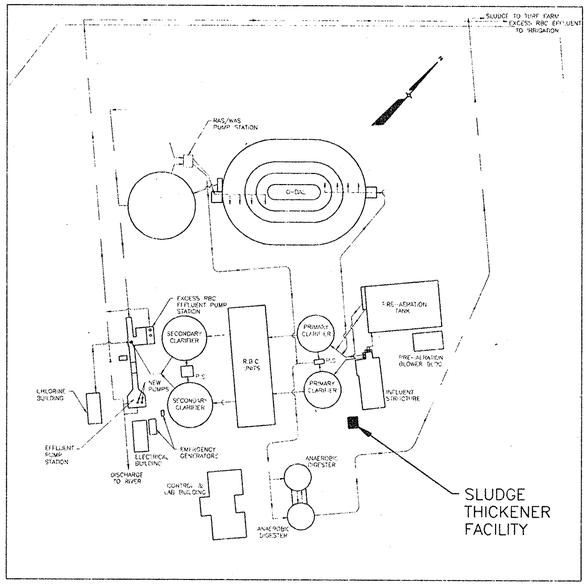
GRAND STRAND WATER & SEWER AUTHORITY
SCHWARTZ WASTEWATER TREATMENT FACILITY
SLUDGE THICKENER FACILITY

CONWAY, SOUTH CAROLINA
JUNE 1997



LOCATION MAP

DRAWING INDEX

PREPARED FOR

GRAND STRAND WATER & SEWER AUTHORITY

P.O. BOX 1537
CONWAY, SOUTH CAROLINA

(803) 650-8033

PREPARED BY

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 4590 HAROLD JOE WILSON
Harold Joe Wilson
7-3-97

SOUTH CAROLINA RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 CERTIFICATE OF AUTHORIZATION

RUST

Rust Environment & Infrastructure Inc.

2694 LAKE PARK DRIVE
CHARLESTON, SOUTH CAROLINA

(803)572-5600

07-013-001/15

PRE-AERATION TANK

8" DUCTILE IRON PLANT SERVICE WATER LINE 3'± DEEP

6" DUCTILE IRON DIGESTER SLUDGE 3'± DEEP

CONCRETE

EXISTING INFLUENT STRUCTURE

24" CURB & GUTTER

CATCH BASIN

DRAINAGE PIPE

30" EFFLUENT DISCHARGE FOR PRIMARY 3'± DEEP #2

30" DUCTILE IRON EFFLUENT DISCHARGE FOR PRIMARY 3'± DEEP

6" DUCTILE IRON WASTE ACTIVATED SLUDGE MAIN 3'± DEEP

EXISTING AIR SCRUBBER EQUIPMENT

CATCH BASIN

PLACE EXISTING GATE VALVE IN VALVE BOX WITH COVER FLUSH WITH NEW DRIVEWAY

EXISTING MANHOLE

8' X 6" CONC. DRIVEWAY

MATE WITH EXIST. ELEVATIONS

2" PVC FORCE MAIN 3'± DEEP

10" PVC SANITARY SEWER

5' RADIUS

RELOCATE EXISTING GATE VALVE

8.0'

8" DUCTILE IRON FORCE MAIN 3'± DEEP

21.50'

ELECTRIC BOX

PLACE EXISTING GATE VALVE IN VALVE BOX WITH COVER FLUSH WITH NEW SIDEWALK

4' X 4" CONC. SIDEWALK (TYPICAL)

40.0'

ASPHALT DRIVE

30" EFFLUENT DISCHARGE FOR PRIMARY #2 3'± DEEP

6" DUCTILE IRON WATER LINE 3'± DEEP

WATER METER

WATER METER

2" PVC POTABLE WATER LINE 3'± DEEP

CONCRETE

CUT & REPAIR SIDEWALKS

22.5° BEND

6" PLUG VALVE 6" TEE ALL RESTRAINED

3" PVC AIR LINE 3'± DEEP

30" EFFLUENT DISCHARGE FOR PRIMARY #2 3'± DEEP

PROPOSED SLUDGE THICKENER BUILDING

PROPOSED 14'ø MANHOLE WITH PLASTI-FAB "TITESEAL" NEOPRENE SEAL OR APPROVED EQUAL FLAP GATE 18.05' OR LOWER IF NECESSARY.

90° BEND

APPROXIMATE 10" IE=16.05±

(2) 6" STEEL HOT WATER LINES & (1) 6" STEEL GAS LINE 3'± DEEP

ELECTRIC BOX

PROPOSED 6" D.I. WASTE ACTIVATED SLUDGE MAIN (RESTRAIN ALL JOINTS)

CUT MAIN & INSTALL (2) 6" PLUG VALVES, 6" TEE, & FLANGED ADAPTOR OR EQUAL. FULLY RESTRAIN ALL JOINTS.

PROPOSED 6" PRIMARY SLUDGE MAIN (RESTRAIN ALL JOINTS)

1" PVC AIR LINE 3'± DEEP

6" 45° WYE & 10.5° DI WITH PLUG (FUTURE CONNECTION) ON 3.5% GRADE UPWARD TO BLDG.

CAREFULLY EXCAVATE EXISTING PIPE, CONDUITS, ETC. INSTALL 6" D.I. GRAVITY DRAIN ON 4.0% GRADE WITH CONCRETE SADDLES WHERE PIPES ARE CLOSE (6" OR LESS.)

1" PVC PEROXIDE LINE 3'± DEEP

EXISTING PRIMARY CLARIFIER #1

EXISTING PRIMARY CLARIFIER #2

EXISTING PRIMARY SLUDGE PUMP HOUSE

RELOCATE EXISTING AIR LINES

4" PVC AIR LINE 3'± DEEP

8" DUCTILE IRON FORCE MAIN 3'± DEEP

6" DUCTILE IRON SECONDARY SLUDGE RETURN 3'± DEEP

24" CURB & GUTTER

PROPOSED 6" D.I. MAIN (RESTRAIN ALL JOINTS)

CATCH BASIN

45° BEND

WASTEWATER SITE PUMP STATION

ELECTRIC BOX

2" TAPPING GATE VALVE WITH TAPPING SADDLE (MUELLER OR EQUAL)

CUT MAIN & INSTALL (2) 6" PLUG VALVES, 6" TEE, & FLANGED ADAPTOR OR EQUAL. FULLY RESTRAIN ALL JOINTS.

TELEPHONE PEDESTAL

MONITORING WELL

DRAINAGE PIPE

45° BEND

11.25° BEND

45° BEND

6" DUCTILE IRON WATER LINE 3'± DEEP

6" DUCTILE IRON PRIMARY CLARIFIER 3'± DEEP

PROPOSED 2" PVC (200psi) PLANT EFFLUENT WATER

6" DUCTILE IRON SLUDGES & SCUM MAIN

LIGHT POLE

CATCH BASIN

1" PVC PEROXIDE LINE 3'± DEEP

6" DUCTILE IRON WATER LINE 3'± DEEP

1-1/2" PVC AIR LINE TO PRIMARY SLUDGE BOX 3'± DEEP

6" DUCTILE IRON PLANT EFFLUENT WATER 3'± DEEP

1" PVC PEROXIDE LINE 3'± DEEP

30" DUCTILE IRON PRIMARY CLARIFIER #2 DEPTH NOT KNOWN

ASPHALT

18" PVC SAN. SEWER

MANHOLE IE = 16.10

24" CURB & GUTTER

CATCH BASIN

SCALE 0' 5' 10' 20'

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER HAROLD JOE WILLSON No. 4590

SOUTH CAROLINA RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 CERTIFICATE OF AUTHORIZATION

Harold Joe Willson 7-3-97

NO	REVISIONS	DRN	CHK	DATE
	CHARLESTON	DRN CLF		05-02-1997
		DES HJW		00-00-0000
		CHK HJW		00-00-0000
		APP HJW		00-00-0000

RUST Rust Environment & Infrastructure Inc.

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

PROPOSED SLUDGE THICKENER SITE PLAN

DATE JUNE 1997

PROJECT NO 200243.10100

FILENAME 20024302.DWG

SHEET NO 2 of 15

DRAWING NO C-1

07-013-002/15

PRE-AERATION TANK

8" DUCTILE IRON PLANT SERVICE WATER LINE 3'± DEEP

6" DUCTILE IRON DIGESTER SLUDGE 3'± DEEP

CONCRETE

EXISTING INFLUENT STRUCTURE

CONSTRUCT DEPRESSION FOR DRAINAGE ACROSS DRIVEWAY

CATCH BASIN

24" CURB & GUTTER

DRAINAGE PIPE

30" DUCTILE IRON EFFLUENT DISCHARGE FOR PRIMARY 3'± DEEP

6" DUCTILE IRON WASTE ACTIVATED SLUDGE MAIN 3'± DEEP

30" EFFLUENT DISCHARGE FOR PRIMARY #2 3'± DEEP

EXISTING AIR SCRUBBER EQUIPMENT

CATCH BASIN

MATE WITH EXIST. ELEVATIONS

8" 6" CONC. DRIVEWAY

2" PVC FORCE MAIN 3'± DEEP

10" PVC SANITARY SEWER

30" EFFLUENT DISCHARGE FOR PRIMARY #2 3'± DEEP

6" DUCTILE IRON WATER LINE 3'± DEEP

EXISTING AIR SCRUBBER EQUIPMENT

8" DUCTILE IRON FORCE MAIN 3'± DEEP

5' RADIUS

ELECTRIC BOX

6" 4" CONC. SIDEWALK (TYPICAL)

40'0"

30" EFFLUENT DISCHARGE FOR PRIMARY #2 3'± DEEP

WATER METER

WATER METER

CUT & REPAIR SIDEWALKS

CONCRETE

22.5° BEND

6" PLUG VALVE 6" TEE ALL RESTRAINED

PROPOSED SLUDGE THICKENER BUILDING FINISHED FLOOR ELEV. = 27.00'

ASPHALT DRIVE

2" PVC POTABLE WATER LINE 3'± DEEP

30" EFFLUENT DISCHARGE FOR PRIMARY #2 3'± DEEP

22.5° BEND

1" PVC AIR LINE 3'± DEEP

90° BEND

APPROXIMATE 10" ID=16.05±

(2) 6" STEEL HOT WATER LINES & (1) 6" STEEL GAS LINE 3'± DEEP

ELECTRIC BOX

PROPOSED 6" D.I. WASTE ACTIVATED SLUDGE MAIN (RESTRAIN ALL JOINTS)

CONSTRUCT MILD SWALES TO DRAIN RAIN WATER AWAY FROM AND AROUND PROPOSED BUILDINGS.

PROPOSED 6" PRIMARY SLUDGE MAIN (RESTRAIN ALL JOINTS)

1" PVC AIR LINE 3'± DEEP

6" 45° WYE & 10.5' DI WITH PLUG (FUTURE CONNECTION) ON 3.5% GRADE UPWARD TO BLDG

CAREFULLY EXCAVATE EXISTING PIPE, CONDUITS, ETC. INSTALL 6" D.I. GRAVITY DRAIN ON 3.6% GRADE WITH CONCRETE SADDLES WHERE PIPES ARE CLOSE (8" OR LESS)

1" PVC PEROXIDE LINE 3'± DEEP

CUT MAIN & INSTALL (2) 6" PLUG VALVES, 6" TEE, & FLANGED ADAPTOR OR EQUAL. FULLY RESTRAIN ALL JOINTS.

EXISTING PRIMARY CLARIFIER #1

EXISTING PRIMARY SLUDGE PUMP HOUSE

EXISTING PRIMARY CLARIFIER #2

RELOCATE EXISTING AIR LINES

4" PVC AIR LINE 3'± DEEP

8" DUCTILE IRON FORCE MAIN 3'± DEEP

6" DUCTILE IRON SECONDARY SLUDGE RETURN 3'± DEEP

PROPOSED 6" D.I. MAIN (RESTRAIN ALL JOINTS)

24" CURB & GUTTER

CATCH BASIN

ELECTRIC BOX

WASTEWATER SITE PUMP STATION

TELEPHONE PEDESTAL

MONITORING WELL

DRAINAGE PIPE

LIGHT POLE

CATCH BASIN

6" DUCTILE IRON WATER LINE 3'± DEEP

6" DUCTILE IRON PRIMARY CLARIFIER 3'± DEEP

PROPOSED 2" PVC (200psi) PLANT EFFLUENT WATER

6" DUCTILE IRON SLUDGES & SCUM MAIN

1" PVC PEROXIDE LINE 3'± DEEP

6" DUCTILE IRON WATER LINE 3'± DEEP

1-1/2" PVC AIR LINE TO PRIMARY SLUDGE BOX 3'± DEEP

6" DUCTILE IRON PLANT EFFLUENT WATER 3'± DEEP

1" PVC PEROXIDE LINE 3'± DEEP

30" DUCTILE IRON PRIMARY CLARIFIER #2 DEPTH NOT KNOWN

ASPHALT

18" PVC SAN. SEWER

MANHOLE IE = 16.10

24" CURB & GUTTER

CATCH BASIN

SCALE 0' 5' 10' 20'

BENCHMARK
FLANGE BOLT TOWARD R.B.C. BUILDING ON FIRE HYDRANT.
ELEV. = 26.35
PROVIDED BY GSWSA

NOTES

1. GRADE TO DRAIN RAINWATER AWAY FROM AND AROUND PROPOSED BUILDING.
2. REVEGETATE AS SOON AS PRACTICAL IN AREAS DISTURBED BY CONSTRUCTION. SOW AND ESTABLISH RYE GRASS OR EQUAL TO RESIST SOIL EROSION, AND SOW PERMANENT GRASS TO MATCH EXISTING BERMUDA GRASS COVER. MINIMIZE EROSION AND ESTABLISH PERMANENT GRASS TO MATCH EXISTING COVERAGE.

LEGEND
- 24 -- EXISTING CONTOUR
- —24— PROPOSED CONTOUR
- SWALE
- PROPOSED BUILDING, SIDEWALK, AND DRIVE

NO	REVISIONS	DRN	CHK	DATE

CHARLESTON

DRN	CLF	05-02-1997
DES	HJW	05-02-1997
CHK	FLC	05-02-1997
APP	HJW	05-02-1997

RUST
Rust Environment & Infrastructure Inc.

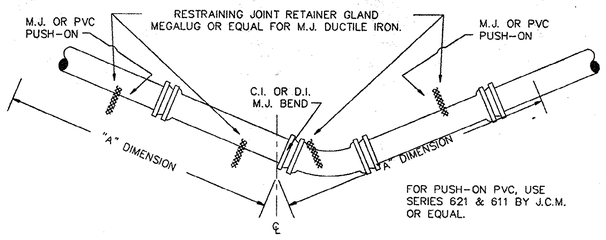
GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

PROPOSED SLUDGE THICKENER GRADING PLAN

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 4590 HAROLD JOE WILLSON
Harold Joe Willson 7-3-97
RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 CERTIFICATE OF AUTHORIZATION

DATE	MAY 1997
PROJECT NO	200243.10100
FILENAME	20024306.DWG
SHEET NO	3 of 15
DRAWING NO	C-2

07-013-003/15



THRUST RESTRAINT SYSTEM
FOR 4" & LARGER PIPE
PLAN VIEW
N. T. S.

THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE AND PVC PIPE TABLE B-6 *

SOIL TYPE: SAND-SILT *

SOIL PARAMETERS
ϕ = 30 Degrees
Cs = 0 psf
γ = 90 pcf
Sf = 1.5
* = 1984 DIPRA Publication

Values listed here are based on a 90 degree horizontal bend. Class 50 D.I.P. and an internal pressure of 100 psi.

For other pressures, multiply by ratio to 100 psi.

For other horizontal bends, multiply by the following coefficients: 45°-0.414, 22 1\2°-0.199, 11 1\4°-0.098.

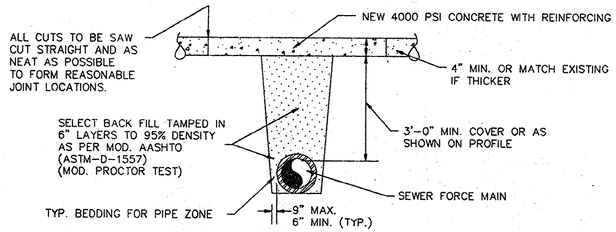
Use alternate method for other type fitting or dead end.

Values in parentheses are for pipe encased in polyethylene and for PVC pipe.

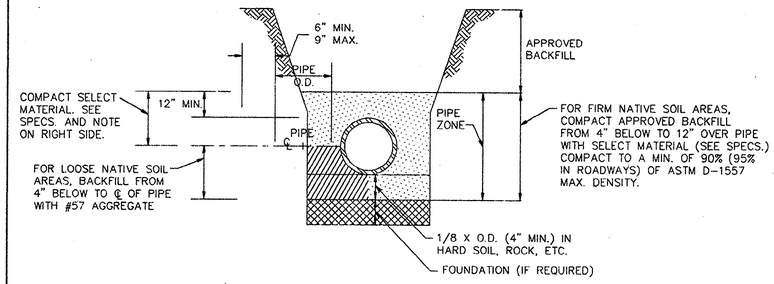
A21.50 - LAYING CONDITIONS

	2	3	4	5
f_ϕ =	0.50	0.75	0.75	0.75
f_c =	0.00	0.00	0.00	0.00
Kn =	0.40	0.60	0.85	1.00

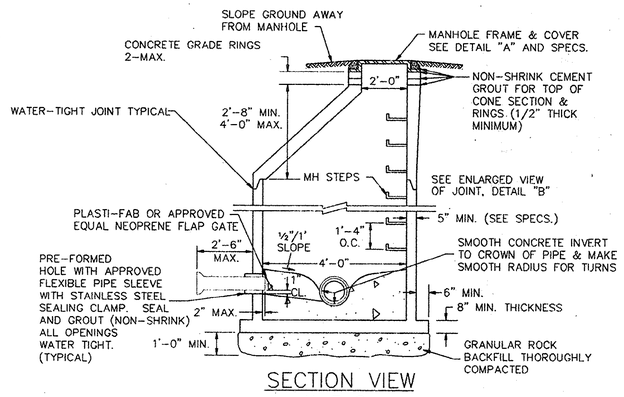
TABLE OF MIN. RESTRAINED LENGTH "A"					Use Condition 4 with sand-silt as pipe zone material	Use Condition 5 with aggregate to pipe centerline
SIZE IN.	DEPTH FT.	A21.50-LAYING CONDITIONS 2 RESTRAINED LENGTH, FT.	3 RESTRAINED LENGTH, FT.	4 RESTRAINED LENGTH, FT.	5 RESTRAINED LENGTH, FT.	
6	2.5	34 (40)	22 (26)	18 (21)	17 (19)	
6	3.0	29 (34)	19 (22)	16 (18)	14 (16)	
6	4.0	22 (26)	15 (17)	12 (14)	11 (12)	
6	6.0	15 (18)	10 (12)	8 (9)	7 (8)	
6	8.0	12 (13)	8 (9)	6 (7)	6 (6)	
6	10.0	9 (11)	6 (7)	5 (6)	5 (5)	
12	2.5	61 (70)	40 (46)	33 (37)	29 (33)	
12	3.0	52 (60)	34 (40)	28 (32)	25 (28)	
12	4.0	40 (47)	27 (31)	22 (25)	20 (22)	
12	6.0	28 (33)	18 (21)	15 (17)	14 (15)	
12	8.0	21 (25)	14 (16)	12 (13)	10 (12)	
12	10.0	17 (20)	11 (13)	9 (11)	8 (9)	
16	2.5	76 (88)	50 (58)	41 (46)	37 (41)	
16	3.0	66 (76)	43 (50)	35 (40)	32 (36)	
16	4.0	52 (60)	34 (40)	28 (31)	25 (28)	
16	6.0	36 (42)	24 (28)	19 (22)	18 (20)	
16	8.0	28 (32)	18 (21)	15 (17)	14 (15)	
16	10.0	23 (26)	15 (17)	12 (14)	11 (12)	



SIDEWALK CUT AND REPAIR DETAIL
N.T.S.

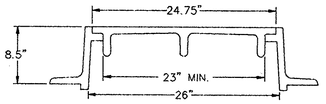


TYPICAL BEDDING DETAIL
N. T. S.

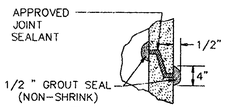


SECTION VIEW
N. T. S.

MANHOLE DETAIL
N.T.S.

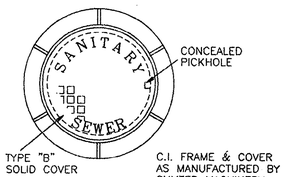


SECTION VIEW
MANHOLE FRAME
N. T. S.



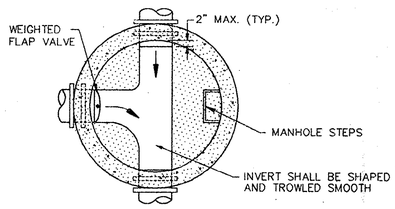
ENLARGED VIEW OF JOINT
N. T. S.

SEE SPECS. FOR REQUIREMENTS ON "O" RING RUBBER AND ROPE MASTIC BUTYL RUBBER SEALANT FOR M.H. JOINTS.



PLAN VIEW
MANHOLE COVER

USE FLEXIBLE MANHOLE SLEEVE FOR ALL 18"ø AND SMALLER PIPES (SEE SPECS). FOR LARGER PIPES, USE FLEXIBLE MANHOLE ENTRANCE JOINTS OR SLEEVES.



PLAN VIEW
N. T. S.

NOTES

1. NUMBER OF PIPES AND DIAMETERS, INVERTS AND OTHER PARAMETERS VARY. SEE PLAN AND PROFILE SHEET FOR ADDITIONAL INFORMATION.
2. INSTALL ACCORDING TO MANUFACTURES RECOMMENDATIONS. COMPACT BACKFILL AROUND MANHOLE TO 90-95% OF MODIFIED PROCTOR DENSITY FOR THE FILL.
3. RIM ELEVATION SHALL BE SET AS NOTED ON PROFILE OR SHALL BE SET AT OR ABOVE EXISTING GRADE, AS APPROVED BY THE ENGINEER.
4. MANHOLE INVERT SHALL BE 3000 PSI CONCRETE. CONC. BRICK MAY BE USED TO FORM CHANNEL BENCH ONLY. PLASTERED WITH A MIN. OF 1" OF CEMENT MORTAR 1:2 MIX (1 PART CEMENT TO 2 PARTS SAND.)
5. STEPS SHALL BE NO. 4 RE-BAR COVERED WITH POLYPROPYLENE OR APPROVED EQUAL. DRIVEN INTO PRE-FORMED HOLES.

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 4590 HAROLD JOE WILLSON
Harold Joe Willson 7-3-97
SOUTH CAROLINA RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 CERTIFICATE OF AUTHORIZATION

NO	REVISIONS	DRN	CHK	DATE

CHARLESTON

DRN	EAM	00-00-0000	
DES	HJW	00-00-0000	
CHK	HJW	00-00-0000	
APP	HKW	00-00-0000	

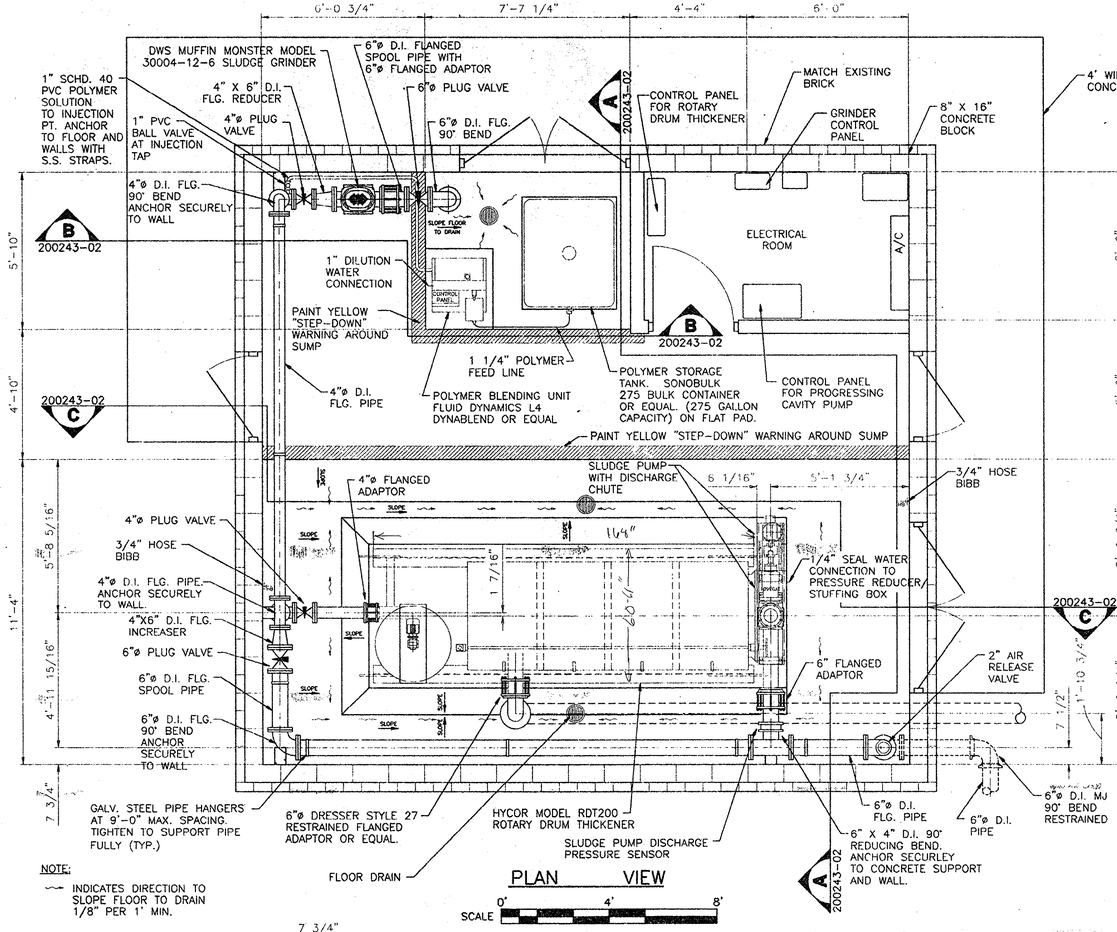
RUST
Rust Environment & Infrastructure Inc.

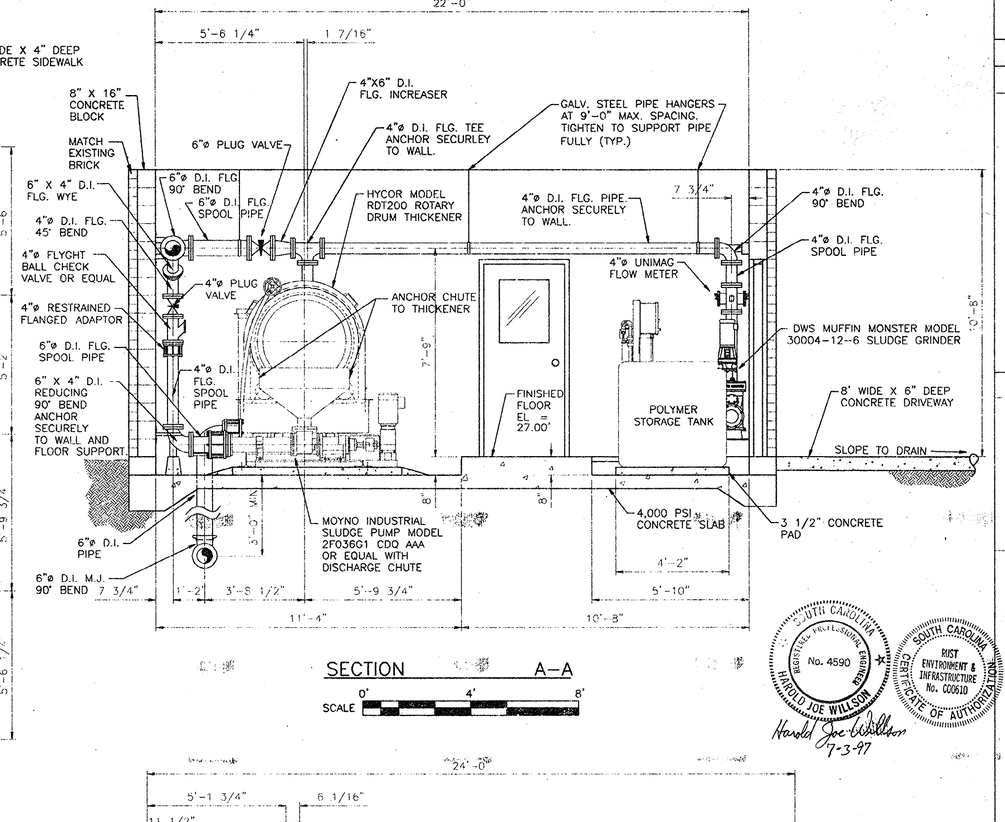
GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

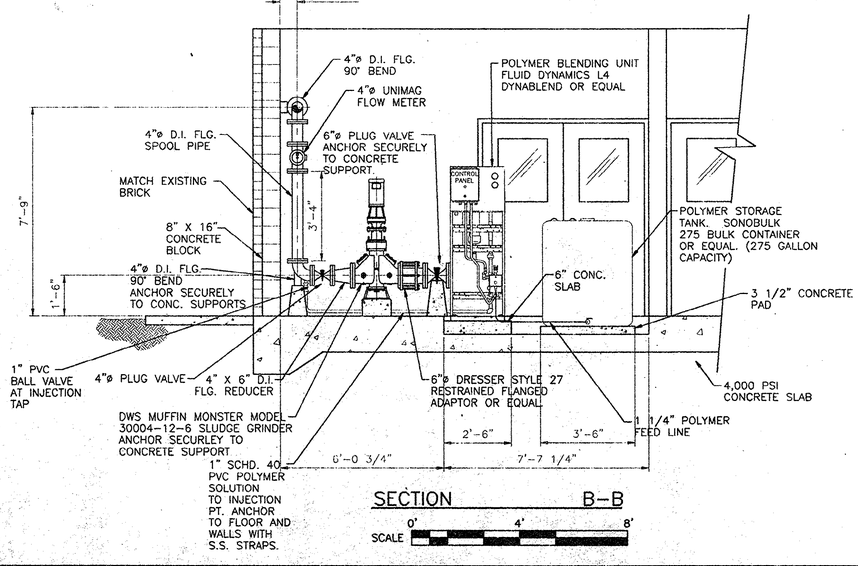
PROPOSED SLUDGE THICKENER DETAILS

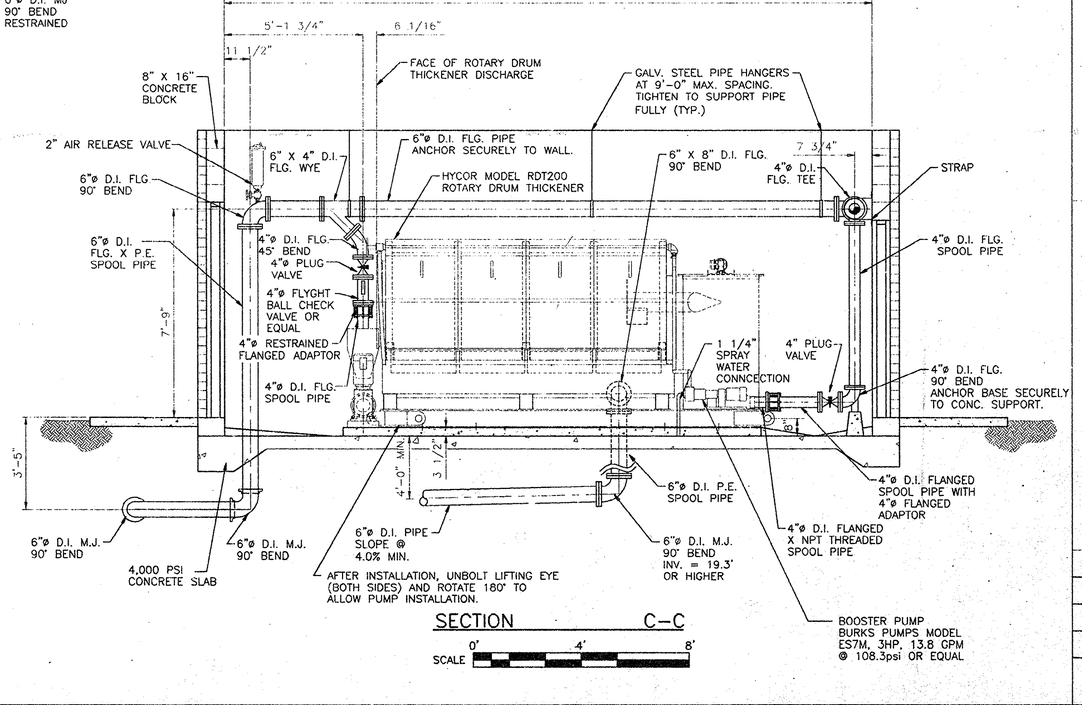
DATE	JUNE 1997
PROJECT NO	200243.10100
FILENAME	20024307.DWG
SHEET NO	4 of 15
DRAWING NO	C-3

07-013-004/15-









SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 4590 HAROLD JOE WILLSON
Harold Joe Willson 9-3-97
SOUTH CAROLINA RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 CERTIFICATE OF AUTHORIZATION

DATE	CHK	DRN	REVISIONS
06/27/1997	HJW	LF	MOVED PIPE & AIR VALVE INSIDE BUILDING, AND REMOVED FLOOR DRAIN PIPES
00-00-0000			
00-00-0000			
00-00-0000			

CHARLESTON

DRN	CLF	04-29-1997
DES	HJW	00-00-0000
CHK	HJW	00-00-0000
APP	HJW	00-00-0000

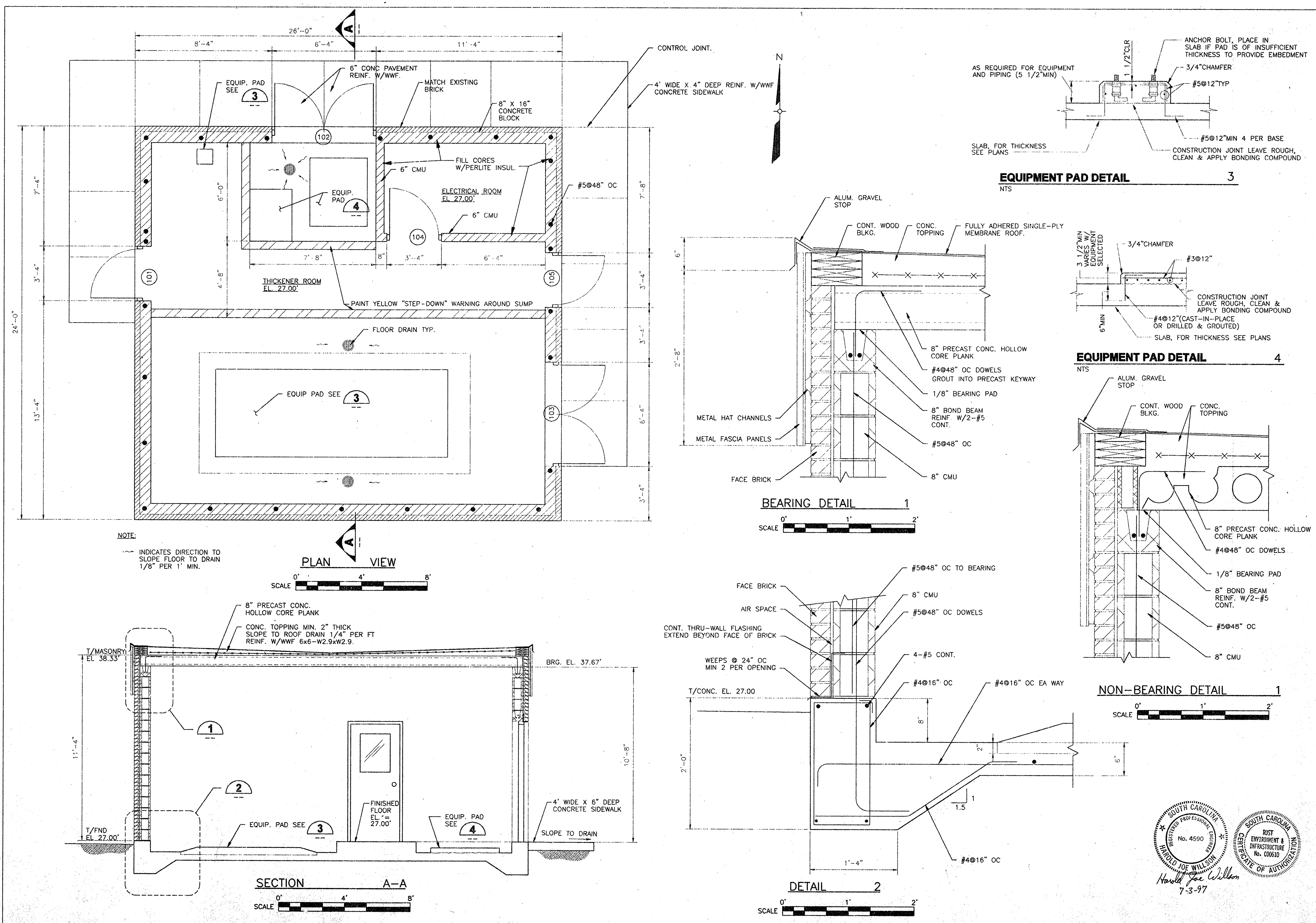
RUST
Rust Environment & Infrastructure Inc.

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

PROPOSED SLUDGE THICKENER BUILDING LAYOUT

DATE	JUNE 1997
PROJECT NO	200243.10000
FILENAME	20024301.DWG
SHEET NO	5 of 15
DRAWING NO	M-1

07-013-005/15



NO	REVISIONS	DRN	CHK	DATE
0				

CHARLESTON

DRN	WHM	5/30/97
DES	WHM	5/30/97
CHK	SJW	5/30/97
APP	HJW	00-00-0000

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RUST

Rust Environment & Infrastructure Inc.

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

SLUDGE THICKENER BUILDING PLANS & DETAILS

DATE JUNE 1997

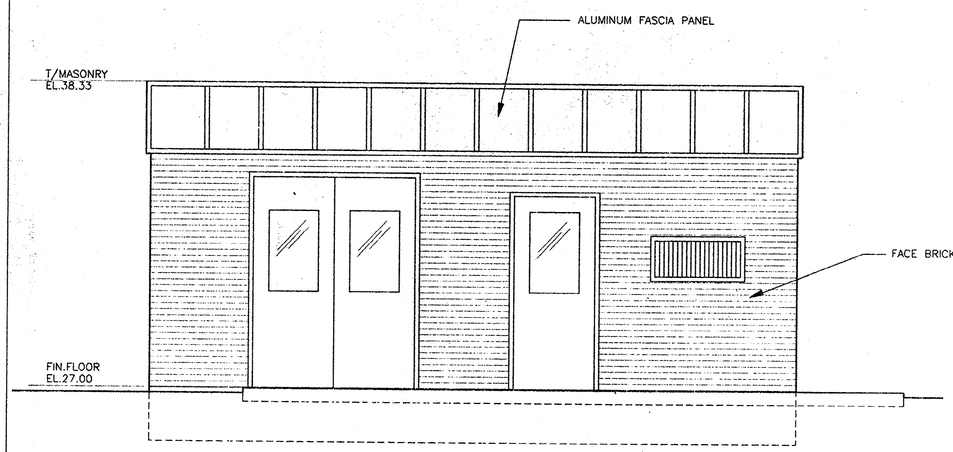
PROJECT NO 200243.10000

FILENAME 243AS1.DWG

SHEET NO 6 of 15

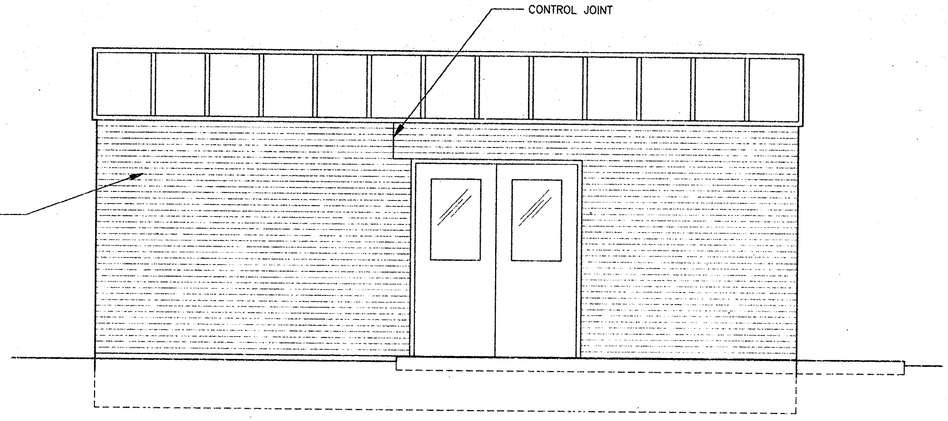
DRAWING NO **AS-1**

07-013-006/15



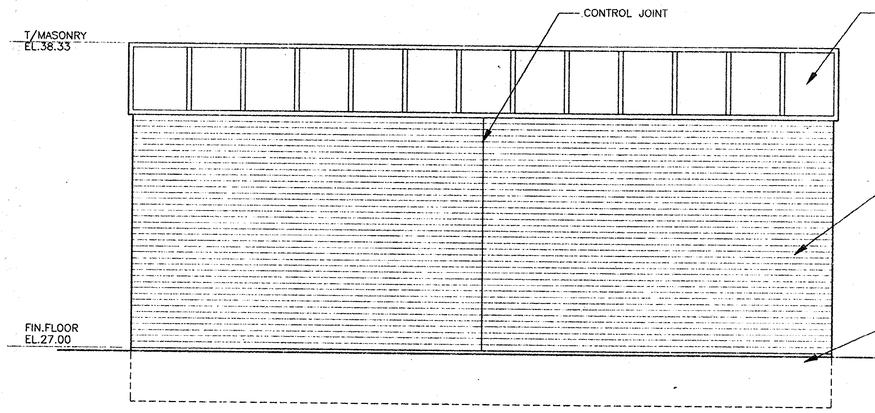
EAST ELEVATION

SCALE 0' 4' 8'



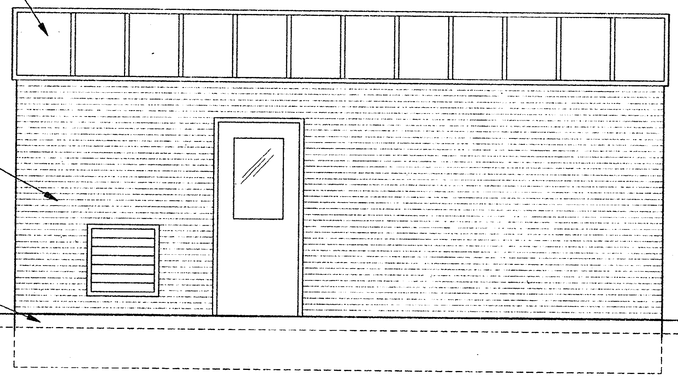
NORTH ELEVATION

SCALE 0' 4' 8'



SOUTH ELEVATION

SCALE 0' 4' 8'



WEST ELEVATION

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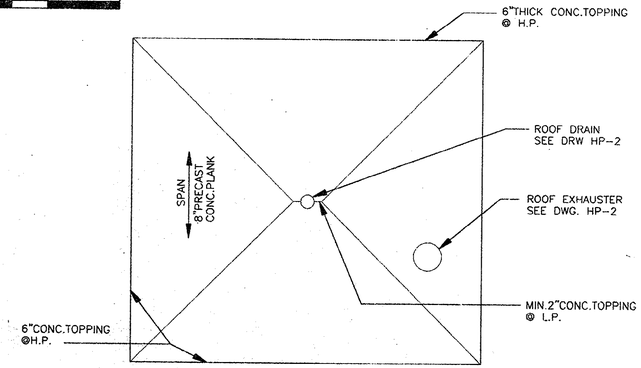


ROOF PLAN

SCALE 0' 8' 16'

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 4590 HAROLD JOE WILLSON

Harold Joe Willson 7-3-97

SOUTH CAROLINA RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 CERTIFICATE OF AUTHORIZATION

NO	Revision Description	DRN	CHK	DATE
0	REVISIONS	AAA	AAA	00-00-0000

DRN	CLF	04-29-1997
DES	HJW	00-00-0000
CHK	HJW	00-00-0000
APP	HJW	00-00-0000

CHARLESTON

RUST

Rust Environment & Infrastructure Inc.

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

PROPOSED SLUDGE THICKENER BUILDING ELEVATIONS

DATE JUNE 1997

PROJECT NO 200243.10000

FILENAME AS2.DWG

SHEET NO 7 of 15

DRAWING NO **AS-2**

07-013-007/15

GENERAL NOTES

1. FINISH SCHEDULE:

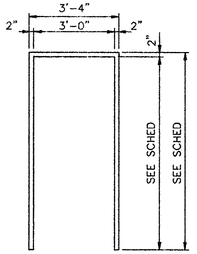
A. FLOOR AND BASE: ——— CONCRETE SEALER
B. WALLS: ——— CONCRETE MASONRY – COATING
C. CEILING: ——— PRECAST CONCRETE PLANK – COATING
D. MISC. STRUCTURAL STEEL: ——— STEEL – COATING
E. SEE SECTION 9805 FOR ADDITIONAL REQUIREMENTS.

2. DOOR SCHEDULE:

A. DOOR 101 & 105
- 3'-0"X7'-2"X1 3/4" FIBERGLASS
- FRAME TYPE F-1 2"X5-3/4"(2"HEAD)FIBERGLASS FRAME
- DOOR STYLE D-1 W/1/4"TEMPERED PLATE GLASS (TINTED)
- HARDWARE GROUP 1

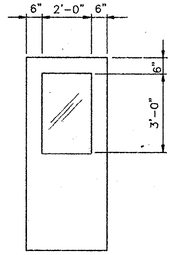
B. DOOR 102 & 103
- 2-3'-0"X7'-2"X1 3/4" FIBERGLASS (DOOR 102)
- 2-3'-0"X7'-10"X1 3/4" FIBERGLASS (DOOR 103)
- FRAME TYPE F-1 2"X5-3/4"(2"HEAD)FIBERGLASS FRAME
- DOOR STYLE D-1 W/1/4"TEMPERED PLATE GLASS (TINTED)
- HARDWARE GROUP 2

C. DOOR 104
- 3'-0"X7'-2"X1 3/4" FIBERGLASS
- FRAME TYPE F-1 2"X5-3/4"(2"HEAD)FIBERGLASS FRAME
- DOOR STYLE D-1 W/1"INSULATING TEMPERED GLASS (TINTED)
- HARDWARE GROUP 3



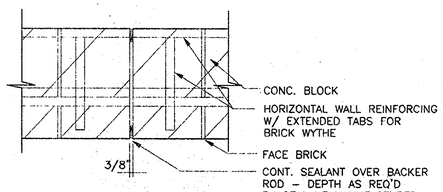
F-1

FRAME TYPE

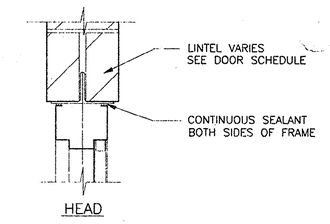


D-1

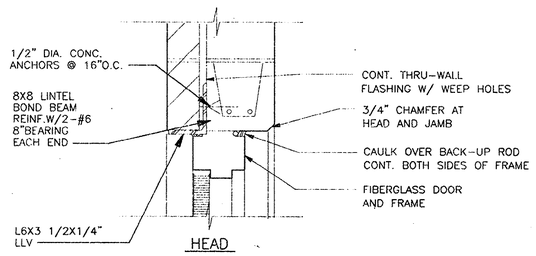
DOOR TYPE



CONTROL JOINT DETAIL (07-101)
1 1/2"=1'-0"



INTERIOR DOOR DETAIL (07-102)
1 1/2"=1'-0"



EXT. DOOR AT CAVITY WALL (07-103)
1 1/2"=1'-0"

GENERAL STRUCTURAL NOTES

GENERAL

1. THE GENERAL STRUCTURAL NOTES AND STANDARD STRUCTURAL DETAILS APPLY TO THE ENTIRE PROJECT UNLESS SPECIFICALLY STATED OTHERWISE

DESIGN CRITERIA

1. DESIGN AND CONSTRUCT IN CONFORMANCE WITH THE THE STANDARD BUILDING CODE, 1994 EDITION.
2. SUPERIMPOSED DESIGN LOADS:
   A. WIND LOAD
      1. BASIC WIND SPEED: 100 MPH
      2. EXPOSURE CLASSIFICATION: C
      3. IMPORTANCE FACTOR: 1.00
   B. SEISMIC ACCELERATION: 0.15 g
   C. LIVE LOAD 20 PSF
   D. MECHANICAL EQUIPMENT: VERIFY WITH EQUIPMENT SUPPLIER. (SEE EQUIPMENT SCHEDULES)

FOUNDATIONS

1. NET SOIL BEARING CAPACITIES ASSUMED: 2000 PSF
2. PLACE FOOTINGS ON NATURAL UNDISTURBED EARTH OR STRUCTURAL FILL.

CONCRETE

1. REINFORCING STEEL:
   A. DEFORMED BARS ASTM A615-GRADE 60
   B. WELDED WIRE FABRIC (WWF) ASTM A185
2. UNLESS OTHERWISE SHOWN PROVIDE COVER FOR REINFORCEMENT AS FOLLOWS:
   A. CAST AGAINST
      1. EARTH 3 INCHES
   B. EXPOSED TO EARTH, WEATHER OR WATER:
      1. SLABS AND JOISTS:
         A. #5 BARS AND SMALLER 1 1/2 INCHES
         B. #6 THRU #11 BARS 2 INCHES
3. PLACE DOWELS BEFORE PLACING CONCRETE.
4. DO NOT WELD OR FIELD BEND REINFORCING BARS, EXCEPT AS APPROVED BY ENGINEER.
5. CONCRETE: MINIMUM 28-DAY STRENGTH F'c=4000 PSI
   MINIMUM CEMENT CONTENT: 6 BAGS/CU YD.
   AIR CONTENT: 6% ±1%
   MAXIMUM SLUMP: 4 INCHES
6. UNLESS NOTED OTHERWISE, CONSTRUCTION JOINTS SHOWN ARE OPTIONAL. CONSTRUCTION JOINTS NOT SHOWN ON THE DRAWINGS SHALL BE APPROVED BY ENGINEER.
7. CONSTRUCTION JOINTS SHALL HAVE KEYS OR ROUGHENED SURFACES. WHERE ROUGHENED SURFACE IS USED, THE SURFACE SHALL HAVE AN AMPLITUDE OF 1/4" MIN.
8. PITCH ALL FLOORS TO FLOOR DRAINS AND GUTTERS A MINIMUM OF 1/8"/FT. OR AS SHOWN ON THE DRAWINGS. MINIMUM THICKNESS OF SLABS AND DEPTH OF BEAMS SHALL BE AS DIMENSIONED ON THE DRAWINGS. PITCH THE BOTTOM OF THE SLAB OR BEAM TO MATCH THE TOP SLOPE OF THE SLAB OR BEAM TO MAINTAIN THE THICKNESS OR DEPTH NOTED. AS AN ALTERNATE, BOTTOM OF THE SLAB OR BEAM MAY BE POURED LEVEL PROVIDED THAT THE MINIMUM THICKNESS OR DEPTH IS MAINTAINED.
9. CHAMFER EXPOSED EDGES OF CONCRETE 3/4" UNLESS OTHERWISE NOTED.
10. EQUIPMENT PAD AND CURB LOCATIONS, DIMENSIONS AND HEIGHTS TO BE COORDINATED BY CONTRACTOR. VERIFY WITH EQUIPMENT MANUFACTURER'S REQUIREMENTS.

MASONRY

1. MASONRY OPENINGS LESS THAN 4'-0" IN WIDTH THAT DO NOT HAVE A LINTEL SCHEDULED SHALL HAVE A BOND BEAM WITH 2-#5 BARS
2. PROVIDE A MINIMUM OF 8" BEARING AT EACH END FOR BOND BEAM LINTELS
3. PROVIDE A CONTINUOUS BOND BEAM AROUND THE TOP OF BUILDINGS, REINFORCED WITH 2-#5 BARS.
4. PROVIDE HORIZONTAL MASONRY REINFORCEMENT IN WALLS AT 16" O.C.
5. FILL JAMB CORES OF OPENINGS OVER 3'-0" WIDE WITH MASONRY GROUT FROM BOTTOM OF LINTEL TO BOTTOM OF WALL. REINFORCE CORES WHERE NOTED.
6. BRACE MASONRY WALLS UNTIL ROOF OR FLOOR SYSTEM IS IN PLACE.

METALS

1. STEEL:
   A. STRUCTURAL STEEL ASTM A36
   B. MISCELLANEOUS STEEL ASTM A36
2. ALUMINUM:
   A. SHAPES AND PLATES ALLOY 6061-T6 OR 6063-T6
3. WELD STRUCTURAL STEEL WITH E70 ELECTRODES IN ACCORDANCE WITH A.W.S. REQUIREMENTS.
4. PROTECT ALUMINUM SURFACES IN CONTACT WITH OTHER MATERIALS IN ACCORDANCE WITH THE SPECIFICATIONS.

MISCELLANEOUS

1. FOR ADDITIONAL OPENINGS, ANCHORS AND EMBEDDED ITEMS SEE ARCHITECTURAL, PROCESS, PLUMBING, HVAC & ELECTRICAL DRAWINGS.
2. VERIFY PERTINENT EXISTING CONDITIONS AND DIMENSIONS BEFORE STARTING CONSTRUCTION AND/OR FABRICATION.

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 4590 HAROLD JOE WILLSON
Harold Joe Willson 7-3-97

RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 CERTIFICATE OF AUTHORIZATION SOUTH CAROLINA

					AAA	00-00-0000
					DRN	CHK	DATE
					AAA	AAA	00-00-0000
				0	Revision Description	NO
					REVISIONS	
CHARLESTON						
DRN	CLF	04-29-1997				
DES	HJW	00-00-0000				
CHK	HJW	00-00-0000				
APP	HJW	00-00-0000				

RUST
Rust Environment & Infrastructure Inc.

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

PROPOSED SLUDGE THICKENER
GENERAL NOTES & DETAILS

DATE JUNE 1997
PROJECT NO 200243.10000
FILENAME AS3.DWG
SHEET NO 8 of 15
DRAWING NO AS-3

07-013-008/15

ABBREVIATIONS

A	AIR
AC	AIR COMPRESSOR
AFF	ABOVE FINISHED FLOOR
BDD	BACK DRAFT DAMPER
BOD	BOTTOM OF DUCT
CAL	COMBUSTION AIR LOUVER
CD	CEILING DIFFUSER
CF	CEILING FAN
CUH	CABINET HEATER
CP	CIRCULATING PUMP (DOMESTIC HOT WATER)
DG	DOOR GRILLE
DFU	DRAINAGE FIXTURE UNITS
DV	DRAIN VALVE
EAL	EXHAUST AIR LOUVER
EG	EXHAUST GRILLE
EH	EXHAUST HOOD
ER	EXHAUST REGISTER
ESP	EXTERNAL STATIC PRESSURE
EWC	ELECTRIC WATER COOLER
FCU	FAN COIL UNIT
FVD	FRP VOLUME DAMPER
H&C	HOT AND COLD WATER
HRU	HEAT RECOVERY UNIT
HVU	HEATING & VENTILATING UNIT
HWA	HIGH WATER ALARM
HWL	HIGH WATER LEVEL
IH	INTAKE HOOD
LD	LINEAR DIFFUSER
LG	LINEAR GRILLE
MAU	MAKE-UP AIR UNIT
MB	MOP BASIN
MOD	MOTOR OPERATED DAMPER
OAL	OUTDOOR AIR LOUVER
P	PUMP
RA	RETURN AIR
RAL	RETURN AIR LOUVER
RG	RETURN GRILLE
RH	RELIEF HOOD
RTU	ROOF TOP UNIT
SD	SMOKE DAMPER
SG	SUPPLY GRILLE
SP	SUMP PUMP
SPD	SUMP PUMP DISCHARGE
SR	SUPPLY REGISTER
SS	SAMPLE SINK
TCP	TEMPERATURE CONTROL PANEL
TD	TRANSFER DUCT
TG	TRANSFER GRILLE
TOD	TOP OF DUCT
TSP	TOTAL STATIC PRESSURE
U	URINAL
VD	VOLUME DAMPER (MANUAL)
VTR	VENT THROUGH ROOF
WSFU	WATER SUPPLY FIXTURE UNITS

PIPE SYMBOLS

- ABOVE GRADE COLD WATER (W1)
- BELOW GRADE COLD WATER (W1)
- ABOVE GRADE HOT WATER (W1)
- ABOVE GRADE HOT WATER RETURN (W1)
- DI — DEIONIZED WATER
- CSW — ABOVE GRADE COLD SOFT WATER (W1)
- HSW — ABOVE GRADE HOT SOFT WATER (W1)
- W2 — ABOVE GRADE SERVICE WATER-COLD (W2)
- W2 — BELOW GRADE SERVICE WATER-COLD (W2)
- W3 — ABOVE GRADE FLUSHING WATER (W3)
- W3 — BELOW GRADE FLUSHING WATER (W3)
- RD — ABOVE GRADE STORM WATER
- RD — BELOW GRADE STORM WATER
- ABOVE GRADE DRAIN PIPE
- BELOW GRADE SANITARY SEWER
- ABOVE GRADE VENT
- BELOW GRADE VENT
- AR — ABOVE GRADE SANITARY SEWER (ACID RESISTANT)
- AR — BELOW GRADE SANITARY SEWER (ACID RESISTANT)
- AR — ABOVE GRADE VENT (ACID RESISTANT)
- AR — BELOW GRADE VENT (ACID RESISTANT)
- SPD — SUMP PUMP DISCHARGE
- V — VACUUM
- G — NATURAL GAS
- A — COMPRESSED AIR
- HS — HOT WATER HEATING SUPPLY
- HR — HOT WATER HEATING RETURN
- CD — CONDENSATE DRAIN
- E — EXPANSION TANK LINE
- ACE — ACETYLENE GAS
- ARG — ARGON GAS
- NIT — NITROUS OXIDE

PIPE SYMBOLS (CONT.)

- BBD — BOILER BLOW DOWN
- CP — CONDENSATE PUMP DISCHARGE
- HPS — HIGH PRESSURE STEAM
- MPS — MEDIUM PRESSURE STEAM
- LPS — LOW PRESSURE STEAM
- HPR — HIGH PRESSURE RETURN
- MPR — MEDIUM PRESSURE RETURN
- LPR — LOW PRESSURE RETURN

PIPE SPECIALTIES (GENERAL)

- ELBOW
- TEE
- ELBOW UP
- ELBOW DOWN
- CONNECTION TOP
- CONNECTION BOTTOM
- UNION
- PITCH ARROW-DOWN
- FLOW DIRECTION
- ECCENTRIC REDUCER
- CONCENTRIC REDUCER
- PIPE CAP
- BLIND FLANGE
- PLUG

PIPE SPECIALTIES (PLUMBING)

- FIRE HYDRANT
- FD — FLOOR DRAIN
- RD — ROOF DRAIN
- CO — FLOOR CLEANOUT
- SANITARY VENT
- AV — SANITARY VENT (ACID)

TEMPERATURE CONTROL SYMBOLS

- TCP — TEMPERATURE CONTROL PANEL
- T — THERMOSTAT - ELECTRIC
- T — THERMOSTAT - PNUEMATIC
- H — HUMIDISTAT
- S — SMOKE DETECTOR
- H-O-A — HAND-OFF-AUTO
- F-O-H — FAN-OFF-HEAT

PIPE SPECIALTIES (HVAC)

- PIPE SUPPORT
- F — FLOW MEASURING DEVICE
- THERMOSTATIC TRAP
- FLOAT & THERMOSTATIC TRAP
- BUCKET TRAP
- EXPANSION COMPENSATOR
- FLEXIBLE CONNECTOR
- HOT WATER CIRCULATION PUMP
- FS — FLOW SWITCH
- PS — PRESSURE SWITCH
- AIR VENT
- THERMOMETER
- PRESSURE GAUGE

VALVE SYMBOLS

- WATER MAIN VALVE
- WH — WALL HYDRANT (NON-FREEZE)
- HB — HOSE BIBB
- GAS COCK
- GAUGE COCK
- PRESSURE REGULATING VALVE
- BALL VALVE
- GATE VALVE
- CHECK VALVE
- BUTTERFLY VALVE
- PLUG VALVE
- CALIBRATED BALANCE VALVE
- MODULATING 3-WAY VALVE
- S — SOLENOID VALVE
- MODULATING 2-WAY VALVE
- GLOBE VALVE
- STRAINER
- PRS — PRESSURE REDUCING STATION (ASSEMBLY)
- RELIEF VALVE (PRESSURE OR VACUUM)

DUCTWORK SYMBOLS

- POSITIVE PRESSURE AIR DUCT RISE
- POSITIVE PRESSURE AIR DUCT DROP
- NEGATIVE PRESSURE AIR DUCT RISE
- NEGATIVE PRESSURE AIR DUCT DROP
- FLEXIBLE CONNECTION
- M — MOTOR OPERATED DAMPER
- VD — MANUAL VOLUME DAMPER
- BDD — BACK DRAFT DAMPER
- SMOKE DAMPER
- F1 — FIRE DAMPER (HORI. POSITION) 1 1/2 HOUR (F1), 3 HOUR (F3)
- F1 — FIRE DAMPER (VERT. POSITION) 1 1/2 HOUR (F1), 3 HOUR (F3)
- INTERNAL ACOUSTICAL INSULATION
- EXTERNAL INSULATION
- ELBOW W/ TURNING VANES
- AIR EXTRACTOR
- R — CHANGE OF ELEVATION RISE (R), DROP (D)
- VD — RIGID DUCT TO ROUND DIFFUSER WITH VOLUME DAMPER
- SD-1 250CFM 24"X24" — RIGID DUCT TO SQUARE DIFFUSER OF SIZE AND CAPACITY INDICATED
- DUCT MOUNTED GRILLE
- FLEX DUCT CONNECTION TO SQUARE CEILING DIFFUSER

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 4590 HAROLD JOE WILLSON

Harold Joe Willson 7-3-97

SOUTH CAROLINA RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 CERTIFICATE OF AUTHORIZATION

NOTE:
1. THIS LIST OF ABBREVIATIONS SHOWN IS A STANDARD LIST. NOT ALL ABBREVIATIONS AND SYMBOLS ARE USED IN THESE CONTRACT DRAWINGS.

NO	REVISIONS	DRN	CHK	DATE

CHARLESTON

DRN	SCC	6/25/97
DES	SCC	6/25/97
CHK	SCC	6/25/97
APP		

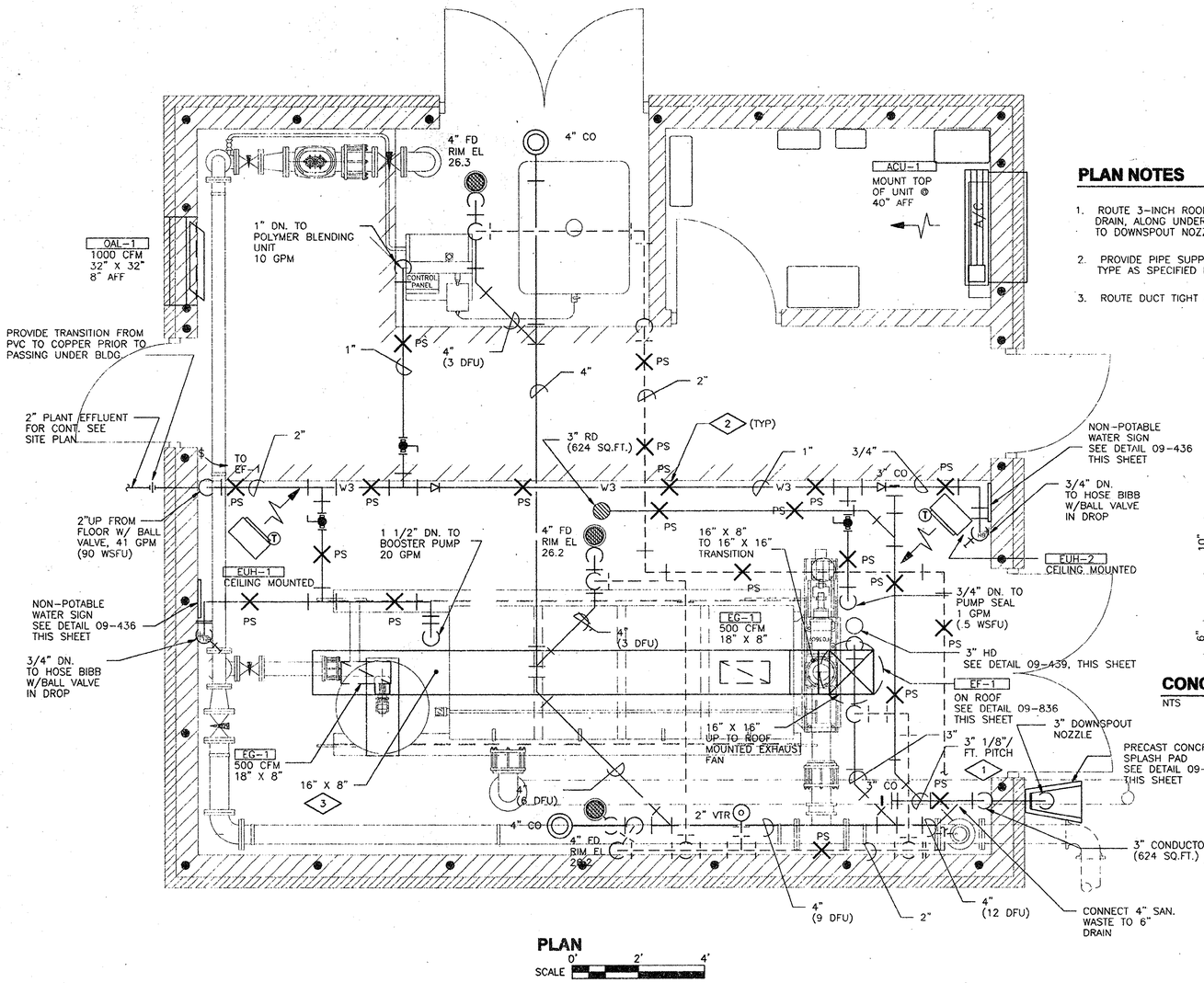
RUST
Rust Environment & Infrastructure Inc.

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

PLUMBING AND HVAC ABBREVIATIONS AND SYMBOLS

DATE	JUNE 1997
PROJECT NO	200243.10000
FILENAME	002HP.DWG
SHEET NO	9 of 15
DRAWING NO	HP-1

07-013-009/15

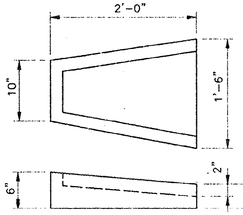


PLAN

SCALE 0' 2' 4'

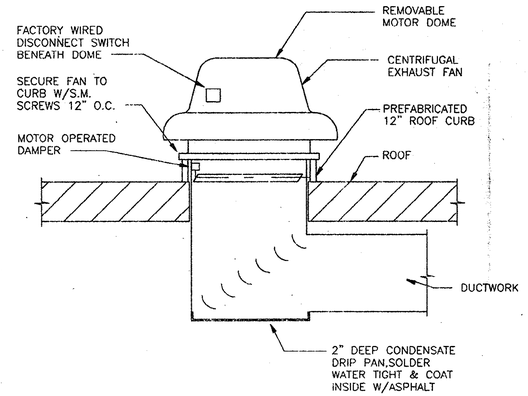
PLAN NOTES

1. ROUTE 3-INCH ROOF DRAIN PIPING FROM ROOF DRAIN, ALONG UNDERSIDE OF CEILING, AND DOWN TO DOWNSPOUT NOZZLE AS SHOWN.
2. PROVIDE PIPE SUPPORT WHERE INDICATED OF TYPE AS SPECIFIED IN SPEC. SECTION 15140.
3. ROUTE DUCT TIGHT AGAINST CEILING.



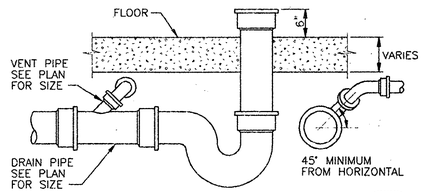
CONCRETE SPLASH PAD (09-435)

NTS



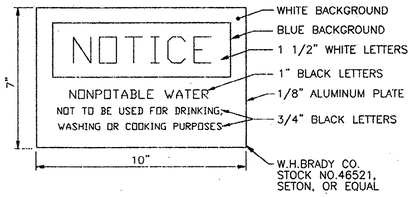
POWER ROOF EXHAUST FAN WITH DUCTWORK (09-836)

N.T.S.



HUB DRAIN (09-439)

NTS



NOTE:
PROVIDE NON-POTABLE SIGN AT EACH SERVICE WATER (W2) OR FLUSHING WATER (W3) HOSE BIBB, WALL HYDRANT AND HOSE REEL (SEE SPECS.)

NON-POTABLE WATER SIGN (09-436)

NTS

TERMINAL AIR CONDITIONING UNIT SCHEDULE

TAG NO.	MANUF.	MODEL	TYPE	SCFM	EAT (DB)	EAT (WB)	LAT (DB)	LAT (WB)	SEN. CAP.	LAT. CAP.	TOTAL CAP.	HEAT KW	HEAT VOLT	HEAT PHASE	VOLT	PHASE	AMPS	REMARKS
ACU-1	TRANE	PTEB-09	WALL UNIT	215	74DegF	63DegF	51DegF	49DegF	5.4 MBH	3.1 MBH	8.5 MBH	1.5	208	1	208	1	10.9	IT,TF

IT = INTEGRAL THERMOSTAT
TF = THROWAWAY AIR FILTER

ELECTRIC UNIT HEATER SCHEDULE

TAG NO.	MANUF	MODEL	TYPE	OUTPUT(MBH)	MOUNT. HGHT (FT)	CFM	THROW	TEMP RISE	KW	VOLT	PHASE	AMPS	MTR H	MTR RPM	REMARKS
EUH-1	QMARK	MUH-05	PROP.	17	CEILING	350	12	45	5	480	3	6	1/100	1600	IT, ID, MB
EUH-2	QMARK	MUH-03	PROP.	10.2	CEILING	350	12	27	3	480	3	3.6	1/100	1600	IT, ID, MB

IT = INTEGRAL THERMOSTAT
ID = INTEGRAL DISCONNECT
MB = MOUNTING BRACKET

AIR INLET AND OUTLET SCHEDULE

TAG NO.	MANUF.	MODEL	SERVICE	MAX APD	MAX NC	PATTERN	MATERIAL	FINISH	DAMPER	REMARKS
EG-1	ANEMOSTA	X3VS	EXHAUST	.03	22	VERTICAL	ALUM.	BE	OB	
EG-1	ANEMOSTA	X3VS	EXHAUST	.03	22	VERTICAL	ALUM.	BE	OB	

BE = BAKED ENAMEL
OB = OPPOSED BLADE

EXHAUST FAN SCHEDULE

TAG NO.	MANU.\MODEL	TYPE	MOUNTING	SCFM	ESP(IN.WC.)	BHP	FRPM	DRIVE	HP	VOLT	PHASE	DAMPER	REMARKS
EF-1	GREENHECK\GB-140-4	CENTRI.	ROOF	1000	.25	.09	741	BELT	1/4	120	1	BDD	ID, RC, BS

ID = INTEGRAL DISCONNECT
RC = ROOF CURB
BS = BIRD SCREEN

WALL LOUVER SCHEDULE

TAG NO.	MANUF.	MODEL	SERVICE	CFM	WIDTH	HEIGHT	DEPTH	MAX. APD	MFAV	REMARKS
OAL-1	GREENHECK	ESD-401	OUTSIDE	1000	32	32	4	.05	400	BIRDSCREEN (1/2" MESH)

NO	REVISIONS	DRN	CHK	DATE

CHARLESTON

DRN	SCC	5/30/97
DES	SCC	5/30/97
CHK	SCC	5/30/97
APP		

RUST
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SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 4590 HAROLD JOE WILLSON
7-3-97

SOUTH CAROLINA RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 CERTIFICATE OF AUTHORIZATION

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

SLUDGE THICKENER BUILDING
HVAC/PLUMBING PLAN & DETAILS

DATE	JUNE 1997
PROJECT NO	200243.10000
FILENAME	001HP.DWG
SHEET NO	10 of 15
DRAWING NO	HP-2

07-013-010/15

ABBREVIATIONS

A	AMPERE
AC	ALTERNATING CURRENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CAPACITY
BWE	BAKED WHITE ENAMEL
C	CONTACTOR/CONDUIT/COIL
CB	CIRCUIT BREAKER
CKT, CCT	CIRCUIT
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
DISC	DISCONNECT
DWG	DRAWING
EP	EXPLOSION PROOF
ETM	ELAPSED TIME METER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GRD	GROUND
GRS	GALVANIZED RIGID STEEL
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HP	HORSEPOWER
HVAC	HEATING, VENTILATING & AIR CONDITIONING
I&C	INSTRUMENTATION & CONTROL
J	JUNCTION BOX
KVA	KILOVOLT AMPERE
KVAR	KILOVOLT AMPERE REACTIVE
KW	KILOWATT
LCP	LOCAL CONTROL PANEL
LP	LIGHTING PANEL
M	METER
MCC	MOTOR CONTROL CENTER
MH	MANHOLE
MTR, M	MOTOR
MTD	MOUNTED
MTG	MOUNTING
NA	NON-AUTOMATIC
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE (ANSI/NFPA-70)
NEUT, N	NEUTRAL
NF	NON FUSED
NO	NORMALLY OPEN
OL	OVERLOAD RELAY
PB	PUSHBUTTON/PULLBOX
PC	PHOTOCELL
PNL	PANEL
PP	POWER PANEL
PVC	POLY VINYL CHLORIDE
SB	SPLICEBOX
SEL	SELECTOR SWITCH
SOL	SOLENOID VALVE
SW	SWITCH
V	VOLTS
WP	WEATHERPROOF
XFMR	TRANSFORMER

PLAN SYMBOLS

A — FLUORESCENT FIXTURE – RECESSED (LETTER DENOTES TYPE)

A — FLUORESCENT FIXTURE – SURFACE OR SUSPENDED (LETTER DENOTES TYPE)

A — FLUORESCENT FIXTURE – WALL MOUNTED (LETTER DENOTES TYPE)

A — INCANDESCENT OR HID FIXTURE – WALL MOUNTED (LETTER DENOTES TYPE)

A — POLE MOUNTED FIXTURE (LETTER DENOTES TYPE)

EMERGENCY BATTERY LIGHT

REMOTE HEAD FOR EMERGENCY BATTERY LIGHT

EXIT LIGHT WITH INDICATING DIRECTIONAL ARROW

SINGLE POLE SWITCH

2 — TWO POLE SWITCH

3 — 3-WAY SWITCH

4 — 4-WAY SWITCH

MC — MOMENTARY CONTACT SWITCH – CENTER OFF

P — SWITCH / PILOT LIGHT

DS — DOOR SWITCH

DUPLEX GROUNDED RECEPTACLE – 120V

C — DUPLEX GROUNDED RECEPTACLE – 120V MOUNTED 6" ABOVE COUNTER

DUPLEX GROUNDED RECEPTACLE FURNISHED UNDER DIVISION 11. INSTALL AND WIRED UNDER DIVISION 16

CONNECTION TO EQUIPMENT

SPECIAL PURPOSE RECEPTACLE, NEMA TYPE AND AMPERE RATING AS INDICATED

TELEPHONE OUTLET, WALL MOUNT WITH 3/4" CONDUIT TO TELEPHONE TERMINAL CABINET
(W – INDICATES 54" MOUNTING HEIGHT FOR PHONE)
(B – INDICATES 96" MOUNTING HEIGHT FOR BELL UNLESS NOTED OTHERWISE)

MANUAL STARTER WITH PILOT LIGHT

THREE PHASE MAGNETIC STARTER

THREE PHASE COMBINATION MAGNETIC STARTER AND DISCONNECT SWITCH

SINGLE PHASE MAGNETIC STARTER

30 — NON-FUSED DISCONNECT SWITCH (NUMERAL INDICATES SWITCH RATING)

60/40 — FUSED DISCONNECT SWITCH – 3 POLE UNLESS OTHERWISE INDICATED
(UPPER NUMERAL INDICATES SWITCH RATING)
(LOWER NUMERAL INDICATES FUSE RATING)

LIGHTING PANEL

T — TRANSFORMER

POWER PANEL

TERMINAL CABINET
(ITC – INDICATES INSTRUMENTATION)
(TTC – INDICATES TELEPHONE)

M — MOTOR

D — DAMPER MOTOR

J — JUNCTION BOX

HH — HANDHOLE

MH — MANHOLE

GROUND ROD

CONDUIT STUB

CONDUIT TURNING UP OR TO OBSERVER

CONDUIT TURNING DOWN OR AWAY FROM OBSERVER

FLEXIBLE CONDUIT CONNECTION

HOMERUN CIRCUIT OR CONDUCTORS

E — DIRECT BURIAL CABLE

UNDERGROUND ELECTRICAL DUCT, CONCRETE ENCASED.

ONE-LINE SYMBOLS

15 M (OR) CL 600 500 — MOLDED CASE CIRCUIT BREAKER
(UPPER NUMERAL INDICATES FRAME SIZE)
(LOWER NUMERAL INDICATES TRIP SETTING)
(CL – INDICATES CURRENT LIMITING CIRCUIT BREAKER)
(M – INDICATES MOTOR CIRCUIT PROTECTOR)

300/5 3 — CURRENT TRANSFORMER
($\frac{300}{5}$ INDICATES TURNS RATIO)
(3 – INDICATES QUANTITY)

3 — 4/1 — POTENTIAL TRANSFORMER
($\frac{4}{1}$ INDICATES TURNS RATIO)
(3 – INDICATES QUANTITY)

52 — DRAWOUT CIRCUIT BREAKER

FVNR 2a 1b 2 — MAGNETIC STARTER AND MOLDED CASE CIRCUIT BREAKER
(FVNR – INDICATES FULL VOLTAGE NON-REVERSING)
(RVNR – INDICATES REDUCED VOLTAGE NON-REVERSING)
(2SPD – INDICATES TWO SPEED)
(AUXILIARY CONTACTS – (2a TWO N.O.)(1b ONE N.C.)
(NUMERAL INDICATES NEMA SIZE)

POWER FACTOR CORRECTION CAPACITOR SIZE AS INDICATED

TRANSFORMER

FVNR 2a 1b 2 — COMBINATION MAGNETIC STARTER WITH MOLDED CASE CIRCUIT BREAKER

GROUND

75 — MOTOR (NUMERAL INDICATES HORSEPOWER)

GENERATOR

THREE PHASE WYE CONNECTION

THREE PHASE DELTA CONNECTION

AS — AMMETER SELECTOR SWITCH

VS — VOLTMETER SELECTOR SWITCH

A — AMMETER

V — VOLTMETER

HOA — CONTROL STATION
SOME ABBREVIATIONS THAT MAY BE USED:

AM	AUTO-MANUAL
CAM	COMPUTER-AUTO-MANUAL
CM	COMPUTER-MANUAL
DS	DOOR SWITCH
ETM	ELAPSED TIME METER
FR	FORWARD-REVERSE
HLO	HIGH-LOW-OFF SWITCH
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
LOS	LOCK-OUT-STOP
LR	LOCAL-REMOTE
MA	MANUAL-REMOTE
OC	OPEN-CLOSED
OCA	OPEN-CLOSED-AUTO
OCS	OPEN-CLOSED-STOP
OO	ON-OFF MAINTAINED CONTACT
OOA	ON-OFF-AUTO
PB	PUSHBUTTON
SF	SLOWER-FASTER
SS	START-STOP MOMENTARY CONTACT
USG	ULTRA SONIC GENERATOR
ZS	LIMIT SWITCH

MOTOR CONTROL CENTER

BUILDING NO. — 10MCC-1
MCC NO.

PANEL BOARDS

BUILDING NO. — 10LP1-4
LIGHTING OR POWER PANEL AS INDICATED
PANEL NO.
CIRCUIT NO.

NOTE:
1. THIS LIST OF ABBREVIATIONS SHOWN IS A STANDARD LIST. NOT ALL ABBREVIATIONS AND SYMBOLS ARE USED IN THESE CONTRACT DRAWINGS.

SOUTH CAROLINA — RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 17600 STEVEN R. SHUGART 7/2/97

REVISIONS	DRN	CHK	DATE
NO			00-00-0000

CHARLESTON

DRN	SRS	05-30-97
DES	SRS	05-30-97
CHK	DK	07-01-97
APP	HJW	07-02-97

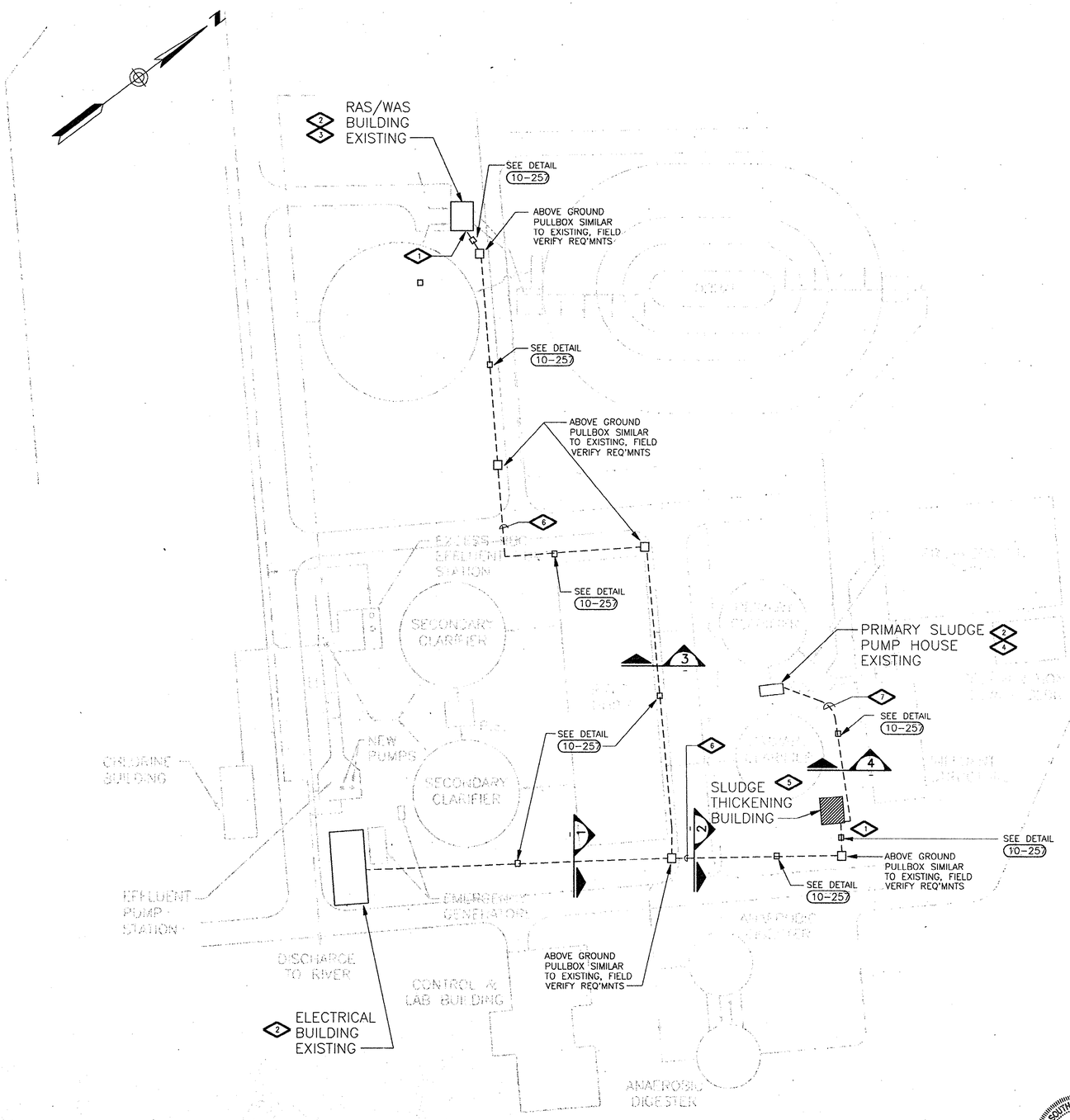
Rust Environment & Infrastructure Inc.

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

ELECTRICAL ABBREVIATIONS AND SYMBOLS

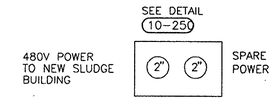
DATE APRIL 1997
PROJECT NO 200243.10000
FILENAME E-1.DWG
SHEET NO 11 of 15
DRAWING NO E-1

07-013-011/15

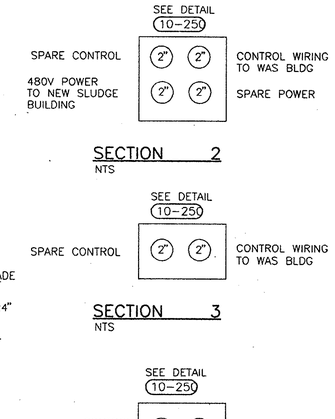


PLAN NOTES:

1. RUN SPARE CONDUIT(S) INTO BUILDING AND CAP FOR FUTURE USE.
2. FOR BUILDING PLAN, SEE DRAWING E-4.
3. EXISTING WAS PUMPS ARE CONTROLLED THROUGH AN HOA SWITCH WITH A 24 HOUR TIMER AND LEAD/LAG ALTERNATOR. INSTALL NEW LOCAL REMOTE SWITCH IN EXISTING CONTROL CIRCUIT TO PROVIDE THE FOLLOWING CONTROL:
   A. IN LOCAL POSITION, THE SYSTEM OPERATES AS IS.
   B. IN REMOTE POSITION, THE SLUDGE THICKENER CONTROL PANEL LOCATED IN THE NEW SLUDGE BUILDING WILL START AND STOP THE WAS PUMP. START/STOP CONTROL SHALL BE LOCATED IN THE CONTROL CIRCUIT TO MAINTAIN THE USE OF THE LEAD/LAG ALTERNATOR AND LEVEL CONTROLS.
4. PROVIDE SIMILAR CONTROL STRATEGY FOR PRIMARY SLUDGE PUMPS AS DESCRIBED IN #3 ABOVE.
5. SEE DRAWING C-1 FOR ACTUAL BUILDING LOCATION.
6. CUT AND PATCH ROADWAY. RESTORE ROADWAY TO ORIGINAL CONDITION.
7. ROUTE CONDUITS THROUGH TRENCH CUT THROUGH SIDEWALK FOR PROCESS PIPING.



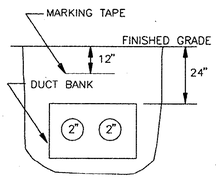
SECTION 1
NTS



SECTION 2
NTS

SECTION 3
NTS

SECTION 4
NTS



TYPICAL DUCT BANK SECTION
NTS

DO NOT SCALE THIS DRAWING
THIS DRAWING IS FOR ROUTING LOCATION ONLY FIELD VERIFY ALL DIMENSIONS AND DISTANCES
APPROX. DISTANCE BETWEEN ELECTRICAL BUILDING AND NEW SLUDGE BUILDING IS 400'
APPROX. DISTANCE BETWEEN RAS/WAS BUILDING AND NEW SLUDGE BUILDING IS 720' (CONDUIT ROUTING DISTANCE)
APPROX. DISTANCE BETWEEN PRIMARY SLUDGE PUMP HOUSE AND NEW SLUDGE BUILDING IS 140' (CONDUIT ROUTING DISTANCE)

SOUTH CAROLINA RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 17600 STEVEN R. SMUGARS
7/2/97

NO	REVISIONS	DRN	CHK	DATE

CHARLESTON

DRN	SRS	05-30-97
DES	SRS	05-30-97
CHK	DK	07-01-97
APP	HJW	07-02-97

RUST
Rust Environment & Infrastructure Inc.

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

PROPOSED SLUDGE THICKENER BUILDING ELECTRICAL SITE PLAN

DATE APRIL 1997
PROJECT NO. 200243.10000
FILENAME E2.DWG
SHEET NO 12 of 15
DRAWING NO E-2

07-013-012/15

$$REF12$$ REFERENCE FILE 1 = *no ref name*
Levels On= *no ref levels*
$$REF02$$ REFERENCE FILE 2 = *no ref name*
Levels On= *no ref levels*
$$REF03$$ REFERENCE FILE 3 = *no ref name*
Levels On= *no ref levels*
$$REF04$$ REFERENCE FILE 4 = *no ref name*
Levels On= *no ref levels*
$$REF05$$ REFERENCE FILE 5 = *no ref name*
Levels On= *no ref levels*
$$REF06$$ REFERENCE FILE 6 = *no ref name*
Levels On= *no ref levels*
$$REF07$$ REFERENCE FILE 7 = *no ref name*
Levels On= *no ref levels*
$$REF08$$ REFERENCE FILE 8 = *no ref name*
Levels On= *no ref levels*
$$REF09$$ REFERENCE FILE 9 = *no ref name*
Levels On= *no ref levels*
$$REF10$$ REFERENCE FILE 10 = *no ref name*
Levels On= *no ref levels*
$$REF11$$ REFERENCE FILE 11 = *no ref name*
Levels On= *no ref levels*
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PENSKE: (PENSKE7.ERS)
LAYERS= Not Available
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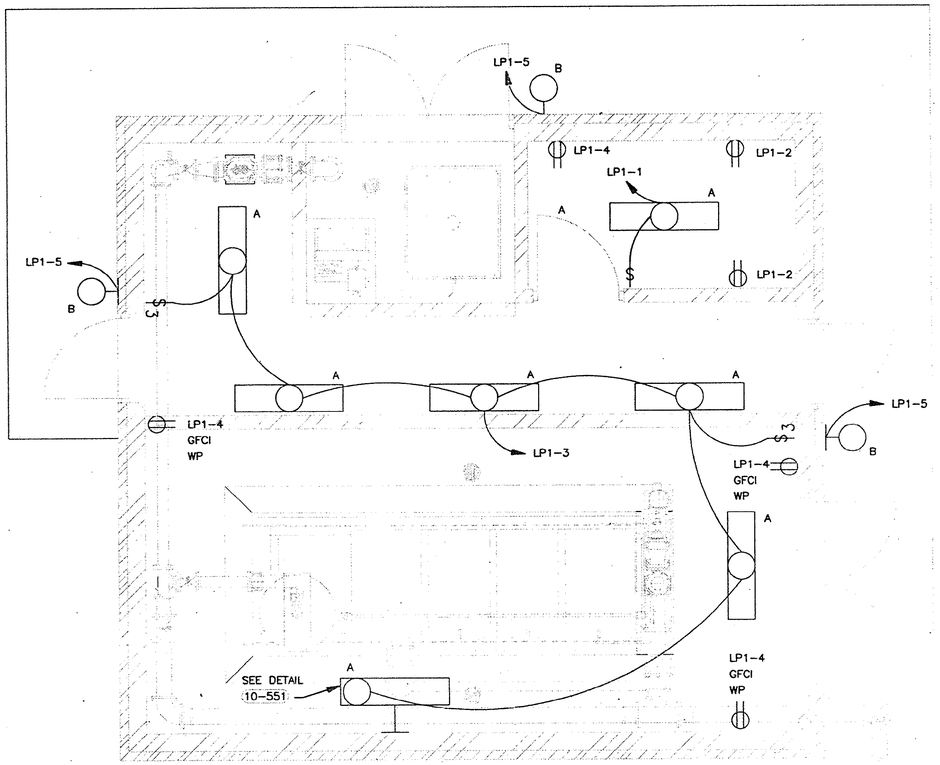
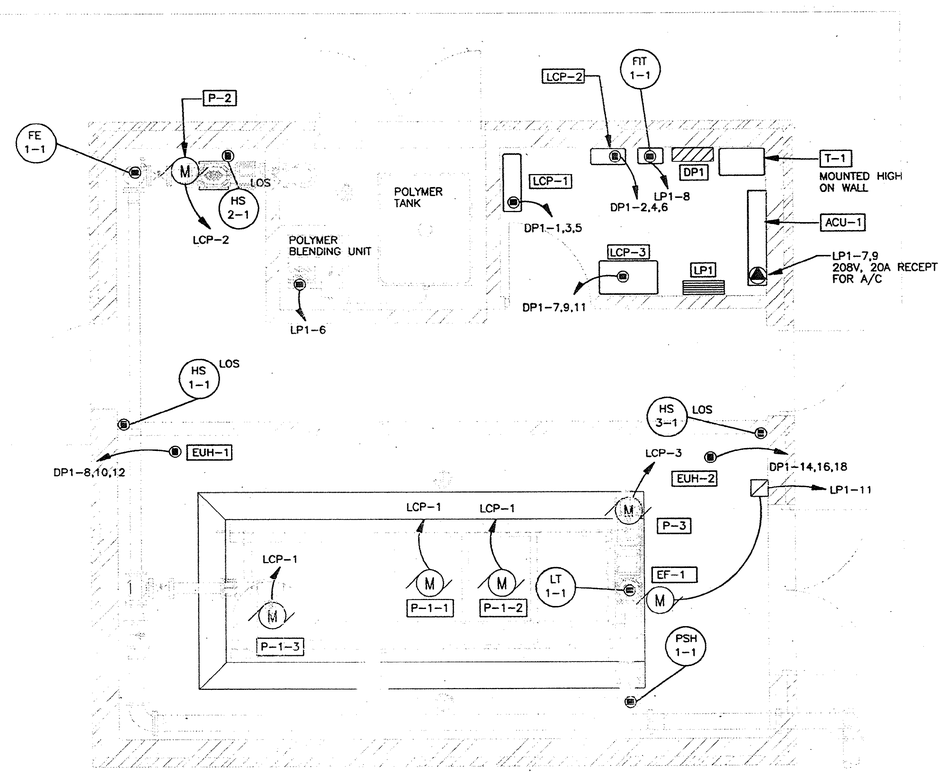
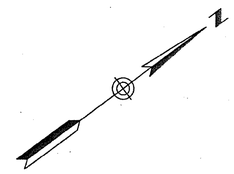


LIGHTING PLAN VIEW

SCALE 0' 4' 8'





POWER PLAN VIEW

SCALE 0' 4' 8'

SOUTH CAROLINA
RUST ENVIRONMENT & INFRASTRUCTURE
No. C00610
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
No. 17600
REGISTERED PROFESSIONAL ENGINEER
STEVEN R. SHUMATE
7/2/97

NO	REVISIONS	DRN	CHK	DATE

CHARLESTON

DRN	SRS	05-30-97
DES	SRS	05-30-97
CHK	DK	07-01-97
APP	HJW	07-02-97

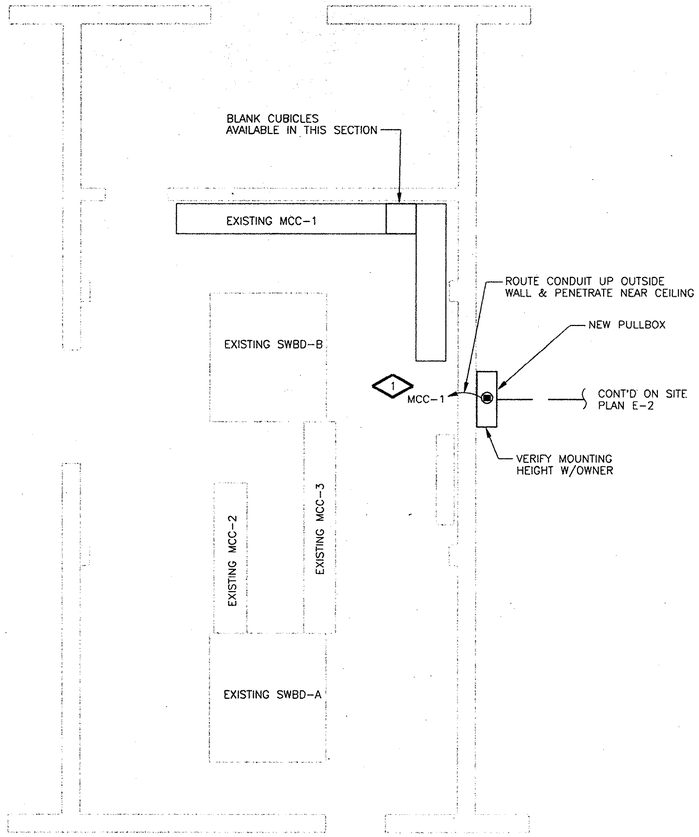
RUST
Rust Environment & Infrastructure Inc.

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

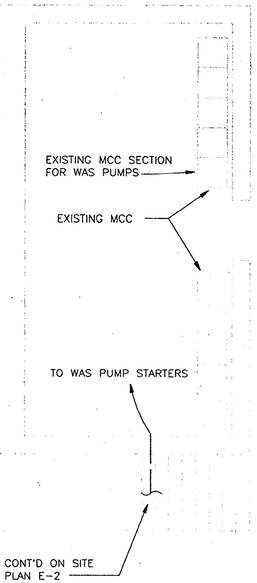
PROPOSED SLUDGE THICKENER
BUILDING ELECTERICAL PLANS

DATE	APRIL 1997
PROJECT NO	200243.10000
FILENAME	E3.DWG
SHEET NO	13 of 15
DRAWING NO	E-3

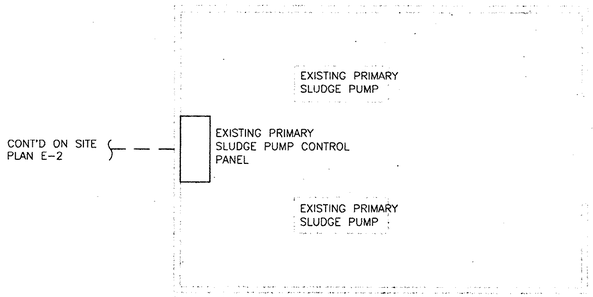
07-013-013/15



EXISTING ELECTRICAL BUILDING PLAN
1/4" = 1'-0"



EXISTING RAS/WAS BUILDING PLAN
1/4" = 1'-0"



EXISTING PRIMARY SLUDGE PUMP HOUSE PLAN
1/4" = 1'-0"

PLAN NOTES:

1. PROVIDE NEW 200AT CIRCUIT BREAKER IN EXISTING MCC-1 IN AVAILABLE BLANK SECTION. CIRCUIT BREAKER SHALL MATCH MAKE, MODEL AND RATINGS OF EXISTING MCC. PROVIDE NEW NAMEPLATE "SLUDGE THICKENER BUILDING FEEDER"

NO	REVISIONS	DRN	CHK	DATE

CHARLESTON

DRN	SRS	05-30-97
DES	SRS	05-30-97
CHK	DK	07-01-97
APP	HJW	07-02-97

RUST
Rust Environment & Infrastructure Inc.

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

EXISTING BUILDINGS
ELECTERICAL PLANS

DATE APRIL 1997
PROJECT NO 200243.10000
FILENAME E-4.DWG
SHEET NO 14 of 15
DRAWING NO E-4

SOUTH CAROLINA RUST ENVIRONMENT & INFRASTRUCTURE No. C00610 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA No. 17500 REGISTERED PROFESSIONAL ENGINEER STEVEN R. SHUGERS
7/2/97

07-013-014/15

PANEL SCHEDULE LP1

SURFACE MOUNTED NEMA 1
120/208 V, 3 PHASE, 4 WIRE
RATING 10,000 A.I.C.

50A MAIN BREAKER
100A MAIN BUS
100A GRD. BUS

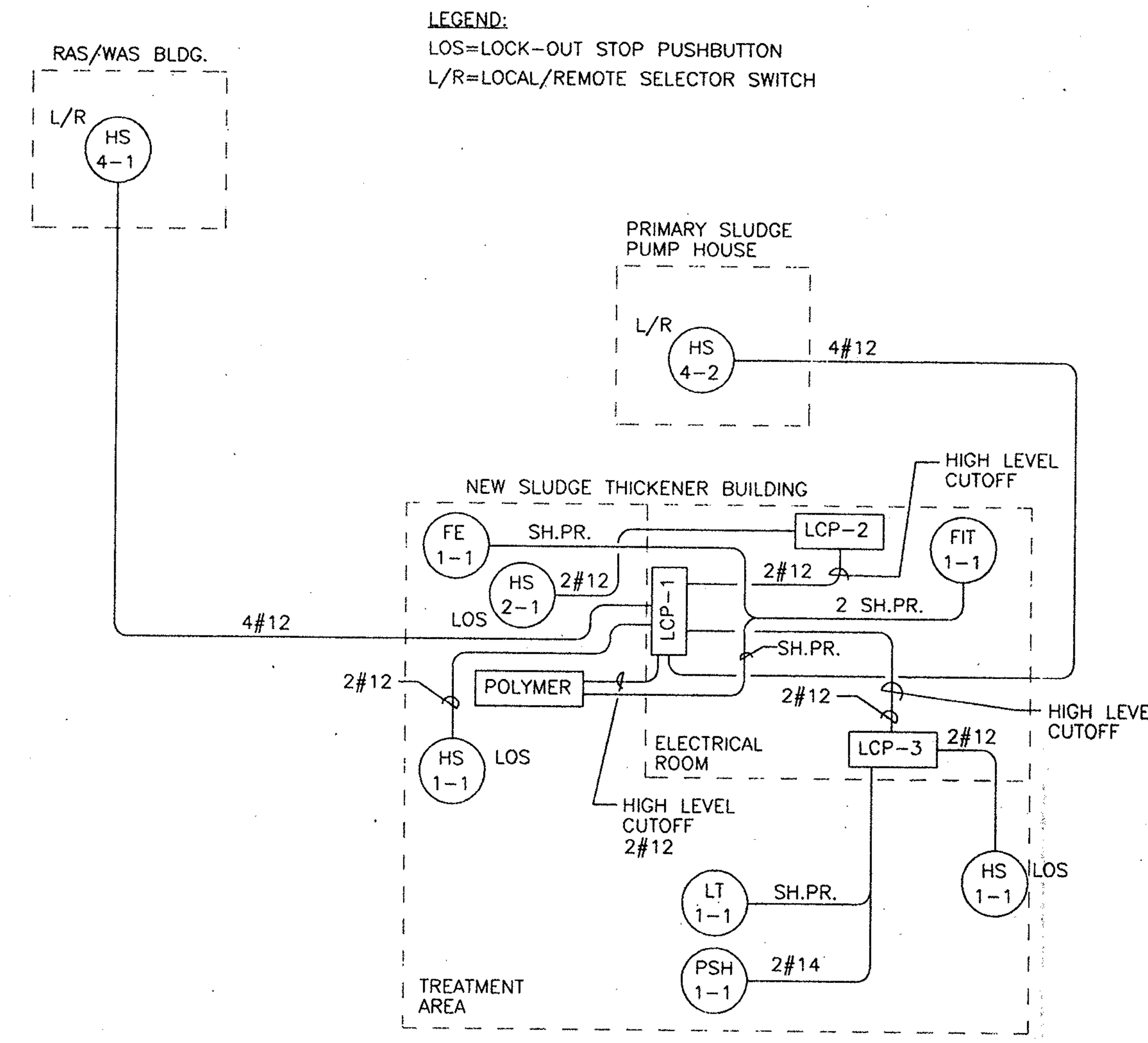
CKT. NO.	TRIP/P	DESCRIPTION	PHASE A	PHASE B	PHASE C	DESCRIPTION	TRIP/P	CKT. NO.
1	20/1	LIGHTING ELECTRICAL ROOM	100 / 540			RECEPTACLES ELECTRICAL ROOM	20/1	2
3	20/1	LIGHTING TREATMENT AREA		600 / 540		RECEPTACLES TREATMENT AREA	20/1	4
5	20/1	LIGHTING OUTDOORS			300 / 720	POLYMER SYSTEM	20/1	6
7	20/2	AIR CONDITIONER	750 / 50			FLOW TRANSMITTER FIT 1-1	20/1	8
9				750 / –		SPARE	20/1	10
11	20/1	ROOF EXHAUST FAN EF-1			667 / –	SPARE	20/1	12
13	20/1	SPARE	– / –			SPARE	20/1	14
15	20/1	SPARE		– / –		SPARE	20/1	16
17	20/1	SPARE			– / –	SPARE	20/1	18
19	20/1	SPARE	– / –			SPARE	20/1	20
21	20/1	SPARE		– / –		SPARE	20/1	22
23	–	SPACE			– / –	SPACE	–	24
25	–	SPACE	– / –			SPACE	–	26
27	–	SPACE		– / –		SPACE	–	28
29	–	SPACE			– / –	SPACE	–	30
31	–	SPACE	– / –			SPACE	–	32
33	–	SPACE		– / –		SPACE	–	34
35	–	SPACE			– / –	SPACE	–	36
37	–	SPACE	– / –			SPACE	–	38
39	–	SPACE		– / –		SPACE	–	40
41	–	SPACE			– / –	SPACE	–	42
		TOTALS:	1340	1890	1687	–		

PANEL SCHEDULE DP1

SURFACE MOUNTED NEMA 1
480 V, 3 PHASE, 3 WIRE
RATING 25,000 A.I.C.

225A MAIN BREAKER
225A MAIN BUS
100A GRD. BUS

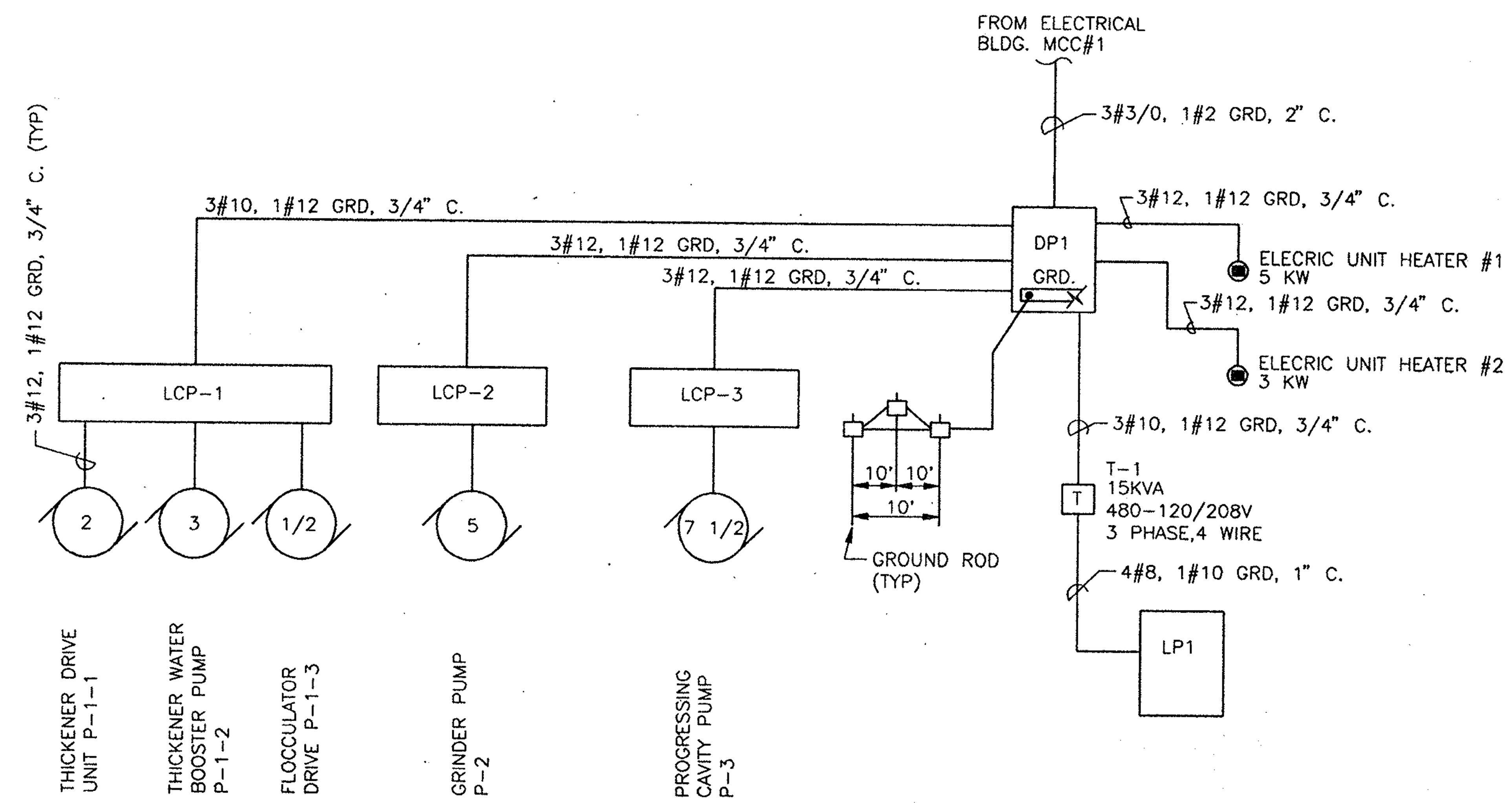
CKT. NO.	TRIP/P	DESCRIPTION	PHASE A	PHASE B	PHASE C	DESCRIPTION	TRIP/P	CKT. NO.
1	30/3	ROTARY DRUM THICKENER CONTROL PANEL LCP-1	3325 / 2106			GRINDER PUMP CONTROL PANEL LCP-2	20/3	2
3				3325 / 2106				4
5					3325 / 2106			6
7	20/3	PROGRESSING CAVITY PUMP CONTROL PANEL LCP-3	3050 / 1667			ELECTRIC UNIT HEATER NO. 1	20/3	8
9				3050 / 1667				10
11					3050 / 1667			12
13	20/3	LIGHTING TRANSFORMER T-1	2000 / 1000			ELECTRIC UNIT HEATER NO. 2	20/3	14
15				2000 / 1000				16
17					2000 / 1000			18
19	20/3	SPARE	– / –			SPARE	20/3	20
21				– / –				22
23					– / –			24
25	–	SPACE	– / –			SPACE	–	26
27				– / –				28
29					– / –			30
31	–	SPACE	– / –			SPACE	–	32
33				– / –				34
35					– / –			36
37	–	SPACE	– / –			SPACE	–	38
39				– / –				40
41					– / –			42
		TOTALS:	13148	13148	13148	–		



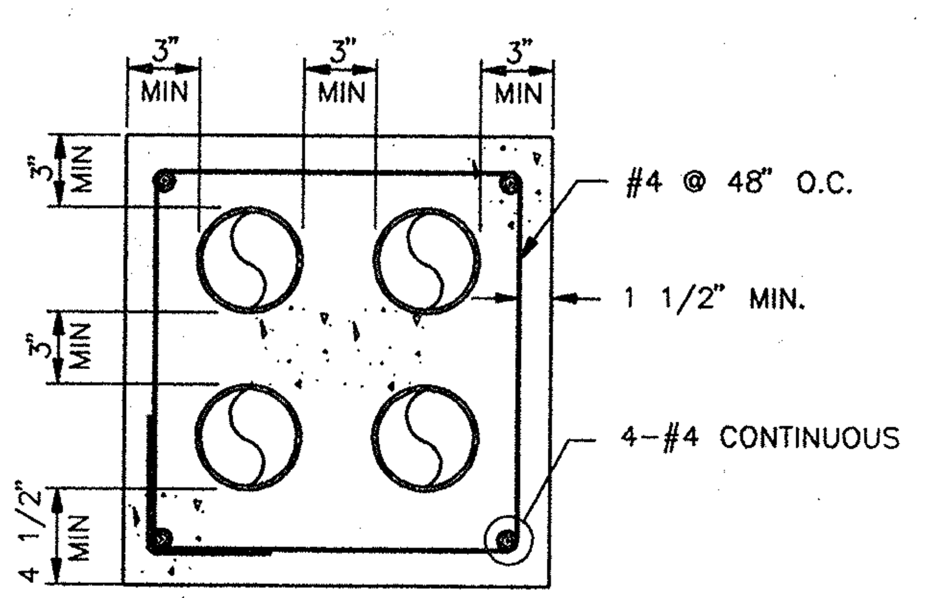
RISER DIAGRAM
NTS

LIGHTING FIXTURE SCHEDULE

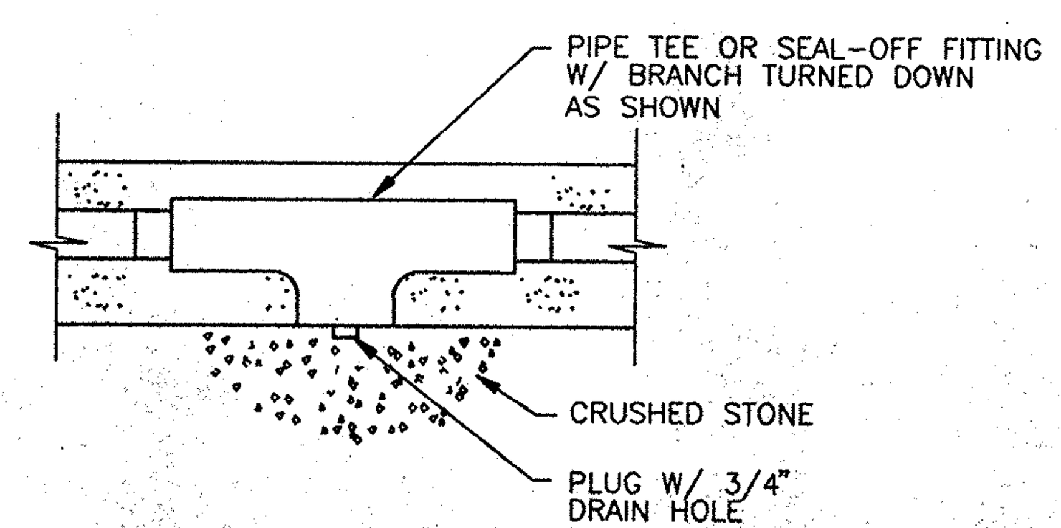
FIX. DES.	LAMPS NO.	LAMPS ORD. ABB.	DESCRIPTION/CATALOG NO.	FINISH	LENS	MOUNTING
A	2	F32T8	1x4 ENCLOSED VAPORTIGHT FLUORESCENT DAY-BRITE CAT. NO. TVD-232 –	FIBERGLASS WHITE	PRISMATIC ACRYLIC	PENDANT 8'-6" AFF UNLESS OTHERWISE NOTED
B	1	HPS	70 WATT HPS WALL PACK HOLOPHANE CAT. NO. WP2A-070HP-12-BZ-P PHOTOCELL CONTROLLED	DIE CAST ALUMINUM	PRISMATIC GLASS	WALL 8'-0" AFF –



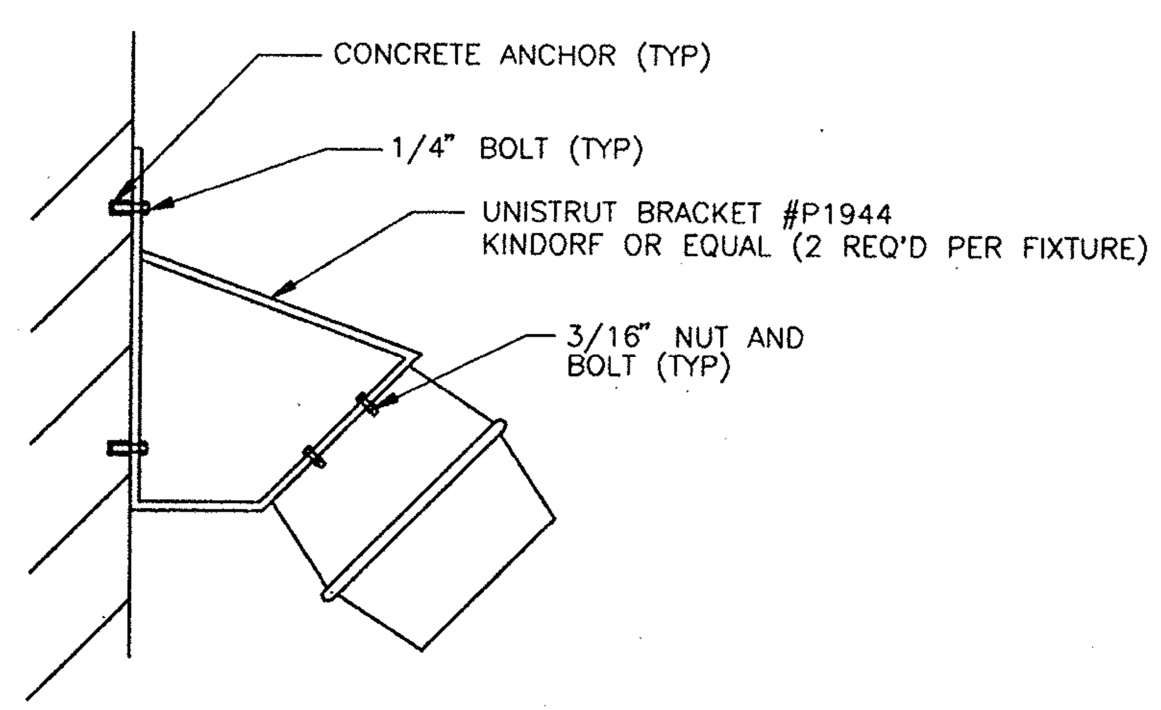
ONE-LINE DIAGRM
NTS



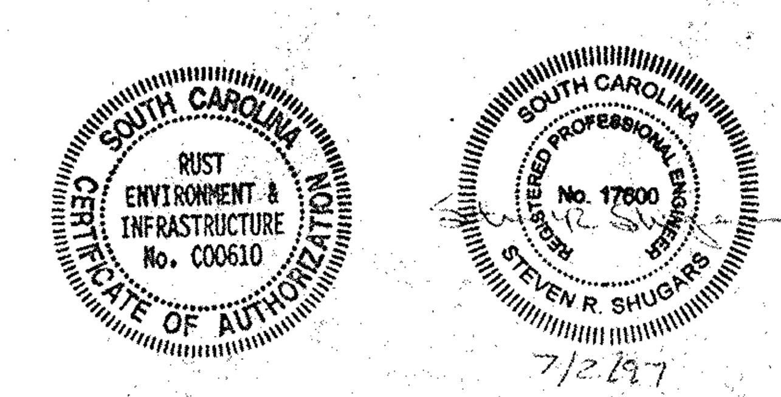
TYPICAL DUCT CONCRETE COVERING (10-250)
NTS



DUCTBANK CONDUIT DRAIN DETAIL (10-257)
NTS



FIXTURE TYPE "A" MOUNTING DETAIL (10-551)
NTS



CHARLESTON		
DRN	SRS	05-30-97
DES	SRS	05-30-97
CHK	DK	07-01-97
APP	HJW	07-02-97

NO	REVISIONS	DRN	CHK	DATE

Rust Environment & Infrastructure Inc.

GRAND STRAND WATER & SEWER AUTHORITY
SLUDGE THICKENER FACILITY
CONWAY, SOUTH CAROLINA

ONE-LINE DIAGRAM, SCHEDULES, RISER DIAGRAM AND DETAILS

DATE APRIL 1997
PROJECT NO 200243.10000
FILENAME E5.DWG
SHEET NO 15 of 15
DRAWING NO E-5

07-013-015/15