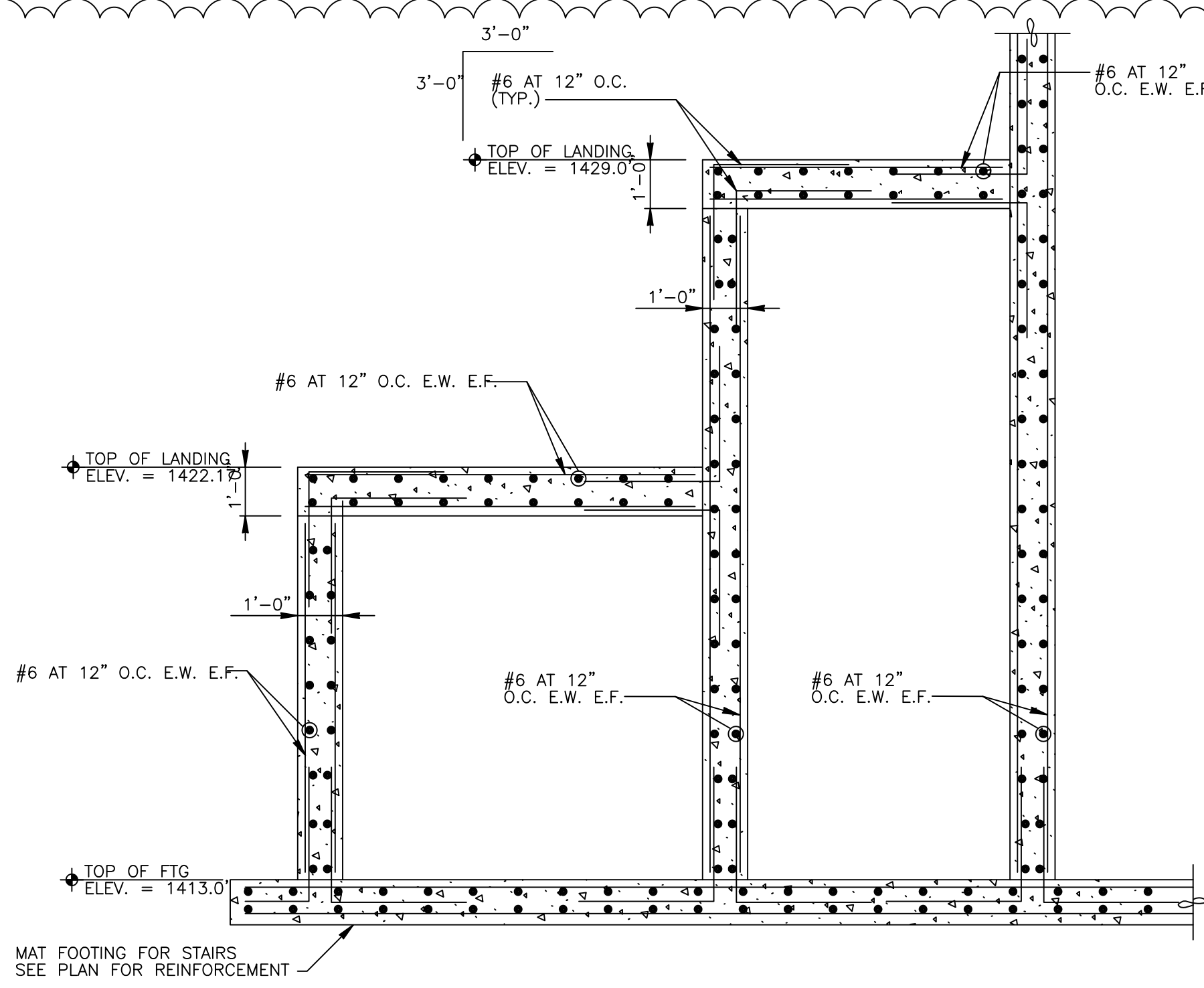
8 DETAIL  
S8 SCALE : 1" = 1'-0"



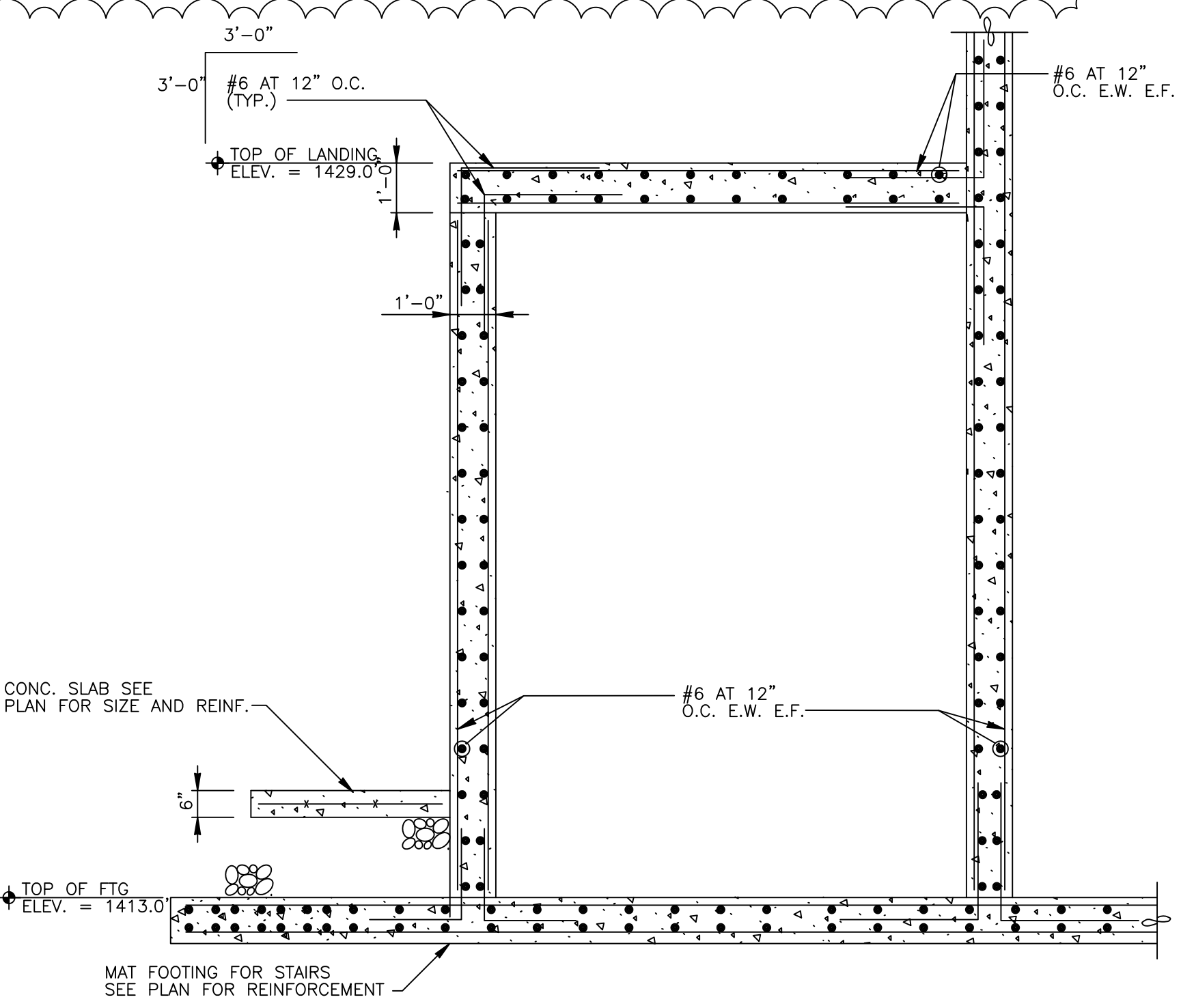
9 SECTION  
S8 SCALE : 1/2" = 1'-0"



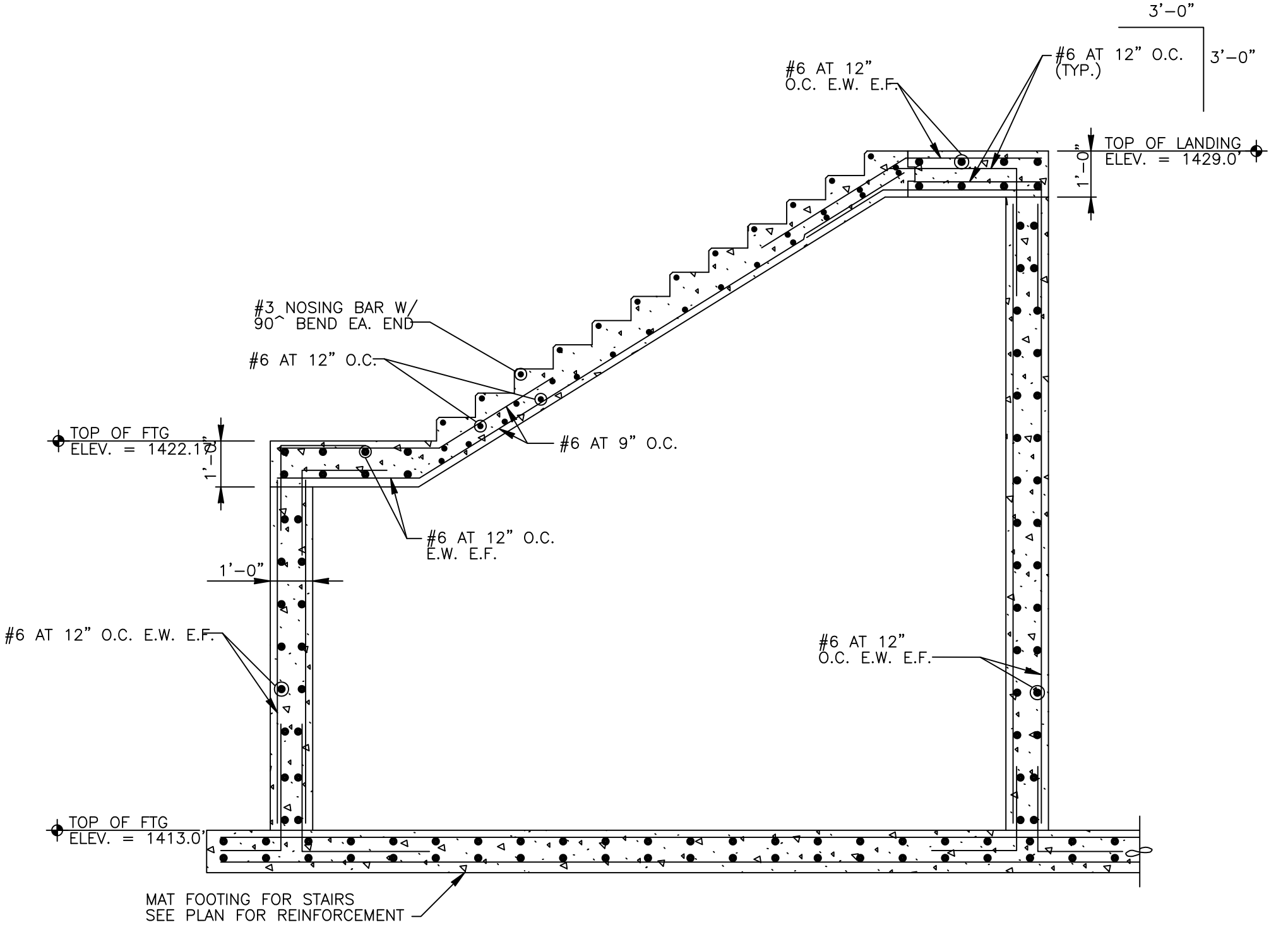
10 SECTION  
S8 SCALE : 1/2" = 1'-0"



11 SECTION THRU STAIRS  
S8 SCALE : 3/8" = 1'-0"



12 SECTION THRU STAIRS  
S8 SCALE : 3/8" = 1'-0"



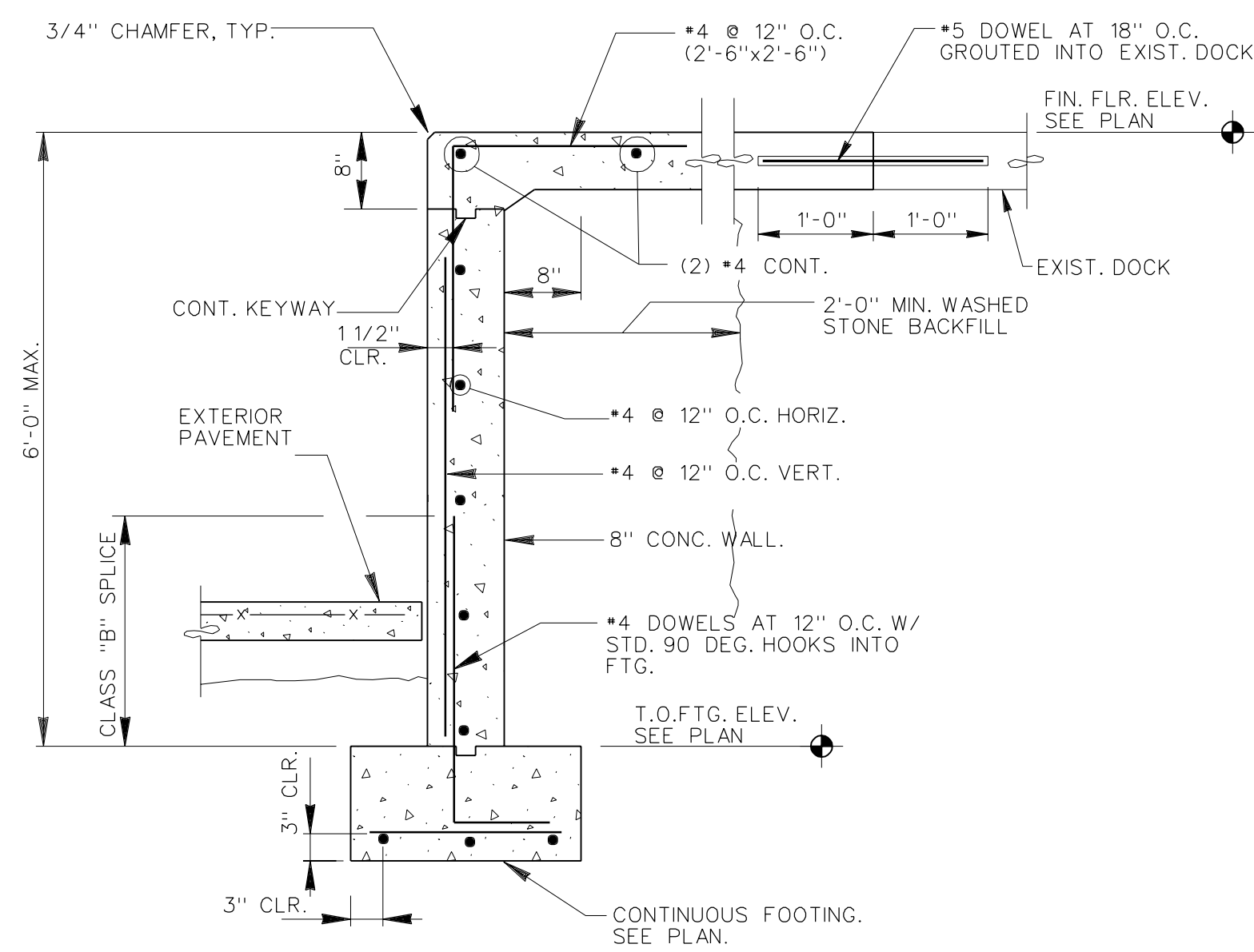
13 SECTION THRU STAIRS  
S8 SCALE : 3/8" = 1'-0"

RAW WATER INTAKE - SECTIONS AND DETAILS

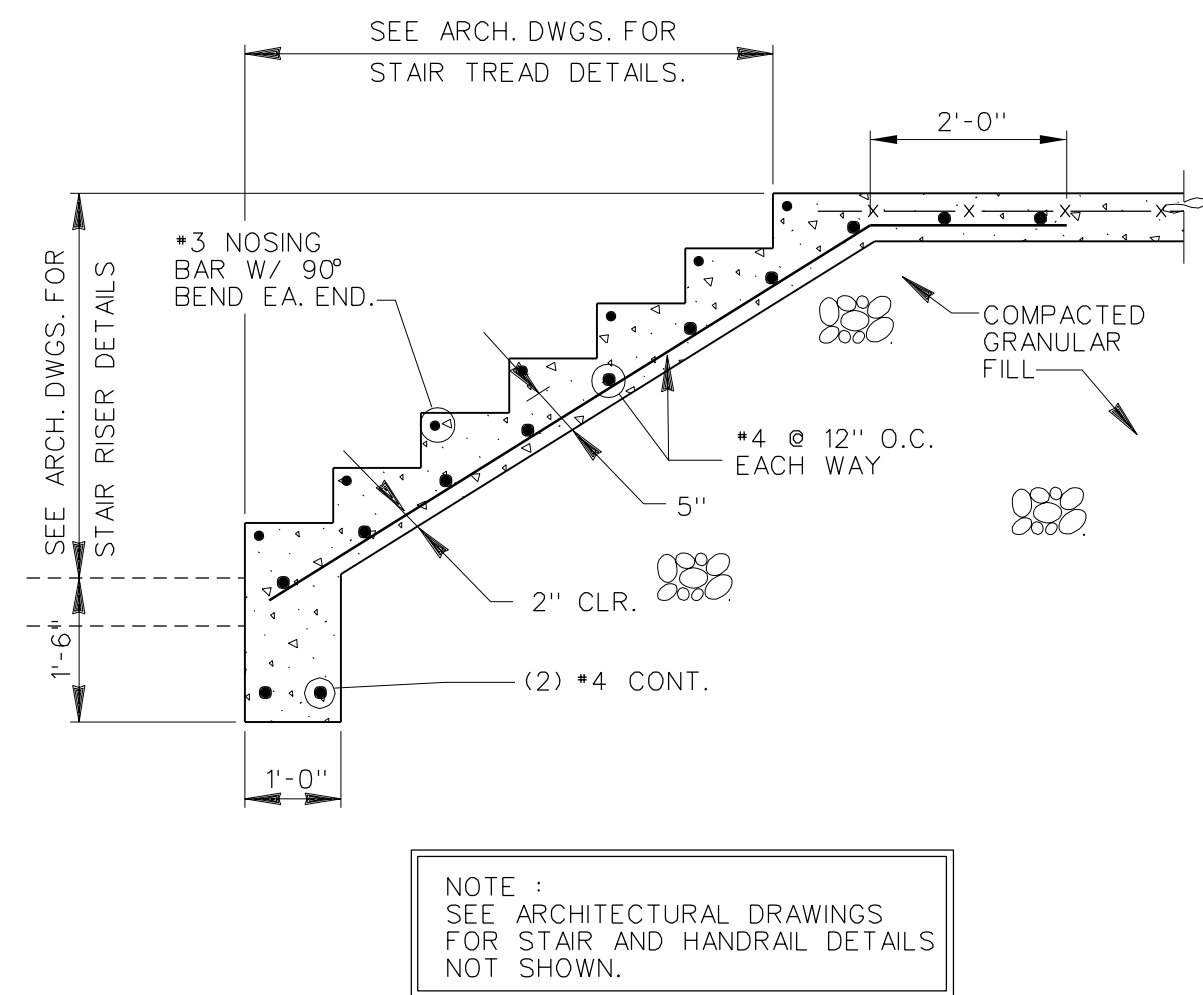
CITY OF JOHNSON CITY  
WATAUGA WATER TREATMENT PLANT  
1998 EXPANSION AND IMPROVEMENTS

DR.	CHK.	DATE	DESCRIPTION
CADD	ANW	11-20-98	ISSUE FOR BID
CADD	ANW	12-28-98	REVISION No. 1
DRH	BAH	01-25-99	REVISION No. 2

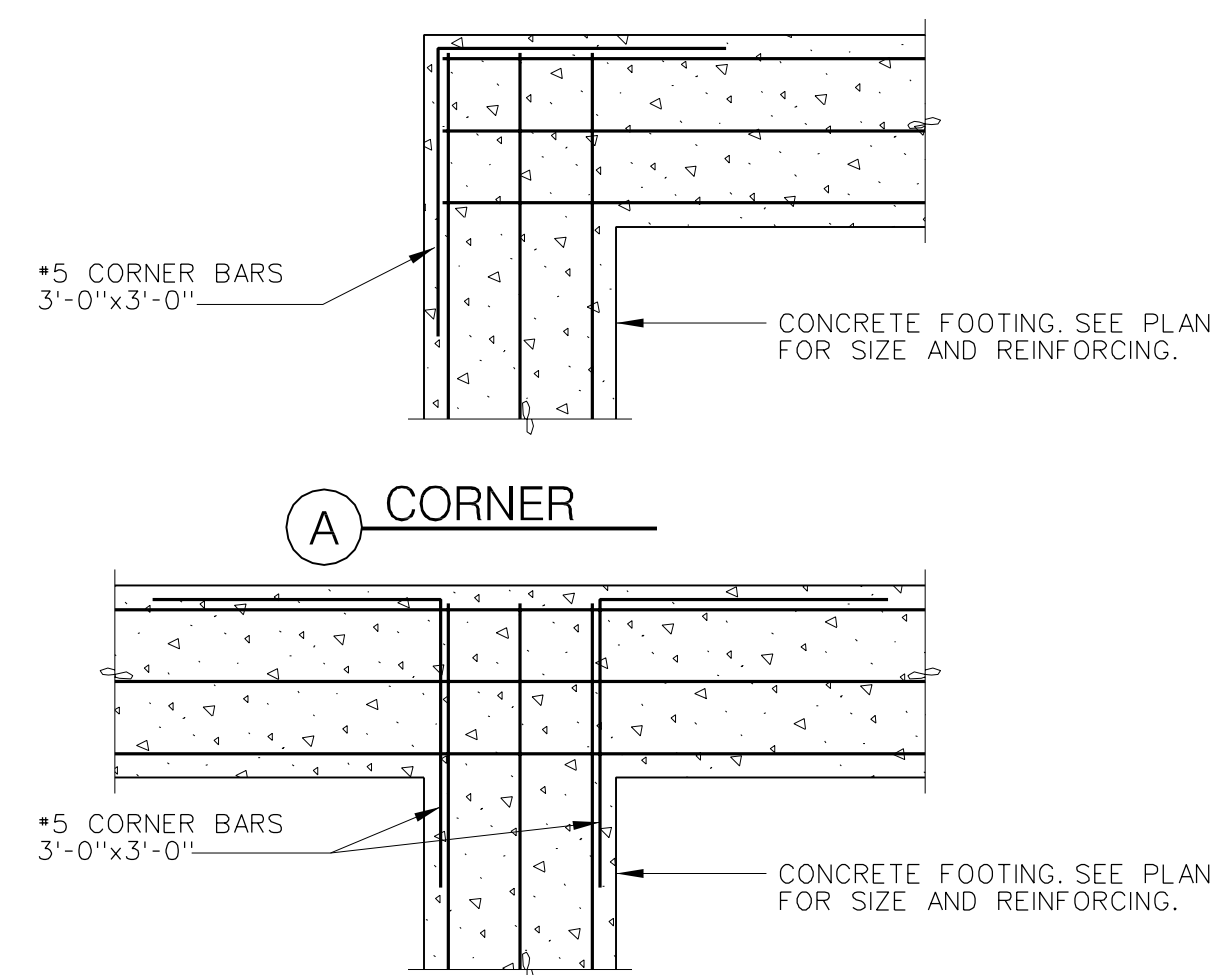
S8  
FILE NO. 15784-20



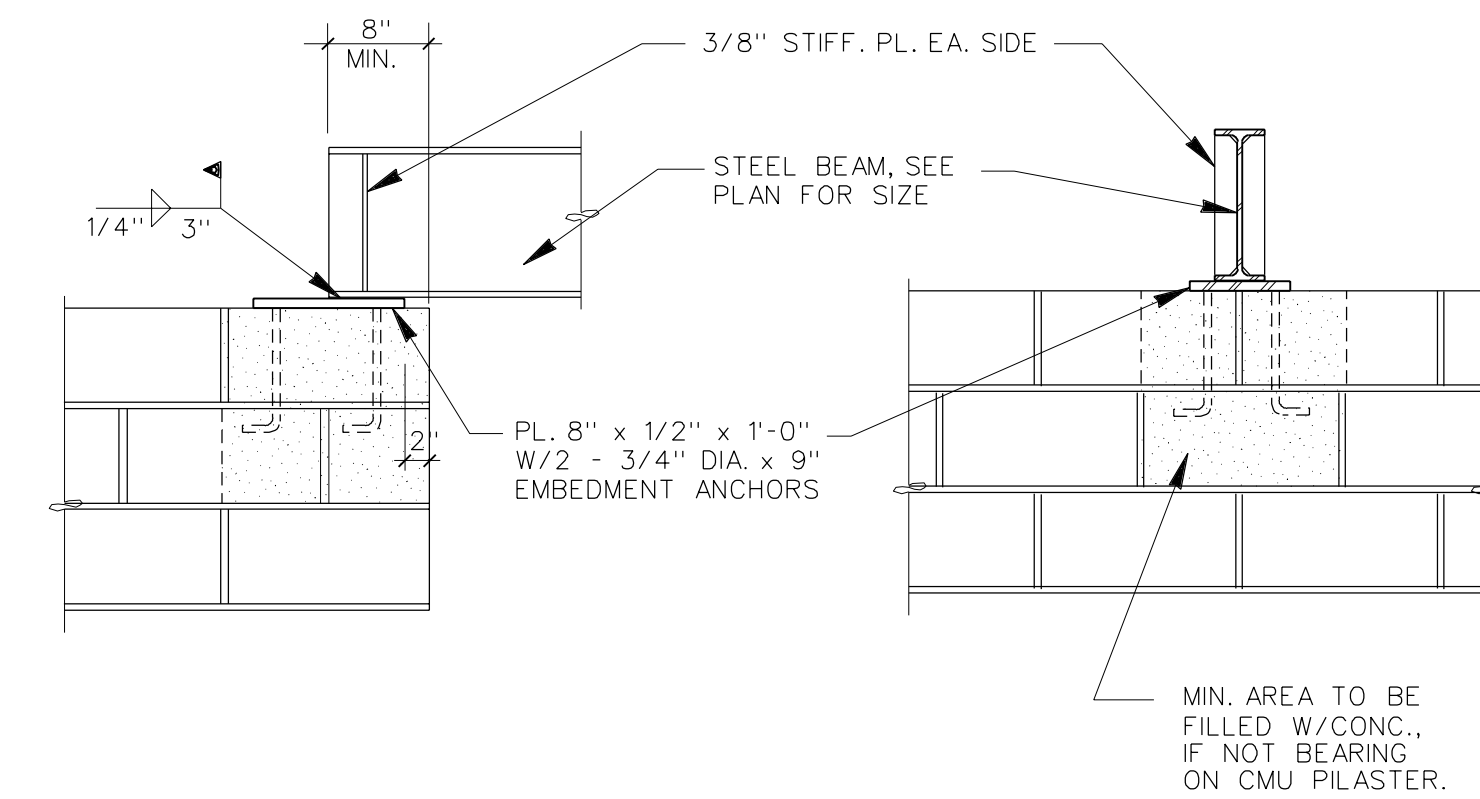
1 SECTION AT DOCK WALL  
S16 SCALE : 3/4" = 1'-0"



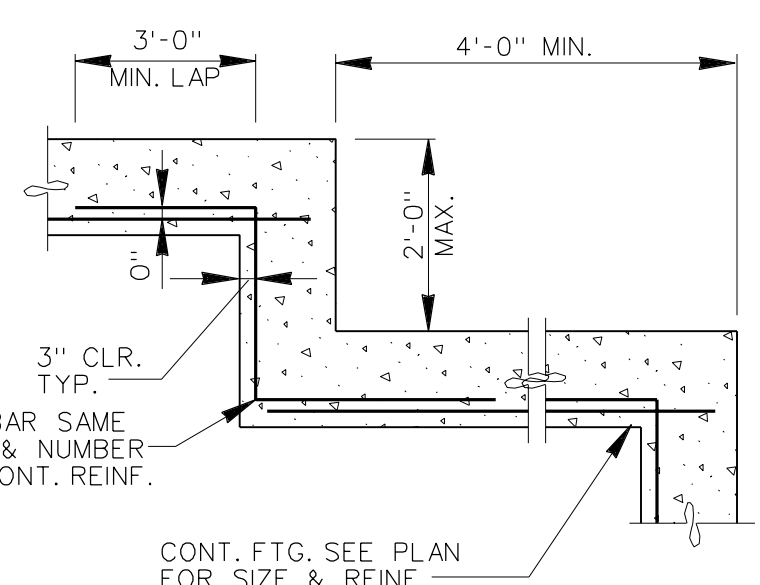
2 SECTION  
S16 SCALE : 1/2" = 1'-0"



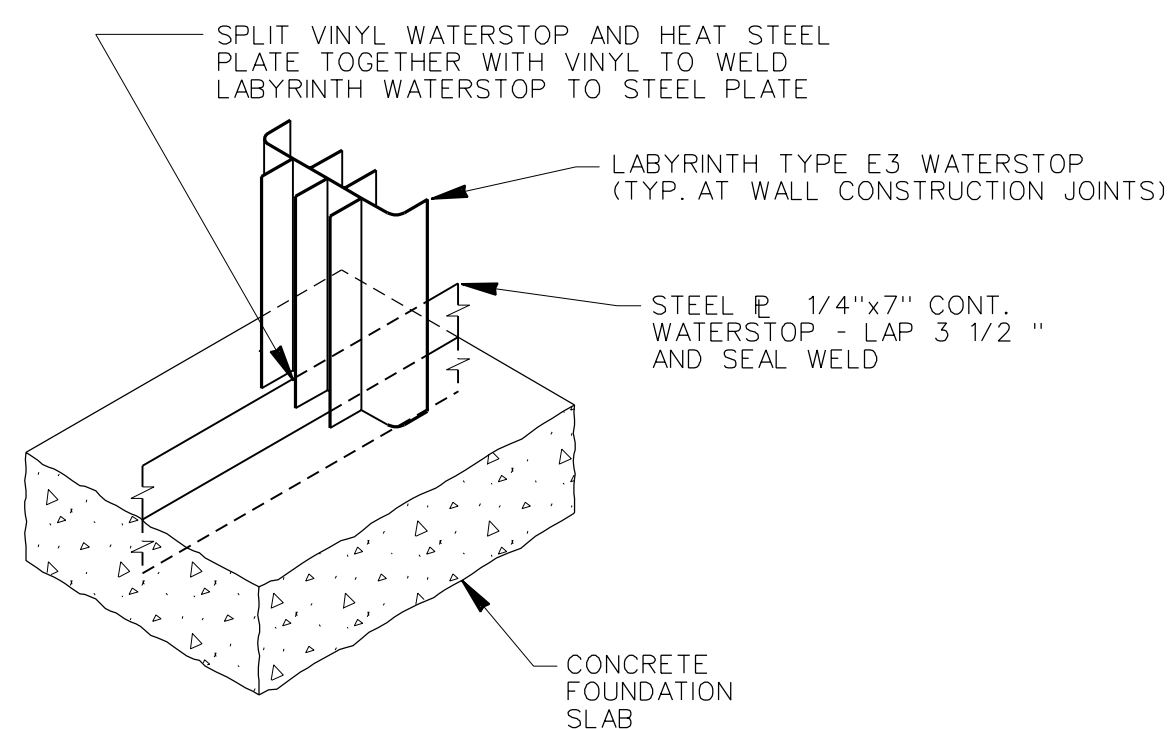
3 FOOTING DETAILS  
S16 SCALE : 1/2" = 1'-0"



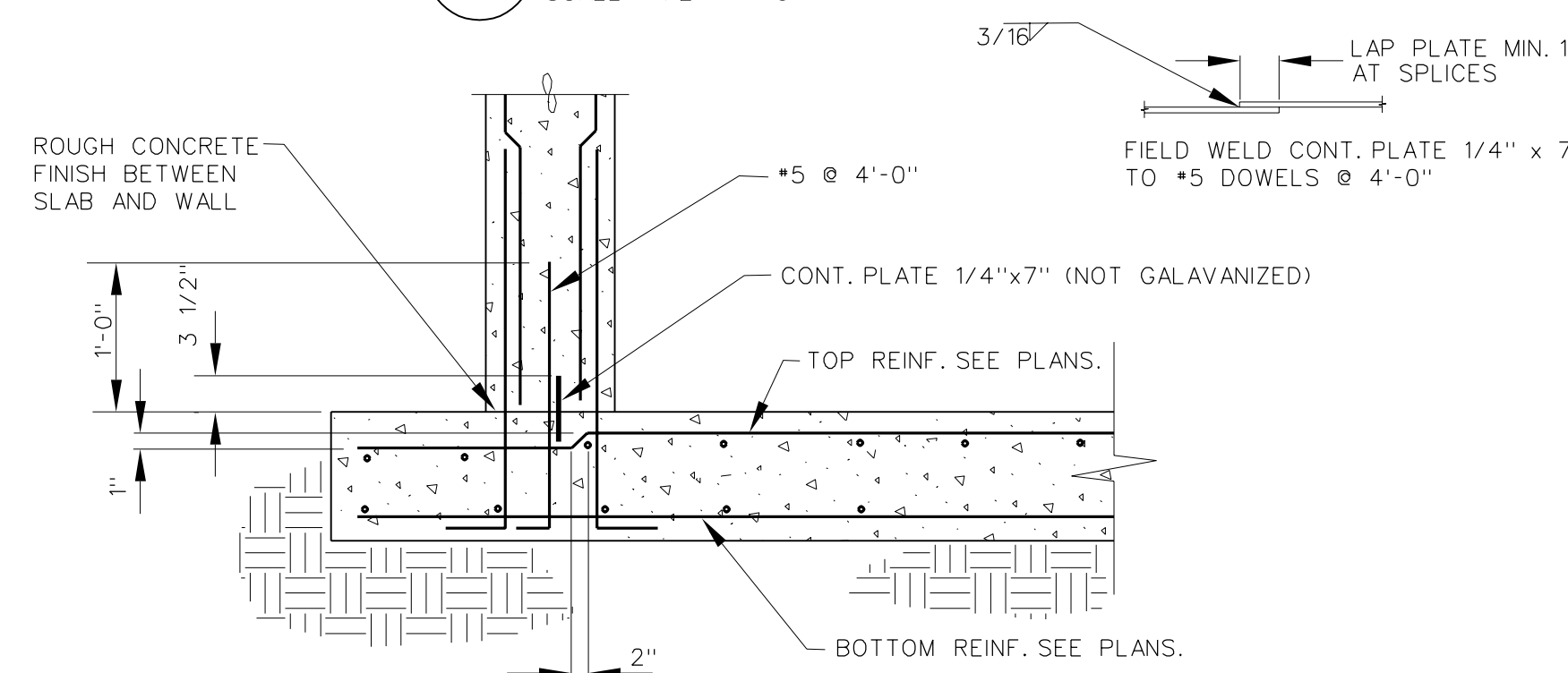
4 TYP. BEAM BRG. ON CMU WALL DETAIL  
S16 NOT TO SCALE



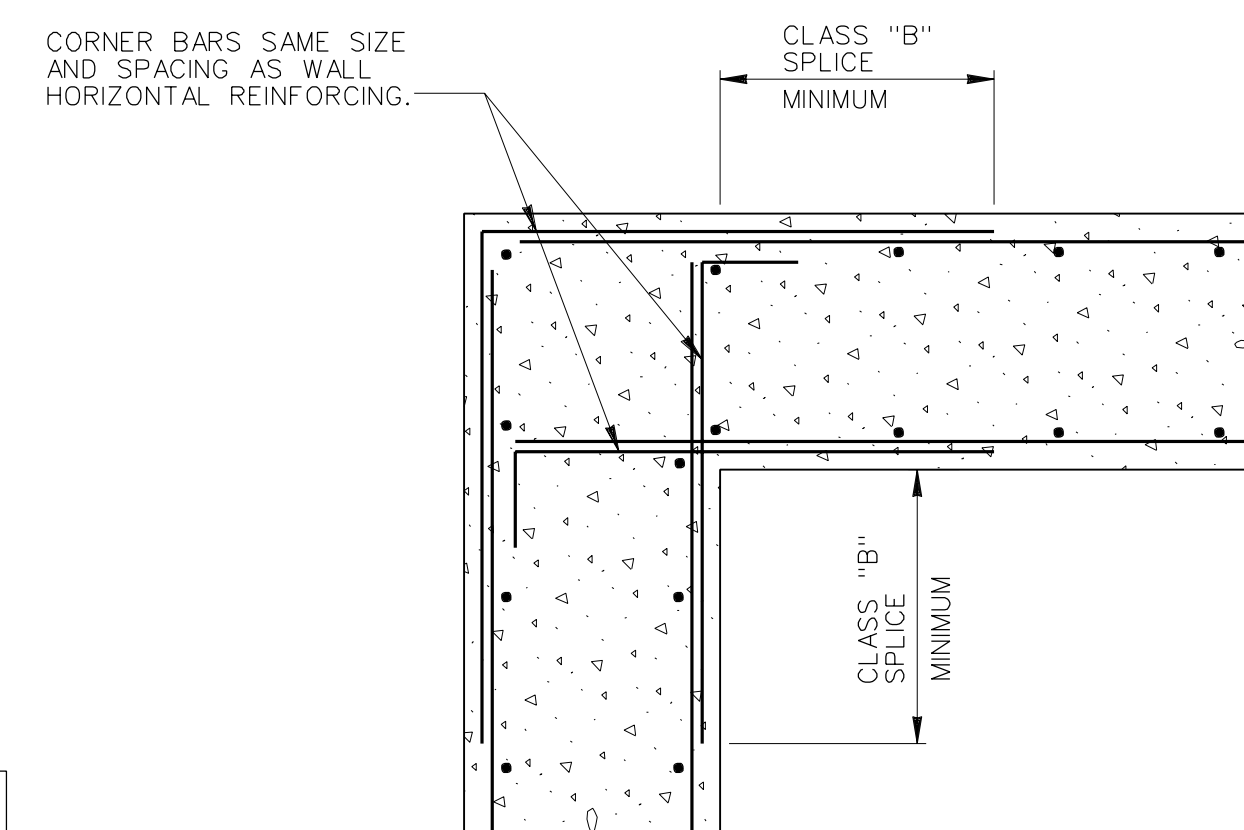
5 TYP. FTG. STEP DETAIL  
S16 NOT TO SCALE



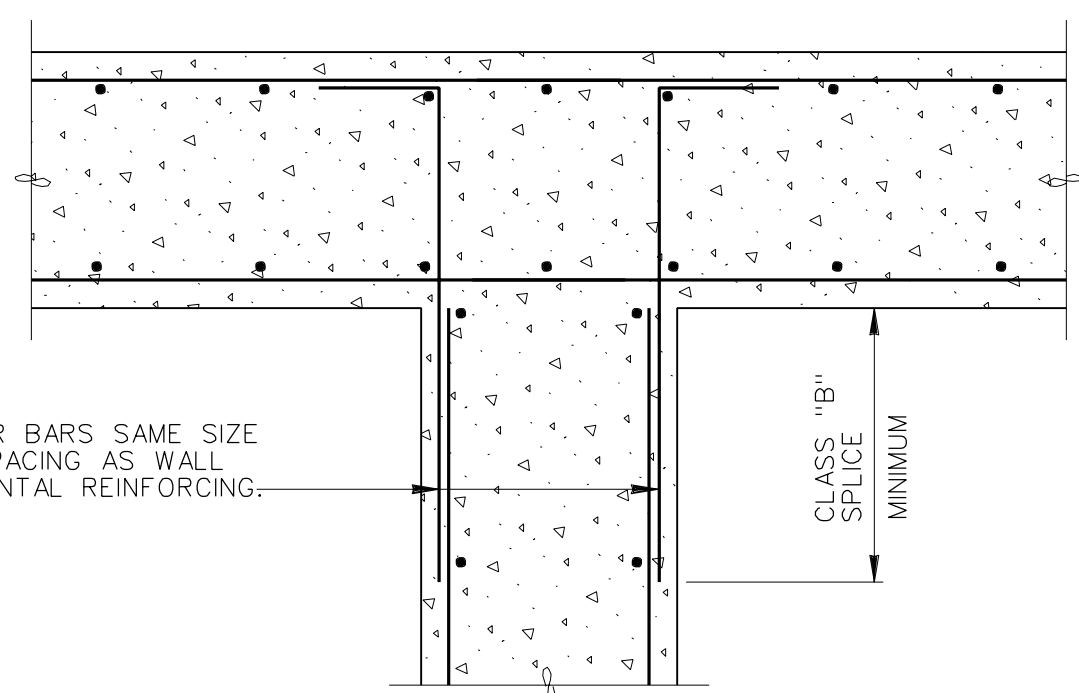
6 TYPICAL INTERSECTION OF STEEL PLATE WATERSTOP AND LABYRINTH TYPE E-3 VINYL WATERSTOP DETAIL  
S16 NOT TO SCALE



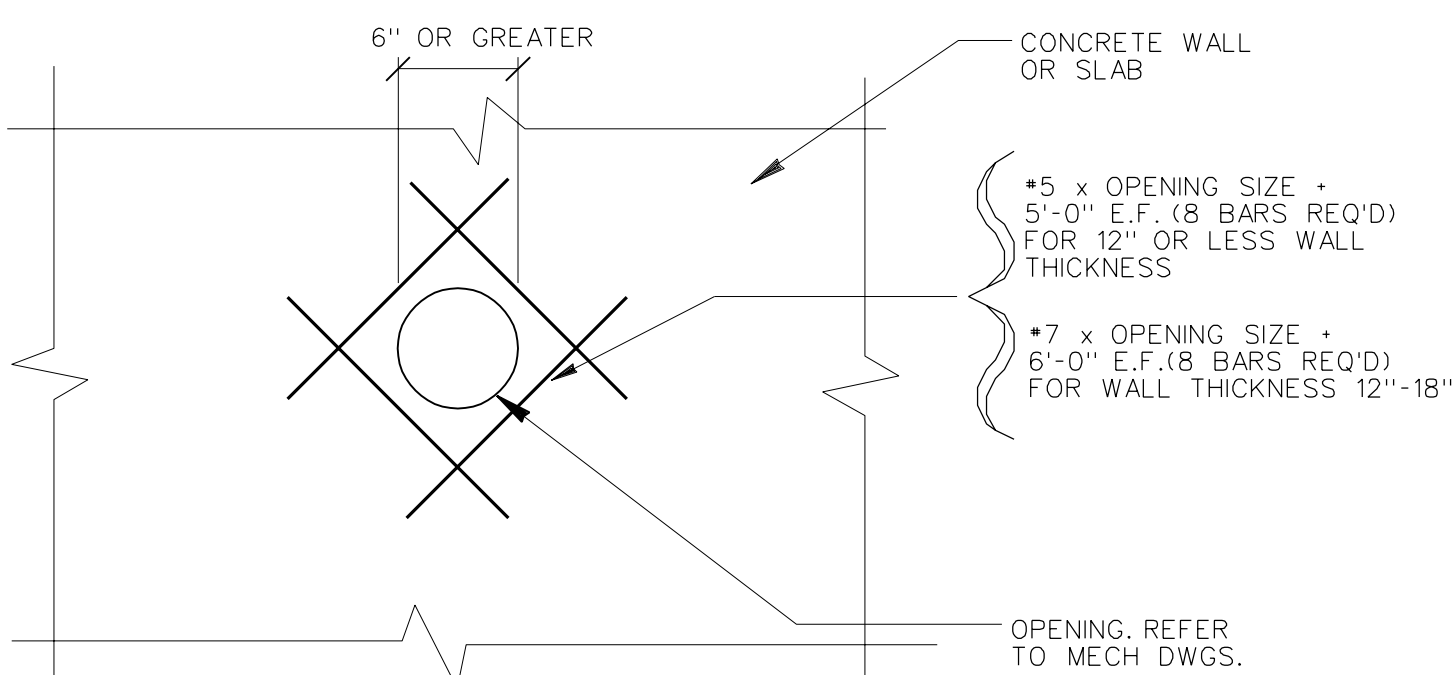
7 TYP. HORIZONTAL WALL WATERSTOP DET.  
S16 SCALE : 3/4" = 1'-0"  
NOTE: PROVIDE AT ALL SLAB AND WALL JOINTS IN WATER HOLDING STRUCTURES (1).



8 TYPICAL WALL CORNER DETAIL  
S16 NOT TO SCALE



9 TYPICAL WALL INTERSECTION DETAIL  
S16 NOT TO SCALE



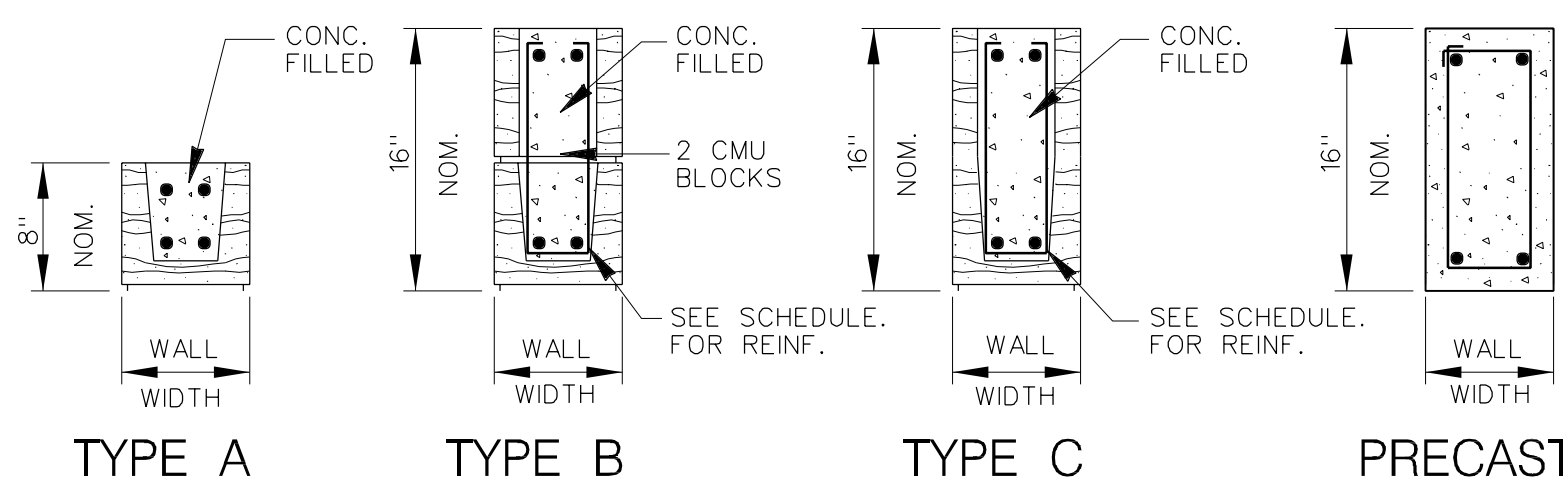
10 CUTOUT DETAIL  
S16 SCALE : 3/4" = 1'-0"

TYPICAL CMU LINTEL SCHEDULE

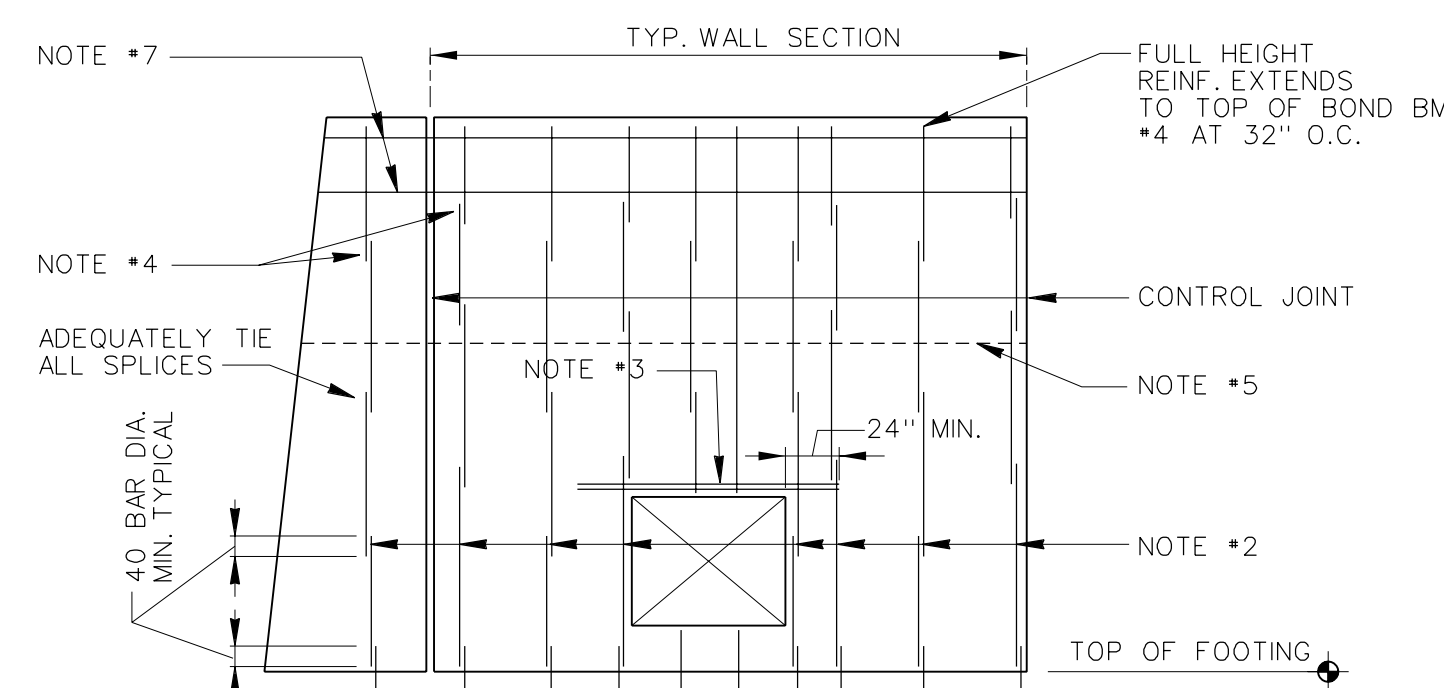
CMU LINTEL SCHEDULE					
WALL THICKNESS	CLEAR SPAN	LINTEL DEPTH	BOTTOM REINF.	TOP REINF.	STIRRUPS & SPACING
12"	UP TO 5'-4"	8"	2 #5	2 #4	---
12"	OVER 5'-4" TO 8'-0"	16"	2 #5	2 #5	#3 @ 12"
8"	UP TO 6'-4"	8"	2 #4	2 #4	---
8"	OVER 6'-4" TO 12'-0"	16"	2 #5	2 #5	#3 @ 12"

- NOTES :
- LINTELS TO HAVE 8" MINIMUM BEARING EACH END UP TO 7'-4" SPAN, LINTEL TO HAVE 16" BEARING EACH END.
  - PRECAST CONCRETE LINTELS CAN BE SUBSTITUTED UPON APPROVAL BY THE ARCHITECT. TOP BARS SHALL BE PROVIDE EQUAL TO SCHEDULED BOTTOM BARS. SEE "PRECAST" DETAIL BELOW.
  - LINTELS SCHEDULED AS 16" HIGH MAY BE EITHER "B" OR "C" AS DETAILED BELOW.
  - CONSTRUCTION JOINT SHALL NOT BE LOCATED WITHIN BEARING WIDTH OF C.M.U. LINTEL.
  - USE 3000 PPS MINIMUM GROUT FOR CMU LINTELS, UNLESS NOTED OTHERWISE.

- BRICK SHELF ANGLE NOTE :
- AT OPENINGS IN BRICK UP TO 4'-0" WIDE PROVIDE BRICK SHELF ANGLE 3 1/2x3 1/2x1/4. BRICK SHELF ANGLES ARE TO BEAR 8" EACH SIDE ON BRICK FACADE.

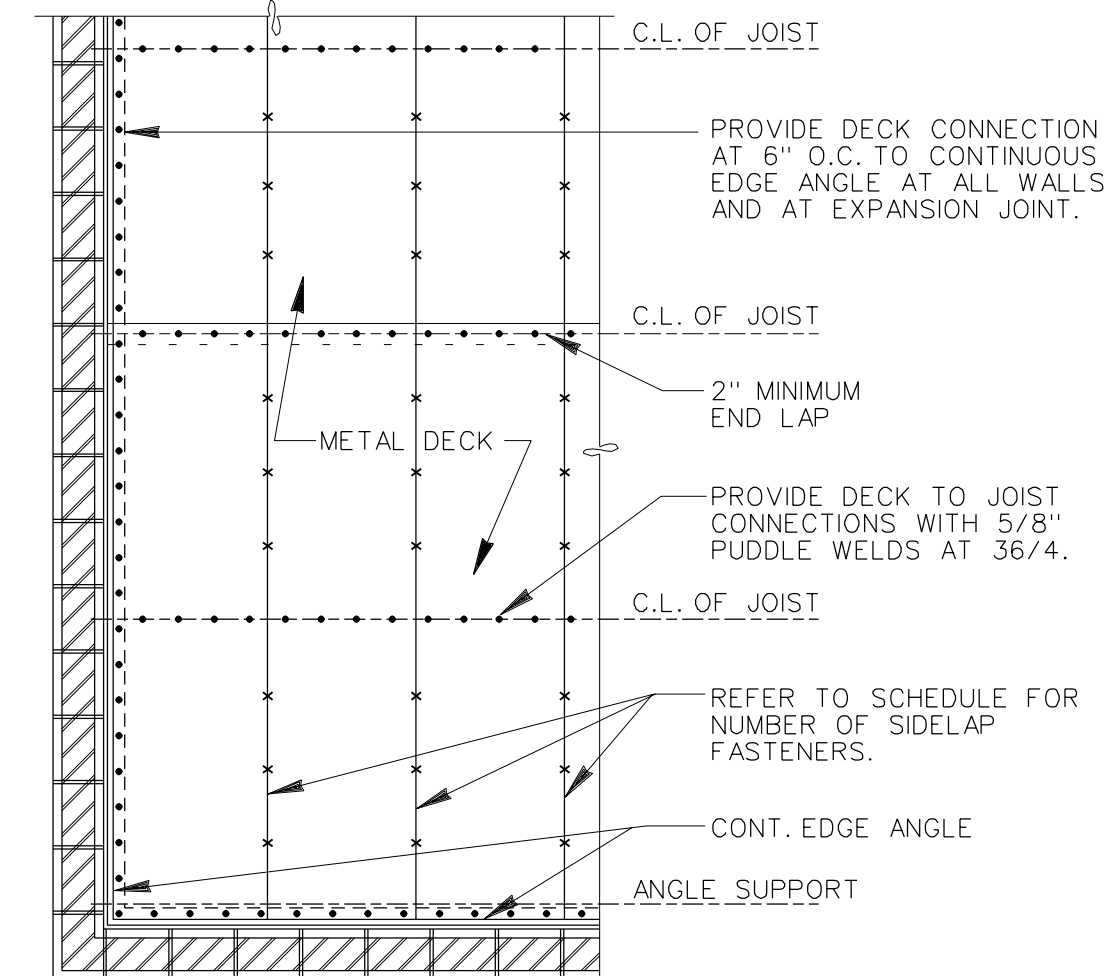


TYPICAL WALL REINFORCING DIAGRAM AND NOTES



- NOTES :
- VERTICAL WALL REINFORCING SHALL ALIGN WITH VERTICAL FOUNDATION DOWELS. DOWELS SHALL BE PLACED IN CENTER OF CMU WALL WITH ACISTANDARD HOOK. REFER TO CMU WALL DETAILS FOR SIZE AND SPACING. HOOK DIRECTLY ON TOP OF BOTTOM LAYER OF REINFORCING.
  - TYPICAL VERTICAL WALL REINFORCEMENT TO BE PLACED IN CENTER OF WALL. GROUT CELLS FULL THAT CONTAIN REINFORCEMENT. REFER TO DETAILS FOR SIZE AND SPACING.
  - LINTEL REINFORCEMENT, REFER TO CMU LINTEL SCHEDULE FOR SIZE, LOCATION AND QUANTITY OF REINFORCEMENT.
  - SPLICES IN ADJACENT BARS SHALL BE STAGGERED AND ARRANGED SO THAT NOT MORE THAN 1/2 OF THE TOTAL NUMBER OF BARS ARE SPLICED AT ANY ONE HEIGHT. VERTICAL REINFORCING BARS MAY BE SPLICED IN 6'-0" TO 8'-0" LENGTHS.
  - HORIZONTAL WALL REINFORCING SHALL BE TRUSS TYPE @ 16" O.C. ABOVE GRADE AND 8" O.C. BELOW GRADE, UNLESS OTHERWISE NOTED ON PLANS AND DETAILS. DISCONTINUE AT CONTROL JOINTS.
  - EITHER HIGH LIFT OR LOW LIFT GROUTING TECHNIQUE MAY BE USED AT CONTRACTORS OPTION.
  - REFER TO PLANS AND DETAILS FOR SIZE AND LOCATION OF BOND BEAMS AND QUANTITY OF REINFORCING. LAP REINFORCING 24" MIN. DISCONTINUE BOND BEAMS AT CONTROL JOINTS.

ROOF DIAPHRAGM CONNECTION DIAGRAM



- CONNECTOR PATTERN DIAGRAM
- NOTES :
- ALL STEEL DECK SIDELAP CONNECTIONS SHALL BE #10-16 TEKS/1 SELF DRILLING SCREWS.
  - ALL ROOF DECK TO BE VULCRAFT 1.5 F, 20 GA.
  - PROVIDE MINIMUM 36" DECK WIDTH, TYPICAL.
  - ATTACH METAL DECK AT 6" O.C. TYPICAL TO ANGLES AROUND PERIMETER OF ALL OPENINGS.

SECTIONS AND DETAILS

CITY OF JOHNSON CITY  
WATAUGA WATER TREATMENT PLANT  
1998 EXPANSION AND IMPROVEMENTS

DR.	CHK.	DATE	DESCRIPTION
CADD	ANW	11-20-98	ORIGINAL ISSUE
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RECORD DRAWING  
05/23/03

S16

FILE NO. 15784-20

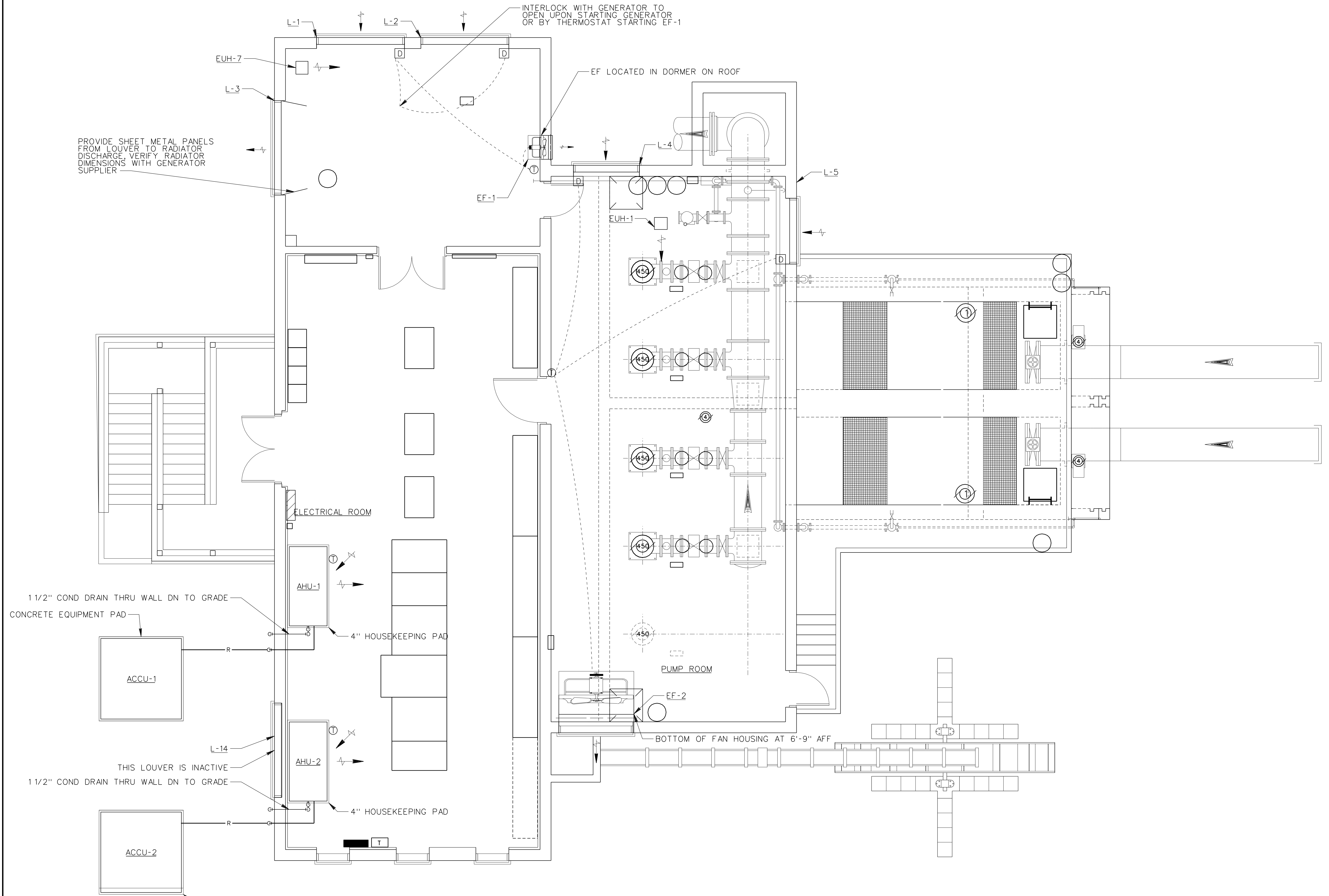
RAW WATER INTAKE - PLAN HVAC

CITY OF JOHNSON CITY  
 WATAUGA WATER TREATMENT PLANT  
 1998 EXPANSION AND IMPROVEMENTS

DR.	CHK.	DATE	DESCRIPTION
CADD	WJL	11-20-98	ORIGINAL ISSUE
RWB	DLH	05-23-03	RECORD DRAWINGS

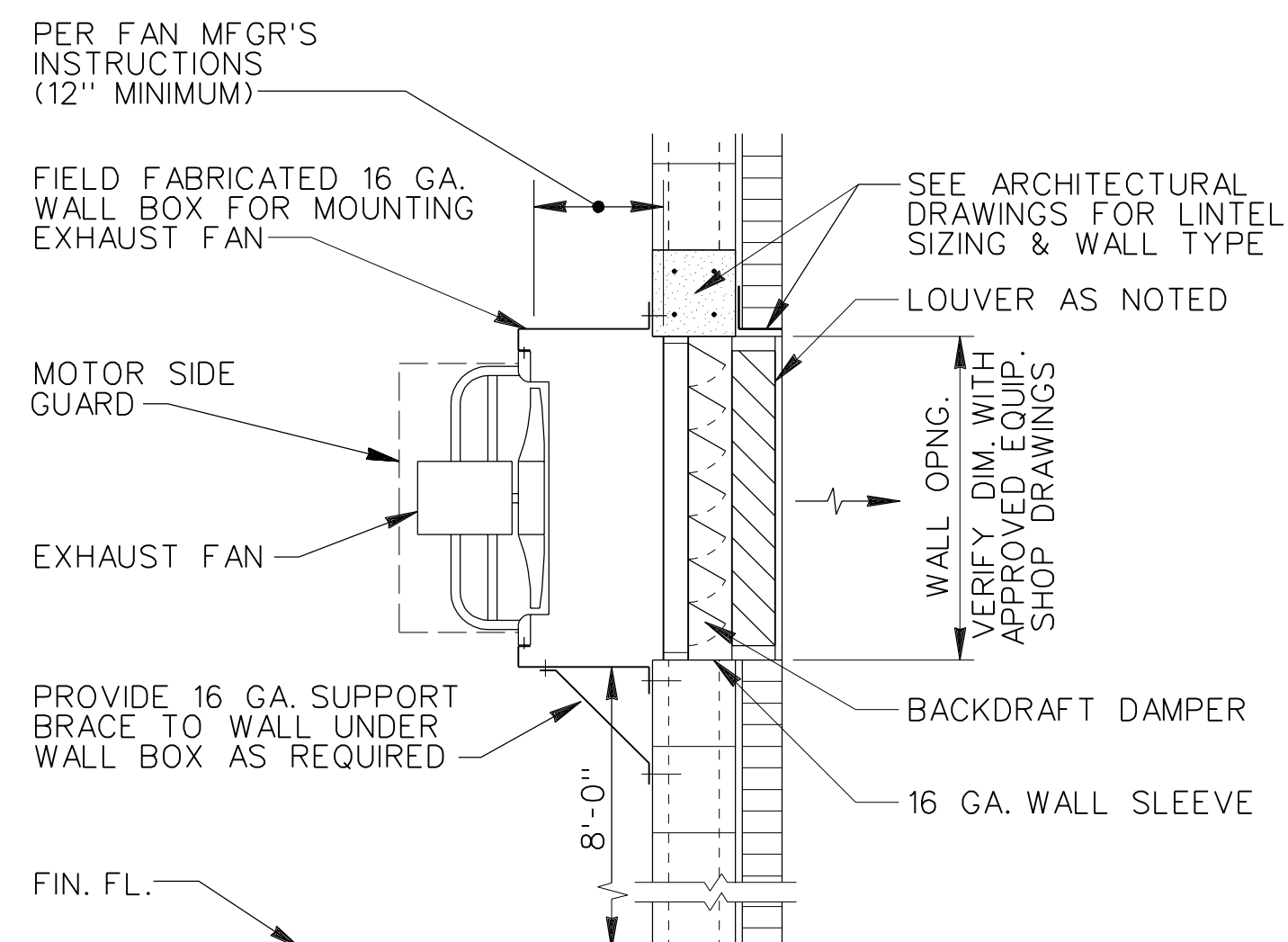
**H5**  
 FILE NO. 15784-20

RECORD DRAWING  
 05/23/03

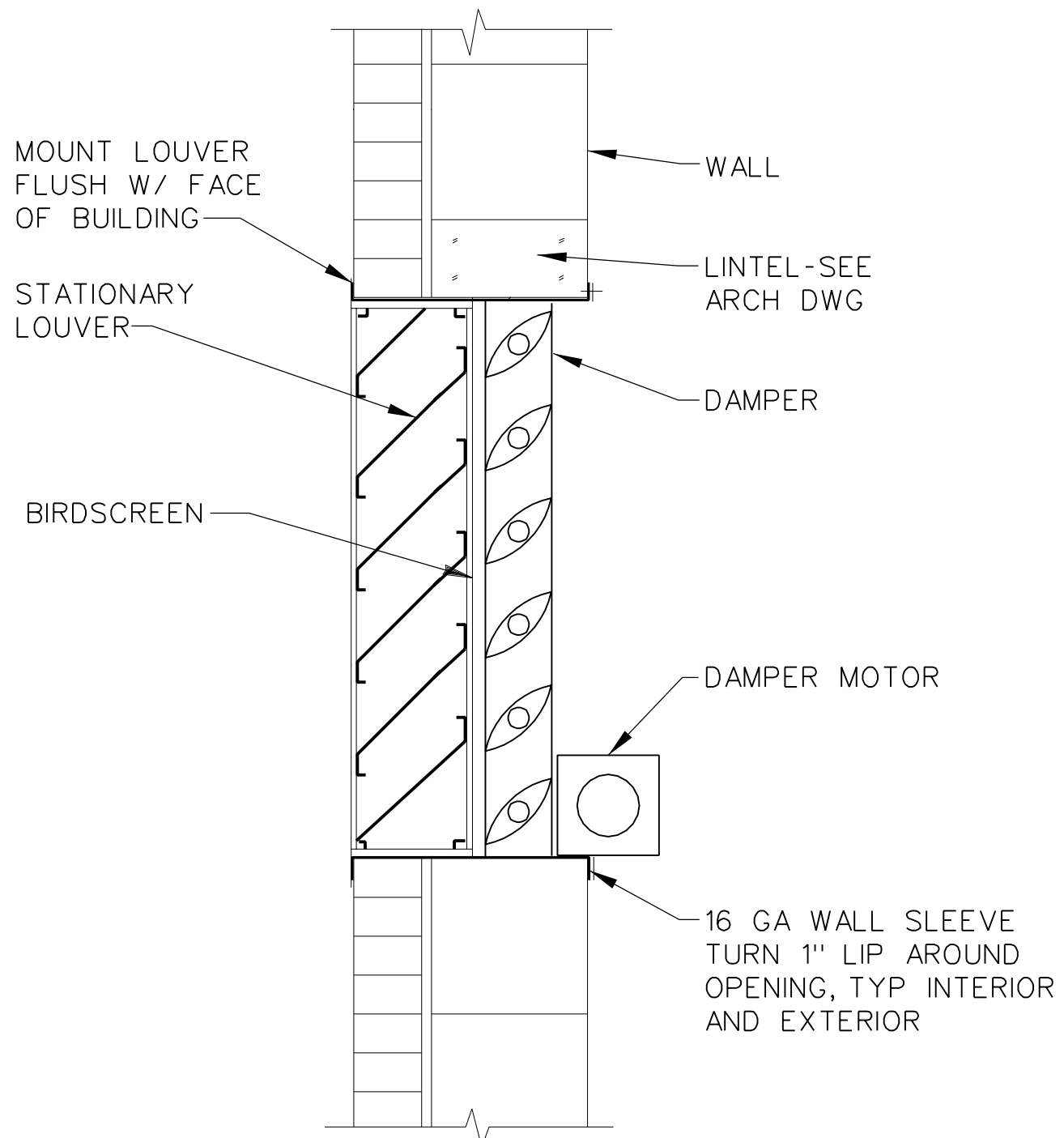


**RAW WATER INTAKE - PLAN HVAC**  
 SCALE 1/4" = 1'-0"  
 0 1' 2' 4' 6'

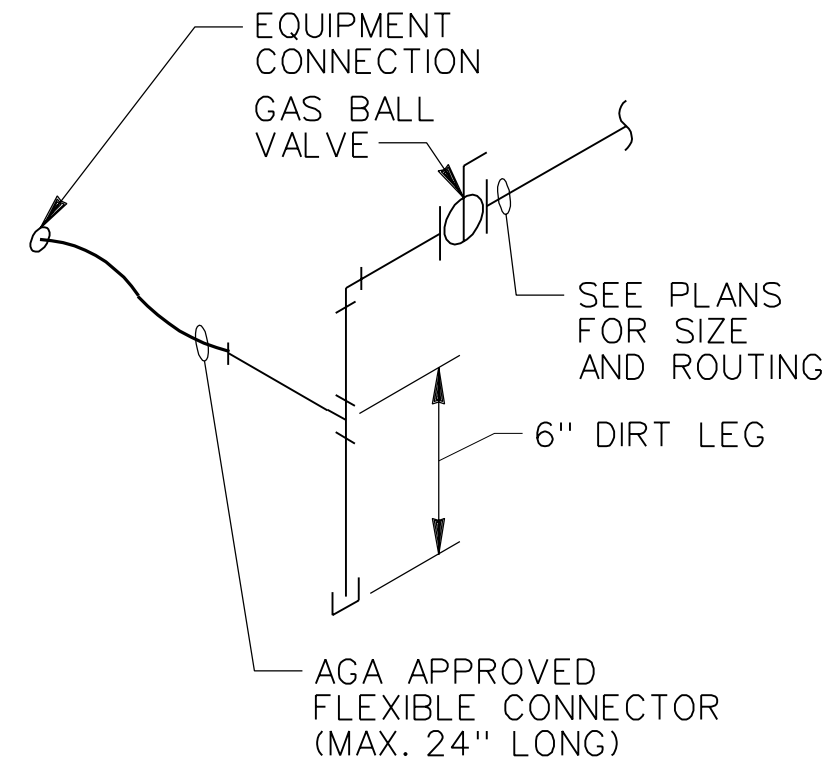




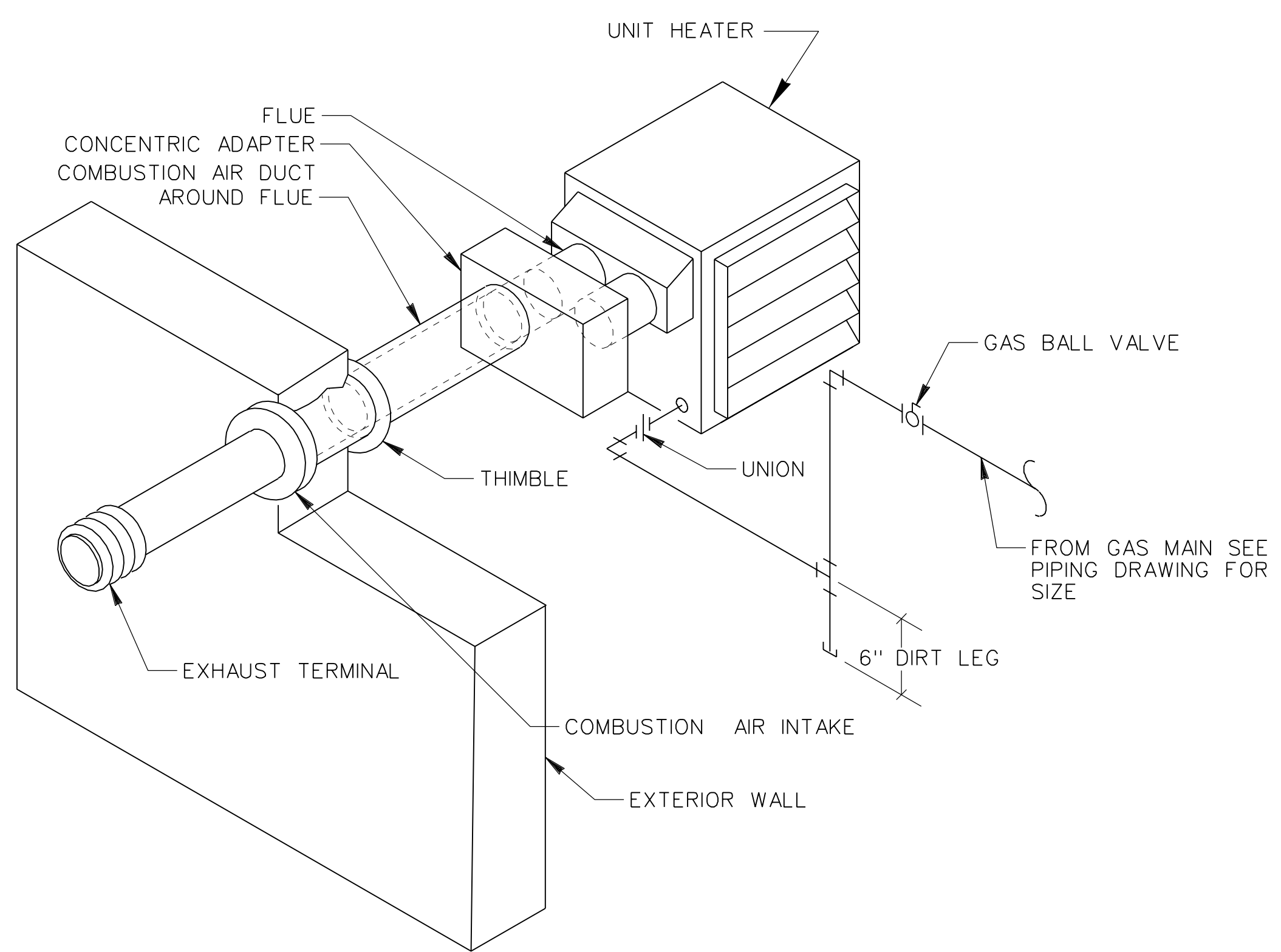
**TYP WALL EXHAUST FAN AT LOUVERED OPENING DETAIL**  
NTS



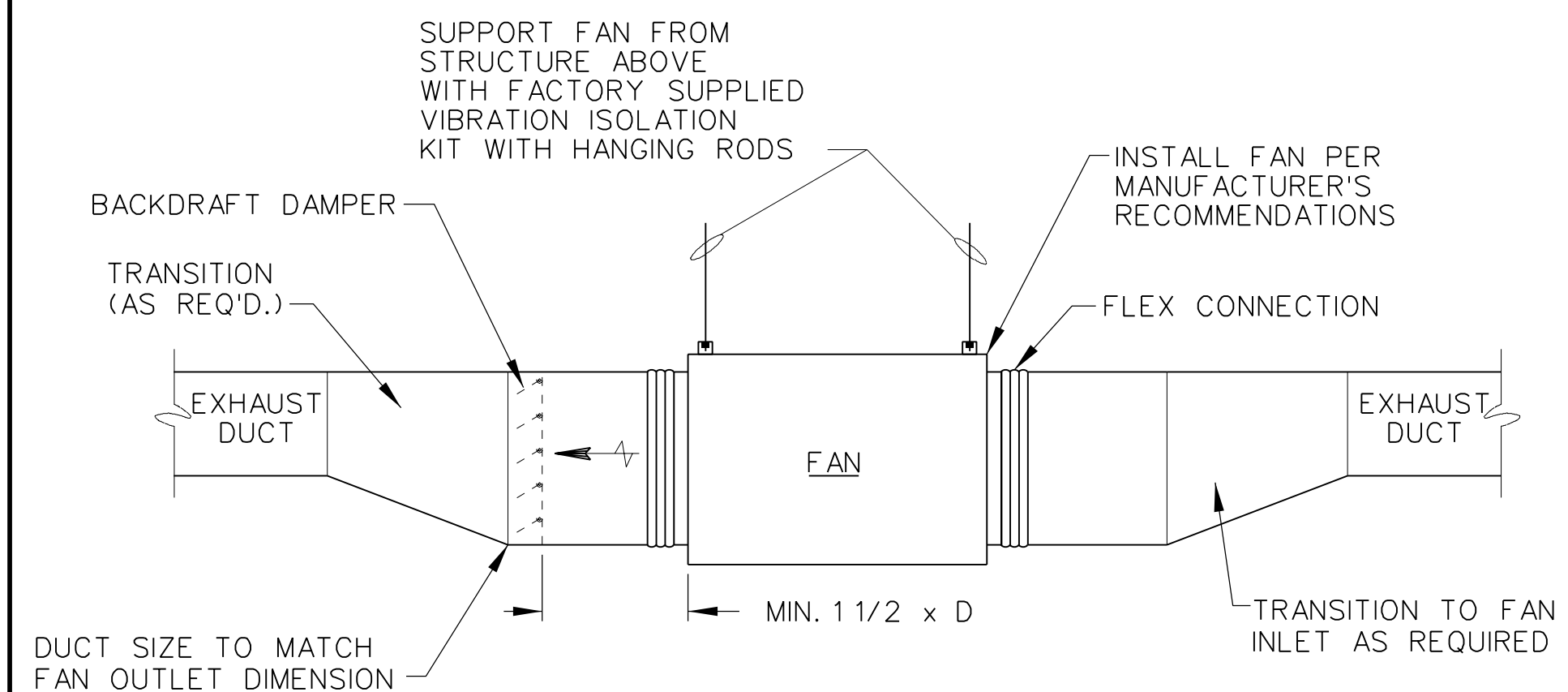
**TYPICAL LOUVER DETAIL**  
NTS



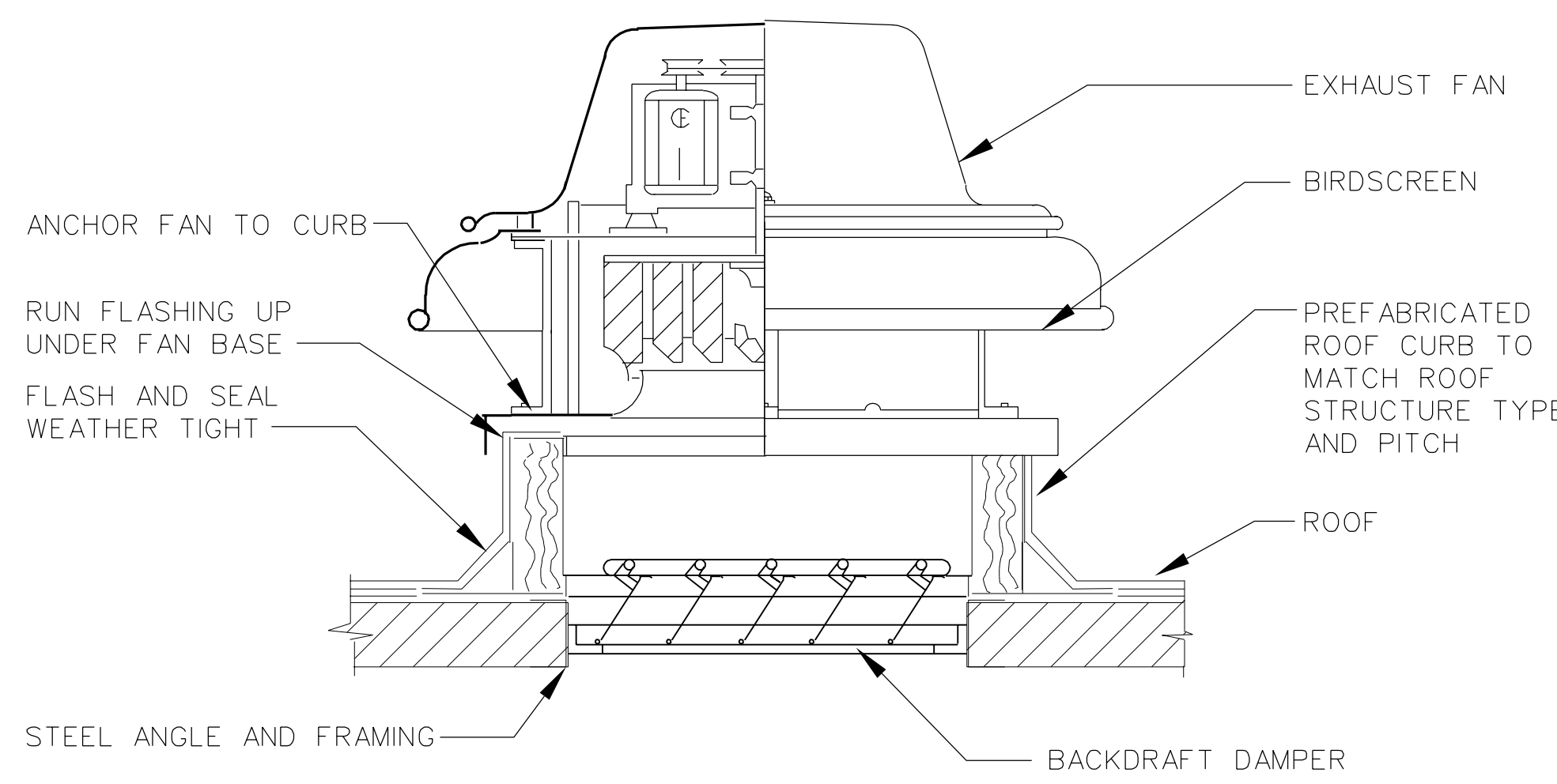
**TYPICAL GAS CONNECTION**  
NTS



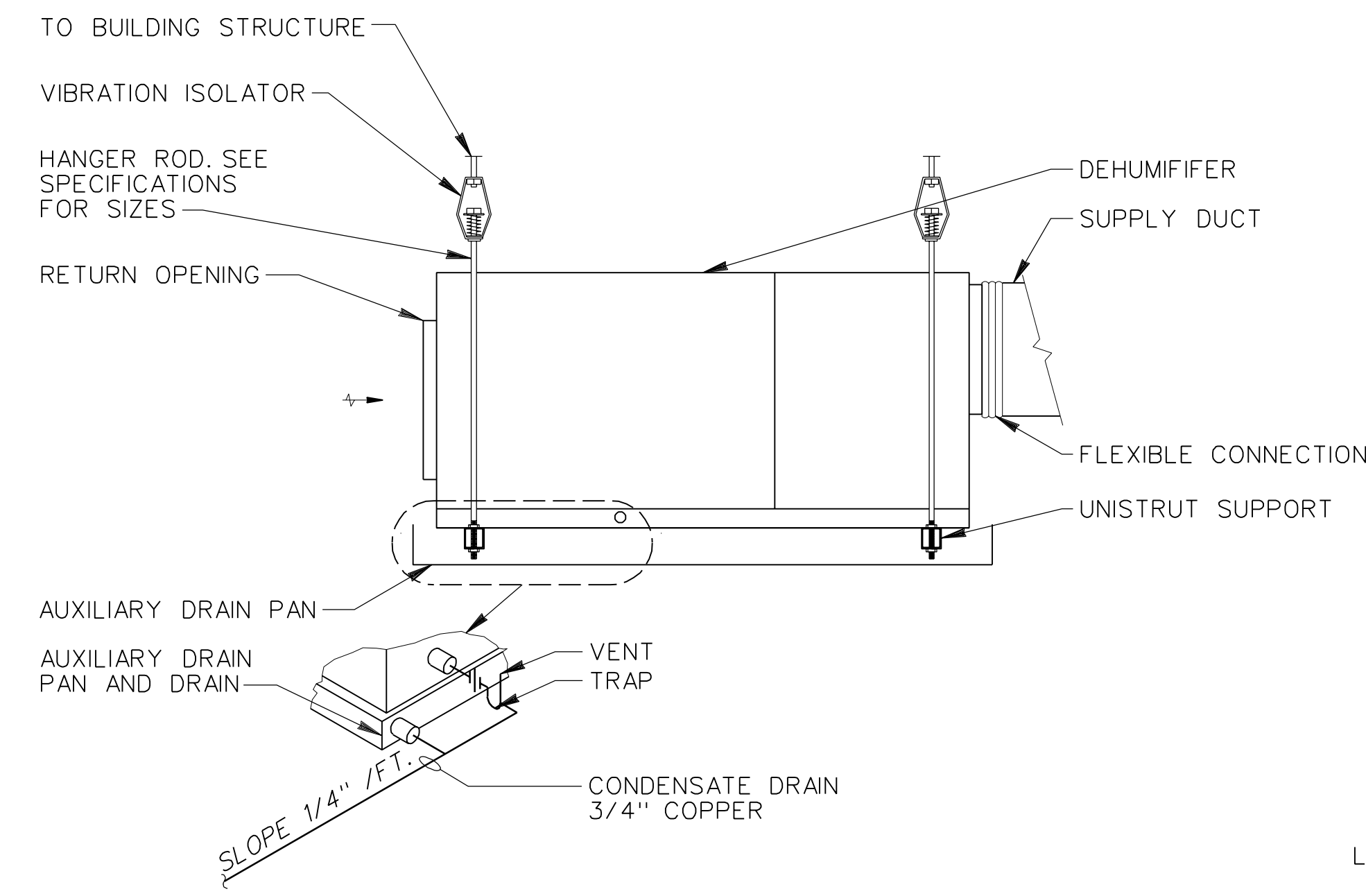
**SEPARATED COMBUSTION GAS UNIT HEATER DETAIL**  
NTS



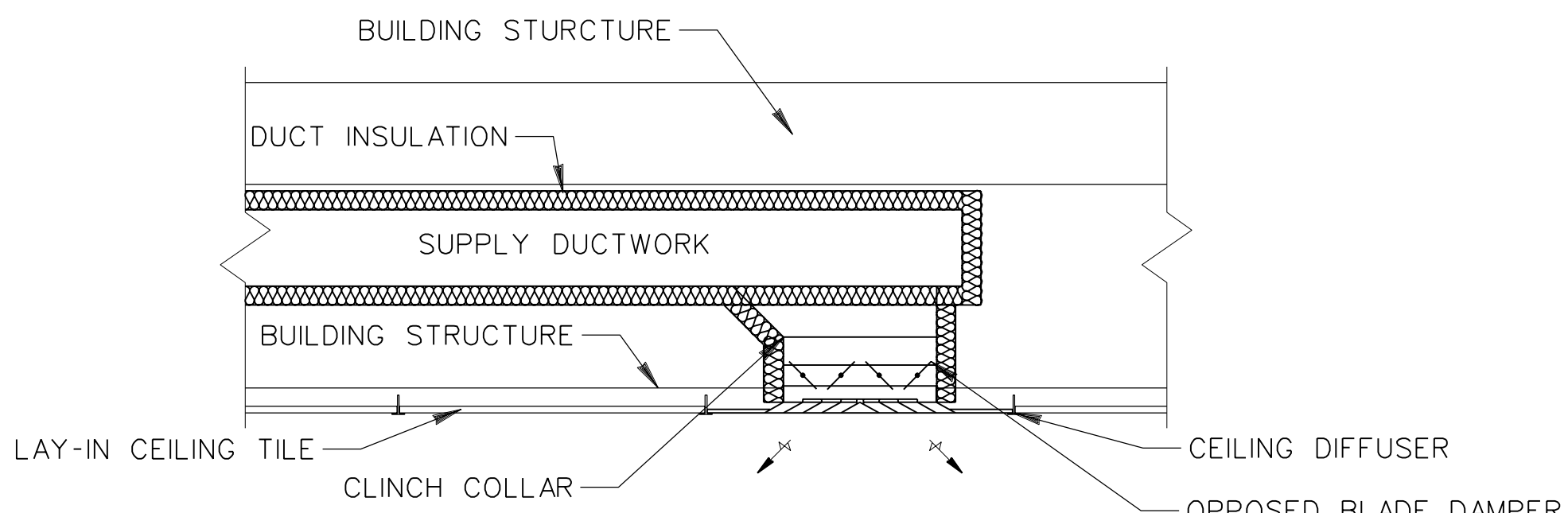
**TYPICAL IN-LINE FAN DETAIL**  
NTS



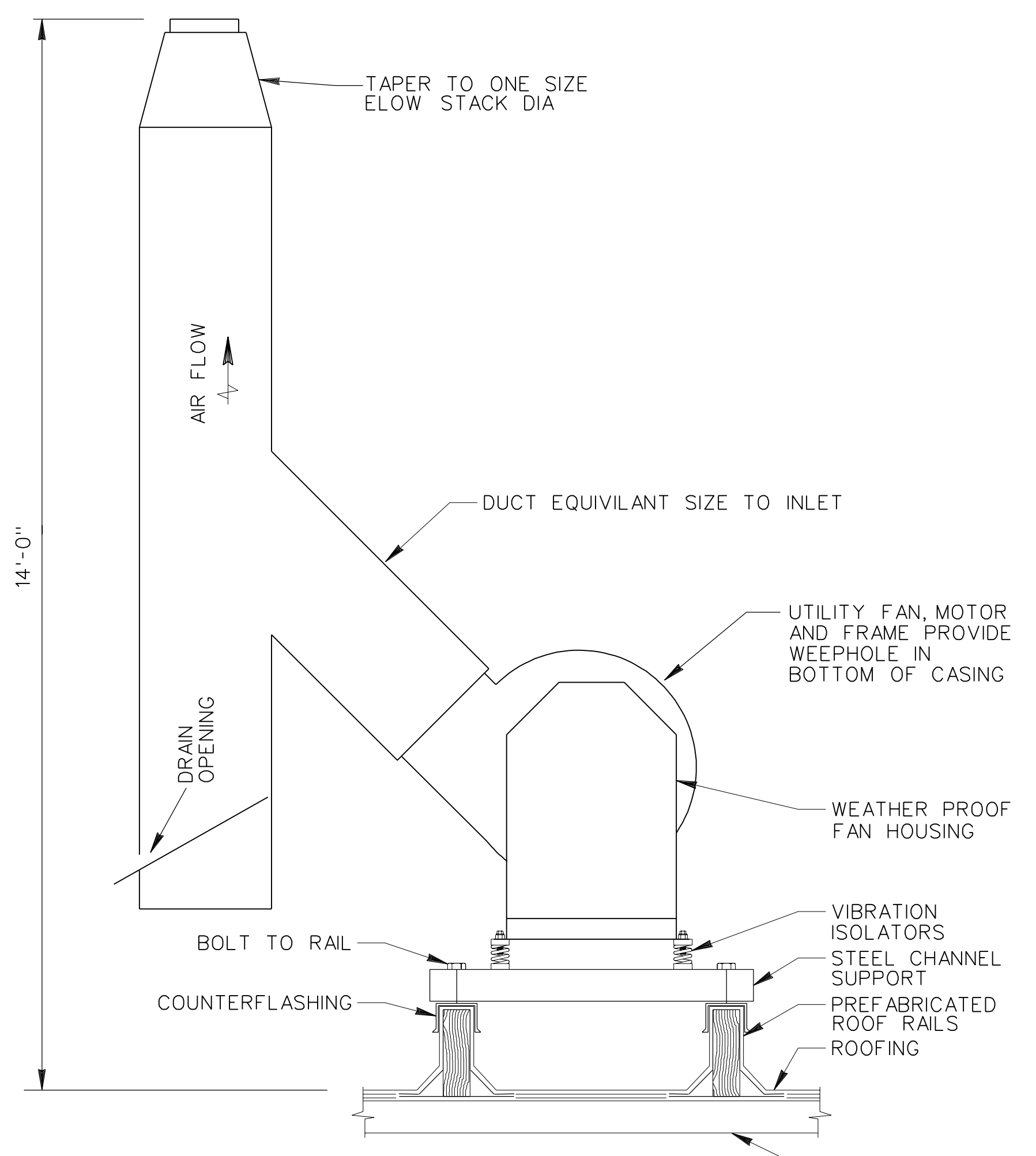
**ROOF MOUNTED EXHAUST FAN DETAIL**  
NTS



**SUSPENDED DEHUMIDIFIER UNIT DETAIL**  
N.T.S.



**TYPICAL CEILING DIFFUSER DETAIL**  
NTS



**ROOF MOUNTED UTILITY FAN DETAIL**  
NTS

**RECORD DRAWING**  
05/23/03

**Barge Waggoner and Cannon, Inc.**  
Engineers, Architects, Planners,  
Landscape Architects and Surveyors  
SUITE 2400 FIRST TENNESSEE PLAZA  
KNOXVILLE, TENNESSEE 37929  
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FAX: (423) 635-8554

**DETAILS HVAC**  
CITY OF JOHNSON CITY  
WATAUGA WATER TREATMENT PLANT  
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RWB	DLH	05-23-03	RECORD DRAWINGS

**H7**  
FILE NO. 15784-20

**ROOFTOP UNIT SCHEDULE**

IDENT.	DESIGN BASIS	CFM	SUPPLY FAN PRESSURE EXT. STATIC IN. W.G.	OUTSIDE AIR CFM	MAXIMUM SUPPLY FAN HP	GAS HEAT (MBH) INPUT	GAS HEAT (MBH) OUTPUT	EAT DB/WB	COOLING CAPACITY (MBH)			V/PH/HZ	REMARKS
									SENS.	TOTAL	TONS		
RTU-1	TRANE / YCD121B4	4000	0.30	0	3.0	122	81	80 / 67	92.4	126.0	10	460/3/60	1,2
RTU-2	TRANE / YCH103C4	3740	0.65	450	2.0	122	81	77 / 63	99.7	86.2	8.5	460/3/60	2,3

REMARKS: 1. PROVIDE 12" INSULATED ROOF CURB.  
2. PROVIDE ECONOMIZER WITH BAROMETRIC RELIEF THRU UNIT.  
3. PROVIDE EQUIPMENT CURB FOR UNIT. UNIT SHALL HAVE HORIZONTAL DISCHARGE AND INTAKE CONNECTIONS.

**LOUVER / DAMPER SCHEDULE**

IDENT.	MANUFACTURER/MODEL	MOUNTING HEIGHT A.F.F.	LOUVER				DAMPER						REMARKS
			W	H	FRAME TYPE	SCREEN TYPE	W	H	BLADES OB/PAR	FRAME TYPE	ACTUATOR TYPE		
L-1	RUSKIN / ELF6375D	0'-2"	96	120	STD	BIRD	96	120	PAR	STD	ELEC	1,3,4	
L-2	RUSKIN / ELF6375D	0'-2"	96	120	STD	BIRD	96	120	PAR	STD	ELEC	1,3,4	
L-3	RUSKIN / ELF6375D	0'-0"	103	133	STD	BIRD	---	---	---	---	---	1,3	
L-4	RUSKIN / ELF6375D	2'-0"	72	104	STD	BIRD	72	104	PAR	STD	ELEC	1,3,4	
L-5	RUSKIN / ELF6375D	2'-0"	72	104	STD	BIRD	72	104	PAR	STD	ELEC	1,3,4	
L-6	RUSKIN / ELF6375D	0'-2"	40	96	STD	BIRD	40	96	PAR	STD	ELEC	2,3,4	
L-7	RUSKIN / ELF6375D	0'-2"	40	96	STD	BIRD	40	96	PAR	STD	ELEC	2,3,4	
L-8	RUSKIN / ELF6375D	0'-2"	48	160	STD	BIRD	48	160	PAR	STD	ELEC	2,3,4	
L-9	RUSKIN / ELF6375D	0'-0"	36	72	STD	BIRD	36	60	PAR	STD	ELEC	2,3,4	
L-10	RUSKIN / ELF6375D	0'-0"	36	72	STD	BIRD	36	60	PAR	STD	ELEC	2,3,4	
L-11	RUSKIN / ELF6375D	0'-0"	36	72	STD	BIRD	36	60	PAR	STD	ELEC	2,3,4	
L-12	RUSKIN / ELF6375D	0'-0"	36	72	STD	BIRD	36	60	PAR	STD	ELEC	2,3,4	
L-13	RUSKIN / ELF6375D	0'-0"	36	72	STD	BIRD	36	60	PAR	STD	ELEC	2,3,4	
L-14	RUSKIN / ELF6375D	0'-0"	103	133	STD	BIRD	---	---	---	---	---	2,3	
L-15	RUSKIN / ELF6375D	0'-8"	58	48	STD	BIRD	58	48	PAR	STD	ELEC	2,3,4	
L-16	RUSKIN / ELF6375D	10'-10"	48	24	STD	BIRD	48	24	PAR	STD	ELEC	2,3,4	

REMARKS: 1. PROVIDE BLACK ANODIZED FINISH.  
2. PROVIDE DARK BRONZE ANODIZED FINISH.  
3. LOUVERS SHALL BE 6" DEEP, EXTRUDED ALUMINUM / DRAINABLE BLADES.  
4. MOTORIZED DAMPERS SHALL NOT BE INTEGRAL WITH LOUVERS.

**EXHAUST FAN SCHEDULE**

IDENT.	MANUFACTURER/MODEL NO.	AREA LOCATED	CFM	ESP IN W.G.	FAN TYPE	DRIVE TYPE	FAN RPM	MOTOR HP	V/PH/HZ	REMARKS
EF-1	GREENHECK / SBE1H204	RAW WATER INTAKE GENERATOR RM	1160	0.25	PROP	BELT	341	1/4	115/1/60	1,2
EF-2	GREENHECK / SBE3L7250	RAW WATER INTAKE PUMP RM	50000	0.25	PROP	BELT	339	5	460/3/60	1,2,5
EF-3	GREENHECK / SBE3L7275	HIGH SERVICE PUMP ROOM	56400	0.25	PROP	BELT	366	7 1/2	460/3/60	1,2,5
EF-4	GREENHECK / CSP152A	MAIN BLDG TOILETS	420	0.25	CENT	DIRECT	1075	FRAC	115/1/60	2,3,4
EF-5	GREENHECK / SBE3L3610	CHLORINE ROOM	10890	0.25	PROP	BELT	561	1	460/3/60	1,2
EF-6	GREENHECK / GB-330-7	CHEMICAL STORAGE	7400	0.25	CENT	BELT	369	3/4	460/3/60	2,6,7
EF-7	M.K. PLASTICS / DHK 1500	FLUORIDE STORAGE FEED ROOM	3000/1500	0.50	CENT	UTILITY	1703	1 1/4	460/3/60	8,9
EF-8	GREENHECK / GWB-18-3	SHOP AREA	2590	0.25	CENT	BELT	778	1/3	115/1/60	2

REMARKS: 1. PROVIDE WALL HOUSING.  
2. PROVIDE BACKDRAFT DAMPER.  
3. PROVIDE SOLID STATE SPEED CONTROLLER AT FAN.  
4. PROVIDE SUSPENSION VIBRATION ISOLATORS.  
5. PROVIDE BLACK FINISH ON BACKDRAFT DAMPER.  
6. PROVIDE ROOF CURB.  
7. PROVIDE BIRD SCREEN.  
8. PROVIDE 2-SPEED, 2 WINDING MOTOR WITH 1/2 SPEED REDUCTION (1800/900 RPM).  
9. PROVIDE EQUIPMENT CURB FOR FAN AND ROOF CURB FOR DUCT.

**UNIT HEATER SCHEDULE**

IDENT.	MANUFACTURER/MODEL	CFM	TYPE	HEATING CAP. INPUT/OUTPUT MBH	FUEL	FAN HP	MOUNT HEIGHT AFF	V/Ø/HZ	REMARKS
UH-1	REZNOR / SCA 100	1230	PROP	100 / 80	N.G.	1/30	8'-0"	115/1/60	1,2,3,4
UH-2	REZNOR / SCA 100	1230	PROP	100 / 80	N.G.	1/30	8'-0"	115/1/60	1,2,3,4
UH-3	REZNOR / SCA 100	1230	PROP	100 / 80	N.G.	1/30	10'-0"	115/1/60	1,2,3,4
UH-4	REZNOR / SCA 100	1230	PROP	100 / 80	N.G.	1/30	10'-0"	115/1/60	1,2,3,4
UH-5	REZNOR / SCA 100	1230	PROP	100 / 80	N.G.	1/30	10'-0"	115/1/60	1,2,3,4
UH-6	REZNOR / SCA 150	1960	PROP	150 / 125	N.G.	1/8	6'-6"	115/1/60	1,2,3,4
UH-7	REZNOR / SCA 150	1960	PROP	150 / 125	N.G.	1/8	6'-6"	115/1/60	1,2,3,4
UH-8	REZNOR / SCA 150	1960	PROP	150 / 125	N.G.	1/8	6'-6"	115/1/60	1,2,3,4
UH-9	REZNOR / SCA 150	1960	PROP	150 / 125	N.G.	1/8	6'-6"	115/1/60	1,2,3,4
UH-10	REZNOR / SCA 100	1230	PROP	100 / 80	N.G.	1/30	8'-0"	115/1/60	1,2,3,4
UH-11	REZNOR / SCA 125	1400	PROP	125 / 100	N.G.	1/20	8'-0"	115/1/60	1,2,3,4
UH-12	REZNOR / SCA 125	1400	PROP	125 / 100	N.G.	1/20	8'-0"	115/1/60	1,2,3,4
UH-13	REZNOR / MODEL F 25	380	PROP	25 / 20	N.G.	1/50	8'-0"	115/1/60	1,2,3,4

REMARKS: 1. PROVIDE SPARK IGNITED PILOT.  
2. PROVIDE FOUR POINT SUSPENSION KIT.  
3. PROVIDE FULL FAN SAFETY GUARD.  
4. PROVIDE UNIT MOUNTED THERMOSTAT.

**AIR HANDLING UNIT SCHEDULE**

IDENT.	MANUFACTURER/MODEL NO.	CFM	COOLING CAP. MBH SENSIBLE	COOLING CAP. MBH TOTAL	MAX ESP (IN.)	AUX. HEAT KW	O.A.	FAN HP	V/PH/HZ	REMARKS
AHU-1	TRANE / SCRC 20	8000	207	289	2.0	---	---	7.5	460/3/60	1,2,3
AHU-2	TRANE / SCRC 20	8000	207	289	2.0	---	---	7.5	460/3/60	1,2,3

REMARKS: 1. PROVIDE DISCHARGE PLENUM.  
2. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH.  
3. PROVIDE 2" THROWAWAY FIBERGLASS FILTERS.

**AIR-COOLED CONDENSER (SPLIT SYSTEM) SCHEDULE**

IDENT.	MANUFACTURER/MODEL NO.	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	O.A. TEMP. (°F)	ENT. EVAP DB TEMP. (°F)	ENT. EVAP WB TEMP. (°F)	REFRIG TYPE	V/PH/HZ	REMARKS
ACCU-1	TRANE / SCAC-20	289	207	95	80	67	R-22	460/3/60	1,2,3,4,5
ACCU-2	TRANE / SCAC-20	289	207	95	80	67	R-22	460/3/60	1,2,3,4,5

REMARKS: 1. PROVIDE SHORT CYCLE TIME DELAY.  
2. PROVIDE FAN TIME DELAY RELAY.  
3. PROVIDE CRANKCASE HEATER.  
4. PROVIDE LOW AMBIENT CONTROLLER (TO 0°F).  
5. PROVIDE TWO STAGE THERMOSTAT.

**MAKE-UP AIR SCHEDULE**

IDENT.	MANUFACTURER/MODEL	CFM	BLOWER HP	STATIC PRESS. "wg	HEATER TYPE	FUEL TYPE	HEATING CAP. MBH	ΔT	V/Ø/HZ	REMARKS
MAU-1	KING AIR SYSTEMS / MODEL 112A	3000/1500	2.0	0.25	DIRECT	NAT GAS	275	60	460/3/60	1,2,3,4,5

REMARKS: 1. PROVIDE ROOF CURB.  
2. PROVIDE HORIZONTAL DISCHARGE.  
3. PROVIDE 2 SPEED, 2 WINDING BLOWER MOTOR.  
4. PROVIDE 2 STAGE HEATER.  
5. PROVIDE 30 TO 1 TURN DOWN RATIO ON BURNER.

**ELECTRIC HEATER SCHEDULE**

IDENT.	MANUFACTURER / MODEL NO.	TYPE	MOUNTING HEIGHT	KW	FAN HP	V/Ph/Hz	REMARKS
EUH-1	REZNOR / AEUH 12-3-48	UNIT	8'-0"	12	1/20	480/3/60	1,2,4
EUH-2	REZNOR / AEUH 3-3-48	UNIT	8'-0"	3	1/20	480/3/60	1,2,3
EUH-3	REZNOR / AEUH 3-3-48	UNIT	8'-0"	3	1/20	480/3/60	1,2,3
EUH-4	REZNOR AEUH 10-3-48	UNIT	8'-0"	10	1/20	480/3/60	1,2,4
EUH-5	REZNOR / AEUH 3-3-48	UNIT	8'-0"	3	1/20	480/3/60	1,2,4
EUH-6	REZNOR / AEUH 5-3-48	UNIT	8'-0"	5	1/20	480/3/60	1,2,4
EUH-7	REZNOR / AEUH 5-3-48	UNIT	8'-0"	5	1/20	480/3/60	1,2,4

REMARKS: 1. PROVIDE MOUNTING HARDWARE.  
2. PROVIDE FULL FAN SAFETY GUARD.  
3. PROVIDE THERMOSTAT AND RELAY KITS.  
4. PROVIDE UNIT MOUNTED THERMOSTAT.

**DIFFUSER / GRILLE SCHEDULE**

IDENT.	MANUFACTURER/MODEL NO.	USE	NC	REMARKS
A	TITUS / TDCA-AA	CD	<30	1,2,3,4,6,7
B	TITUS / 50F	RA	<30	1,3,5,6,7
C	TITUS / 300FS	HSW	<30	1,7
D	TITUS / 50F	EG	<30	1,2,3,5,6,7
E	TITUS / CT-700	DG	<30	1,7,8

REMARKS: 1. STANDARD WHITE FINISH.  
2. 24x24 FACE.  
3. T-BAR LAY IN.  
4. FOUR WAY THROW.  
5. 1/2"x 1/2"x 1" GRID.  
6. OPPOSED BLADE DAMPER.  
7. ALUMINUM CONSTRUCTION.  
8. PROVIDE AUXILLARY TRIM FRAME.

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HVAC SCHEDULES

CITY OF JOHNSON CITY  
WATAUGA WATER TREATMENT PLANT  
1998 EXPANSION AND IMPROVEMENTS

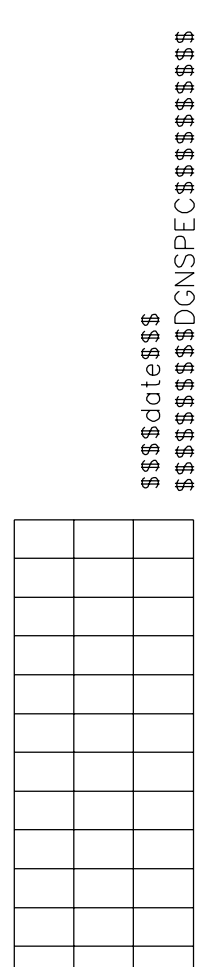
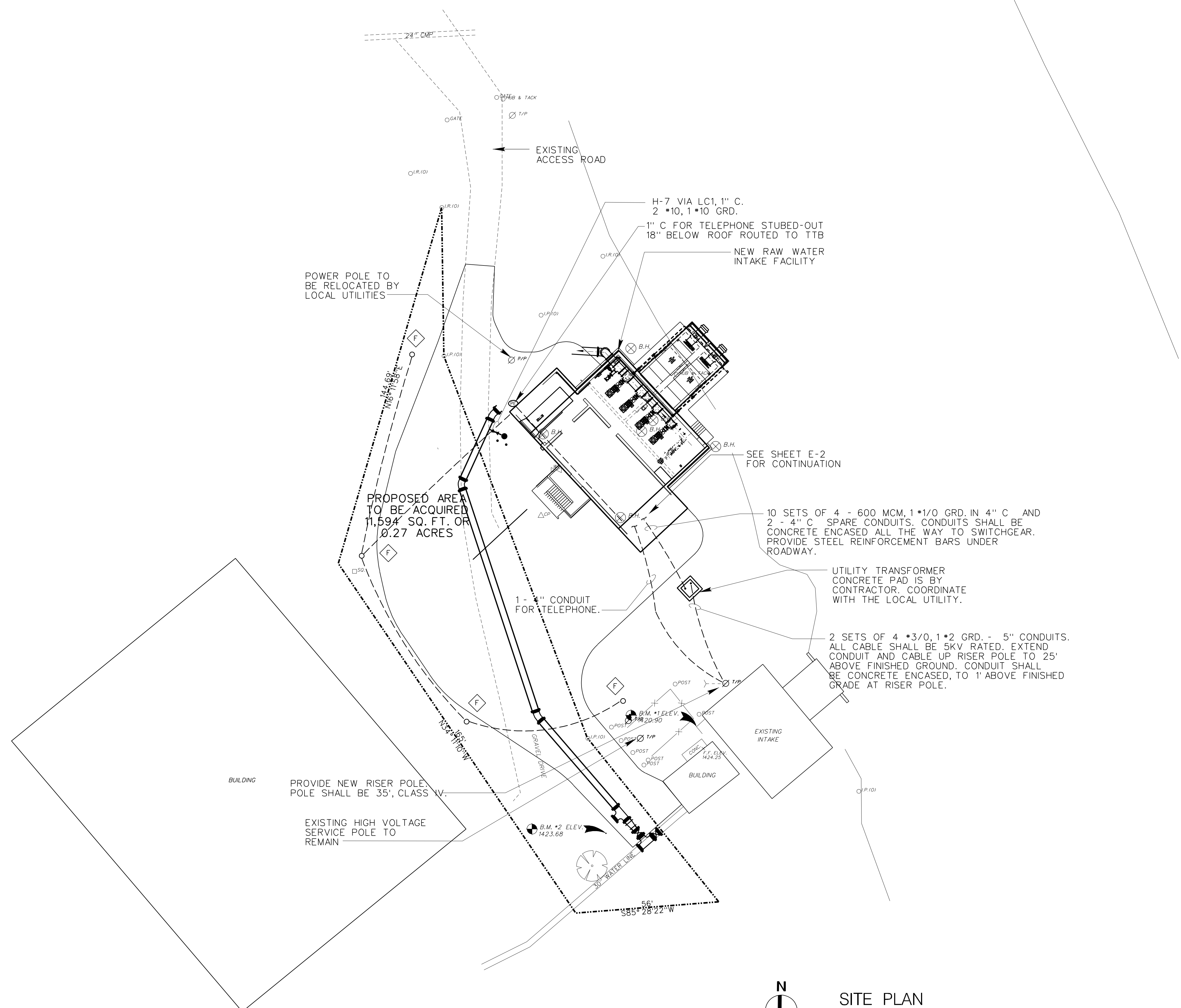
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CADD	WVL	11-20-98	ORIGINAL ISSUE
RWB	DLH	05-23-03	RECORD DRAWINGS

**RECORD DRAWING**  
05/23/03

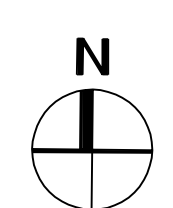
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FILE NO. 15784-20

GENERAL ELECTRICAL NOTES:

- COORDINATE WITH ALL LOCAL UTILITIES AND AUTHORITIES FOR RELOCATION OF EXISTING POWER/TELEPHONE POLES.

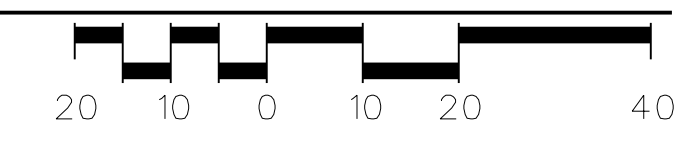


B.O.



SITE PLAN

SCALE: 1" = 20'



RECORD DRAWING  
05/23/03

RAW WATER INTAKE - ELECTRICAL SITE PLAN

CITY OF JOHNSON CITY  
WATAUGA WATER TREATMENT PLANT  
1998 EXPANSION AND IMPROVEMENTS

DR.	CHK.	DATE	DESCRIPTION
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DR.	CHK.	DATE	DESCRIPTION
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RWB	DLH	05-23-03	RECORD DRAWINGS

**GENERAL ELECTRICAL NOTES:**

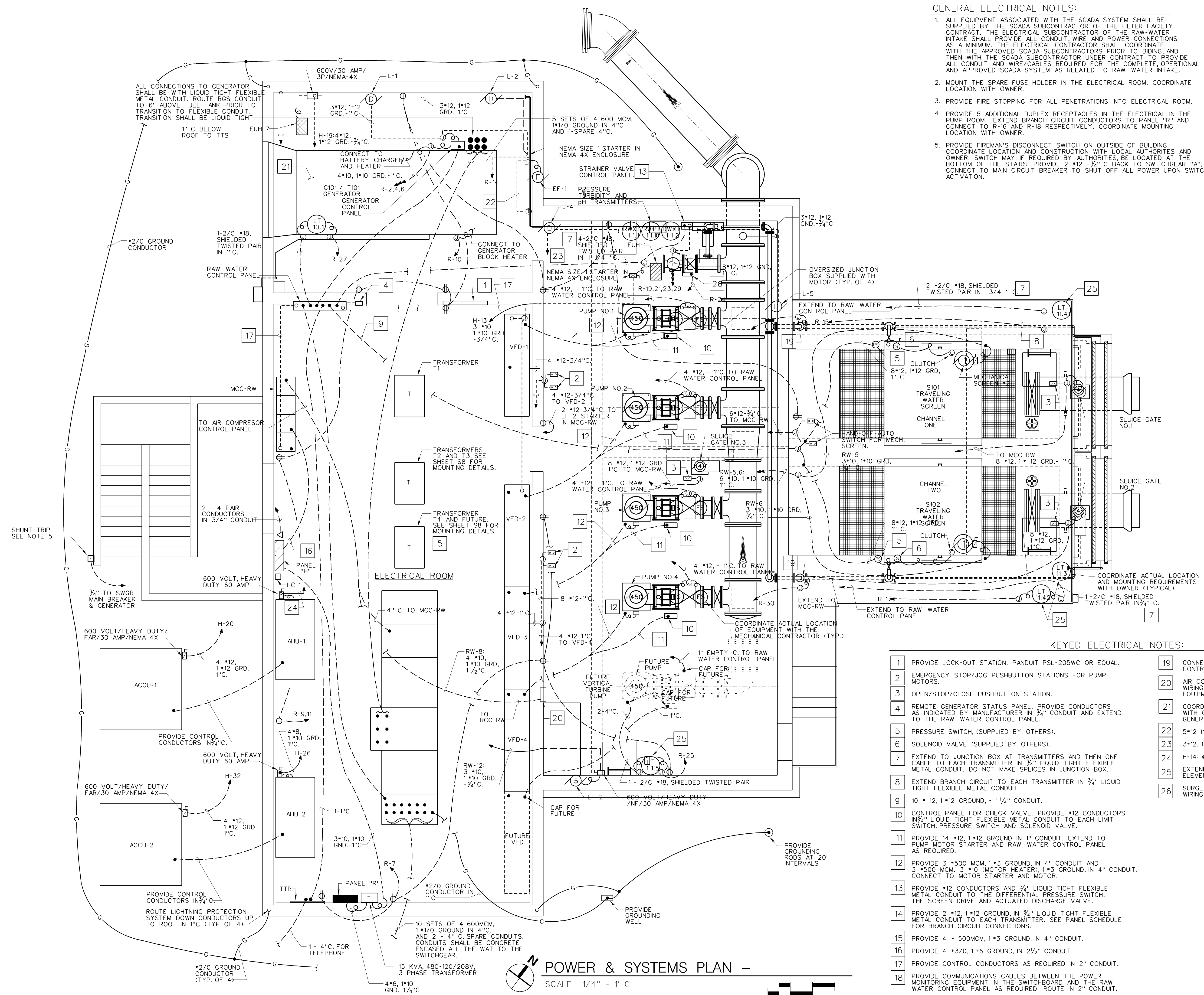
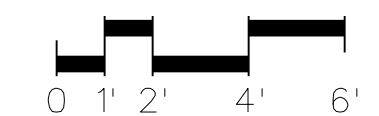
1. ALL EQUIPMENT ASSOCIATED WITH THE SCADA SYSTEM SHALL BE SUPPLIED BY THE SCADA SUBCONTRACTOR OF THE FILTER FACILITY CONTRACT. THE ELECTRICAL SUBCONTRACTOR OF THE RAW-WATER INTAKE SHALL PROVIDE ALL CONDUIT, WIRE AND POWER CONNECTIONS AS A MINIMUM. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE APPROVED SCADA SUBCONTRACTORS PRIOR TO BIDDING, AND THEN WITH THE SCADA SUBCONTRACTOR UNDER CONTRACT TO PROVIDE ALL CONDUIT AND WIRE/CABLES REQUIRED FOR THE COMPLETE OPERATIONAL AND APPROVED SCADA SYSTEM AS RELATED TO RAW WATER INTAKE.
2. MOUNT THE SPARE FUSE HOLDER IN THE ELECTRICAL ROOM. COORDINATE LOCATION WITH OWNER.
3. PROVIDE FIRE STOPPING FOR ALL PENETRATIONS INTO ELECTRICAL ROOM.
4. PROVIDE 5 ADDITIONAL DUPLEX RECEPTACLES IN THE ELECTRICAL IN THE PUMP ROOM. EXTEND BRANCH CIRCUIT CONDUCTORS TO PANEL "R" AND CONNECT TO R-16 AND R-18 RESPECTIVELY. COORDINATE MOUNTING LOCATION WITH OWNER.
5. PROVIDE FIREMAN'S DISCONNECT SWITCH ON OUTSIDE OF BUILDING. COORDINATE LOCATION AND CONSTRUCTION WITH LOCAL AUTHORITIES AND OWNER. SWITCH MAY IF REQUIRED BY AUTHORITIES, BE LOCATED AT THE BOTTOM OF THE STAIRS. PROVIDE 2 \*12 3/4" C. BACK TO SWITCHGEAR "A". CONNECT TO MAIN CIRCUIT BREAKER TO SHUT OFF ALL POWER UPON SWITCH ACTIVATION.

**KEYED ELECTRICAL NOTES:**

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1 PROVIDE LOCK-OUT STATION, PANDUIT PSL-205WC OR EQUAL.</li> <li>2 EMERGENCY STOP/JOG PUSHBUTTON STATIONS FOR PUMP MOTORS.</li> <li>3 OPEN/STOP/CLOSE PUSHBUTTON STATION.</li> <li>4 REMOTE GENERATOR STATUS PANEL. PROVIDE CONDUCTORS AS INDICATED BY MANUFACTURER IN 3/4" CONDUIT AND EXTEND TO THE RAW WATER CONTROL PANEL.</li> <li>5 PRESSURE SWITCH, (SUPPLIED BY OTHERS).</li> <li>6 SOLENOID VALVE (SUPPLIED BY OTHERS).</li> <li>7 EXTEND TO JUNCTION BOX AT TRANSMITTERS AND THEN ONE CABLE TO EACH TRANSMITTER IN 3/4" LIQUID TIGHT FLEXIBLE METAL CONDUIT. DO NOT MAKE SPLICES IN JUNCTION BOX.</li> <li>8 EXTEND BRANCH CIRCUIT TO EACH TRANSMITTER IN 3/4" LIQUID TIGHT FLEXIBLE METAL CONDUIT.</li> <li>9 10 * 12, 1 * 12 GROUND, - 1/4" CONDUIT.</li> <li>10 CONTROL PANEL FOR CHECK VALVE. PROVIDE *12 CONDUCTORS IN 3/4" LIQUID TIGHT FLEXIBLE METAL CONDUIT TO EACH LIMIT SWITCH, PRESSURE SWITCH AND SOLENOID VALVE.</li> <li>11 PROVIDE 14 * 12, 1 * 12 GROUND IN 1" CONDUIT. EXTEND TO PUMP MOTOR STARTER AND RAW WATER CONTROL PANEL AS REQUIRED.</li> <li>12 PROVIDE 3 * 500 MCM, 1 * 3 GROUND, IN 4" CONDUIT AND 3 * 500 MCM, 3 * 10 (MOTOR HEATER), 1 * 3 GROUND, IN 4" CONDUIT. CONNECT TO MOTOR STARTER AND MOTOR.</li> <li>13 PROVIDE *12 CONDUCTORS AND 3/4" LIQUID TIGHT FLEXIBLE METAL CONDUIT TO THE DIFFERENTIAL PRESSURE SWITCH, THE SCREEN DRIVE AND ACTUATED DISCHARGE VALVE.</li> <li>14 PROVIDE 2 * 12, 1 * 12 GROUND, IN 3/4" LIQUID TIGHT FLEXIBLE METAL CONDUIT TO EACH TRANSMITTER. SEE PANEL SCHEDULE FOR BRANCH CIRCUIT CONNECTIONS.</li> <li>15 PROVIDE 4 - 500MCM, 1 * 3 GROUND, IN 4" CONDUIT.</li> <li>16 PROVIDE 4 * 3/0, 1 * 6 GROUND, IN 2 1/2" CONDUIT.</li> <li>17 PROVIDE CONTROL CONDUCTORS AS REQUIRED IN 2" CONDUIT.</li> <li>18 PROVIDE COMMUNICATIONS CABLES BETWEEN THE POWER MONITORING EQUIPMENT IN THE SWITCHBOARD AND THE RAW WATER CONTROL PANEL AS REQUIRED. ROUTE IN 2" CONDUIT.</li> </ol> | <ol style="list-style-type: none"> <li>19 CONNECT TO HEAT TRACING PROVIDED BY MECHANICAL CONTRACTOR.</li> <li>20 AIR COMPRESSOR CONTROL PANEL. ALL CONDUIT AND WIRING BETWEEN THE CONTROL PANEL AND COMPRESSOR EQUIPMENT SHALL BE BY COMPRESSOR CONTRACTOR.</li> <li>21 COORDINATE LOCATION OF CONDUITS AND JUNCTION BOXES WITH GENERATOR. COORDINATE DEVICE PROVISIONS WITH GENERATOR VENDOR.</li> <li>22 5 * 12 IN 3/4" CONDUIT.</li> <li>23 3 * 12, 1 * 12 GND - 3/4" C TO EF-2 MOTOR STARTER IN MCC-RW.</li> <li>24 H-14: 4 * 8, 1 * 10 GROUND IN 1" CONDUIT.</li> <li>25 EXTEND MANUFACTURER'S CABLE/S IN 1" CONDUIT TO SENSING ELEMENT IS REQUIRED.</li> <li>26 SURGE ANTICIPATOR VALVE CONTROL PANEL. PROVIDE ALL WIRING AND CONDUIT REQUIRED BY ASSOCIATED COMPONENTS.</li> </ol> |
|--|---|

**POWER & SYSTEMS PLAN**

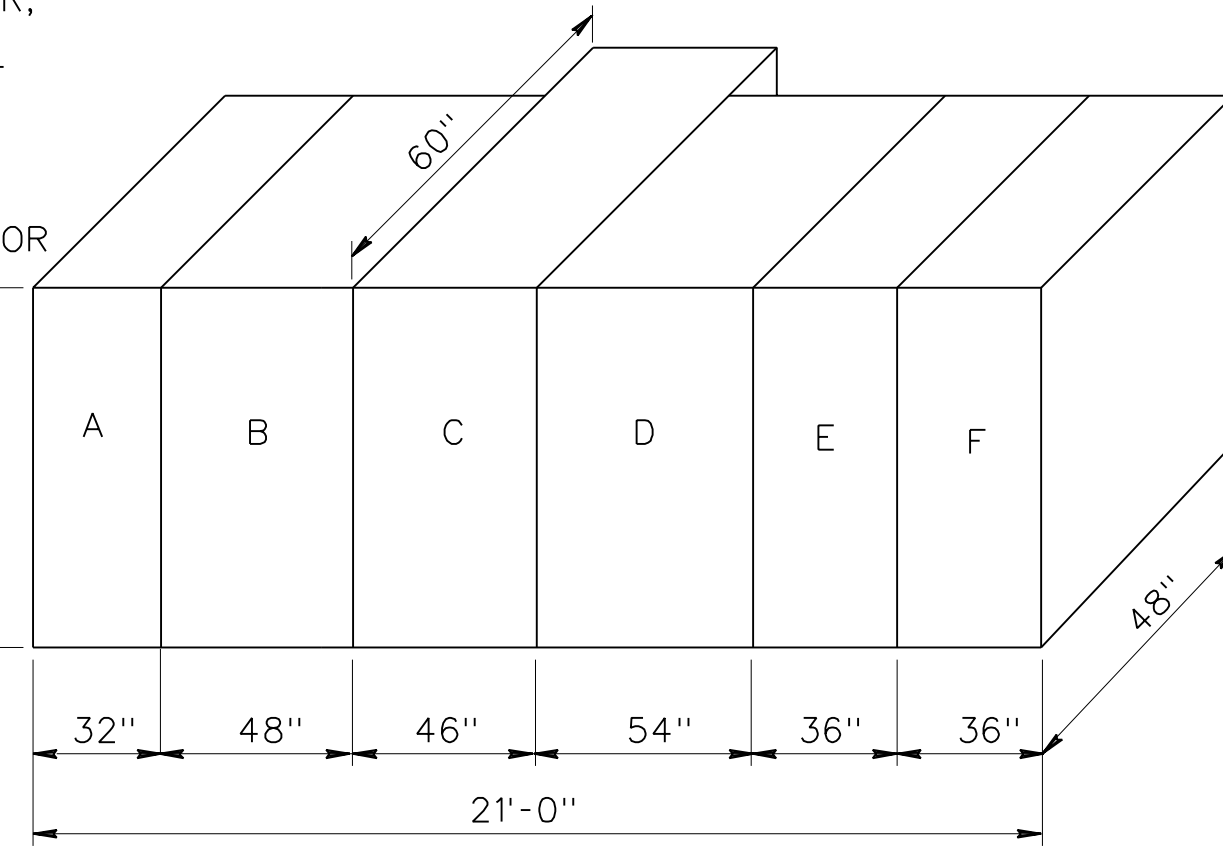
SCALE 1/4" = 1'-0"





**GENERAL NOTES:**

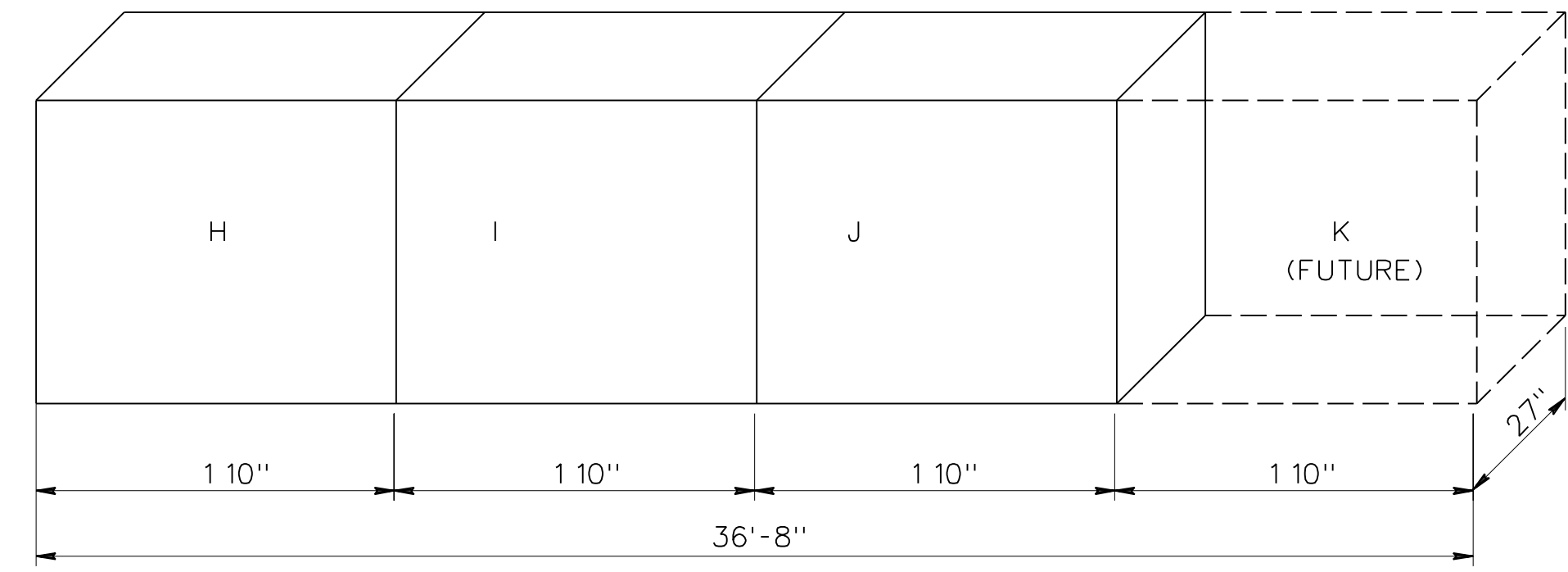
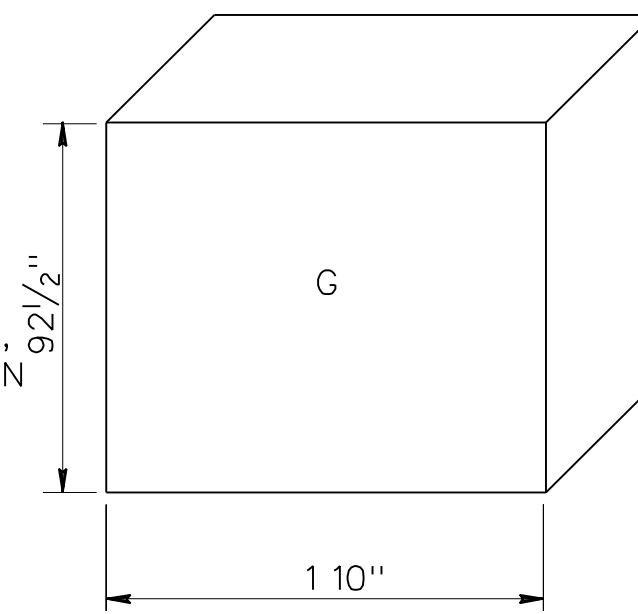
1. INSTALLATION OF ELECTRICAL EQUIPMENT SHALL MEET THE RECOMMENDATIONS STIPULATED BY IEEE 519 - 1992. CONTRACTOR SHALL MEASURE AND SUBMIT TO THE ENGINEER, HARMONIC VALUES AT THE INCOMING FEEDER OF EACH VARIABLE FREQUENCY DRIVE, AND AT THE MAIN CIRCUIT BREAKER OF THE FACILITY. MEASUREMENTS SHALL BE MADE WITH THREE MOTORS RUNNING AT 25% SPEED INCREMENTS. USING THE MEASURED VALUES, THE CONTRACTOR SHALL COORDINATE WITH THE LOCAL UTILITY TO OBTAIN THEIR SYSTEM PARAMETERS, CALCULATE THE IMPACT ON THE ELECTRICAL SYSTEM, AND SUBMIT CALCULATIONS AND MEASUREMENTS TO ENGINEER AND LOCAL UTILITY.
2. PROVIDE FOR TRIPPING OF THE MAIN CIRCUIT BREAKER UPON ACTIVATION OF FIREMAN'S DISCONNECT SWITCH.



**SWITCHGEAR "A" ELEVATION**

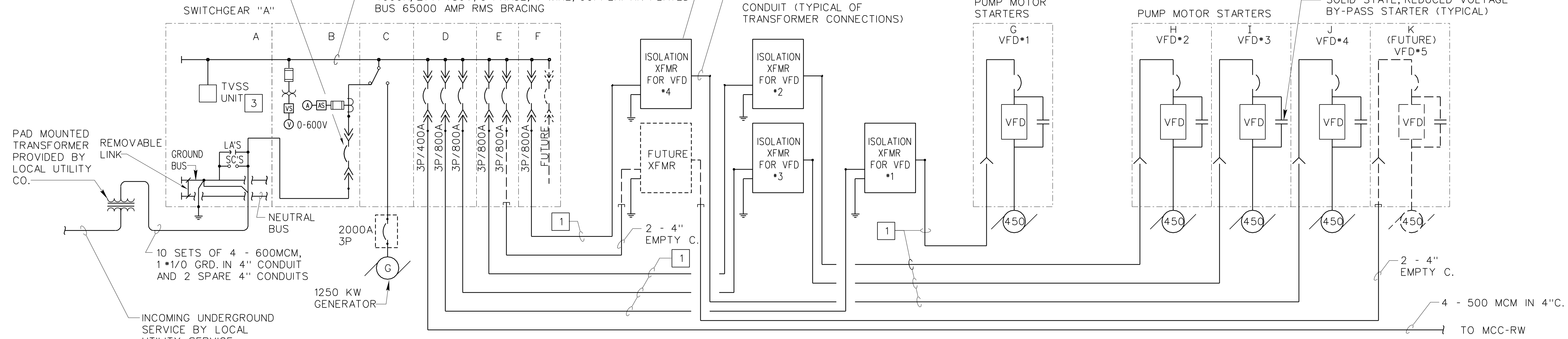
**KEYED NOTES:**

- 1 TWO SETS OF 3 - 500 MCM, 1\*3 GROUND IN 4" C.
- 2 PROVIDE A HAND-OFF-AUTO, AND UP-DOWN SELECTION, SWITCH, START/STOP PUSH-BUTTON SWITCHES AND RUN LIGHTS FOR EACH DIRECTION.
- 3 TVSS STATUS INDICATOR SHALL BE ON FRONT COVER.
- 4 ISOLATION TRANSFORMERS SHALL BE BY THE SAME MANUFACTURER AND HAVE THE SAME GENERAL REQUIREMENTS AS THE TWO-WINDING, DRY TYPE TRANSFORMERS. ISOLATION TRANSFORMERS SHALL BE LISTED FOR THAT PURPOSE, AND SHIELDED. SECONDARY WINDINGS SHALL BE AS REQUIRED BY DRIVE (INCLUDING NUMBER OF WINDINGS).

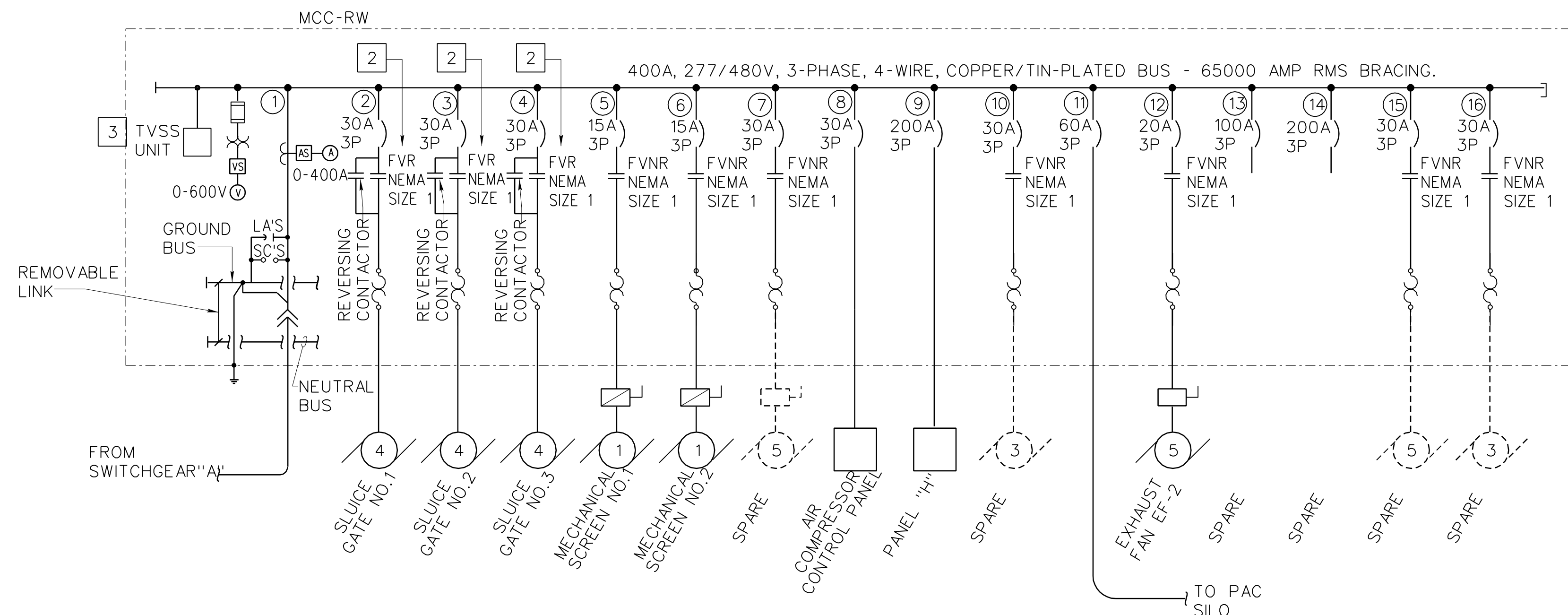


**PUMP MOTOR STARTERS ELEVATION**

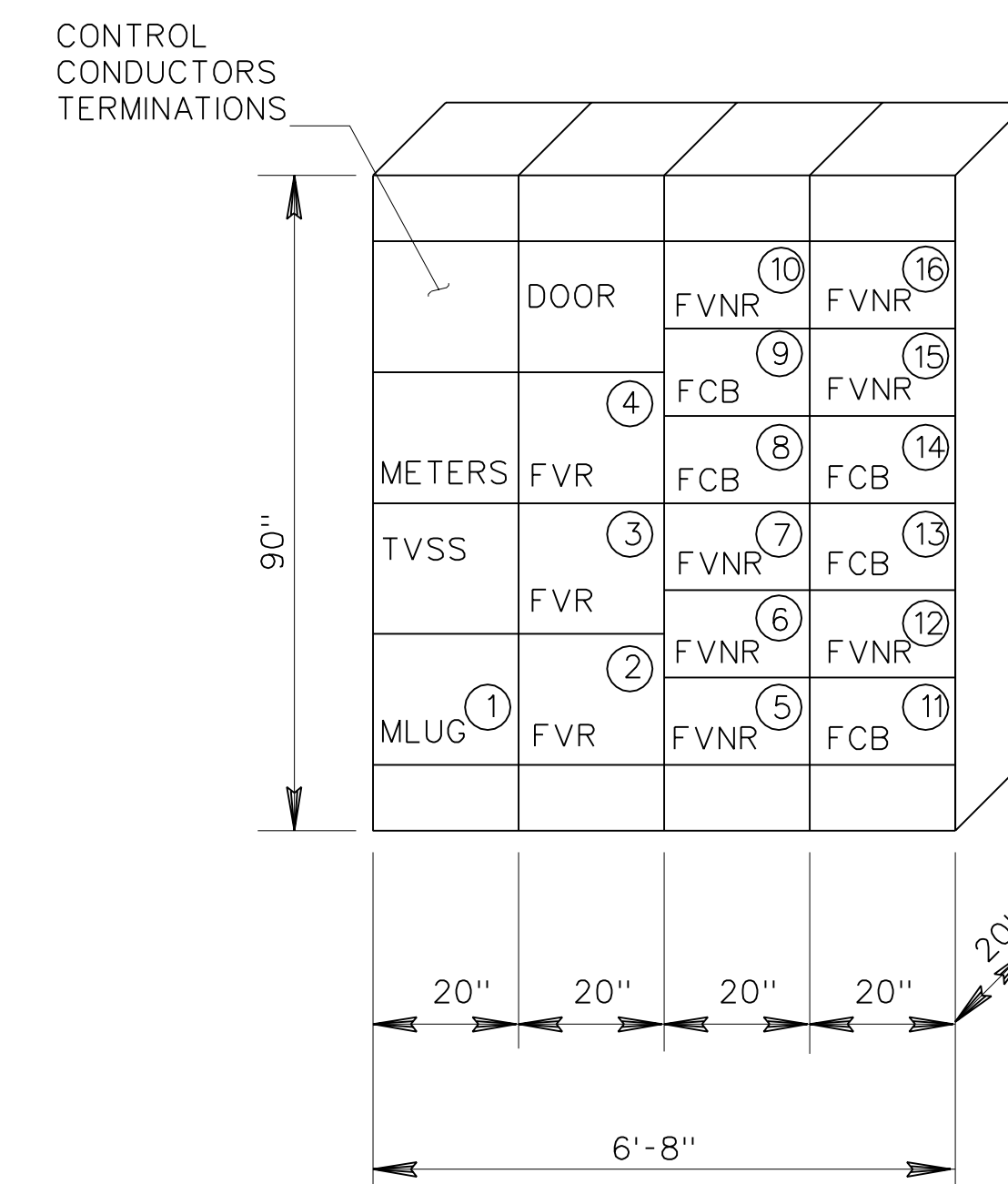
4000A/3-POLE, WITH GROUND FAULT INTERRUPTION, PHASE FAILURE, AND PHASE REVERSAL (WITH TIME DELAY) SET TRIP AT 3700 AMPS.



**ONE-LINE DIAGRAM OF SWITCHGEAR "A"**



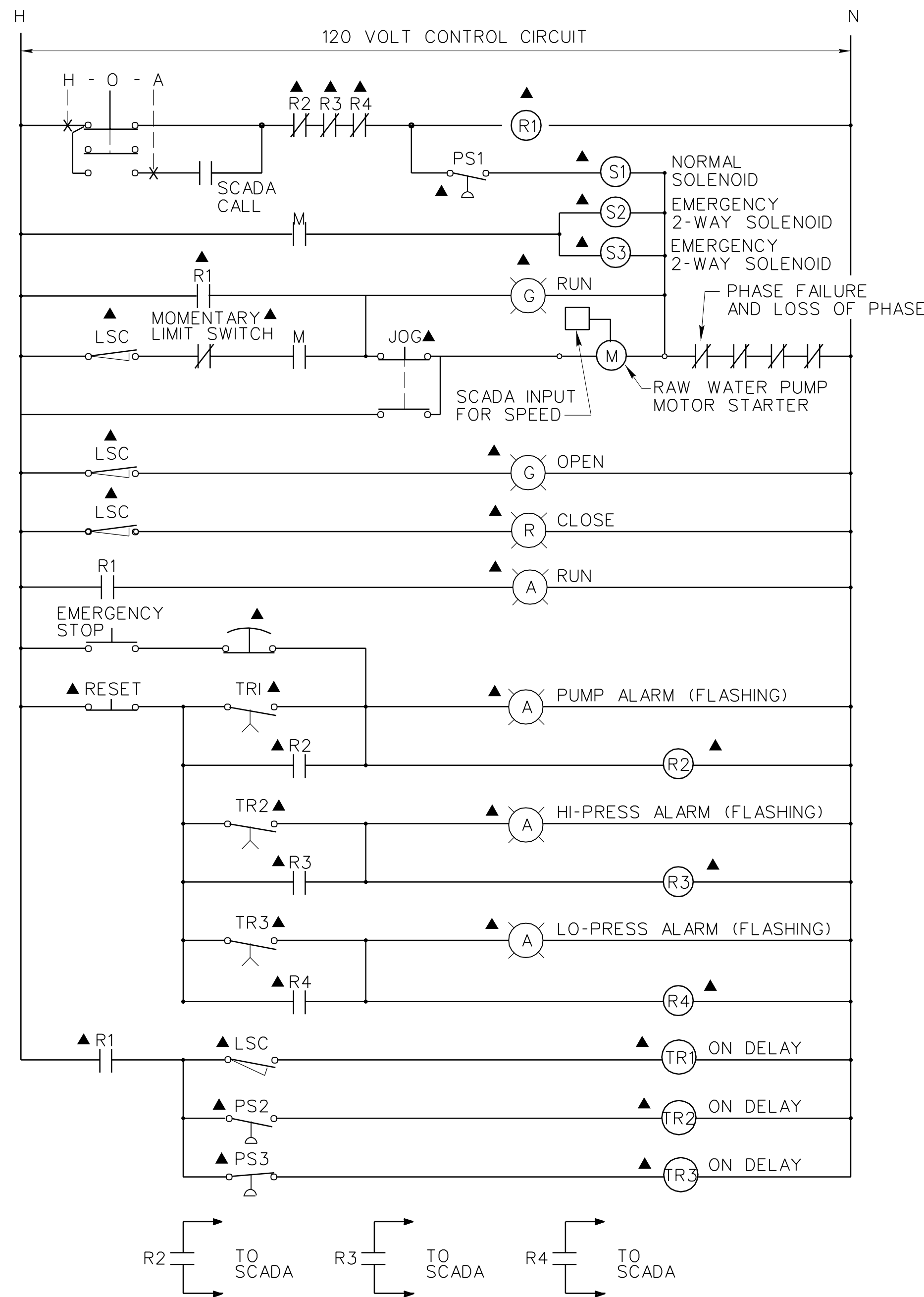
**ONE-LINE DIAGRAM FOR MCC-RW**



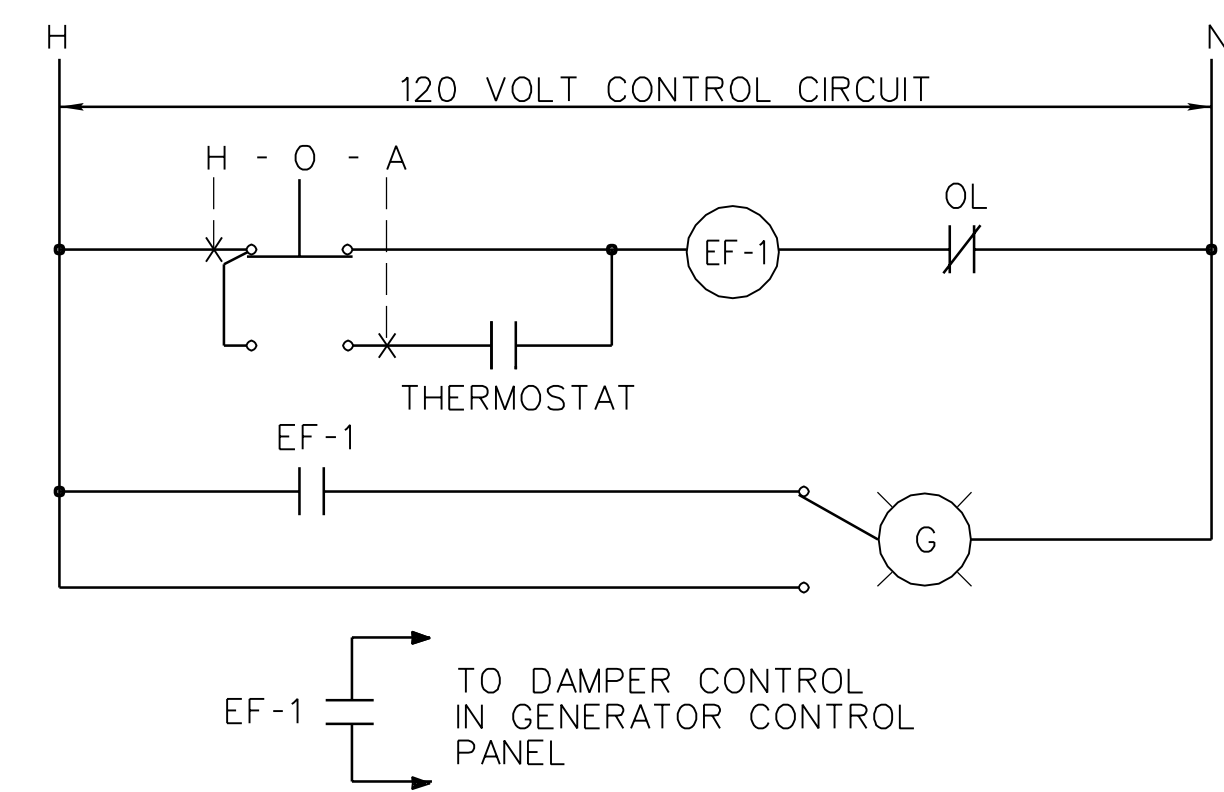
**ELEVATION FOR MCC-RW**

RECORD DRAWING  
05/23/03

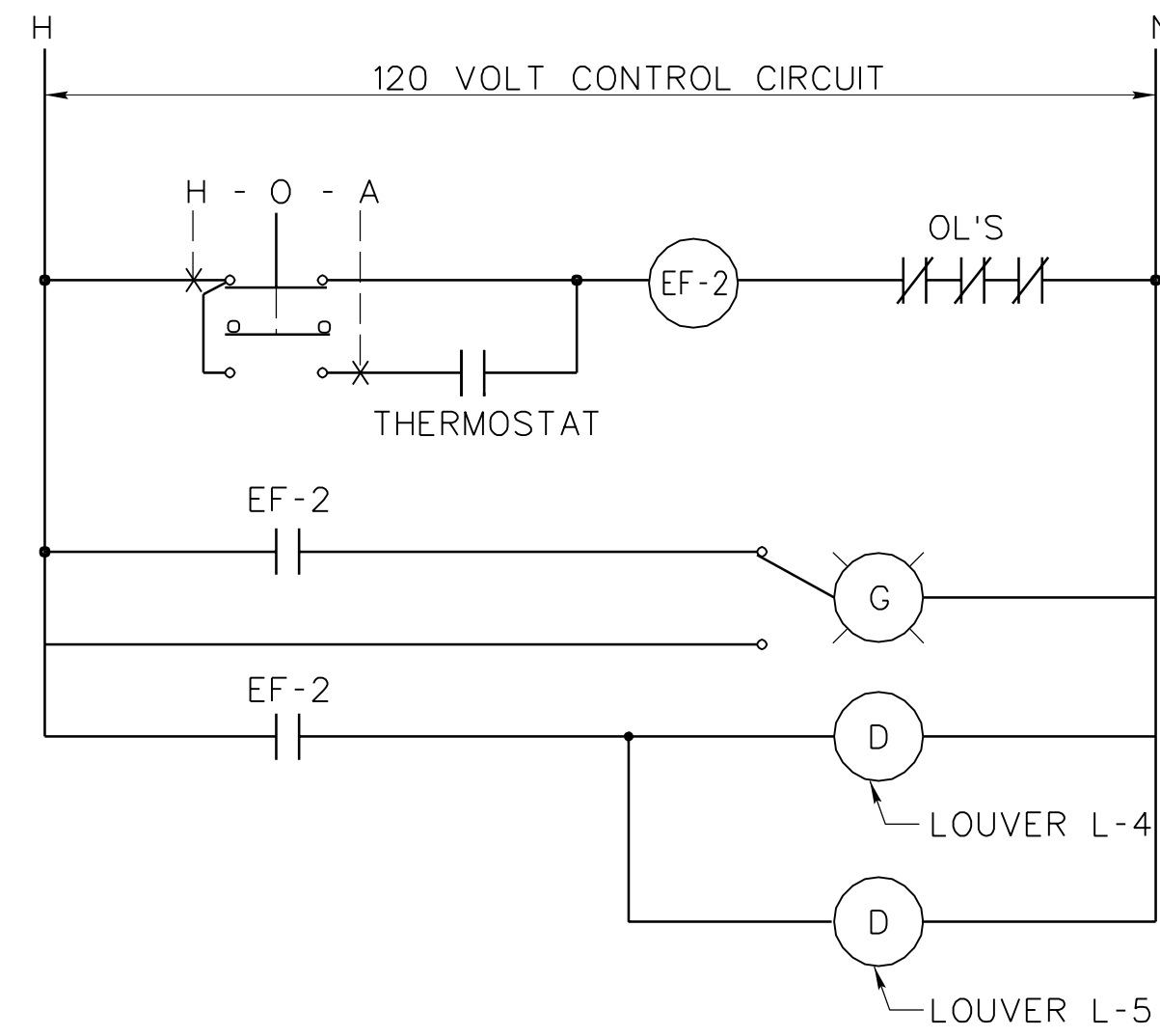
DR.	CHK.	DATE	DESCRIPTION
RWB	DLH	05-23-03	RECORD DRAWINGS



**RAW WATER PUMP/CHECK VALVE CONTROL DIAGRAM**  
(TYPICAL FOR 4 PUMPS)



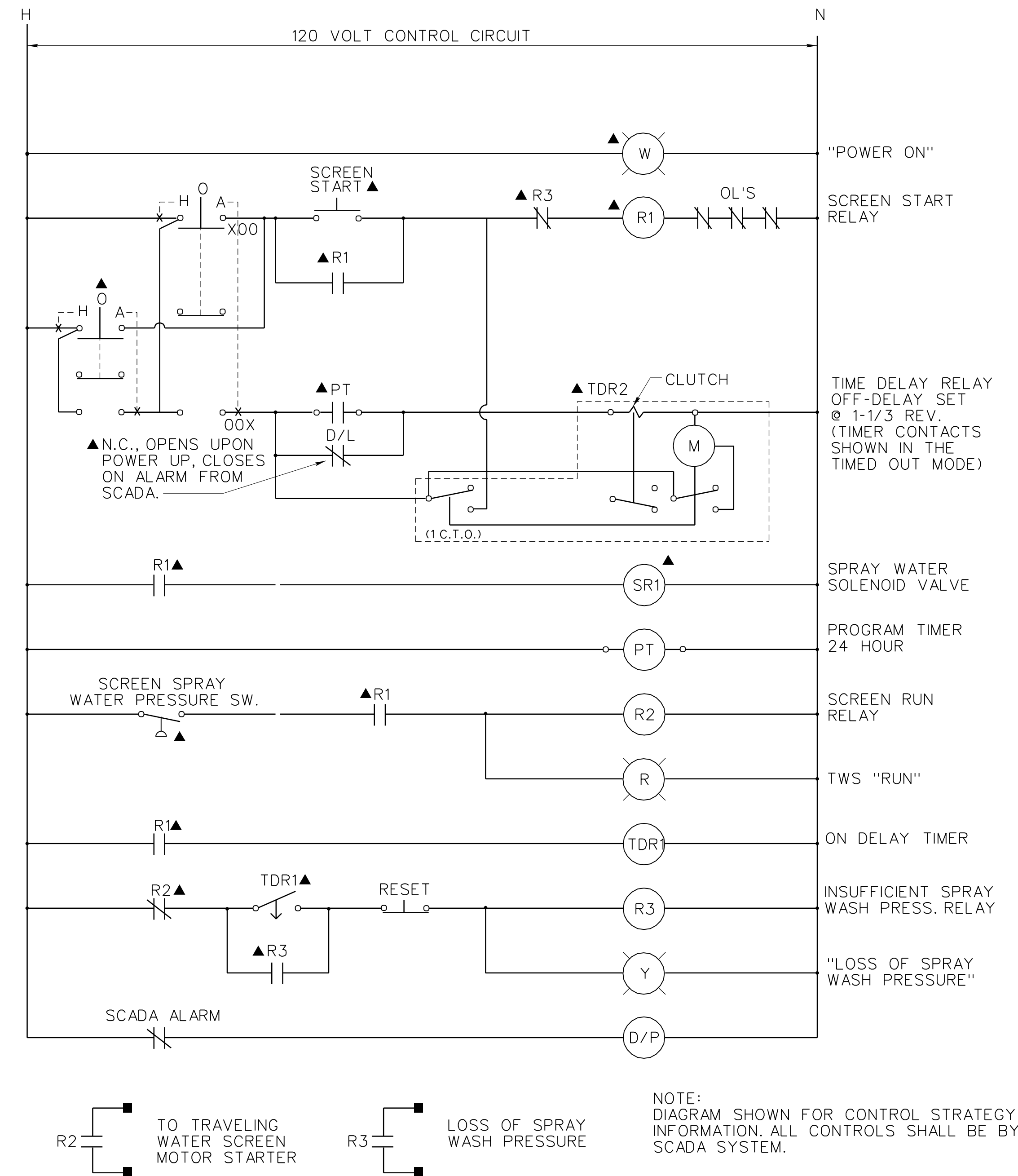
**EF-1 CONTROL DIAGRAM**



**EF-2 CONTROL DIAGRAM**

SCHEMATIC DIAGRAM LEGEND	
	FUSE
	480-120 VOLT CONTROL TRANSFORMER
	MOTOR STARTER OPERATING COIL
	CONTROL RELAY OPERATING COIL
	TIME DELAY RELAY OPERATING COIL
	NORMALLY OPEN (N.O.) INSTANTANEOUS CONTACT
	NORMALLY CLOSED (N.C.) INSTANTANEOUS CONTACT
	NORMALLY OPEN TIME DELAY CONTACT - TIMED CLOSED AFTER ENERGIZED (TCAE)
	THERMOSTAT - NORMALLY OPEN
	FLOW SWITCH - NORMALLY CLOSED
	PRESSURE SWITCH - NORMALLY OPEN
	LOCK-OUT RELAY
	THERMAL OVERLOAD CONTACTS - MAGNETIC MOTOR STARTER
	PUSHBUTTON - SINGLE CIRCUIT, MOMENTARY MAKE
	PUSHBUTTON - SINGLE CIRCUIT, MOMENTARY BREAK
	SELECTOR SWITCH - DOUBLE CIRCUIT, THREE POSITION (HAND-OFF-AUTOMATIC), MAINTAINED CONTACT
	SELECTOR SWITCH - SINGLE CIRCUIT, TWO POSITION POSITION, MAINTAINED CONTACT
	MANUAL MOTOR STARTING SWITCH WITH THERMAL OVERLOAD
	RED PILOT LIGHT WITH PUSH-TO-TEST
	ELECTRIC DAMPER MOTOR
	ELECTRIC MOTOR - FRACTIONAL HP
	GROUND CONNECTION
	INDICATES SERVICE REMOTELY LOCATED FROM STARTER

**GENERAL NOTES:**  
A. SEE POWER AND SYSTEMS PLANS FOR, MOTOR STARTER AND CONTROL DEVICE LOCATIONS.



**MECHANICAL SCREEN CONTROL DIAGRAM**

NOTE: DIAGRAM SHOWN FOR CONTROL STRATEGY INFORMATION. ALL CONTROLS SHALL BE BY SCADA SYSTEM.

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RAW WATER INTAKE - CONTROL DIAGRAMS  
CITY OF JOHNSON CITY  
WATAUGA WATER TREATMENT PLANT  
1998 EXPANSION AND IMPROVEMENTS

DR.	CHK.	DATE	DESCRIPTION
RWB	DLH	05-23-03	RECORD DRAWINGS
		11-20-98	ORIGINAL ISSUE

RECORD DRAWING  
05/23/03

E5  
FILE NO. 15784-20

PANEL: H				SERVICE: 277/480 VOLT, 3 PHASE, 4 WIRE					
				LOCATION: LOCATED IN RAW WATER INTAKE ELECTRIC RM					
CKT NO.	DIRECTORY	CKT BKR	LOAD (KVA)	ØA ØB ØC	LOAD (KVA)	CKT BKR	DIRECTORY	CKT NO.	
1	LIGHTS - ELECTRIC ROOM	20/1	0.50	---	0.70	20/1	EMERGENCY LIGHTING	2	
3	LIGHTS - ELECTRIC ROOM	20/1	0.50	---	0.40	20/1	LIGHTS - GENERATOR ROOM	4	
5	LIGHTS - SCREEN AREA	20/1	0.70	---	2.40	20/1	LIGHTS - PUMP ROOM	6	
7	LIGHTS - EXTERIOR	20/1	0.18	---	1.20	20/2	SCREEN PANEL	8	
9	SPARE	20/1		---	1.20	--/2		10	
11	SPARE	20/1		---		20/1	SPARE	12	
13	EUH-1	30/3	4.00	---	5.00	40/3	AHU-1	14	
15	↓	--/3	4.00	---	5.00	--/3	↓	16	
17	↓	--/3	4.00	---	5.00	--/3	↓	18	
19	EUH-7	20/3	1.70	---	2.10	20/3	ACCU-1	20	
21	↓	--/3	1.70	---	2.10	--/3	↓	22	
23	↓	--/3	1.70	---	2.10	--/3	↓	24	
25	SPARE	30/3		---	5.00	40/3	AHU-2	26	
27	↓	--/3		---	5.00	--/3	↓	28	
29	↓	--/3		---	5.00	--/3	↓	30	
31	SPARE	30/3		---	2.10	20/3	ACCU-2	32	
33	↓	--/3		---	2.10	--/3	↓	34	
35	↓	--/3		---	2.10	--/3	↓	36	
37	XFMR FOR PANEL R	30/3	4.10	---	2.10	20/3	STAINER VALVE	38	
39	↓	--/3	3.80	---	2.10	--/3	↓	40	
41	↓	--/3	4.00	---	2.10	--/3	↓	42	
REMARKS:				ØA	ØB	ØC	MAINS: 200 MLO		
LC - LOCKING CLIP				30.3	27.9	29.1	FEEDS FROM FROM MCC-RW		
TOTAL CONNECTED LOAD:				78.6 KVA				MOUNTING: SURFACE	

PANEL: R				SERVICE: 120/208 VOLT, 3 PHASE, 4 WIRE				
				LOCATION: LOCATED IN RAW WATER INTAKE ELECTRIC RM				
CKT NO.	DIRECTORY	CKT BKR	LOAD (KVA)	ØA ØB ØC	LOAD (KVA)	CKT BKR	DIRECTORY	CKT NO.
1	RECEPTACLES AT SCREENS	20/1	0.4	---	0.80	20/1	GEN. BATTERY CHARGER	2
3	RECEPTACLES AT SCREENS	20/1	0.4	---	1.20	20/1	GEN. BATTERY CHARGER	4
5	EF #2 DAMPER	20/1	0.4	---	1.00	20/2	BLOCK HEATER	6
7	RECEPTACLES	20/1	0.8	---	1.00	--/2	↓	8
9	RECEPTACLES	20/1	0.8	---	1.00	20/2	BLOCK HEATER	10
11	RECEPTACLES	20/1	0.2	---	1.00	--/2	↓	12
13	PLC	20/1	0.10	---	0.30	20/1	EF-1	14
15	RIVER/PRE-SCREEN LEVEL	20/1	0.10	---		30/1	SPARE	16
17	SPARE	20/1		---		30/1	SPARE	18
19	SPARE	20/1		---		20/2	SPARE	20
21	TURBIDITY METER	20/1	0.10	---		--/2	↓	22
23	SPARE	20/1		---	0.60	20/1	SURGE ANT. VALVE	24
25	POST SCREEN LEVEL	20/1	0.10	---		20/1	SPARE	26
27	GEN. FUEL TANK LEVEL	20/1	0.10	---	0.50	20/1	HEAT TRACING	28
29	REC. AT HVAC UNIT	20/1	0.10	---	0.50	20/1	HEAT TRACING	30
REMARKS:				ØA	ØB	ØC	MAINS: 60 AMCB	
TOTAL CONNECTED LOAD:				3.60	4.20	3.80	FEEDS FROM: FROM XFMR VIA PANEL H	
				MOUNTING: SURFACE				

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RAW WATER INTAKE - SCHEDULES

CITY OF JOHNSON CITY  
WATAUGA WATER TREATMENT PLANT  
1998 EXPANSION AND IMPROVEMENTS

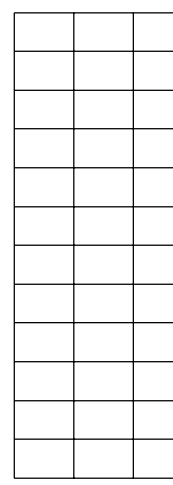
SEE SHEET E22  
FOR LIGHT FIXTURE  
SCHEDULE

RECORD DRAWING  
05/23/03

DR.	CHK.	DATE	DESCRIPTION
RWB	DLH	05-23-03	RECORD DRAWINGS

E6

FILE NO. 15784-20

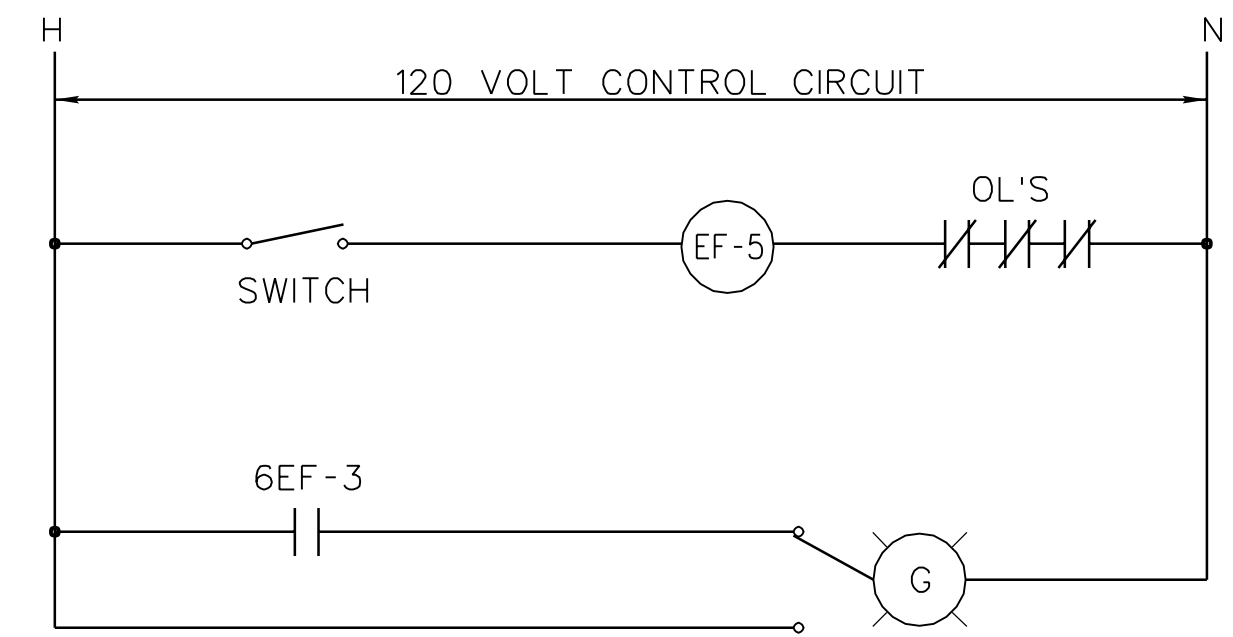




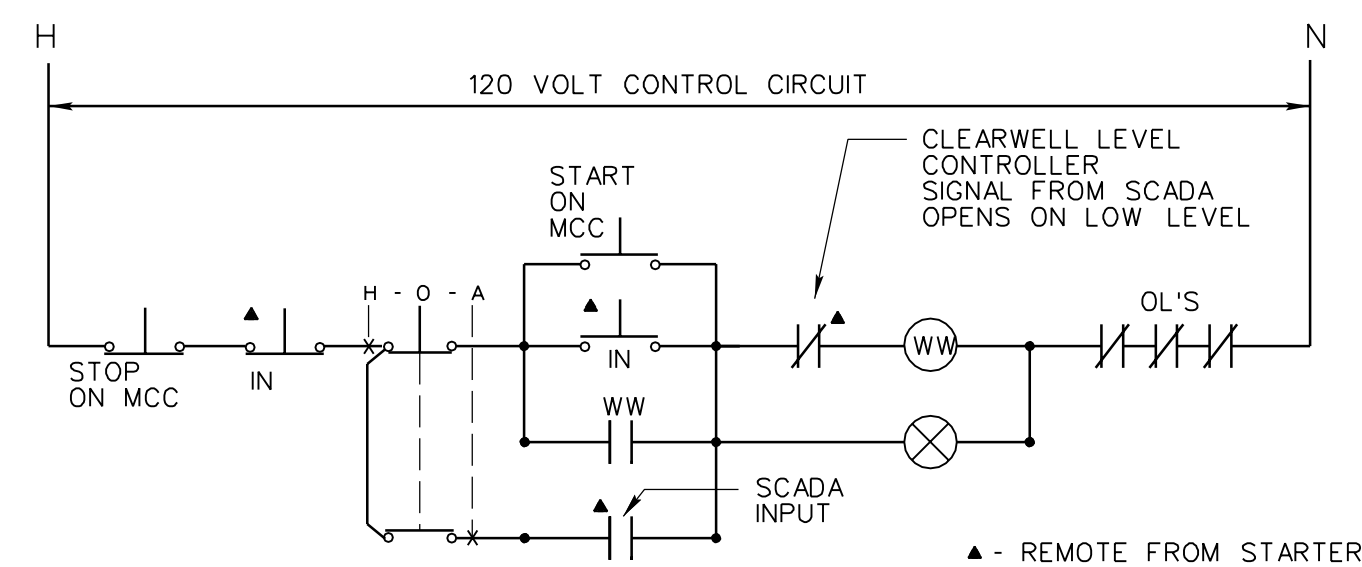
SCHEMATIC DIAGRAM LEGEND	
	FUSE
	480-120 VOLT CONTROL TRANSFORMER
	MOTOR STARTER OPERATING COIL
	CONTROL RELAY OPERATING COIL
	TIME DELAY RELAY OPERATING COIL
	NORMALLY OPEN (N.O.) INSTANTANEOUS CONTACT
	NORMALLY CLOSED (N.C.) INSTANTANEOUS CONTACT
	NORMALLY OPEN TIME DELAY CONTACT - TIMED CLOSED AFTER ENERGIZED (TCAE)
	THERMOSTAT - NORMALLY OPEN
	FLOW SWITCH - NORMALLY CLOSED
	PRESSURE SWITCH - NORMALLY OPEN
	THERMAL OVERLOAD CONTACTS - MAGNETIC MOTOR STARTER
	PUSHBUTTON - SINGLE CIRCUIT, MOMENTARY MAKE
	PUSHBUTTON - SINGLE CIRCUIT, MOMENTARY BREAK
	SELECTOR SWITCH - DOUBLE CIRCUIT, THREE POSITION (HAND-OFF-AUTOMATIC), MAINTAINED CONTACT
	SELECTOR SWITCH - SINGLE CIRCUIT, TWO POSITION POSITION, MAINTAINED CONTACT
	MANUAL MOTOR STARTING SWITCH WITH THERMAL OVERLOAD
	RED PILOT LIGHT WITH PUSH-TO-TEST
	ELECTRIC DAMPER MOTOR
	ELECTRIC MOTOR - FRACTIONAL HP
	GROUND CONNECTION
	INDICATES SERVICE REMOTELY LOCATED FROM STARTER

**GENERAL NOTES:**

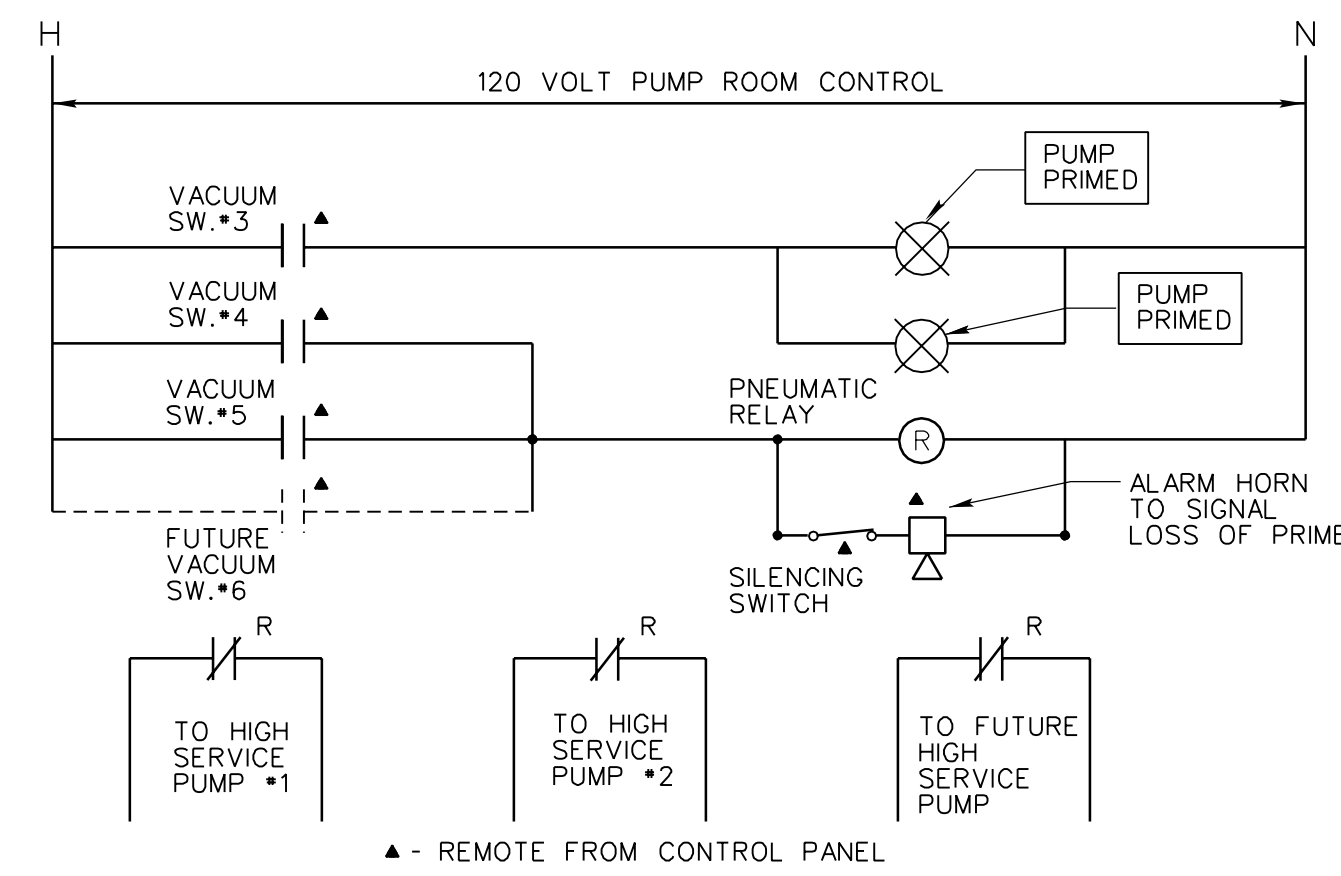
- A. SEE POWER AND SYSTEMS PLANS FOR MOTOR STARTER AND CONTROL DEVICE LOCATIONS.
- B. ALL WIRING TO EMS SYSTEMS WILL BE PROVIDED BY MECHANICAL TRADE.



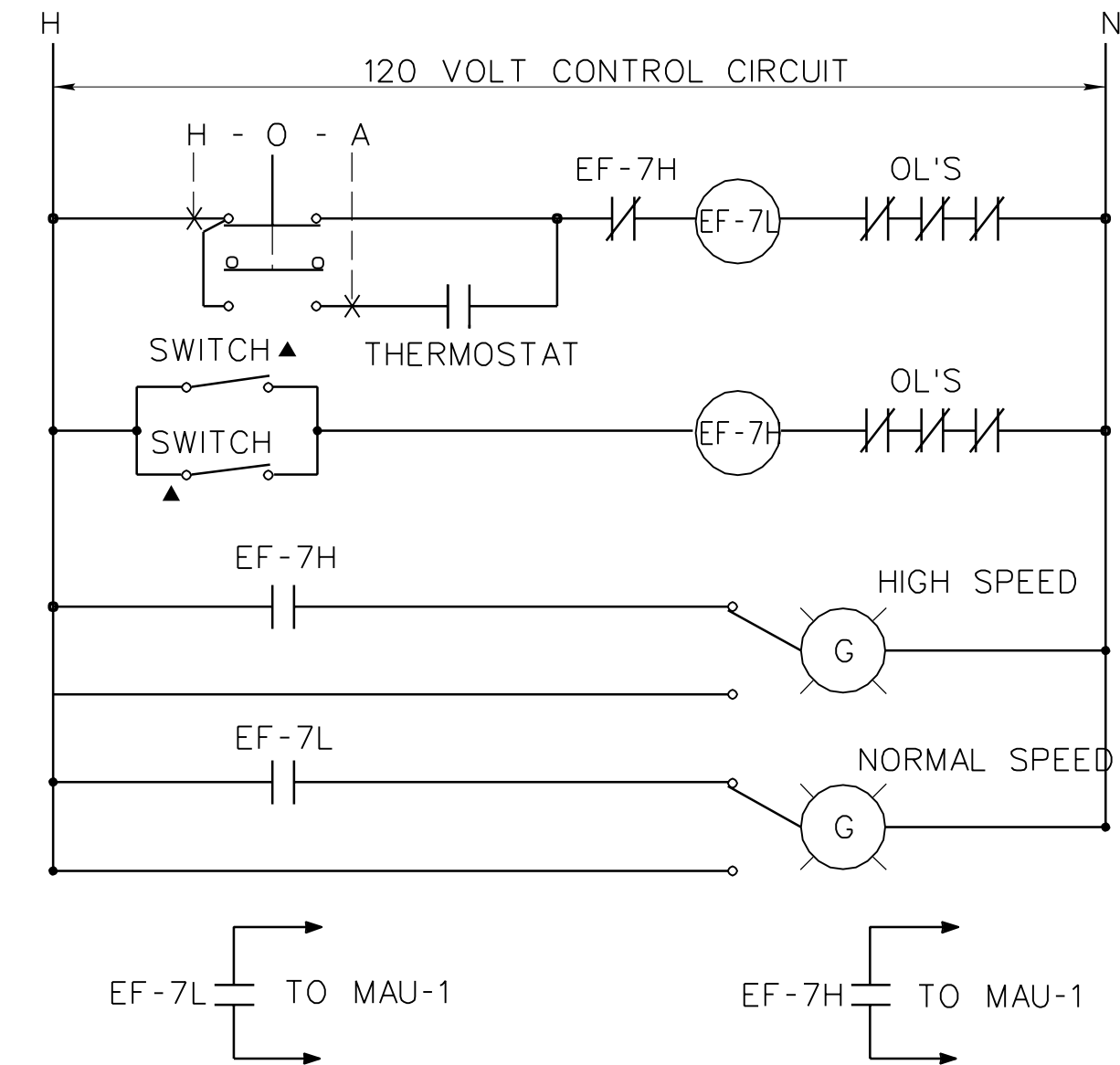
**EF-5 CONTROL DIAGRAM**



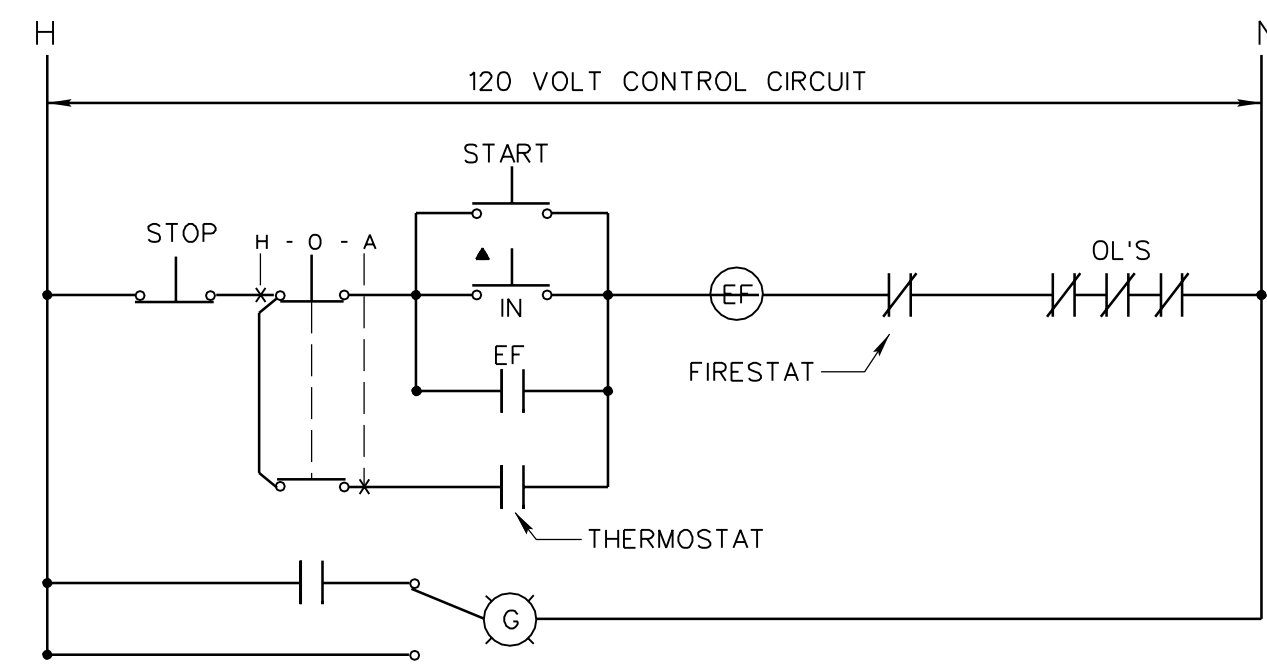
**WASH WATER TRANSFER PUMP**



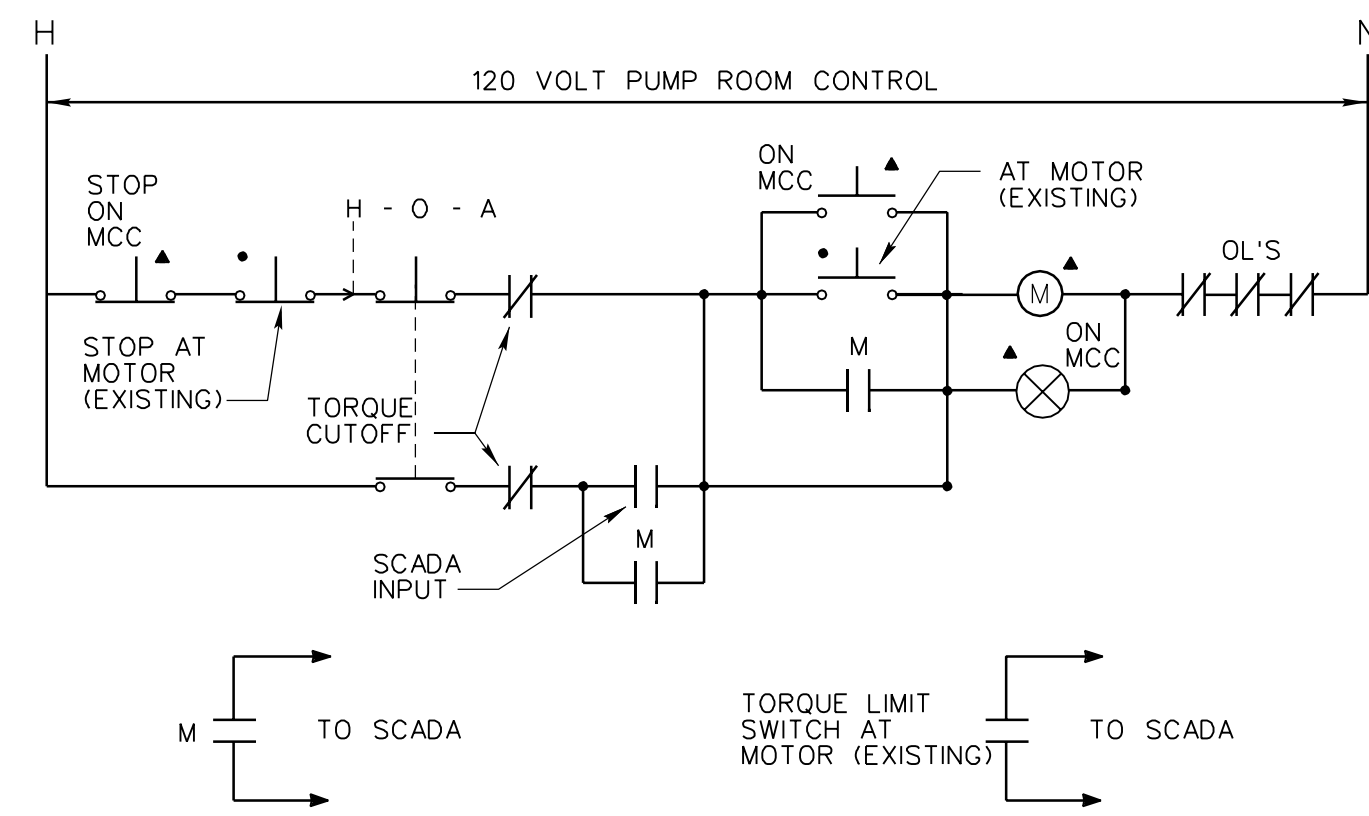
**PUMP PRIME REQUIRED CIRCUIT FOR EXISTING PUMPS**



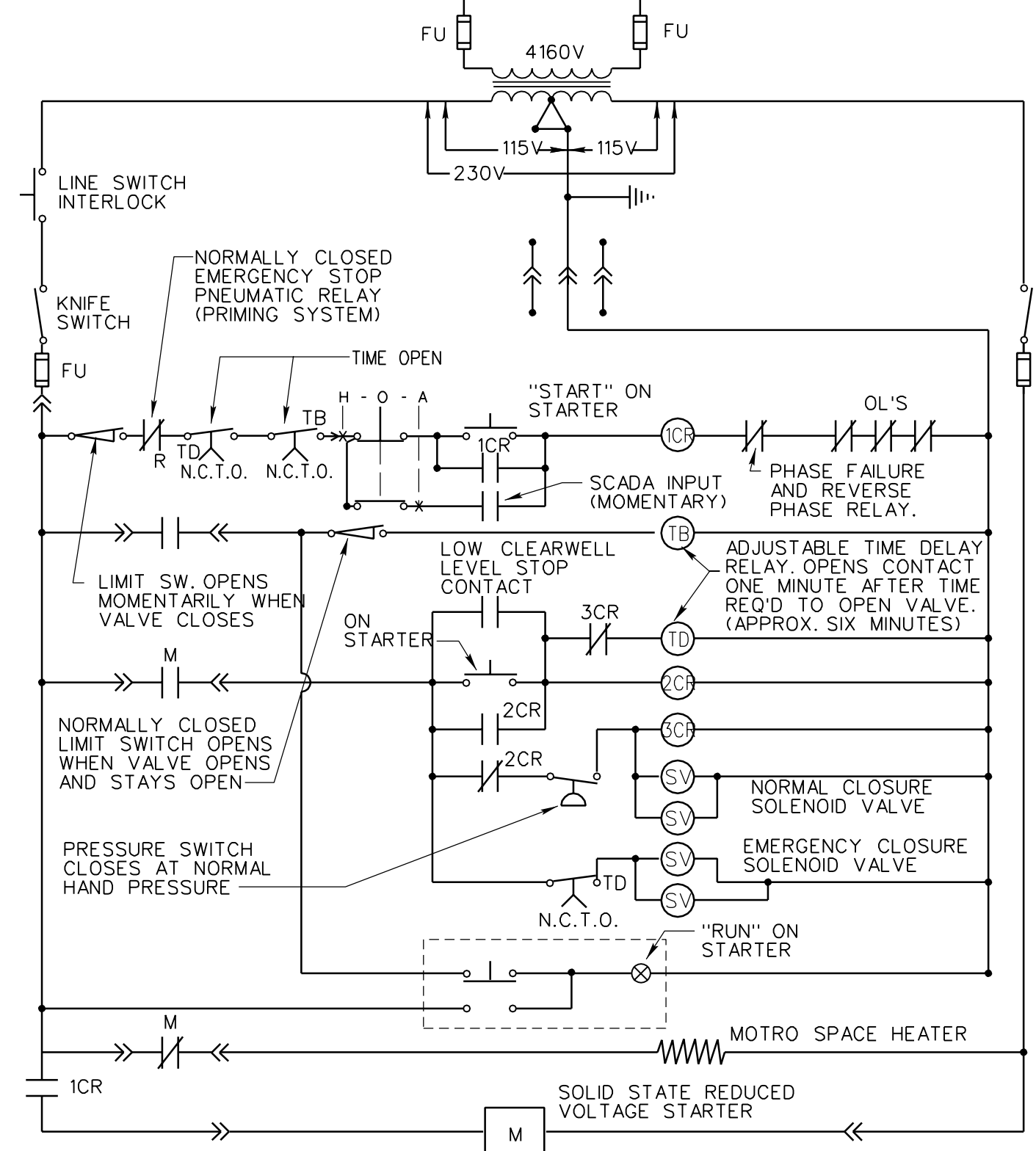
**EF-7 CONTROL DIAGRAM**



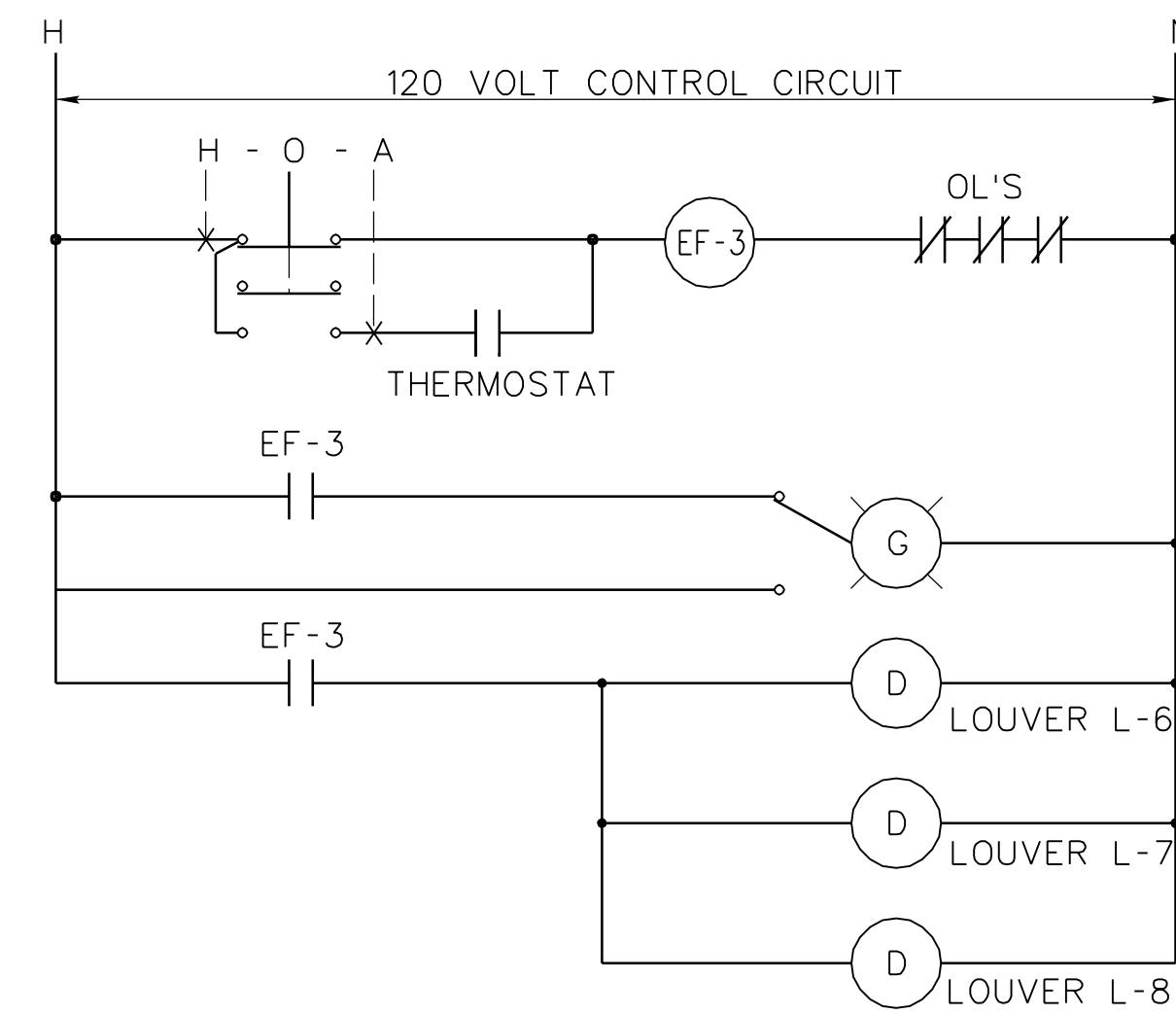
**EXISTING PUMP ROOM EXHAUST FANS**



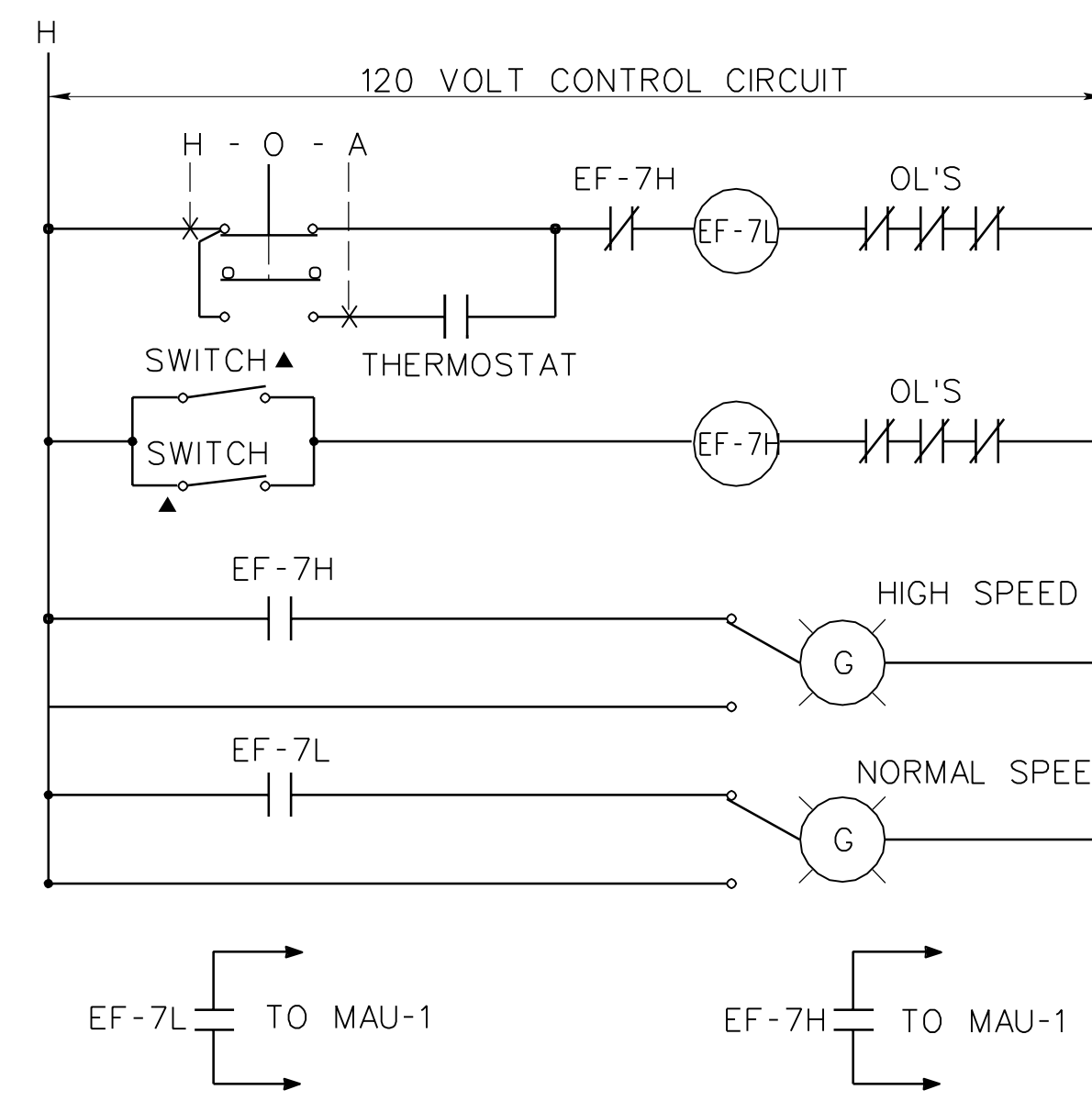
**SLUDGE COLLECTORS CONTROL DIAGRAM**



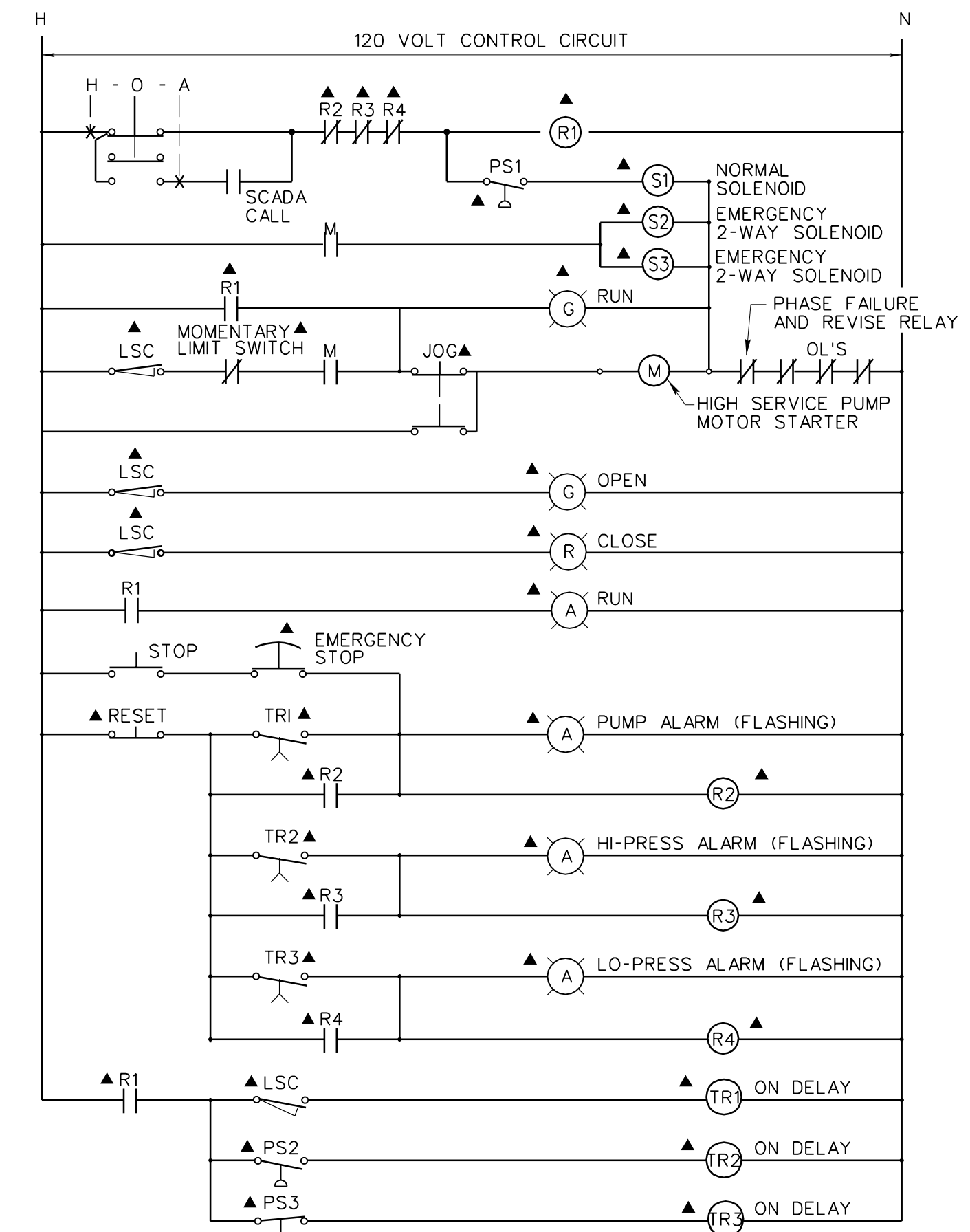
**EXISTING HIGH SERVICE PUMPS - 4160V, 3PH**



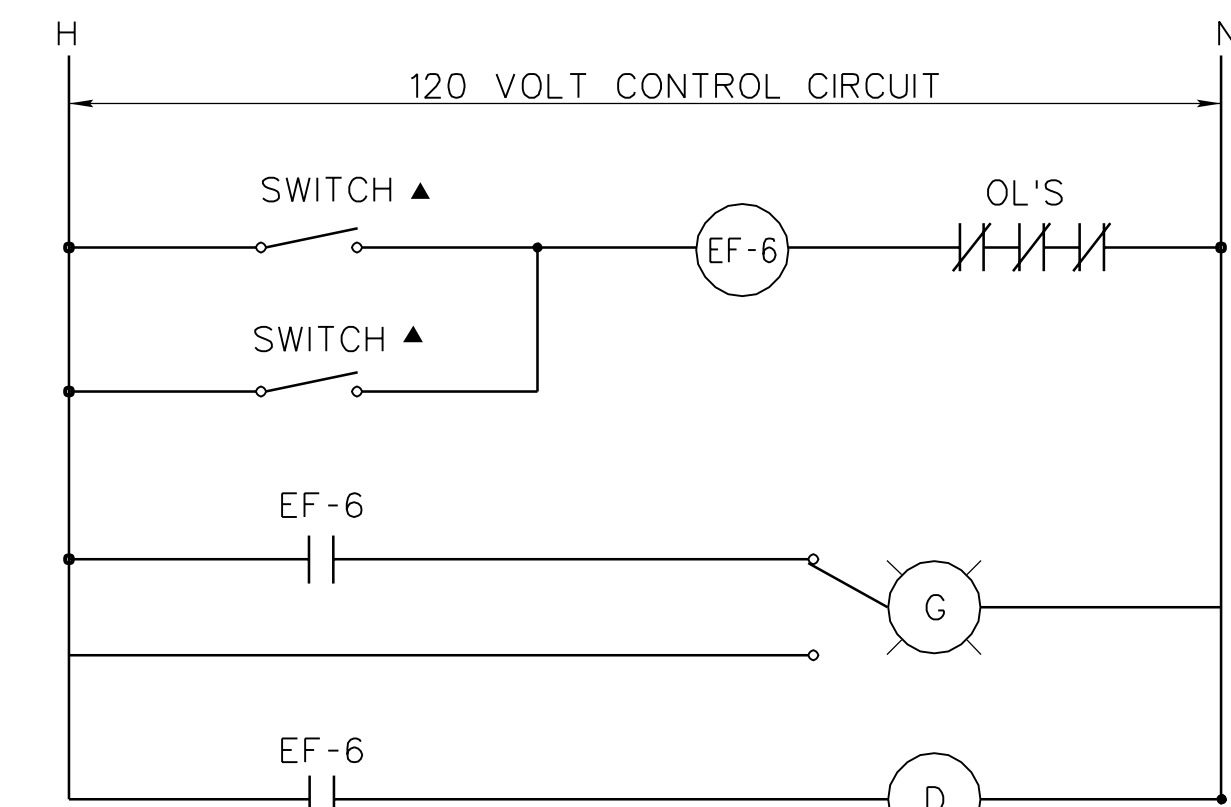
**EF-3 CONTROL DIAGRAM**



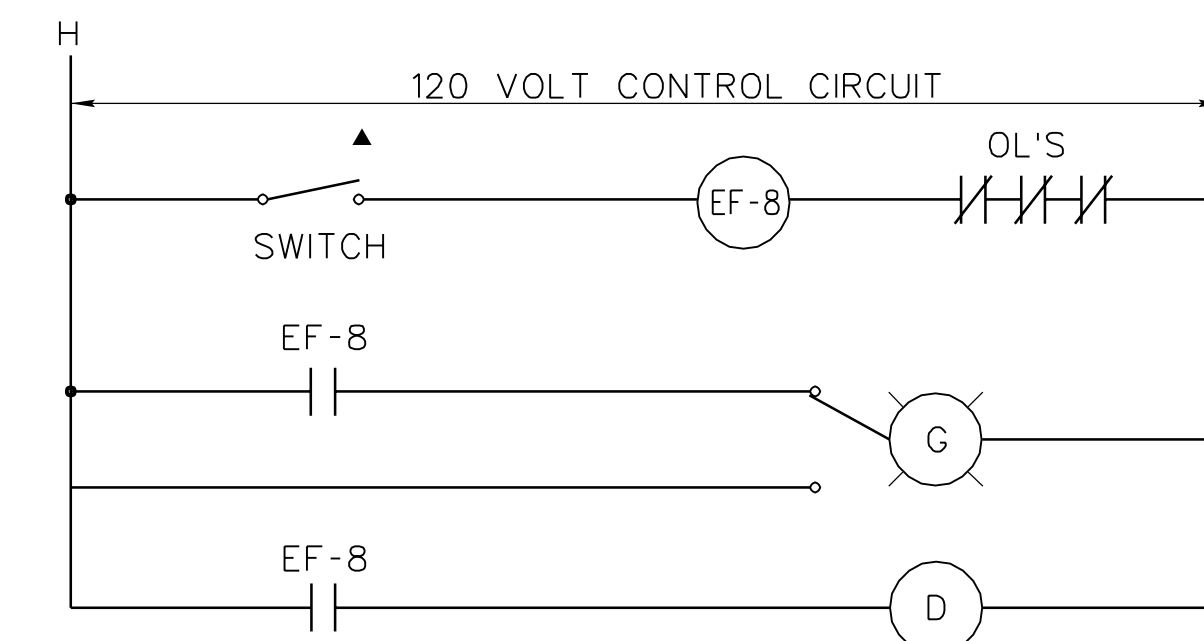
**EF-7 CONTROL DIAGRAM**



**NEW HIGH SERVICE PUMP/CHECK VALVE CONTROL DIAGRAM**



**EF-6 CONTROL DIAGRAM**



**EF-8 CONTROL DIAGRAM**

RECORD DRAWING  
05/23/03

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ELECTRICAL CONTROL DIAGRAMS

CITY OF JOHNSON CITY  
WATAUGA WATER TREATMENT PLANT  
1998 EXPANSION AND IMPROVEMENTS

DR.	CHK.	DATE	DESCRIPTION
VET	PEH	11-20-98	ORIGINAL ISSUE
RWB	DLH	05-23-03	RECORD DRAWINGS

E20  
FILE NO. 15784-20

PANEL: B				SERVICE: 120/208 VOLT, 3 PHASE, 4 WIRE LOCATION: SECOND FLOOR				
CKT NO.	DIRECTORY	CKT BKR	LOAD (KVA)	ØA ØB ØC	LOAD (KVA)	CKT BKR	DIRECTORY	CKT NO.
1	SPARE	20/1			0.5	20/1	OFFICE COMPUTER RECEPT.	2
3	SPARE	20/1			0.2	20/1	OFFICE RECEPT	4
5	SPARE	20/1			1.0	20/1	OFFICE RECEPT	6
7	SPARE	20/1			0.6	20/1	BATHROOM RECEPT.	8
9	LAB. RECEPTACLE	20/1	0.7		0.5	20/1	RECEPTACLE	10
11	LAB. RECEPTACLE	20/1	0.7		0.5	20/1	RECEPTACLE	12
13	LAB. RECEPTACLE	20/1	0.4		0.5	20/1	RECEPTACLE	14
15	LAB. RECEPTACLE	20/1	0.6		0.6	20/1	RECEPTACLE	16
17	LAB. RECEPTACLE	20/1	0.6		0.5	20/1	RECEPTACLE	18
19	LAB. RECEPTACLE	20/1	0.5		0.2	20/1	LAB. COMPUTER	20
21	LAB. RECEPTACLE	20/1	0.5		0.5	20/1	LAB. COMPUTER	22
23	VENDING	20/1	1.4		0.6	20/1	REFRIGERATOR	24
25	LAB. COMP. REC.	20/1	0.5		0.4	20/1	COUNTER	26
27	ELEVATOR LIGHTS	20/1	0.8	LC	1.0	20/1	PILOT FILTER	28
29	MAIN PLANT CONTROL PANEL	20/1	0.6		0.5	20/1	RAW WATER SAMPLE PUMP	30
31	MAIN PLANT CONTROL PANEL	20/1	0.6		0.5	20/1	MIX SAMPLE PUMP	32
33	SCADA SYSTEM CONSOLE	20/1	0.8		1.0	15/2	STILL	34
35	SCADA SYSTEM CONSOLE	20/1	0.8		1.0	--/2	STILL	36
37	SCADA SYSTEM CONSOLE	20/1	0.8		0.4	20/1	SAMPLE PUMP	38
39	REFRIGERATOR	20/2	1.2		5.0	70/2	STOVE LAB.	40
41	SPARE	--/2	1.2		5.0	--/2	STOVE LAB.	42
REMARKS: LC - LOCKING CLIP				ØA ØB ØC	MAINS: 225 AMP MLO			
TOTAL CONNECTED LOAD				5.9 13.4 14.4	FEEDS FROM: PANEL DR			
				MOUNTING: FLUSH				

PANEL: C				SERVICE: 120/208 VOLT, 3 PHASE, 4 WIRE LOCATION: EXISTING HIGH SERVICE PUMP ROOM				
CKT NO.	DIRECTORY	CKT BKR	LOAD (KVA)	ØA ØB ØC	LOAD (KVA)	CKT BKR	DIRECTORY	CKT NO.
1	LIGHTS - ROOM	20/1				20/1	LIGHTS - PUMP ROOM	2
3	LIGHTS - ROOM	20/1				20/1	LIGHTS - PUMP ROOM	4
5	LIGHTS - ROOM	20/1				20/1	LIGHTS ENTRANCE	6
7	LIGHTS - SHOP	20/1				20/1	LIGHTS CL2 ROOM	8
9	LIGHTS - SHOP EQUIPMENT	20/1				20/1	LIGHTS OFFICE	10
11	LIGHTS - EQUIP. ROOM	20/1				20/1	OUTSIDE LIGHTS	12
13	LIGHTS - CL2 ROOM	20/1				20/1	OUTSIDE LIGHTS	14
15	OUTSIDE LIGHTS	20/1				20/1	OUTSIDE LIGHTS & PIT	16
17	OUTSIDE LIGHTS	20/1				20/1	RECEPTACLE - SHOP	18
19	OUTSIDE LIGHTS & PIT	20/1				20/1	RECEPTACLE - EQUIP. RM	20
21	RECEPTACLE ENTRANCE	20/1				20/1	RECEPTACLE - CL2 ROOM	22
23	RECEPTACLE OFFICE	20/1				20/1	RECEPTACLE - STORAGE RM.	24
25	RECEPTACLE CL2 ROOM	20/1				20/1	RECEPTACLE - PUMP RM.	26
27	COAGULENT FEED PUMP	20/1				20/1	OUTSIDE FLOOD LIGHTS	28
29	RECEPTACLE PUMP ROOM	20/1				20/1	OUTSIDE FLOOD LIGHTS	30
31	SETTING BASIN LEVEL	20/1				20/3	WATER HEATER	32
33	SPARE	20/1				-/3	WATER HEATER	34
35	SPARE	20/1				-/3	WATER HEATER	36
37	HOIST	20/3				20/3	ELEC. HEATER HALL	38
39	-	-/3				-/3	ELEC. HEATER HALL	40
41	-	-/3				-/3	ELEC. HEATER HALL	42
REMARKS:				ØA ØB ØC	MAINS: 225 AMP MLO			
TOTAL CONNECTED LOAD				10.3 10.3 10.3	FEEDS FROM: PANEL DL			
				MOUNTING: FLUSH				

PANEL: DR				SERVICE: 120/208 VOLT, 3 PHASE, 4 WIRE LOCATION: EXISTING HIGH SERVICE PUMP ROOM				
CKT NO.	DIRECTORY	CKT BKR	LOAD (KVA)	ØA ØB ØC	LOAD (KVA)	CKT BKR	DIRECTORY	CKT NO.
1	PANEL "A"	70/3	2.6		0.4	20/1	CHEMICAL FEED PANEL	2
3	-	-/3	2.6		0.4	20/1	CHEMICAL FEED PANEL	4
5	-	-/3	2.6		0.4	20/1	CHEMICAL FEED PANEL	6
7	PANEL "B"	100/3	5.5		1.8	20/1	UNIT HTRS. PUMP RM.	8
9	-	-/3	13.4		0.2	20/1	ROOFTOP RECEPT.	10
11	-	-/3	14.4		0.9	20/1	CHLORINE LEAK DETECTOR	12
13	PANEL "C"	100/3	10.3		0.4	20/1	CHLORINE SCALE	14
15	-	-/3	10.3		0.8	20/1	CHLORINE VALVE SHUTOFF	16
17	-	-/3	10.3		1.0	20/1	CHLORINE VALVE HEATERS	18
19	PANEL "D"	70/3	7.8		0.8	20/1	CHLORINE CABINETS	20
21	-	-/3	7.8		0.3	20/1	EF-8	22
23	-	-/3	7.8		0.9	20/1	FACP	24
25	PANEL "E"	100/3	13.0		1.2	20/1	UH-6, UH-7	26
27	-	-/3	13.0		1.6	20/1	UH-8, UH-9, UH-10	28
29	-	-/3	13.0		1.2	20/1	FILTER SCADA MONITOR	30
31	CHEMICAL FEED RECEPT.	20/1	1.4		0.2	20/1	EXISTING VALVE PIT	32
33	BULK TANK LEVELS	20/1	0.1			20/1	SPARE	34
35	BULK TANK LEVELS	20/1	0.1		0.3	20/1	FLUORIDE FEED	36
37	DAY TANK LEVELS	20/1	0.1		0.3	20/3	PAX FEEDER	38
39	CAUSTIC FEEDER	20/1	0.5		0.3	-/3	-	40
41	PHOSPHATE FEEDER	20/1	0.5		0.3	-/3	-	42
REMARKS: LC - LOCKING CLIP				ØA ØB ØC	MAINS: 400 AMP MLO			
TOTAL CONNECTED LOAD				45.6 49.3 53.9	FEEDS FROM: TRANSF. VIA PNL. "DH"			
				MOUNTING: IN CABINET				

PANEL: HFL				SERVICE: 277/480 VOLT, 3 PHASE, 4 WIRE LOCATION: NEW HIGH SERVICE PUMP ROOM				
CKT NO.	DIRECTORY	CKT BKR	LOAD (KVA)	ØA ØB ØC	LOAD (KVA)	CKT BKR	DIRECTORY	CKT NO.
1	INTERIOR LIGHTS	20/1	2.0			20/1	SPARE	2
3	EMERGENCY LIGHTS	20/1	1.4	LC		20/1	SPARE	4
5	INTERIOR LIGHTS	20/1	0.8		1.2	20/1	EXTERIOR LIGHTS	6
7	SPARE	20/1				20/1	SPARE	8
9	SPARE	20/1				20/1	SPARE	10
11	SPARE	20/1				20/1	SPARE	12
13	SPARE	20/1				20/1	SPARE	14
15	SPARE	20/1				20/1	SPARE	16
17	SPARE	20/2				20/1	SPARE	18
19	SPARE	-/2				30/3	SPARE	20
21	SPARE	20/2				-/3	SPARE	22
23	SPARE	-/2				-/3	SPARE	24
25	SPARE	20/3				1.3 30/3	XFMR FOR "RFL"	26
27	SPARE	-/3				1.2 -/3	-	28
29	SPARE	-/3				2.0 -/3	-	30
REMARKS: LC - LOCKING CLIP				ØA ØB ØC	MAINS: 225 AMP M.L.O.			
TOTAL CONNECTED LOAD				3.3 2.6 4.0	FEEDS FROM: MCC-FL			
				MOUNTING: SURFACE				

PANEL: RFL				SERVICE: 120/208 VOLT, 3 PHASE, 4 WIRE LOCATION: NEW HIGH SERVICE PUMP ROOM				
CKT NO.	DIRECTORY	CKT BKR	LOAD (KVA)	ØA ØB ØC	LOAD (KVA)	CKT BKR	DIRECTORY	CKT NO.
1	PUMP ROOM RECEPT.	20/1	1.1		0.6	20/1	UH-13	2
3	ELECTRICAL RM. RECEPT.	20/1	1.2			20/1	SPARE	4
5	ELECTRICAL RM. RECEPT.	20/1	0.6		1.4	20/1	PUMP ROOM CONTROL PANEL	6
7	CLEARWELL "C" LEVEL	20/1	0.2		2.0	40/3	GENERATOR PANEL	8
9	SPACE	20/1			2.0	--/3	-	10
11	SPACE	20/1			2.0	--/3	-	12
REMARKS:				ØA ØB ØC	MAINS: 60 AMP MAIN BREAKER			
TOTAL CONNECTED LOAD				3.9 3.2 4.0	FEEDS FROM: TRANSFORMER T2			
				MOUNTING: SURFACE				

PANEL: DH				SERVICE: 277/480 VOLT, 3 PHASE, 4 WIRE LOCATION: EXISTING HIGH SERVICE PUMP ROOM				
CKT NO.	DIRECTORY	CKT BKR	LOAD (KVA)	ØA ØB ØC	LOAD (KVA)	CKT BKR	DIRECTORY	CKT NO.
1	PUMP RM. EXHAUST FANS	20/3	1.5		0.6	20/3	EF-5/EF-6	2
3	-	-/3	1.5		0.6	-/3	-	4
5	-	-/3	1.5		0.6	-/3	-	6
7	MAU-1/EF-7	20/3	1.6		2.0	40/3	PIPIE GALLERY DEHMD.	8
9	-	-/3	1.6		2.0	-/3	-	10
11	-	-/3	1.6		2.0	-/3	-	12
13	EUH-3	20/3	1.3		1.3	20/3	EUH-5	14
15	-	-/3	1.3		1.3	-/3	-	16
17	-	-/3	1.3		1.3	-/3	-	18
19	EUH-4	30/3	3.6		1.9	20/3	EUH-6	20
21	-	-/3	3.6		1.9	-/3	-	22
23	-	-/3	3.6		1.9	-/3	-	24
25	RTU-2	30/3	6.7		1.3	20/3	EUH-2	26
27	-	-/3	6.7		1.3	-/3	-	28
29	-	-/3	6.7		1.3	-/3	-	30
31	LTS. CHEMICAL STOR.	20/1	0.8			20/1	SPARE	32
33	LTS. CHEMICAL STOR.	20/1	4.0			20/1	SPARE	34
35	EMERGENCY LTS.	20/1	1.0	LC	3.68	20/1	PUMP ROOM LIGHTS	36
37	LTS. CHEM. FEED, DOCK	20/1	1.6		45.6	20/3	XFMR FOR PANEL "DR"	38
39	LTS. OPERATOR, LAB	20/1	1.6		47.9	-/3	-	40
41	LTS. OFFICE, LAB	20/1	1.5		53.9	-/3	-	42
REMARKS: LC - LOCKING CLIP				ØA ØB ØC	MAINS: 400 AMP - NON AUTOMATIC			
TOTAL CONNECTED LOAD				69.8 75.3 81.88	FEEDS FROM: MCC-FL			
				MOUNTING: IN CABINET				

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ELECTRICAL SCHEDULES  
 CITY OF JOHNSON CITY  
 WATAUGA WATER TREATMENT PLANT  
 1998 EXPANSION AND IMPROVEMENTS

DR.	CHK.	DATE	DESCRIPTION
VET	PEH	11-20-98	ORIGINAL ISSUE
RWB	DLH	05-23-03	RECORD DRAWINGS

RECORD DRAWING  
05/23/03

E21

FILE NO. 15784-20

B.O.   
 \$\$\$\$date\$\$\$  
 \$\$\$\$\$\$\$\$\$\$DGN\$SPEC\$\$\$\$\$\$\$\$\$

LIGHTING PLANS	
SYMBOL	DESCRIPTION
◇	FIXTURE TYPE INDICATOR - SEE LIGHT FIXTURE SCHEDULE
•	POLE MTD SITE LIGHTING FIXTURE - SINGLE FIXTURE ARRAY
▭	RECESSED MOUNTED FLUORESCENT LIGHT FIXTURE
▭	SURFACE OR PENDANT MOUNTED FLUORESCENT LIGHT FIXTURE
○	RECESSED MOUNTED LIGHT FIXTURE
○	WALL OR BRACKET MOUNTED LIGHT FIXTURE
○	HID PENDANT OR SURFACE MOUNTED LIGHT FIXTURE
↑	CEILING MOUNTED EXIT SIGN (DIRECTIONAL ARROW(S) AS INDICATED)
↑	WALL MOUNTED EXIT SIGN (DIRECTIONAL ARROW(S) AS INDICATED)
⚡	BATTERY OPERATED EMERGENCY LIGHT FIXTURE
S	SINGLE-POLE TOGGLE SWITCH
S <sub>3</sub>	THREE-WAY TOGGLE SWITCH
⊙	PHOTOELECTRIC SWITCH
⊞	LIGHTING CONTACTOR
▭	SURFACE MOUNTED PANELBOARD - 277/480 VOLT / 120/208 VOLT
▭	FLUSH MOUNTED PANELBOARD - 277/480 VOLT / 120/208 VOLT
▭	DRY-TYPE TRANSFORMER - SEE SCHEDULE
⊞	ENCLOSED CIRCUIT BREAKER
⊞	NON FUSED DISCONNECT SWITCH-AMPS (FUSE SIZE)/POLES AS NOTED
⊞	FUSED DISCONNECT SWITCH-AMPS (FUSE SIZE)/POLES AS NOTED
⊞	COMBINATION MOTOR STARTER
⊞	MANUAL MOTOR STARTING SWITCH WITH OVERLOADS
⊞	CONTROL STATION - TYPE & MOUNTING AS NOTED
⊞	DUPLEX CONVENIENCE RECEPTACLE
⊞ WP	DUPLEX CONVENIENCE RECEPTACLE WITH WEATHERPROOF COVER
⊞	DUPLEX CONVENIENCE RECEPTACLE MOUNTED ABOVE FINISHED COUNTER.
⊞	SURFACE MOUNTED METAL RACEWAY
⊞ GFI	GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE
⊞ IG	ISOLATED GROUND RECEPTACLE
⊞ SS	SURGE SUPPRESSION RECEPTACLE
⊞ R	RANGE RECEPTACLE
⊞	ELECTRIC MOTOR - HORSEPOWER AS INDICATED ("F" INDICATES FRACTIONAL HP)
⊞	ELECTRIC DAMPER MOTOR
⊞	THERMOSTAT
⊞	GROUND ROD
⊞	GROUND ROD IN GROUNDING WELL
— C —	GROUNDING CONDUCTOR - INSTALLED AS NOTED
⊞	JUNCTION BOX WITH BLANK COVER - SIZE PER SPEC'S
—	HOMERUN CONDUIT - MIN 3/4" C
—	SHORT SLASHES INDICATE QTY OF *12 PHASE OR SWITCHING CONDUCTORS
—	LONG SLASHES INDICATE NEUTRAL CONDUCTORS - NO SLASHES INDICATE 2*12, 1*12 GRD, UON
---	CONDUIT EXPOSED ON CEILING OR WALL - MIN 2*12, 1*12G- 3/4" C
- - -	CONDUIT CONCEALED IN FLOOR OR UNDERGROUND - MIN 2*12, 1*12G- 3/4" C
---	CONDUIT CONCEALED IN CEILING OR WALL - MIN 2*12, 1*12G- 3/4" C
⊞	FLEXIBLE CONDUIT
⊞	CONDUIT TURNING UP/DOWN
⊞	WIRE & CONDUIT INDICATOR - SEE SCHEDULE
⊞	PRESSURE SWITCH
⊞	FLOW SWITCH
⊞	FIRE ALARM CONTROL PANEL
⊞	SMOKE DETECTOR
⊞	ALARM HORN (F INDICATES FOR FACP, S INDICATES FOR SCADA)
— T —	TELEPHONE CONDUIT (INSTALLATION METHOD AS INDICATED)
◀	TELEPHONE OUTLET
◀ W	WALL MOUNTED TELEPHONE OUTLET - MOUNTED 54" AFF UON
— TTB	TELEPHONE TERMINAL BACKBOARD
TTG / TTC	TELEPHONE TERMINAL CABINET - FLUSH/SURFACE MOUNTED
◁	VOICE/DATA OUTLET
⊞	NOTE INDICATOR

ABBREVIATIONS	
AFC	ABOVE FINISHED COUNTERTOP OR LAVATORY
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ATS	AUTOMATIC TRANSFER SWITCH
C	CONDUIT
E	EXISTING
EF	EXHAUST FAN
ER	EXISTING TO BE REPLACED
EUH	ELECTRIC UNIT HEATER
EWB	ELECTRIC WATER HEATER
FAR	FUSE AS REQUIRED
G	GENERATOR
G/GRD	GROUND
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GUH	GAS UNIT HEATER
HD	HEAVY DUTY
L	LOUVER
LC	LIGHTING CONTACTOR
MTD	MOUNTED
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP.	TYPICAL
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTABLE POWER SUPPLY
WP	WEATHERPROOF
XFMR	TRANSFORMER

LIGHT FIXTURE SCHEDULE					
TYPE	MFGR	CATALOG NO.	LAMPS (QUANT./TYPE)	MOUNTING (METHOD/TYPE)	REMARKS (DESCRIPTION/ACCESSORIES)
A	WILLIAMS	93-4-2320C-A-SS-SSMB	2-F32T8CW	SURFACE/CHAIN	FIXTURE SHALL BE PROVIDED FOR 277 OPERATION. WHERE NOTED, PROVIDE FOR 120 VOLT OPERATION
		VBY			
B	CROUSE-HINDS	DMV-M3A175GP	1-175W MH	SURFACE	
C	McGRAW-EDISON	WLMH1021-277V	1-100W MH	SURFACE	WALL MOUNTED 11'-0" A.F.F.
D	PHEONIX	DLX-50N	1-50W HPS	ARM	
E	GE	P17M-15-M-4-H-I-L-M55-GR-U	1-150W MH	10' POLE	MATCH POLE CONSTRUCTION OF TYPE F LIGHT FIXTURE
F	GE	(2) P17M-17-M-4-H-I-L-MN5-GR-U	1-175W MH EACH FIXTURE	25' POLE	MOUNT ON GE POLE • ARTA25PB06.0BSNE W/FBAPB2TT BRACKET
G	WILLIAMS	50G-S24-3320C-FWKA125-(2)-E3320C-277	3 - F32T8SP35	RECESSED	2 X 4 - 3 LAMP TROFFER
H	WILLIAMS	50G-S24-2320C-FWKA125-(2)-E2320C-120	2 - F32T8SP35	RECESSED	2 X 4 - 2 LAMP TROFFER
J	WILLIAMS	50G-S22-2310CUW-FWKA125-(2)-E2310CUW-120	2 - F32T8U-SP35	RECESSED	2 X 2 - 2 LAMP TROFFER
K	PEACHTREE	PTC-7-PCC7100	1-150W/PAR 38 HALOGEN	RECESSED	RECESSED DOWNLIGHT W/HALOGEN LAMP
L	McGRAW-EDISON	MHMN50-277	1-50W MH	SURFACE	WALL MOUNTED 8'-0" AFF
M	ASL CORP.	FMC-Q13-277V	1-PL13	SURFACE	
N	McGRAW-EDISON	WL2521 277 BZ	1-250W MH	SURFACE	WALL MOUNTED 11'-0" AFF
P	LIGHTGUARD	N4X6L18-2H76	FURNISHED	SURFACE	EMERGENCY LIGHT W/ BATTERY BACKUP
R	SPERO	516-68-3/4-50HPS-277 42PR-642 3/4-BCC-ST3L 3/4	1-50W HPS	PENDANT	PENDANT MOUNTED HID PENDANT PAINTED TO MATCH FIXTURE
S	PHOENIX	SLX70MH-GN 120 VOLT	1-70W METAL HALIDE	SURFACE	120 VOLT RATED, WITH FLEXIBLE CABLE RATED FOR INSTALLATION.
T	EXIDE	LTC125XX-2V 120 VOLT EMERGENCY		WALL	EMERGENCY LIGHT RATED FOR 120 VOLT OPERATION, WITH OFF DELAY

**LIGHT FIXTURE SCHEDULE NOTES:**  
 LUMARK, COOPER AND APPLETON ARE APPROVED MANUFACTURERS OF EQUAL LIGHT FIXTURES.

**LIGHT FIXTURE ACCESSORIES ABBREVIATIONS:**

CH	CHAIN HUNG	LG	LOUVER GUARD	RFI	RADIO FREQUENCY INTERFERENCE FILTERED
CO	CONVENIENCE OUTLET	PE	PHOTO-ELECTRIC-CELL	SC	SAFETY CHAIN
CS	CORD SET-LENGTH AS REQ'D.	MB	MOUNTING BRACKET	TP	TAMPER PROOF
EM	EMERGENCY BALLAST/LIGHT FUSED	PH	POWER HOOK	UM	UNIVERSAL MOUNTING
F	FUSED	PM	PENDANT MTD.	VR	VANDAL RESISTANT
HCP	HOOKED CORD & PLUG	Q	QUARTZ RESTRIKE	WG	WIRE GUARD
HPF	HIGH POWER FACTOR	RB	REMOTE BALLAST	WL	WET LOCATION
NL	NIGHT LIGHT CIRCUIT	SW	SWITCH INCLUDED		
CWB	COLD WEATHER BALLAST				

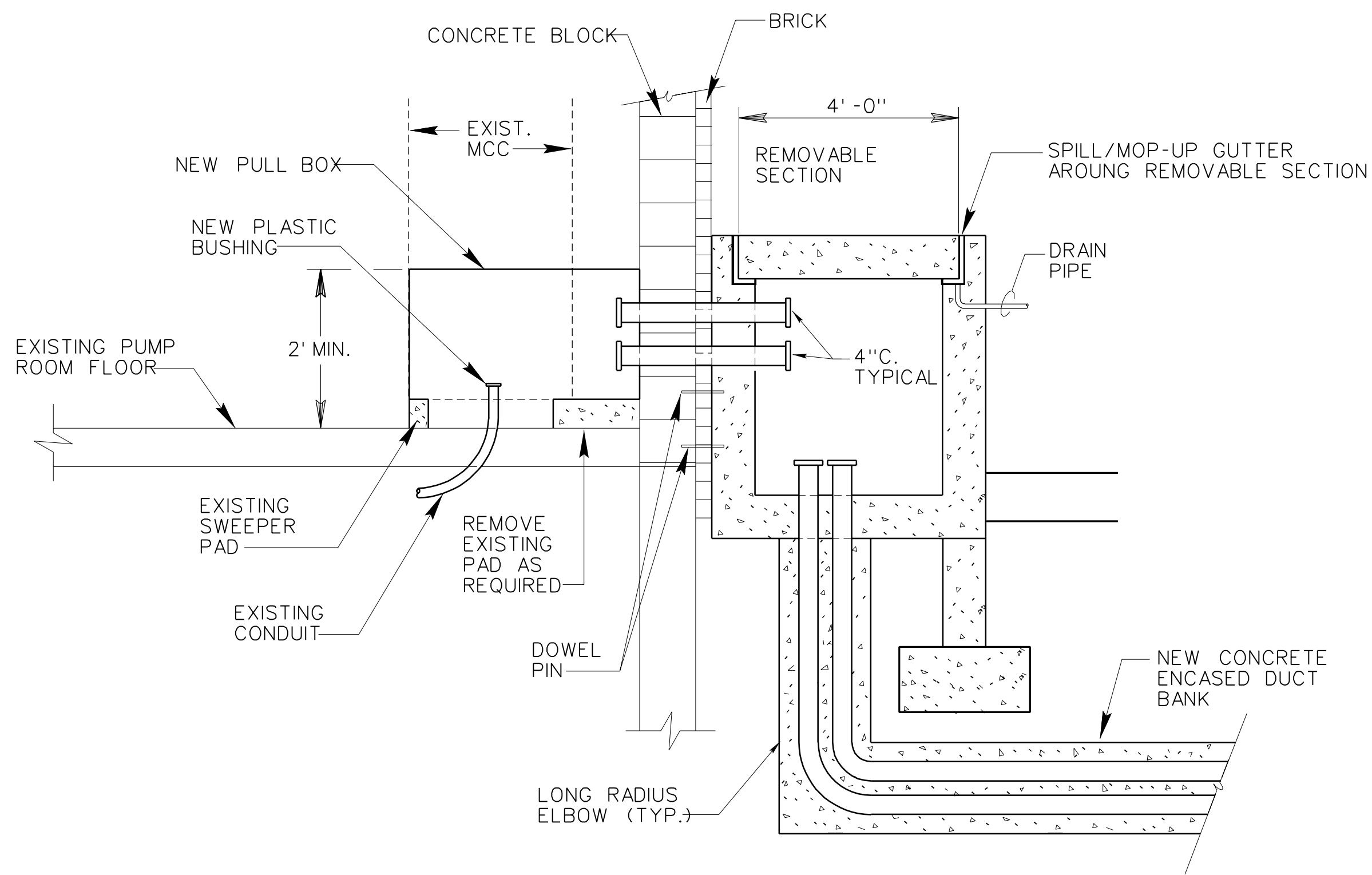
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ELECTRICAL SCHEDULES AND LEGENDS  
 CITY OF JOHNSON CITY  
 WATAUGA WATER TREATMENT PLANT  
 1998 EXPANSION AND IMPROVEMENTS

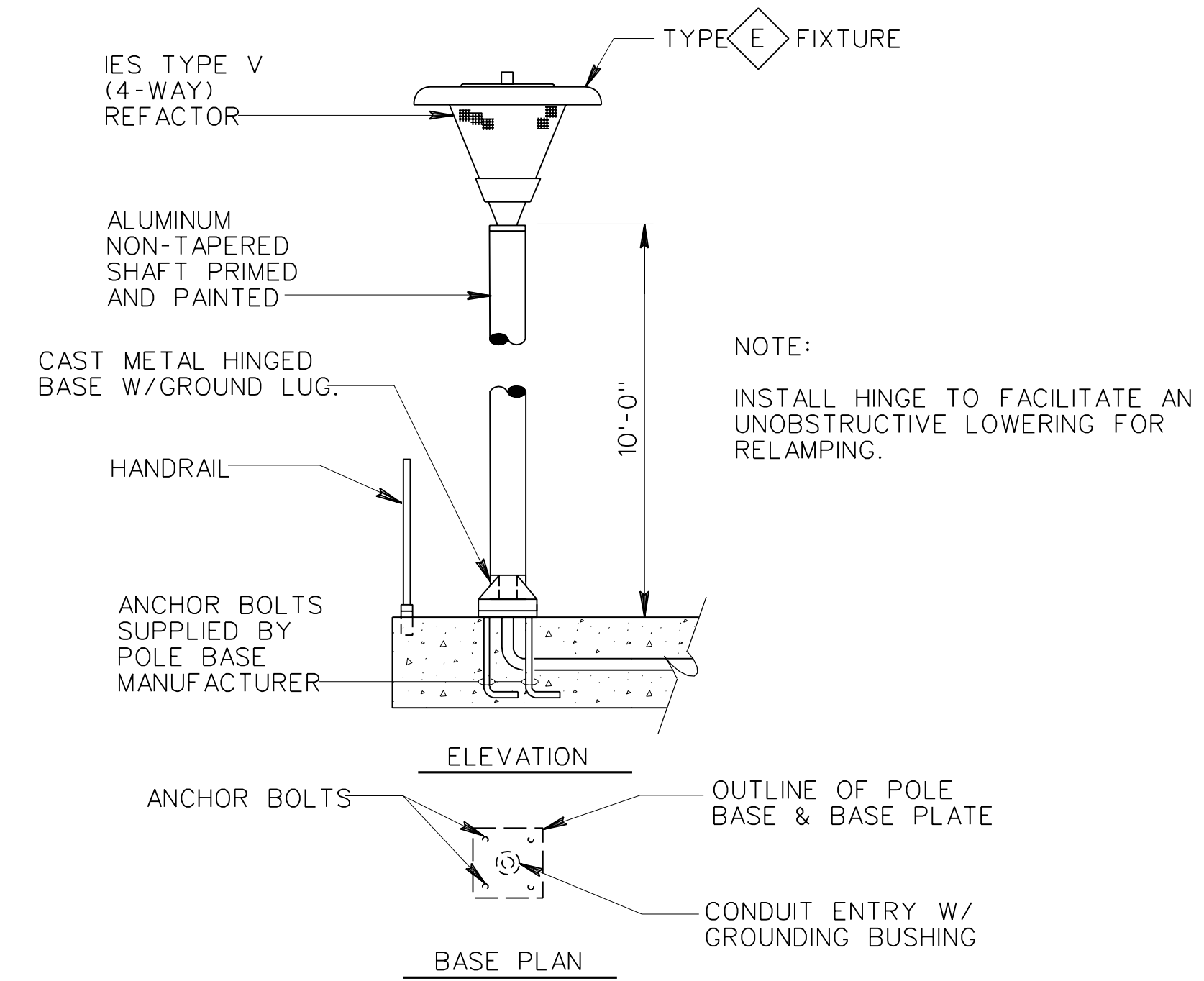
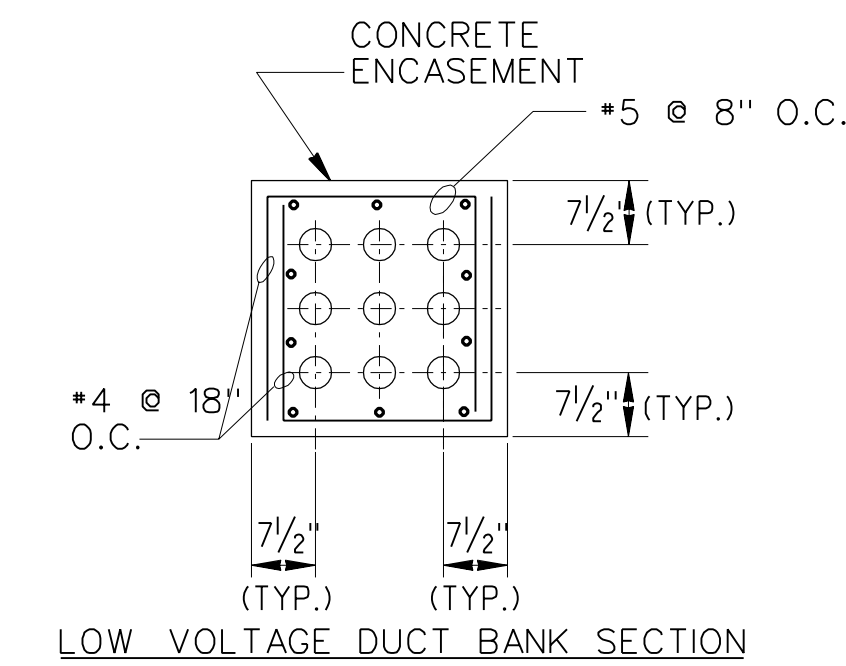
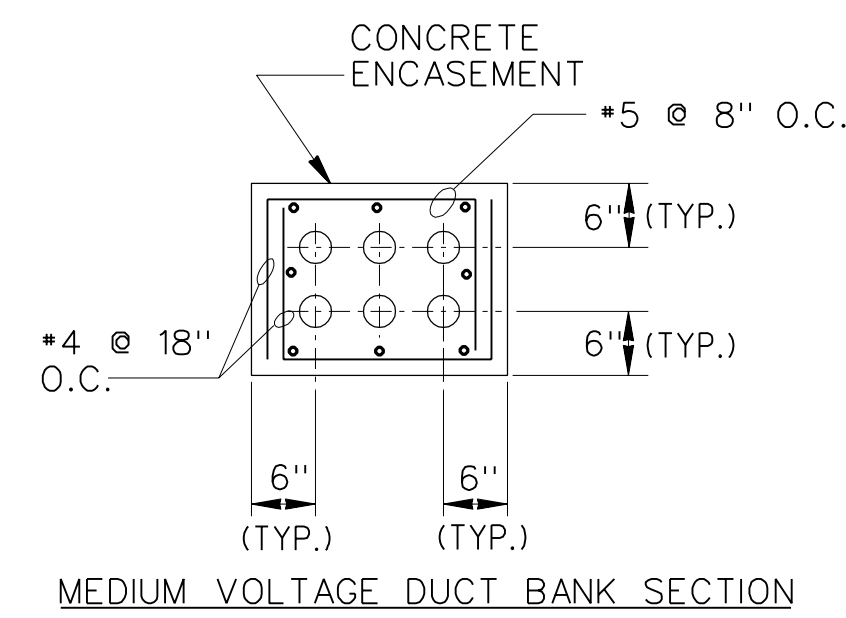
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RWB	DLH	05-23-03	RECORD DRAWINGS

RECORD DRAWING  
05/23/03

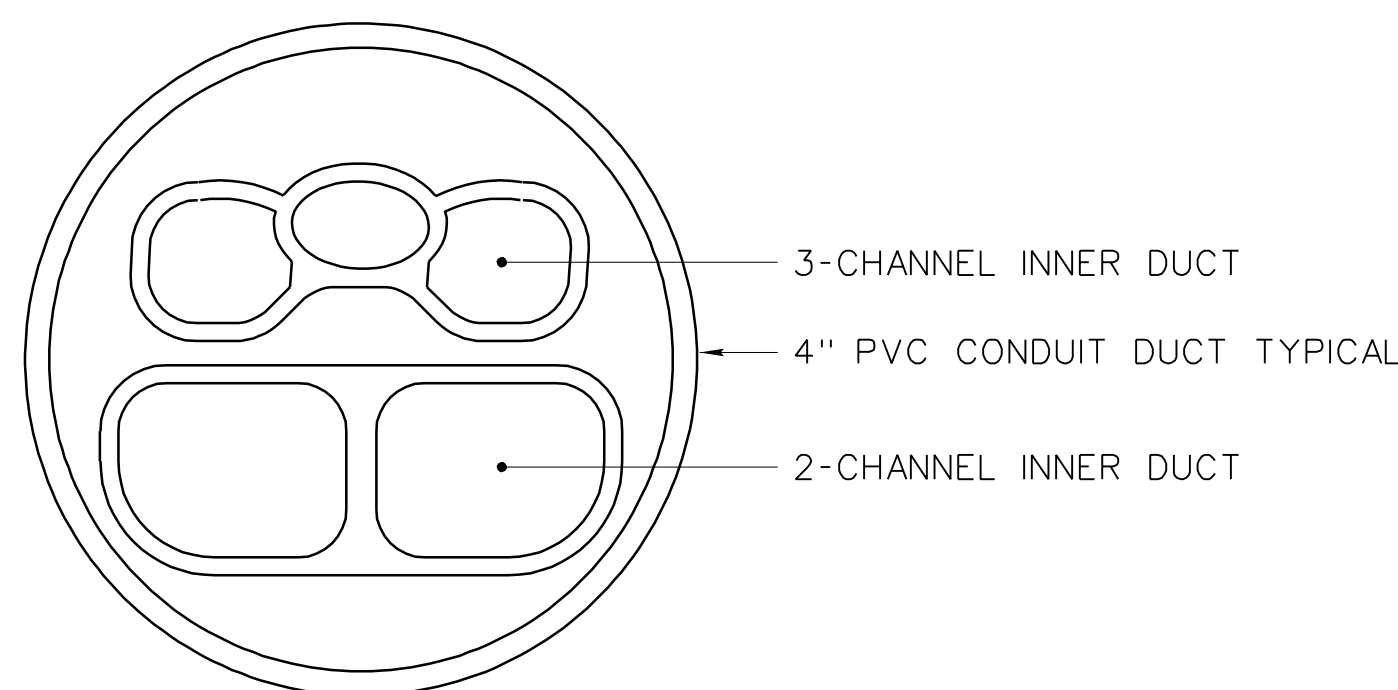
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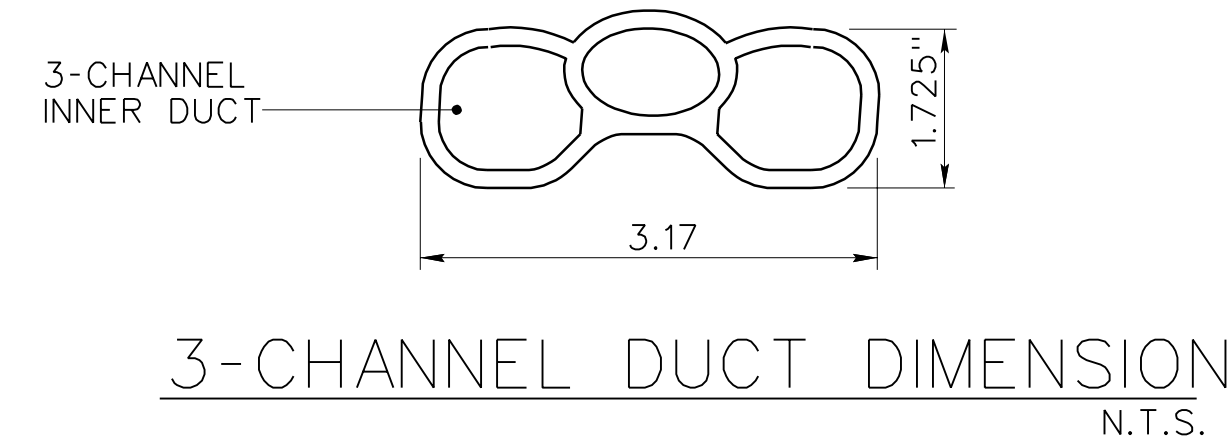
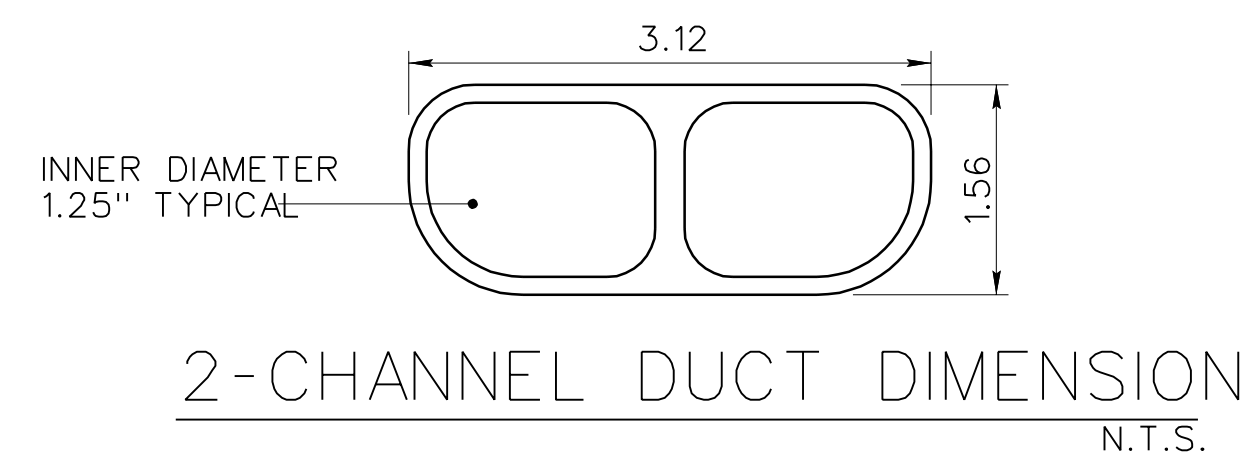
SECTION AT MEDIUM AND LOW VOLTAGE CABLE ENTRANCE  
SCALE 1/2" = 1'-0"



LIGHT FIXTURE DETAIL FOR CONCRETE WALKWAY MOUNTING  
N.T.S.



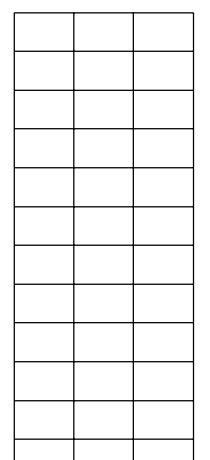
SECTION OF 4" CONDUIT WITH INNER DUCT AND INNER DUCT CONFIGURATION  
N.T.S.

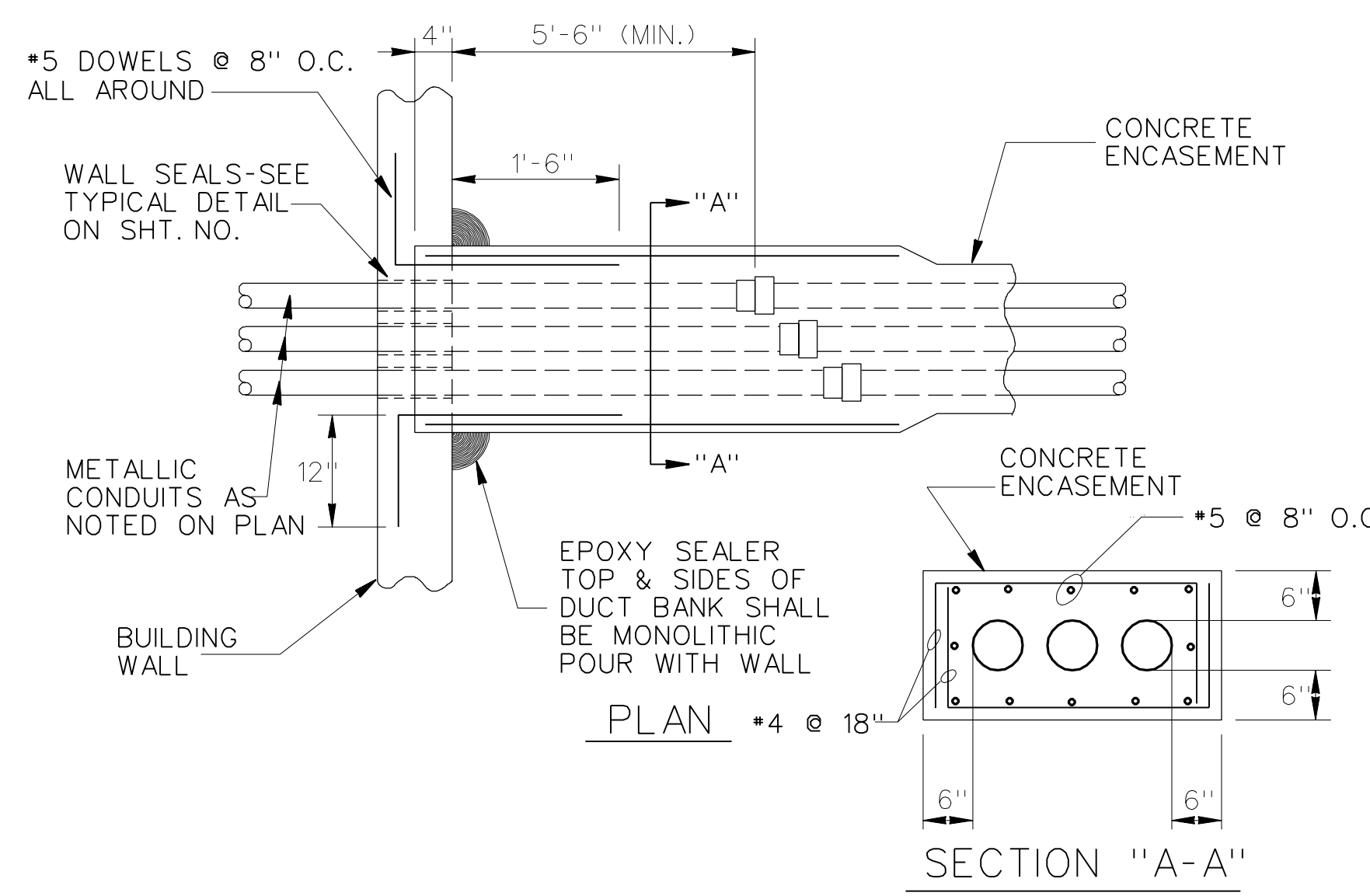


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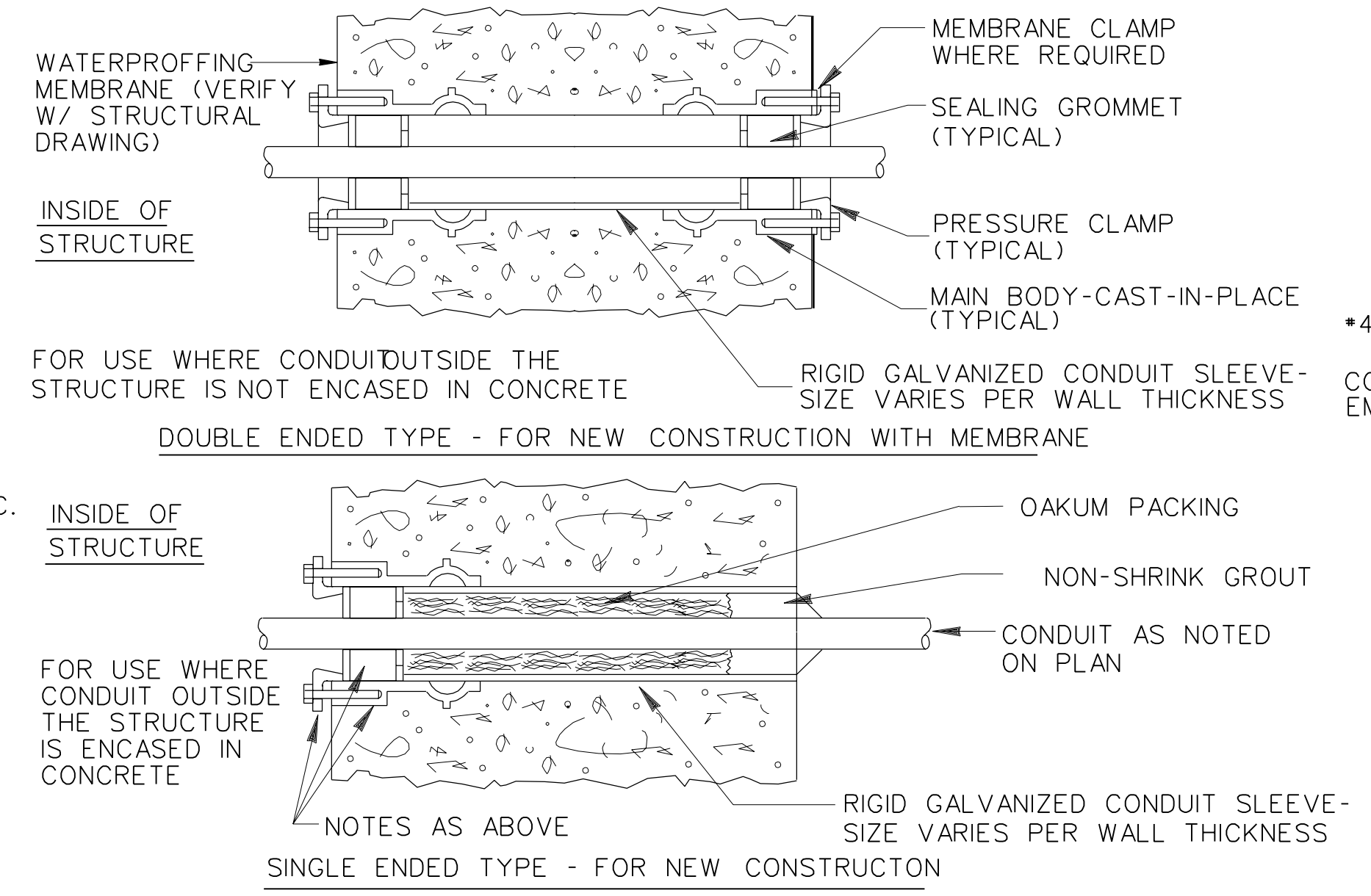
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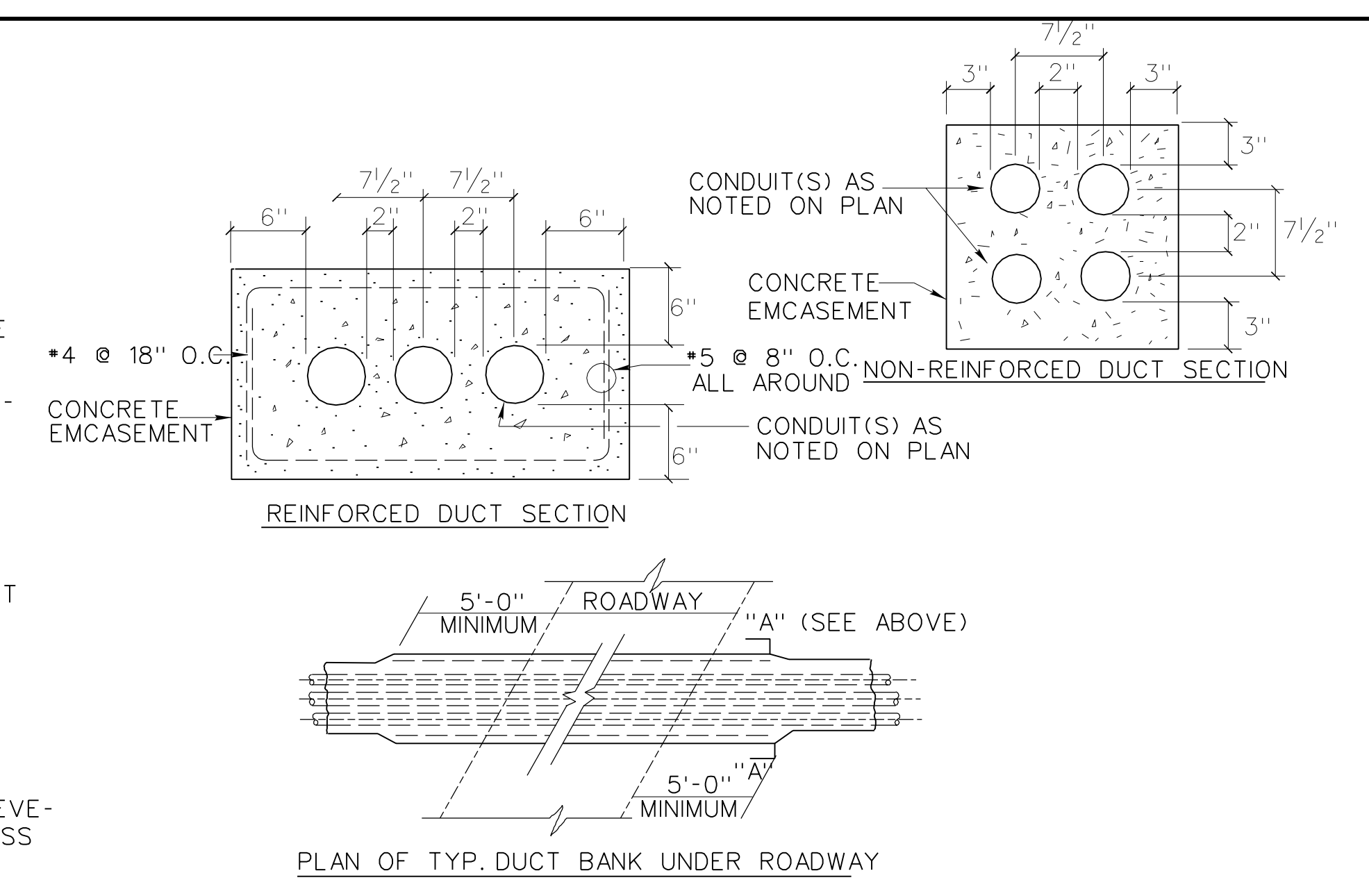




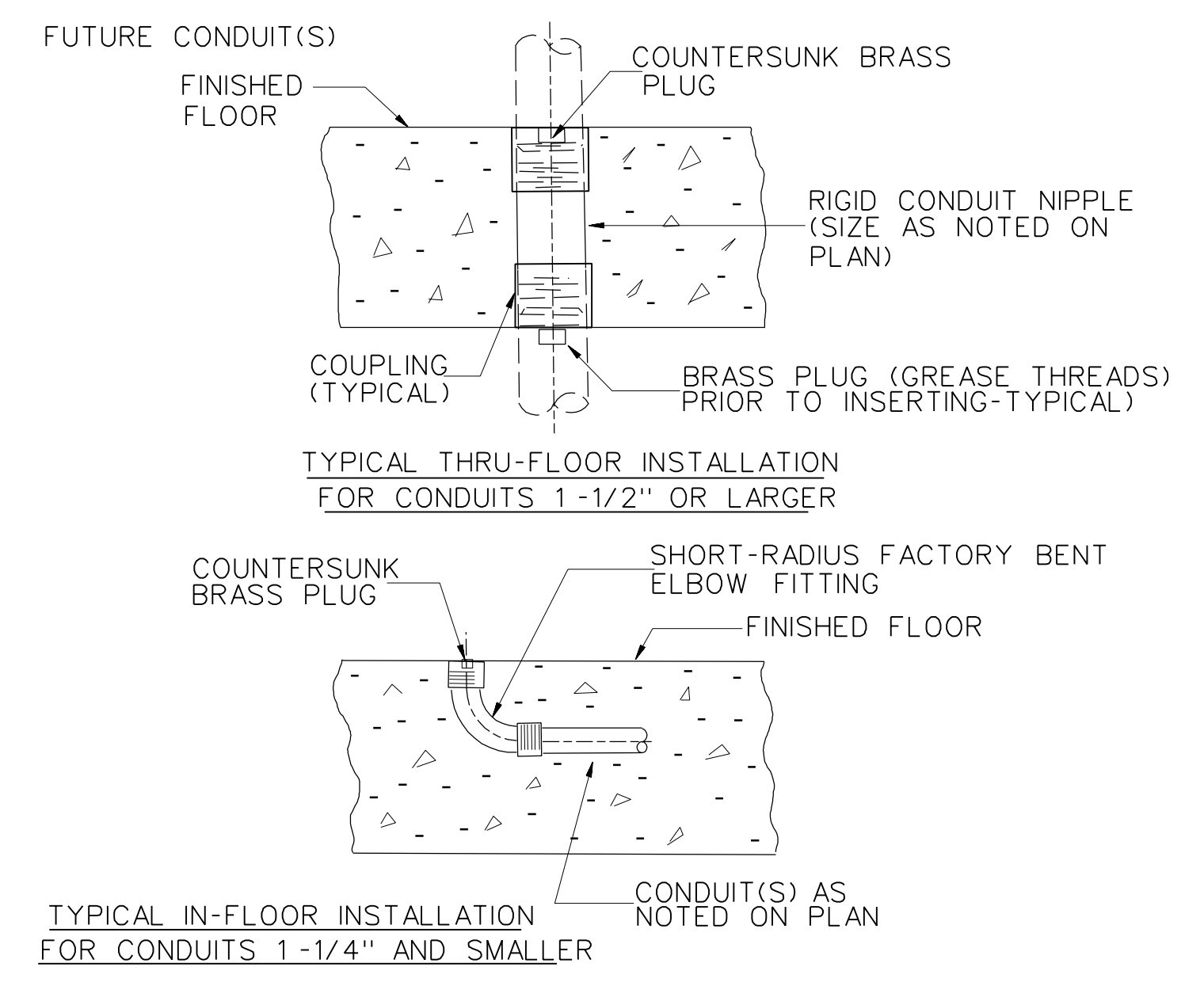
DETAIL - UNDERGROUND DUCT BANK ENTRANCE AT BUILDING WALL  
N.T.S.



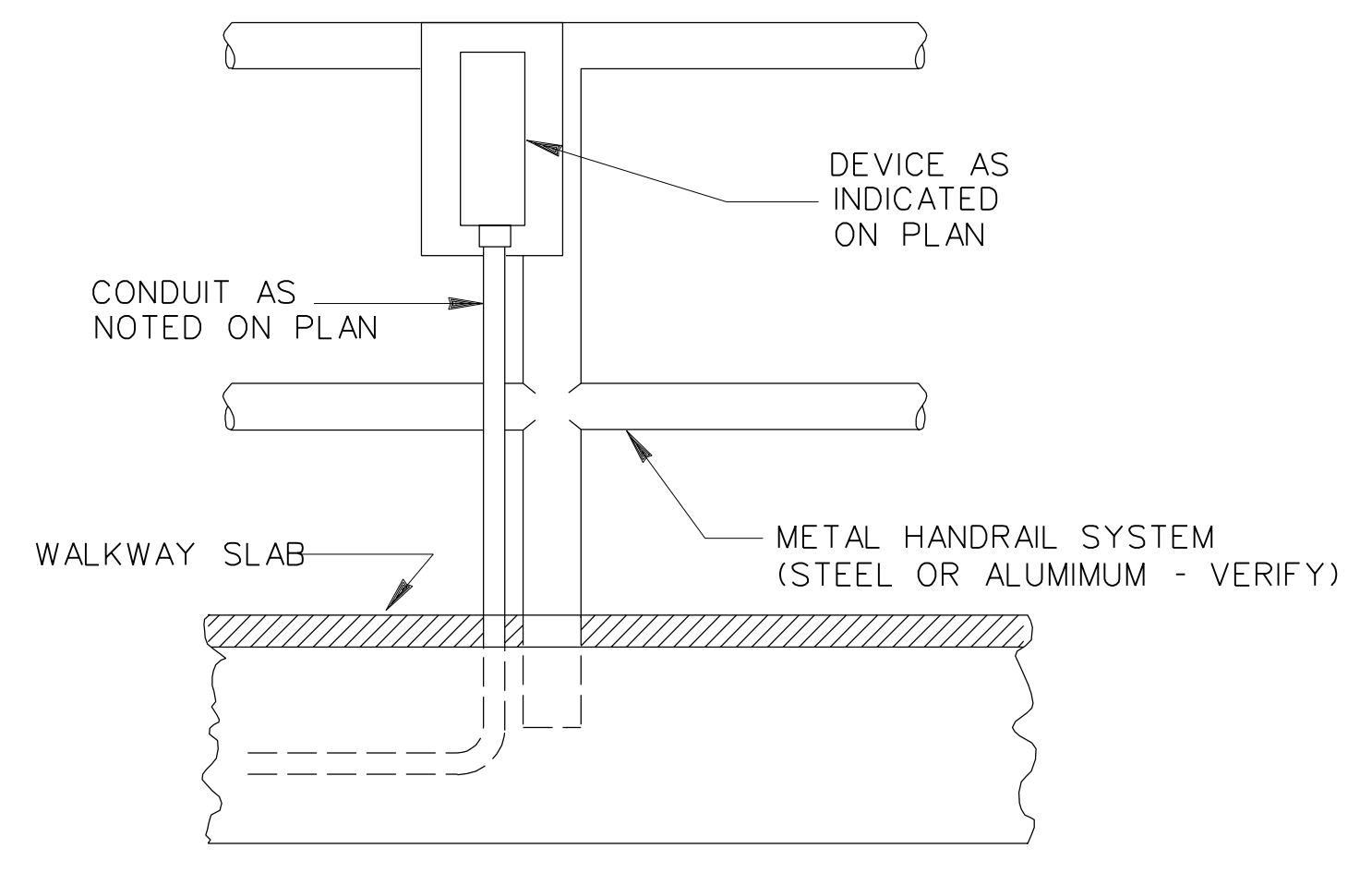
DETAIL - TYPICAL CONDUIT SEAL  
N.T.S.



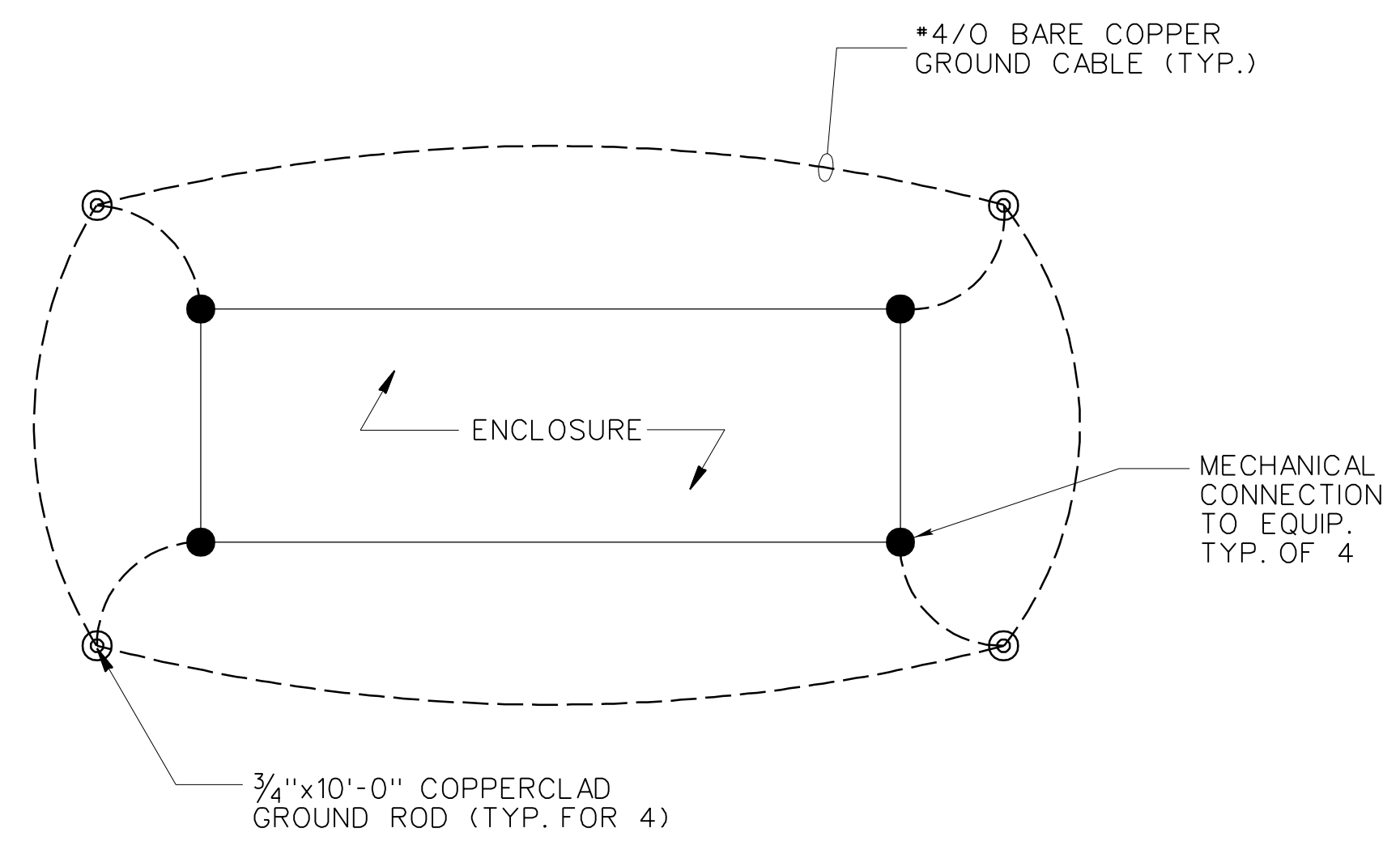
DETAIL - TYPICAL UNDERGROUND CONCRETE ENCASED DUCTBANK INSTALLATION  
N.T.S.



DETAIL - TYPICAL CONDUIT TERMINATION AT FUTURE EQUIPMENT LOCATION  
N.T.S.



DETAIL - TYPICAL INSTALLATION OF EQUIPMENT ON METAL PIPE HANDRAIL  
N.T.S.



DETAIL - TYPICAL ENCLOSURE GROUNDING  
N.T.S.

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ELECTRICAL DETAILS

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RECORD DRAWING  
05/23/03

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