

WASTEWATER TREATMENT PLANT SLUDGE HANDLING IMPROVEMENTS VILLAGE OF OAK HARBOR OTTAWA COUNTY, OHIO 1999

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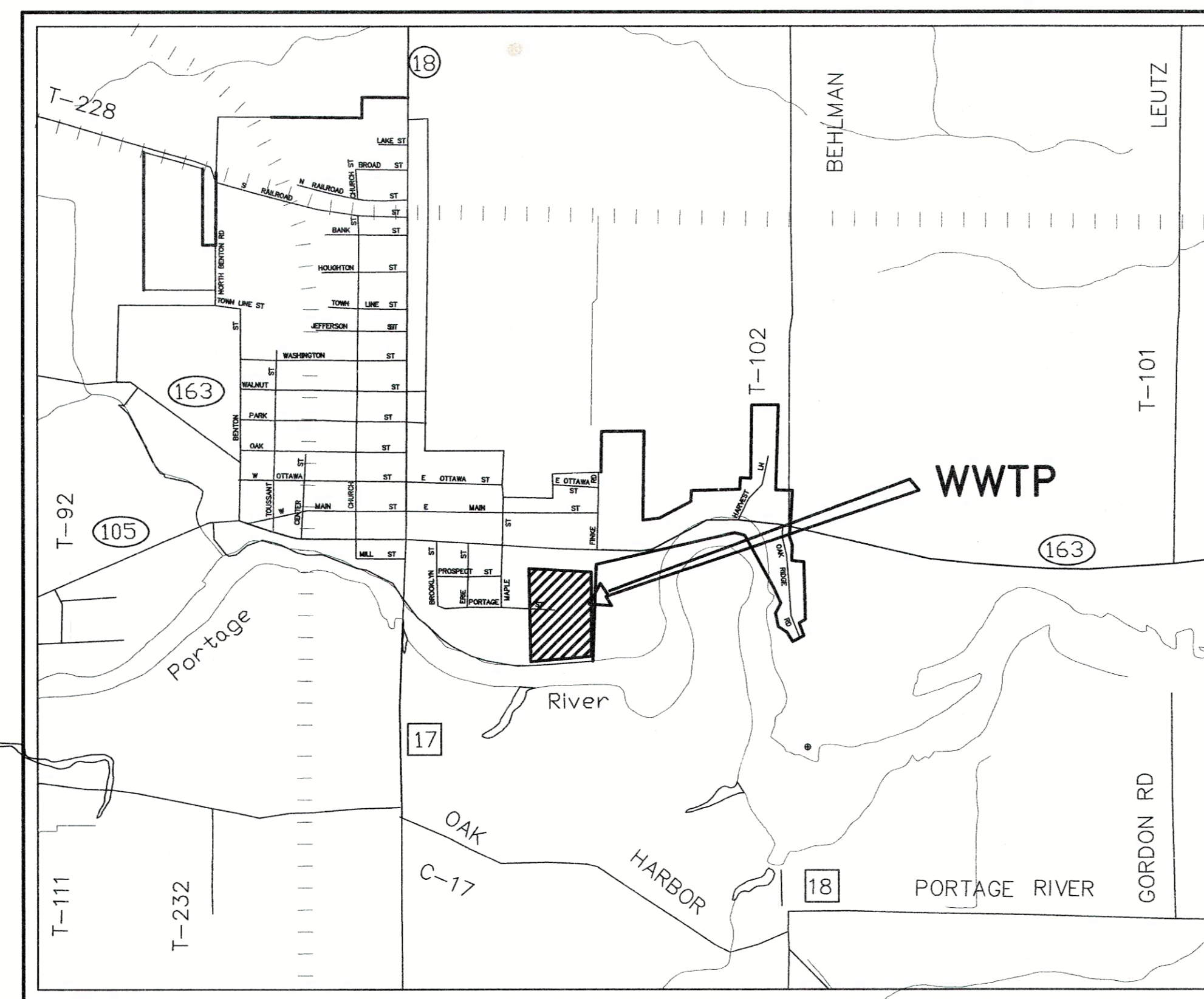
DESIGN ENGINEERS



MICHAEL ATHERINE, JR. P.E. - 43597 DATE _____



STEVEN ROBERT WONDERLY P.E. - 45621 DATE _____



SITE MAP

N.T.S.

APPROVALS

APPROVED *Paul Gault* DATE 1-28-99
VILLAGE ADMINISTRATOR

Melissa
Your Copy

POGGEMEYER DESIGN GROUP, INC.
ARCHITECTS ENGINEERS PLANNERS
1168 NORTH MAIN STREET BOWLING GREEN, OHIO 43402
(419) 352-7537



SET NO.

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ISSUANCE

DATE	DESCRIPTION

REVISION

DATE	DESCRIPTION

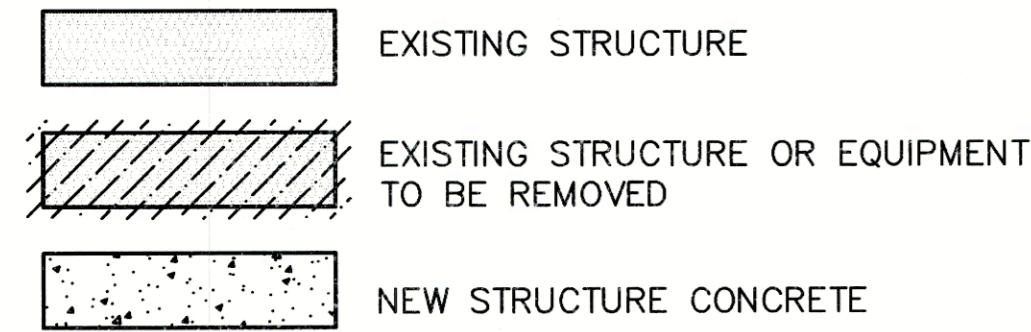
**WWTP
SLUDGE HANDLING
IMPROVEMENTS
VILLAGE OF
OAK HARBOR
OTTAWA COUNTY
OHIO**

PDG NO. 1590-058

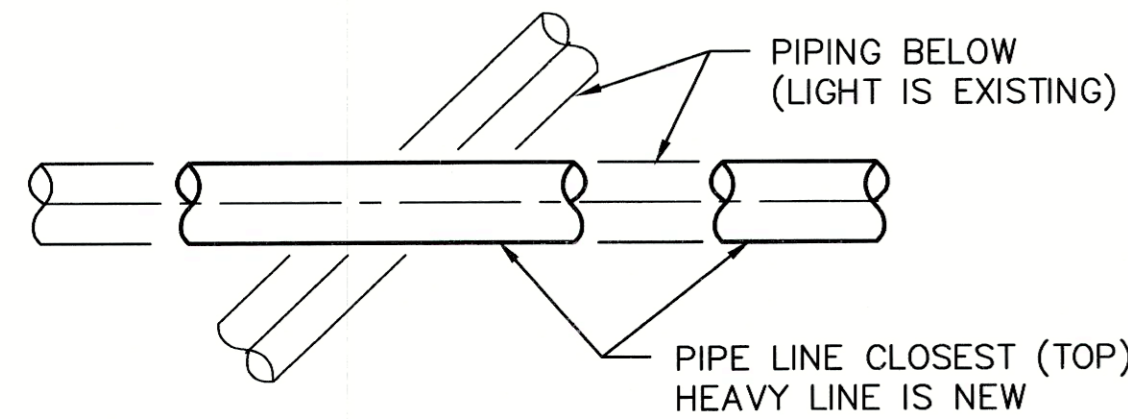
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BUILDING LEGEND

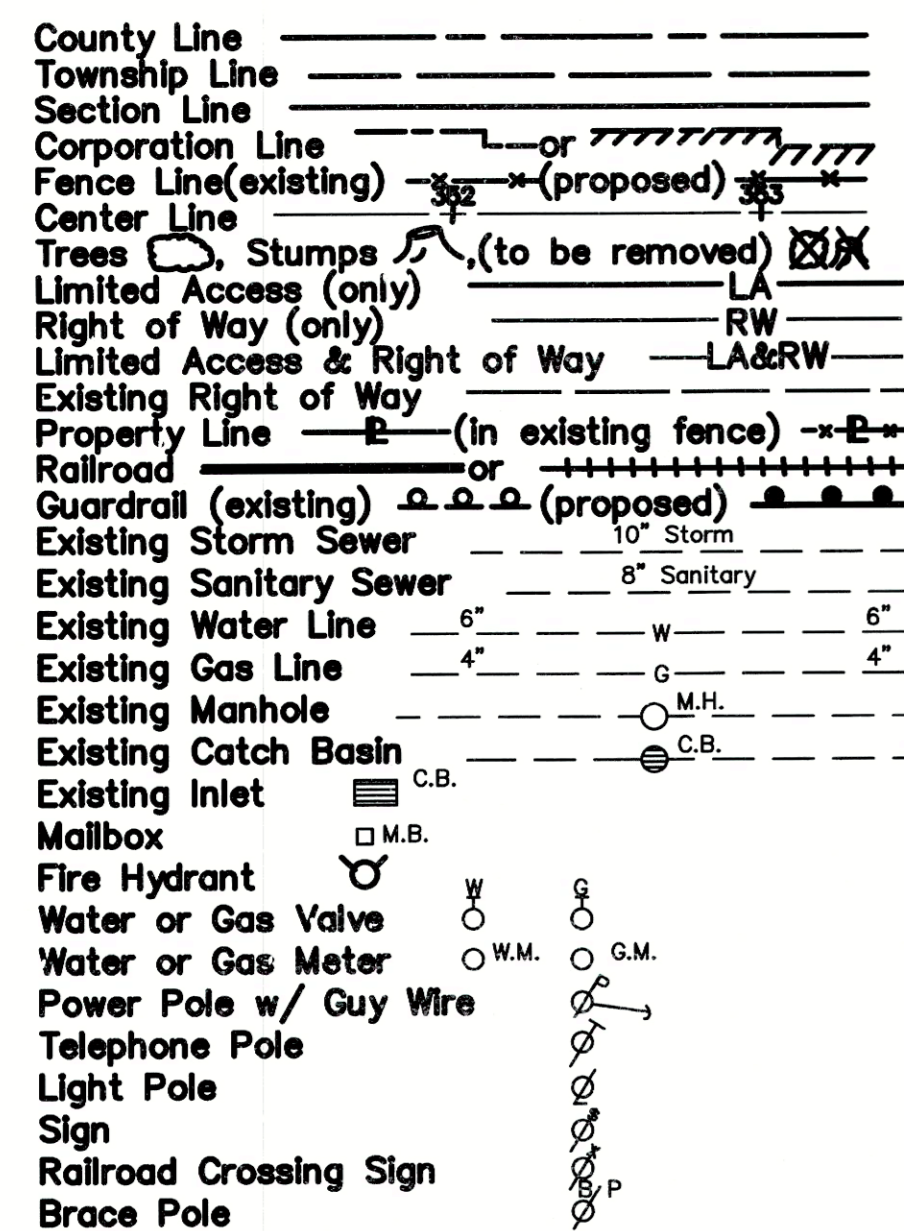


PIPING LEGEND



NEW PIPING AND EQUIPMENT UNDER CONTRACT LABEL "NEW" UNLESS OTHERWISE NOTED.

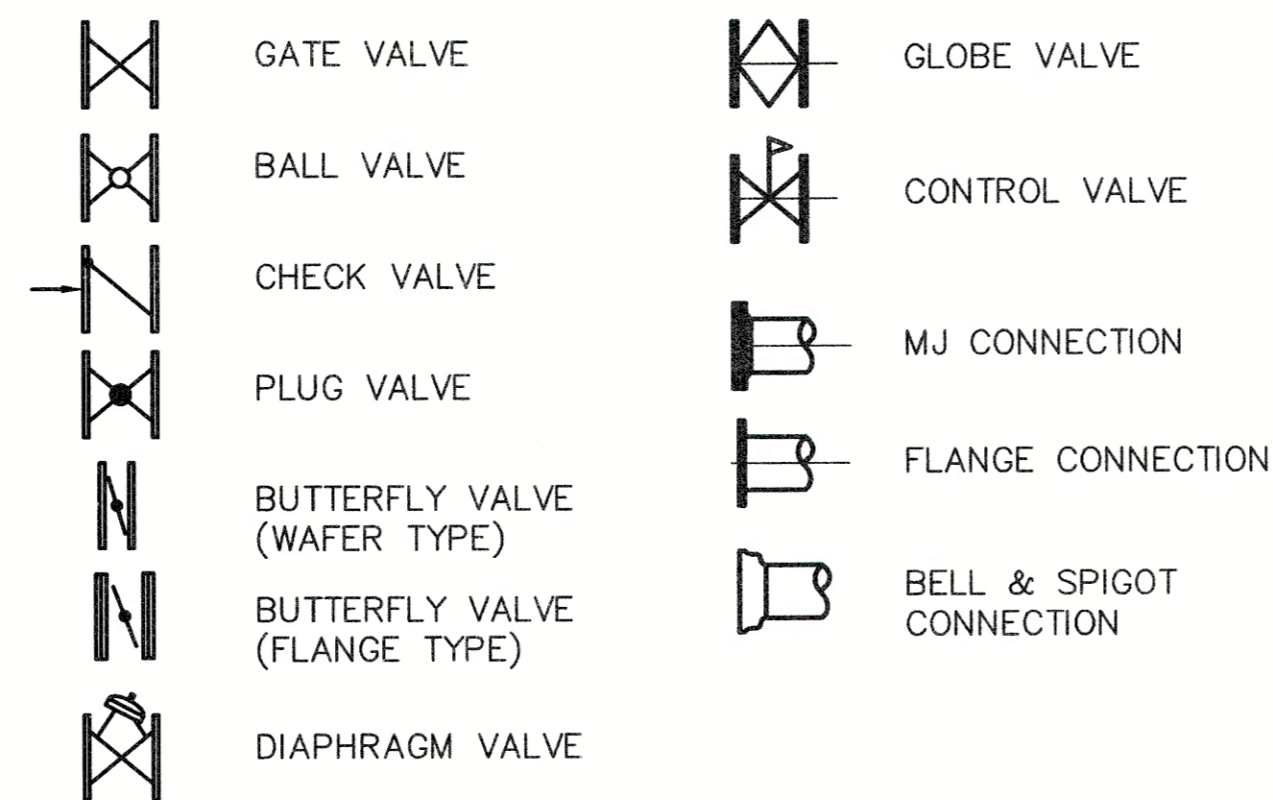
TOPOGRAPHY LEGEND



PROJECT GENERAL NOTE:

- 1.) CONTRACTOR TO VERIFY ALL DIMENSIONS, ELEVATIONS, TYPE OF CONNECTIONS, MATERIALS, MECHANICAL AND ELECTRICAL INTERFACING PRIOR TO CONSTRUCTION.
- 2.) ALL PIPING SHALL BE SUPPORTED PER SPECIFICATIONS.
- 3.) DUCTILE IRON PIPE (PRESSURE LINE) BELOW SLABS SHALL HAVE RATAINER GLANDS UNLESS OTHERWISE NOTED.
- 4.) CONTRACTOR TO COORDINATE AND APPLY STANDARD MISCELLANEOUS DETAILS AS REQUIRED.
- 5.) ALL PIPE INSTALLATIONS THRU EXISTING STRUCTURES SHALL BY DONE USING A LINK-SEAL ASSEMBLY OR EQUAL. IN SURFACES EXPOSED TO WATER CONTRACTOR TO GROUT SMOOTH W/ NONE-SHRINK GROUT CAVITY AT L-SEAL

VALVE SYMBOL LEGEND



- NOTE 1.) VALVE DESIGNATION AND TYPE APPLIES TO SCALE DRAWINGS ONLY. SCHEMATIC DIAGRAMS DO NOT REPRESENT ALL TYPES.
- 2.) PROVIDE GEARED AND HANDWHEEL ACTUATOR FOR VALVES 6" AND LARGER UNLESS OTHERWISE NOTED. PROVIDE CHAIN WHEEL ON VALVES HIGHER THAN SIX (6) FEET.

PIPING ABBREVIATIONS

MATERIAL

BSP	BLACK STEEL PIPE
CMP	CORRUGATED METAL PIPE
CPP	CONCRETE PRESSURE PIPE (PRESTRESSED)
CPVC	CHLORINATED POLYVINYL CHLORIDE PIPE
Cu	COPPER TUBING OR PIPING
DI	DUCTILE IRON PIPE
GS	GALVANIZED STEEL PIPE
CP	CONCRETE PIPE (PLAIN)
PVC	POLYVINYL CHLORIDE PIPE
ST	STEEL PIPE
S,ST	STAINLESS STEEL PIPE
PE	POLYETHYLENE
FRP	FIBERGLASS REINFORCED POLYESTER

SERVICE

NG	NATURAL GAS
CW	CITY WATER
HW	HOT CITY WATER
NPW	PLANT WATER (NON-DRINKABLE)
PW	POTABLE WATER
CA	COMPRESSED AIR
SS	SANITARY SEWER
RW	RAW WATER
DW	DIGESTED WATER

INDEX OF DRAWINGS

SHEET NO.	DESCRIPTION
1.	COVER SHEET
2.	INDEX AND LEGENDS
3.	SITE PLAN
4.	SITE GRADING AND ROAD PLAN
5.	DIGESTER SYSTEM REMOVALS - PLANS AND SECTIONS
6.	SLUDGE DRYING BEDS REMOVALS - PLAN
7.	DIGESTER SYSTEM RENOVATION - PLANS
8.	DIGESTER SYSTEM RENOVATION - SECTIONS
9.	SLUDGE HOLDING TANK - DETAILS
10.	SLUDGE STORAGE BUILDING RENOVATION - FOUNDATION PLAN
11.	SLUDGE STORAGE BUILDING RENOVATION - FLOOR PLAN
12.	SLUDGE STORAGE BUILDING - SECTIONS AND DETAILS
13.	ARCHITECTURAL DETAILS AND SCHEDULES
14.	SLUDGE AND AIR SYSTEMS SCHEMATIC DIAGRAM
15.	STRUCTURAL DETAILS AND GENERAL NOTES
16.	MISCELLANEOUS DETAILS
17.	TRENCH AND PIPING DETAILS
M1	SLUDGE STORAGE BUILDING
M2	LEGENDS, DETAILS AND SPECIFICATIONS
E1	ELECTRICAL SITE PLAN
E2	ELECTRICAL SYMBOL LEGEND AND SCHEDULES
E3	DIGESTER BUILDING AND TANKS
E4	SLUDGE STORAGE BUILDING

AS BUILT CERTIFICATION

ALL UTILITIES, PAVEMENT, AND OTHER WORK ON THIS PROJECT HAVE BEEN COMPLETED IN CONFORMITY TO THE PLANS, APPROVED BY:

VILLAGE OF OAK HARBOR, OHIO _____

 CONTRACTOR DATE

UNDERGROUND UTILITIES
 TWO WORKING DAYS
BEFORE YOU DIG
 Call 800-362-2764 (Toll Free)
 OHIO UTILITIES PROTECTION SERVICE
 NON-MEMBERS
 MUST BE CALLED DIRECTLY



RECORD DRAWING



POGEMEYER DESIGN GROUP, INC.
 ARCHITECTS ENGINEERS PLANNERS
 1168 NORTH MAIN STREET
 BOWLING GREEN, OHIO 43402
 (419) 352-7537

**WASTEWATER TREATMENT PLANT
 SLUDGE HANDLING IMPROVEMENTS
 VILLAGE OF OAK HARBOR, OHIO**

**LEGEND
 AND
 INDEX**

DRAWN BY CHECKED BY
 W.M.V. S.R.W.

REVISION

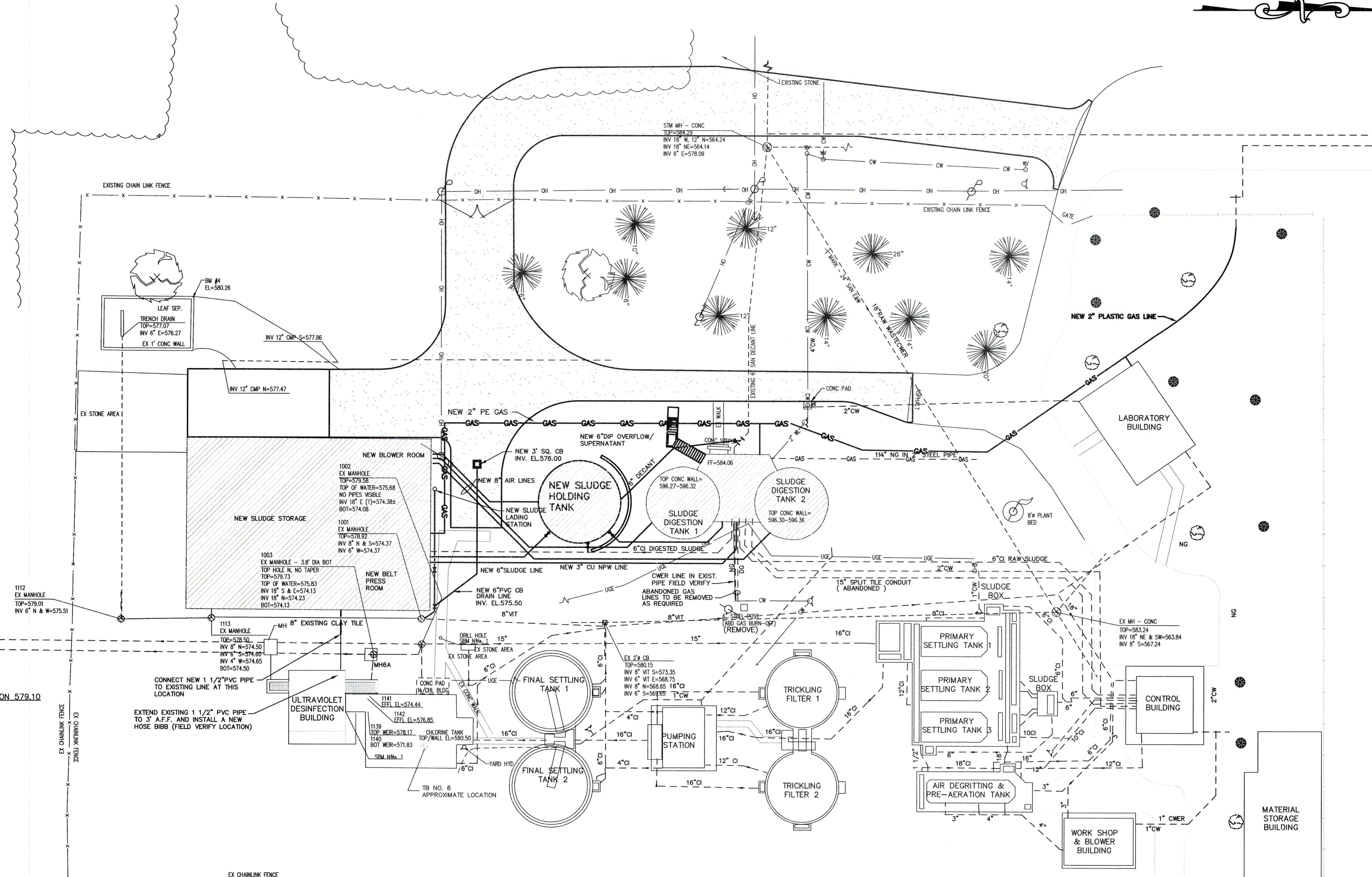
2
 OF
 22
 JOB NUMBER
 1590-066

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I:\1590\066\ENV\15906603.DWG 6-20-00 7:28:23 am EST

PORTAGE RIVER (HIGH WATER LEVEL EL.576.00)

100 YEAR FLOOD ELEVATION 579.10



SITE BENCHMARK No. 1 TOP OF WALL @ SOUTHERN MOST SOUTHEAST CORNER OF CHLORINE TANK ELEVATION=580.50	SITE BENCHMARK No. 2 DRILL HOLE IN CONCRETE WALK (CONTROL POINT No. 31) ELEVATION=579.23
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SITE PLAN
SCALE 1" = 20'

INDICATES WORK AREA UNDER THIS CONTRACT

RECORD DRAWING



DRAWN BY: DISIGNED BY:
W.M.V. S.R.W.
REVISION: 6-19-00, JAB
RECORD DRAWING
3 of 22
JOB NUMBER: 1590-066

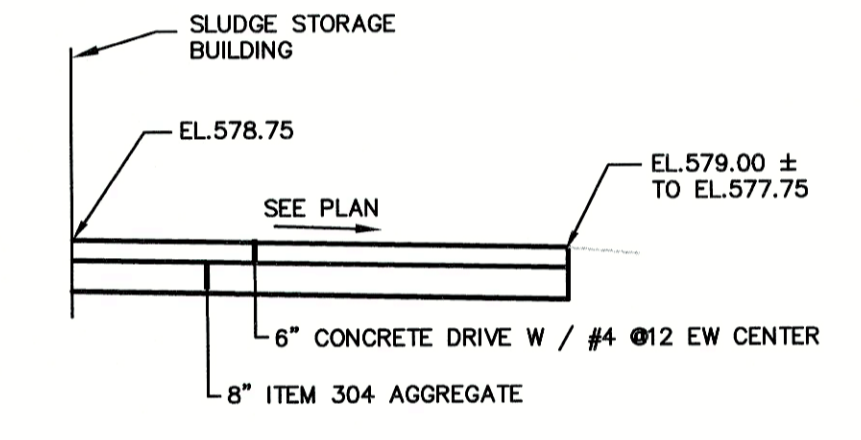
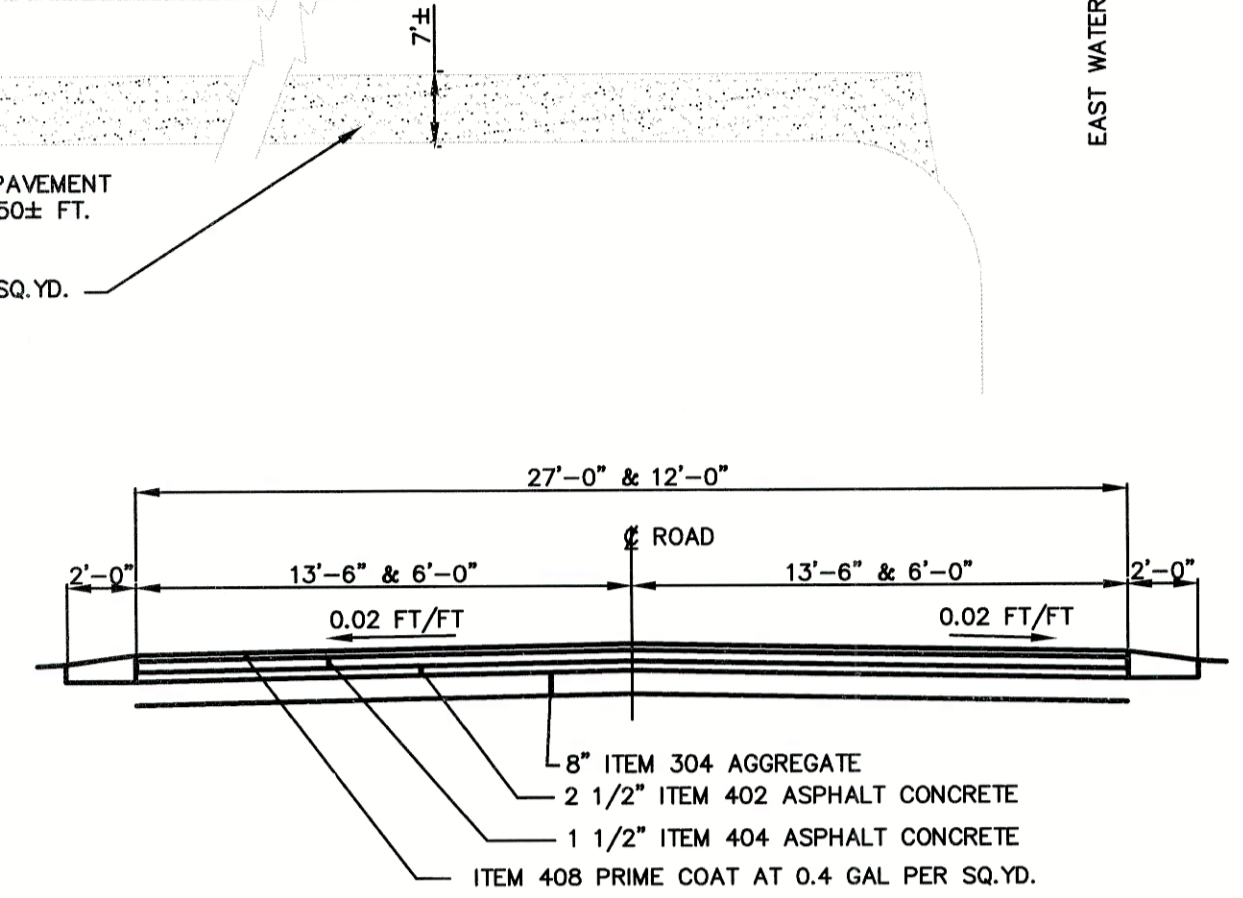
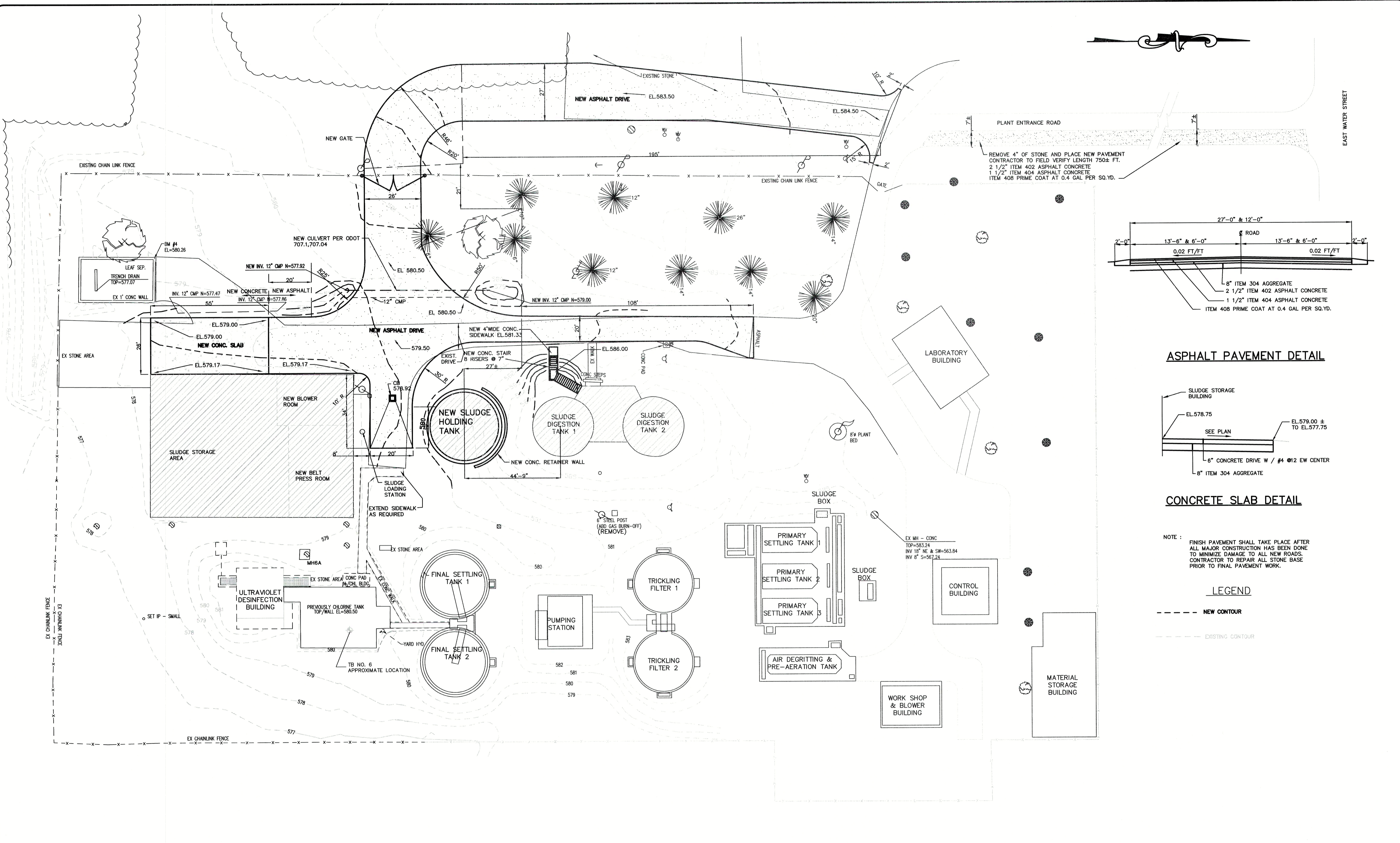
**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

SITE PLAN

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PLANNERS
ARCHITECTS ENGINEERS
1168 NORTH MAIN STREET
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NOTE :
 FINISH PAVEMENT SHALL TAKE PLACE AFTER ALL MAJOR CONSTRUCTION HAS BEEN DONE TO MINIMIZE DAMAGE TO ALL NEW ROADS. CONTRACTOR TO REPAIR ALL STONE BASE PRIOR TO FINAL PAVEMENT WORK.

LEGEND
 - - - - - NEW CONTOUR
 - - - - - EXISTING CONTOUR

SITE BENCHMARK No. 1	SITE BENCHMARK No. 2
TOP OF WALL @ SOUTHERN MOST SOUTHEAST CORNER OF CHLORINE TANK	DRILL HOLE IN CONCRETE WALK (CONTROL POINT No. 31)
ELEVATION=580.50	ELEVATION=579.23

SITE PLAN
 SCALE 1" = 20'

RECORD DRAWING



POGEMEYER DESIGN GROUP, INC.
 PLANNERS ARCHITECTS ENGINEERS
 1168 NORTH MAIN STREET BOWLING GREEN, OHIO 43402
 (419) 352-7537

**WASTEWATER TREATMENT PLANT
 SLUDGE HANDLING IMPROVEMENTS
 VILLAGE OF OAK HARBOR, OHIO**

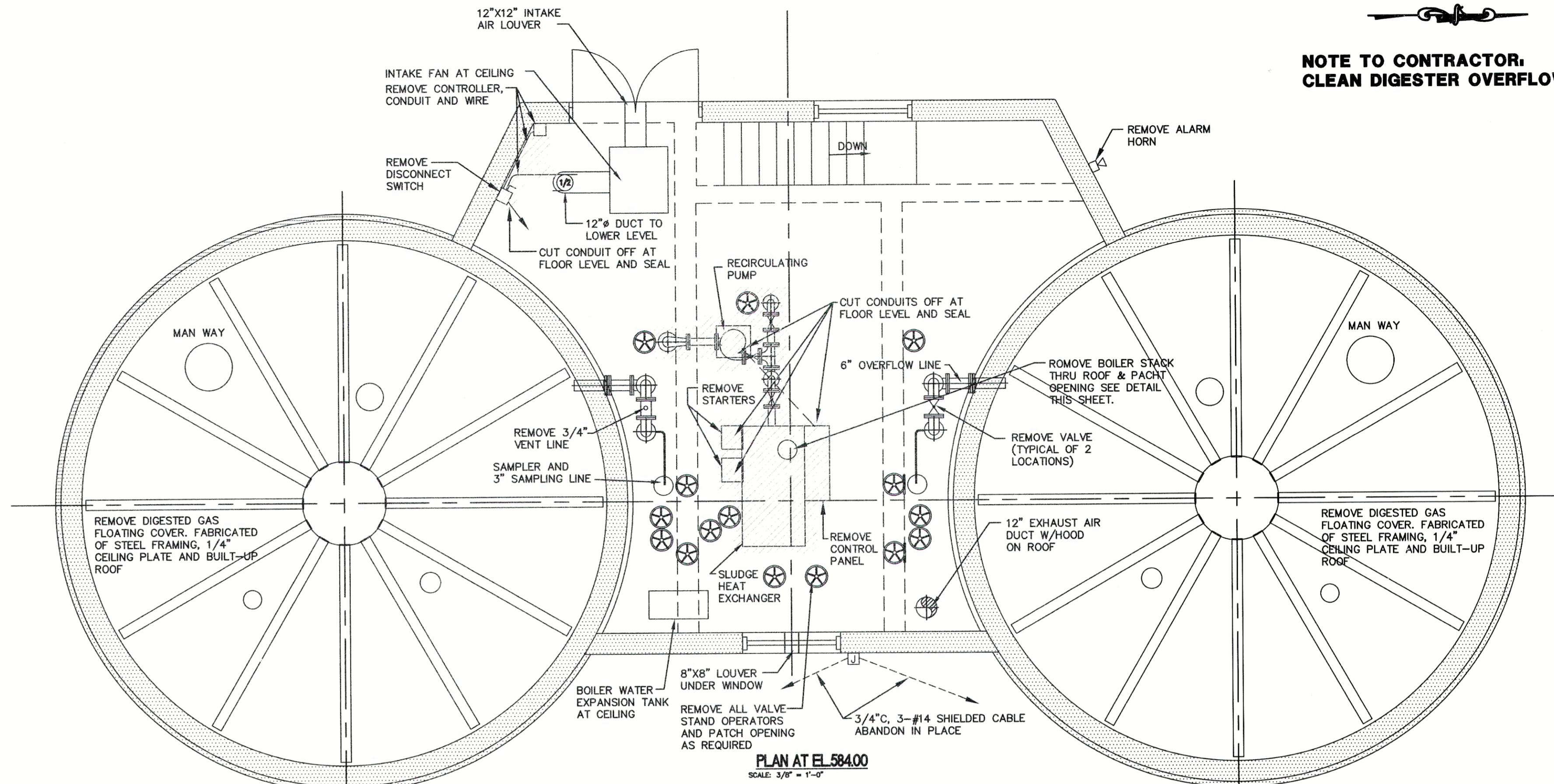
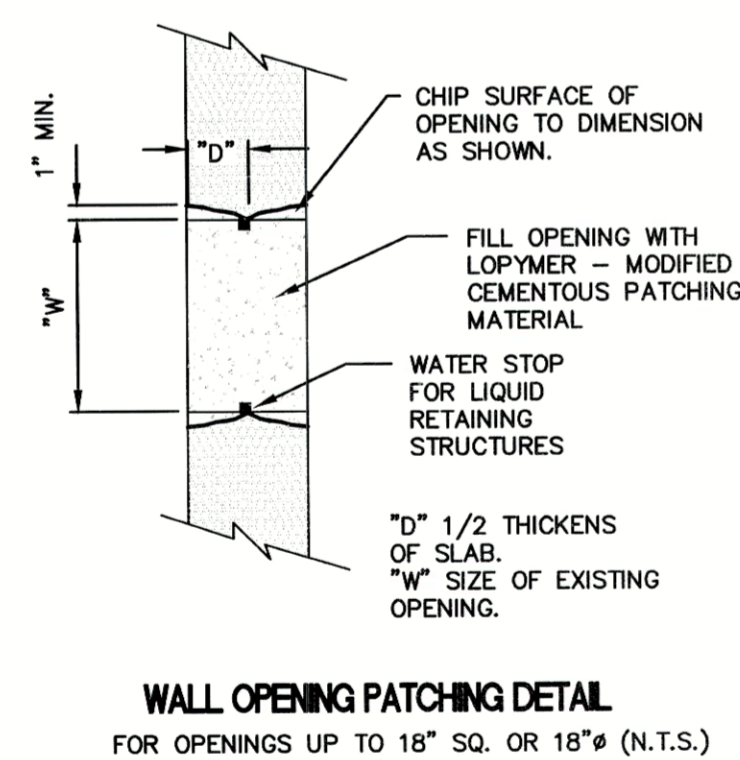
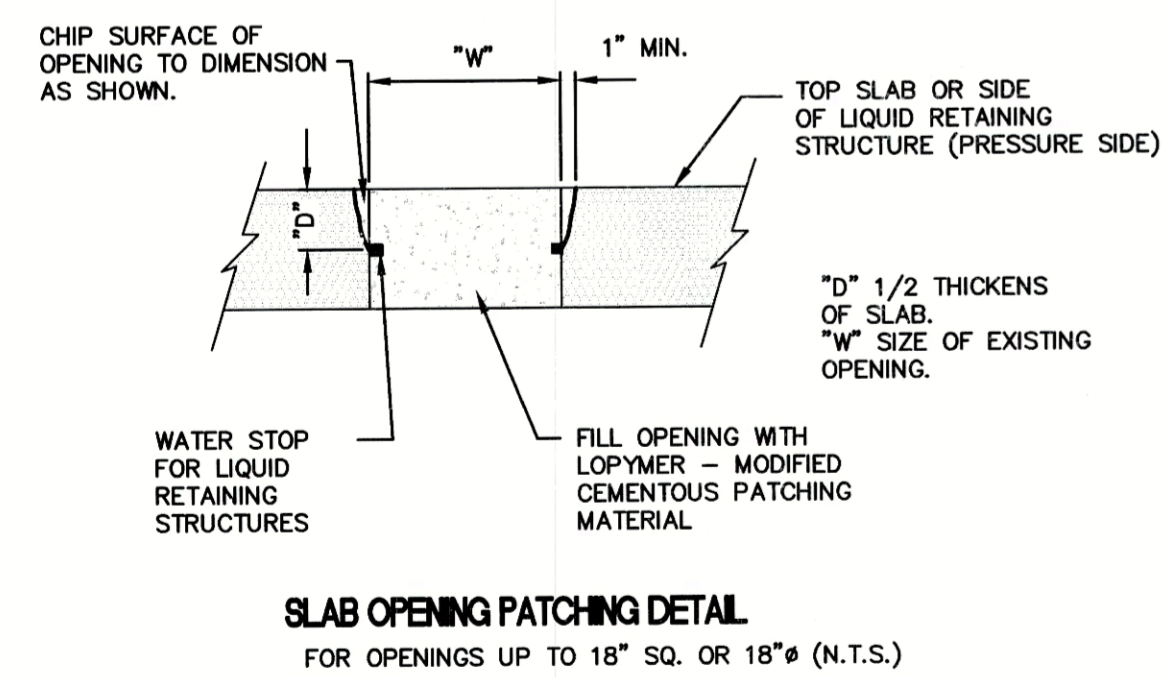
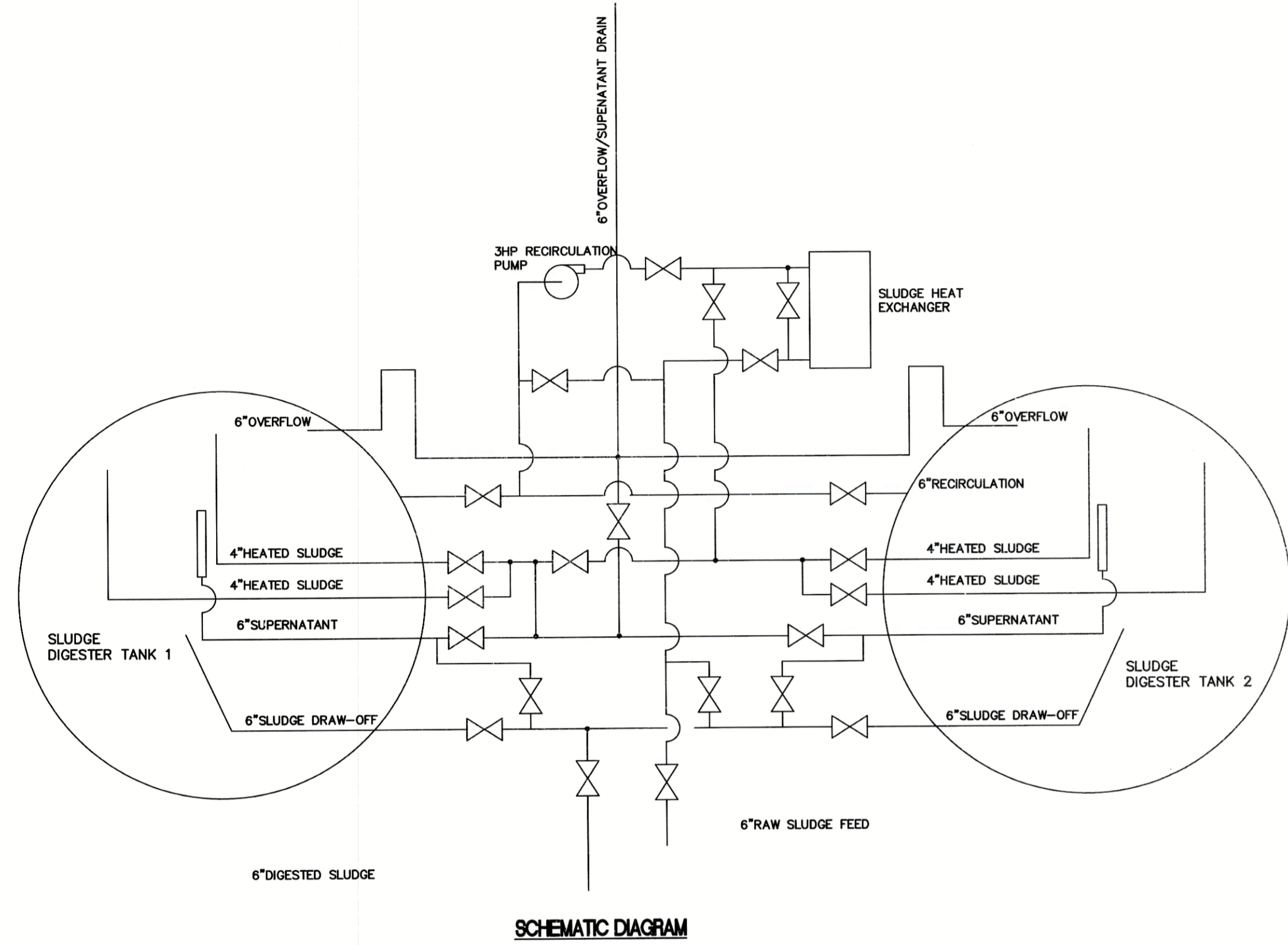
SITE ROADS AND GRADING PLAN

DRAWN BY: GREGORY BY
 W.M.V. S.R.W.
 REVISION: 6-19-00, JAB
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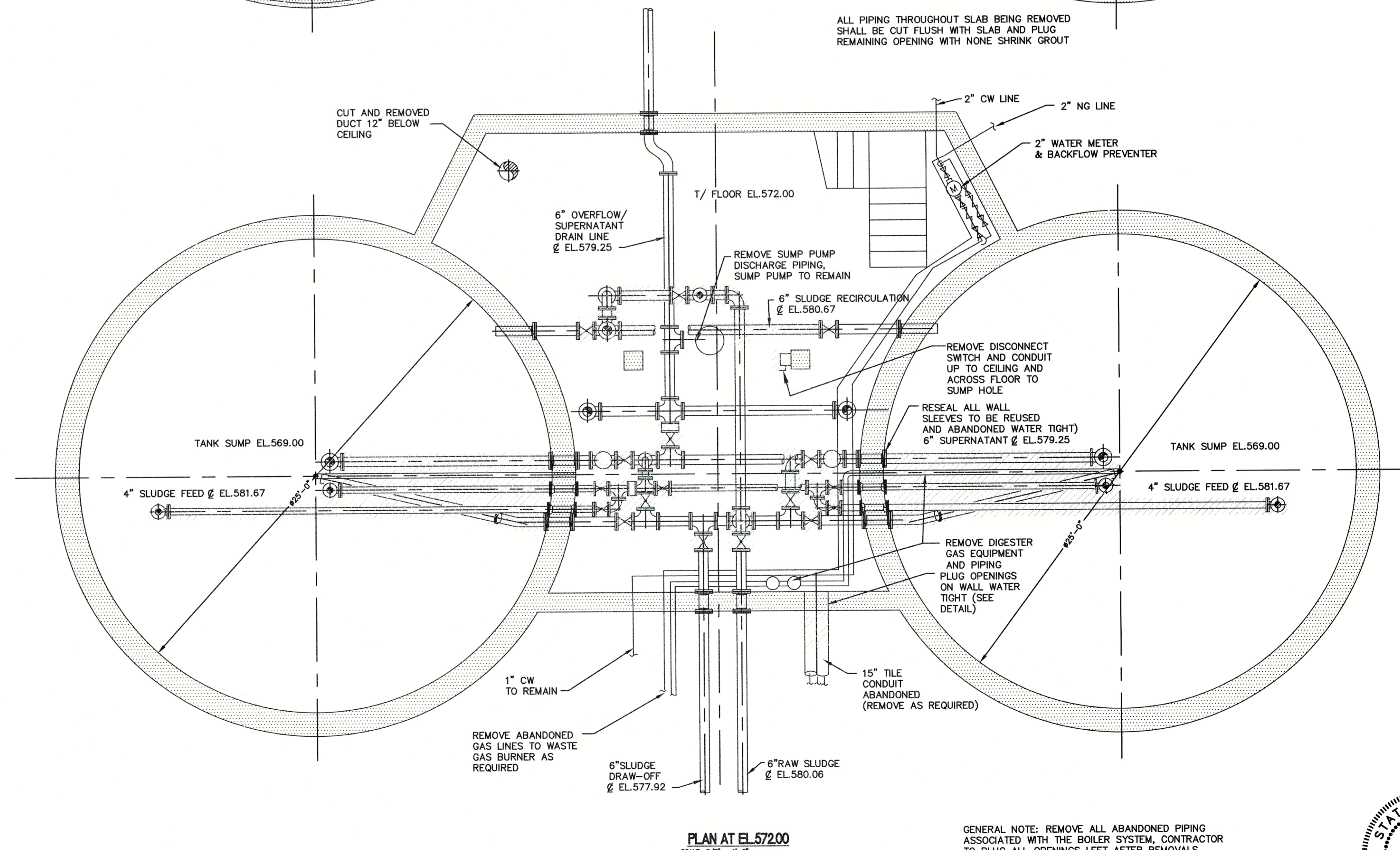
4 OF 22
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ALL PIPING THROUGHOUT SLAB BEING REMOVED SHALL BE CUT FLUSH WITH SLAB AND PLUG REMAINING OPENING WITH NONE SHRINK GROUT



GENERAL NOTE: REMOVE ALL ABANDONED PIPING ASSOCIATED WITH THE BOILER SYSTEM, CONTRACTOR TO PLUG ALL OPENINGS LEFT AFTER REMOVALS.

NOTE TO CONTRACTOR:
CLEAN DIGESTER OVERFLOW LINES



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**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

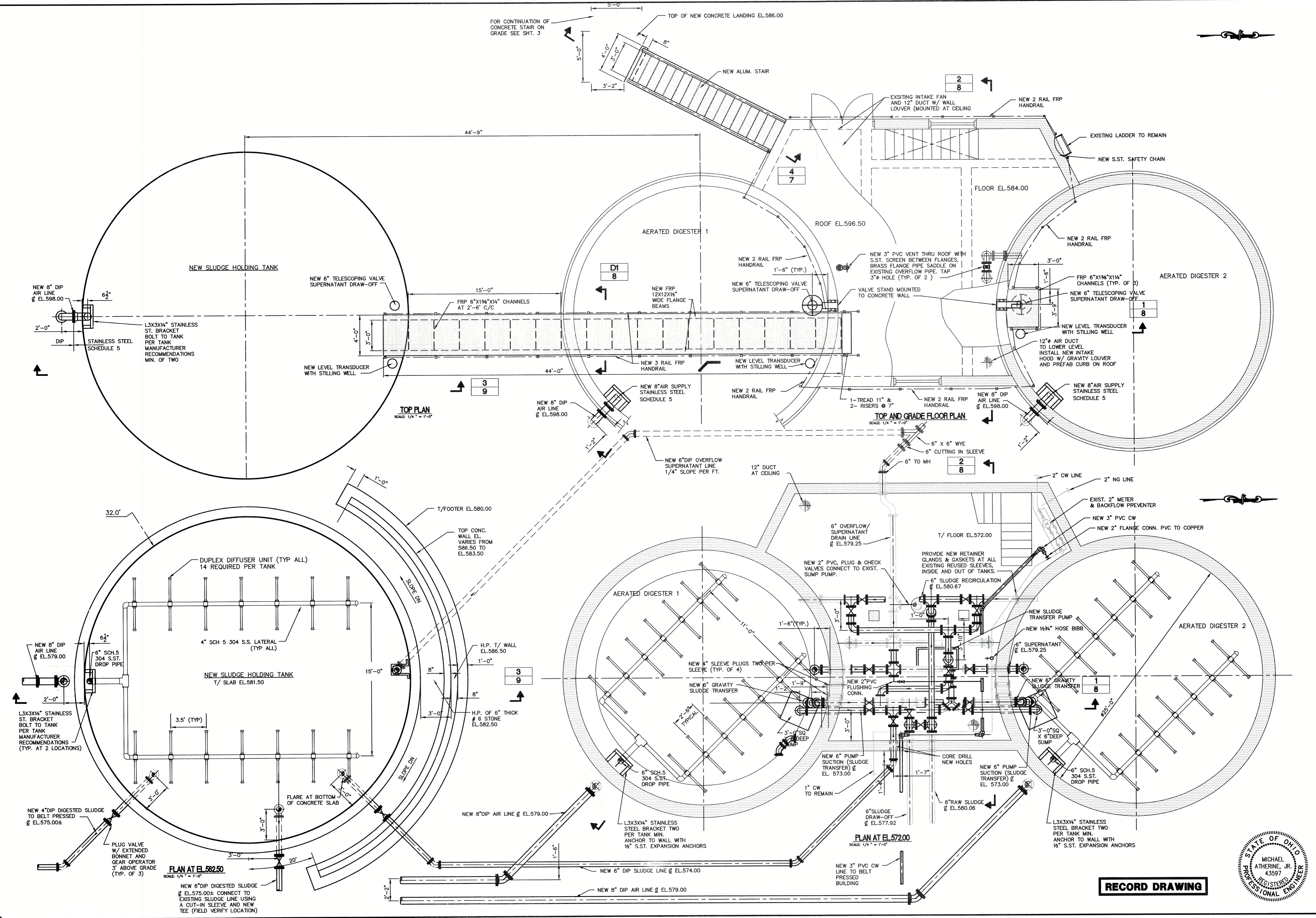
**DIGESTER SYSTEM
REMOVALS
PLANS & SECTIONS**

DRAWN BY: W.M.V. CHECKED BY: S.R.W.
REVISION: 6-19-00, JAB
RECORD DRAWING

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OF
22
JOB NUMBER
1590-066

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RECORD DRAWING

STATE OF OHIO
 MICHAEL
 AATHERINE, JR.
 43597
 REGISTERED
 PROFESSIONAL ENGINEER

POGEMEYER DESIGN GROUP, INC.
 PLANNERS
 ENGINEERS
 ARCHITECTS
 1168 NORTH MAIN STREET
 BOWLING GREEN, OHIO 43402
 (419) 352-7537

**WASTEWATER TREATMENT PLANT
 SLUDGE HANDLING IMPROVEMENTS
 VILLAGE OF OAK HARBOR, OHIO**

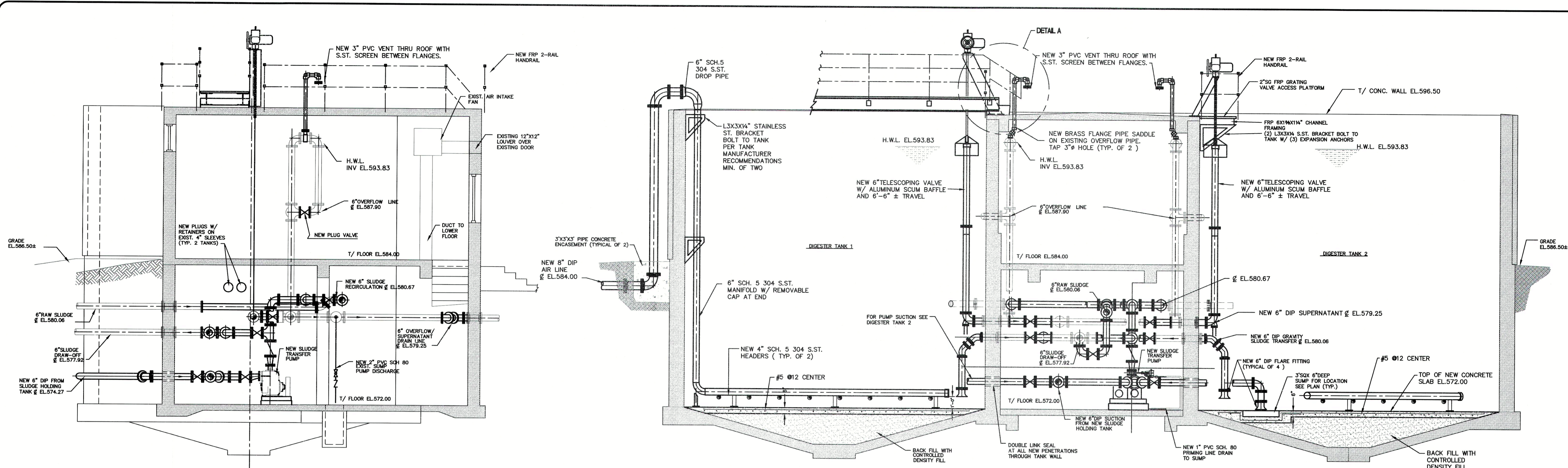
**DIGESTER SYSTEM
 RENOVATION
 PLANS & SECTIONS**

DESIGNED BY
 W.M.V. S.R.W.

REVISION
 P.H. 3/18/99
 6-19-00 JAB
 RECORD DRAWING

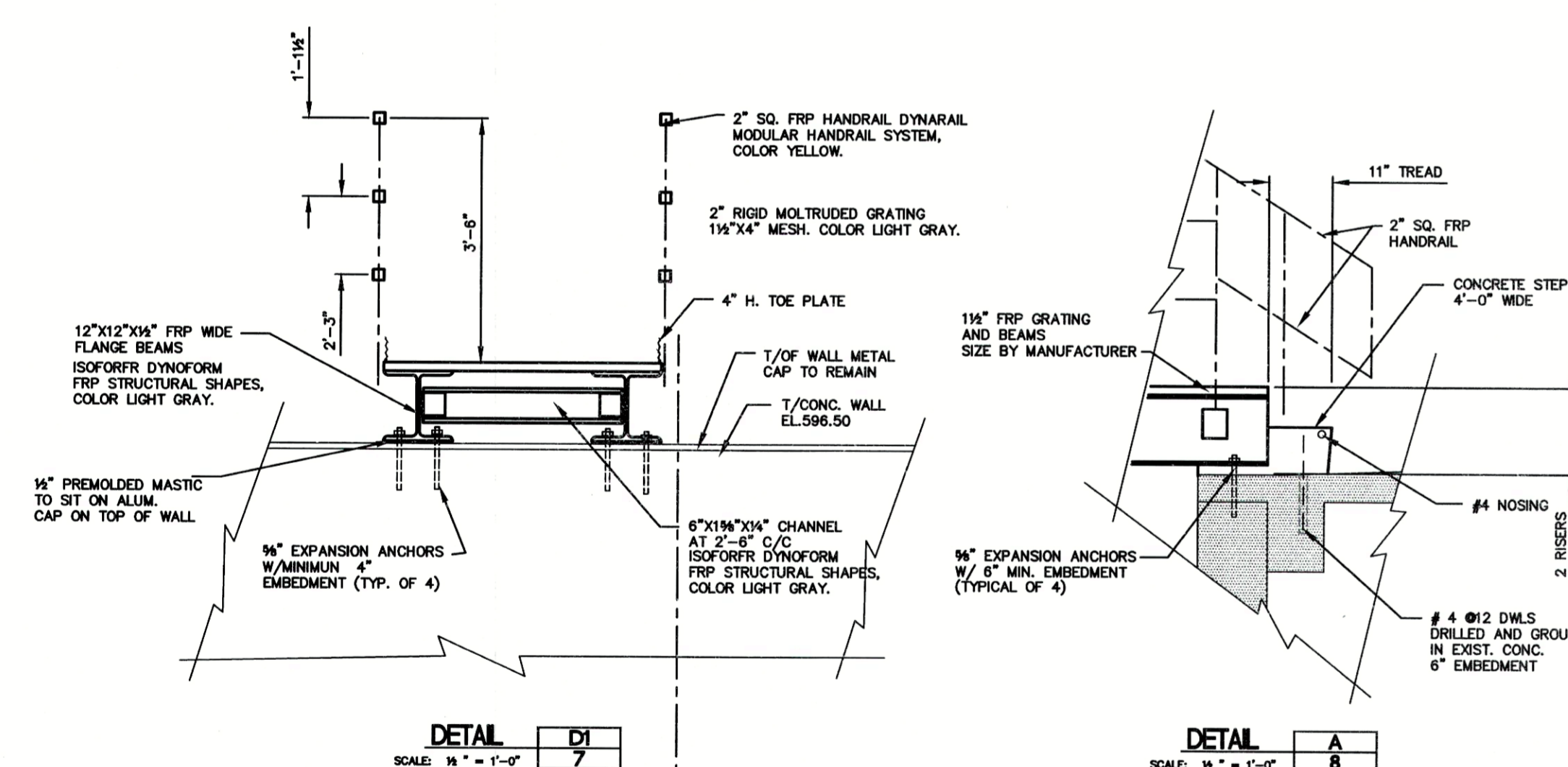
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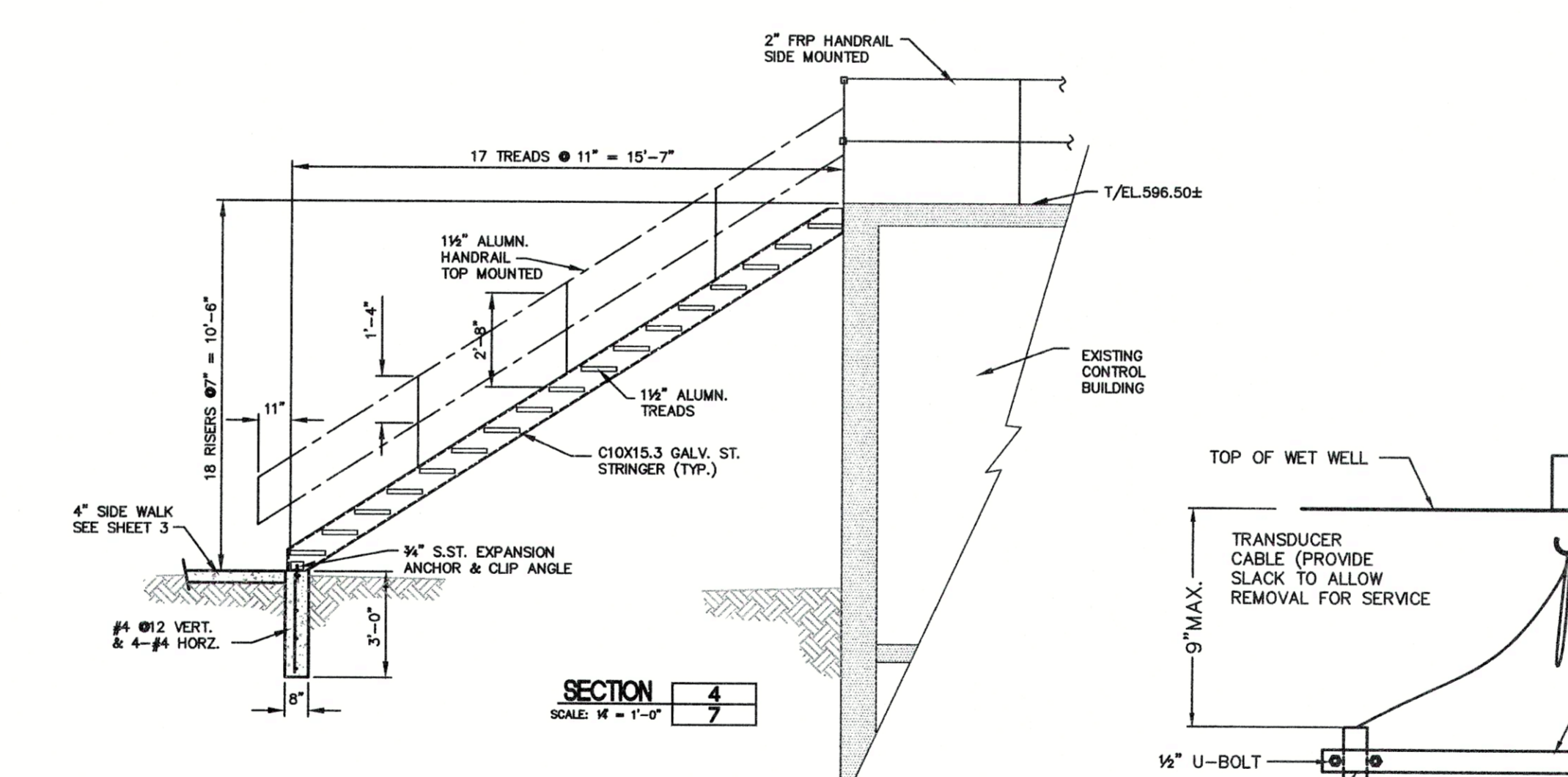


SECTION 2
SCALE: 1/4" = 1'-0"

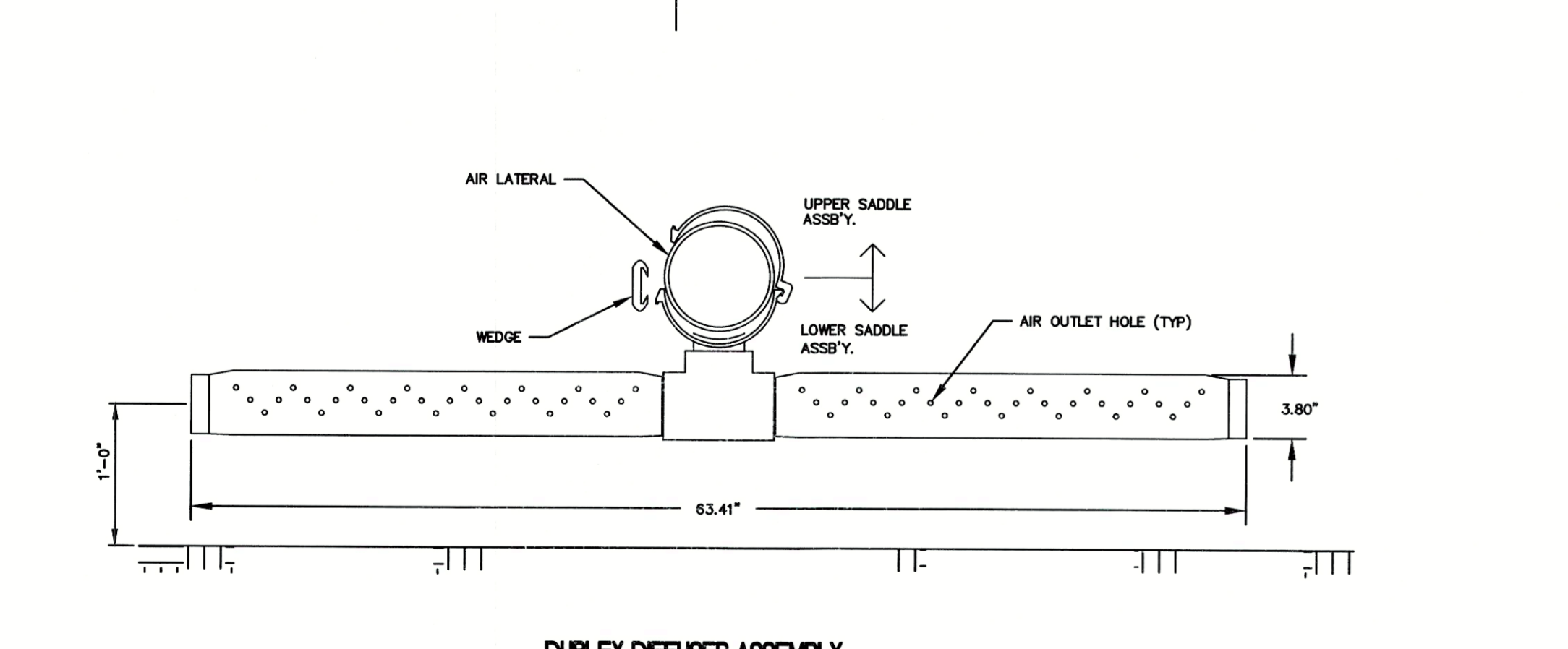
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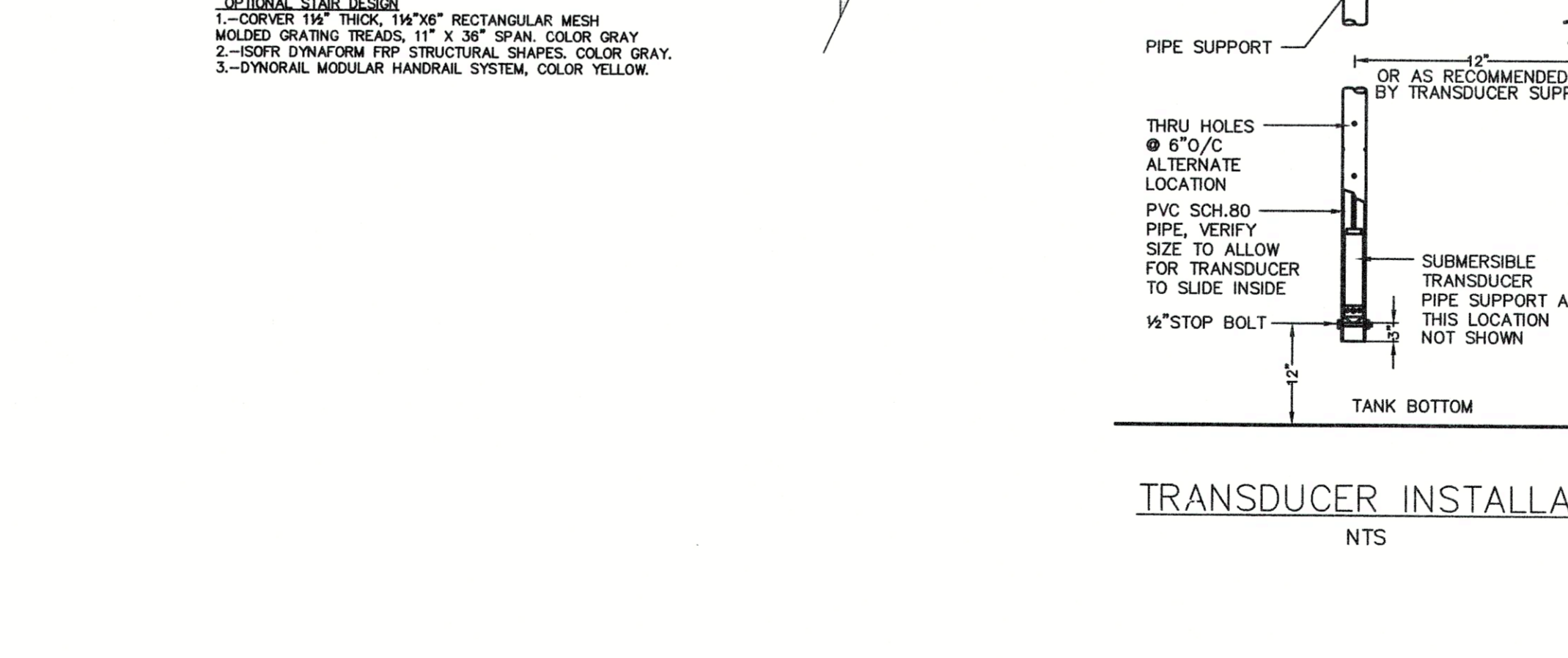
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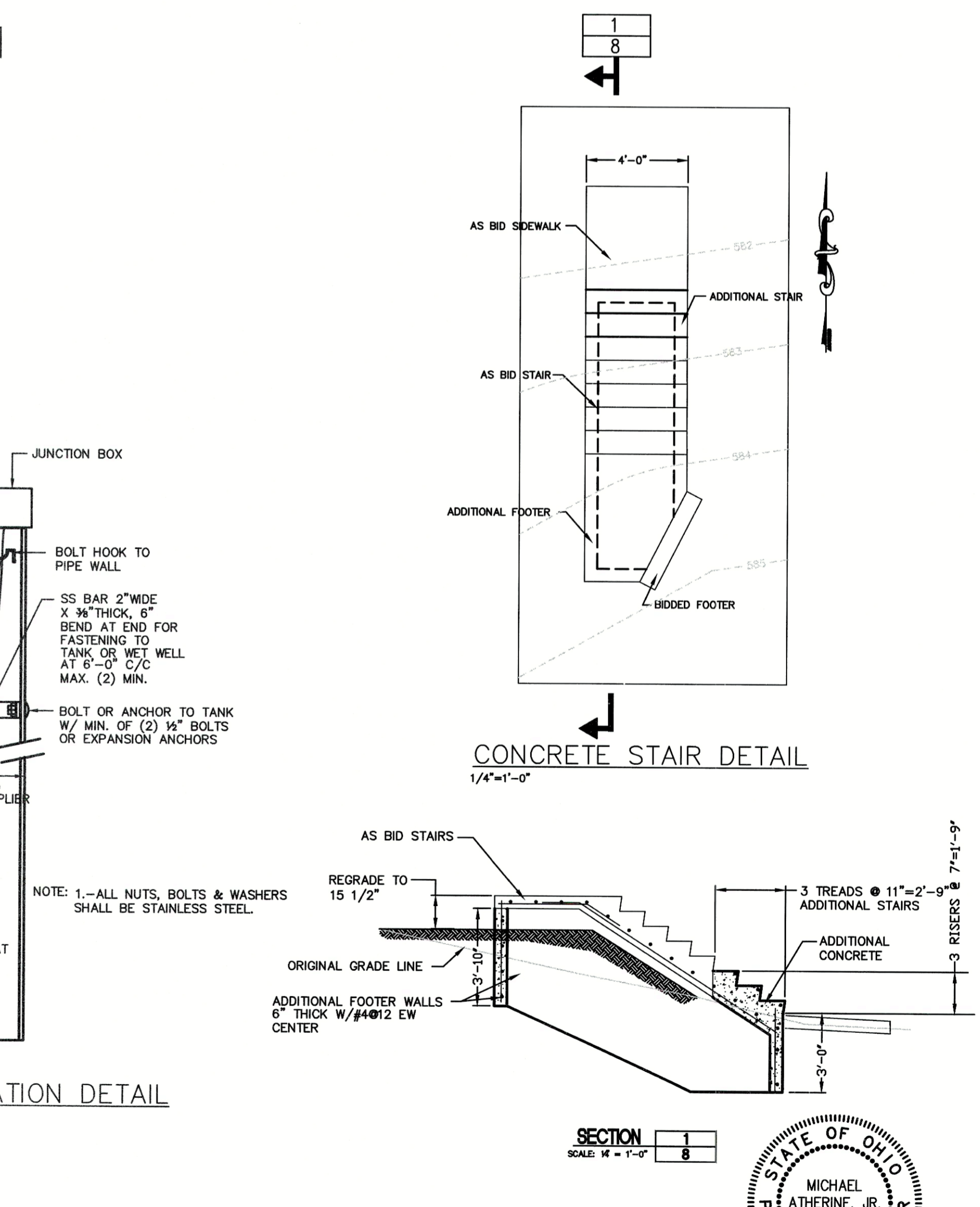
SECTION 4
SCALE: 1/4" = 1'-0"



DUPLX DIFFUSER ASSEMBLY
SCALE: N.T.S.



TRANSDUCER INSTALLATION DETAIL
NTS



SECTION 8
SCALE: 1/4" = 1'-0"

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PLANNERS
BOWLING GREEN, OHIO 43402
ARCHITECTS
1168 NORTH MAIN STREET
BOWLING GREEN, OHIO 43402
(419) 352-7537

**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

**DIGESTER SYSTEM
RENOVATION
SECTIONS**

DRAWN BY: CHECKED BY:
W.M.V. S.R.W.
REVISION
DATE: 3/28/98
BY: 18-00 JAB
RECORD DRAWING

8
OF
JOB NUMBER
1590-066

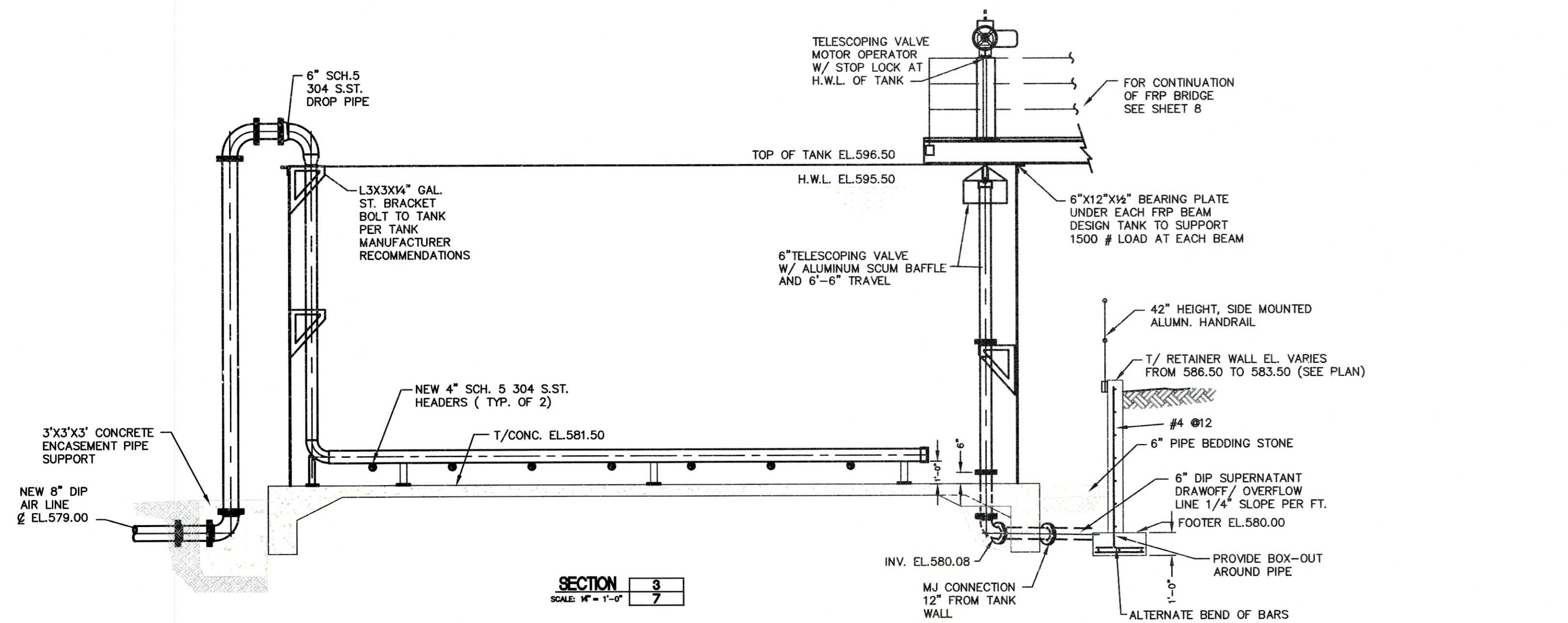


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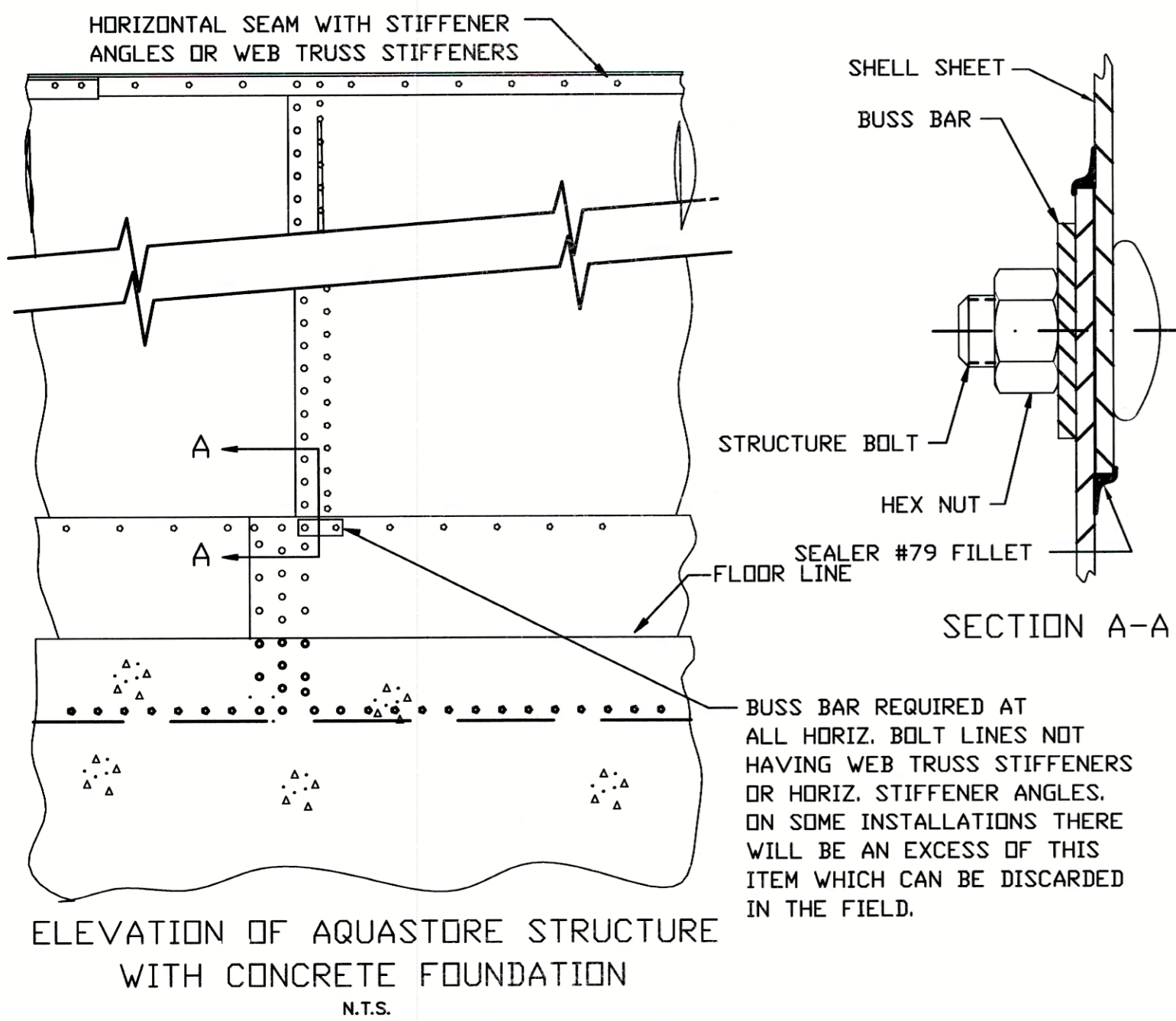
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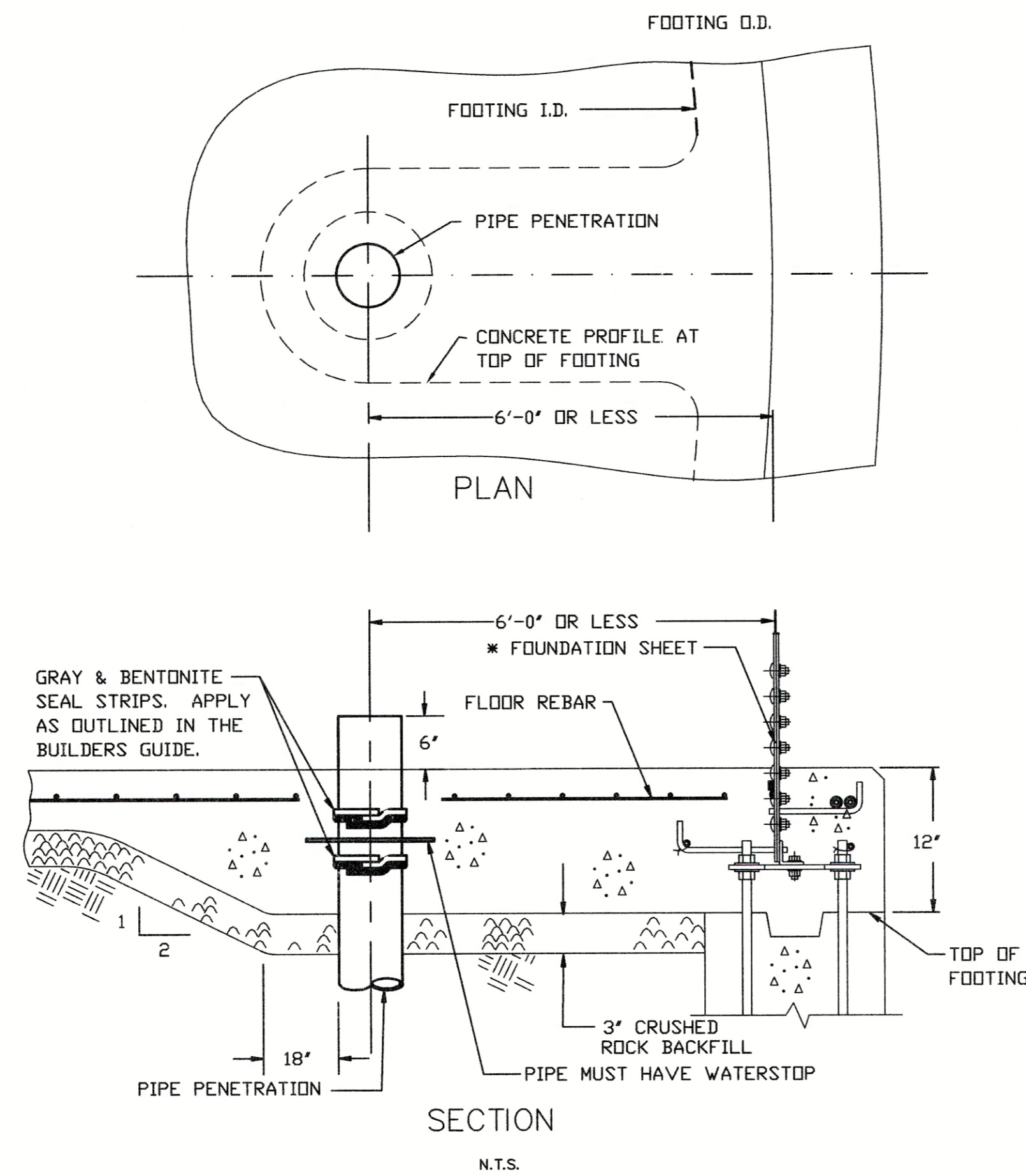
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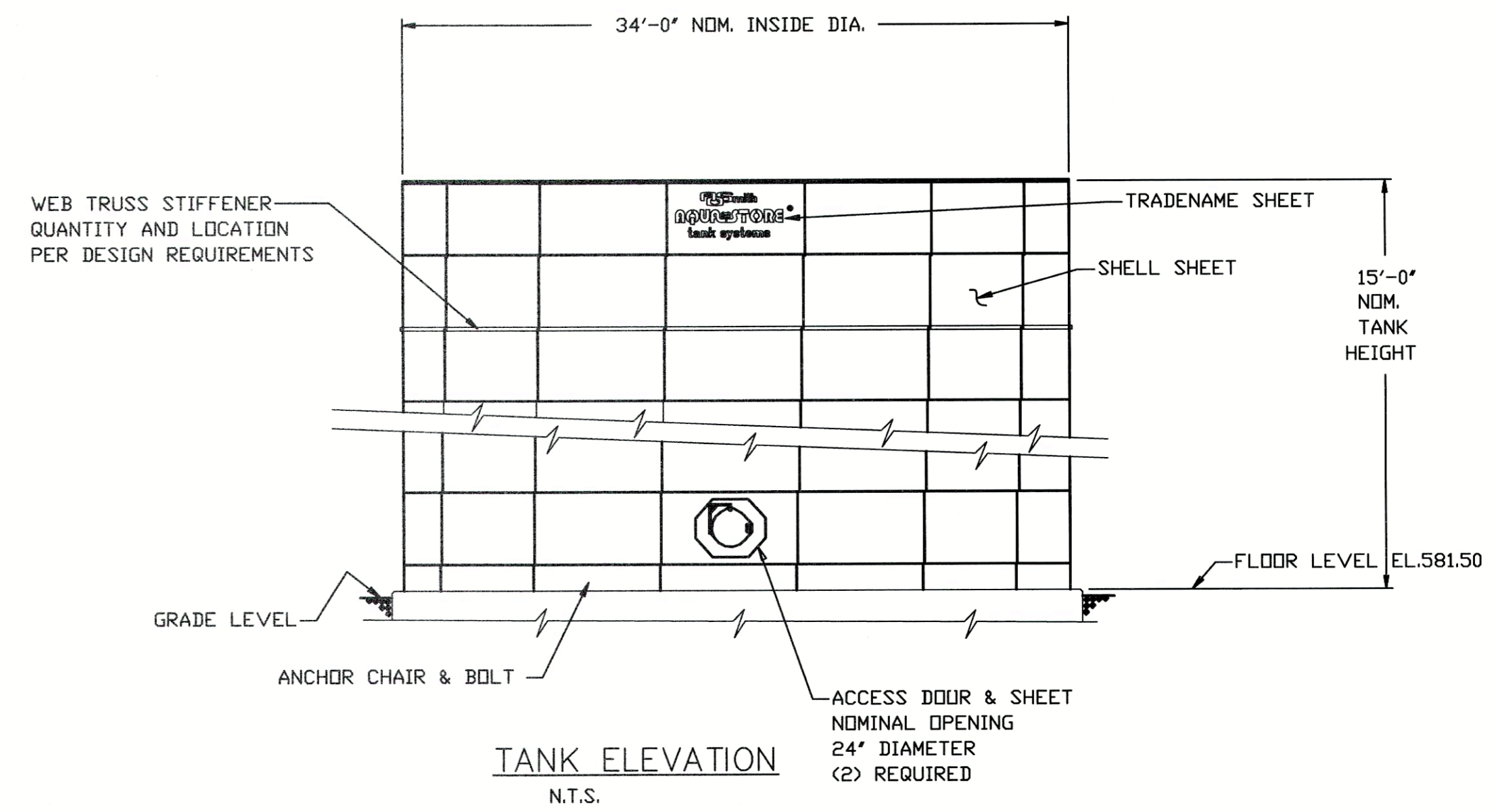
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SCALE 1/4" = 1'-0"



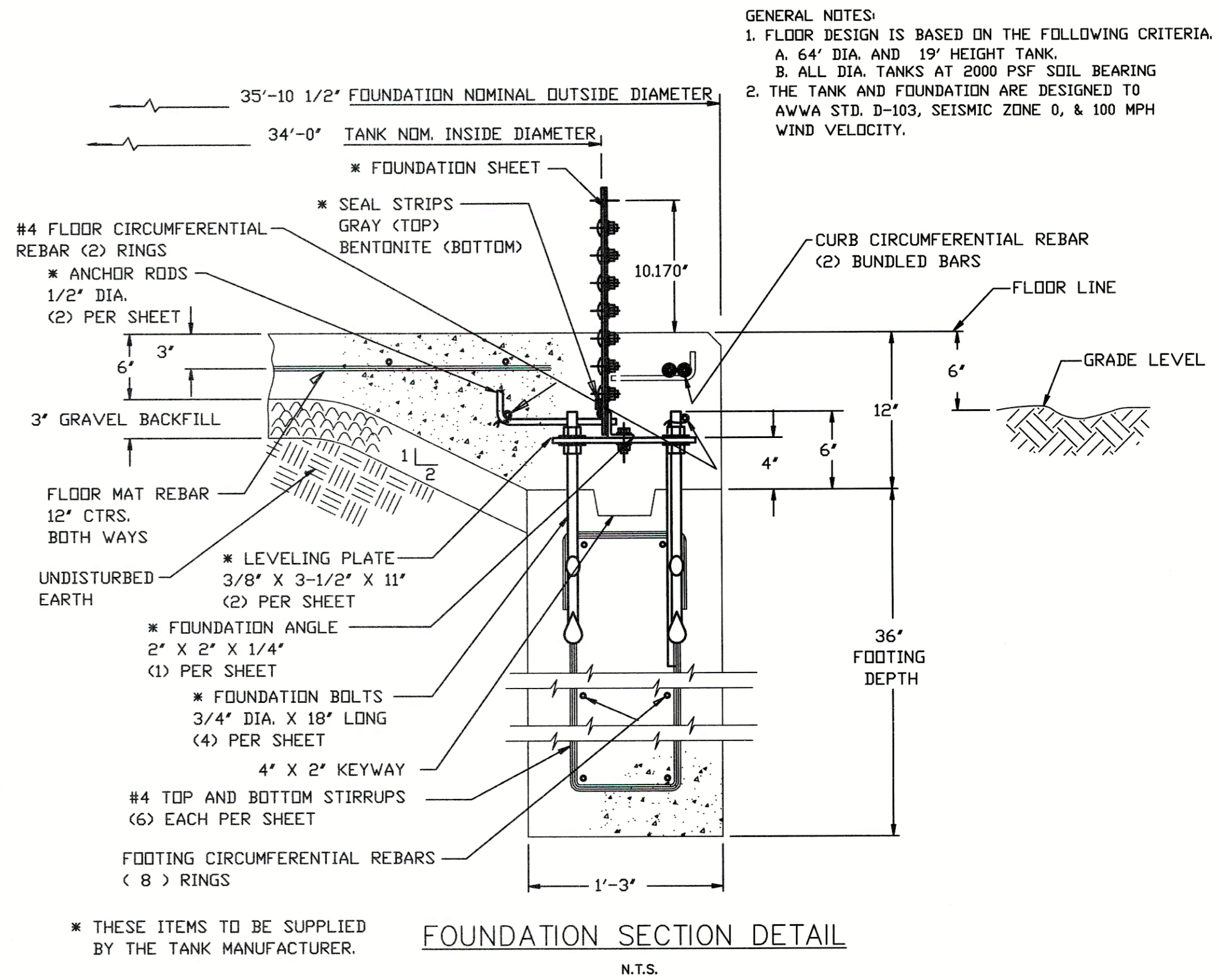
ELEVATION OF AQUASTORE STRUCTURE WITH CONCRETE FOUNDATION
N.T.S.



SECTION
N.T.S.



TANK ELEVATION
N.T.S.



FOUNDATION SECTION DETAIL
N.T.S.

- GENERAL NOTES:
- FLOOR DESIGN IS BASED ON THE FOLLOWING CRITERIA:
 - 64" DIA. AND 19' HEIGHT TANK.
 - ALL DIA. TANKS AT 2000 PSF SOIL BEARING
 - THE TANK AND FOUNDATION ARE DESIGNED TO AWWA STD. D-103, SEISMIC ZONE 0, & 100 MPH WIND VELOCITY.

RECORD DRAWING



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1168 NORTH MAIN STREET
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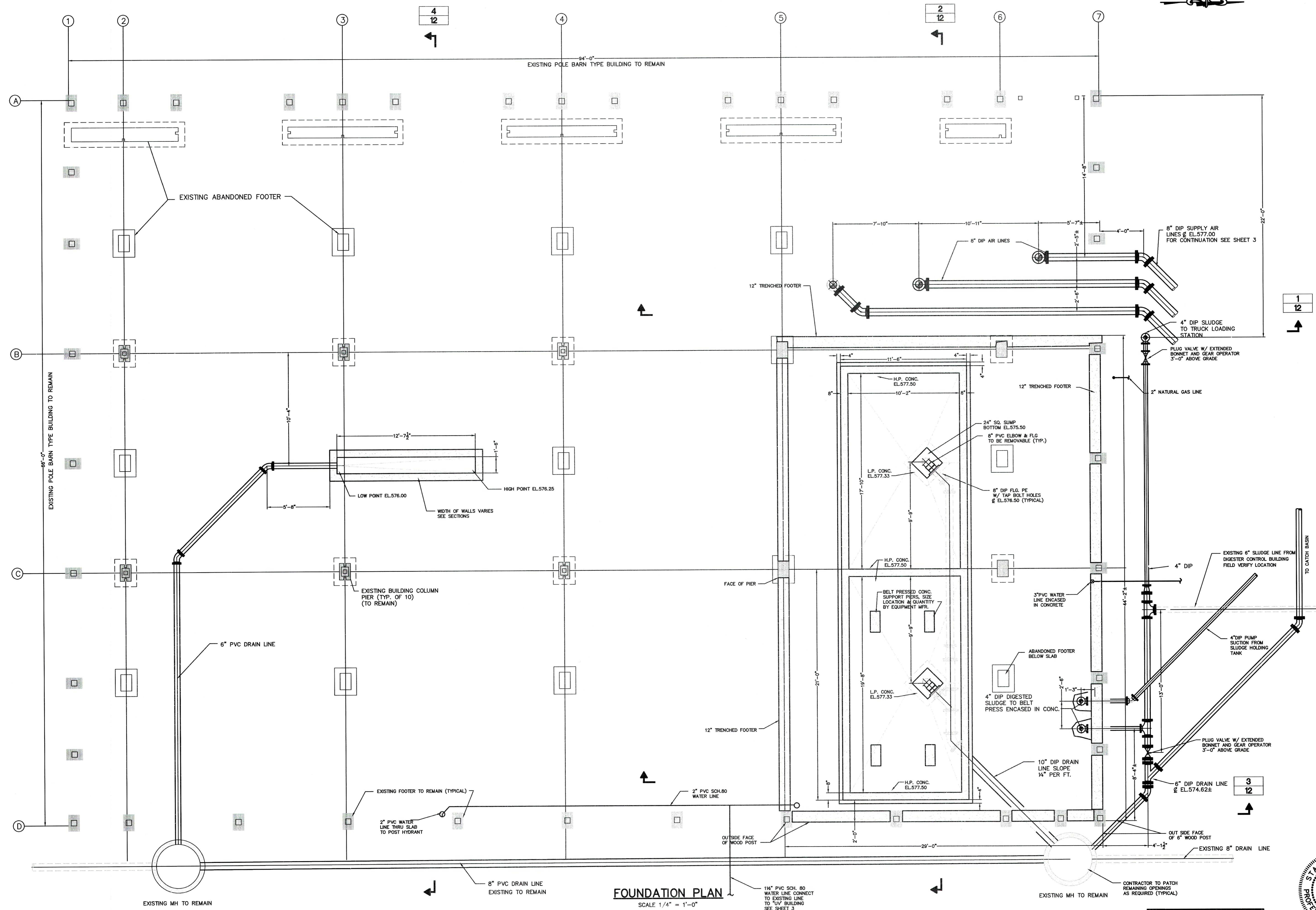
**SLUDGE HOLDING
TANK
DETAILS**

DESIGNED BY
W.M.V. S.R.W.
REVISION
P.H. 3/18/99
6-19-00 JAP
RECORD DRAWING

9
OF
22
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FOUNDATION PLAN
SCALE 1/4" = 1'-0"

GENERAL NOTE: ALL PIPING AND CONCRETE WORK IS NEW UNLESS NOTED OTHERWISE

RECORD DRAWING



DRAWN BY	CHECKED BY
W.M.V.	S.R.W.
REVISION	
6-19-00_LAB	
RECORD DRAWING	

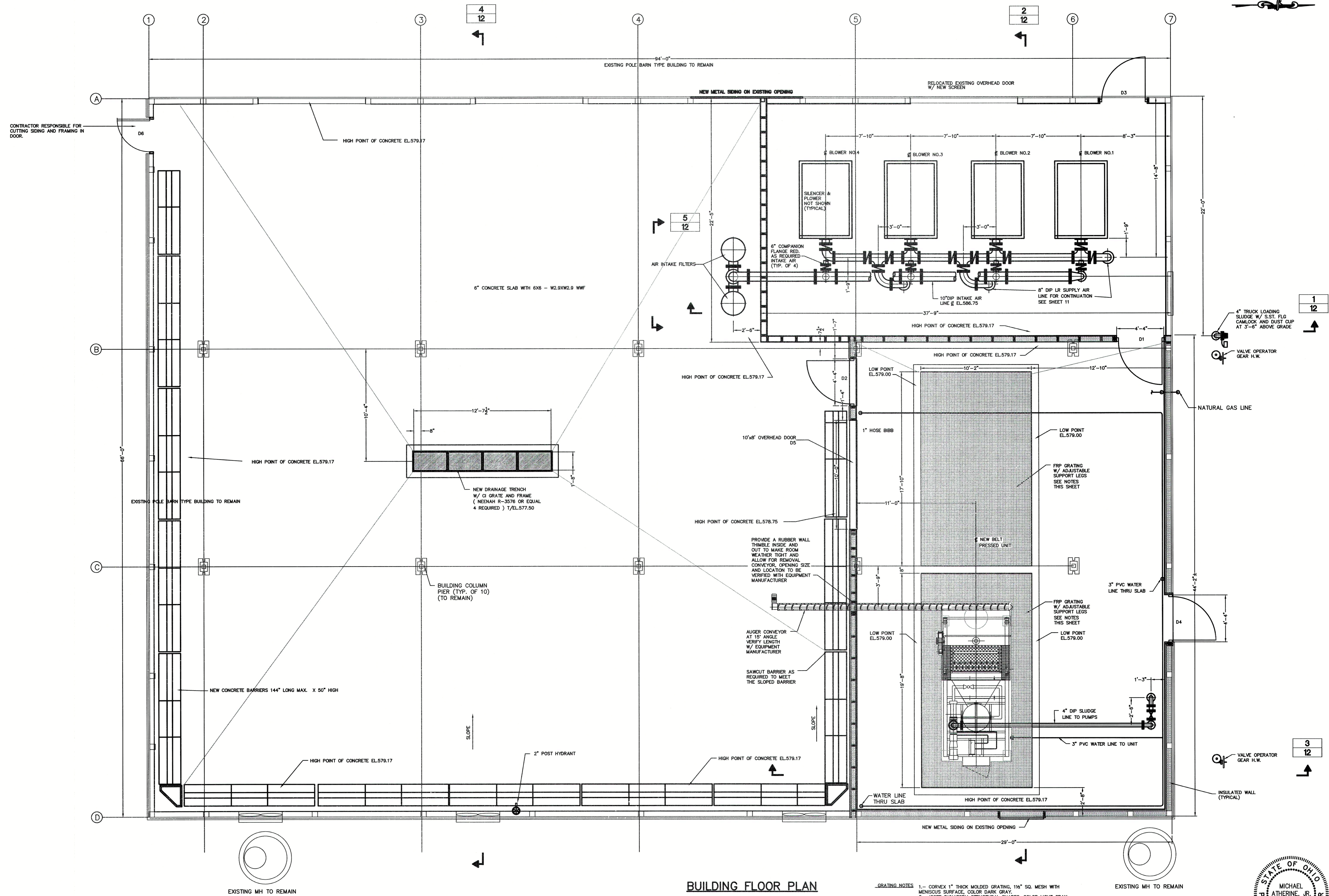
10 OF 22
JOB NUMBER 1590-066

**WASTEWATER TREATMENT PLANT
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BUILDING FLOOR PLAN

SCALE 1/4" = 1'-0"

- GRATING NOTES**
- 1.- CORVEX 1" THICK MOLDED GRATING, 1/2" SQ. MESH WITH MENISCUS SURFACE, COLOR DARK GRAY.
 - 2.- ISOFR DYNAFORM STRUCTURAL SHAPES, COLOR LIGHT GRAY.
 - 3.- ISOFR DYNAFORM STRUCTURAL SUPPORT GRATING LEGS, SPACING AND LOCATION BY GRATING MANUFACTURER.

RECORD DRAWING





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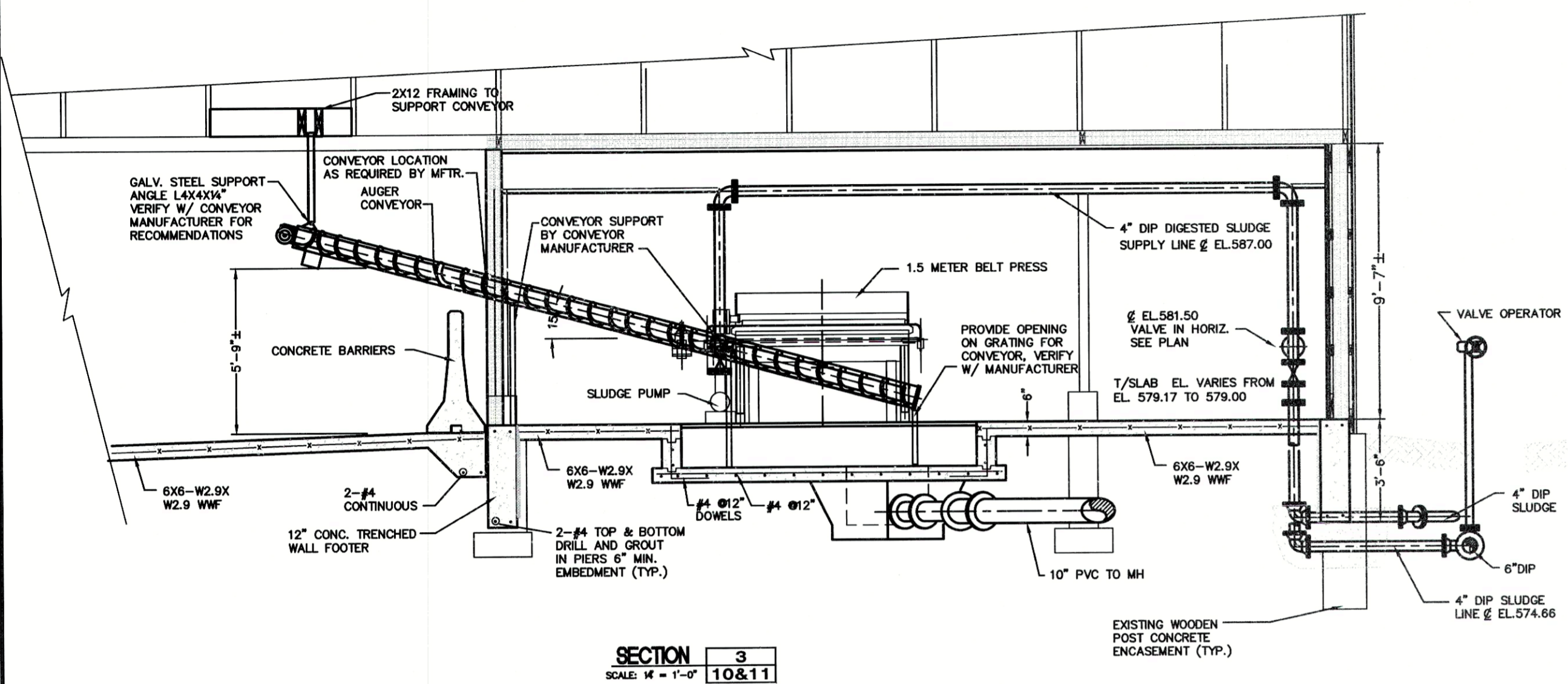
**SLUDGE STORAGE
BLDG. RENOVATION
FLOOR PLAN**

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6-19-00 JAB
RECORD DRAWING

11
OF
22
JOB NUMBER
1590-066

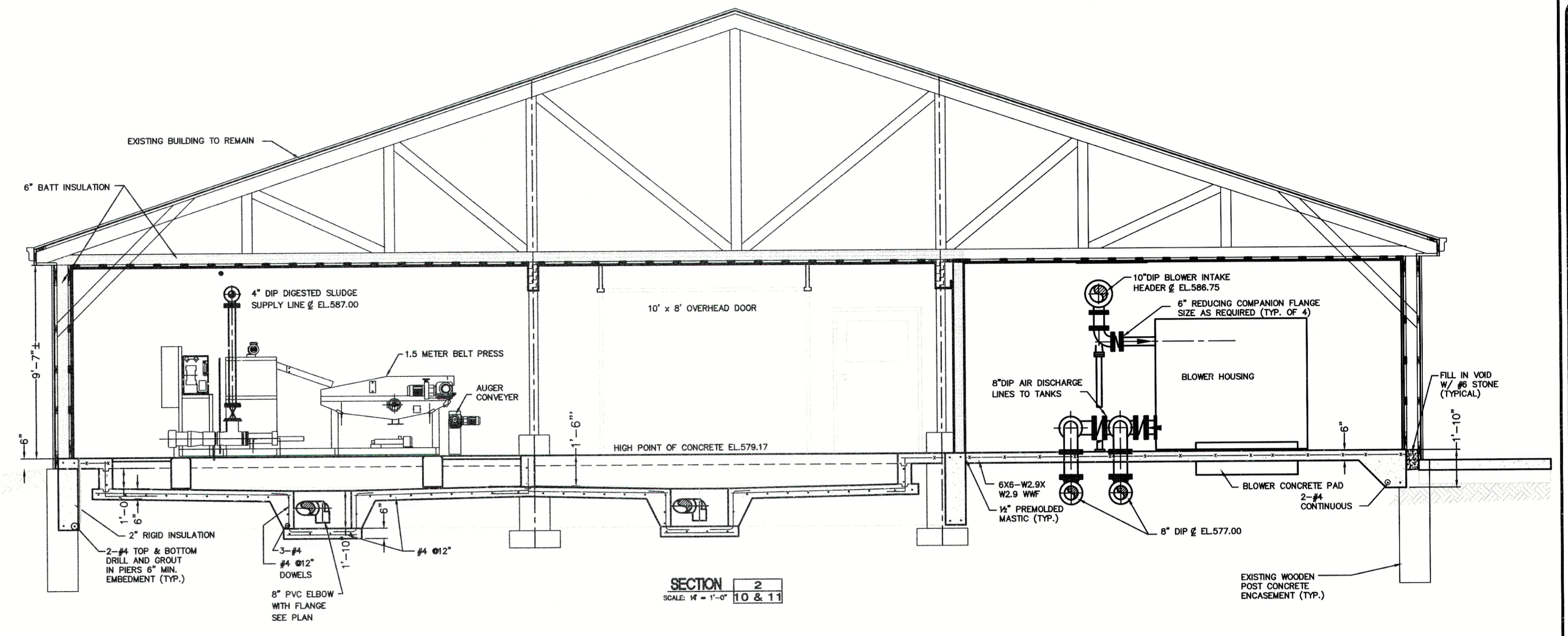
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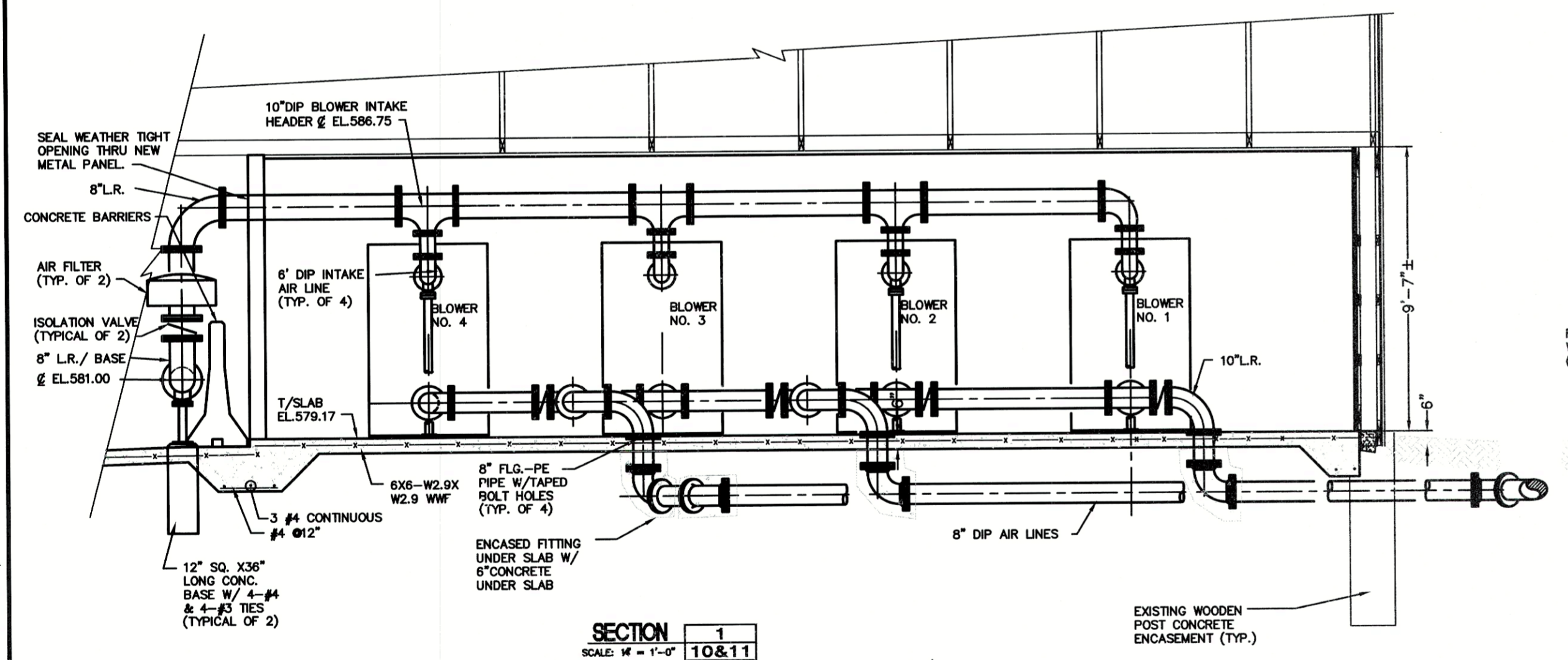


SECTION 3
SCALE: 1/4" = 1'-0"
10 & 11

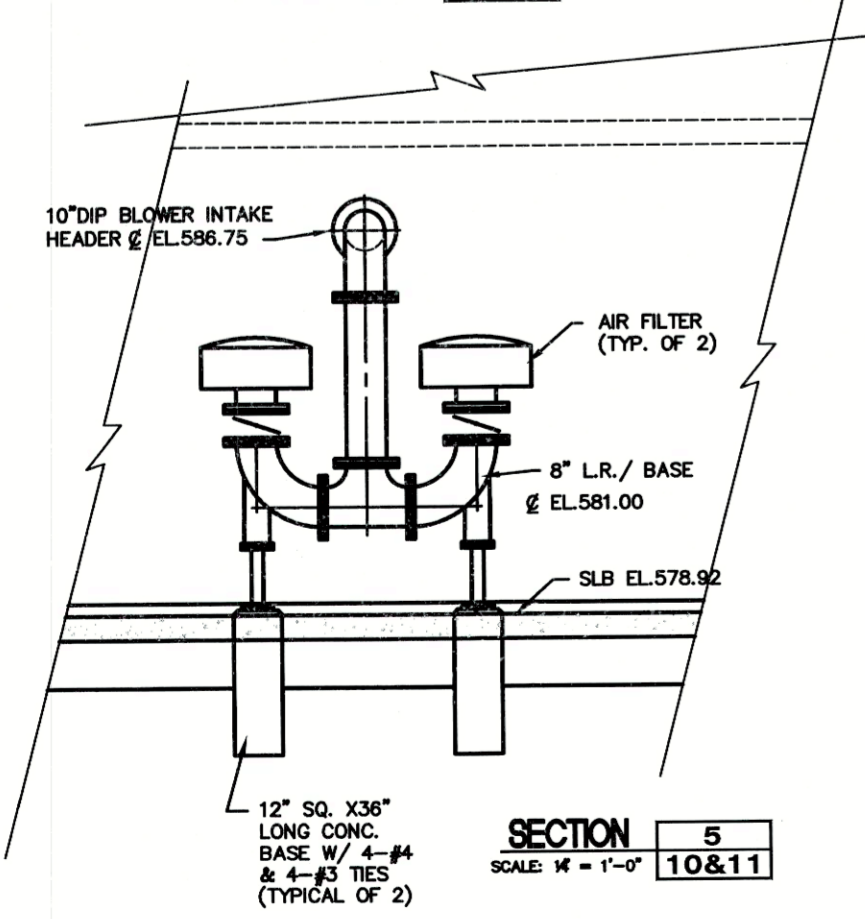
CONTRACTOR SHALL PROVIDE STRUCTURAL STEEL OR CONCRETE SUPPORT AS REQUIRED BY THE SCREW CONVEYOR MANUFACTURER



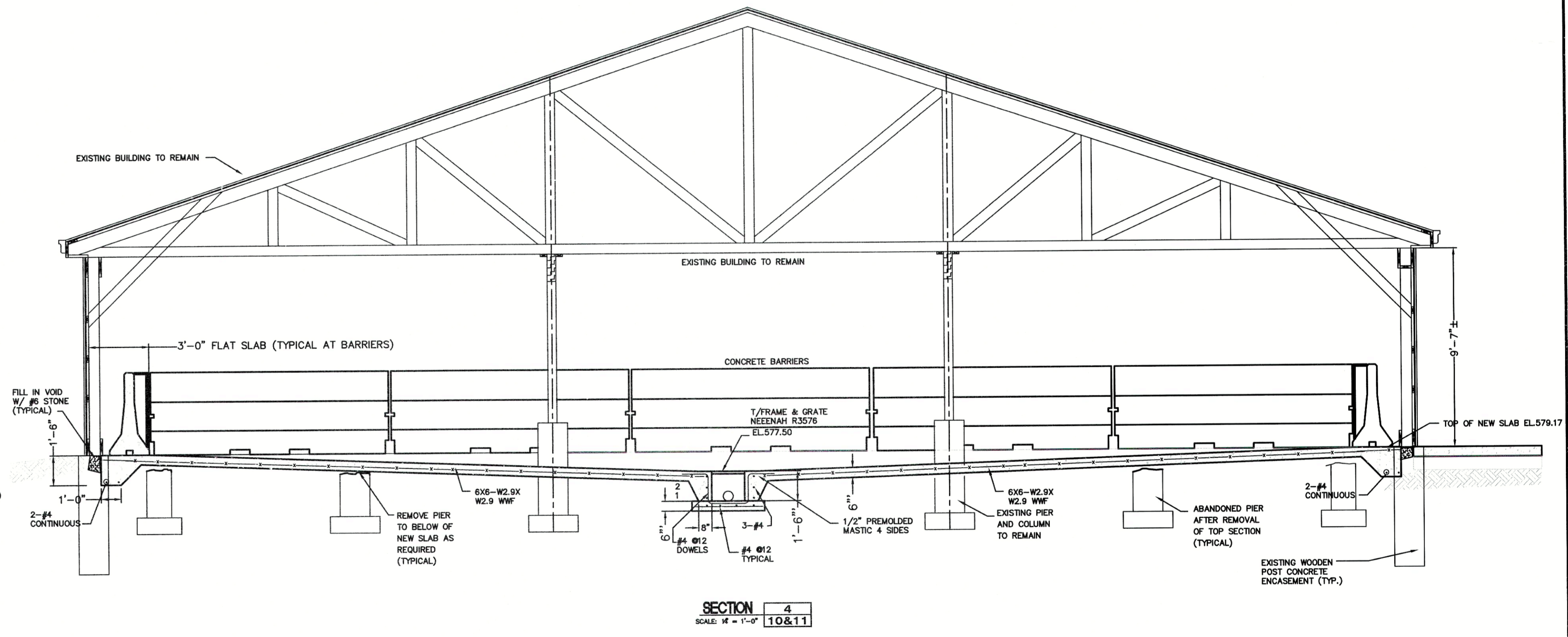
SECTION 2
SCALE: 1/4" = 1'-0"
10 & 11



SECTION 1
SCALE: 1/4" = 1'-0"
10 & 11



SECTION 5
SCALE: 1/4" = 1'-0"
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SECTION 4
SCALE: 1/4" = 1'-0"
10 & 11

RECORD DRAWING

NOTE: ALL PIPING AND EQUIPMENT IS NEW UNLESS NOTED OTHERWISE



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**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

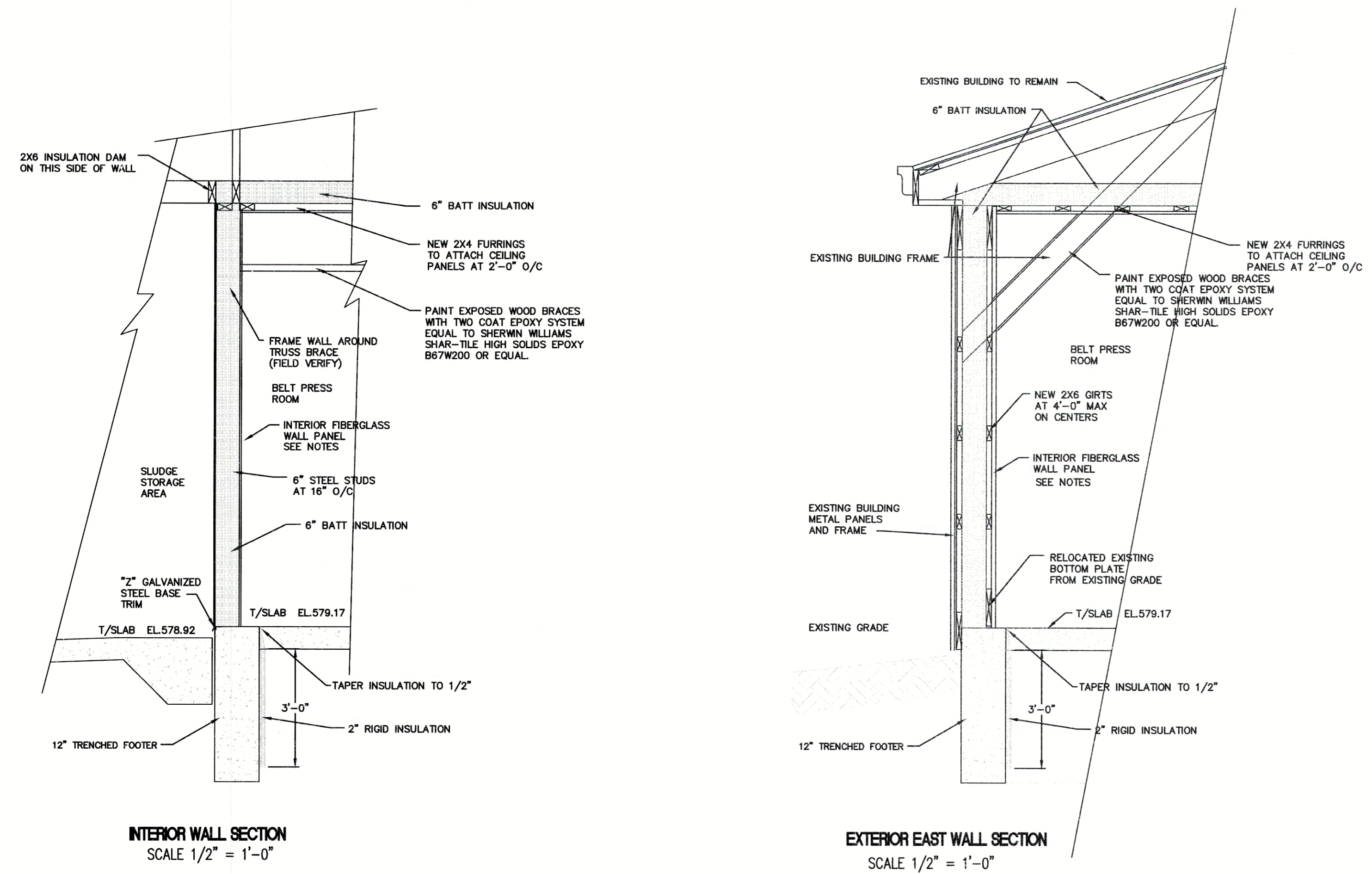
**SLUDGE STORAGE
BLDG. RENOVATION
SECTIONS**

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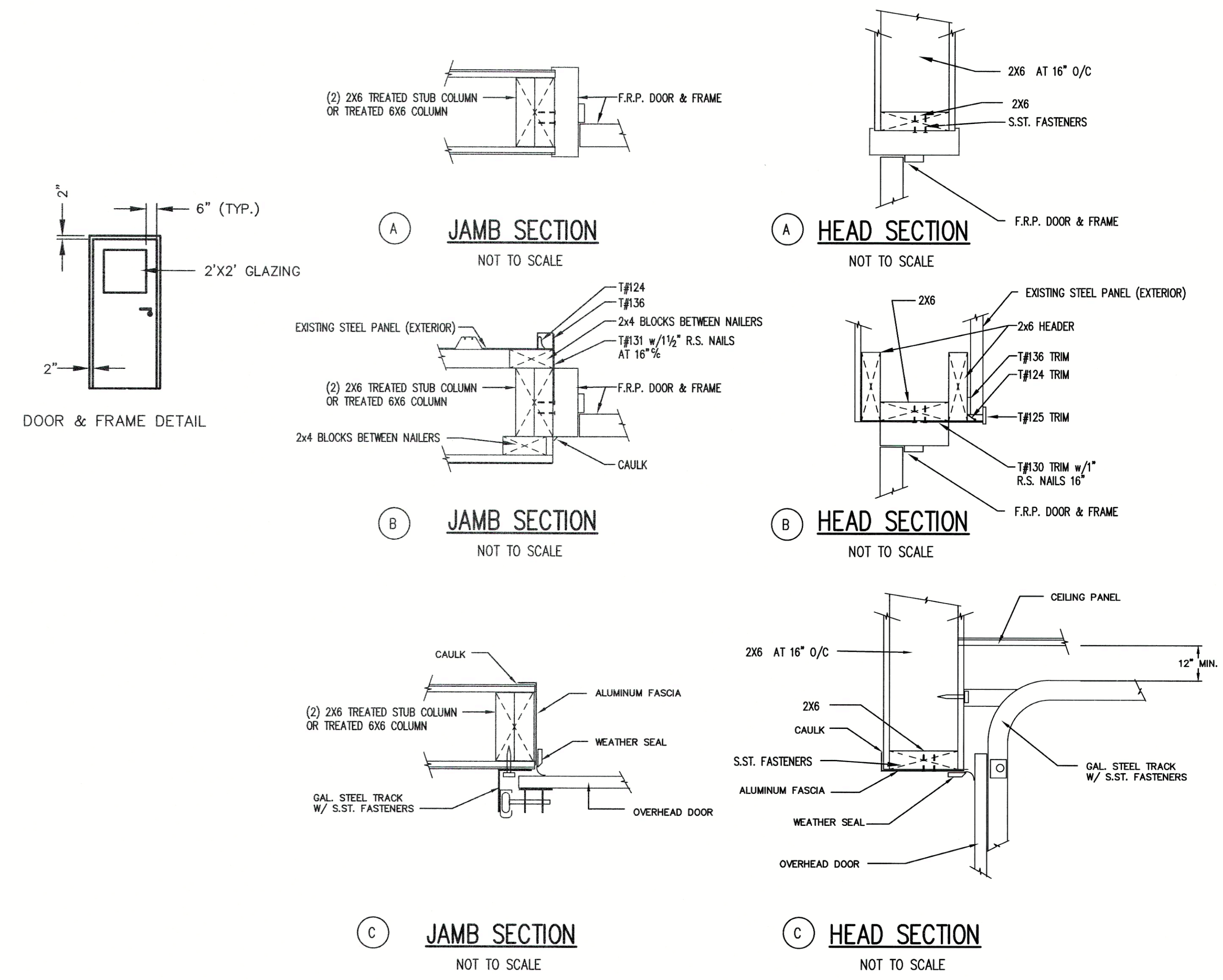
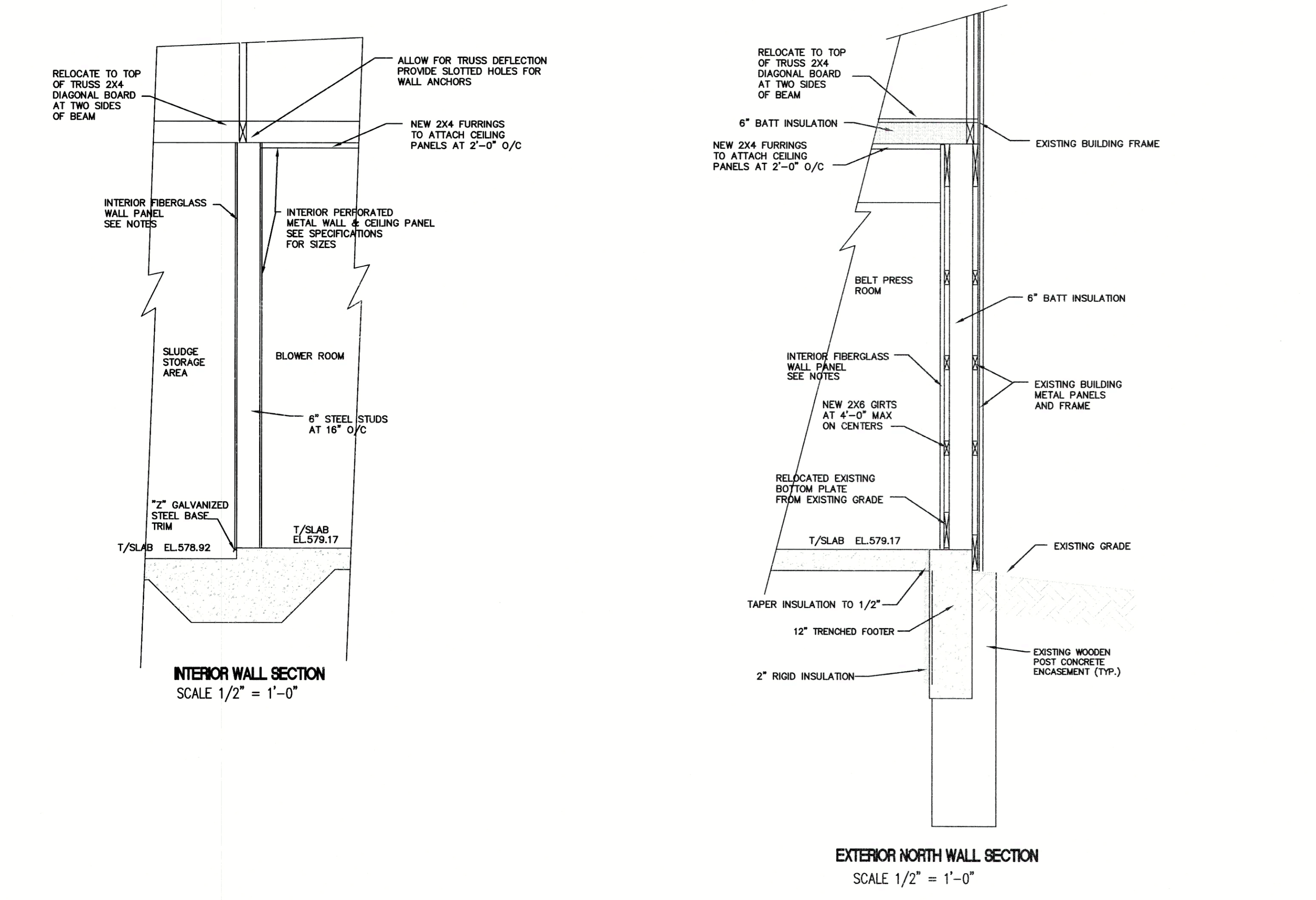
12
OF
22
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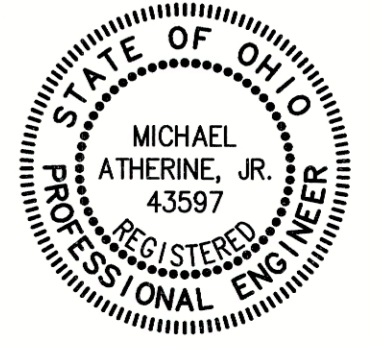
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NOTE: WALL AND CEILING PANELS IN BELT PRESS ROOM SHALL BE OF TUFF SPAN FRP PANELS, SERIES FR 200, COLOR WHITE. 9/16" DEPTH X 44" RIB SPACING X 45.25" PANEL WIDTH WITH STAINLESS STEEL SELF TAPPING FASTENERS PER MANUFACTURER RECOMMENDATIONS.



RECORD DRAWING



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**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

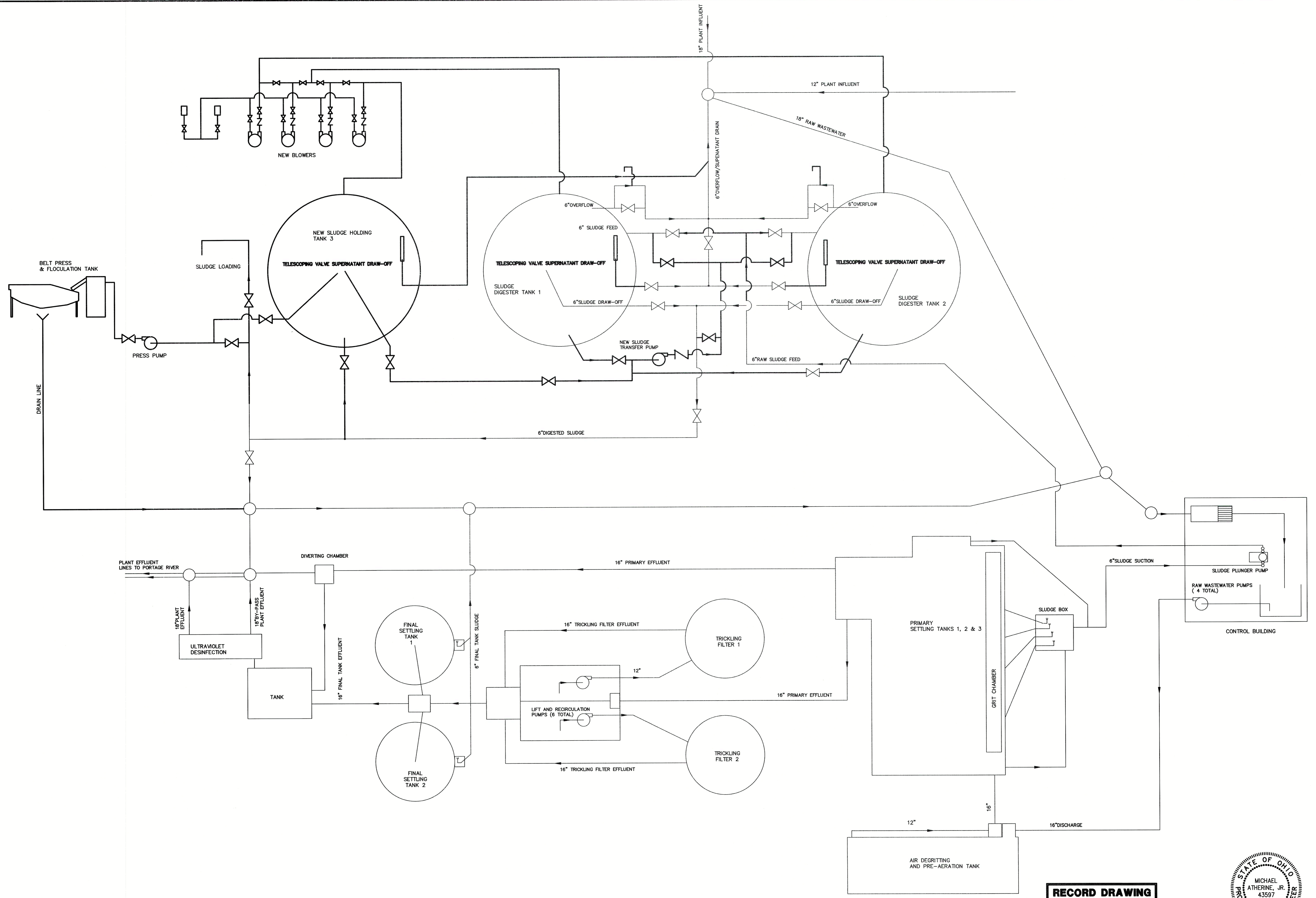
**ARCHITECTURAL
DETAILS AND
SCHEDULES**

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6-19-00 JAB
RECORD DRAWING

13 OF 22
JOB NUMBER 1590-066

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RECORD DRAWING



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**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

**PLANT
SCHEMATIC
DIAGRAM**

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P.H. 3/18/88
P-18-00 JAB
RECORD DRAWING

14
OF
22
JOB NUMBER
1590-066

THIS DRAWING IS NOT INTENDED TO BE SUITABLE FOR REUSE BY ANY PERSON, FIRM OR CORPORATION OR ANY OTHERS ON EXTENSIONS OF THE BUILDING CODE USED BY THE AUTHORITY HAVING JURISDICTION OVER BUILDING WHERE THE PROJECT IS LOCATED.

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GENERAL NOTES

- THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE WHEN COMPLETED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE PROCEDURES FOR ERECTION AND CONSTRUCTION SEQUENCES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE BUILDING AND ITS OCCUPANTS THROUGHOUT CONSTRUCTION.
- SHOP DRAWINGS REVIEWED BY THE CONTRACTOR AND STAMPED INDICATING APPROVAL SHALL BE SUBMITTED TO THE A/E FOR REVIEW PRIOR TO FABRICATION DETAILING ALL NECESSARY COMPONENTS. REPRODUCTIONS OF THE CONTRACT DOCUMENTS WILL NOT BE ACCEPTED WITHOUT PRIOR PERMISSION OF A/E.

DESIGN CRITERIA

- ALL DESIGN LOADS SHALL COMPLY WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE BUILDING CODE USED BY THE AUTHORITY HAVING JURISDICTION OVER BUILDING WHERE THE PROJECT IS LOCATED.

FLOOR	---	
ROOF	20psf LIVE LOAD (MIN)	
SNOW	UNIFORM & DRIFTING BASED ON 25psf GROUND SNOW LOAD (Pg)	
	Pf =	---
	Ce =	---
	I =	---
WIND	80mph BASIC WIND SPEED	
	I =	---
	EXP =	---
	P =	---
SEISMIC	Av = 0.077	EXPOSURE GROUP ---
	Ao = 0.10	PERFORMANCE CATEGORY ---
	R =	SOIL PROFILE ---
	Cd =	ANALYSIS PROCEDURE ---
CONCENTRATED LOADS	---	
IMPACT LOADS	---	
SPECIAL LOADS	---	

FOUNDATIONS AND EARTHWORK

- FOUNDATIONS SHALL BEAR ON UNDISTURBED SOIL OR ENGINEERED FILL PROVIDING A SAFE BEARING CAPACITY OF ≥ 2 psf (MIN). MATERIAL AT BEARING ELEVATIONS WHICH DOES NOT CONFORM WITH THESE REQUIREMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE A/E FOR REVIEW AND DETERMINATION.
- FILL UNDER BUILDING SLABS, PATWAYS, CURBS, WALKS, ETC. SHALL BE MADE WITH COARSE SAND, GRAVEL, OR CRUSHED STONE COMPACTED TO NOT LESS THAN 100% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698.
- THE STABILITY AND POSITION OF WALLS SHALL BE MAINTAINED DURING BACKFILLING BY BRACING OF THE WALL OR PLACEMENT OF THE FILL SHALL BE SUCH THAT THE HEIGHT OF FILL ON EACH SIDE OF THE WALL IS APPROXIMATELY EQUAL.
- FOR WALLS SPANNING FROM GROUND FLOORS TO THE FIRST SUPPORTED FLOOR OR ROOF (BASEMENTS), THE GROUND FLOOR SLAB AND THE FLOOR OR ROOF STRUCTURE AT THE TOP SHALL BE IN PLACE BEFORE BACKFILL IS PLACED AGAINST THE WALL.
- UNLESS OTHERWISE NOTED IN THE CONTRACT DOCUMENTS FOUNDATIONS SHALL EXTEND BELOW LOCAL FROST DEPTHS.

CONCRETE

- DESIGN, FURNISH, AND PLACE CONCRETE IN ACCORDANCE WITH THE LATEST SPECIFICATIONS OF THE ACI.
- UNLESS NOTED OR SPECIFIED OTHERWISE, CONCRETE SHALL BE CONTROLLED STONE OR GRAVEL CONCRETE. CONCRETE SHALL HAVE THE FOLLOWING MINIMUM 28 DAY COMPRESSIVE STRENGTHS:

UNEXPOSED FOUNDATIONS	3000psi
FLOORS AND EXPOSED WORK	4000psi
- EXTERIOR CONCRETE OR CONCRETE SUBJECT TO FREEZE-THAW CYCLING SHALL BE AIR-ENTRAINED (6% ±1%).
- DESIGN, DETAIL, FABRICATE, AND ERECT REINFORCING STEEL ACCORDING TO THE LATEST ACI AND CRSI SPECIFICATIONS FROM ASTM A-615, GRADE 60 MATERIAL.
- WALL AND FOOTING REINFORCING SHALL BE HOOKED AROUND CORNERS A MINIMUM OF 30 BAR DIAMETERS OR SEPARATE CORNER BARS SHALL BE PROVIDED
- REINFORCING BARS SHALL LAP A MINIMUM OF 30 BAR DIAMETERS, BUT NOT LESS THAN 12".
- PROVIDE A 1" NOMINAL CHAMFER AT ALL EXPOSED CORNERS OF BEAMS, COLUMNS, AND WALLS.
- AT ALL CONSTRUCTION JOINTS PROVIDE KEYWAYS 1 1/2" DEEP BY 1/3 THE WIDTH OF THE MEMBER (3 1/2" MIN).
- PROVIDE CONTROL JOINTS IN FLOOR SLABS AT 20' c/c MAXIMUM EACH WAY UNLESS OTHERWISE NOTED ON DRAWINGS.
- PROVIDE THE FOLLOWING PROTECTION (COVER) OVER REINFORCING:

COLUMNS, BEAMS, AND GRIDERS	1 1/2"
SLABS AND WALLS	3/4"
MEMBERS IN CONTACT WITH OR OVER WATER	2"
FORMED MEMBERS IN CONTACT WITH EARTH	2"
MEMBERS PLACED AGAINST EARTH	3"

PRECAST PRESTRESSED CONCRETE

- PRECAST AND PRESTRESSED CONCRETE SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST ACI SPECIFICATIONS.
- THE MANUFACTURING PLANT USED SHALL BE CERTIFIED BY THE PCI PLANT CERTIFICATION PROGRAM AND ALL MEMBERS SHALL COMPLY WITH THE RECOMMENDATIONS OF THE PCI "MANUAL FOR QUALITY CONTROL FOR PLANTS AND PRODUCTION OF PRECAST AND PRESTRESSED CONCRETE PRODUCTS" (MNL-116).
- ALL MEMBERS SHALL BE OF THE NOMINAL SIZE AND SHAPE SHOWN ON THE DRAWINGS. DESIGN MEMBERS TO SAFELY SUPPORT ALL LOADS (DEAD AND LIVE) INDICATED ON THE DRAWINGS IN ADDITION TO THE SELF WEIGHT OF THE MEMBER.
- CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3500psi AT TRANSFER OF PRESTRESS AND 5000psi AT 28 DAYS.
- REINFORCING STEEL SHALL BE SEVEN WIRE PRESTRESSING STRAND COMPLYING WITH ASTM A-416, GRADE 250k OR 270k, AND DEFORMED BILLET STEEL BARS COMPLYING WITH ASTM A-615, GRADE 40 OR 60.
- STEEL ANCHORS AND EMBEDDED PLATES SHALL COMPLY WITH ASTM A36.
- BEARING STRIPS SHALL BE TEMPERED HARDBOARD.
- ALL CONCRETE SLAB KEYWAYS SHALL BE GROUTED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. FILL ALL JOINTS COMPLETELY AND REMOVE EXCESS SEEPAGE BEFORE IT HARDENS.

MASONRY

- MASONRY CONSTRUCTION SHALL CONFORM TO THE LATEST ACI AND NOMA SPECIFICATIONS PERTINENT TO THE PARTICULAR TYPE OF CONSTRUCTION OR CONDITION OCCURRING.
- ASTM C-90 CONCRETE MASONRY UNITS SHALL BE USED. MORTAR SHALL BE TYPE S. REINFORCED MASONRY DESIGN IS BASED ON $f_m = 1350$ psi. USE ONLY PORTLAND CEMENT FOR REINFORCED MASONRY.
- THREE COURSES (24" MIN) OF SOLID BEARING, BUILT IN A PYRAMID FASHION, SHALL BE PROVIDED BELOW ALL BEAM AND JOIST BEARINGS AND LINTELS IN BEARING WALLS. OTHER LINTELS OR LOAD CONCENTRATIONS SHALL BE PROVIDED WITH 16" MINIMUM DEPTH OF SOLID MASONRY BEARING.
- SINGLE WYTHE WALLS SHALL HAVE TRUSS DESIGN MASONRY WALL REINFORCEMENT IN EVERY OTHER HORIZONTAL JOINT (16" c/c) AND IN EACH JOINT (8" c/c) FOR TWO JOINTS ABOVE AND BELOW OPENINGS. REINFORCEMENT SHALL BE CONTINUOUS WITH 6" MINIMUM LAPS. REINFORCEMENT AT OPENINGS SHALL EXTEND 2' BEYOND EACH SIDE OF THE OPENING. CAVITY WALLS SHALL HAVE ONE ROD FOR EACH BED JOINT. NO "TRUSS" RODS SHALL EXTEND THROUGH THE CAVITY.
- PROVIDE CONTROL JOINTS IN CONCRETE MASONRY WALLS AT A MAXIMUM SPACING OF 40' c/c OR AS OTHERWISE SHOWN ON THE DRAWINGS. EXPANSION JOINTS IN BRICK MASONRY VENEERS SHALL BE PROVIDED AT A MAXIMUM SPACING OF 20' c/c OR AS OTHERWISE SHOWN ON THE DRAWINGS.
- FASTENERS/ANCHORS USED IN MASONRY CONSTRUCTION SHALL BE SLEEVE TYPE EXPANSION ANCHORS, MIN 3/8" DIA UNLESS NOTED OTHERWISE. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- WHERE MASONRY WYTHES CHANGE THICKNESS, PROVIDE SOLID (OR GROUTED) COURSE IMMEDIATELY BELOW CHANGE.

MISCELLANEOUS METALS

- UNLESS OTHERWISE SHOWN ON THE DRAWINGS, PROVIDE LOOSE ANGLE LINTELS OVER ALL MASONRY OPENINGS AND RECESSES AS REQUIRED. LINTELS NOT SCHEDULED ON DRAWINGS SHALL CONSIST OF A SINGLE ANGLE WITH A 3 1/2" HORIZONTAL LEG FOR EACH FOUR INCHES OF WALL THICKNESS. ANGLES SHALL BE AS FOLLOWS:

MASONRY OPENING	ANGLE SIZE	BEARING (EACH END)
4'-0" (OR LESS)	3 1/2 x 3 1/2 x 5/16	4"
4'-0" - 6'-0"	4 x 3 1/2 x 5/16	6"
6'-0" - 8'-0"	5 x 3 1/2 x 5/16	8"
8'-0" - 10'-0"	6 x 3 1/2 x 5/16	8"

- ALUMINUM IN CONTACT WITH CONCRETE OR A DISSIMILAR METAL SHALL BE COATED WITH A BITUMASTIC PAINT.

STRUCTURAL STEEL

- DESIGN, DETAIL, FABRICATE, AND ERECT STEEL IN ACCORDANCE WITH THE LATEST AISC SPECIFICATIONS.
- STEEL SHAPES SHALL BE ASTM A36; TUBING ASTM A500 GRADE B; AND PIPE ASTM A53 GRADE B.
- ALL STRUCTURAL STEEL SHALL HAVE ONE SHOP COAT OF APPROVED PRIMING PAINT. PARTS INACCESSIBLE AFTER ERECTION SHALL RECEIVE TWO COATS.
- CONNECTIONS SHALL BE SHOP WELDED AND FIELD BOLTED UNLESS OTHERWISE SHOWN.
- UNLESS INDICATED OTHERWISE ON THE DRAWINGS, CONNECTIONS SHALL DEVELOP THE FULL STRENGTH OF THE MEMBER AS DETERMINED BY THE LOAD TABLES IN THE "AISC MANUAL."
- BOLTED CONNECTIONS SHALL BE OF 3/4", A325, WITH A MINIMUM OF 2 BOLTS PER CONNECTION.
- ALL WELDING SHALL BE IN ACCORDANCE WITH THE LATEST AISC AND AWS SPECIFICATIONS USING E70 ELECTRODES.
- BASE PLATES SHALL BE WELDED TO COLUMNS.
- ALL COLUMNS SHALL HAVE 3/4" NON SHRINK GROUT AND A 1/4" LEVELING PLATE BETWEEN THE BASE PLATE AND CONCRETE.
- ANCHOR BOLTS SHALL BE A307, 3/4" WITH A MINIMUM OF 8" PLUS A HOOK EMBEDDED IN THE CONCRETE UNLESS NOTED OTHERWISE.

STEEL JOIST AND JOIST GIRDERS

- DESIGN, DETAIL, FABRICATE, AND ERECT STEEL JOIST AND JOIST GIRDERS IN ACCORDANCE WITH THE LATEST SJI SPECIFICATIONS.
- PROVIDE STANDARD BRIDGING AND WALL ANCHORS FOR ALL JOIST AND JOIST GIRDERS ACCORDING TO SJI SPECIFICATIONS UNLESS NOTED OTHERWISE.
- PROVIDE DEEP BEARINGS AND SLOPED BEARINGS WHERE CALLED FOR ON THE DRAWINGS.
- EXTEND THE BOTTOM CHORDS OF ALL JOIST AND JOIST GIRDERS AT COLUMNS. DO NOT WELD THE BOTTOM CHORDS UNTIL ALL DEAD LOADS ARE APPLIED.
- PROVIDE BOTTOM CHORD BRACES FOR JOIST GIRDERS ACCORDING TO SJI SPECIFICATIONS.
- PROVIDE BEARING PLATES FOR ALL JOIST AND JOIST GIRDERS BEARING ON MASONRY AND CONCRETE.

LIGHT GAUGE METAL FRAMING

- LIGHT GAUGE FRAMING SHALL BE DESIGNED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE LATEST AISI "SPECIFICATIONS FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS".
- MATERIALS SHALL MEET ASTM A-446 AND A-525 REQUIREMENTS FOR ZINC COATED SHEET STEEL.
- ALL WELDING SHALL BE IN ACCORDANCE WITH AWS "CODE FOR WELDING IN BUILDING CONSTRUCTION, D1.0" AND ANSI Z49.1.
- COLD-FORMED LIGHT GAUGE STEEL FRAMING MEMBERS SHALL INCLUDE "C"-SHAPED AND ANGLES, STRUCTURAL STEEL STUDS, JOIST, AND RUNNER TRACK.

CARPENTRY

- ALL WOOD CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION".
- LUMBER AND WOOD FRAMING SHALL NOT HAVE A MOISTURE CONTENT GREATER THAN 19% BY WEIGHT WHEN PLACED INTO THE CONSTRUCTION.
- LUMBER FOR FRAMING SHALL BE SPRUCE-PINE-FIR #2 OR BETTER.
- PRESERVATIVE OR FIRE RETARDANT TREATED LUMBER SHALL BE SOUTHERN PINE #2 OR BETTER.
- PROVIDE WOOD FRAMING AS SHOWN AND AS REQUIRED TO COMPLETE THE PROJECT.
 - STUDS SHALL BE OF SIZE AND SPACING AS SHOWN ON THE DRAWINGS, DOUBLED AROUND OPENINGS AND TRIPLED AT CORNERS.
 - PROVIDE PLATES TOP AND BOTTOM OF STUD WALLS (DOUBLE TOP PLATES). SPLICES IN TOP PLATES SHALL BE MADE OVER STUDS AND STAGGERED.
- JOIST, RAFTERS, AND OTHER FRAMING MEMBERS SHALL BE SECURELY ANCHORED TO THEIR SUPPORTING MEMBERS AND BLOCKED TO PREVENT ROTATION. PROVIDE GALVANIZED METAL CONNECTORS WHERE INDICATED.
- ALL HEADERS SHALL BE MULTIPLE 2x10's (1 FOR EACH NOMINAL 2" OF WALL), UNLESS NOTED OTHERWISE.
- ALL HEADERS SHALL BEAR ON MINIMUM 1 STUD, SISTERED TO 1 FULL HEIGHT STUD UNLESS NOTED OTHERWISE.
- UNLESS NOTED OTHERWISE, ALL BEAMS BEARING ON WALLS SHALL BE SUPPORTED BY 1 STUD FOR EACH NOMINAL 2" OF BEAM, SISTERED TO 1 FULL HEIGHT STUD.

WOOD ROOF TRUSSES

- ROOF TRUSSES SHALL BE DESIGNED AND FABRICATED IN ACCORDANCE WITH THE LATEST TRUSS PLATE INSTITUTE SPECIFICATIONS.
- STRUCTURAL COMPUTATIONS AND DETAILS SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE LOCALITY OF THE PROJECT SHALL BE SUBMITTED FOR EACH TRUSS CONFIGURATION.
- TRUSSES SHALL BE DESIGNED FOR 10psf DEAD LOAD AND 25psf LIVE LOAD ALL ON THE TOP CHORD, AND 10psf DEAD LOAD ON THE BOTTOM CHORD, PLUS ANY ADDITIONAL LOADING SHOWN ON THE DRAWINGS. SNOW LOADS SHALL BE APPLIED ACCORDING TO THE APPLICABLE BUILDING CODE INCLUDING INCREASES DUE TO DRIFTING OR SLIDE OFF FROM AN ADJACENT ROOF.
- PROVIDE GALVANIZED METAL TRUSS CLIPS TO ANCHOR EACH END OF TRUSS.
- ALL TRUSS HANGERS SHALL BE DESIGNED AND SUPPLIED BY THE TRUSS MANUFACTURER TO ACCOMMODATE TRUSSES SUPPLIED.
- PROVIDE TRUSS BRACING CONFORMING TO TRUSS PLATE INSTITUTE STANDARDS. PROVIDE TEMPORARY BRACING DURING ERECTION. PROVIDE PERMANENT BRACING AS REQUIRED IN THE DESIGN OF THE TRUSS AS INDICATED. IN ADDITION TO THE ABOVE PROVIDE PERMANENT BRACING AS FOLLOWS UNLESS OTHERWISE NOTED:
 - UNLESS SHEATHED WITH APA RATED SHEATHING, PROVIDE CONTINUOUS LATERAL BRACING OF THE TOP CHORD AS INDICATED ON THE DRAWINGS. PROVIDE DIAGONAL BRACING ON BOTH SIDES OF THE RIDGE AT END BAYS AND AT 20' INTERVALS FOR BUILDINGS OVER 60' IN LENGTH.
 - PROVIDE DIAGONAL BRACING IN THE PLANE OF WEB MEMBERS AT 12'-16" INTERVALS ALONG THE LENGTH OF TRUSSES AT END BAYS AND AT 20' INTERVALS ALONG THE LENGTH OF THE BUILDING.
 - UNLESS CONTINUOUSLY SHEATHED PROVIDE CONTINUOUS LATERAL BRACING OF THE BOTTOM CHORD AT 8'-10' INTERVALS AT OR NEAR PANEL POINTS, OR AS INDICATED ON THE DRAWINGS. PROVIDE DIAGONAL BRACING ON BOTH SIDES OF THE RIDGE AT END BAYS AND AT 20' INTERVALS FOR BUILDINGS OVER 60' IN LENGTH.

LAMINATED VENEER LUMBER (LVL)

- PARALLEL LAMINATED VENEER LUMBER SHALL BE MANUFACTURED FROM APPROPRIATE VENEERS GLUED UP IN A CONTINUOUS PROCESS WITH ALL GRAIN PARALLEL WITH THE LENGTH OF THE MEMBER. LVL SHALL BE MANUFACTURED IN A PLANT AND UNDER PROCESSES APPROVED BY THE NATIONAL RESEARCH BOARD.
- LVL SHALL BE OF SINGLE, ONE-PIECE LENGTH FREE OF FINGER JOINTS, SCARF JOINTS OR MECHANICAL CONNECTIONS IN FULL LENGTH MEMBERS.
- DESIGN SHALL BE IN ACCORDANCE WITH PROVISIONS OF THE "NATIONAL DESIGN SPECIFICATION FOR WOOD".
- MINIMUM ALLOWABLE DESIGN PARAMETERS SHALL BE:

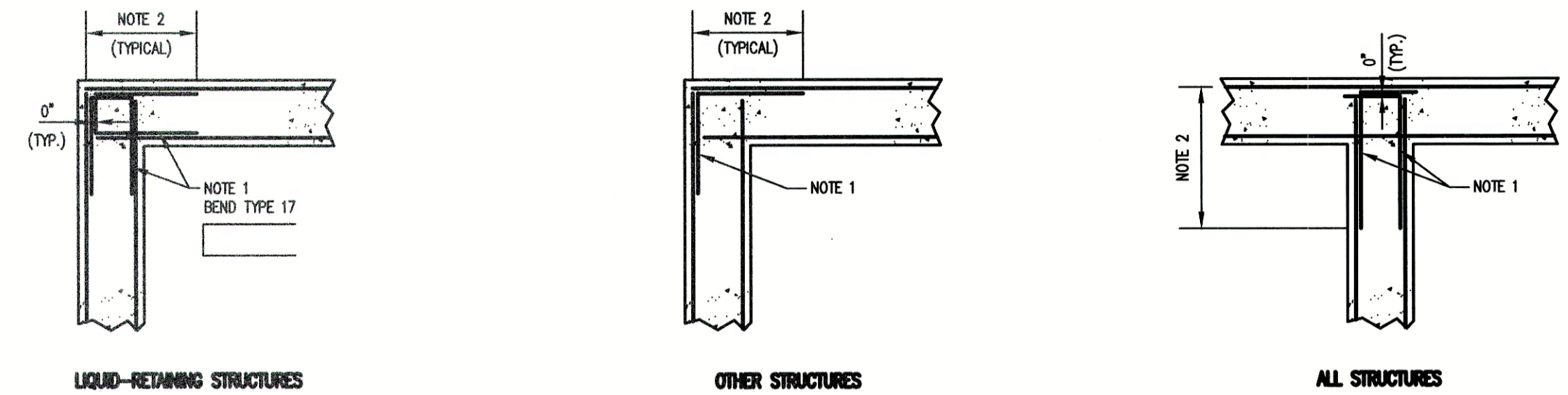
E =	2000000psi
Ft =	2800psi
Fv =	285psi

WOOD "I" JOISTS

- ALL WOOD "I" JOISTS SHALL BE DESIGNED, FABRICATED, AND INSTALLED IN ACCORDANCE WITH CURRENT INDUSTRY STANDARDS, FOLLOWING THE MANUFACTURER'S RECOMMENDATIONS, OF THE SIZES AND AT SPACINGS SHOWN. "I" JOISTS SHALL MEET THE REQUIREMENTS OF APA-THE ENGINEERED WOOD ASSOCIATION STANDARD P10-400.
- CHORDS SHALL BE OF LAMINATED VENEER LUMBER OR OTHER APPROVED MATERIAL.
- WEBS SHALL BE OF STRUCTURAL 1 PLYWOOD OR OTHER APPROVED APA MATERIALS.
- EXCEPT FOR LENGTH, CHORDS MAY NOT BE CUT. HOLES IN WEBS MUST CONFORM TO THE MANUFACTURER'S STANDARDS.
- PROVIDE WEB STIFFENERS, SQUASH BLOCKS, OR BLOCKING AT POINTS OF BEARING AND AT CONCENTRATED LOADS. FOLLOW MANUFACTURER'S RECOMMENDATIONS OR CONSULT A/E.
- PROVIDE A PLYWOOD "RIM" JOIST OR "I" BEAM BLOCKING AT ENDS OF JOISTS AS REQUIRED.
- APPROVED METAL HANGERS AND FASTENERS SHALL BE PROVIDED WHERE REQUIRED.

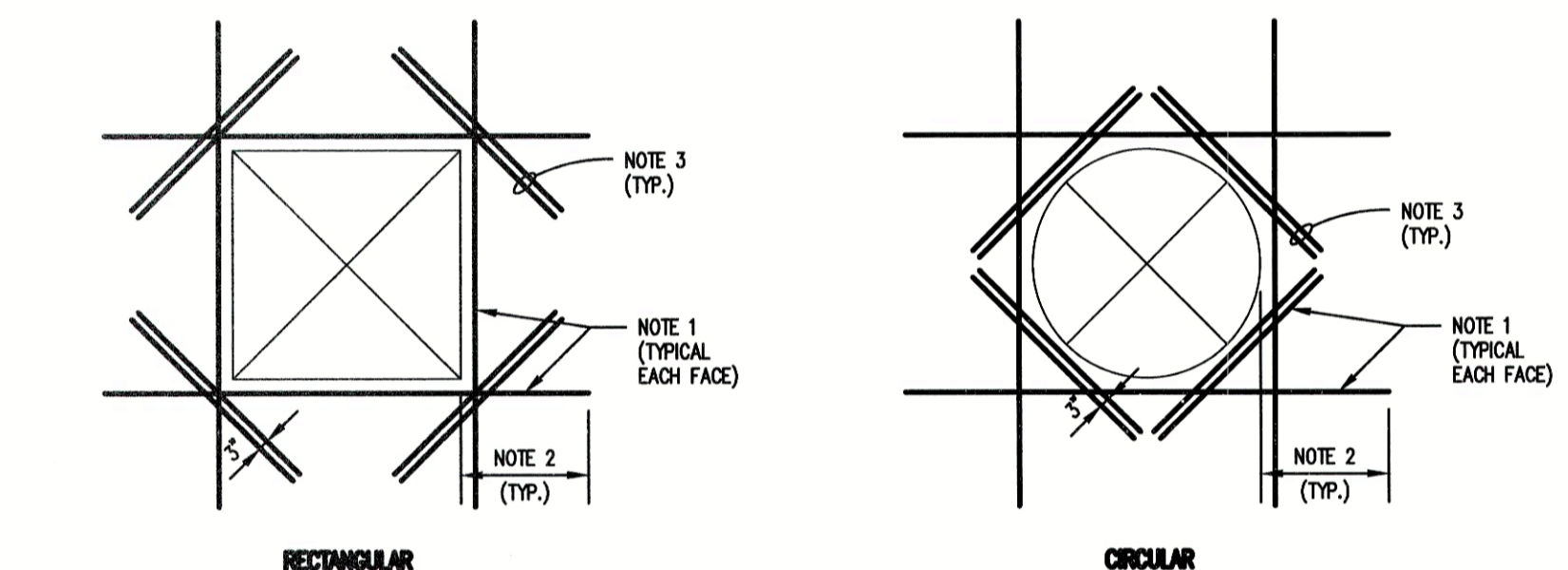
PRE-ENGINEERED METAL BUILDING

- THE DESIGN SHALL BE A CLEAR OR MULTI SPAN RIGID FRAME WITH TAPERED OR STRAIGHT COLUMNS AS INDICATED, ROOF BEAMS, GABLE OR MONO SLOPE ROOF AS SHOWN. INCLUDE ALL WALL GRIDS, ROOF PURLINS, SIDING, LINER PANELS, BRACING, AND ROOFING.
- ALL COMPONENTS AND PARTS OF THE STRUCTURAL SYSTEM SHALL BE AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS. ALL COMPONENTS AND PARTS SHALL BE CLEARLY MARKED AND AN ERECTION DRAWING SHALL BE SUPPLIED FOR IDENTIFICATION AND ASSEMBLY.
- VERIFY ALL FOUNDATION LOADS/REQUIREMENTS WITH A/E PRIOR TO CONSTRUCTION.
- ALL STRUCTURAL SECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST EDITION OF AISC "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
- COLD FORMED STEEL STRUCTURAL MEMBERS SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST EDITION OF AISI "SPECIFICATIONS FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS".
- THE DESIGN OF THE STRUCTURAL SYSTEM WILL BE IN ACCORDANCE WITH THE BUILDING CODE(S) LISTED TO MEET THE MINIMUM LOADS SPECIFIED.
- BRACING SHALL BE LOCATED AS INDICATED ON THE DRAWINGS.
- WELDING SHALL BE IN ACCORDANCE WITH AWS STANDARDS.
- PARTS SHALL BE SHOP PRIME PAINTED IN ACCORDANCE WITH FEDERAL SPECIFICATION TT-P-636.



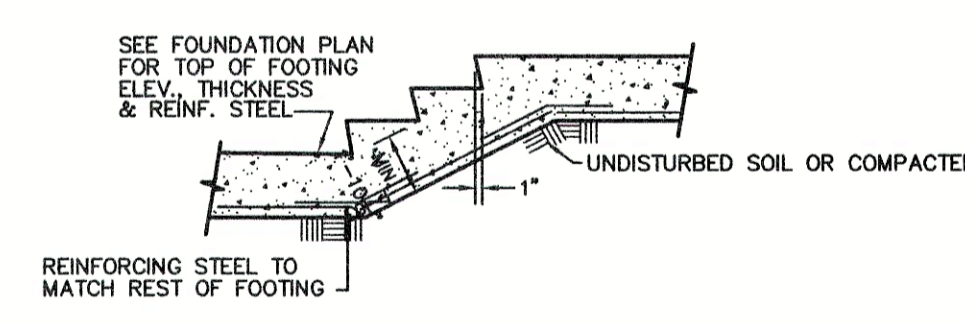
TYPICAL CORNER REINFORCEMENT WALL TYPICAL

NOT TO SCALE

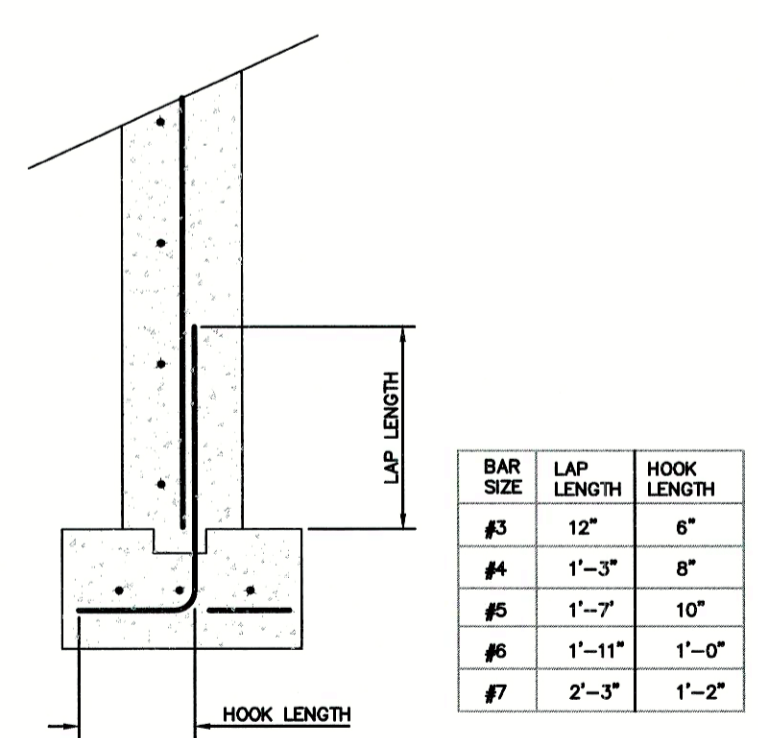


TYPICAL ADDITIONAL REINFORCEMENT AT OPENINGS LARGER THAN 12"

NOT TO SCALE



STEPPED FOOTING DETAIL



STANDARD LAP AND HOOK

NOT TO SCALE

RECORD DRAWING



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**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

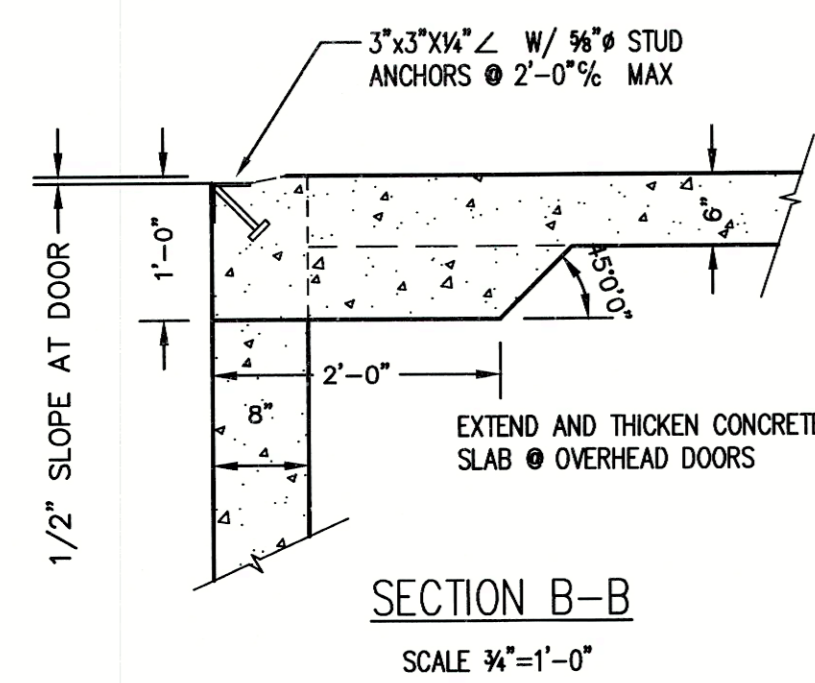
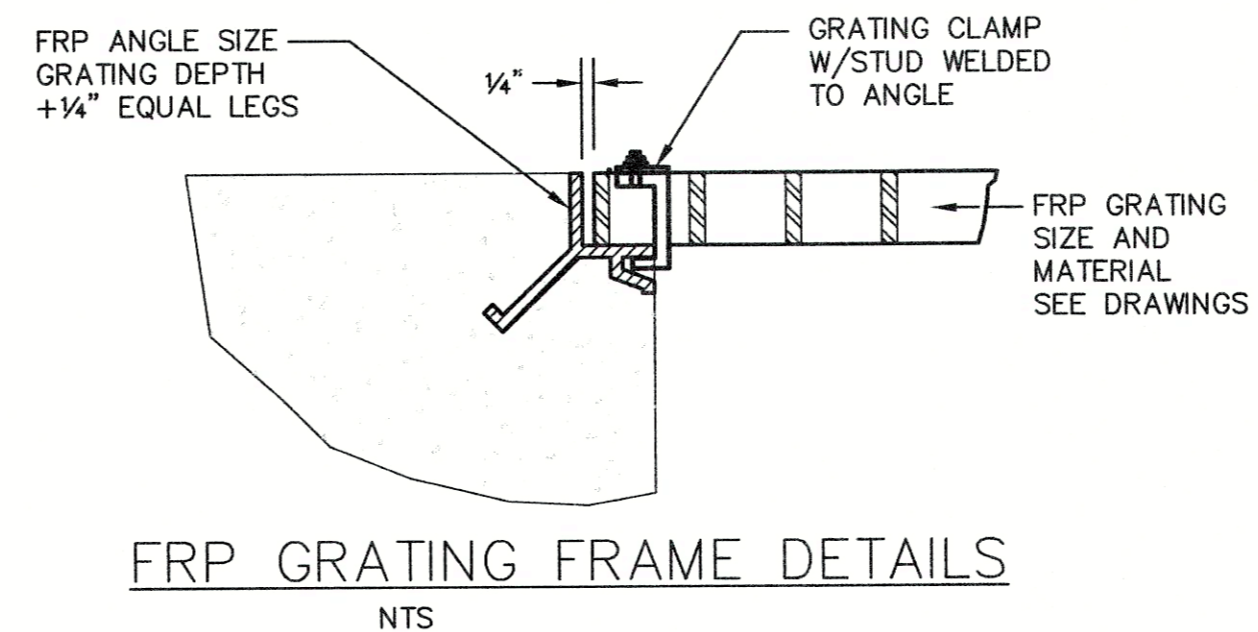
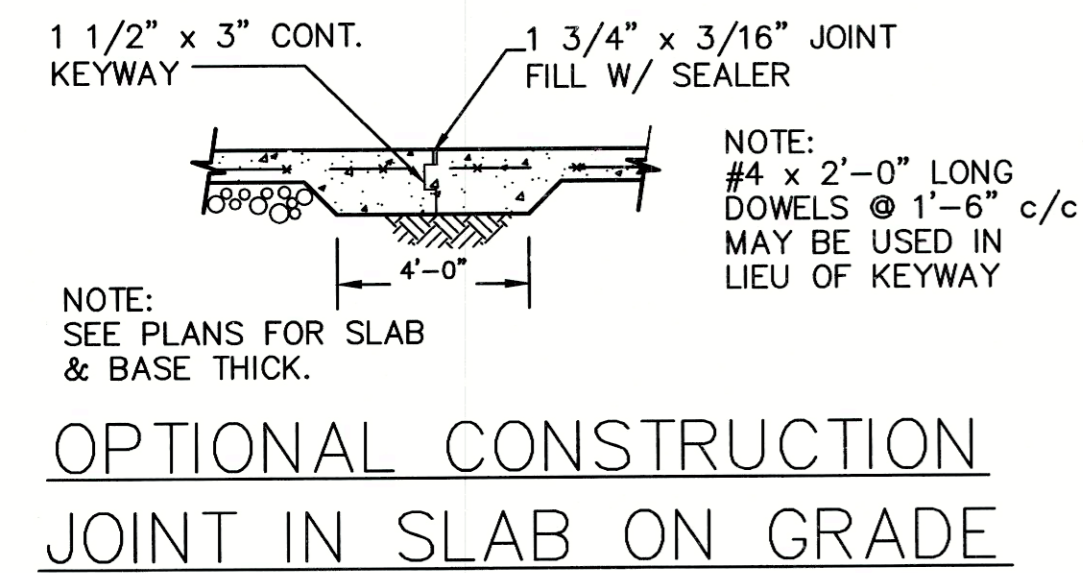
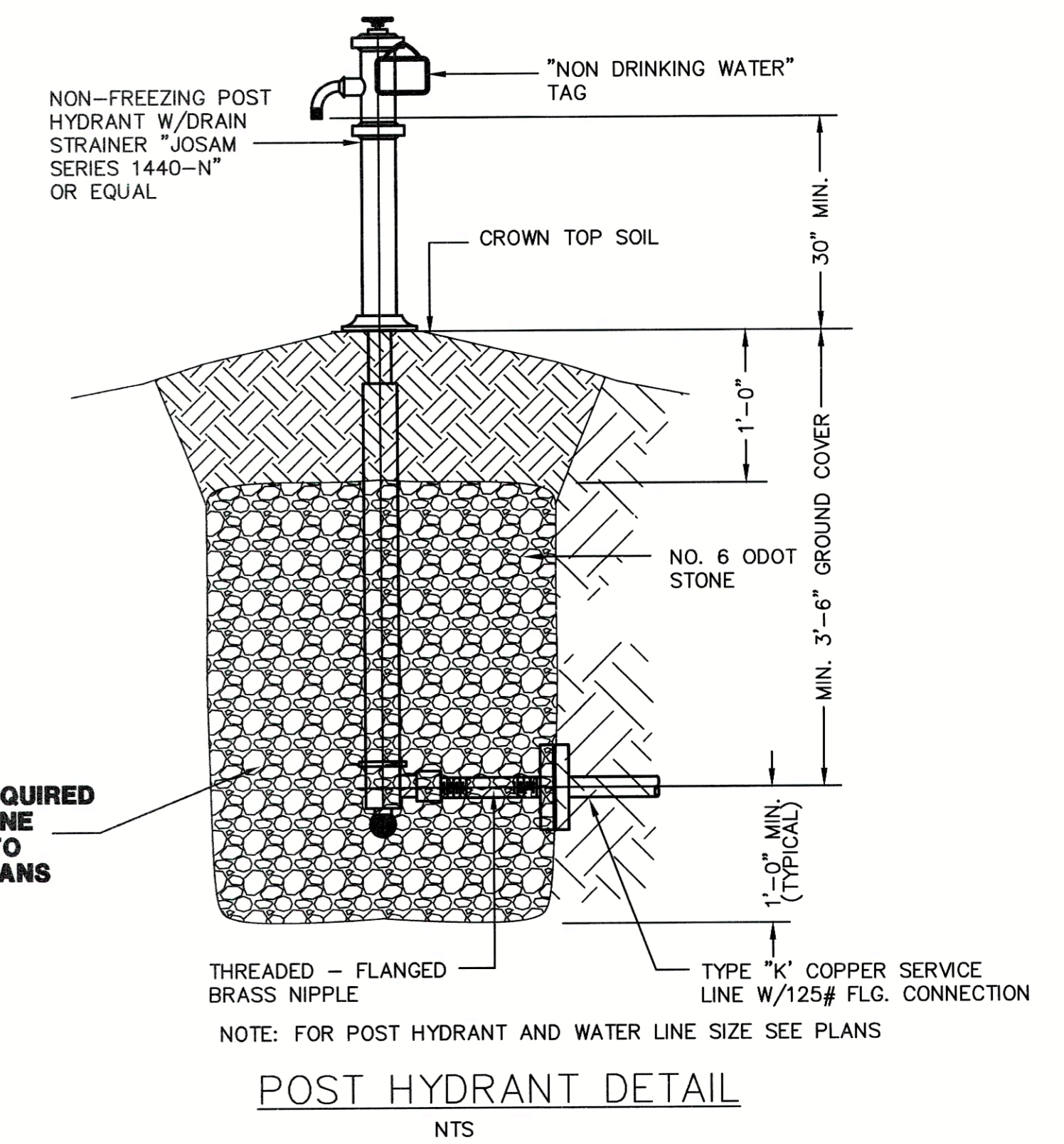
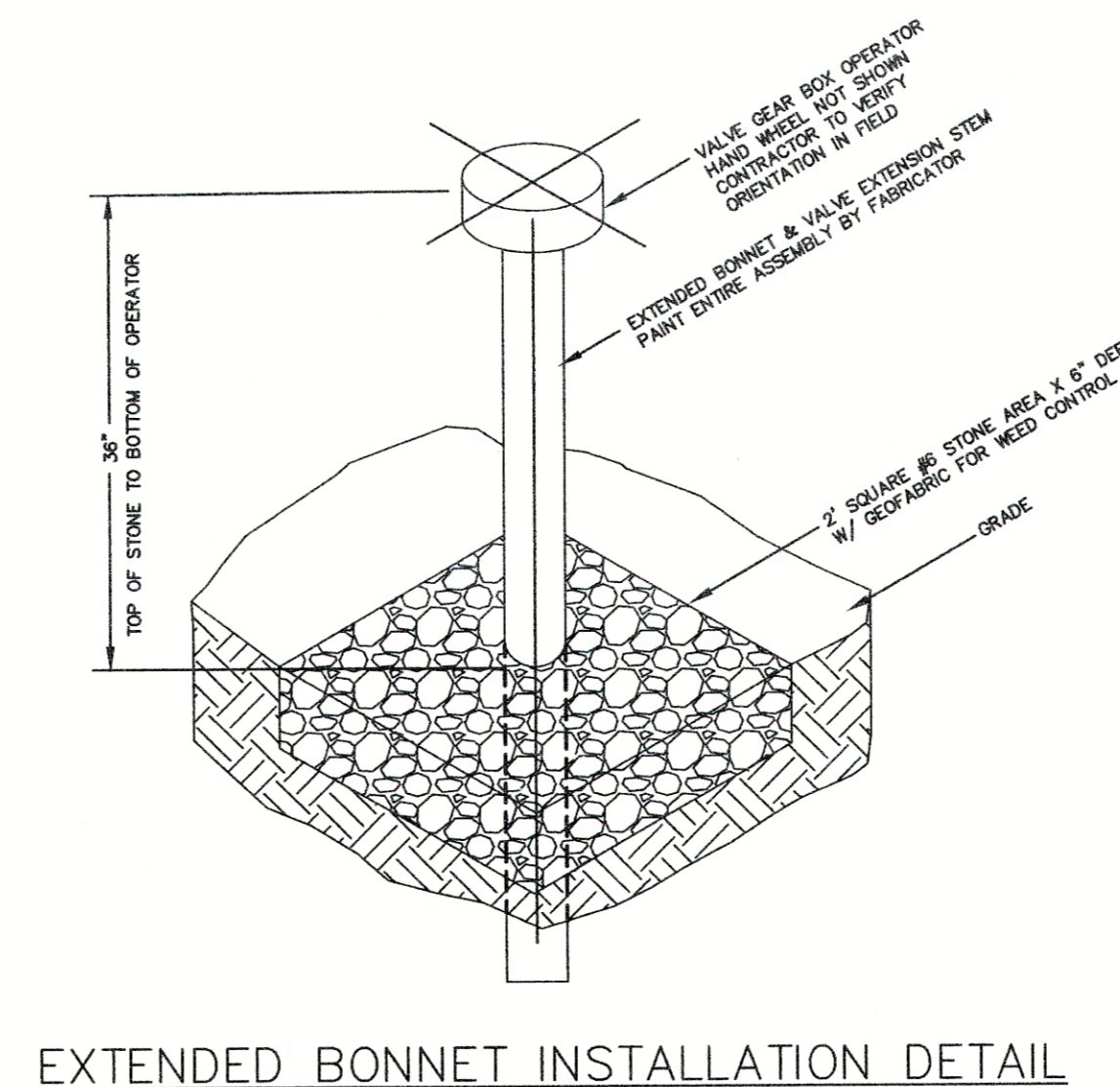
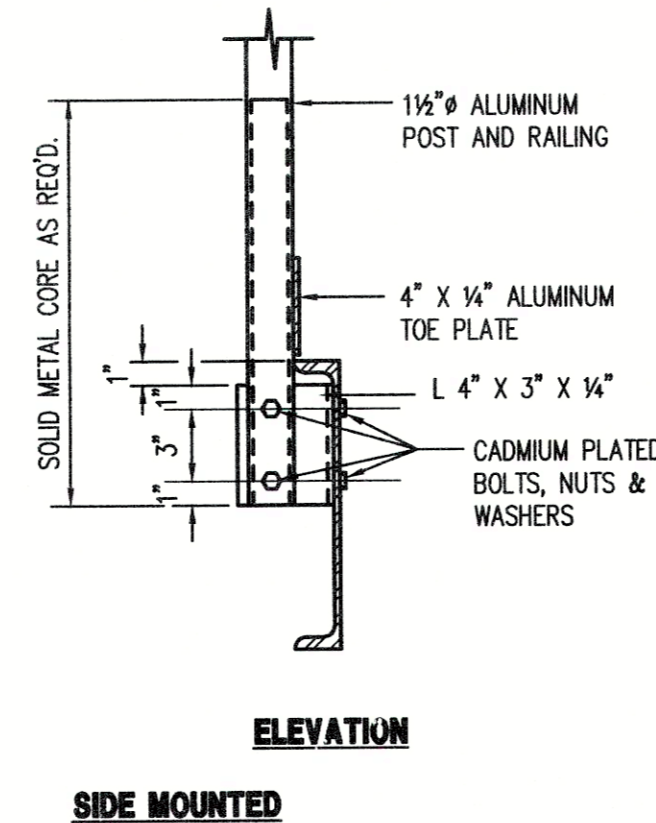
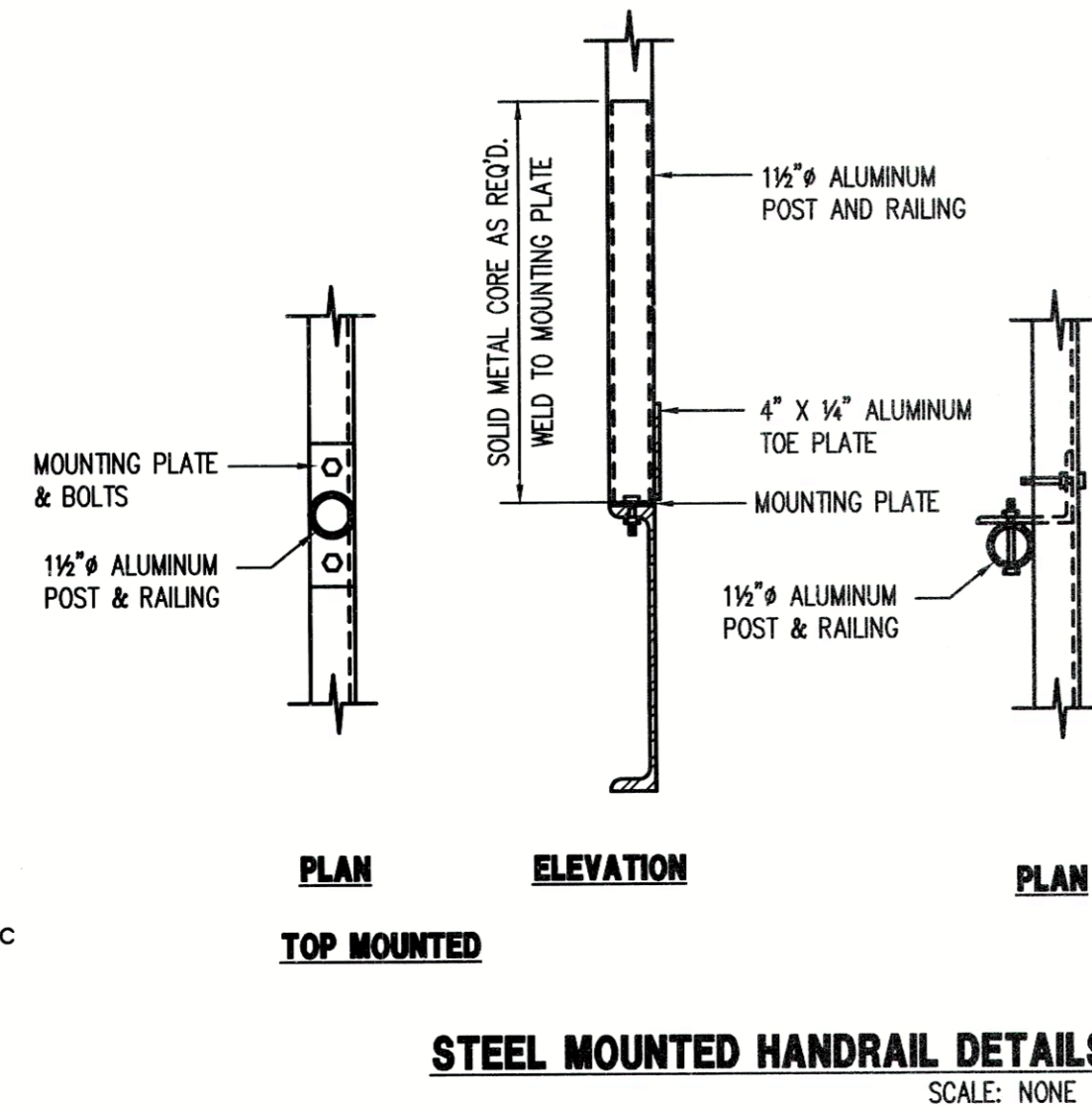
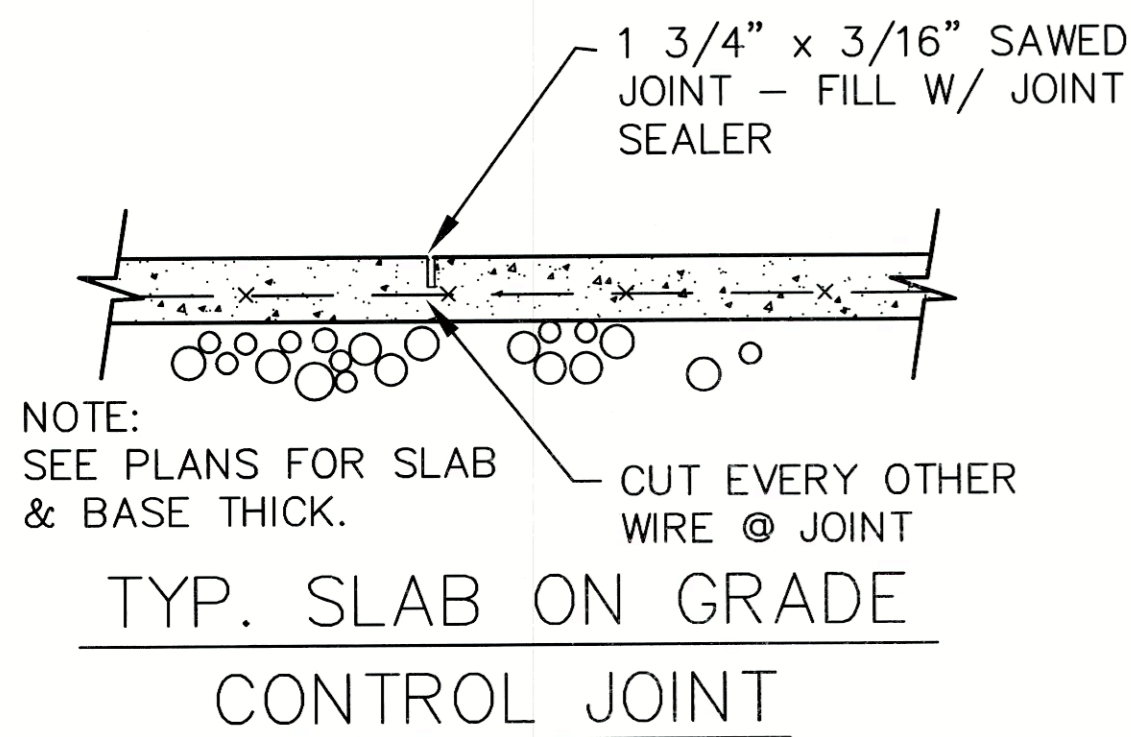
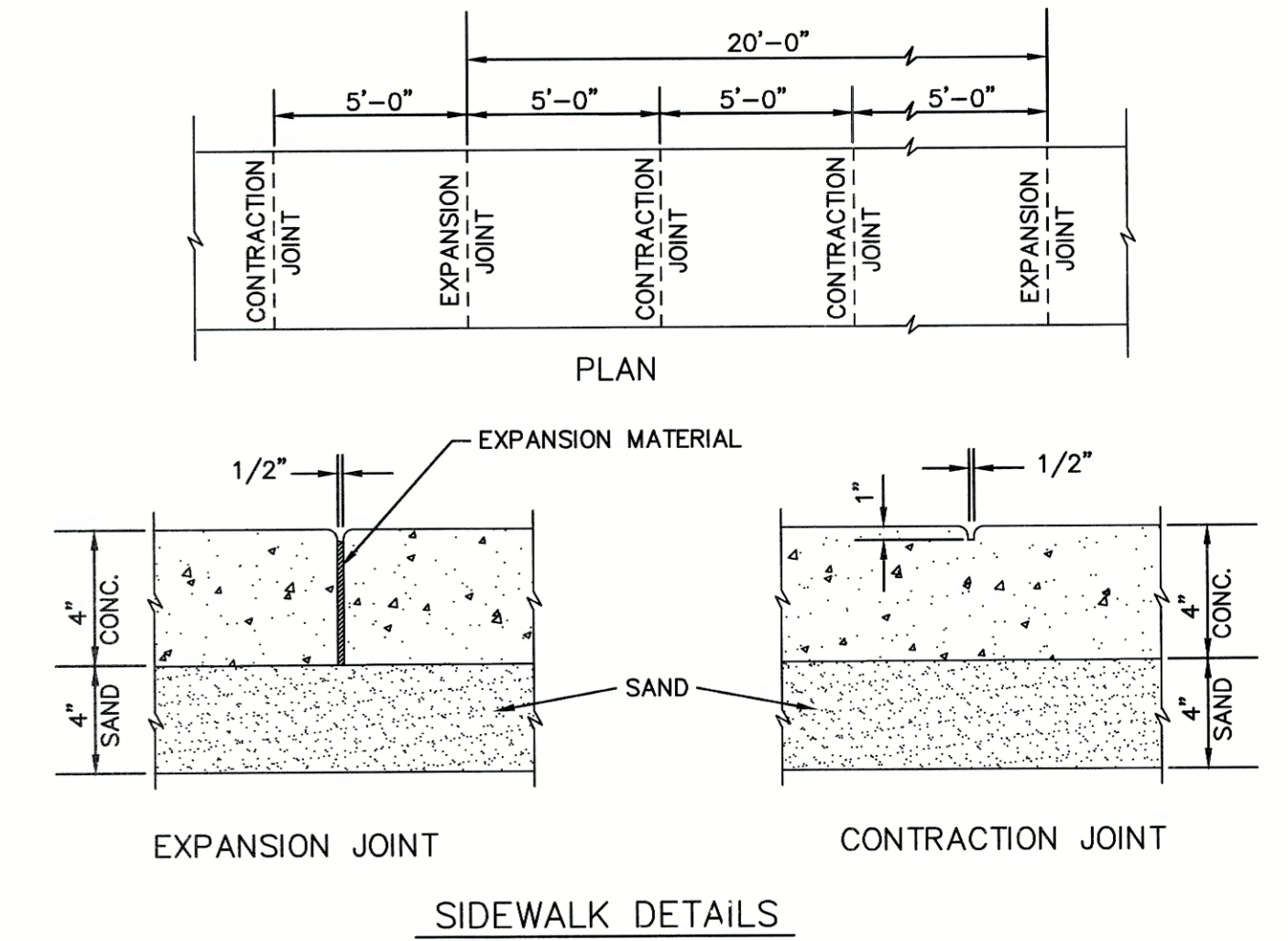
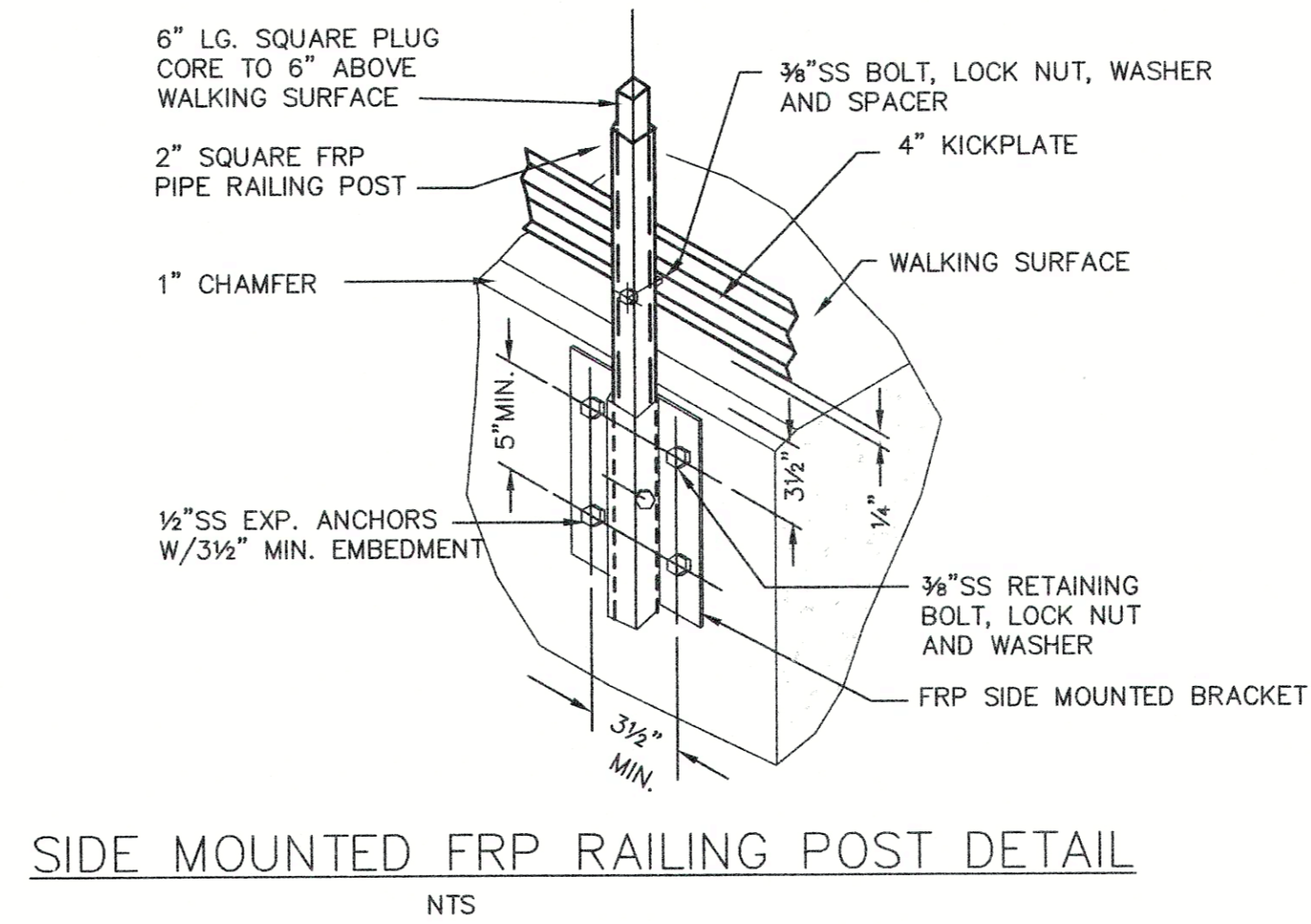
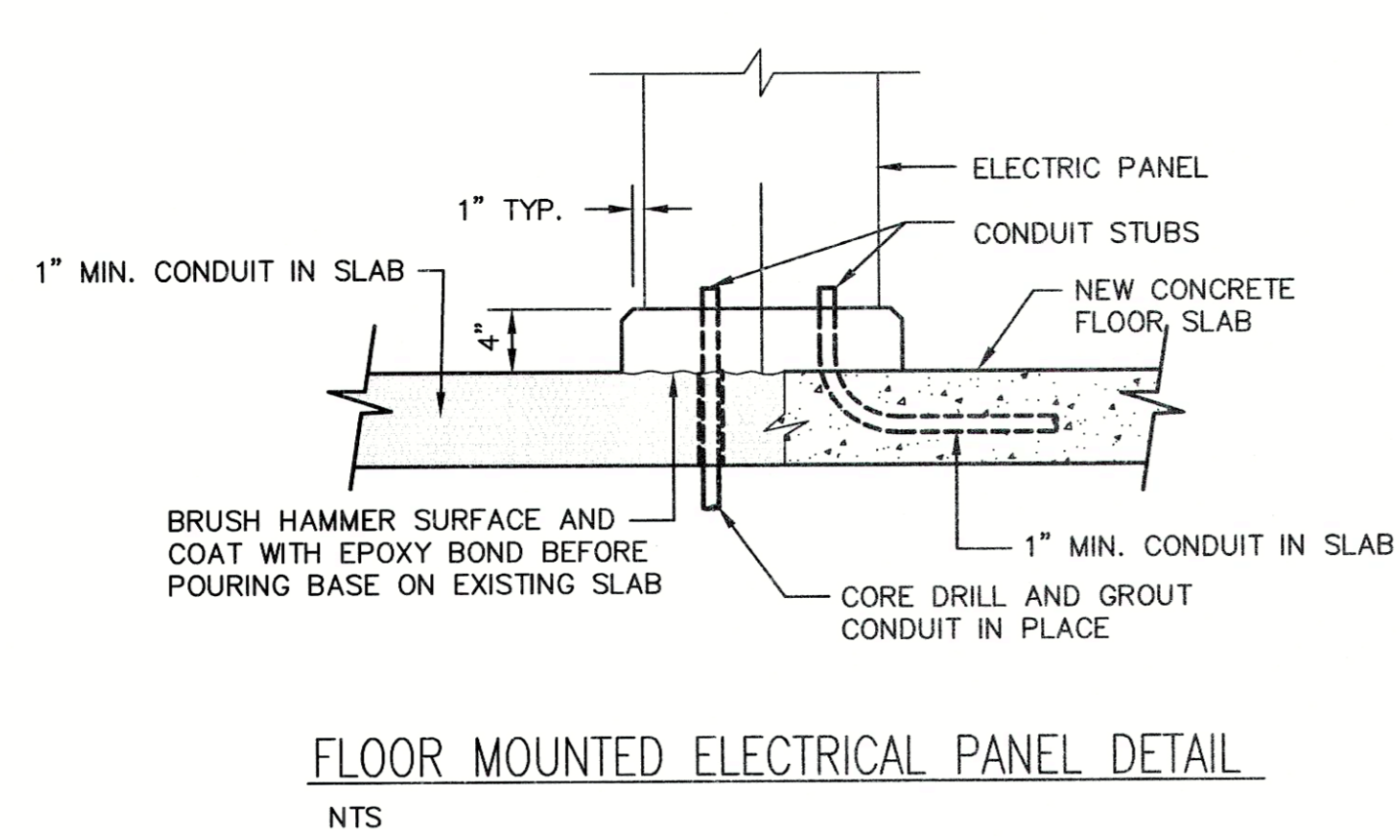
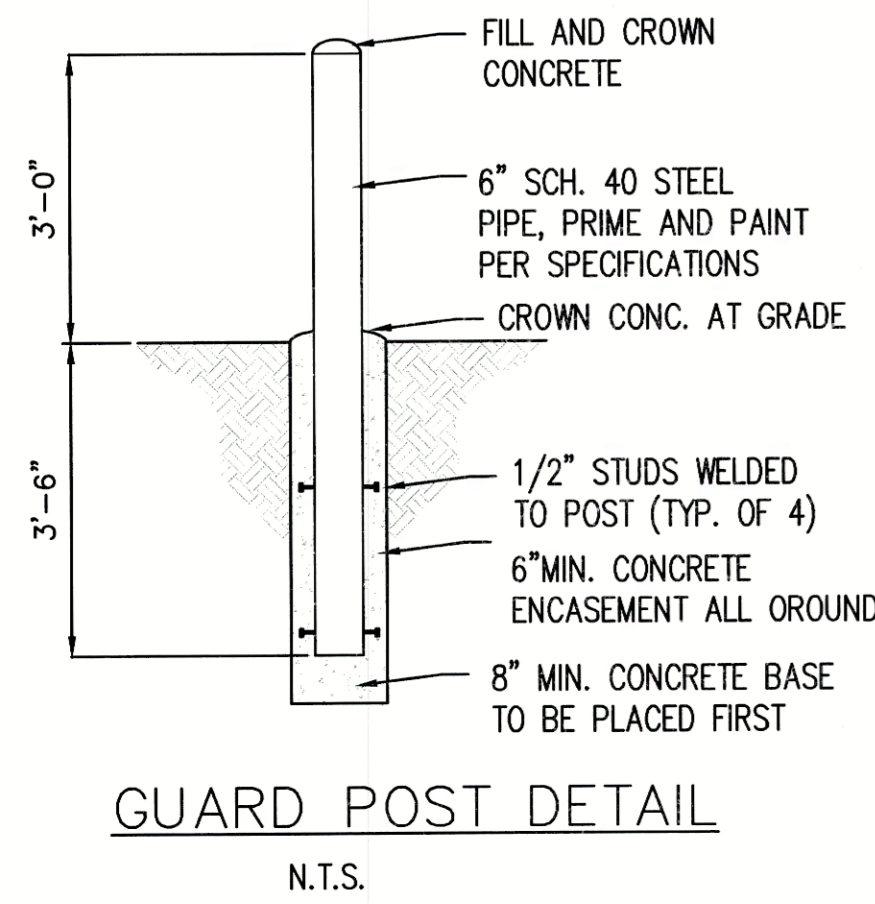
**STRUCTURAL
DETAILS AND
GENERAL NOTES**

DRAWN BY: CHECKED BY:
W.M.V. S.R.W.
REVISION
6-19-00, JAB
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OF
22
JOB NUMBER
1590-066

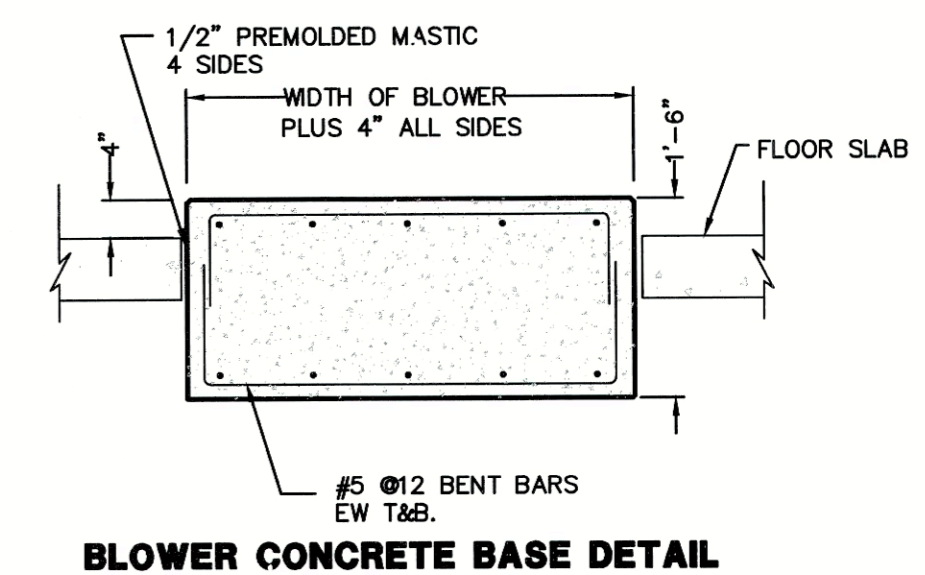
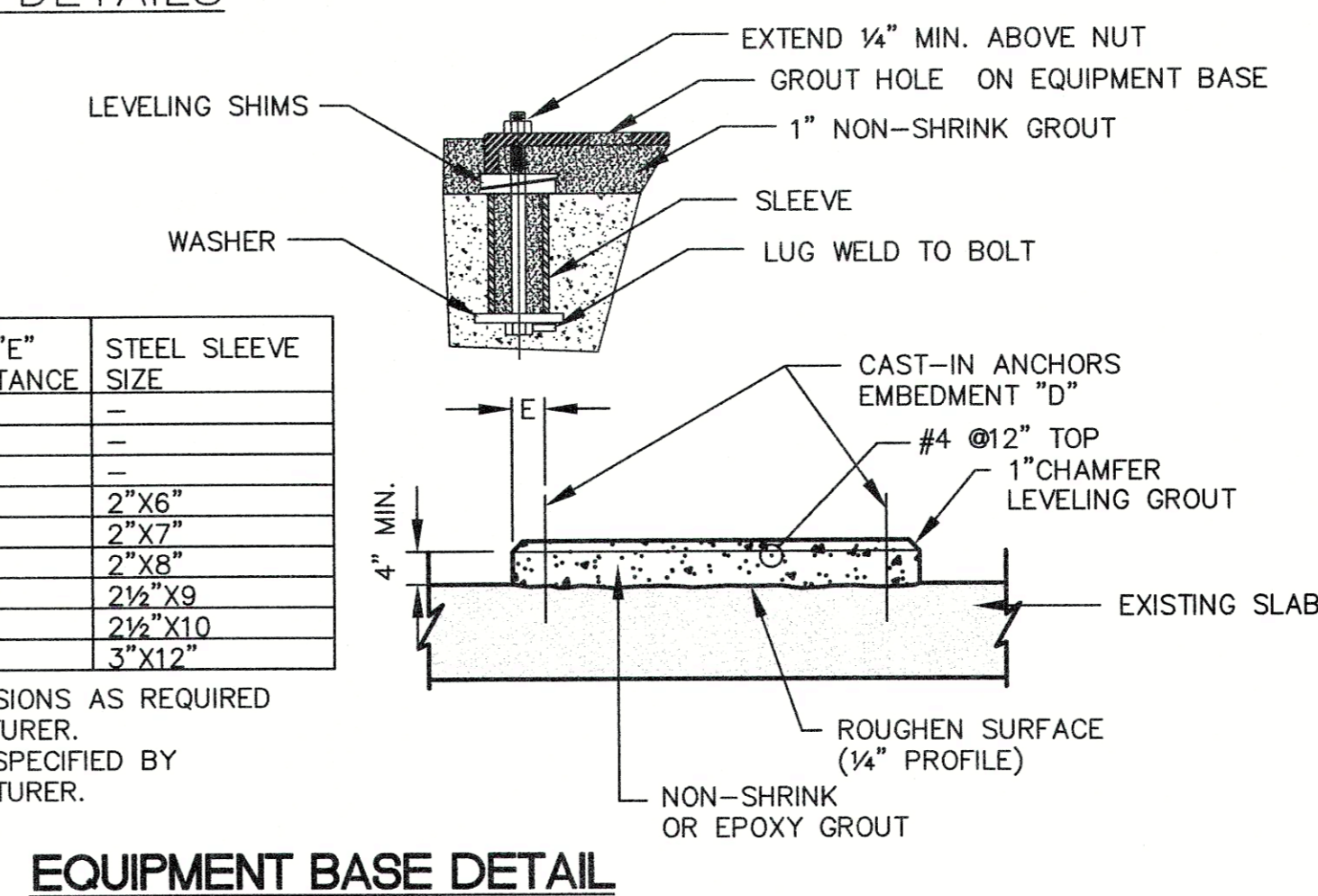
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ANCHOR DIAMETER	MINIMUM "D" EMBEDMENT	MINIMUM "E" EDGE DISTANCE	STEEL SLEEVE SIZE
3/8"	5.0"	3.5"	-
1/2"	7.5"	4.5"	-
5/8"	9.5"	4.5"	-
3/4"	11.5"	4.5"	2"X6"
7/8"	13.5"	4.5"	2"X7"
1"	15.0"	4.5"	2"X8"
1 1/8"	17.0"	4.5"	2 1/2"X9"
1 1/4"	19.0"	5.0"	2 1/2"X10"
1 1/2"	22.5"	6.0"	3"X12"

NOTES: 1. PUMP BASE DIMENSIONS AS REQUIRED PER PUMP MANUFACTURER.
2. ANCHOR SIZE AS SPECIFIED BY EQUIPMENT MANUFACTURER.



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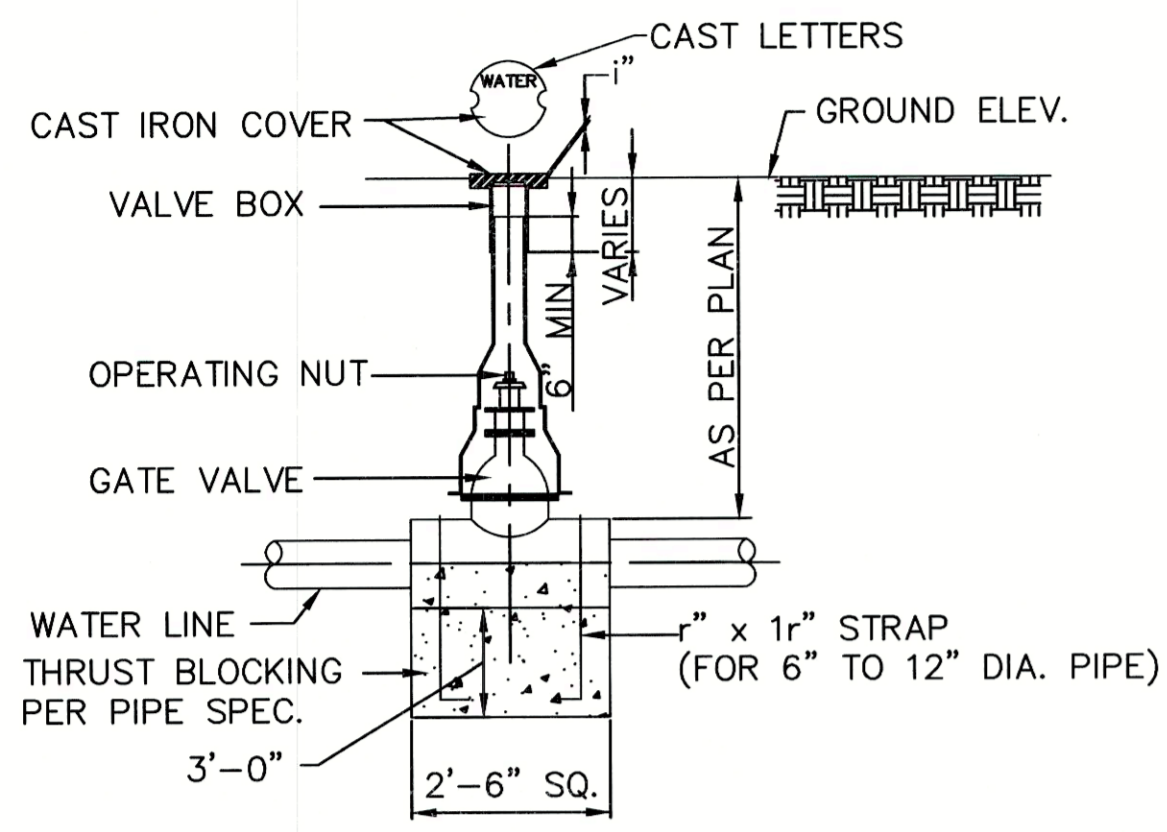
**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

**MISCELLANEOUS
DETAILS**

DESIGNED BY
W.M.V. S.R.W.
REVISION
6-19-00, JAB
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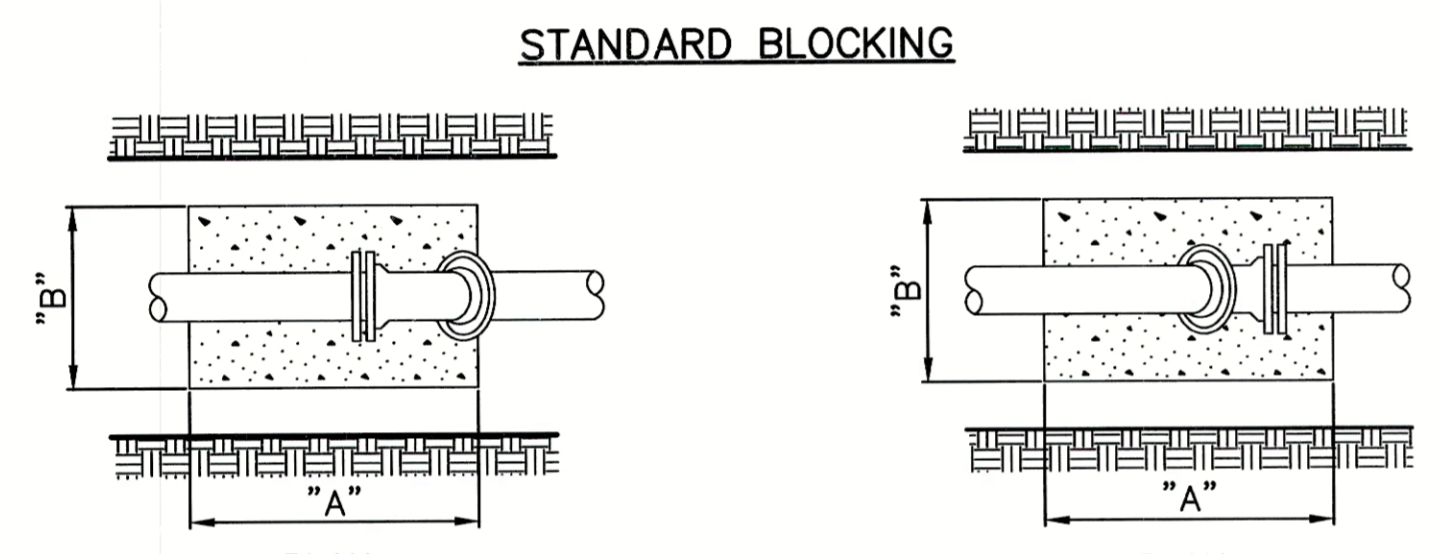
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1590-066

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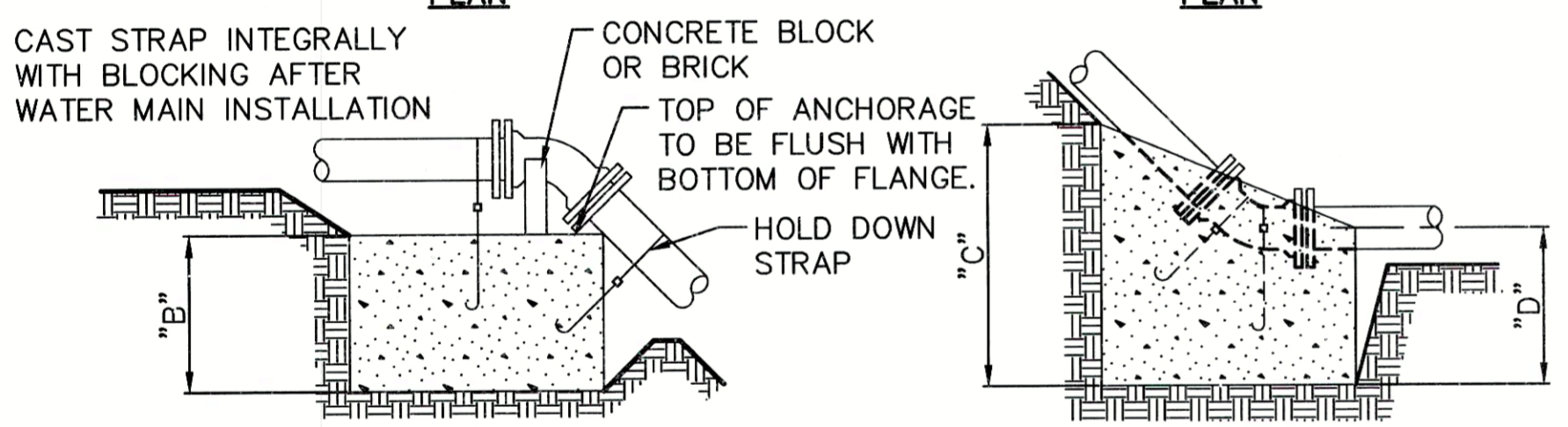


GATE VALVE INSTALLATION
(12" MAX.)

INSTALLATION OF VALVES UNDER PRESSURE CONDITIONS, ALL VALVES (INCLUDING THOSE IN HYDRANT RUN-OUTS) REQUIRE ANCHORAGE AGAINST THRUST CREATED WHEN VALVE IS CLOSED. JOINT RESTRAINTS ARE REQUIRED EACH DIRECTION FROM VALVE FOR A DISTANCE (L_{de}), SEE JOINT RESTRAINT REQUIREMENTS FOR DEAD END LINES FOR THIS DISTANCE.



STANDARD BLOCKING



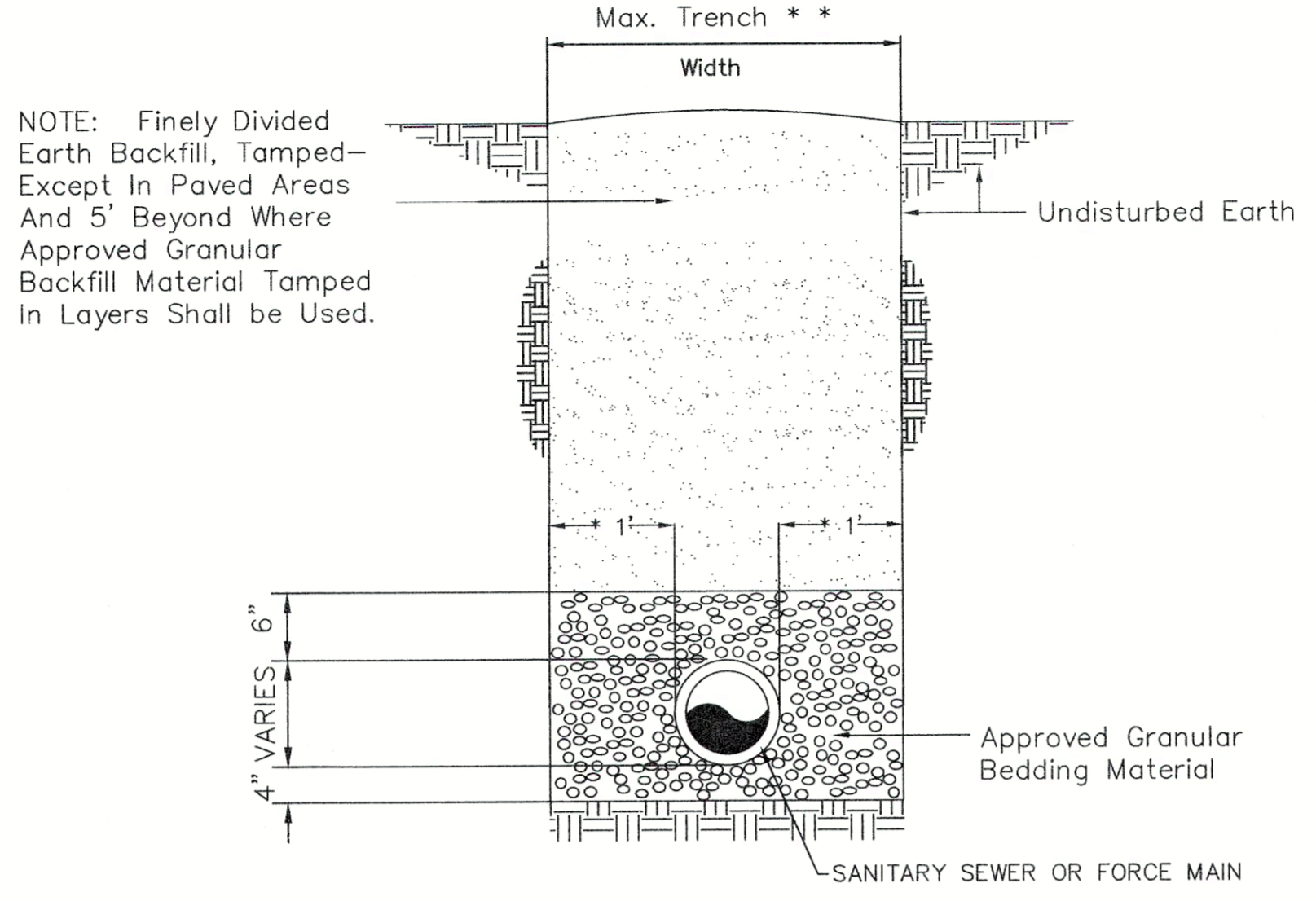
ELEVATION

ELEVATION

NOTE:
6" TO 8" 1-1/4"x1-1/8" STRAP
10" TO 12" 2-1/4"x1-1/4" STRAP
14" TO 16" 2-3/8"x1-1/2" STRAP
18" TO 20" 2-1/2"x1-3/4" STRAP

VERTICAL BENDS

SOIL TYPE	SIZE	TYPE A			TYPE B			
		A	B	C	A	B	C	D
2000 PSF SOIL	6"	36"	30"	24"	24"	24"	24"	16"
	8"	42"	36"	24"	30"	24"	30"	18"
	10"	48"	42"	30"	36"	30"	33"	18"
	12"	54"	48"	36"	36"	36"	36"	21"
	14"	54"	48"	60"	42"	42"	42"	24"
	16"	60"	54"	60"	48"	48"	44"	24"
	20"	72"	60"	72"	60"	54"	54"	30"
	24"							

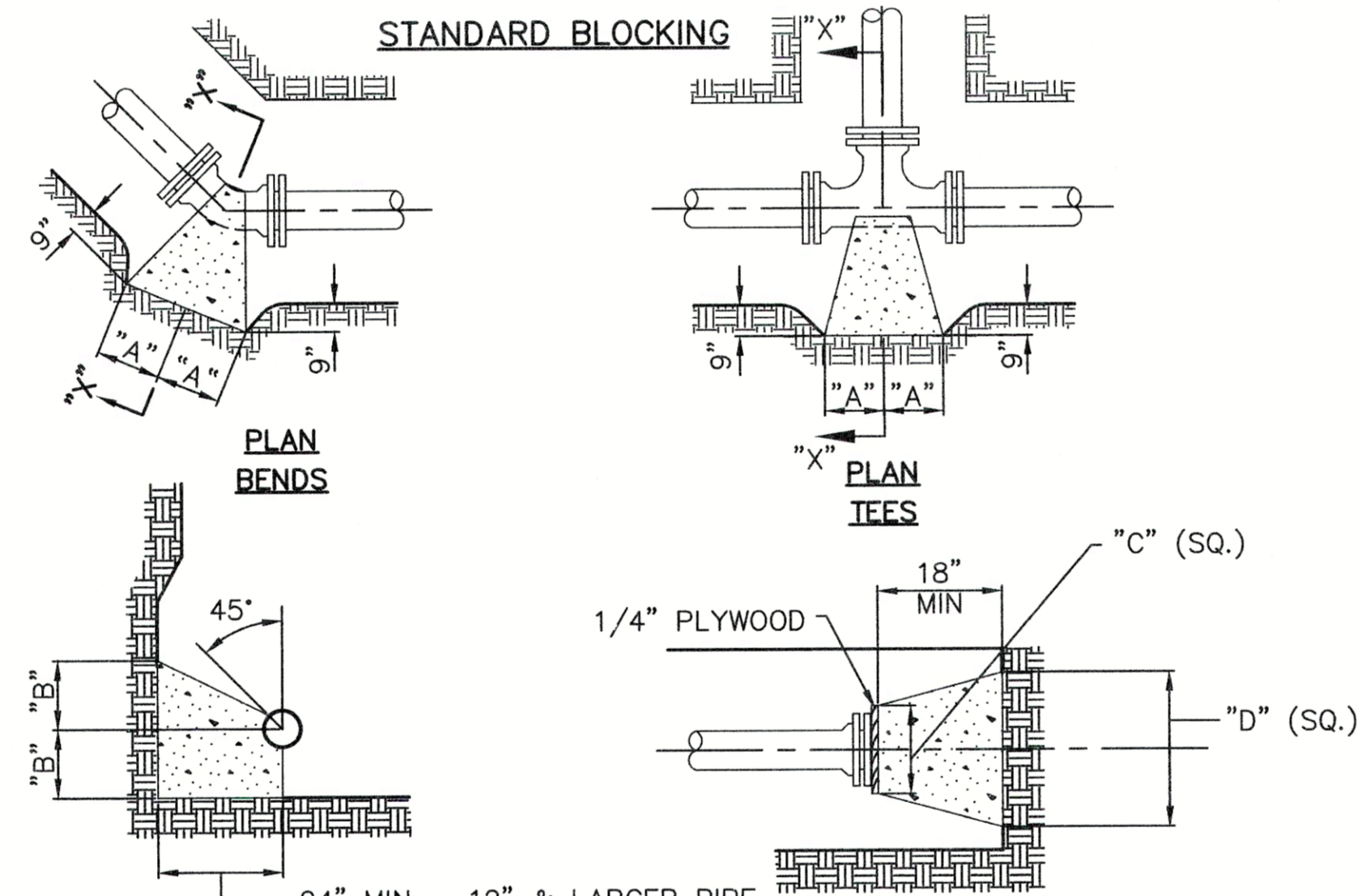


NOTE: Finely Divided Earth Backfill, Tamped - Except In Paved Areas And 5' Beyond Where Approved Granular Backfill Material Tamped In Layers Shall be Used.

** Pay Limits Only, Maximum Trench Width Shall Be The Same As The Trench Width At The Top Of The Pipe.

* For Sewer Up To 24" I.D. (Max. Is 18" For Sewers Over 24" I.D.)

GRAVITY SANITARY SEWER TRENCH DETAIL



SECTION X-X BENDS AND TEES

PLAN AND ELEVATION PLUGS

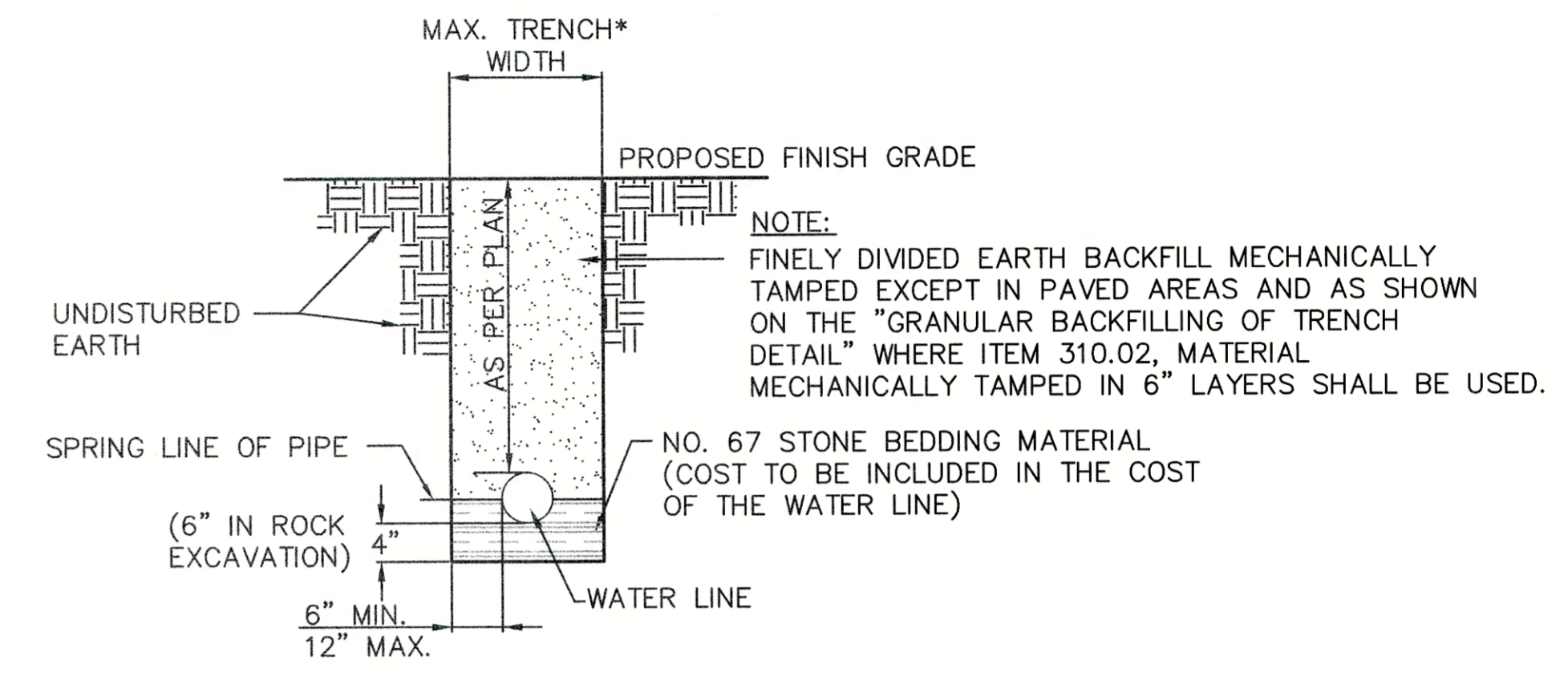
TYPE	SIZE	1/4 BENDS		1/8 BENDS		1/16 BENDS		TEES		PLUGS		
		A	B	A	B	A	B	A	B	C	D	
2000 PSF SOIL	6"	16"	10"	9"	10"	6"	8"	10"	12"	10"	21"	
	8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"	
	10"	26"	17"	14"	17"	10"	13"	16"	20"	14"	36"	
	12"	29"	21"	16"	21"	11"	16"	18"	24"	16"	41"	
	14"	35"	24"	19"	24"	12"	20"	22"	27"	18"	48"	
	16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"	
	20"	46"	36"	25"	36"	15"	30"	30"	39"	24"	68"	
	24"											

NOTE BASED ON 100 P.S.I. STATIC PRESSURE PLUS A.W.W.A. WATER HAMMER.

ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.

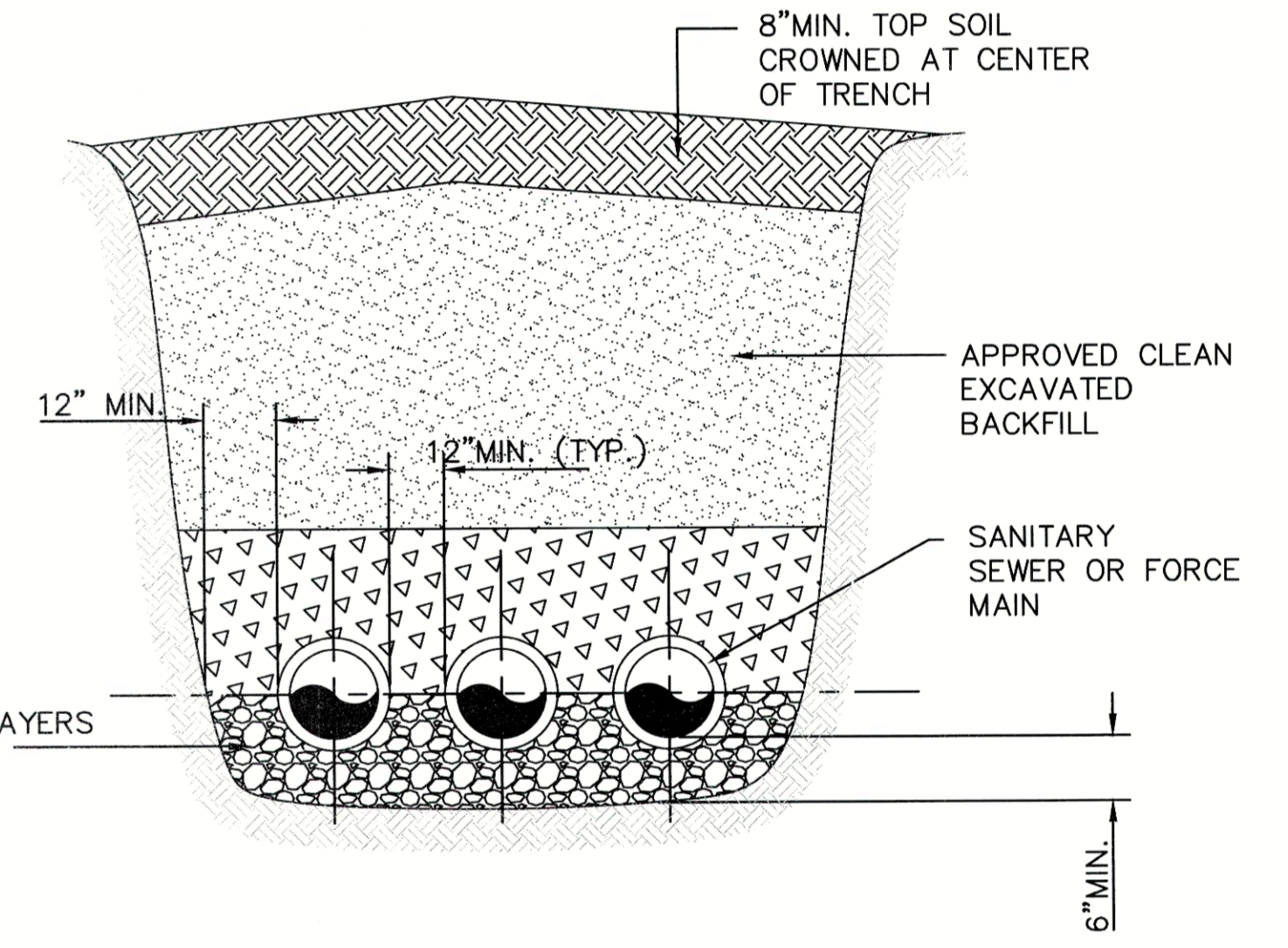
ALL PIPE SURFACES COMING IN CONTACT WITH CONCRETE SHALL BE WRAPPED WITH 6MIL POLYETHYLENE.

CONCRETE FOR BLOCKING SHALL BE CAST IN PLACE AND SHALL CONFORM TO O.D.O.T. ITEM 499, CLASS "C" AS PER THE O.D.O.T. CONSTRUCTION AND MATERIAL SPECIFICATIONS.



P.V.C. WATER LINE TRENCH DETAIL

* FOR PAY LIMITS ONLY, MAXIMUM TRENCH WIDTH SHALL BE THE SAME AS THE TRENCH WIDTH AT THE TOP OF THE PIPE.



MULTIPLE PIPE INSTALLATION

PIPE BEDDING MATERIAL HAND TAMPERED IN 6" LAYERS TO A MINIMUM OF 6" ABOVE TOP OF PIPE

LEGEND

- COMPACTED EARTH BACKFILL
- UNDISTURBED EARTH
- ITEM 310.02 GRANULAR BACKFILL
- NO. 67 STONE

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**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

**TRENCH AND PIPING
DETAILS**

DRAWN BY CHECKED BY
W.M.V. S.R.W.
REVISION
6-19-00 JAB
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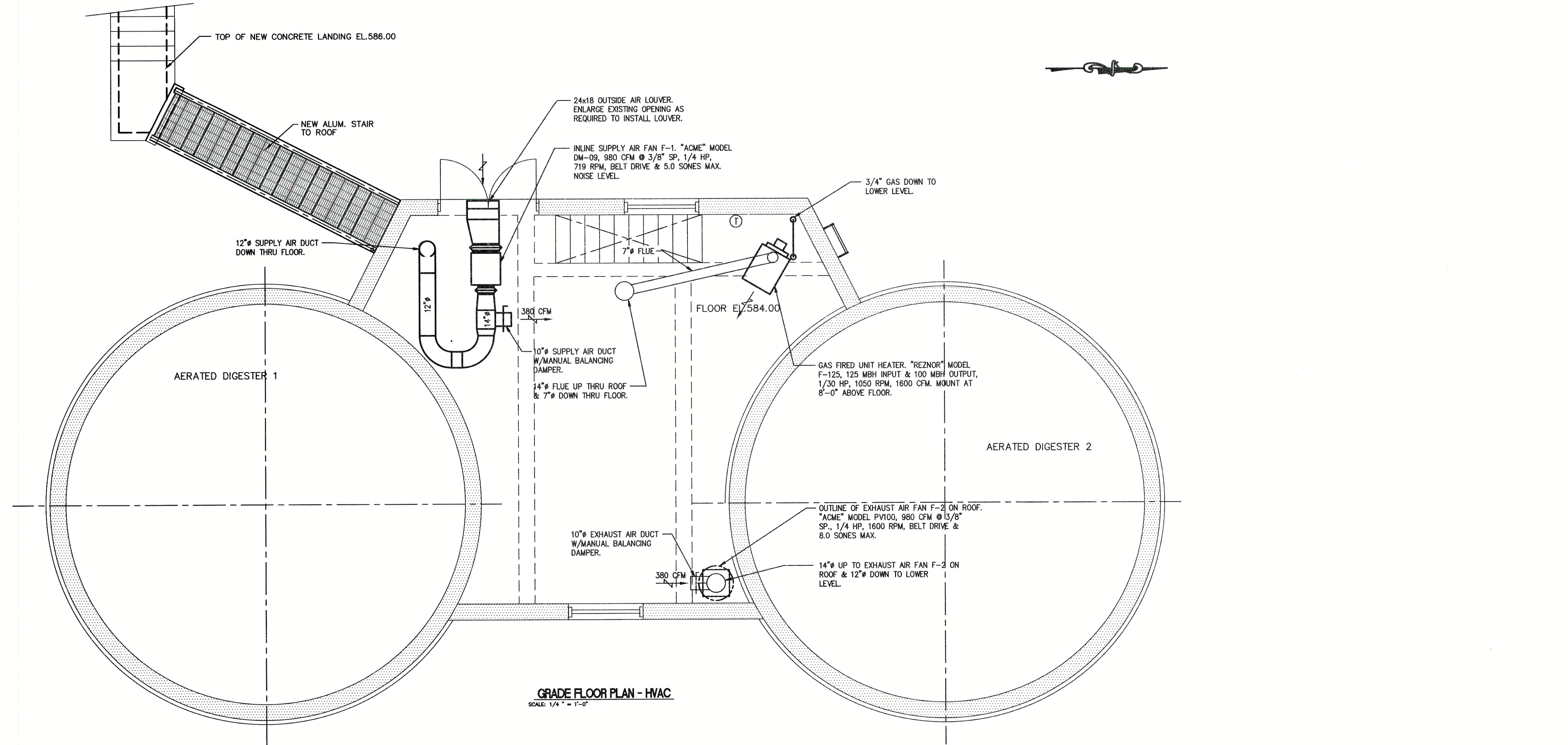


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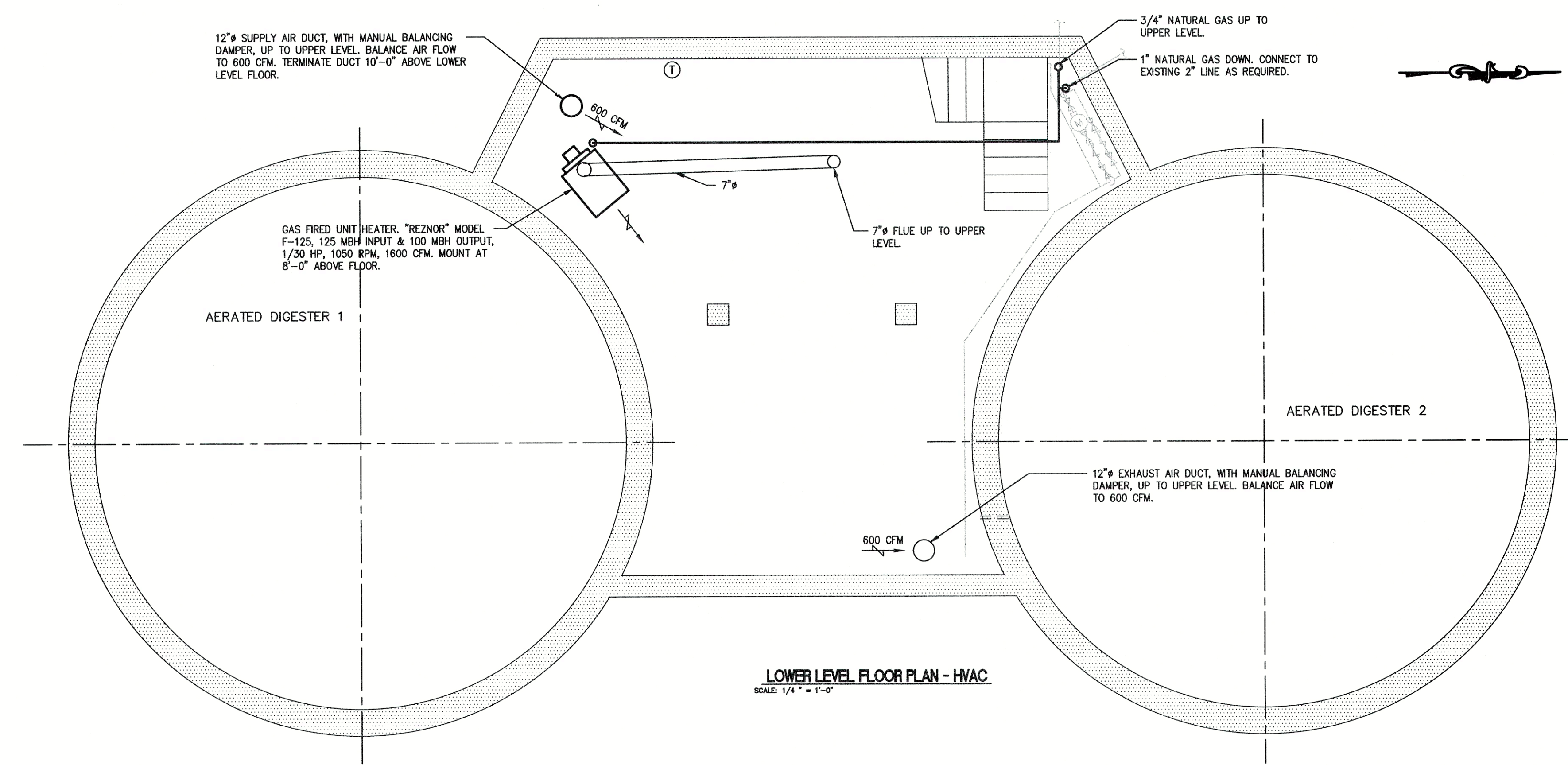
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JOB NUMBER 1590-066

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GRADE FLOOR PLAN - HVAC
SCALE: 1/4" = 1'-0"



LOWER LEVEL FLOOR PLAN - HVAC
SCALE: 1/4" = 1'-0"

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**WASTEWATER TREATMENT PLANT
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VILLAGE OF OAK HARBOR, OHIO**

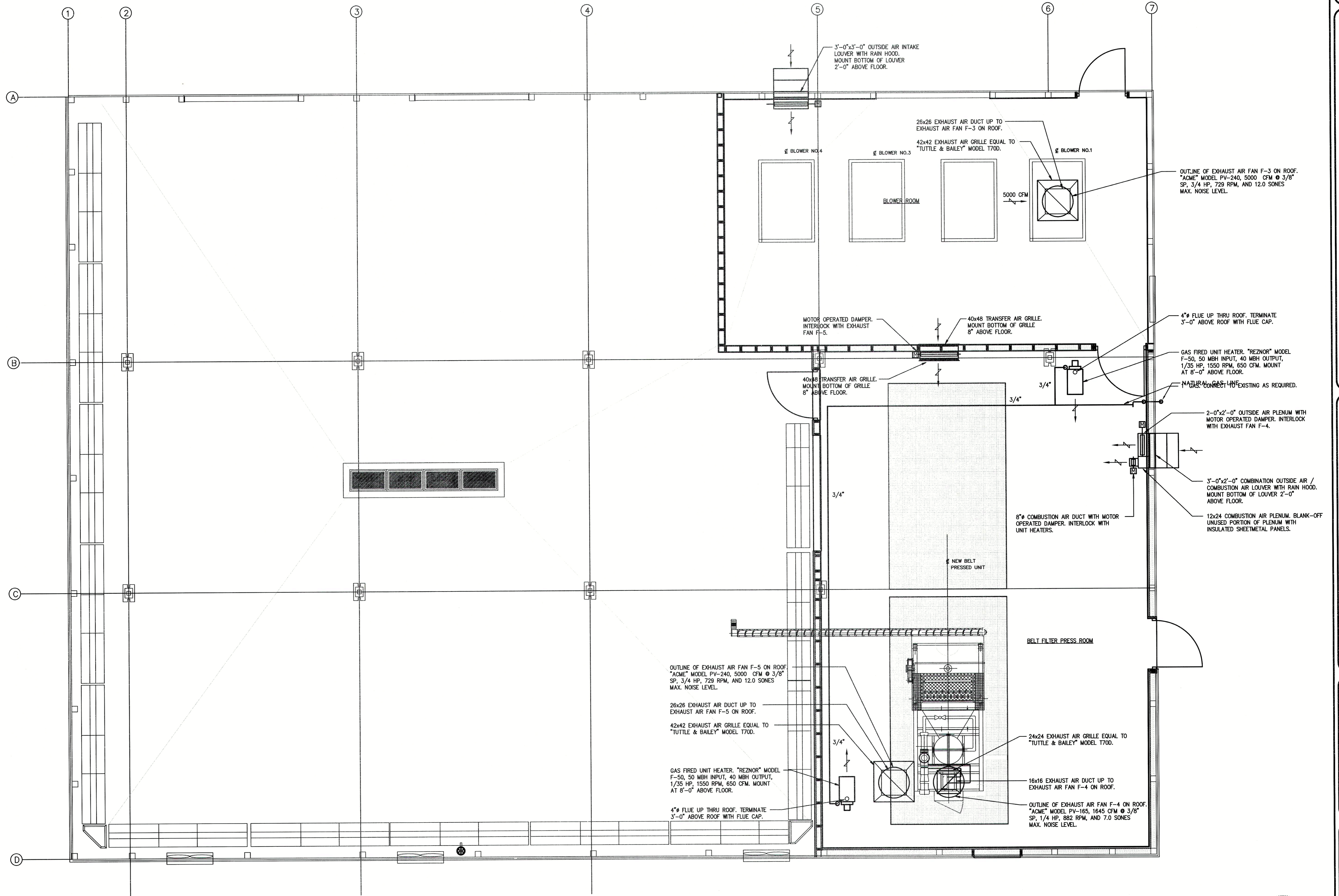
**DIGESTER BLDG.
RENOV. PLANS
HEATING & VENT.**

DESIGN BY	W.M.V.
CHECKED BY	S.R.W.
REVISION	
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M-1
OF
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BUILDING FLOOR PLAN

SCALE 1/4" = 1'-0"

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**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

**SLUDGE STORAGE
BLDG. - HEATING
& VENTILATING**

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W.M.V. S.R.W.

REVISION

M2
OF
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OUTLINE MECHANICAL SPECIFICATIONS

PART 1 - GENERAL

- A. These are Outline Specifications and not intended to cover all necessary items, but are to serve only as a guide. It is intended that complete Mechanical Systems as described herein will be furnished and installed.
- B. Contractor shall visit the job site and examine all existing conditions.
- C. All work shall be installed in accordance with local and state codes and regulations and shall receive the approval of the inspection department having jurisdiction.
- D. All work specified herein shall carry the Contractor's Warranty for workmanship and materials for a period of one year minimum from the date of final acceptance or beneficial use by the Owner, whichever occurs first. The Contractor shall remedy the defects and reimburse the Owner for all damage to other work, whether caused by the defects or the work of correcting same.
- E. All work shall be done by mechanics skilled in the particular trade involved, under responsible supervision and with the best modern practices.
- F. All materials shall be new and of the grade and quality specified. Only the best material of each class specified shall be used.
- G. In new construction, the General Contractor will provide duct openings where shown on the architectural or structural drawings and also where indicated and sized by this Contractor.
- H. In existing construction, this Contractor shall do all cutting, core drilling, and patching as required for complete installation unless openings are indicated on the architectural drawings. This Contractor shall hire the General Contractor to do all patching to match existing conditions.
- I. This Contractor shall provide all miscellaneous steel and hardware as required to support, hang and secure all equipment as furnished, relocated or revised by him, unless such materials are specifically called out to be provided by other Contractors.
- J. All work installed under this contract shall be tested in the presence of and to the satisfaction of the inspecting authority having jurisdiction and the Owner's representative.
- K. Mechanical shop drawings, fixture cuts, and schedules shall be submitted for review, in general before starting the work involved, and so as to cause no delay in this work or that of any other Contractor or Subcontractor. A minimum of six copies shall be submitted and all shall bear the stamp of approval of the Contractor as evidence that the submittals have been approved by him.
- L. This Contractor shall cooperate fully with the Owner in scheduling and making connections into existing service lines so as to cause the least possible inconvenience and shortest interruption of service. Contractor shall include any time and materials necessary for draining, venting, purging and refilling the existing system to permit connection of the new or removal of existing equipment, piping, etc.
- M. This Contractor to remove all unused ductwork, piping, etc. from the area and remove it from the premises. The Owner shall be given the option of retaining any removed items. The Contractor shall, in general, keep the site clean and free of all debris generated by his work.

PART 2 - SCOPE OF WORK

- A. Heating and Ventilating of Belt Filter Press Room.
- B. Ventilating of Blower Room.
- C. Heating and Ventilating of existing Digester Building.

PART 3 - ELECTRICAL

- A. The Electrical Contractor will provide all power wiring, starters and disconnects unless equipment is provided with starters or disconnect switches as part of the assembly. The Mechanical Contractor shall furnish all special control items, control and interlock wiring, and motors required for the operation of all equipment provided under his sections of work.
- B. In general, all motors under 1/2 horsepower will be 120/1/60. For electrical power characteristics of other motors, see the mechanical drawings and schedules.
- C. Motors 1/2 HP and over will be provided with across-the-line starters with overload protection unless otherwise specified. All motors under 1/2 HP shall have integral overload protection. On factory-supplied prewired equipment, accessory motors such as condensing unit fan motors may be single phase instead of three phase if standard with the manufacturer. All motors must conform to current NEMA Standards.
- D. Where electrical requirements and/or motor horsepowers for the equipment supplied varies from that shown on the mechanical drawings or as specifically called out in the mechanical specifications, the electrical drawings and specifications shall govern and be adhered to as to electrical power characteristics for the supplied equipment.

PART 4 - CONTRACT CLOSEOUT

A. Testing and Adjustment

Contractor shall operate all parts of the entire system, make any and all adjustments and repairs, and shall leave the entire work tested and ready for operation by the Owner and/or operation and final testing and balancing by the Testing and Balancing Contractor.

B. Operating Instructions:

Contractor shall provide four complete manuals in hardbacked binders, each containing all operating, servicing, lubrication, etc. information and parts lists for all equipment installed under his Contract. Where diagrams are too large for the binder, arrange manila pockets with reinforced holes to hold folded drawings. Manuals to be submitted for approval at least 30 days before completion of the work.

Contractor shall arrange for technical instruction of the Owner's maintenance personnel for such time as is reasonably required to acquaint them with their duties. Instruction period shall be after all systems are in operation, and have

been tested, balanced and adjusted.

C. Record Drawings:

Contractor shall keep an accurate record of all deviations from contract drawings. He shall neatly and correctly enter, in colored pencil, any deviations on drawings effected during the progress of the project and shall keep drawings available for inspection. At completion of job and before final acceptance, make any final corrections to drawings and deliver same to the Owner's representative.

D. Adjustments and Balancing:

The Contractor shall operate all parts of the entire heating, ventilating and air conditioning system, making any and all adjustments and repairs, balance air delivery at all outlets, and leave the work tested and ready for operation.

The Contractor shall check out all controls and wiring to insure the operation of the equipment under all modes of operations.

The above tests and adjustments are made to accomplish the conditions as set forth in the drawings and specifications.

This Contractor shall provide for approval, prior to final acceptance by the Owner's representative, balancing reports. These reports shall include a statement that the control system has been checked and verified for operation.

PART 5 - GENERAL REQUIREMENTS FOR PIPING INSTALLATION

A. All piping materials furnished and all procedures followed in fabrication and erection shall comply with the applicable sections of the Local Building code, applicable Pressure Piping Code, and requirements of applicable sections of "Code for Pressure Piping", ANSI B31.1, latest revision and addenda.

B. Contractor shall furnish and install all adjustable hangers, special pipe supports spring hangers, anchors, guides, clamps, rods, miscellaneous iron supports and appurtenances as required to securely and properly hang or support the piping systems. On insulated piping, hangers to be oversized to fit on the outside of insulation with a heavy gauge protection pipe saddle or shield. Vertical lines shall be supported by pipe clamp type supports designed for this purpose at each floor level. Hangers to be equivalent to Grinnell No. 260 clevis type.

(1) Steel Pipe

Pipe Size	Rod	Maximum Spacing
Thru 1"	3/8"	8'
1-1/4"	3/8"	10'

C. Sleeves shall be installed by Contractor wherever pipes pass through wood, concrete or masonry slabs, walls, floors or ceilings. Openings around exposed and concealed pipes or in sleeves for pipes passing through floor slabs, fire-rated walls, smoke partitions, or fire rated ceilings must be sealed with a noncombustible material. Seal at both sides of wall. Insulation shall not extend through sleeve. Pack sleeve opening with Dow Corning 3-6548 RTV silicone foam, 3M Fire Barrier or GE RTV. Depth of fill material shall provide same fire rating as floor or wall penetrated. Fiberglass is not acceptable except as a backing for the above materials.

D. Escutcheon plate for finished areas shall be chrome-plated escutcheon plates and for unfinished areas, black iron escutcheon plates are acceptable.

PART 6 - PIPING

A. Natural Gas Aboveground 15 PSI or Less:

Black steel, Schedule 40, ASTM A-53, screwed 1/2" through 2" with 150# malleable iron joints.

Black steel, Schedule 40, ASTM A-53, butt welded 2-1/2" and larger with forged steel Schedule 40 butt welded joints.

PART 7 - VALVES

A. Gate, Globe, Balance, Check - Crane, Walworth, Nibco, Stockham or Milwaukee

B. Lubricated Plug - Homestead or Nordstrom

C. Ball - Smith, Crane, Apollo, Watts, Nibco or Milwaukee

D. Natural gas shutoff - 125 psi, screwed - semi-steel body - Nordstrom 142 or Ball Valve - screwed - bronze body - Teflon trim - Watts B-6000.

PART 8 - AIR DISTRIBUTION SYSTEM

A. Sheet Metal Ductwork:

Shall be fabricated and installed in accordance with the latest ASHRAE and SMACNA recommendations and in the best practices of good workmanship. All ductwork shall be constructed of prime hot dip galvanized sheet steel.

B. While the drawings are to be adhered to as closely as possible, the right is reserved to vary the run and sizes of ducts during the progress of the work as may be found necessary or desirable to avoid local interferences.

C. Openings around exposed or concealed ductwork passing through walls, or partitions, when not protected by fire dampers or doors properly installed, shall be sealed with a sheet metal collar on both sides of the wall.

D. On all fans, duct connections shall be flexible connections using Ventglas 30 ounce, or Durolon 24 ounce material. Canvas will not be acceptable.

E. Manual Balancing Damper:

In low pressure square or rectangular ductwork less than 1 s.f. in area or less than 12" high shall be Titus Model AD-35B or equivalent by Grille, Register and Diffuser Manufacturer. Damper in square or rectangular ductwork larger than the above shall be American Warning and Ventilating Company Type VC-1 or equivalent by Vent Products, Arrow, Ruskin, Safe Air or Louver and Damper, Inc.

F. Motor-Operated Damper:

Shall be American Warning and Ventilating Type VC-2 low leakage, parallel blade operation with heavy galvanized steel frame, 16 gauge galvanized steel blades, and self-lubricating bearings. The damper shall be anti-leak construction with aluminum gmb seats and vinyl blade edge seats. For complete control and best method of insuring minimum air leakage on low

leakage dampers, each panel 48" x 72" or less shall be provided with its own individual damper control motor. Equivalent dampers by above manufacturers are acceptable.

G. Register, Grille and Diffuser:

Shall be as shown on the drawings. Ceiling unit to have off-white finish, sidewall unit to have prime coat finish. Exhaust register shall be fabricated of steel with an electro/plated zinc core and frame or of all aluminum construction. Unit shall be by Tuttle & Bailey, Titus, Carnes, Anemostat or Krueger.

H. Flue:

Shall be of double wall construction equal to Metabestos or Ameri-Vent Products. Provide flue supports, spacers, storm collars, counterflashing cap, etc. to insure a weatherproof and fireproof installation.

N. Louvers:

American Warning Type LE-31 extruded aluminum with 1/2" aluminum birdscreen in an extruded aluminum frame on inside of louver, and having a 204-RI etch and anodized aluminum finish with one coat of lacquer. Louver shall bear the AMCA certified rating seal.

Equivalent louvers by Airolett, Vent Products or Ruskin will be acceptable. Paint duct behind louver dull black.

PART 9 - INSULATION

A. General:

All work shall be done by experienced insulation applicators in strict accordance with manufacturer's latest recommendations and shall be finished in a neat and workmanlike manner. Thermal conductivity shall not exceed 0.24 BTUH per square foot F/inch. Insulation shall be equivalent to Owens-Corning Fiberglas 25 AS/SSL.

All insulation shall have a composite rating including insulation adhesives, jacket, etc. as follows. The composite assembly shall have a flame spread rating not over 25 and a smoke developed rating not higher than 50.

B. Ductwork:

Externally insulate all outside air intake ductwork with 1-1/2" thick semi-rigid fiberglass insulation with foil reinforced Kraft vapor barrier equivalent to OCF 703-FRK.

PART 10 - EXHAUST FANS

A. All fans shall be AMCA rated for airflow.

The maximum sound level, where given, represents the highest acceptable value for each fan. The same value represents loudness levels obtained at 5'-0" from the fan inlet.

All belt driven units, 1/2 horsepower and over, shall have at least double groove sheaves and dual belts. Drives to have a service factor of at least 125% of motor horsepower.

All disconnect switches supplied shall be horsepower rated per the National Electrical Code.

Fans shall be as manufactured by Penn, Carnes, Jenn-Aire, Acme, Power-Line, Loren Cook, Ammerman or Greenheck.

B. Roof Mounted Fans:

Belt driven or direct driven as scheduled and have birdscreens, automatic back draft shutters and factory mounted and wired safety disconnect switches.

C. Inline Exhauster:

Centrifugal type drive - internally lined housing, back draft damper and disconnect switch.

PART 11 - ROOF CURBS AND SUPPORTS

A. Provide a roof curb for each roof mounted exhaust air fan and flue passing through the roof. Verify curb size with equipment furnished. Curb shall be constructed to conform to the roof pitch and form a level top surface. Curb shall be of box section design, 18 gauge galvanized steel with continuous welded corner seams and factory installed 1-1/2 x 1-1/2 inch roller. Curb shall be insulated with 1-1/2", three pound density rigid fiberglass board with internal metal liner.

B. In general, the top of the installed curb shall be approximately 12" above finished roof.

C. Curb for built-up roofing system to be equivalent to a Pate Model PC-5, with raised cant.

D. For single ply membrane type roofing system, curb to be equivalent to a Pate Model PC-2 without cant.

E. Acceptable manufacturers are Pate Manufacturing Company, Custom Curb, Inc., Roof Products and Systems Corporation, Thybor, Vent Products or Shipman. When applicable, an equivalent roof curb for a particular fan by the fan manufacturer will be acceptable.

PART 12 - TEMPERATURE CONTROL

A. Furnish and install as described a complete system of temperature controls as manufactured by Honeywell, Siebe, Penn, Johnson Controls, Robertshaw, or Powers. This system shall be installed complete in all respects by competent mechanics, regularly employed by the manufacturer of the temperature control equipment.

B. All electrical wiring to be in accordance with the National Electrical Code. The HVAC Contractor is responsible for all control and interlock wiring required for the complete installation that is not shown on the Electrical Drawings.

C. On completion of the job, the Control Contractor shall completely adjust, ready for use, all thermostats, valves, dampers, damper motors and relays provided under his Contract. The Control Contractor shall provide a complete instruction manual covering the function and operation of all control components on the job. This manual shall be furnished to the Owner's operating personnel and a competent technician shall be provided for instruction purposes after the system is substantially complete and ready for operation.

PART 13 - SEQUENCE OF OPERATION

A. Digester Building

1. Unit heaters to be controlled by space thermostats.
2. Supply air Fan F-1 to run continuously.
3. Exhaust air Fan F-2 to run continuously.

B. Blower Room

1. Blower Room space temperature shall be controlled by an adjustable space thermostat. Upon a call for cooling space thermostat to open motor operated damper at inlet lower and energize exhaust Fan F-3.

C. Belt Filter Press Room

1. Unit heaters to be controlled by space thermostat. Thermostat to open combustion air damper upon a call for heat.
2. Exhaust Fan F-4 to be activated manually. When fan is activated the motor operated damper at the inlet lower shall open and then energize the fan.
3. Exhaust air Fan F-5 to be activated manually. When Fan F-5 is activated the motor operated dampers at the transfer air grille and Blower Room outside air intake shall be opened, exhaust Fan F-4 to be manually de-energized and Fan F-5 energized.



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(419) 352-7537

**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

**MECHANICAL
SPECIFICATIONS
HEATING & VENT.**

DRAWN BY CHECKED BY
W.M.V. S.R.W.
REVISION



RECORD DRAWING

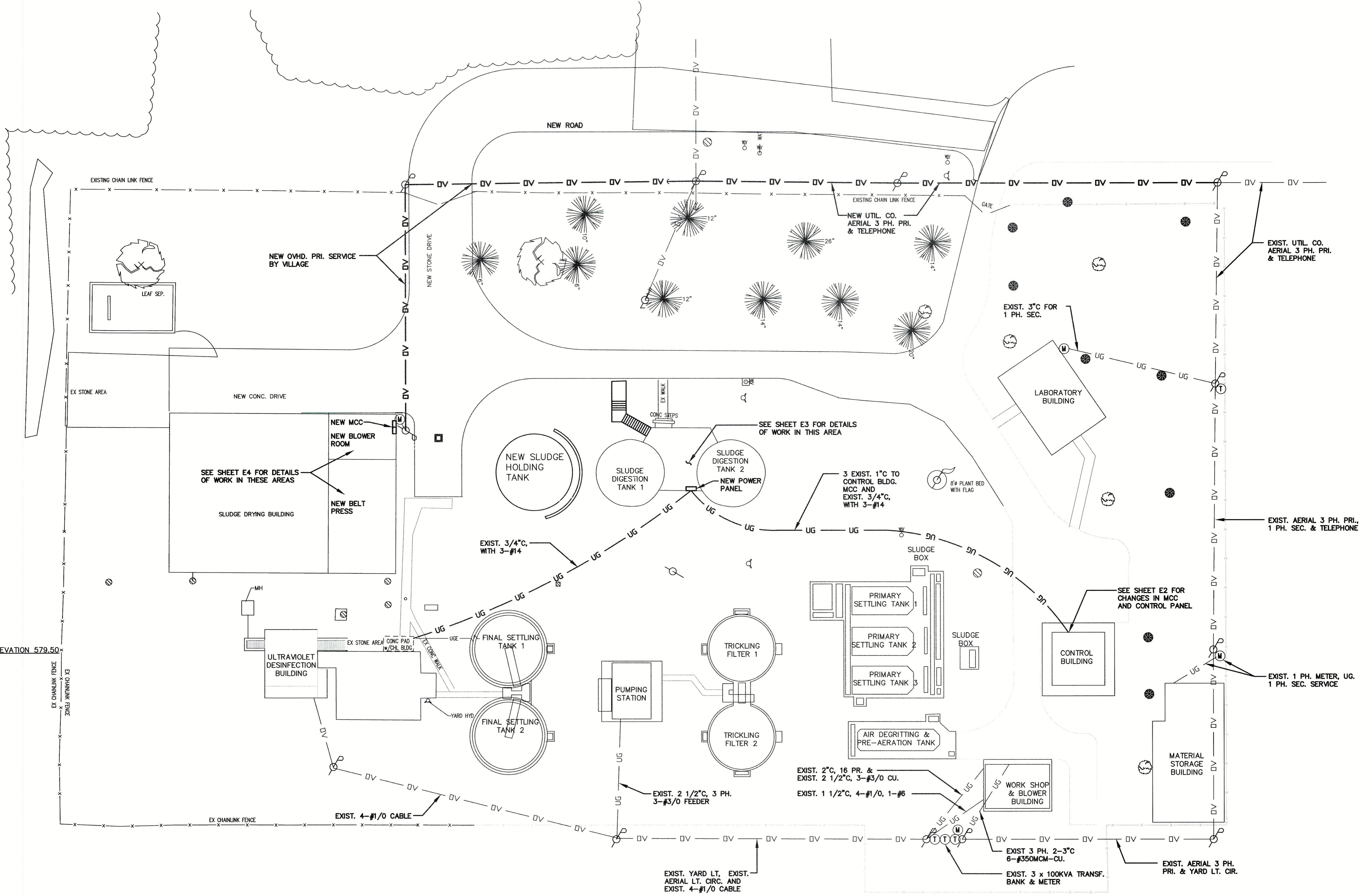
M3
OF
23
JOB NUMBER
1590-066

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PORTAGE RIVER (HIGH WATER LEVEL EL.576.00)

100 YEAR FLOOD ELEVATION 579.50'



SITE PLAN
SCALE 1" = 20'



RECORD DRAWING



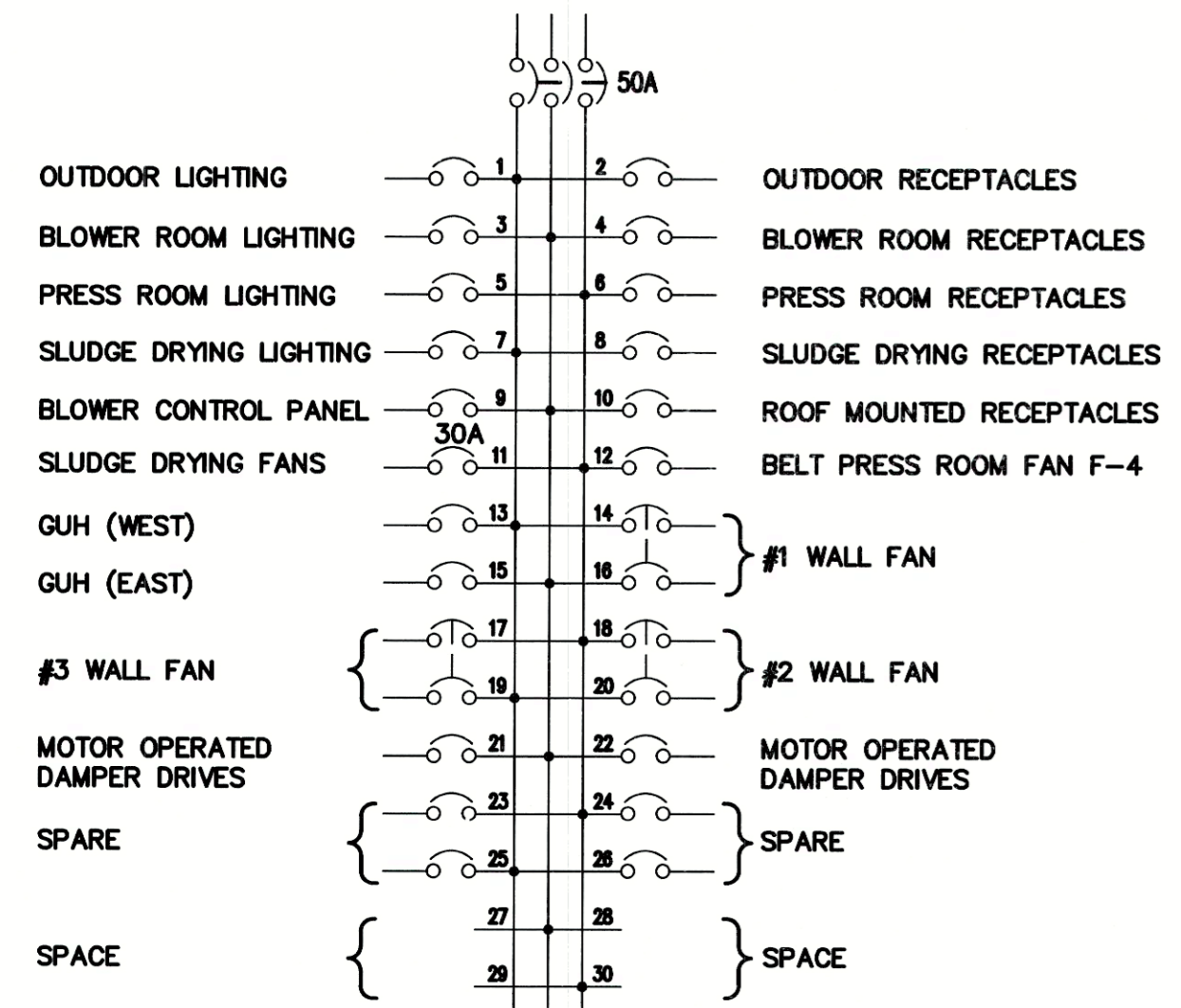
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E1
OF
22
JOB NUMBER
1590-066

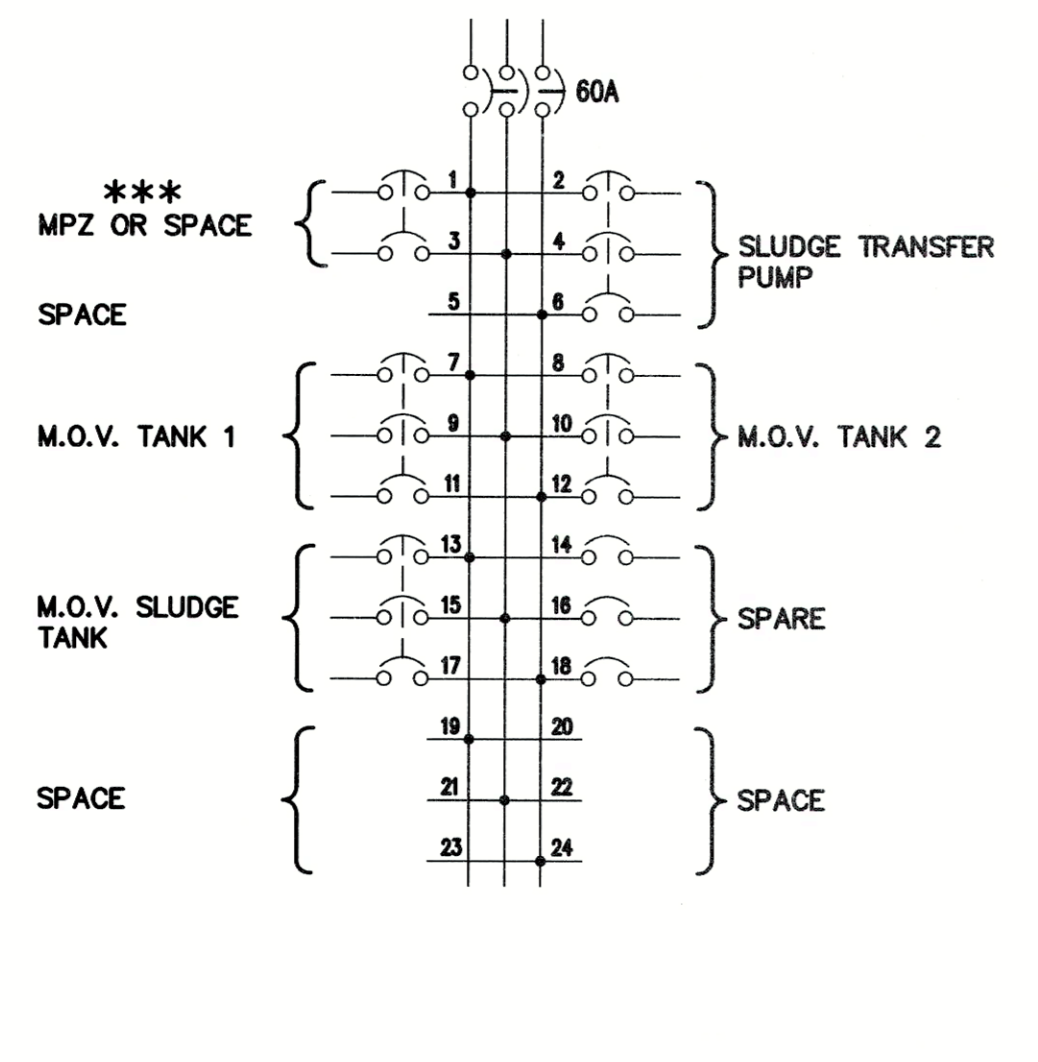
**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

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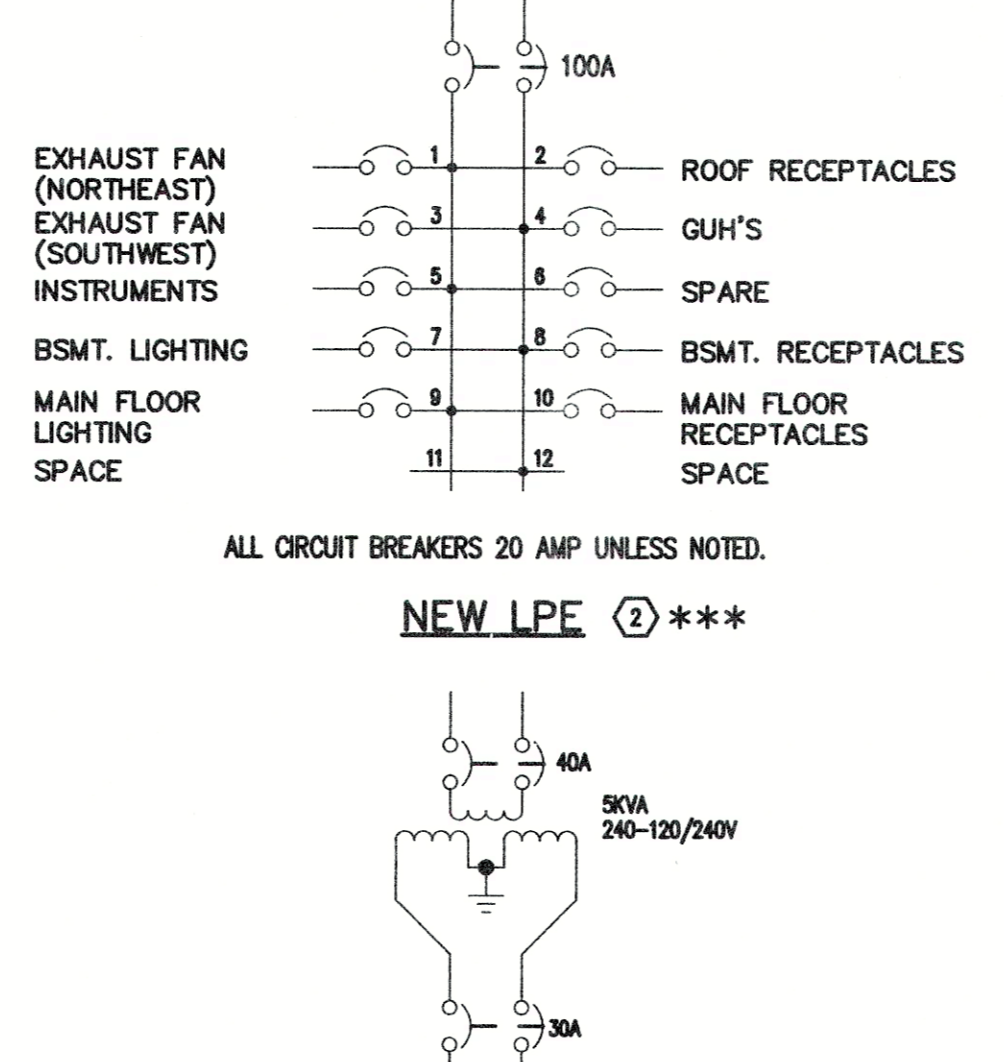
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120/208 VOLT, 3 PHASE, 4 WIRE
SLUDGE DRYING BUILDING
LIGHTING PANEL (LP)



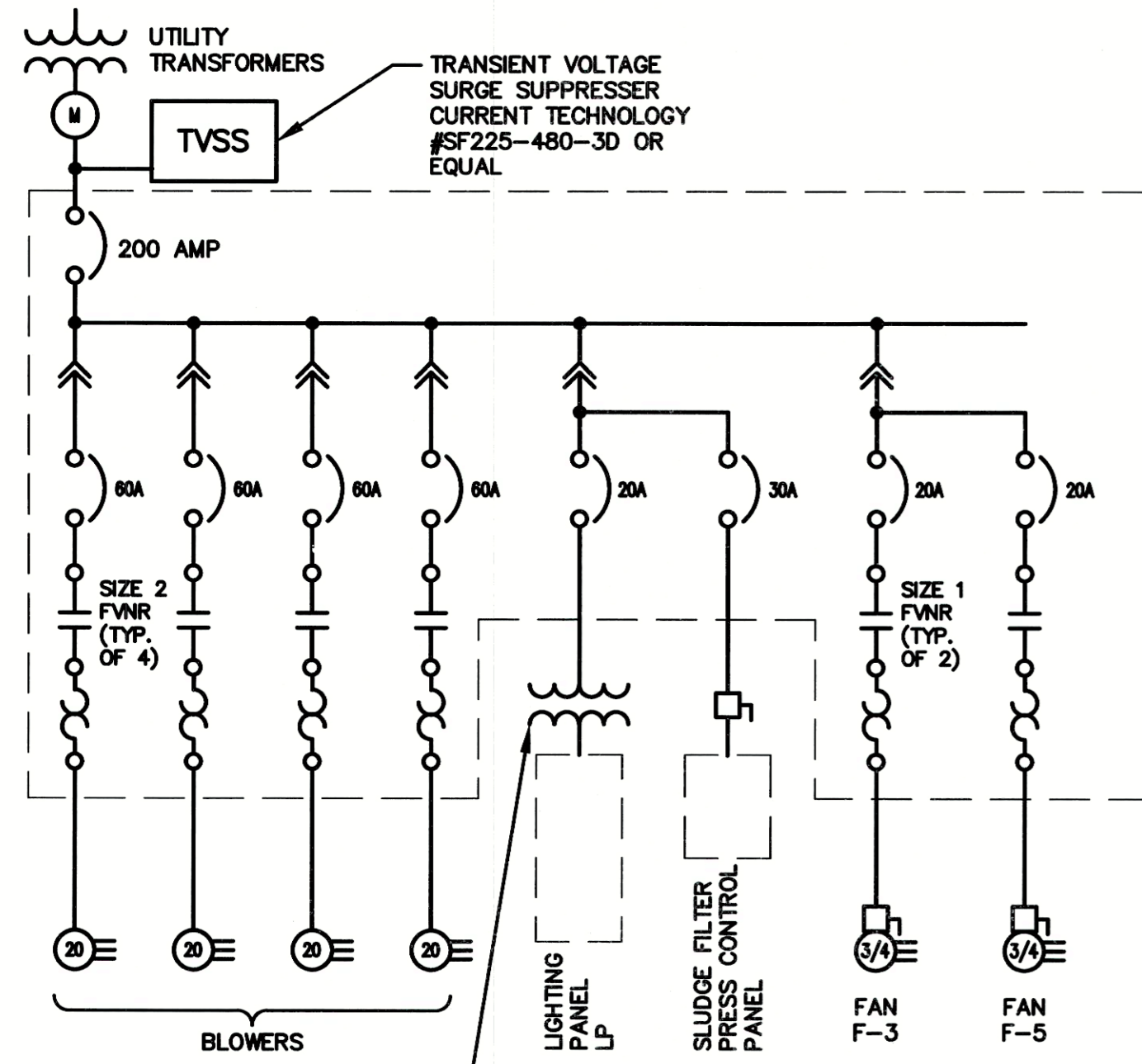
240 VOLT, 3 PHASE, 3 WIRE
DIGESTER BUILDING
NEW POWER PANEL (PP) (2) ***



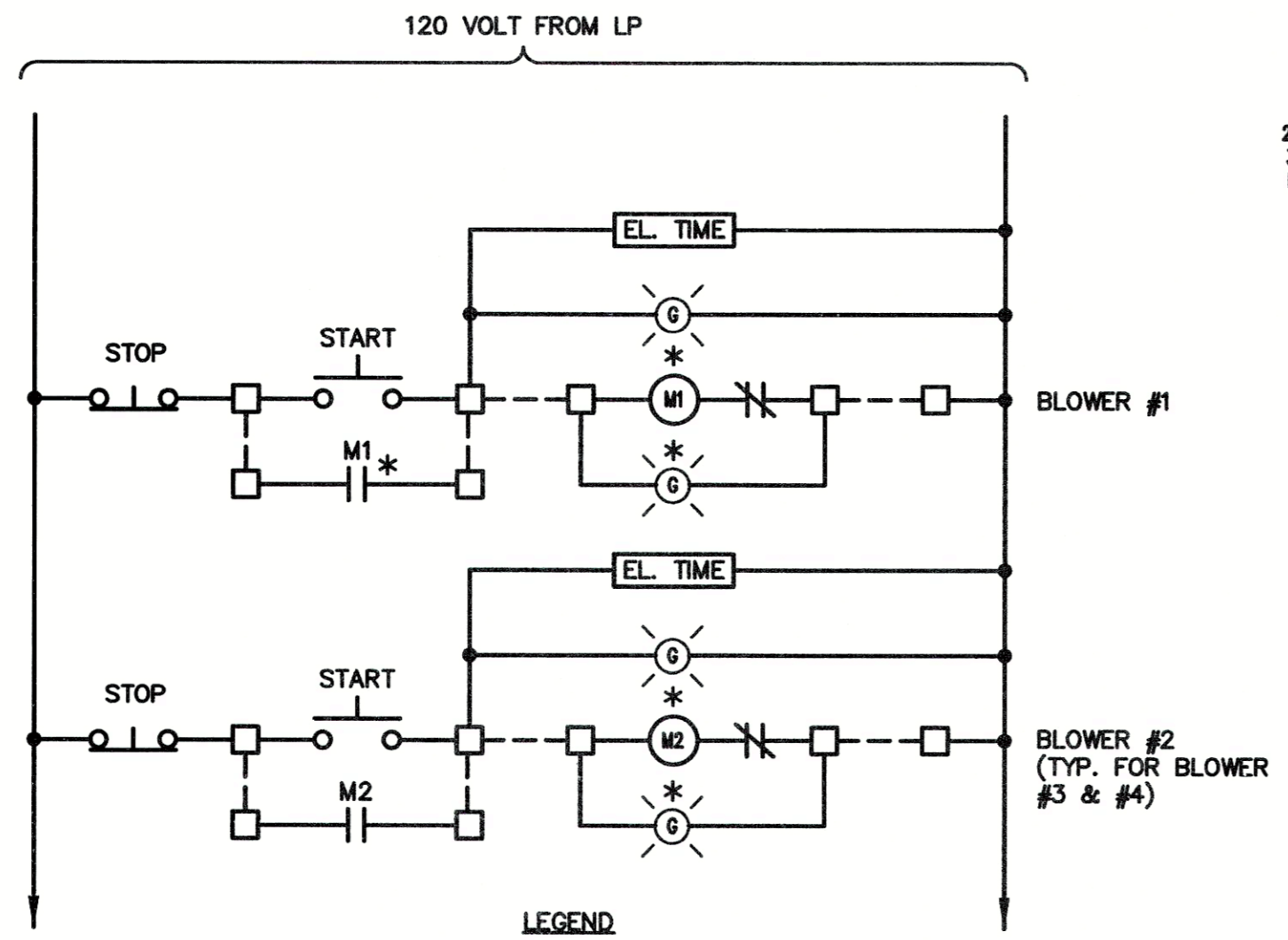
NEW LPE (2) ***
MINI POWER ZONE (MPZ) (1) ***

SYMBOL AND FIXTURE LEGEND

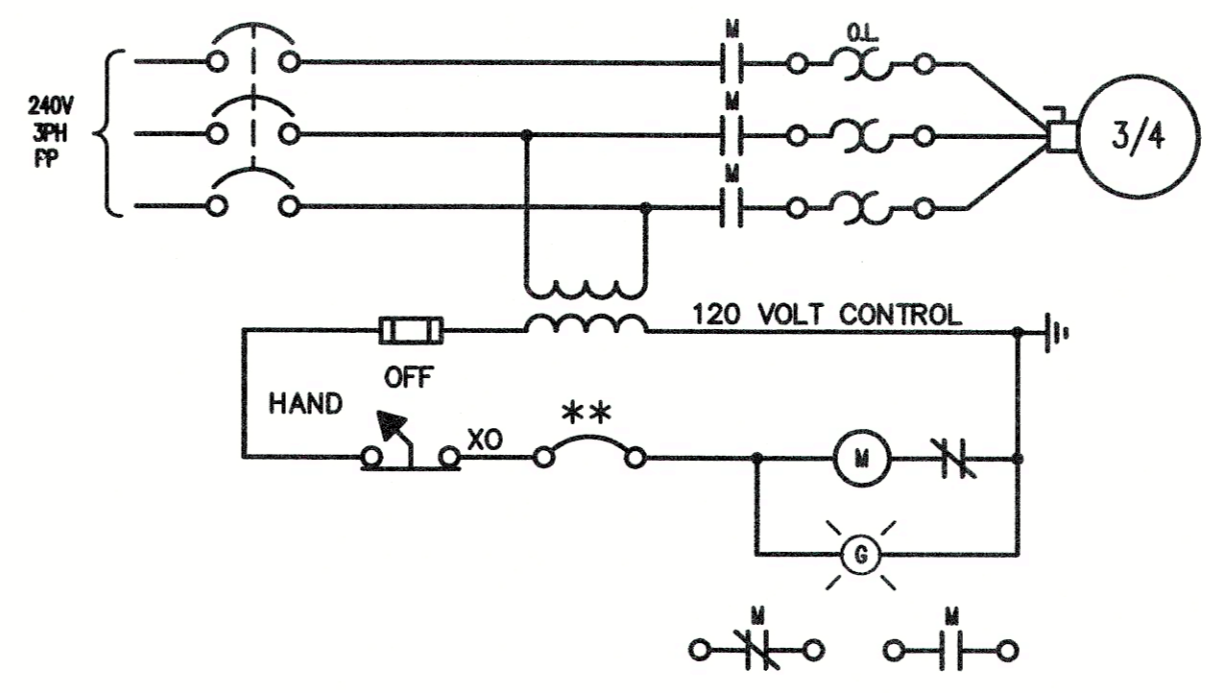
- S 120/277 VOLT AC, 20A, SINGLE POLE HEAVY DUTY TOGGLE SWITCH, SIMILAR TO HUBBELL #HBL1221, PROVIDE COVERPLATE.
- S₃ 120/277 VOLT AC, 20A, DOUBLE POLE HEAVY DUTY TOGGLE SWITCH, SIMILAR TO HUBBELL #HBL1222, PROVIDE COVERPLATE.
- ⊖-6 DUPLEX SPECIFICATION GRADE GROUND FAULT CIRCUIT INTERRUPTING GROUNDING TYPE RECEPTACLE, 125 VOLT, 20A, 3 WIRE. SIMILAR TO HUBBELL #GF5362. PROVIDE COVER PLATE.
- ⊖-5 DOUBLE DUPLEX (QUAD) SPECIFICATION GRADE GROUND FAULT CIRCUIT INTERRUPTING GROUNDING TYPE RECEPTACLE, 125 VOLT, 20A, 3 WIRE. SIMILAR TO TWO (2) HUBBELL #GF5362. PROVIDE COVER PLATE.
- A 4" ENCLOSED AND GASKETED FLUORESCENT 120 VOLT LIGHTING FIXTURE WITH 2-32 WATT LAMPS, THERMOPLASTIC HOUSING, STIPPLED ACRYLIC ENCLOSURE, ELECTRONIC BALLAST AND UNIVERSAL MOUNTING BRACKET. SIMILAR TO HUBBELL #EWL042R-SPDR-T1-EDUB
- AA SAME AS TYPE "A" WITH BODINE B90 BATTERY PACK. SIMILAR TO HUBBELL #EWL042R-SPDR-T1-2A-EDUB
- B 70 WATT HIGH PRESSURE SODIUM EXTERIOR WALL MOUNTED FIXTURE WITH POLYCARBONATE PRISMATIC LENS, DIE-CAST HOUSING WITH BRONZE FINISH, INTEGRAL BALLAST AND PHOTOCONTROL. SIMILAR TO HUBBELL #FVL-0070S-511-PBT-1 AND PVL-PK.
- EXT 3 C SERIES DIE CAST INCANDESCENT/LED 120 VOLT EXIT SIGN WITH SEALED MAINTENANCE FREE NICKEL CADMIUM BATTERY AND LED AC/CHARGER INDICATOR WITH DIFFUSED LIGHT SOURCE AND RED LETTERS. SIMILAR TO HUBBELL #CWP-R-W-L-1
- (1/2) SINGLE PHASE MOTOR, HORSE POWER AS INDICATED, FR = FRACTIONAL.
- (20) THREE PHASE MOTOR, HORSE POWER AS INDICATED.



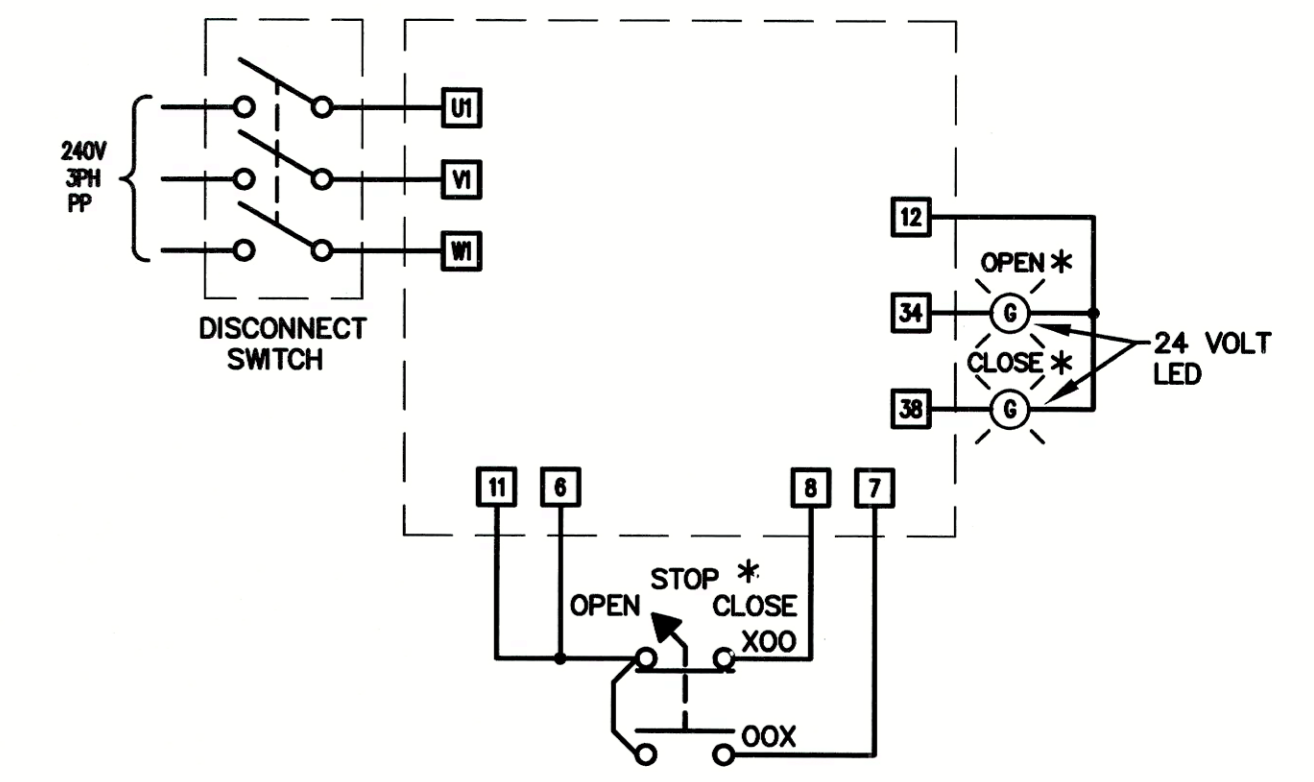
MOTOR CONTROL CENTER
ONE LINE DIAGRAM
SLUDGE DRYING BLDG.



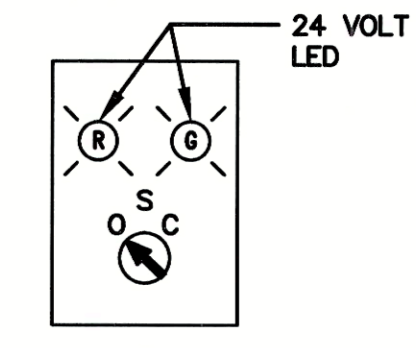
BLOWER CONTROL PANEL
SCHEMATIC DIAGRAM



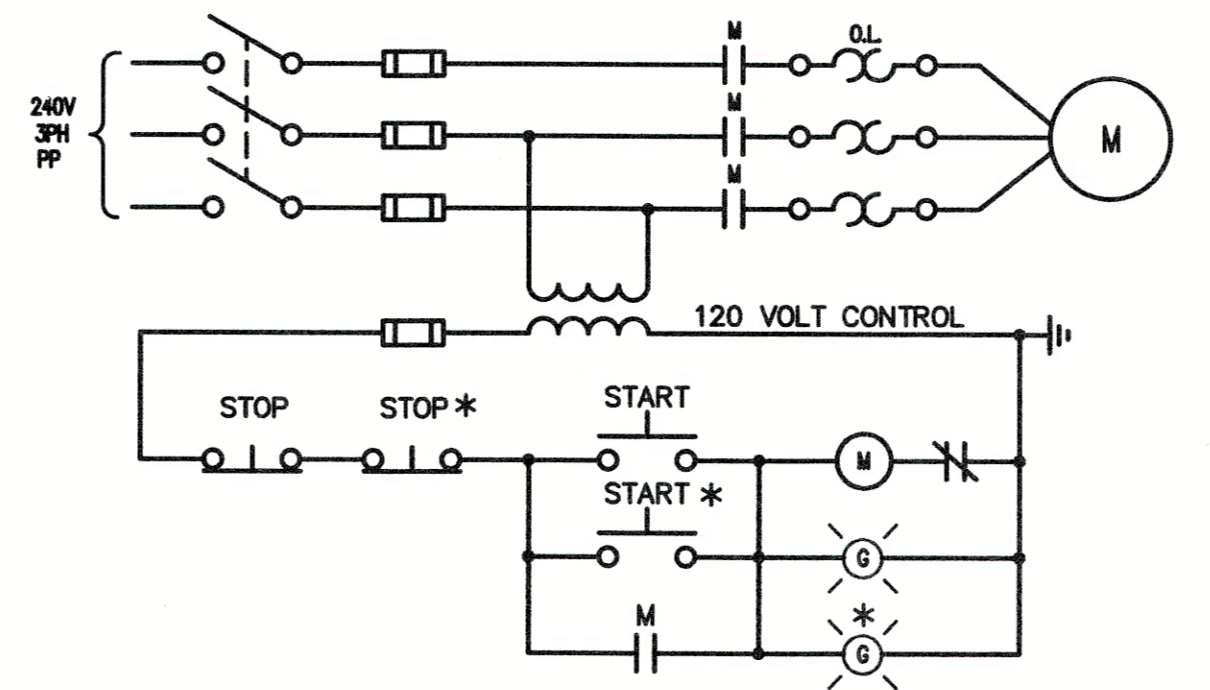
SLUDGE STORAGE BUILDING
VENT FANS F-3 AND F-5



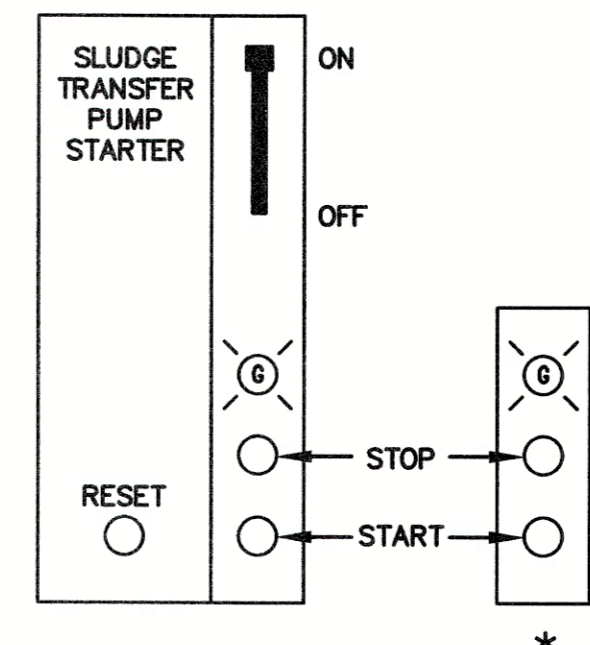
VALVE CONTROLLER
SCHEMATIC DIAGRAM



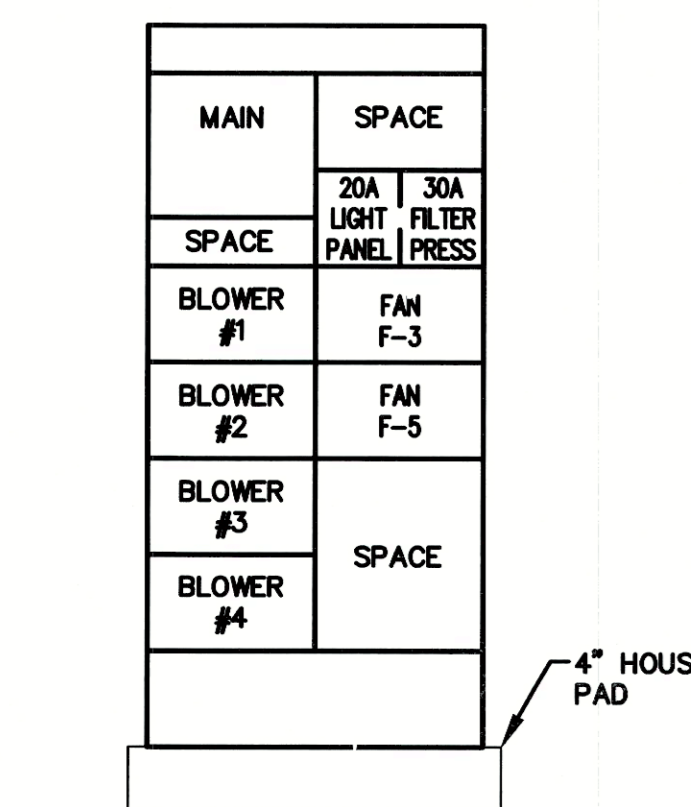
VALVE CONTROLLER
ARRANGEMENT



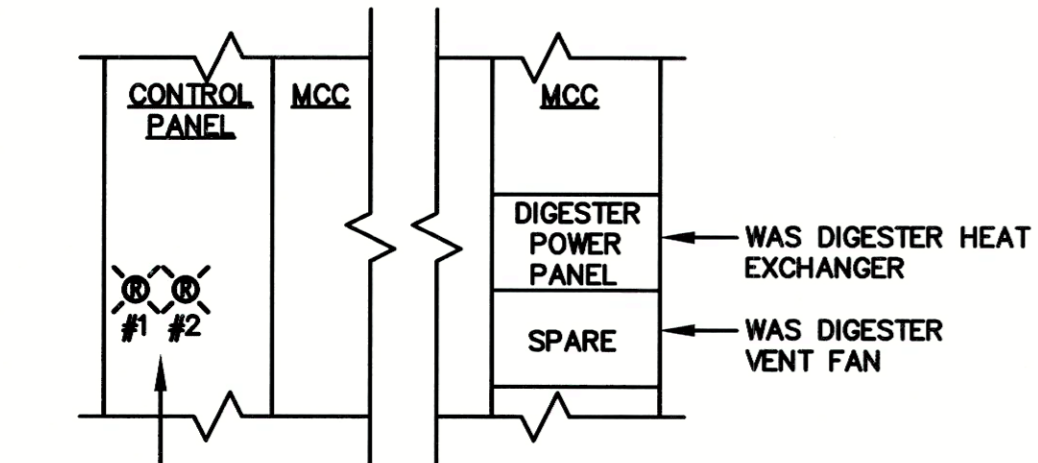
SCHEMATIC DIAGRAM



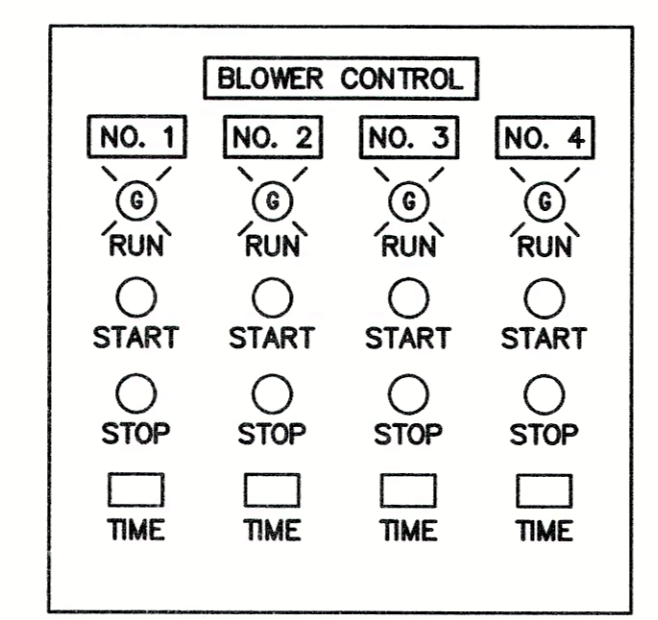
CONTROL PANEL
ARRANGEMENT



MOTOR CONTROL CENTER
ARRANGEMENT
SLUDGE DRYING BLDG.



EXISTING CONTROL BUILDING
MOTOR CONTROL CENTER



BLOWER CONTROL PANEL
ARRANGEMENT

SLUDGE TRANSFER PUMP
* LOCATED IN REMOTE CONTROL

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WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO

ELECTRICAL
SCHEDULES AND
ONE LINE DIAGRAM

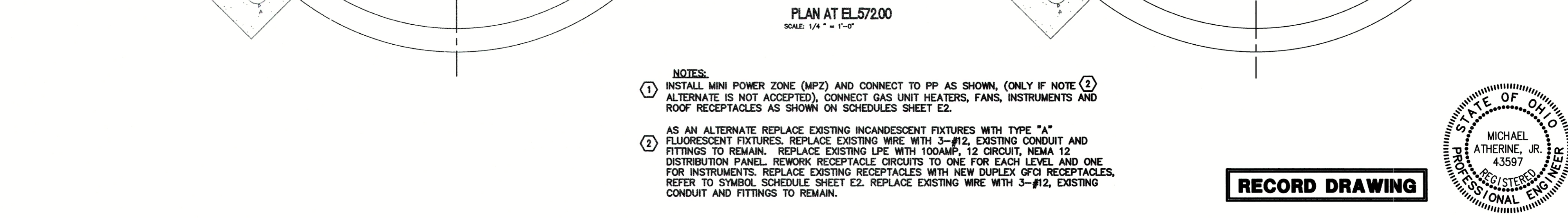
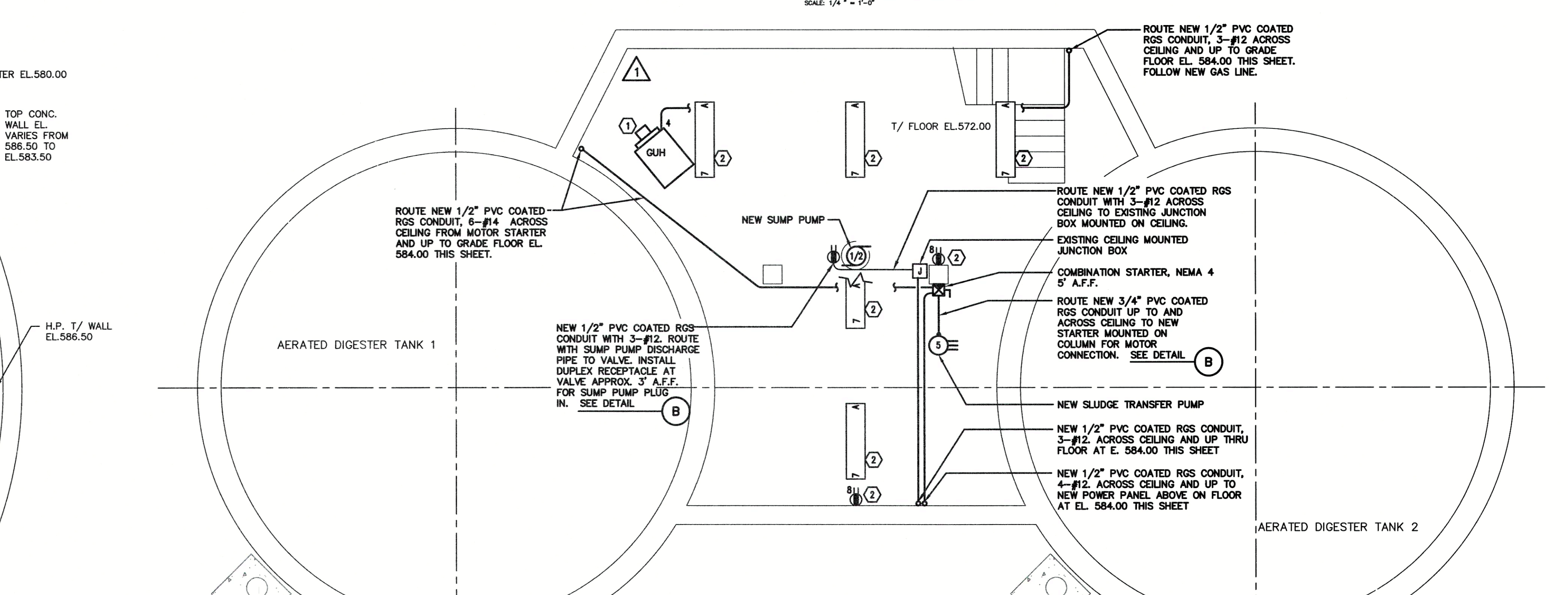
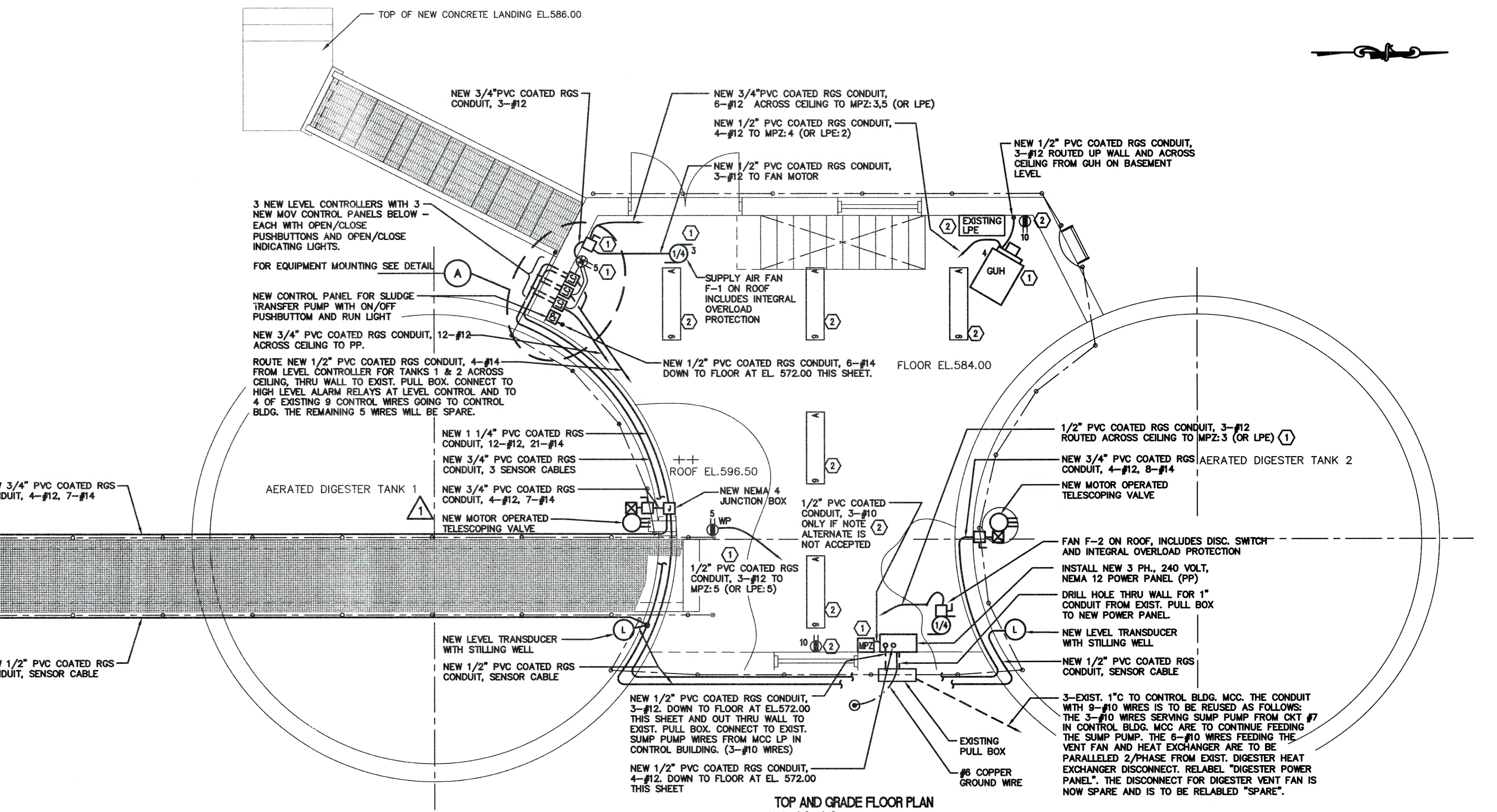
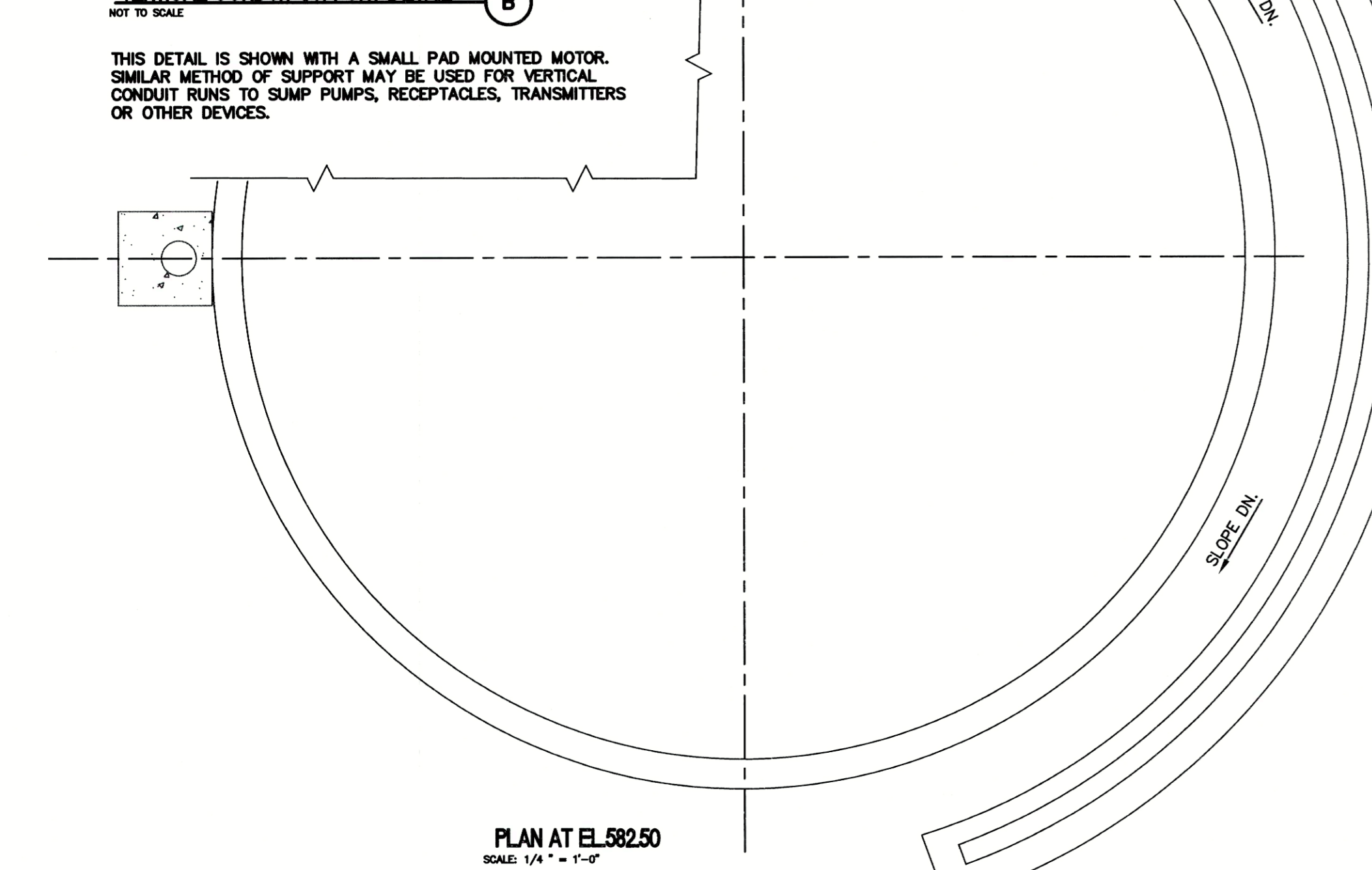
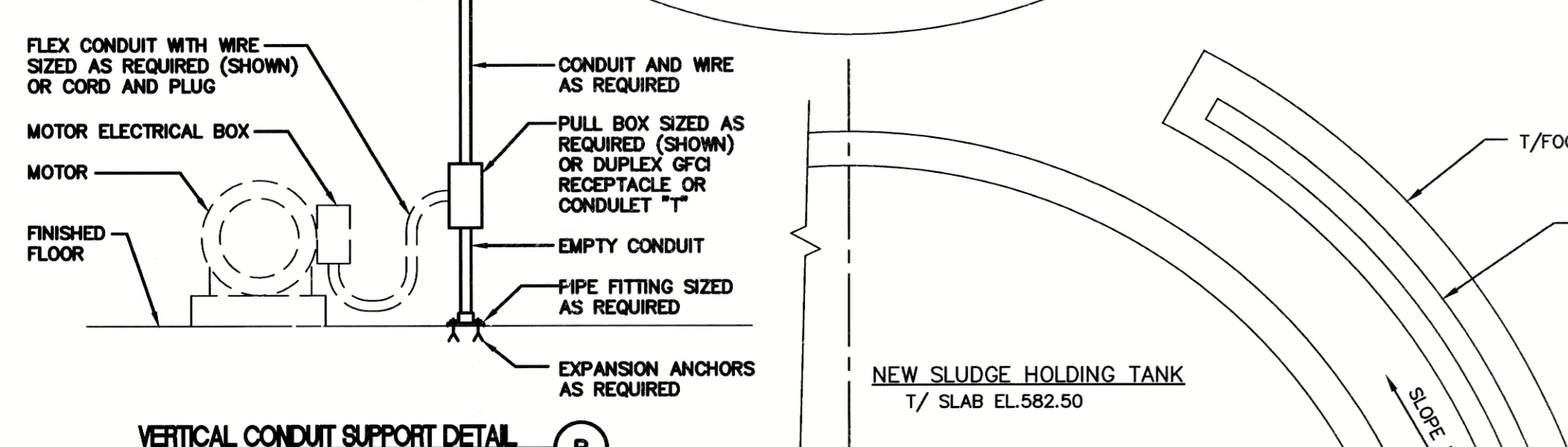
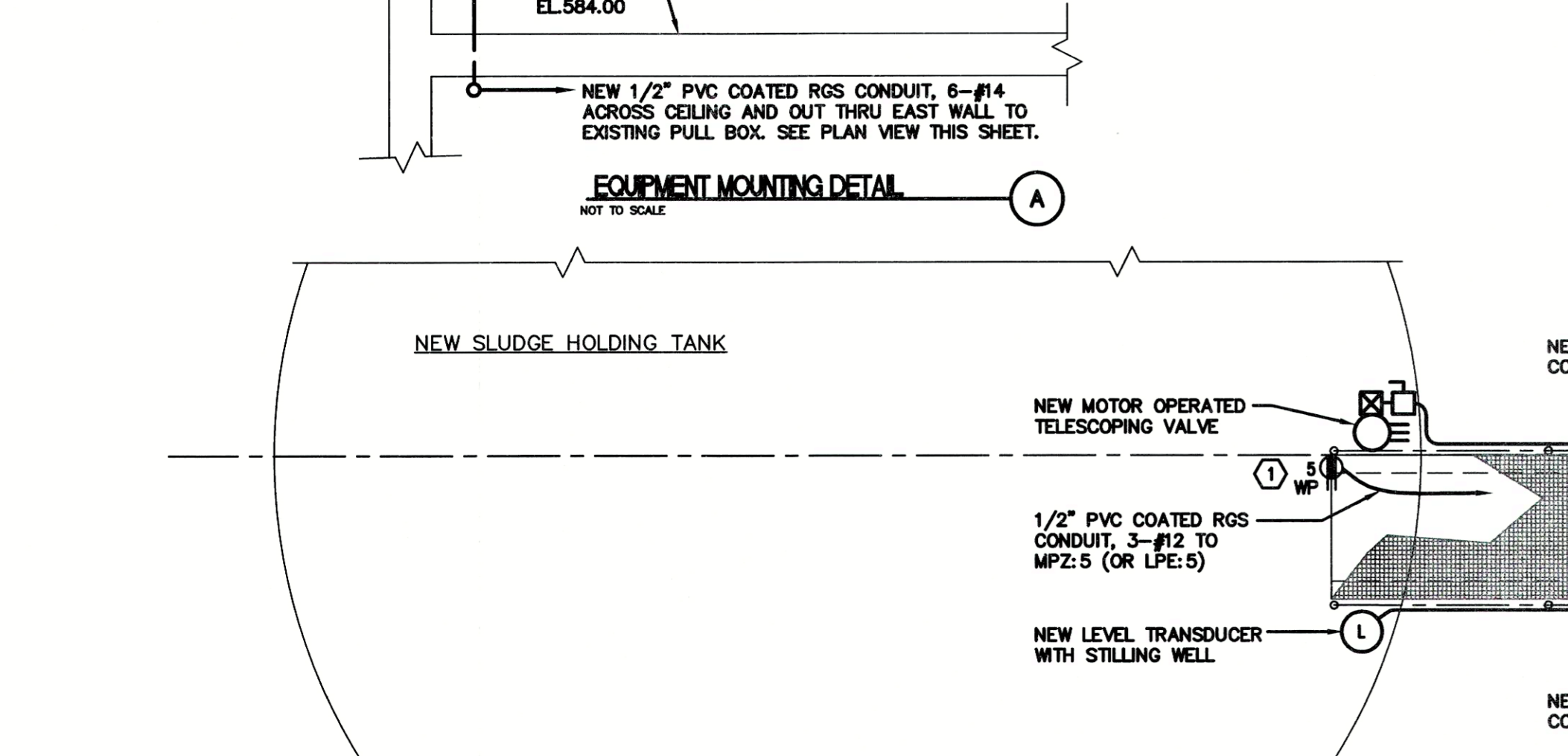
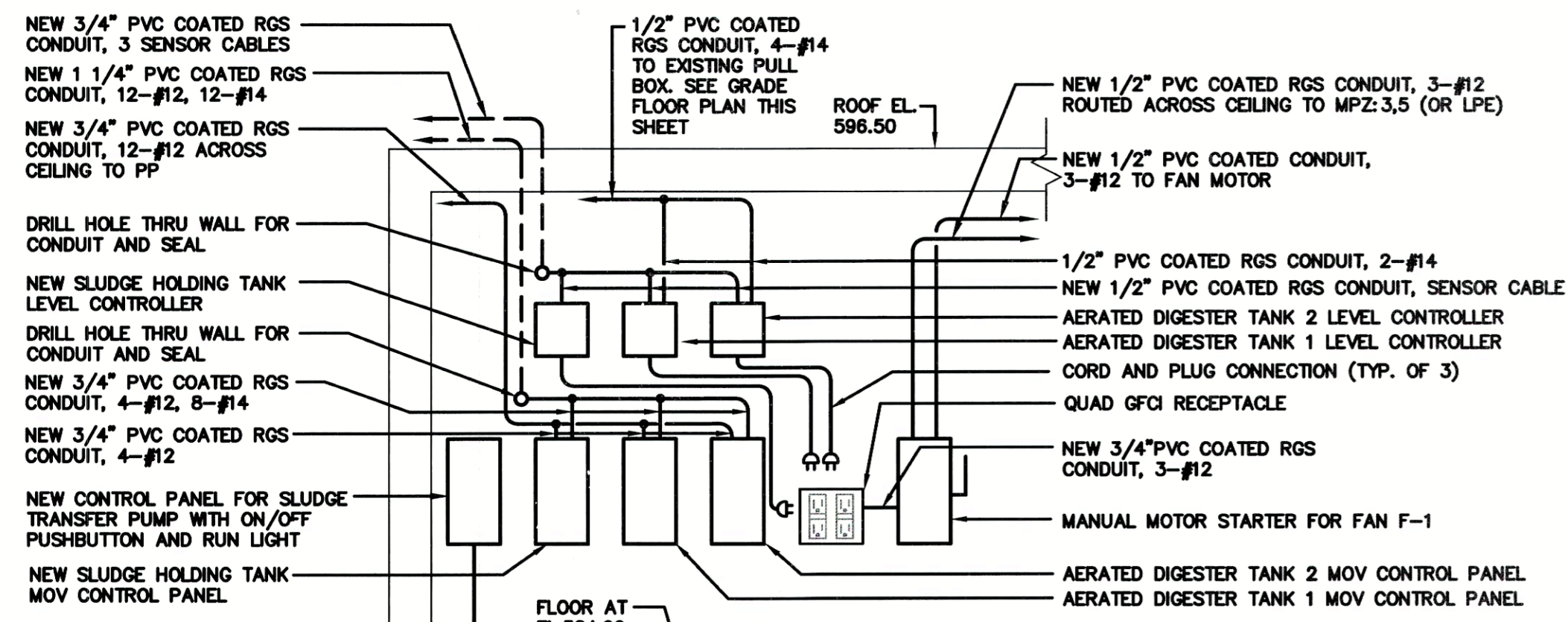
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JOB NUMBER
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**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

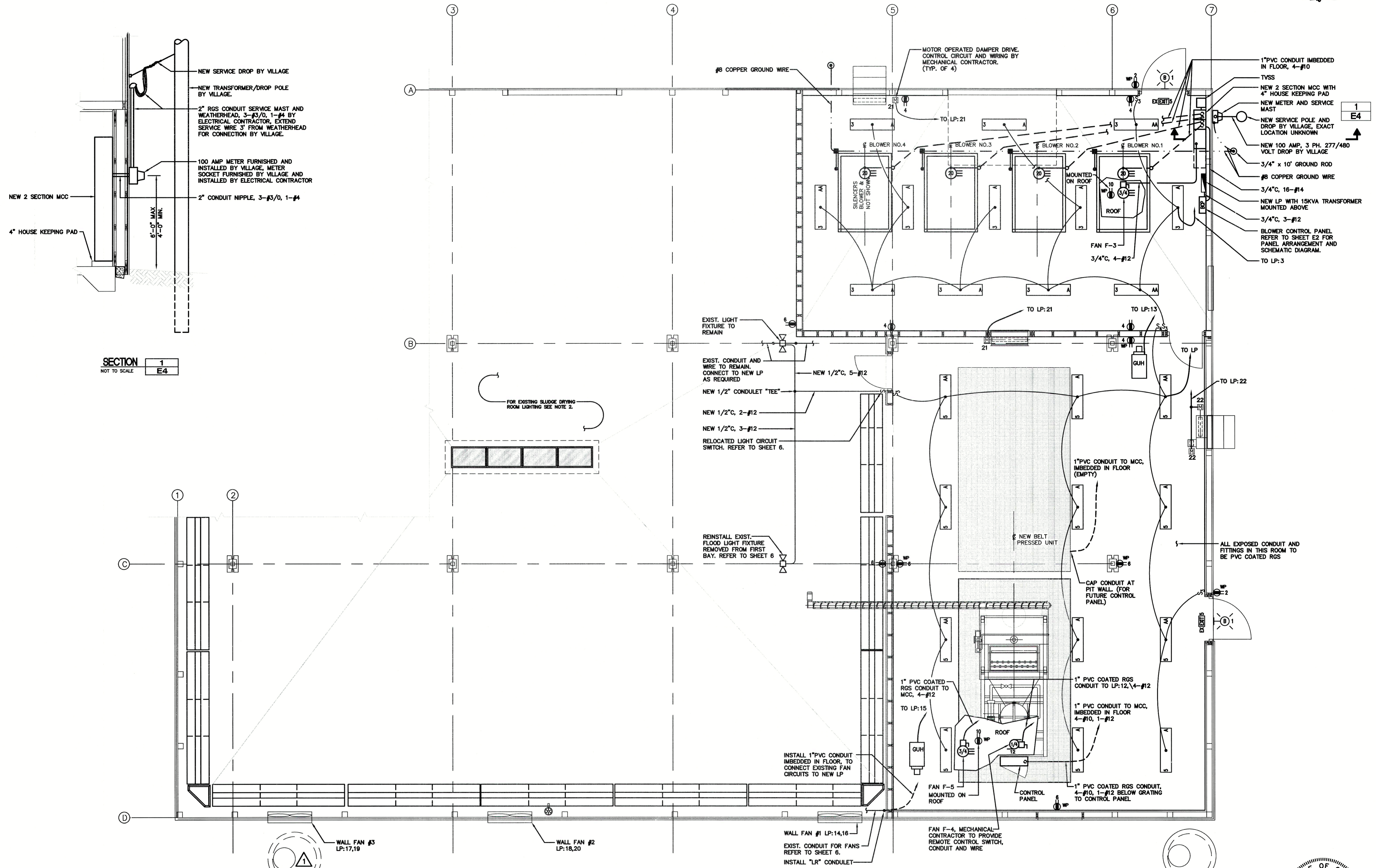
**DIGESTER SYSTEM ELECTRICAL
PLANS & DETAILS**

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SECTION 1
NOT TO SCALE E4

BUILDING FLOOR PLAN
SCALE 1/4" = 1'-0"

- NOTES:
- REFER TO SHEET E2 FOR LIGHTING PANELBOARD SCHEDULE, ONE LINE DIAGRAM, M.C.C. AND BLOWER CONTROL PANEL ARRANGEMENTS, SCHEMATIC DIAGRAM, SYMBOL AND FIXTURE LEGEND.
 - RECONNECT EXISTING LIGHTING AND RECEPTACLE LOADS IN SLUDGE DRYING ROOM TO NEW LIGHTING PANELBOARD.

RECORD DRAWING



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**WASTEWATER TREATMENT PLANT
SLUDGE HANDLING IMPROVEMENTS
VILLAGE OF OAK HARBOR, OHIO**

**SLUDGE STORAGE
BLDG. ELECTRICAL
FLOOR PLAN**

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E4
OF

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1590-066