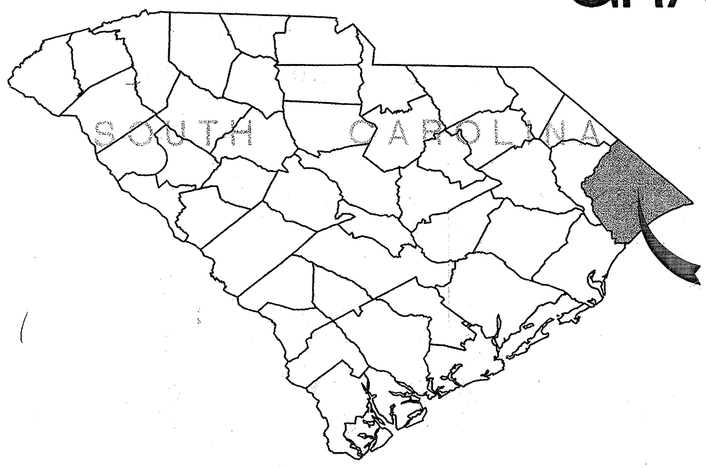
BULL CREEK SURFACE WATER TREATMENT PLANT 15 MGD UPGRADE

GRAND STRAND WATER & SEWER AUTHORITY

Quality service now and in the future

GRAND STRAND WATER AND SEWER AUTHORITY



HOBBS, UPCHURCH & ASSOCIATES, P.A.
CERTIFICATE OF AUTHORIZATION No. C00238

REGISTERED PROFESSIONAL ENGINEER
SOUTH CAROLINA
No. 12335
JOSEPH W. McGUIGAN
15 Nov 99

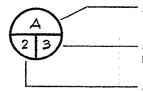
HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

33-013-001

HOBBS UPCHURCH & ASSOC. J:\GS9814**GSMCDUPGRADE\G-1.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:32 PLOT SCALE: 1"=1.00'

SECTION/DETAIL LEGEND

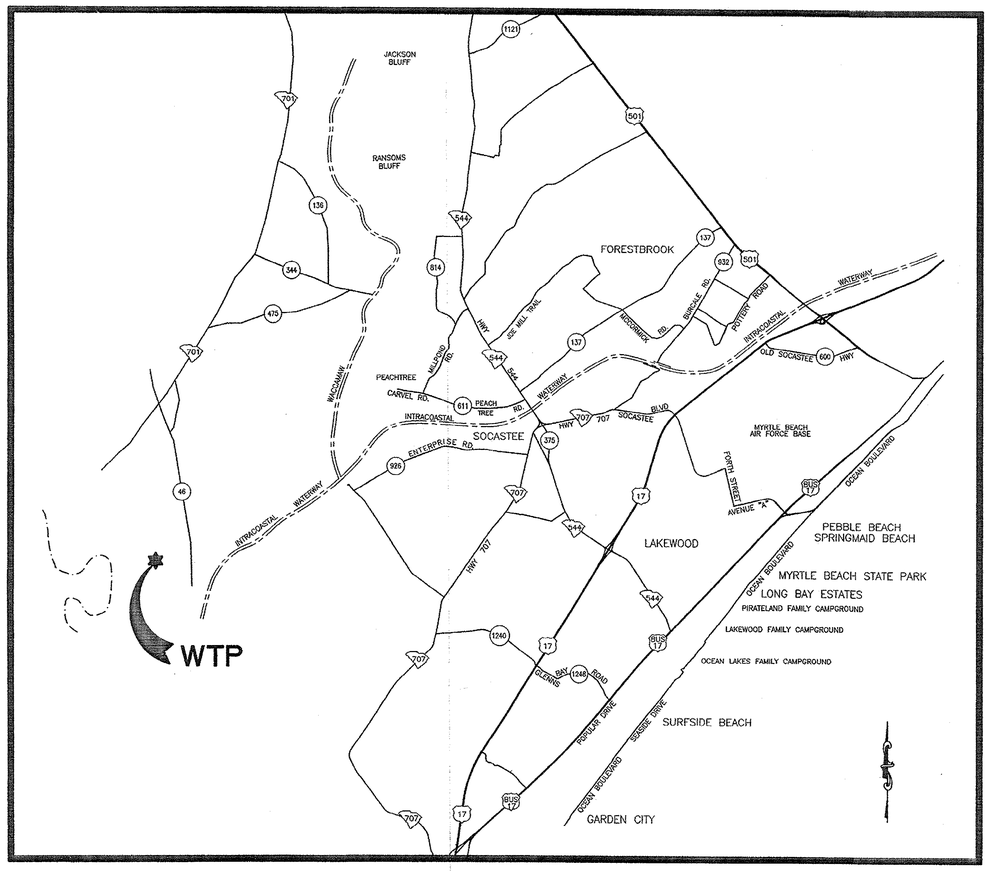
DETAIL CALL-OUT AND DETAIL TITLE IDENTIFICATION SYMBOL



- DETAIL IDENTIFICATION LETTER (IN SAME STRUCTURE)
- SHEET NUMBER (IN SAME DISCIPLINE) WHERE DETAIL IS DRAWN.
- SHEET NUMBER ON WHICH DETAIL CONDITION OCCURS. (DASH INDICATES CONDITION OCCURS ON MULTIPLE SHEETS.)

SECTION CUT SYMBOL (W/ARROW) OR TITLE IDENTIFICATION SYMBOL (W/O ARROW)

- SECTION IDENTIFICATION NUMBER
- SHEET NUMBER (IN SAME STRUCTURE) WHERE SECTION IS DRAWN.
- SHEET NUMBER (IN SAME STRUCTURE) ON WHICH SECTION IS INITIALLY CUT.



VICINITY MAP
N.T.S.

GENERAL CONSTRUCTION ABBREVIATIONS

#	NUMBER OR POUND
ø	DIAMETER
&	AND
<	LESS THAN
<=	LESS THAN OR EQUAL TO
>	GREATER THAN
@	AT
A.B.	ANCHOR BOLT
A.F.F.	ABOVE FINISHED FLOOR
ADDL	ADDITIONAL
ALUM	ALUMINUM OR ALUM
APPROX	APPROXIMATE(LY)
ARCH	ARCHITECTURAL
BM	BENCH MARK OR BEAM
BOTT.	BOTTOM
B.W.	BLOCK WALL
C.I.	CAST IRON
C/C	CENTER TO CENTER
CAP	CAPACITY
CIRCUM	CIRCUMFERENCE
CL	CLAY
CLR	CLEARANCE
℄	CENTERLINE
CL2	CHLORINE
CLARIF	CLARIFIER
CHEM.	CHEMICAL
COL	COLUMN
CONC.	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CU	COPPER
C.W.	CONCRETE WALL
D	DIAMETER
DIA	DIAMETER
D.I.P.	DUCTILE IRON PIPE
DISCH.	DISCHARGE
DP	DEEP
DWL.S.	DOWELS
EF.	EACH FACE
E.J.	EXPANSION JOINT
EA	EACH
EFF.	EFFLUENT
EL	ELEVATION
ELEV	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
EXIST.	EXISTING
EXP.	EXPANSION
F.E.S.	FLARED END SECTION
F.R.P.	FIBERGLASS REINFORCED PLASTIC
FIG	FIGURE
FIN	FINISHED
FL.	FLANGE
FLR	FLOOR
FTG	FOOTING
GALV	GALVANIZED
HDWE	HARDWARE
HK	HOOK
HORIZ.	HORIZONTAL
H.P.	HIGH POINT
HYD	HYDRANT
I.D.	INSIDE DIAMETER
O.D.	OUTSIDE DIAMETER
INFL	INFLUENT
INS.	INSIDE
INV.	INVERT
JT.	JOINT
JTS	JOINTS
L.L.O.	LONG LEG OUT
LB	POUND
LG	LONG
L.P.	LOW POINT
M.J.	MECHANICAL JOINT
MATL.	MATERIAL
MAS	MASONRY
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MNTG	MOUNTING
N.P.W.	NONPOTABLE WATER
N.T.S.	NOT TO SCALE
NO.	NUMBER
O.C.	ON CENTER
O/O	OUTSIDE TO OUTSIDE
OPNG	OPENING
OX	OXIDATION
P.E.	PLAIN END
PED	PEDESTAL
PL	PLATE
PLCS.	PLACES
PROJ	PROJECTION
P.S.	PUMP STATION
P.V.C.	POLYVINYL CHLORIDE
R.C.P.	REINFORCED CONCRETE PIPE
RAD.	RADIUS
RAS	RETURN ACTIVATED SLUDGE
RED	REDUCER
REF	REFERENCE
REINF	REINFORCING OR REINFORCED
REQ'D	REQUIRED
S.S.	STAINLESS STEEL
SCH.	SCHEDULE
SHT	SHEET
SIM	SIMILAR
SO2	SULFUR DIOXIDE
SPA	SPACES
SQ.	SQUARE
STD.	STANDARD
STL	STEEL
STN	STAINLESS
S.W.	SLAB WIDTH
S.W.D.	SIDE WALL DEPTH
T/	TOP OF
TC,JC,J	TYP. CONTROL JOINT, CONSTRUCTION JOINT
THRD	THREAD(SXED)
TRICK	TRICKLING
TYP	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
VERT	VERTICAL
W.W.F.	WELDED WIRE FABRIC
W/	WITH
W/O	WITHOUT
WAS	WASTE ACTIVATED SLUDGE
W/L	WATER LEVEL

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33-013-002

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12339 REGISTERED JOSEPH W. MCMANUS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

VICINITY MAP AND INDEX

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. G-2
OF: 12

H:\GSB61A\45M2UPGRADE\G-2.dwg,DWG EDITED BY: ARM DATE: 01/18/00 TIME: 15:30 SCALE: 1/4"=1'-0" HOBBS, UPCHURCH & ASSOC.

EXIST. 6" BLOW-OFF
EXIST. 6" FORCE MAIN
EXIST. 6" GATE VALVE
EXIST. 8" FORCE MAIN
EXIST. DITCH LINE
EXIST. 30" D.I. FORCE MAIN TO CONWAY P.S.
EXIST. 8" GATE VALVE
EXIST. 8" FORCE MAIN
EXIST. DECANT FLOW METER
EXIST. 8" GATE VALVE
EXIST. THICKENED SLUDGE PUMP STATION
EXIST. 12" D.I. DECANT LINE
EXIST. EQUALIZATION LAGOON
EXIST. SLUDGE DRYING BEDS
℄ EXIST. DITCH
EXIST. 12" D.I. SLUDGE DRAW-OFF LINE
2" PVC WATER LINE
EXIST. SLUDGE THICKENER
EXIST. SLUDGE THICKENER
EXIST. CHEMICAL SPILL LAGOON
EXIST. TREE LINE
EXIST. BLOW-DOWN PUMP STATION
EXIST. POLYMER FEED BUILDING
EXIST. ASPHALT DRIVE W/ CONC. CURB AND GUTTER
EXIST. MAINTENANCE BUILDING
EXIST. 18" D.I. INFLUENT LINE
EXIST. 42" D.I. FILTER EFFLUENT
EXIST. 2,000,000 GALLON CLEARWELL
PROPERTY LINE
EXIST. 12" D.I. DECANT LINE
EXIST. 4" PVC WATER LINE
EXIST. 30" D.I. FILTER BACKWASH
EXIST. 12" D.I. BLOW-DOWN WASTE LINE
EXIST. SPLITTER BOX
EXIST. 30" D.I. FILTERED WATER LINE
EXIST. 18" D.I. INFLUENT LINE
EXIST. 4" PVC PLANT WATER
℄ DITCH
EXIST. HYDROTANK
EXIST. 6' CHAIN LINK FENCE
EXIST. CLARIFIERS 1 & 2
EXIST. CLARIFIERS 3 & 4
EXIST. 4" PLANT WATER
EXIST. 4" PVC WATER LINE
EXIST. PVC IRRIGATION LINES
EXIST. FILTERS 1-4
EXIST. FILTERS 5-8
EXIST. FINISHED WATER PUMP STATION
EXIST. POP-UP SPRINKLER (TYP.)
EXIST. LIME & P.A.C.
2" PVC WATER
EXIST. SANITARY SEWER PUMP STATION AND CONTROL PANEL
EXIST. OPERATIONS BLD.
1ST FLOOR CHEMICAL FEED
2ND FLOOR OPERATIONS
EXIST. BULK CHEM. STORAGE
EXIST. CHLORINE BUILDING
EXIST. 120± LF 24" PVC R.W. BLOW-OFF LINE TO DITCH
EXIST. ASPHALT DRIVE (TYP.)
EXIST. RADIO TOWER ON CONC. SLAB
EXIST. 36"x36" M.J. TEE 36" M.J. B.F.V. 20LF± D.I.P. 36" PLUG
EXIST. 4" PLANT WATER
EXIST. 500,000 GALLON CLEARWELL
EXIST. ASPHALT DRIVE
EXIST. 36"x24" M.J. REDUCER
EXIST. P.A.C. VAULT
EXIST. 24" BUTTERFLY VALVE
EXIST. 2" PVC WATER LINE
EXIST. 24" BUTTERFLY VALVE
EXIST. 36" M.J. B.F.V.
EXIST. 36" RAW WATER LINE
EXIST. 3" PVC POTABLE WATER LINE TO EXIST. RAW WATER PUMP STATION
EXIST. 30" D.I. FINISHED WATER MAIN TO EXIST. SOUTH RESERVOIR
EXIST. 45° M.J. BEND
PP
PP
PP
EXIST. 1 1/4" CONDUIT
TEMPORARY BENCH MARK (T.B.M.)
RAIL ROAD SPIKE IN POWER POLE
ELEV. 17.91'

BENCHMARK:
S.C.G.S. MONUMENT
"BUCKSPORT" #7
ELEV. 14.12'

BULL CREEK WATER TREATMENT PLANT
EXISTING SITE PLAN
SCALE: 1" = 40'

40' 0 20' 40' 80'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12439 REGISTERED JOSEPH W. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

EXISTING SITE PLAN

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. G-3
OF: 12

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\G-3.dwg,DWG EDITED BY: dc DATE: 01/19/00 TIME: 09:35 PLOT SCALE: 1"=40.0000'

33-013-003

EXIST. 6" FORCE MAIN
EXIST. 8" FORCE MAIN
EXIST. DITCH LINE
EXIST. 30" D.I. FORCE MAIN TO CONWAY P.S.
EXIST. 1,000 GAL. CAUSTIC SODA POLY TANK TO BE REMOVED
EXIST. EQUALIZATION LAGOON
EXIST. SLUDGE DRYING BEDS
℄ EXIST. DITCH
EXIST. 12" D.I.P. TO BE REMOVED
EXIST. SLUDGE THICKENER
EXIST. SLUDGE THICKENER
EXIST. CHEMICAL SPILL LAGOON
EXIST. TREE LINE
40.0'
EXIST. MAINTENANCE BUILDING
PROPERTY LINE
EXIST. ASPHALT DRIVE TO BE DEMOLISHED
EXIST. 2,000,000 GALLON CLEARWELL
336'±
EXIST. 4" PVC WATER LINE TO BE REMOVED
EXIST. 42" PLUG TO BE REMOVED
EXIST. CONC. CURB AND GUTTER TO BE DEMOLISHED
EXIST. 4" PVC WATER LINE TO BE REMOVED
EXIST. HYDROTANK
EXIST. IRRIGATION LINES TO BE REMOVED (TYP.)
EXIST. CLARIFIERS 1 & 2
EXIST. CLARIFIERS 3 & 4
EXIST. 1" GALV. AIR LINE TO BE REMOVED
EXIST. 6' CHAIN LINK FENCE TO BE REMOVED/ RELOCATED
EXIST. POP-UP SPRINKLER TO BE REMOVED (TYP.)
EXIST. FILTERS 1-4
EXIST. FILTERS 5-8
EXIST. LIME & PAC
EXIST. CONC. CURB AND GUTTER TO BE REMOVED
EXIST. FINISHED WATER PUMP STATION
EXIST. 4" PVC PLANT WATER TO BE REMOVED
EXIST. 4" POTABLE WATER LINE TO BE REMOVED
EXIST. SANITARY SEWER PUMPS/PIPING AND CONTROL PANEL TO BE RELOCATED WET WELL TO REMAIN
EXIST. OPERATIONS BLD.
1ST FLOOR CHEMICAL FEED
2ND FLOOR OPERATIONS
EXIST. BULK CHEM. STORAGE
EXIST. HYDROTANK, PIPING AND VALVES TO BE REMOVED
CLEARING LIMITS
EXIST. 120± LF 24" PVC TO BE REMOVED
EXIST. YARD HYDRANT & VALVE TO BE RELOCATED
EXIST. 36"x24" M.J. REDUCER AND 24" M.J. 45° BEND TO BE REMOVED
EXIST. 4" PLANT WATER
EXIST. 2" WATER LINE TO BE ABANDONED
EXIST. 36" PLUG TO BE REMOVED
EXIST. 500,000 GALLON CLEARWELL
EXIST. P.A.C. VAULT
EXIST. 24" BUTTERFLY VALVE
EXIST. 24" BUTTERFLY VALVE
EXIST. 3" PVC POTABLE WATER LINE TO EXIST. RAW WATER PUMP STATION
EXIST. 36" RAW WATER LINE
EXIST. 30" D.I. FINISHED WATER MAIN TO EXIST. SOUTH RESERVOIR
RELOCATE EXIST. POWER POLE AS REQUIRED
EXIST. 1 1/4" CONDUIT

INDICATES PORTIONS TO BE REMOVED

BULL CREEK WATER TREATMENT PLANT
SITE DEMOLITION PLAN
SCALE: 1" = 40'

40' 0 20' 40' 80'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER
REGISTERED
No. 12205
JOHN W. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

SITE DEMOLITION PLAN

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
G-4
OF: 12

33-013-004

HOBBS UPCHURCH & ASSOC. J:\GS9814\4\45MGDUPGRADE\G-4.dwg.DWG EDITED BY: dc DATE: 01/19/09 TIME: 10:02 PLOT SCALE: 1"=40.0000'

10 LF
306 LF
6' CHAIN LINK FENCE
EXIST. 6' CHAIN LINK FENCE (TYP.)
EXIST. DITCH LINE
20' SWING GATE
BACKWASH EQUALIZATION LAGOON
85.00'
40'
30'
SLUDGE DRAW-OFF PUMP STATION
GRAVEL ROAD
R10'
34'
EXIST. SLUDGE THICKENER
EXIST. SLUDGE THICKENER
EXIST. EQUALIZATION LAGOON
EXIST. SLUDGE DRYING BEDS
EXIST. CHEMICAL SPILL LAGOON
EXIST. MAINTENANCE BUILDING
EXIST. 2,000,000 GALLON CLEARWELL
12'
16'
R20'
R20'
27'
20'
367'±
PROPOSED TREE LINE
℄ PROPOSED DITCH LINE
12' LF
CHEMICAL SPILL EFFLUENT PUMP STATION
CHEMICAL SPILL LAGOON
20'
40.00'
CLARIFIERS
59.5'
68.25'
EXIST. CLARIFIERS 1 & 2
EXIST. CLARIFIERS 3 & 4
EXIST. HYDROTANK
30'
18'
CHEMICAL SPILL INFLUENT PUMP STATION
40'
15'
12'
FILTERS
R40'
EXIST. LIME & PAC
R10'
EXIST. FILTERS 1-4
EXIST. FILTERS 5-8
NEW TRANSFORMER (SEE ELECTRICAL)
EXIST. TRANSFORMER
NEW STANDBY GEN. (SEE ELECTRICAL)
EXIST. GENERATOR
EXIST. FINISHED WATER PUMP STATION
58.00'
82.00'
EXIST. OPERATIONS BLD.
1ST FLOOR CHEMICAL FEED
2ND FLOOR OPERATIONS
EXIST. BULK CHEM. STORAGE
20'
R40'
OPERATIONS BUILDING
25'
R20'
20'
BULK ALUM STORAGE
141.00'
R40'
R40'
35.00'
RAW WATER METER VAULT
ASPHALT PAVING
EXIST. 500,000 GALLON CLEARWELL
10'
CONC. CURB AND GUTTER
BULK CHLORINE STORAGE
EXIST. P.A.C. VAULT
R40'
STATIC MIXER VAULT
EXIST. ASPHALT, CURB AND GUTTER
EXIST. 6' CHAIN LINK FENCE (TYP.)
96 LF
270 LF
EXIST. POWER POLE RELOCATED AS REQUIRED
6' CHAIN LINK FENCE
R25'
20' SLIDE GATE
70.00'
92.00'
322.16'

BULL CREEK WATER TREATMENT PLANT
SITE LAYOUT PLAN
SCALE: 1" = 40'

40' 0 20' 40' 80'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER
REGISTERED
No. 19355
JOSEPH W. McCORMAN
JAN 2000

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

SITE LAYOUT PLAN

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
G-5
OF: 12

33-013-005

HOBBS UPCHURCH & ASSOC. J:\OS\981A\45MGD\UPGRADE\G-5.dwg EDITED BY: dc DATE: 01/19/00 TIME: 10:00 PLOT SCALE: 1"=40.0000'

6' CHAIN LINK FENCE

8"x8" M.J. TEE
8"x12" M.J. REDUCER
8" M.J. GATE VALVE W/ VALVE BOX
12" M.J. GATE VALVE W/ VALVE BOX

5 / G6 — NEW SODIUM BISULFITE TANK — EN38

EXIST. 6" BLOW-OFF

EXIST. 6" FORCE MAIN

EXIST. 8" FORCE MAIN

EXIST. 6' CHAIN LINK FENCE

EXIST. DITCH LINE

EXIST. 30" D.I. FORCE MAIN TO CONWAY P.S.

12" M.J. 90° BEND

SLUDGE DRAW-OFF PUMP STATION

INV. OUT 10.4'

BACKWASH EQUALIZATION "LAGOON"

EXIST. EQUALIZATION LAGOON

EXIST. SLUDGE DRYING BEDS

3 / 6 — PIPING DETAIL

EXIST. SLUDGE THICKENER

EXIST. SLUDGE THICKENER

EXIST. CHEMICAL SPILL LAGOON

INV. OUT 13.0'

PROPOSED TREE LINE

℄ PROPOSED DITCH LINE

EXIST. MAINTENANCE BUILDING

2" 90° BEND

EXIST. 2,000,000 GALLON CLEARWELL

INV. 42" 10.25'±

INV. 12" 11.0'

INV. 12" 9.0'±

INV. 18" 11.9'

EXIST. 30" D.I. BACK-WASH INV. EL. 5.25'±

EXIST. 42" BUTTERFLY VALVE

4" PLANT WATER

42" M.J. 90° BEND

42" M.J. 45° BEND

CHEMICAL SPILL EFFLUENT PUMP STATION

INV. IN 13.93'

INV. OUT 13.83'

CHEMICAL SPILL LAGOON

INV. IN 5.41'

42" D.I. FILTERED WATER MAIN

CLARIFIERS

EXIST. CLARIFIERS 1 & 2

EXIST. CLARIFIERS 3 & 4

SEE 4 / 6

EXIST. HYDROTANK

30" D.I. BACKWASH WASTE LINE

OPERATIONS BUILDING

FILTERS

EXIST. FILTERS 1-4

EXIST. FILTERS 5-8

EXIST. FINISHED WATER PUMP STATION

CHEMICAL SPILL INFLUENT PUMP STATION

30" M.J. PLUG

INV. IN 7.43'

EXIST. LIME & PAC

EXIST. MH TO REMAIN

EXIST. OPERATIONS BLD.
1ST FLOOR CHEMICAL FEED
2ND FLOOR OPERATIONS

EXIST. BULK CHEM. STORAGE

BULK ALUM STORAGE
13.0' off of Containment wall
3.0' off of Curb
4.0' Bury

4" PLANT WATER

2" YARD HYDRANT

6" PVC SAN. SEW. DRAIN

30° M.J. 45° BEND

30" M.J. 90° BEND

30" M.J. 45° BEND

30"x30" M.J. REDUCER

SANITARY SEW. PUMP STATION (PUMPS RELOCATED)

EXIST. 4" PLANT WATER

4"x4" M.J. TEE W/ 4"x3" M.J. REDUCER

EXIST. 500,000 GALLON CLEARWELL

2" 90° BEND

BULK CHLORINE STORAGE

YARD HYDRANT RELOCATED

EXIST. P.A.C. VAULT

EXIST. 24" BUTTERFLY VALVE

EXIST. 24" BUTTERFLY VALVE

3"x2" TEE

3" 90° BEND (TYP.)

EXIST. 30" D.I. FINISHED WATER MAIN TO EXIST. SOUTH RESERVOIR

3" POTABLE WATER LINE

RAW WATER METER VAULT (TYP.)

48" M.J. 45° BEND

48" D.I. RAW WATER MAIN

3"x3" TEE W/ 3" GATE VALVE & VALVE BOX

NEW 48" RAW WATER MAIN FROM EXIST. RAW WATER PUMP STATION (BY GRAND STRAND WATER & SEWER AUTHORITY)

1 / 6 — PIPING DETAIL

STATIC MIXER VAULT

2 / 6 — PIPING DETAIL

EXIST. 8" FIRE PROTECTION LINE

EXIST. 3" PVC POTABLE WATER LINE TO EXIST. RAW WATER PUMP STATION

BULL CREEK WATER TREATMENT PLANT
SITE PIPING PLAN

SCALE: 1" = 40'

40' 0 20' 40' 80'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER — REGISTERED — JOSEPH W. HOBBS — No. 11335

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

SITE PIPING PLAN

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

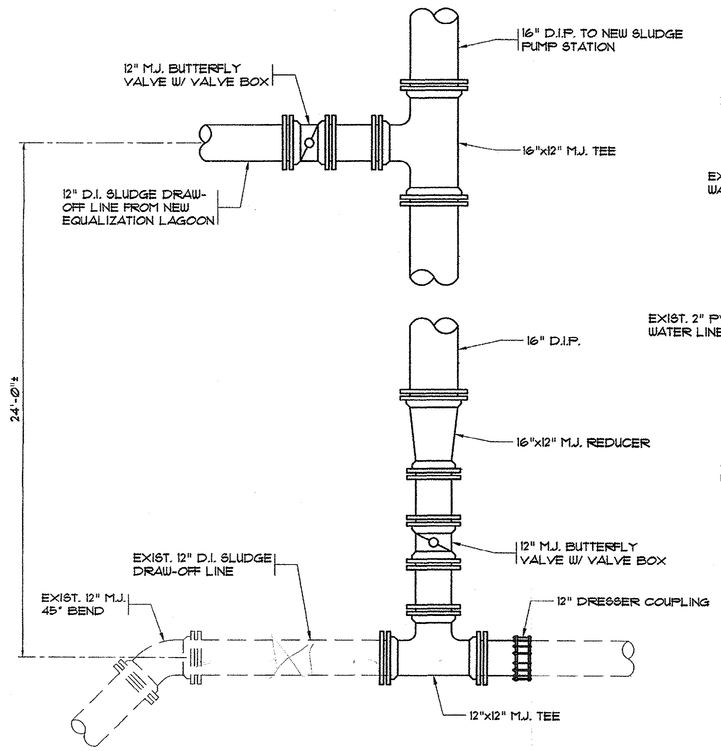
DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. G-6

OF: 12

33-013-006

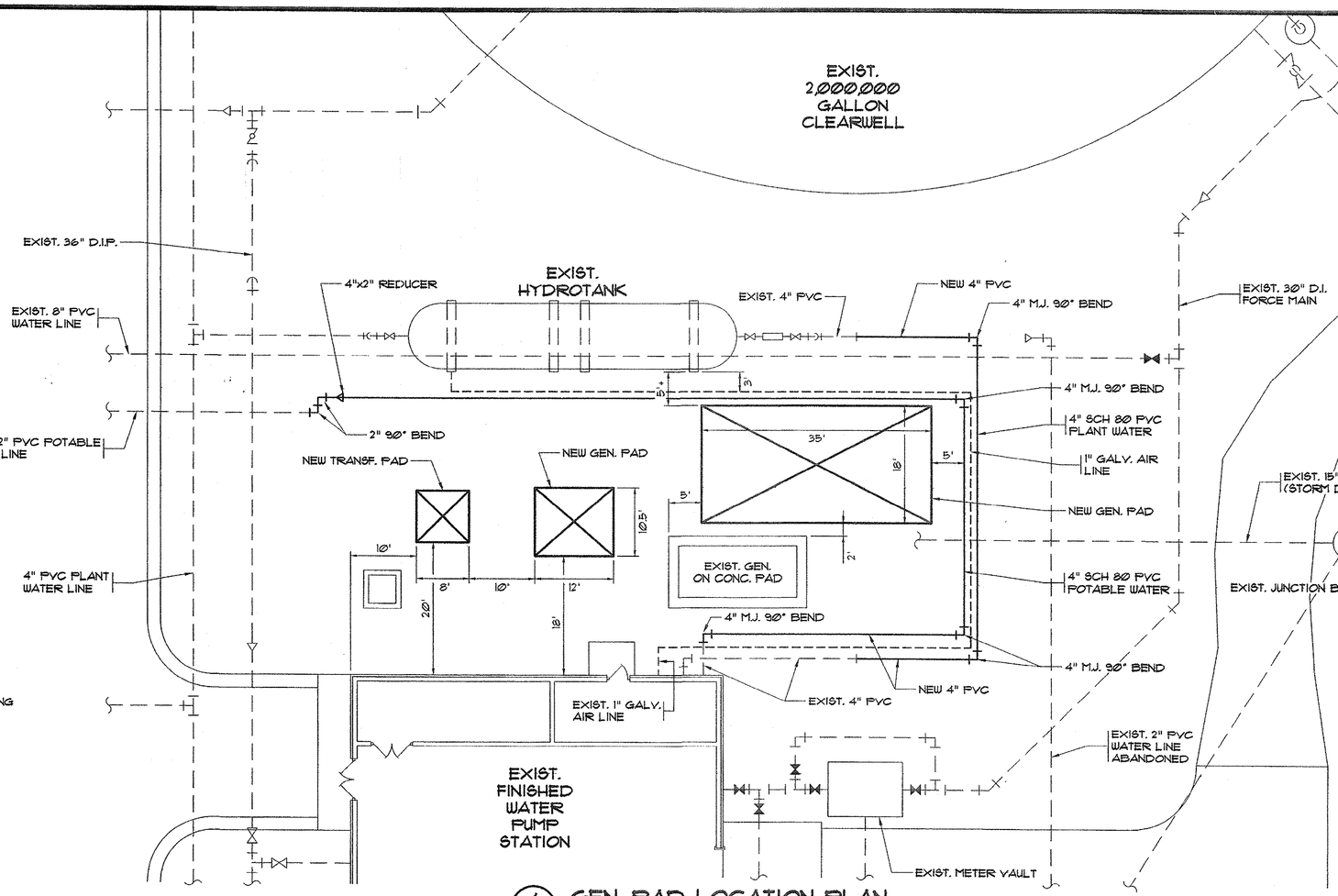
J:\OS9514\ASMDUPGRADE\G-6.dwg,DWG EDITED BY: dc DATE: 01/19/00 TIME: 10:32 PLOT SCALE: 1"=40.0000' HOBBS UPCHURCH & ASSOC.



3 / 6 | 7 **SLUDGE DRAW-OFF PIPING DETAIL**

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

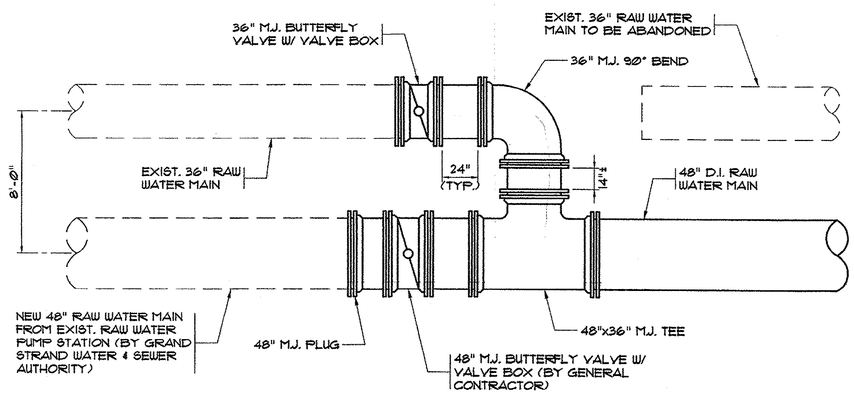
2' 1' 0 2'



4 / 6 | 7 **GEN. PAD LOCATION PLAN**

SCALE: 1" = 10'

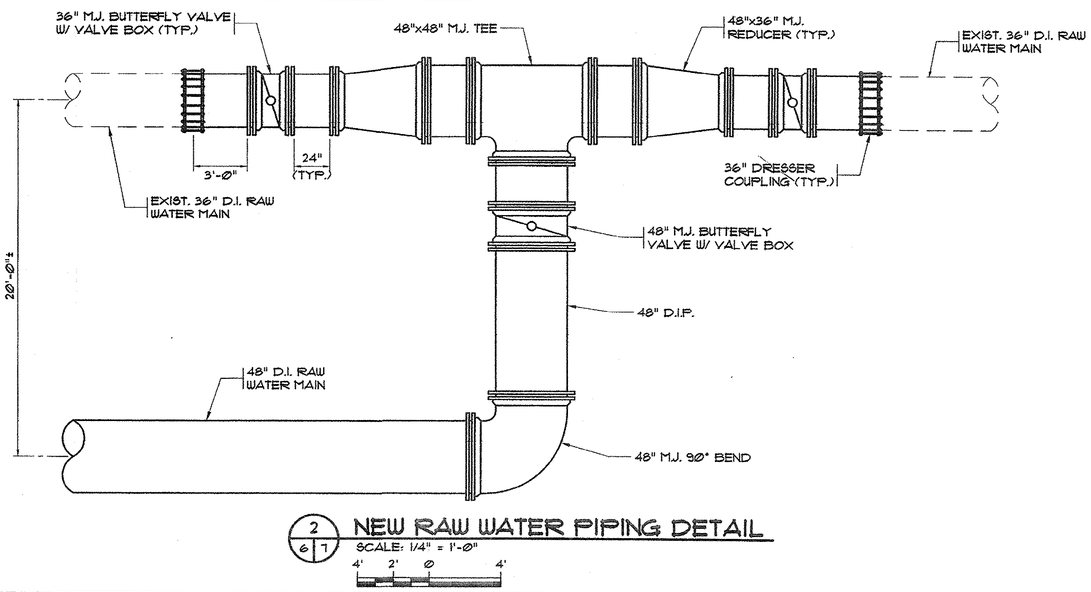
10' 0 5' 10' 20'



1 / 6 | 7 **NEW RAW WATER PIPING DETAIL**

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

4' 2' 0 4'



2 / 6 | 7 **NEW RAW WATER PIPING DETAIL**

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

4' 2' 0 4'

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER JAMES W. HOBBS No. 12305 REGISTERED

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

RAW WATER PIPING DETAILS

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. G-7 OF: 12

HOBBS UPCHURCH & ASSOC. J:\GS8814\15MGDUPGRADE\G-7.dwg DWG EDITED BY: dc DATE: 01/19/00 TIME: 10:51 PLOT SCALE: 1/4"=1'-0"

33-013-007

PIPING SCHEDULE

LINE NUMBER	SIZE AND MATERIAL	DESCRIPTION	FROM	TO
1	48" DIP (CLASS 50)	RAW WATER MAIN	EXIST. 36" MAIN	EXIST. 36" MAIN
2	30" DIP (CLASS 50)	RAW WATER MAIN	EXIST. 36" MAIN	FLASH MIX
3	30" DIP (CLASS 50)	RAW WATER MAIN	EXIST. 36" MAIN	30" M.J. PLUG
4	36" DIP (CLASS 50)	CLARIFIER EQUALIZATION	NEW CLARIFIER TROUGH	EXIST. CLARIFIER TROUGH
5	8" DIP (CLASS 50)	FLASH MIX DRAIN	FLASH MIX	LINE NO. 12
6	8" DIP (CLASS 50)	DRAIN	CLARIFIER	LINE NO. 11
7	12" DIP (CLASS 50)	BLOW-DOWN PIT DRAIN	BLOW-DOWN PIT	MH NO. 3
8	8" DIP (CLASS 50)	DRAIN	CLARIFIER	LINE NO. 11
9	12" DIP (CLASS 50)	BLOW- DOWN PIT DRAIN	BLOW-DOWN PIT	MH NO. 2
10	12" DIP (CLASS 50)	DRAIN	MH NO. 1	MH NO. 2
11	12" DIP (CLASS 50)	DRAIN	MH NO. 2	MH NO. 3
12	12" DIP (CLASS 50)	DRAIN	MH NO. 3	EXIST. MH
13	42" DIP (CLASS 50)	FILTERED WATER	EFFLUENT CHAMBER	EXIST. 42" BFV
14	30" DIP (CLASS 50)	BACKWASH WASTE	FILTERS	MH NO. 5
15	36" DIP (CLASS 50)	BACKWASH WASTE	MH NO. 4	MH NO. 5
16	36" DIP (CLASS 50)	BACKWASH WASTE	MH NO. 5	MH NO. 6
17	36" DIP (CLASS 50)	BACKWASH WASTE	MH NO. 6	EQUALIZATION LAGOON
18	12" DIP (CLASS 50)	SLUDGE DRAW-OFF	EQUALIZATION LAGOON	LINE NO. 19
19	16" DIP (CLASS 50)	SLUDGE DRAW-OFF	EXIST. 12" LINE	SLUDGE DRAW-OFF P.S.
20	12" DIP (CLASS 50)	DECANT	FLOATING DECANTER	MH NO. 7
21	12" DIP (CLASS 50)	DECANT	MH NO. 7	EXIST. MH
22	12" DIP (CLASS 50)	SLUDGE DISCHARGE	SLUDGE DRAW-OFF	12" M.J. PLUG
23	8" PVC (SDR 35)	CHEMICAL DRAIN	FLOOR DRAINS	MH NO. 8
24	8" PVC (SDR 35)	CHEMICAL DRAIN	FLOOR DRAINS	MH NO. 8
25	8" PVC (SDR 35)	CHEMICAL DRAIN	MH NO. 8	MH NO. 9
26	6" PVC (SDR 35)	CHEMICAL DRAIN	ALUM BULK STOR.	MH NO. 9
27	8" PVC (SDR 35)	CHEMICAL DRAIN	MH NO. 9	INFLUENT P.S.
28	6" PVC (CLASS 200)	FORCE MAIN	INFLUENT P.S.	CHEMICAL SPILL LAGOON
29	12" DIP (CLASS 50)	DRAIN	CHEMICAL SPILL LAGOON	EFFLUENT P.S.
30	6" PVC (CLASS 200)	FORCE MAIN	EFFLUENT P.S.	EQUALIZATION LAGOON
31	2" PVC (CLASS 200)	DRAIN	BULK CHLORINE STOR.	EXIST. CHEM. SPILL LAGOON
32	3" SCH 80 PVC	PLANT WATER	EXIST. 4" WATER LINE	BULK CHORINE STOR.
33	3" SCH 80 PVC	POTABLE WATER	EXIST. 3" WATER LINE	COMPRESSOR ROOM
34	4" SCH 80 PVC	PLANT WATER	EXIST. 4" WATER LINE	SEE G-6
35	4" SCH 80 PVC	PLANT WATER	LINE NO. 34	SEE G-6
36	4" SCH 80 PVC	PLANT WATER	LINE NO. 35	EXIST. WATER LINE

MANHOLE SCHEDULE

MH #	INVERT IN	INVERT OUT	DIAMETER	RIM ELEV.
1		EAST 15.07'	4' DIA.	34.0'
2	EAST 14.63' SOUTH 16.0'	EAST 14.53'	4' DIA.	34.0'
3	EAST 14.36' SOUTH 16.0'	EAST 14.26'	4' DIA.	34.0'
4	SOUTH 5.25'±	WEST 5.25'	5' DIA. DOGHOUSE MH	14.0'
5	SOUTH 5.25' EAST 5.25'	NORTH 5.25'	5' DIA.	14.0'
6	EAST 5.25'	NORTH 10.0'	6' DIA.	14.0'
7	EAST 10.50'	EAST 10.50'	4' DIA.	16.0'
8	WEST 8.25' WEST 8.25'	WEST 8.15'	4' DIA.	18.90'
9	WEST 7.66' EAST 12.0'	NORTH 7.56'	4' DIA.	17.0'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18305 REGISTERED JOSEPH W. HOGAN

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

PIPING AND MANHOLE SCHEDULE

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
G-8
OF: 12

HOBBS UPCHURCH & ASSOC. J:\GS9314\45MGDUPGRADE\G-8.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 16:20 PLOT SCALE: 1/4"=1'-0"

33-013-008

BACKWASH EQUALIZATION "LAGOON"

EXIST. SLUDGE THICKENER

EXIST. SLUDGE THICKENER

EXIST. EQUALIZATION LAGOON

EXIST. SLUDGE DRYING BEDS

EXIST. CHEMICAL SPILL LAGOON

EXIST. MAINTENANCE BUILDING

EXIST. 2,000,000 GALLON CLEARWELL

EXIST. HYDROTANK

EXIST. FINISHED WATER PUMP STATION

EXIST. 500,000 GALLON CLEARWELL

CHEMICAL SPILL LAGOON

BULK ALUM STORAGE

CLARIFIERS

EXIST. CLARIFIERS 1 & 2

EXIST. CLARIFIERS 3 & 4

EXIST. PAC TOWER

FILTERS

EXIST. LIME TOWER

EXIST. FILTERS 1-4

EXIST. FILTERS 5-8

EXIST. OPERATIONS BLD.
1ST FLOOR CHEMICAL FEED
2ND FLOOR OPERATIONS

EXIST. BULK CHEM. STORAGE

EXIST. CHLORINE LAYOUT
G9
EN29

FUTURE
1 1/2"
1 1/2"
2"
1"
RAW WATER METER VAULT

EXIST. 3" P.A.C. FEED LINE

EXIST. P.A.C. FEED VAULT

STATIC MIXER VAULT

BULK CHLORINE STORAGE

2"
4"
3"
1"

PIPE LEGEND:

- CAUSTIC
- ALUM
- POLYMER
- FILTER AID
- CHLORINE
- P.A.C.
- LIME
- SAMPLE
- SPARE
- AIR

NOTE:
CONTRACTOR SHALL BORE UNDER EXIST. ROADS AS REQUIRED FOR NEW CHEMICAL FEED PIPING.

BULL CREEK WATER TREATMENT PLANT
CHEMICAL FEED SITE PLAN

SCALE: 1" = 40'

40' 0 20' 40' 80'

NOTES:
1. ALL CHEMICAL FEED AND SAMPLE PIPING SHALL BE SCH 80 PVC.
2. 2'-0" MIN. RADIUS ON ALL BENDS FOR LIME FEED LINES.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 19355 REGISTERED JOSEPH W. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

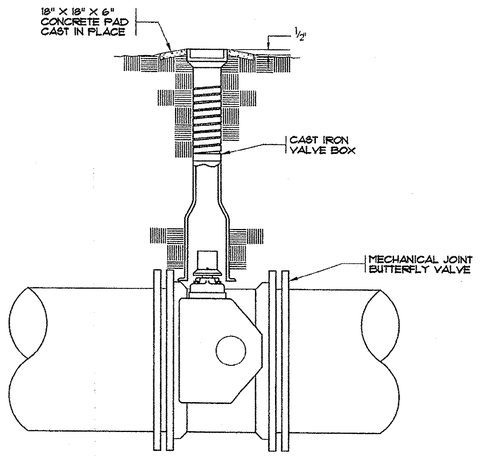
CHEMICAL FEED - SITE PLAN

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

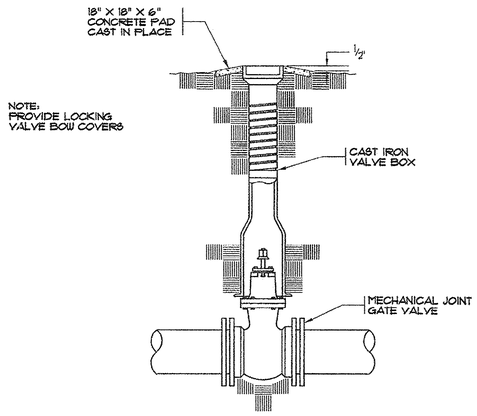
SHEET NO. G-9
OF: 12

33-013-009

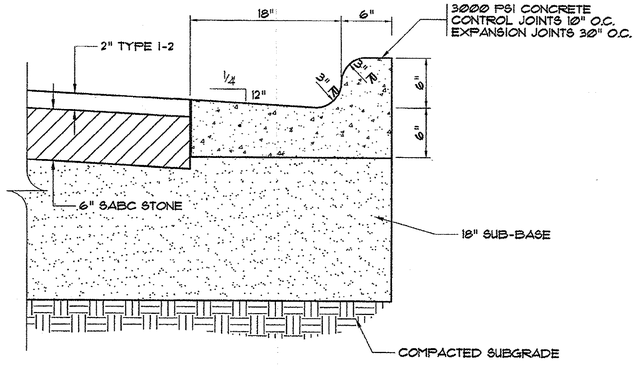
HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\G-9.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 16:19 PLOT SCALE: 1"=40.0000'



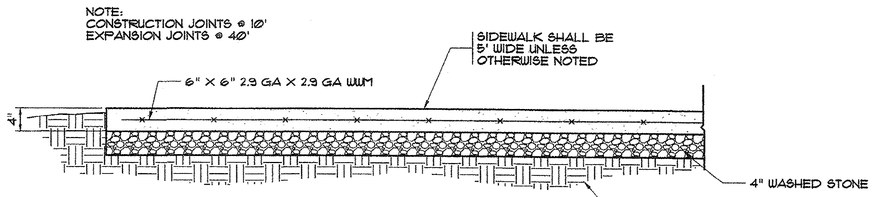
BUTTERFLY VALVE ASSEMBLY
N.T.S.



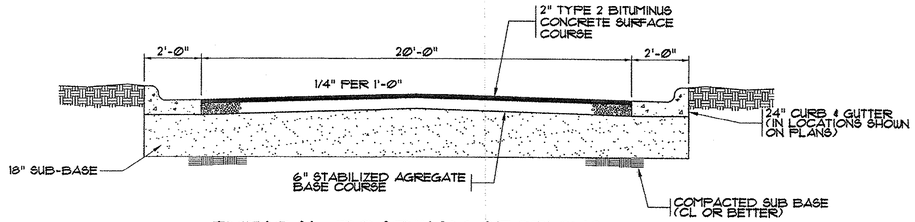
GATE VALVE ASSEMBLY
N.T.S.



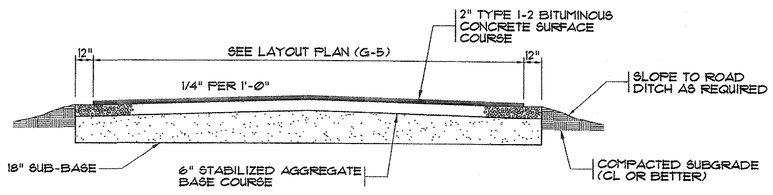
PAVEMENT, CURB & GUTTER
N.T.S.



SIDEWALK DETAIL
N.T.S.



TYPICAL ROADWAY SECTIONS
N.T.S.



TYPICAL ROADWAY SECTION
N.T.S.

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12555 REGISTERED JOSEPH W. McMILLAN

HOBBS, UPCHURCH, & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

MISCELLANEOUS DETAILS

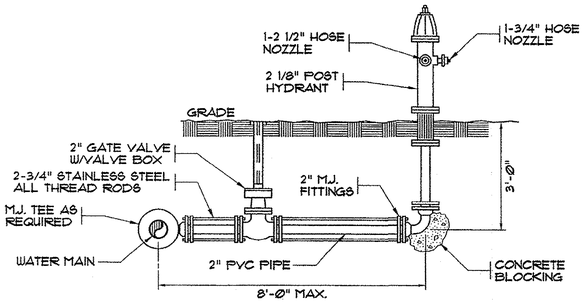
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
G-10
OF: 12

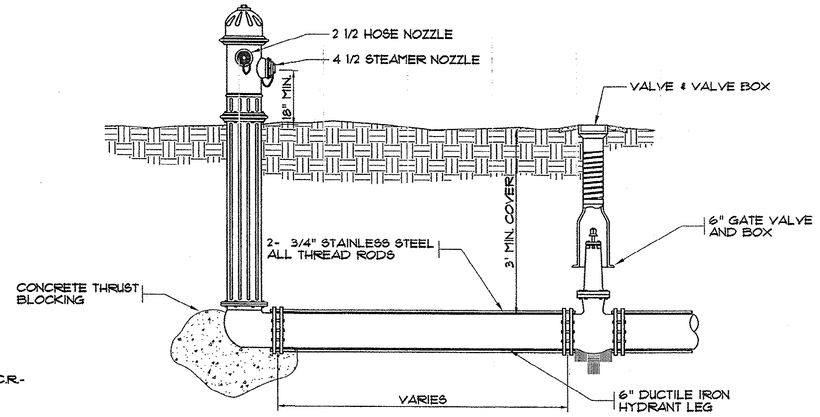
33-013-010

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\G-10.dwg,DWG EDITED BY: dc DATE: 01/31/00 TIME: 11:58 PLOT SCALE: 1/2"=1'-0"



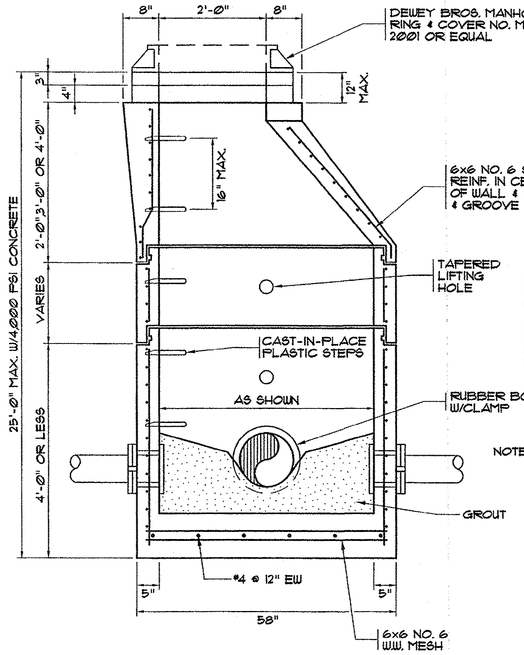
YARD HYDRANT DETAIL

N.T.S.



FIRE HYDRANT ASSEMBLY DETAIL

N.T.S.

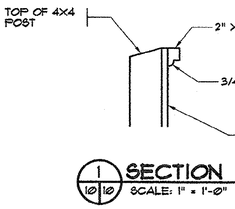


NOTES:
1. CONCRETE (4,000 PSI MIN.) REINF. IN ADJUSTABLE RINGS TO MEET ASTM. C-478-72 WIRE MESH-ASTM. A-1 85-69.
2. FLAT-TOP MANHOLE TO BE USED WHERE REQUIRED BY GRADE.

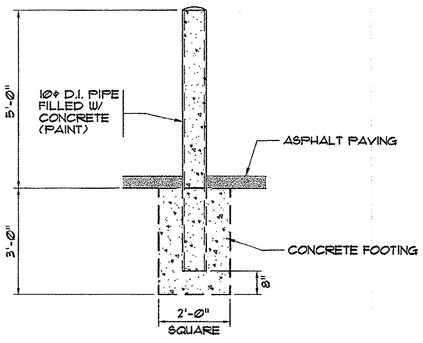
NOTE: THE CONTRACTOR SHALL ADJUST RIM OF MANHOLE TO MATCH EXISTING GRADE.

PRECAST MANHOLE DETAIL

N.T.S.

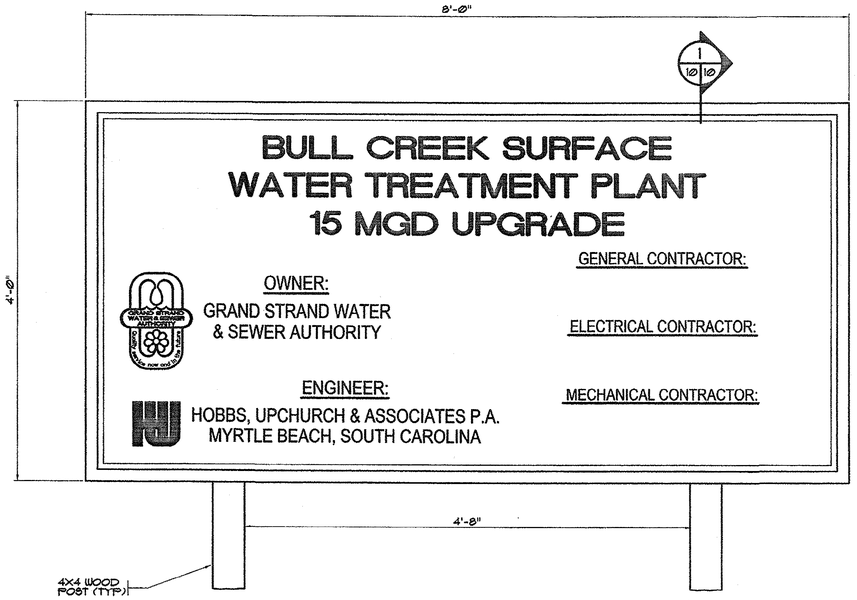


1/10|10 SECTION
SCALE: 1" = 1'-0"



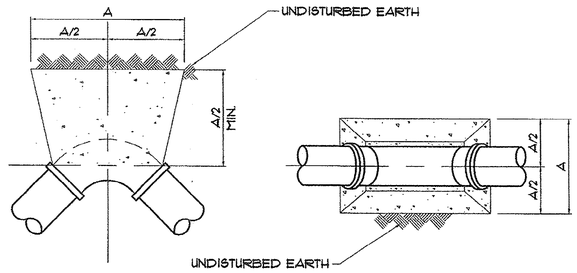
BOLLARD DETAIL

N.T.S.



PROJECT CONSTRUCTION SIGN

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



PLAN ELEVATION

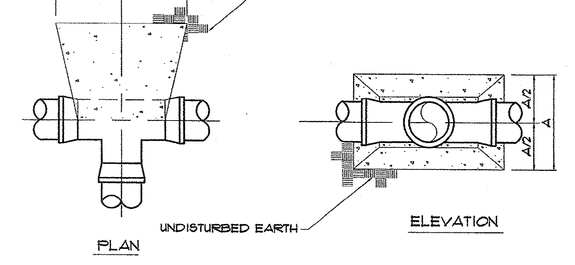
NOTE: THRUST BLOCKS SHALL BE CONSTRUCTED OF 2000 P.S.I. CONCRETE

TABLE "A" DIMENSIONS (IN FEET)

BEND	PIPE SIZE (NOM. DIA. IN INCHES)								
	6"	8"	12"	16"	20"	24"	30"	36"	48"
90°	5	9	19	35	53	77	120	172	320
45°	3	5	11	19	29	42	65	94	166
22 1/2°	2	3	6	10	15	22	34	48	85
11 1/4°	1	2	3	5	8	11	17	24	43

THRUST BLOCK DETAIL FOR WATER MAIN BENDS

N.T.S.



PLAN ELEVATION

NOTE: THRUST BLOCK SIZE DETERMINED BY SMALLEST DIA. OF TEE

DIM. (IN INCHES)	PIPE SIZE (INCHES)								
	6"	8"	12"	16"	20"	24"	30"	36"	48"
A	5	9	19	35	53	77	120	172	320

THRUST BLOCK DETAIL FOR TEES

N.T.S.

NOTES:

1. THE CONTRACTOR SHALL USE MECHANICAL RESTRAINTS UNLESS OTHERWISE INSTRUCTED.
2. CONTRACTOR SHALL PROVIDE CALCULATIONS FOR INSTALLATION OF MECHANICAL RESTRAINTS.
3. THRUST BLOCKING DIMENSIONS ARE BASED ON A TEST PRESSURE OF 200 PSI. CONTRACTOR SHALL SUBMIT CALCULATIONS TO ENGINEER FOR REDUCED BLOCKING DIMENSIONS BASED ON ACTUAL OPERATING PRESSURES.

REVISIONS

STM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER REGISTERED No. 22355 W. MACKEY HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

MISCELLANEOUS DETAILS

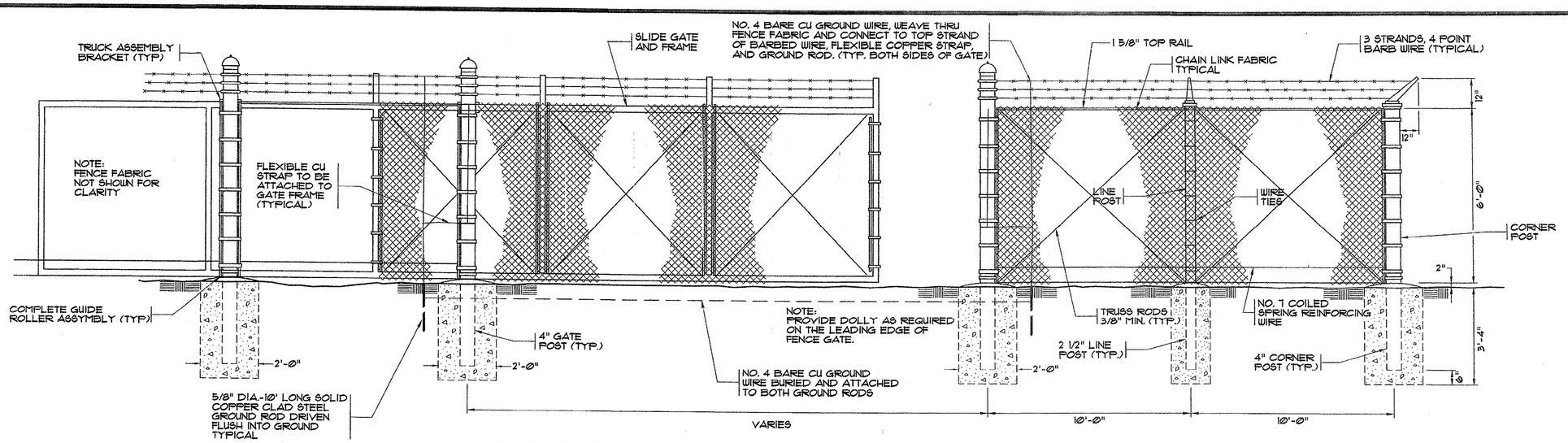
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. G-11
OF: 12

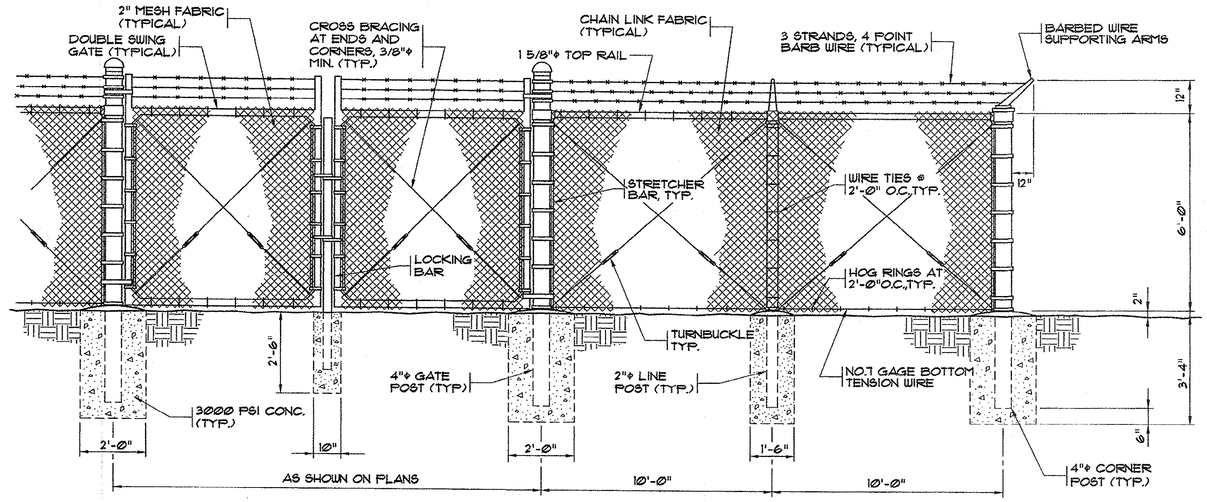
33-013-011

HOBBS UPCHURCH & ASSOC. J:\JOBS\814\45MGDUPGRADE\G-11.dwg DWG EDITED BY: ARM DATE: 01/18/00 TIME: 15:31 SCALE: 1/2"=1'-0"



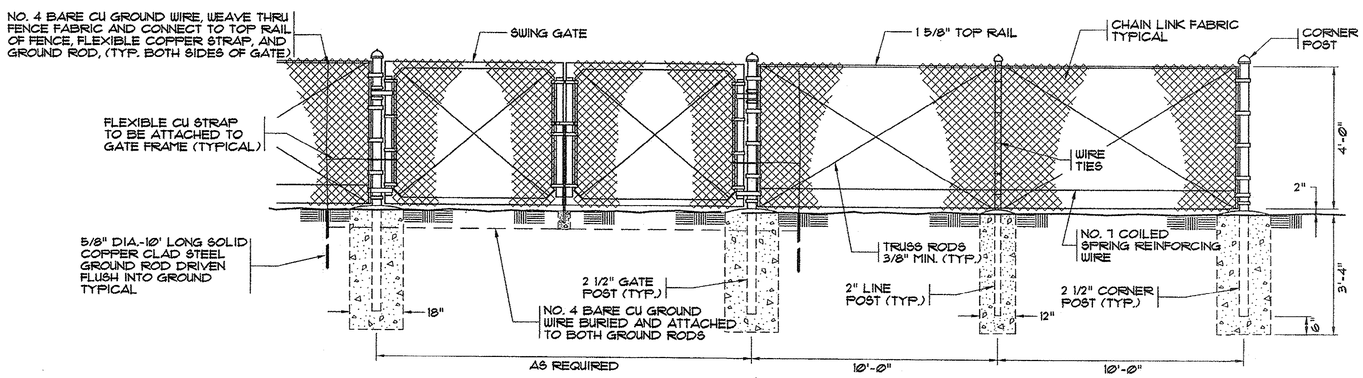
6' CHAIN LINK FENCE W/ SLIDE GATE DETAIL

N.T.S.



6' CHAIN LINK FENCE W/ DOUBLE SWING GATE DETAIL

N.T.S.



4' CHAIN LINK FENCE DETAIL

N.T.S.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER — REGISTERED — JOSEPH W. MCCLENDON — 23355

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

MISCELLANEOUS DETAILS

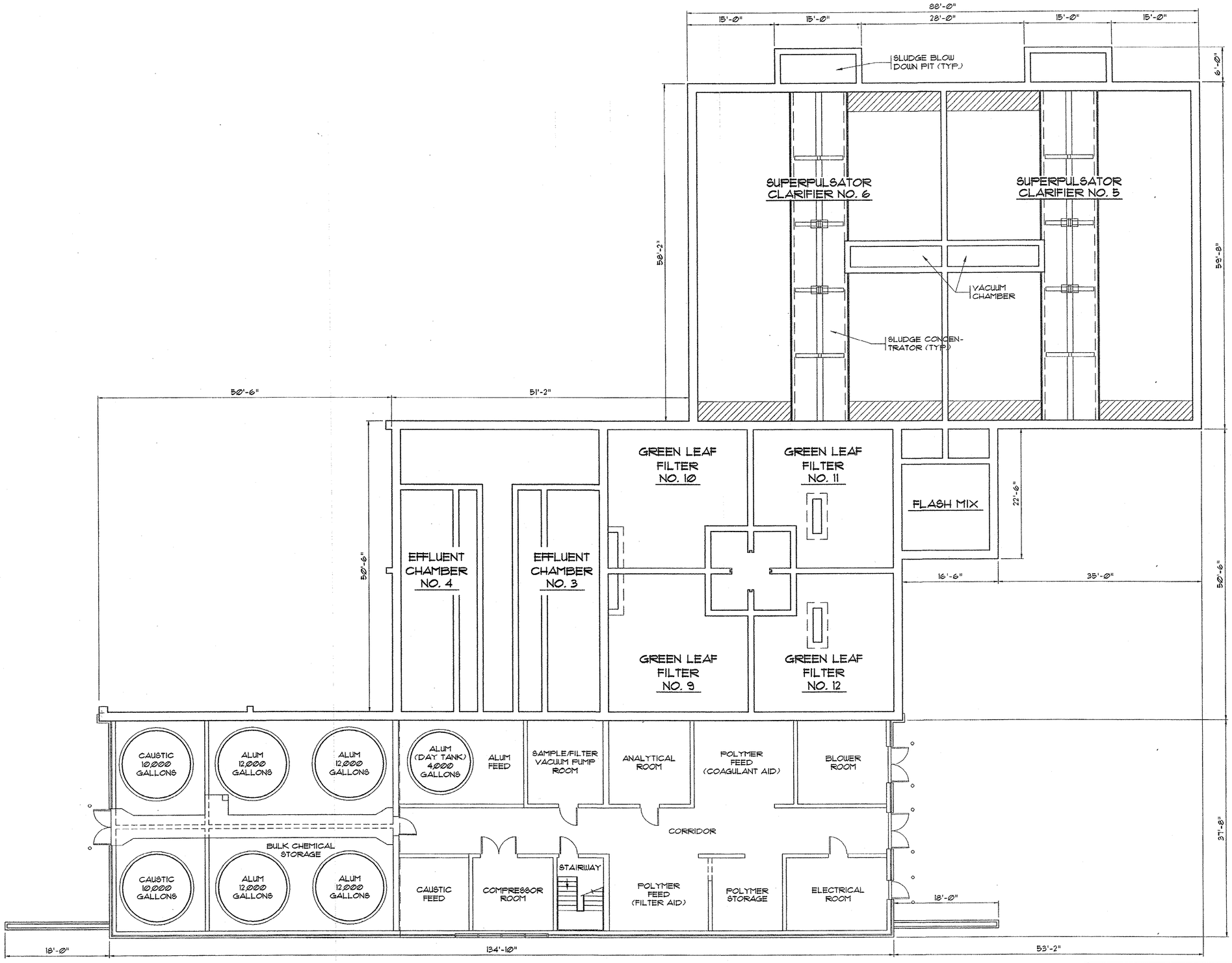
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. G-12
OF: 12

33-013-012

HOBBS UPCHURCH & ASSOC. J:\GS9814\45W00UPGRADE\G-12.dwg DWG EDITED BY: ARM DATE: 01/18/00 TIME: 15:33 SCALE: 1/4"=1'-0"



PLANT UNIT LAYOUT
SCALE: 1/8" = 1'-0"

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9936

SOUTH CAROLINA PROFESSIONAL ENGINEER 13770 WILLIAM P. DIXON 1/28/00

SOUTH CAROLINA DIXON ASSOCIATES C-00600 CERTIFICATE OF AUTHORIZATION

REVISIONS

STM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

PLANT UNIT LAYOUT

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/LAW
CHECKED:	WPD
SCALE:	AS SHOWN
SHEET NO.	S-1
OF:	17

33-013-013

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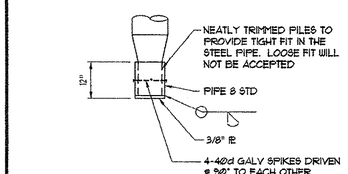
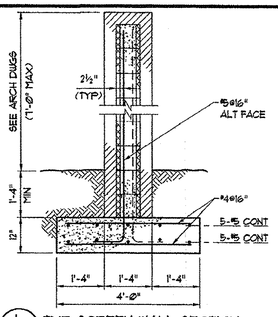
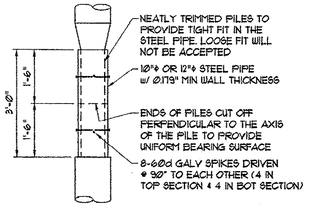


NOTE:
OTHER PROPRIETARY DRIVING SHOES WILL BE CONSIDERED. DRIVING SHOES SHALL BE USED WHEN DIRECTED BY THE ENGINEER.

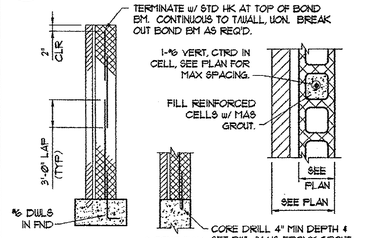
H / S-2 TYP TIMBER PILE DRIVING SHOE
NO SCALE



L / S-2 TYP SCREEN WALL SECTION
1/2" = 1'-0"



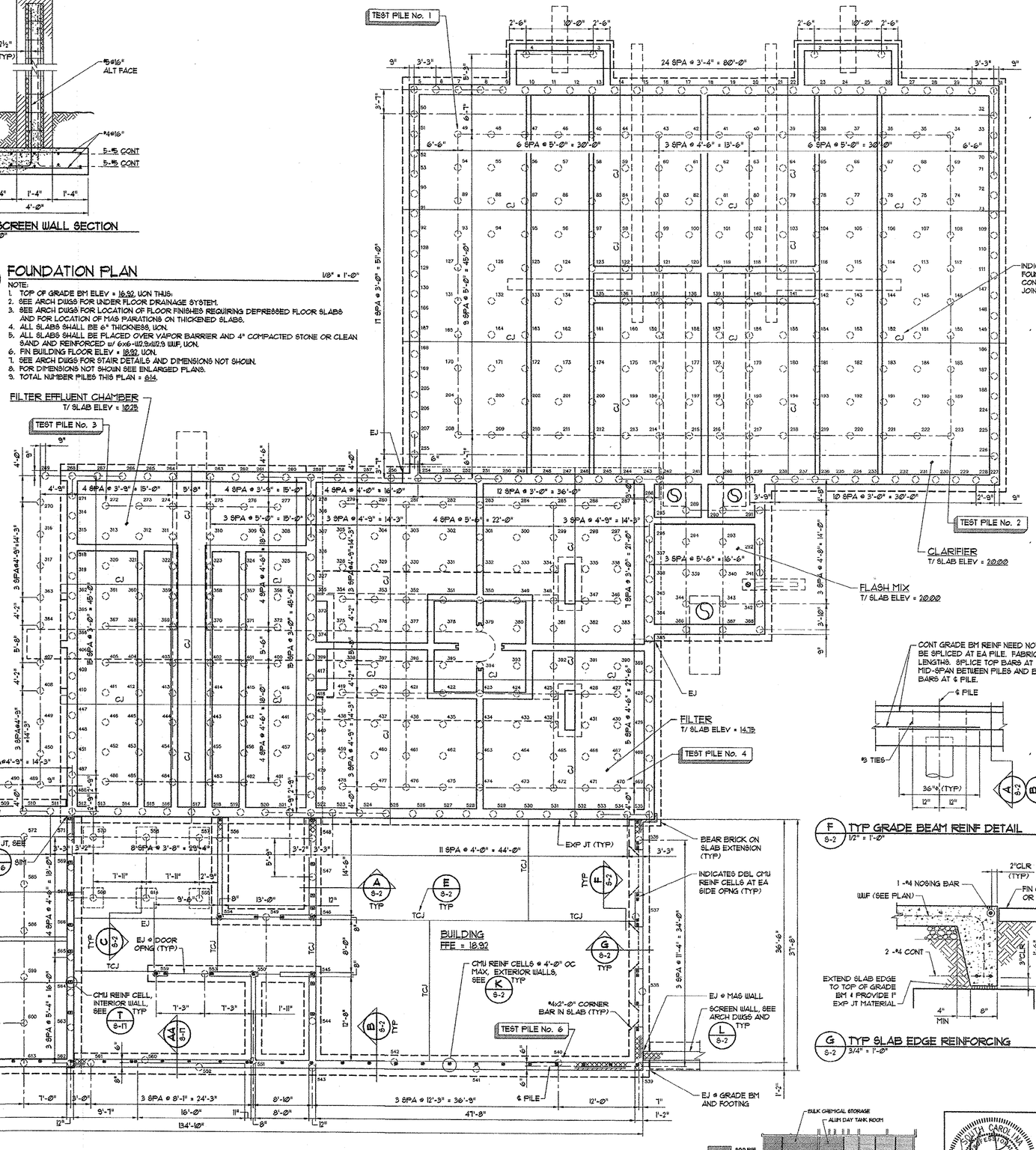
J / S-2 TYP TIMBER PILE SPLICE DETAIL
NO SCALE



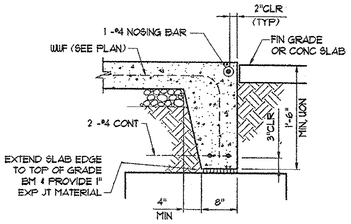
K / S-2 TYP CMU WALL REINFORCING DETAIL
NO SCALE

N FOUNDATION PLAN
1/8" = 1'-0"

NOTE:
1. TOP OF GRADE BM ELEV = 16.92, UON THUS:
2. SEE ARCH DWGS FOR UNDER FLOOR DRAINAGE SYSTEM.
3. SEE ARCH DWGS FOR LOCATION OF FLOOR FINISHES REQUIRING DEPRESSED FLOOR SLABS AND FOR LOCATION OF MAS PAIRATIONS ON THICKENED SLABS.
4. ALL SLABS SHALL BE 6" THICKNESS, UON.
5. ALL SLABS SHALL BE PLACED OVER VAPOR BARRIER AND 4" COMPACTED STONE OR CLEAN SAND AND REINFORCED w/ 6x6-W2.9xW2.9 WWF, UON.
6. FIN BUILDING FLOOR ELEV = 18.92, UON.
7. SEE ARCH DWGS FOR STAIR DETAILS AND DIMENSIONS NOT SHOWN.
8. FOR DIMENSIONS NOT SHOWN SEE ENLARGED PLANS.
9. TOTAL NUMBER PILES THIS PLAN = 614.

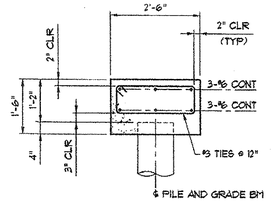


F / S-2 TYP GRADE BEAM REINF DETAIL
1/2" = 1'-0"

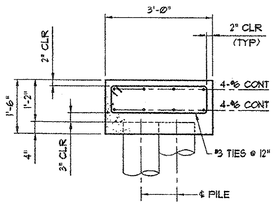


G / S-2 TYP SLAB EDGE REINFORCING
3/4" = 1'-0"

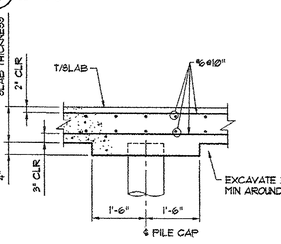
BUILDING FIRST FLOOR DESIGN LOADS



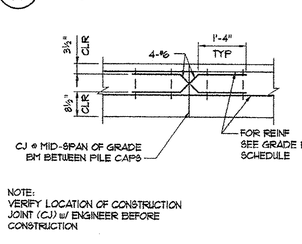
A / S-2 TYP GRADE BEAM REINF DETAIL
1/2" = 1'-0"



B / S-2 TYP GRADE BEAM REINF DETAIL
1/2" = 1'-0"

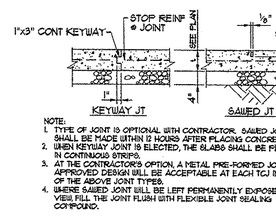


C / S-2 TYP PILE CAP DETAIL
1/2" = 1'-0"



NOTE:
VERIFY LOCATION OF CONSTRUCTION JOINT (CJ) w/ ENGINEER BEFORE CONSTRUCTION

D / S-2 TYP ELEVATION OF GRADE BEAM CONSTRUCTION JOINT (CJ)
1/2"=1'-0"



NOTE:
1. TYPE OF JOINT IS OPTIONAL WITH CONTRACTOR. SAWED JOINTS SHALL BE MADE WITHIN 12 HOURS AFTER PLACING CONCRETE.
2. WHEN KEYWAY JOINT IS ELECTED, THE SLABS SHALL BE PLACED IN CONTINUOUS STRIPS.
3. AT THE CONTRACTOR'S OPTION, A METAL PRE-FORMED JOINT OF APPROVED DESIGN WILL BE ACCEPTABLE AT EACH TCJ IN LIEU OF THE ABOVE JOINT TYPES.
4. WHERE SAWED JOINT WILL BE LEFT PERMANENTLY EXPOSED TO VIEW, FILL THE JOINT FLUSH WITH FLEXIBLE JOINT SEALING COMPOUND.

E / S-2 TYP CONTROL JOINT (TCJ) AT SLAB-ON-GRADE
NO SCALE

REVISIONS		
DESCRIPTION	DATE	BY

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CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

PILE LAYOUT PLAN

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	LAW
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SHEET NO.	S-2
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Structural Design By:
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SOUTH CAROLINA PROFESSIONAL ENGINEER 13770 WILLIAM P. DIXON 1/28/00

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION DIXON ASSOCIATES C-00600

9936

33-013-014

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LINTEL SCHEDULE

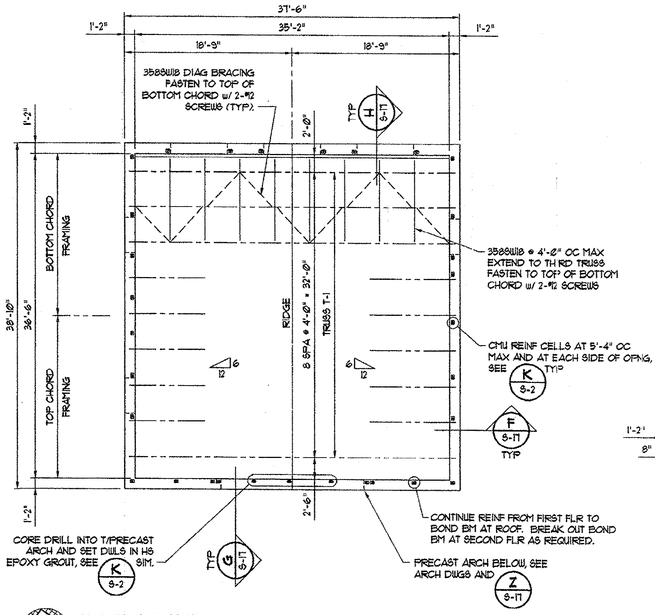
OPENING	LINTEL		BEARING
0'-0" TO 1'-4"	IE 3½x3½	*	8"
1'-4" TO 4'-0"	L3½x3½x5/16	*	8"
4'-0" TO 6'-8"	L4x3½x5/16 (LLV)	*	8"
6'-8" TO 8'-0"	L5x3½x5/16 (LLV)	*	8"

* PER 4" OF WALL THICKNESS

OPENING	6" OR 8" WALL	12" WALL	BEARING
2'-0" TO 4'-0"	7⅝" 2-#3 2-#3	2-#3 2-#3	8"
4'-0" TO 5'-4"	7⅝" 2-#4 2-#5	2-#4 3-#4	8"
5'-4" TO 8'-0"	7⅝" 2-#5 2-#6	2-#5 3-#5	16"

CONC MASONRY LINTELS SHALL BE FILLED WITH MASONRY GROUT.

NOTE:
ALL UNSCHEDULED OPNGS INCLUDING OPNGS FOR MECHANICAL WORK SHALL BE PROVIDED WITH LINTELS IN ACCORDANCE WITH THIS SCHEDULE.



ROOF FRAMING PLAN

1/8" = 1'-0"

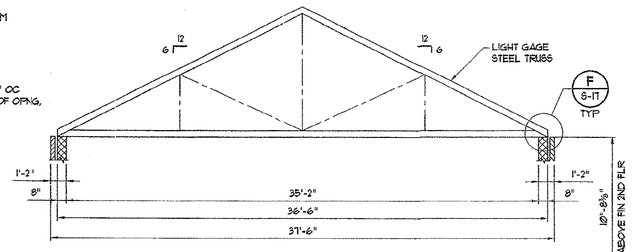
NOTE:
1. SEE ARCH DWGS FOR LOCATION AND ELEVATION OF LINTELS.
2. SEE ARCH AND MECH DWGS FOR LOCATION OF ROOF OPNGS.

LIGHT-GAGE STEEL TRUSS NOTES

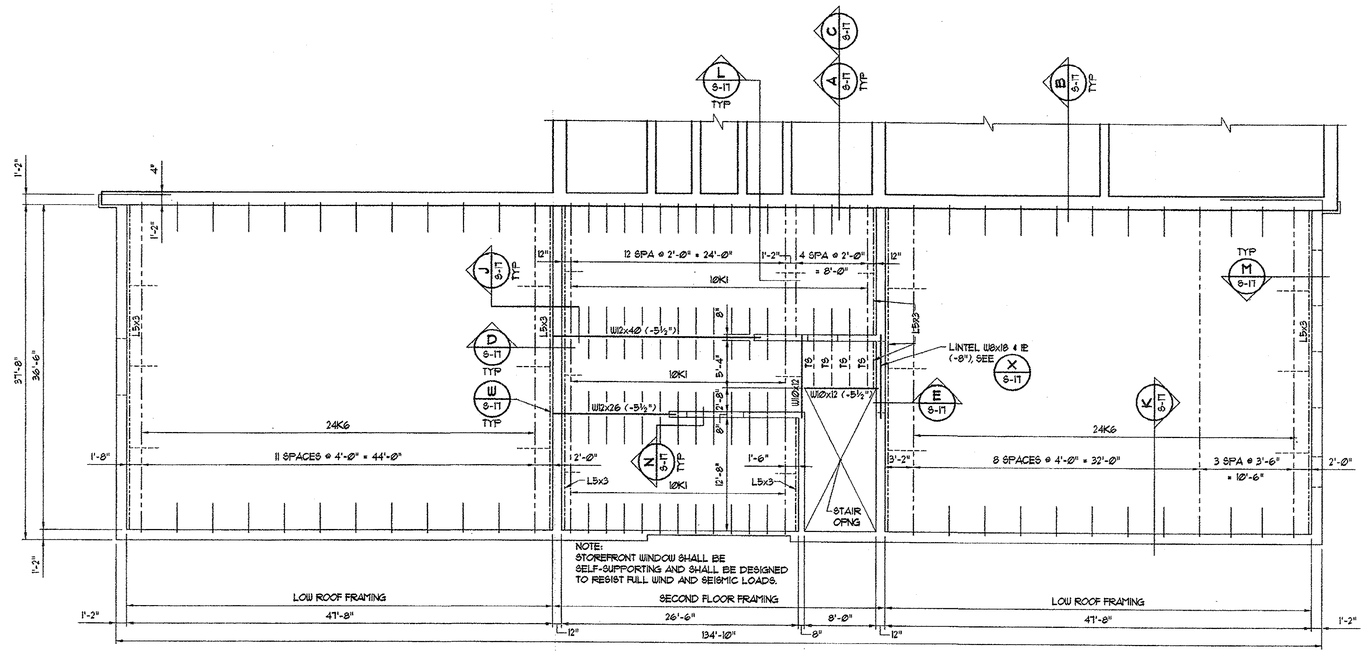
1. MAXIMUM TRUSS SPACING = 4'-0" ON CENTER.
2. CENTROIDAL LINES OF MEMBERS SHALL INTERSECT AT A POINT, UON.
3. TRUSS DESIGN LOADS
   WIND ASCE 7-93, 100 MPH EXPOSURE C, WIND IMPORTANCE FACTOR = 1.11
   GCpi=±0.25, DESIGN TRUSSES FOR COMPONENT LOADING
   SEISMIC (SEE GENERAL NOTES)

TOP CHORD DEAD LOAD	7 PSF
BOTTOM CHORD DEAD LOAD	10 PSF
TOP CHORD ROOF LIVE LOAD	16 PSF
BOTTOM CHORD LIVE LOAD	5 PSF

4. TRUSSES SHALL BE DESIGNED BY A REGISTERED SOUTH CAROLINA PROFESSIONAL ENGINEER EMPLOYED BY THE TRUSS MANUFACTURER. SUBMIT SEALED CALCULATIONS FOR TRUSS MEMBER AND CONNECTION DESIGN WITH SHOP DRAWINGS.



TRUSS T1 ELEVATION



SECOND FLOOR AND LOW ROOF FRAMING PLAN

1/8" = 1'-0"

NOTE:
1. "REF STEEL ELEV" AT LOW ROOF = 13'-6 ¾" ABOVE REFERENCED FINISHED FIRST FLOOR, UON THUS: (±X'-X").
2. REFERENCED FINISHED FIRST FLOOR ELEV = 18.92.
3. "REF STEEL ELEV" AT SECOND FLOOR = 3" BELOW REFERENCED SECOND FLOOR ELEV, UON THUS: (±X'-X").
4. REFERENCED FINISHED SECOND FLOOR = 32.25.
5. ------- DENOTES LOCATION OF CONT ROWS OF HORIZ BRIDGING.
6. SEE ARCH DWGS FOR LOCATIONS AND ELEVATIONS OF MASONRY LINTELS.
7. SEE ARCH AND MECH DWGS FOR LOCATIONS OF ROOF AND FLOOR OPENINGS.
8. "TS" DENOTES TS 2½x2½x¼ BEARING SIMILAR TO JOISTS.
9. "L5x3" DENOTES CONTINUOUS L5x3x5/16 (LLV) DECK SUPPORT ANGLE.
10. ONLY LOAD BEARING MAS WALLS ARE SHOWN. SEE ARCH DWGS FOR LOCATIONS OF MAS PARTITIONS NOT SHOWN. SEE T S-11 FOR PARTITION REINF.

GENERAL NOTES

A. FOUNDATIONS.
1. MAXIMUM ALLOWABLE NET BEARING PRESSURE = 2000 PSF.
2. EXCAVATIONS AND FORMS SHALL BE REVIEWED BY THE ENGINEER PRIOR TO PLACING CONCRETE.
3. AS DIRECTED BY THE ENGINEER, LOOSE AND UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE BOTTOM OF THE FOUNDATIONS AND REPLACED WITH COMPACTED STRUCTURAL FILL OR STONE.
4. PLACE CONCRETE FOR WALLS AND SLABS IN ALTERNATE SECTIONS AND PROVIDE CONSTRUCTION JOINTS AT LOCATIONS SHOWN ON THE DRAWINGS, OR AT 30 FEET MAXIMUM.
5. PROVIDE BRACING AGAINST WALLS AS REQUIRED TO PREVENT DAMAGE DURING COMPACTION OF FILL.
6. TIMBER PILES SHALL BE TREATED AND SHALL CONFORM TO ASTM D25 WITH A MINIMUM TIP DIAMETER OF 8 INCHES AND SHALL BE DRIVEN TO 20 TONS CAPACITY. SEE SPECIFICATIONS.

B. CONCRETE.
1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS AS FOLLOWS:
   PILE CAPS, GRADE BEAMS AND CONTAINMENT STRUCTURES ..... 4,000 PSI
   SLABS-ON-GRADE AND SLAB ON METAL FORMS ..... 3,500 PSI
   ALL OTHER CONCRETE ..... 3,000 PSI
2. CONCRETE WORK SHALL CONFORM TO ACI 318-95 AND ACI 301-96.
3. CONCRETE SHALL BE CURED A MINIMUM OF 7 DAYS BY ONE OR MORE METHODS SPECIFIED IN ACI 301.
4. CHAMFER EXPOSED EDGES OF CONCRETE (AND ALL CORNERS OF ALL COLUMNS) 3/4 INCH, UNLESS OTHERWISE NOTED.
5. PLACE 1/2 INCH EXPANSION JOINT MATERIAL BETWEEN EDGES OF SLABS AND VERTICAL SURFACES, UNLESS OTHERWISE NOTED.
6. PROVIDE CONSTRUCTION OR CONTROL JOINTS IN SLABS AND WALLS AT LOCATIONS SHOWN ON DRAWINGS, AT OFFSETS AND CHANGES IN DIRECTION, AND AT 30 FEET MAXIMUM. CONSTRUCTION JOINTS IN WALLS SHALL BE LOCATED A MINIMUM OF 10'-0" FROM WALL INTERSECTIONS.
7. SEE ARCHITECTURAL FINISH SCHEDULE FOR REQUIRED FLOOR FINISHES.
8. SEE ARCHITECTURAL DRAWINGS FOR WATERPROOFING AND DAMPPROOFING.

C. REINFORCING STEEL.
1. BARS SHALL BE ROLLED FROM NEW BILLET-STEEL CONFORMING TO ASTM A615, GRADE 60.
2. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497.
3. REINFORCING STEEL IN PLACE SHALL BE REVIEWED BY THE ENGINEER PRIOR TO PLACING CONCRETE.

D. GROUT.
1. NON-SHRINK GROUT SHALL CONFORM TO CORP OF ENGINEERS SPECIFICATION CRD-C 671.
2. GROUT SHALL BE NON-STAINING AND NON-SHRINKING.

E. STRUCTURAL STEEL.
1. STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 OR ASTM A572, GRADE 50.
2. STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A500, GRADE B, Fy = 46 KSI.
3. STEEL WORK SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS - ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN," OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC., EFFECTIVE JUNE 1, 1989, INCLUDING ALL SUPPLEMENTS, AND THE "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES," EFFECTIVE SEPTEMBER 1, 1986.
4. CONNECTION BOLTS SHALL CONFORM TO ASTM A325, TYPE X, UNLESS OTHERWISE NOTED. INSTALL EACH BOLT WITH A HARDENED WASHER (OR LOAD INDICATOR WASHER) UNDER THE NUT OR HEAD, WHICHEVER IS TURNED FOR TIGHTENING. CONNECTION BOLTS ARE REQUIRED TO BE TIGHTENED "SNUG-TIGHT" ONLY, UNLESS OTHERWISE NOTED.
5. OVERSIZE HOLES AND SLOTTED HOLES SHALL NOT BE USED FOR BOLTED CONNECTIONS ON THIS PROJECT, UNLESS OTHERWISE NOTED.
6. WELDING SHALL BE BY WELDERS AND WELDING OPERATORS WHO HAVE BEEN PREVIOUSLY QUALIFIED BY TESTS AS PRESCRIBED IN THE "STRUCTURAL WELDING CODE," AWS D1.1 OF THE AMERICAN WELDING SOCIETY TO PERFORM THE TYPES OF WELDS REQUIRED ON THIS PROJECT.
7. ANCHOR BOLT LENGTHS SHOWN ON THE DRAWINGS SHALL INCLUDE HOOKS OF NOT LESS THAN 3 INCHES IN LENGTH. PROVIDE ONE NUT AND ONE WASHER WITH EACH ANCHOR BOLT UNLESS OTHERWISE NOTED. COLUMNS ARE TO BE ERECTED AND LEVELED WITH LEVELING SHIMS (LEVELING NUTS ARE PROHIBITED).

F. OPEN WEB STEEL JOISTS.
1. FABRICATE AND ERECT JOISTS IN ACCORDANCE WITH "STANDARD SPECIFICATIONS, LOAD TABLES AND WEIGHT TABLES FOR STEEL JOISTS AND JOIST GIRDERS," OF THE STEEL JOIST INSTITUTE, 1994 EDITION.
2. JOISTS SHALL HAVE MINIMUM BEARING ON SUPPORTS IN ACCORDANCE WITH THE SJI SPECIFICATIONS UNLESS OTHERWISE NOTED.
3. BRIDGING SHALL BE IN PLACE, ANCHORED AND REVIEWED BY THE ENGINEER PRIOR TO PLACING CORRUGATED STEEL FORMS OR DECKING.

G. STEEL ROOF DECK.
1. STEEL ROOF DECK SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH THE "SDI STEEL ROOF DECK SPECIFICATIONS" AND THE "SDI CODE OF RECOMMENDED STANDARD PRACTICE, ROOF DECK CONSTRUCTION," OF THE STEEL DECK INSTITUTE.
2. THE STEEL DECK SHALL BE 1-1/2 INCHES IN DEPTH, 22 GAGE, INTERMEDIATE RIB, AND SHALL BE ZINC COATED.
3. PROVIDE ALL RIDGE AND VALLEY PLATES, CANT STRIPS, SUMPS AND OTHER ACCESSORIES TO BE ATTACHED TO THE DECK FOR THE INSTALLATION OF INSULATION, ROOFING AND DRAINAGE.
4. ANCHOR DECK TO STRUCTURAL SUPPORTS AT 12 INCHES O.C. MAXIMUM WITH 5/8 INCH DIAMETER PUDDLE WELDS OR 3/16 INCH DIAMETER SELF-TAPPING SCREWS, UNLESS OTHERWISE NOTED ON PLANS.
5. FASTEN SIDE LAPS TOGETHER AT 3'-0" MAXIMUM O.C. WITH 5/8 INCH DIAMETER PUDDLE WELDS OR 3/16 INCH DIAMETER SELF-TAPPING SCREWS, UNLESS OTHERWISE NOTED ON PLANS.
6. SPOT PAINT ALL FIELD WELDS, FIELD CUT EDGES AND SERIOUS ABRASIONS TO THE SHOP COAT WITH ZINC CHROMATE PRIMER CONFORMING TO SSPC PAINT 11.

H. LIGHT-GAGE STEEL FRAMING
1. SEE SPECIFICATION SECTION 05400, "COLD-FORMED METAL FRAMING," FOR FRAMING REQUIREMENTS.
2. SEE SPECIFICATION SECTION 05450, "LIGHT-GAGE STEEL TRUSSES," FOR ROOF TRUSS REQUIREMENTS.
3. SEE "TRUSS NOTES" FOR STEEL TRUSS DESIGN REQUIREMENTS.

J. UNIT MASONRY
1. ASSUMED COMPRESSIVE STRENGTH OF LOAD-BEARING CONCRETE MASONRY f'm = 1,350 PSI
2. MASONRY GROUT FILL FOR REINFORCED MASONRY CELLS, LINTELS, BOND BEAMS AND AS SHOWN ON THE DRAWINGS SHALL CONFORM TO ASTM C476.
3. ALL LAP SPLICES FOR REINFORCING BARS IN MASONRY WALL SHALL BE 48X BAR DIAMETER, UON.

K. WATERSTOPS
1. PROVIDE CONTINUOUS PVC WATERSTOPS WHERE SHOWN ON DRAWINGS. AT EXTERIOR WALL CONSTRUCTION JOINTS AND WHERE DIFFERENTIAL HEIGHTS OF FLUIDS EXIST ON EITHER SIDE OF WALL.
2. WATERSTOPS SHALL BE MANUFACTURED OF VIRGIN MATERIAL COMPOSED OF AN ELASTOMERIC POLYVINYL CHLORIDE COMPOUND MEETING THE REQUIREMENTS OF CORPS OF ENGINEERS CRD-C572. SUBMIT MANUFACTURER'S LITERATURE SHOWING COMPLIANCE WITH THE ABOVE SPECIFICATION AND SHOWING WATERSTOP SHAPES FOR USE.
3. WATERSTOPS AT CONSTRUCTION JOINTS SHALL BE 6 INCH MINIMUM LENGTH "DUMBBELL" TYPE UNLESS OTHERWISE INDICATED ON DRAWINGS. WATERSTOPS AT EXPANSION JOINTS SHALL BE 9 INCH MINIMUM LENGTH "DUMBBELL" TYPE WITH 3/4 INCH MINIMUM INSIDE DIAMETER CENTER BULB, UNLESS OTHERWISE INDICATED ON DRAWINGS.
4. ALL SPLICING OF WATERSTOPS SHALL BE SHOP FABRICATED EXCEPT THAT BUTT SPLICES MAY BE FIELD FABRICATED.

L. DESIGN LIVE LOADS.
STRUCTURAL MEMBERS ARE DESIGNED FOR FULL DEAD LOADS AND THE FOLLOWING LIVE LOADS:
1. ROOF LIVE LOAD — 20 PSF (LESS THAN 4:12 PITCH); 16 PSF (GREATER THAN 4:12 BUT LESS THAN 12:12 PITCH)
2. SNOW — 10 PSF (GROUND SNOW LOAD)
3. FLOOR — CHEMICAL STORAGE AREA SLABS ..... 800 PSF; OTHER AREAS ..... 300 PSF
4. WIND — 100 MPH (BASIC WIND VELOCITY) ASCE 7-93 EXPOSURE C; WIND IMPORTANCE FACTOR = 1.11, INTERNAL PRESSURE GCpi = +0.25, -0.25; CALCULATED WIND BASE SHEARS (MWFRS) Vx = 31 KIPS, Vy = 90 KIPS
5. LATERAL DESIGN CONTROL — WIND CONTROLS
6. SEISMIC — SEISMIC PERFORMANCE CATEGORY A; COMPLIANCE WITH SECTION 1607.3.6.1.1 TIES AND CONTINUITY? YES.
   SEISMIC PERFORMANCE CATEGORY B&C
   EFFECTIVE PEAK VELOCITY-RELATED ACCELERATION ..... Av = 0.10
   PEAK ACCELERATION COEFFICIENT ..... Aa = 0.10
   SEISMIC HAZARD EXPOSURE GROUP ..... SHEG = III
   SEISMIC PERFORMANCE GROUP ..... SPC = C
   SITE COEFFICIENT ..... S = 1.2
   BASIC STRUCTURAL SYSTEM
   X BEARING WALL ____ DUAL w/SPECIAL MOMENT FRAME
   ____ BUILDING FRAME ____ DUAL w/INTERMEDIATE R/C OR SPECIAL STEEL
   ____ MOMENT FRAME ____ INVERTED PENDULUM
   RESPONSE MODIFICATION FACTOR ..... R = 3 1/2
   DEFLECTION AMPLIFICATION FACTOR ..... Cd = 3
   BUILDING HEIGHT LIMIT, FEET ..... H = NL
   SEISMIC BASE SHEAR ..... V = 21 KIPS
   MODAL ANALYSIS PROCEDURE
   MODAL BASE SHEAR ..... Vt = NA
   ELF PROCEDURE BASE SHEAR ..... V = 21 KIPS

M. DIMENSIONS.
1. DIMENSIONS SHOWN TO EXISTING CONSTRUCTION ARE PLUS OR MINUS REGARDLESS OF WHETHER SHOWN AS SUCH ON THE DRAWINGS OR NOT. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS TO EXISTING CONSTRUCTION.

N. ABBREVIATIONS.
THE FOLLOWING LIST OF ABBREVIATIONS IS NOT INTENDED TO REPRESENT ALL THOSE USED ON THESE DRAWINGS, BUT TO SUPPLEMENT THE MORE COMMON ABBREVIATIONS USED:
1. TYP - TYPICAL
2. UON - UNLESS OTHERWISE NOTED
3. CLR - CLEAR, CLEARANCE
4. CJ - CONTROL JOINT
5. EJ - EXPANSION JOINT
6. TCJ - TYPICAL CONTROL JOINT, TYPICAL CONSTRUCTION JOINT

P. CONSTRUCTION SAFETY.
1. THESE STRUCTURAL DRAWINGS DO NOT CONTAIN NECESSARY COMPONENTS FOR SAFETY DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY BRACING AND SHORING OF NEW AND EXISTING FRAMING AGAINST WIND, CONSTRUCTION LOADS AND OTHER TEMPORARY FORCES UNTIL SUCH PROTECTION IS NO LONGER REQUIRED FOR THE SAFE SUPPORT OF THE FRAMING.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 25770 — 28/60

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9836

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION — DIXON ASSOCIATES C-00600

SYM.	DESCRIPTION	DATE	BY
	REVISIONS		

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

SECOND FLOOR AND ROOF FRAMING PLANS AND DETAILS

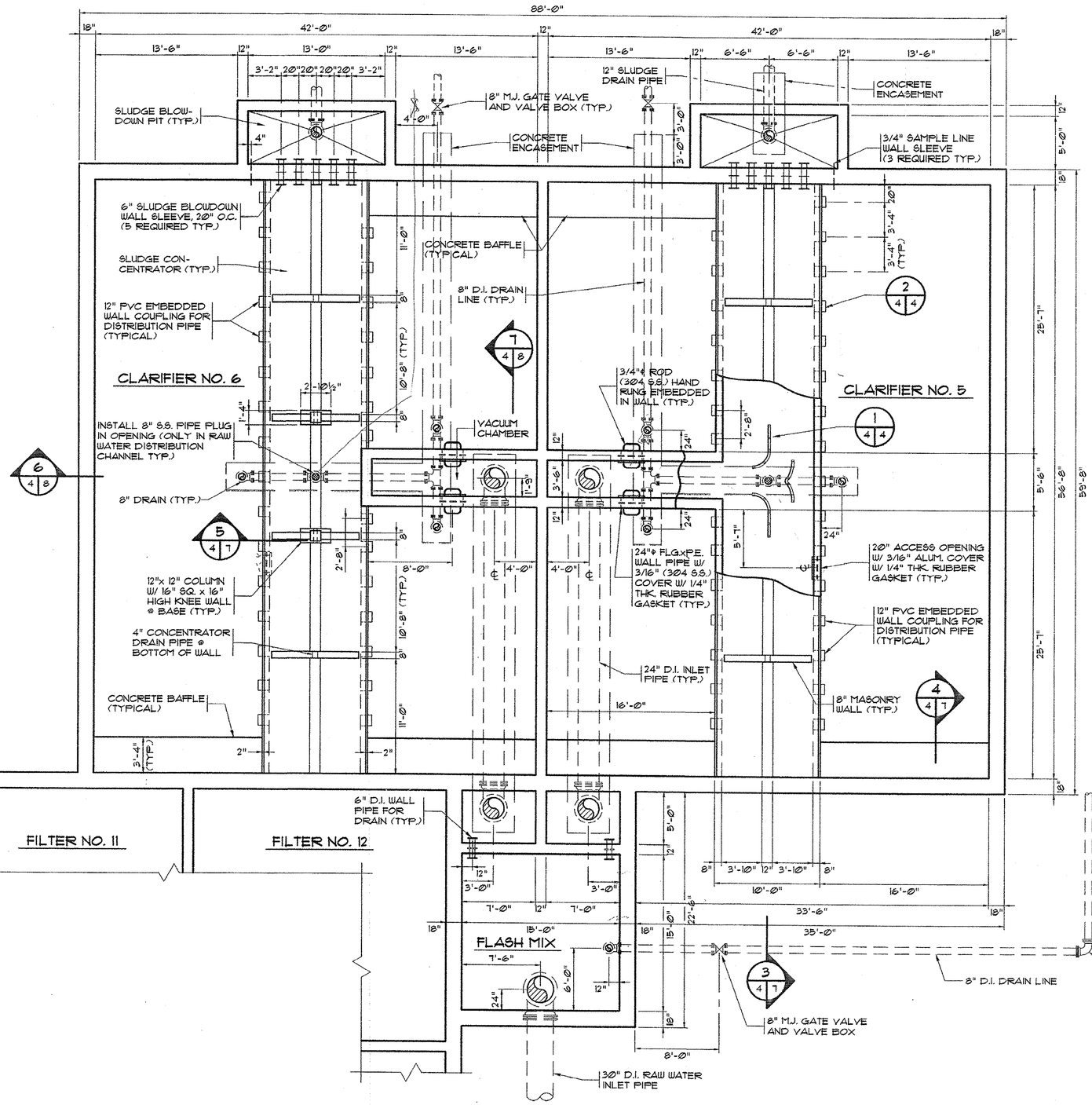
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	LAW
CHECKED:	WPD
SCALE:	AS SHOWN

SHEET NO. S-3
OF: 17

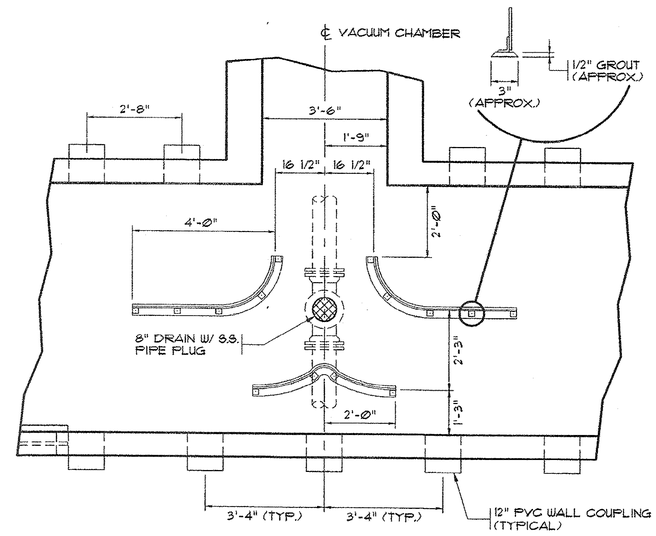
33-013-015

JANUARY 28, 2000 8:31AM P:\2000\2935\s03.dwg - ARCHWALL CUTSHEET COMPOSITE WORKSHEET G-NOTES, TRUSSES, TRUSSHTS

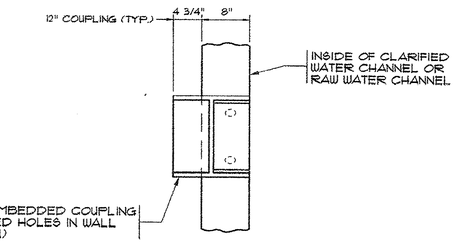


CLARIFIERS NO. 5 & 6 - LOWER PLAN
SCALE: 3/16" = 1'-0"

NOTE:
BOLT BAFFLES TO TOP OF CHANNEL FIRST, GROUT UNDER BAFFLES ON BOTTOM ALONG FULL LENGTH OF EACH BAFFLE.



1/4 4/4 DISTRIBUTION CHANNEL BAFFLE
N.T.S.



2/4 4/4 DISTRIBUTOR AND COLLECTOR WALL COUPLING
N.T.S.

4' ø 4' 8'
3/16" = 1'-0"

REVISIONS

SYM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

CLARIFIERS NO. 5 + 6
LOWER PLAN

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/STW
CHECKED:	WPD
SCALE:	AS SHOWN
SHEET NO.	S-4
OF:	17

SOUTH CAROLINA PROFESSIONAL ENGINEER 16570 WILLIAM P. DIXON 1/28/00

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
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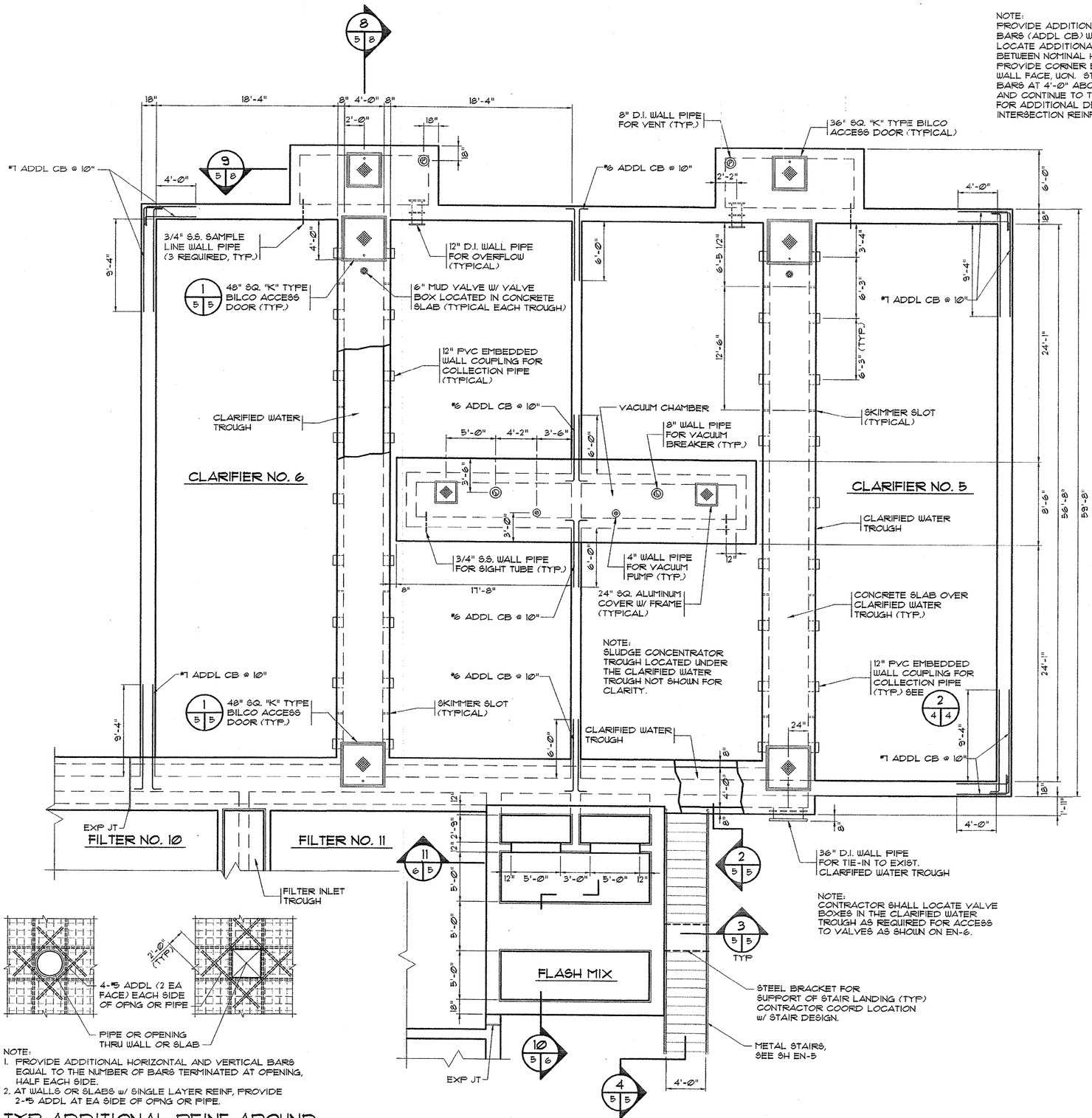
SOUTH CAROLINA DIXON ASSOCIATES C-00600 CERTIFICATE OF AUTHORIZATION

JANUARY 28, 2000 - 8:03AM - P:\99\02\99S\S04.dwg - OUTSET, HORIZ, CLASC

33-013-016



NOTE:
1. PROVIDE ADDITIONAL HORIZONTAL AND VERTICAL BARS EQUAL TO THE NUMBER OF BARS TERMINATED AT OPENING, HALF EACH SIDE.
2. AT WALLS OR SLABS w/ SINGLE LAYER REINF, PROVIDE 2-#5 ADDL AT EA SIDE OF OPNG OR PIPE.

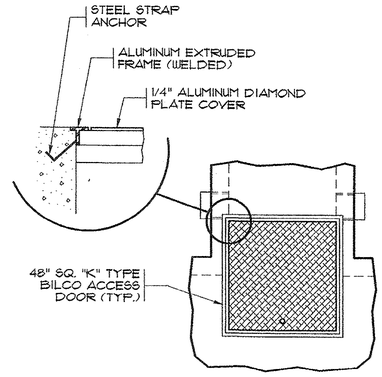
TYP ADDITIONAL REINF AROUND OPNG AT SLAB OR WALL

NO SCALE

CLARIFIERS NO. 5 & 6 - UPPER PLAN

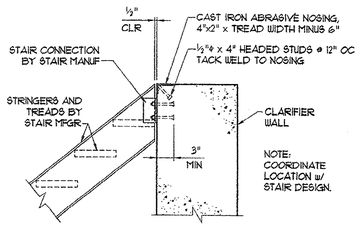
SCALE: 3/16" = 1'-Ø"

NOTE:
PROVIDE ADDITIONAL HORIZ CORNER REINF BARS (ADDL CB) WHERE SHOWN ON PLAN. LOCATE ADDITIONAL CORNER BARS BETWEEN NOMINAL HORIZ REINF. PROVIDE CORNER BARS ON EACH WALL FACE, UON. START CORNER BARS AT 4'-Ø" ABOVE BASE SLAB AND CONTINUE TO TOP OF WALL, UON. FOR ADDITIONAL DETAILS, SEE "TYP WALL INTERSECTION REINF."



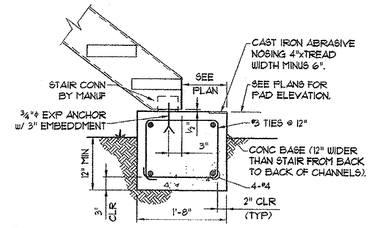
1/5 "K" TYPE ACCESS DOOR DETAIL

SCALE: 3/8" = 1'-Ø"



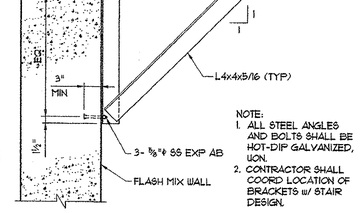
2/5 TYP STAIR TO WALL CONN

SCALE: 3/4" = 1'-Ø"



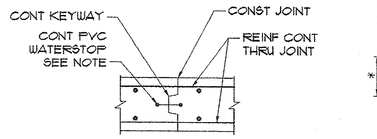
4/5 TYP EXTERIOR STAIR FTG

SCALE: 3/4" = 1'-Ø"



3/5 STAIR BRACKET DETAIL

SCALE: 3/4" = 1'-Ø"

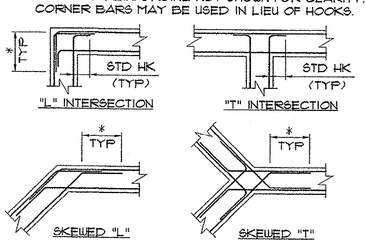


NOTE:
PROVIDE CONSTRUCTION JOINTS IN ALL WALLS AND SLABS AS REQUIRED FOR CONSTRUCTION AND AT 30'-Ø" MAX. PROVIDE CONTINUOUS PVC WATERSTOPS AT SLAB JOINTS, AT ALL EXTERIOR WALL JOINTS AND ANY INTERIOR WALL JOINTS WHERE DIFFERENTIAL HEIGHTS OF FLUIDS EXIST ON EITHER SIDE OF WALL. PLACE CONCRETE IN ALTERNATE SECTIONS.

TYP WALL OR SLAB CONSTRUCTION JOINT

NO SCALE

NOTE:
1. * DENOTES "CLASS B" LAP SPLICE.
2. VERTICAL REINFORCING NOT SHOWN FOR CLARITY. CORNER BARS MAY BE USED IN LIEU OF HOOKS.



TYP WALL INTERSECTION REINFORCING

NO SCALE

4' Ø 4' 8'
3/16" = 1'-Ø"
2' 0 2' 4'
3/8" = 1'-Ø"
1' Ø 1' 2'
3/4" = 1'-Ø"

SOUTH CAROLINA ESS 9936 PROFESSIONAL ENGINEER WILLIAM P. DIXON 1/28/00

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9936

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION DIXON ASSOCIATES C-00600

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

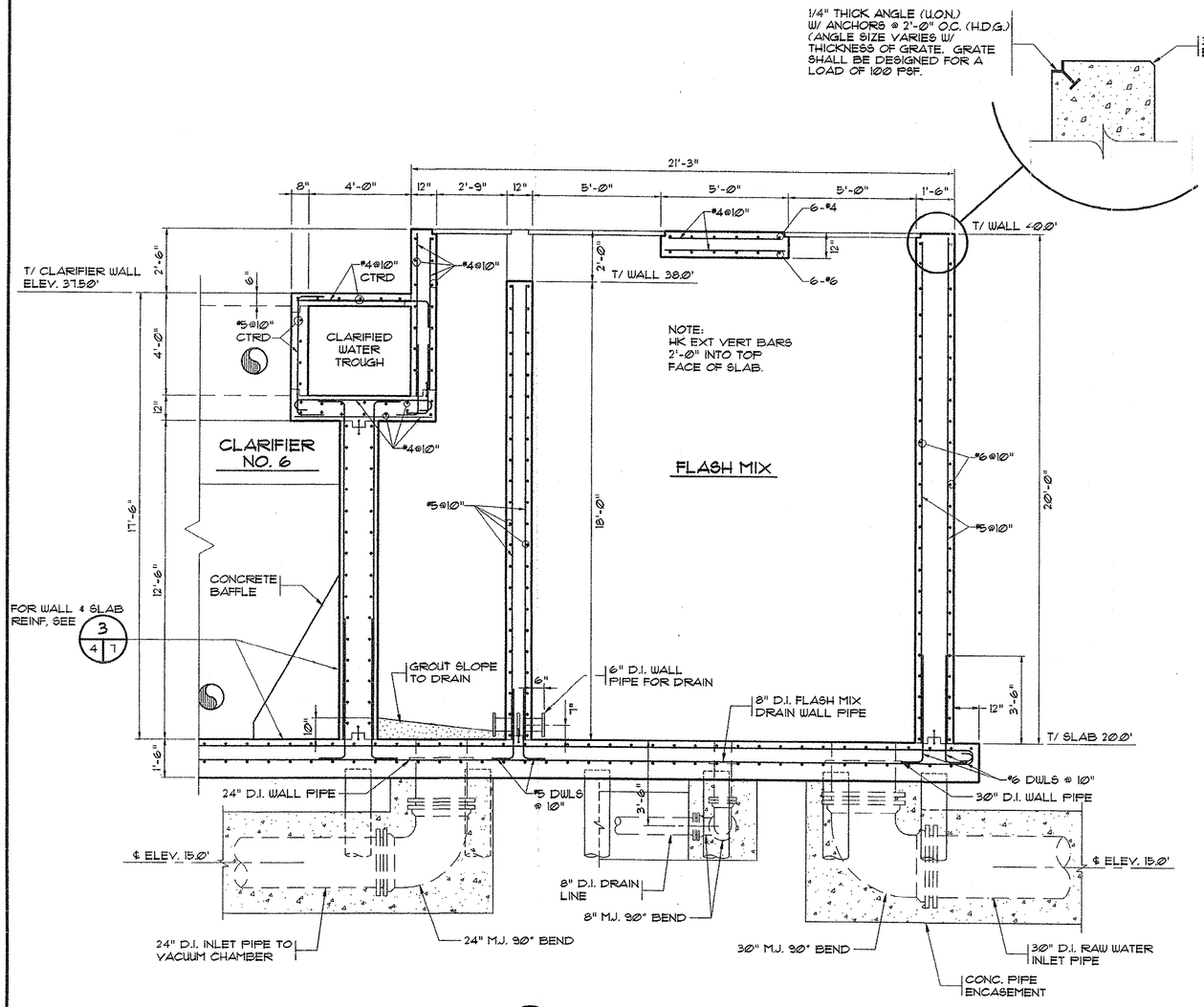
CLARIFIERS NO. 5 + 6
UPPER PLAN

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

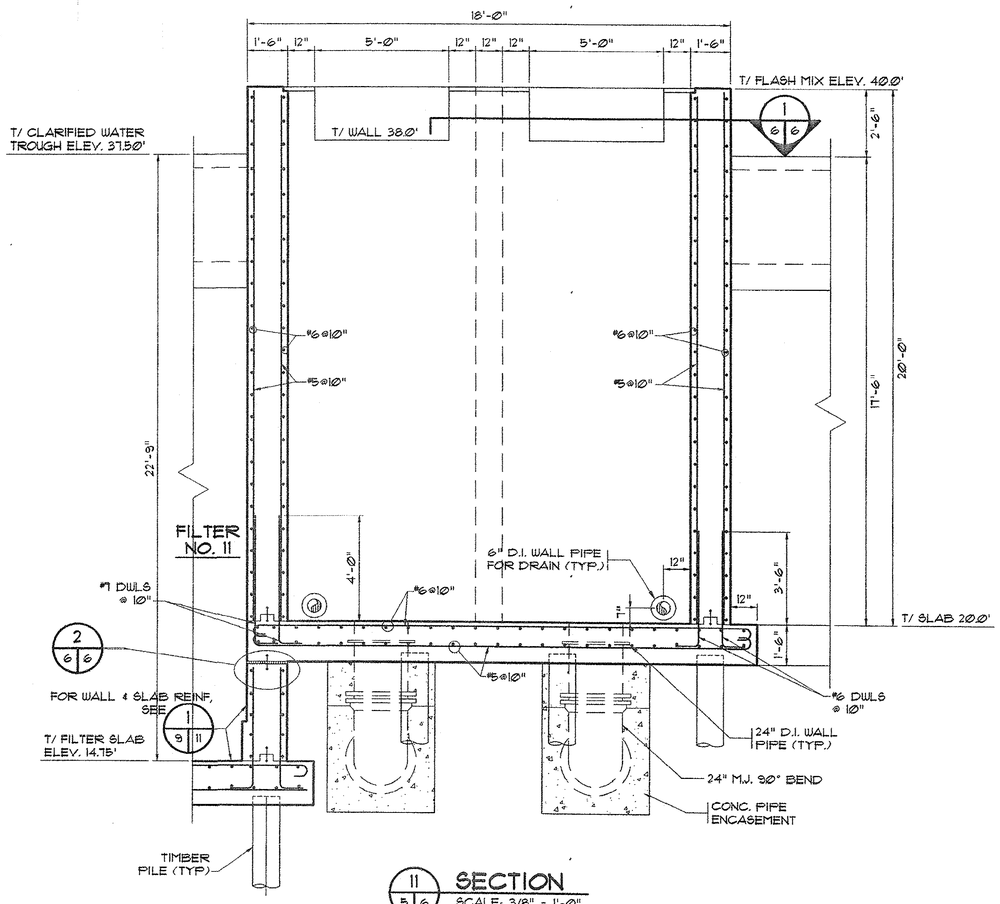
DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/STW/SHA
CHECKED:	WPD
SCALE:	AS SHOWN
SHEET NO.	S-5
OF:	17

33-013-017

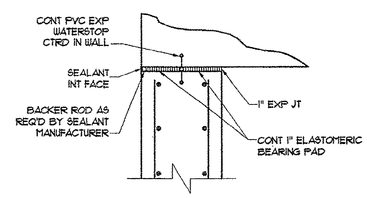
JANUARY 28, 2000 10:07AM K:\2000\2000105\dwg — CUTSHT WP350 CRACK STARTER, STARTER



10|5|6 SECTION
SCALE: 3/8" = 1'-0"

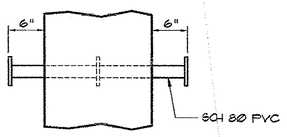


11|5|6 SECTION
SCALE: 3/8" = 1'-0"

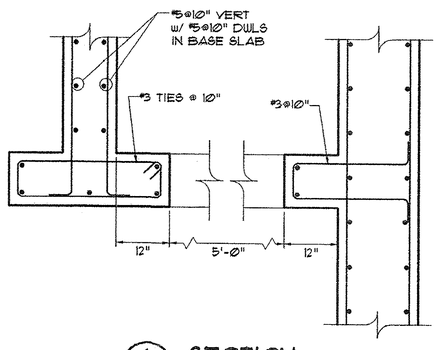


2|6|6 TYP HORIZ EXP JT @ FILTER WALL
SCALE: 3/4" = 1'-0"

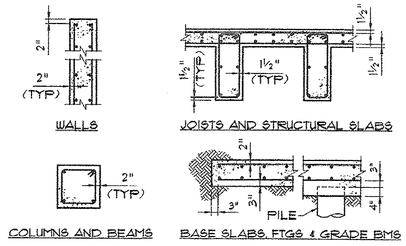
NOTE:
ALL CHEMICAL FEED WALL PENETRATIONS ARE CORE DRILLED AND GROUTED.



TYPICAL CHEMICAL FEED WALL PIPE DETAIL
SCALE: 1" = 1'-0"



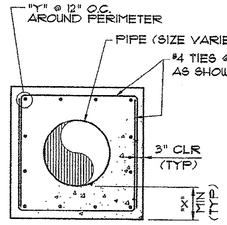
1|6|6 SECTION
SCALE: 3/4" = 1'-0"



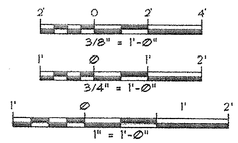
TYP REINF BAR CLEARANCES
(UNLESS OTHERWISE NOTED) NO SCALE

NOTE:
ENCASE PIPES UNDER ALL STRUCTURES 5'-0"± BEYOND OUTSIDE OF BUILDING.

PIPE DIA	"X"	"Y"
LESS THAN 12"	6"	#4
12" TO 24"	8"	#4
30" TO 48"	12"	#5
GREATER THAN 48"	1'-6"	#5



TYPICAL PIPE ENCASEMENT DETAIL
NO SCALE



REVISIONS

SYM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

FLASH MIX SECTIONS

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/SMH/STW
CHECKED:	WPD
SCALE:	AS SHOWN
SHEET NO.	S-6
OF:	17

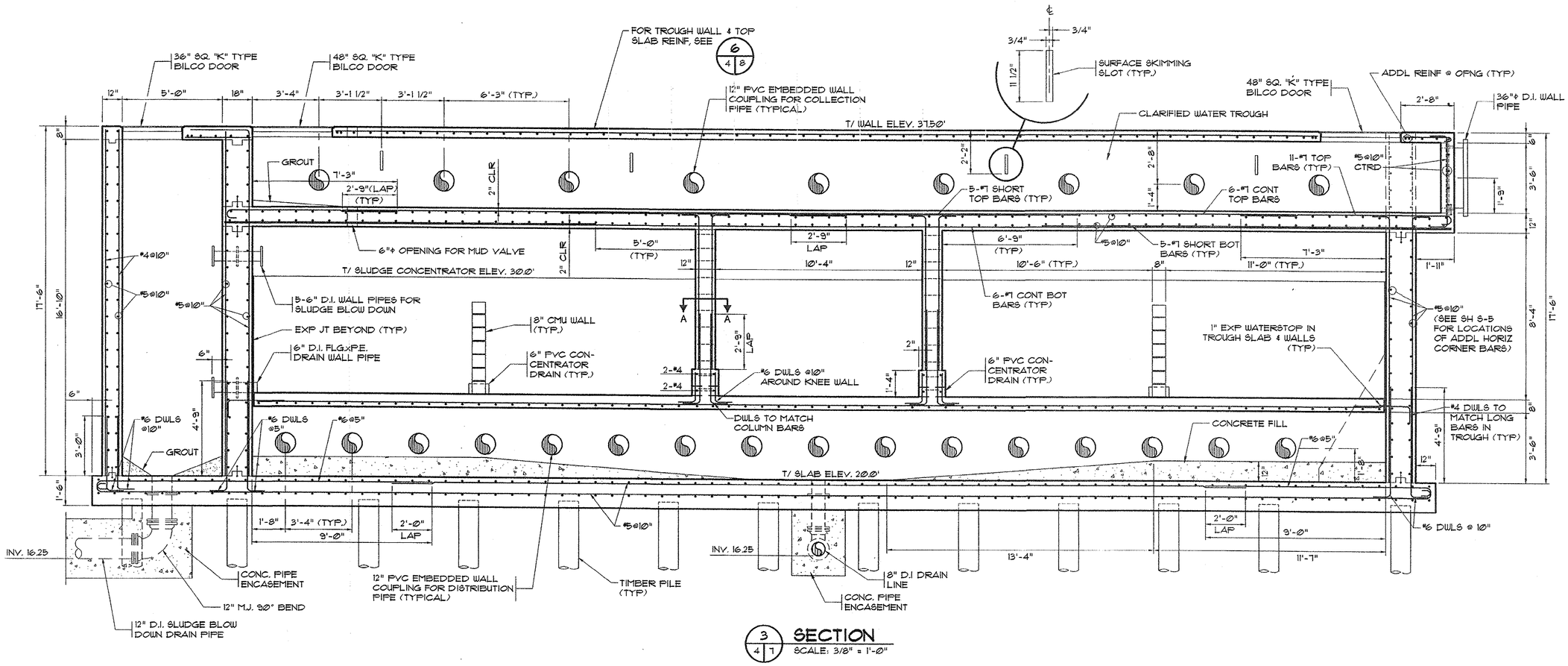
SOUTH CAROLINA PROFESSIONAL ENGINEER 9836 WILLIAM P. DIXON 1/28/00

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9836

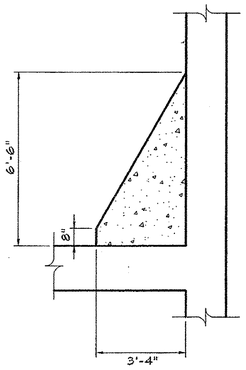
SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION DIXON ASSOCIATES C-00600

JANUARY 28, 2000 8:54AM P:\99\00\33\S\S6.dwg - OUTPUT: CGMS: HP650L: 1:ORDP

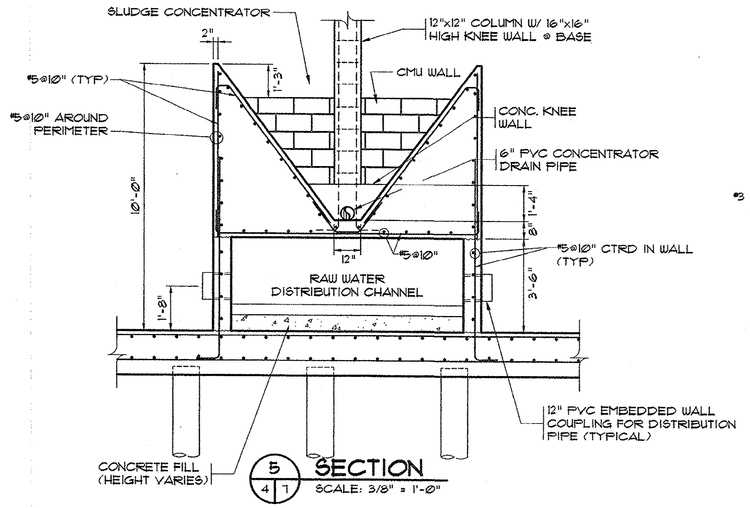
33-013-018



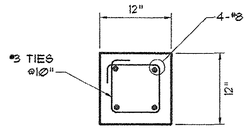
3/4 | 4 | SECTION
SCALE: 3/8" = 1'-0"



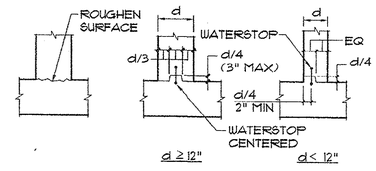
4/4 | 7 CONCRETE BAFFLE
SCALE: 3/8" = 1'-0"



5/4 | 7 SECTION
SCALE: 3/8" = 1'-0"



SECTION A-A
SCALE: 1" = 1'-0"



NOTE: ALL WATERSTOPS 6" PVC "DUMBELL" TYPE UON. SEE GENERAL NOTES.

STANDARD CONSTRUCTION JOINT DETAILS
NO SCALE

1" = 1'-0"

3/8" = 1'-0"

REVISIONS

STM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

CLARIFIER SECTIONS

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/STW
CHECKED:	WPD
SCALE:	AS SHOWN
SHEET NO.	S-7
OF:	17

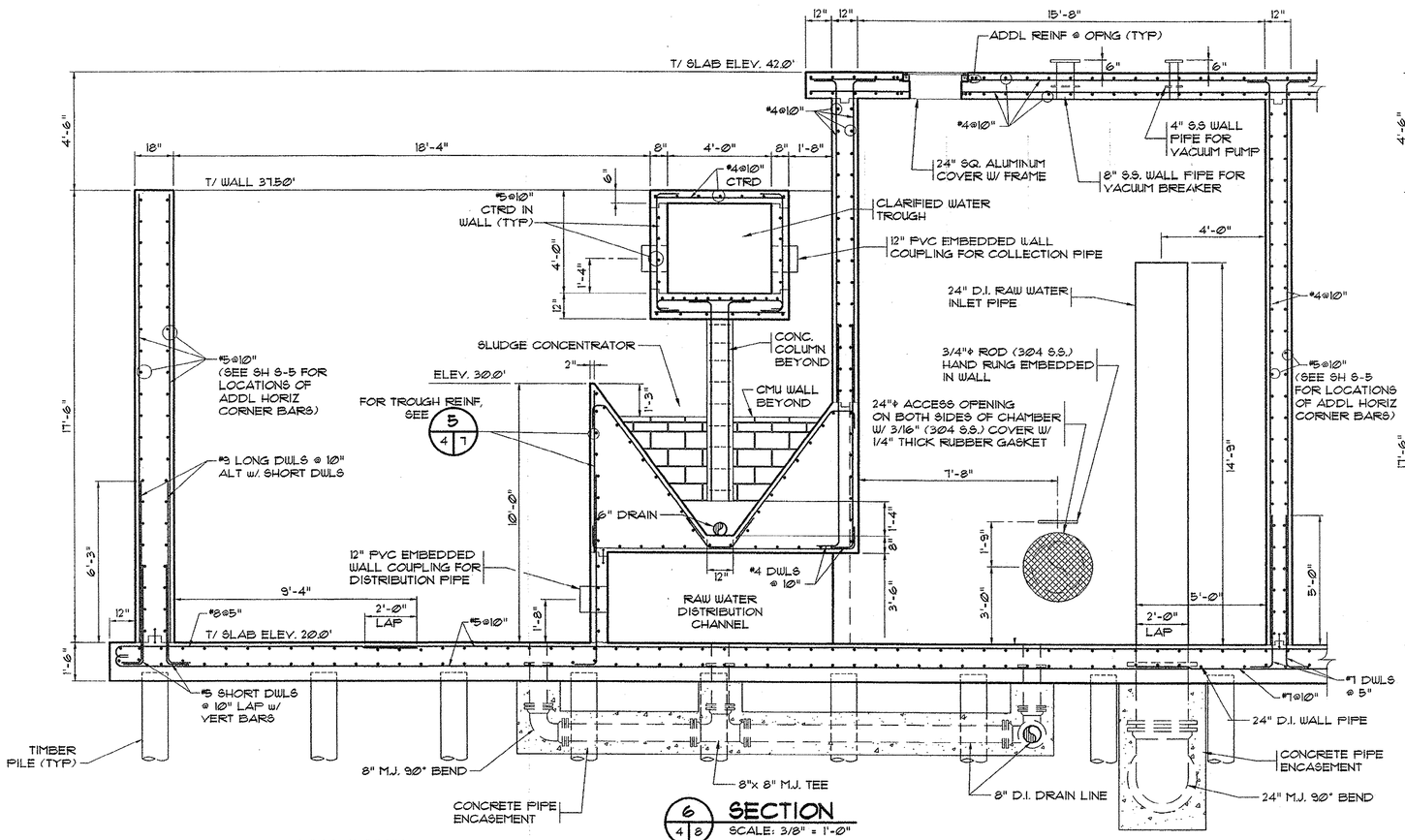
SOUTH CAROLINA PROFESSIONAL ENGINEER 17170 WILLIAM P. DIXON 1/28/00

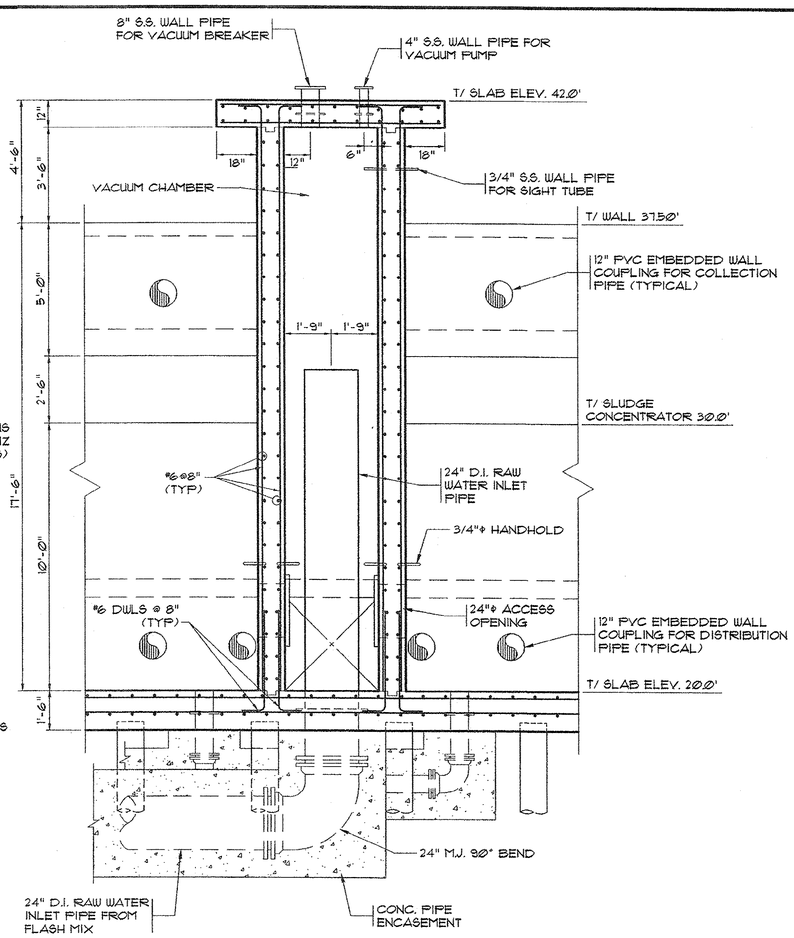
Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9936

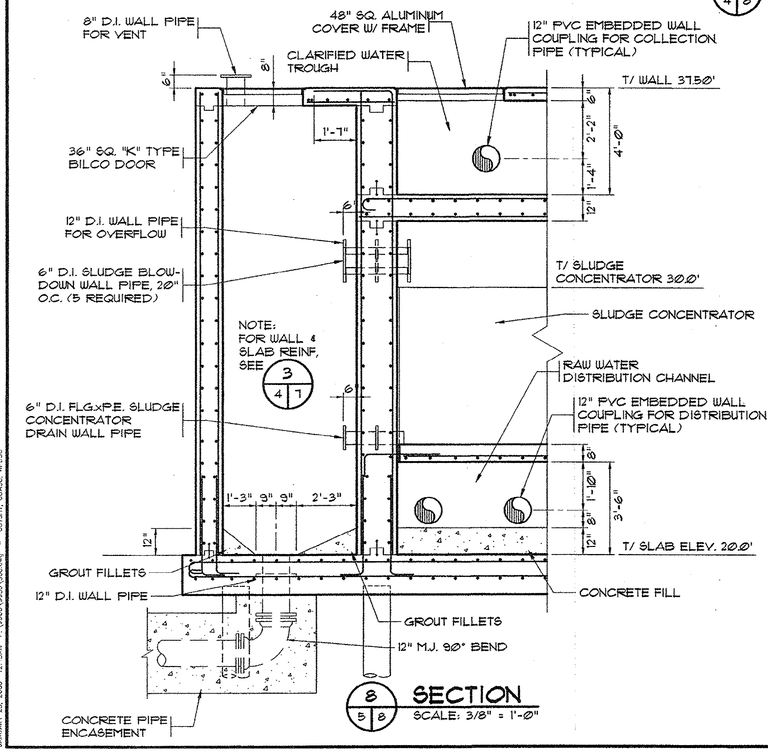
SOUTH CAROLINA DIXON ASSOCIATES C-00600 CERTIFICATE OF AUTHORIZATION

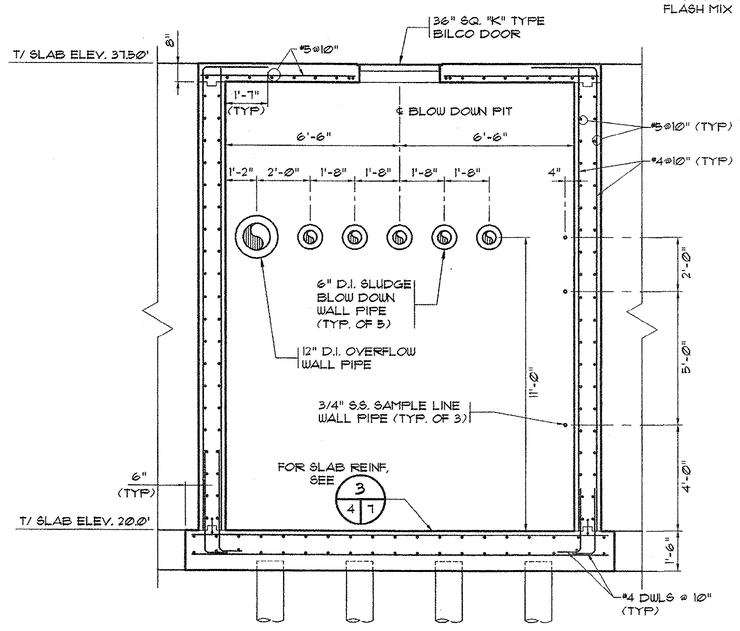
33-013-019

JANUARY 28, 2000 12:12AM P:\9920\1993\1\S07.dwg - CUTSHT, CONSC, WPDSC









REVISIONS

SYM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

CLARIFIER SECTIONS

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/STW
CHECKED:	WPD
SCALE:	AS SHOWN

SHEET NO. S-8
OF: 17

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9936

SOUTH CAROLINA PROFESSIONAL ENGINEER 21934 WILLIAM P. DIXON 1/28/00

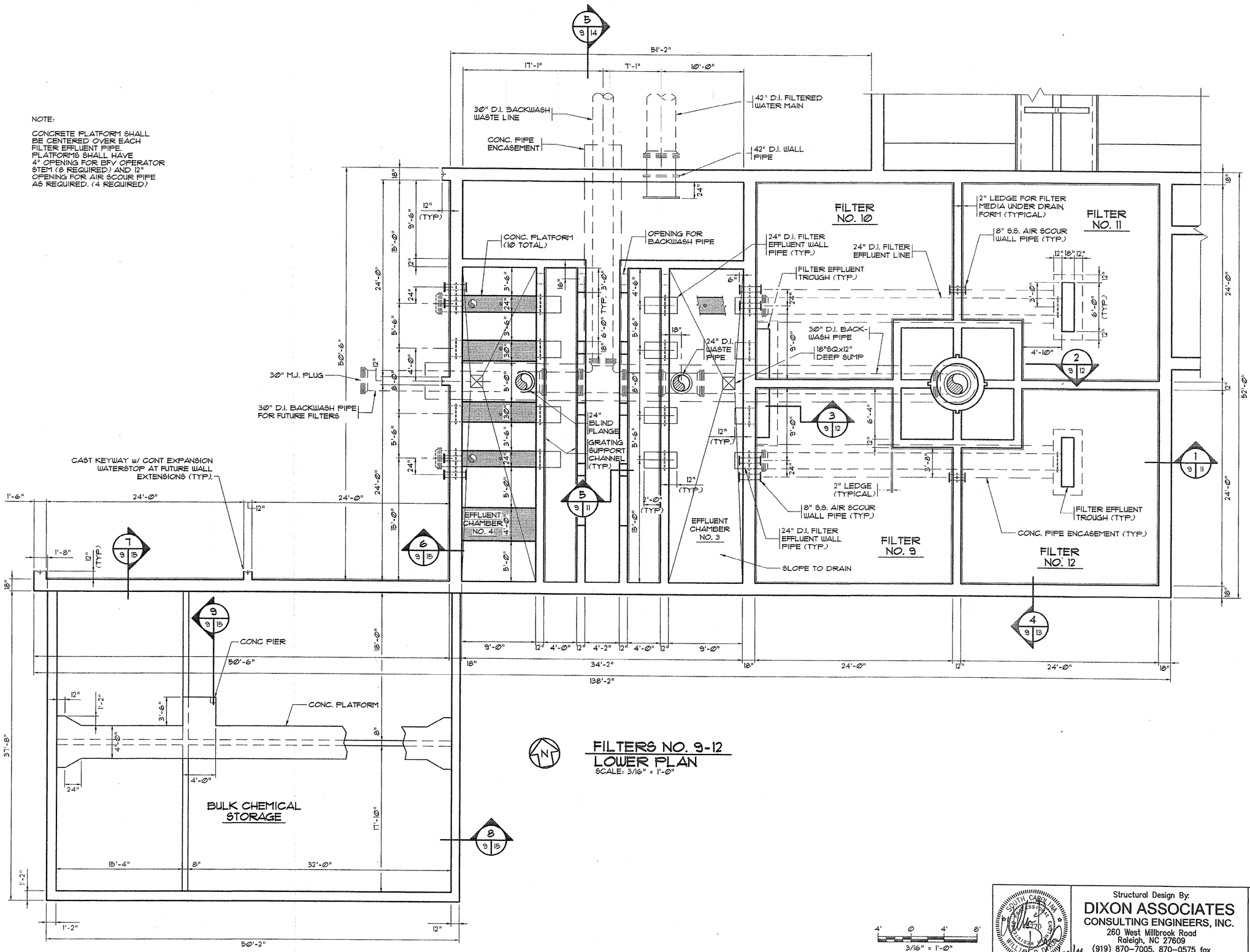
SOUTH CAROLINA DIXON ASSOCIATES C-00600 CERTIFICATE OF AUTHORIZATION

33-013-020

JANUARY 28, 2000 12:10AM P:\PROJ\9936\S\S08.dwg - GUEST, CHASE, WPD

NOTE:

CONCRETE PLATFORM SHALL BE CENTERED OVER EACH FILTER EFFLUENT PIPE. PLATFORMS SHALL HAVE 4" OPENING FOR BFV OPERATOR STEM (8 REQUIRED) AND 12" OPENING FOR AIR SCOUR PIPE AS REQUIRED. (4 REQUIRED)



N

FILTERS NO. 9-12 LOWER PLAN

SCALE: 3/16" = 1'-0"

4' 0 4' 8'

3/16" = 1'-0"

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH SOUTH CAROLINA 29577

FILTERS NO. 9-12
LOWER PLAN

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/STW
CHECKED:	WPD
SCALE:	AS SHOWN
SHEET NO.	S-9
OF:	17

SOUTH CAROLINA PROFESSIONAL ENGINEER 19570 WILLIAM P. DIXON 1/28/00

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9936

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION DIXON ASSOCIATES C-00600

JANUARY 28, 2000 12:14AM P:\9800\9936\S29.dwg - CUTSHT, COASC, WPDSC

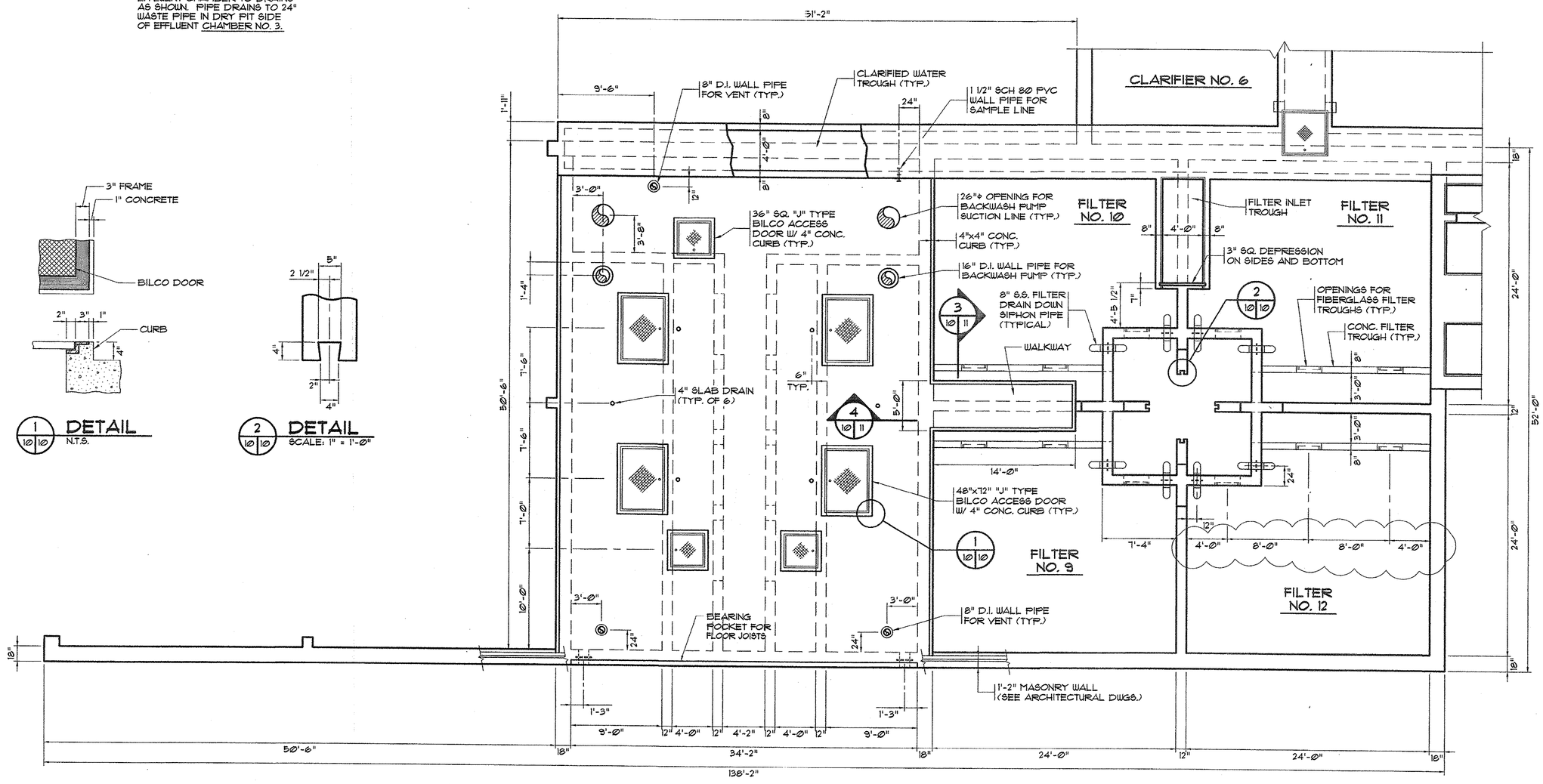
33-013-021

NOTES:

1. PIPE ALL DRAINS ON "J" TYPE BILCO DOORS TO 24" WASTE PIPE IN DRY PIT SIDE OF EFFLUENT CHAMBER.
2. SLOPE CONCRETE SLAB ON EFFLUENT CHAMBER TO DRAINS AS SHOWN. PIPE DRAINS TO 24" WASTE PIPE IN DRY PIT SIDE OF EFFLUENT CHAMBER NO. 3.

1/10/10 DETAIL
N.T.S.

2/10/10 DETAIL
SCALE: 1" = 1'-0"



N

FILTERS NO. 9-12
UPPER PLAN
SCALE: 3/16" = 1'-0"

1' 0 1'
1" = 1'-0"

4' 0 4' 8'
3/16" = 1'-0"

REVISIONS			
SYM.	DESCRIPTION	DATE	BY
	DHEC REVISIONS	3/15/00	JWM

SOUTH CAROLINA PROFESSIONAL ENGINEER
JOSEPH W. HOBBS
REGISTERED
NO. 12335

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

FILTERS NO. 9-12
UPPER PLAN

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/SMH
CHECKED:	WPD
SCALE:	AS SHOWN

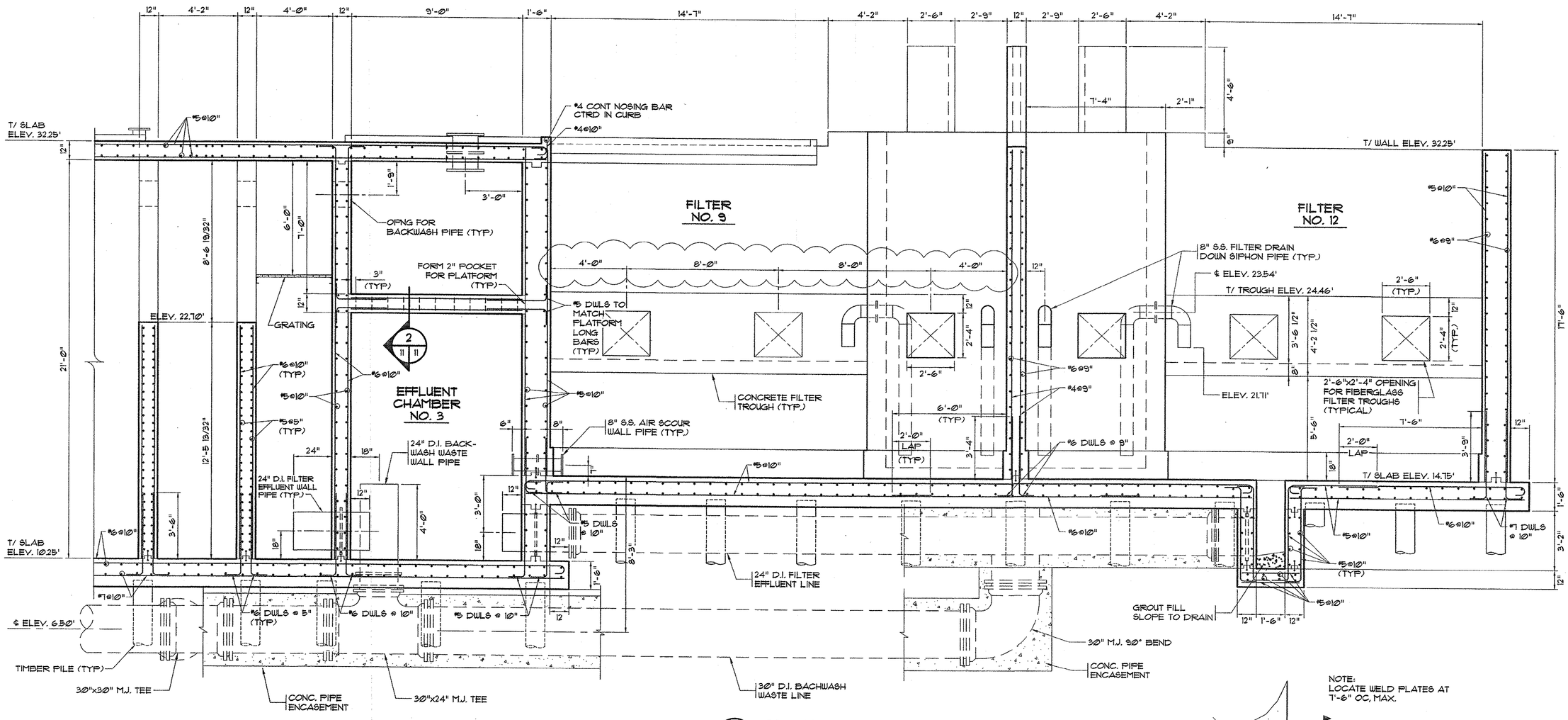
SHEET NO.
S-10
OF: 17

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax

9936

33-013-022

HOBBS UPCHURCH & ASSOC. J:\99814\45MGDUPGRADE\DIXONDWGS\S10.dwg,DWG EDITED BY: dc DATE: 03/17/00 TIME: 11:17 PLOT SCALE: 3/16"=1'-0"



1 | 9 | II SECTION
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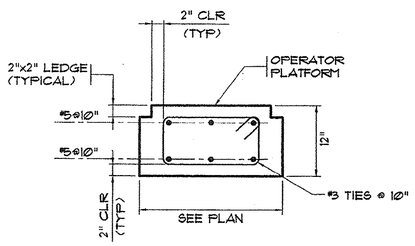

2 | 11 | II SECTION
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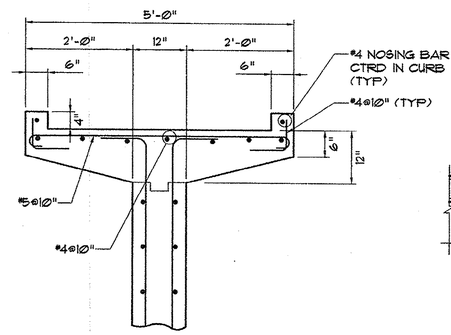
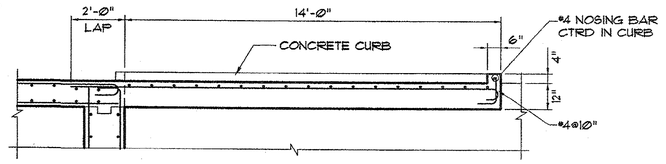


3 | 10 | II WALKWAY SECTION
N.T.S.



4 | 10 | II SECTION
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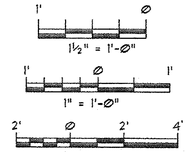
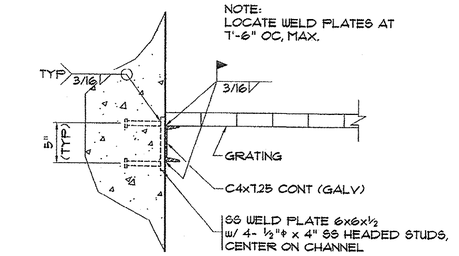




5 | 9 | II GRATING SUPPORT CHANNEL
SCALE: 1½" = 1'-0"

REVISIONS

SYM.	DESCRIPTION	DATE	BY
	DHEC REVISIONS	3/15/00	JWM

SOUTH CAROLINA PROFESSIONAL ENGINEER JOSEPH W. WOODSON 12335 REGISTERED

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

FILTERS SECTIONS AND DETAILS

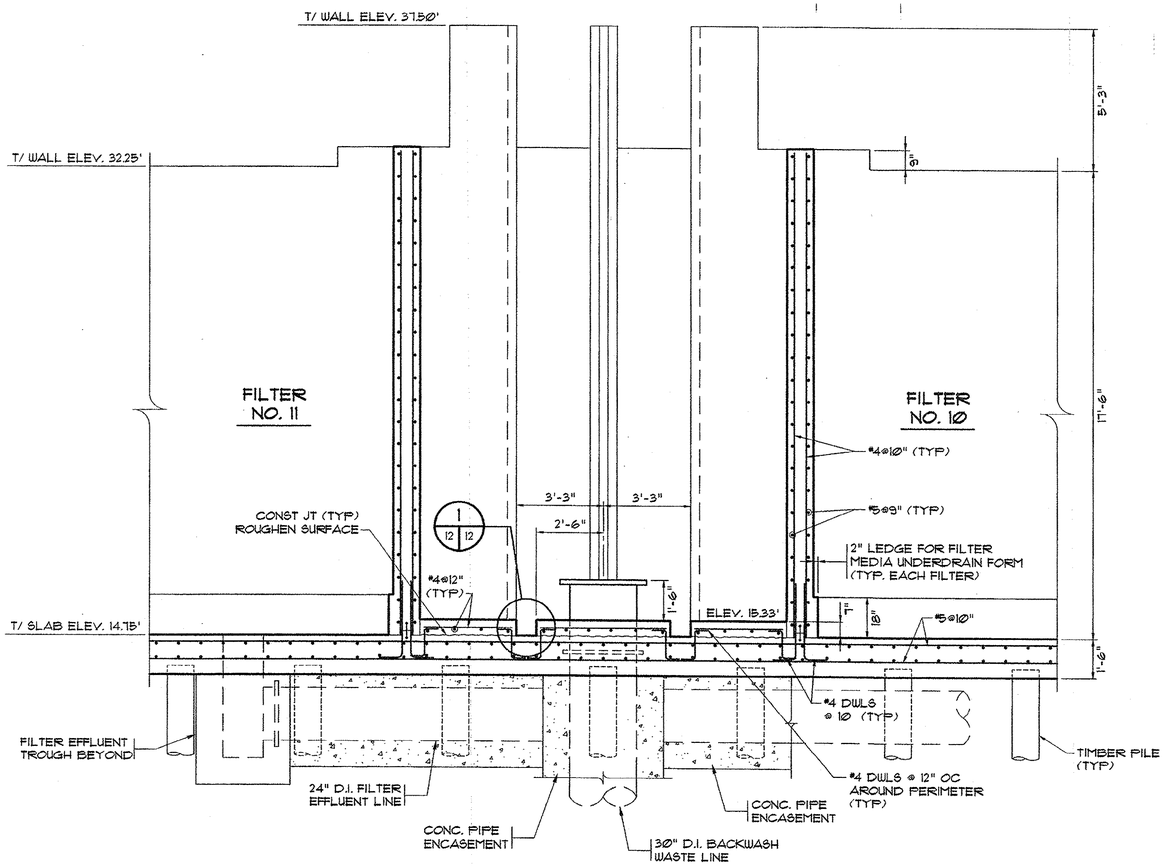
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/SMH
CHECKED:	WPD
SCALE:	AS SHOWN
SHEET NO.	S-11
OF:	17

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9936

HOBBS UPCHURCH & ASSOC. J:\GS9814\15MGDUPGRADE\DIXONDWGS\S11.dwg DWG EDITED BY: dc DATE: 03/17/00 TIME: 11:18 PLOT SCALE: 3/8"=1'-0"

33-013-023



2 / 9 | 12 SECTION
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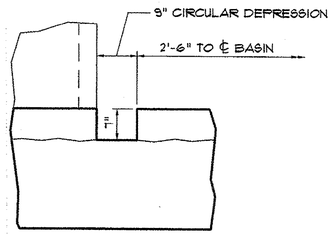

1 / 12 | 12 DETAIL
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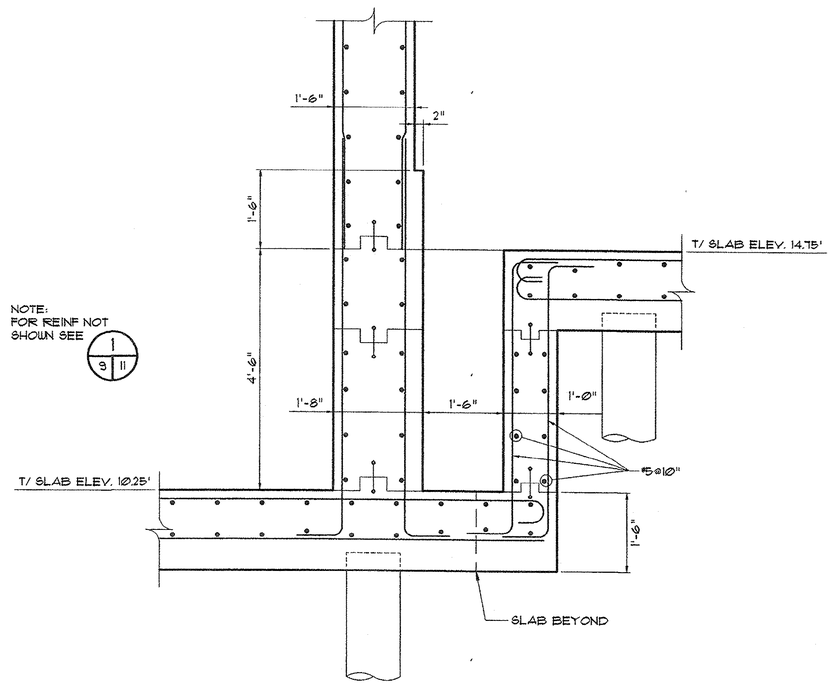


3 / 9 | 12 TYP. SECTION AT FILTER EFFLUENT COLLECTION TROUGH
SCALE: 3/4" = 1'-0"

2' 0 2' 4'
3/8" = 1'-0"

1' 0 1' 2'
3/4" = 1'-0"

REVISIONS

SYM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

FILTER SECTIONS AND DETAILS

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/SMH
CHECKED:	WPD
SCALE:	AS SHOWN

SHEET NO. S-12
OF: 17

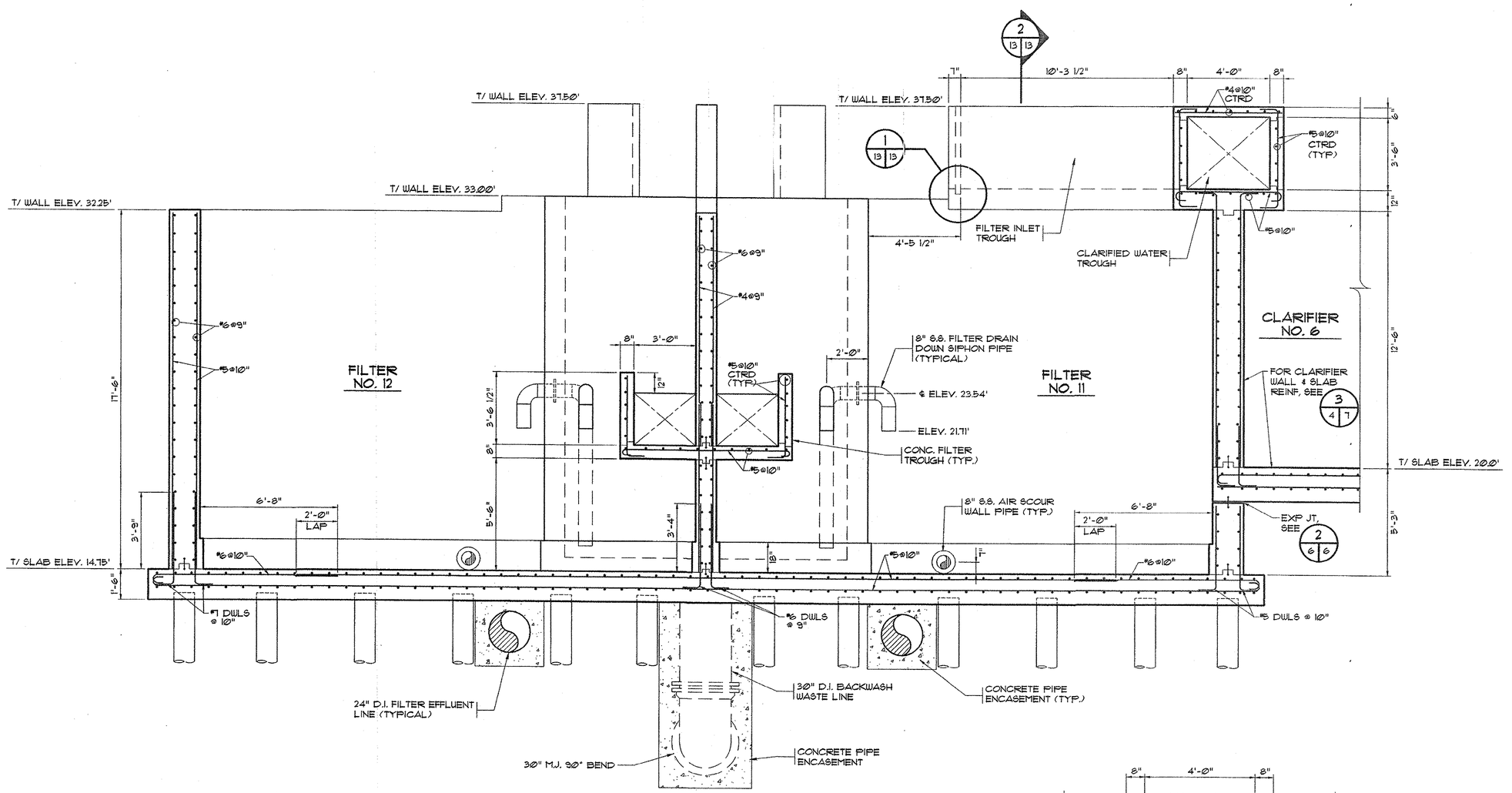
SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER 15770 WILLIAM P. DIXON 1/28/00

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9936

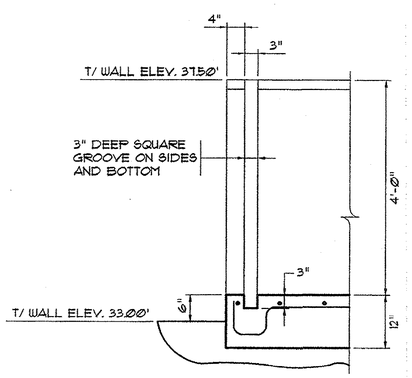
SOUTH CAROLINA DIXON ASSOCIATES C-00600 CERTIFICATE OF AUTHORIZATION

JANUARY 28, 2000 12:15AM P:\9900\9936\S12.dwg - CUTSHT, WPDSC, COASC

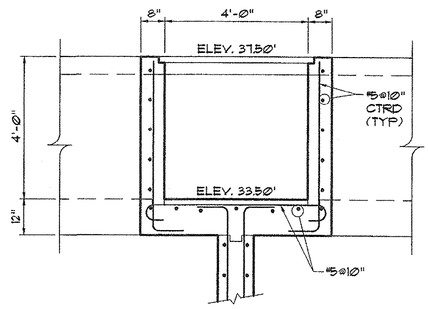
33-013-024



4/9/13 SECTION
SCALE: 3/8" = 1'-0"



1/13/13 SECTION
SCALE: 3/4" = 1'-0"



2/13/13 SECTION
SCALE: 1/2" = 1'-0"

2' 0 2' 4'
3/8" = 1'-0"
1' 0 1' 2'
3/4" = 1'-0"
2' 0 2' 4'
1/2" = 1'-0"

SOUTH CAROLINA PROFESSIONAL ENGINEER 19770 CIVIL 12/31/2000

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9936

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION DIXON ASSOCIATES C-00600

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

FILTER SECTIONS AND DETAILS

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/SMH
CHECKED:	WPD
SCALE:	AS SHOWN

SHEET NO.
S-13
OF: 17

33-013-025

JANUARY 28, 2000 12:16AM P:\99\01\99013\313.dwg — CITSHT, CDISC, WPSSC

CLARIFIED WATER TROUGH, SEE 4 | 9 | 13 FOR REINF

T/ WALL ELEV. 37.50'

1 1/2" SCH 80 PVC WALL PIPE FOR SAMPLE LINE

16" D.I. WALL PIPE FOR BACKWASH PUMP (TYP.)

#5@10"

T/ WALL ELEV. 37.50'

BILCO ACCESS DOORS W/ 4" CONC. CURB (TYP.)

8" D.I. WALL PIPE FOR VENT

2'-0"

BEARING POCKET

T/ SLAB ELEV. 32.25'

26"ϕ D.I. WALL SLEEVE FOR BACKWASH PUMP SUCTION LINE

12" D.I. WALL SLEEVE FOR AIR SCOUR PIPE

CLARIFIER BEYOND

#7@10"

1 | 14 | 14

ELEV. 22.70'

9'-6" 4'-0" 6'-0" 1'-6" 6'-0" 1'-6" 6'-0" 1'-6" 6'-0" 7'-0"

22'-0"

T/ SLAB ELEV. 20.0'

#6@10"

#5@9"

#5@10"

2'-0"

#7 LONG DWLS @ 10" ALT W/ SHORT DWLS

42" D.I. WALL PIPE (FLG.xP.E.)

3'-6"

2'-6"

42" D.I. FILTERED WATER LINE

#6 SHORT DWLS @ 10" LAP W/ VERT REINF

#6@10"

#7@10"

#5 DWLS @ 10"

CONC. PIPE ENCASEMENT

30" D.I. BACKWASH WASTE LINE

30"x30" M.J. TEE

5 | 9 | 14 SECTION
SCALE: 3/8" = 1'-0"

#5@10" VERT W/ #5@10" DWLS IN BASE SLAB

#6@10" HORIZ

12" 3'-0" 6'-0" (TYP.) 18" (TYP.)

3 TIES @ 10"

WEIR OPNG.

12"

3 TIES @ 10"

#8 VERT @ WEIR

6 - #8 LAP 3'-0" W/ VERT REINF

PLAN VIEW

1 | 14 | 14 TYP. REINF. DETAIL ABOVE TOP OF WEIR OPNG.
SCALE: 3/4" = 1'-0"

1' ϕ 1' 2'
3/4" = 1'-0"

2' ϕ 2' 4'
3/8" = 1'-0"

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
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(919) 870-7005, 870-0575 fax
9936

SOUTH CAROLINA PROFESSIONAL ENGINEER WILLIAM P. DIXON 1/18/00

DIXON ASSOCIATES C-00600 SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION

REVISIONS

SYM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

EFFLUENT CHAMBER SECTIONS

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/SMH
CHECKED:	WPD
SCALE:	AS SHOWN
SHEET NO.	S-14
OF:	17

33-013-026

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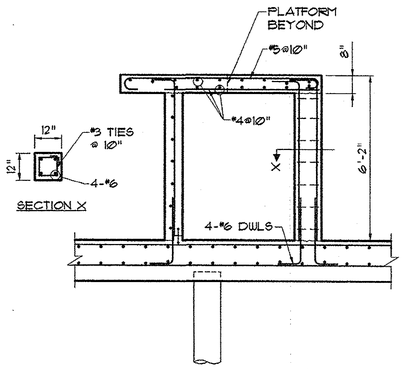
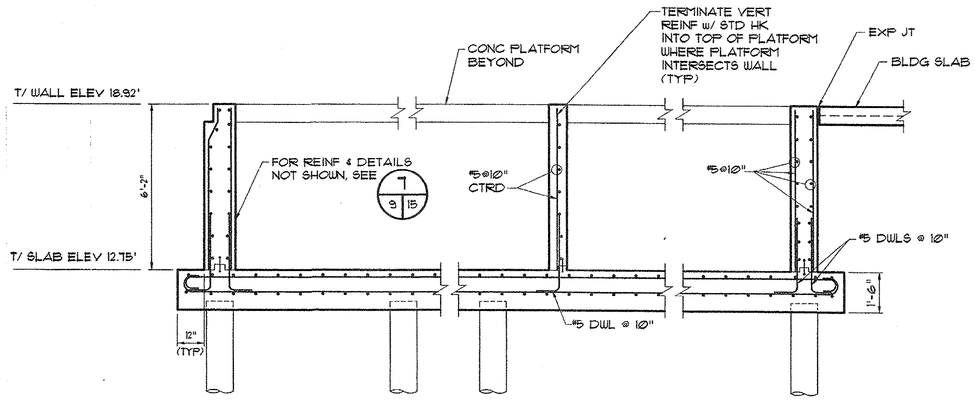
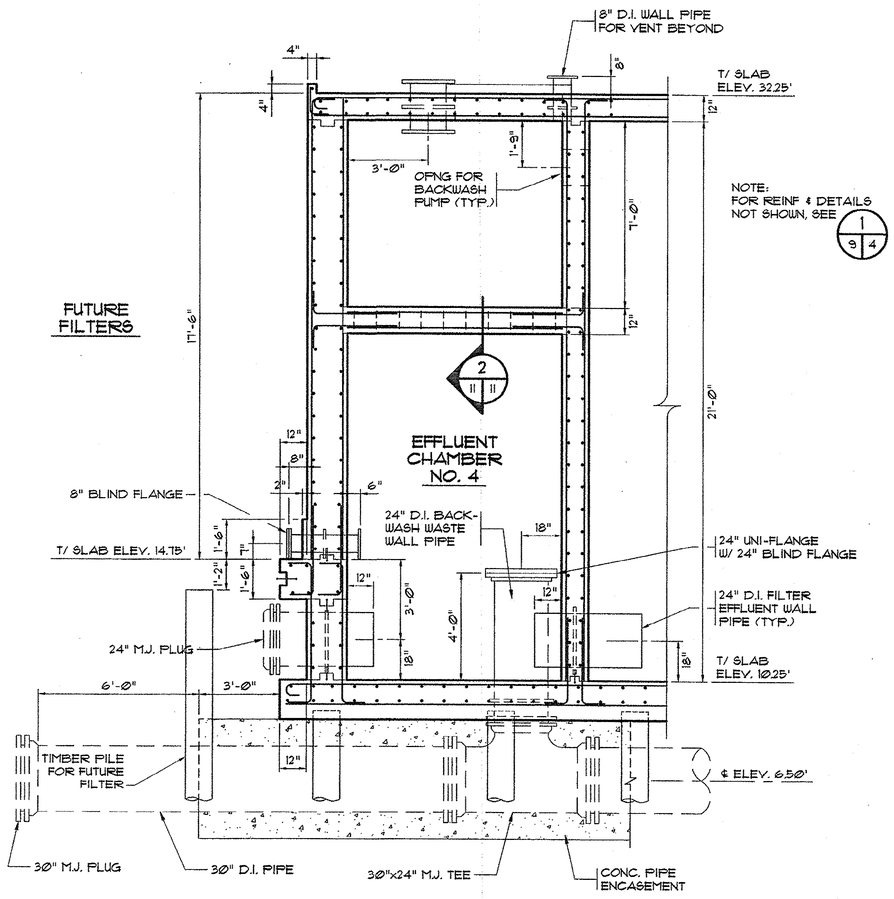


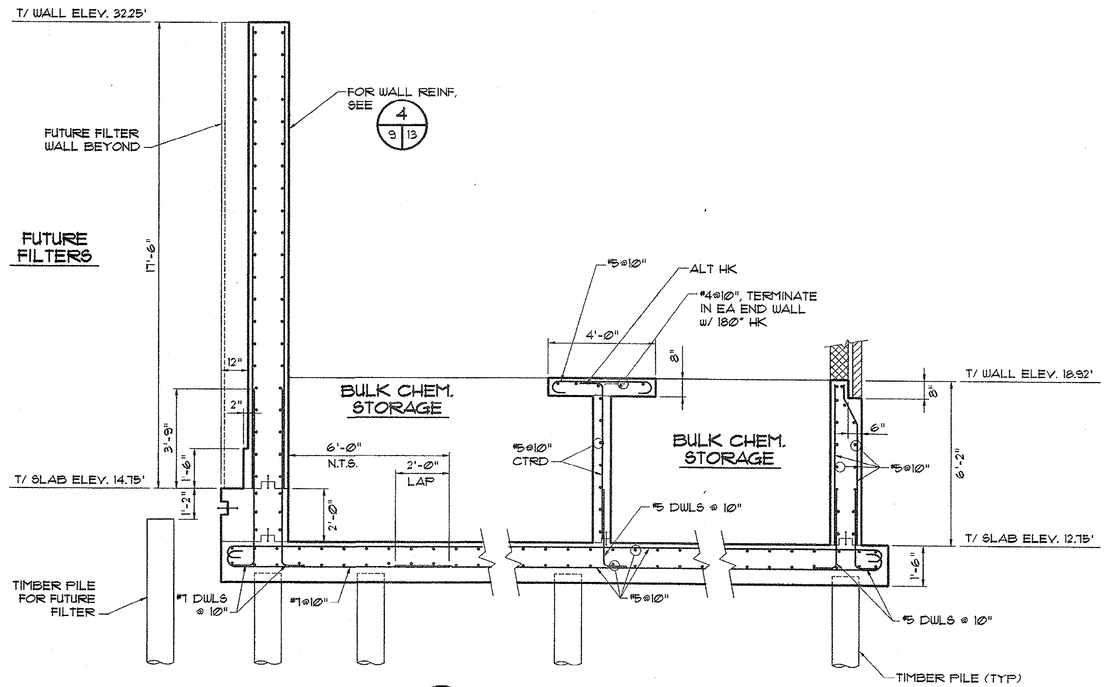
9 | 15 SECTION
SCALE: 3/8" = 1'-0"



8 | 9 | 15 SECTION
SCALE: 3/8" = 1'-0"



6 | 9 | 15 SECTION
SCALE: 3/8" = 1'-0"



7 | 9 | 15 SECTION
SCALE: 3/8" = 1'-0"

2' 0 2' 4'
3/8" = 1'-0"

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

EFFLUENT CHAMBER/ BULKCHEMICAL STORAGE SECTION

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	DC/STW
CHECKED:	WPD
SCALE:	AS SHOWN
SHEET NO.	S-15
OF:	17

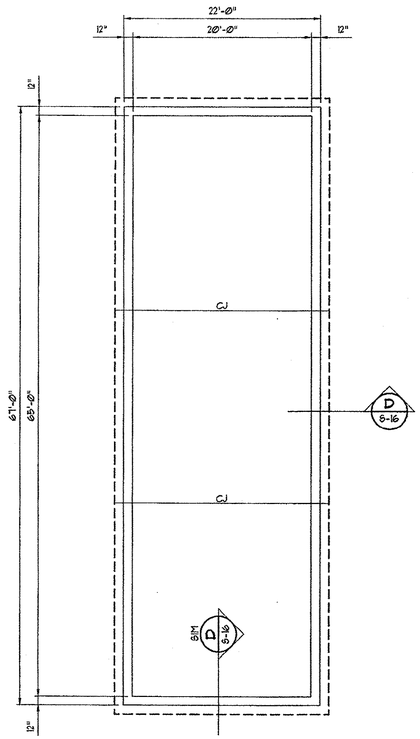
NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 9336 WILLIAM C. DIXON 1/24/00

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9336

SOUTH CAROLINA DIXON ASSOCIATES C-00600 CERTIFICATE OF AUTHORIZATION

33-013-027

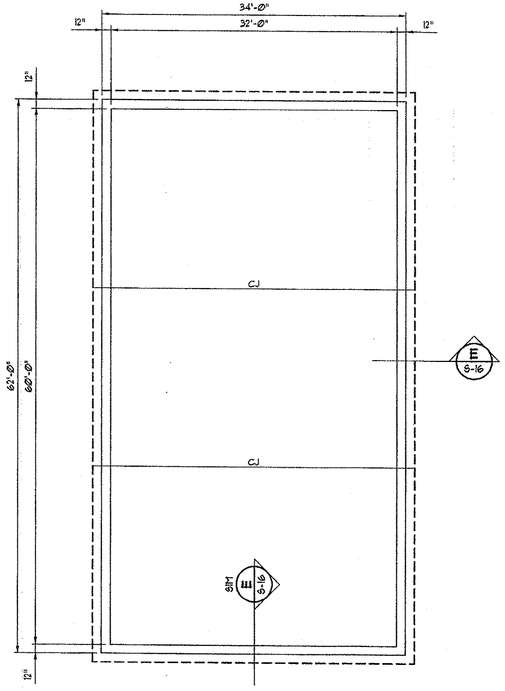
JANUARY 28, 2000 13:17AM P:\00000\99300\US15.dwg — CUTSHT, COASC, HPOSS, DETS, DETR



PLAN

FOUNDATION PLAN CHLORINE STORAGE

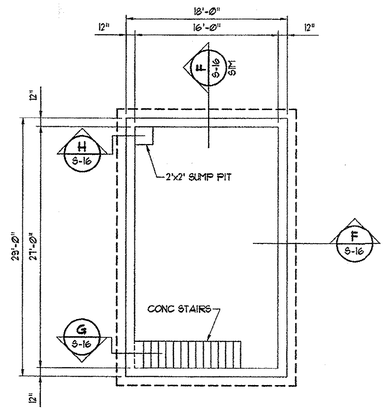
1/8" = 1'-Ø"



PLAN

FOUNDATION PLAN ALUM STORAGE

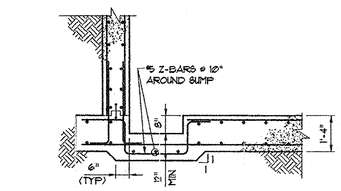
1/8" = 1'-Ø"



PLAN

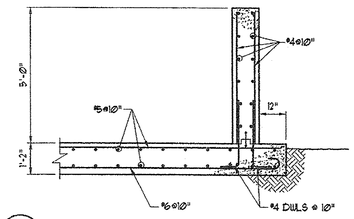
FOUNDATION PLAN SLUDGE DRAW-OFF PUMP STATION

1/8" = 1'-Ø"



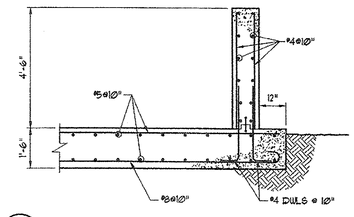
H S-16 SECTION THRU SUMP

3/8"=1'-Ø"



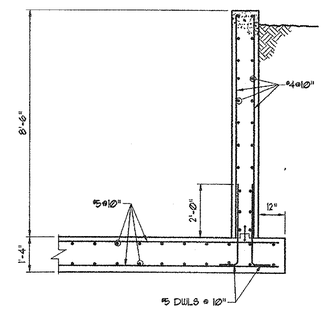
D S-16 TYP CLORINE STORAGE WALL SECTION

3/8"=1'-Ø"



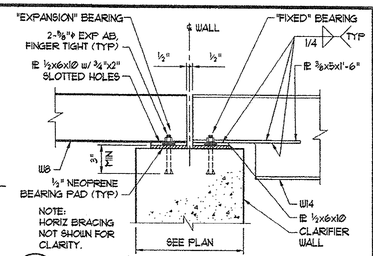
E S-16 TYP BULK ALUM STORAGE WALL SECTION

3/8"=1'-Ø"



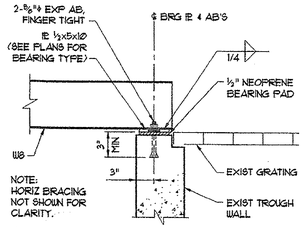
F S-16 TYP PUMP STATION WALL SECTION

3/8"=1'-Ø"



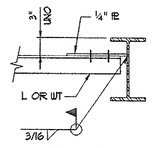
A S-16 TYP BRIDGE BEARING DETAIL

1"=1'-Ø"

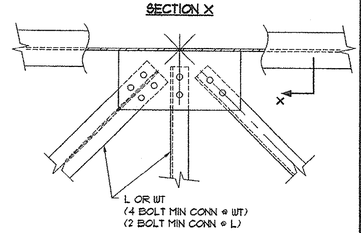


B S-16 BRIDGE BEARING DETAIL @ EXIST WALL

1"=1'-Ø"

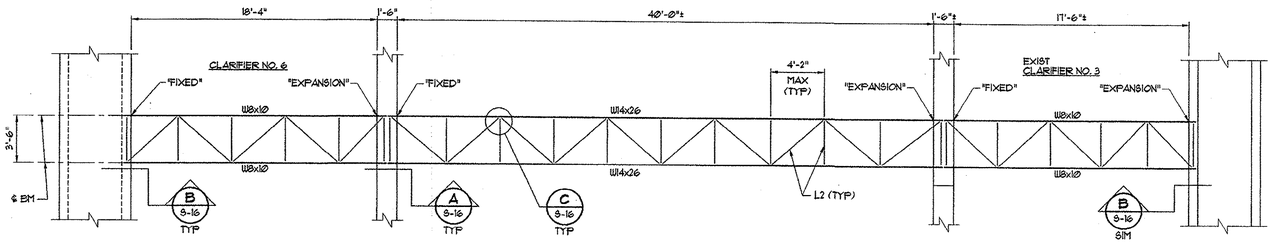


SECTION X



C S-16 TYP HORIZ BRACING CONN DETAIL

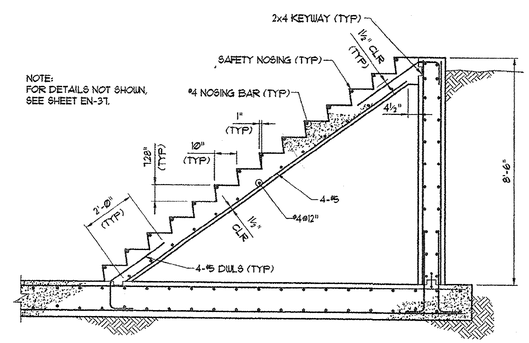
SCALE: 1"=1'-Ø"



FRAMING PLAN - ACCESS PLATFORM

3/16" = 1'-Ø"

NOTE:
1. FOR PLATFORM LOCATION, SEE SH EN-5.
2. "L2" INDICATES L2x2x¼ (-3") HORIZ BRACE, TOE DOWN.
3. ALL STEEL BEAMS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
4. ALL ANCHOR BOLTS SHALL BE A304 STAINLESS STEEL.
5. "EXPANSION" AND "FIXED" INDICATE BEARING TYPES, SEE A S-16 FOR DETAILS.



G S-16 CONC STAIR DETAILS

3/8"=1'-Ø"

REVISIONS

SYM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

MISCELLANEOUS FOUNDATION PLANS, PLATFORM FRAMING PLAN, AND DETAILS

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	SMH/SHA
CHECKED:	WPD
SCALE:	AS SHOWN
SHEET NO.	S-16
OF:	17

SOUTH CAROLINA PROFESSIONAL ENGINEER WILLIAM P. DIXON 24513 REGISTERED 1/24/00

Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
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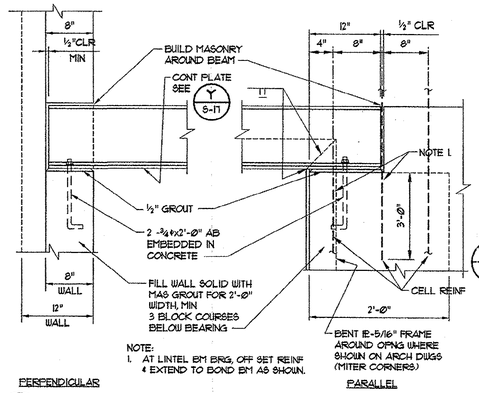
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9936

SOUTH CAROLINA DIXON ASSOCIATES C-00600 CERTIFICATE OF AUTHORIZATION

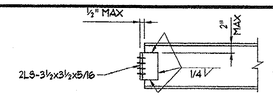
33-013-028

JANUARY 25, 2000 12:17AM P:\99\09\09S\16.dwg - CUTSHT_EXPBRG, HDWBRACE_BRIDGBRG, SECT_16, SECT_16, FND_JOS, FND_AS, FND_SDPS, SECT_16, SECT_16, STAIRS



NOTE:
1. AT LINTEL BM BRG, OFF SET REINF & EXTEND TO BOND BM AS SHOWN.

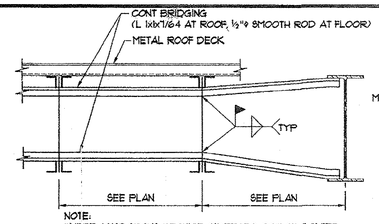
X S-17 TYP BEAM BEARING AT CMU WALL 1"=1'-0"



BEAM CONN. SCHEDULE			
BM DEPTH	L LENGTH	NO. BOLTS L CONN	NO. BOLTS PL CONN
8", 10"	0'-5½"	4	2
12", 14"	0'-8½"	6	3
16", 18"	0'-11½"	8	4
21", 24"	1'-2½"	10	5

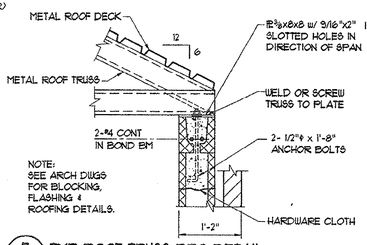
NOTE:
USE 2L8-3x3½x5/16 (SLO) WHERE BM FRAMES INTO W8 COL WEB. LARGER ANGLES MAY BE USED TO ACCOMMODATE COLUMN GAGES.

R S-17 TYP BEAM CONNECTIONS NO SCALE



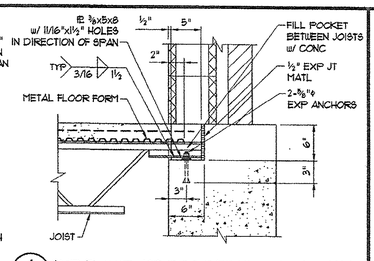
NOTE:
WHERE JOIST SPANS REQUIRE CENTERED ROW OF BOLTED CROSS BRIDGING, PROVIDE CROSS BRIDGING IN ACCORDANCE WITH SJI SPECIFICATIONS.

L S-17 TYP HORIZONTAL BRIDGING: 1" = 1'-0"



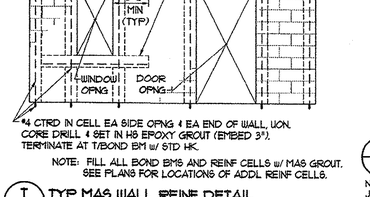
NOTE:
SEE ARCH DWGS FOR BLOCKING, FLASHING & ROOFING DETAILS.

F S-17 TYP ROOF TRUSS BRG DETAIL 3/4" = 1'-0"



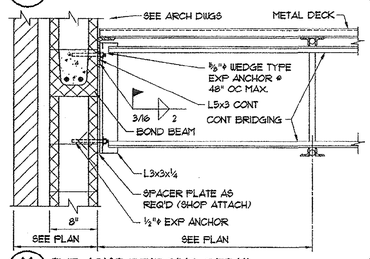
A S-17 TYP FLOOR JST BRG DETAIL @ CONC WALL 1" = 1'-0"

Y S-17 TYPICAL LINTEL DETAIL NO SCALE

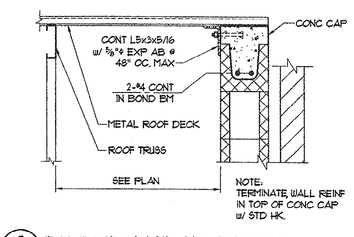


NOTE: FILL ALL BOND BMS AND REINF CELLS w/ MAS GROUT. SEE PLANS FOR LOCATIONS OF ADDL REINF CELLS.

S S-17 TYP FLOOR SECTION 3/4" = 1'-0"

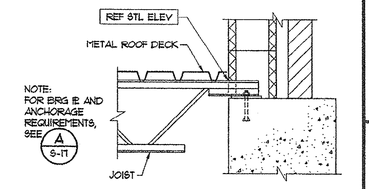


M S-17 TYP JOIST BRIDGING DETAIL 1" = 1'-0"



NOTE:
TERMINATE WALL REINF IN TOP OF CONC CAP w/ STD HK.

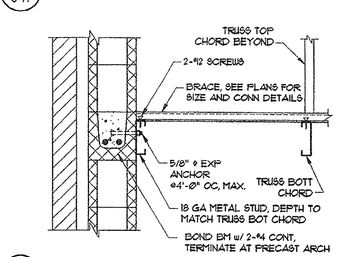
G S-17 TYP ROOF DETAIL AT GABLE END 1"=1'-0"



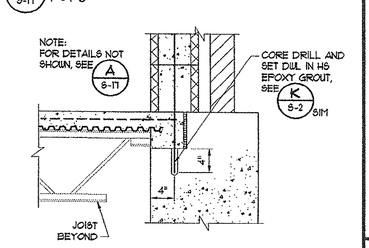
B S-17 TYP ROOF JOIST BRG DETAIL @ CONC WALL 1" = 1'-0"

NOTE:
WHERE JOISTS FROM OPPOSITE SIDES OF WALL ARE NOT IN LINE, PROVIDE BEARING PLATES OF SUFFICIENT LENGTH TO RECEIVE JOISTS, OR PROVIDE PL ⅜x8x8 AS REQUIRED AT SINGLE JOISTS.

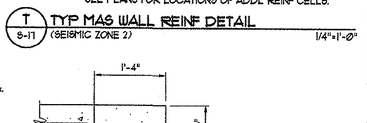
N S-17 TYP JOIST BEARING DETAIL AT MASONRY WALL 3/4" = 1'-0"



H S-17 TYP TRUSS BOT CHORD BRACING 1"=1'-0"

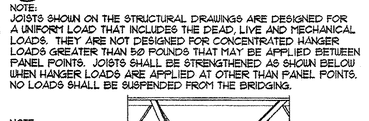


C S-17 TYP MAS WALL REINF DETIAL @ CONC WALL 1" = 1'-0"



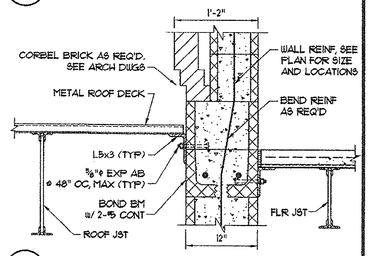
BREAK-OUT BOTTOM OF BOND BEAM AS REQD TO ALLOW PASSAGE OF REINF AND PLACEMENT OF CONC. SEE ARCH DWGS AND ELEVS FOR LOCATIONS.

T S-17 TYP MAS WALL REINF DETAIL (SEISMIC ZONE 2) 1/4"=1'-0"

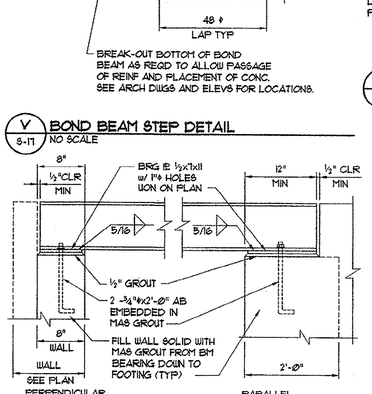


NOTE:
WHERE JOISTS BEAR FROM ONLY ONE SIDE OR ARE NOT OPPOSITE ONE ANOTHER, EXTEND FULL BEARING TO FULL WIDTH OF BEAM FLANGE, UON.

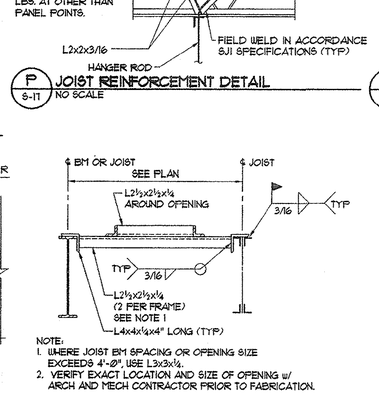
J S-17 TYP JOIST TO BEAM CONN 3/4" = 1'-0"



D S-17 TYP WALL SECTION AT LOW ROOF / 2ND FLR 1" = 1'-0"

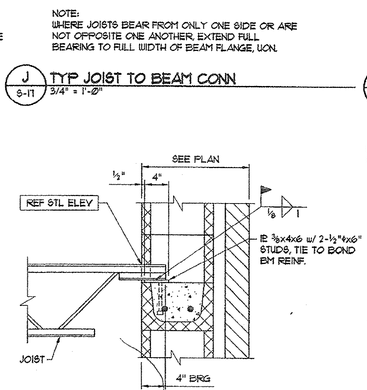


W S-17 TYP BEAM BEARING DETAILS AT WALLS NO SCALE

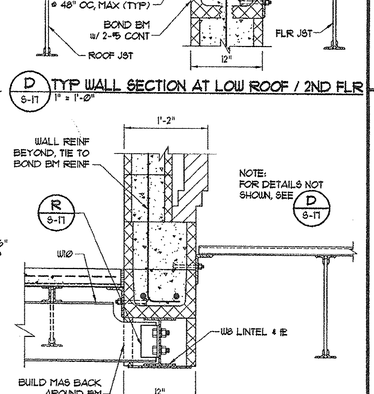


NOTE:
1. WHERE JOIST BM SPACING OR OPENING SIZE EXCEEDS 4'-0", USE L3x3x¼.
2. VERIFY EXACT LOCATION AND SIZE OF OPENING w/ ARCH AND MECH CONTRACTOR PRIOR TO FABRICATION.

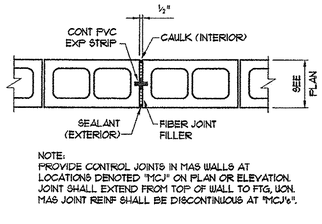
Q S-17 TYP FRAME AROUND ROOF OPENING NO SCALE



K S-17 TYP JOIST BEARING DETAIL 1" = 1'-0"

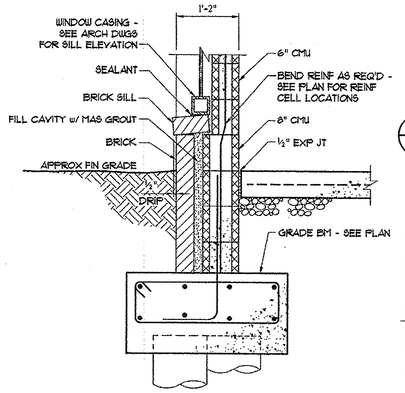


E S-17 WALL SECTION AT LINTEL BM 1" = 1'-0"



NOTE:
PROVIDE CONTROL JOINTS IN MAS WALLS AT LOCATIONS DENOTED "MCJ" ON PLAN OR ELEVATION. JOINT SHALL EXTEND FROM TOP OF WALL TO FTG, UON. MAS JOINT REINF SHALL BE DISCONTINUOUS AT "MCJ's".

BB S-17 TYP MAS WALL CONTROL JOINT (MCJ) 1"=1'-0"



AA S-17 WALL SECTION AT STOREFRONT WINDOW 3/4"=1'-0"

REVISIONS

SYM.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

MISC DETAILS

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN 2000
DESIGNED:	SHA
DRAWN:	LAW
CHECKED:	WPD
SCALE:	AS SHOWN
SHEET NO.	S-17
OF:	17

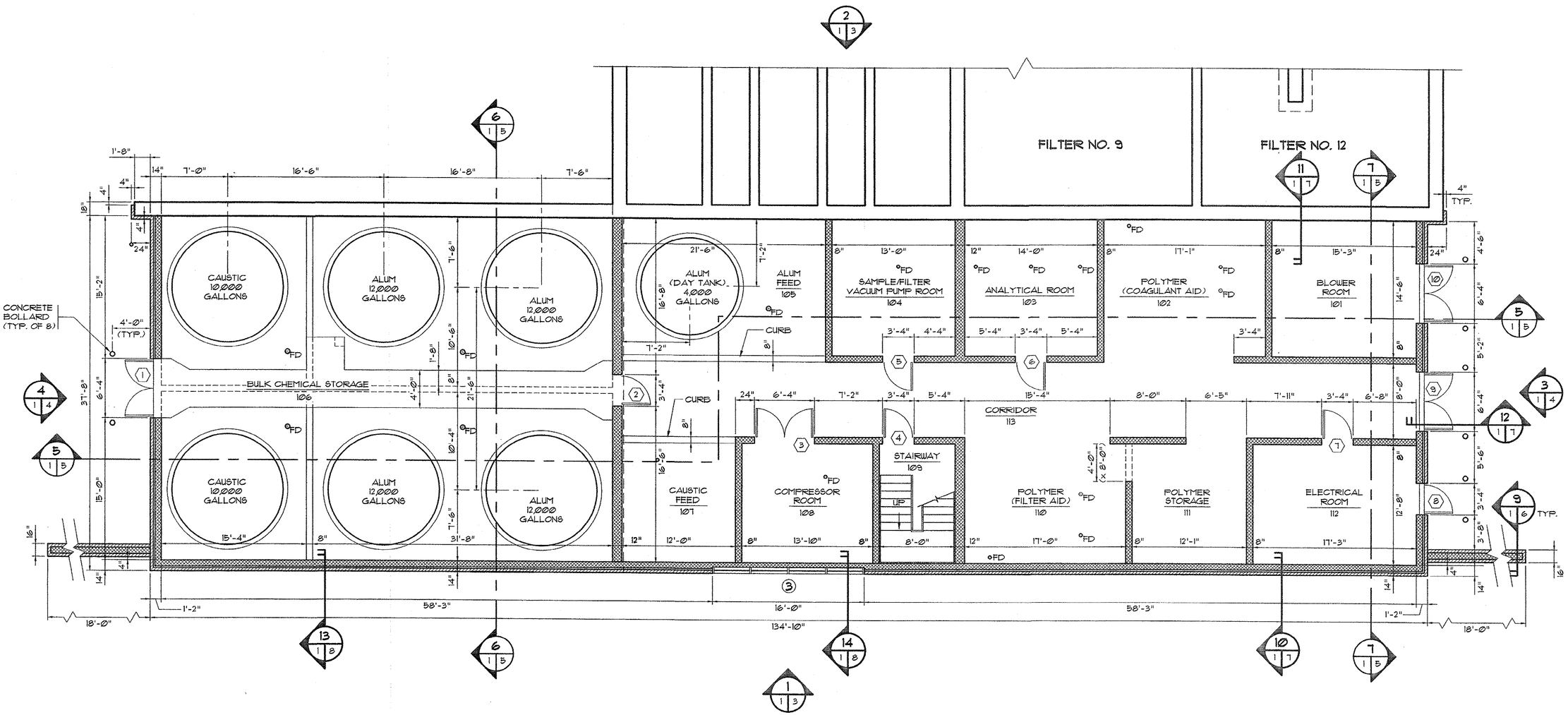
Structural Design By:
DIXON ASSOCIATES
CONSULTING ENGINEERS, INC.
260 West Millbrook Road
Raleigh, NC 27609
(919) 870-7005, 870-0575 fax
9936

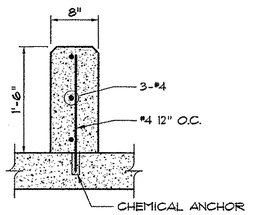
SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER WILLIAM E. DIXON 1/28/00

SOUTH CAROLINA DIXON ASSOCIATES C-00600 CERTIFICATE OF AUTHORIZATION

33-013-029

JANUARY 28, 2000 12:18AM P:\99000\99053\S17.dwg - CUTSHT, CONSE, MPOSE, A_S3, B_S4, C_S3, D_S3, E_S3, TRUSSBRG, GABEL, TRUSPACE, JOI1, JOI8, J1A, J1NA, JOI1A, JSTRENF, STL13, STL36, JOI, CANTSHT, BM





CONCRETE CONTAINMENT CURB

SCALE: 1" = 1'-0"

1' 6" 0 1'

FIRST FLOOR PLAN

SCALE: 3/16" = 1'-0"

4' 2' 0 4' 8'

NOTE:
SEE MECHANICAL DRAWINGS FOR LOUVER LOCATIONS NOT SHOWN.

WALL TYPE KEY

SCALE: 3/8" = 1'-0"

14" — TYPICAL EXTERIOR WALL
4" FACE BRICK VENEER
2" INSULATION/AIRSPACE
8" CMU

8"/12" — TYPICAL CMU WALL

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER — REGISTERED — No. 17355 — JAMES W. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

FIRST FLOOR PLAN

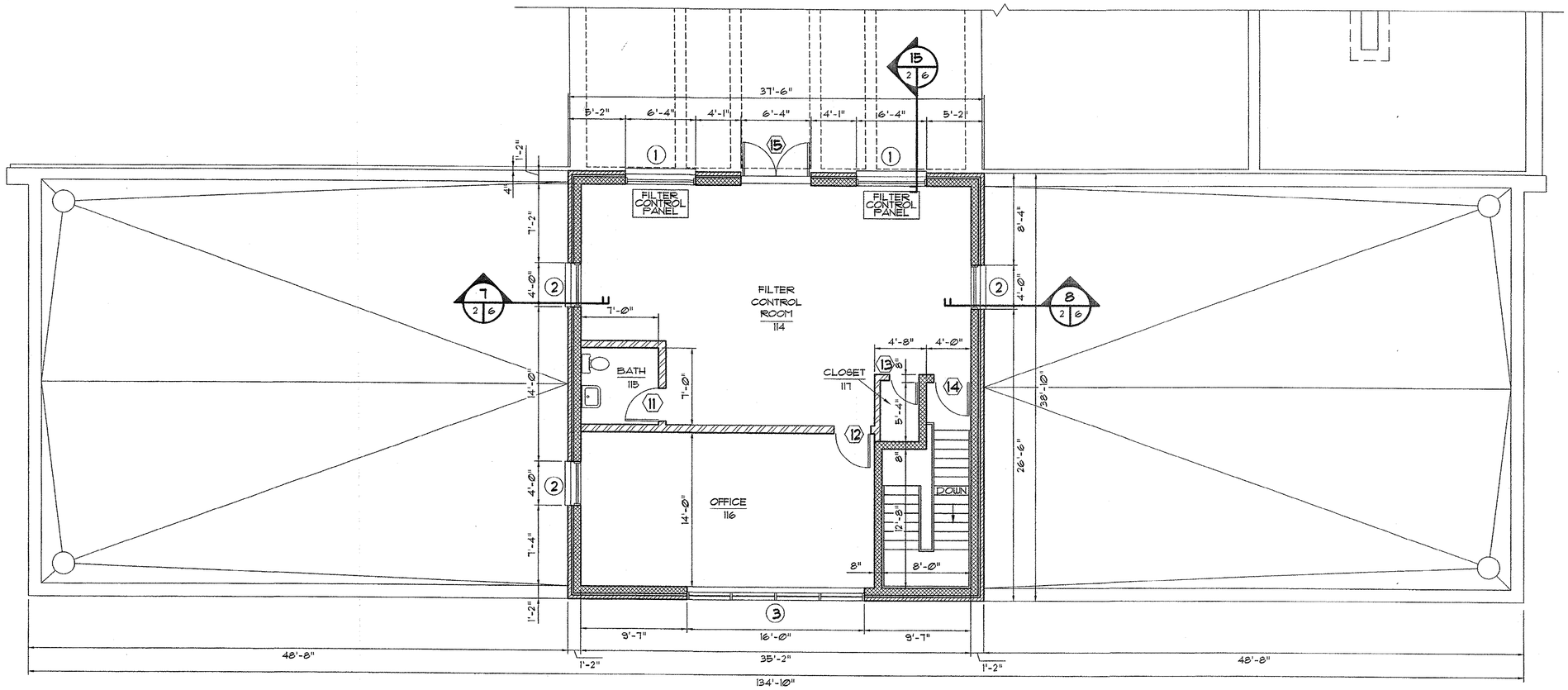
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
A-1
OF: 13

33-013-030

HOBBS UPCHURCH & ASSOC. J:\GS9814\4SMGDUPGRADE\A-DWGS\GS-A-01-REV.dwg,DWG EDITED BY: dc DATE: 01/31/00 TIME: 13:39 PLOT SCALE: 3/16"=1'-0"



SECOND FLOOR PLAN

SCALE: 3/16" = 1'-0"

4' 2' 0 4' 8'

WALL TYPE KEY

SCALE: 3/8" = 1'-0"

14" — TYPICAL EXTERIOR WALL
4" FACE BRICK VENEER
2" INSULATION/AIRSPACE
8" CMU

8" — TYPICAL CMU WALL

6-1/8" — TYPICAL TWO HOUR WALL: UL U411
2 LAYERS 5/8" TYPE "X" GYPSUM BOARD EACH SIDE
3-5/8" 20 GA. STEEL STUDS @ 16" O.C. VERT.

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12336 REGISTERED JOSEPH W. HOBBS NORTH CAROLINA

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

SECOND FLOOR PLAN

BULL CREEK WTP 15 MGD UPGRADE

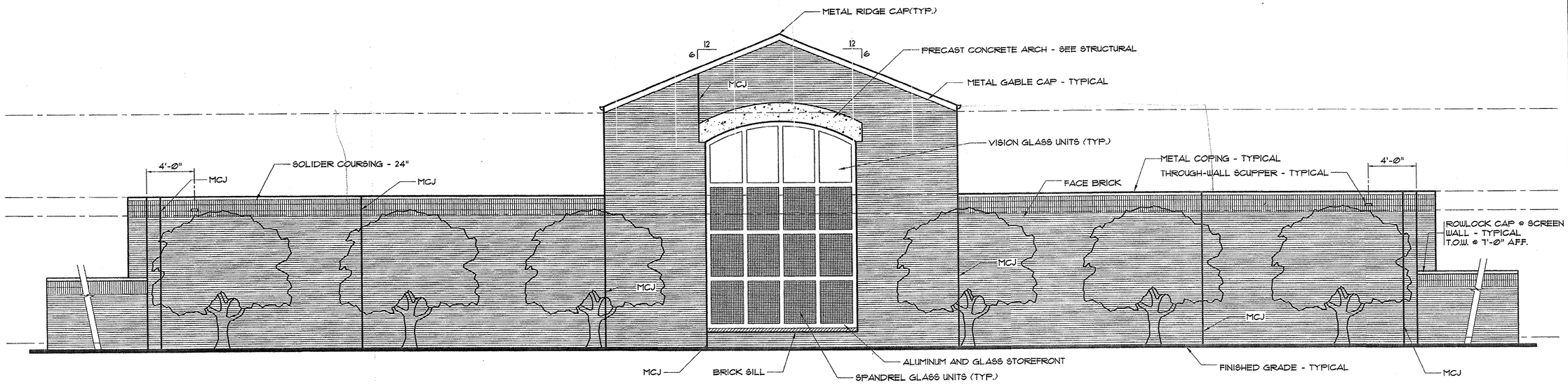
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

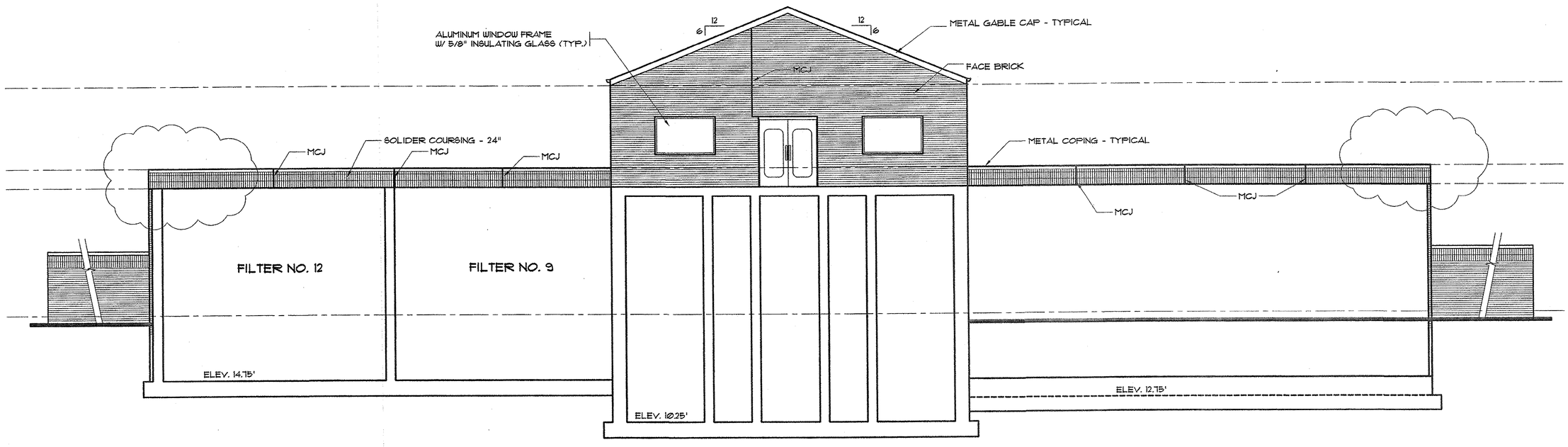
SHEET NO. A-2 OF: 13

33-013-031

HOBBS UPCHURCH & ASSOC. J:\OS9814\45MGDUPGRADE\X-DWGS\GS-A-02.dwg,DWG EDITED By: dc DATE: 01/21/00 TIME: 11:07 PLOT SCALE: 3/16"=1'-0"



1/1.3 BULL CREEK WATER TREATMENT PLANT
FRONT ELEVATION (SOUTH)
SCALE: 3/16" = 1'-Ø"
4' 2' Ø 4' 8'



2/1.3 BULL CREEK WATER TREATMENT PLANT
REAR ELEVATION (NORTH)
SCALE: 3/16" = 1'-Ø"
4' 2' Ø 4' 8'

REVISIONS			
SYM.	DESCRIPTION	DATE	BY
	DHEC REVISIONS	3/15/00	JWM

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12335 REGISTERED JOSEPH W. MCCORD

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

FRONT AND REAR ELEVATION

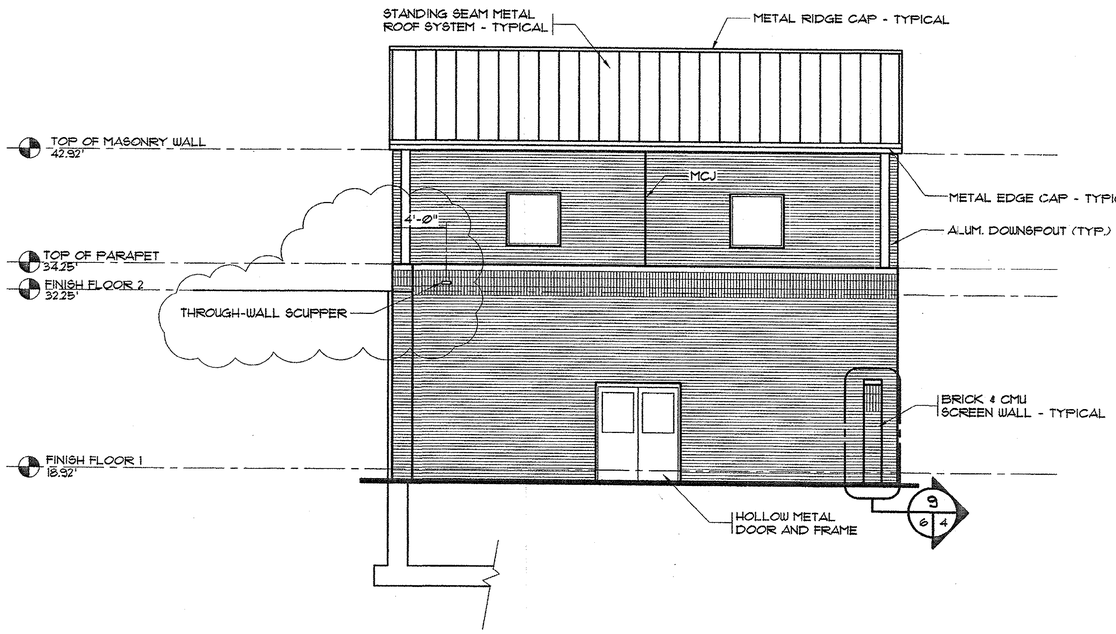
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
A-3
OF: 13

33-013-032

HOBBS UPCHURCH & ASSOC. J:\GSB814\45MGDUPGRADE\A-DWGS\GS-A-03.dwg,DWG EDITED BY: de DATE: 03/17/00 TIME: 11:12 PLOT SCALE: 0'-0 3/16"=1'-0"

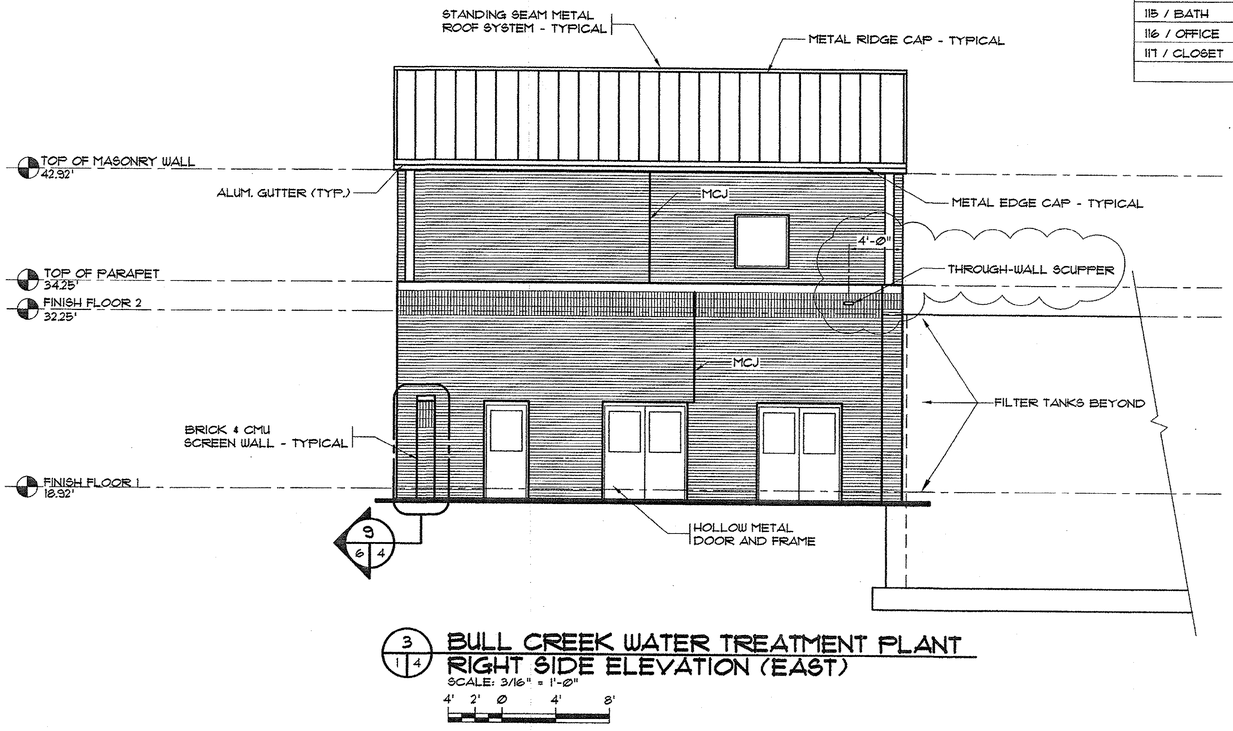


4 / 1 | 4 BULL CREEK WATER TREATMENT PLANT
LEFT SIDE ELEVATION (WEST)
SCALE: 3/16" = 1'-0"
4' 2' 0 4' 8'

ROOM FINISH SCHEDULE

NO./ROOM	FLOOR	BASE	WALLS	CEILING	REMARKS
101 / BLOWER ROOM	SEALED CONCRETE	NONE	PAINTED CMU	EXPOSED DECK	
102 / POLYMER (C.A.)	SEALED CONCRETE	NONE	PAINTED CMU	EXPOSED DECK	
103 / ANALYTICAL ROOM	SEALED CONCRETE	NONE	PAINTED CMU	EXPOSED DECK	
104 / SAMPLE/FILTER VACUUM PUMP	VINYL COMPOSITION TILE	NONE	PAINTED CMU	EXPOSED DECK	
105 / ALUM FEED	SEALED CONCRETE	NONE	PAINTED CMU	EXPOSED DECK	
106 / BULK CHEM. STOR.	SEALED CONCRETE	NONE	PAINTED CMU	EXPOSED DECK	
107 / CAUSTIC FEED	SEALED CONCRETE	NONE	PAINTED CMU	EXPOSED DECK	
108 / COMPRESSOR ROOM	SEALED CONCRETE	NONE	PAINTED CMU	EXPOSED DECK	
109 / STAIRWAY	VINYL COMPOSITION TILE	4" VINYL	PAINTED GYP. BD.	PAINTED GYP. BD.	
110 / POLYMER (F.A.)	SEALED CONCRETE	NONE	PAINTED CMU	EXPOSED DECK	
111 / POLYMER STOR.	SEALED CONCRETE	NONE	PAINTED CMU	EXPOSED DECK	
112 / ELECTRICAL ROOM	SEALED CONCRETE	NONE	PAINTED CMU	EXPOSED DECK	
113 / CORRIDOR	SEALED CONCRETE	NONE	PAINTED CMU	EXPOSED DECK	
114 / FILTER CONTROL ROOM	VINYL COMPOSITION TILE	4" VINYL	PAINTED GYP. BD.	2'X2' A.T.C.	
115 / BATH	CERAMIC TILE	CERAMIC TILE	PAINTED GYP. BD. *	2'X2' GYP. BD.	
116 / OFFICE	CARPET	4" VINYL	PAINTED GYP. BD.	2'X2' A.T.C.	
117 / CLOSET	VINYL COMPOSITION TILE	4" VINYL	PAINTED GYP. BD.	2'X2' A.T.C.	

* MOISTURE RESISTANT GYPSUM BOARD



3 / 1 | 4 BULL CREEK WATER TREATMENT PLANT
RIGHT SIDE ELEVATION (EAST)
SCALE: 3/16" = 1'-0"
4' 2' 0 4' 8'

REVISIONS

SYM.	DESCRIPTION	DATE	BY
	DHEC REVISIONS	3/15/00	JWM

SOUTH CAROLINA PROFESSIONAL ENGINEER 22326 REGISTERED JOSEPH W. MCLAUGHLIN

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

LEFT AND RIGHT ELEVATION/ ROOM FINISH SCHEDULE

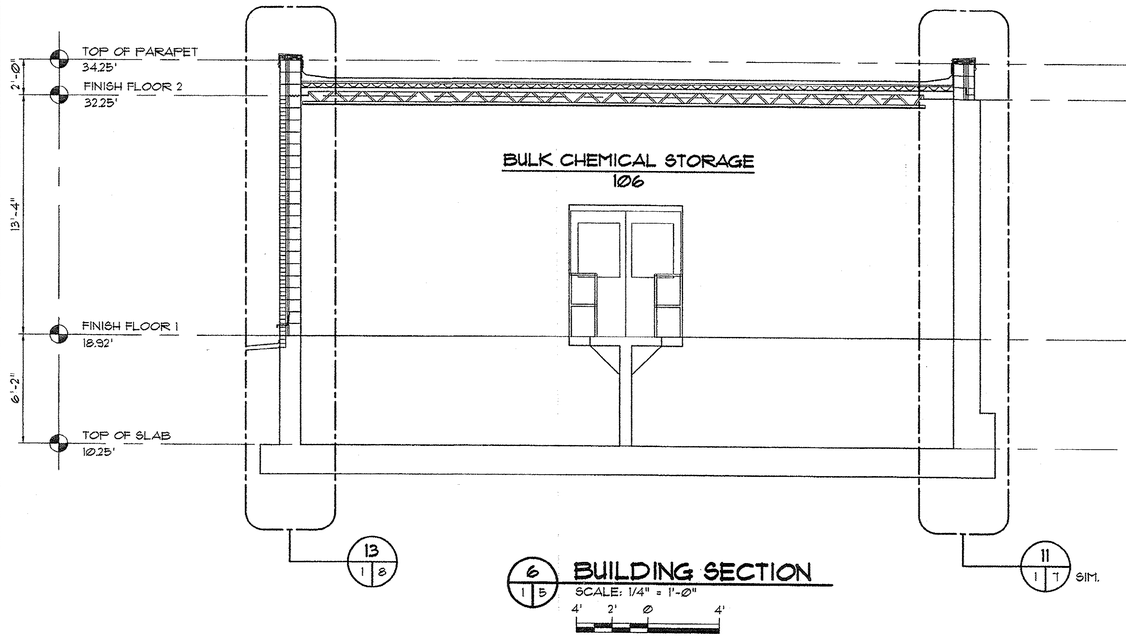
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

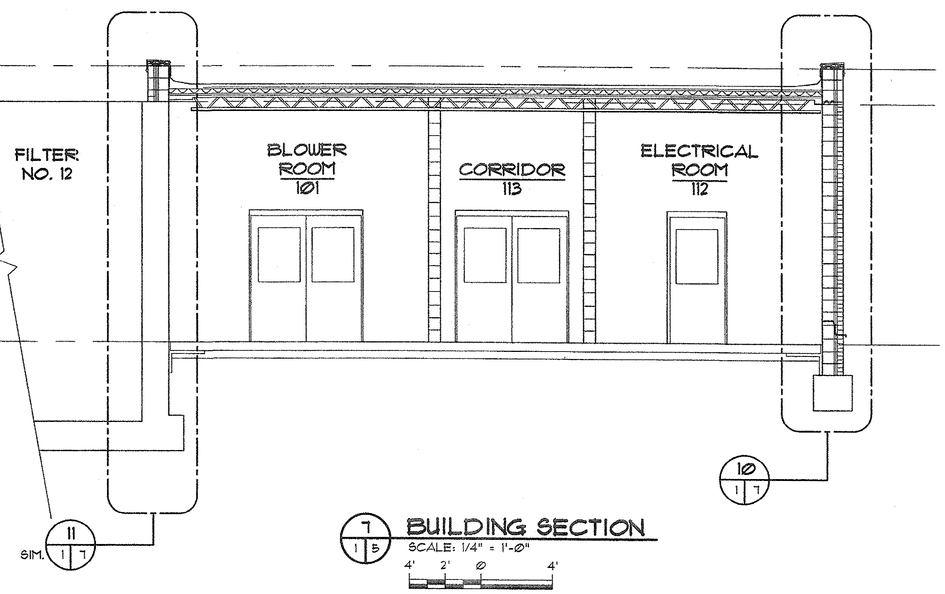
SHEET NO.
A-4
OF: 13

HOBBS UPCHURCH & ASSOC. J:\0398\4\45MGDUPGRADE\A-DWGS\GS-A-04.dwg DWG EDITED BY: dc DATE: 03/17/00 TIME: 11:13 PLOT SCALE: 3/16"=1'-0"

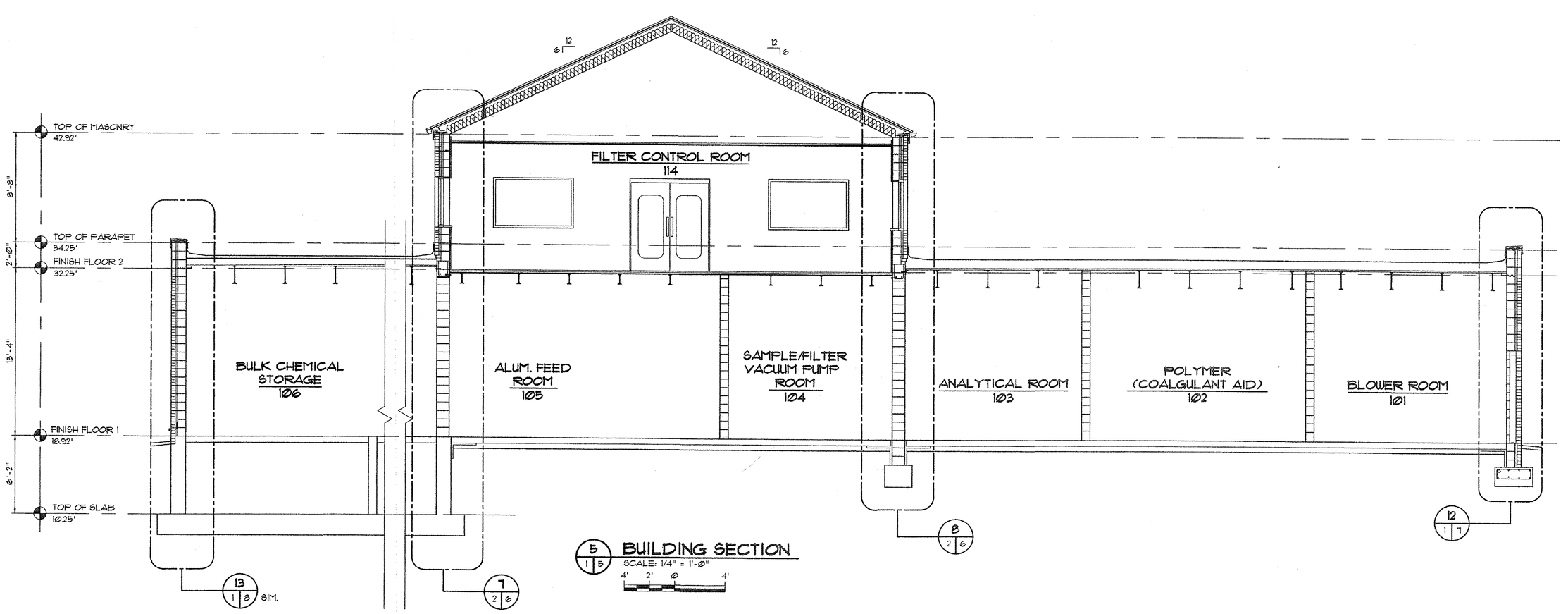
33-013-033



6 1 5 BUILDING SECTION
SCALE: 1/4" = 1'-0"
4' 2' 0 4'



7 1 5 BUILDING SECTION
SCALE: 1/4" = 1'-0"
4' 2' 0 4'



5 1 5 BUILDING SECTION
SCALE: 1/4" = 1'-0"
4' 2' 0 4'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER
REGISTERED No. 17335
JOSEPH W. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BUILDING SECTIONS

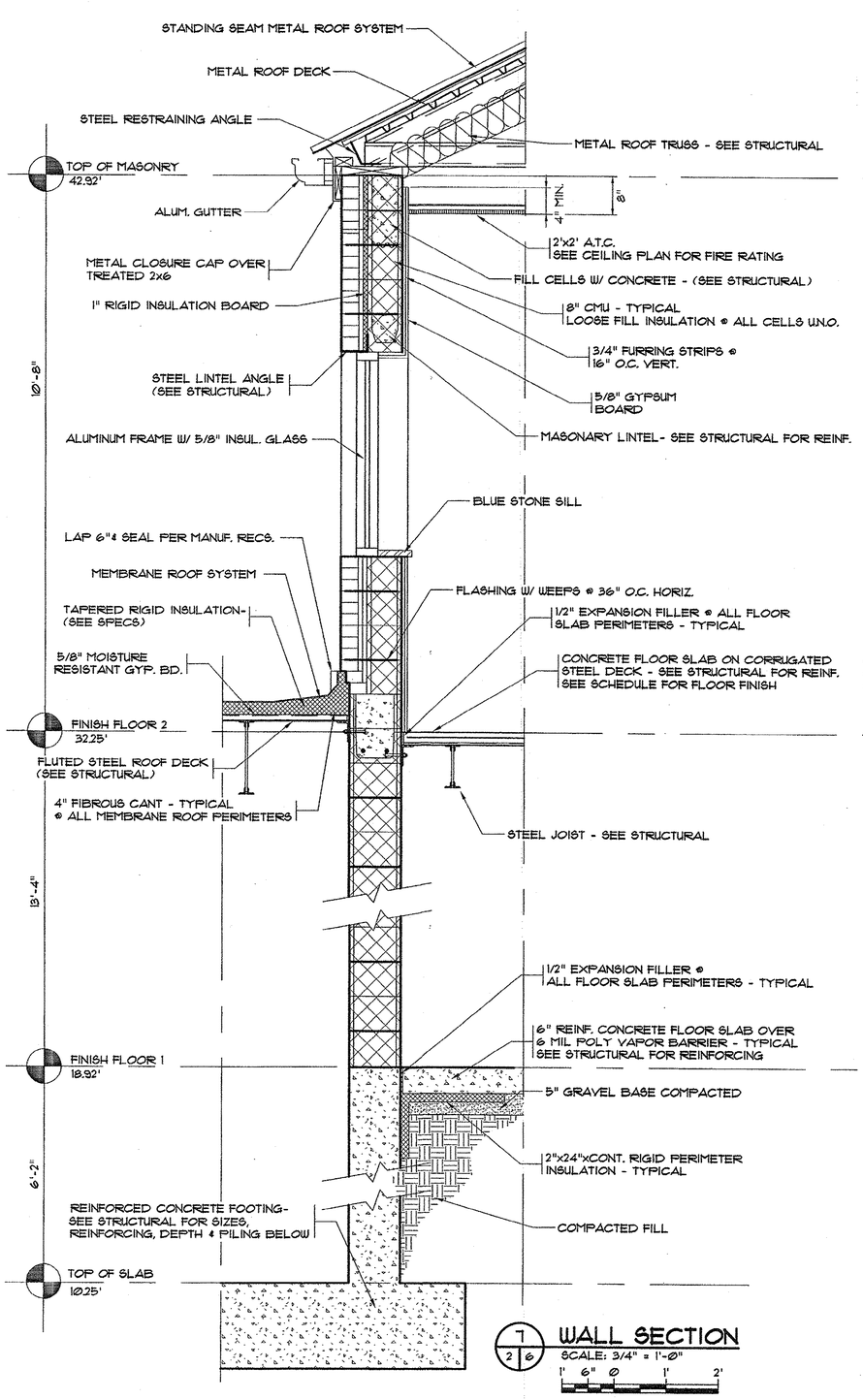
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

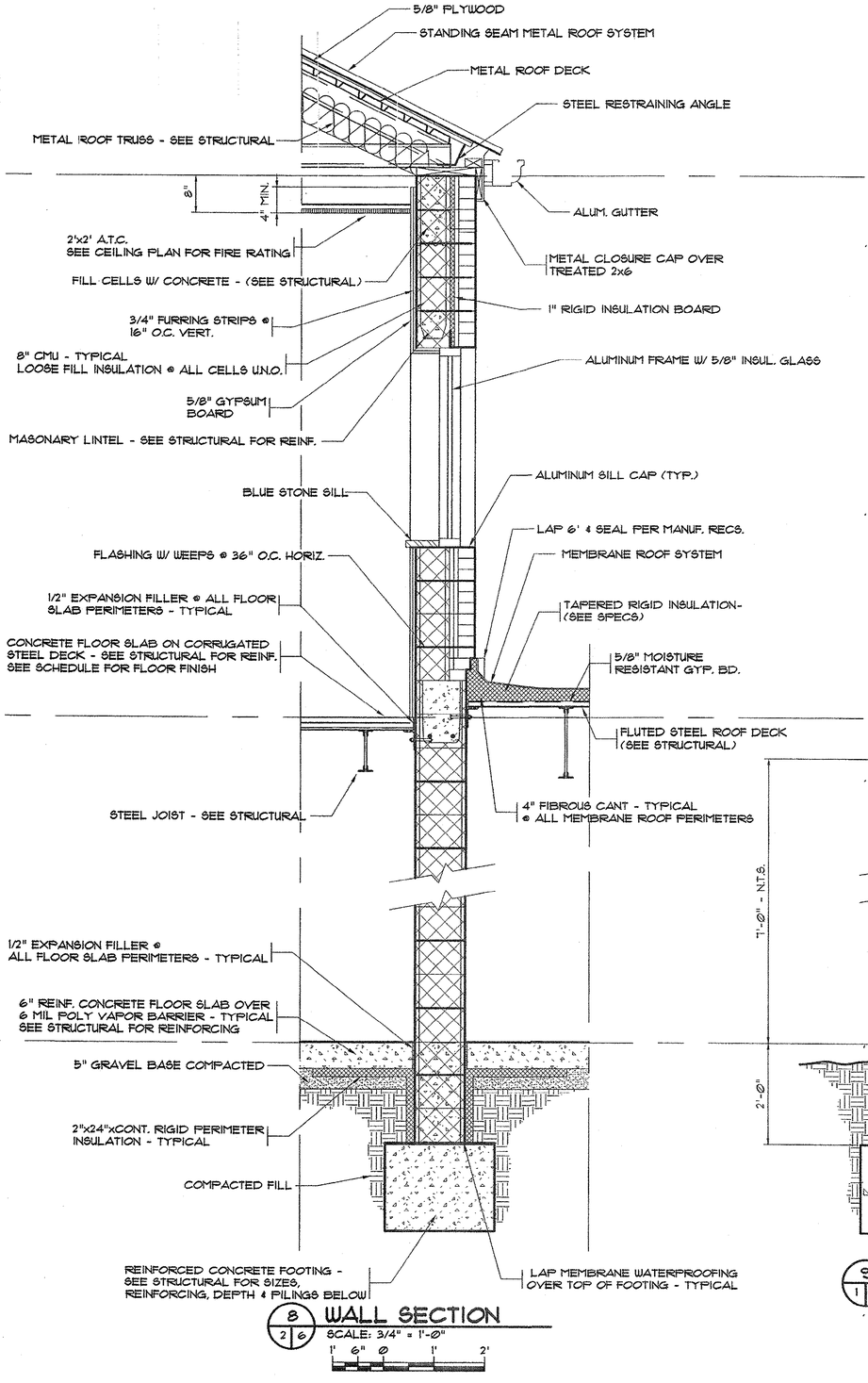
SHEET NO.
A-5
OF: 13

33-013-034

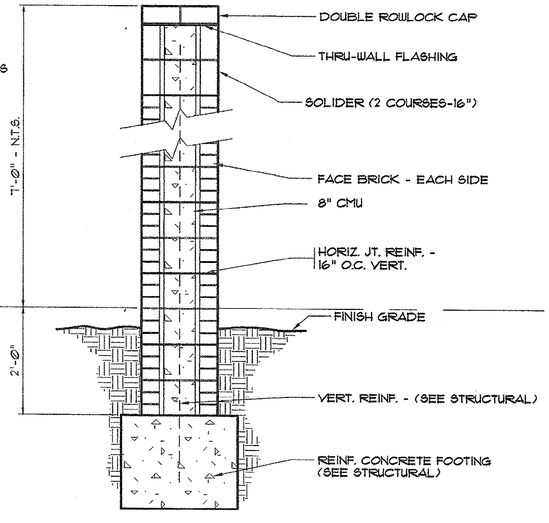
HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\J-DWGS\GS-A-05.dwg,DWG EDITED BY: dc DATE: 01/21/00 TIME: 11:10 PLOT SCALE: 1/4"=1'-0"



7/2/6 WALL SECTION
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'



8/2/6 WALL SECTION
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'



9/1/6 SCREEN WALL SECTION
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12335 REGISTERED JOSEPH W. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

WALL SECTIONS

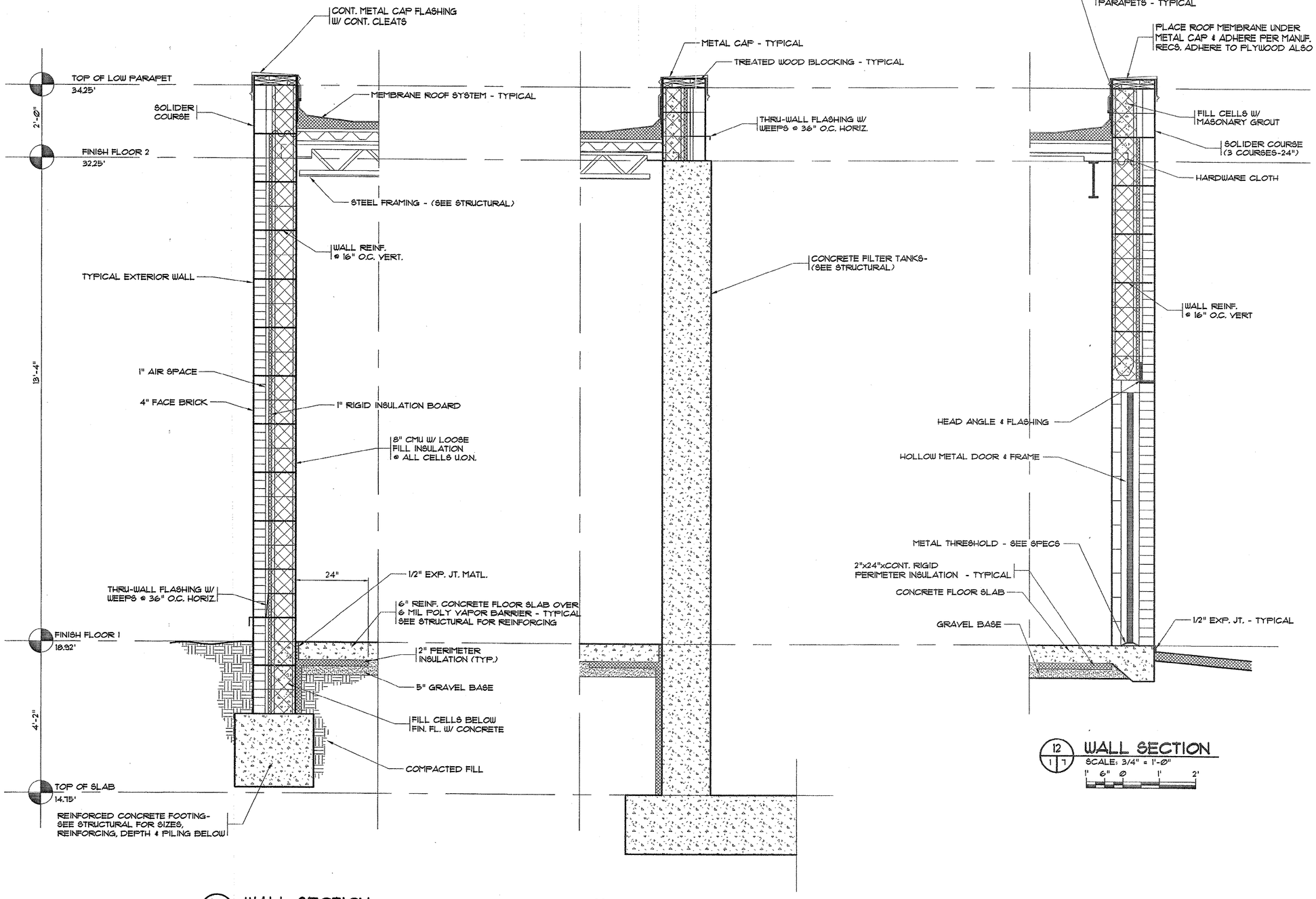
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. A-6
OF: 13

HOBBS UPCHURCH & ASSOC. J:\GSB614\45MGDUPGRADE\X-DWGS\GS-A-06-REV.dwg,DWG EDITED BY: dc DATE: 01/21/00 TIME: 11:11 PLOT SCALE: 3/4"=1'-0"

33-013-035



10/1/7 WALL SECTION
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'

11/1/7 WALL SECTION
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'

12/1/7 WALL SECTION
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER REGISTERED No. 12335 JOSEPH W. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

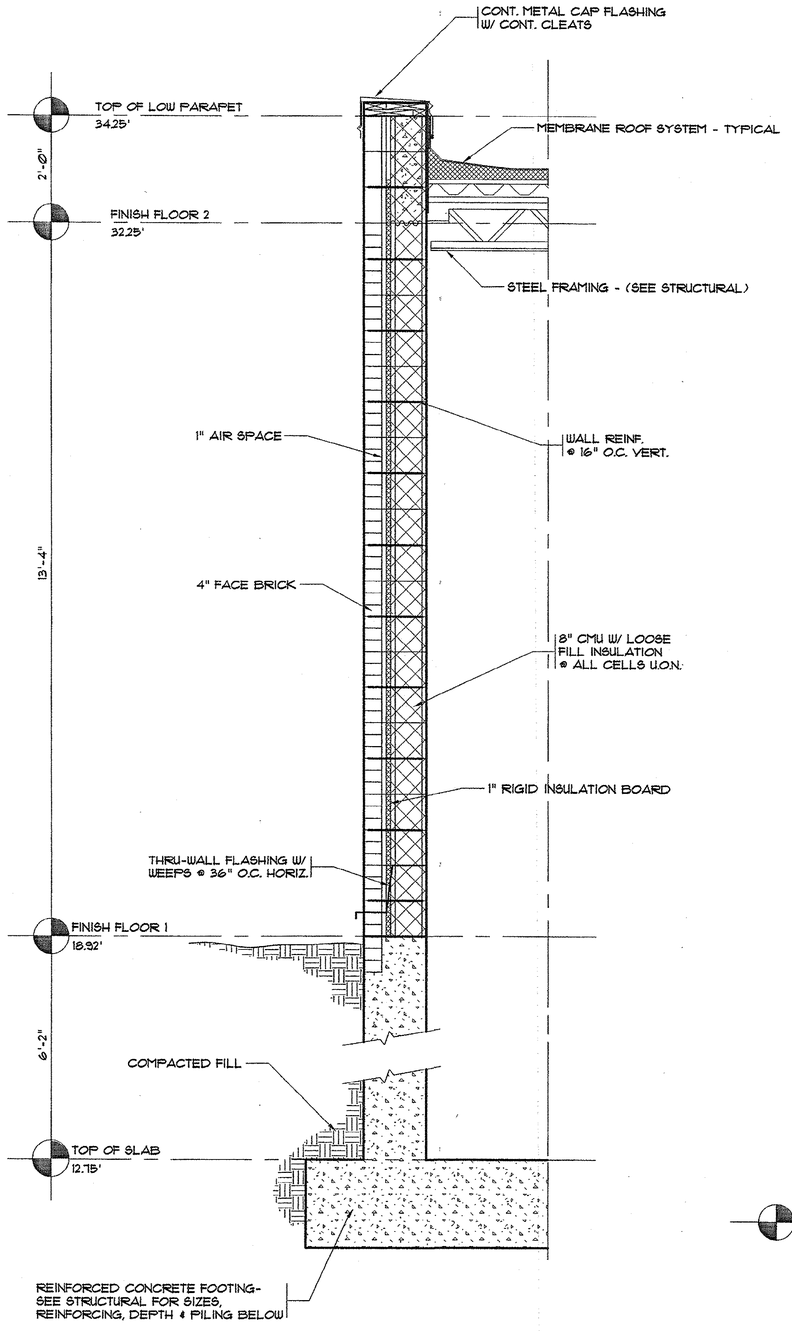
WALL SECTIONS

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

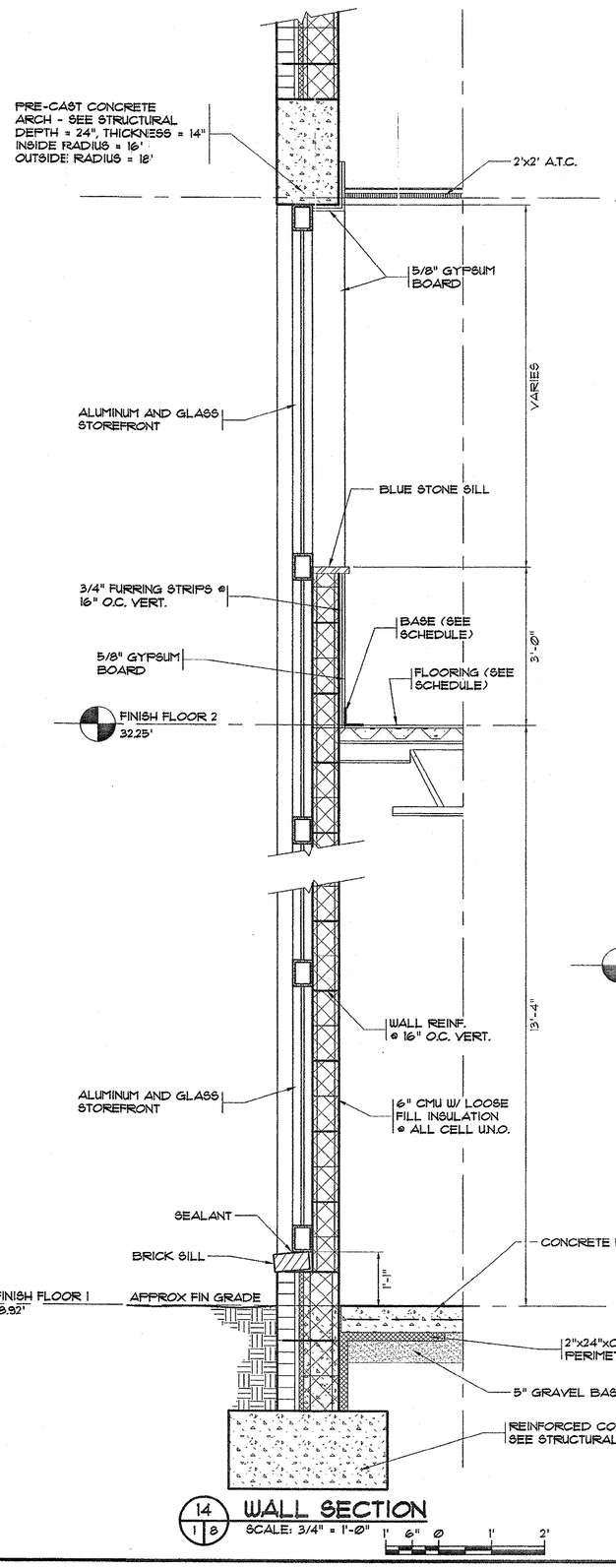
SHEET NO. A-7
OF: 13

33-013-036

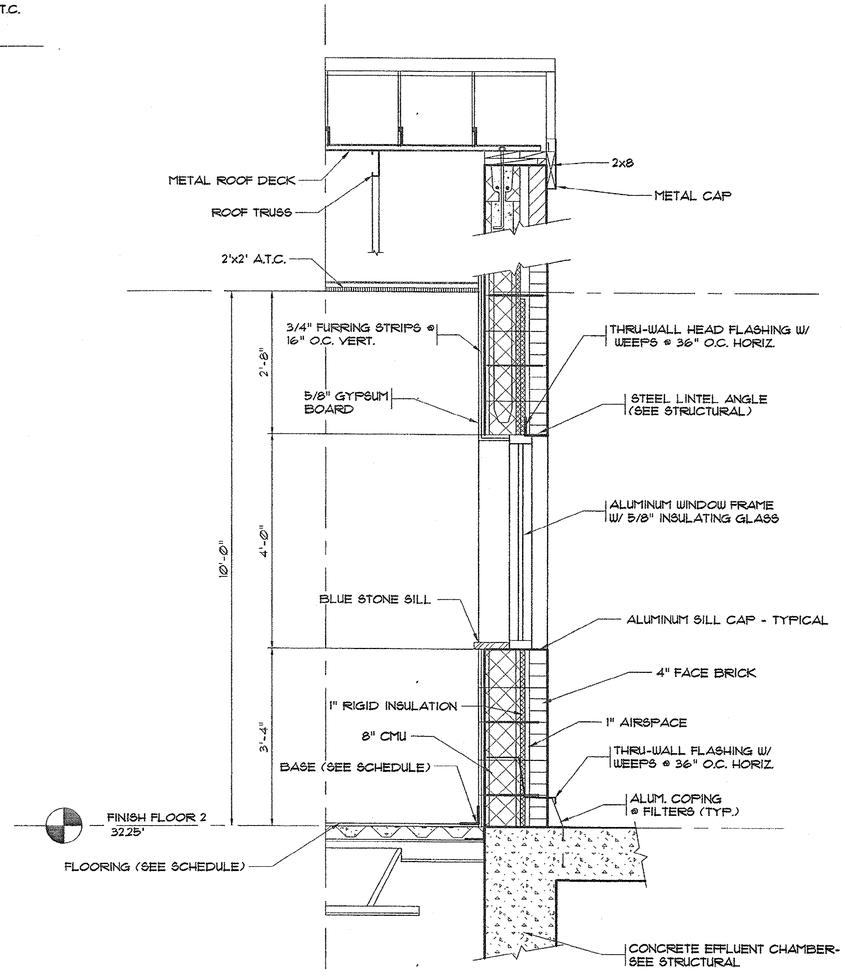
HOBBS UPCHURCH & ASSOC. J:\GS98\14\45MGDUPGRADE\A-DWGS\GS-A-07.dwg DWG EDITED BY: dc DATE: 01/21/00 TIME: 14:45 PLOT SCALE: 3/4"=1'-0"



13/18 BULK CHEMICAL STORAGE BUILDING WALL SECTION
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'



14/18 WALL SECTION
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'



15/18 WALL SECTION
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER JOSEPH W. HOBBS No. 19335 REGISTERED

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

WALL SECTIONS

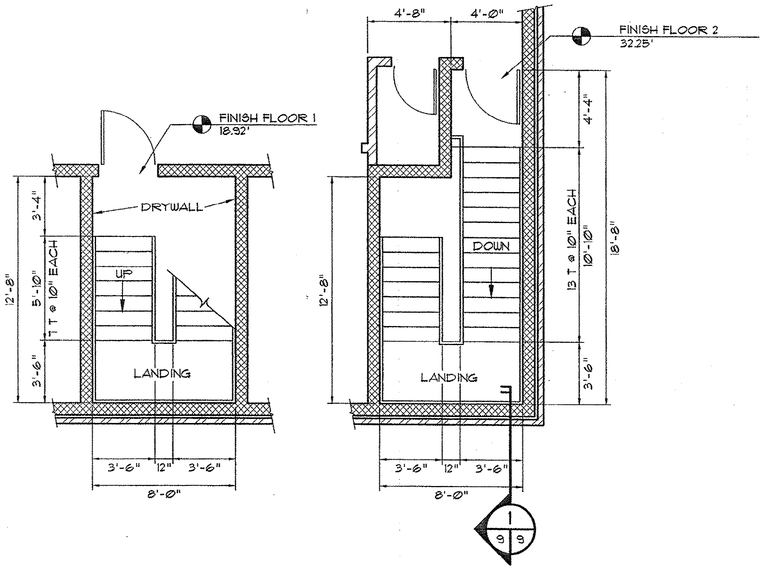
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
A-8
OF: 13

33-013-037

HOBBS UPCHURCH & ASSOC. J:\0598\4\45MGDUPGRADE\4-SWISS\05-A-08-REV.dwg DWG EDITED BY: dc DATE: 01/21/00 TIME: 14:49 PLOT SCALE: 3/4"=1'-0"



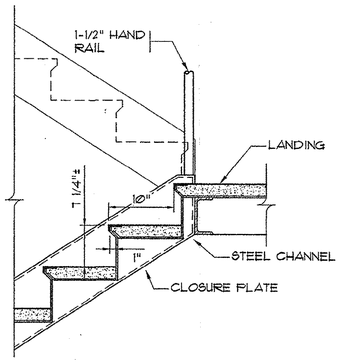
PLAN @ 1ST FLOOR

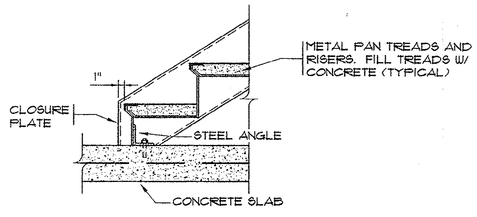
PLAN @ 2ND FLOOR

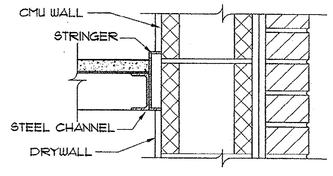
STAIR PLAN VIEWS

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

4' 2' 0 4'



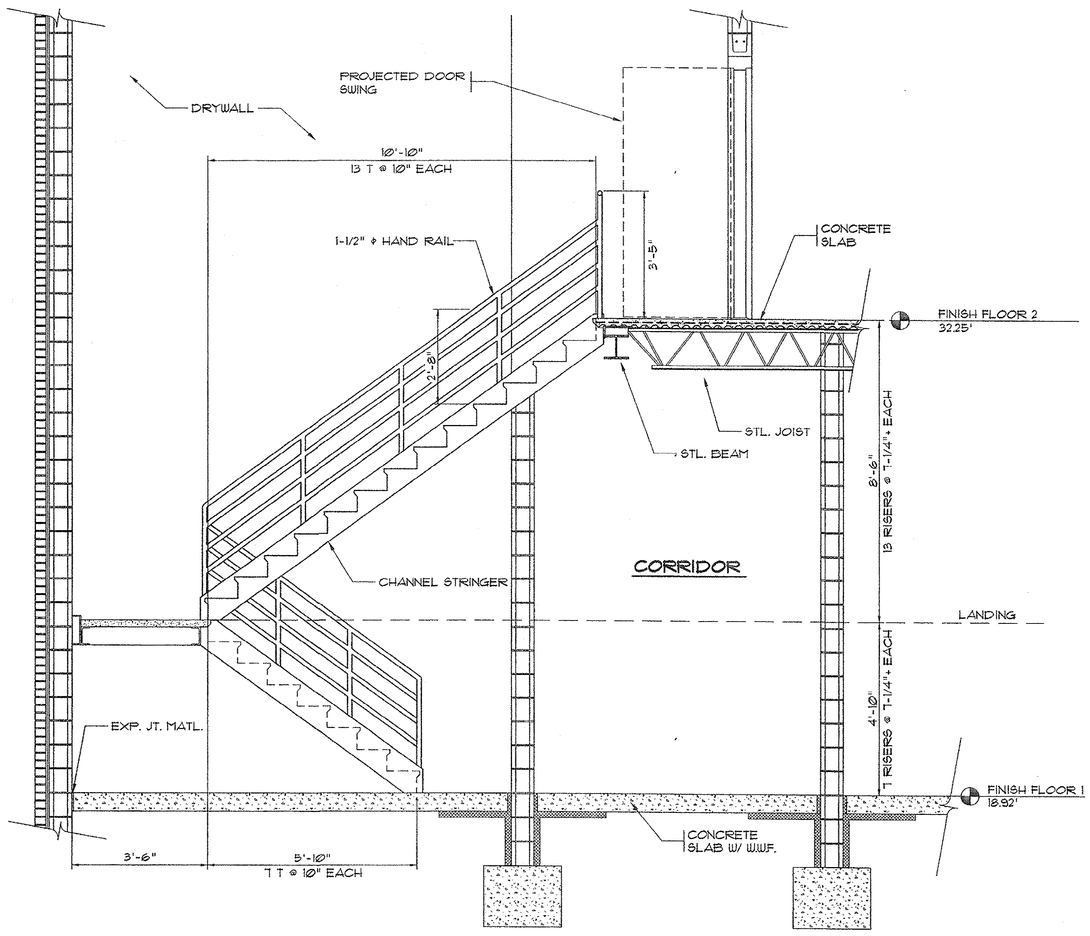




STAIR DETAILS

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

NOTE:
STAIR AND HANDRAIL DESIGN & CONNECTION DETAILS BY STAIR MANUFACTURER. PROVIDE SEALED CALCULATIONS.



STAIR SECTION

1/9 1/9

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

2' 1' 0 2'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 17335 REGISTERED JOSEPH W. MCGOUGAN

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

STAIR DETAILS

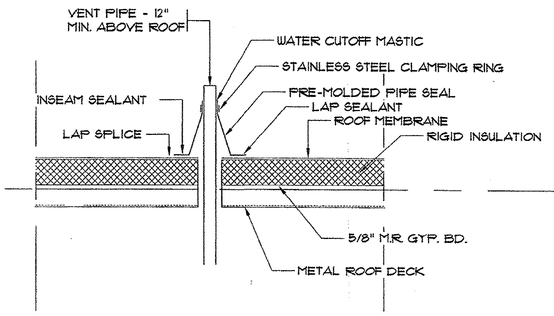
DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. A-9

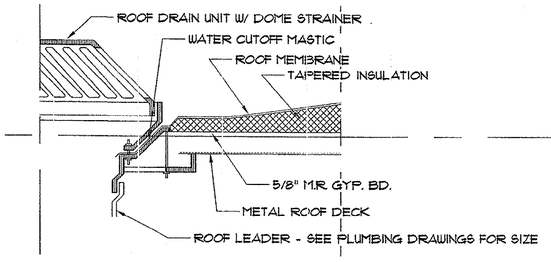
OF: 13

33-013-038

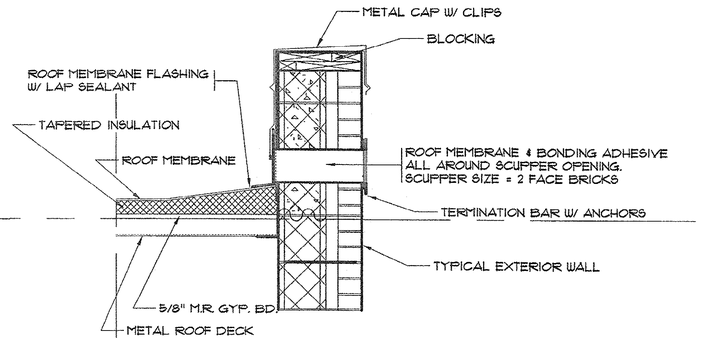
HOBBS UPCHURCH & ASSOC. J:\GSB81A\45MGDUPGRADE\V-DWGS\SS-A-09.dwg DWG EDITED BY: dc DATE: 01/21/00 TIME: 11:21 PLOT SCALE: 1/4"=1'-0"



VENT PIPE



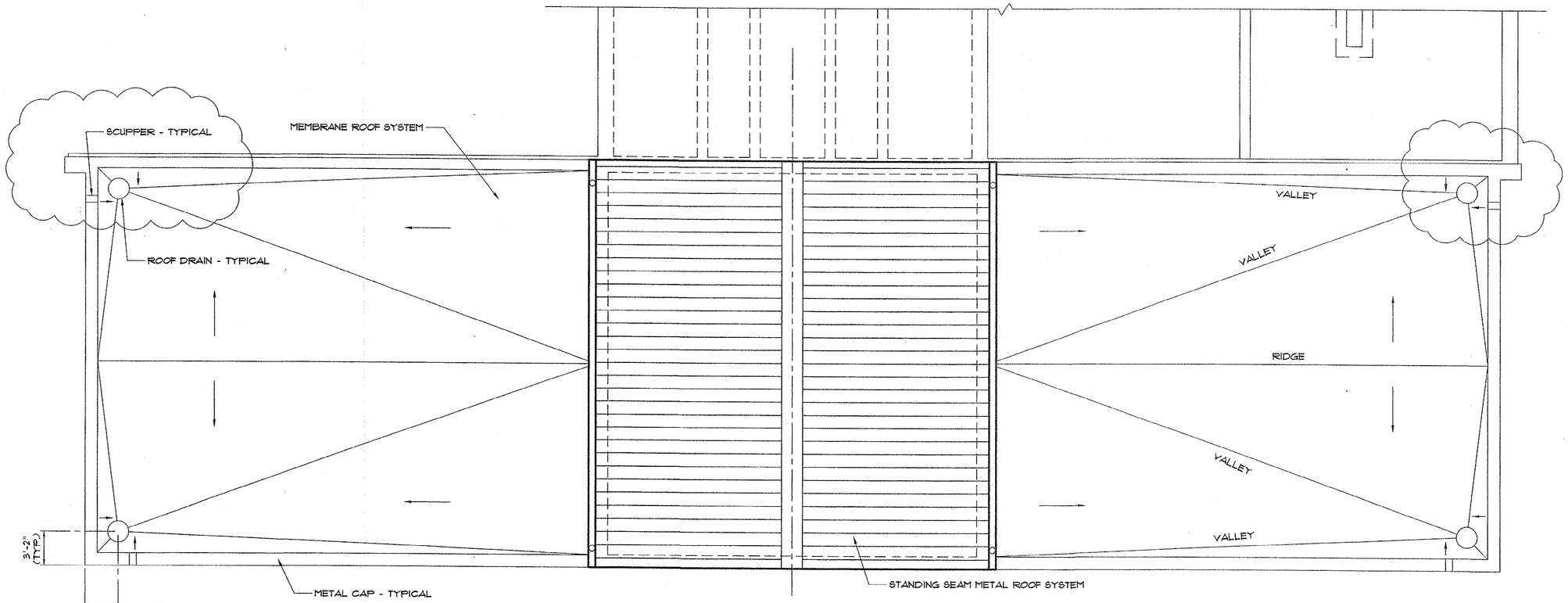
ROOF DRAIN



THROUGH-WALL SCUPPER

ROOF DETAILS

SCALE 1" = 1'-0"



ROOF PLAN

SCALE: 3/16"=1'-0"

4' 2' 0 4' 8'

NOTE: SEE MECHANICAL DRAWINGS FOR LOCATION OF ALL ROOFTOP HVAC UNITS, VENTILATOR UNITS, EQUIPMENT CURBS, ETC.

NOTE: SEE PLUMBING DRAWINGS FOR LOCATIONS OF ALL VENTS THROUGH ROOF (V.T.R.), ROOF LEADERS, ETC.

REVISIONS

SYM.	DESCRIPTION	DATE	BY
	DHEC REVISIONS	3/15/00	JWM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12335 JOSEPH W. WHITTINGTON REGISTERED

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

ROOF DETAILS

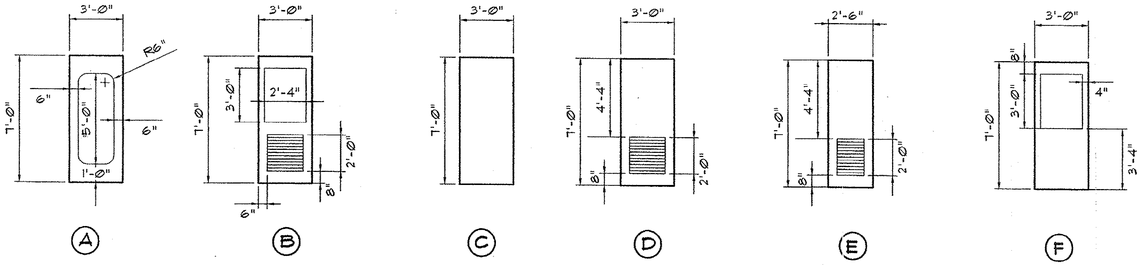
DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

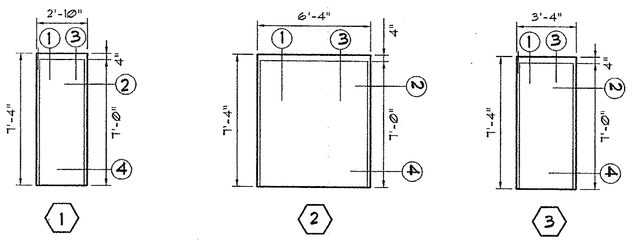
SHEET NO. A-10

OF: 13

33-013-039

HOBBS UPCHURCH & ASSOC. J:\GS9814\4SMGDUPGRADE\A-DWGS\GS-A-10.dwg DWG EDITED BY: dc DATE: 03/17/00 TIME: 11:14 PLOT SCALE: 3/16"=1'-0"

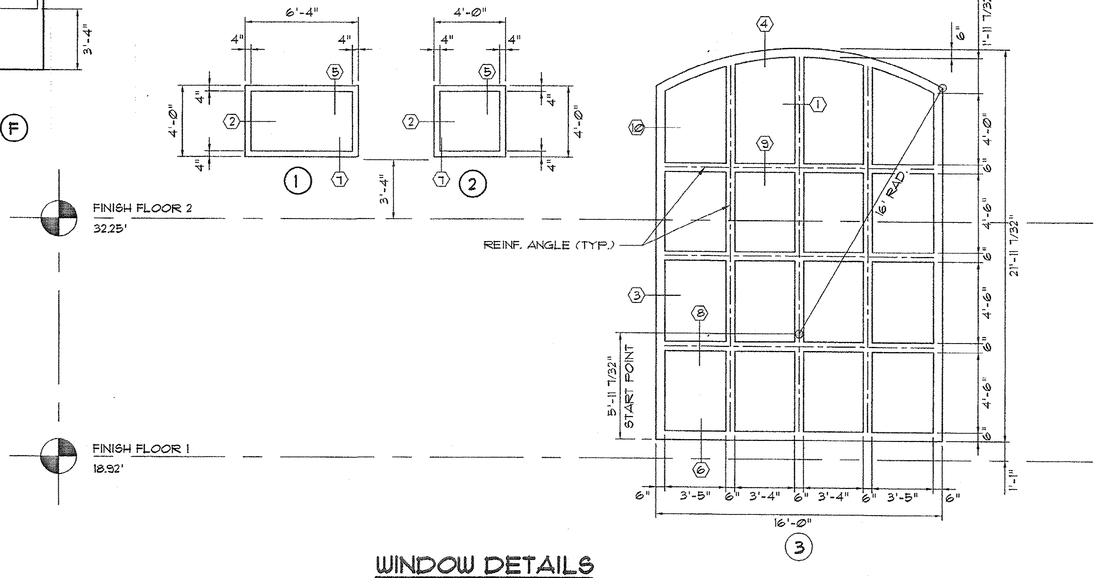




DOOR DETAILS

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

4' 2' 0 4'



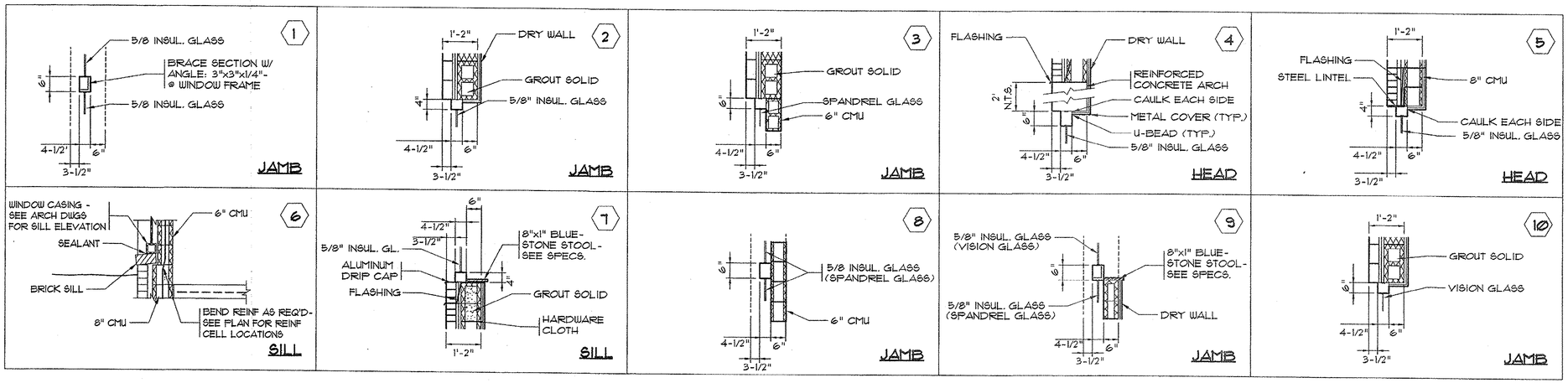
WINDOW DETAILS

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

4' 2' 0 4'

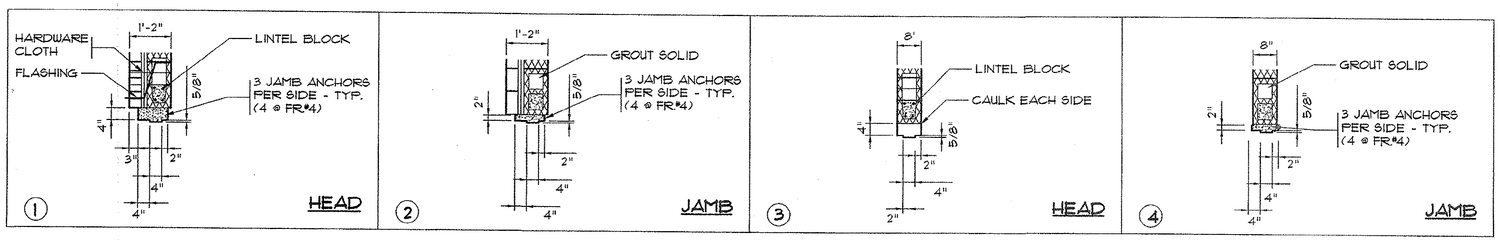
ALUMINUM FRAME DETAILS

N.T.S.



HOLLOW METAL DETAILS

N.T.S.



REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12535 REGISTERED JOSEPH W. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

DOOR AND WINDOW DETAILS

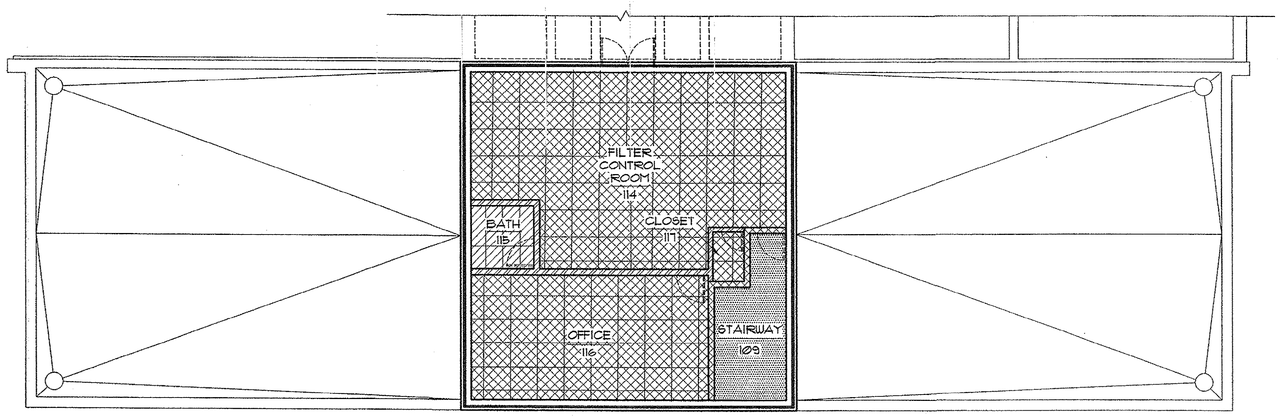
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
A-11
OF: 13

33-013-040

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\J-DWGS\GS-A-11.dwg DWG EDITED BY: dc DATE: 01/21/00 TIME: 14:41 PLOT SCALE: 1/4"=1'-0"

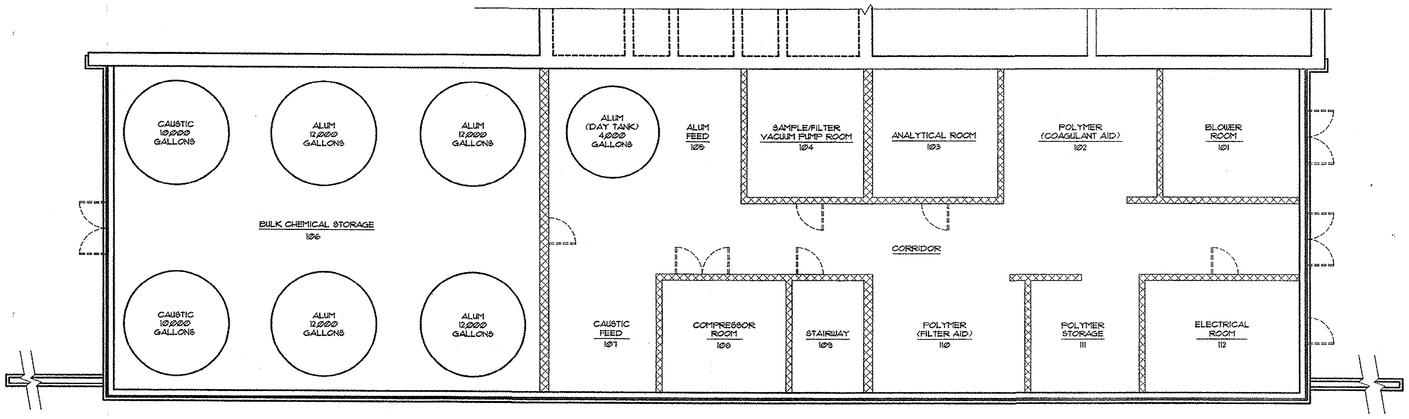


SECOND FLOOR REFLECTED CEILING PLAN

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

8' 4' 0 8'

NOTE: NO FINISH CEILING @ ENTIRE FIRST FLOOR - EXPOSED STRUCTURE & ROOF DECK ONLY.



FIRST FLOOR REFLECTED CEILING PLAN

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

8' 4' 0 8'

CEILING TYPE KEY

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

- 2'x2' A.T.C. - NONRATED — FISSURE FINISH, 10'-0" A.F.F.)
- 5/8" GYPSUM BOARD - 2 HR. RATED — SPRAY FINISH, 10'-0" A.F.F. COMPLY WITH U.L. ASSEMBLY # D501
- NO CEILING — CHASE, STAIRS
- 2'x2' A.T.C. - 1 HR. RATED — FISSURE FINISH, 10'-0" A.F.F.)
- 2'x2' GYPSUM BOARD - NONRATED — 1/2" VINYL FACED PANEL, 8'-0" A.F.F. ACOUSTICAL BATT INSULATION ABOVE, SEE SPECS
- 5/8" GYPSUM BOARD SOFFIT — SPRAY FINISH, 7'-0" A.F.F.)

WALL TYPE KEY

SCALE: 3/8" = 1'-0"

- TYPICAL EXTERIOR WALL
- TYPICAL CMU WALL — CARRY WALL TO DECK U.N.O.
- TYPICAL TWO HOUR WALL: UL U411 — STOP WALL 4" ABOVE FIN. CLG.
- TYPICAL UNRATED WALL — STOP WALL 4" ABOVE SIN. CLG.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12336 REGISTERED JOSEPH W. MCCOLGAN

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

REFLECTED CEILING PLAN

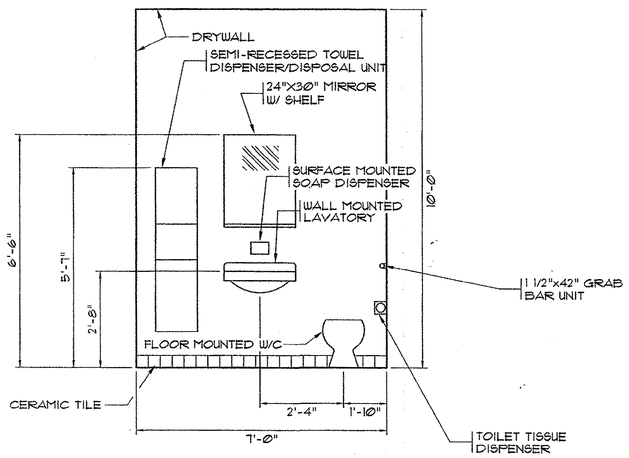
DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. A-12

OF: 13

33-013-041

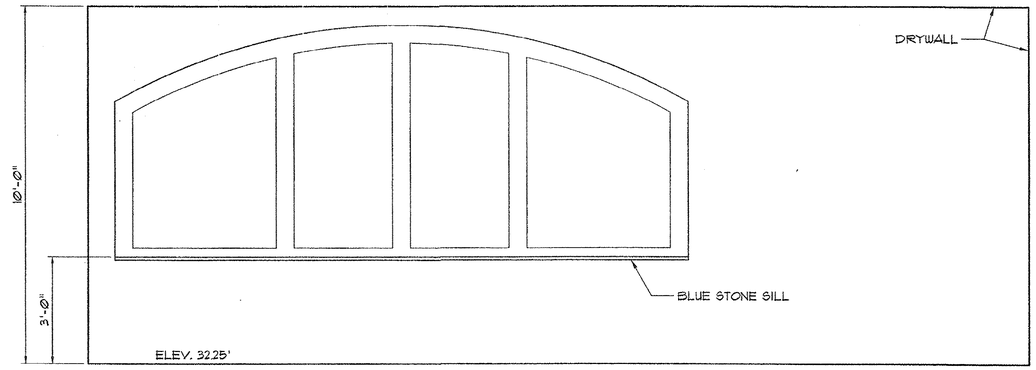
HOBBS UPCHURCH & ASSOC. J:\GS9814\49MGDUPGRADE\A-DWGS\GS-A-12.dwg DWG EDITED BY: dc DATE: 01/31/00 TIME: 14:38 PLOT SCALE: 1/8"=1'-0"



1/13|13 ELEVATION

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

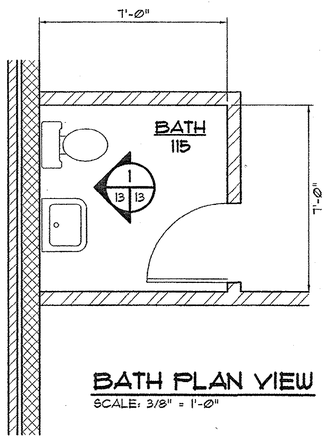
2' 1' 0 2'



2/13|13 ELEVATION

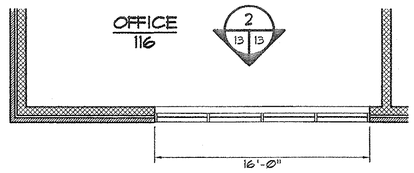
SCALE: 1/2"=1'-0"

2' 1' 0 2'



BATH PLAN VIEW

SCALE: 3/8" = 1'-0"



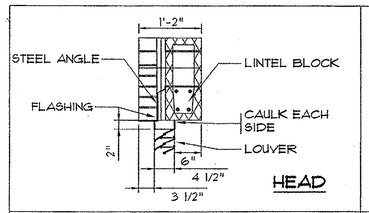
OFFICE PLAN VIEW

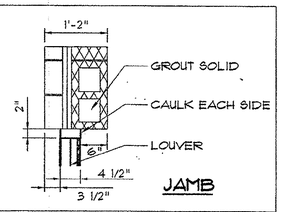
SCALE: 3/16" = 1'-0"

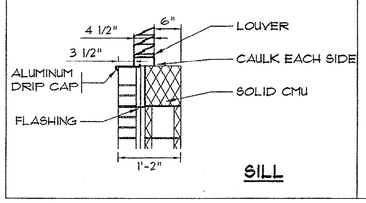
4' 2' 0 4' 8'

TYP. ALUMINUM LOUVER DETAILS

(SEE MECHANICAL DWGS. FOR SIZE AND LOCATION







NOTE: SEE SPECIFICATIONS FOR GAUGE & FINISH.
NOTE: PROVIDE 48%-49% FREE AREA PROFILE
NOTE: PROVIDE STORM-PROOF LOUVER PROFILE.
NOTE: PROVIDE BRACING PER MANUFACTURER'S RECOMMENDATIONS.
NOTE: PROVIDE BIRD/INSECT SCREEN PER SPECIFICATIONS.
NOTE: PROVIDE 4 #3 BARS @ ALL LINTELS UNLESS NOTED OTHERWISE IN THE STRUCTURAL DRAWINGS. FILL W/CONCRETE.

SEE A-11 FOR DOOR AND FRAME DETAILS

DOOR SCHEDULE

No.	DOOR SIZE	DOOR TYPE	DOOR MTL.	DOOR GLASS	DOOR LOUVER	DOOR LABEL	FRAME TYPE	FRAME MTL.	FRAME GLASS	HARDWARE SET NO.	REMARKS
1	Pr.3'x7'x1.75"	F	INSUL. H.M.	1/4' TEMP.	NONE	NONE	2	H.M.	NONE		PAINT DOOR & FRAME
2	3'x7'x1.75"	F	INSUL. H.M.	1/4" TEMP.	NONE	NONE	3	H.M.	NONE		PAINT DOOR & FRAME
3	Pr.3'x7'x1.75"	B	INSUL. H.M.	1/4" TEMP.	24"X24"	NONE	2	H.M.	NONE		PAINT DOOR & FRAME
4	3'x7'x1.75"	C	INSUL. H.M.	NONE	NONE	20 MIN.	3	H.M.	NONE		PAINT DOOR & FRAME
5	3'x7'x1.75"	B	INSUL. H.M.	1/4" TEMP.	24"x24"	NONE	3	H.M.	NONE		PAINT DOOR & FRAME
6	3'x7'x1.75"	B	INSUL. H.M.	1/4" TEMP.	24"x24"	NONE	3	H.M.	NONE		PAINT DOOR & FRAME
7	3'x7'x1.75"	C	INSUL. H.M.	NONE	NONE	20 MIN.	3	H.M.	NONE		PAINT DOOR & FRAME
8	3'x7'x1.75"	F	INSUL. H.M.	1/4" TEMP.	NONE	NONE	3	H.M.	NONE		PAINT DOOR & FRAME
9	Pr.3'x7'x1.75"	F	INSUL. H.M.	1/4" TEMP.	NONE	NONE	2	H.M.	NONE		PAINT DOOR & FRAME
10	Pr.3'x7'x1.75"	F	INSUL. H.M.	1/4" TEMP.	NONE	NONE	2	H.M.	NONE		PAINT DOOR & FRAME
11	3'x7'x1.75"	C	S.C. WOOD	NONE	NONE	NONE	3	H.M.	NONE		STAIN DOOR, PAINT FRAME
12	3'x7'x1.75"	C	S.C. WOOD	NONE	NONE	20 MIN.	3	H.M.	NONE		STAIN DOOR, PAINT FRAME
13	2.5'x7'x1.75"	E	S.C. WOOD	NONE	NONE	NONE	1	H.M.	NONE		STAIN DOOR, PAINT FRAME
14	3'x7'x1.75"	C	S.C. WOOD	NONE	NONE	B LABEL	3	H.M.	NONE		STAIN DOOR, PAINT FRAME
15	Pr.3'x7'x1.75"	A	INSUL. H.M.	1/4" TEMP.	NONE	NONE	2	H.M.	NONE		PAINT DOOR & FRAME

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 12335 J. WESLEY MCSWAIN JR.

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

BATH ELEVATION AND DOOR SCHEDULE

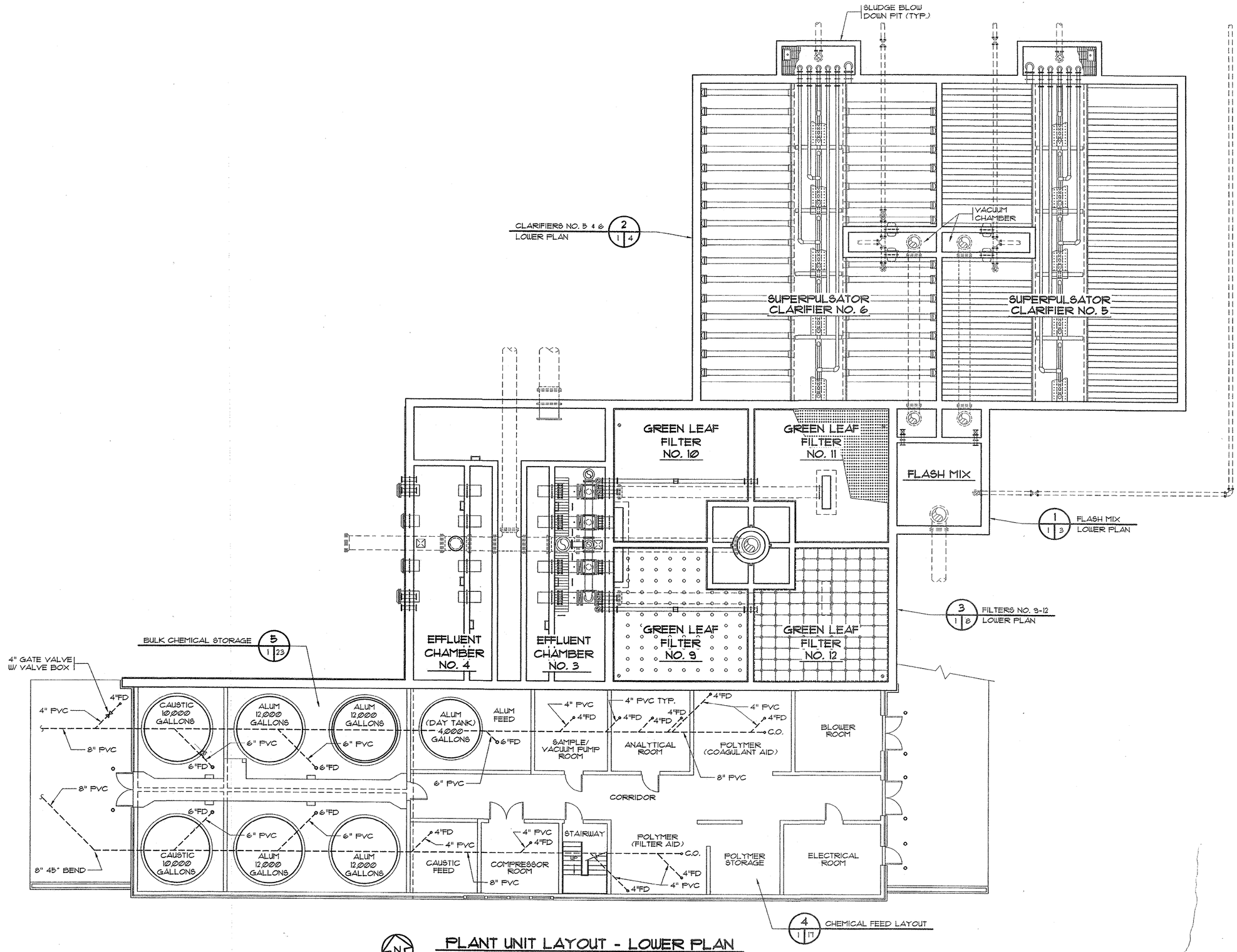
DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. A-13

OF: 13

33-013-042

HOBBS UPCHURCH & ASSOC. J:\GIS9814\15MGDUPGRADE\A-DWGS\GS-A-13.dwg,DWG EDITED BY: dc DATE: 01/21/00 TIME: 13:53 PLOT SCALE: 3/16"=1'-0"



PLANT UNIT LAYOUT - LOWER PLAN

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

8' 4' 0 8'

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER JOSEPH W. MCDOUGAL NO. 12335 REGISTERED

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

PLANT UNIT LAYOUT LOWER PLAN

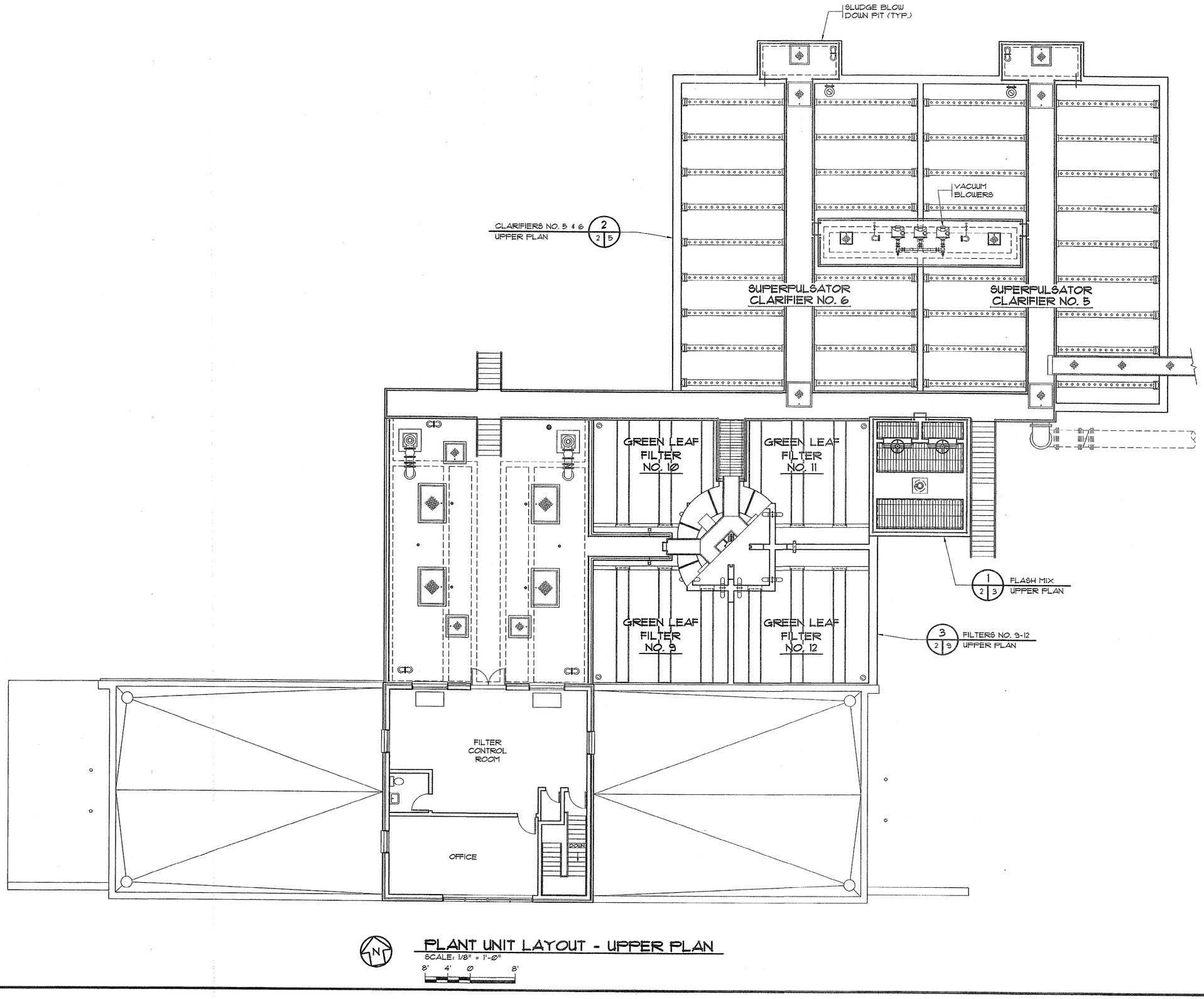
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-1
OF: 38

33-013-043

HOBBS UPCHURCH & ASSOC. J:\GS9814\ASMODUPGRADE\EN-1.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 14:56 PLOT SCALE: 1/8"=1'-0"



PLANT UNIT LAYOUT - UPPER PLAN

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

8' 4' 0 8'

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER JOSEPH W. HOBBS REGISTERED No. 12335

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

PLANT UNIT LAYOUT
UPPER PLAN

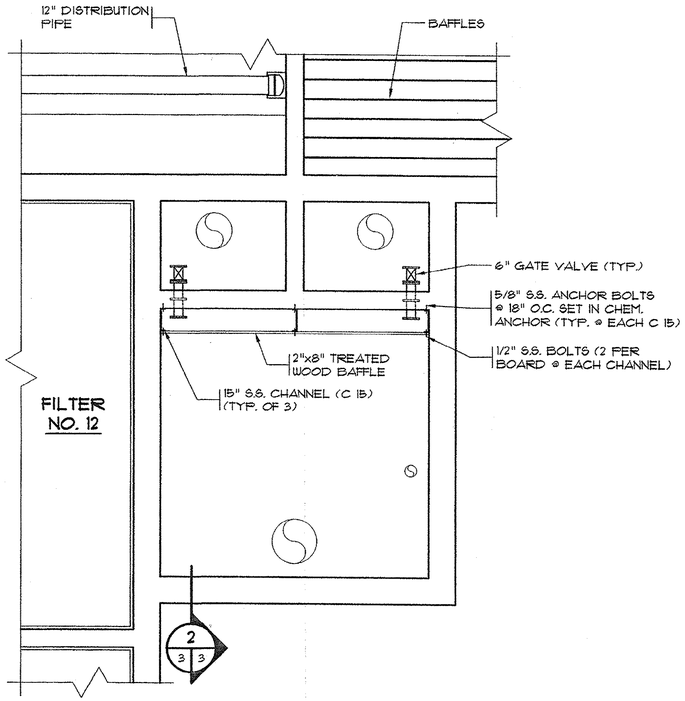
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-2
OF: 38

33-013-044

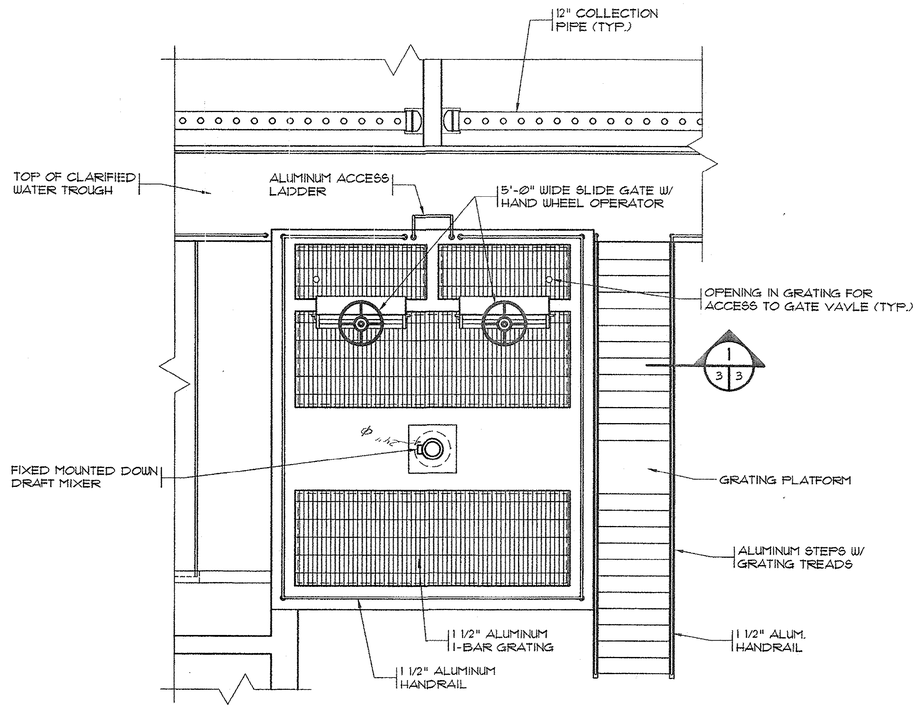
HOBBS UPCHURCH & ASSOC. J:\GS9814\15MGDUPGRADE\EN-2.dwg DWG EDITED BY: dc DATE: 01/18/00 TIME: 14:56 PLOT SCALE: 1/8"=1'-0"



1 / 1 3 FLASH MIX - LOWER PLAN VIEW

SCALE: 1/4" = 1'-Ø"

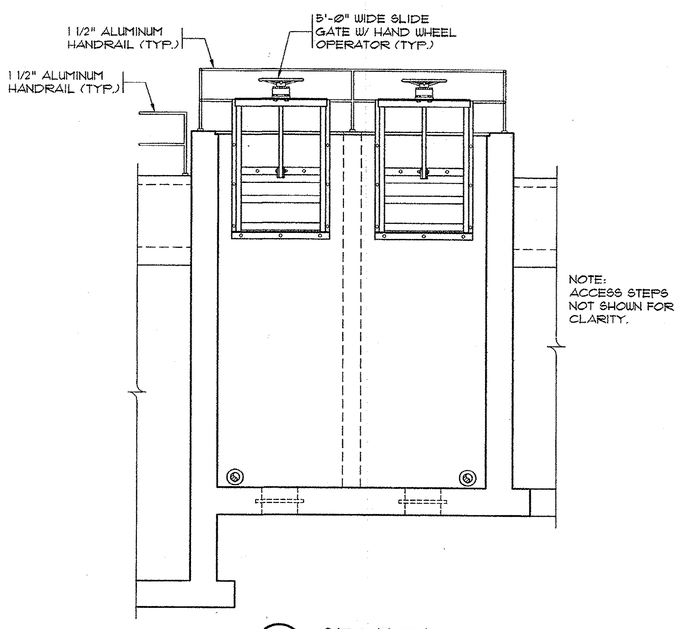
4' 2' Ø 4'



1 / 2 3 FLASH MIX - UPPER PLAN VIEW

SCALE: 1/4" = 1'-Ø"

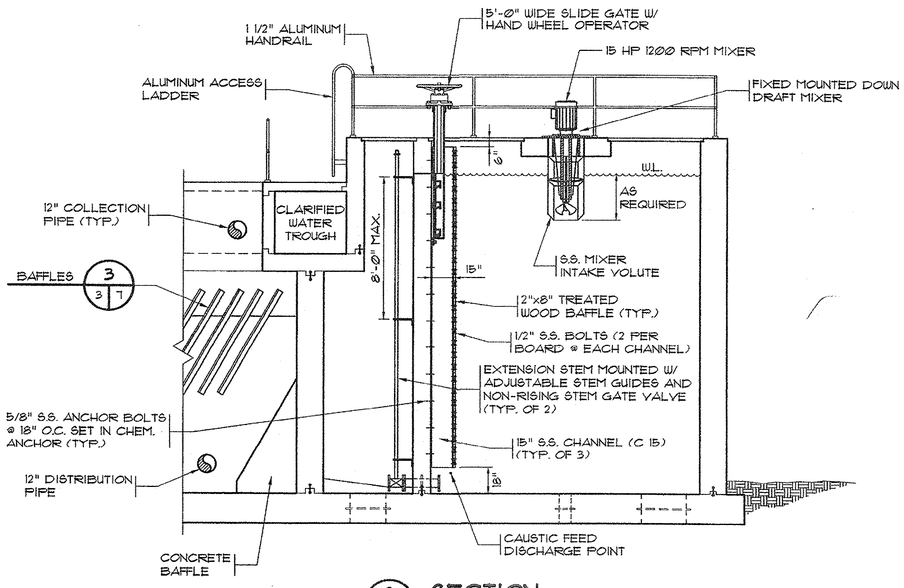
4' 2' Ø 4'



1 / 3 3 SECTION

SCALE: 1/4" = 1'-Ø"

4' 2' Ø 4'



2 / 3 3 SECTION

SCALE: 1/4" = 1'-Ø"

4' 2' Ø 4'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER REGISTERED JOSEPH W. MCCORKLE 22221 1-31-01

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

FLASH MIX PLAN VIEWS AND SECTIONS

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

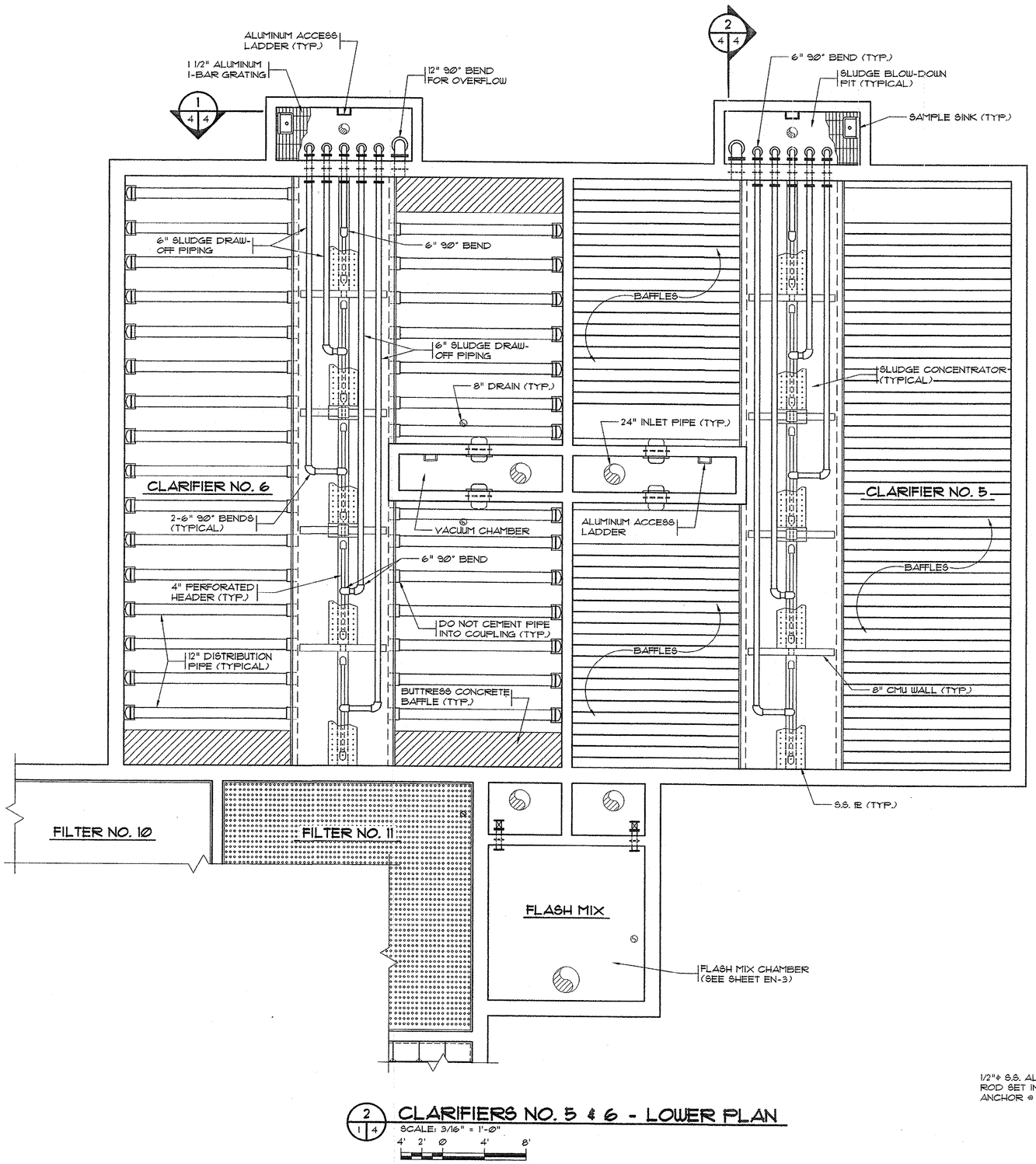
SHEET NO.

EN-3

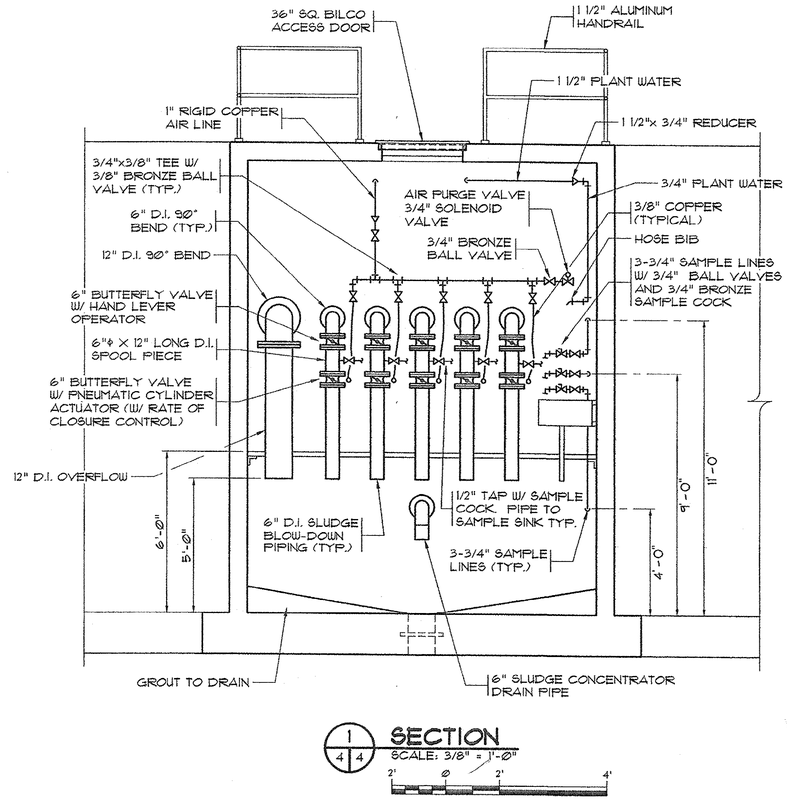
OF: 38

33-013-045

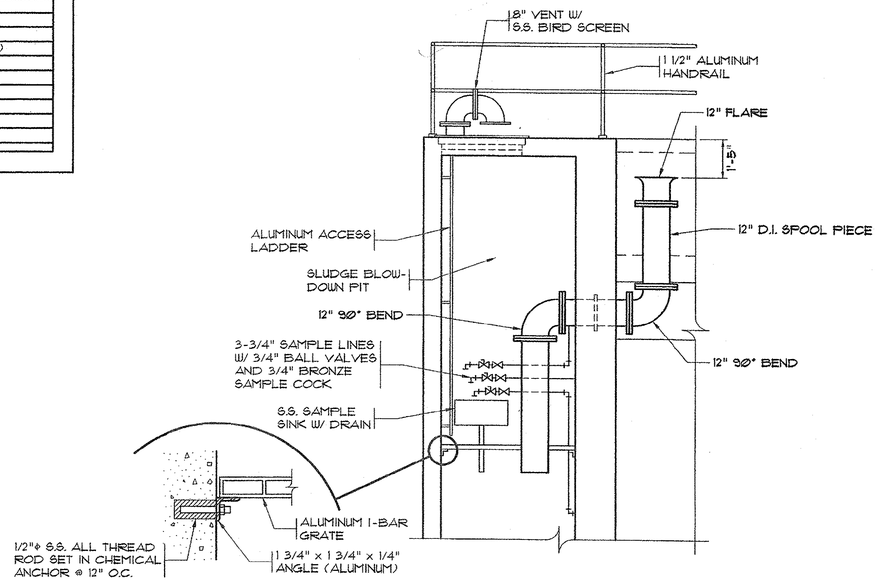
HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-3.dwg,DWG EDITED BY: ARM DATE: 01/18/00 TIME: 15:54 SCALE: 1/4"=1'-0"



2 / 1 4 CLARIFIERS NO. 5 & 6 - LOWER PLAN
SCALE: 3/16" = 1'-0"
4' 2' 0 4' 8'



1 / 4 4 SECTION
SCALE: 3/8" = 1'-0"
2' 0 2' 4'



2 / 4 4 SECTION
SCALE: 3/8" = 1'-0"
2' 0 2' 4'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12305 REGISTERED JOSEPH W. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

CLARIFIERS NO. 5 + 6 LOWER PLAN

BULL CREEK WTP 15 MGD UPGRADE

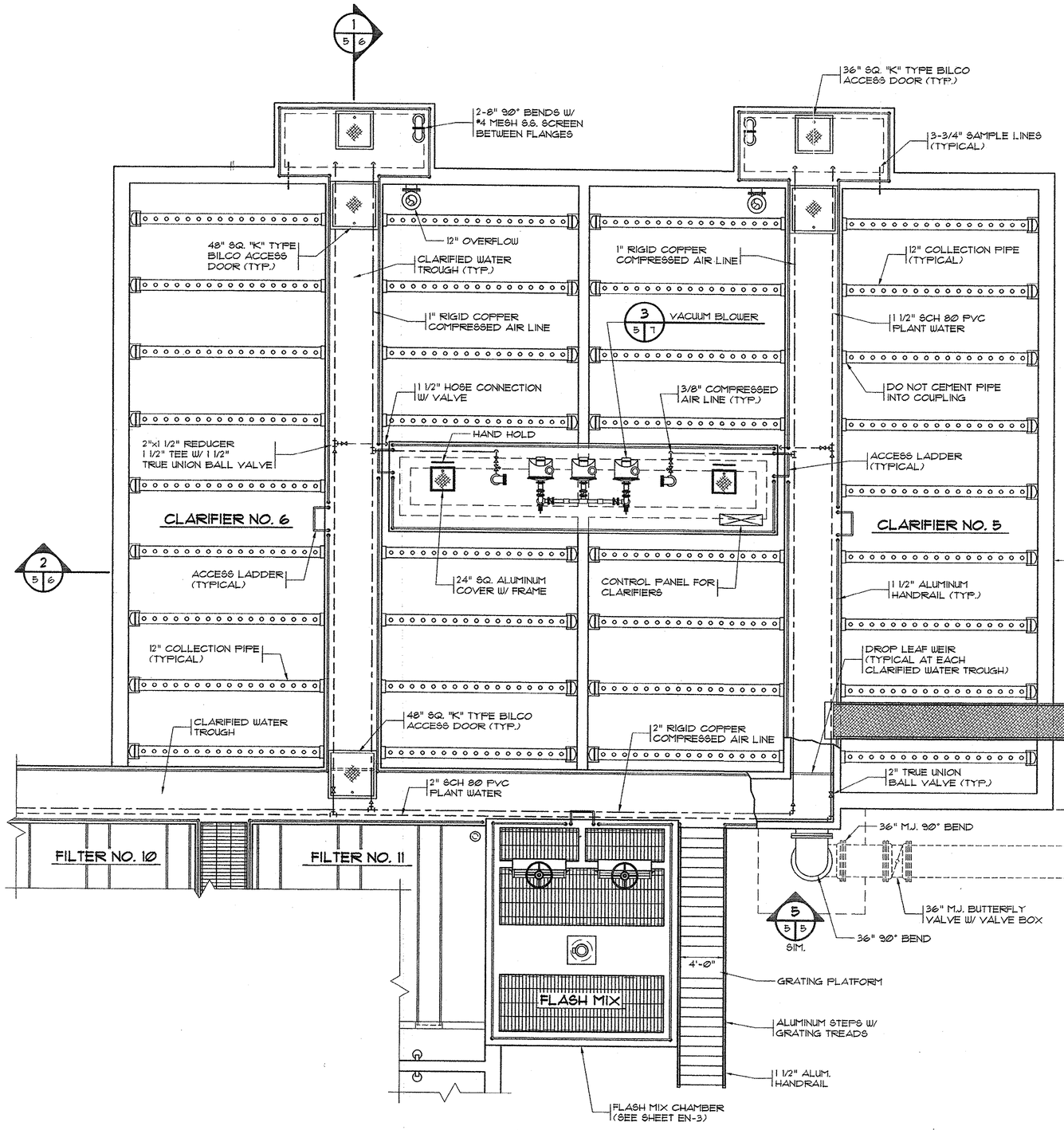
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-4
OF: 38

33-013-046

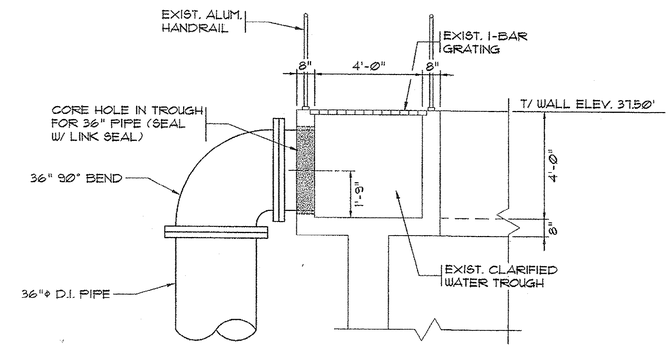
HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-4.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 14:57 PLOT SCALE: 3/16"=1'-0"



2 5 CLARIFIERS NO. 5 & 6 - UPPER PLAN

SCALE: 3/16" = 1'-0"

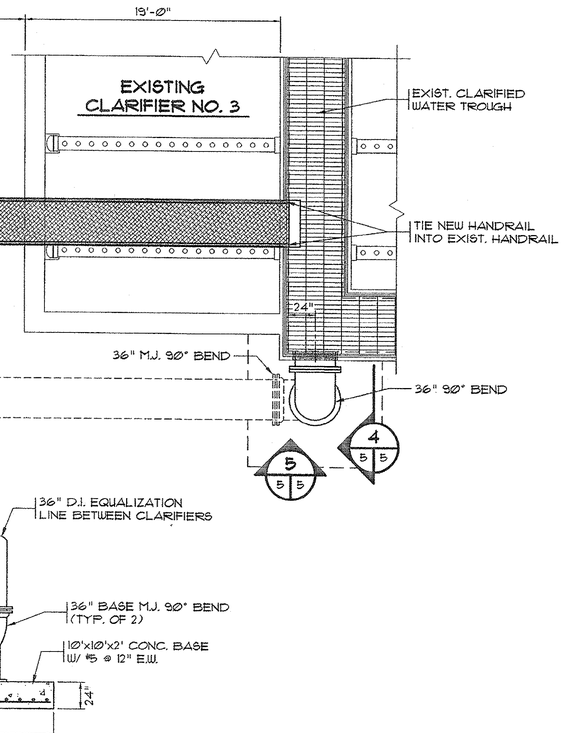
4' 2' 0 4' 8'



4 5 5 SECTION VIEW

SCALE: 3/8" = 1'-0"

2' 0 2' 6'



5 5 5 CONC. PIPE SUPPORT DETAIL

SCALE: 3/16" = 1'-0"

4' 2' 0 4' 8'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER JOSEPH W. HOBBS No. 12335 REGISTERED

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

CLARIFIERS NO. 5 + 6 UPPER PLAN

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

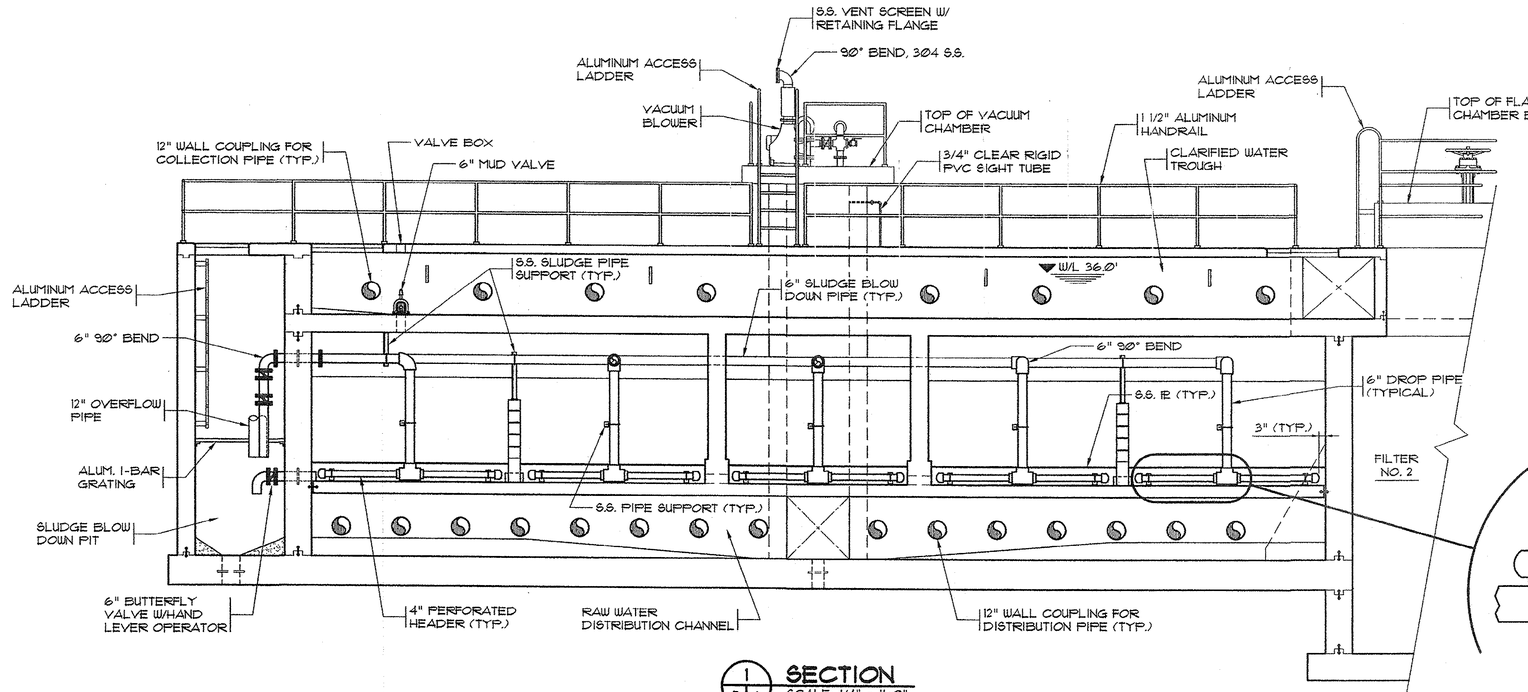
DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. EN-5

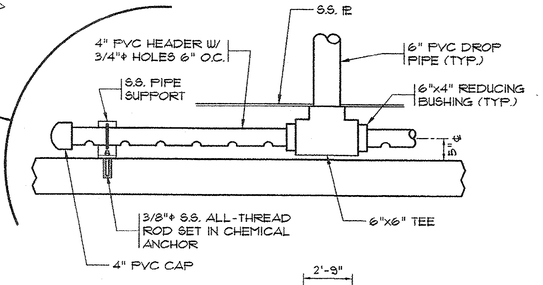
OF: 38

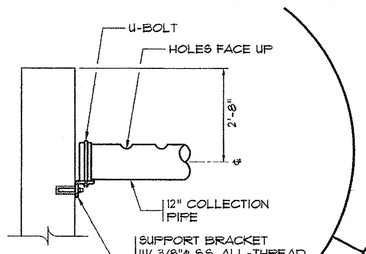
HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-5.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 14:57 PLOT SCALE: 3/16"=1'-0"

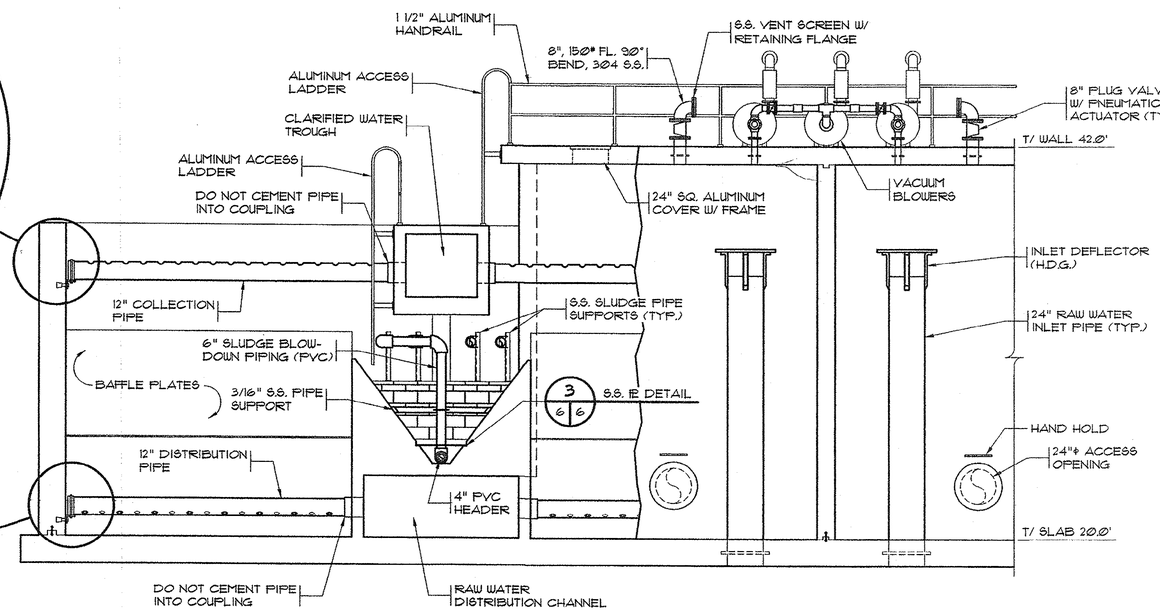
33-013-047



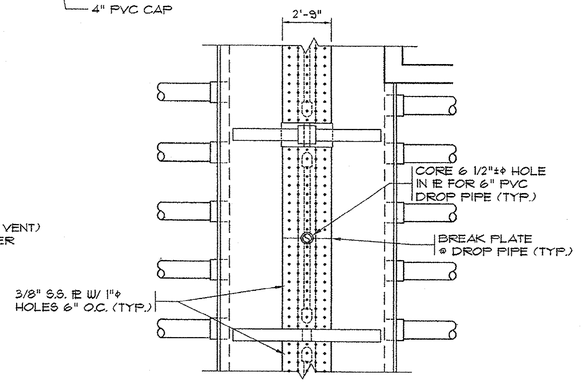
1/5|6 **SECTION**
SCALE: 1/4" = 1'-0"
4' 2' 0 4'



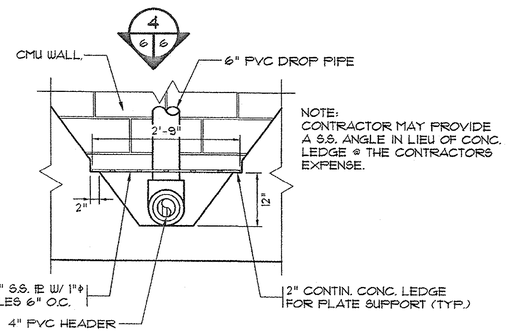




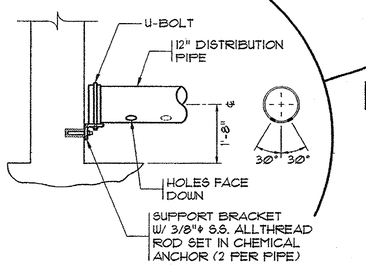
2|5|6 **SECTION**
SCALE: 1/4" = 1'-0"
4' 2' 0 4'



4|6|6 **PLAN VIEW @ S.S. IE**
SCALE: 1/4" = 1'-0"
4' 2' 0 4'



3|6|6 **S.S. IE DETAIL**
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'



REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEERS — REGISTERED — No. 19355 — MCGUINN & HOBSON

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 28577

CLARIFIER SECTIONS

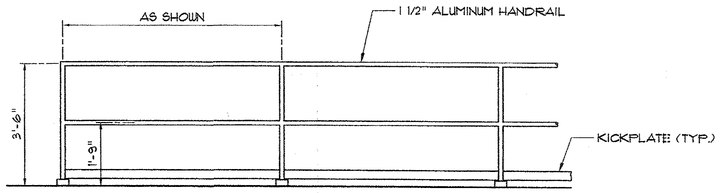
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

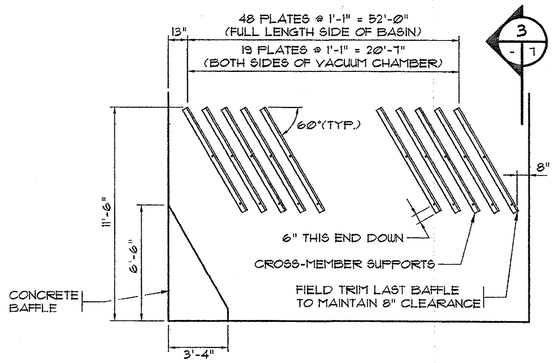
SHEET NO.
EN-6
OF: 38

33-013-048

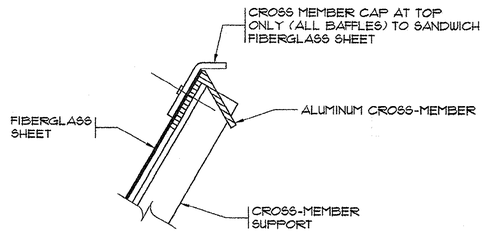
HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-6.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 14:58 PLOT SCALE: 1/4"=1'-0"



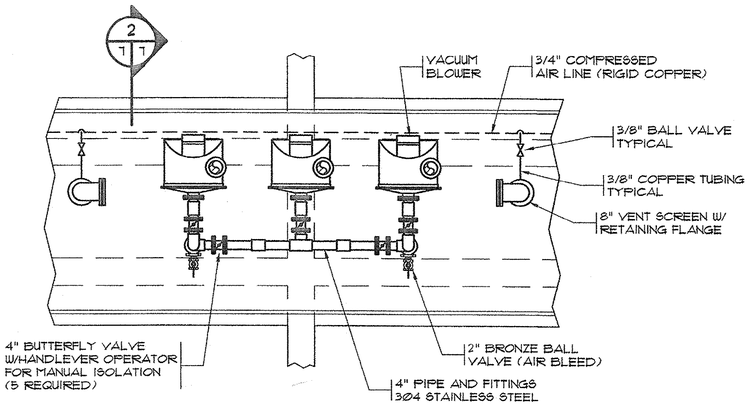
TYPICAL HANDRAIL DETAIL
N.T.S.



CROSS-MEMBER SUPPORT
NTS



CROSS-MEMBER CAP DETAIL
NTS



3 / 5 7 VACUUM BLOWER MECHANICAL
SCALE: 3/8" = 1'-0"

2' 0 2' 6'

(6) NYLON PANEL CLIPS
REQUIRED EVERY OTHER
CROSS-MEMBER

FILON, TYPE 180, FLAT, WHITE 8 OZ/FT2
FIBERGLASS BAFFLES (4) SHEETS
CLIPED TO TOP OF CROSS-MEMBERS

CROSS MEMBER CAP
SEE DETAIL THIS SHEET

4'-0"
(TYP.)

CROSS-MEMBER (4) PIECES
HORIZONTAL DEFLECTOR
ALUMINUM 60° ANGLE

ALUMINUM CROSS-MEMBER
SUPPORT. SIDE OF SUPPORT
TO BE PAINTED WITH (1)
COAT TNEMEC SERIES 20
POTAPOX

ANCHOR TO CONCRETE WALL WITH
3/8" CHEMICAL ANCHORS (2) PER SUPPORT

OVERLAY AS
REQUIRED

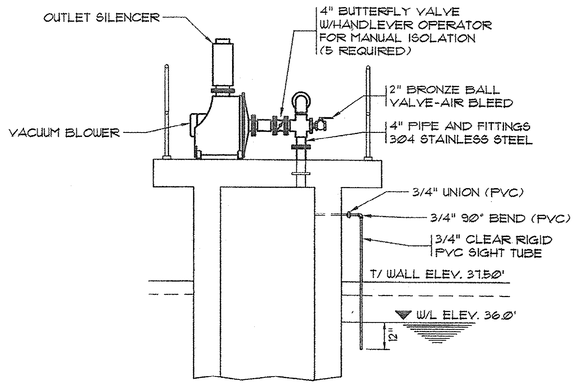
3/4" (TYP.)

BAFFLE ASSEMBLY
TYPICAL (89) PLACES (PER CLARIFIER)

NOTE:

FIBERGLASS BAFFLE SHEETS TO BE ATTACHED TO ALUMINUM CROSS MEMBERS WITH NYLON RIVETS. .187 DIA. PILOT HOLES ARE DRILLED THRU THE BAFFLE CAP, BAFFLE & BAFFLE SUPPORT, NYLON RIVETS ARE TO BE INSTALLED THRU THE BAFFLE SHEETS IN THE FIELD.

3 / 3 7 BAFFLE ASSEMBLY
N.T.S.



2 / 7 7 SECTION
SCALE: 3/8" = 1'-0"

2' 0 2' 6'

REVISIONS

NO.	DESCRIPTION	DATE	BY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

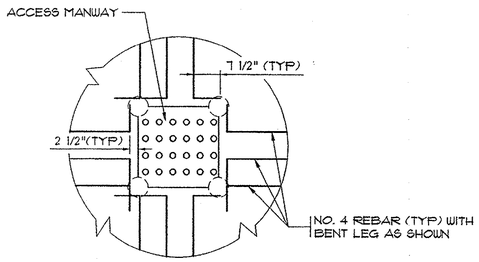
CLARIFIER DETAILS

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

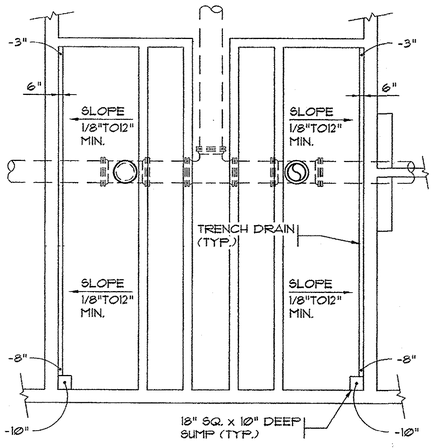
SHEET NO.
EN-7
OF: 38

33-013-049

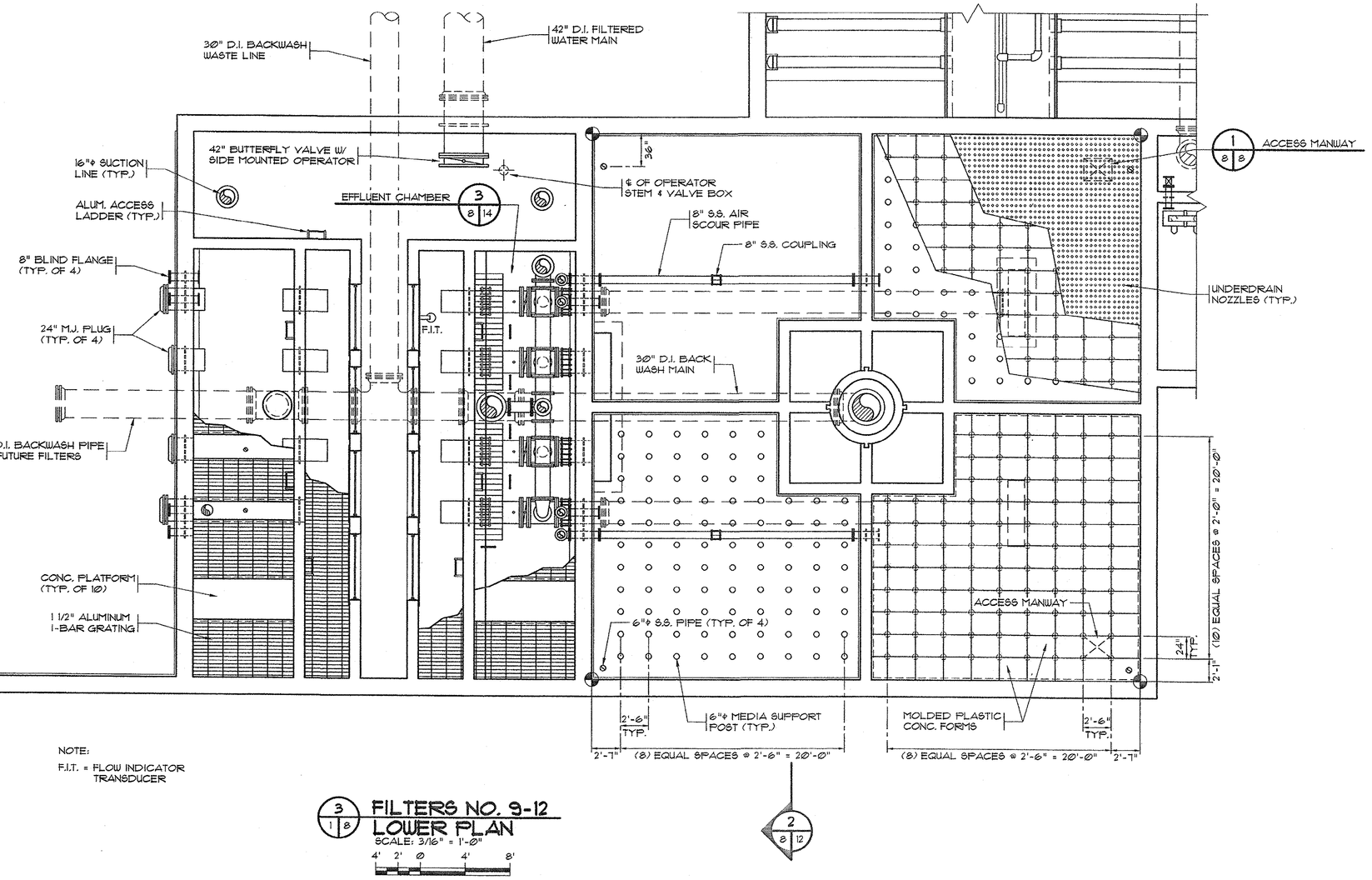
HOBBS UPCHURCH & ASSOC. J:\GS8814\49MGDUPGRADE\EN-7.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 14:58 PLOT SCALE: 3/8"=1'-0"



1/8 ACCESS MANWAY
N.T.S.



TRENCH DRAIN LAYOUT
N.T.S.



NOTE:
F.I.T. = FLOW INDICATOR TRANSDUCER

3/1/8 FILTERS NO. 9-12 LOWER PLAN
SCALE: 3/16" = 1'-0"
4' 2' 0 4' 8'

2/8/12

NOTES:
1. FOR ANCHORS AND REINFORCING LAYOUT SEE EN-13.
2. FOR DETAILS AND INSTALLATION DRAWING SEE EN-12.
3. ⊕ INDICATES W.P. FOR STARTING INSTALLATION FOR EACH CELL.

SYM.

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 19335 REGISTERED JAMES W. MCGOUGHAN HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

FILTERS NO. 9-12
LOWER PLAN

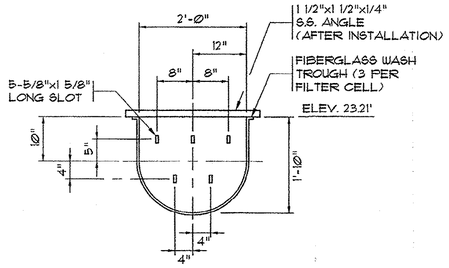
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-8
OF: 38

HOBBS UPCHURCH & ASSOC. J:\DSR814\45MGDUPGRADE\EN-8.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 14:59 PLOT SCALE: 3/16"=1'-0"

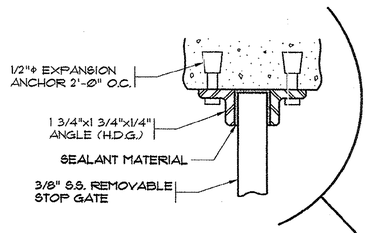
33-013-050

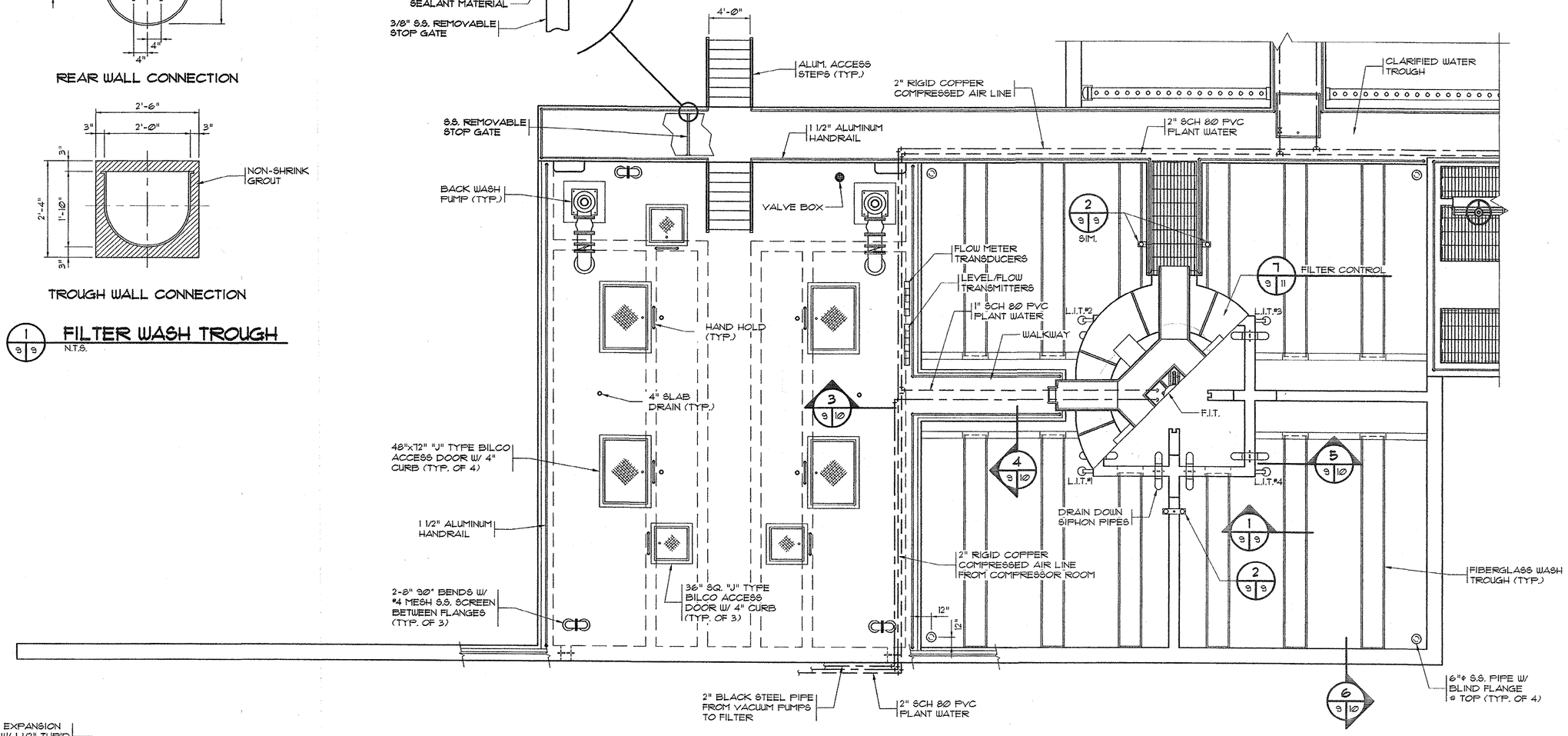


REAR WALL CONNECTION

TROUGH WALL CONNECTION

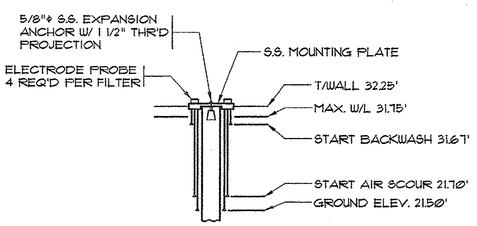
1/9 **FILTER WASH TROUGH**
N.T.S.





3/2 9 **FILTERS NO. 9-12 UPPER PLAN**
SCALE: 3/16" = 1'-Ø"
4' 2' Ø 4' 8'

NOTE:
L.I.T. = LEVEL INDICATOR TRANSDUCER



2/9 9 **FILTER BACKWASH PROBE**
NTS

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER REGISTERED No:12355 JOSEPH W. MCGOUGAN

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

FILTERS NO. 9-12 UPPER PLAN

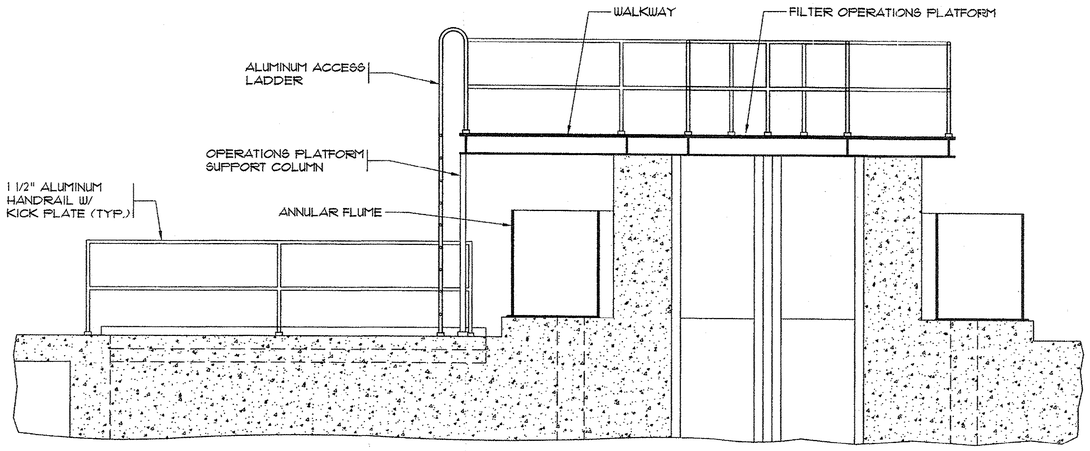
DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-9
OF: 38

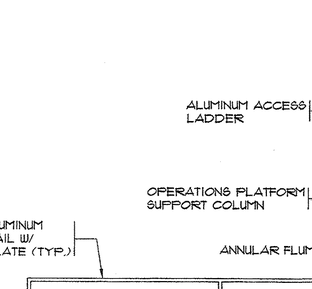
33-013-051

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-9.dwg EDITED BY: dc DATE: 01/18/00 TIME: 14:59 PLOT SCALE: 3/16"=1'-0"

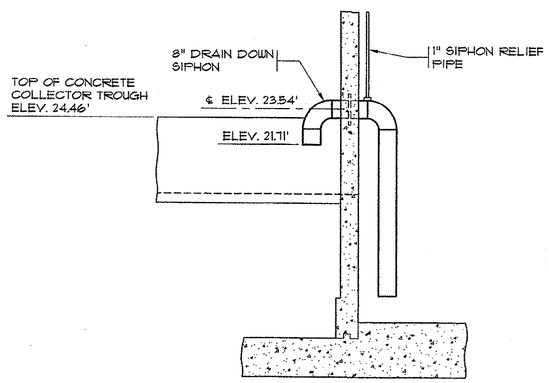
NOTE:
FILTER CENTER CONTROL NOT SHOWN FOR CLARITY.



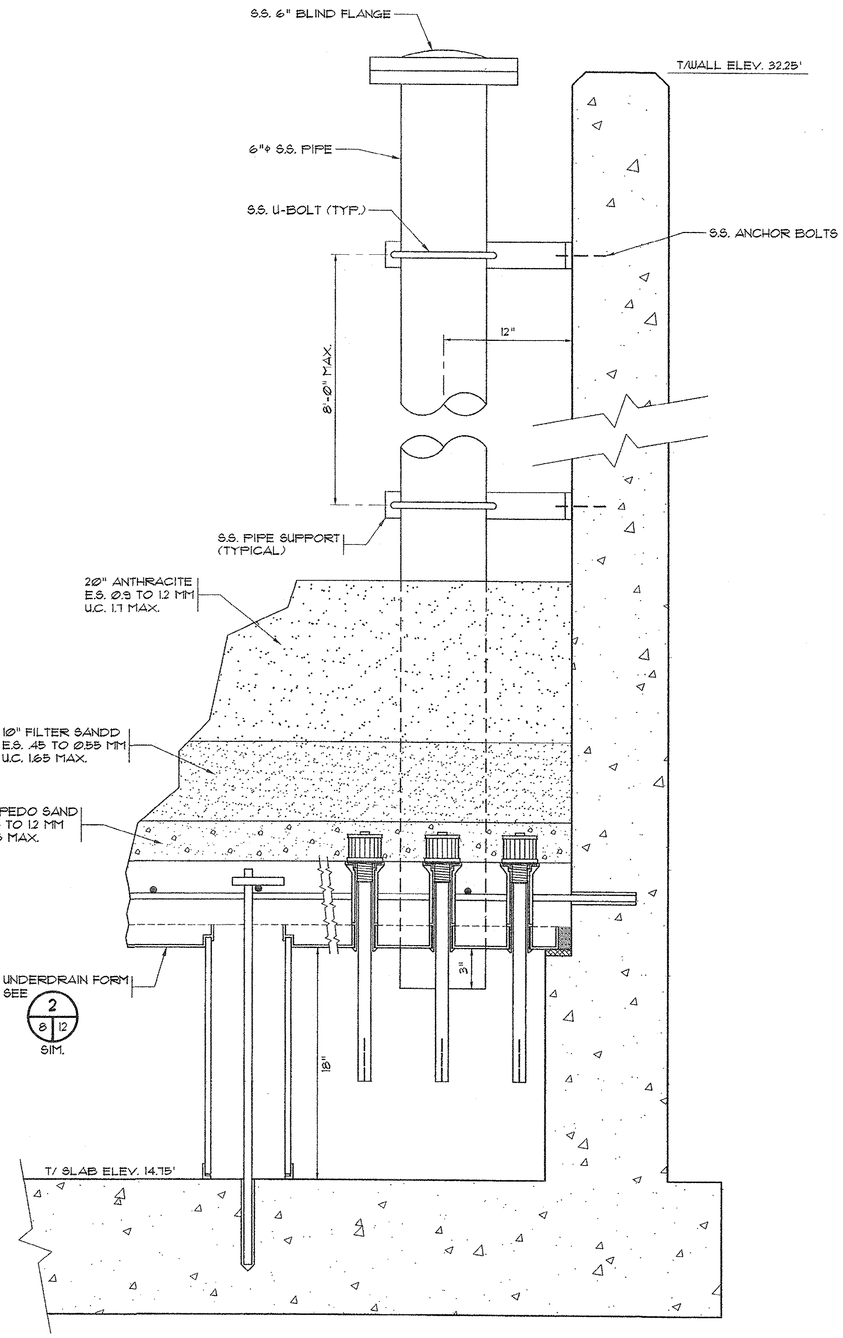
3/9|10 SECTION
SCALE: 3/8" = 1'-0"
2' 0 2' 6'



4/9|10 SECTION
N.T.S.



5/9|10 DRAIN DOWN SIPHON DETAIL
NTS



6/9|10 FILTER MEDIA SECTION
N.T.S.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER JOSEPH W. WOODROW REGISTERED No. 12335

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

FILTER DETAILS

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-10
OF: 38

33-013-052

HOBBS UPCHURCH & ASSOC. J:\GS\81\4\SMGDUPGRADE\EN-10.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:00 PLOT SCALE: 3/16"=1'-0"

NOTE:
PROVIDE 1" SCH 80 PVC PLANT WATER TO CENTER CONTROL AND PROVIDE HOSE BIB.

S.S. FLUME

FLOW

FLOW

L.I.T.#2

L.I.T.#3

S.S. SIPHON TYPICAL

1" SCH 80 PVC PLANT WATER

ALUMINUM ACCESS LADDER

WATER LEVEL GAGE

WALKWAY ASSEMBLY BOLTS (6)

HB

2" BLACK STEEL VACUUM LINE

BACKWASH SIPHON (SECTION OF LOWER ELEVATION SHOWN)

L.I.T.#1

L.I.T.#4

NOTE:
L.I.T. = LEVEL IND. TRANSDUCER
F.I.T. = FLOW IND. TRANSDUCER

AFTER ASSEMBLY AND LEVELING OF (4) CONTROL CENTER CORE UNIT SECTIONS AND BEFORE GROUTING, FIELD WELD (4) JOINTS USING CONT. WATER-TIGHT BEND OF S.S. ROD

CORE UNIT INNER TUBE

NON-SHRINK GROUT

FABRICATED (FURNISHED) S.S. ASSEMBLY BOLTS

FILTER DIVISION WALL

2 1/2" DRAIN W/ BRONZE GATE VALVE

7 OPERATIONS PLATFORM PLAN VIEW

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

2' 1' 0 2'

VACUUM GAGE

GAGE COCK

HEX BUSHING

2" VACUUM PIPE

LIQUID LEVEL CONTROLS ELECTRODE HOLDER W/ ELECTRODES

VACUUM TANK

WATER LEVEL GAGE

1 1/2" ALUMINUM HANDRAIL

3 FIBERGLASS CONTROL CENTER COVER (SEE DETAIL THIS SHEET)

ANNULAR INLET FLUME

USE RUBBER FIBER SPACERS AT VACUUM TANK ATTACHMENTS AND AT ANNULAR FLUME SUPPORTS TO INSULATE BETWEEN MILD STEEL AND STAINLESS STEEL

GROUT ALL AROUND (ANNULAR INLET FLUME TO CONCRETE FLUME)

INLET FLOW

4 INFLUENT WEIR

INLET FLOW

APPROX. 3/4" LEVELING GROUT (GROUT COMPLETELY UNDER FLUME)

2" S.S. PIPE

12"

S.S. LADDER RUNGS

6'-0" I.D. INNER TUBE

WASH TROUGH

BACKWASH FLOW

TOP FUNNEL ELEV 19.70'

(20) 1/2"x8" S.STL. ANCHOR BOLTS W/2 NUTS AND PLAIN WASHERS - 2 1/2" PROJ.

WASTE FUNNEL

GASKET

LEVELING GROUT

WASTE PIPE

CORE UNIT INNER TUBE

FILL GROUT

LEVELING GROUT

1 SECTION

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

2' 1' 0 2' 4'

WALKWAY

ANNULAR INLET FLUME

LEVELING GROUT

2 SECTION

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

2' 1' 0 2'

40" MIN.

STAINLESS STEEL HINGE

RIGID 1" POLYURETHANE FOAM

ACCESS DOOR (2 REQUIRED)

MOLDED FIBERGLASS REINFORCED PLASTIC

74"

51" MIN.

NOTE:
COVER SHALL COME COMPLETE W/ LIGHT, EXHAUST FAN, DUPLEX RECEPTACLE AND HEATER.

3 FIBERGLASS COVER DETAIL

N.T.S.

1/4"

WEIR ↱

GASKET

WEIR WALL

4 SECTION

SCALE: 1" = 1'-0"

1' 0 1' 2'

SYM.	DESCRIPTION	DATE	BY
REVISIONS			

SOUTH CAROLINA PROFESSIONAL ENGINEER JOSEPH W. McDOUGAN REGISTERED No. 22335

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

OPERATIONS PLATFORM PLAN AND SECTIONS

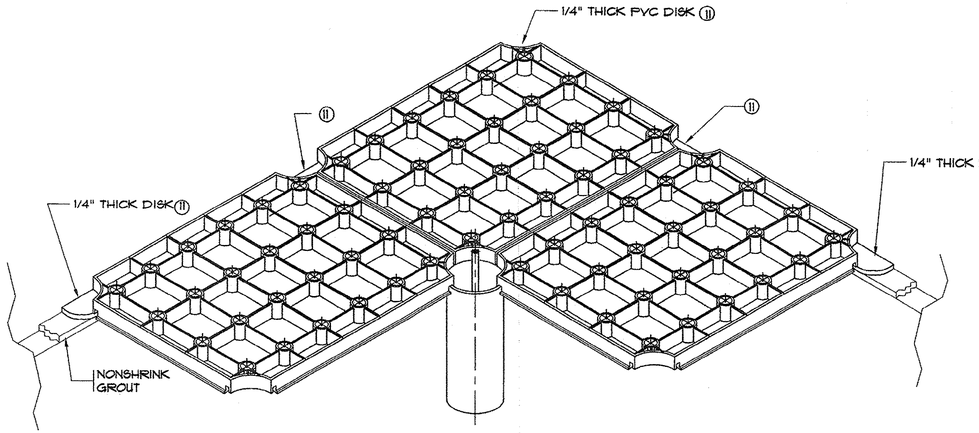
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

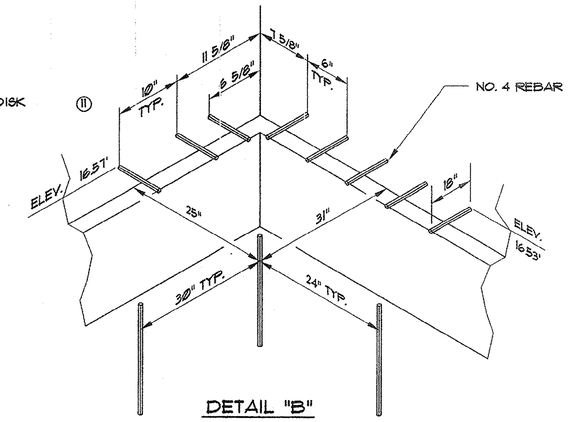
SHEET NO.
EN-11
OF: 38

33-013-053

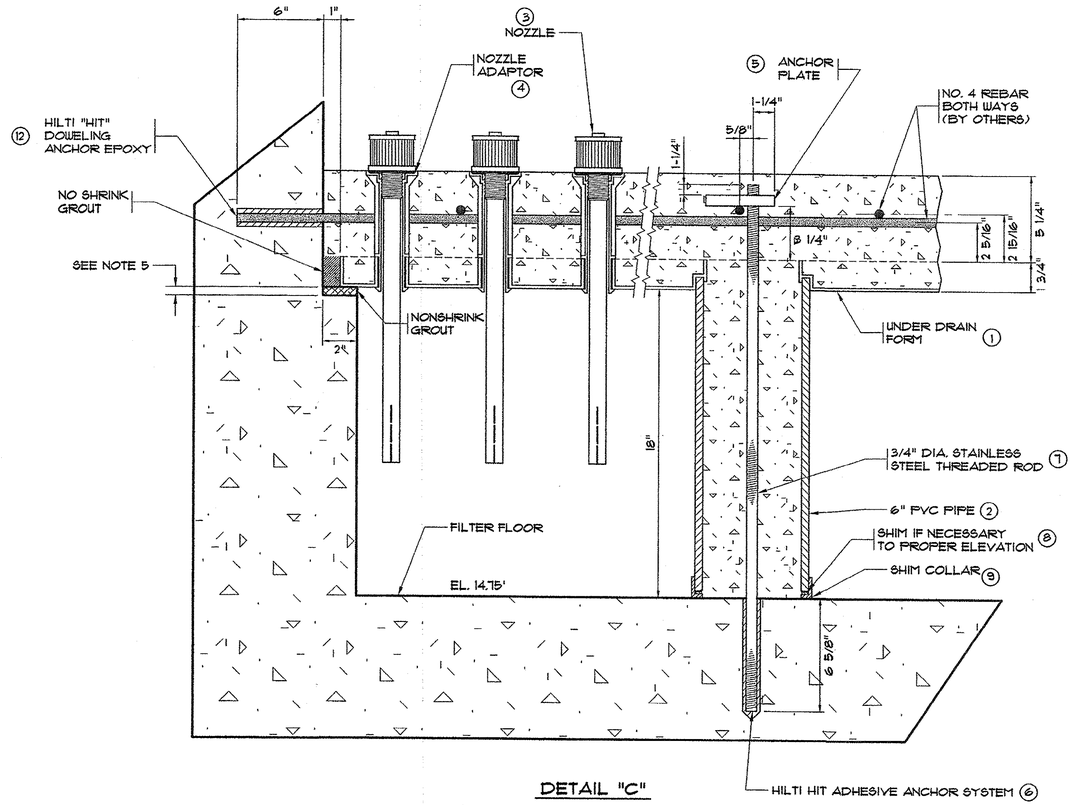
HOBBS UPCHURCH & ASSOC. J:\JSS9814\45MGDUPGRADE\EN-11.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 14:55 PLOT SCALE: 1/2"=1'-0"



DETAIL "A"



DETAIL "B"



DETAIL "C"

2 / 8 | 12 UNDERDRAIN SECTION
N.T.S.

NOTE:

A MINIMUM OF ONE WEEK PRIOR TO THE START OF INSTALLATION OF THE MONOFLOR® UNDER DRAIN, CONTACT HILTI, INC. (1-800-879-8000) AND REFER TO IDI REFERENCE NUMBER #047567600. A LOCAL HILTI REPRESENTATIVE WILL PROVIDE ONSITE HIT ANCHORING SYSTEM INSTALLATION GUIDELINES.

UNDER DRAIN INSTALLATION

1. START IN DESIGNATED CORNER OF CELL AND DRILL 13/16" DIA. HOLES 6 5/8" DEEP IN FILTER FLOOR. HOLES MUST BE VERTICAL AND DEPTH MUST NOT VARY BY MORE THAN ±1/8". INSTALL 3/4" DIA. THREADED RODS (7) AS SHOWN IN DETAILS "B" & "C", THIS DRAWING. TOLERANCE ON SPACING IS ±1/8". DO NOT ACCUMULATE TOLERANCE. INSTALL HIT ANCHORS IN STRICT ACCORDANCE WITH HILT INSTRUCTIONS MAKING CERTAIN THAT DRILLED HOLES ARE CLEANED WITH A WIRE BRUSH AND THEN CLEANED WITH COMPRESSED AIR.
2. SWEEP DEBRIS FROM FILTER FLOOR AND PLACE A 6" PVC PIPE COLUMN (2) AT EACH FLOOR ANCHOR LOCATION. ACCURATELY DETERMINE THE ELEVATION OF THE TOP OF EACH PIPE COLUMN. THE TOP OF THE HIGHEST PIPE COLUMN WILL BE THE DATUM REFERENCE ELEVATION. THE FILTER FLOOR AT THIS PIPE COLUMN(S) WILL BE CALLED 0'-0".
3. AT REMAINING PIPE COLUMNS SHIM AS REQUIRED TO BRING TOPS OF COLUMNS TO DATUM REFERENCE ELEVATION (+0"-0" LESS THAN -1/8"). USE A SHIM COLLAR (9) IF COLUMN IS 1/8" BELOW DATUM REFERENCE ELEVATION. FOR COLUMNS THAT REQUIRE MORE THAN 1/8" A SHIM COLLAR AND THE PROPER NUMBER OF SHIM RINGS (8) (1/8" OR 1/4" THICK) ARE USED TO BRING COLUMN TOPS TO DATUM REFERENCE ELEVATION.
4. DRILL 5/8" DIA. HOLES IN FILTER WALLS FOR #4 REBAR. HOLES MUST BE HORIZONTAL AND DEPTH MUST NOT VARY MORE THAN ±1/8". ELEVATIONS ARE REFERENCED FROM FLOOR ELEVATION 0'-0" ESTABLISHED IN STEP 2.
5. PLACE NON-SHRINK GROUT ON THE WALL LEDGE TO AN ELEVATION THAT IS 0.75 INCHES LESS THAN PIPE COLUMN REFERENCE ELEVATION ESTABLISHED IN STEP 2. TOLERANCE IS ±1/16". DO NOT ACCUMULATE TOLERANCE
6. REMOVE ALL DEBRIS FROM FILTER CELL AND THOROUGHLY CLEAN FILTER
7. START REPLACEMENT OF UNDER DRAIN FORMS (1) IN DESIGNATED START CORNER (OBSERVE A 4B EDGE OF FORM). WORK IN BOTH DIRECTIONS AND DIAGONALLY ACROSS FILTER (SEE DETAIL "A"). MAINTAIN 1" GAP BETWEEN UNDER DRAIN FORMS AND WALLS OPPOSITE STARTING WALLS BY CUTTING FORMS IF NECESSARY. INSTALL 1/4" THICK DISK (11) ON LEDGE BETWEEN FORMS ON WALLS ADJACENT TO START CORNER. INSTALL ON LEDGE OPPOSITE WALLS IF REQUIRED AND CUT DISK TO SUITE IF NECESSARY. CUT DISK REQUIRED. INSTALL NOZZLE ADAPTERS (4) WHILE SETTING FORMS.
8. GROUT ON 1" SPACE BETWEEN UNDER DRAIN FORMS AND ALL WALLS. (SEE DETAIL "C").
9. INSTALL #4 REBAR AT HEIGHTS ABOVE UNDER DRAIN FORM AS SHOWN IN DETAIL "C". INSTALL HIT DOWEL ANCHOR EPOXY IN STRICT ACCORDANCE WITH HILT INSTRUCTIONS. TIE #4 MAIN REBAR AT ALTERNATE INTERSECTIONS. POSITION REBAR CHAIRS PROVIDED IN LINE WITH 2'-6"℄-℄ COLUMNS MIDWAY BETWEEN EACH 2'-6"℄-℄ COLUMN POST. REBAR CHAIRS WILL SIT ON UNDER DRAIN FORM AND SUPPORT (SEE DETAIL "C") AND CENTERED IN COLUMN PIPE. (BOTH WAYS) VERIFY THAT #4 REBAR IS AT THE ELEVATION SHOWN IN DETAIL "C" WHEN TYING TO 3/4" DIA. FLOOR ANCHORS.
10. HOLD FURTHER CONSTRUCTION PRIOR TO PLACING THE CONCRETE MONOFLOOR® SLAB. THE UNDER DRAIN SHALL BE INSPECTED AND APPROVED BY AN AUTHORIZED INFILCO DEGREMONT, INC. REPRESENTATIVE.
11. CONCRETE TO BE PLACED ON FORMS AND IN COLUMNS SHALL BE A CONTINUOUS POUR ON EACH FILTER CELL. CONCRETE SHALL BE MINIMUM 5000 PSI STRENGTH WITH 1/2" TOP SIZE AGGREGATE. A PLASTICIZER SHALL BE USED TO INCREASE THE SLUMP TO A TOTAL OF 8" TO 10". PLACE CONCRETE ONTO FORMS BY PUMPING OR WITH SMALLEST BUCKET AVAILABLE.
12. SCREENED CONCRETE LEVEL WITH TOP OF NOZZLE ADAPTERS MAKING CERTAIN ALL PIPE COLUMNS ARE FILLED WITH CONCRETE. ROD EACH COLUMN AND VIBRATE FORM AT EACH ADAPTER AND IN EACH COLUMN. HAND FLOATING CONCRETE SURFACE IS SATISFACTORY.
13. WHEN CONCRETE HAS OBTAINED A MINIMUM OF 3500 PSI STRENGTH, PLIERS MAY BE USED TO UNSCREW NOZZLE PLUGS FROM NOZZLE ADAPTERS. REMOVE ANY LOOSE MATERIAL FROM NOZZLE ADAPTERS AND INSTALL NOZZLES (3) BY HAND UNTIL SNUG AGAINST THE TOP OF THE ADAPTER. THEN TIGHTEN NOZZLES WITH A CALIBRATED TORQUE WRENCH TO 35" LBS. DO NOT USE LUBRICANT. ANY NOZZLES THAT CANNOT BE TURNED DOWN TO THE ADAPTER BY HAND MUST BE REMOVED AND THE ADAPTER THREADS CLEANED.
14. SWEEP ANY DEBRIS FROM CONCRETE SLAB SURFACE.

WARNING!

EXTRA PRECAUTION NEEDS TO BE TAKEN TO INSURE THAT THE COLUMN FORM IS COMPLETELY FILLED WITH CONCRETE. A SMALL DIAMETER VIBRATOR SHOULD BE USED IN THE COLUMNS AND ON THE FORM AT EACH ADAPTOR. SEE NOTE 12.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER JOSEPH W. HOBBS No. 12335 REGISTERED

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

MONOFLOR® INSTALLATION AND DETAILS

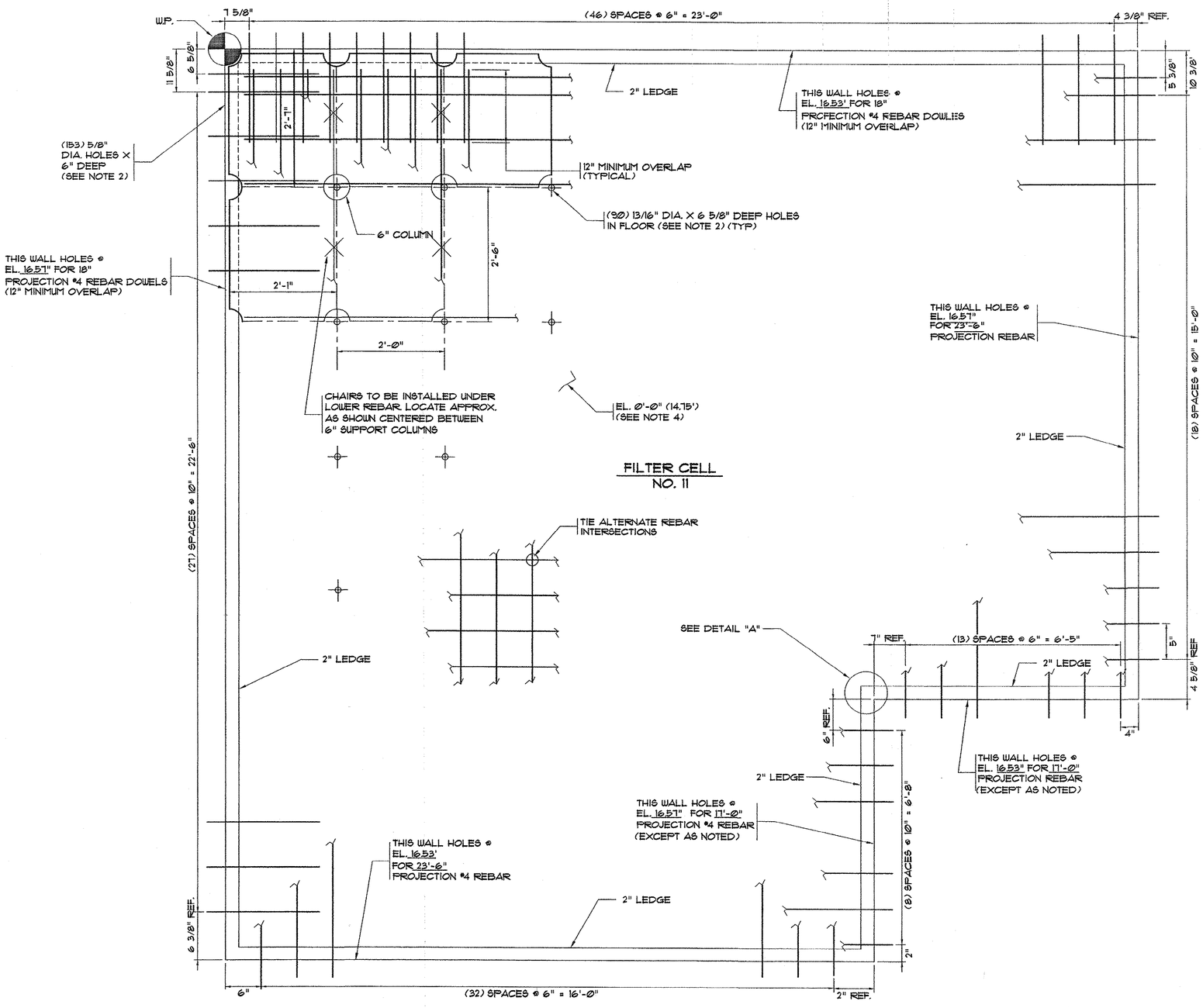
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-12
OF: 38

33-013-054

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-12.dwg DWG EDITED BY: dc DATE: 01/18/00 TIME: 14:55 PLOT SCALE: 3/8"=1'-0"



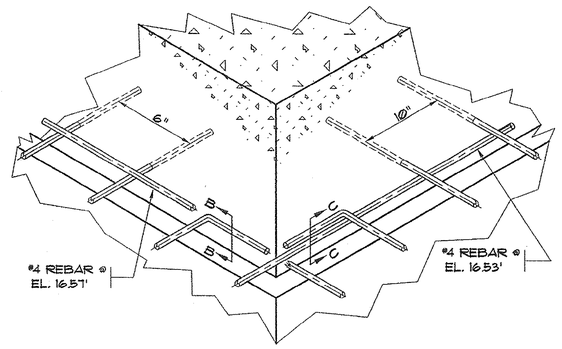
FILTER CELL NO. 11

FILTER CELL PLAN VIEW (TYP. OF 4) FLOOR AND WALL DRILLING LAYOUT

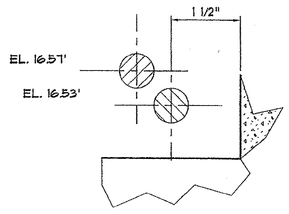
N.T.S.

NOTES

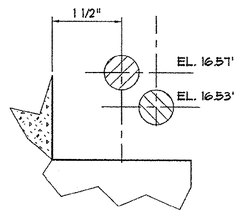
1. ORIENT DRAWING TO CELL BEING WORKED ON. WORKING POINT (W.P.) IS ALWAYS AT INTERSECTION OF TWO OUTER BASIN WALLS.
2. TOLERANCE ON HOLE SPACING = ±1/8". DO NOT ACCUMULATE.
3. SEE DRAWING EN-8 FOR BASIN LAYOUT.
4. ELEVATION 0'-0" ESTABLISHED IN NOTE 2 ON DRAWING EN-12.



DETAIL "A"



SECTION "B-B"



SECTION "C-C"

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER REGISTERED JOSEPH W. HOBBS No. 12335 NATIONAL

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

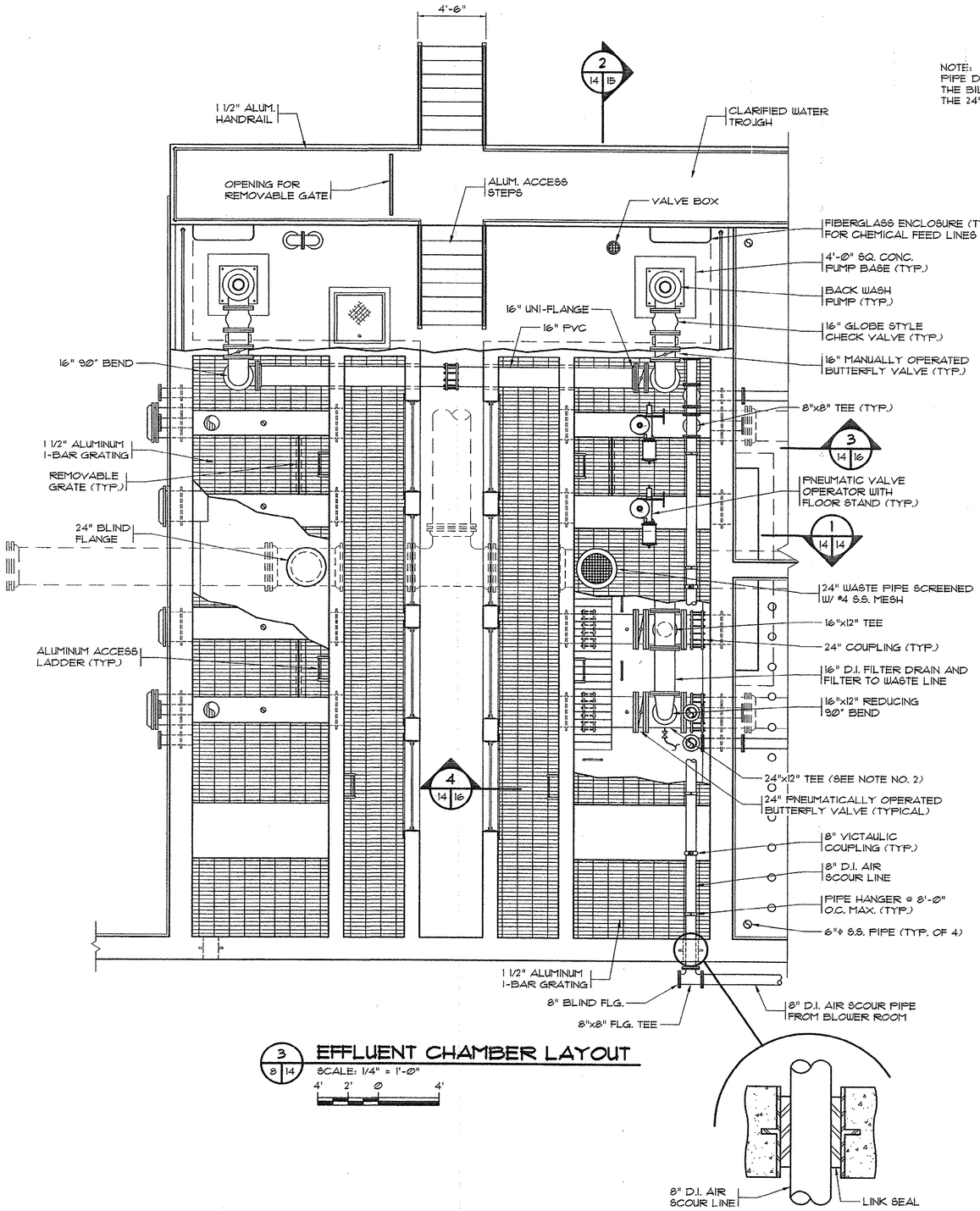
FILTER CELL PLAN VIEW FLOOR AND WALL DRILLING LAYOUT

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. EN-13 OF: 38

HOBBS UPCHURCH & ASSOC. J:\GS98\41.45MGDUPGRADE\EN-13.dwg.DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:00 PLOT SCALE: 3/8"=1'-0"

33-013-055

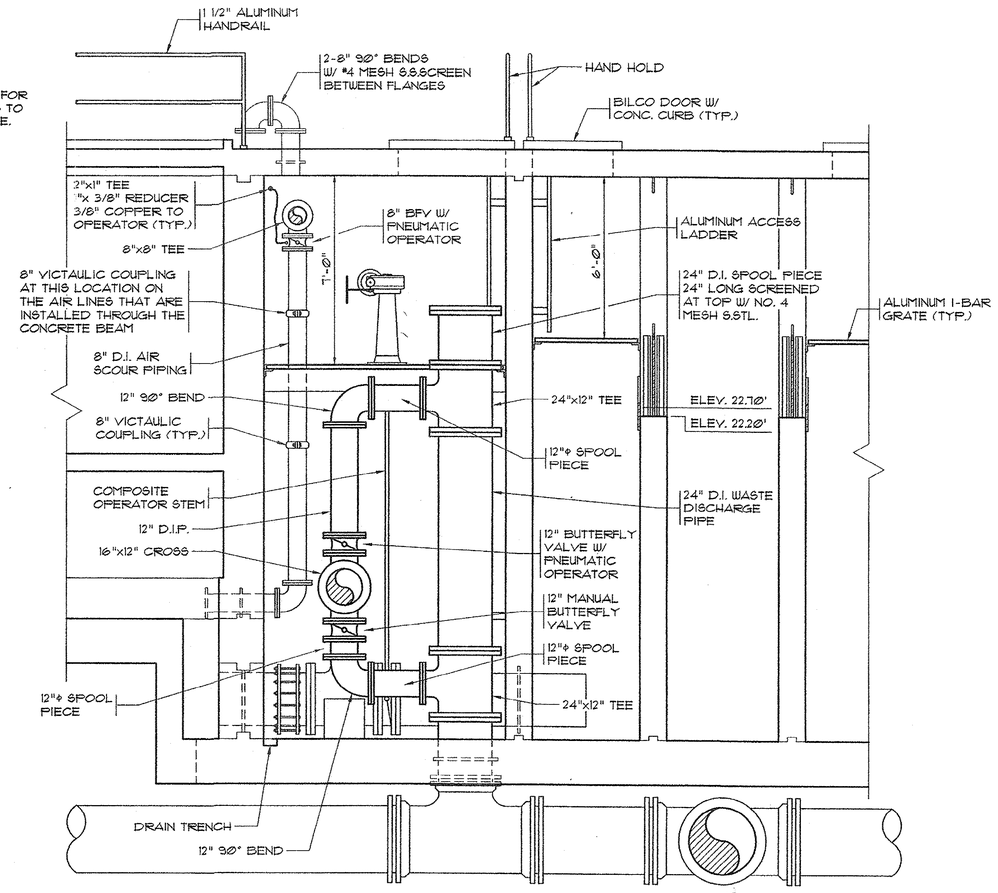


3 / 8 14 — **EFFLUENT CHAMBER LAYOUT**

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

4' 2' 0 4'

NOTE:
PIPE DRAIN LINES FOR THE BILCO DOORS TO THE 24" WASTE PIPE.



1 / 14 14 — **SECTION**

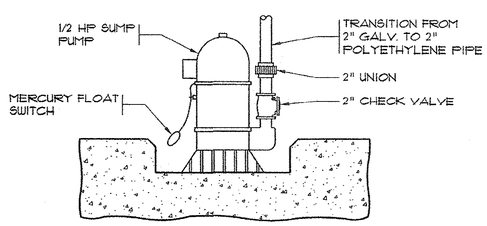
SCALE: 3/8" = 1'-0"

2' 0 2' 6'

NOTES:

1. TAP 2" SUMP PUMP OUTLET INTO 24" WASTE PIPE WITH SADDLE AND CORPORATION.
2. TAP EACH 24"x12" TEE W/ 1/2" TAP AND VALVE, EXTEND 1/2" FLEXIBLE PIPE TO FILTER TURBIDITY PANEL.

NOTE:
CONTRACTOR SHALL POUR BOTTOM OF DRY PIT AREA OF EFFLUENT CHAMBERS TO DRAIN TO DRAIN TRENCH.



SUMP PUMP DETAIL
(EFFLUENT CHAMBER NO. 3 ONLY)
N.T.S.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER JOSEPH W. HOBBS No. 12335 REGISTERED

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

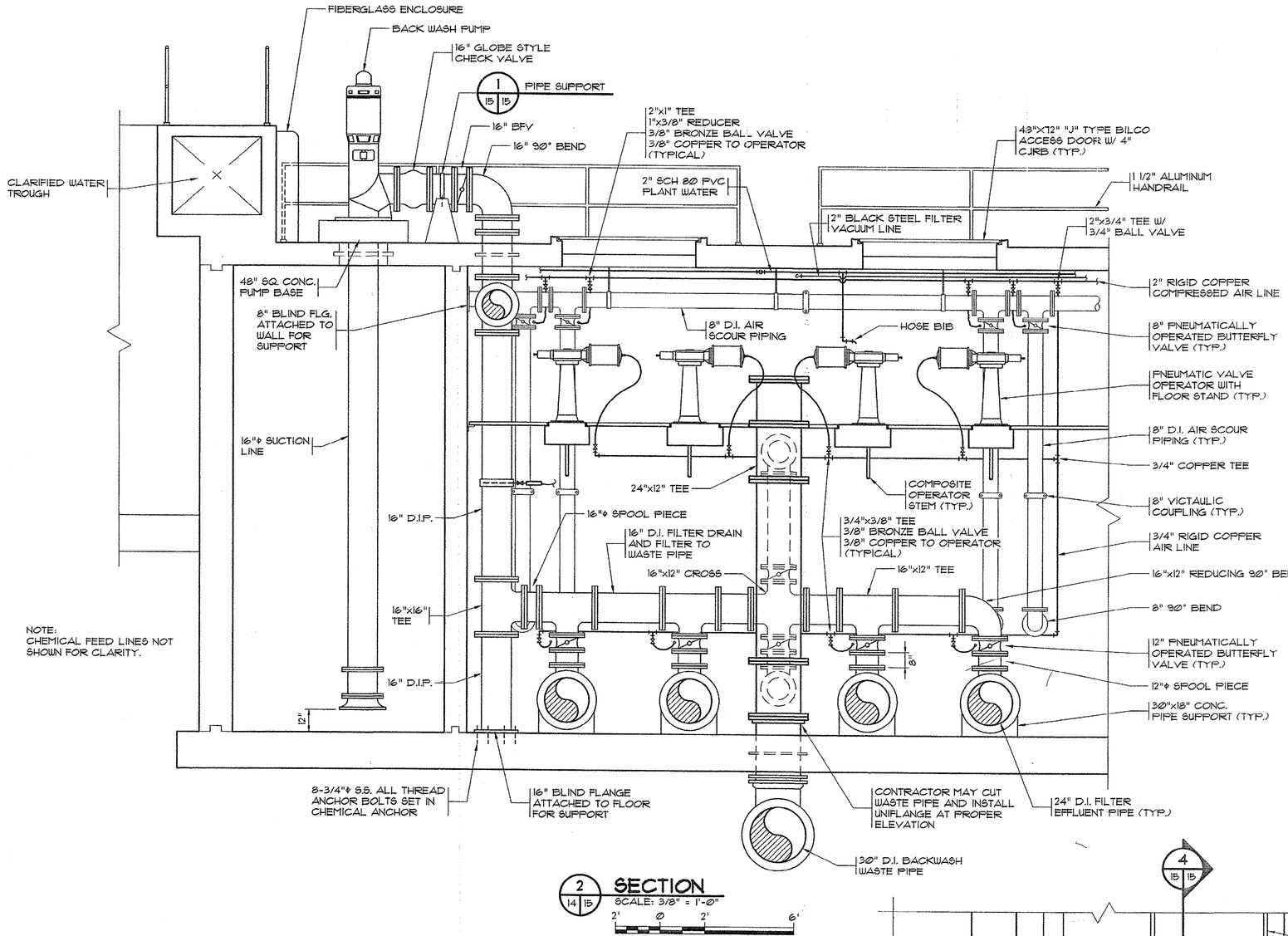
EFFLUENT CHAMBER LAYOUT, SECTIONS AND DETAILS

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-14
OF: 38

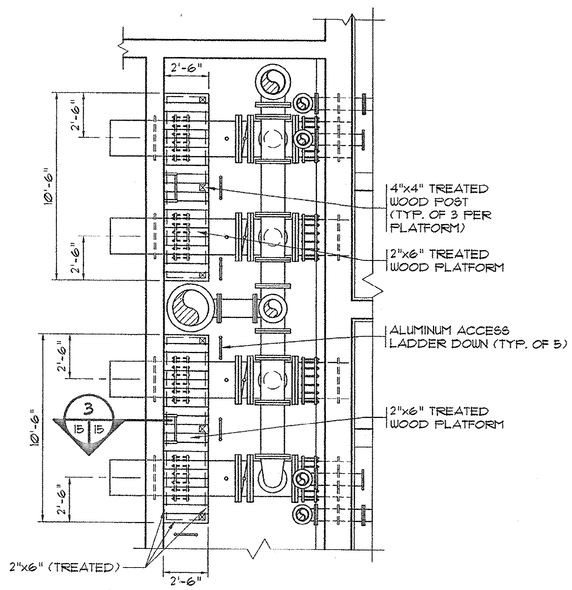
33-013-056

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-14.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:04 PLOT SCALE: 1/4"=1'-0"

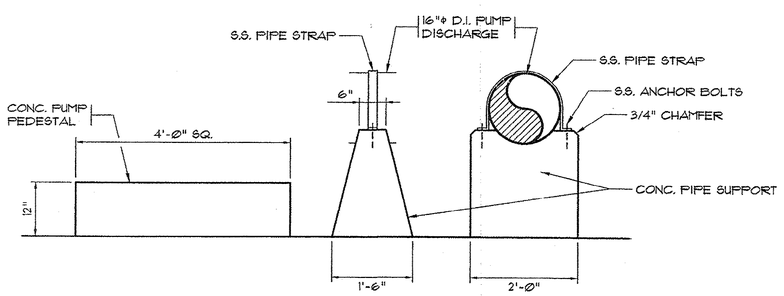


NOTE:
CHEMICAL FEED LINES NOT SHOWN FOR CLARITY.

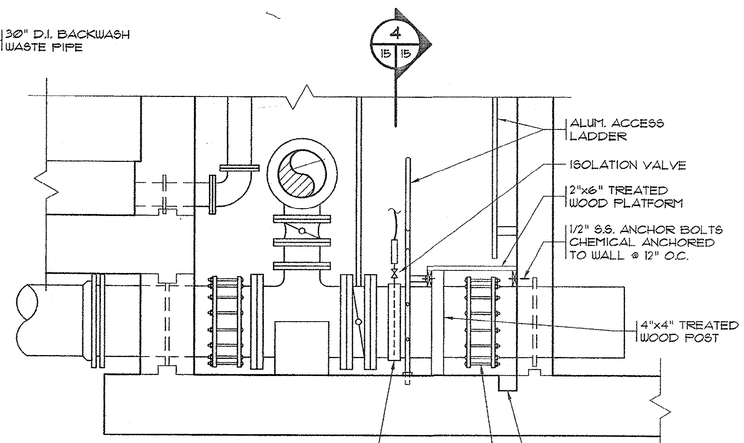
2/14/15 **SECTION**
SCALE: 3/8" = 1'-0"
2' 0 2' 6'



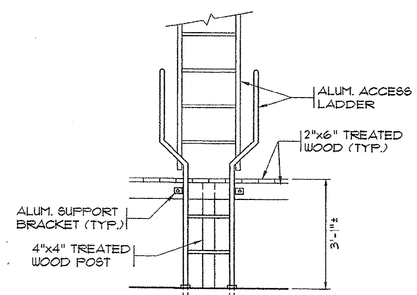
WOOD PLATFORM LAYOUT
SCALE: 1/4" = 1'-0"
4' 2' 0 4'



1/15/15 **PIPE SUPPORT DETAIL**
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'



3/15/15 **SECTION**
SCALE: 1/2" = 1'-0"
2' 1' 0 2'



4/15/15 **ACCESS LADDER ELEVATION**
SCALE: 1/2" = 1'-0"
2' 1' 0 2'

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER
REGISTERED
JOSEPH W. MCCLOSKEY
No. 18355

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

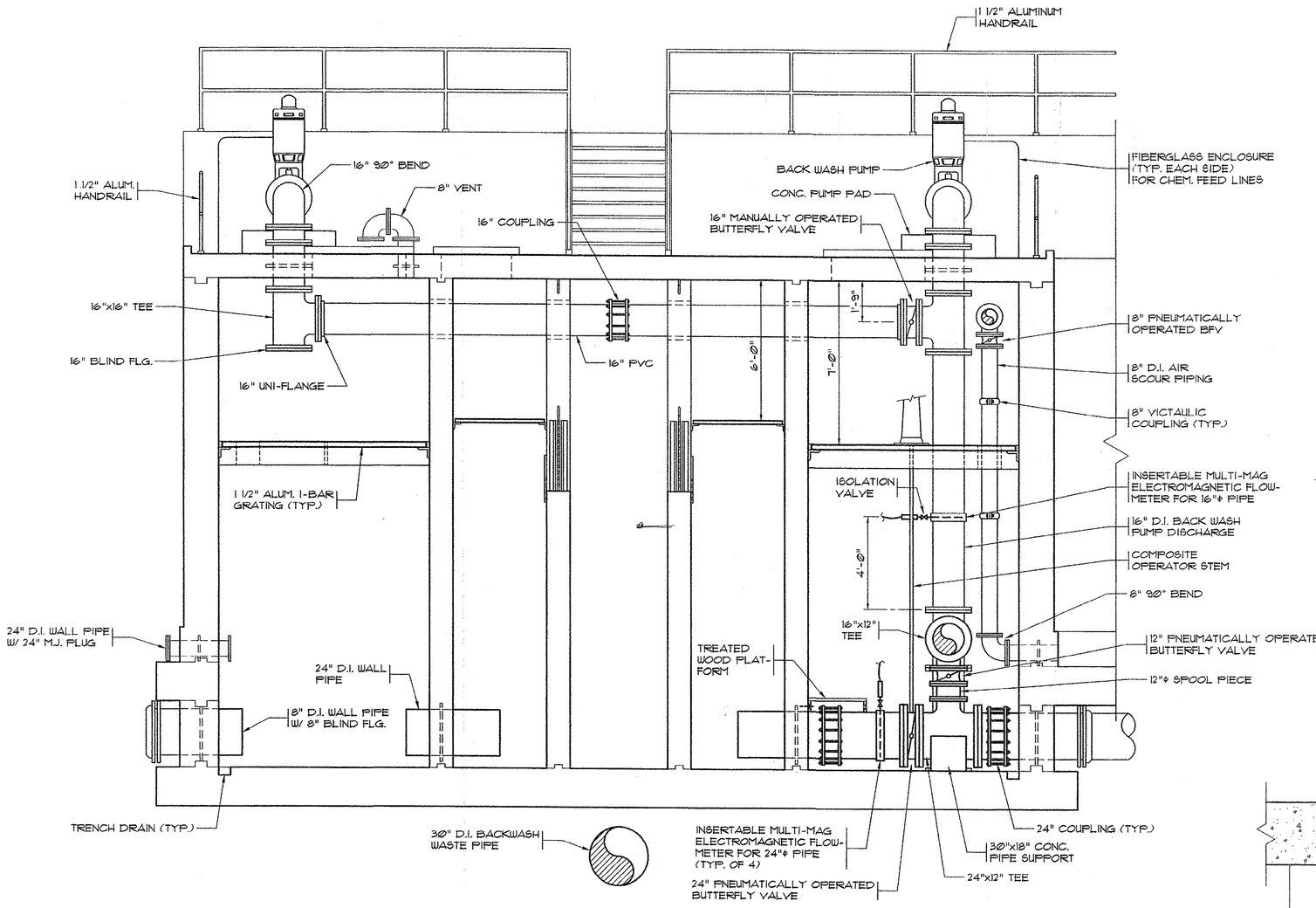
EFFLUENT CHAMBER SECTION AND DETAILS

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

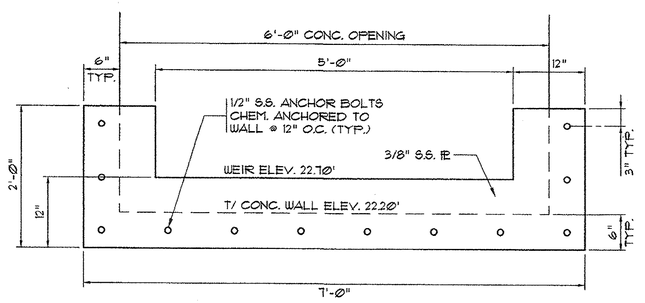
SHEET NO.
EN-15
OF: 38

33-013-057

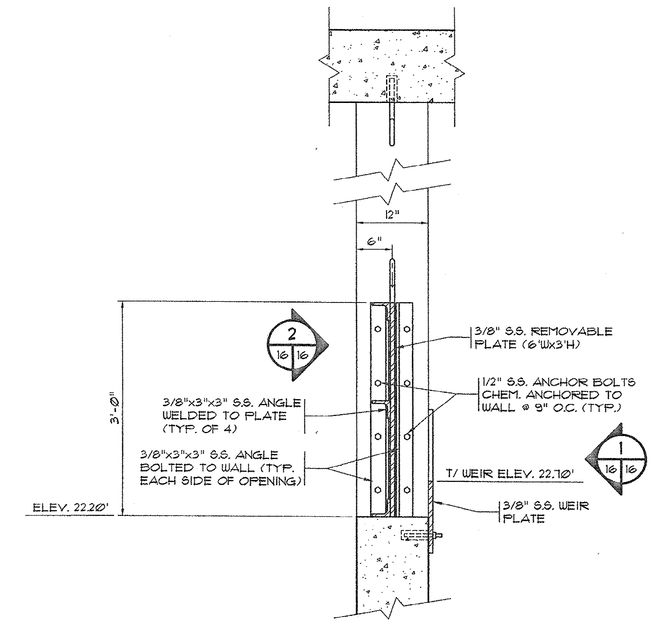
HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-15.dwg DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:05 PLOT SCALE: 3/8"=1'-0"



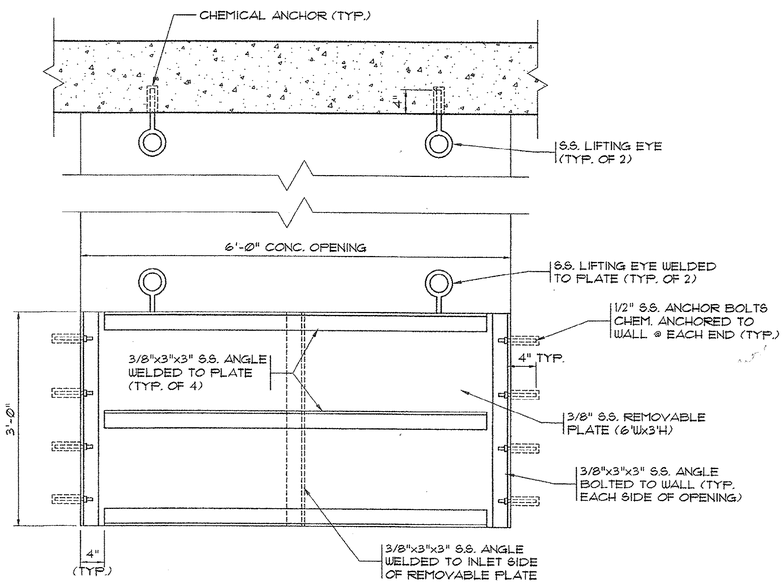
3/14 16 SECTION
SCALE: 3/8" = 1'-0"
2' 0 2' 6'



1/16 16 S.S. WEIR PLATE ELEVATION
N.T.S.



4/14 16 S.S. REMOVABLE PLATE AND WEIR DETAIL
N.T.S.



2/16 16 S.S. REMOVABLE PLATE ELEVATION
N.T.S.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 19235 REGISTERED JAMES W. MCCUTCHEON

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

EFFLUENT CHAMBER SECTION AND DETAILS

BULL CREEK WTP 15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-16
OF: 38

33-013-05B

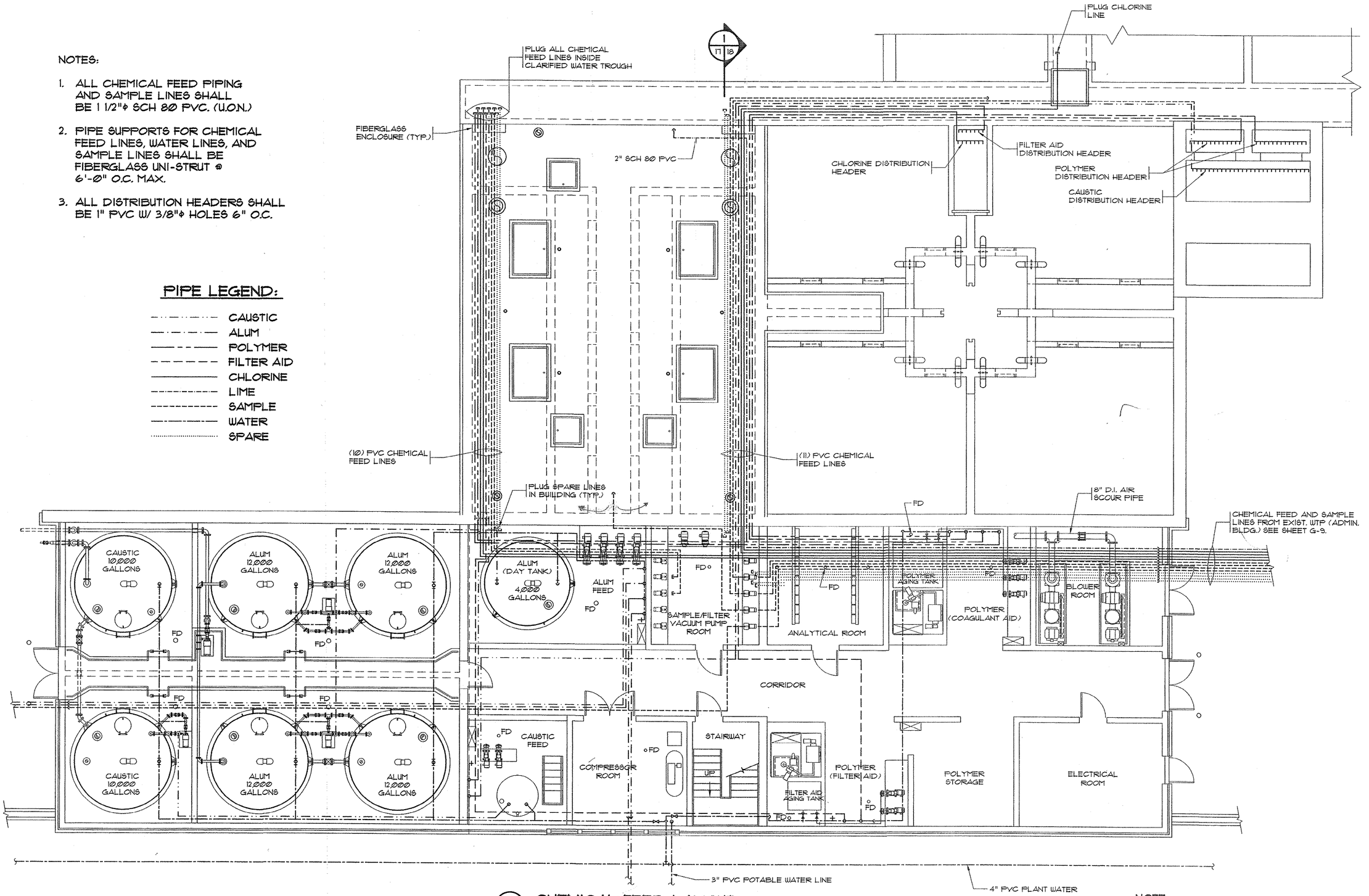
HOBBS UPCHURCH & ASSOC. J:\SS9814\45MGDUPGRADE\EN-16.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:06 PLOT SCALE: 3/8"=1'-0"

NOTES:

1. ALL CHEMICAL FEED PIPING AND SAMPLE LINES SHALL BE 1 1/2"ϕ SCH 80 PVC. (U.O.N.)
2. PIPE SUPPORTS FOR CHEMICAL FEED LINES, WATER LINES, AND SAMPLE LINES SHALL BE FIBERGLASS UNI-STRUT @ 6'-0" O.C. MAX.
3. ALL DISTRIBUTION HEADERS SHALL BE 1" PVC W/ 3/8"ϕ HOLES 6" O.C.

PIPE LEGEND:

- CAUSTIC
- ALUM
- POLYMER
- FILTER AID
- CHLORINE
- LIME
- SAMPLE
- WATER
- SPARE



4 / 1 | 17 CHEMICAL FEED LAYOUT APPLICATION AND SAMPLE POINTS

SCALE: 3/16" = 1'-0"

4' 2' 0 4' 8'

NOTE:
2'-0" MIN. RADIUS ON ALL BENDS FOR LIME FEED LINES.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER REGISTERED No. 20335 JOSEPH W. MCCULLOUGH

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

CHEMICAL FEED LAYOUT APPLICATIONS POINTS

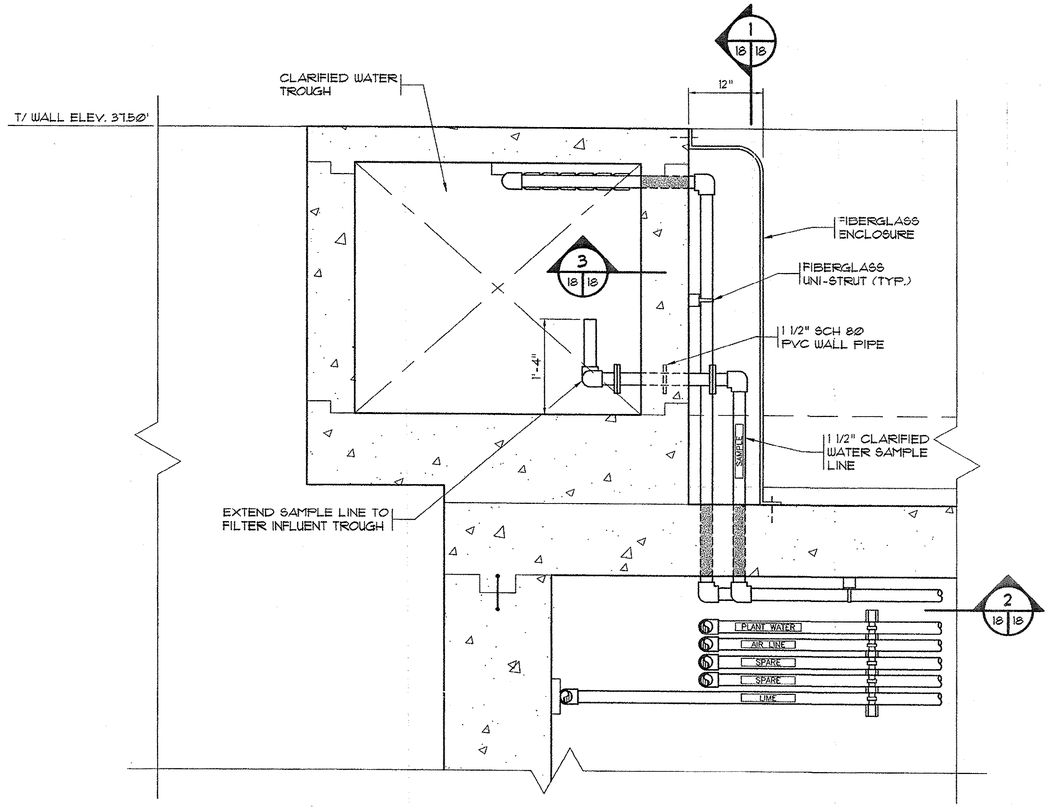
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-17
OF: 38

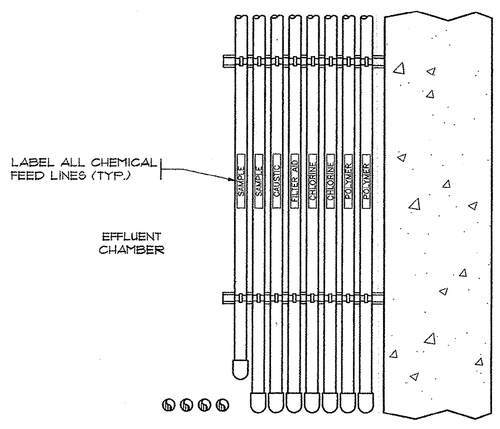
33-013-059

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGD\UPGRADE\EN-17.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 13:37 PLOT SCALE: 3/16"=1'-0"

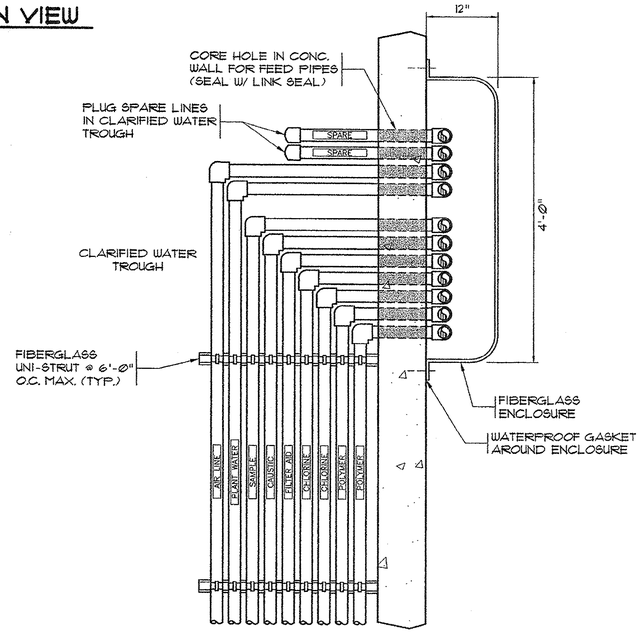


1 / 17 | 18 SECTION VIEW
N.T.S.

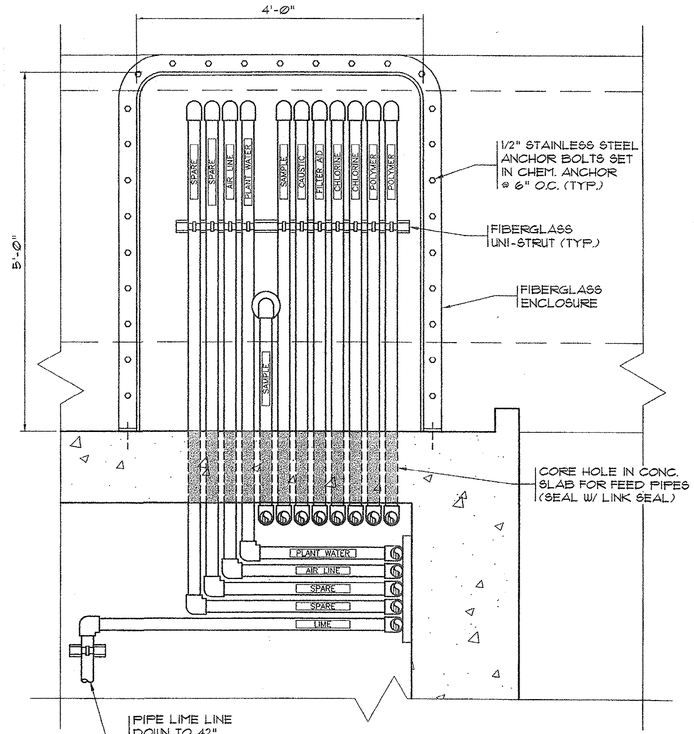
NOTE:
FUTURE EFFLUENT CHAMBER FEED PIPING SIMILAR. PLUG ALL LINES INSIDE CLARIFIED WATER TROUGH.



2 / 18 | 18 SECTION VIEW
N.T.S.



3 / 18 | 18 SECTION VIEW
N.T.S.



1 / 18 | 18 SECTION VIEW
N.T.S.

NOTE:
CONTRACTOR MAY BOX OUT AND GROUT FOLLOWING INSTALLATION OF PIPES.

NOTE:
PIPE SUPPORTS FOR CHEMICAL FEED LINES, WATER LINES, AND SAMPLE LINES SHALL BE FIBERGLASS UNI-STRUT @ 6'-0" O.C. MAX.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER — REGISTERED — JOSEPH W. HOBBS — No. 12335

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

CHEMICAL FEED PIPING SECTIONS

BULL CREEK WTP 15 MGD UPGRADE

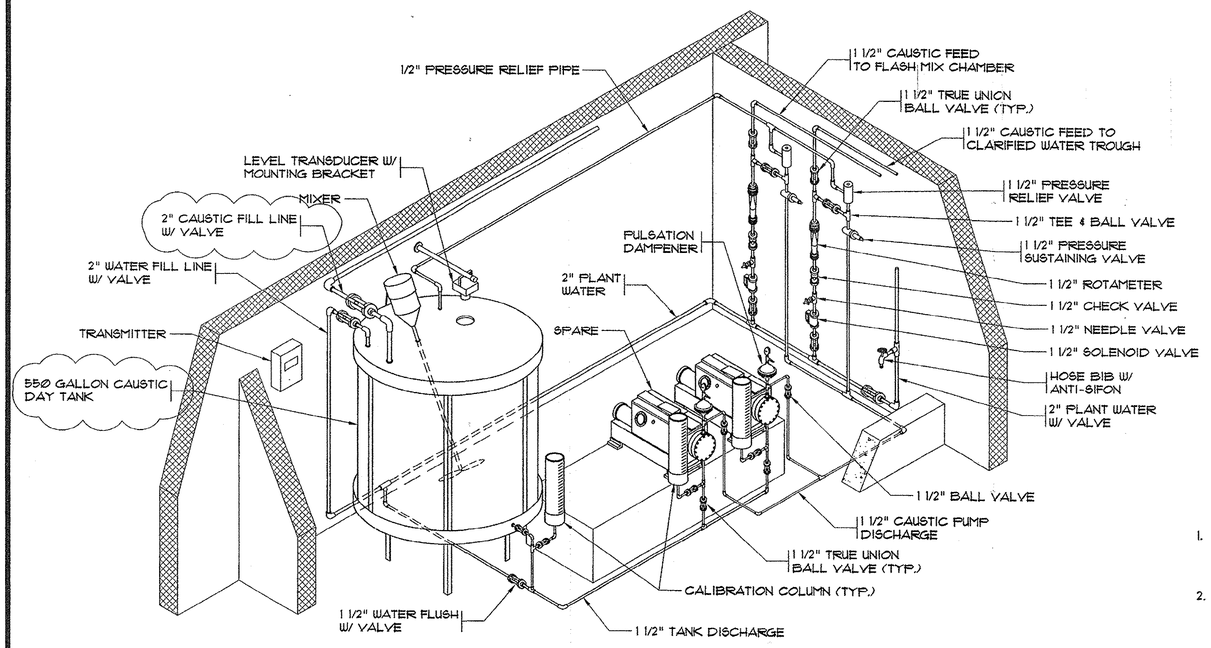
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

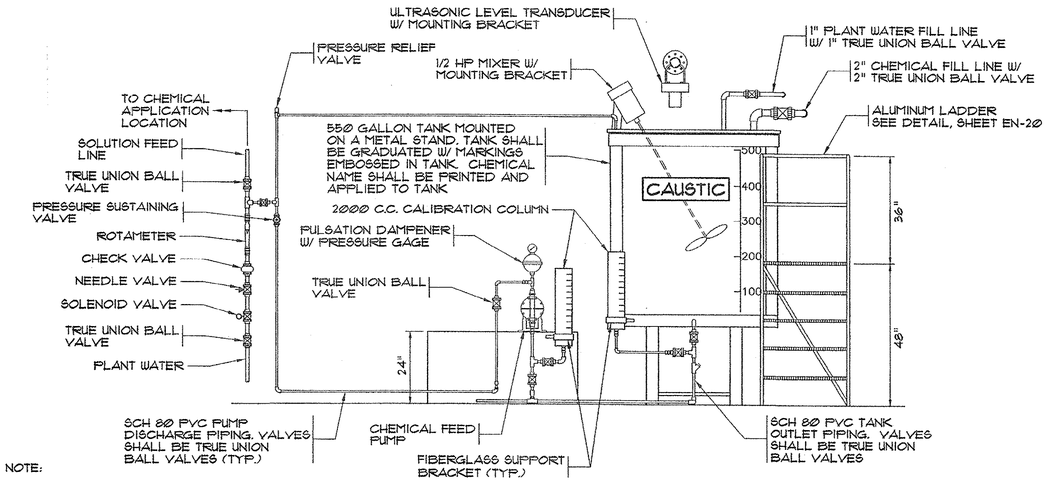
SHEET NO.
EN-18
OF: 38

33-013-060

HOBBS UPCHURCH & ASSOC. J:\GS1814\15MGDUPGRADE\EN-18.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:09 PLOT SCALE: 1"=1'-0"



CAUSTIC FEED SCHEMATIC
N.T.S.

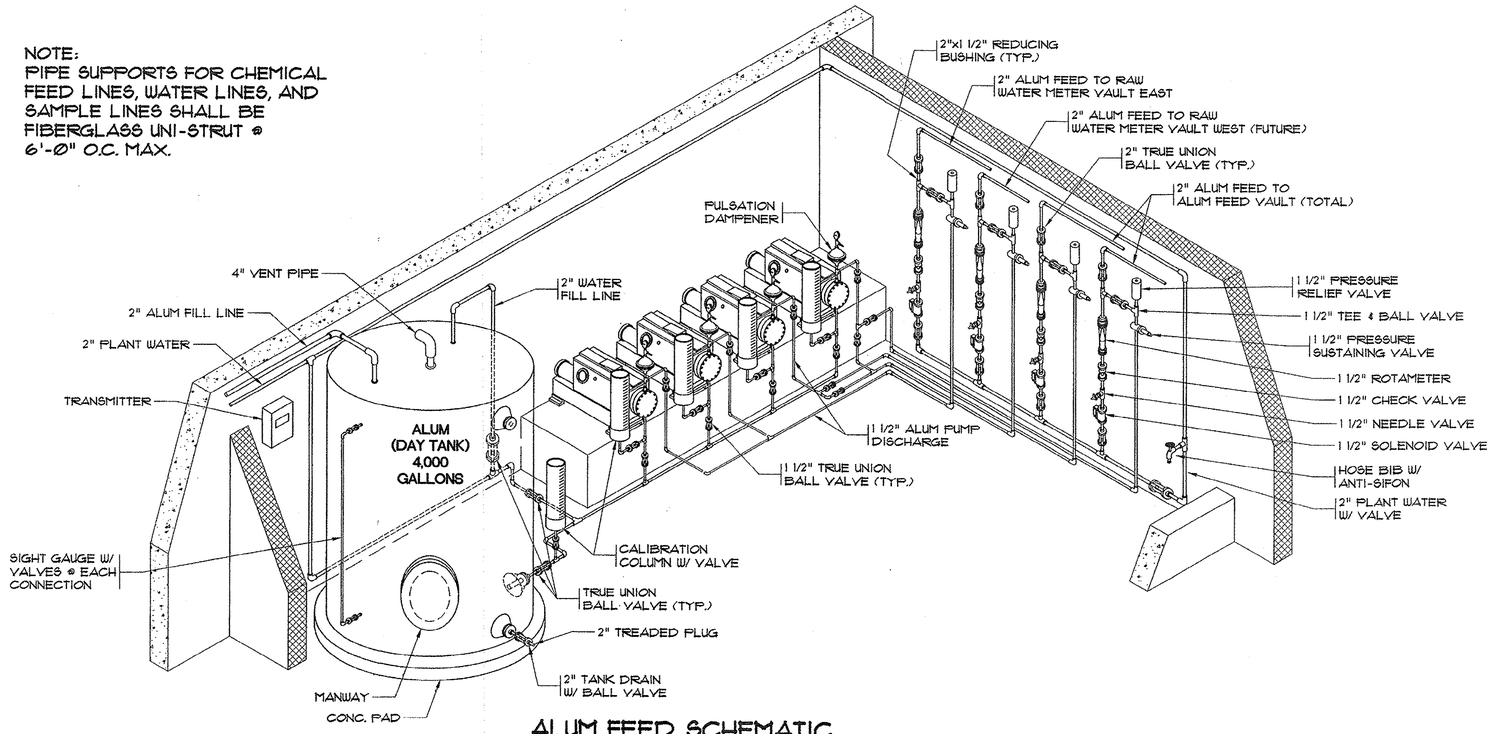


NOTE:

1. THE FITTINGS BETWEEN THE CHEMICAL FEED PUMP, THE CHEMICAL FEED LINES, AND THE PULSATION DAMPENERS SHALL BE STAINLESS STEEL.
2. SEE INDIVIDUAL SCHEMATICS FOR PIPE SIZES.

TYPICAL LIQUID CHEMICAL FEED SYSTEM SCHEMATIC
N.T.S.

NOTE:
PIPE SUPPORTS FOR CHEMICAL FEED LINES, WATER LINES, AND SAMPLE LINES SHALL BE FIBERGLASS UNI-STRUT @ 6'-0" O.C. MAX.



ALUM FEED SCHEMATIC
N.T.S.

REVISIONS

SYM.	DESCRIPTION	DATE	BY
	DHEC REVISIONS	3/15/00	JWM

SOUTH CAROLINA PROFESSIONAL ENGINEER REGISTERED No. 12335 JOSEPH W. McCULLOUGH

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

LIQUID CHEMICAL FEED SCHEMATICS

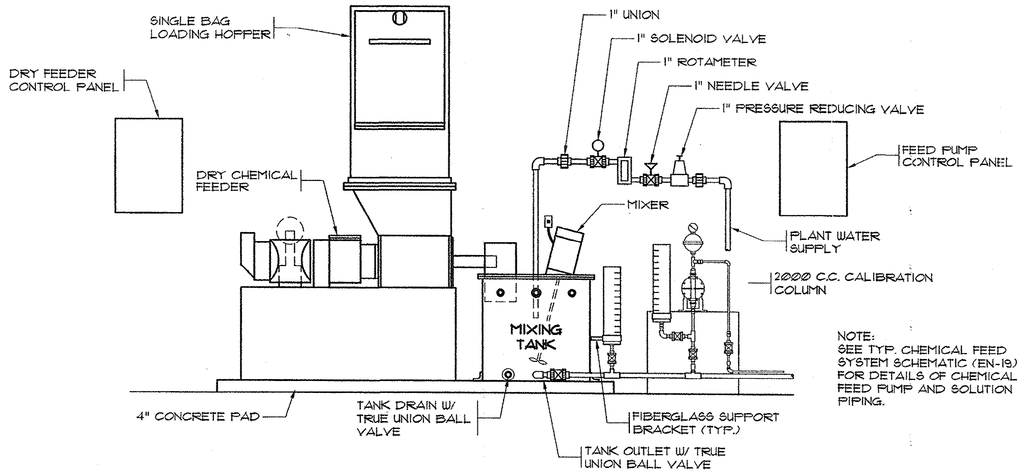
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-19
OF: 38

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-19.dwg DWG EDITED BY: dc DATE: 03/17/00 TIME: 11:07 PLOT SCALE: 1/2"=1'-0"

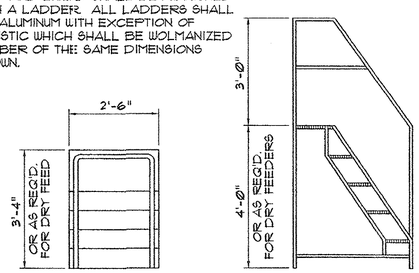
33-013-061



NOTE:
SEE TYP. CHEMICAL FEED SYSTEM SCHEMATIC (EN-19) FOR DETAILS OF CHEMICAL FEED PUMP AND SOLUTION PIPING.

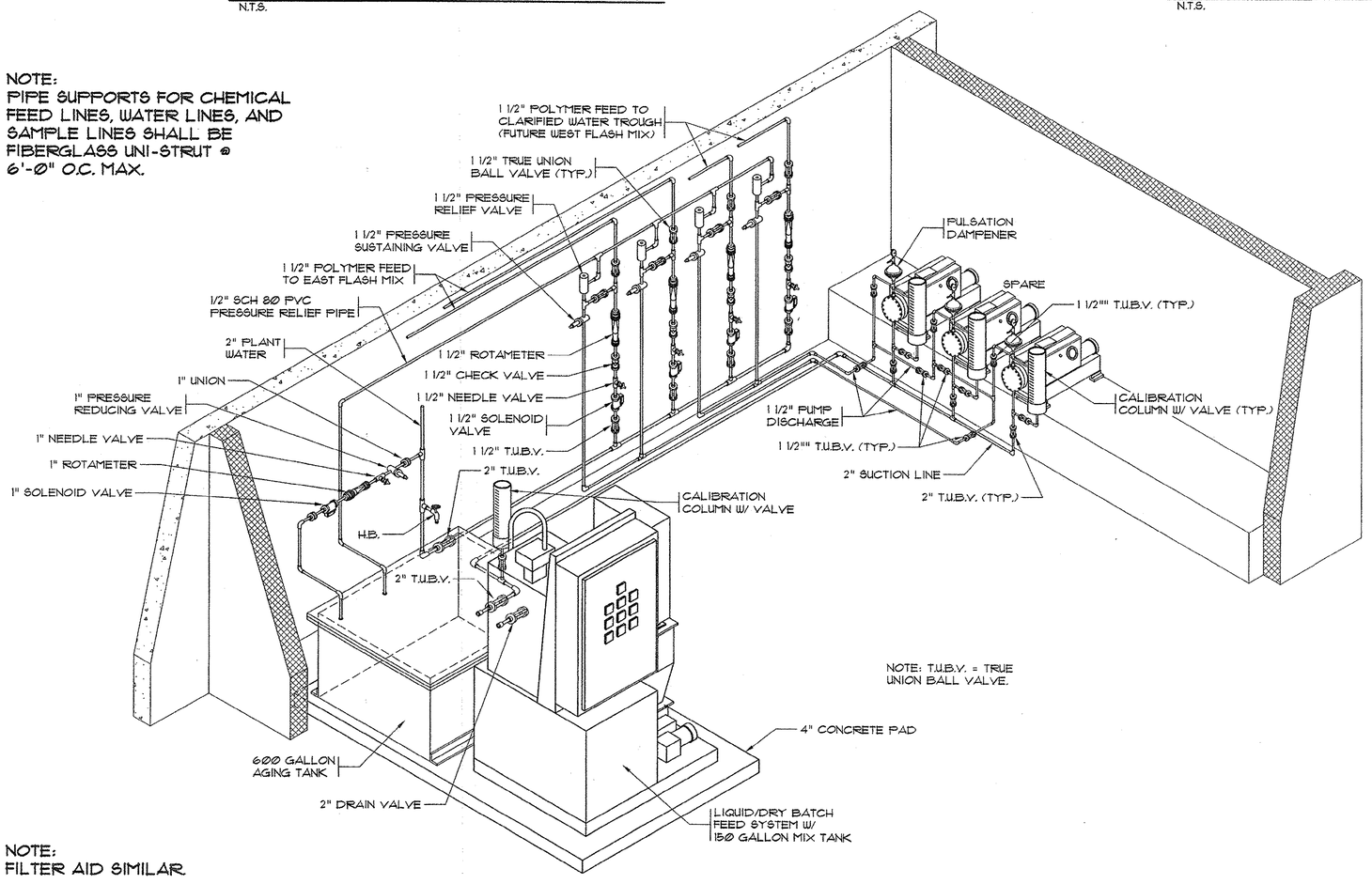
TYPICAL DRY CHEMICAL FEEDER
N.T.S.

NOTE:
ALL CHEMICAL FEED INSTALLATIONS DRY AND LIQUID SHALL BE FURNISHED WITH A LADDER. ALL LADDERS SHALL BE ALUMINUM WITH EXCEPTION OF CAUSTIC WHICH SHALL BE WOLMANIZED LUMBER OF THE SAME DIMENSIONS SHOWN.



CHEMICAL ACCESS LADDER DETAIL
N.T.S.

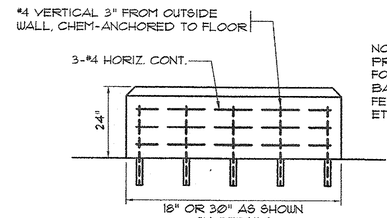
NOTE:
PIPE SUPPORTS FOR CHEMICAL FEED LINES, WATER LINES, AND SAMPLE LINES SHALL BE FIBERGLASS UNI-STRUT @ 6'-0" O.C. MAX.



NOTE: T.U.B.V. = TRUE UNION BALL VALVE.

NOTE:
FILTER AID SIMILAR

POLYMER FEED SCHEMATIC
N.T.S.



NOTE:
PROVIDE SIMILAR REINFORCING FOR ALL PUMP AND EQUIPMENT BASES INCLUDING CHEMICAL FEED, CHEMICAL TRANSFER, ETC.

TYPICAL CHEMICAL FEED PUMP BASE DETAIL
N.T.S.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 19335 REGISTERED JOHN W. MCCOSKEY

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

DRY CHEMICAL FEED SCHEMATICS

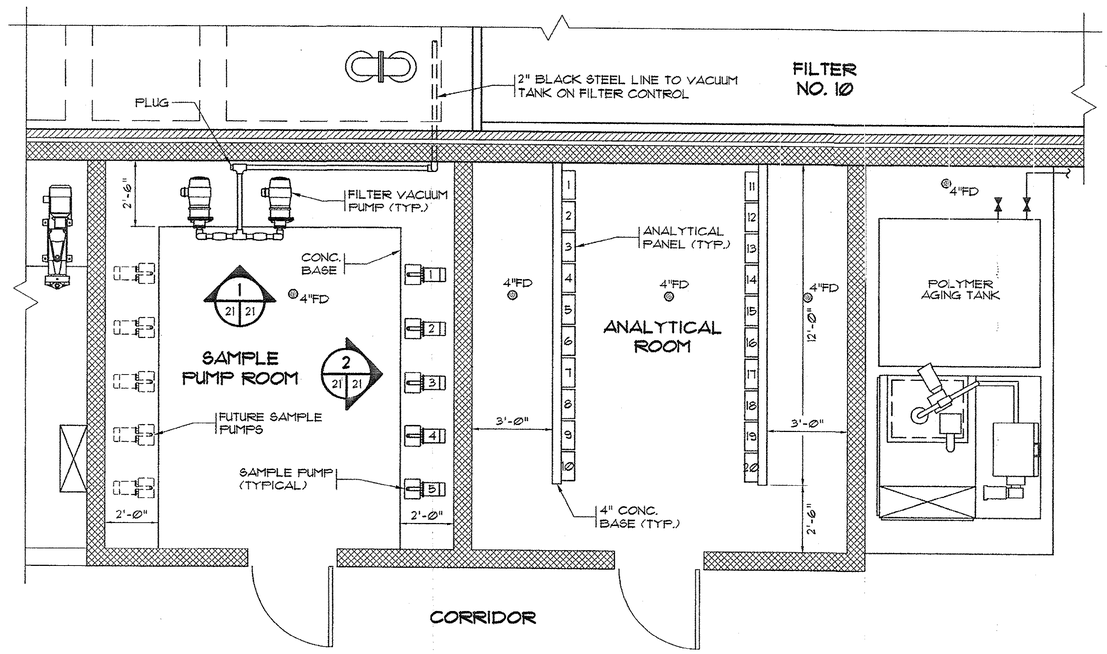
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-20
OF: 38

HOBBS UPCHURCH & ASSOC. J:\0598141\4SMGDUPGRADE\EN-20.dwg, DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:10 PLOT SCALE: 1/2"=1'-0"

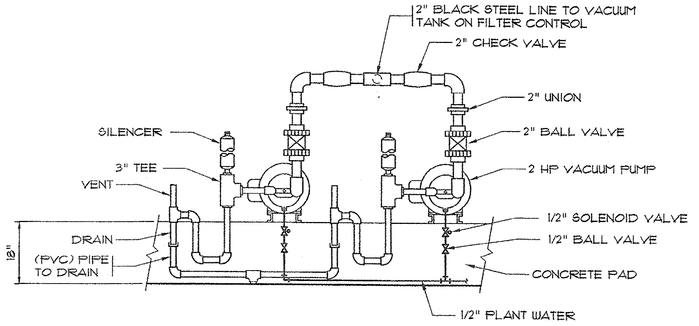
33-013-062



SAMPLE PUMP AND ANALYTICAL ROOM LAYOUT

SCALE: 3/8" = 1'-0"

2' 0 2' 6'

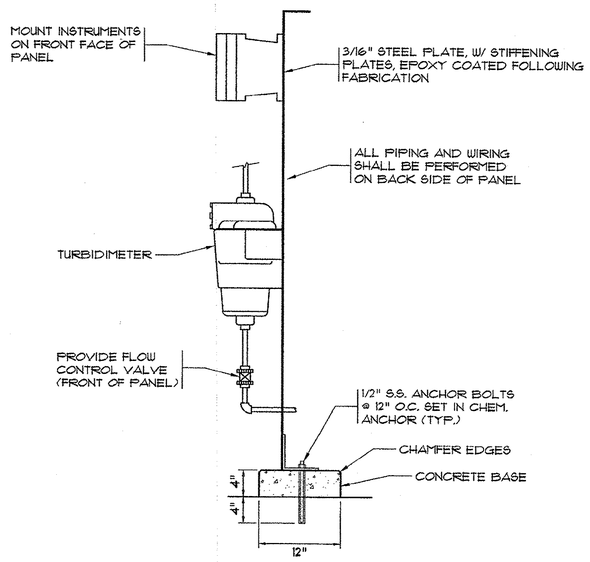


ELEVATION VIEW

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

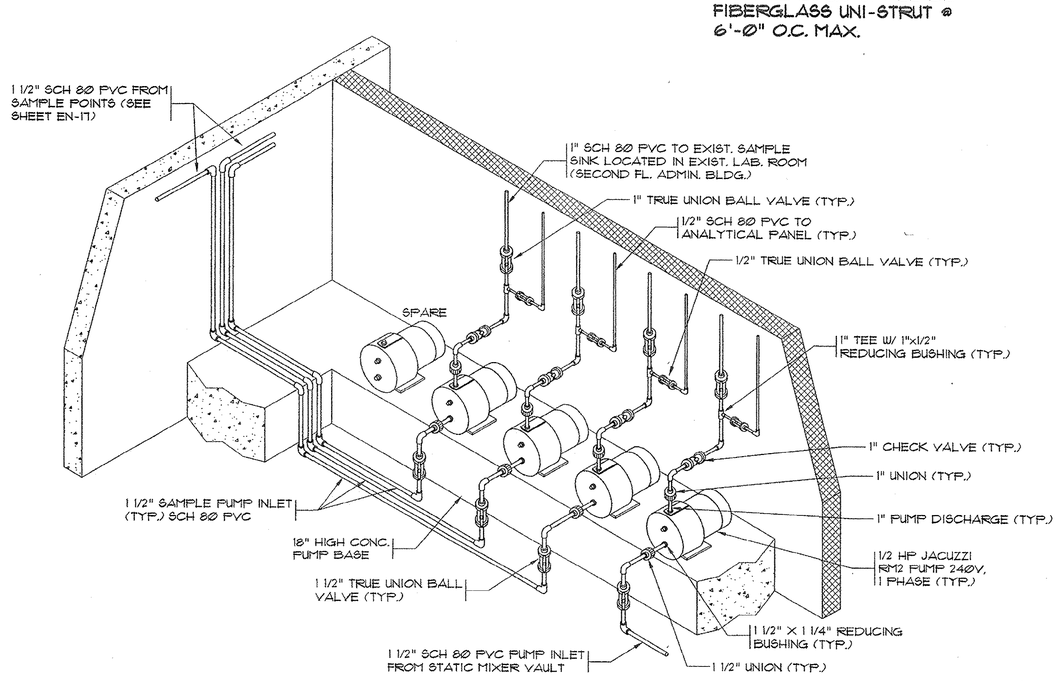
1' 6" 0 1' 2'

NOTE:
PIPE SUPPORTS FOR CHEMICAL FEED LINES, WATER LINES, AND SAMPLE LINES SHALL BE FIBERGLASS UNI-STRUT @ 6'-0" O.C. MAX.



ANALYTICAL PANEL SECTION

N.T.S.



SAMPLE PUMPS - SCHEMATIC

N.T.S.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12335 REGISTERED JOHN W. HUBBARD

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

SAMPLE PUMP AND ANALYTICAL ROOM LAYOUT AND DETAILS

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

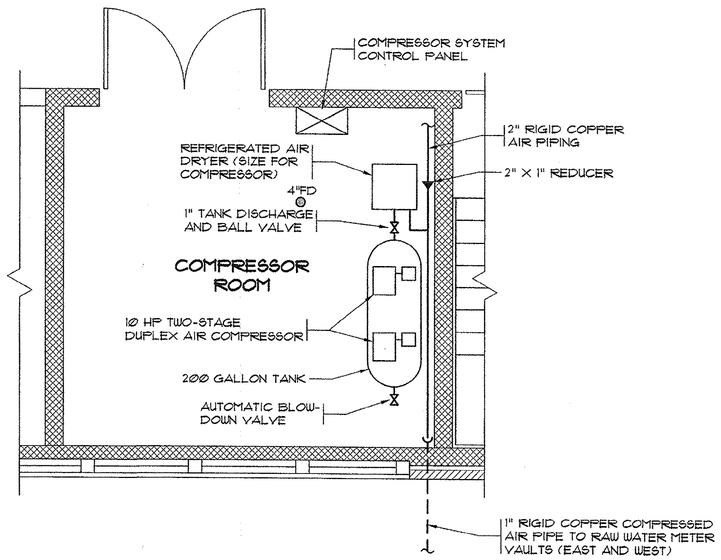
SHEET NO.

EN-21

OF: 38

33-013-063

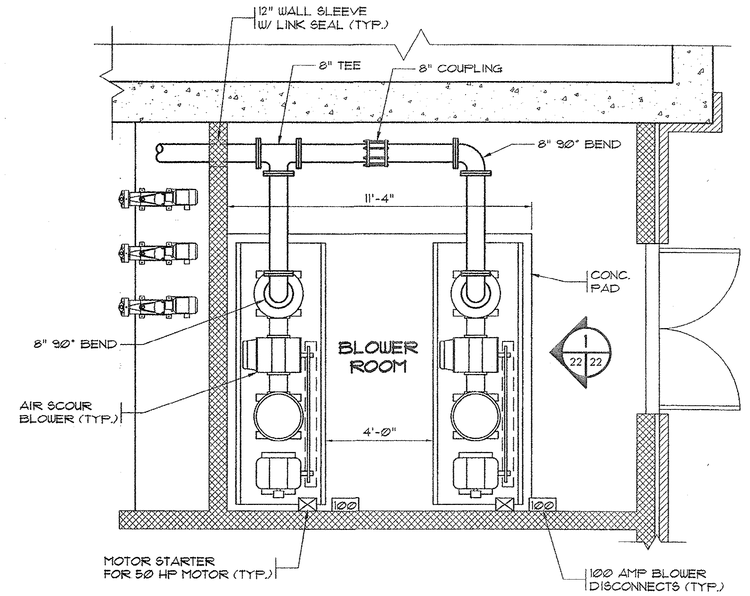
HOBBS UPCHURCH & ASSOC. J:\GSB814\45MGDUPGRADE\EN-21.dwg DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:10 PLOT SCALE: 3/8"=1'-0"



COMPRESSOR ROOM LAYOUT

SCALE: 3/8" = 1'-0"

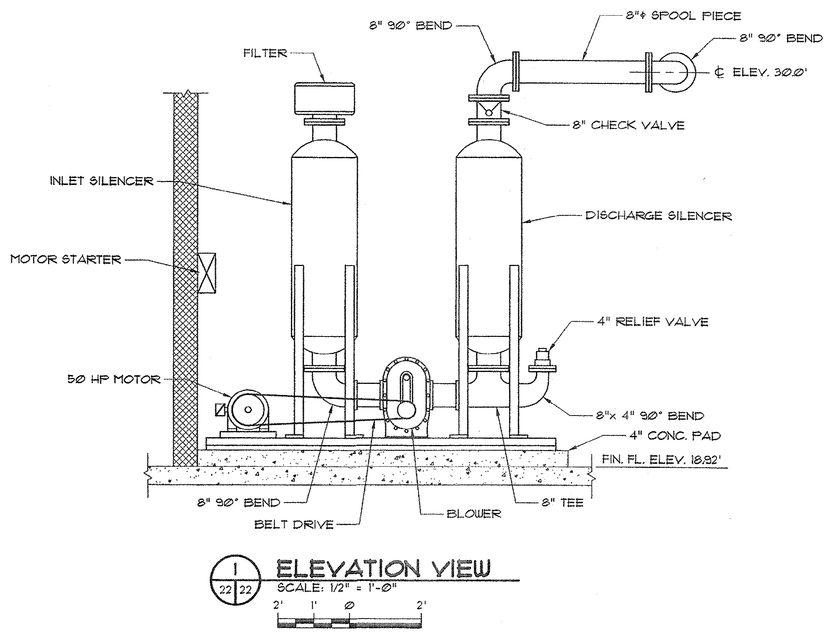
2' 0 2' 6'



BLOWER ROOM LAYOUT

SCALE: 3/8" = 1'-0"

2' 0 2' 6'



1/22 ELEVATION VIEW

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

2' 1' 0 2'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER REGISTERED No. 12335 JOSEPH W. MCKEON

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

COMPRESSOR AND BLOWER ROOM LAYOUT AND DETAILS

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

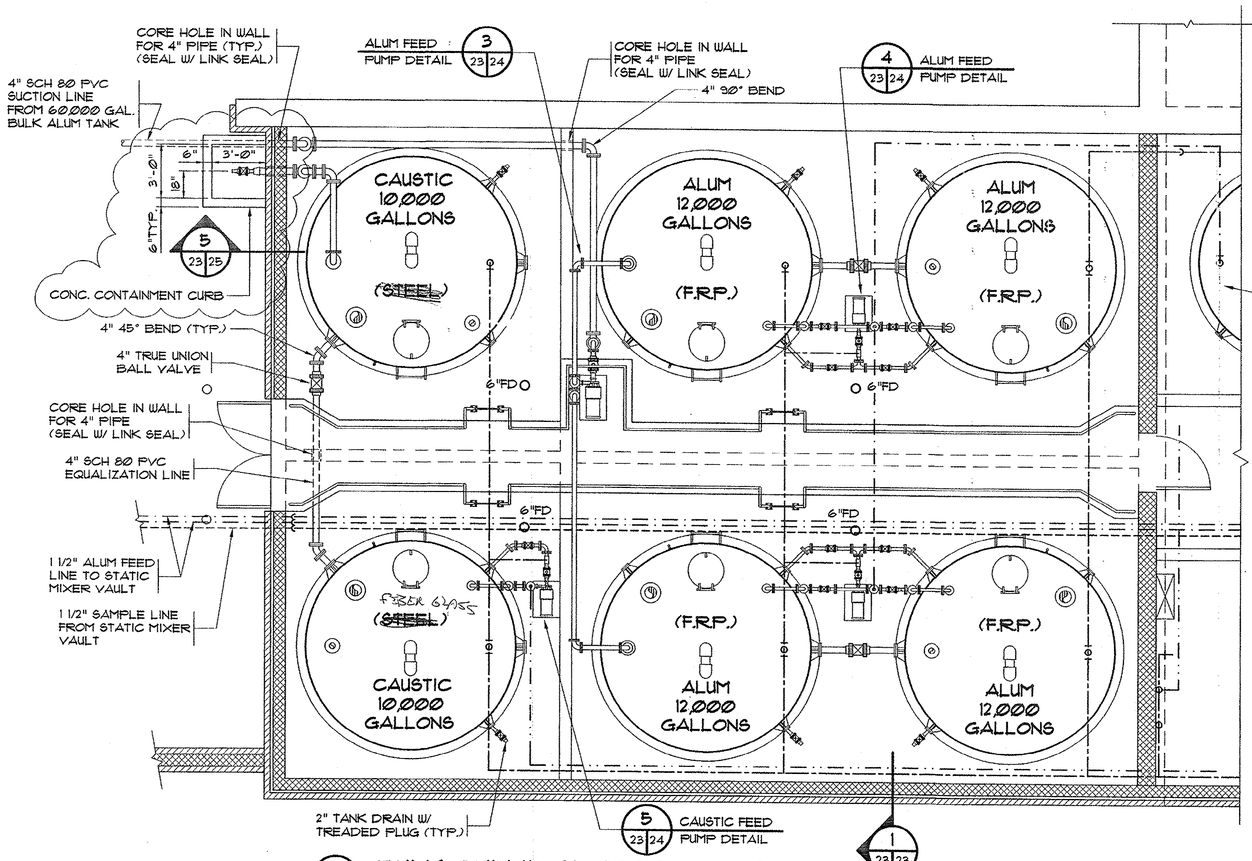
DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. EN-22

OF: 38

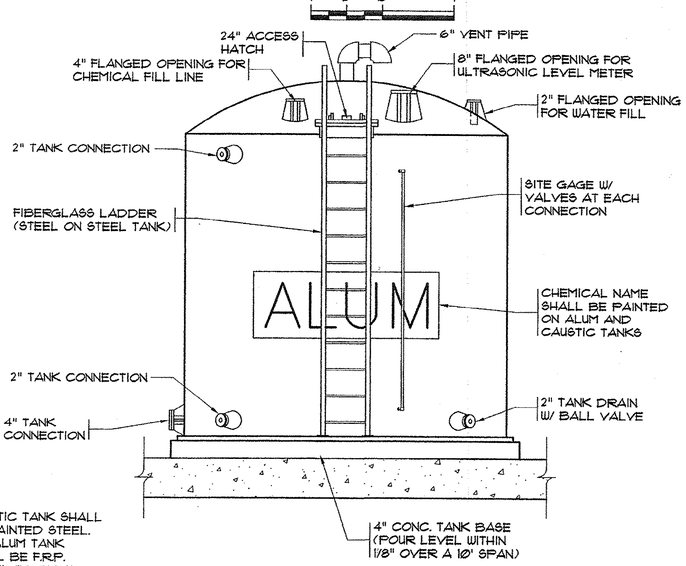
33-013-064

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-22.dwg DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:11 PLOT SCALE: 3/8"=1'-0"



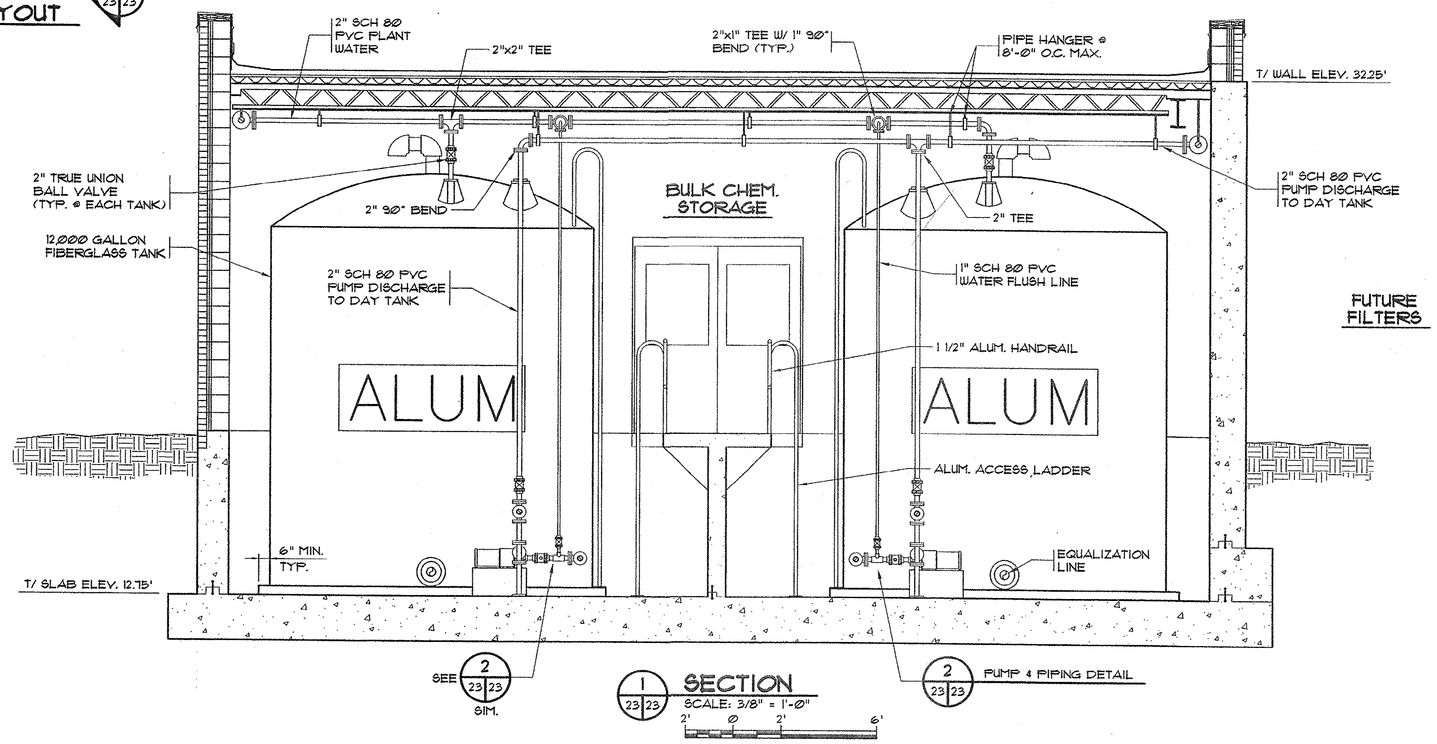
5 BULK CHEMICAL STORAGE LAYOUT
1 23 — SCALE: 1/4" = 1'-0"

4' 2' 0 4'

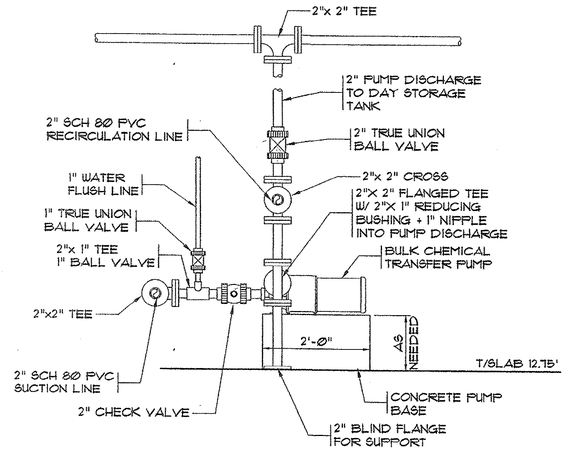


NOTE:
CAUSTIC TANK SHALL BE PAINTED STEEL. THE ALUM TANK SHALL BE F.R.P. DETAIL TO RIGHT IS F.R.P. APPURTENANCES ON ALL TANKS SHALL BE SIMILAR.

TYP. TANK OPENING AND APPURTENANCES DETAIL
N.T.S.



PIPE LEGEND:
- CAUSTIC
- ALUM
- SAMPLE
- WATER



2 PUMP AND PIPING DETAIL
23 23 — SCALE: 3/4" = 1'-0"

1' 6" 0 1' 2'

NOTE:
PIPE SUPPORTS FOR CHEMICAL FEED LINES, WATER LINES, AND SAMPLE LINES SHALL BE FIBERGLASS UNI-STRUT @ 6'-0" O.C. MAX.

REVISIONS

SYM.	DESCRIPTION	DATE	BY
	DHEC REVISIONS	3/15/00	JWM

SOUTH CAROLINA PROFESSIONAL ENGINEER — REGISTERED — No. 12335 — JOSEPH W. MOSSER, P.E. — CHAIRMAN

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

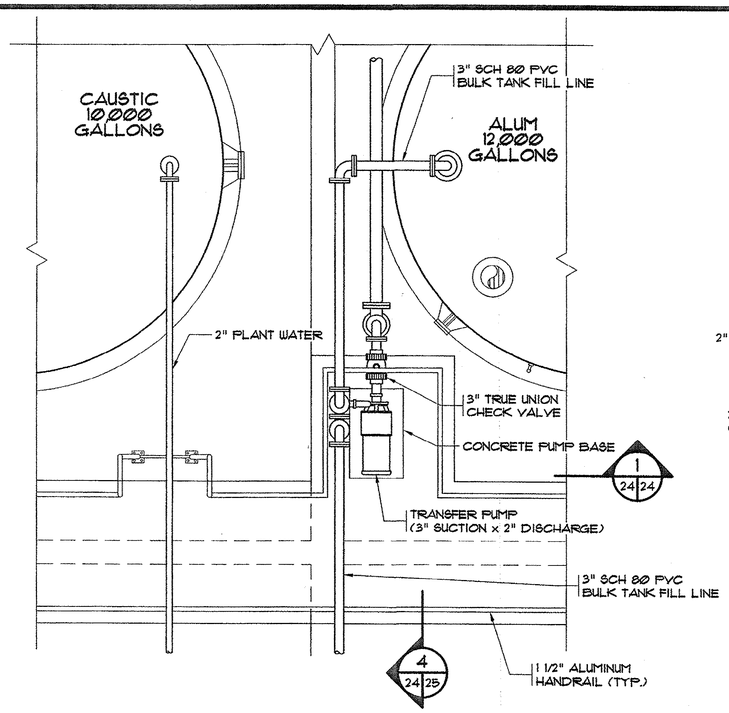
BULK CHEMICAL STORAGE LAYOUT AND SECTIONS

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

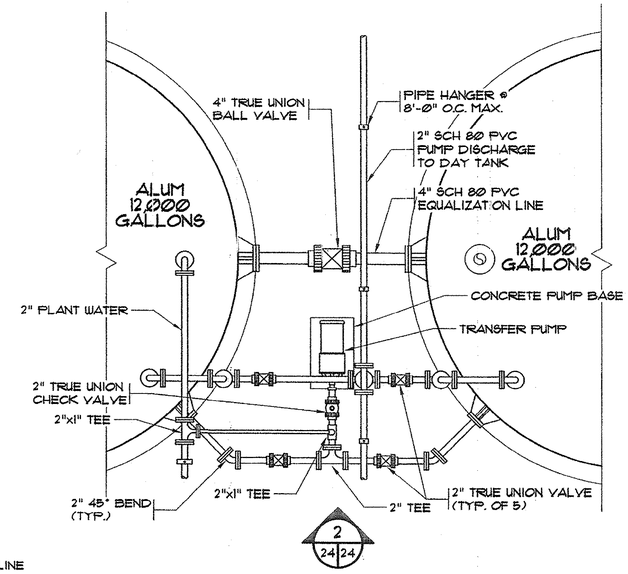
SHEET NO.
EN-23
OF: 38

33-013-065

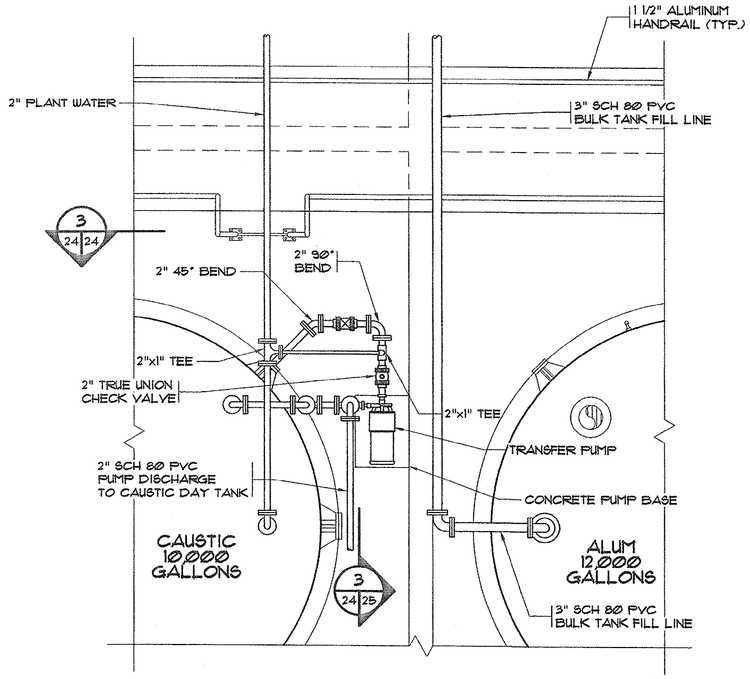
HOBBS UPCHURCH & ASSOC. J:\GS981#1\45MGDUPGRADE\EN-23.dwg,DWG EDITED BY: dc DATE: 03/17/00 TIME: 11:21 PLOT SCALE: 1/4"=1'-0"



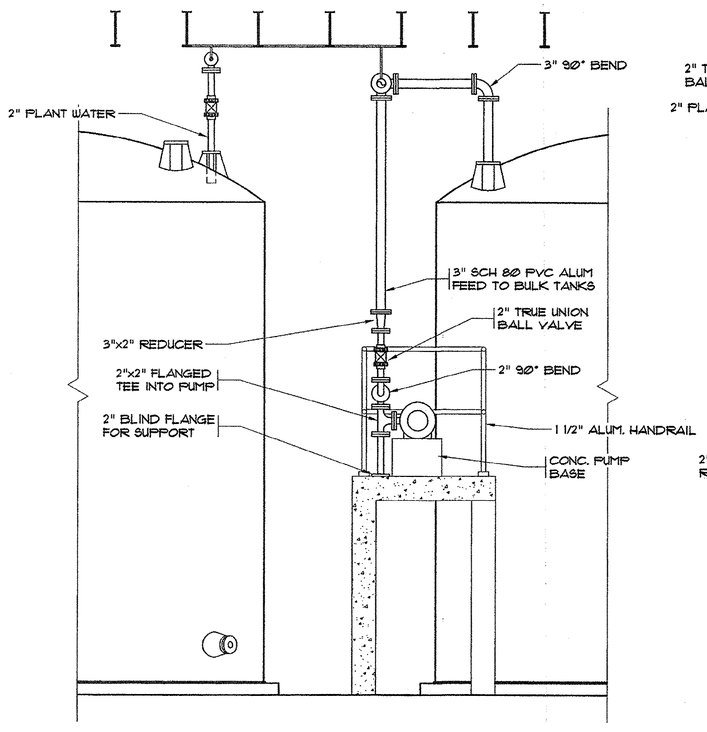
3 23 24 ALUM FEED PUMP DETAIL
SCALE: 1/2"=1'-0"
2' 1' 0 2'



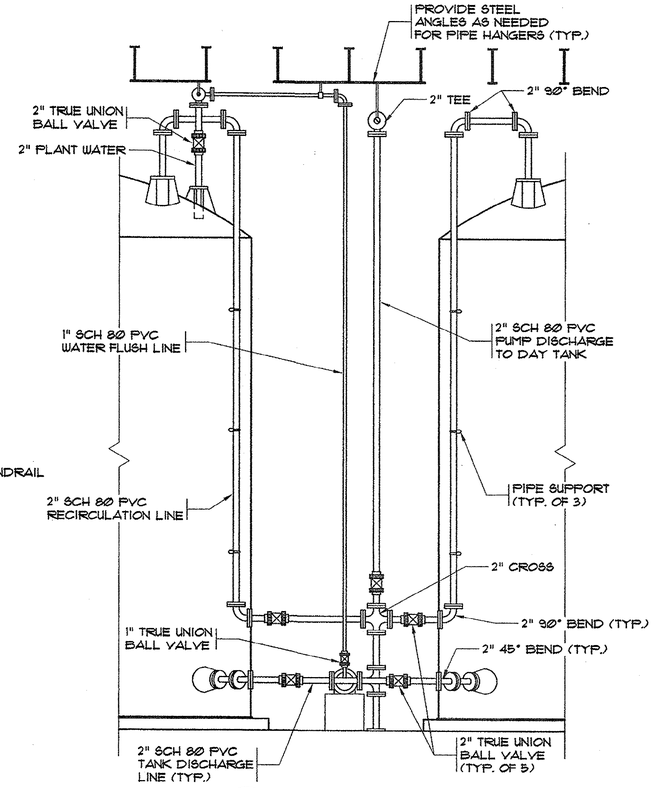
4 23 24 ALUM FEED PUMP DETAIL
SCALE: 1/2"=1'-0"
2' 1' 0 2'



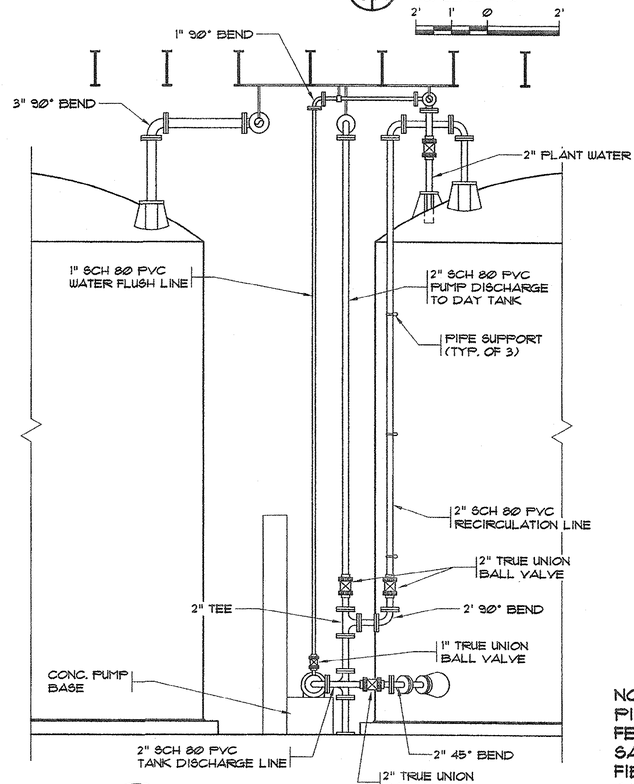
5 23 24 CAUSTIC FEED PUMP DETAIL
SCALE: 1/2"=1'-0"
2' 1' 0 2'



1 24 24 SECTION VIEW
SCALE: 1/2"=1'-0"
2' 1' 0 2'



2 24 24 SECTION VIEW
SCALE: 1/2"=1'-0"
2' 1' 0 2'



3 24 24 SECTION VIEW
SCALE: 1/2"=1'-0"
2' 1' 0 2'

NOTE:
PIPE SUPPORTS FOR CHEMICAL FEED LINES, WATER LINES, AND SAMPLE LINES SHALL BE FIBERGLASS UNI-STRUT @ 6'-0" O.C. MAX.

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 19335 REGISTERED JOSEPH W. MCCRACKEN

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULK CHEMICAL STORAGE DETAILS

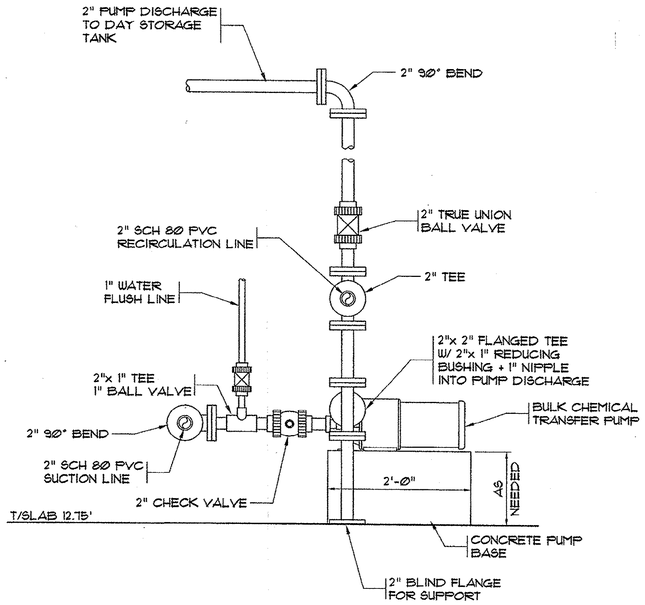
BULL CREEK WTP 15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-24
OF: 38

33-013-066

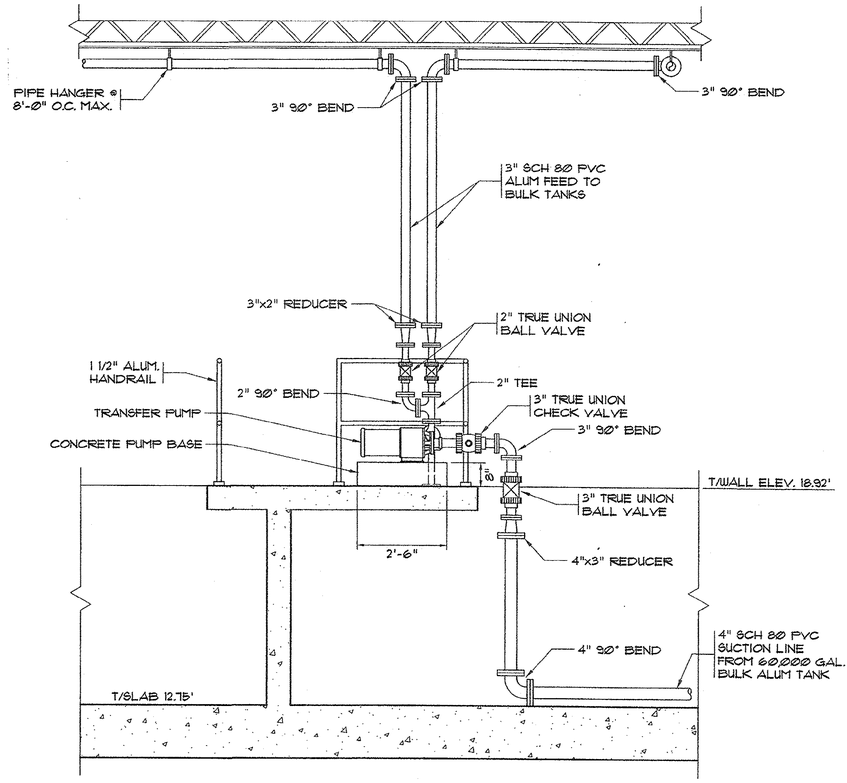
HOBBS UPCHURCH & ASSOC. J:\GS9814\15MGDUPGRADE\EN-24.dwg,DWG EDITED BY: cc DATE: 01/18/00 TIME: 15:19 PLOT SCALE: 1/2"=1'-0"



3 24|25 **CAUSTIC FEED PUMP ELEVATION**

SCALE: 1"=1'-Ø"

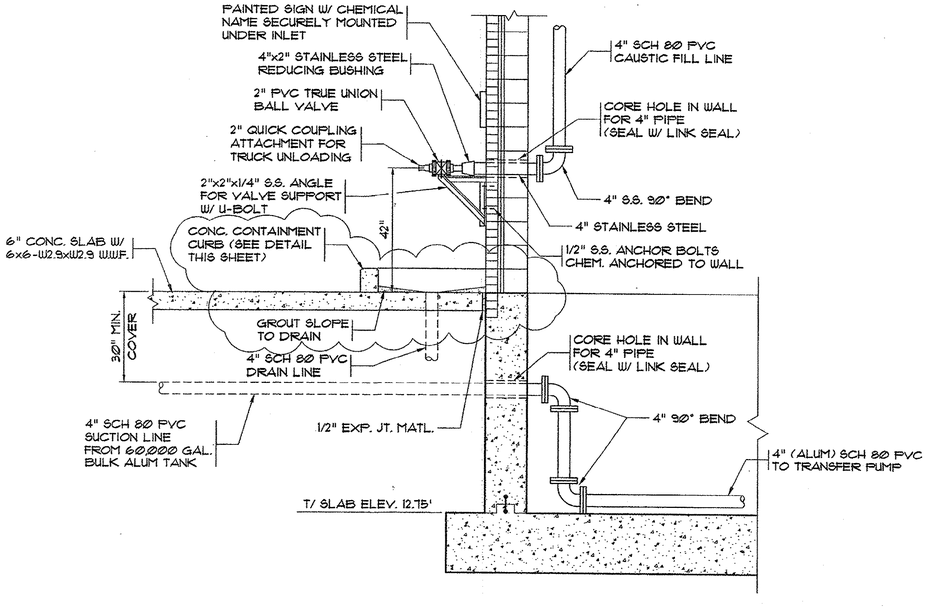
1' Ø 1' 2'



4 24|25 **ALUM FEED TRANSFER PUMP ELEVATION VIEW**

SCALE: 1/2"=1'-Ø"

2' 1' Ø 2'

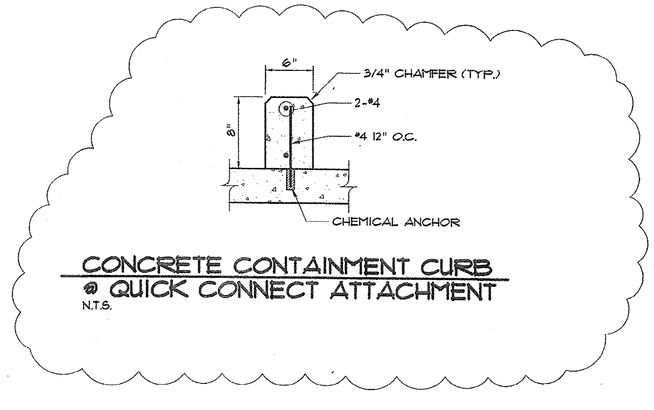


5 23|25 **CAUSTIC/ALUM FILL LINE ELEVATION VIEW**

SCALE: 1/2"=1'-Ø"

2' 1' Ø 2'

NOTE:
PIPE SUPPORTS FOR CHEMICAL FEED LINES, WATER LINES, AND SAMPLE LINES SHALL BE FIBERGLASS UNI-STRUT @ 6'-0" O.C. MAX.



CONCRETE CONTAINMENT CURB @ QUICK CONNECT ATTACHMENT

N.T.S.

REVISIONS

SYM.	DESCRIPTION	DATE	BY
	DHEC REVISIONS	3/15/00	JWM

SOUTH CAROLINA PROFESSIONAL ENGINEER 22335 REGISTERED JOHN W. MASON

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULK CHEMICAL STORAGE DETAILS

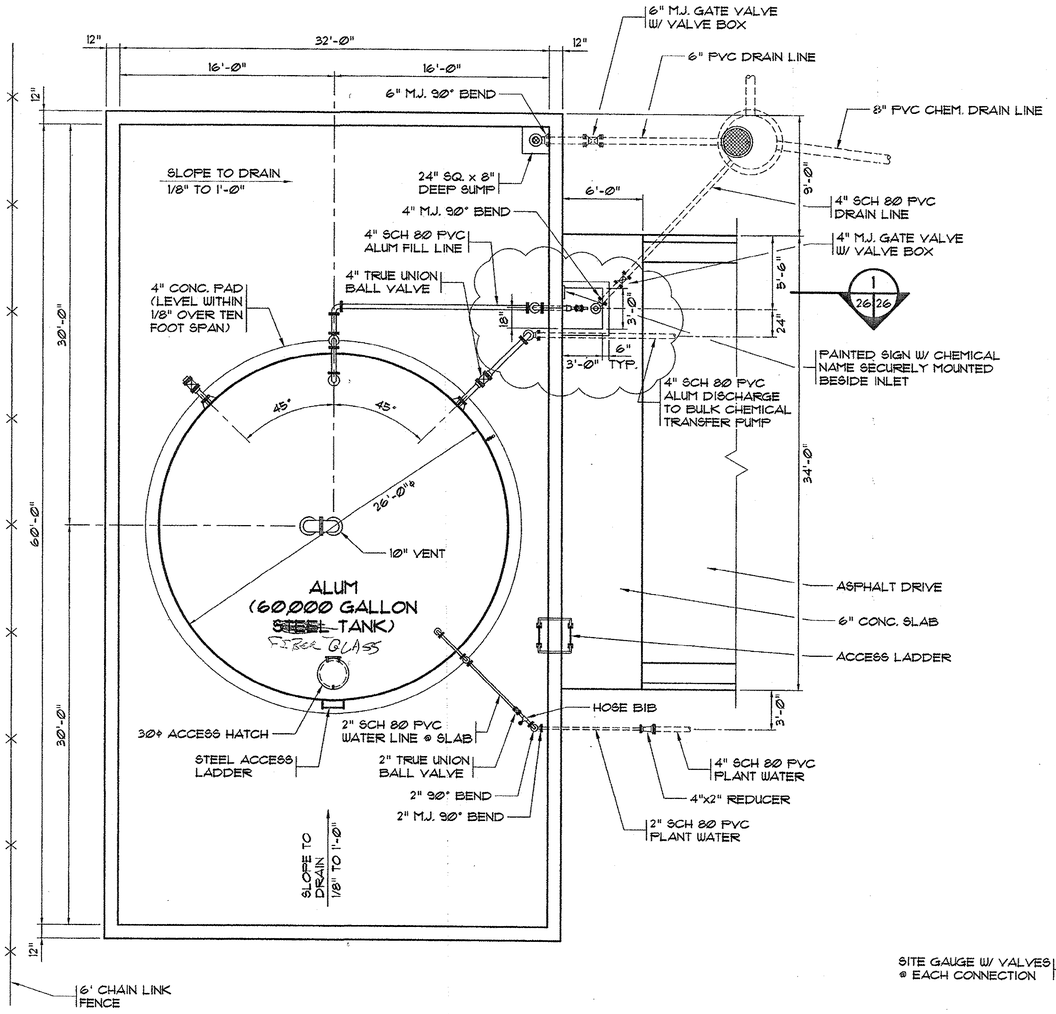
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-25
OF: 38

33-013-067

HOBBS UPCHURCH & ASSOC. J:\GS9814\ASMCDUPGRADE\EN-25.dwg,DWG EDITED BY: dc DATE: 03/17/00 TIME: 12:09 PLOT SCALE: 1/2"=1'-0"

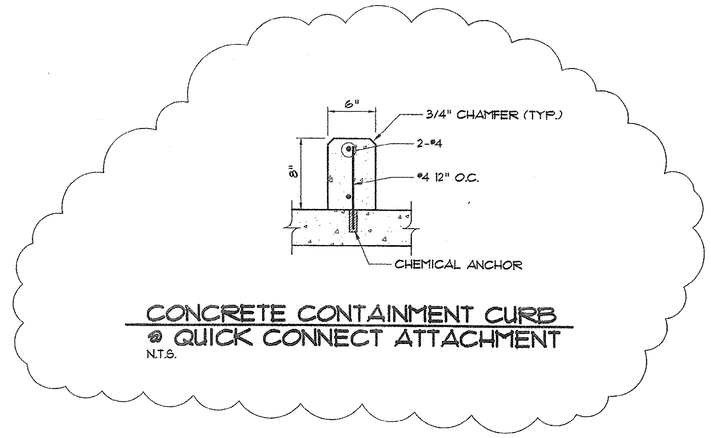


BULK ALUM STORAGE LAYOUT PLAN

SCALE: 3/16" = 1'-0"

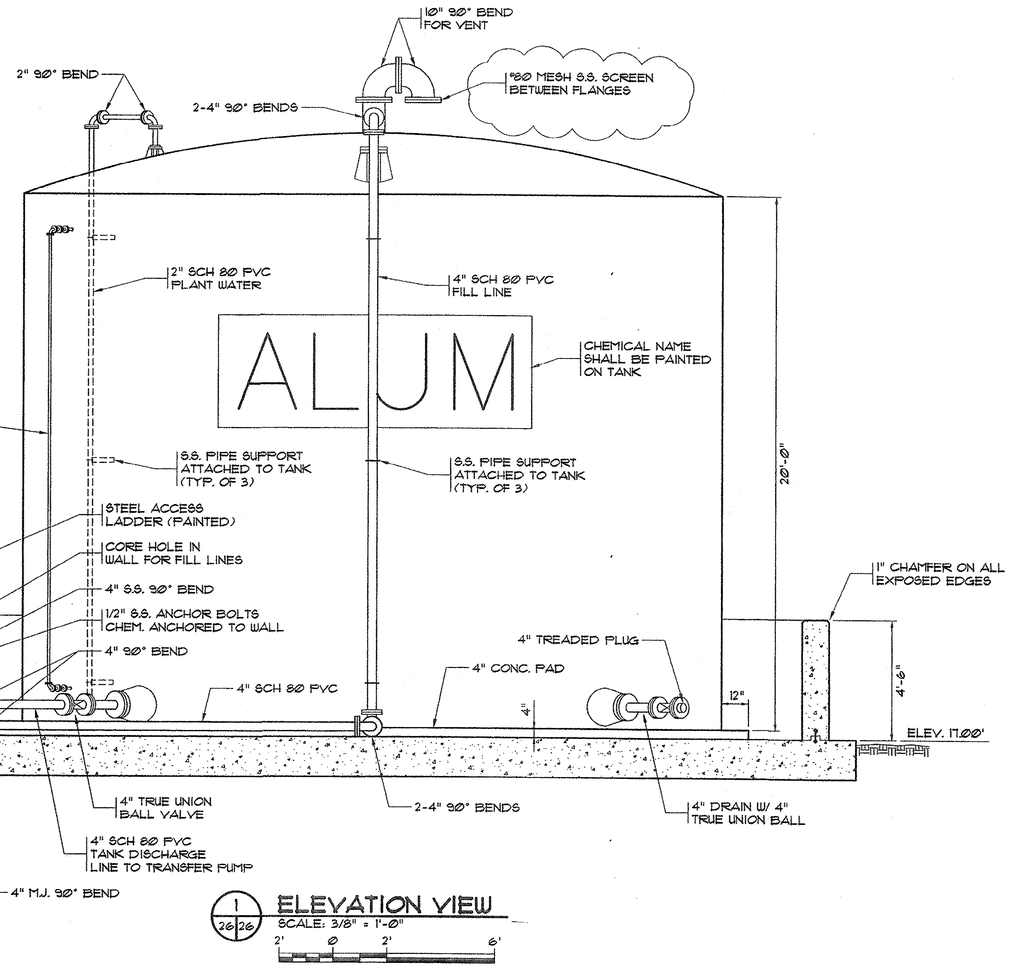
4' 2' Ø 4' 8'

NOTE:
PROVIDE FIBERGLASS ACCESS LADDER INSIDE TANK (20' LENGTH) @ ACCESS HATCH.



CONCRETE CONTAINMENT CURB @ QUICK CONNECT ATTACHMENT

N.T.S.



ELEVATION VIEW

1 / 26/26

SCALE: 3/8" = 1'-0"

2' Ø 2' 6'

REVISIONS			
SYM.	DESCRIPTION	DATE	BY
	DHEC REVISIONS	3/15/00	JWM

SOUTH CAROLINA PROFESSIONAL ENGINEER 12355 REGISTERED JOSEPH W. MCCULLOUGH, JR.

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

BULK ALUM STORAGE LAYOUT AND DETAILS

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

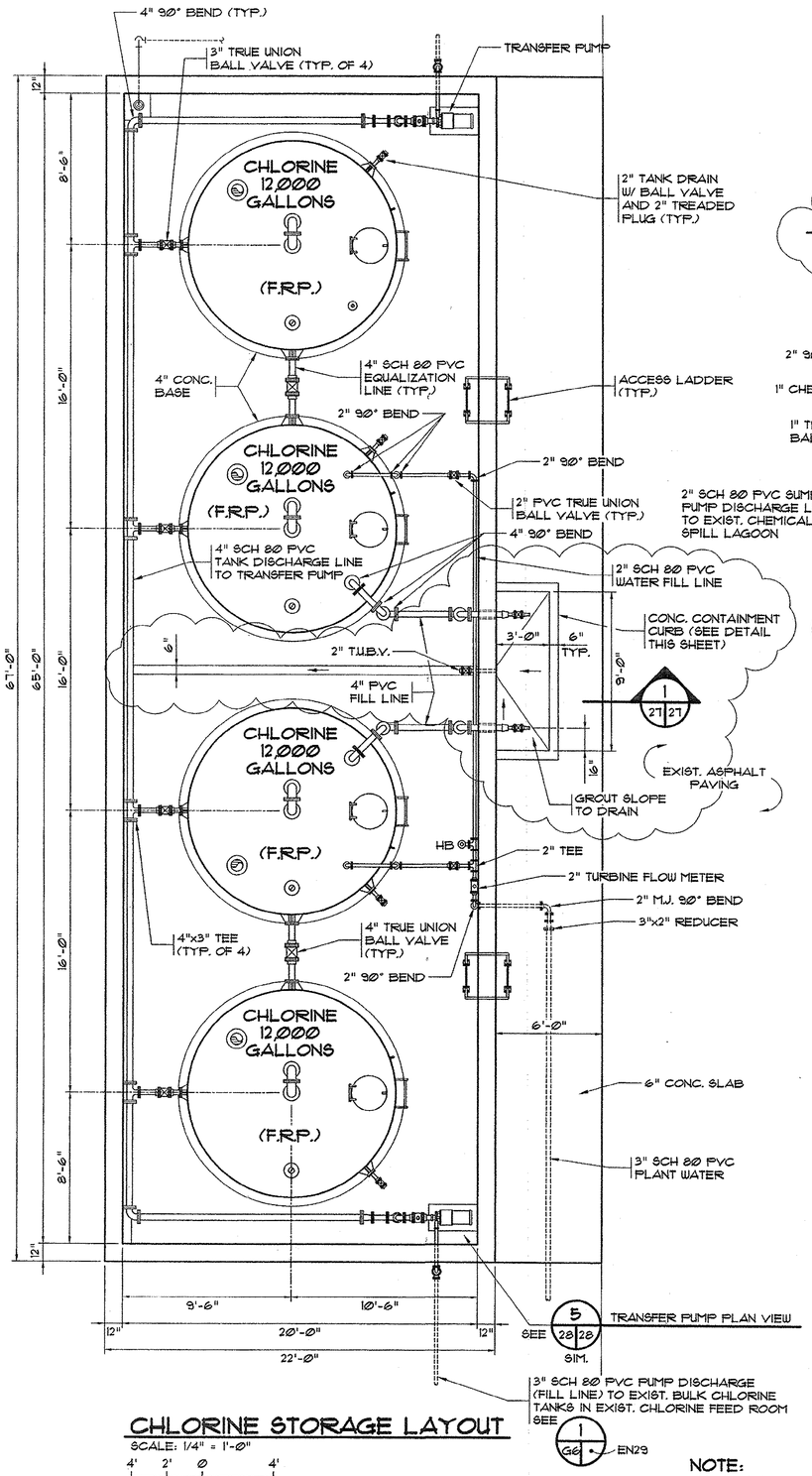
SHEET NO.

EN-26

OF: 38

33-013-068

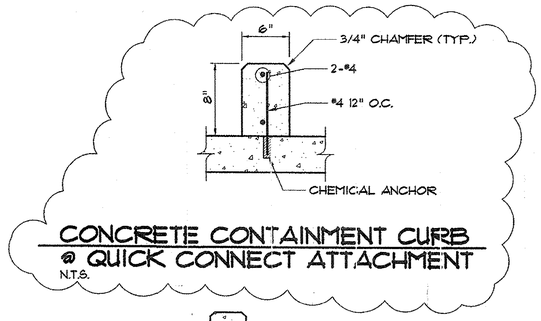
HOBBS UPCHURCH & ASSOC. J:\GS8814\15MGDUPGRADE\EN-26.dwg,DWG EDITED BY: dc DATE: 03/17/00 TIME: 13:21 PLOT SCALE: 3/16"=1'-0"



CHLORINE STORAGE LAYOUT

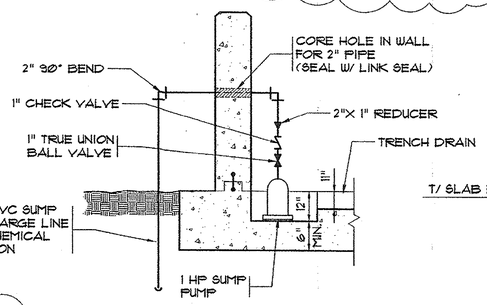
SCALE: 1/4" = 1'-0"

4' 2' 0 4'



CONCRETE CONTAINMENT CURB @ QUICK CONNECT ATTACHMENT

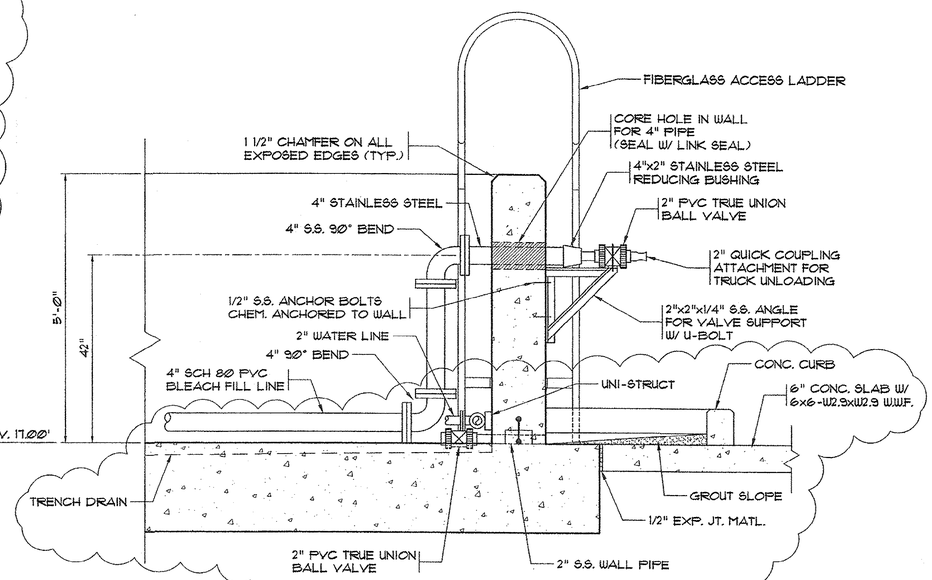
N.T.S.



2/27 SUMP PUMP SECTION VIEW

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

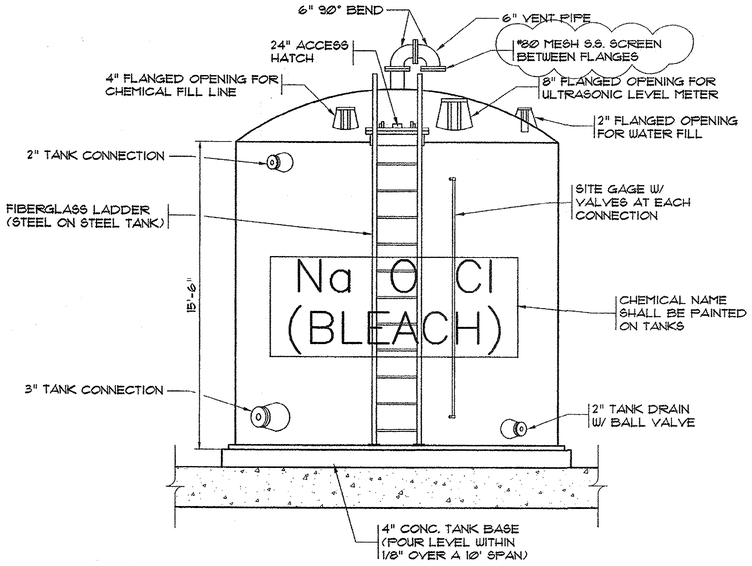
2' 1' 0 2'



1/27 SECTION VIEW

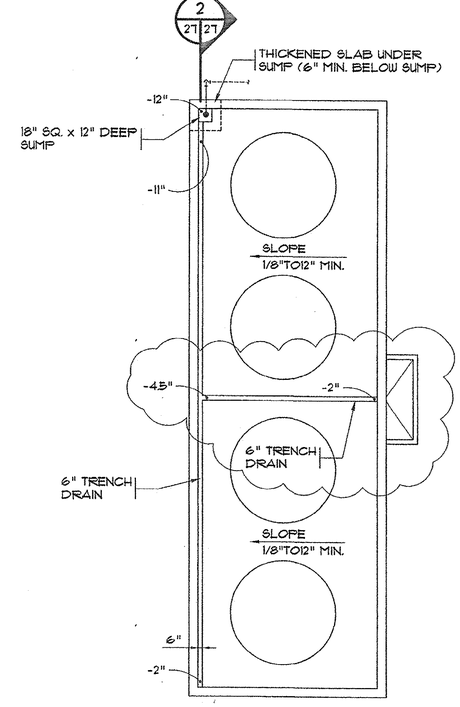
SCALE: 3/4" = 1'-0"

1' 6" 0 1' 2'



TYP. TANK OPENING AND APPURTENANCES DETAIL

N.T.S.



TRENCH DRAIN LAYOUT

N.T.S.

NOTE:
PIPE SUPPORTS FOR CHEMICAL FEED LINES, WATER LINES, AND SAMPLE LINES SHALL BE FIBERGLASS UNI-STRUT @ 6'-0" O.C. MAX.

NOTE:
ALL WATER LINES AND WATER LINE VALVES ABOVE GRADE SHALL BE WRAPPED W/ INSULATION AND HEAT TRACED.

REVISIONS

SYM.	DESCRIPTION	DATE	BY
	DHEC REVISIONS	3/15/00	JWM

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 12305 JOSEPH W. MOSER, JR.

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

CHLORINE STORAGE LAYOUT AND DETAILS

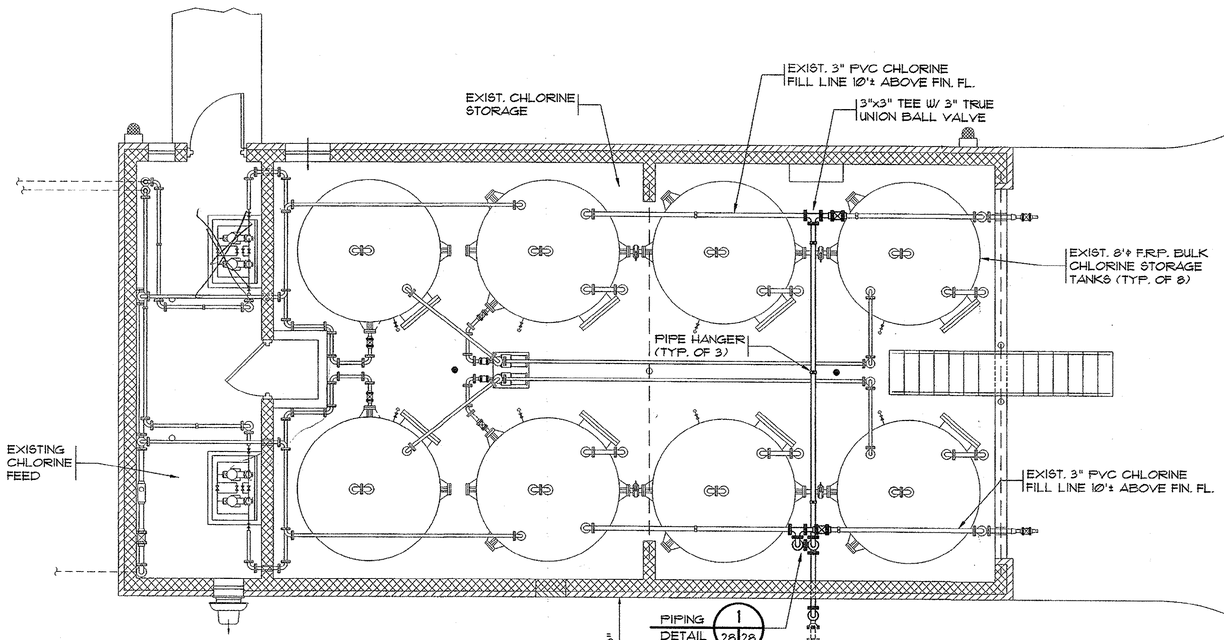
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-27
OF: 38

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-27.dwg,DWG EDITED BY: ds DATE: 03/17/00 TIME: 11:02 PLOT SCALE: 1/4"=1'-0"

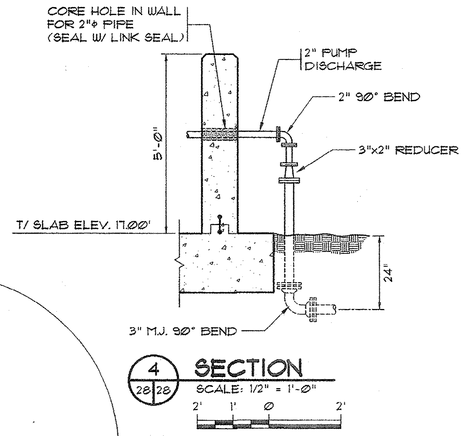
33-013-069



EXIST. CHLORINE STORAGE LAYOUT

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

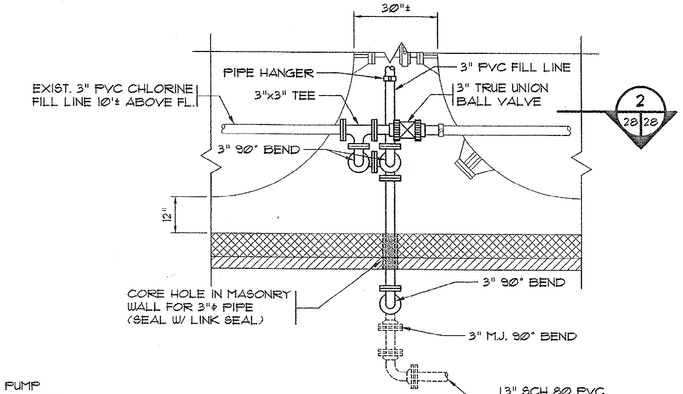
4' 2' Ø 4'



4 28 28 SECTION

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

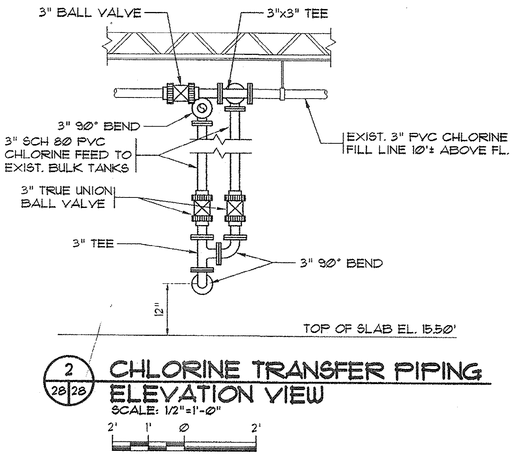
2' 1' Ø 2'



1 28 28 PIPING DETAIL

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

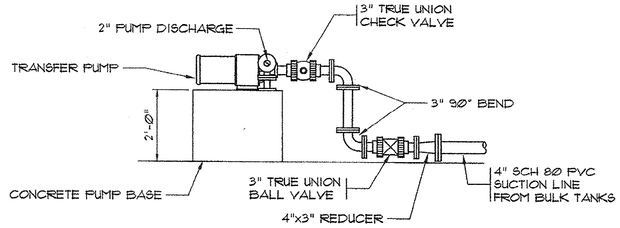
2' 1' Ø 2'



2 28 28 CHLORINE TRANSFER PIPING ELEVATION VIEW

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

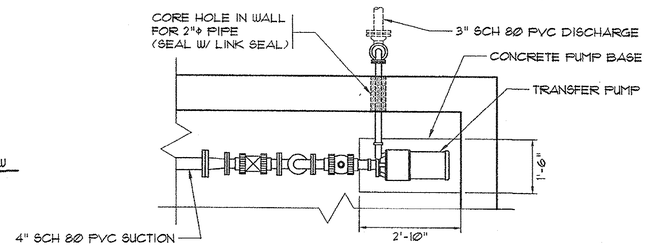
2' 1' Ø 2'



3 28 28 PUMP DETAIL

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

2' 1' Ø 2'



5 28 28 TRANSFER PUMP PLAN VIEW

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

2' 1' Ø 2'

REVISIONS

STM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER JOSEPH W. MCCOLGAN REGISTERED No. 17235

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

CHLORINE TRANSFER PUMP AND DETAILS

BULL CREEK WTP 15 MGD UPGRADE

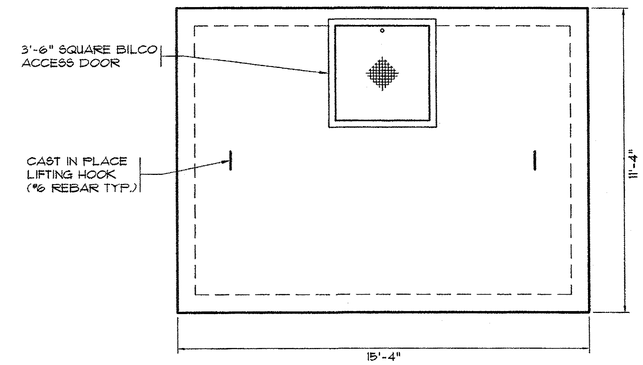
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	ARM
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-28
OF: 38

33-013-070

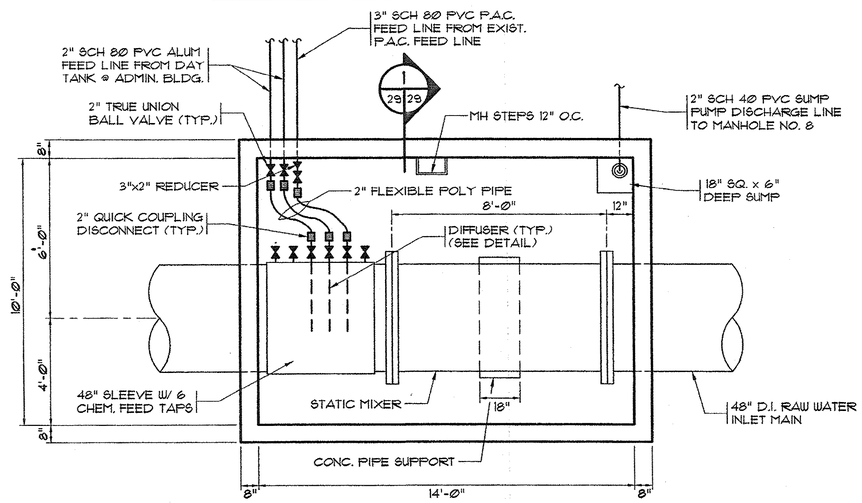
HOBBS UPCHURCH & ASSOC. J:\GS98\4\45MGDUPGRADE\EN-28.dwg DATE: 01/19/00 TIME: 13:34 PLOT SCALE: 1/4"=1'-0" EDITED BY: dc



ALUM FEED VAULT W/ STATIC MIXER TOP PLAN VIEW

SCALE: 3/8" = 1'-0"

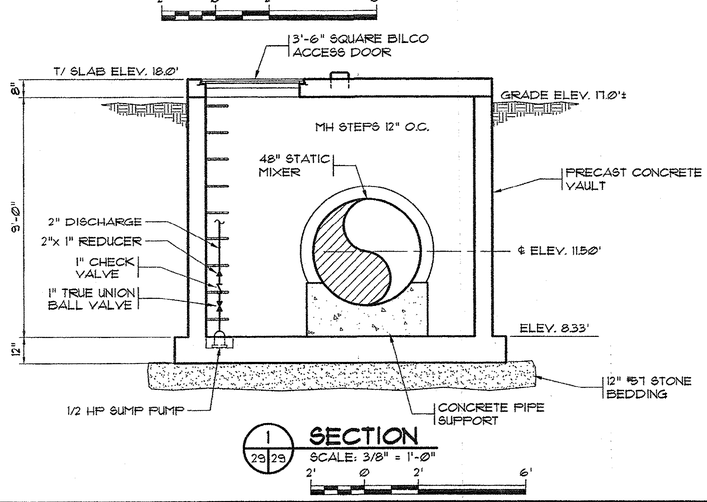
2' 0 2' 6'



ALUM FEED VAULT W/ STATIC MIXER LOWER PLAN VIEW

SCALE: 3/8" = 1'-0"

2' 0 2' 6'



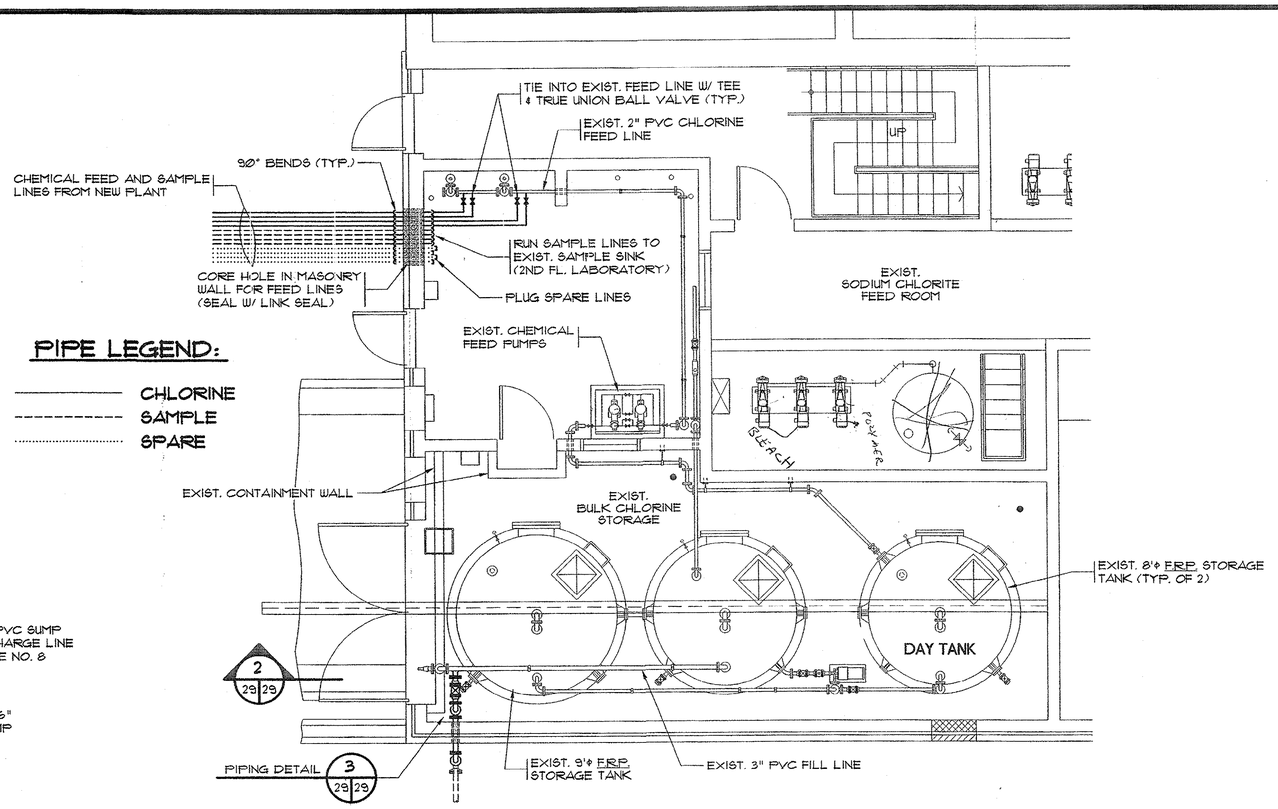
1 / 29 / 29 SECTION

SCALE: 3/8" = 1'-0"

2' 0 2' 6'

PIPE LEGEND:

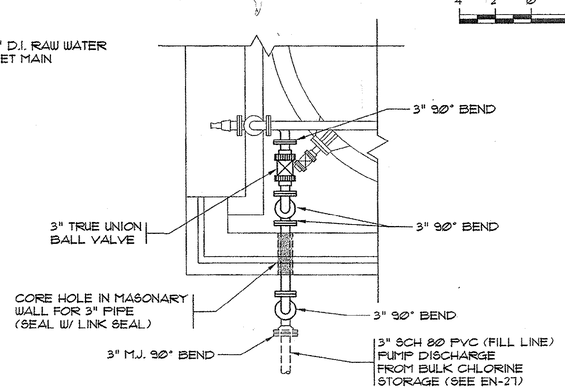
- CHLORINE
- SAMPLE
- SPARE



1 / G9 / EN29 EXIST. CHLORINE FEED AND STORAGE LAYOUT (LOCATED @ FIRST FL. EXIST. ADMIN. BLDG.)

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

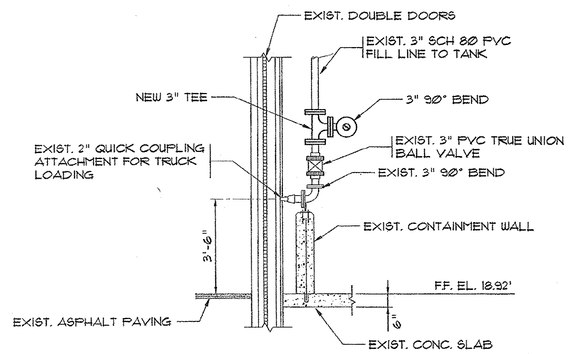
4' 2' 0 4'



3 / 29 / 29 PIPING DETAIL

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

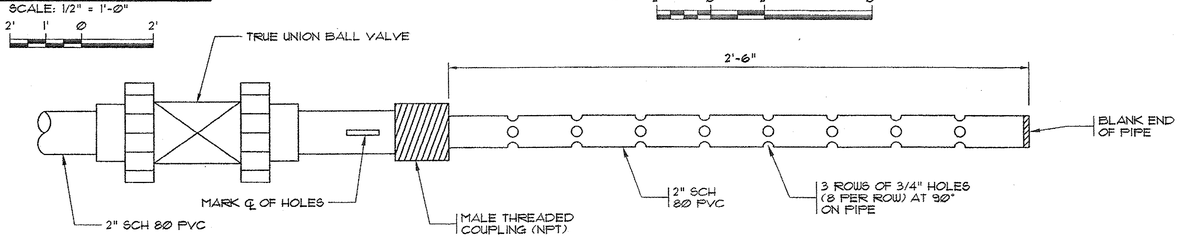
2' 1' 0 2'



2 / 29 / 29 SECTION VIEW

SCALE: 3/8" = 1'-0"

2' 0 2' 6'



CHEMICAL FEED DIFFUSER DETAIL

N.T.S.

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER REGISTERED No. 12339 JOSEPH W. MCCRACKEN

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

ALUM FEED VAULT W/ STATIC MIXER PLAN AND SECTIONS

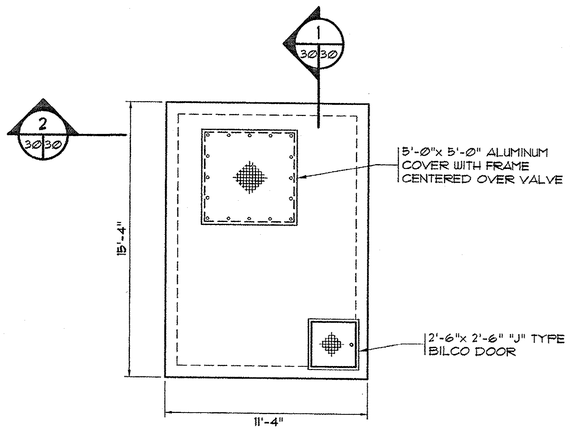
DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. EN-29

OF: 38

HOBBS UPCHURCH & ASSOC. J:\GS9814\4SMGDUPGRADE\EN-29.dwg,DWG EDITED BY: dc DATE: 01/19/00 TIME: 14:08 PLOT SCALE: 3/8"=1'-0"

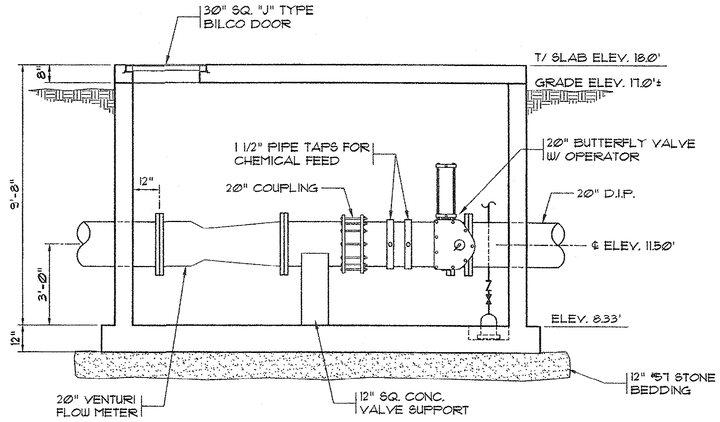
33-013-071



RAW WATER METER VAULT TOP PLAN VIEW

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

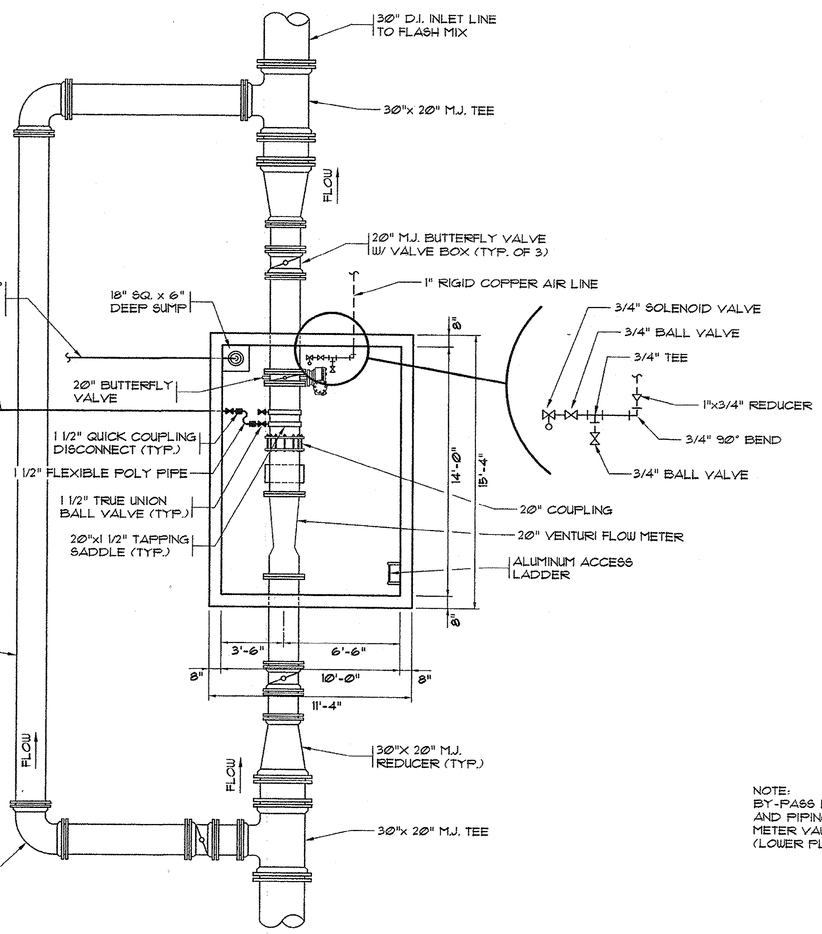
4' 2' 0 4'



1 30/30 SECTION

SCALE: 3/8" = 1'-0"

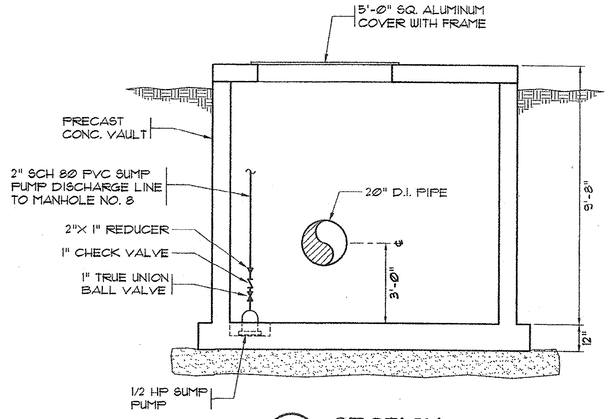
2' 0 2' 6'



RAW WATER METER VAULT LOWER PLAN VIEW

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

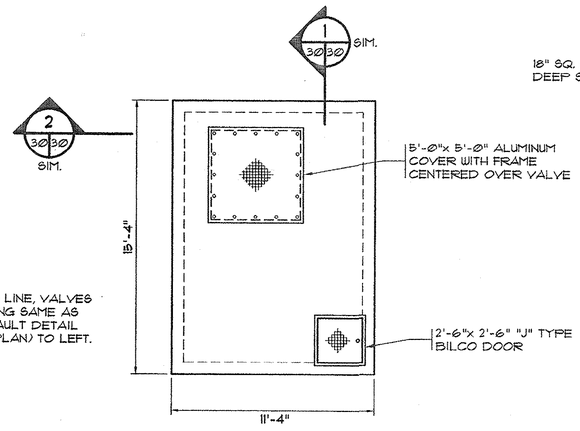
4' 2' 0 4'



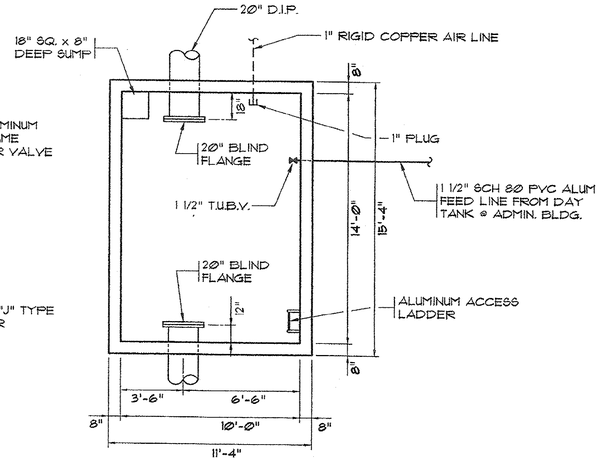
2 30/30 SECTION

SCALE: 3/8" = 1'-0"

2' 0 2' 6'



NOTE:
BY-PASS LINE, VALVES AND PIPING SAME AS METER VAULT DETAIL (LOWER PLAN) TO LEFT.



RAW WATER METER VAULT (FUTURE) TOP/LOWER PLAN VIEWS

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

4' 2' 0 4'

SYM.	DESCRIPTION	DATE	BY
	REVISIONS		

SOUTH CAROLINA PROFESSIONAL ENGINEER JOHN W. McCORQUODALE REGISTERED No. 12335

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

RAW WATER METER VAULT PLAN AND SECTIONS

BULL CREEK WTP 15 MGD UPGRADE

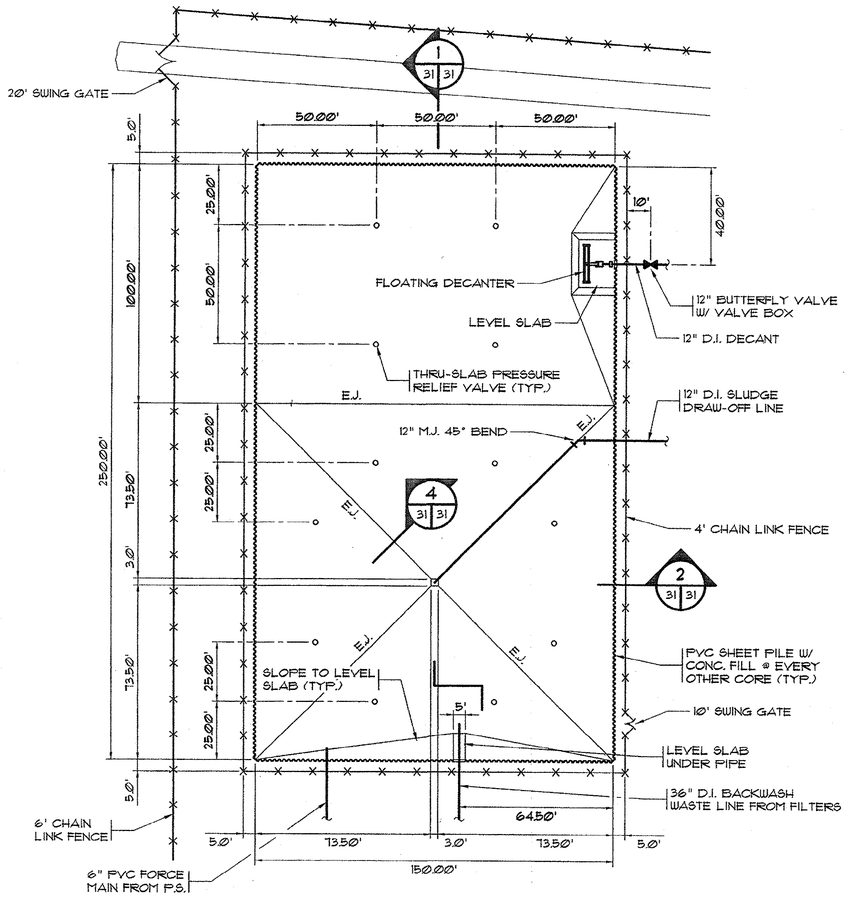
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-30
OF: 38

HOBBS UPCHURCH & ASSOC. J:\GS98141\45MGDUPGRADE\EN-30.dwg,DWG EDITED BY: dc DATE: 01/19/00 TIME: 10:56 PLOT SCALE: 1/4"=1'-0"

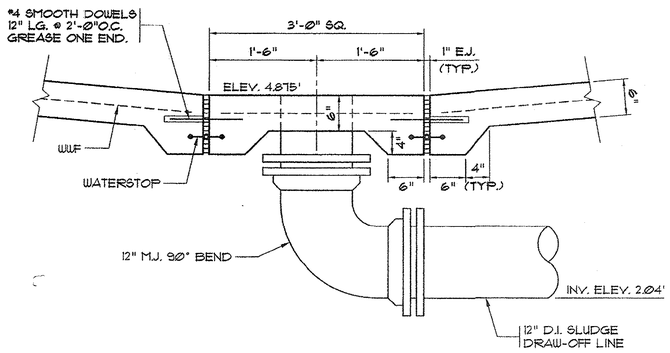
33-013-072



EQUALIZATION LAGOON LAYOUT

SCALE: 1" = 30'

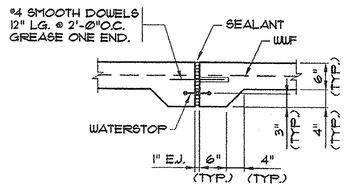
30' 0 15' 30' 60'



3 SLUDGE DRAW-OFF DETAIL

SCALE: 1" = 1'-0"

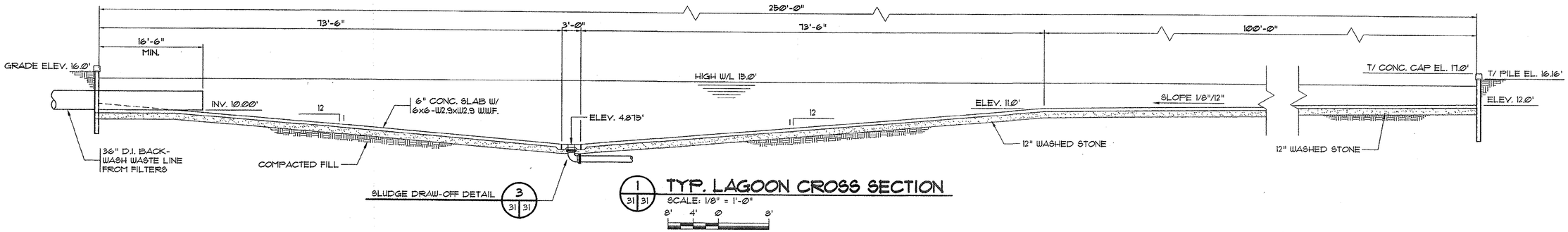
1' 0 1' 2'



4 TYP. EXP. JOINT (E.J.) DETAIL

SCALE 3/4" = 1'-0"

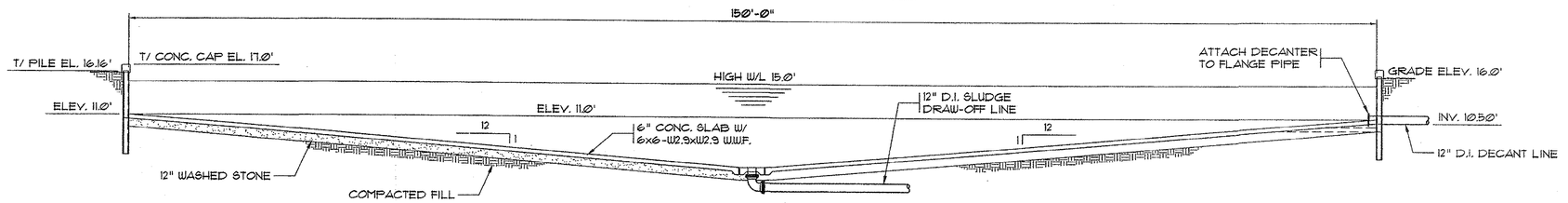
1' 6" 0 1' 2'



1 TYP. LAGOON CROSS SECTION

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

8' 4' 0 8'



2 TYP. LAGOON CROSS SECTION

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

8' 4' 0 8'

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12335 REGISTERED JOSEPH W. HUCHURCH

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

EQUALIZATION LAGOON LAYOUT SECTIONS AND DETAILS

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

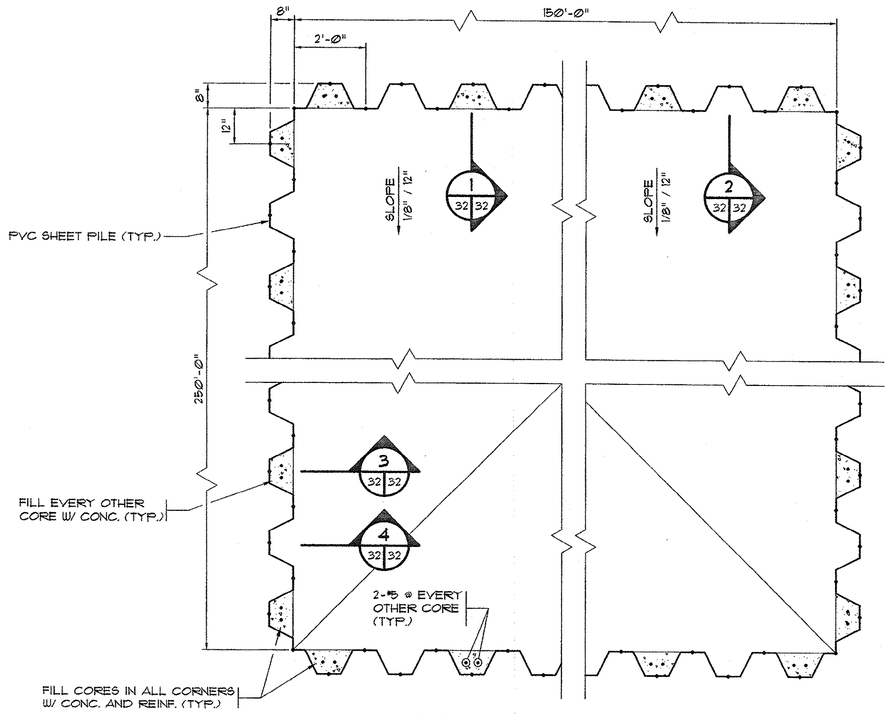
SHEET NO.

EN-31

OF: 38

HOBBS UPCHURCH & ASSOC. J:\GS9814\15MGDUPGRADE\EN-31.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:23 PLOT SCALE: 1"=30.0000'

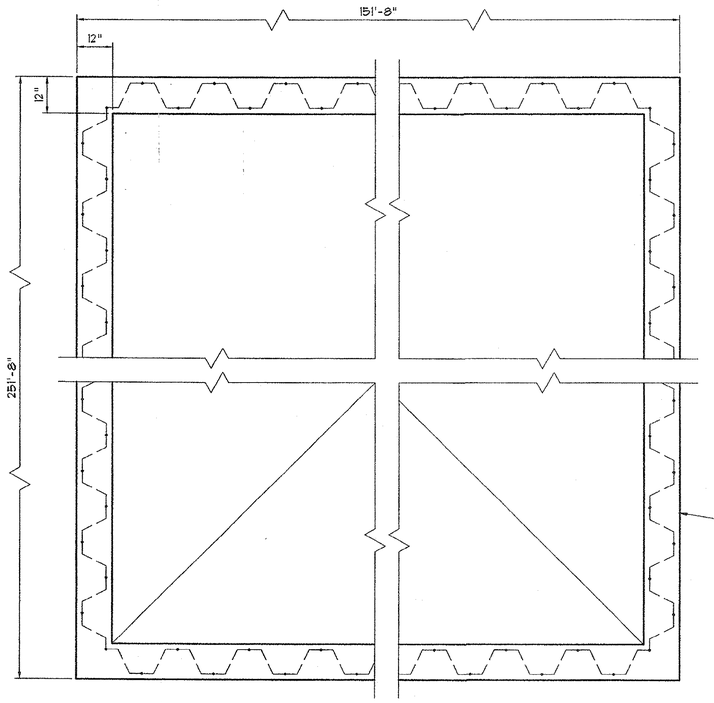
33-013-073



EQUALIZATION LAGOON LOWER PLAN VIEW

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

2' 1' 0 2'



EQUALIZATION LAGOON UPPER PLAN VIEW

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

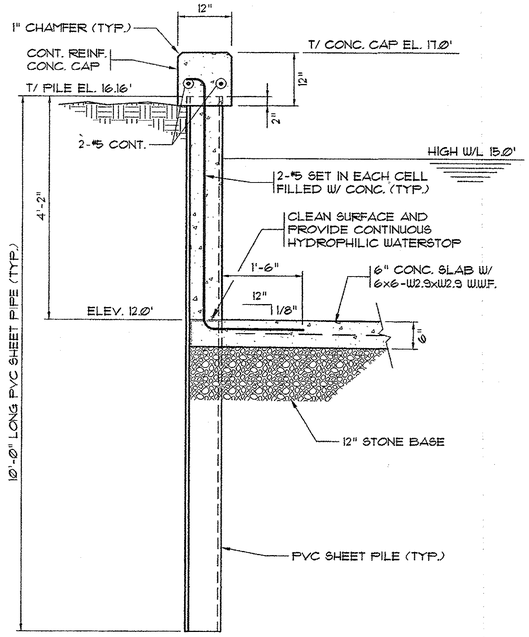
2' 1' 0 2'

NOTES:

1. STRUCTURES SHALL BE LAID OUT USING THE STANDARD DIMENSIONS OF THE PVC SHEET PLING TO AS CLOSELY AS POSSIBLE MATCH THE DIMENSIONS SHOWN IN DRAWING.
2. PVC SHEET PILING SHALL BE SHOREGUARD 500 OR APPROVED EQUIVALENT. THE MATERIAL SHALL BE INSTALLED PER MANUFACTURERS INSTRUCTIONS. THE CONTRACTOR SHALL INCLUDE ON-SITE COORDINATION BY A PRODUCT REPRESENTATIVE. THE CONTRACTOR SHALL PROVIDE LAYOUT DRAWINGS OF EACH STRUCTURE FOR REVIEW BY THE ENGINEER.

HYDROPHILIC WATERSTOPS:

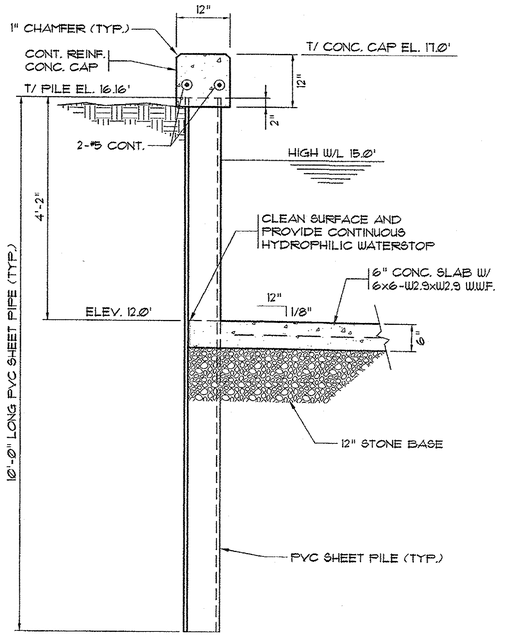
1. WATERSTOPS SHALL BE A NON-BENTONITE, CO-EXTRUDED STRIP APPLIED HYDROPHILIC RUBBER CONSISTING OF CHLOROPRENE RUBBER AND CHLOROPRENE RUBBER MODIFIED TO IMPART HYDROPHILIC PROPERTIES.
2. WATERSTOPS SHALL HAVE AN EXPANSION DELAY COATING TO INHIBIT INITIAL EXPANSION DUE TO MOISTURE PRESENT IN FRESH CONCRETE.
3. WATERSTOP VOLUMETRIC EXPANSION RATIO MUST BE A MINIMUM OF 3:1.



1 / 32 32 SECTION @ CORE W/ CONC. FILL

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

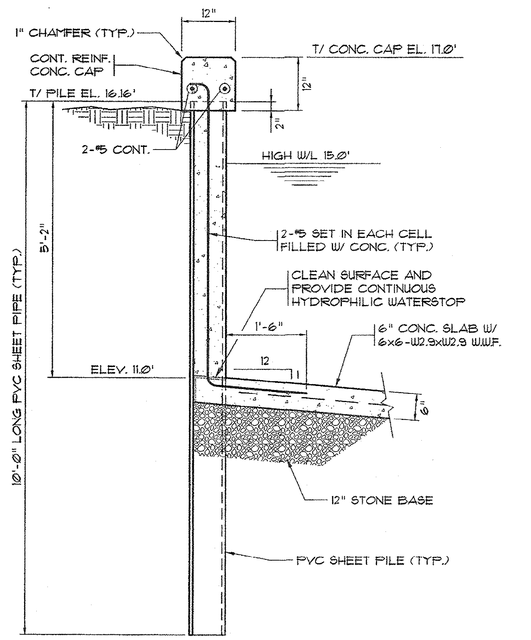
1' 6" 0 1' 2'



2 / 32 32 SECTION @ CORE W/ NO CONC.

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

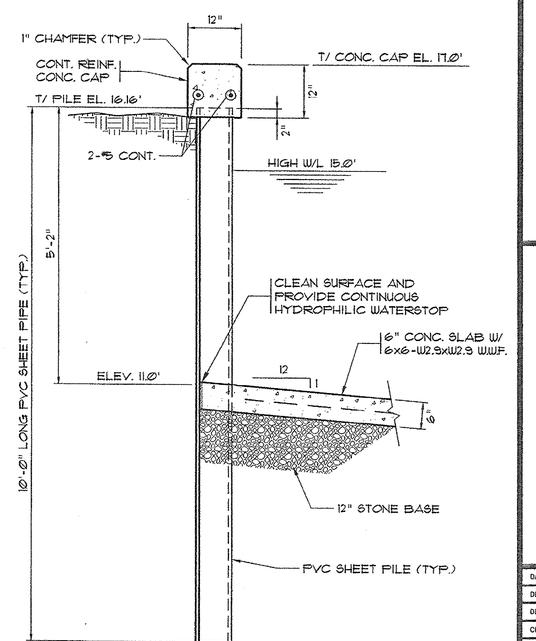
1' 6" 0 1' 2'



3 / 32 32 SECTION @ CORE W/ CONC. FILL

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

1' 6" 0 1' 2'



4 / 32 32 SECTION @ CORE W/ NO CONC.

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

1' 6" 0 1' 2'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12335 REGISTERED JOHN W. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

EQUALIZATION LAGOON LAGOON PLAN VIEWS SECTIONS AND DETAILS

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

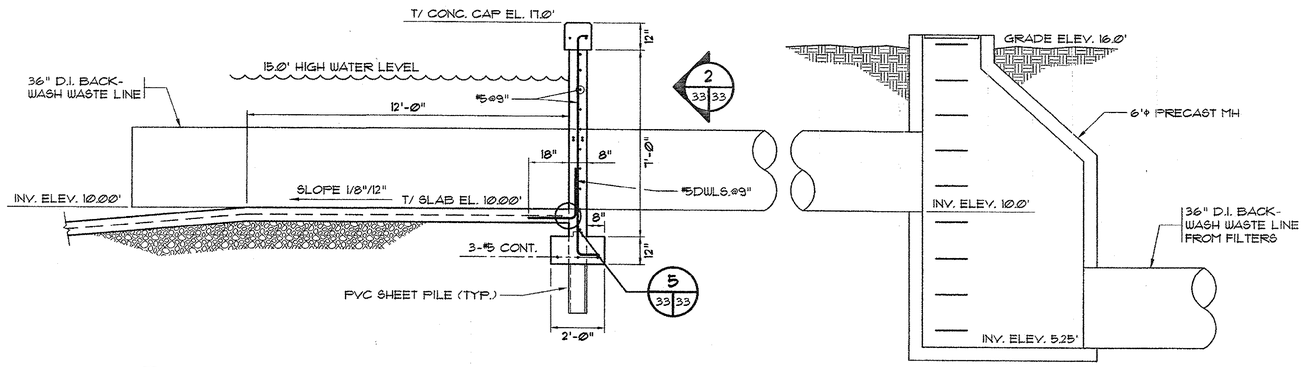
DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. EN-32

OF: 38

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-32.dwg DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:24 PLOT SCALE: 1/2"=1'-0"

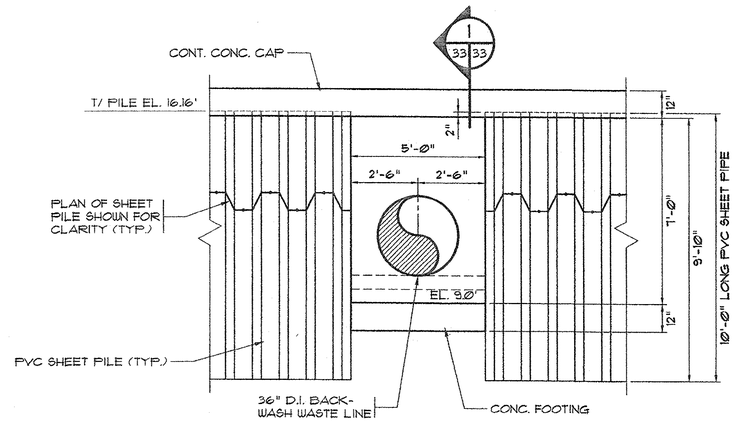
33-013-074



1 33|33 BACKWASH PIPING TO LAGOON SECTION

SCALE: 3/8" = 1'-Ø"

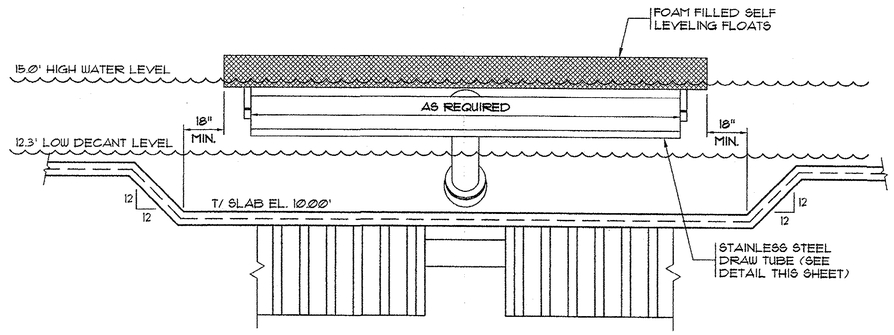
2' Ø 2' 6'



2 33|33 BACKWASH LINE TO LAGOON ELEVATION

SCALE: 3/8" = 1'-Ø"

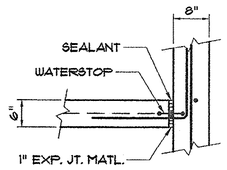
2' Ø 2' 6'



6 33|33 LAGOON DECANT SECTION

SCALE: 3/8" = 1'-Ø"

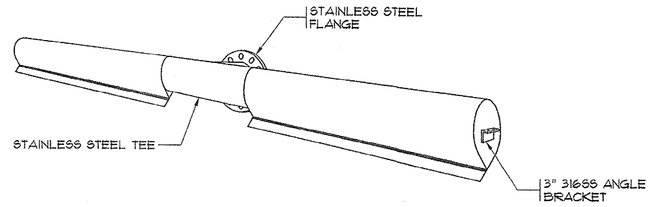
2' Ø 2' 6'



5 33|33 EXP. JT. DETAIL

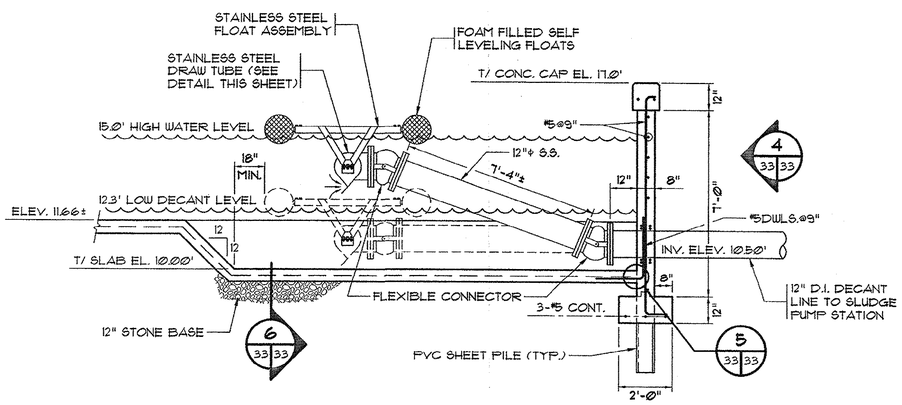
SCALE: 3/4" = 1'-Ø"

1' 6" Ø 1' 2'



S.S. SOLIDS EXCLUDING DECANTER DRAW TUBE DETAIL

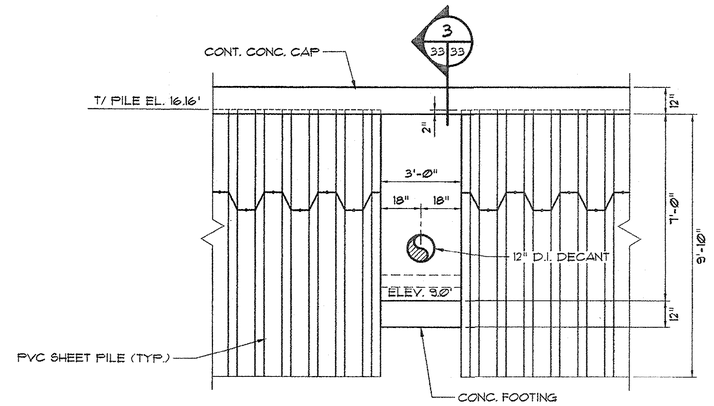
N.T.S.



3 33|33 LAGOON DECANT SECTION

SCALE: 3/8" = 1'-Ø"

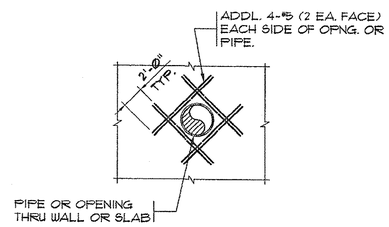
2' Ø 2' 6'



4 33|33 LAGOON DECANT ELEVATION

SCALE: 3/8" = 1'-Ø"

2' Ø 2' 6'



TYPICAL REINFORCING AT PIPE AND OPENING

N.T.S.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12535 REGISTERED JOSEPH W. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

EQUALIZATION LAGOON DETAILS AND SECTIONS

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

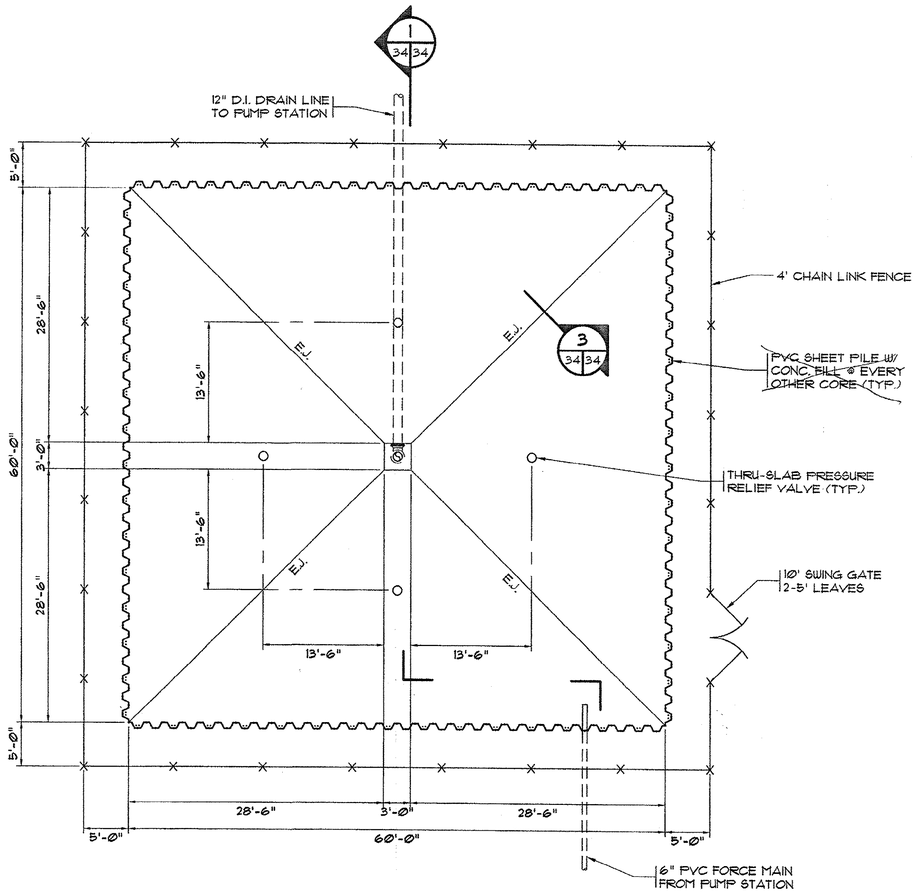
DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. EN-33

OF: 38

33-013-075

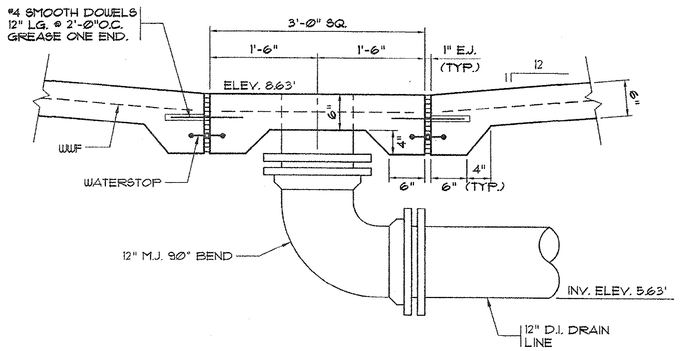
HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-33.dwg DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:24 PLOT SCALE: 3/8"=1'-0"



CHEMICAL WASTE LAGOON LAYOUT

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

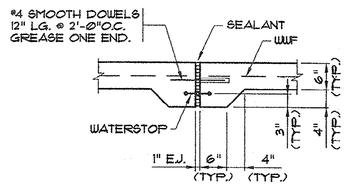
8' 4' 0 8'



2 34|34 DRAIN LINE DETAIL

SCALE: 1" = 1'-0"

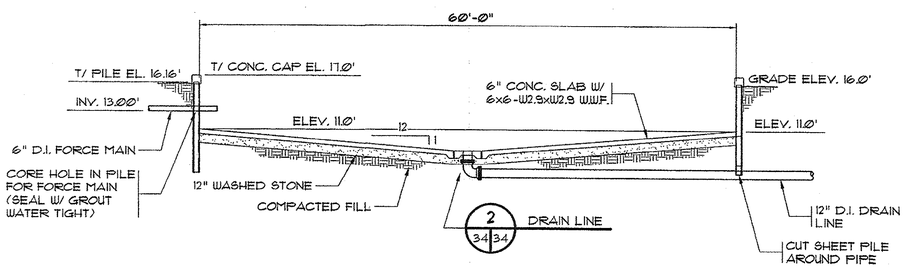
1' 0 1' 2'



3 34|34 TYP. EXP. JOINT (E.J.) DETAIL

SCALE 3/4" = 1'-0"

1' 0 1' 2'



1 34|34 TYP. LAGOON CROSS SECTION

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

8' 4' 0 8'

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER 17335 REGISTERED JOSEPH W. MCDONOUGH

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

CHEMICAL WASTE LAGOON PLAN AND DETAILS

BULL CREEK WTP 15 MGD UPGRADE

GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

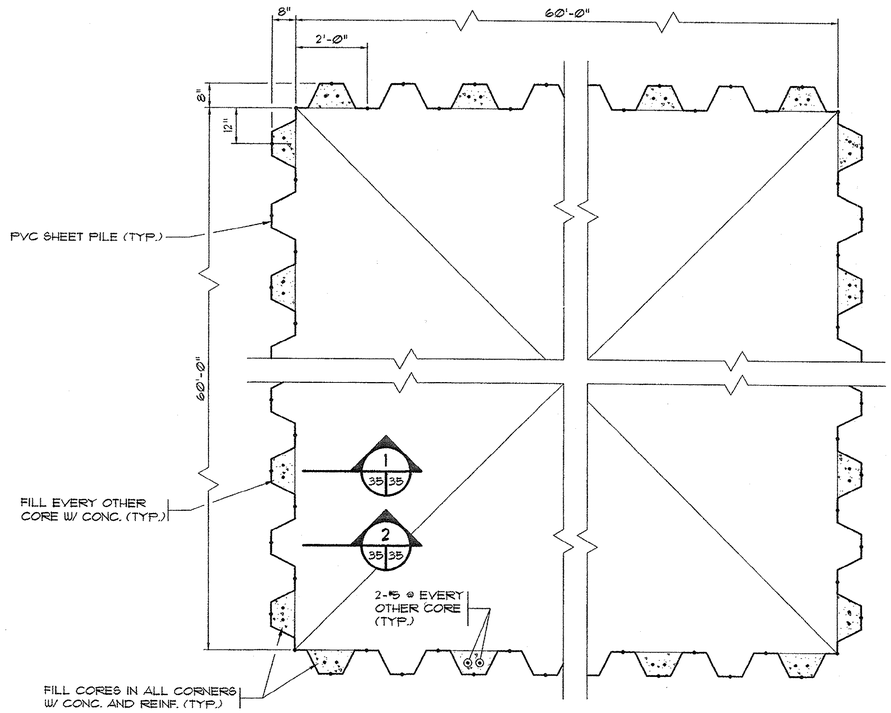
SHEET NO.

EN-34

OF: 38

33-013-076

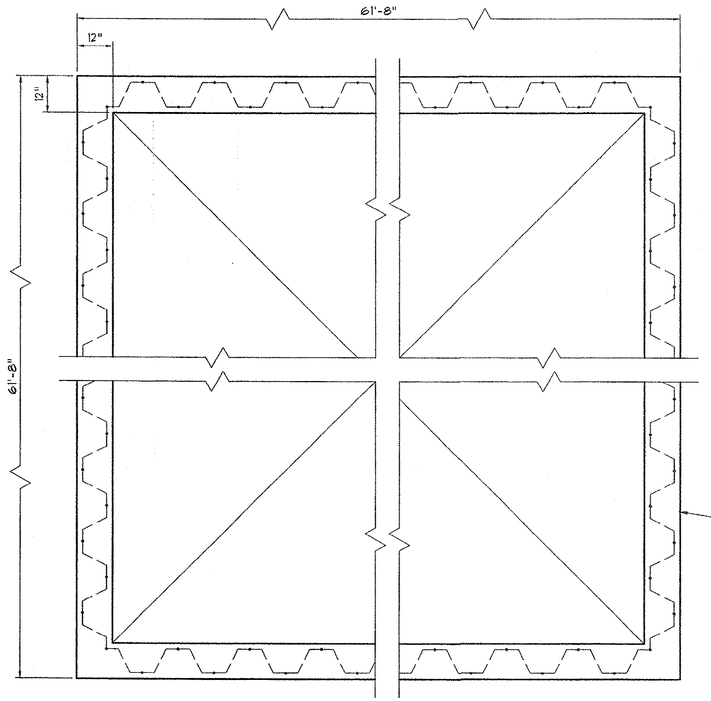
HOBBS UPCHURCH & ASSOC. J:\GS981-41.45MGDUPGRADE\EN-34.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:25 PLOT SCALE: 1/8"=1'-0"



CHEMICAL WASTE LAGOON LOWER PLAN VIEW

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

2' 1' 0 2'



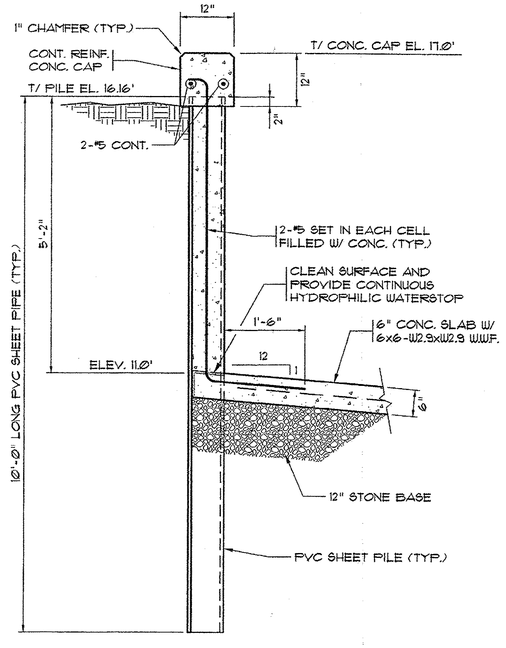
CHEMICAL WASTE LAGOON UPPER PLAN VIEW

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

2' 1' 0 2'

NOTES:

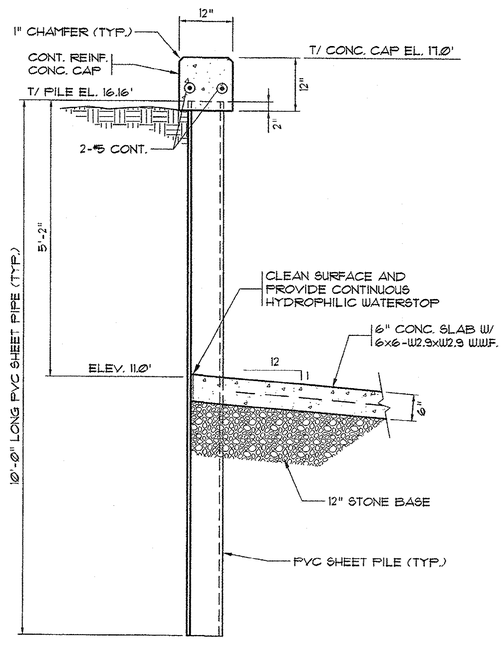
1. STRUCTURES SHALL BE LAID OUT USING THE STANDARD DIMENSIONS OF THE PVC SHEET PLUNG TO AS CLOSELY AS POSSIBLE MATCH THE DIMENSIONS SHOWN IN DRAWING.
2. PVC SHEET PILING SHALL BE SHOREGUARD 500 OR AFFROVED EQUIVALENT. THE MATERIAL SHALL BE INSTALLED PER MANUFACTURERS INSTRUCTIONS. THE CONTRACTOR SHALL INCLUDE ON-SITE COORDINATION BY A PRODUCT REFRESENTATIVE. THE CONTRACTOR SHALL PROVIDE LAYOUT DRAWINGS OF EACH STRUCTURE FOR REVIEW BY THE ENGINEER.



1 35|35 TYP. SECTION @ CORE W/ CONC. FILL

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

1' 6" 0 1' 2'



2 35|35 TYP. SECTION @ CORE W/ NO CONC.

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

1' 6" 0 1' 2'

HYDROPHILIC WATERSTOPS:

1. WATERSTOPS SHALL BE A NON-BENTONITE, CO-EXTRUDED STRIP APPLIED HYDROPHILIC RUBBER CONSISTING OF CHLOROPRENE RUBBER AND CHLOROPRENE RUBBER MODIFIED TO IMPART HYDROPHILIC PROPERTIES.
2. WATERSTOPS SHALL HAVE AN EXPANSION DELAY COATING TO INHIBIT INITIAL EXPANSION DUE TO MOISTURE PRESENT IN FRESH CONCRETE.
3. WATERSTOP VOLUMETRIC EXPANSION RATIO MUST BE A MINIMUM OF 3:1.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 12835 JOSEPH M. HOBBS

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

CHEMICAL WASTE LAGOON PLAN VIEWS SECTIONS AND DETAILS

BULL CREEK WTP 15 MGD UPGRADE

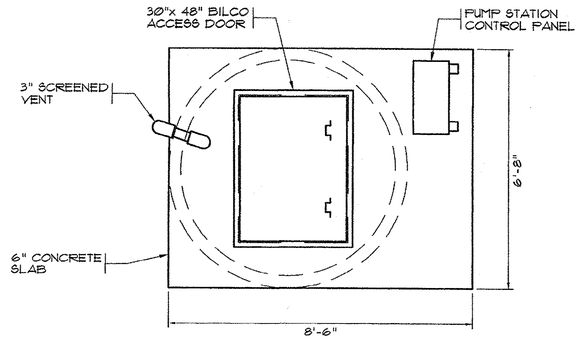
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

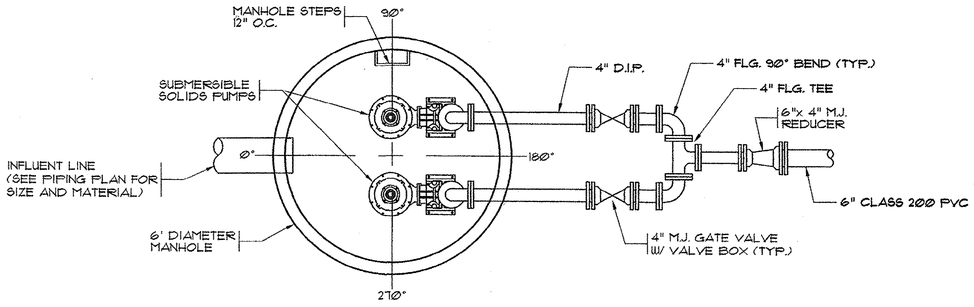
SHEET NO.
EN-35
OF: 38

HOBBS UPCHURCH & ASSOC. J:\GS9814\4SMGDUPGRADE\EN-35.dwg DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:25 PLOT SCALE: 1/2"=1'-0"

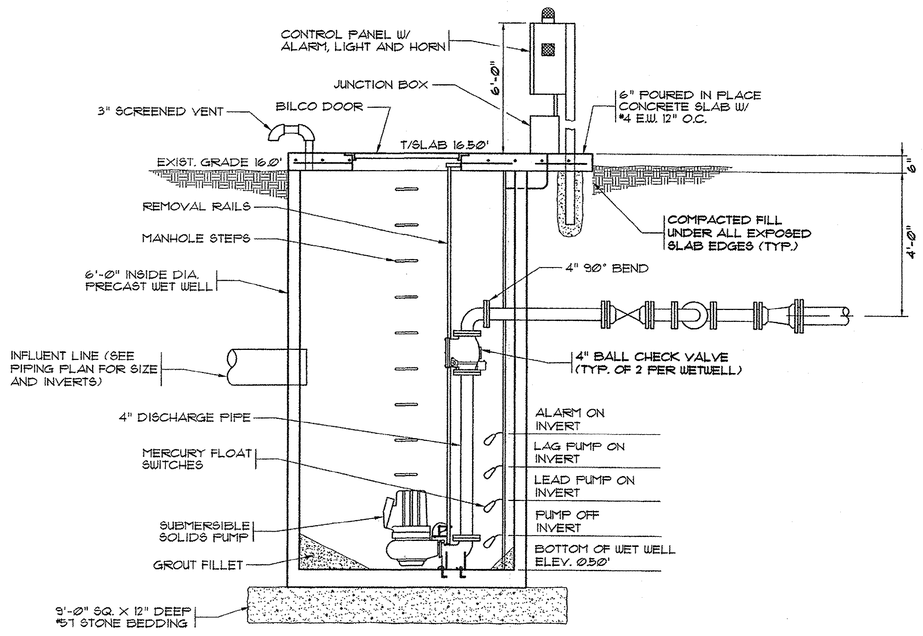
33-013-077



CHEMICAL SPILL LAGOON INFLUENT/EFFLUENT PUMP STATION
TOP PLAN VIEW
N.T.S.



CHEMICAL SPILL LAGOON INFLUENT/EFFLUENT PUMP STATION
BOTTOM PLAN VIEW
N.T.S.



CHEMICAL SPILL LAGOON INFLUENT/EFFLUENT PUMP STATION
ELEVATION VIEW
N.T.S.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER — JOSEPH W. HOBBS — REGISTERED — No. 22535

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

CHEMICAL SPILL LAGOON INFLUENT/ EFFLUENT PUMP STATION

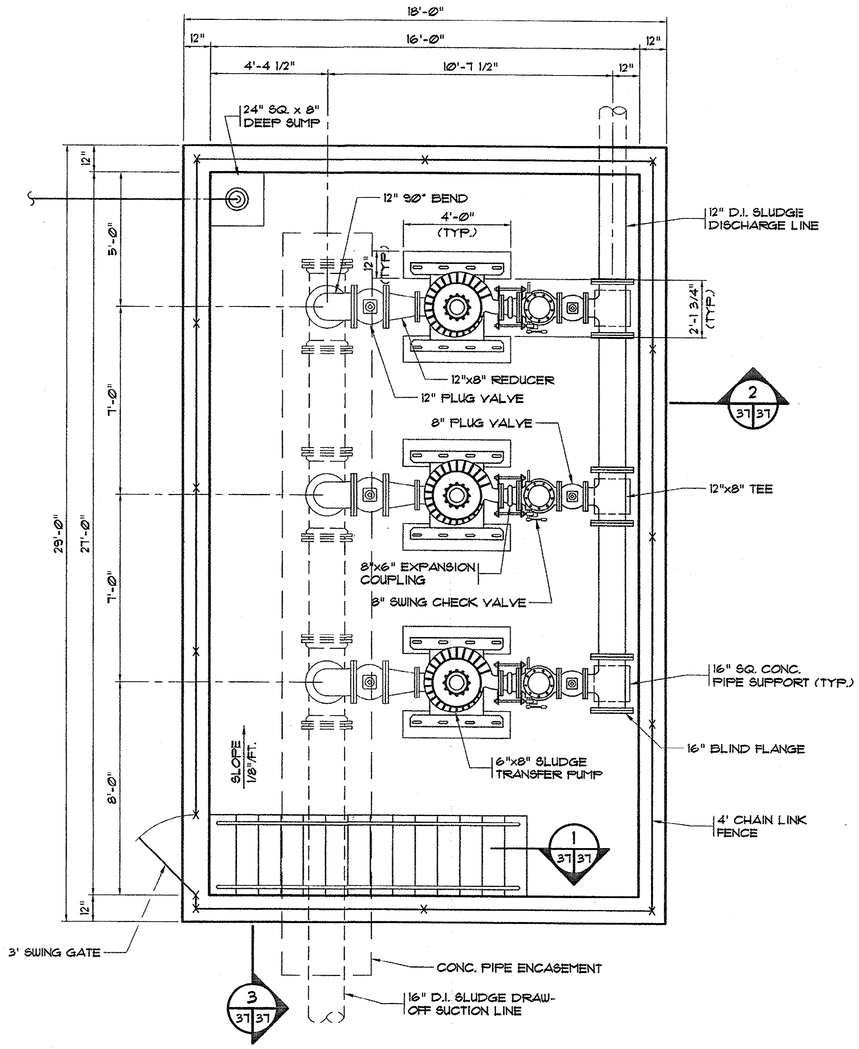
BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

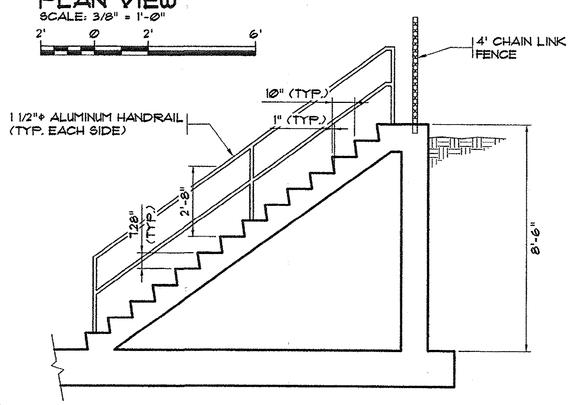
SHEET NO.
EN-36
OF: 38

HOBBS UPCHURCH & ASSOC. J:\GS9814\45MGDUPGRADE\EN-36.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:27 PLOT SCALE: 1/2"=1'-0"

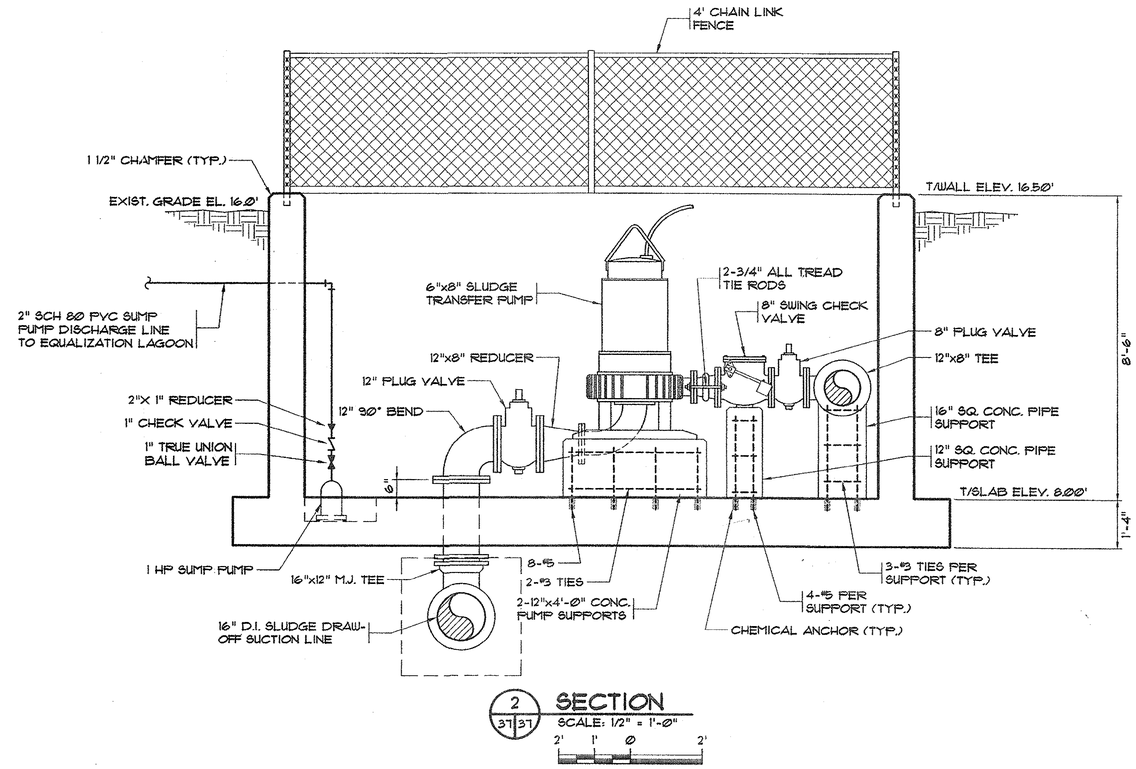
33-013-078



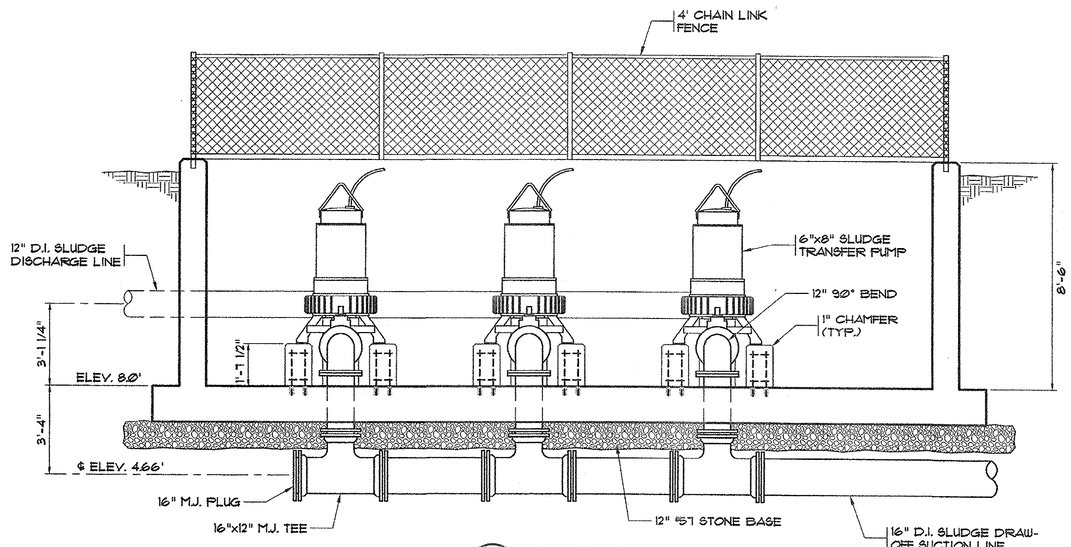
SLUDGE DRAW-OFF PUMP STATION
PLAN VIEW
SCALE: 3/8" = 1'-Ø"



1 — CONCRETE STAIR DETAIL
SCALE: 3/8" = 1'-Ø"



2 — SECTION
SCALE: 1/2" = 1'-Ø"



3 — SECTION
SCALE: 1/2" = 1'-Ø"

REVISIONS

SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEER JOSEPH W. HOBBS No. 12335 REGISTERED

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

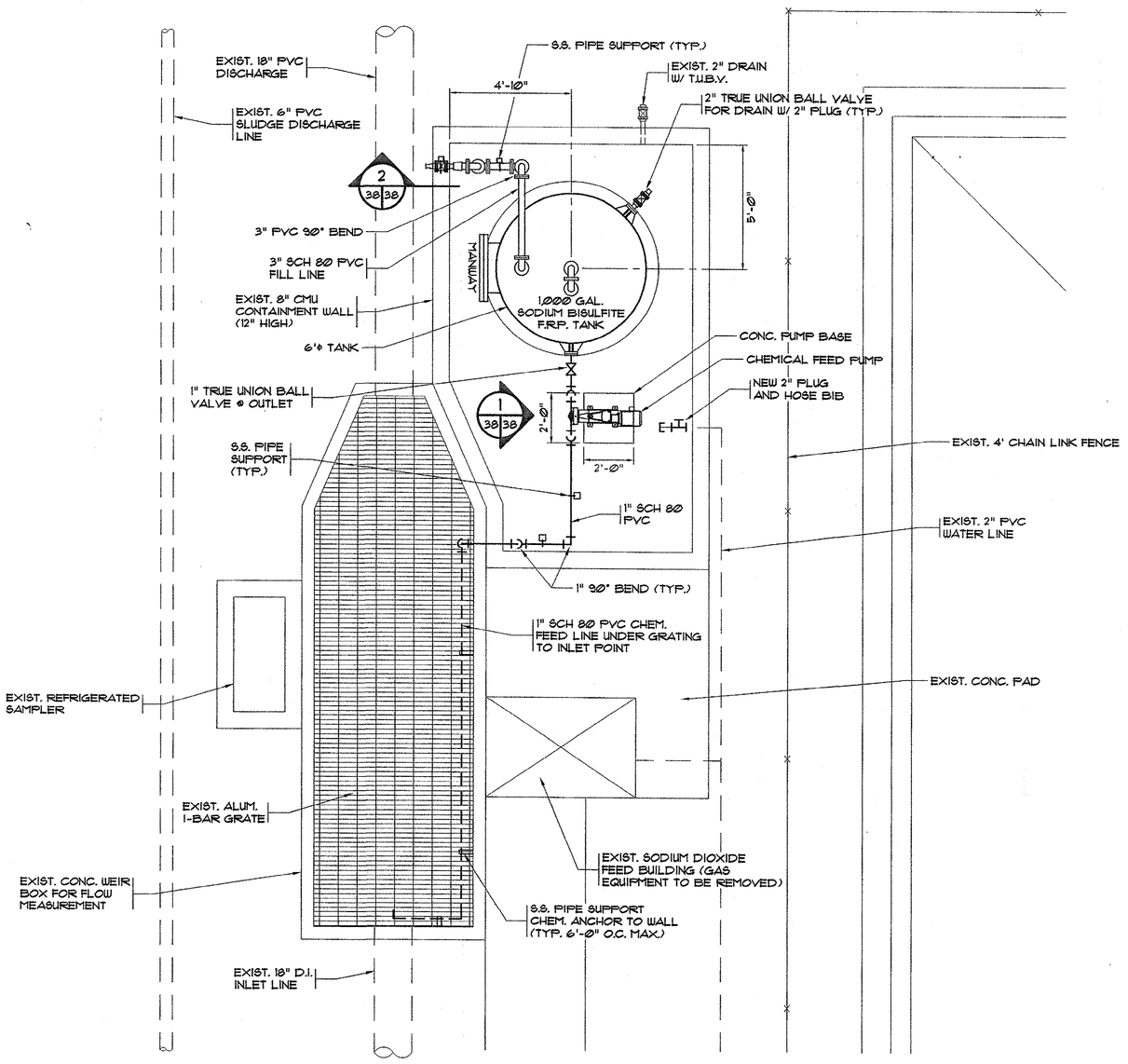
SLUDGE DRAW-OFF PUMP STATION PLAN AND SECTIONS

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-37
OF: 38

HOBBS UPCHURCH & ASSOC. J:\GS9814\15MGDUPGRADE\EN-37.dwg DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:28 PLOT SCALE: 3/8"=1'-0"

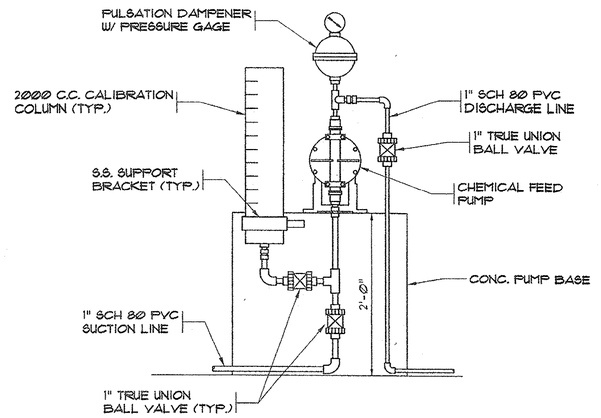
33-013-079



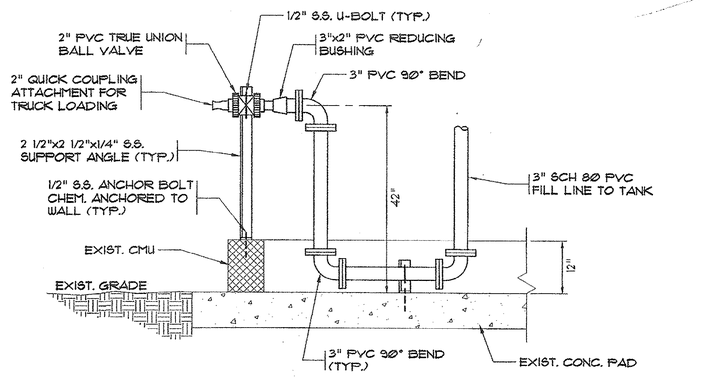
5 / G6 EN38 — SODIUM BISULFITE CHEMICAL STORAGE LAYOUT PLAN
SCALE: 3/8" = 1'-0"
2' 0 2' 6'

NOTE:

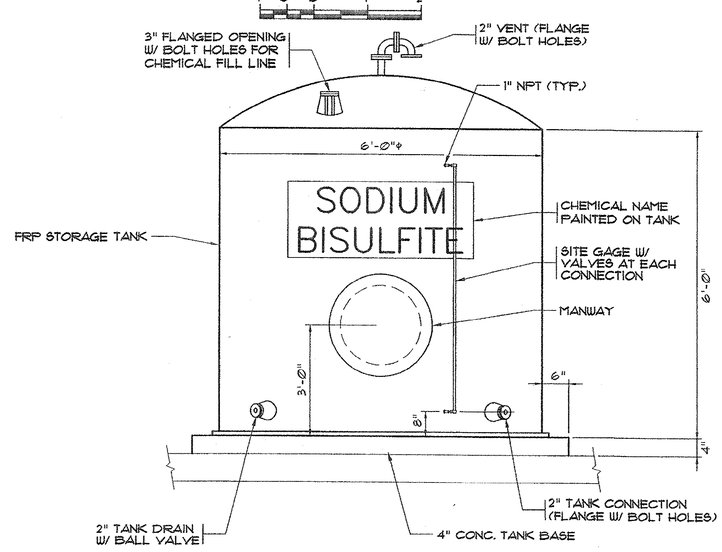
1. ALL PIPING SHALL BE SCH 80 PVC UNLESS OTHERWISE NOTED.



1 / 38 38 — CHEMICAL FEED PUMP DETAIL
N.T.S.



2 / 38 38 — TYPICAL FILL LINE CONNECTION DETAIL
SCALE: 3/4" = 1'-0"
1' 6" 0 1' 2'



TANK OPENING AND APPURTENANCES DETAIL
N.T.S.

SYM.	DESCRIPTION	DATE	BY
REVISIONS			

SOUTH CAROLINA PROFESSIONAL ENGINEER REGISTERED No. 19335 JAMES W. MASON

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577

SODIUM BISULFITE BULK CHEMICAL STORAGE PLAN AND DETAILS

BULL CREEK WTP
15 MGD UPGRADE
GRAND STRAND WATER AND SEWER AUTHORITY

DATE:	JAN. 2000
DESIGNED:	JWM
DRAWN:	DC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
EN-38
OF: 38

HOBBS UPCHURCH & ASSOC. J:\GS0814\45MGDUPGRADE\EN-38.dwg,DWG EDITED BY: dc DATE: 01/18/00 TIME: 15:29 PLOT SCALE: 3/8" = 1'-0"

33-013-080