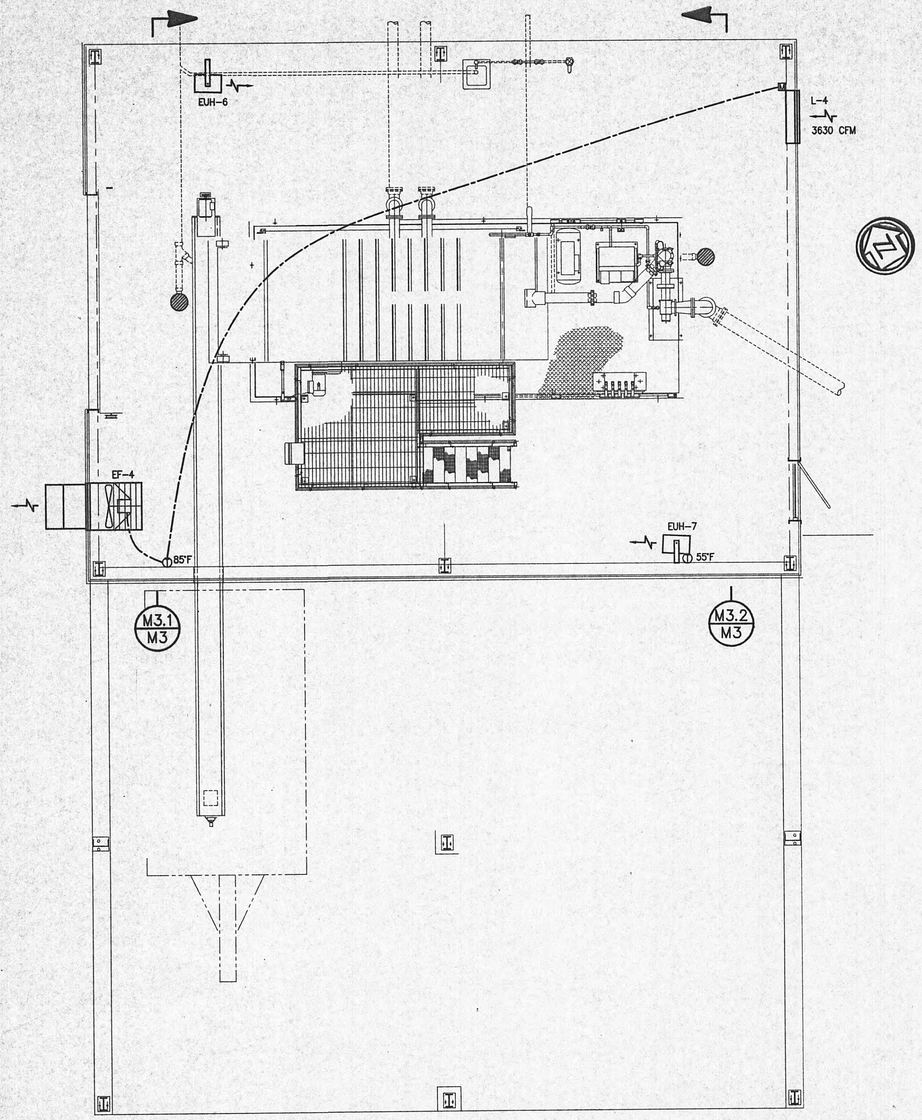
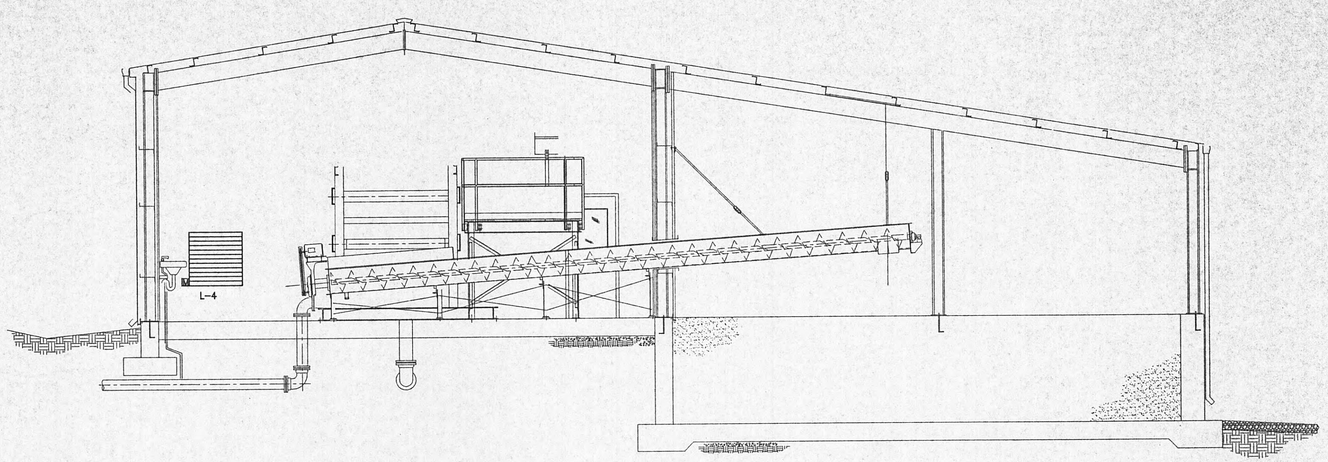
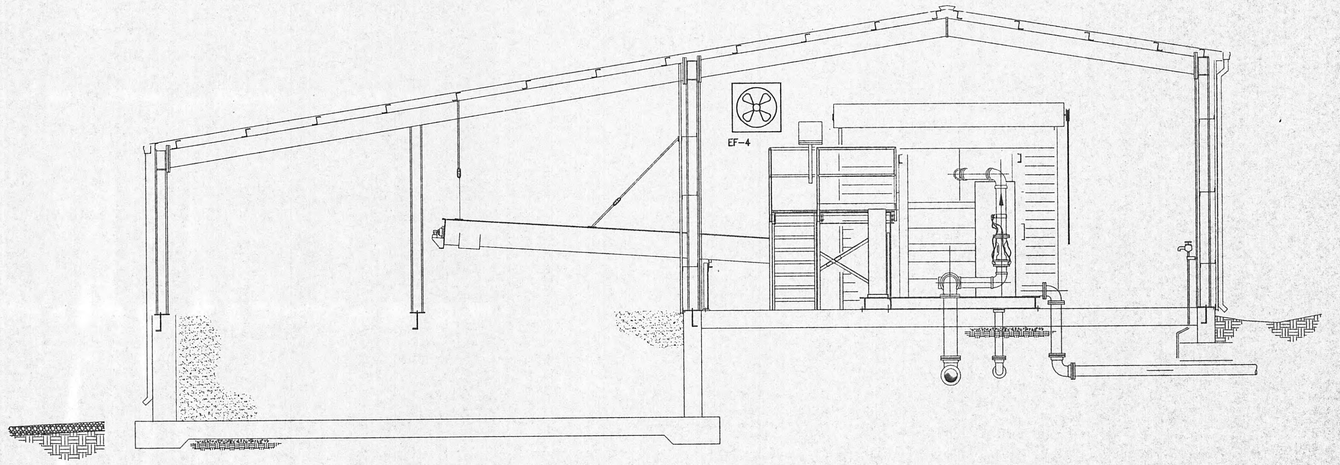


BELT PRESS BUILDING – PLAN
SCALE: 1/4"=1'-0"



SECTION
SCALE: 1/4"=1'-0"
M3.1
M3



SECTION
SCALE: 1/4"=1'-0"
M3.2
M3

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. ELY REGISTERED ENGINEER No. 090002 STATE OF TENNESSEE
10-2-02

GRW PROJECT NO. 7601-10

BELT FILTER PRESS BUILDING
MECHANICAL PLAN & SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGE	DATE: 8-1-02
DRAWN: JMG	SCALE: AS NOTED
REVIEWED: RGE	SHEET NO. M-3
APPROVED: RGE	

Wed, 02 Oct 2002 - 9:37am
FILE NAME: U:\3041\08-HARRIMAN WWTP\cadd\working\3041-M3.dwg

CONSTRUCTION PLANS
FOR
WASTEWATER SYSTEM IMPROVEMENTS

HARRIMAN UTILITY BOARD
HARRIMAN, TENNESSEE
WASTEWATER TREATMENT PLANT
UPGRADE

CONTRACT S02-01

SEPTEMBER, 2002

GRW Elrod Dunson, Inc.

Engineers, Architects, Planners

404 BNA Drive, Suite 201 NASHVILLE, TN 37217
PH. (615)366-1600 FAX (615)366-0406

LEXINGTON LOUISVILLE NASHVILLE KNOXVILLE INDIANAPOLIS

ROBERT G. THREADGILL JR. REGISTERED ENGINEER AGRICULTURE NO. 012648 STATE OF TENNESSEE

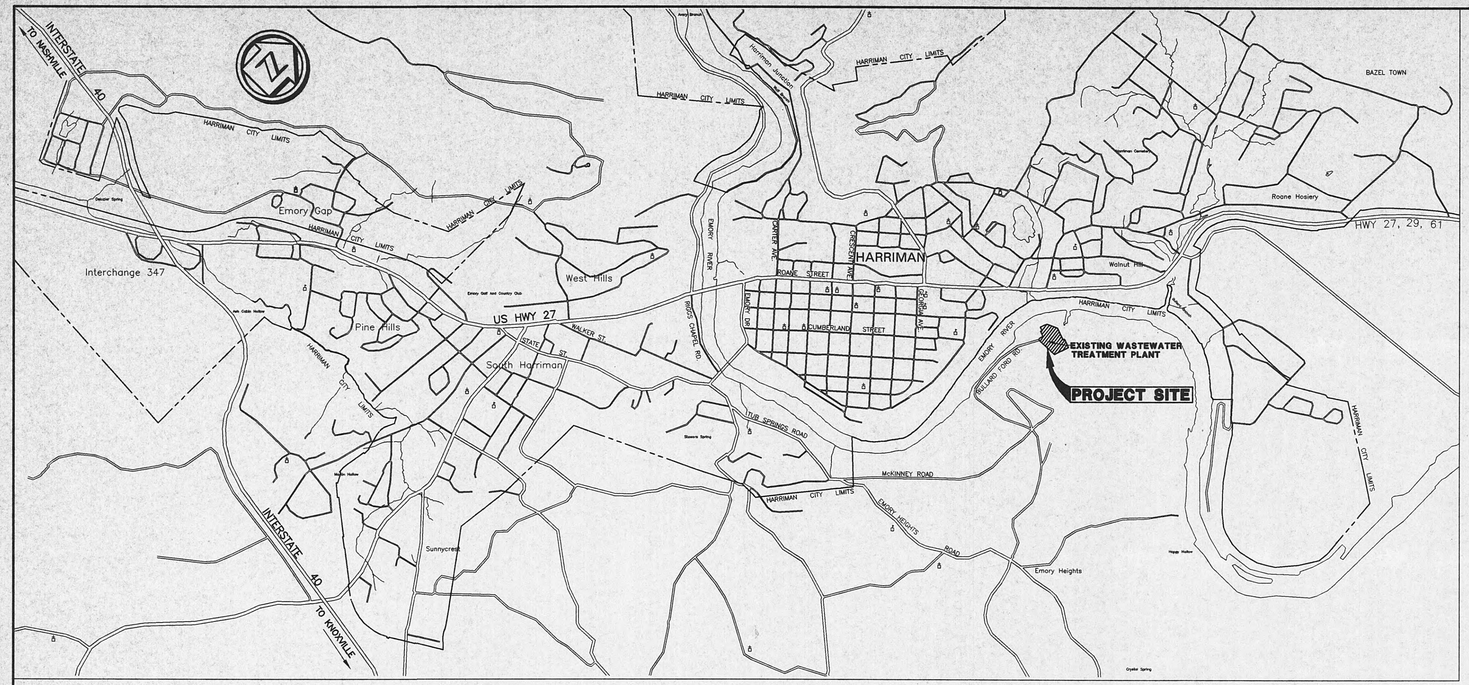
9-30-02

Accepted By: _____
Title: MANAGER
For: HARRIMAN UTILITY BOARD
Date: 9/30/02

PROJECT NO. 7601-10

SET NO.

FILE NAME: $FILE$



LOCATION MAP

SCALE: 1" = 1500'

VICINITY MAP

NOT TO SCALE

INDEX OF SHEETS

GRW PROJECT NO. 7601-10

LOCATION PLAN, VICINITY MAP INDEX OF DRAWINGS WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

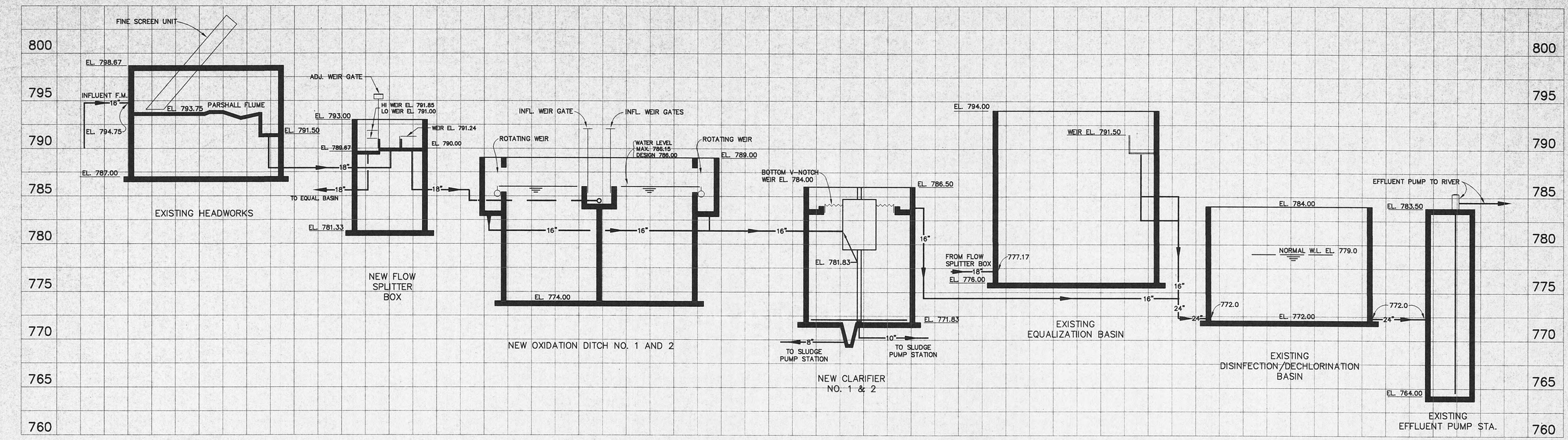
ROBERT G. THREADGILL JR. REGISTERED ENGINEER No. 017648 STATE OF TENNESSEE

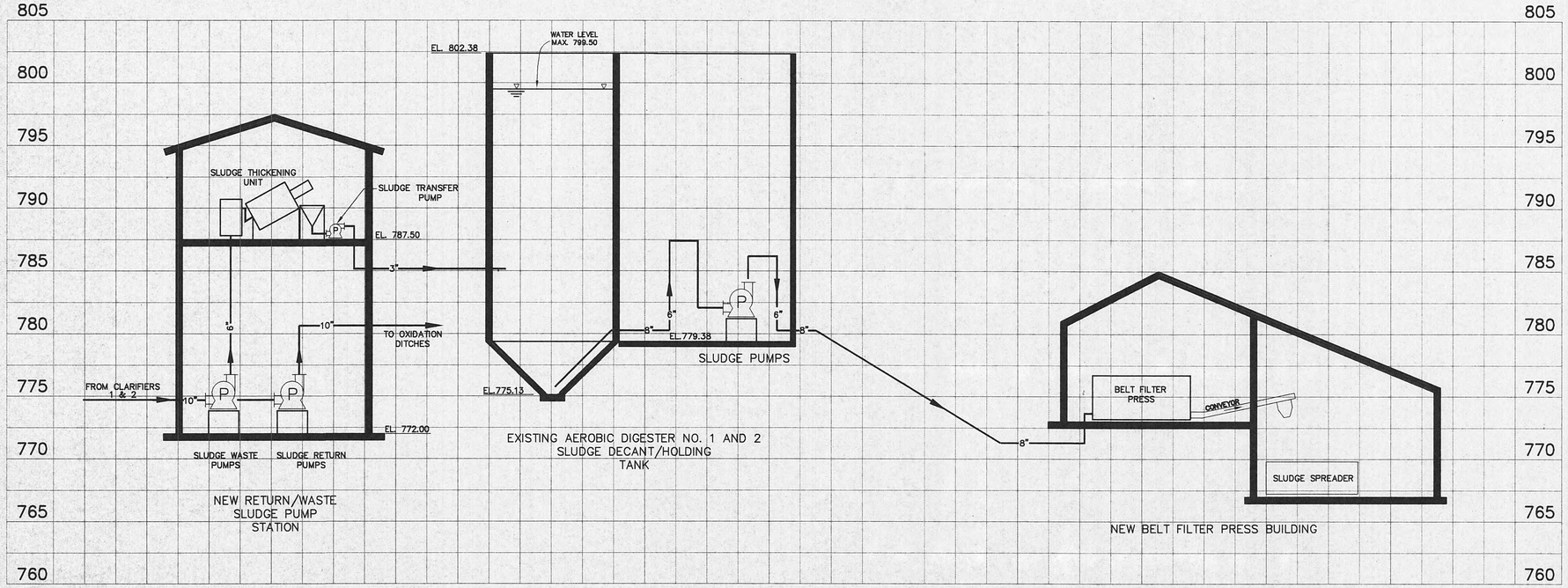
9-30-02

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-1
APPROVED: RGT	

FILE NAME: 7601-10





HYDRAULIC PROFILE

SCALE: VERT. – 1" = 5'-0"
HORZ. – NONE

GRW PROJECT NO. 7601-10

HYDRAULIC PROFILE
WASTWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

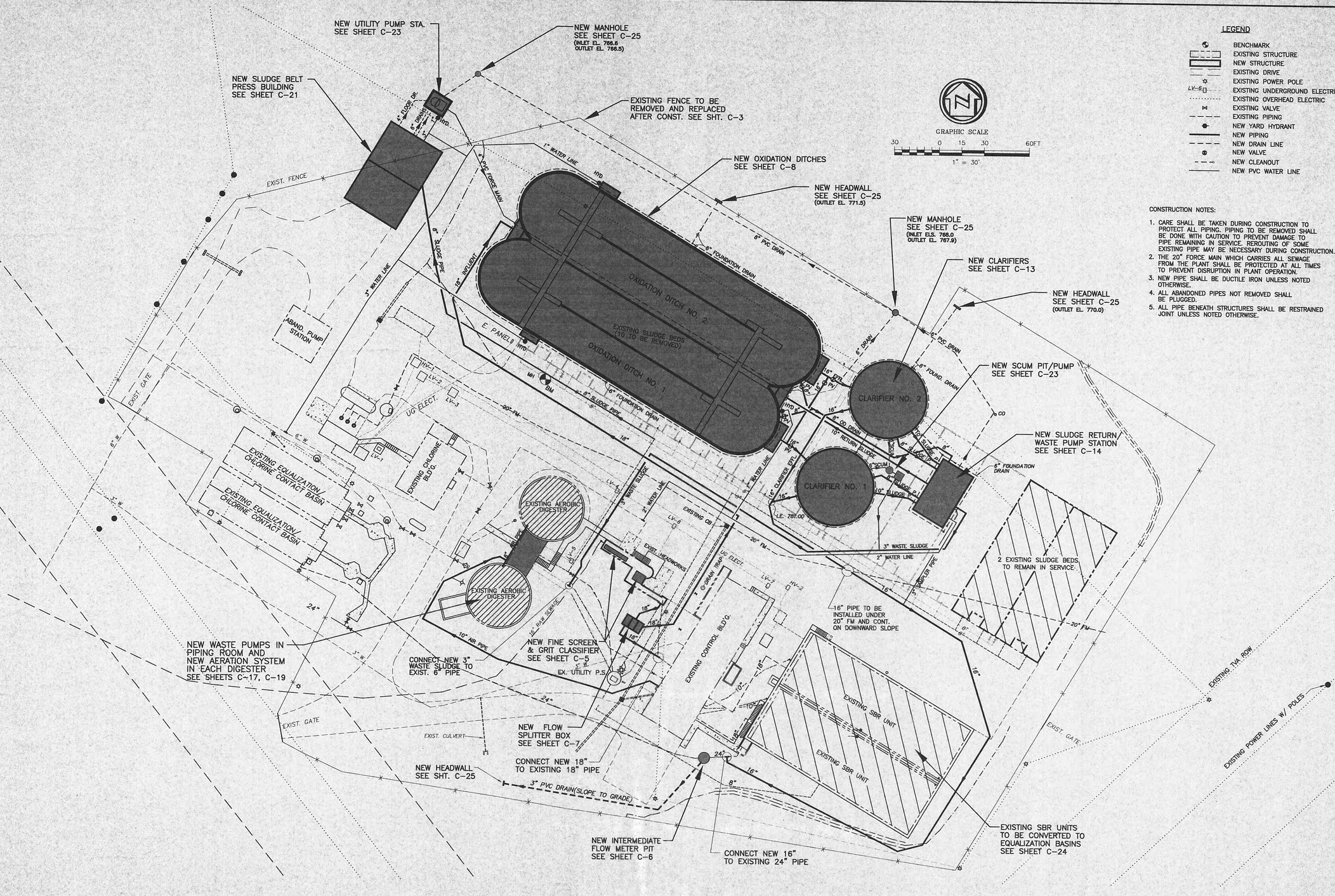
NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL, JR. REGISTERED ENGINEER STATE OF TENNESSEE NO. 017648

9-30-02

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-2
APPROVED: RGT	



CONSTRUCTION NOTES:

1. CARE SHALL BE TAKEN DURING CONSTRUCTION TO PROTECT ALL PIPING. PIPING TO BE REMOVED SHALL BE DONE WITH CAUTION TO PREVENT DAMAGE TO PIPE REMAINING IN SERVICE. REROUTING OF SOME EXISTING PIPE MAY BE NECESSARY DURING CONSTRUCTION.
2. THE 20" FORCE MAIN WHICH CARRIES ALL SEWAGE FROM THE PLANT SHALL BE PROTECTED AT ALL TIMES TO PREVENT DISRUPTION IN PLANT OPERATION.
3. NEW PIPE SHALL BE DUCTILE IRON UNLESS NOTED OTHERWISE.
4. ALL ABANDONED PIPES NOT REMOVED SHALL BE PLUGGED.
5. ALL PIPE BENEATH STRUCTURES SHALL BE RESTRAINED JOINT UNLESS NOTED OTHERWISE.

BASE MAP SURVEY PROVIDED BY:
LACKEY AND ASSOCIATES, INC
OLIVER SPRINGS, TENNESSEE
PH. 865-435-7663

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL JR. REGISTERED ENGINEER 012845 STATE OF TENNESSEE

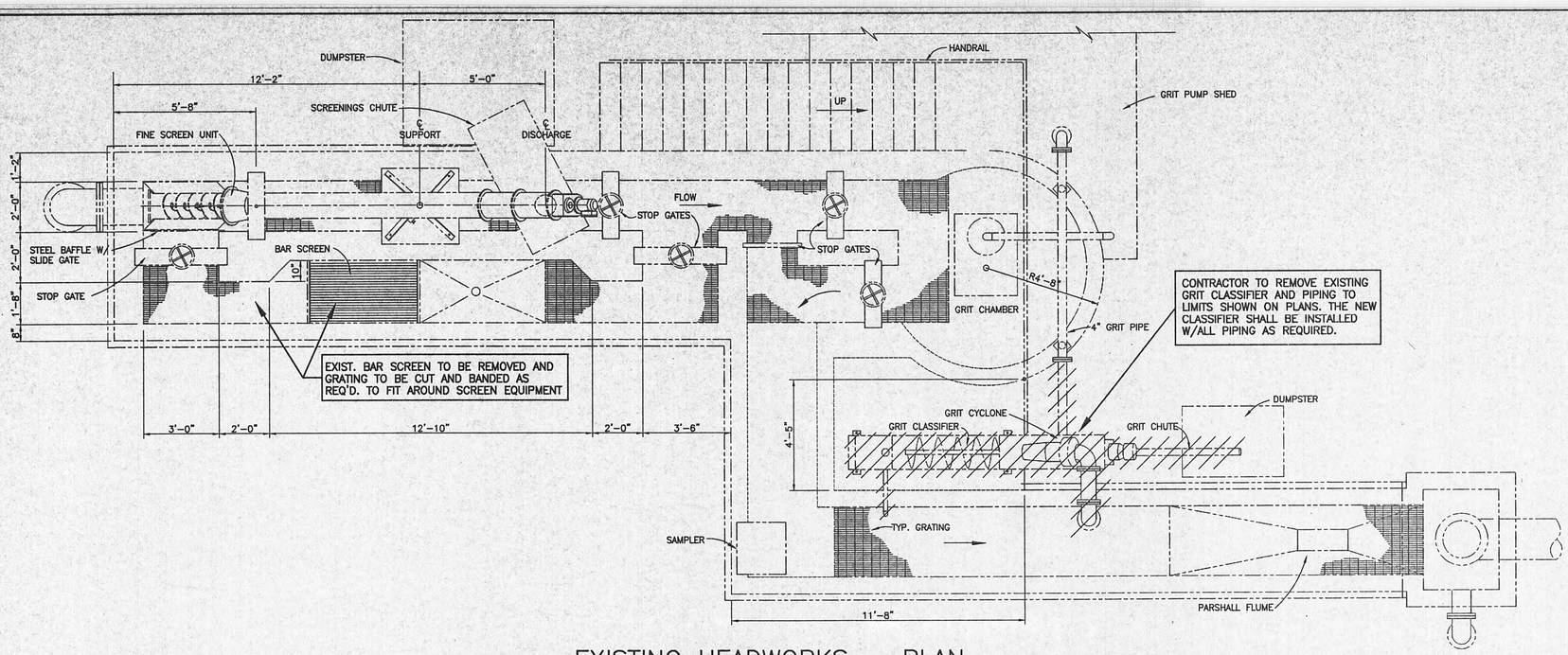
9-30-02

GRW PROJECT NO.7601-10

SITE PIPING PLAN
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

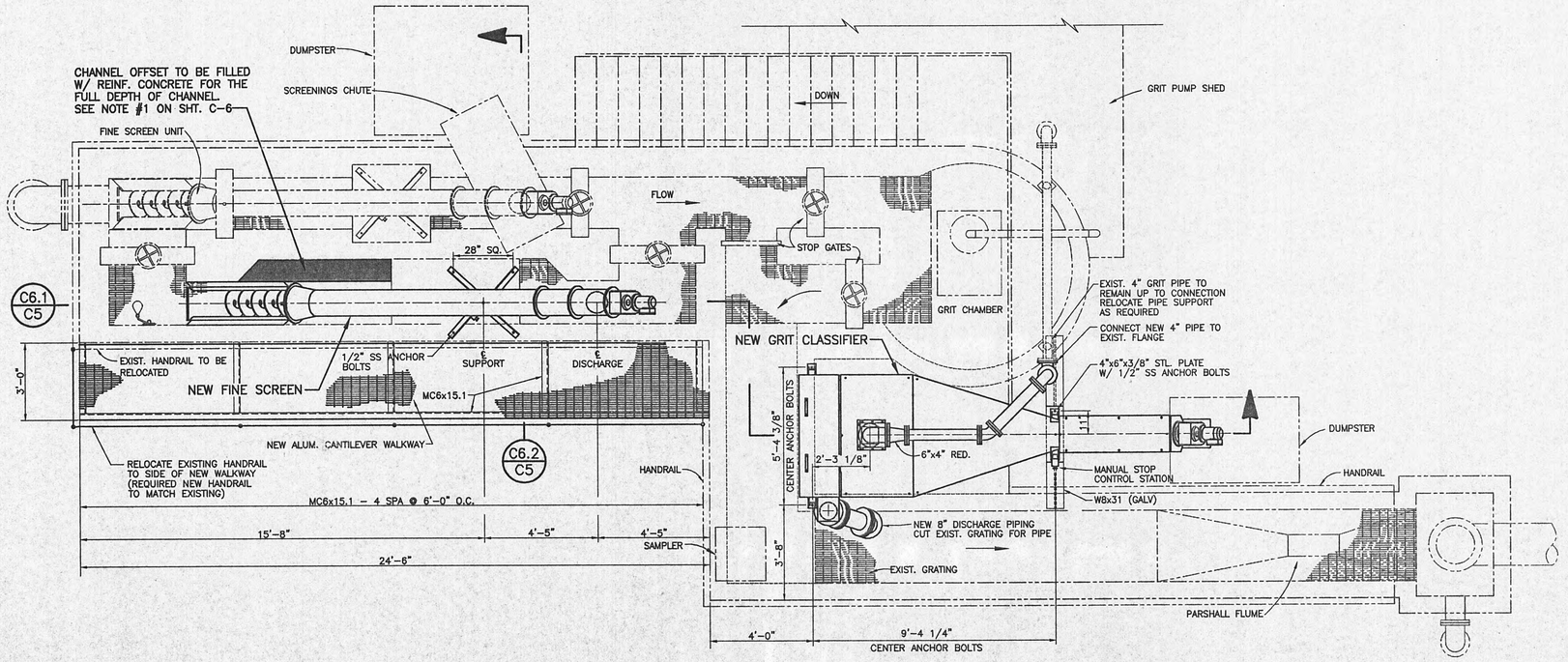
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS
NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-4
APPROVED: RGT	



EXISTING HEADWORKS – PLAN

SCALE: 3/8=1'-0"



UPGRADED HEADWORKS – PLAN

SCALE: 3/8=1'-0"

GRW PROJECT NO.7601-10

EXISTING HEADWORKS – PLAN
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

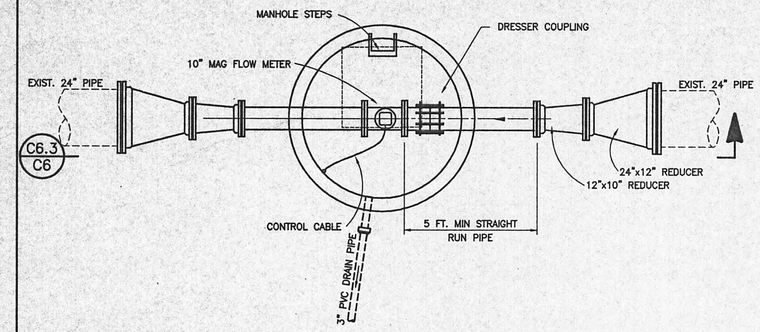
KRISHNAPURA R. NARAYANAN REGISTERED ENGINEER No. 092135 STATE OF TENNESSEE 10-2-02

ROBERT G. THREADGILL, JR. REGISTERED ENGINEER No. 019940 STATE OF TENNESSEE 9-30-02

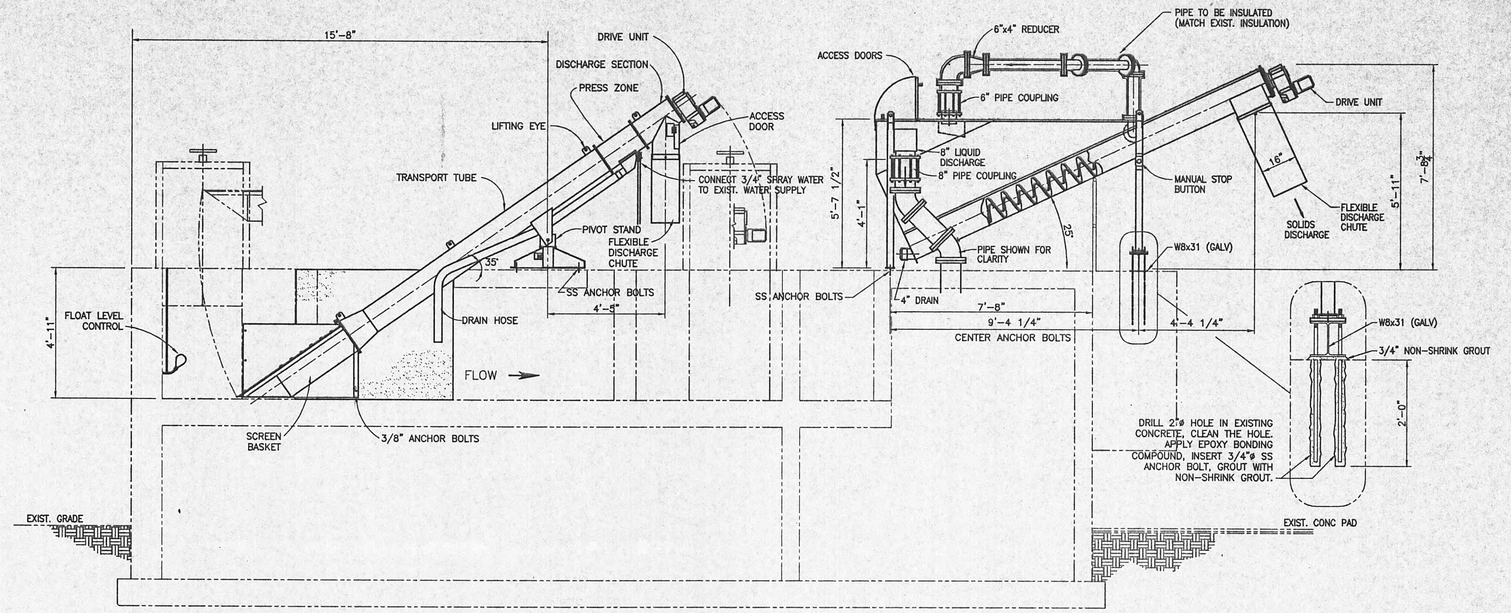
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALED: AS NOTED
REVIEWED: RGO	SHEET NO. C-5
APPROVED: RGT	

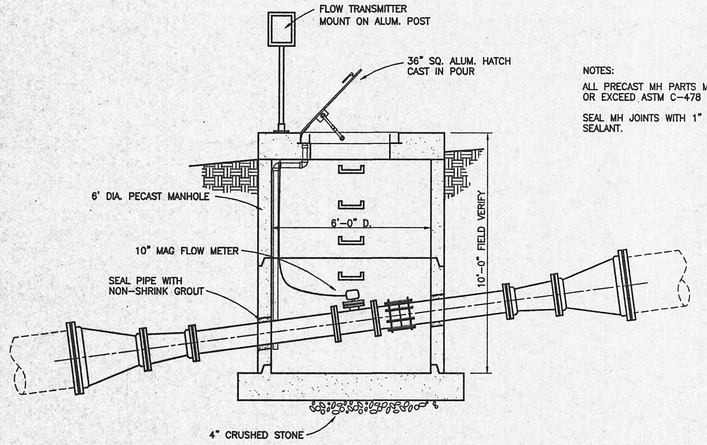
NOTES:
CONTRACTOR TO LOCATE EXISTING 24" PIPE AND CUT AND INSTALL PIPING AND METER PIT AS SHOWN.



PLAN – INTERMEDIATE FLOW METER PIT
SCALE: 3/8=1'–0"



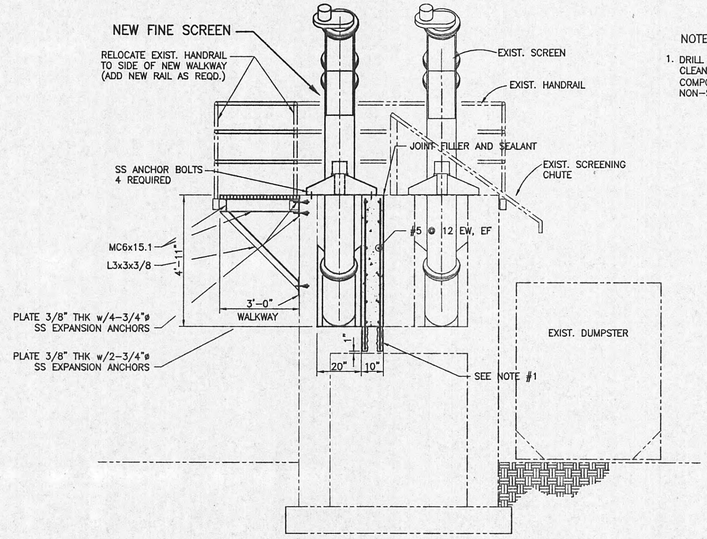
SECTION
SCALE: 3/8=1'–0"
C6.1 / C5



NOTES:
ALL PRECAST MH PARTS MUST MEET OR EXCEED ASTM C–478 SPECS.

SEAL MH JOINTS WITH 1" BUTYL SEALANT.

SECTION
SCALE: 3/8=1'–0"
C6.3 / C6



NOTES:
1. DRILL 2"ø HOLE IN EXISTING CONCRETE 18" O.C., CLEAN THE HOLE. APPLY EPOXY BONDING COMPOUND, INSERT #5 REBAR, GROUT WITH NON–SHRINK GROUT. STAGGER THE HOLES.

SECTION
SCALE: 3/8=1'–0"
C6.2 / C5

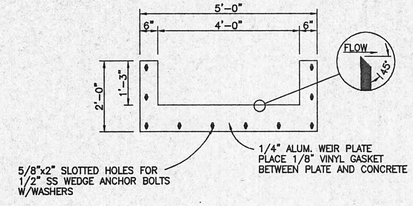
GRW PROJECT NO.7601–10

EXISTING HEADWORKS – SECTIONS
INTERMEDIATE FLOW METER PIT – PLAN & SECTION
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

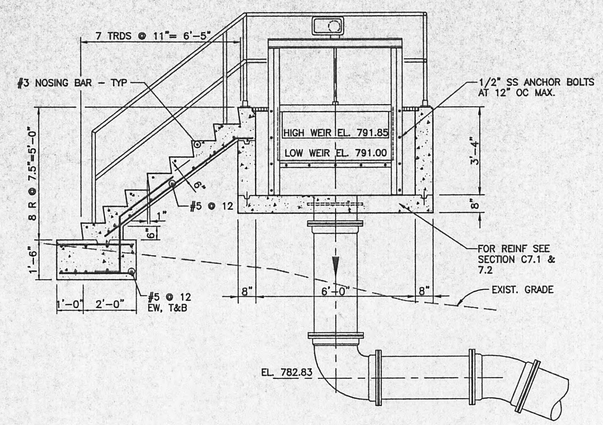
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO: C–6
APPROVED: RGT	



RECTANGULAR WEIR PLATE DETAIL

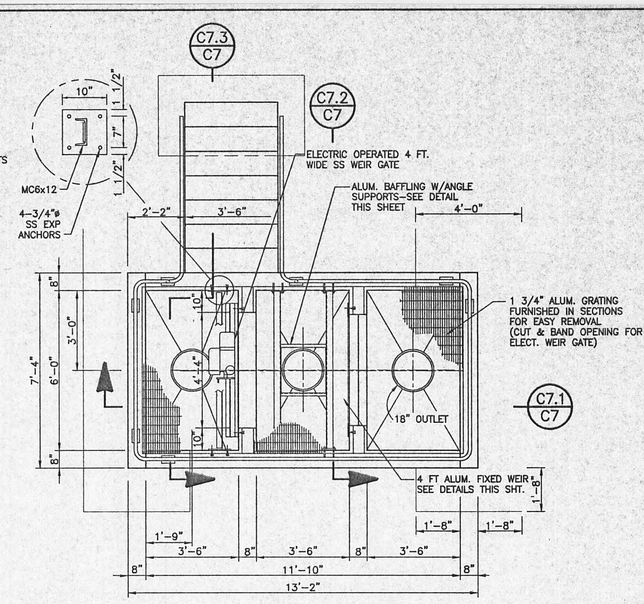
SCALE: 1/2"=1'-0"



SECTION

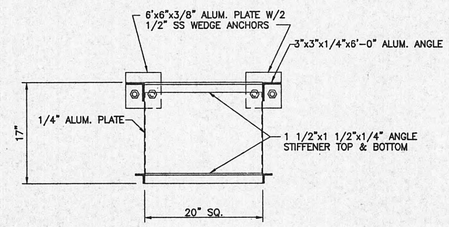
SCALE: 3/8" = 1'-0"

C7.3 / C7



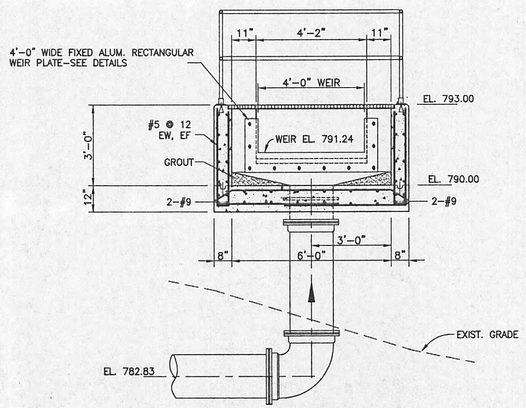
FLOW SPLITTER STRUCTURE-PLAN

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



BAFFLE DETAIL

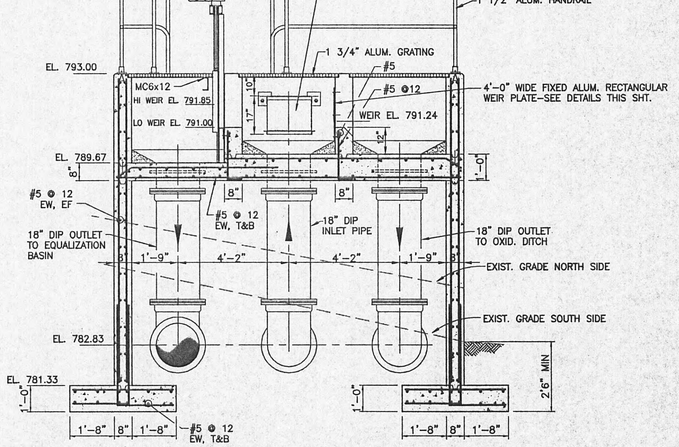
SCALE: 1"=1'-0"



SECTION

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

C7.2 / C7



SECTION

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

C7.1 / C7

NO.	DESCRIPTION	DATE	BY

REVISIONS

RAMAKRISHNA R. NARAYANPETH — REGISTERED ENGINEER — No. 022159 — STATE OF TENNESSEE

10-2-02

ROBERT G. THREADGILL, JR. — REGISTERED ENGINEER — No. 012648 — STATE OF TENNESSEE

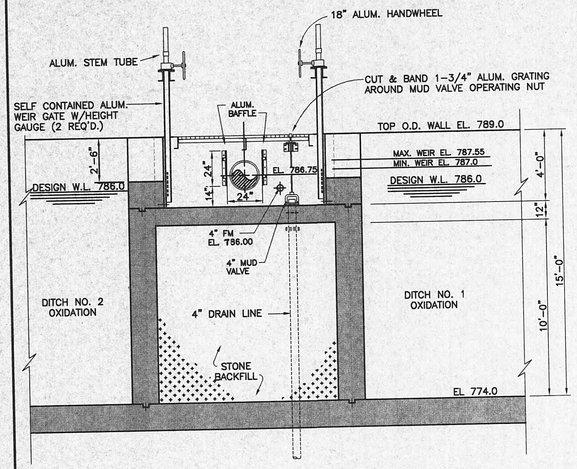
9-30-02

GRW PROJECT NO.7601-10

FLOW SPLITTER STRUCTURE PLAN AND SECTIONS WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD - HARRIMAN, TENNESSEE

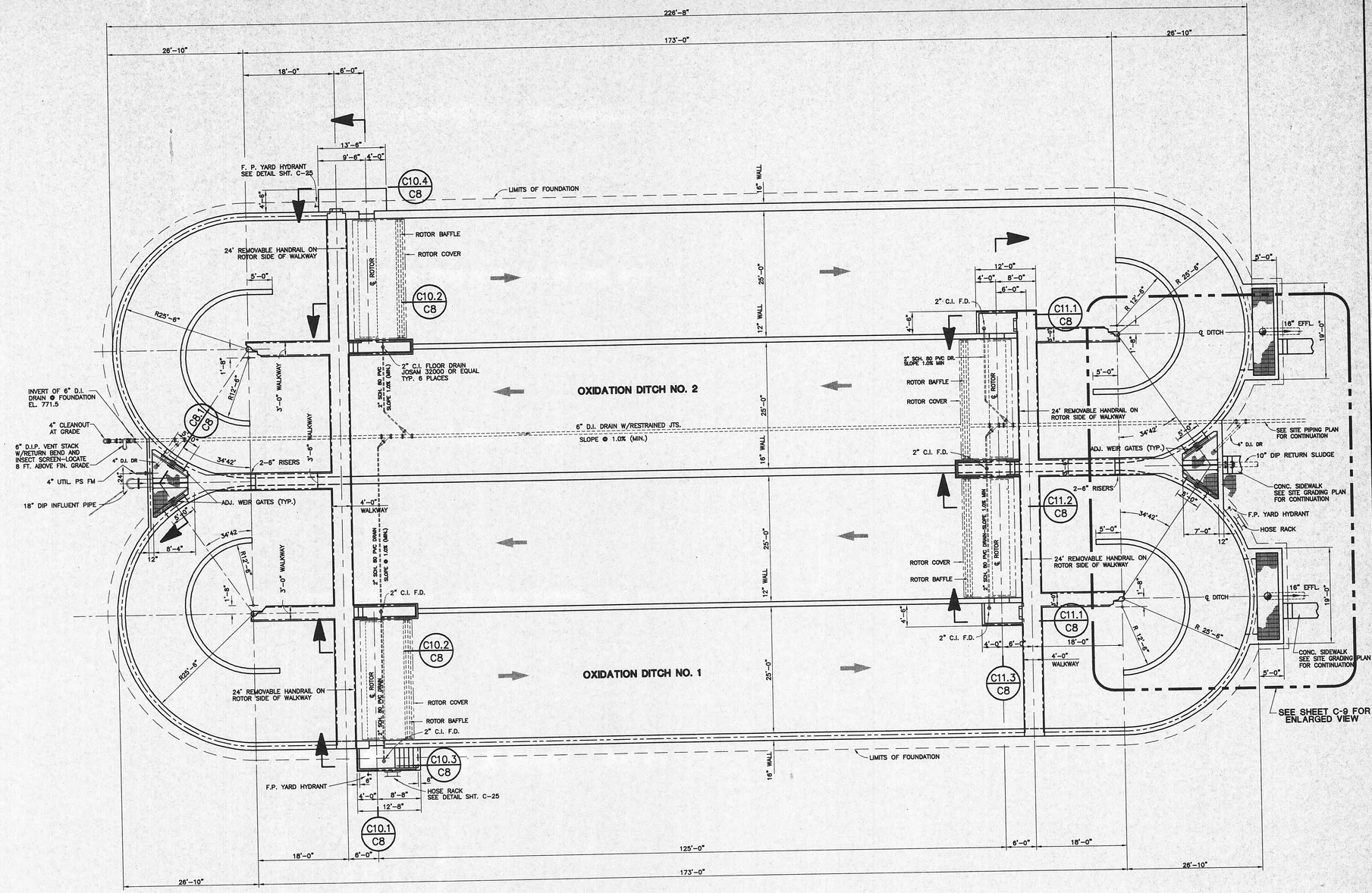
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-7
APPROVED: RGT	



O.D. INFLUENT WEIRS – SECTION C8.1 C8

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



PLAN – OXIDATION DITCH

SCALE: 3/32"=1'-0"

USE RESTRAINED JOINT D.I.P. AND FITTINGS UNDER STRUCTURE EXCEPT WHERE NOTED

GRW PROJECT NO.7601-10

OXIDATION DITCHES
PLAN AND SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY

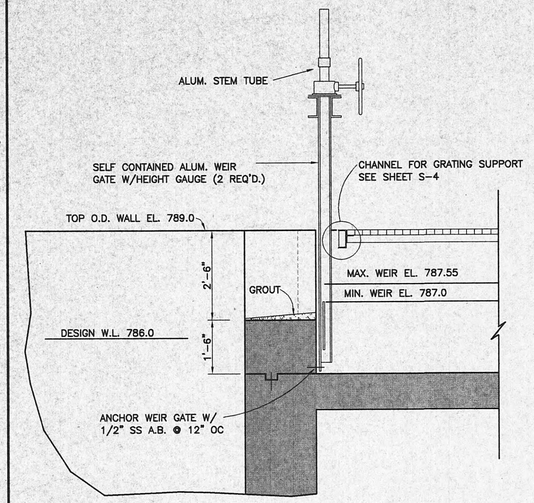
REVISIONS

ROBERT G. THREADGILL — REGISTERED ENGINEER — STATE OF TENNESSEE — 019845

9-30-02

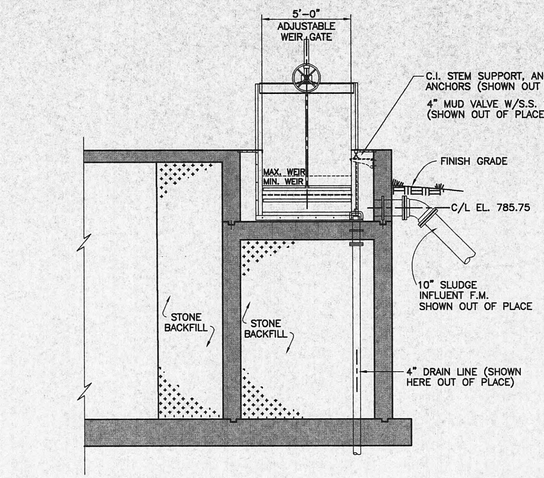
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-8
APPROVED: RGT	



WEIR GATE DETAIL

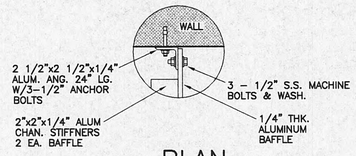
SCALE: 1/2" = 1'-0"



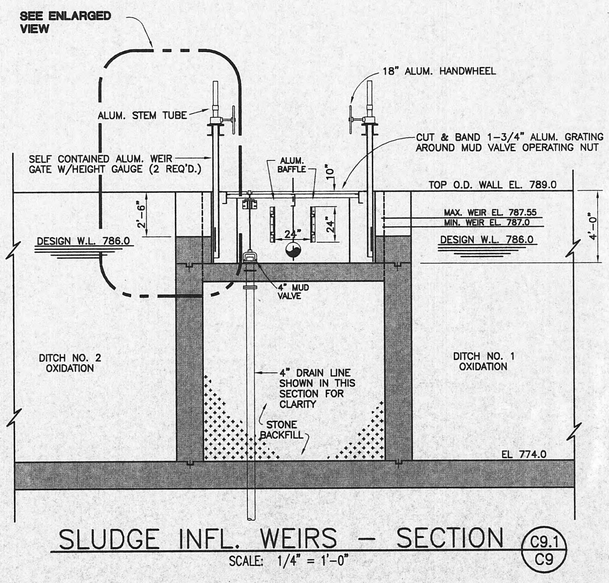
SLUDGE INFL. WEIRS – SECTION

C9.2 / C9

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



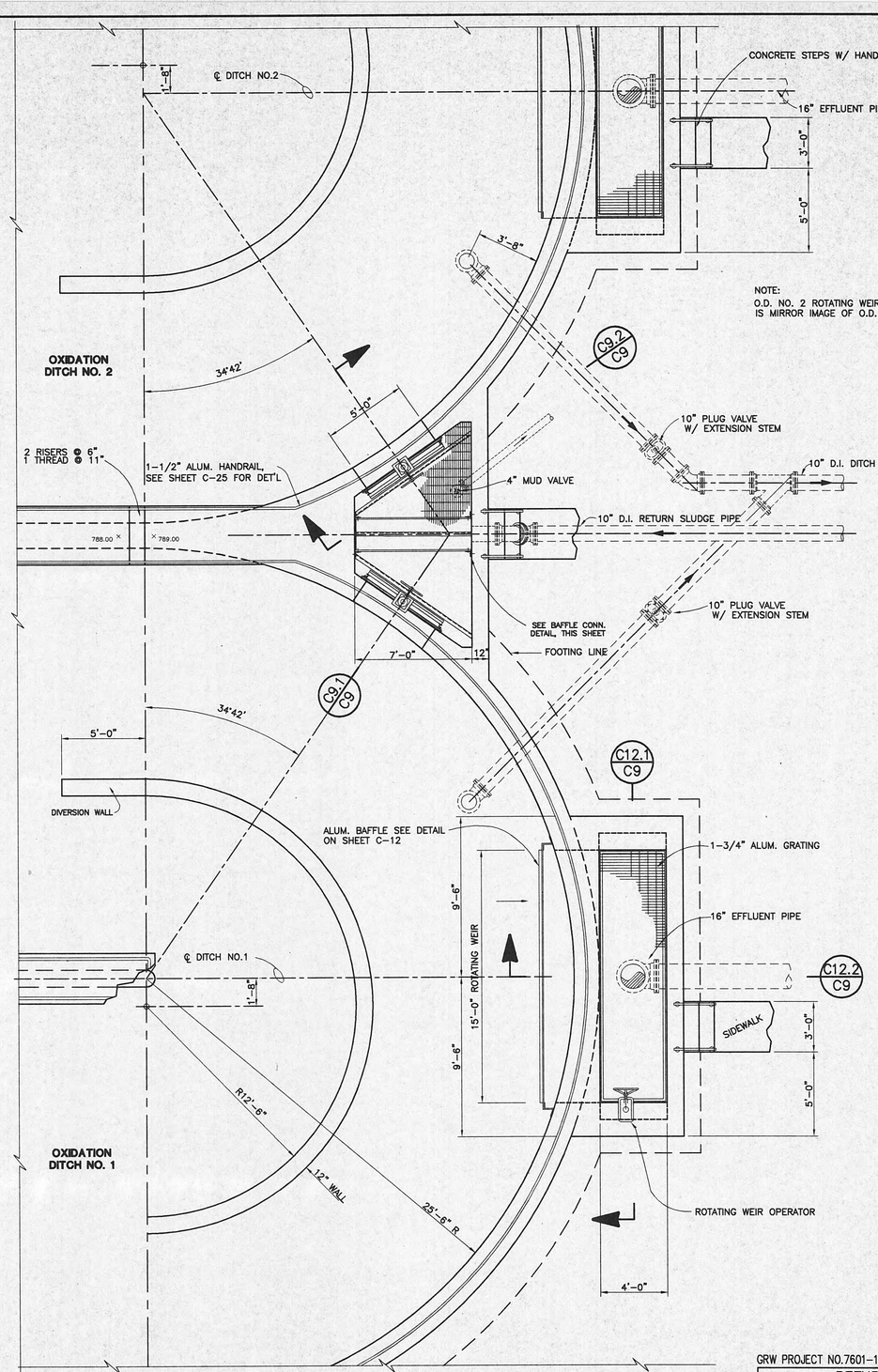
PLAN
BAFFLE CONNECTION



SLUDGE INFL. WEIRS – SECTION

C9.1 / C9

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



ROTATING EFFLUENT WEIRS – PLAN VIEW

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

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL, JR. REGISTERED ENGINEER No. 017646 STATE OF TENNESSEE

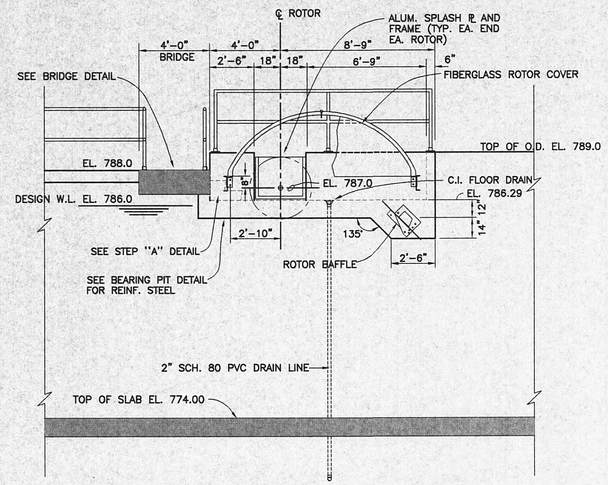
9-30-02

GRW PROJECT NO.7601-10

RETURN SLUDGE INFLUENT WEIRS PLAN, SECTIONS AND DETAILS WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

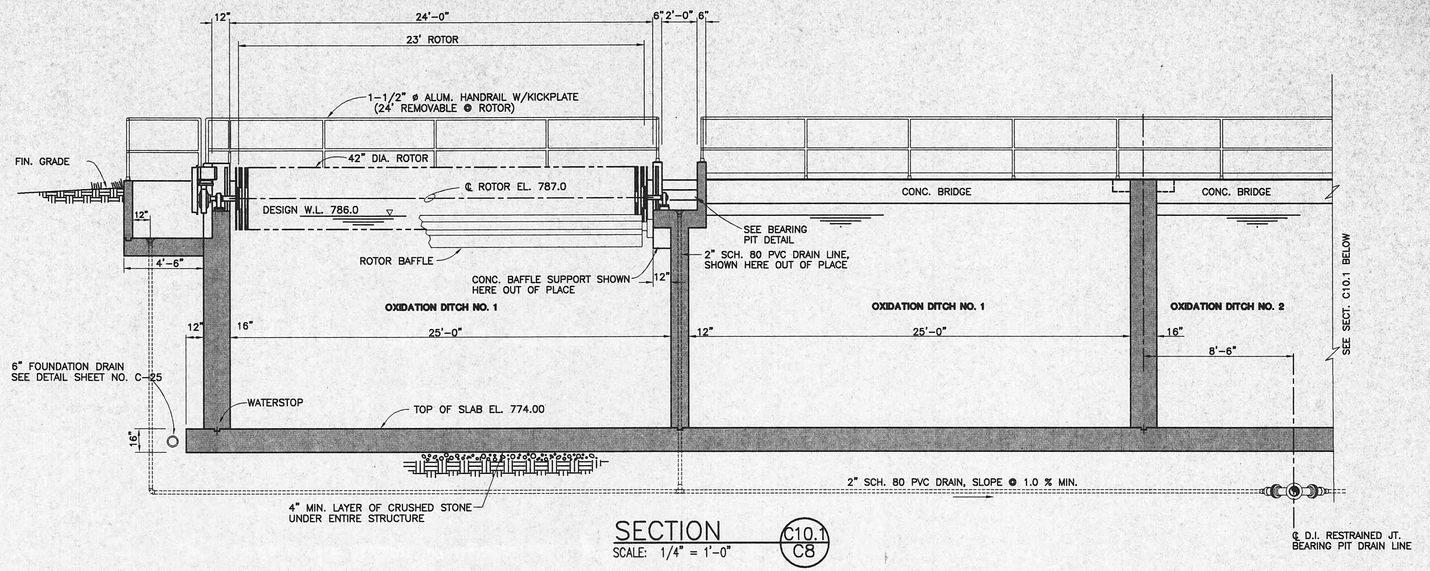
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-9
APPROVED: RGT	

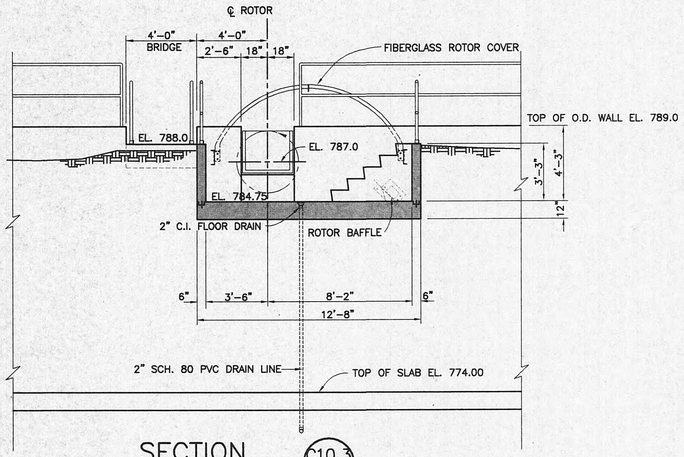


SECTION C10.2 / C8
SCALE: 1/4" = 1'-0"

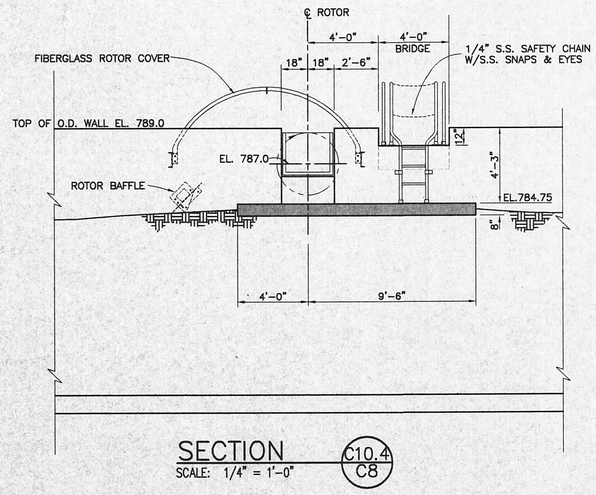
SECT. C10.2 @ DITCH NO. 2 IS MIRROR IMAGE OF SECT. C10.2 @ DITCH NO. 1



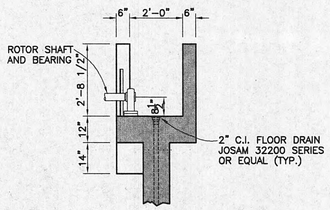
SECTION C10.1 / C8
SCALE: 1/4" = 1'-0"



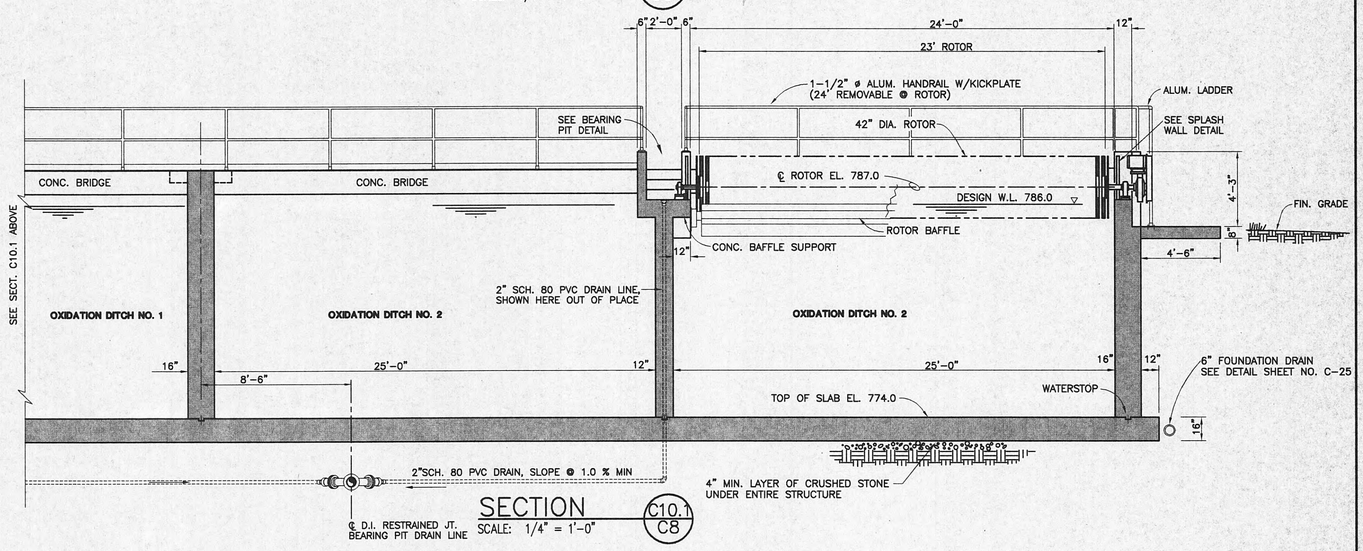
SECTION C10.3 / C8
SCALE: 1/4" = 1'-0"



SECTION C10.4 / C8
SCALE: 1/4" = 1'-0"



BEARING PIT DETAIL
SCALE 3/8"= 1'-0"



SECTION C10.1 / C8
SCALE: 1/4" = 1'-0"

GRW PROJECT NO.7601-10

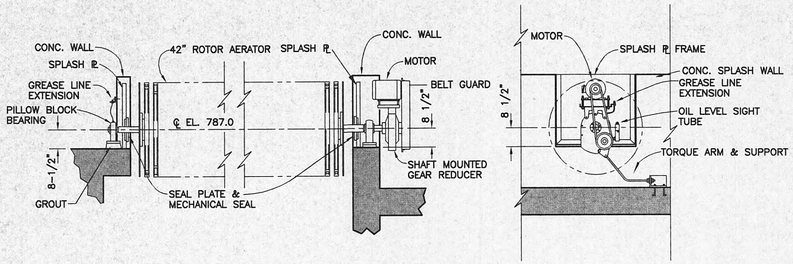
OXIDATION DITCH – SECTIONS AND DETAILS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL JR. REGISTERED ENGINEER STATE OF TENNESSEE NO. 012881
9-30-02

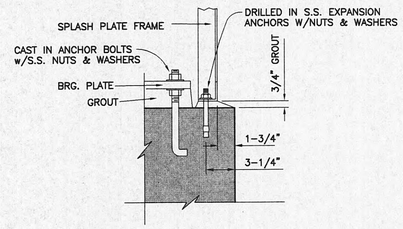
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-10
APPROVED: RGT	



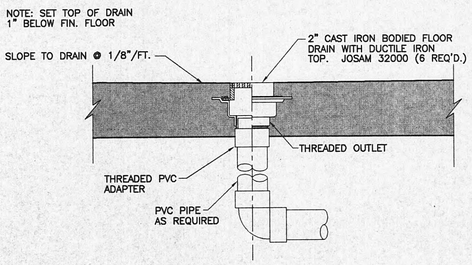
ROTOR DRIVE MECHANISM DETAIL

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



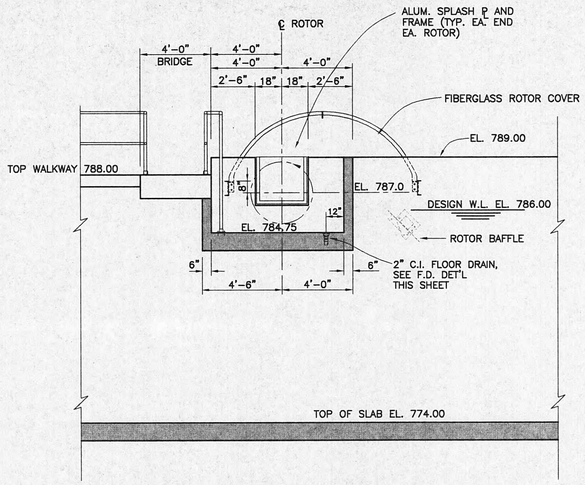
BEARING/SPLASH PLATE MOUNTING DETAIL

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



FLOOR DRAIN INSTALLATION DETAIL

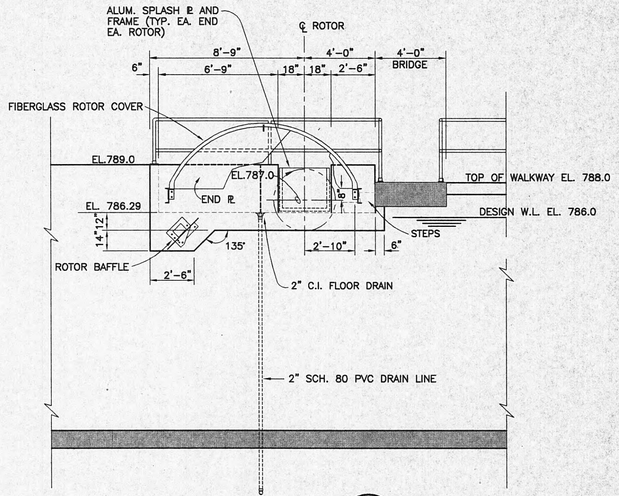
SCALE: 3/4"=1'-0"



SECTION

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

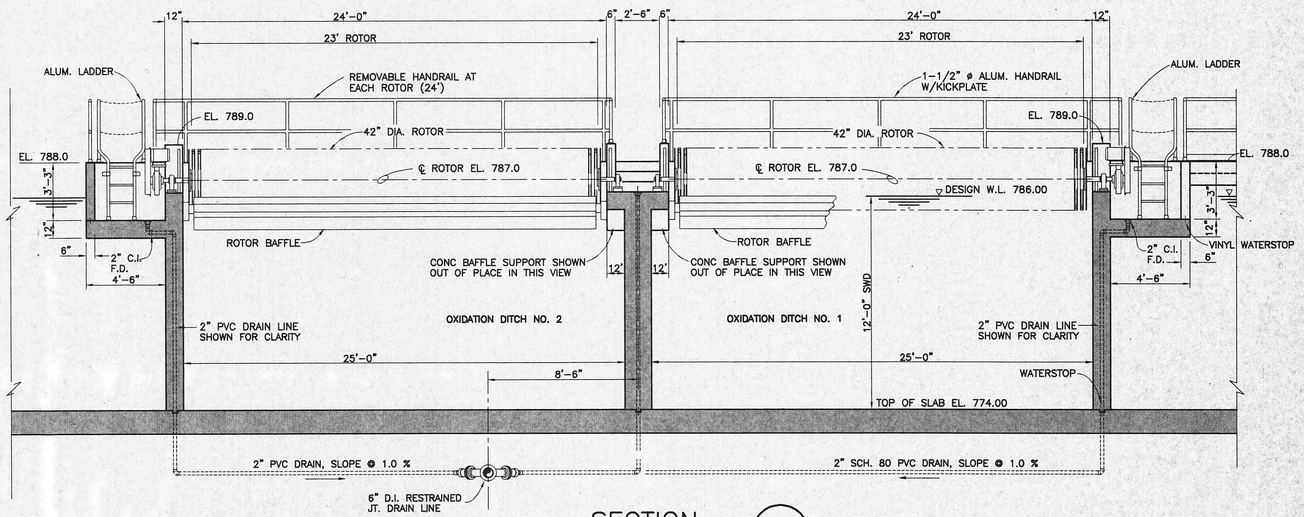
C11.1 / C8



SECTION

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

C11.2 / C8



SECTION

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

C11.3 / C8

GRW PROJECT NO.7601-10

OXIDATION DITCH – SECTIONS AND DETAILS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

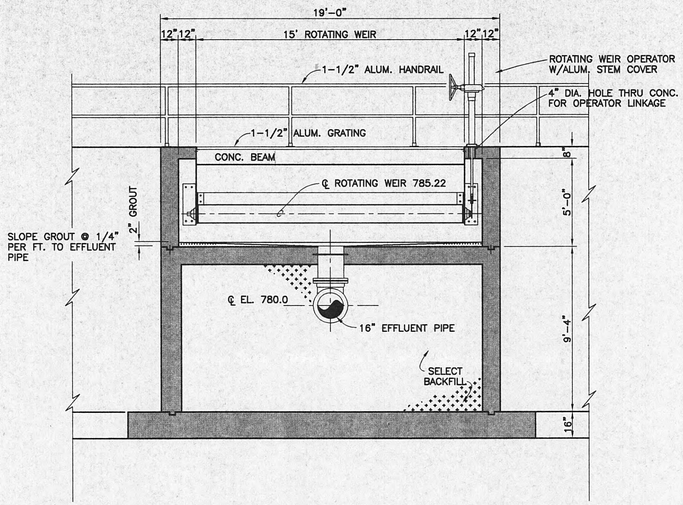
NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL JR. REGISTERED ENGINEER STATE OF TENNESSEE 10 015649

9-30-02

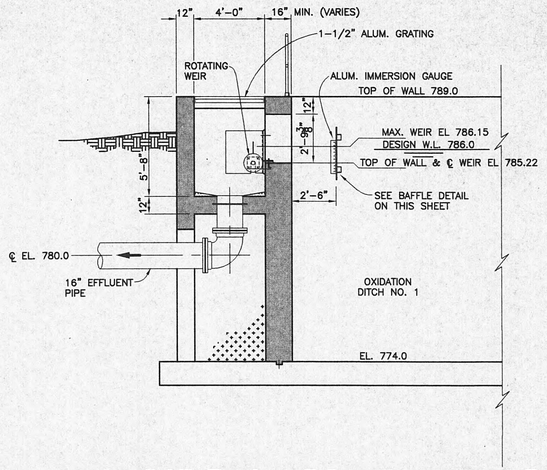
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-11
APPROVED: RGT	



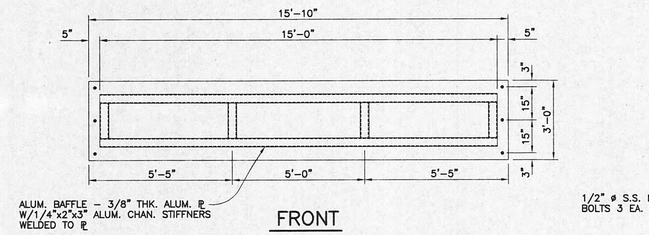
O.D. ROTATING WEIR –SECTION (C12.1 / C9)

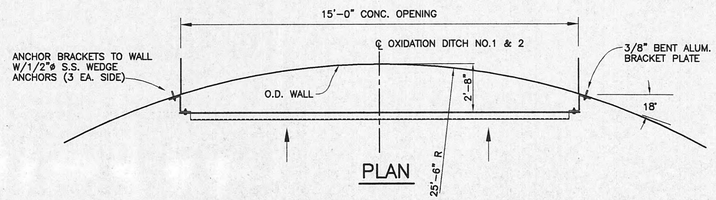
SCALE: 1/4" = 1'-0"



O.D. ROTATING WEIR –SECTION (C12.2 / C9)

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





EFFLUENT BAFFLE DETAIL

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

GRW PROJECT NO.7601-10

EFFLUENT ROTATING WEIR – SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY

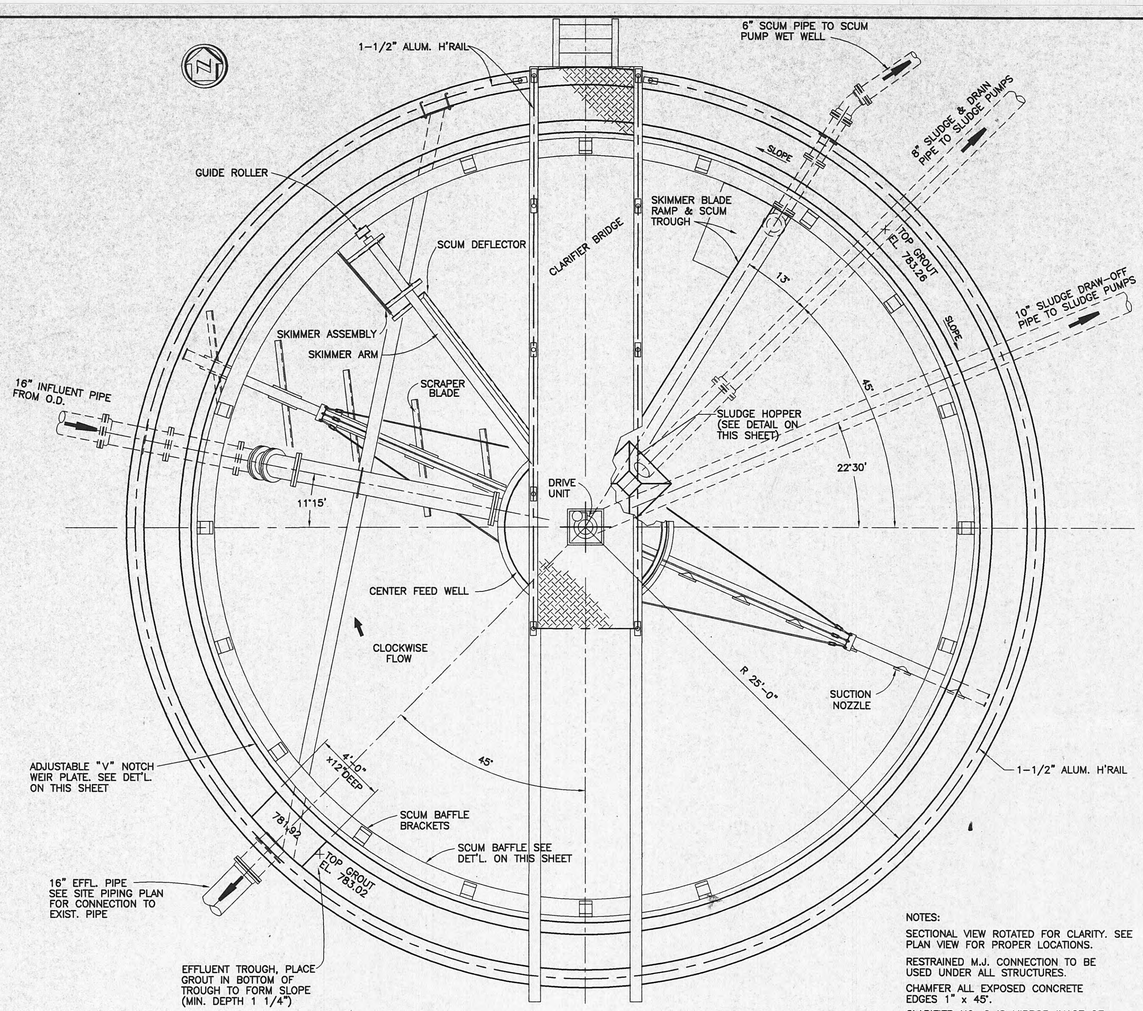
REVISIONS

ROBERT G. THREADGILL REGISTERED LANDSCAPE ARCHITECT No. 012694 STATE OF TENNESSEE

9-30-02

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO: C-12
APPROVED: RGT	



PLAN VIEW – CLARIFIER NO. 1

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

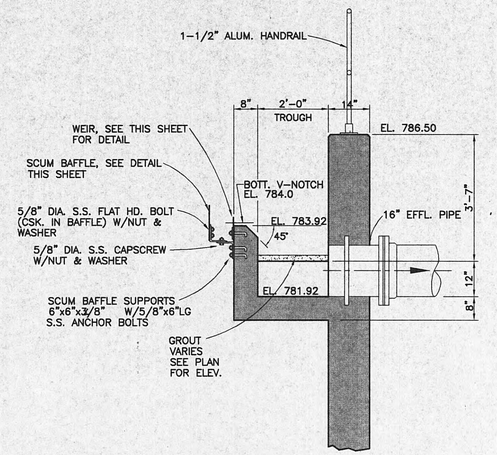
NOTES:

SECTIONAL VIEW ROTATED FOR CLARITY. SEE PLAN VIEW FOR PROPER LOCATIONS.

RESTRAINED M.J. CONNECTION TO BE USED UNDER ALL STRUCTURES.

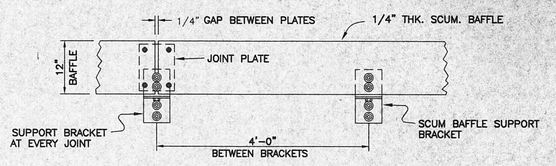
CHAMFER ALL EXPOSED CONCRETE EDGES 1" x 45°.

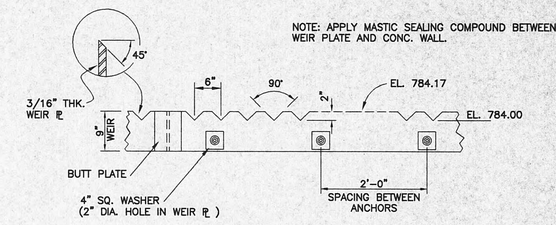
CLARIFIER NO. 2 IS MIRROR IMAGE OF CLARIFIER NO. 1 EXCEPT FOR EFFLUENT PIPE (SEE PIPING PLAN ON SHEET C-4).



EFFLUENT WEIR AND BAFFLE DETAIL

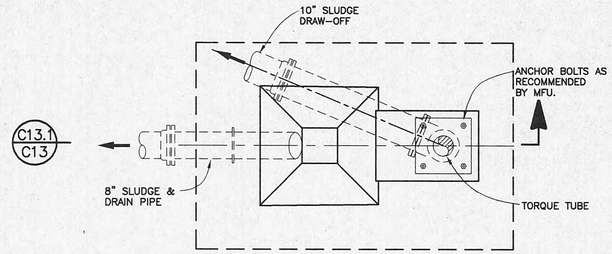
SCALE: 1/2"=1'-0"





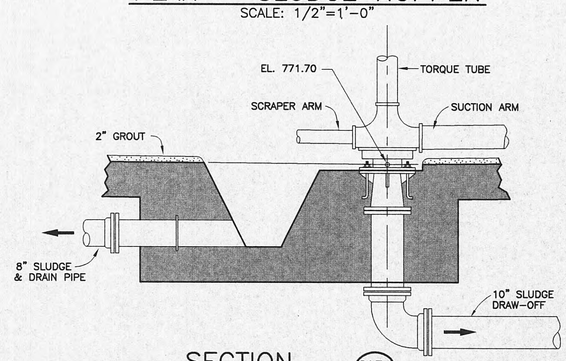
EFFLUENT WEIR AND BAFFLE DETAIL

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



PLAN – SLUDGE HOPPER

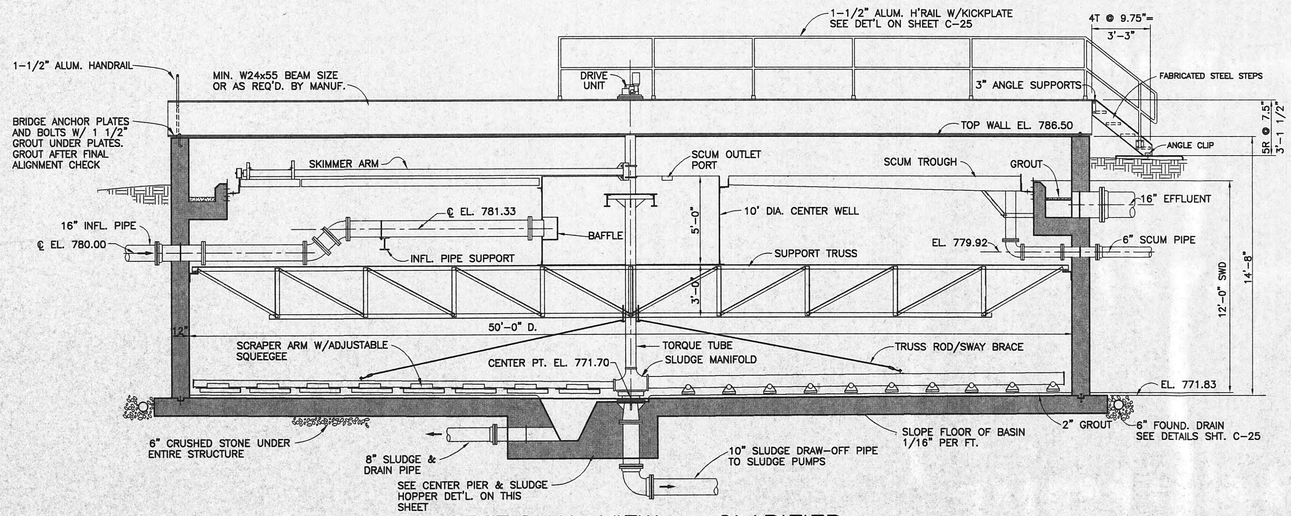
SCALE: 1/2"=1'-0"



SECTION

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

C13.1
C13



SECTIONAL VIEW – CLARIFIER

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

GRW PROJECT NO.7601-10

CLARIFIERS – PLAN AND SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

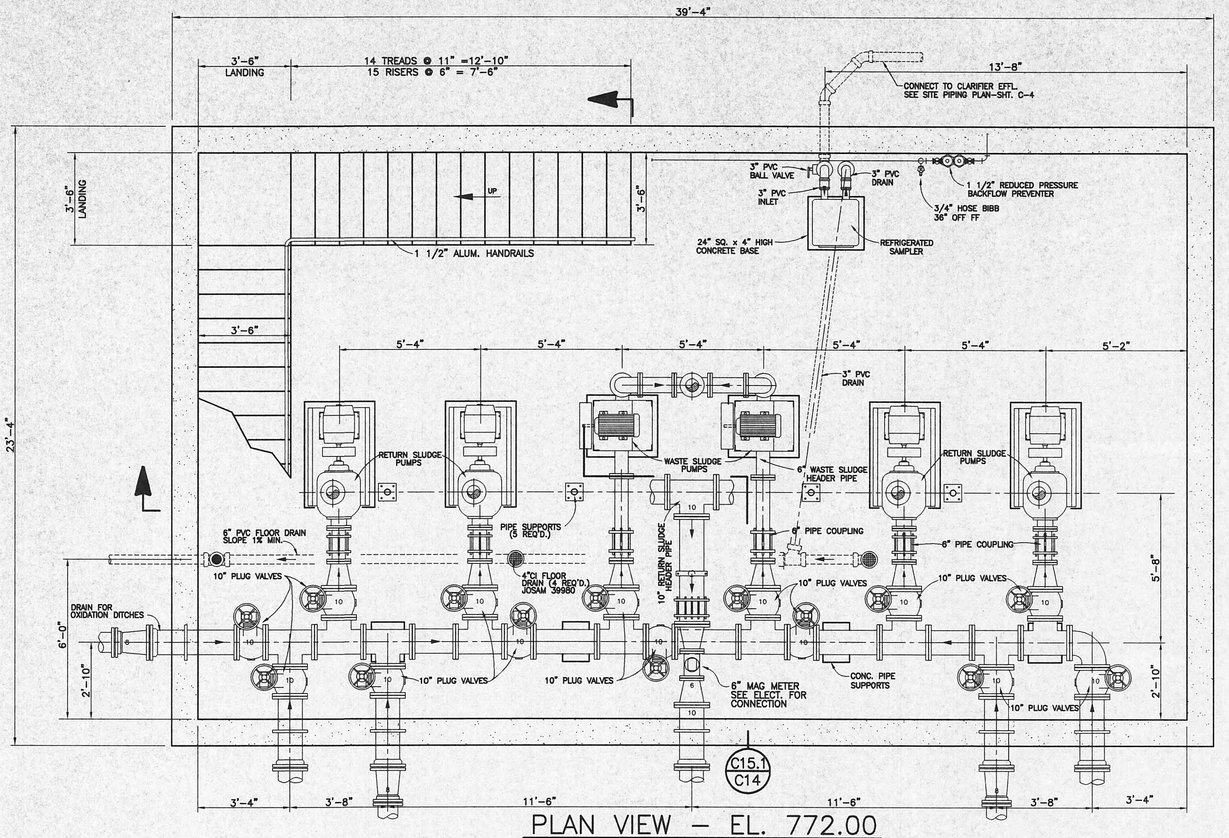
NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL, JR. REGISTERED ENGINEER No. 017849 STATE OF TENNESSEE

9-30-02

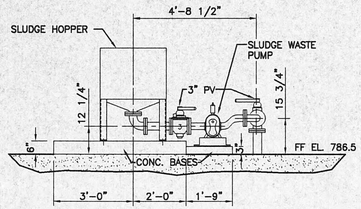
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-13
APPROVED: RGT	



PLAN VIEW – EL. 772.00

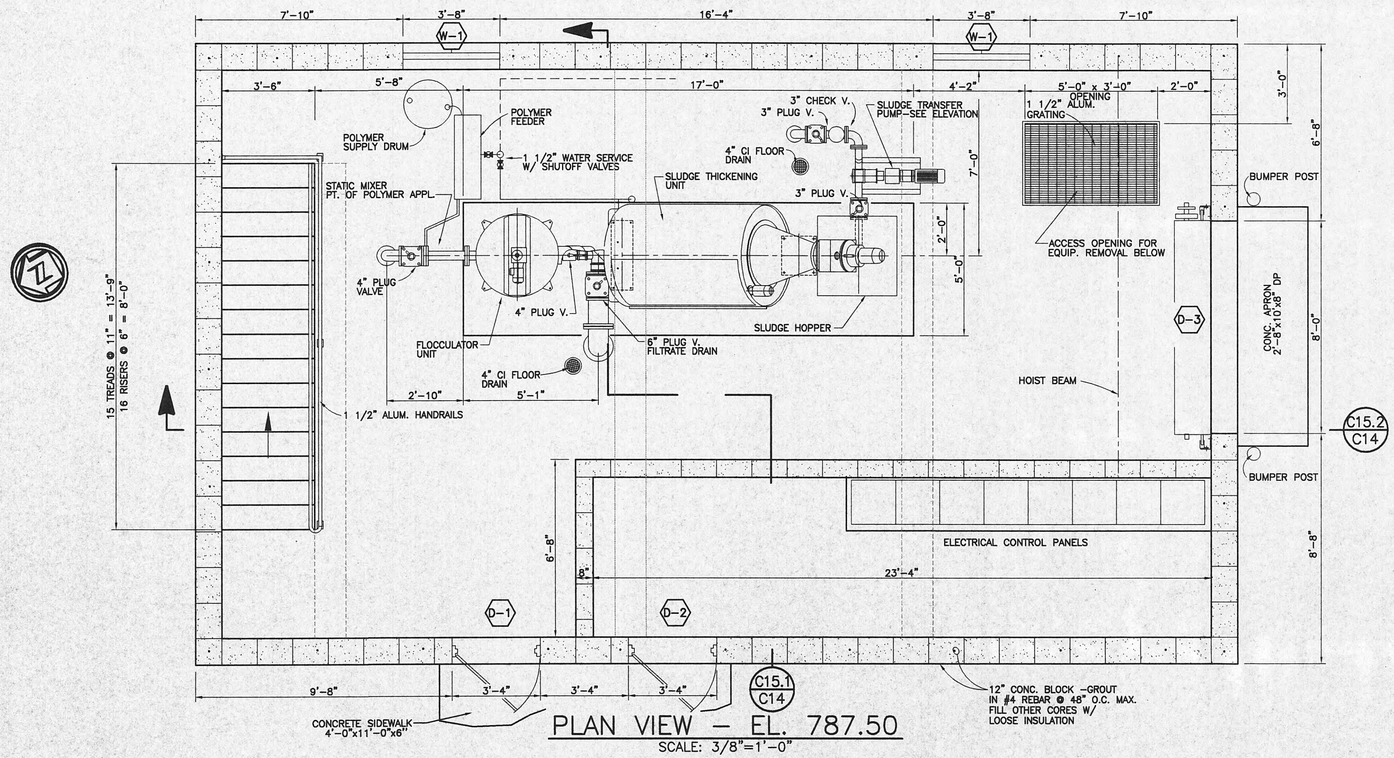
SCALE: 3/8"=1'-0"



ELEVATION SLUDGE TRANSFER PUMP

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

C15.2
C14



PLAN VIEW – EL. 787.50

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

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL REGISTERED ENGINEER No. 019861 STATE OF TENNESSEE

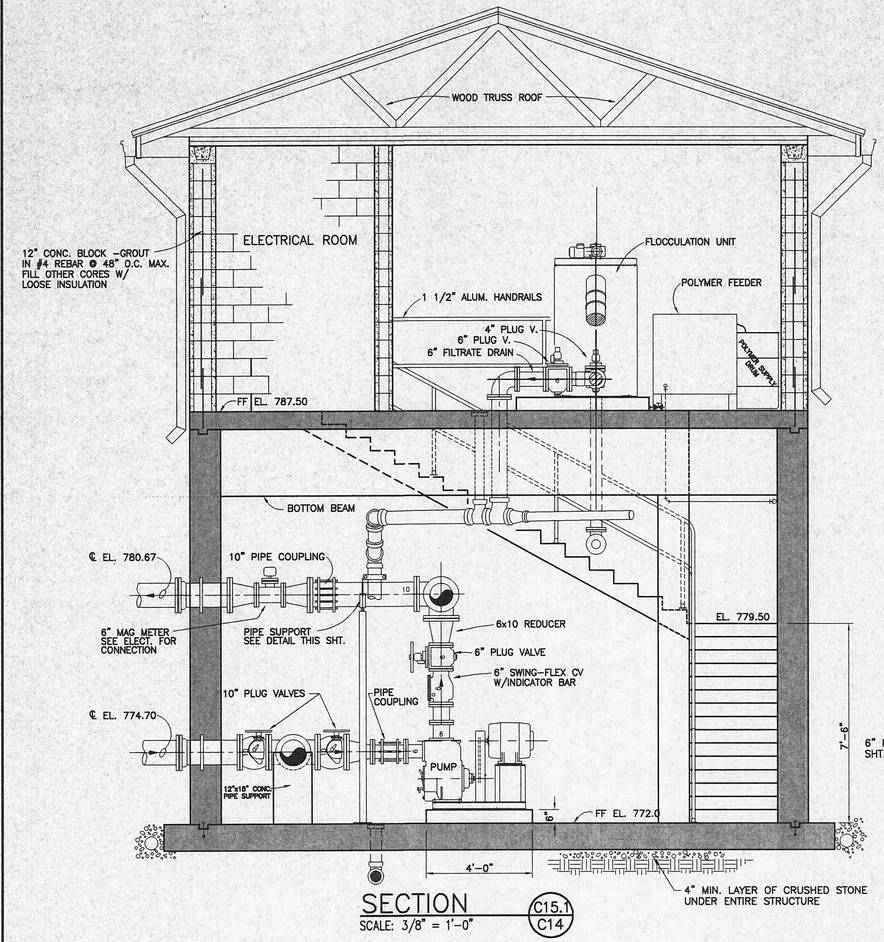
4-30-02

GRW PROJECT NO. 7601-10

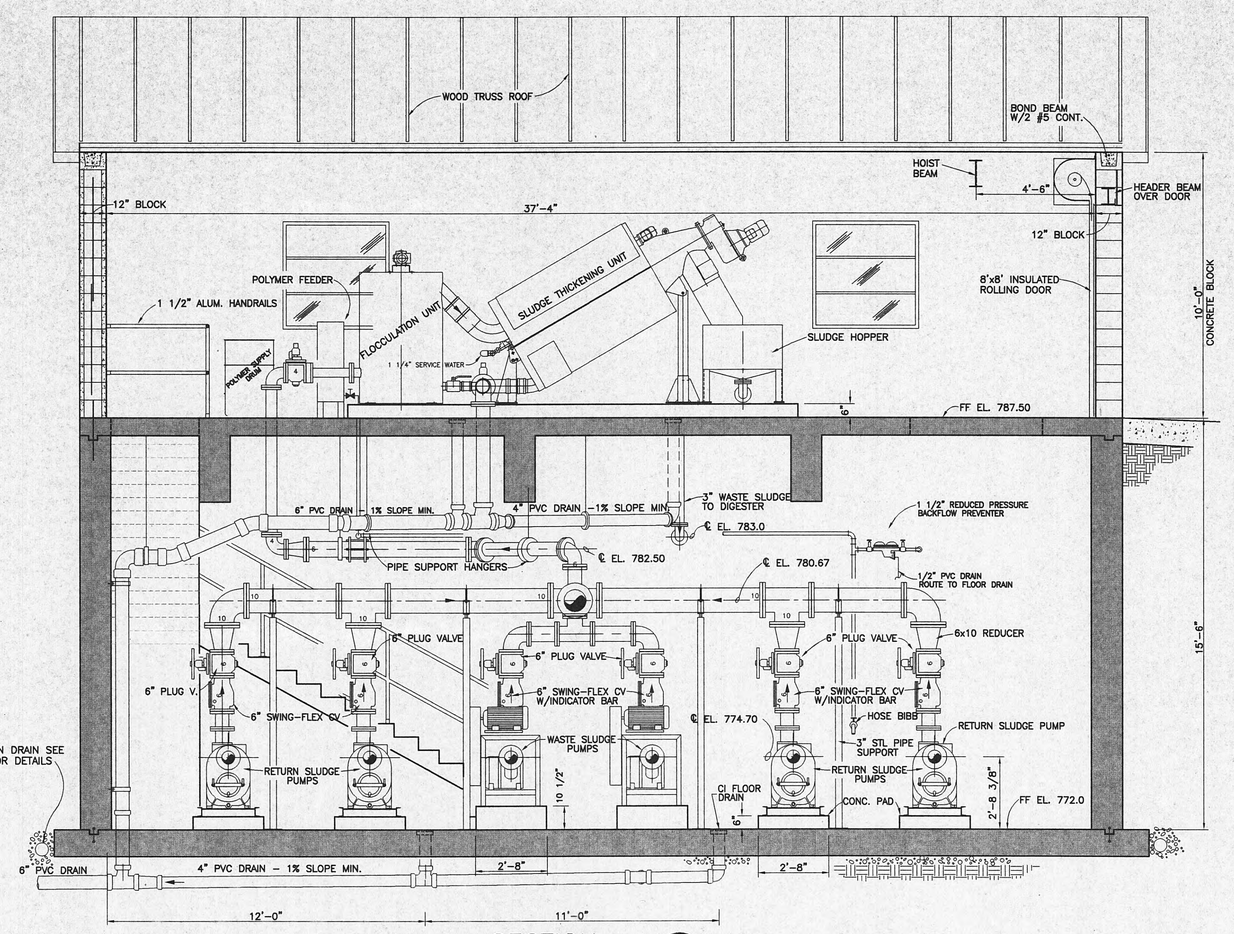
RETURN/WASTE SLUDGE PUMP BUILDING PLAN AND DETAILS WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

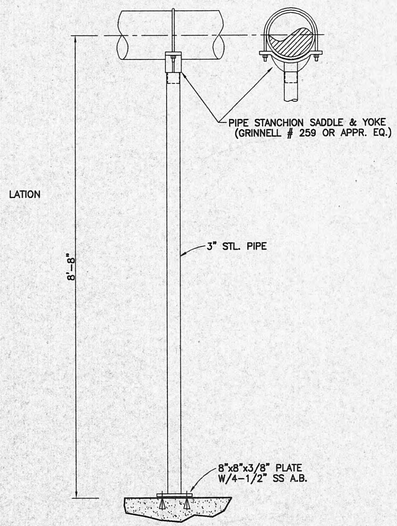
DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-14
APPROVED: RGT	



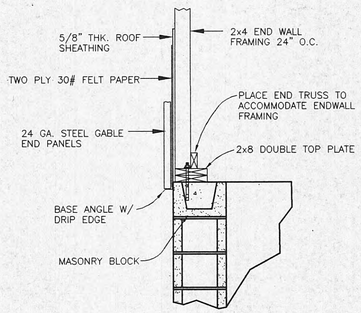
SECTION C15.1 / C14
SCALE: 3/8" = 1'-0"



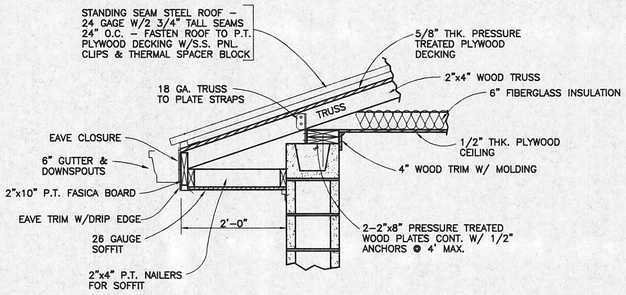
SECTION C15.2 / C14
SCALE: 3/8" = 1'-0"



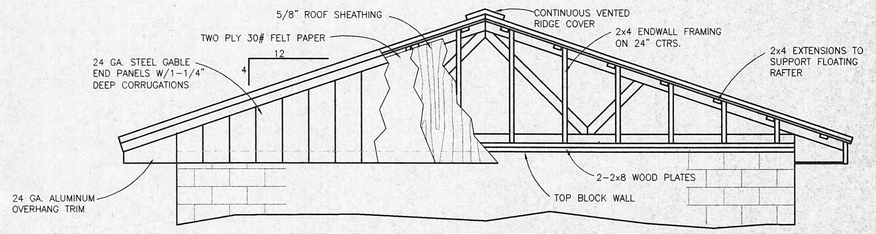
TYPICAL PIPE SUPPORT
SCALE: 3/4" = 1'-0"



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



TYPICAL EAVE DETAIL
SCALE: 3/4" = 1'-0"



GABLE CONSTRUCTION DETAIL
SCALE: 3/8" = 1'-0"

NO.	DESCRIPTION	DATE	BY

REVISIONS

ROBERT G. THREADGILL JR. REGISTERED ENGINEER AGRICULTURAL NO. 012845 STATE OF TENNESSEE

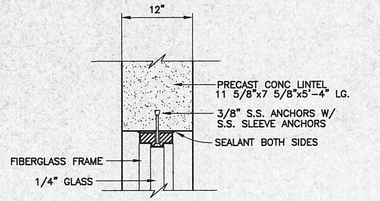
9-30-02

GRW PROJECT NO. 7601-10

RETURN/WASTE SLUDGE PUMP BUILDING SECTIONS AND DETAILS WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD - HARRIMAN, TENNESSEE

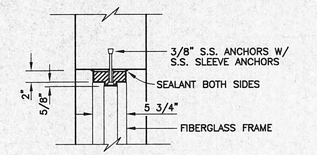
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-15
APPROVED: RGT	

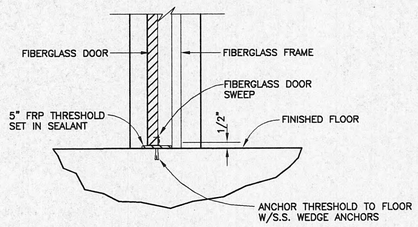


HEAD A

NOTE: ANCHOR FRAME AS PER MANUFACTURERS INSTRUCTIONS



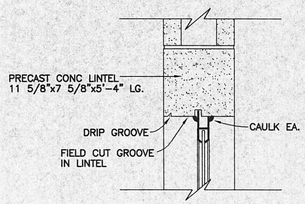
JAMB A



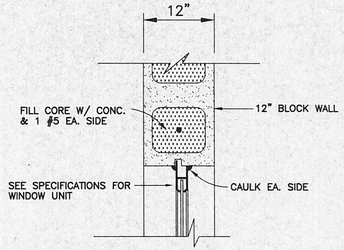
THRESHOLD DETAIL

TYPICAL DOOR DETAILS

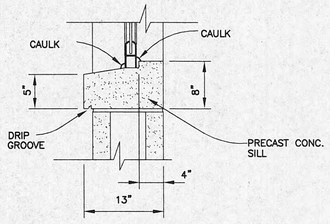
SCALE: 1"=1'-0"



HEAD B



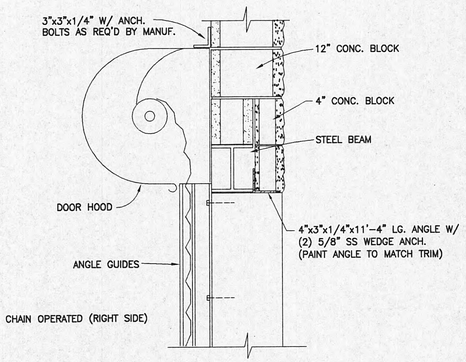
JAMB B



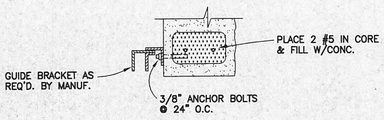
SILL B

TYPICAL WINDOW DETAILS

SCALE: 1"=1'-0"



HEAD C



JAMB C

OVERHEAD DOOR DETAILS

SCALE: 1"=1'-0"

DOOR SCHEDULE

MARK	LOCATION	HAND	DOOR TYPE	FRAME TYPE	DOOR SIZE	HDW	THRES-HOLD	JAMB	HEAD	REMARKS
D-1	OUTSIDE-RET/WASTE SLUDGE ROOM	LHRB	A	A	3'-0" x 7'-2"	1	YES	A	A	WEATHERSTRIPPING
D-2	OUTSIDE-ELECTRICAL ROOM	LHRB	A	A	3'-0" x 7'-2"	1	YES	A	A	WEATHERSTRIPPING
D-3	OUTSIDE-RET/WASTE SLUDGE ROOM	ROLLUP	B	NONE	8'-0" x 8'-0"	*	NO	C	C	INSULATED WITH WEATHERSTRIPPING
D-4	OUTSIDE-BELT FILTER PRESS BLDG.	RHR	A	A	3'-0" x 7'-2"	1	YES	**	**	WEATHERSTRIPPING
D-5	OUTSIDE-BELT FILTER PRESS BLDG.	ROLLUP	C	NONE	12'-0" x 10'-0"	*	NO	**	**	INSULATED WITH WEATHERSTRIPPING

* HARDWARE FURNISHED BY DOOR MANUF.
** STEEL FRAME FOR ROLLUP DOOR FURNISHED BY METAL BLDG. MANUFACTURER

HARDWARE SCHEDULE

NO.	BUTTS	DOOR STOPS /HOLDERS	LOCKSET	LATCHSET	CLOSER	REMARKS
1	1-1/2 PAIR	YES	KEY-BUTTON	KNOB-KNOB	YES	

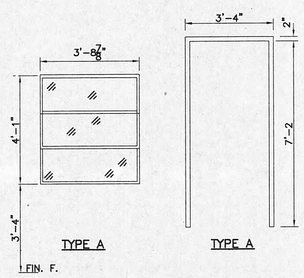
WINDOW SCHEDULE

MARK	TYPE	LOCATION	MASONRY OPENING	SILL	HEAD	JAMB	REMARKS
W-1	A	RET/WASTE SLUDGE BLDG.	3'-8-7/8" x 4'-1"	B	B	B	PROJECT OUT w/SCREEN

NOTE 1 – WINDOWS TO BE FURNISHED WITH ALL ITEMS NECESSARY FOR PROPER INSTALLATION.

FINISH SCHEDULE

ROOM	WALL	FLOOR	CEILING
RET/WASTE SLUDGE BLDG. UPPER FLOOR	PAINTED CONC. BLOCK	HARDENED CONC.	PAINTED WOOD
ELECTRICAL ROOM	PAINTED CONC. BLOCK	HARDENED CONC.	PAINTED WOOD
RET/WASTE SLUDGE BLDG. LOWER FLOOR	FINISHED CONCRETE	HARDENED CONC.	FINISHED CONC.
BELT FILTER PRESS BLDG. INTERIOR	METAL LINERS	HARDENED CONC.	METAL LINERS
BELT FILTER PRESS BLDG. EXTERIOR	METAL PANELS	N/A	N/A

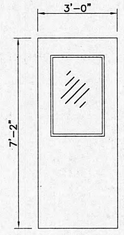


TYPE A

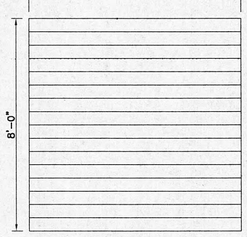
WINDOW TYPE
SCALE: 3/8"=1'-0"

TYPE A

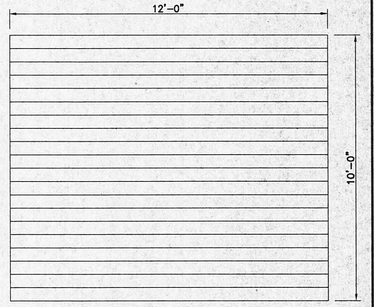
DOOR FRAME TYPE
SCALE: 3/8"=1'-0"



TYPE A



TYPE B



TYPE C

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

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL JR. REGISTERED ENGINEER AGRICULTURAL No. 012845 STATE OF TENNESSEE

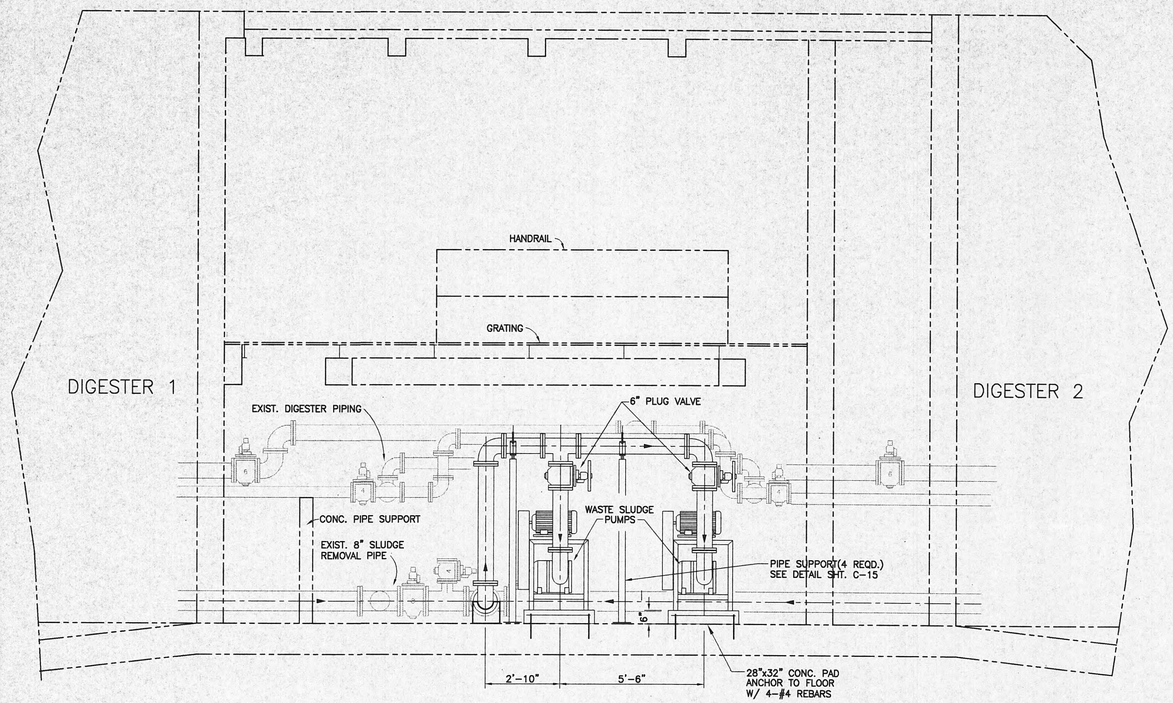
9-30-02

GRW PROJECT NO. 7601-10

RETURN/WASTE SLUDGE PUMP BUILDING
DOOR AND WINDOW SCHEDULE
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS
NASHVILLE KNOXVILLE

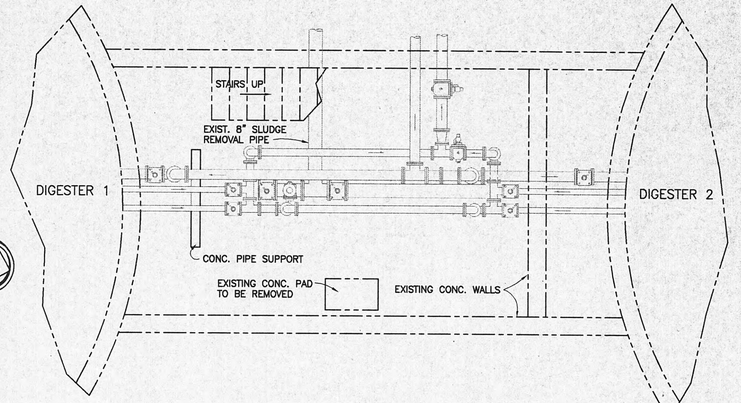
DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-16
APPROVED: RGT	



SECTION

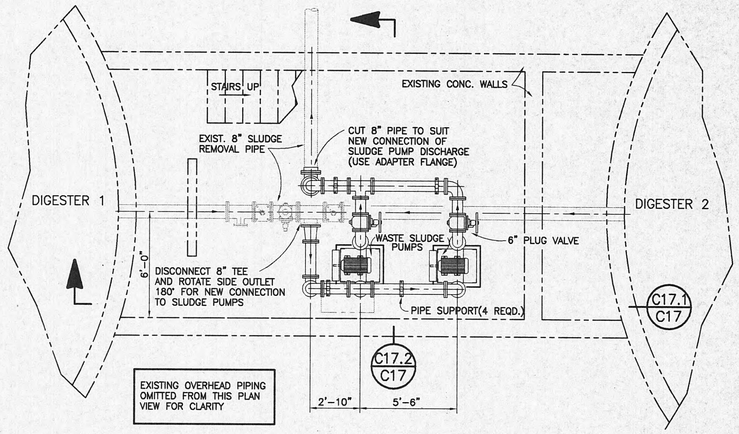
SCALE: 3/8" = 1'-0"

C17.1 / C17



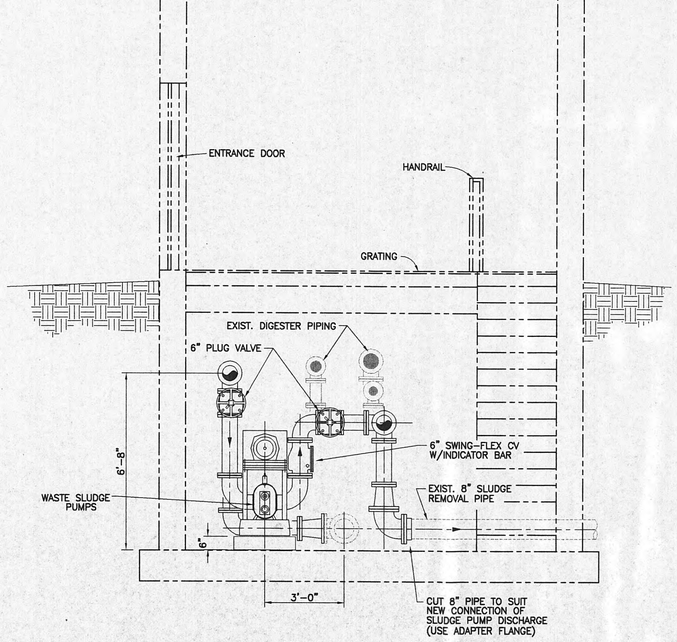
PLAN – EXISTING DIGESTER PIPING ROOM

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



PLAN – NEW WASTE SLUDGE PUMPS

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



SECTION

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

C17.2 / C17

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL JR. REGISTERED PROFESSIONAL ENGINEER STATE OF TENNESSEE 012649

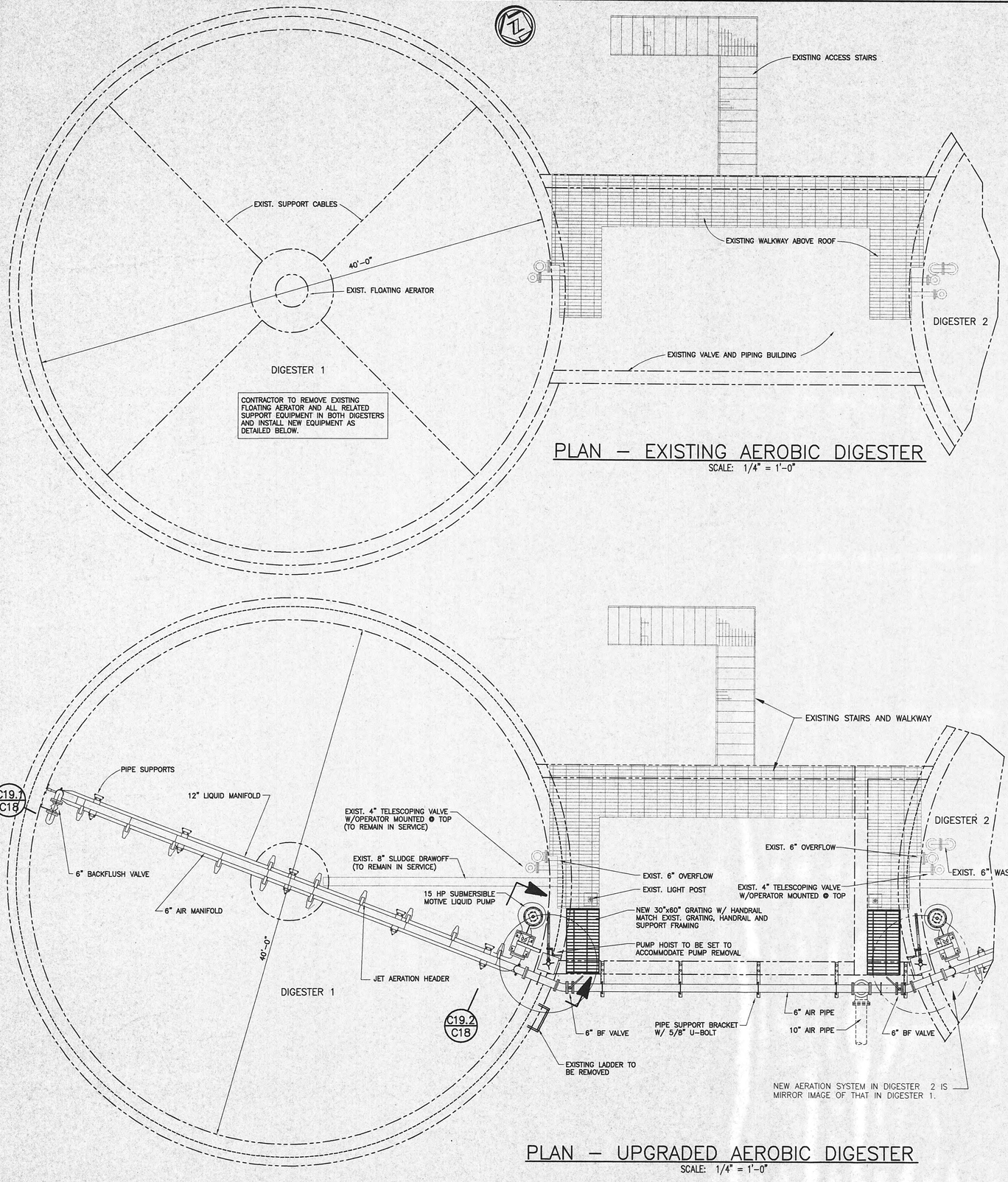
9-30-02

GRW PROJECT NO. 7601-10

EXISTING AEROBIC DIGESTERS PIPE ROOM PLAN, SECTIONS AND DETAILS WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-17
APPROVED: RGT	



PLAN – EXISTING AEROBIC DIGESTER

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

PLAN – UPGRADED AEROBIC DIGESTER

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

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL, JR. REGISTERED ENGINEER NO. 012846 STATE OF TENNESSEE

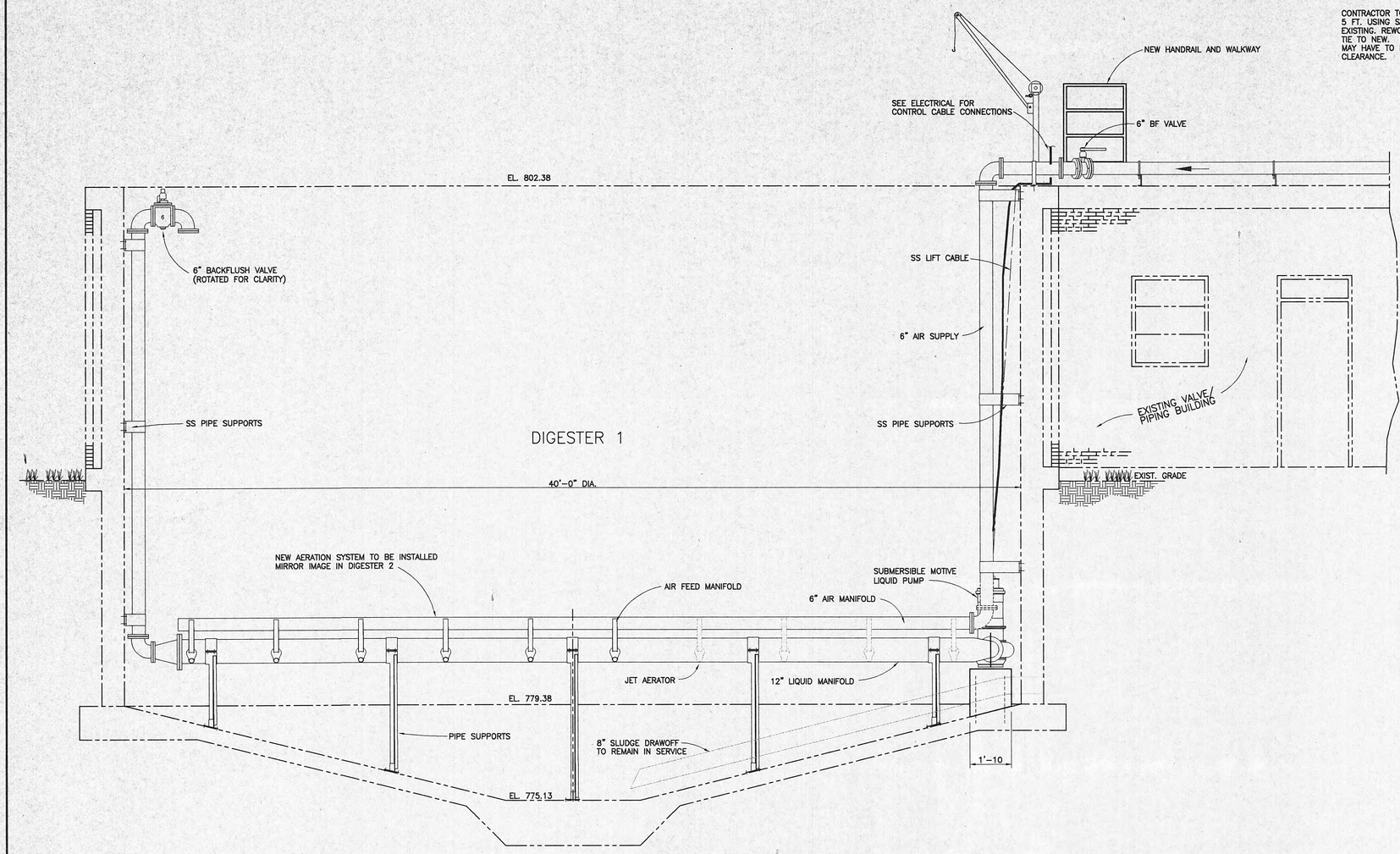
9-30-02

GRW PROJECT NO. 7601-10

EXISTING AEROBIC DIGESTERS PLAN AND DETAILS WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

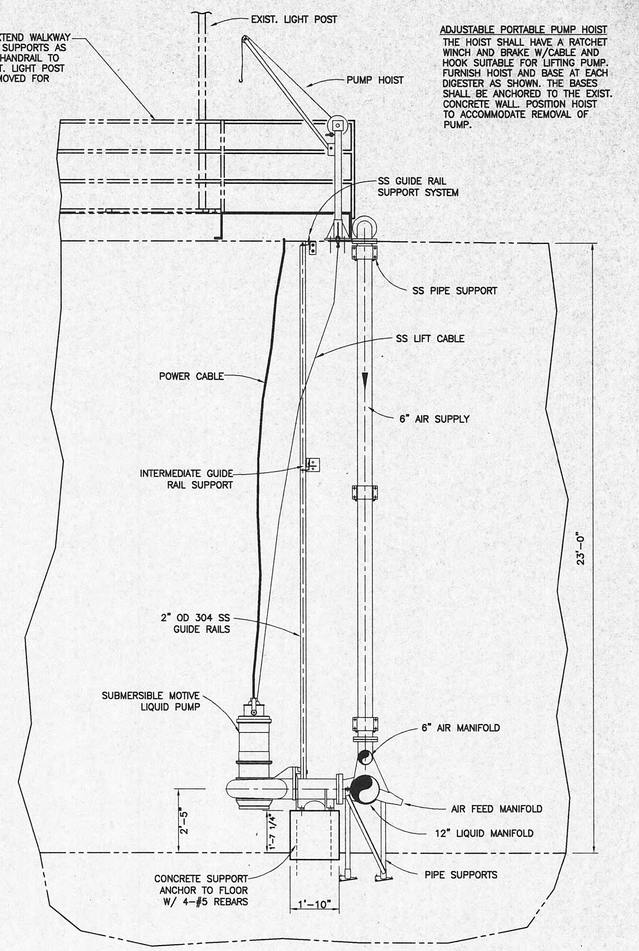
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-18
APPROVED: RGT	



SECTION C19.1 / C18

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



SECTION C19.2 / C18

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

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL, JR. REGISTERED ENGINEER No. 017845 STATE OF TENNESSEE

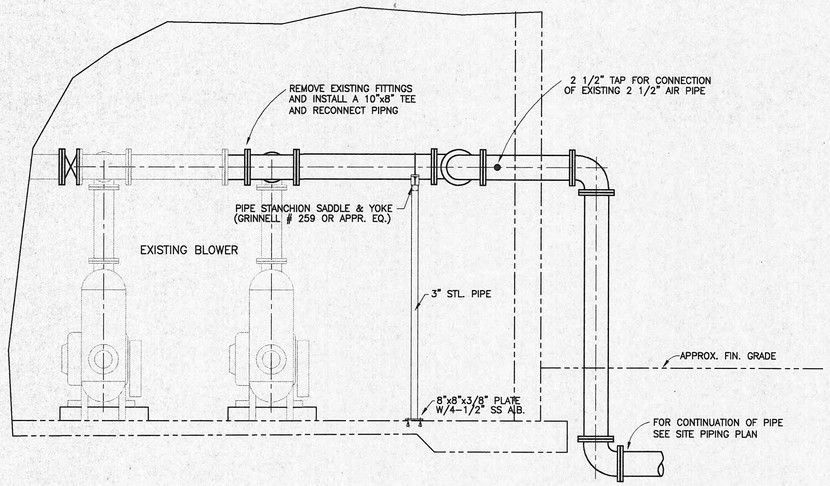
9-30-02

GRW PROJECT NO. 7601-10

EXISTING AEROBIC DIGESTER SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

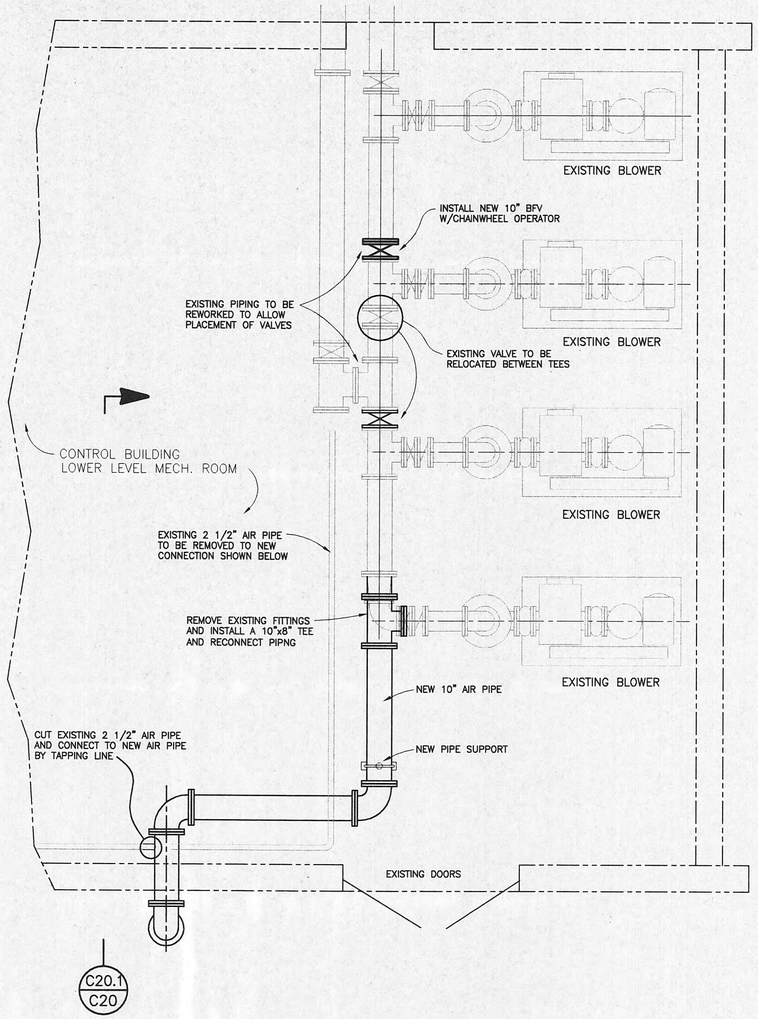
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-19
APPROVED: RGT	



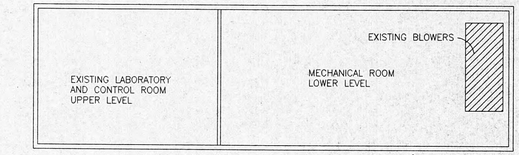
SECTION (C20.1 / C20)

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



PLAN – EXISTING BLOWERS

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



PLAN – EXISTING CONTROL BUILDING

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

NO.	DESCRIPTION	DATE	BY

REVISIONS

ROBERT G. THREADGILL, JR. REGISTERED ENGINEER STATE OF TENNESSEE NO. 013249

9-30-02

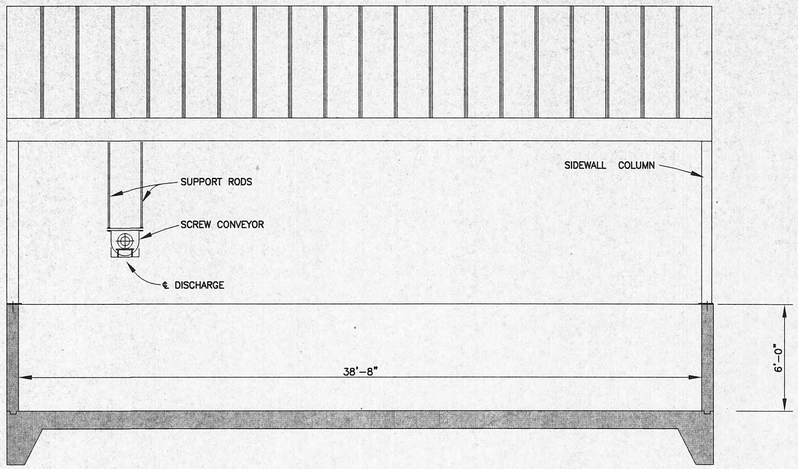
GRW PROJECT NO. 7601-10

RENOVATION EXISTING BLOWERS PLAN AND SECTIONS WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

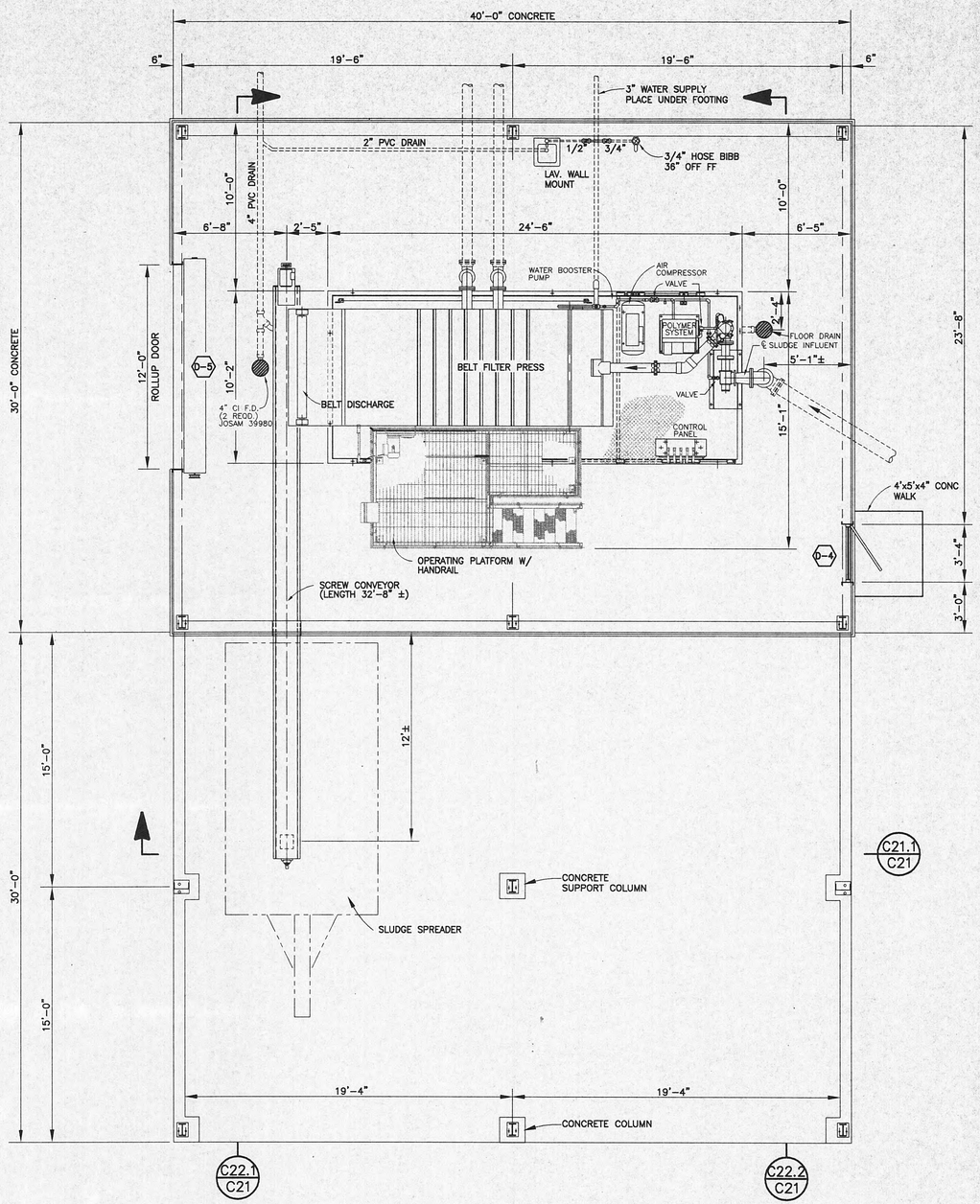
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-20
APPROVED: RGT	

FILE NAME:



SECTION (C21.1 / C21)
SCALE: 1/4" = 1'-0"



BELT PRESS BUILDING – PLAN
SCALE: 1/4" = 1'-0"

GRW PROJECT NO. 7601-10

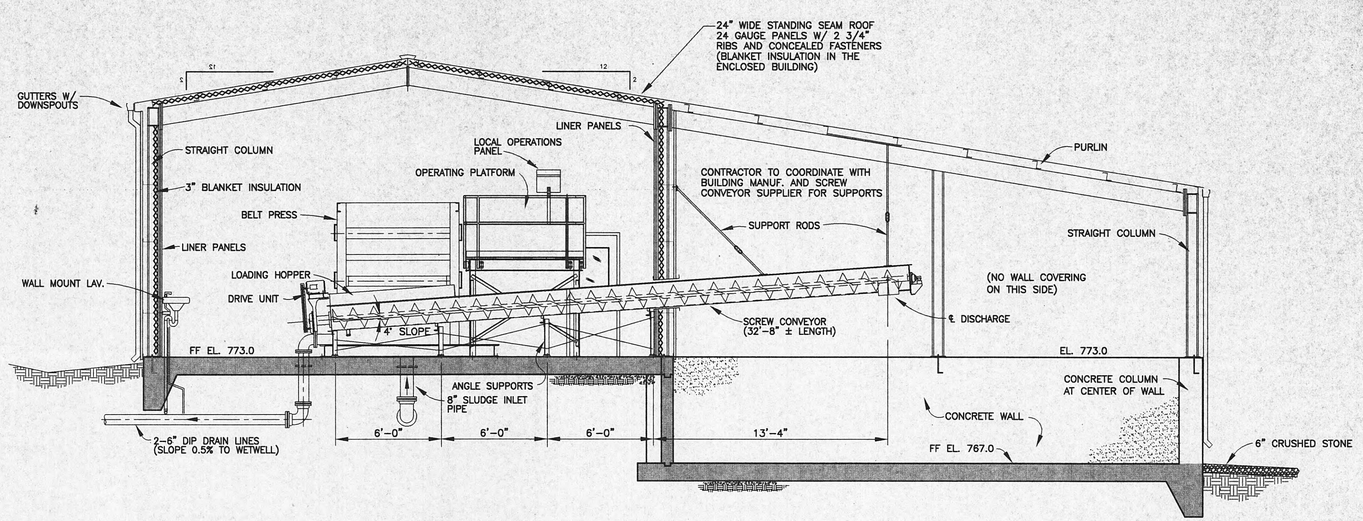
BELT FILTER PRESS BUILDING
PLAN AND SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

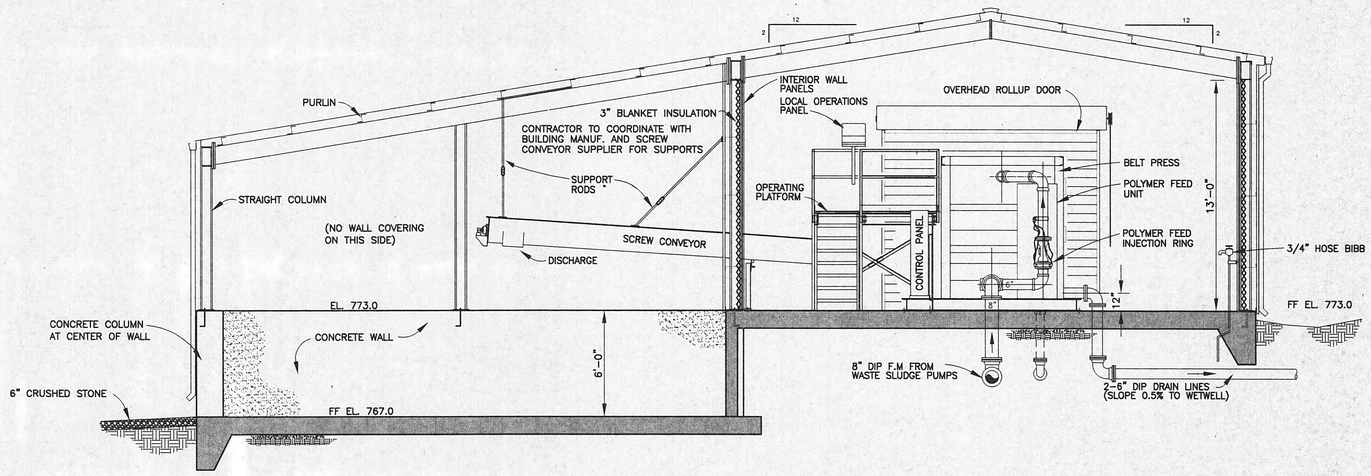
ROBERT G. THREADGILL, JR. REGISTERED ENGINEER 015841 STATE OF TENNESSEE
9-30-02

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS
NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER,2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-21
APPROVED: RGT	



SECTION (C22.1 / C21)
SCALE: 1/4" = 1'-0"



SECTION (C22.2 / C21)
SCALE: 1/4" = 1'-0"

GRW PROJECT NO. 7601-10

BELT FILTER PRESS BUILDING SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

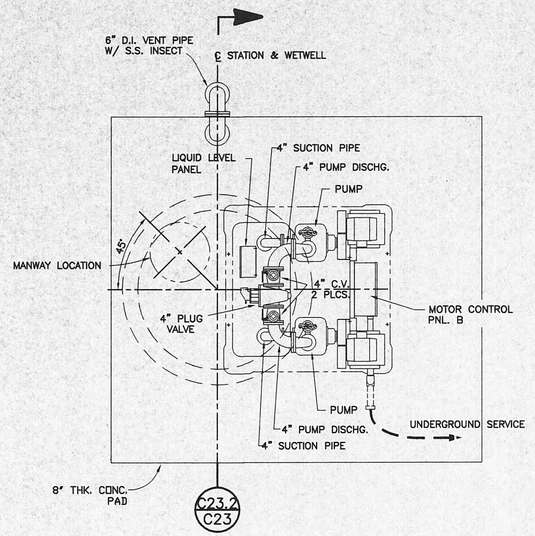
NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL, JR. REGISTERED ENGINEER STATE OF TENNESSEE 017268

9-30-02

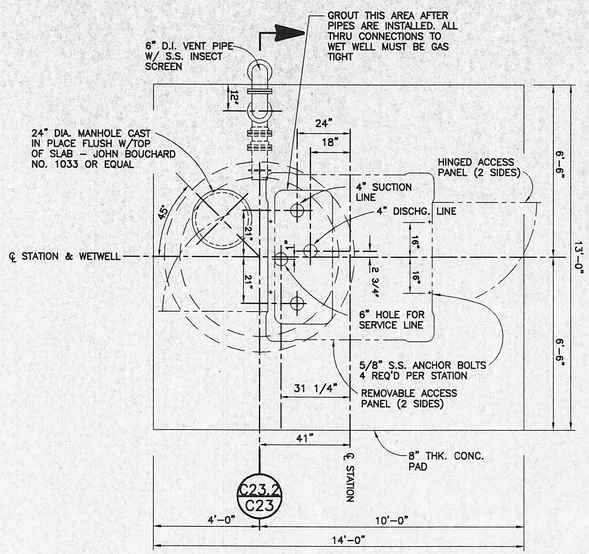
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS
NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-22
APPROVED: RGT	



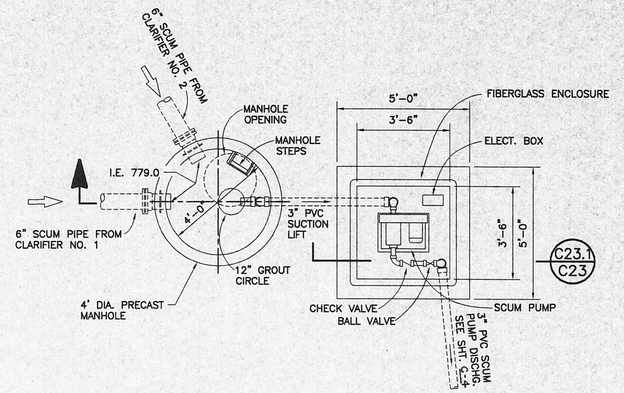
PLAN VIEW–UTILITY PUMP STATION

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



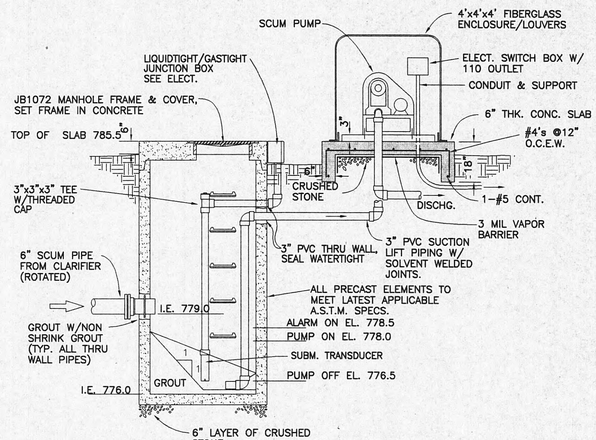
PLAN LAYOUT–UTILITY PUMP STATION

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



PLAN – SCUM PUMP/WETWELL

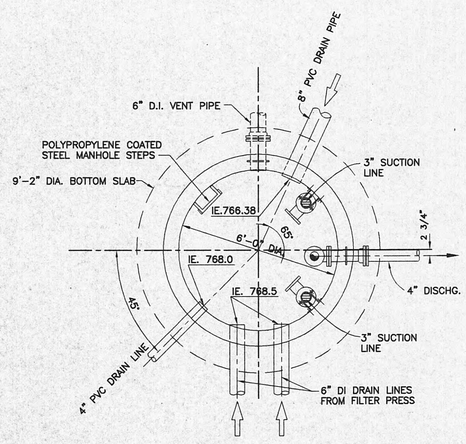
SCALE: 3/8" = 1'-0"



SECTION

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

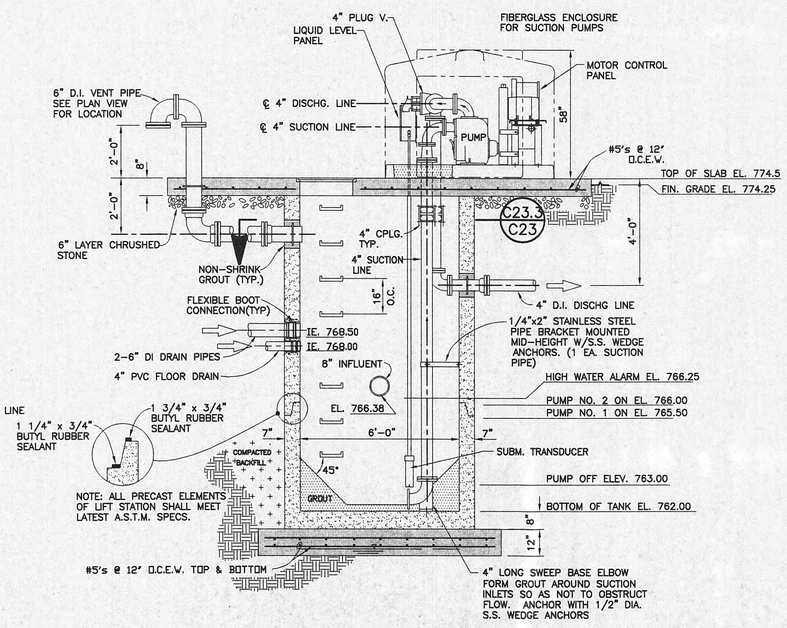
C23.1 / C23



SECTION

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

C23.3 / C23



SECTION

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

C23.2 / C23

EQUIPMENT IN WETWELL HAS BEEN ROTATED FOR CLARITY

NO.	DESCRIPTION	DATE	BY

REVISIONS

ROBERT G. THREADGILL, JR. REGISTERED ENGINEER NO. 015949 STATE OF TENNESSEE

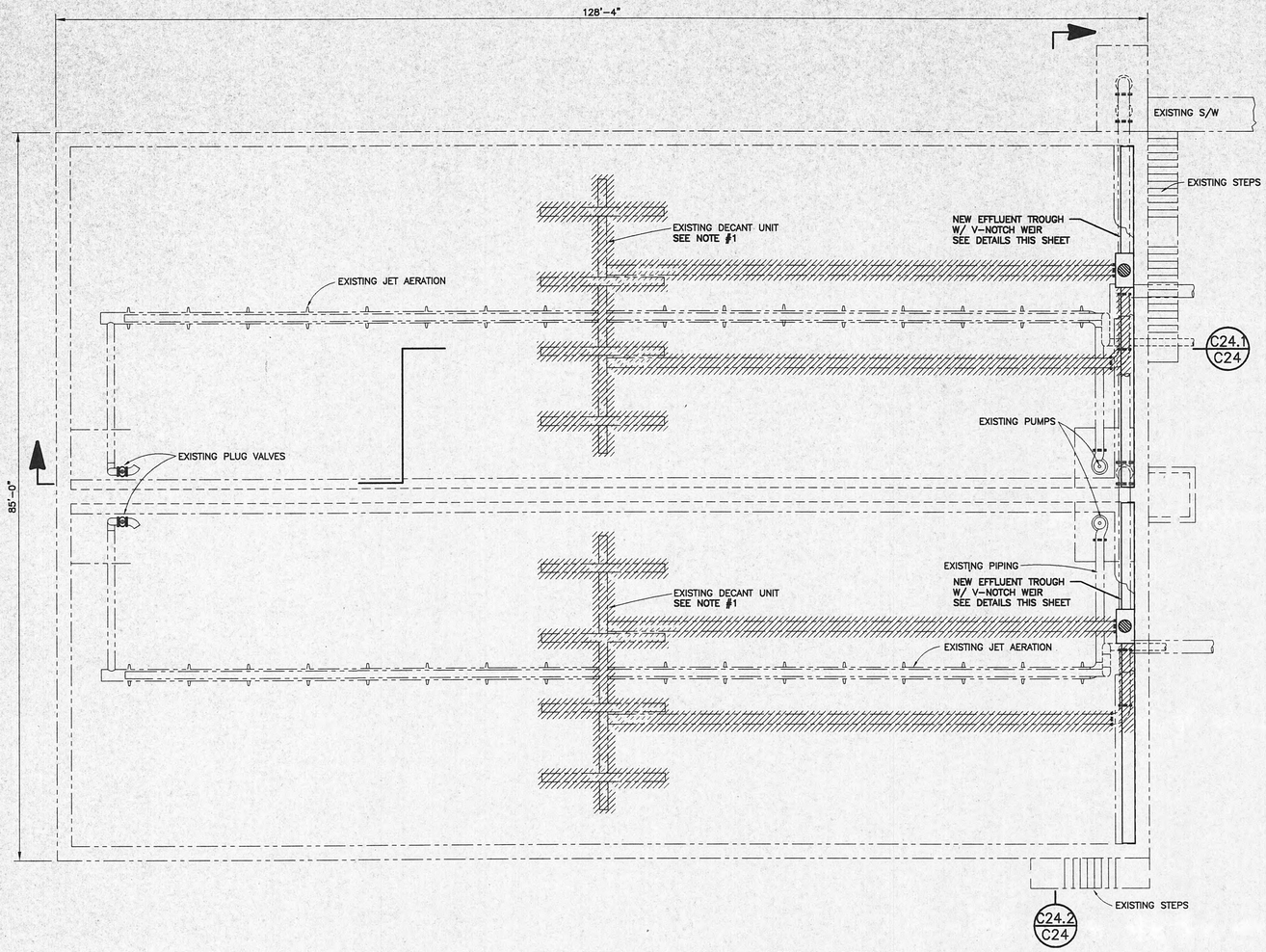
9-30-02

GRW PROJECT NO. 7601-10

SCUM PUMP AND UTILITY PUMP STATION PLAN AND SECTIONS WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

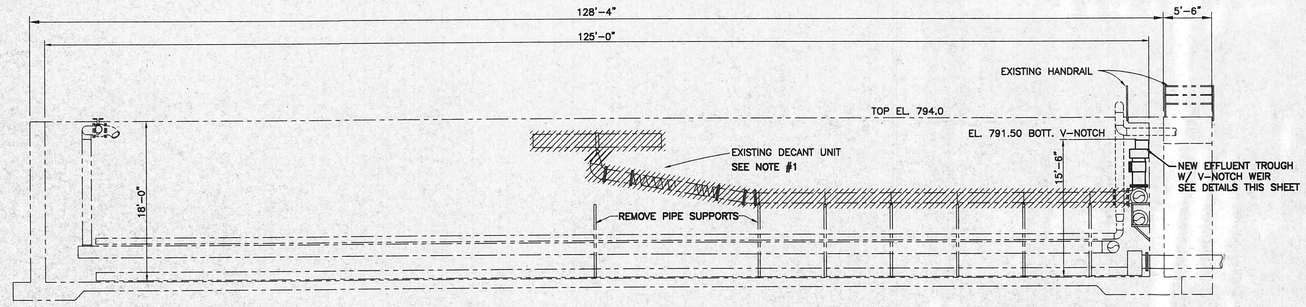
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-23
APPROVED: RGT	



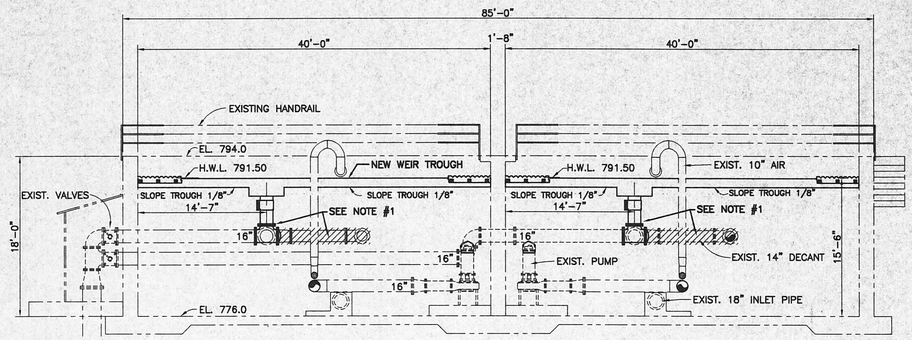
PLAN – EXISTING SBR STRUCTURE

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



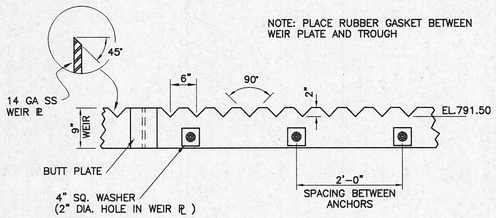
SECTION

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



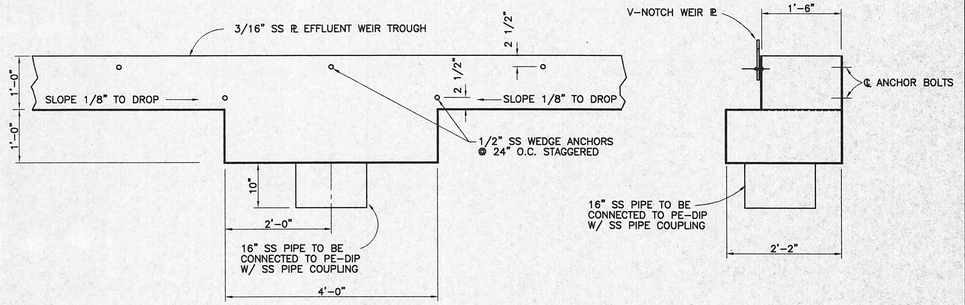
NOTES:

1. CONTRACTOR TO REMOVE EXISTING DECANT PIPING WHERE INDICATED. EXISTING TEES SHALL BE ROTATED AS SHOWN WITH PIPING EXTENDED UP TO NEW EFFLUENT WEIR BOX.



EFFLUENT WEIR DETAIL

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



EFFLUENT TROUGH DETAIL

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

GRW PROJECT NO.7601-10

EXISTING SBR RENOVATION – PLAN AND SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY

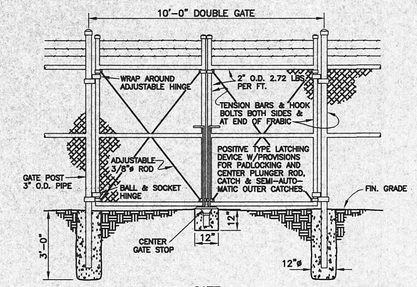
REVISIONS

ROBERT G. THREADGILL — REGISTERED ENGINEER — No. 017248 — STATE OF TENNESSEE

9-30-02

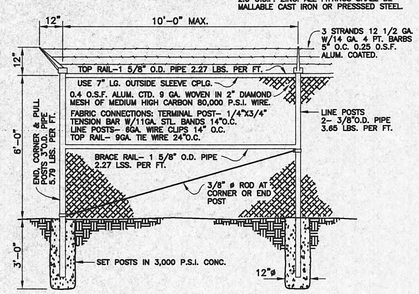
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS
NASHVILLE KNOXVILLE

DESIGNED: RGT	DATE: SEPTEMBER, 2002
DRAWN: DGR	SCALE: AS NOTED
REVIEWED: RGO	SHEET NO. C-24
APPROVED: RGT	



GATE

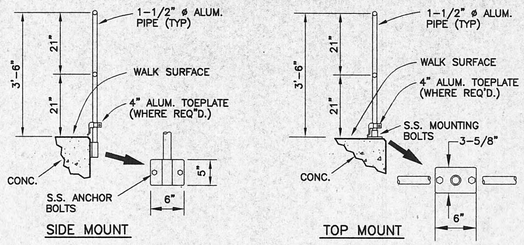
ALL POSTS & OTHER APPURTENANCES SHALL BE HOT DIP GALVANIZED W/MIN. 2.0 O.S.F. ZINC. ALL FITTINGS SHALL BE MALLABLE CAST IRON OR PRESSSED STEEL.



FENCE DETAIL

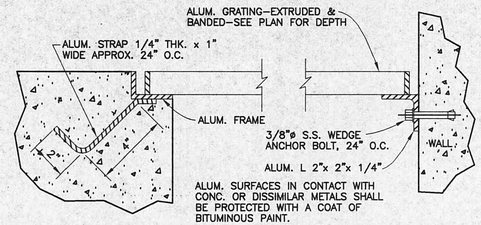
NOT TO SCALE

NOTE: MAXIMUM SPACING BETWEEN POST SHALL BE 7'-0"
ALUM. SURFACES IN CONTACT W/DISSIMILAR MATERIALS SHALL BE PROTECTED W/MYLAR ISOLATORS.



TYPICAL HANDRAIL DETAIL

NOT TO SCALE



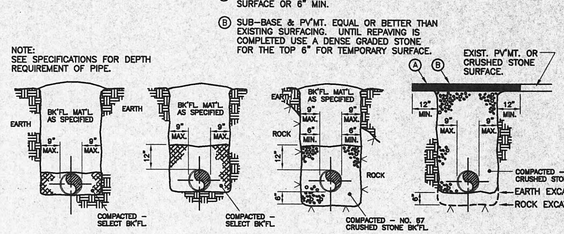
TYPICAL GRATING DETAIL

NOT TO SCALE

Ⓐ CRUSHED STONE SURFACE EQUAL TO EXISTING SURFACE OR 6" MIN.

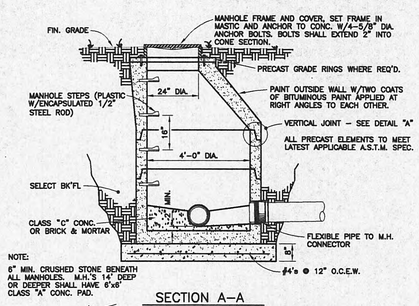
Ⓑ SUB-BASE & PVMT. EQUAL OR BETTER THAN EXISTING SURFACING. UNTIL REPAVING IS COMPLETED USE A DENSE GRADED STONE FOR THE TOP 6" FOR TEMPORARY SURFACE.

NOTE: SEE SPECIFICATIONS FOR DEPTH REQUIREMENT OF PIPE.

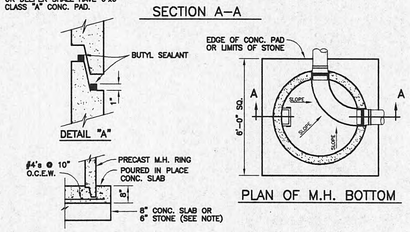


STANDARD WATER LINE BEDDING AND BACKFILLING

NOT TO SCALE

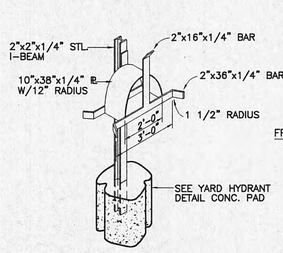


SECTION A-A

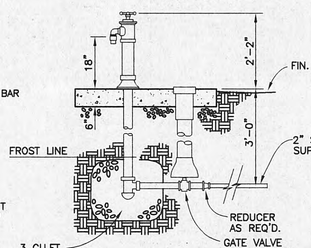


STANDARD MANHOLE

NOT TO SCALE

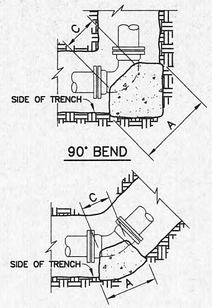


ISOMETRIC VIEW
HOSE RACK



YARD HYDRANT DETAIL

NOT TO SCALE



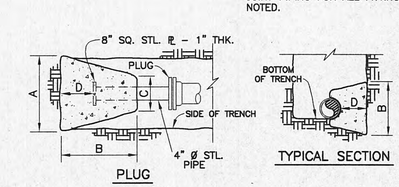
(16" AND LARGER 11 1/4° BENDS DO NOT REQUIRE RESTRAINED JOINTS)

NOTES:

1. THRUST BLOCKS ON 12" AND SMALLER PIPE DESIGNED FOR 100 PSI PRESSURE AND 1000 PSF SOIL BEARING. THRUST BLOCKS FOR 16" AND LARGER PIPE DESIGNED FOR 100 PSI PRESSURE AND 3000 PSF SOIL BEARING. FOR GREATER PRESSURE OR LESS SOIL BEARING, QUANTITIES WILL HAVE TO BE RECALCULATED.
2. THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
3. IF EXACT SIZE PIPE BLOCKING IS NOT SHOWN, USE NEXT LARGER SIZE.
4. THRUST BLOCKING TO BE POURED IN PLACE WITH CLASS C CONCRETE.
5. THRUST BLOCKS FOR 16" AND LARGER PIPE SHALL BE USED IN CONJUNCTION WITH RESTRAINED JOINT PIPING FOR ALL FITTINGS UNLESS OTHERWISE NOTED.

90° BEND							
SIZE	24"	16"	12"	10"	8"	6"	4"	2"
A	81	54	50	42	34	26	18	16
B	40	27	50	42	34	26	18	16
C	32	21	16	15	12	12	9	9
D	20	14	25	21	17	13	9	9
45° BEND								
SIZE	24"	16"	12"	10"	8"	6"	4"	2"
A	60	40	37	31	25	18	12	12
B	30	20	37	31	25	18	12	12
C	21	16	16	14	12	12	8	8
D	15	10	18	15	12	9	6	6
22 1/2° BEND								
SIZE	24"	16"	12"	10"	8"	6"	4"	2"
A	42	28	28	23	18	13	9	9
B	21	14	28	23	18	13	9	9
C	21	16	16	14	12	10	8	8
D	11	7	13	11	9	6	4	4
11 1/4° BEND								
SIZE	24"	16"	12"	10"	8"	6"	4"	2"
A	30	20	19	16	13	11	9	9
B	15	10	19	16	13	11	9	9
C	20	15	16	14	12	10	8	8
D	8	5	9	8	8	5	4	4
PLUG/DEAD END								
SIZE	24"	16"	12"	10"	8"	6"	4"	2"
A	68	46	52	43	34	26	26	26
B	34	23	52	43	34	26	26	26
C	36	26	12	12	12	12	12	12
D	17	11	32	22	15	11	11	11
TEE								
SIZE	MAIN	24"	24"	12"	12"	10"-8"	6"-4"	2"
	BRANCH	24"	16"	12"	8"-10"	4"	6"-8"	4"	2"-4"
A		68	46	52	42	28	43	26	26
B		34	23	52	43	28	43	26	26
C		44	32	12	12	12	12	12	12
D		17	11	26	21	14	21	13	13

DIMENSIONS ARE IN INCHES



PLUG

THRUST BLOCKING DETAIL

NOT TO SCALE

90° BEND			
SIZE	24"	16"	12"
	100	72	54
45° BEND			
SIZE	24"	16"	12"
	40	36	20
22 1/2° BEND			
SIZE	24"	16"	12"
	18	18	18
DEAD ENDS/VALVES			
SIZE	24"	16"	12"
	90	54	54
TEE			
SIZE MAIN	24"	24"	24"
SIZE BRANCH	24"	16"	12"
	80	54	36

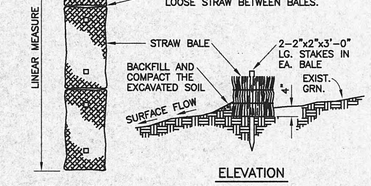
NOTES:

1. RESTRAINED JOINT PIPING TO BE USED IN CONJUNCTION WITH THRUST BLOCKS FOR FITTINGS & VALVES UNLESS OTHERWISE INDICATED.
2. VERTICAL DOWNWARD FITTINGS WILL NOT BE ACCEPTABLE.
3. RESTRAINED JOINT PIPING WILL NOT BE REQUIRED ON 11 1/4° BENDS.

DIMINSIONS ARE IN FEET & ARE REQUIRED ON EACH SIDE OF OF THE FITTING.

RESTRAINED JOINT PIPING REQUIREMENTS

NOT TO SCALE

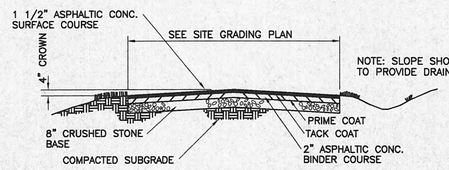


PLAN VIEW

ELEVATION

EROSION/SILTATION BARRIER

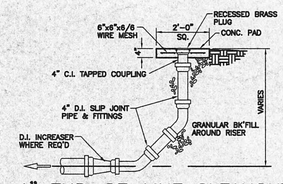
NOT TO SCALE



TYPICAL SECTION

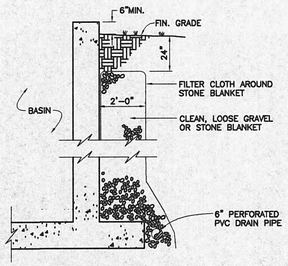
PAVED PARKING AREA & DRIVE DETAIL

NOT TO SCALE



4" END-OF-LINE CLEANOUT

NOT TO SCALE

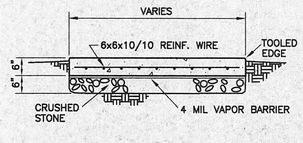


FRENCH DRAIN
W/GRAVEL BLANKET DETAIL

NOT TO SCALE

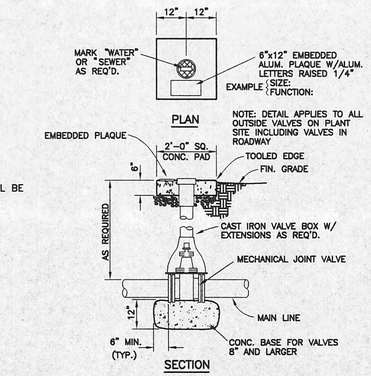
NOTES:
GROOVED 1/4" CONTRACTION JOINTS SHALL BE EQUALLY SPACED AT 5' MAX. CENTERS.

MAX. SIDEWALK SLOPE SHALL BE 5%



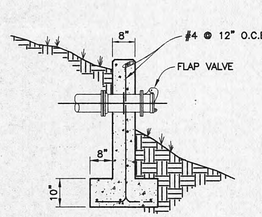
TYPICAL SIDEWALK DETAIL

NOT TO SCALE



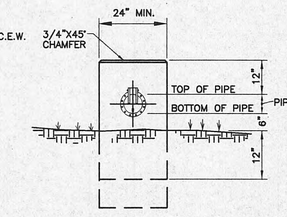
PLANT SITE VALVE SETTING DETAIL

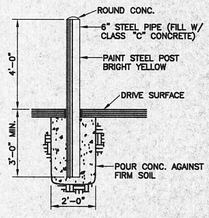
NOT TO SCALE



HEADWALL DETAIL

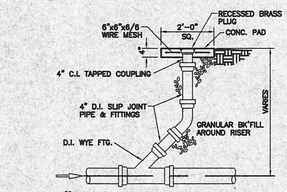
NOT TO SCALE





BUMPER DETAIL

NOT TO SCALE



4" IN-LINE CLEANOUT

NOT TO SCALE

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. THREADGILL — REGISTERED ENGINEER — No. 017845 — STATE OF TENNESSEE

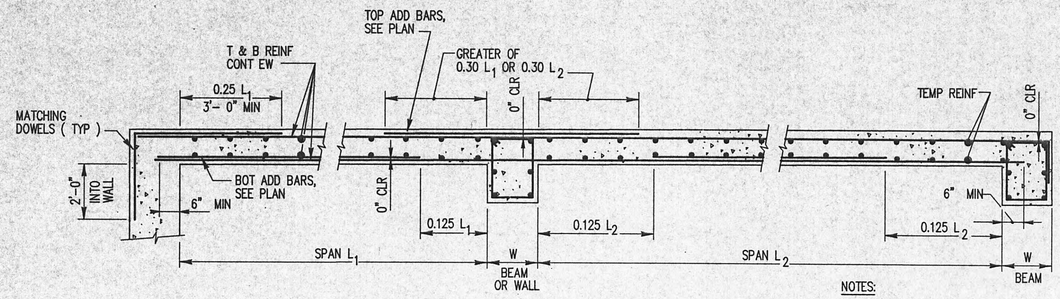
9-30-02

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

GRW PROJECT NO. 7601-10

MISCELLANEOUS CONSTRUCTION DETAILS
WASTEWATER TREATMENT PLANT
HARRIMAN UTILITY BOARD - HARRIMAN, TENNESSEE

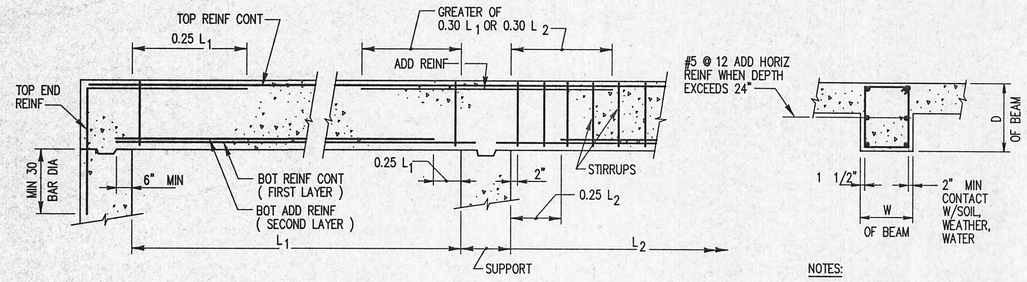
DESIGNED:	DATE:
RGT	SEPTEMBER, 2002
DRAWN:	SCALE:
DGR	NONE
REVIEWED:	SHEET NO.
RGO	C-25
APPROVED:	
RGT	



TYPICAL CONCRETE SLAB DETAIL

NTS

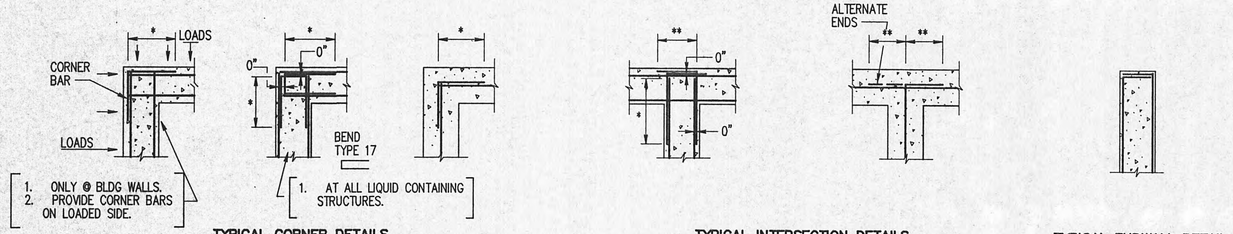
NOTES:
1. TOP BARS SPLICE @ MID SPAN.
2. BOT BARS SPLICE @ SUPPORTS



TYPICAL CONCRETE BEAM DETAIL

NTS

NOTES:
1. TOP BARS SPLICE @ MID SPAN.
2. BOT BARS SPLICE @ SUPPORTS



1. ONLY @ BLDG WALLS.
2. PROVIDE CORNER BARS ON LOADED SIDE.

TYPICAL CORNER DETAILS

1. AT ALL LIQUID CONTAINING STRUCTURES.

TYPICAL INTERSECTION DETAILS

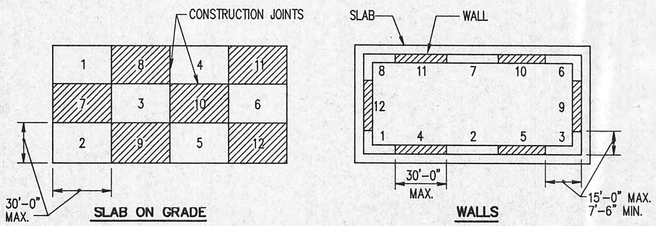
TYPICAL ENDWALL DETAIL

TYPICAL WALL DETAILS – SHOWN IN HORIZONTAL CROSS SECTION

NTS

NOTES:
* – DENOTES CLASS C SPLICE.
** – DENOTES TENSION DEVELOPMENT LENGTH

NOTES:
1. PLACING SEQUENCE FOR OTHER WALLS SIMILAR.
2. FOR ADDITIONAL DETAILS, SEE GENERAL STRUCTURAL NOTES, ITEM 11.



TYPICAL CONCRETE PLACING SEQUENCE DETAILS

NTS

GENERAL STRUCTURAL NOTES

1. DESIGN LIVE LOADS:

WORKING ROOFS	100 psf
ALL OTHER ROOFS	30 psf
OFFICES, LABS, STAIRS AND MISC. AREAS	100 psf

2. MATERIALS

CONCRETE CLASS A	f'c = 4,000 psi
CLASS B	f'c = 3,000 psi
REINFORCING STEEL A615 GRADE 60	fy = 60 ksi
STRUCTURAL STEEL A36	Fy = 36 ksi

3. CONCRETE SHALL BE MIXED AND PLACED IN ACCORDANCE WITH ACI 318. USE MIXES WITH MAXIMUM AGGREGATE SIZE APPROPRIATE FOR FORM SPACERS AND REINFORCEMENT PLACEMENT REQUIRED IN THIS PROJECT.

4. CONCRETE PROPORTIONS, INCLUDING WATER CEMENT RATIO, SHALL BE ESTABLISHED IN ACCORDANCE WITH SECTION 5.3 OF ACI-318 ON THE BASIS OF FIELD EXPERIENCE AND/OR TRIAL MIXTURES WITH MATERIALS PROPOSED FOR USE IN THIS PROJECT FOR EACH MIX SPECIFIED, SUBMIT DOCUMENTATION OF CONCRETE PROPORTIONS.

5. DELAYS CAUSED BY FAILURE TO CONFORM TO THE REQUIREMENTS IN ITEM 2, ABOVE, SHALL NOT BE ACCEPTED AS JUSTIFICATION FOR ADDITIONAL COMPENSATION OR EXTENSIONS OF TIME.

6. CONCRETE SHALL BE REINFORCED UNLESS SPECIFICALLY NOTED "NOT REINFORCED".

7. PROVIDE WATERSTOPS IN EXPANSION JOINTS AND CONSTRUCTION JOINTS OF LIQUID CONTAINING STRUCTURES AND WHERE REQUIRED TO PREVENT INFILTRATION OF GROUND WATER.

8. UNLESS OTHERWISE SHOWN, PROVIDE DOWELS TO MATCH VERTICAL BARS IN ALL WALLS AND COLUMNS, AND HORIZONTAL BARS IN ALL BEAMS AND SLABS.

9. UNLESS OTHERWISE DETAILED, SPREAD REINFORCING AT OPENINGS AND SLEEVES. DO NOT CUT REINFORCING BARS. CONTRACTOR SHALL VERIFY SIZE AND LOCATION OF ALL OPENINGS WITH SHOP DRAWINGS FOR EQUIPMENT TO BE INSTALLED.

10. STRUCTURE SHALL NOT BE BACKFILLED UNTIL MEMBERS DESIGNED TO BRACE THE WALLS HAVE ATTAINED THEIR DESIGN COMPRESSIVE STRENGTH.

11. UNLESS OTHERWISE NOTED, PROVIDE 1" CHAMFER ON EXPOSED CONCRETE EDGES.

12. UNLESS OTHERWISE SHOWN, PROVIDE CONCRETE PROTECTION FOR ALL REINFORCING IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-99).

13. ALL REINFORCEMENT SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH ACI 315.

    a. TOP BARS ARE HORIZONTAL BARS WHICH HAVE MORE THAN 12 INCHES OF CONCRETE CAST BELOW THE BAR (INCLUDES ALL HORIZONTAL WALL REINFORCEMENT).

    b. OTHER BARS INCLUDE ALL VERTICAL REINFORCEMENT AND ALL HORIZONTAL REINFORCEMENT WHICH HAS LESS THAN 12 INCHES OF CONCRETE CAST BELOW THE BAR FOR WHICH BASIC TENSION LAP SPLICES IN NORMAL WEIGHT CONCRETE ARE APPLICABLE.

    c. UNLESS OTHERWISE SHOWN, ALL REINFORCEMENT SHALL BE TREATED AS TENSION REINFORCEMENT.

    d. THE TENSION DEVELOPMENT (EMBEDMENT) LENGTH, Ld OR Ldt, EQUALS A CLASS A SPLICE LENGTH.

    e. IF MORE THAN ONE HALF OF THE TENSION REINFORCING BARS ARE LAP SPLICED WITHIN THE REQUIRED LAP LENGTH, A CLASS C SPLICE SHALL BE USED. UNLESS OTHERWISE SHOWN, ALL OTHER TENSION SPLICES SHALL BE CLASS B.

    f. TENSION SPLICE AND TENSION EMBEDMENT LENGTHS SHALL BE NOT LESS THAN 12 INCHES.

14. UNLESS OTHERWISE SHOWN, REINFORCEMENT AT WALL CORNERS AND INTERSECTIONS SHALL BE IN ACCORDANCE WITH DETAILS SHOWN ON ACI 315.

15. UNLESS OTHERWISE NOTED CONSTRUCTION AND EXPANSION JOINTS SHALL BE AT THE LOCATIONS SHOWN ON THE DRAWINGS. ADDITIONAL CONSTRUCTION JOINTS LOCATED BY THE CONTRACTOR AS FOLLOWS:

    a. FOUNDATION SLABS, SLABS ON GRADE AND SLABS RETAINING LIQUIDS AT A SPACING OF APPROXIMATELY 25 FEET. CONCRETE SHALL BE PLACED IN A CHECKERBOARD PATTERN. FOR DETAIL SEE THIS SHEET.

    b. WALLS AT A SPACING OF APPROXIMATELY 25 FEET, CONCRETE SHALL BE PLACED IN ALTERNATE SECTIONS, WITH CONSTRUCTION JOINTS LOCATED APPROXIMATELY 12 FEET FROM CORNERS. FOR DETAIL SEE THIS SHEET.

    c. FRAMED SLABS AND BEAMS: CONSTRUCTION JOINTS SHALL BE LOCATED AT THE CENTER OF SPANS OF SLABS OR BEAMS.

    d. FOR ADDITIONAL INFORMATION SEE SPECIFICATIONS – SECTION 03300, ITEM 3.03G

THESE ADDITIONAL CONSTRUCTION JOINTS LOCATIONS SHALL HAVE THE WRITTEN APPROVAL OF THE ENGINEER. CONSTRUCTION AND EXPANSION JOINTS SHALL BE IN ACCORDANCE WITH TYPICAL DETAILS.

12. CONTINUOUS REINFORCING IN WALLS AND SLABS MAY BE SPLICED, AS REQUIRED, PROVIDING BARS ARE OF THE LONGEST PRACTICABLE LENGTH AND ALL SPLICES ARE SHOWN ON REINFORCING SHOP DRAWINGS. WHENEVER POSSIBLE SPLICES SHALL BE STAGGERED.

13. PROVIDE ADEQUATE INSPECTION PANELS IN WALL FORMING TO FACILITATE CONCRETE PLACEMENT, TO INSURE THAT NO VOIDS OCCUR AND THAT ADEQUATE CONSOLIDATION IS OBTAINED.

14. REINFORCE ALL CONCRETE WALLS, NOT OTHERWISE SHOWN, AS FOLLOWS:

a. 8"	#4 @ 8 EW, MIDDLE
10"	#4 @ 12 EW, EF
12"	#4 @ 10 EW, EF
14" & 15"	#4 @ 9 EW, EF
16"	#4 @ 8 EW, EF

    b. ADD 2-#5 CONTINUOUS AT THE TOP OF ALL WALLS.

15. STUD SHEAR CONNECTORS AND CONCRETE ANCHORS SHALL BE AUTOMATICALLY END WELDED HEADED STUDS OF STANDARD MANUFACTURER. WHERE USED AS CONCRETE ANCHORS IN CURB AND EDGE ANGLES ONLY, WELDED FLAT BARS OF EQUAL YIELD LOAD VALUES MAY BE SUBSTITUTED FOR WELDED STUD.

16. SEE EQUIPMENT MANUFACTURERS DRAWINGS FOR SIZES AND/OR LOCATIONS OF EQUIPMENT PIERS & PADS, ANCHOR BOLTS, FRAMES SUPPORTING EQUIPMENT, AND OPENINGS IN SLABS AND GRATING. CONTRACTOR TO VERIFY OPENING SIZES AND LOCATIONS OF SLEEVES, ETC. WITH SHOP DRAWINGS FOR EQUIPMENT.

17. UNLESS OTHERWISE SHOWN OR NOTED, ALL PIERS AND FOOTINGS ARE LOCATED ON COLUMN CENTER LINES.

18. FOR COORDINATES TO LOCATE STRUCTURES, SEE CIVIL DRAWINGS.

19. UNLESS OTHERWISE NOTED, POROUS FILL AND WATERPROOF PAPER SHALL BE PLACED UNDER ALL CONCRETE SLABS ON GRADE, TANK BOTTOMS AND FOUNDATIONS. FOR ADDITIONAL INFORMATION, SEE SPECIFICATION SECTION 03300, ITEMS 2.04H & 3.03B

20. UNLESS OTHERWISE NOTED, ALL CONCRETE COLUMN REINFORCEMENT, TIES AND SPLICES SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH ACI 315.

21. ALL CONSTRUCTION SHALL CONFORM TO THE PROVISIONS OF THE LATEST AISC CODE. SECTIONS 3.1, 3.4, 3.5, AND 4.2 OF THE AISC CODE OF STANDARD PRACTICE ARE EXCLUDED FROM THIS PROJECT.

22. UNLESS OTHERWISE NOTED, ALL BOLTS FOR BOLTED STRUCTURAL JOINT FASTENERS SHALL BE 3/4" DIAMETER HIGH STRENGTH STRUCTURAL BOLTS, ASTM A-325.

23. CONTRACTOR TO PROVIDE ADEQUATE BRACING FOR STRUCTURE SO THAT IT WILL BE STABLE DURING ALL STAGES OF CONSTRUCTION. THE STRUCTURE AND FOUNDATIONS ARE DESIGNED FOR A COMPLETED CONDITION ONLY AND THEREFORE REQUIRES ADDITIONAL SUPPORT TO MAINTAIN STABILITY BEFORE COMPLETION.

24. GUSSET PLATES SHALL BE?" THICK MINIMUM.

25. WHERE PRACTICAL, UNLESS SHOWN DIFFERENTLY ON DRAWINGS, ALL BRACING CONNECTIONS SHALL BE DESIGNED AND DETAILED SO THAT ALL FORCE COMPONENTS CAN BE DELIVERED DIRECTLY TO THE CENTERLINE OF INTERSECTING MEMBERS.

26 THE CONTRACTOR IS TO COORDINATE THE STRUCTURAL DRAWINGS WITH THE CIVIL, ARCHITECTURAL, ELECTRICAL AND MECHANICAL DRAWINGS AND MAKE CERTAIN ALL PIPE SLEEVES, DUCTS, INSERTS AND HOLES ARE LOCATED AND IN PLACE BEFORE EACH CONCRETE POUR.

27. OMISSIONS, CONFLICTS OR MISUNDERSTANDINGS BETWEEN THE VARIOUS ELEMENTS OF THE CONTRACT DOCUMENTS, IF ANY, SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK.

28. MEMBERS AND BRACING REQUIRED TO SUPPORT EQUIPMENT FROM (OR ATTACH IT TO) THE STRUCTURAL FRAMING SHOWN ON THE DRAWINGS SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR SUPPLYING THE EQUIPMENT.

29. THE CONNECTION BOLTS SHALL BE TIGHTENED BY THE "SNUG TIGHT" METHOD UNLESS TENSION, BRACING, MOMENT, OR SLIP CRITICAL CONNECTIONS ARE SHOWN, WHICH THEN SHALL BE INSTALLED BY "DIRECT TENSION INDICATORS" METHOD.

NO.	DESCRIPTION	DATE	BY

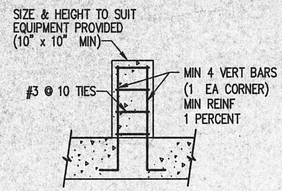
REVISIONS

GRW PROJECT NO.7601-10

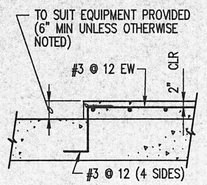
TYPICAL DETAILS AND GENERAL STRUCTURAL NOTES
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: DGE	DATE: SEPTEMBER, 2002
DRAWN: DGE	SCALE: AS NOTED
REVIEWED: KRN	SHEET NO. S-1
APPROVED: KRN	



EQUIPMENT PIER
NTS



EQUIPMENT PAD
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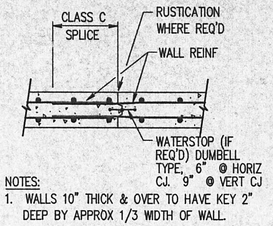
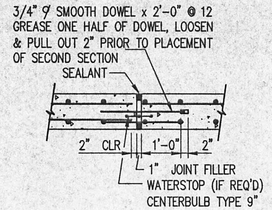
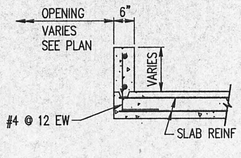


NOTES:
1. WALLS 10" THICK & OVER TO HAVE KEY 2" DEEP BY APPROX 1/3 WIDTH OF WALL.
2. CONSTRUCTION JOINTS IN SLABS SIMILAR.

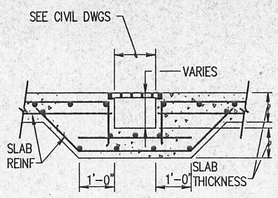
CONSTRUCTION JOINT
NTS



EXPANSION JOINT
NTS

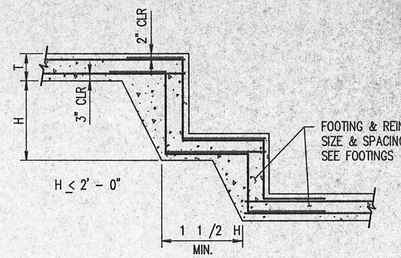


CURB DETAIL
NTS

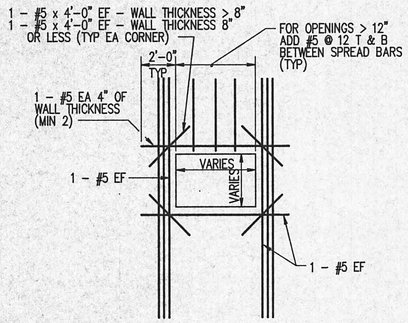


NOTE: TRENCH DETAIL SIMILAR

SUMP DETAIL
NTS

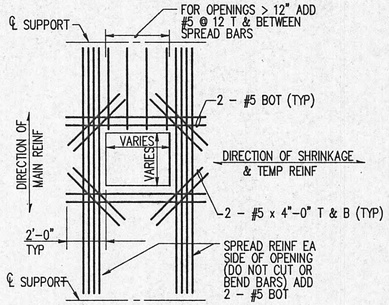


FOOTING STEP
NTS



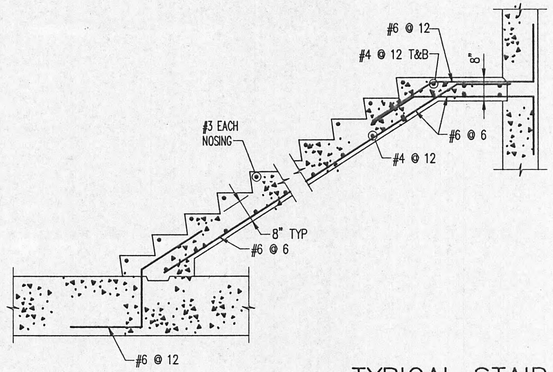
NOTE:
REINF FOR CIRCULAR OPENINGS SIMILAR.

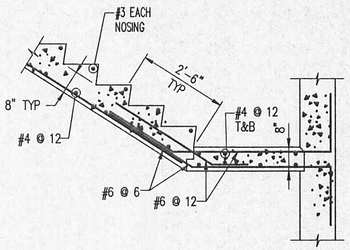
REINF AT OPENINGS IN WALL
NTS



NOTES:
1. REINF FOR CIRCULAR OPENINGS SIMILAR.
2. CUT THE SHRINKAGE & TEMPERATURE REINF AT OPENINGS, EXCEPT IN A TWO WAY SLAB.
3. SPREAD REINF ON EACH SIDE OF OPENINGS IN A TWO WAY SLAB IN BOTH DIRECTIONS, ADD #5 @ 12 T&B IN BETWEEN SPREAD BARS.

REINF AT OPENINGS IN SLAB
NTS





TYPICAL STAIR DETAILS
N.T.S.

NO.	DESCRIPTION	DATE	BY

REVISIONS

ERI SRIVATSA R. NARAYANAPPA
REGISTERED ENGINEER
NUMBER 102156
STATE OF TENNESSEE

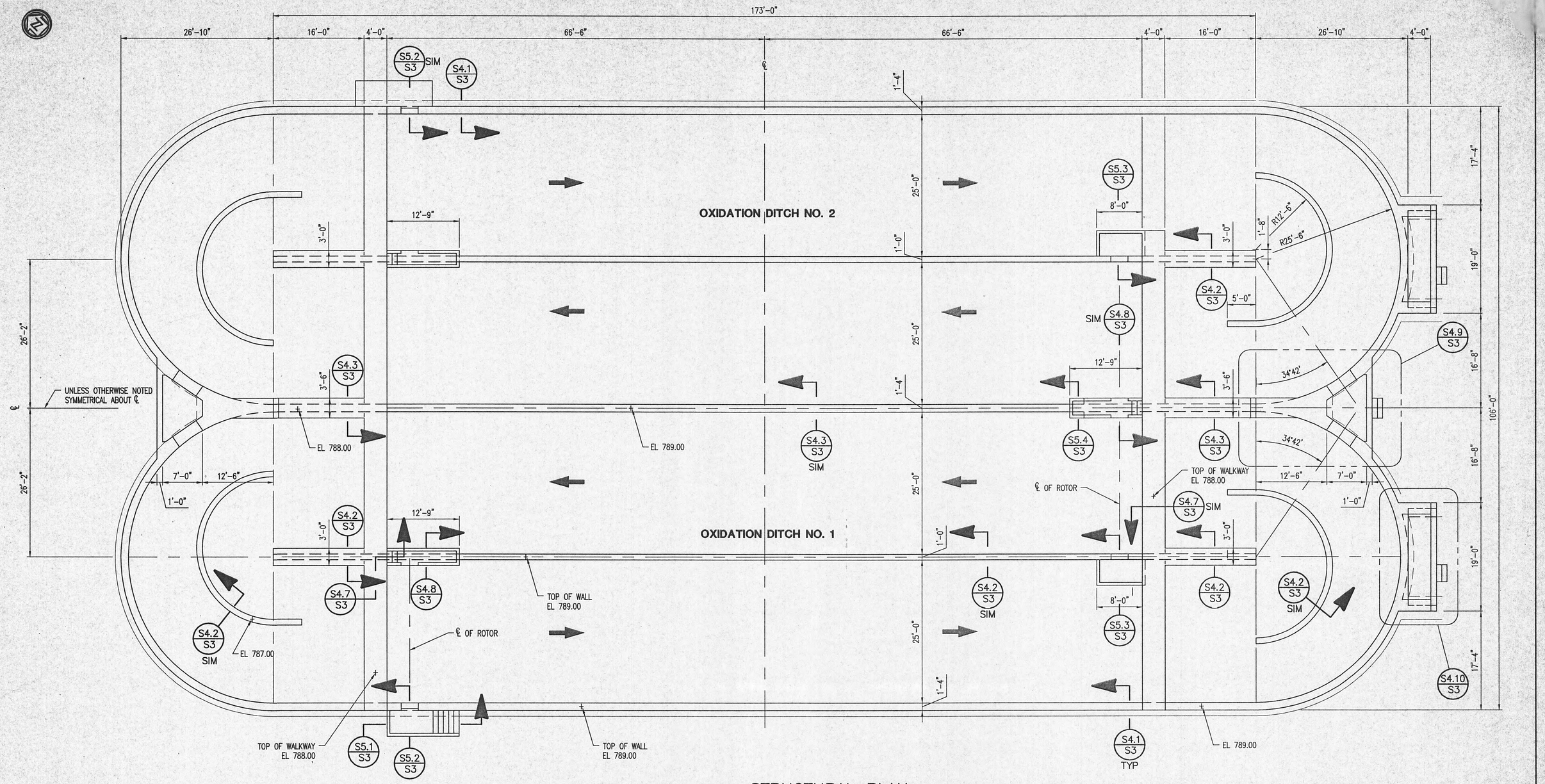
GRW PROJECT NO.7601-10

TYPICAL DETAILS

WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD - HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: DGE	DATE: SEPTEMBER, 2002
DRAWN: DGE	SCALE: AS NOTED
REVIEWED: KRN	SHEET NO. S-2
APPROVED: KRN	



STRUCTURAL PLAN

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

GRW PROJECT NO.7601-10

OXIDATION DITCH
STRUCTURAL PLAN
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY

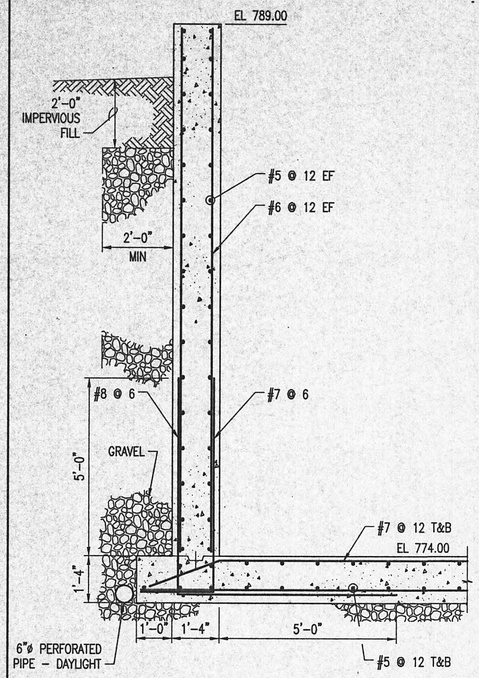
REVISIONS

KRISHNAPRIA R. NARAYANAN — REGISTERED ENGINEER — No. 102139 — STATE OF TENNESSEE

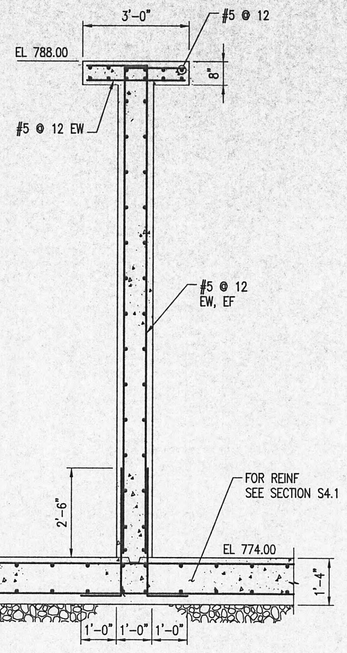
10-2-02

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: DGE	DATE: SEPTEMBER, 2002
DRAWN: DGE	SCALE: AS NOTED
REVIEWED: KRN	SHEET NO. S-3
APPROVED: KRN	



SECTION
SCALE: 1/2" = 1'-0"
S4.1 / S3



SECTION
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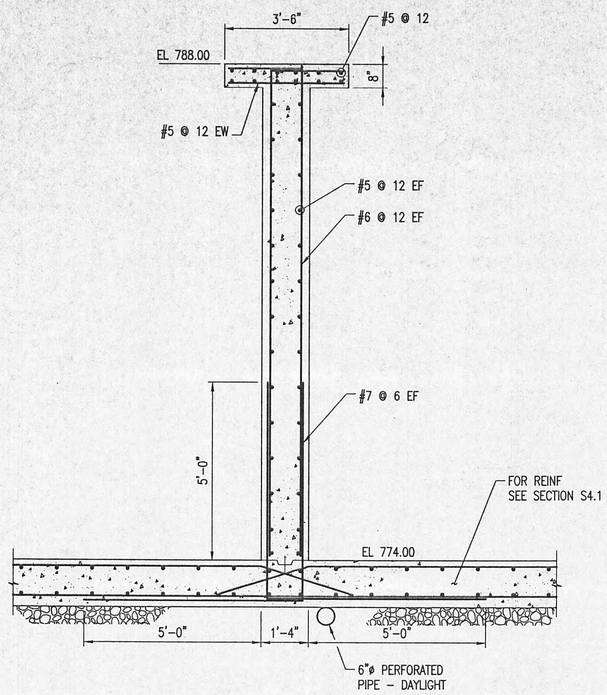
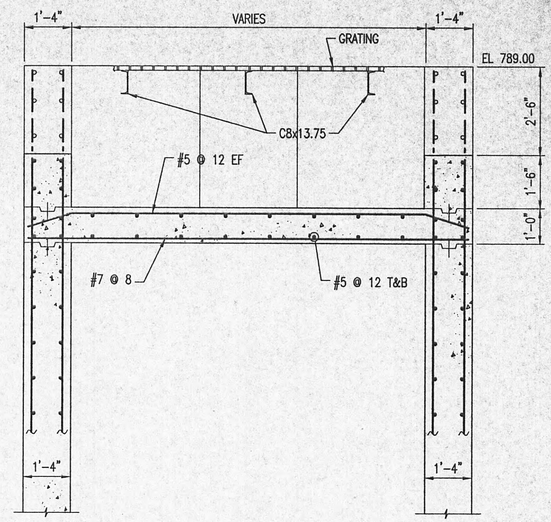
S4.2 / S3

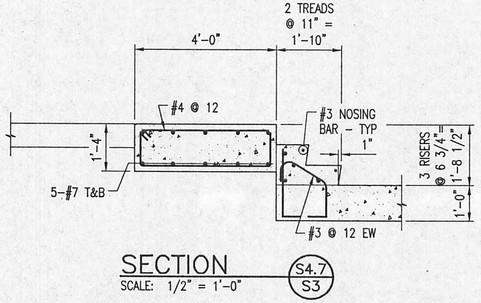


SECTION
SCALE: 1/2" = 1'-0"
S4.3 / S3

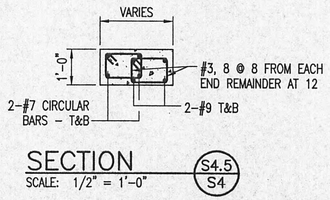


SECTION
SCALE: 1/2" = 1'-0"
S4.4 / S4

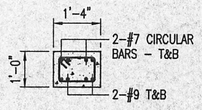
DETAIL
SCALE: 1/4" = 1'-0"
S4.10 / S3



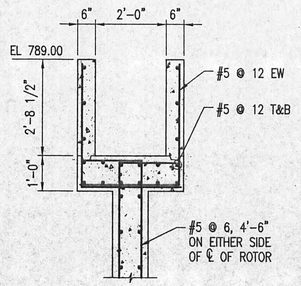
SECTION
SCALE: 1/2" = 1'-0"
S4.7 / S3



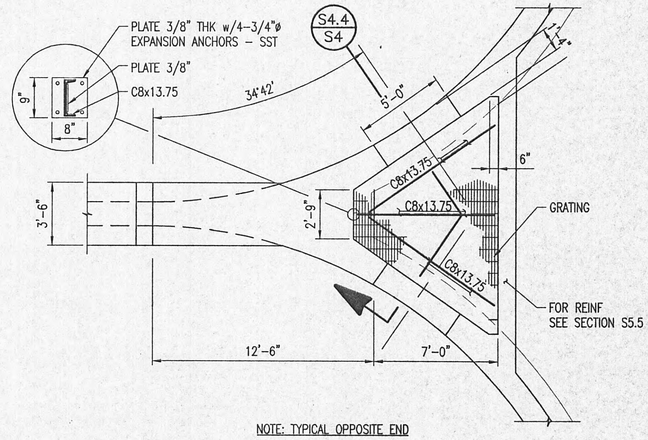
SECTION
SCALE: 1/2" = 1'-0"
S4.5 / S4



SECTION
SCALE: 1/2" = 1'-0"
S4.6 / S4



SECTION
SCALE: 1/2" = 1'-0"
S4.8 / S3



NOTE: TYPICAL OPPOSITE END

DETAIL
SCALE: 1/4" = 1'-0"
S4.9 / S3

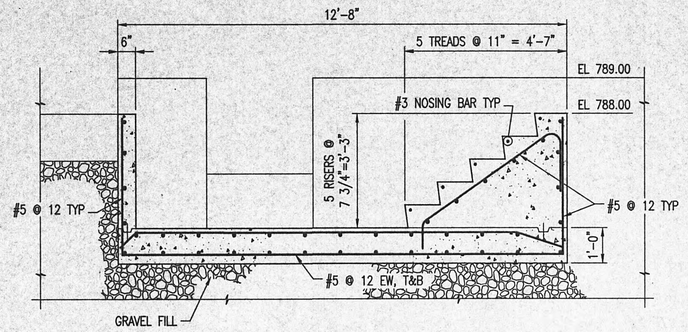
NO.	DESCRIPTION	DATE	BY
	REVISIONS		

GRW PROJECT NO.7601-10

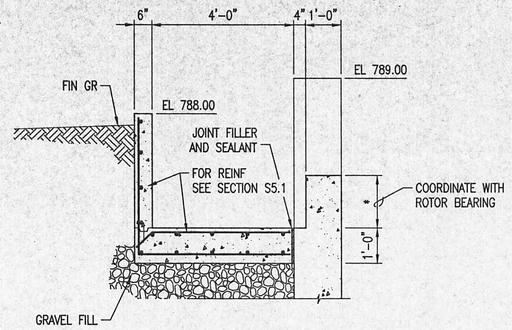
OXIDATION DITCH SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD - HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

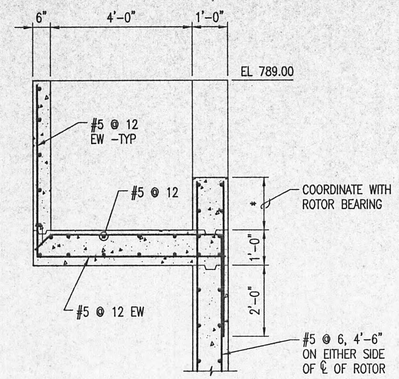
DESIGNED: DGE	DATE: SEPTEMBER, 2002
DRAWN: DGE	SCALE: AS NOTED
REVIEWED: KRN	SHEET NO. S-4
APPROVED: KRN	



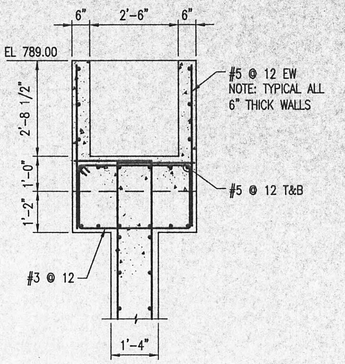
SECTION
SCALE: 1/2" = 1'-0"
S5.1 / S3



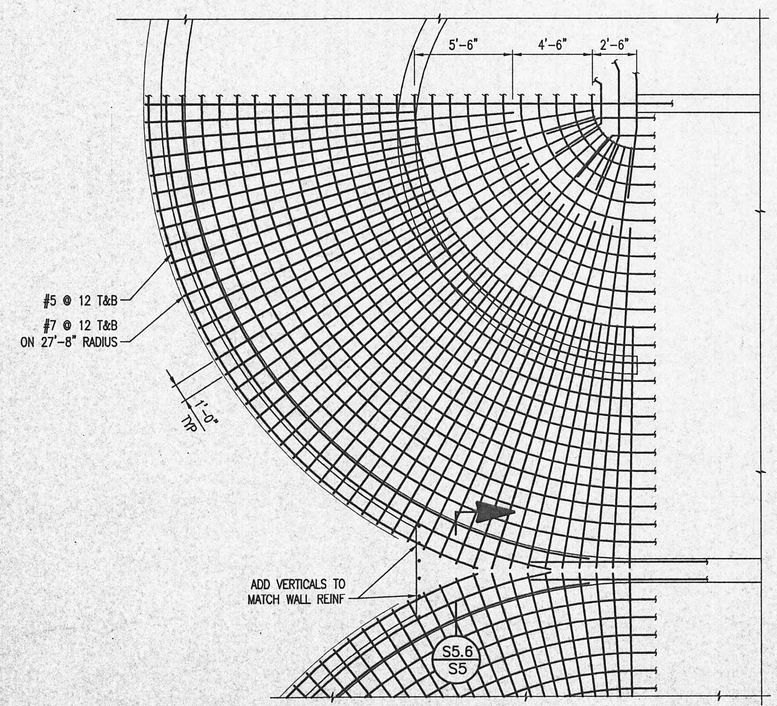
SECTION
SCALE: 1/2" = 1'-0"
S5.2 / S3



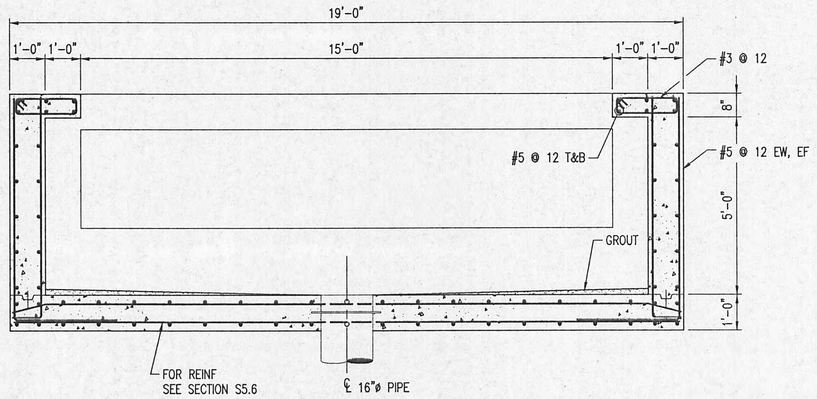
SECTION
SCALE: 1/2" = 1'-0"
S5.3 / S3



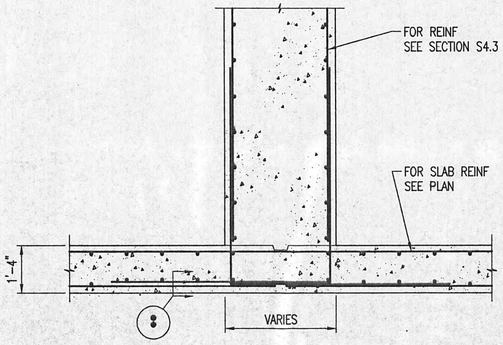
SECTION
SCALE: 1/2" = 1'-0"
S5.4 / S3



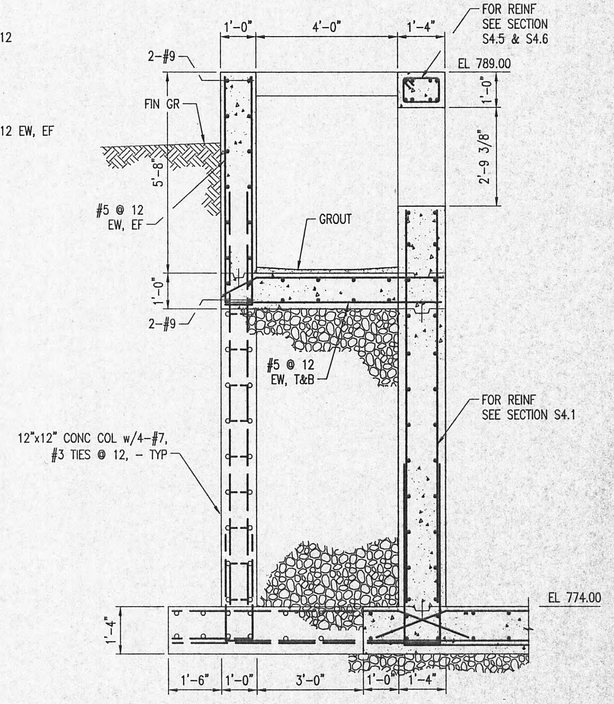
PARTIAL FOUNDATION PLAN
SCALE: 1/4" = 1'-0"



SECTION
SCALE: 1/2" = 1'-0"
S5.5 / S4



SECTION
SCALE: 1/2" = 1'-0"
S5.6 / S5



SECTION
SCALE: 1/2" = 1'-0"
S5.6 / S4

GRW PROJECT NO.7601-10

NO.	DESCRIPTION	DATE	BY

REVISIONS

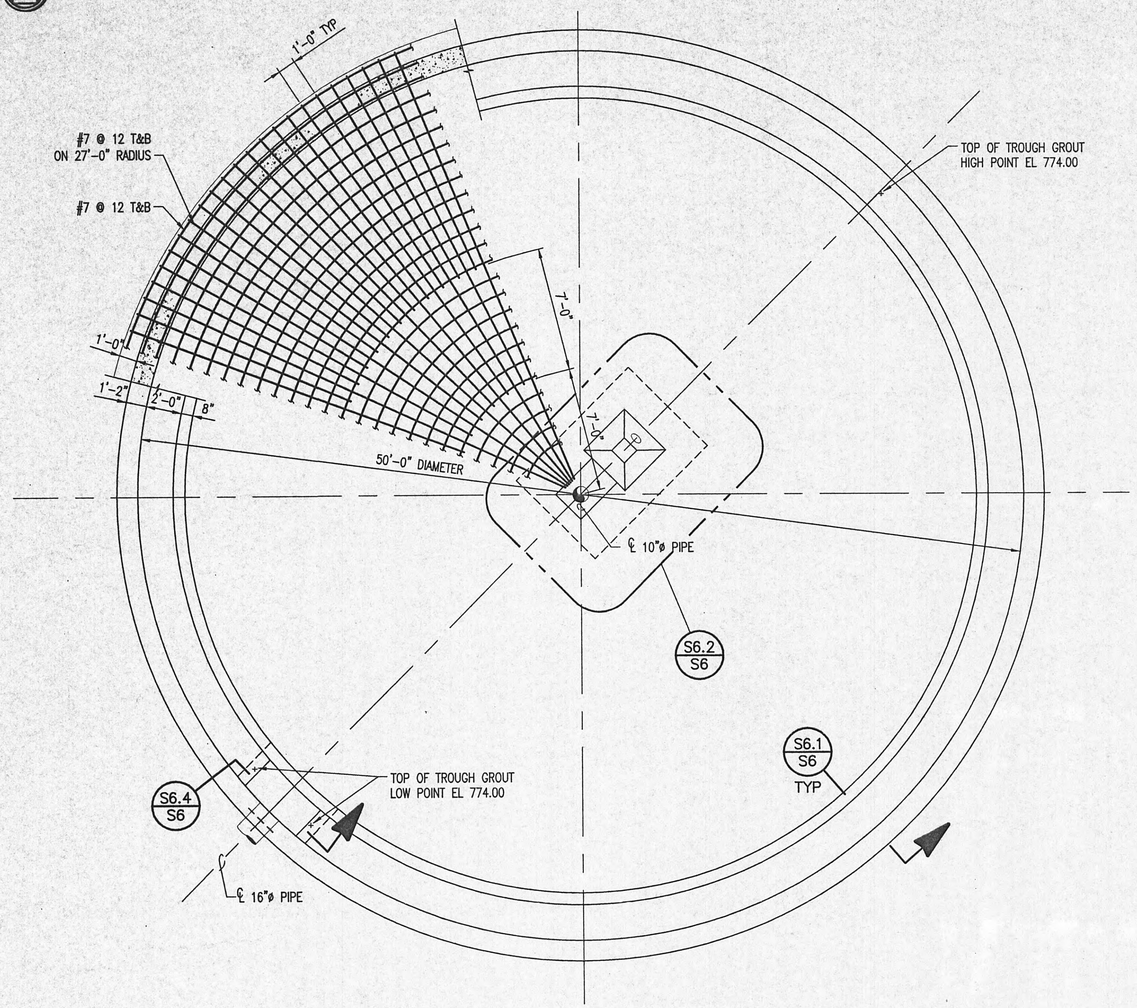
KRISHNAPURA R. NARAYANAN — REGISTERED ENGINEER — NUMBER 092139 — STATE OF TENNESSEE

10-2-02

OXIDATION DITCH
SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

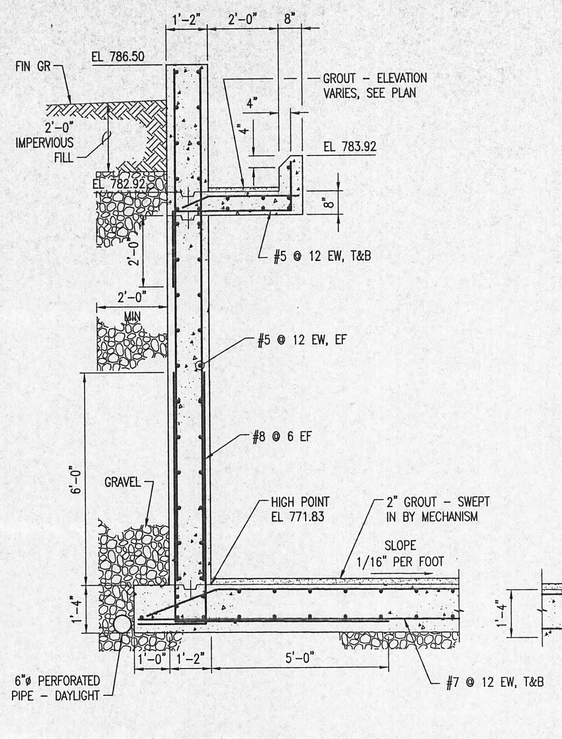
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: DGE	DATE: SEPTEMBER, 2002
DRAWN: DGE	SCALE: AS NOTED
REVIEWED: KRN	SHEET NO. S-5
APPROVED: KRN	

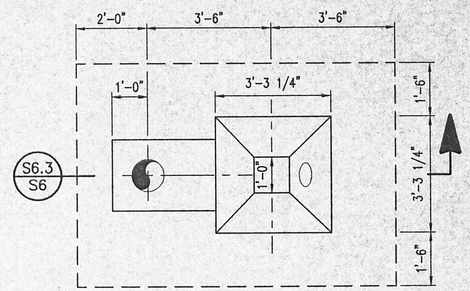


NOTE:
CLARIFIER No. 1 – AS SHOWN.
CLARIFIER No. 2 – SIMILAR.

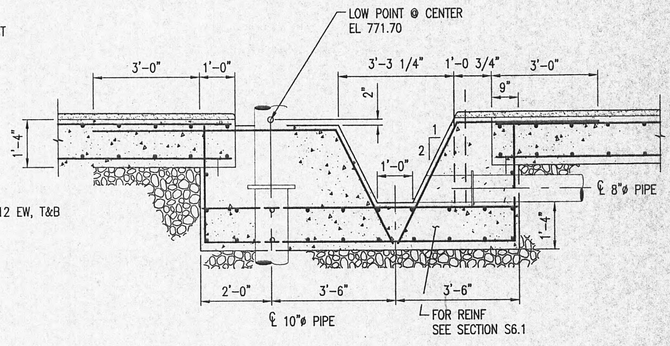
PLAN
SCALE: 1/4" = 1'-0"



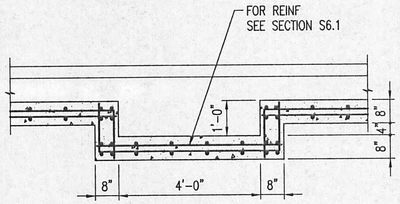
SECTION
SCALE: 1/2" = 1'-0"
S6.1 S6



PLAN AT SLUDGE HOPPER
DETAIL
SCALE: 1/2" = 1'-0"
S6.2 S6



SECTION
SCALE: 1/2" = 1'-0"
S6.3 S6



SECTION
SCALE: 1/2" = 1'-0"
S6.4 S6

NO.	DESCRIPTION	DATE	BY

REVISIONS

KRISHNAPPA R. NARAYANAPPA REGISTERED ENGINEER AGRICULTURE No. 0021135 STATE OF TENNESSEE

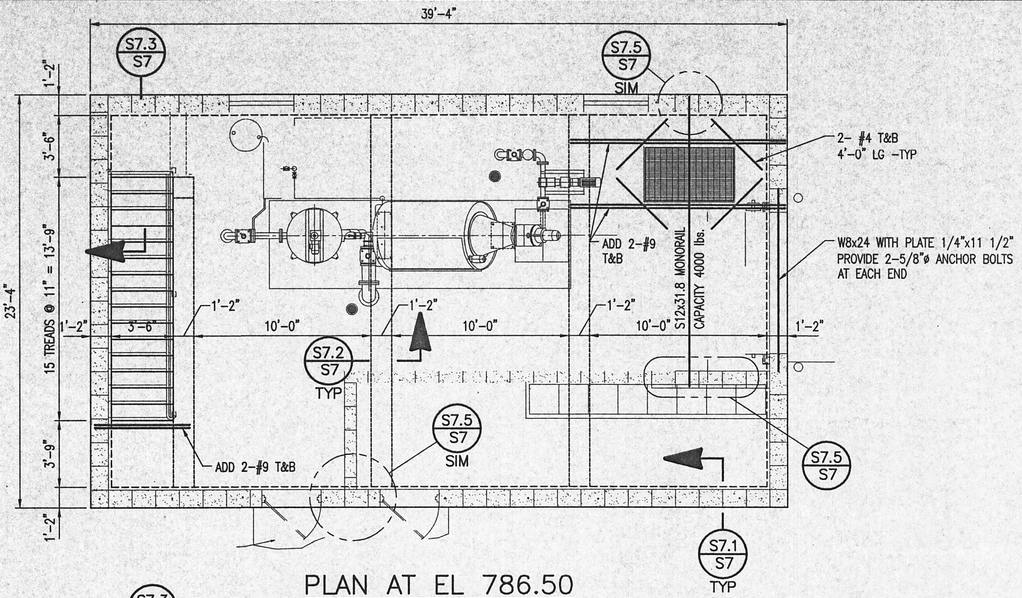
11-2-02

GRW PROJECT NO.7601-10

CLARIFIER
STRUCTURAL PLAN AND SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

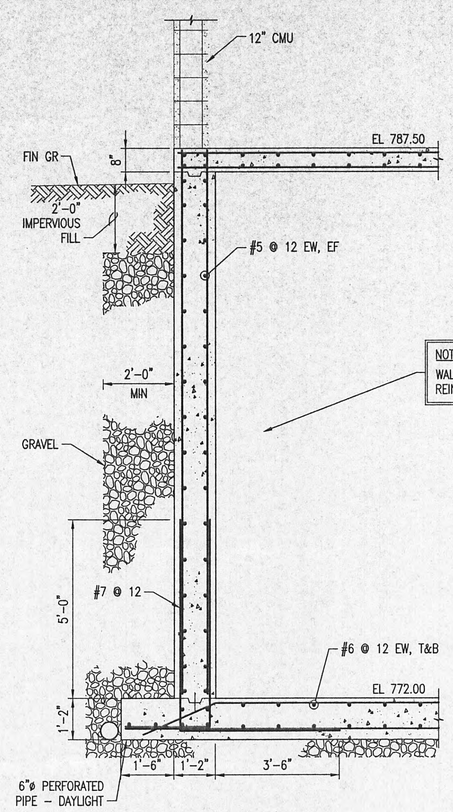
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: DGE	DATE: SEPTEMBER, 2002
DRAWN: DGE	SCALE: AS NOTED
REVIEWED: KRN	SHEET NO. S-6
APPROVED: KRN	



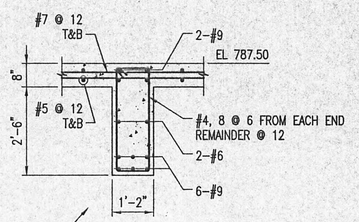
PLAN AT EL 786.50

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



SECTION

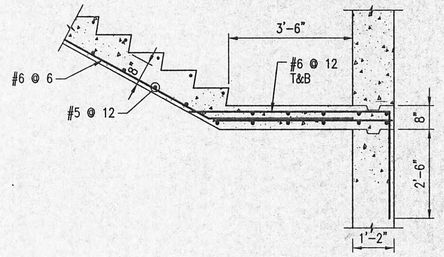
SCALE: 1/2" = 1'-0" — S7.1 S7



NOTE:
WALL AND BEAM REINFORCEMENT TYPICAL

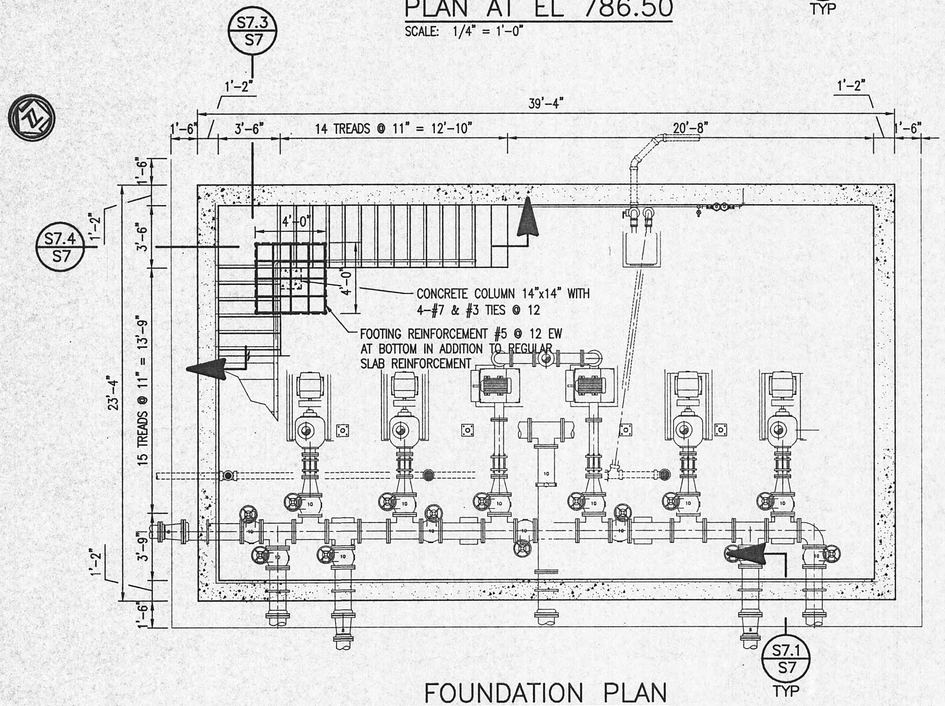
SECTION

SCALE: 1/2" = 1'-0" — S7.2 S7



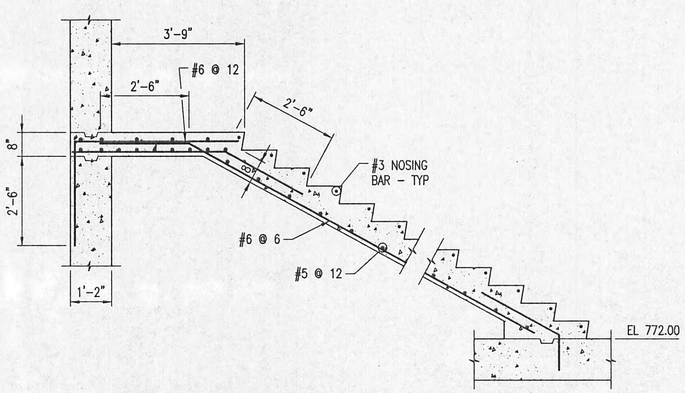
SECTION

SCALE: 1/2" = 1'-0" — S7.3 S7



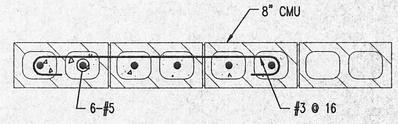
FOUNDATION PLAN

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



SECTION

SCALE: 1/2" = 1'-0" — S7.4 S7



TYPICAL DETAIL

SCALE: 1" = 1'-0" — S7.5 S7

GRW PROJECT NO.7601-10

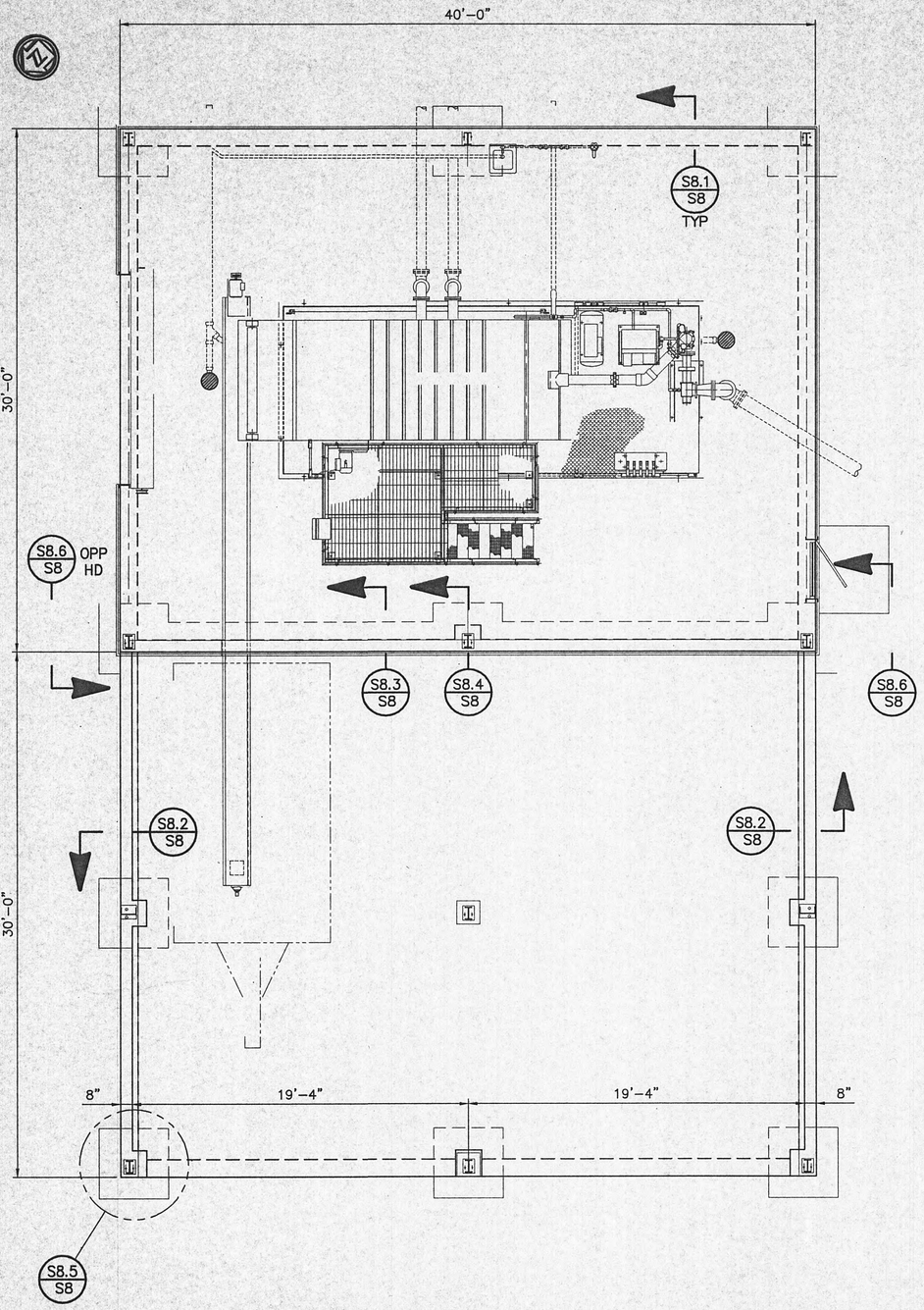
RETURN / WASTE SLUDGE PUMP BUILDING STRUCTURAL PLAN AND SECTIONS WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD - HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

SEETHARAMA R. NARAYANPET — REGISTERED ENGINEER — No. 092198 — STATE OF TENNESSEE — 10-2-02

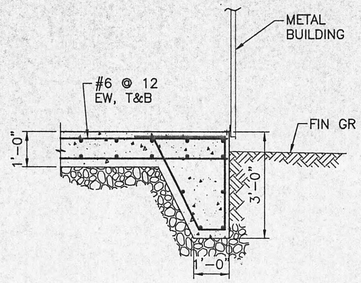
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: DGE	DATE: SEPTEMBER, 2002
DRAWN: DGE	SCALE: AS NOTED
REVIEWED: KRN	SHEET NO. S-7
APPROVED: KRN	

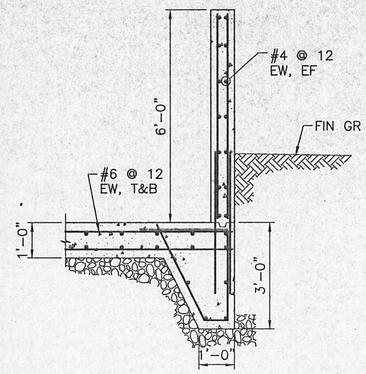


FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

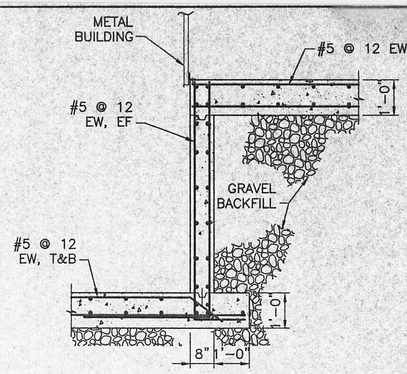
NOTE: FOR LOCATION OF COLUMNS, COORDINATE WITH METAL BUILDING SUPPLIER.



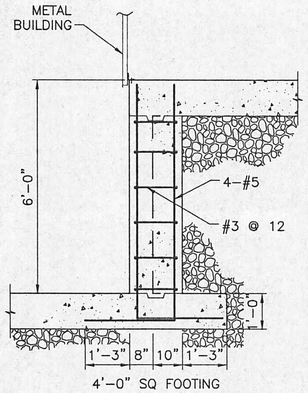
SECTION
SCALE: 1/2" = 1'-0" — S8.1 / S8



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



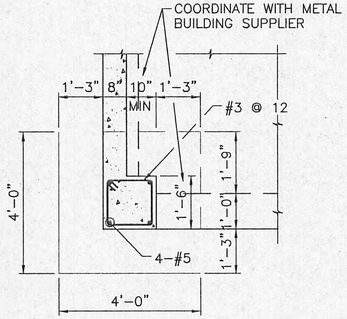
SECTION
SCALE: 1/2" = 1'-0" — S8.3 / S8



4'-0" SQ FOOTING

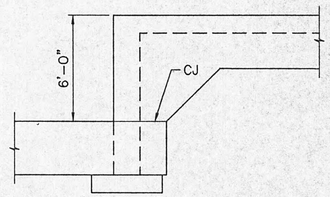
NOTE: WALL AND SLAB REINFORCEMENT NOT SHOWN FOR CLARITY

SECTION
SCALE: 1/2" = 1'-0" — S8.4 / S8



NOTE: TYPICAL ALL COLUMN LOCATIONS

DETAIL
SCALE: 1/2" = 1'-0" — S8.5 / S8



ELEVATION
SCALE: 1/2" = 1'-0" — S8.6 / S8

NO.	DESCRIPTION	DATE	BY

REVISIONS

ERLSHAFTRA R. NARAYANAPPA — REGISTERED ENGINEER — No. 002125 — STATE OF TENNESSEE — 10-2-02

GRW PROJECT NO. 7601-10

BELT FILTER PRESS BUILDING
STRUCTURAL PLAN AND SECTIONS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: DGE	DATE: 8-1-02
DRAWN: DGE	SCALE: AS NOTED
REVIEWED: KRN	SHEET NO. S-8
APPROVED: KRN	

Wed, 02 Oct 2002 - 1:21pm
FILE NAME: U:\3041\08-HARRIMAN WWTP\cadd\working\3041-S8.dwg

INTERIOR LIGHTING

CEILING MOUNTED		WALL MOUNTED
A, b	TWO BY FOUR FOOT FLUORESCENT LIGHTING FIXTURE, A – INDICATES TYPE b – DENOTES SWITCH DESIGNATION	
b a A	TWO BY FOUR FOOT FLUORESCENT LIGHTING FIXTURE WIRED FOR INDIVIDUAL SWITCHING OF INSIDE AND OUTSIDE LAMPS, LETTER INDICATES TYPE	
b a A	EMERGENCY TWO BY FOUR FOOT FLUORESCENT LIGHTING FIXTURE WIRED FOR INDIVIDUAL SWITCHING OF INSIDE AND OUTSIDE LAMPS, LETTER INDICATES TYPE	
A	EMERGENCY TWO BY FOUR FLUORESCENT LIGHTING FIXTURE, LETTER INDICATES TYPE	
C	FLUORESCENT ONE BY FOUR LIGHTING FIXTURE, LETTER INDICATES TYPE	C
C	EMERGENCY ONE BY FOUR FLUORESCENT LIGHTING FIXTURE, LETTER INDICATES TYPE	
D	STRIP FLUORESCENT LIGHTING FIXTURE, LETTER INDICATES TYPE	D
D	8' STRIP FLUORESCENT LIGHTING FIXTURE,	
A	TWO BY TWO FOOT FLUORESCENT LIGHTING FIXTURE, LETTER INDICATES TYPE	
A	EMERGENCY TWO BY TWO FOOT FLUORESCENT LIGHTING FIXTURE LETTER INDICATES TYPE	
A	EMERGENCY SELF CONTAINED LIGHTING UNIT WITH TWO LIGHT FIXTURE HEADS, LETTER INDICATES TYPE	A
OR / OR	EXIT LIGHT WITH ARROW, LETTER INDICATES TYPE X1 – SINGLE FACE X2 – DOUBLE FACE	OR / OR
R	EMERGENCY REMOTE HEAD	R
A	INCANDESCENT OR HID LIGHTING FIXTURE, LETTER INDICATES TYPE	A
A	EMERGENCY INCANDESCENT OR HID LIGHTING FIXTURE, LETTER INDICATES TYPE	A
A	HID LIGHTING FIXTURE WITH QUARTZ RESTRIKE, LETTER INDICATES TYPE	A

INTERIOR CONDUIT AND WIRE

- CONDUIT CONCEALED IN WALL OR CEILING TIC MARKS INDICATE NUMBER OF WIRES. #12 IF NOT OTHERWISE SHOWN. CONDUIT SHALL BE 3/4 " UNLESS OTHERWISE NOTED.
  - GROUND
  - PHASE(S)
  - NEUTRAL
- CONDUIT CONCEALED BEHIND CEILING OR WALL FINISH
- CONDUIT EXPOSED ON WALL OR STRUCTURE
- CONDUIT IN OR UNDER FLOOR SLAB
- LP1-2 — HOMERUN TO PANEL (PANEL LP1 CIRCUIT 2 INDICATED)
- SIGNIFIES MULTIPLE CIRCUITS IN ONE CONDUIT
- EXPLOSION PROOF CONDUIT SEAL
- CONDUIT WITH END CAPPED
- CONDUIT TURNED UP
- CONDUIT TURNED DOWN
- B — BLANKED OFF OUTLET BOX

FIRE ALARM/SUPPRESSION SYSTEM DEVICES

- EOL — END OF LINE RESISTOR
- FCP — FIRE ALARM CONTROL PANEL
- FSA — FIRE ALARM ANNUNICATOR PANEL
- FAC — FIRE ALARM COMMUNICATOR
- X — FIRE ALARM MANUAL STATION
  X= H– HALON
  C– CARBON DIOXIDE
  D– DRY CHEMICAL
  F– FOAM
  W– WET CHEMICAL
  P– MANUAL PULL STATION
- FIRE ALARM SPEAKER-HORN/STROBE LIGHT
- FIRE ALARM HORN OR SPEAKER
- FIRE ALARM BELL/LIGHT
- WATER MOTOR GONG
- FIRE ALARM STROBE LIGHT
- WALL MOUNTED FIRE ALARM STROBE LIGHT
- X — SMOKE DETECTOR
  X= P– PHOTOELECTRIC
  I– IONIZATION
  BT– BEAM TRANSMITTER
  BR– BEAM RECEIVER
- OR — DUCT MOUNTED SMOKE DETECTOR
- ULTRAVIOLET DETECTOR
- X — HEAT DETECTOR, SUBSCRIPT DENOTES THE FOLLOWING
  X= F-FIXED TEMPERATURE
  R-RATE OF RISE
  R/F-COMBINATION RATE OF RISE AND FIXED
- TAMPER SWITCH CONNECTION
- FLOW SWITCH CONNECTION
- DOOR HOLDER
- GAS DETECTOR
- PRESSURE SWITCH
- LEVEL SWITCH
- VALVE WITH TAMPER SWITCH
- MUSHROOM HEAD EMERGENCY PUSHBUTTON SWITCH
- FIREMANS TELEPHONE STATION
- CO_2 FIRE EXTINGUISHER
- DRY CHEMICAL FIRE EXTINGUISHER

INTERIOR POWER EQUIPMENT AND DEVICES

- SINGLE RECEPTACLE
- PUSHBUTTON STATION
- G — GENERATOR SET
- AUTOMATIC TRANSFER SWITCH
- DUPLEX RECEPTACLE, 125 VOLT, 2-POLE, 3 WIRE, NEMA 5-20R GROUNDING TYPE, SUBSCRIPT DENOTES THE FOLLOWING:
  WP : WEATHERPROOF
  GFI : INTEGRAL GROUND FAULT INTERRUPT
  IG : ISOLATED GROUND
  EXP : EXPLOSION PROOF
- (6-60) GFI — SPECIAL PURPOSE RECEPTACLE, NUMBER DENOTES NEMA CONFIGURATION, SUBSCRIPTS DENOTE THE FOLLOWING:
  WP : WEATHERPROOF
  GFI : INTEGRAL GROUND FAULT INTERRUPT
  EXP : EXPLOSION PROOF, PROVIDE TYPE 7 ENCLOSURE
- TRIPLEX RECEPTACLE, SUBSCRIPT DENOTES THE FOLLOWING
  WP : WEATHERPROOF
  GFI : INTEGRAL GROUND FAULT INTERRUPT
- QUADRAPLEX RECEPTACLE, 125 VOLT, 2-POLE, 3 WIRE, NEMA 5-20R GROUNDING TYPE, SUBSCRIPT DENOTES THE FOLLOWING:
  WP : WEATHERPROOF
  GFI : INTEGRAL GROUND FAULT INTERRUPT
- SINGLE SPECIAL PURPOSE RECEPTACLE
- FLOOR MOUNTED RECEPTACLE
- RANGE OUTLET
- J — JUNCTION BOX WALL OR CEILING MOUNTED FLUSH, 4"X4" SQUARE UNLESS OTHERWISE NOTED
- J — JUNCTION BOX SURFACE MOUNTED ON WALL OR STRUCTURE 4"X4" SQUARE UNLESS OTHERWISE NOTED
- P — PULL BOX-SIZE AS INDICATED ON DRAWINGS
- (1) (3) (5) (3) — MULTI-OUTLET SURFACE RACEWAY, SIZE AND NUMBER OF RECEPTACLE AS SCHEDULED. NUMBER INDICATES CIRCUIT NUMBER
- W — WIREWAY
- C — CABLE TRAY
- B — PLUGIN OR FEEDER BUS
- WALL MOUNTED SINGLE FACE CLOCK
- WALL MOUNTED DOUBLE FACE CLOCK
- $X — WALL SWITCH 120-277 VOLT, 20 AMP, SINGLE POLE SUBSCRIPT (X) DENOTES OTHERWISE SWITCH DESIGNATIONS DESIGNATION:

X=	
EP : EXPLOSIONPROOF	2 : DOUBLE POLE
M : MOTOR RATED WITH OVERLOAD PROTECTION	3 : THREE WAY
T : TIMER	4 : FOUR WAY
D,600 : DIMMER SWITCH, 600 WATT NOTED	K : KEY OPERATED
a : SWITCHING DESIGNATION	P : PILOT LIGHT
L : LOW VOLTAGE	D : DOOR SWITCH
	WP : WEATHERPROOF

- M OR 5 — MOTOR CONNECTION (5 HP INDICATED)
- SWITCHBOARD
- PANELBOARD, SURFACE MOUNTED
- PANELBOARD, RECESSED
- DISCONNECT SWITCH
  - NON-FUSED
  - FUSED
- 3/30-15RK5/3R
  - NEMA DESIGNATION
  - FUSE SIZE, UL CLASS (FUSED SWITCH ONLY)
  - SWITCH AMP RATING
  - NUMBER OF POLES
- ENCLOSED CIRCUIT BREAKER
- 3/100-22K/3R
  - NEMA DESIGNATION
  - AIC RATING
  - TRIP RATING (AMPS)
  - NUMBER OF POLES
- MOTOR CONTROLLER
- 31/R
  - NOTATION WHEN OTHER THAN ACROSS THE LINE
    RVA – REDUCED VOLTAGE AUTO TRANSFORMER
    RVR – REDUCED VOLTAGE PRIMARY RESISTER
    RVW – REDUCED VOLTAGE WHY/DELTA
    RVP – REDUCED VOLTAGE PART WINDING
    R – REVERSIBLE
  - STARTER NEMA SIZE
  - NUMBER OF POLES
- COMBINATION STARTER/FUSED DISCONNECT
- 31/60-30RK5/3R
  - NEMA DESIGNATION
  - FUSE RATING AND UL CLASS
  - SWITCH AMP RATING
  - STARTER NEMA SIZE
  - NUMBER OF POLES
- COMBINATION STARTER/CIRCUIT BREAKER
- 31/60-22K/3R
  - NEMA DESIGNATION
  - AIC RATING
  - TRIP AMP RATING
  - STARTER NEMA SIZE
  - NUMBER OF POLES
- VARIABLE FREQUENCY CONTROLLER
- 3/15-V/3R
  - NEMA DESIGNATION
  - CONTROLLER TYPE:
    H – CONSTANT HP
    C – CONSTANT TORQUE
    V – VARIABLE TORQUE
  - HP RATING
  - NUMBER OF POLES
- MCD — MAGNETIC CONTACT, DOOR MOUNTED
- MCW — MAGNETIC CONTACT, WINDOW MOUNTED
- M — PASSIVE INFRARED MOTION DETECTOR, ARROW DENOTES CURTAIN DIRECTION

- ETM — ELAPSED TIME METER
- TM — TIMER MOTOR
- R OR CR# — RELAY
- SV — SOLENOID VALVE CONNECTION
- LS — LIMIT SWITCH CONNECTION
- T — THERMOSTAT CONNECTION
- PE — PNEUMATIC/ELECTRIC CONNECTION
- PC — PHOTOCELL
- PS — PRESSURE SWITCH CONNECTION

EXTERIOR

EXISTING		NEW
Ø 35/3	POLE, LENGTH AND CLASS AS INDICATED	Ø 35/3
8M-20	DOWN GUY-NOTED AS 8000 POUND STRENGTH. ANCHOR AT 20 FEET FROM POLE	8M-20
3-25	TRANSFORMER BANK POLE MOUNTED-SHOWN AS THREE PHASE 25 KVA TRANSFORMERS	3-25
25	SINGLE PHASE TRANSFORMER, POLE MOUNTED 25 KVA NOTED	25
T 100	PAD MOUNTED TRANSFORMER INDICATED AS 100 KVA	T 100
	FUSE CUTOUT WITH FUSE SIZE AND TYPE NOTED	
	DISCONNECT SWITCH OR SECTIONALIZING SWITCH	
4#6 4160V EOP	OVERHEAD PRIMARY-SHOWN AS 4-#6 CONDUCTORS, 4160V	3 PHASE 4#6 4160V OHP SINGLE PHASE
EUP	UNDERGROUND PRIMARY	UP
EOS	OVERHEAD SECONDARY	OHS
EUS	UNDERGROUND SECONDARY	US
EUT	UNDERGROUND TELEPHONE CONDUIT	UT
EOT	OVERHEAD TELEPHONE	OT
EUC	UNDERGROUND COMMUNICATION	UC
	POLE MOUNTED LIGHTING FIXTURE	
EG	BURIED GROUND WIRE	G
EG	GROUND WIRE IN OR UNDER FLOOR SLAB	G
EG	GROUND WIRE EXPOSED	G
	GROUND CONNECTION OR EQUIPMENT BOND	
EG	ROOF CONDUCTOR	G
10-3/4 W	GROUND ROD. SIZE AS NOTED 10 FT. LENGTH AND 3/4 INCHES DIAMETER NOTED (W DENOTES INSTALLATION IN WELL)	10-3/4 W
24	LIGHTNING ROD, (24 INCHES HIGH NOTED)	24
60/2	MAST TYPE LIGHTNING PROTECTION SYSTEM. 60' CLASS 2 POLE NOTED	60/2
XXX	MANHOLE, SUBSCRIPT DENOTES THE FOLLOWING XXX= EMH=ELECTRICAL TMH=TELEPHONE CMH=COMMUNICATIONS	
	WALLPACK EXTERIOR LIGHT FIXTURE	

COMMUNICATION

- ±54' — TELEPHONE OUTLET. SUBSCRIPT DENOTES THE FOLLOWING
  P – PAY PHONE
  ±54"-WALL MOUNTED @ 54" A.F.F.
- COMBINATION VOICE, DATA & VIDEO, 1 EACH
- COMBINATION VOICE & DATA OUTLET, 1 EACH
- 1D — ONE DATA OUTLET
- 2D — TWO DATA OUTLETS
- 3D — THREE DATA OUTLETS
- 4D — FOUR DATA OUTLETS
- V D T — ONE VOICE, DATA & VIDEO COMBINED
- FLOOR MOUNTED TELEPHONE OUTLET (CAN BE APPLIED TO DATA OUTLET ALSO)
- S — SPEAKER, WALL MOUNTED
- S — SPEAKER,CEILING MOUNTED
- FIXED CAMERA
- PAN/TILT/ZOOM CAMERA
- X XX — TV OUTLET– SUBSCRIPT DENOTES MOUNTING HEIGHT
  XX=72" OR 24" AFF
  X : V=VOICE
  D=DATA
  T=VIDEO(TV)
- B — CLASSROOM BELL
- OR C — INTERCOM CALL STATION

ABBREVIATIONS

A, AMP – AMPERES
AF – AMPERE FRAME
AFF – ABOVE FINISHED FLOOR
AFG – ABOVE FINISHED GRADE
AHU – AIR HANDLING UNIT
AL – ALUMINUM
AT – AMPERE TRIP
ATRV – AUTOTRANSFORMER REDUCED VOLTAGE
ATS – AUTOMATIC TRANSFER SWITCH
AWG – AMERICAN WIRE GAUGE
BLDG – BUILDING
C – CONDUIT
CB – CIRCUIT BREAKER
CCTV – CLOSED CIRCUIT TELEVISION
CKT – CIRCUIT
C/L – CENTERLINE
CLG – CEILING
COND – CONDUCTOR
CONN – CONNECTION
CTL – CONTROL
CU – COPPER
DACT – DIGITAL ALARM COMMUNICATING TRANSMITTER
DB – DIRECT BURIAL
DET – DETAIL
DP – DISTRIBUTION PANEL
DISC – DISCONNECT
DN – DOWN
DP – DISTRIBUTION PANEL
DPST – DOUBLE POLE SINGLE THROW
EA – EACH
EC – EMPTY CONDUIT
ELEC – ELECTRICAL
ELEV – ELEVATOR
EM, EMERG – EMERGENCY
EMT – ELECTRICAL METALLIC TUBING
EOL – END OF LINE
EUH – ELECTRIC UNIT HEATER
EWC – ELECTRIC WATER COOLER
EWH – ELECTRIC WATER HEATER
EX – EXISTING
F – FUSE
FLA – FULL LOAD AMPS
FLEX – FLEXIBLE
FLR – FLOOR
FLUOR – FLUORESCENT
FOR – FOWARD-OFF-REVERSE
FTG – FITTING
FVNR – FULL VOLTAGE NON-REVERSING
GALV – GALVANIZED
G, GND – GROUND
GFI – GROUND FAULT INTERRUPTING
HID – HIGH INTENSITY DISCHARGE
HP – HORSEPOWER
HT, H – HEIGHT
IG – ISOLATED GROUND
IN – INCH
INC – INCANDESCENT
J-BOX, JB – JUNCTION BOX
KCMIL – 1000 CIRCULAR MILS
KVA – KILOVOLT AMPS
KVAF – KILOVOLT AMPS REACTIVE
KW – KILOWATT
KWH – KILOWATT HOUR
LA – LIGHTNING ARRESTER
LTG – LIGHTING
LV – LOW VOLTAGE
LVDT – LINEAR VARIABLE DIFFERENTIAL TRANSFORMER
MAU – MAKEUP AIR UNIT
MAX – MAXIMUM
MCB – MAIN CIRCUIT BREAKER
MCC – MOTOR CONTROL CENTER
MCP – MOTOR CIRCUIT PROTECTOR
MDP – MAIN DISTRIBUTION PANEL
MFR – MANUFACTURER
MG – MOTOR GENERATOR
MH – MANHOLE, METAL HALIDE, MOUNTING HEIGHT
MIC – MICROPHONE
MIN – MINIMUM
MLO – MAIN LUGS ONLY
MTD – MOUNTED
MV – MEDIUM VOLTAGE
N/A – NOT APPLICABLE
NEC – NATIONAL ELECTRICAL CODE
NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NESC – NATIONAL ELECTRICAL SAFETY CODE
NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
NIC – NOT IN CONTRACT
NTS – NOT TO SCALE
NO – NORMALLY OPEN, NUMBER
OH – OVERHEAD
OL – OVERLOAD
P – POLE
PB – PULL BOX, PUSH BUTTON
PH – PHASE
PNL – PANEL
POC – POINT OF CONNECTION
PS – PULL SWITCH OR PRESSURE SWITCH
QTY – QUANTITY
REF – REFERENCE, REFER
RCPT – RECEPTACLE
RGS – RIGID GALVANIZED STEEL
SCH – SCHEDULE
SMR – SURFACE METAL RACEWAY
S/N – SOLID NEUTRAL
SQ FT – SQUARE FOOT
SS – STAINLESS STEEL
STD – STANDARD
SW – SWITCH
SYS – SYSTEM
TEL – TELEPHONE
TM – THERMAL MAGNETIC
TV – TELEVISION
TVSS – TRANSIENT VOLTAGE SURGE SUPPRESSER
TYP – TYPICAL
UG – UNDERGROUND
UH – UNIT HEATER
V – VOLTAGE
VFD – VARIABLE FREQUENCY DRIVE
W – WIRE
W/ – WITH
W/O – WITH OUT
WP – WEATHERPROOF
WT – WEIGHT
X'FMR, XFMR – TRANSFORMER

- LIST OF ABBREVIATIONS, ACRONYMS, AND SYMBOLS IS A STANDARD LIST. NOT ALL SYMBOLS ARE USED ON THIS PROJECT.
- SYMBOLS USED BUT NOT LISTED HERE SHALL BE DEFINED ELSEWHERE IN THE BID DOCUMENTS. IF NOT, CONTACT THE ENGINEER FOR CLARIFICATION PRIOR TO BID OPENING.

A — KEY NOTE CALL OUT

CONTROLS

- A — AMMETER
- DM — DAMPER MOTOR ACTUATOR, SPRING RETURN
- EF — EXHAUST FAN MOTOR
- V — VOLTMETER
- W — WATTMETER
- WH — WATTHOUR METER
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- TVSS — TRANSIENT VOLTAGE SURGE SUPPRESSOR
- TS OR — LIGHTNING ARRESTOR (CROWBAR STYLE)
- CAPACITOR
- GROUND
- TRANSFORMER
- RELAY CONTROLS (NORMALLY OPEN)
- RELAY CONTROLS (NORMALLY CLOSED)
- ---K--- KEY INTERLOCK
- THERMAL OVERLOAD PROTECTION
- OR — FUSE
- SWITCH, NONFUSED
- FUSED SWITCH
- DOUBLE THROW SWITCH OR TRANSFER SWITCH
- FLOAT SWITCH
- THERMOSTATIC SWITCH
- PRESSURE SWITCH
- LIMIT SWITCH OR TORQUE SWITCH
- DOT INDICATES CONNECTION OF WIRES
- 1 2 — TERMINALS FOR WIRE CONNECTIONS FROM REMOTE DEVICE
- OR — PILOT LIGHT IN CONTROL CIRCUIT
- M — MOTOR STARTER COIL
- AUTOTRANSFORMER
- TIMER CLUTCH OR SOLENOID
- CIRCUIT BREAKER GENERIC
- MAGNETIC ONLY CIRCUIT BREAKER (SINGLE POLE SHOWN)
- THERMAL-MAGNETIC CIRCUIT BREAKER (SINGLE POLE SHOWN)
- BATTERY
- GF — GROUND FAULT PROTECTED BREAKER
- STOP START M — START-STOP PUSHBUTTON (NON-MAINTAINED CONTACT)
- OFF ON — ON-OFF PUSHBUTTON (MAINTAINED CONTACT)
- H O A — 3 POSITION SELECTOR SWITCH
  H O A – HAND/OFF/ON AUTOMATIC
  L O R – LOCAL/OFF/REMOTE

MISCELLANEOUS

DETAIL CONVENTIONS

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

C5.2 / C3
- SHEET WHERE DETAIL IS DRAWN
- DETAIL NUMBER
- SHEET WHERE DETAIL OCCURS
- C– CIVIL/SANITARY
- A– ARCHITECTURAL
- S– STRUCTURAL
- M– MECHANICAL
- P– PLUMBING
- E– ELECTRICAL

DETAIL IN PLAN

GRW PROJECT NO. 7601-10

ELECTRICAL
SYMBOL SHEET
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY

REVISIONS

MICHELLE HOWLETT REGISTERED ENGINEER AGRICULTURE COMMERCE NO. 00105945 STATE OF TENNESSEE
10/2/02

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED:	DATE:
GLW	8-1-02
DRAWN:	SCALE:
MKC	AS NOTED
REVIEWED:	SHEET NO.
GLW	E-1
APPROVED:	
TMH	

Tue, 01 Oct 2002 – 4:24pm
FILE NAME: U:\3041\08-HARRIMAN WWTP\cadd\working\3041-E1.dwg

NEW UTILITY PUMP STATION SEE SHEET _

NEW MANHOLE SEE SHEET _

NEW FENCE

TOP SLAB 774.5

10" C.S. DRIVE

3#6, 1#10, 1"C

NEW SLUDGE BELT PRESS BLDG. SEE SHEET __

NEW 12' C. STONE DRIVE

EX. DRIVE EXPANDED & RESURFACED W/ C. STONE

GATE

15KV METAL ENCLOSED SWITCH GEAR

EXIST. DRAIN # OUTLET EL. 779

ABAND. PUMP STATION

2#12, 3/4"C 3#2, 1#8, 1 1/4"C

LE-6

NEW OXIDATION DITCHES SEE SHEET C-8

NEW MANHOLE SEE SHEET _

NEW CLARIFIERS SEE SHEET C-13

NEW SCUM PUMP/WETWELL SEE SHEET _

NEW SLUDGE RETURN/ WASTE PUMP STATION SEE SHEET C-14

2-4"C, 3#2, 15kV SEE DUCT BANK DETAIL SHT. E13 DB BB

LE-7

2-3/4"C, 3#8, 1#10 EACH ONE
2-3/4"C, 6#12 EACH ONE

SURGE T.

E. PANEL

EXISTING T1-EPS PAD MOUNTED TRANSFORMER

EXISTING CHLORINE BLD'G.

CLARIFIER

EXISTING DIGESTER

2-3/4"C, 4#10, EACH ONE

MCC-RWB

2 EXISTING SLUDGE BEDS SHALL REMAIN IN OPERATION

3#10, 3/4"C (1#16 STR, 3/4"C)

4"C, 3#2, 15kV SEE DUCT BANK DETAIL SHT. E13 DB AA

NEW WASTE PUMPS IN DIGESTER PIPING RM. SEE SHEET C-17

NEW FINE SCREEN & GRIT CLASSIFIER SEE SHEET C-5

NEW INFLUENT FLOW SPLITTER BOX SEE SHEET C-7

EXIST. UTILITY P.S.

EXISTING CONTROL BLD'G.

EXISTING TRANSFORMER T1-SBR/T2-SBR

EXISTING SBR UNIT

EXISTING SBR UNIT

DITCH EL. 786.88

EXISTING TVA 6.0 KV

EXISTING TVA POWER LINES

NEW INTERMEDIATE FLOW METER PIT

EXISTING SBR UNITS TO BE CONVERTED TO EQUALIZATION BASINS SEE SHEET _

GRAPHIC SCALE
0
1" = 30'

MAP LEGEND

- 780 — EXISTING CONTOUR
- 780.5 EXISTING SPOT ELEVATION
- 780.5 PROPOSED SPOT ELEVATION
- 780 PROPOSED CONTOUR
- EXISTING DRIVEWAY
- NEW DRIVEWAY
- NEW STRUCTURE
- EXISTING POWER POLE
- EXISTING VALVE
- EXISTING FENCE
- NEW FENCE
- BENCH MARK

NOTES:

1. EXISTING NEMA 4x FUSED DISCONNECT SWITCH TO BE REMOVED AND RETURNED TO OWNER.
2. CONTRACTOR SHALL INSTALL A NEMA 4X JUNCTION BOX FOR SPLICING OF 350 kcmil CONDUCTOR FEEDING THE EXISTING FUSED DISCONNECT SWITCH.
3. NEW 350 kcmil COPPER CONDUCTORS IN A 2 1/2" CONDUIT TO NEW 480V, PANELBOARD C.

   NEW PAD MOUNTED TRANSFORMERS FEEDING MCC-RWB. SEE SHT. E13 FOR CONCRETE PAD DETAIL.
4. NEW EXTERIOR POLE MOUNTED LIGHTING. MOUNT FIXTURES AT 40'. SEE LIGHT FIXTURE SCHEDULE FOR DETAILS.
5. FIXTURE TO BE CONTROLLED BY PHOTOCELL. SEE SHT. E13 FOR MOUNTING DETAIL.

   CONTRACTOR SHALL INSTALL TWO NEW PRIMARY FEEDS. POUR NEW CONCRETE SLAB TO MATCH EXISTING SLAB FOR MOUNTING OF NEW SWITCH GEAR. SEE SHT. E13 FOR DETAIL.
6. EXISTING CHLORINE BUILDING.

   3/4"C WITH #16 STP TO CHLORINATOR FROM RAS/WAS ELECTRICAL ROOM.
7. SEE SHT. C-23 FOR MOUNTING OF ELECTRICAL EQUIPMENT.
8. NEW CONDUITS FOR EQUALIZATION BASIN BLOWER CONTROLS. 2-3/4" CONDUITS WITH 2 FLOAT CABLES IN EACH CONDUIT.
9.
10.

ELECTRICAL SITE PLAN

SCALE: 30'=1"

GRW PROJECT NO. 7601-10

ELECTRICAL SITE PLAN

WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY

REVISIONS

MICHELE K. HOWARD — REGISTERED ENGINEER — AGRICULTURE — COMMERCE — No. 001059 — STATE OF TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: GLW	DATE: 8-1-02
DRAWN: MKC	SCALE: AS NOTED
REVIEWED: GLW	SHEET NO. E-2
APPROVED: TMH	

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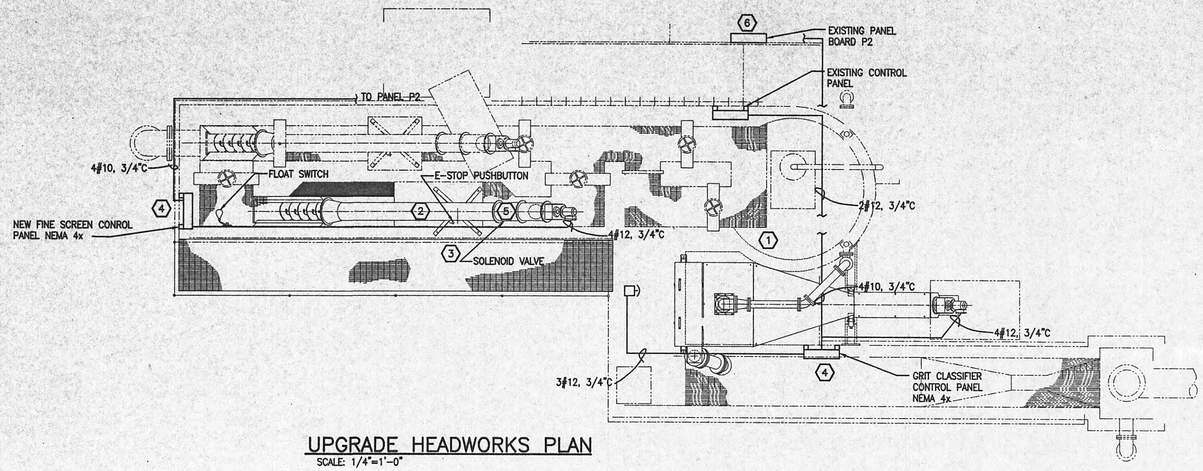
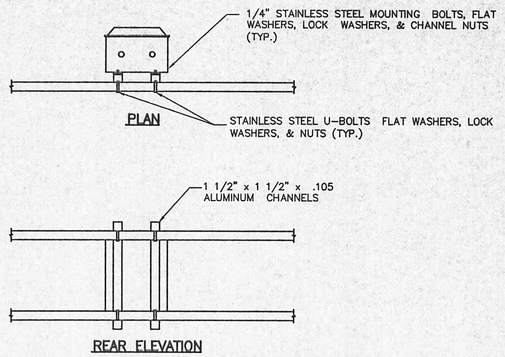
FILE NAME: U:\3041\08-HARRIMAN WWTP\cadd\working\3041-E2.dwg



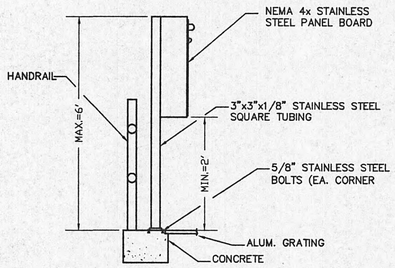
UPGRADE HEADWORKS PLAN

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



HANDRAIL MOUNTED EQUIPMENT

NOT TO SCALE



TYPICAL PANEL MOUNTING-HEADWORKS

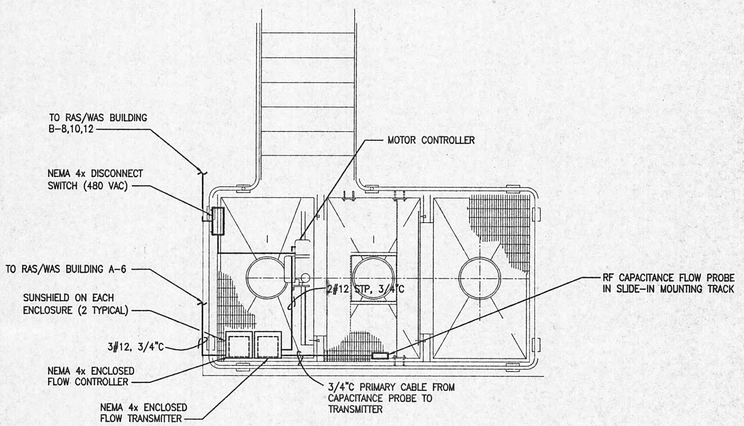
SCALE: 3/4"=1'-0"

GENERAL NOTES:

1. AREAS SHOWN (HEADWORKS & SPLITTER BOX) ARE CONSIDERED A CLASS 1, DIVISION 2 AREA. CLASS 1, DIVISION 2 AREA EXTENDS TO 18" ABOVE TOP OF TANK WALL AND 18" BEYOND EXTERIOR SIDE WALL. ANY EQUIPMENT LOCATED WITHIN THE CLASSIFIED AREA SHALL BE UL LISTED FOR THAT AREA.
2. CONDUITS ENTERING HAZARDOUS LOCATIONS SHALL HAVE SEAL FITTING BEFORE ENTRANCE INTO AREA. CONDUITS LEAVING HAZARDOUS LOCATIONS SHALL HAVE SEAL FITTING AFTER LEAVING HAZARDOUS AREA.

NOTES:

1. REMOVE ALL ELECTRICAL CONNECTIONS TO EXISTING GRIT CLASSIFIER EQUIPMENT. REMOVE CONDUITS AND WIRING.
2. CONTRACTOR SHALL WIRE E-STOP PUSHBUTTON TO NEW FINE SCREEN CONTROL PANEL. 2#12, 3/4"C.
3. CONTRACTOR SHALL WIRE 120VAC SOLENOID VALVE TO NEW FINE SCREEN CONTROL PANEL. 3#12, 3/4"C.
4. BOTTOM OF CONTROL PANEL TO BE MOUNTED 24" MINIUM ABOVE GRATING.
5. CONTRACTOR SHALL CONNECT HEAT TRACE WIRING AND THERMOSTAT. 3#12, 3/4"C.
6. CONTRACTOR SHALL INSTALL TWO 30AMP/3P, 480V CIRCUIT BREAKER TO EXISTING PANEL P2 TO FEED NEW EQUIPMENT.



ADJUSTABLE WEIR SPLITTER BOX

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

NO.	DESCRIPTION	DATE	BY

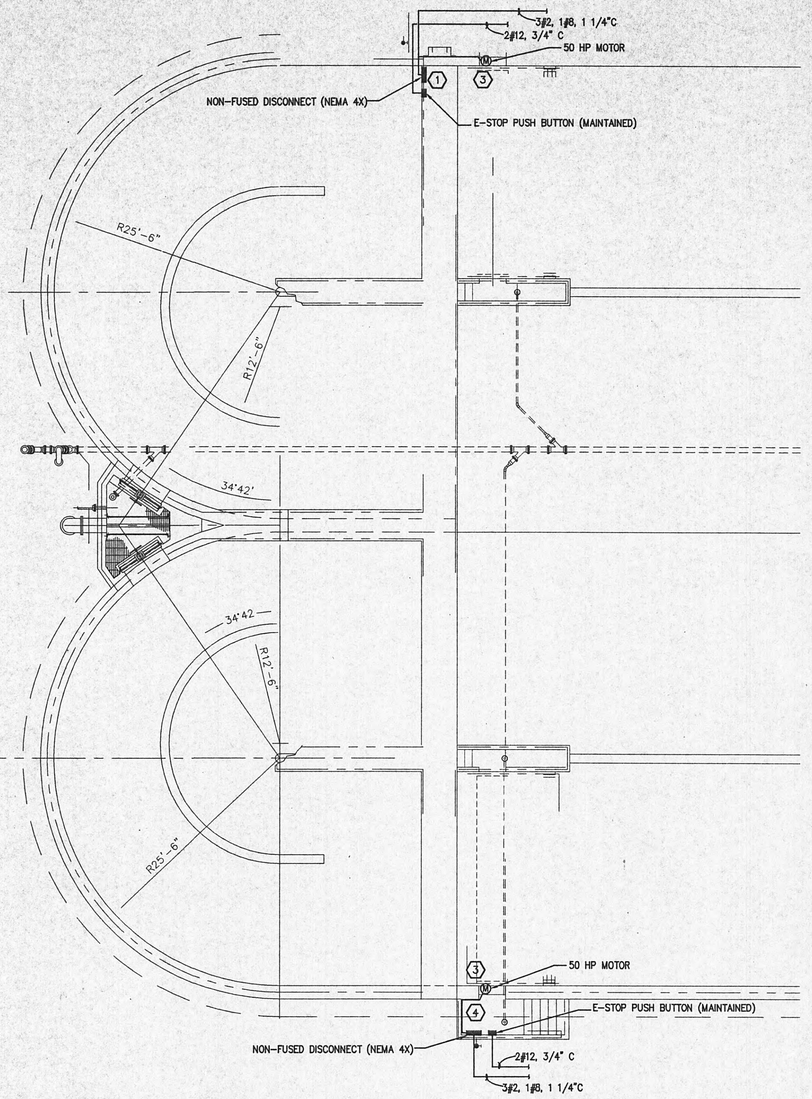
REVISIONS

GRW PROJECT NO. 7601-10

NEW HEADWORKS FLOOR PLAN & SPLITTER STRUCTURE WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD - HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: GLW	DATE: 8-1-02
DRAWN: MKC	SCALE: AS NOTED
REVIEWED: GLW	SHEET NO. E-3
APPROVED: TMH	



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

GENERAL NOTES:

1. AREA SHOWN IS CONSIDERED A CLASS 1 DIVISION 2 AREA. CLASS 1, DIVISION 2 AREA EXTENDS TO 18" ABOVE TOP OF TANK WALL AND 18" BEYOND EXTERIOR SIDE WALL. ANY EQUIPMENT LOCATED WITHIN CLASSIFIED AREA SHALL BE UL LISTED FOR THAT AREA.
2. NON-FUSED DISCONNECTS AND EMERGENCY PUSH BUTTONS SHOWN ON PAGE SHALL BE RATED NEMA 4X.
3. CONDUITS ENTERING HAZARDOUS LOCATIONS SHALL HAVE SEAL FITTING BEFORE ENTRANCE INTO AREA. CONDUITS LEAVING HAZARDOUS LOCATIONS SHALL HAVE SEAL FITTING INSTALLED AFTER LEAVING HAZARDOUS AREA.

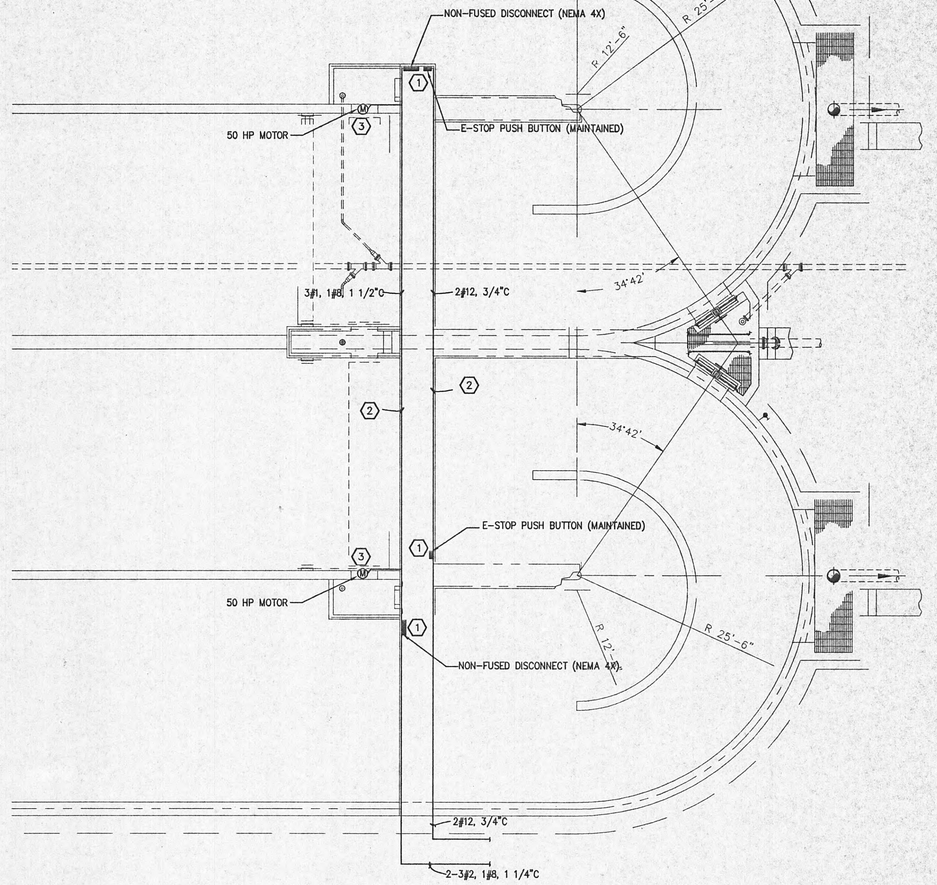
NOTES:

(1) MOUNT EQUIPMENT 18" ABOVE OXIDATION DITCH WALL.

(2) CONDUIT TO BE RAN UNDERNEATH WALKWAY. PROVIDE SEAL FITTINGS AS NEEDED.

(3) MOTORS INSTALLED WITHIN THE CLASS 1, DIVISION 2 AREA SHALL MEET THE REQUIREMENTS NEC 501.8 (B). OVER TEMPERATURE DEVICES (16220.2.02.N) HAVE INTENTIONALALY NOT BEEN INCLUDED IN THE CONTROL CIRCUIT TO MEET THESE REQUIREMENTS.

(4) MOUNT DISCONNECT AND EMERGENCY PUSH BUTTON MORE THAN 18" AWAY FROM CONCRETE SPLASH WALL.



NO.	DESCRIPTION	DATE	BY

REVISIONS

MICHELLE KOWALSKI — REGISTERED PROFESSIONAL ENGINEER — AGRICULTURE — COMMERCE — No. 0010596 — STATE OF TENNESSEE

10/2/02

GRW PROJECT NO. 7601-10

OXIDATION DITCH PLAN
ELECTRICAL PLAN
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: GLW	DATE: 8-1-02
DRAWN: MKC	SCALE: AS NOTED
REVIEWED: GLW	SHEET NO. E-4
APPROVED: TMH	

Tue, 01 Oct 2002 – 4:26pm
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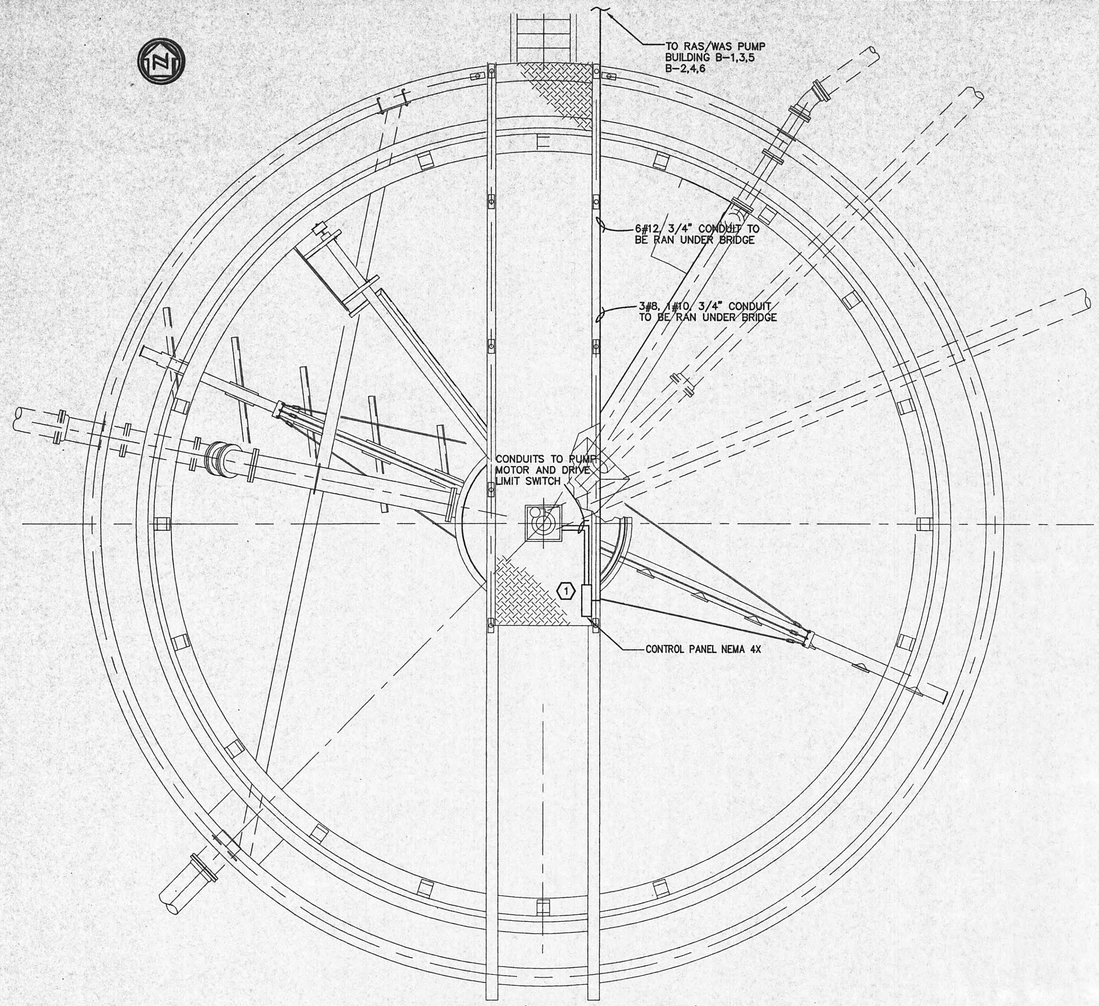
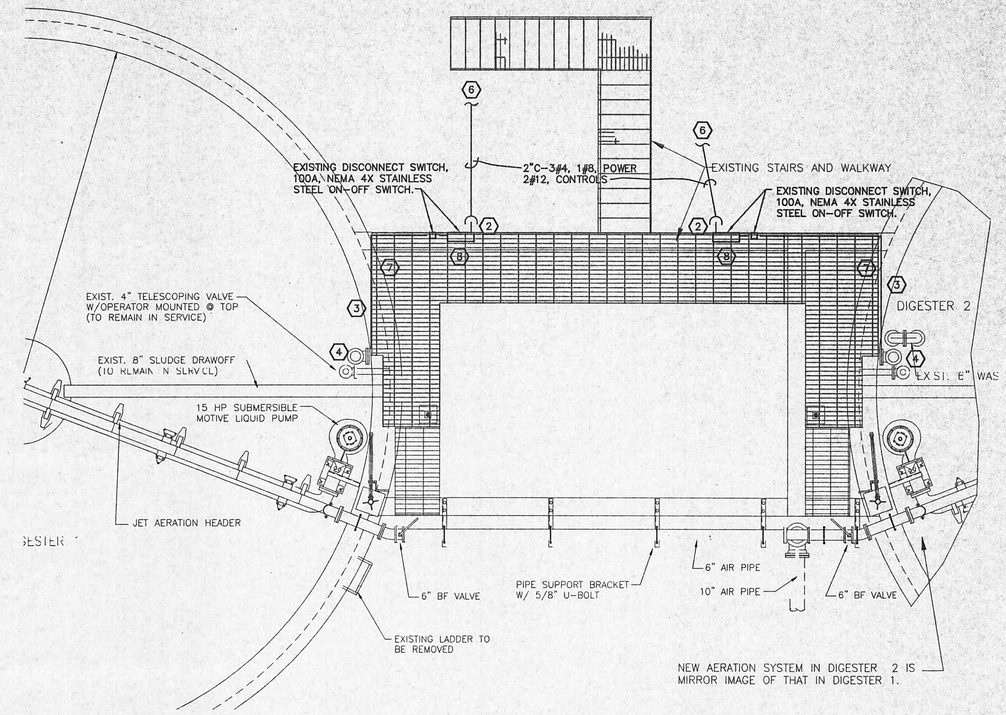


CLARIFIER (TYPICAL OF TWO)

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



DIGESTER ROOF PLAN

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

GENERAL NOTES:

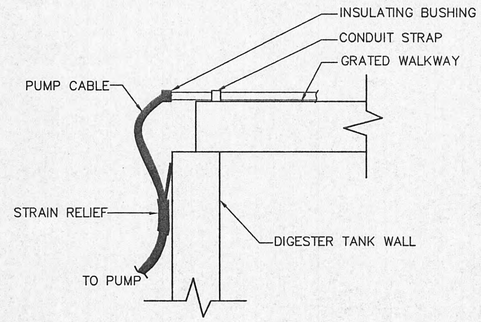
1. AREA SHOWN IS CONSIDERED A CLASS 1 DIVISION 2 AREA. CLASS 1, DIVISION 2 AREA EXTENDS TO 18" ABOVE TOP OF TANK WALL AND 18" BEYOND EXTERIOR SIDE WALL.
2. CONDUITS ENTERING HAZARDOUS LOCATIONS SHALL HAVE SEAL FITTING BEFORE ENTRANCE INTO AREA. CONDUITS LEAVING HAZARDOUS LOCATIONS SHALL HAVE SEAL FITTING INSTALLED AFTER LEAVING HAZARDOUS AREA.

NOTES:

1. CONTROL PANEL TO BE MOUNTED 18" ABOVE TOP OF TANK WALL TO AVOID CLASS 1, DIVISION 2 HAZARDOUS LOCATION. PANEL SHALL BE RATED NEMA 4X.
2. EXISTING DISCONNECT, ON-OFF SWITCH AND WIRING BACK TO CONTROL BUILDING (MCC-SBR) TO REMAIN.
3. CONTRACTOR SHALL INSTALL PUMP POWER CABLE IN 1 1/4" CONDUIT TO JUNCTION BOX. CONTRACTOR SHALL VERIFY LENGTH NEEDED FOR PUMP POWER CABLE.

   SEE PUMP CABLE SUPPORT DETAIL FOR TRANSITION OF PUMP CABLE FROM CONDUIT TO MOTOR.
4. CONTRACTOR SHALL RUN PUMP CABLE FROM CONDUIT TO MOTOR BOX. INSTALL STRAIN RELIEF CONNECTION TO PUMP CABLE.
5. CONDUIT AND WIRING BACK TO MCC IN CONTROL BUILDING. CONTRACTOR SHALL REPLACE EXISTING CIRCUIT BREAKERS AND OVERLOADS IN "GE" 8000 LINE MOTOR CONTROL CENTER. NEW CIRCUIT BREAKER FOR 15HP PUMPS SHALL BE 40 AMPS. CONTROLS SHALL WORK THE SAME AS EXISTING PUMPS BEING REMOVED. SEE DETAIL SHEET E-8.
6. CONTRACTOR SHALL REMOVE EXISTING WIRING AND CONDUIT TO EXISTING SLUDGE DIGESTER 40HP MOTORS.

   INSTALL SEAL FITTING BEFORE ENTRANCE OF PUMP CABLE AND CONDUIT INTO DISCONNECT SWITCH.
7.
8.



PUMP CABLE SUPPORT DETAIL

NOT TO SCALE

NO.	DESCRIPTION	DATE	BY

REVISIONS

MICHELLE HOLLOWAY KENDRICK, REGISTERED ENGINEER, AGRICULTURE, SUMNER, NO. 001099, STATE OF TENNESSEE

10/2/02

GRW PROJECT NO. 7601-10

CLARIFIER 1 & 2, DIGESTER
ELECTRICAL PLANS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD - HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: GLW	DATE: 8-1-02
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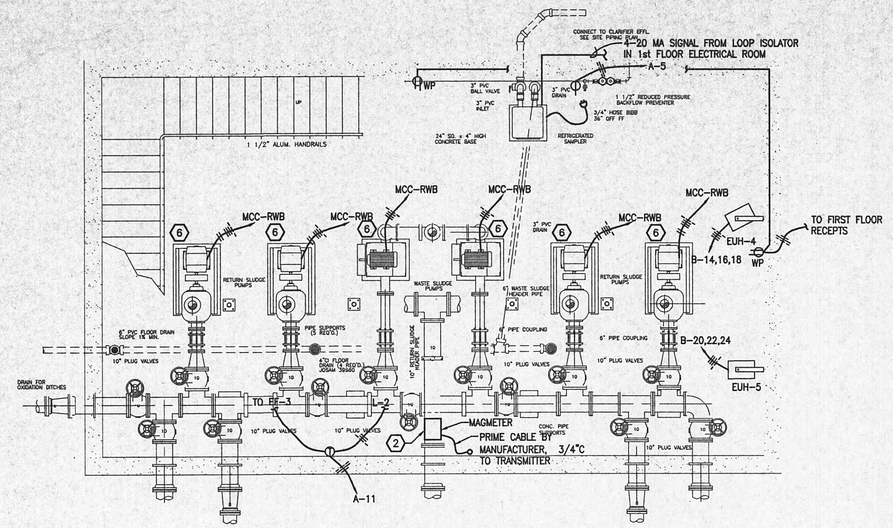
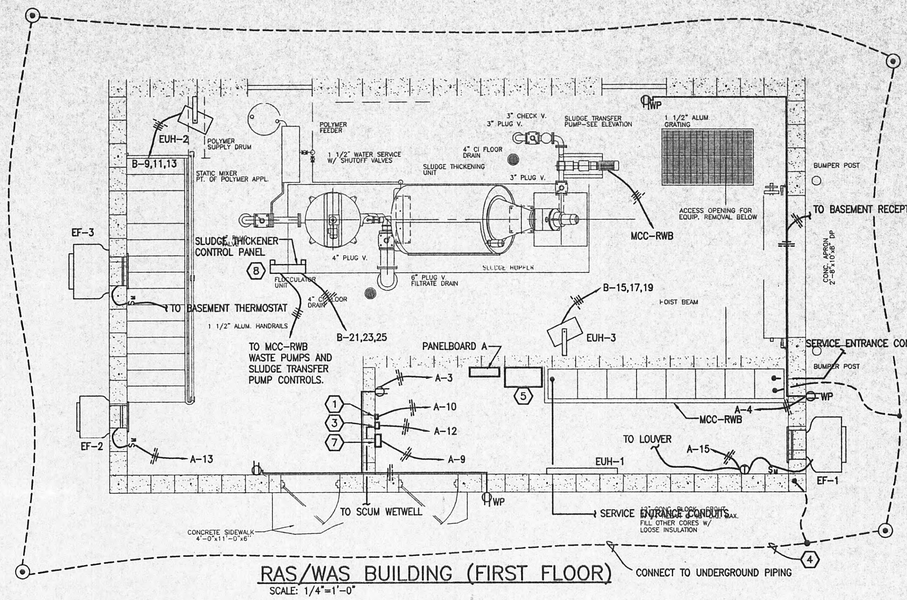
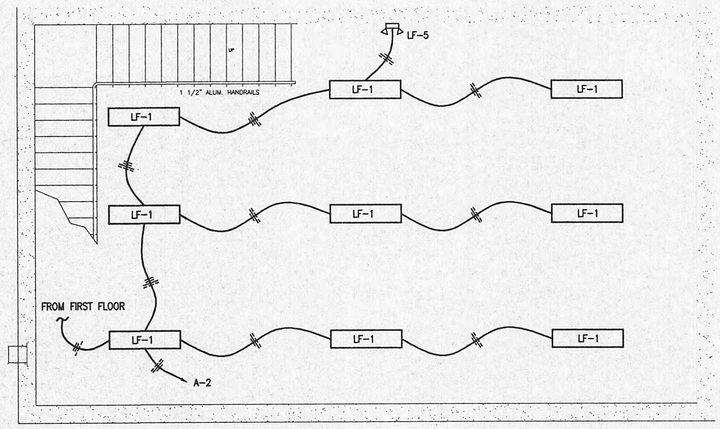


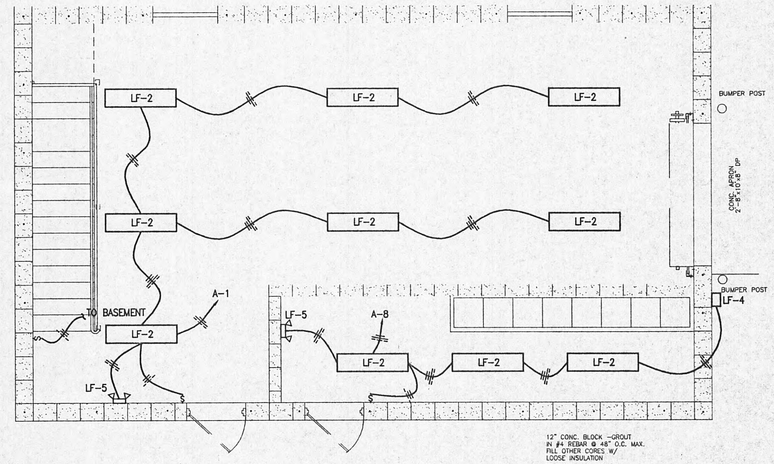
RAS/WAS BUILDING (BASEMENT)
SCALE: 1/4"=1'-0"



RAS/WAS BUILDING (FIRST FLOOR)
SCALE: 1/4"=1'-0"



RAS/WAS LIGHTING PLAN (BASEMENT)
SCALE: 1/4"=1'-0"



RAS/WAS LIGHTING PLAN (FIRST FLOOR)
SCALE: 1/4"=1'-0"

NOTES:

1. FLOW DISPLAY TRANSMITTER FOR RETURN SLUDGE FLOW. PRIMARY CABLE FROM SENSOR TO TRANSMITTER TO BE IN 3/4" CABLE.
2. SENSOR FOR FLOW METER TO BE MOUNTED ON 6" PIPE. SENSOR SHALL HAVE 7 PIPE DIAMETERS OF STRAIGHT RUN BEFORE, AND 3 PIPE DIAMETER AFTER.
3. SUBMERSIBLE PRESSURE TRANSDUCER (TRANSMITTER) FOR MONITORING SCUM WETWELL LEVEL. TRANSDUCER CABLE TO TRANSMITTER IN 3/4"C.
4. CONTRACTOR SHALL INSTALL 3/0 BARE COPPER CONDUCTOR WITH GROUND RODS. REFER TO CONTRACT SPECIFICATION FOR GROUND ROD PARAMETERS AND CONNECTIONS.
5. 30 KVA WALL MOUNTED TRANSFORMER, 480V-120/208V, 3 PHASE.
6. CIRCUIT BREAKER FOR PUMP SHALL HAVE THE OPTION OF BEING LOCKABLE IN THE OFF POSITION.
7. LOOP ISOLATORS FOR NEW INTERMEDIATE FLOW METER CONTROL LOOP. NEMA 1 ENCLOSURE.
8. CONTRACTOR SHALL PROVIDE CONDUIT AND WIRING FROM CONTROL PANEL TO SLUDGE THICKENER EQUIPMENT.

NO.	DESCRIPTION	DATE	BY

REVISIONS

MICHELE LYNN WOLK — REGISTERED ENGINEER — AGRICULTURE — POWER — No. 001098 — STATE OF TENNESSEE
10/2/02

GRW PROJECT NO. 7601-10

RETURN AND WASTE SLUDGE PUMP BUILDING WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: GLW	DATE: 8-1-02
DRAWN: MKC	SCALE: AS NOTED
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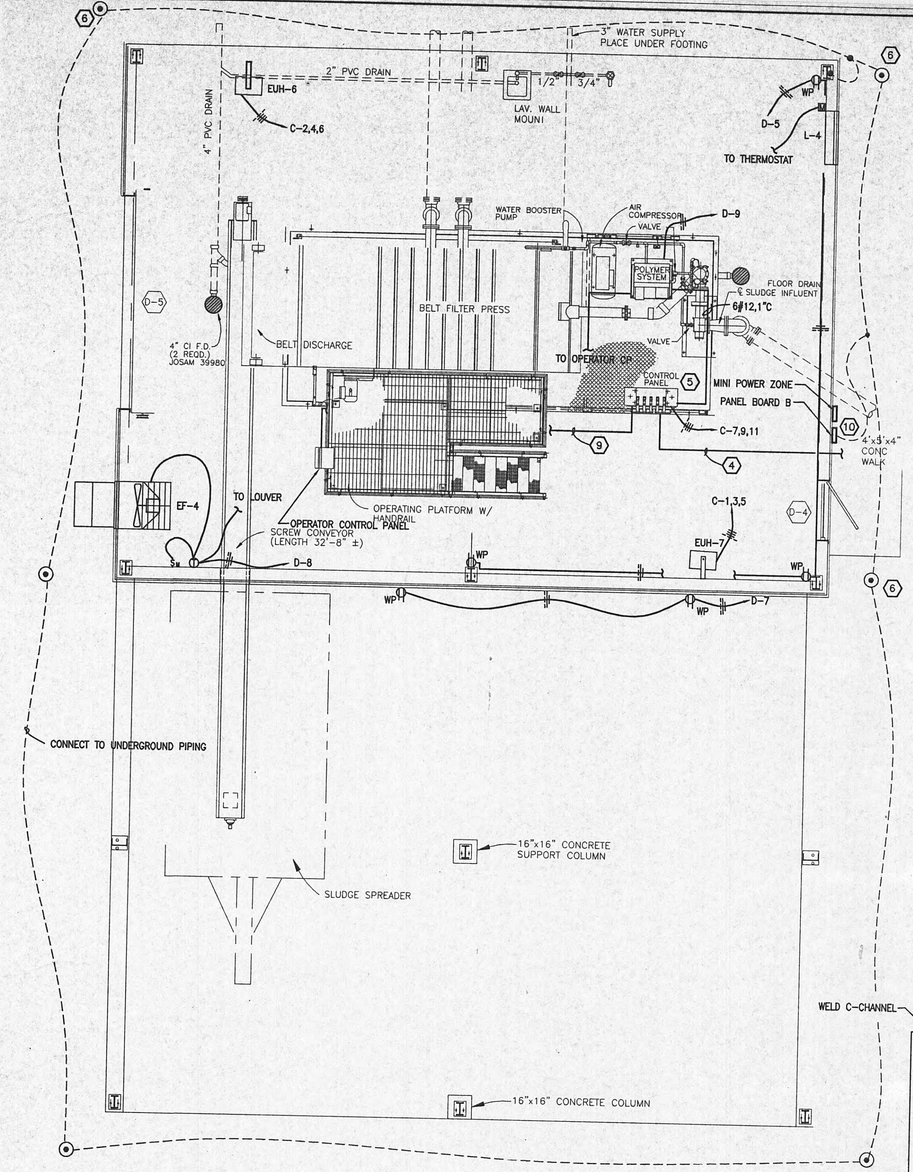
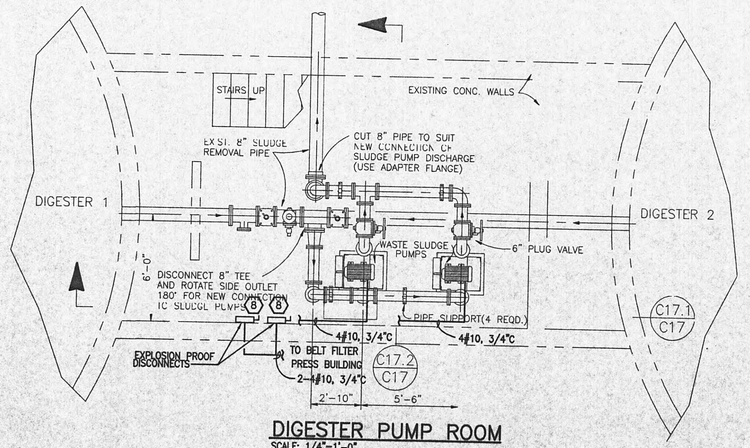


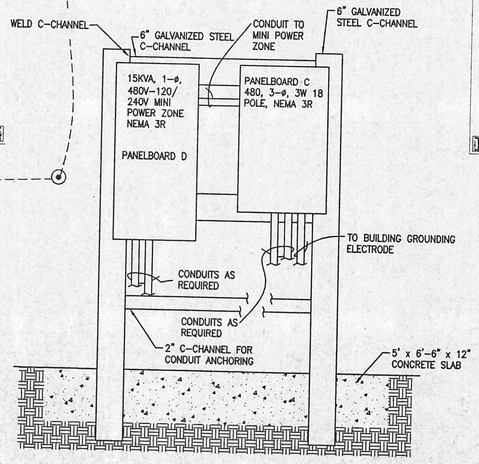
DIGESTER PUMP ROOM

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



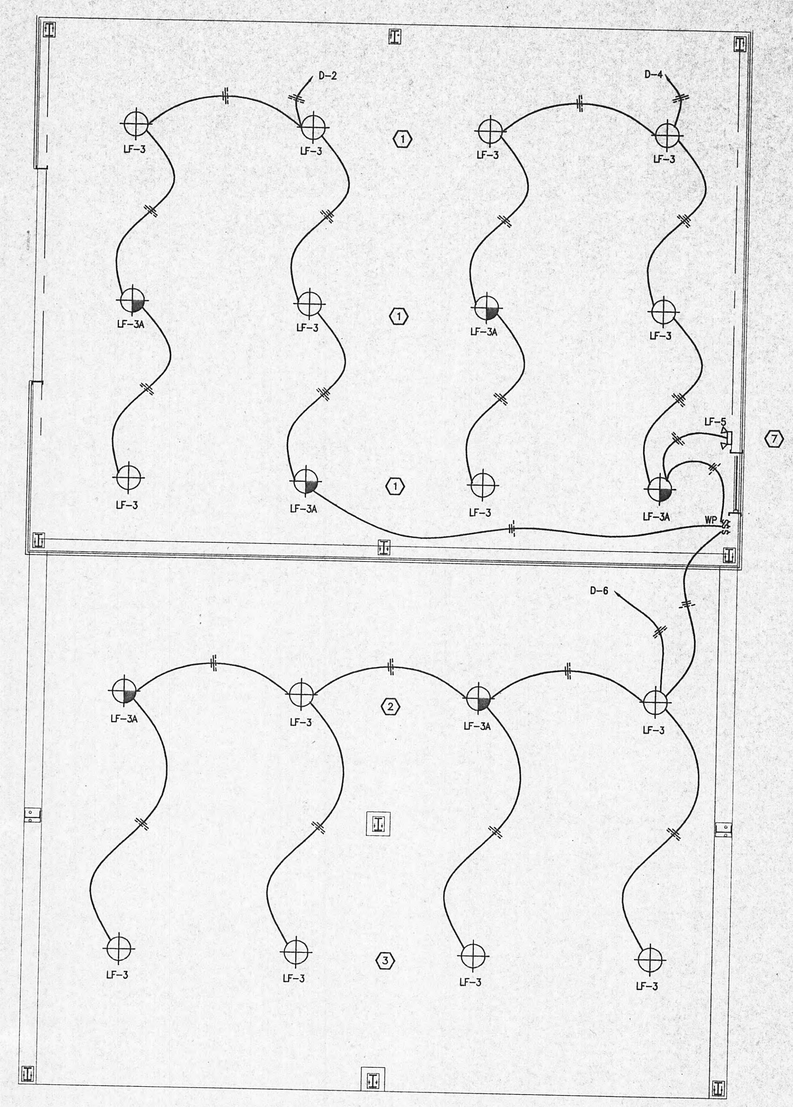
NOTES:

1. FIXTURES TO BE PENDENT MOUNTED AT 13' AFF.
2. FIXTURES TO BE PENDENT MOUNTED AT 16' AFF.
3. FIXTURES TO BE PENDENT MOUNTED AT 15' AFF.
4. TO SLUDGE PUMPS IN DIGESTER BUILDING; 2-4#10, 3/4"C.
5. CONTROL PANEL SHALL HAVE MINIMUM 3'-6" OF CLEAR AREA IN FRONT OF DOOR.
6. CONTRACTOR SHALL INSTALL #2 AWG BARE COPPER CONDUCTOR WITH GROUND RODS. GROUND RODS SHALL BE A MINIMUM OF 10' LONG AND 5/8" DIAMETER.
7. EMERGENCY LIGHT FIXTURE. MOUNT FIXTURE AT 6'-6".
8. NEMA 4x EXPLOSION PROOF NON-FUSED DISCONNECT FOR WASTE SLUDGE PUMPS.
9. CONDUITS AND CONDUCTORS PER MANUFACTURERS RECOMMENDATION.
10. SEE BFP ELECTRICAL DETAIL FOR MOUNTING OF PANELS.



BFP ELECTRICAL DETAIL

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



BELT FILTER PRESS LIGHTING PLAN

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

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

MICHELLE K. CRAFT — REGISTERED PROFESSIONAL ENGINEER — AGRICULTURE — NUMBER NO. 001099E — STATE OF TENNESSEE

10/2/02

GRW PROJECT NO. 7601-10

DIGESTER PUMP ROOM & BELT FILTER PRESS BUILDING WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: GLW	DATE: 8-1-02
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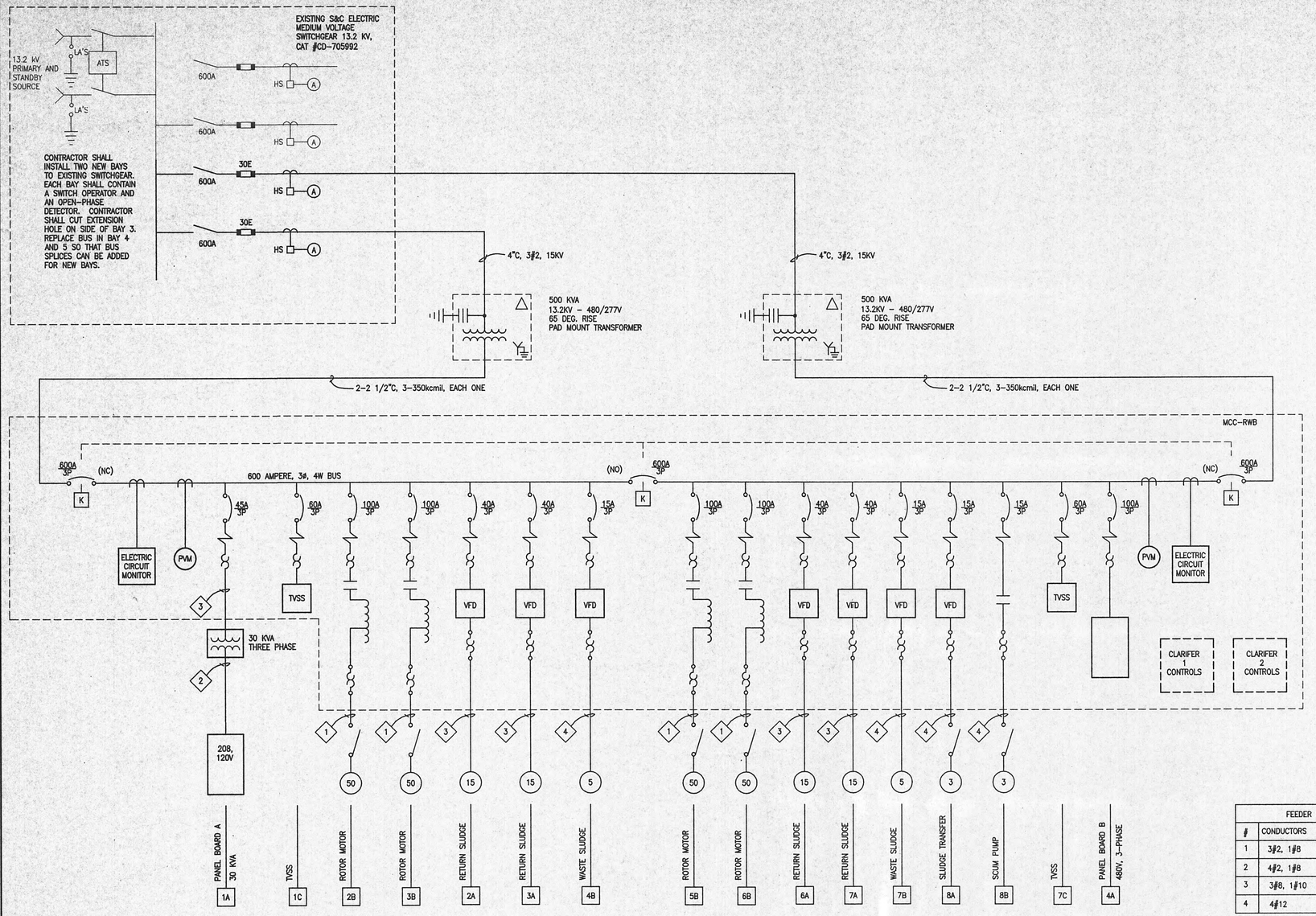
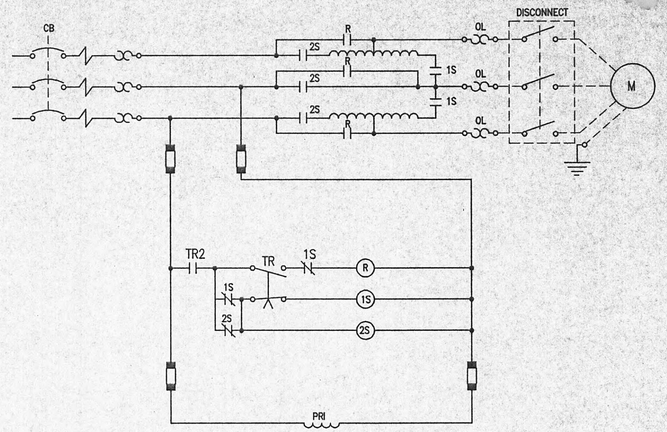
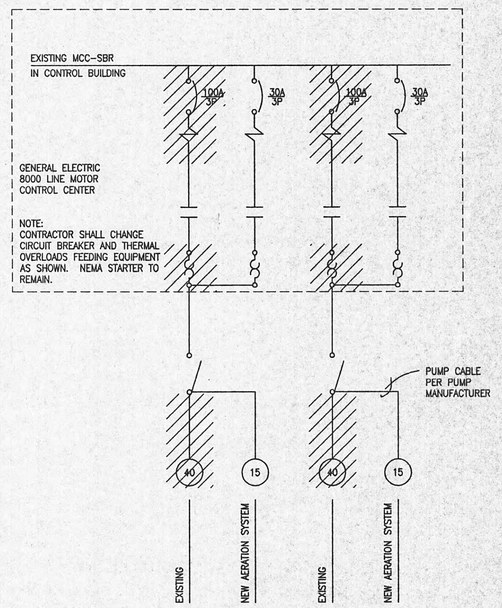


MOTOR CONTROL CENTER-MCC-RWB

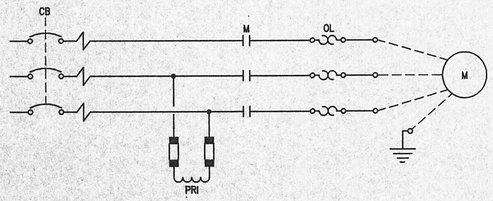
FEEDER SCHEDULE		
#	CONDUCTORS	CONDUIT
1	3#2, 1#8	1 1/4"
2	4#2, 1#8	1 1/2"
3	3#8, 1#10	3/4"
4	4#12	3/4"



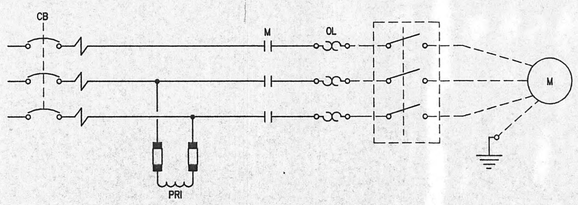
TYPE C RVAT STARTER



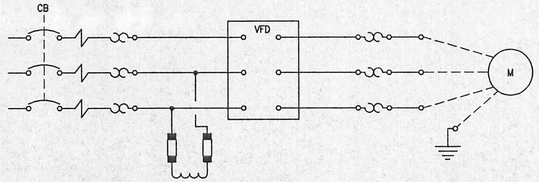
EXISTING MCC-SBR NEW WORK



TYPE A STARTER WIRING FVNR



TYPE B STARTER WIRING FVNR



VFD TYPE D STARTER

NO.	DESCRIPTION	DATE	BY

REVISIONS

GRW PROJECT NO. 7601-10

CONTROL CIRCUITS AND ONE LINE DIAGRAMS
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD - HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

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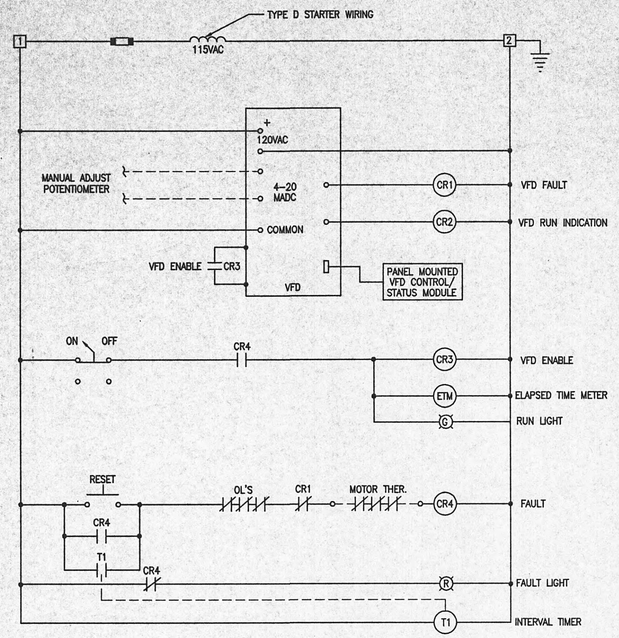
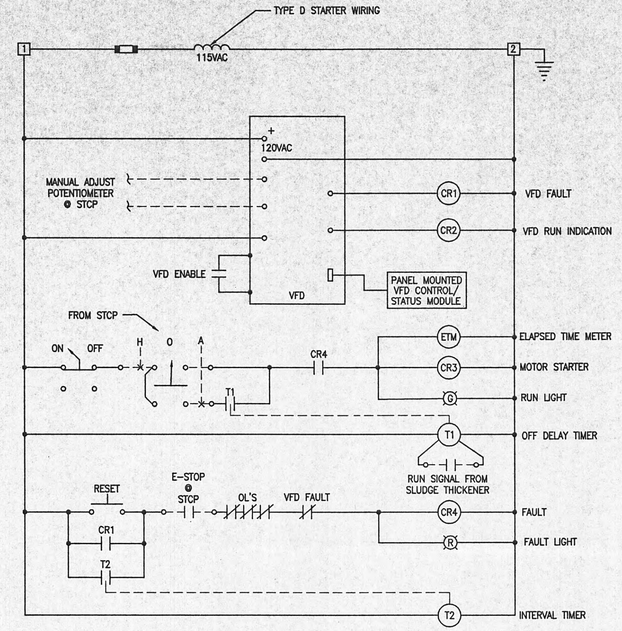


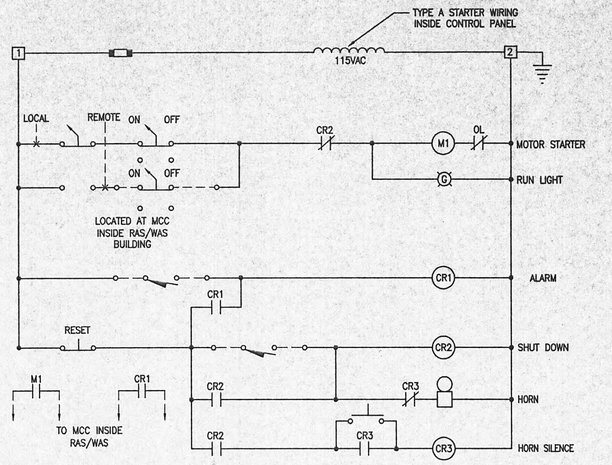
RETURN SLUDGE PUMPS

4 REQUIRED MCC–RWB



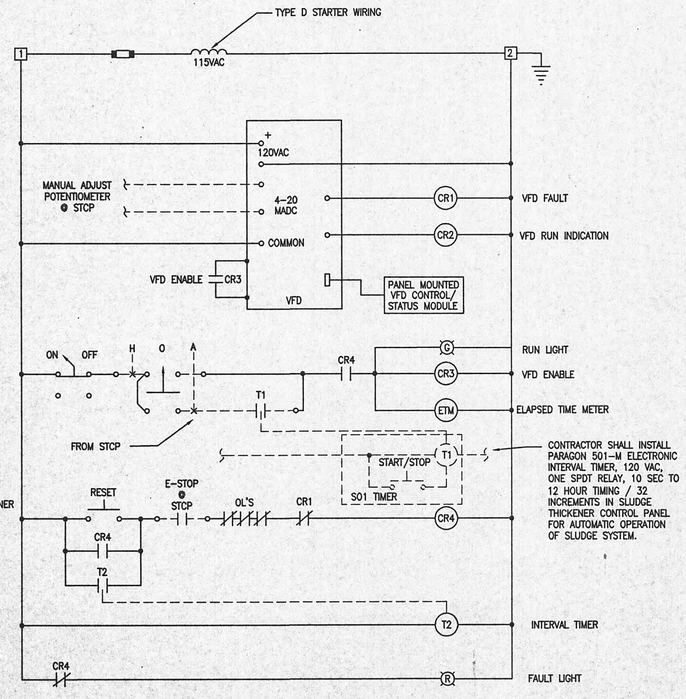
SLUDGE TRANSFER PUMP

1 REQUIRED MCC–RWB



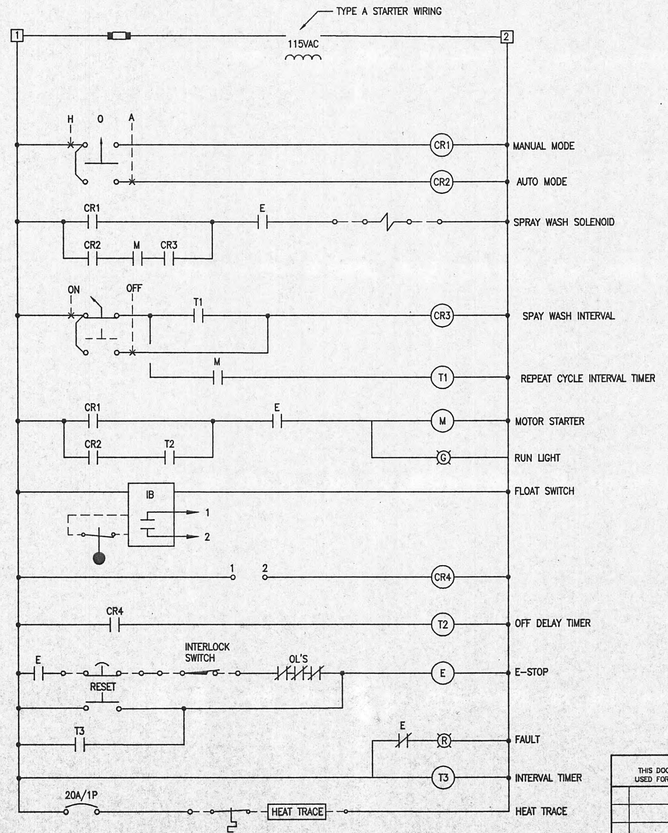
CLARIFIERS CONTROL PANEL

2 UNITS REQUIRED NEMA 4x ENCLOSURE
INSTALL TVSS IN PANEL



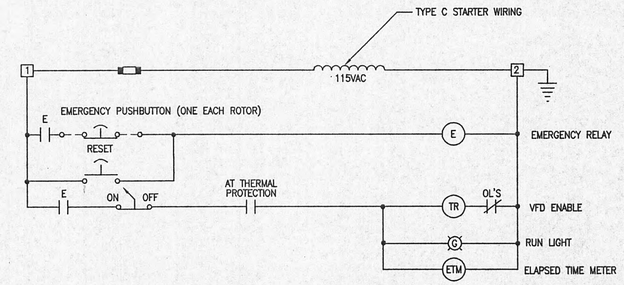
WASTE SLUDGE PUMPS

2 REQUIRED NICC–RWB



FINE SCREEN CONTROL PANEL

NEMA 4x CONTROL PANEL
INSTALL TVSS IN PANEL



OXIDATION DITCH ROTORS

4 UNITS REQUIRED MCC–RWB

NO.	DESCRIPTION	DATE	BY

REVISIONS

GRW PROJECT NO. 7601–10

CONTROL CIRCUITS

WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

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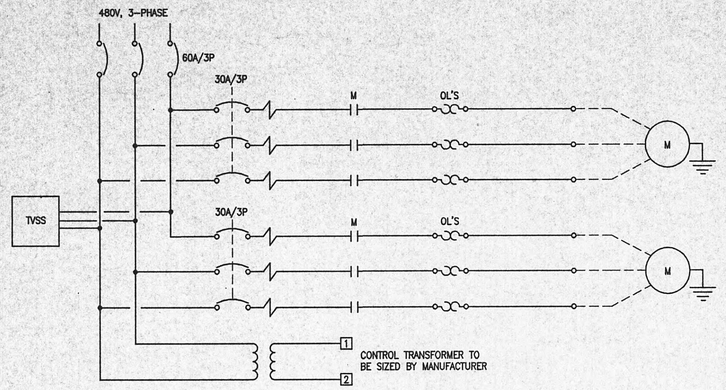
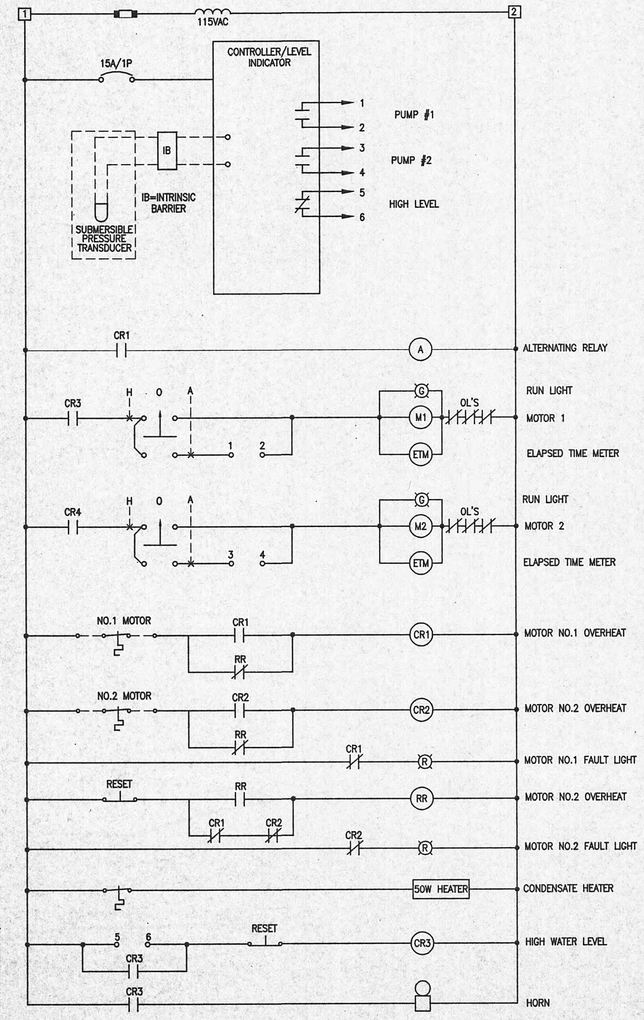
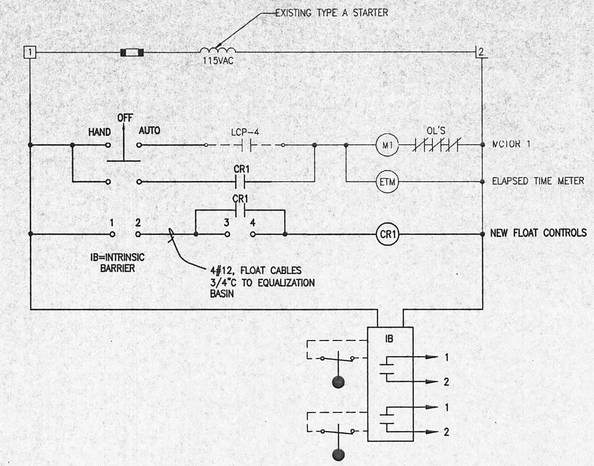




UTILITY PUMP STATION CONTROL PANEL

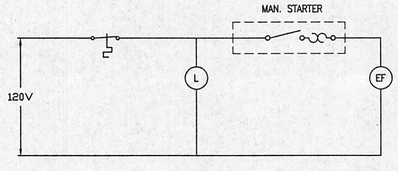
NEMA 4x CONROL PANEL MOUNTED @ PUMPS



EXISTING BLOWERS FOR NEW EQUALIZATION BASINS

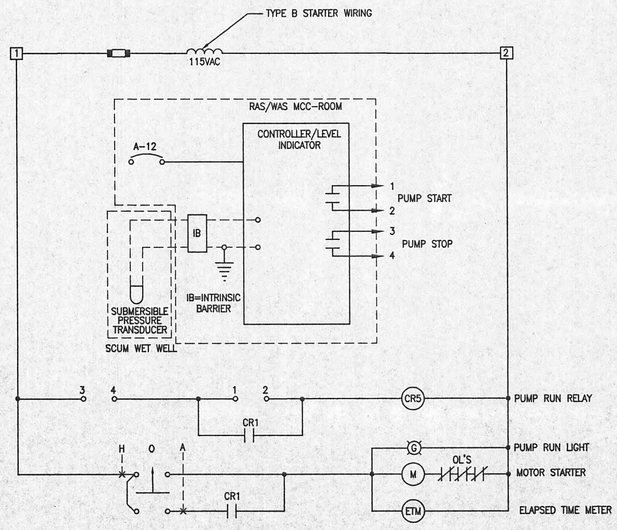
(2 TYPICAL)

CONTRACTOR SHALL REWIRE EXISTING BLOWERS AS SHOWN ABOVE. DARK PEN IN CONTROL CIRCUIT REPRESANTS NEW WORK. BLOWERS SHALL TURN ON WHEN LEVEL IN EQUILIZATION BASIN REACHES 5ft. AND TURN OFF WHEN BASIN LEVEL REACHES 4ft. SEE SHEET E-13 FOR FLOAT MOUNTING DETAIL.



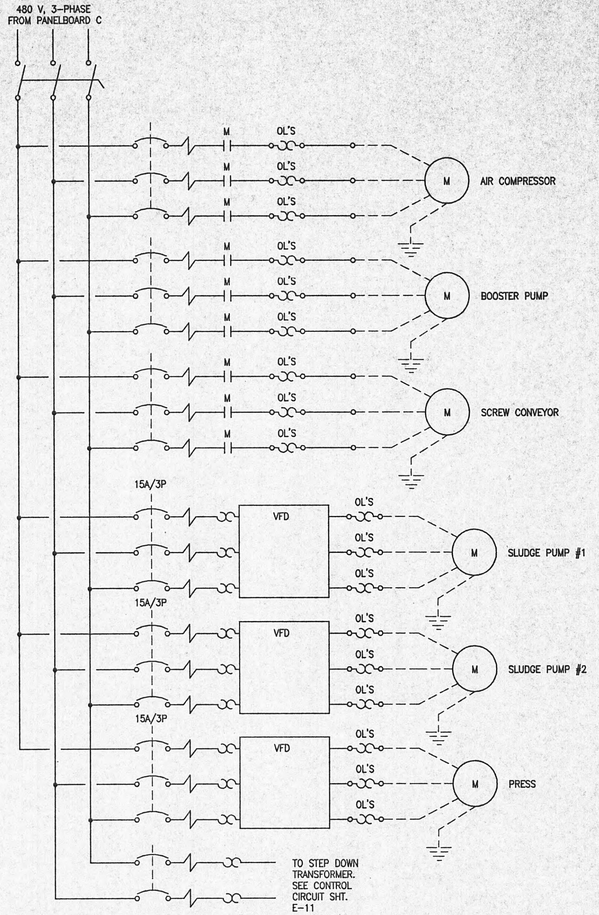
EXHAUST FAN CONTROL CIRCUIT

EF-1, EF-4, EF-3



SCUM PUMP

1 REQUIRED MCC-RWB



BELT PRESS CONTROL PANEL

NEMA 4X ENCLOSED

NO.	DESCRIPTION	DATE	BY

REVISIONS

MITCHELL HOWARD
REGISTERED ENGINEER
AGRICULTURE
NUMBER
No. 001[illegible]
STATE OF TENNESSEE
10/1/02

GRW PROJECT NO. 7601-10

CONTROL CIRCUITS

WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS
NASHVILLE KNOXVILLE

DESIGNED: GLW	DATE: 8-1-02
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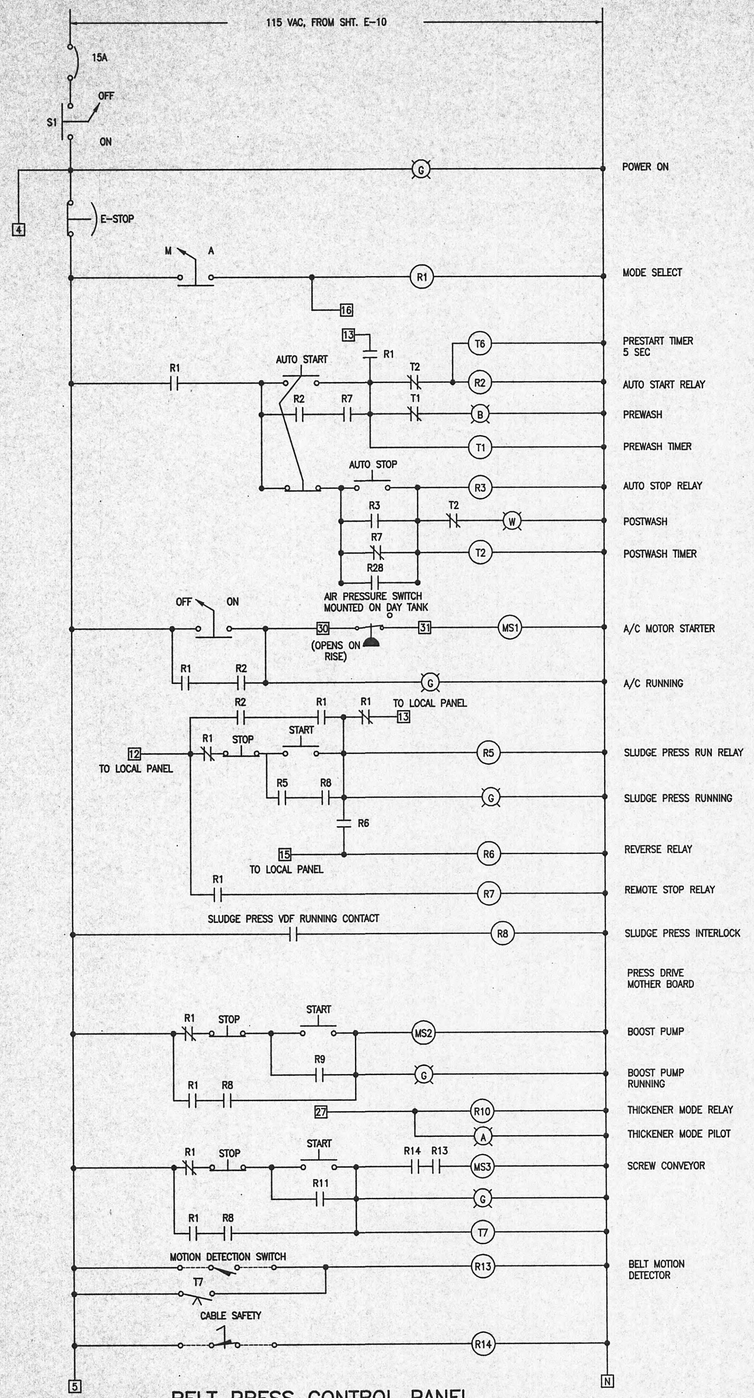
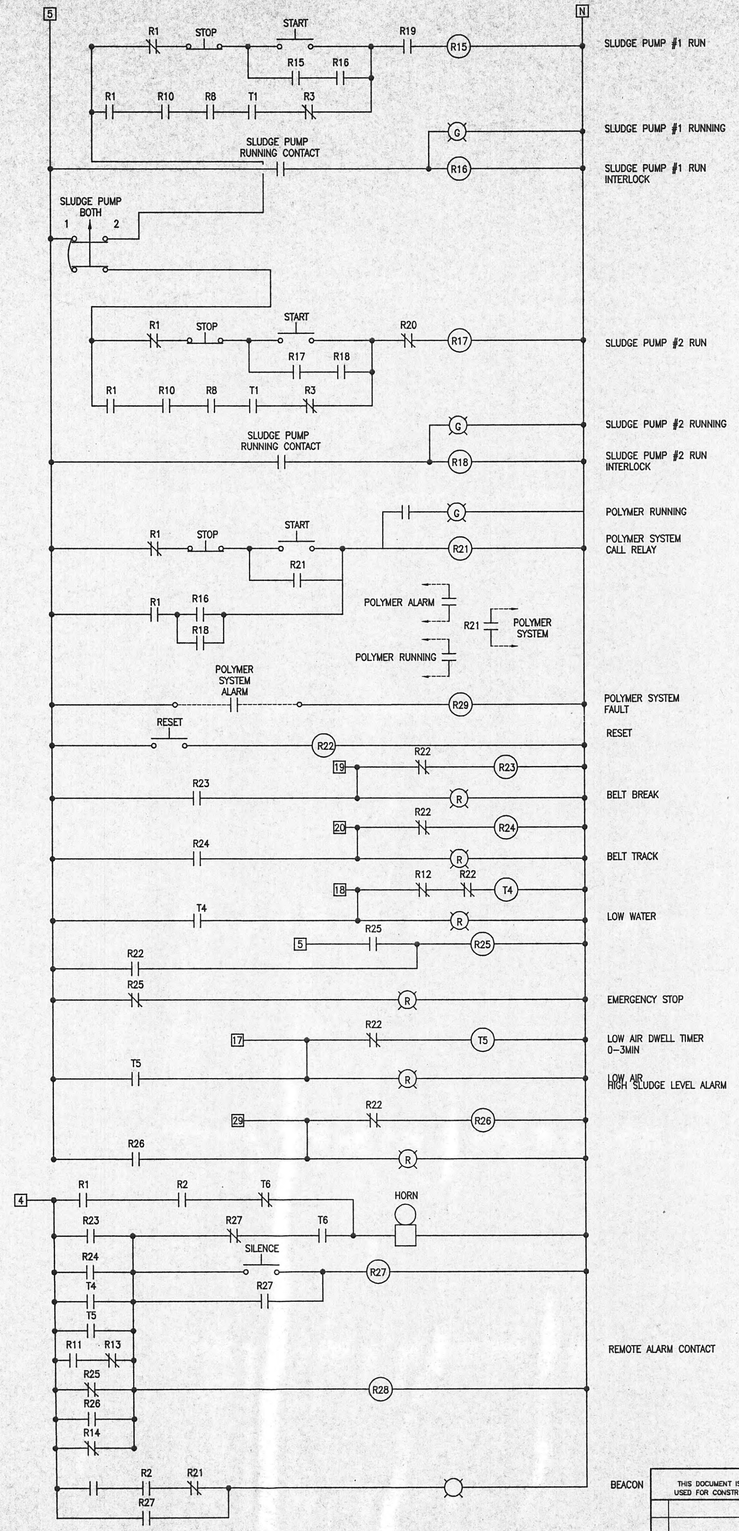
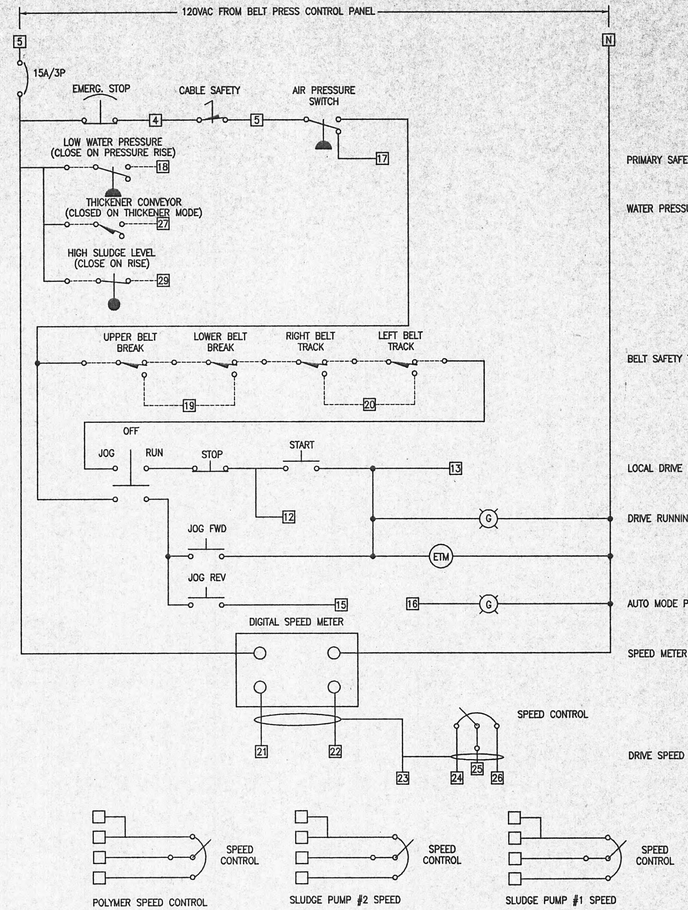


BELT PRESS CONTROL PANEL

1 REQUIRED, NEMA 4X ENCLOSED





REMOTE PANEL ON BELT PRESS

N.T.S.
1 REQUIRED, NEMA 4X ENCLOSED

GRW PROJECT NO. 7601-10

CONTROL CIRCUITS

WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY

REVISIONS

MICHELLE HOWELL — REGISTERED ENGINEER — AGRICULTURE — No. 001026 — STATE OF TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: GLW	DATE: 8-1-02
DRAWN: MKC	SCALE: AS NOTED
REVIEWED: GLW	SHEET NO.: E-11
APPROVED: TMH	

PANEL SCHEDULE	PANELBOARD A
LOCATION	RAS/WAS
ENCLOSURE	NEMA 1
SURFACE, FLUSH, OR MCC	FLUSH

VOLTAGE	120/208 VOLT, 3-PHASE, 4 WIRE
MAINS AMPACITY	225 AMP
MAIN C.B. SIZE	100 AMP
TOTAL SPACES	30

DESCRIPTION	VA	#P	BKR	FEEDER	NO	-A- VA	-B- VA	-C- VA	NO.	FEEDER	BKR	#P	VA	DESCRIPTION
LIGHTING 1ST FLOOR	800	1	20A	3#12, 3/4"C	1	2000			2	3#12, 3/4"C	20A	1	1200	LIGHTING BASEMENT
RECEPTACLES	540	1	20A	3#12, 3/4"C	3		1260		4	3#12, 3/4"C	20A	1	720	RECEPTACLES
SAMPLER RECEPT	500	1	20A	3#12, 3/4"C	5			1300	6	3#10, 3/4"C	20A	1	800	ADJUST. WEIR LEVEL INDIC.
INTERMEDIATE FLOW METER	1000	1	20A	3#10, 3/4"C	7	1600			8	3#12, 3/4"C	20A	1	600	LIGHTING ELECTRICAL ROOM
LOOP ISOLATORS	600	1	20A	3#12, 3/4"C	9		1200		10	3#12, 3/4"C	20A	1	600	RAS SLUDGE FLOW
EF-3	1176	1	20A	3#12, 3/4"C	11			1776	12	3#12, 3/4"C	20A	1	600	SCUM WETWELL LEVEL
EF-2	864	1	20A	3#12, 3/4"C	13	864			14					
EF-1	864	1	20A	3#12, 3/4"C	15		864		16					
					17			0	18					
					19	0			20					
					21		0		22					
					23			0	24					
					25	0			26					
					27		0		28					
					29			0	30					
TOTAL VOLT-AMPERES PER PHASE						4464	3324	3076						
TOTAL AMPERES PER PHASE						37.2	27.7	25.6						

PANEL SCHEDULE	PANELBOARD C
LOCATION	BELT FILTER
ENCLOSURE	NEMA 3R
SURFACE, FLUSH, OR MCC	SURFACE

VOLTAGE	480 VOLT, 3-PHASE, 3-WIRE
MAINS AMPACITY	225A
MAIN C.B. SIZE	200AMP
TOTAL SPACES	30

DESCRIPTION	VA	#P	BKR	FEEDER	NO	-A- VA	-B- VA	-C- VA	NO.	FEEDER	BKR	#P	VA	DESCRIPTION
EUH-7	2500	3	20A	4#12, 3/4"C	1	5000			2	4#12, 3/4"C	20A	3	2500	EUH-6
	2500				3		5000		4				2500	
	2500				5			5000	6				2500	
BELT FILTER PRESS	12465	3	60A	3#6, 1#10, 1"C	7	26315			8	3#6, 1#10, 1"C	60A	3	13850	Utility Pump Station
	12465				9		26315		10				13850	
	12465				11			26315	12				13850	
					13	3828			14	4#6, 1"C	60	2	3828	Mini Power Zone
					15		3126		16				3126	
					17			0	18					
					19	0			20					
					21		0		22					
					23			0	24					
					25	0			26					
					27		0		28					
					29			0	30					
TOTAL VOLT-AMPERES PER PHASE						35143	34441	31315						
TOTAL AMPERES PER PHASE						126.9	124.3	113.1						

PANEL SCHEDULE	PANELBOARD B
LOCATION	RAS/WAS
ENCLOSURE	NEMA 1
SURFACE, FLUSH, OR MCC	MCC

VOLTAGE	480 VOLT, 3-PHASE, 4-WIRE
MAINS AMPACITY	100 AMP
MAIN C.B. SIZE	MLO
TOTAL SPACES	30

DESCRIPTION	VA	#P	BKR	FEEDER	NO	-A- VA	-B- VA	-C- VA	NO.	FEEDER	BKR	#P	VA	DESCRIPTION
CLARIFIER 1	5540	3	30	3#8, 1#10, 3/4"C	1	5570			2	3#8, 1#10, 3/4"C	5540	3	30	CLARIFIER 2
	5540				3		5540		4		5540			
	5540				5			5540	6		5540			
TWIN CONFIG. OUTDOOR LIGHT	900	1	20A	3#12, 3/4"C	7	3670			8	3#10, 1#12, 3/4"C	20A	3	2770	ADJUSTABLE WEIR MOTOR
EUH-2	1100	3	20A	4#12, 3/4"C	9		3870		10				2770	
	1100				11			3870	12				2770	
	1100				13	6100			14	4#10, 3/4"C	30A	3	5000	EUH-4
EUH-3	3333	3	20A	4#12, 3/4"C	15		8333		16				5000	
	3333				17			8333	18				5000	
	3333				19	5833			20	4#12, 3/4"C	20A	3	2500	EUH-5
SLUDGE THICKENER CP	3333	3	20A	4#12, 3/4"C	21		5833		22				2500	
	3333				23			5833	24				2500	
	3333				25	3333			26					
					27		0		28					
					29			0	30					
TOTAL VOLT-AMPERES PER PHASE						24506	23576	23576						
TOTAL AMPERES PER PHASE						88.5	85.1	85.1						

PANEL SCHEDULE	PANELBOARD D
LOCATION	BELT FILTER
ENCLOSURE	NEMA 3R
SURFACE, FLUSH, OR MCC	SURFACE

VOLTAGE	120/240 VOLT, 1-PHASE
MAINS AMPACITY	
MAIN C.B. SIZE	80 AMP
TOTAL SPACES	16

DESCRIPTION	VA	#P	BKR	FEEDER	NO	-A- VA	-B- VA	NO.	FEEDER	BKR	#P	VA	DESCRIPTION
OUTDOOR LIGHTING	225	2	20A	3#12, 3/4"C	1	1538		2	3#12, 3/4"C	20A	1	1313	LIGHTING
	225				3		1590	4	3#12, 3/4"C	20A	1	1365	LIGHTING
RECEPTACLES	540	1	20A	3#12, 3/4"C	5	2290		6	3#12, 3/4"C	20A	1	1750	LIGHTING
OUTDOOR RECEPTACLES	360	1	20A	3#12, 3/4"C	7		1536	8	3#12, 3/4"C	20	1	1176	EF-4
POLYMER SYSTEM	1200	1	20A	3#12, 3/4"C	9	1200		10					
					11		0	12					
					13	0		14					
SPARE		1	20A		15		0	16		20A	1		SPARE
TOTAL VOLT-AMPERES PER PHASE						5028	3126						
TOTAL AMPERES PER PHASE						41.9	26.1						

LIGHT FIXTURE SCHEDULE

MARK	DESCRIPTION	LAMPS	MFR.	MODEL NUMBER
LF-1	INDUSTRIAL FLUORESCENT w/ WG	3-32W T8	HOLOPHANE	IW T 04 D N WG 043 EP 120
LF-2	INDUSTRIAL FLUORESCENT w/ WG	2-32W T8	HOLOPHANE	IW T 04 D N WG 042 EP 1 120
LF-3	INDUSTRIAL "PETROLUX"	175W MH	HOLOPHANE	PTA 175MH 24 P 25C
LF-3A	INDUSTRIAL "PETROLUX"	175W MH	HOLOPHANE	PTA 175MH 24 P 25C
LF-4	OUTDOOR WALL PAKS	100 W MH	LITHONIA	TWH 100M 120 PE
LF-5	EMERGENCY LIGHTING UNIT	6W HALO	LITHONIA	ELM2 SSB DL
LF-6	OUTDOOR AREA POLE MOUNT 40 FT	400W HPS	HOLOPHANE	MS 2 A 400HP 24 H3 w/ PHOTOCEL
LF-6,LF-7	ROUND, TAPERED STEEL POLE	40 FT	HOLOPHANE	HOT DIP GALVANIZED
LF-7	OUTDOOR AREA TWIN CONFIG. 40 FT	400W HPS	HOLOPHANE	MS 2 A 400HP 27 H3 w/ PHOTOCEL

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

MICHELLE HOWARD KELLEY, REGISTERED ENGINEER, AGRICULTURE, COMMERCE, No. 001059(6), STATE OF TENNESSEE, 10/3/02

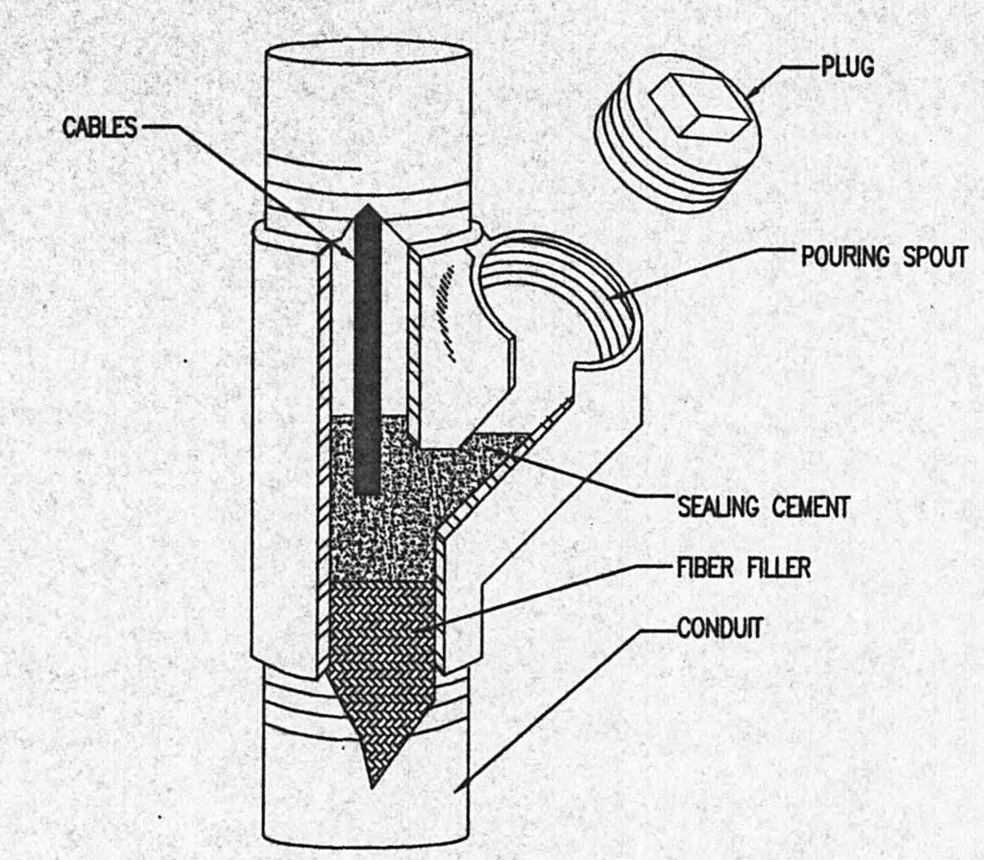
GRW PROJECT NO. 7601-10

PANEL SCHEDULES
LIGHT FIXTURE SCHEDULE
WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD - HARRIMAN, TENNESSEE

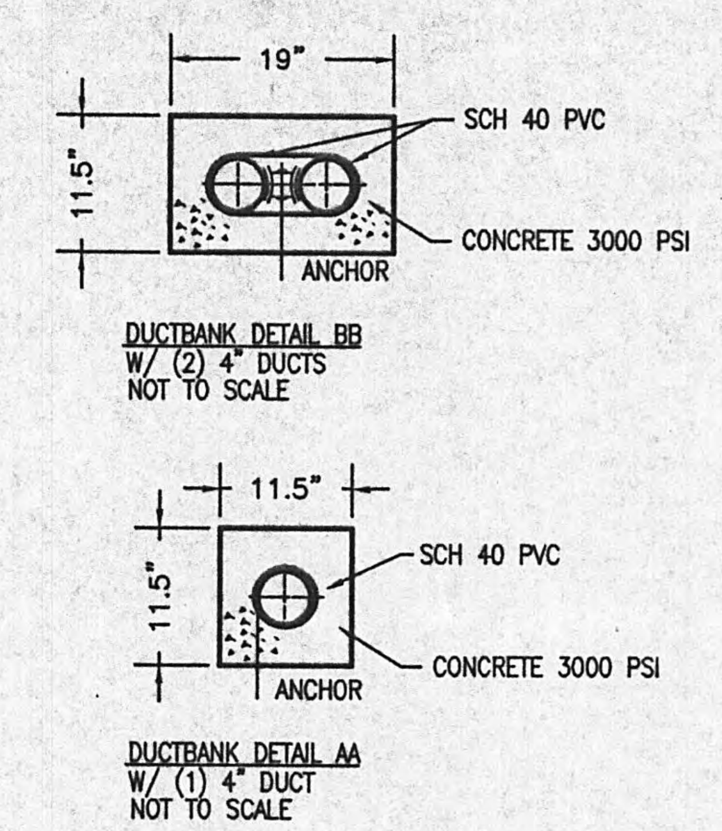
GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED:	DATE:
GLW	8-1-02
DRAWN:	SCALE:
MKC	AS NOTED
REVIEWED:	SHEET NO.
GLW	E-12
APPROVED:	
TMH	

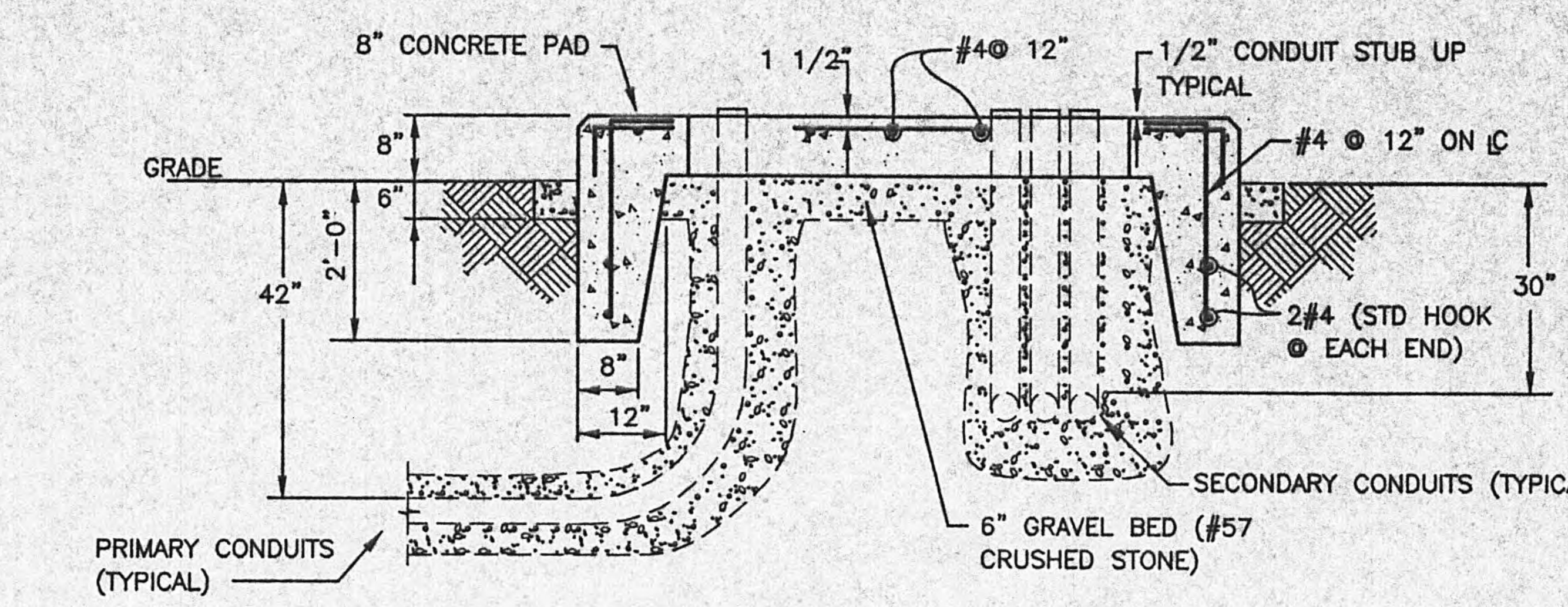
Tue, 01 Oct 2002 - 4:23pm
FILE NAME: U:\3041\08-HARRIMAN WWTP\cadd\working\3041-E12.dwg



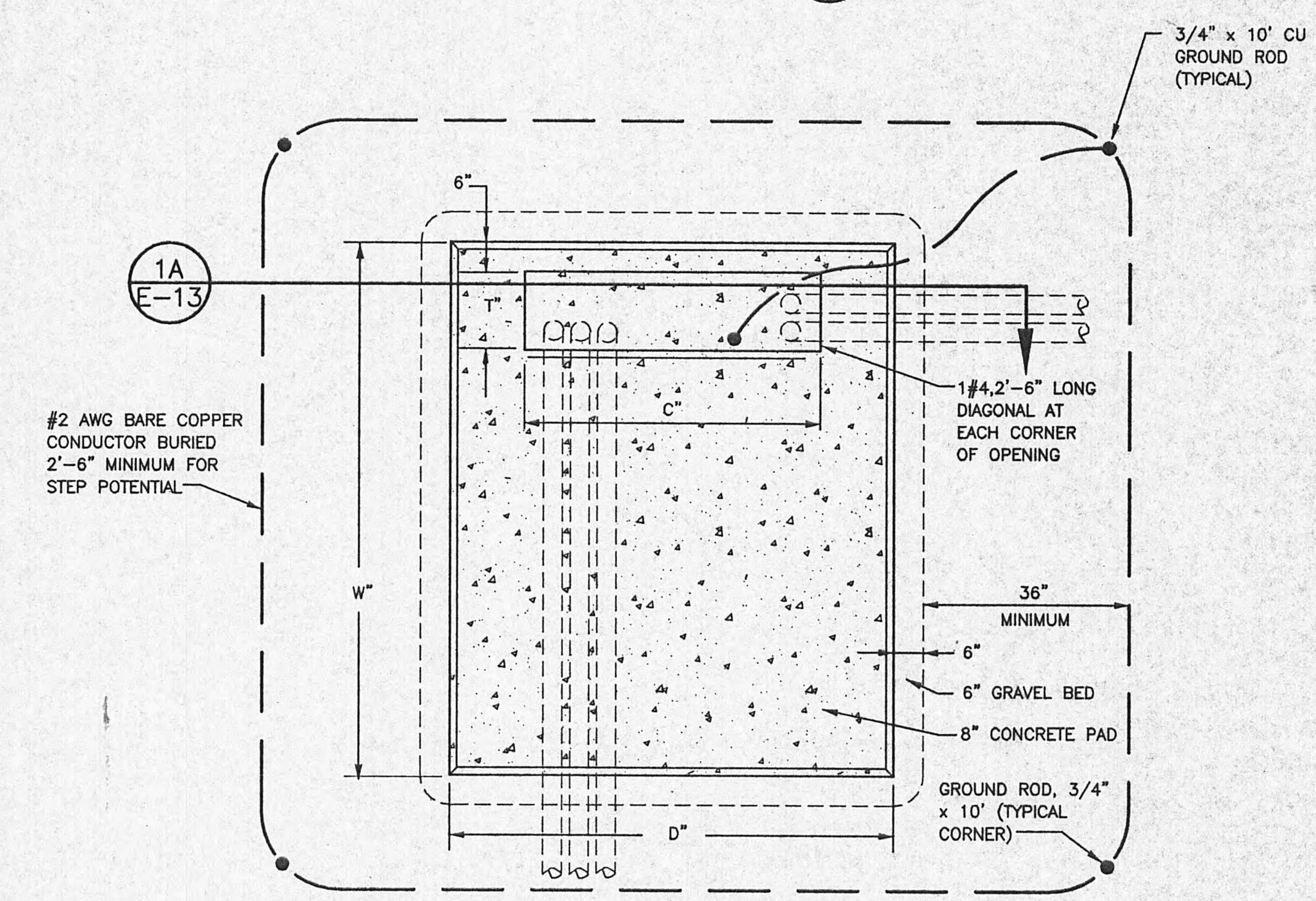
CONDUIT SEALING FITTING
NOT TO SCALE



DUCT BANK DETAILS
NOT TO SCALE



SECTION 1A/E-13
NOT TO SCALE



PLAN

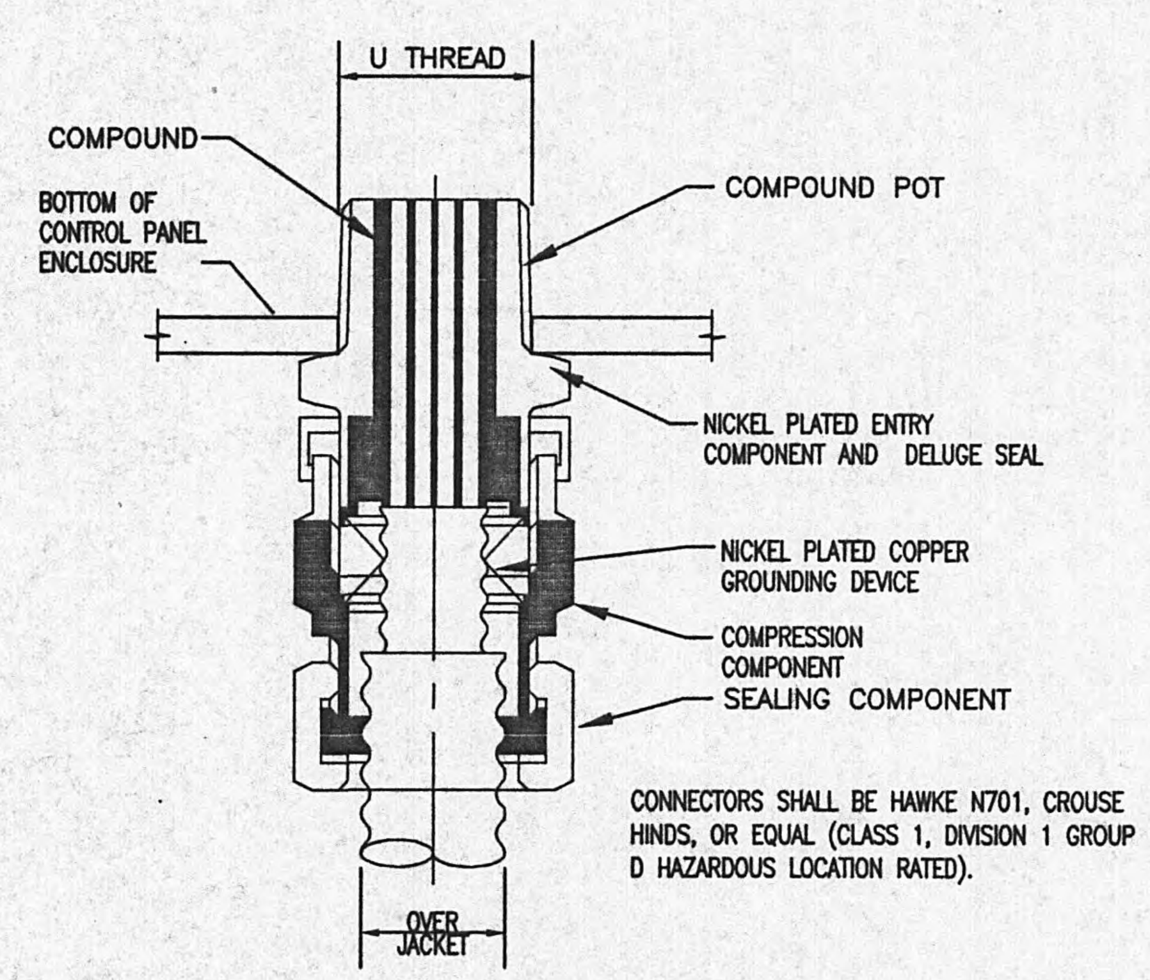
TRANSFORMER PAD FOUNDATION DIMENSIONS

KVA	W	D	C	T
500	7'-0"	7'-6"	4'-6"	16"

NOTES:

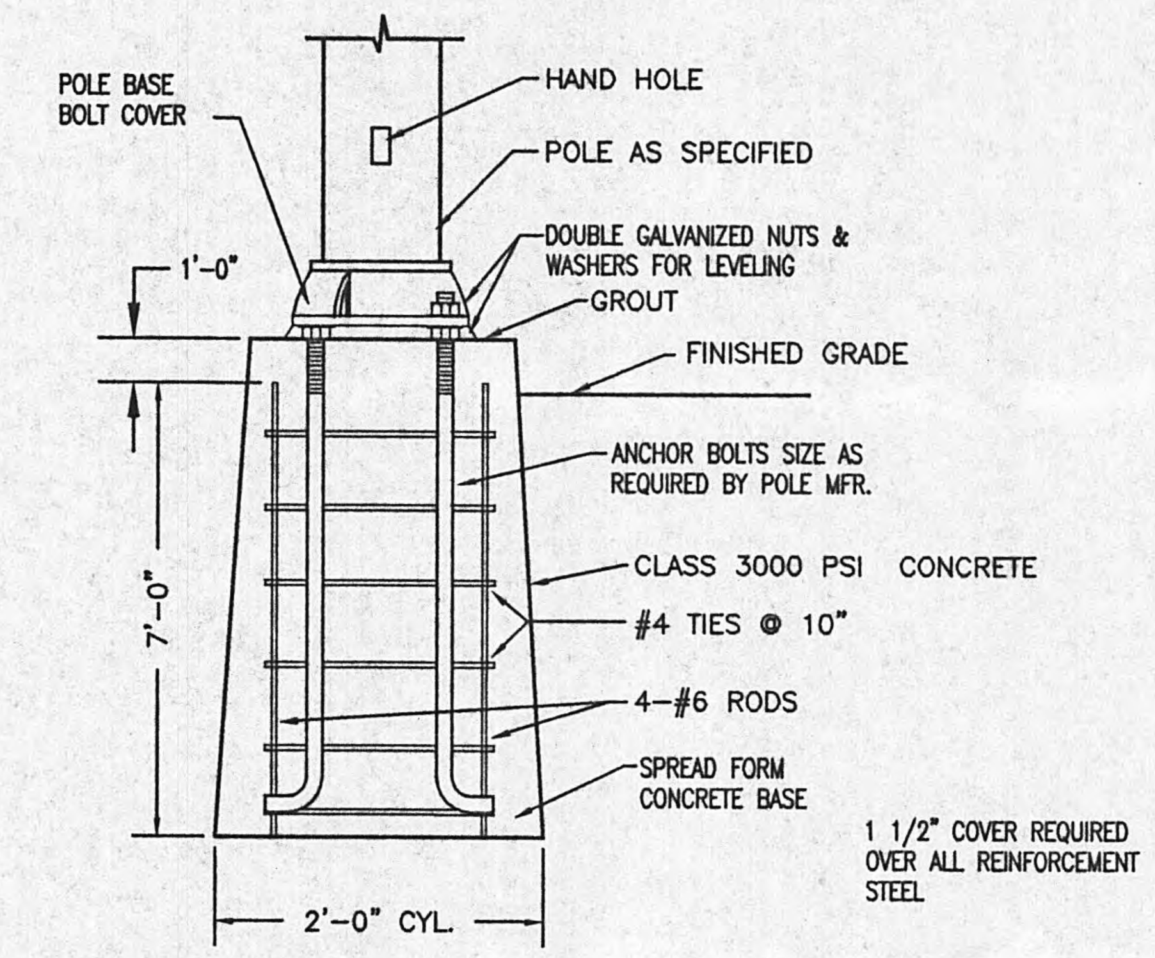
- TRANSFORMER PAD WILL BE A SOLID BLOCK OF CONCRETE WITH DIMENSIONS AS SHOWN, REINFORCED WITH STEEL RODS OR EQUIVALENT, ALL OF WHICH SHALL BE SOLIDLY WELDED TOGETHER FOR A FIRM AND STRUCTURAL FOUNDATION. PAD SHALL BE POURED ENTIRELY ON SITE, USING CONCRETE OF 1-2-4 MIX OR 3000 P.S.I. STRENGTH (6 BAG MIX). TOP OUTSIDE EDGES OF PAD WILL HAVE 1/2" BEVEL, AND ALL SURFACES WILL BE TROWLED TO A SEMI-SMOOTH FINISH. POURING OR PLACING OF THE PAD WILL BE DONE AFTER THE NECESSARY CONDUITS ARE IN PLACE AND GROUND HAS BEEN MECHANICALLY TAMPED.
- ANCHOR TRANSFORMER TO PAD WITH 3/8" DIAMETER STAINLESS STEEL ANCHOR BOLTS.
- ALL GROUNDING CONNECTIONS EXTERNAL TO TRANSFORMER ENCLOSURE SHALL BE EXOTHERMIC WELD.
- DIMENSIONS ARE INTENDED TO BE 12" LARGER THAN TRANSFORMER IN BOTH DIRECTIONS.

1A/E-13 TRANSFORMER PAD DETAIL



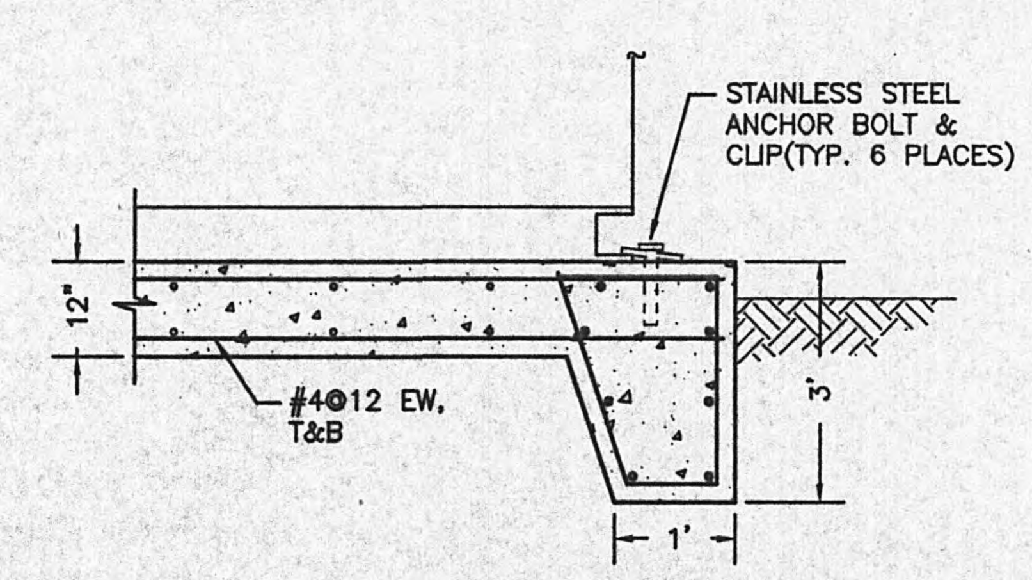
CONNECTORS SHALL BE HAWKE N701, CROUSE HINDS, OR EQUAL (CLASS 1, DIVISION 1 GROUP D HAZARDOUS LOCATION RATED).

PUMP & PRESSURE SWITCH CABLE GLAND CONNECTION
NOT TO SCALE

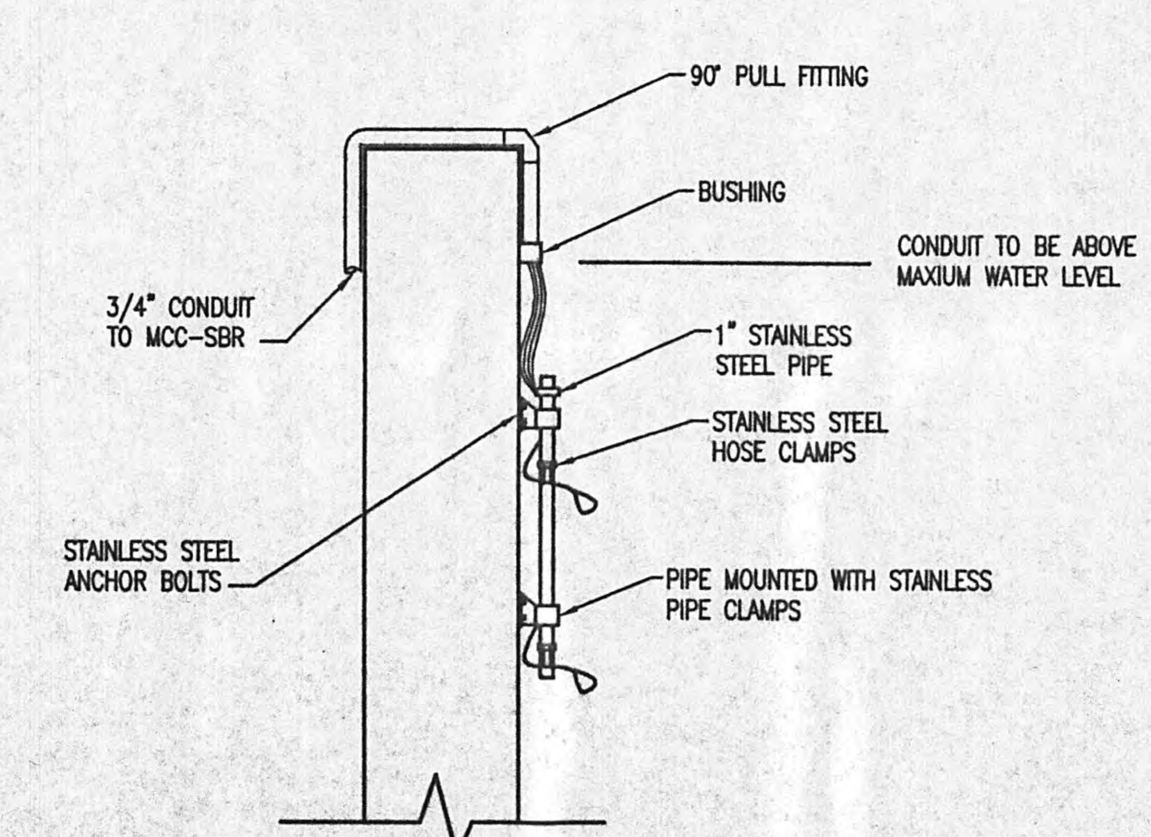


1 1/2" COVER REQUIRED OVER ALL REINFORCEMENT STEEL

TYPICAL LIGHT POLE BASE DETAIL
NOT TO SCALE
2 REQUIRED



MEDIUM VOLTAGE SWITCHGEAR – FOUNDATION
NOT TO SCALE



EQUALIZATION FLOAT MOUNTING BRACKET
NOT TO SCALE
2 REQUIRED

NO.	DESCRIPTION	DATE	BY

REVISIONS

MICHELLE HOWLAND
REGISTERED ENGINEER
STATE OF TENNESSEE
AGRICULTURE COMMERCE
10/2/02

GRW PROJECT NO. 7601-10

MISC. DETAILS

WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: GLW	DATE: 8-1-02
DRAWN: MKC	SCALE: AS NOTED
REVIEWED: GLW	SHEET NO.
APPROVED: TMH	E-13

Tue, 01 Oct 2002 - 4:23pm
FILE NAME: U:\3041\08-HARRIMAN WWTP\cadd\working\3041-E13.dwg

INSTRUMENT SYMBOL IDENTIFICATION LETTERS TABLE

	FIRST–LETTER		SUCCEEDING–LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION			CLOSE, STOP, DECREASE	
C	CONTROL			CONTROL	
D		DIFFERENTIAL	SENSOR (PRIMARY ELEMENT)	OPEN, START, INCREASE	
E	VOLTAGE				
F	FLOW RATE	RATIO (FRACTION)			FAIL
G			GLASS, VIEWING DEVICE		
H	HAND				HIGH OR OPEN
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW OR CLOSE
M	MOTOR, MOTION	MOMENTARY		MOTOR	MIDDLE INTERMEDIATE
N					STATUS (ON–OFF)
O			ORIFICE, RESTRICTION		OVERLOAD
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION	PUMP	
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		RELAY
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS	VELOCITY		VALVE, DAMPER LOUVER	
W	WEIGHT, FORCE		WELL		
X		X AXIS			
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR FINAL CONTROL ELEMENT	

EXPLANATORY NOTATIONS

SIGNAL CONVERTERS

NOTE 1: PROCESS OR INITIATING VARIABLE

2:

A = ANALOG		M = MOTOR	
D = DIGITAL		O = ELECTROMAGNETIC, SONIC	
E = VOLTAGE		P = PNEUMATIC	
F = FREQUENCY		PF = PULSE FREQUENCY	
H = HYDRAULIC		PD = PULSE DURATION	
I = CURRENT		R = RESISTANCE	

SMALL CIRCLE SIGNIFIES SIGNAL INVERSION

HAND SWITCHES

SELECTOR SWITCH (MAINTAINED CONTACT)

SPRING RETURN SWITCH OR PUSHBUTTONS (MOMENTARY CONTACT)

NOTE XXX:

AM = AUTO/MANUAL		CM = COMPUTER/MANUAL	
CAM = COMPUTER/AUTO/MANUAL		CL = COMPUTER/LOCAL	
FR = FOWARD/REVERSE		FOR = FOWARD/OFF/REVERSE	
FS = FAST/SLOW		FOS = FAST/OFF/SLOW	
HO = HAND/OFF		LR = LOCAL/REMOTE	
LOS = LOCKOUT/STOP		MFS = MODULATE FASTER/SLOWER	
MOC = MODULATE OPEN/CLOSE		OC = OPEN/CLOSE	
OO = ON/OFF		OSC = OPEN/STOP/CLOSE	
SS = START/STOP			

1. "A", WHEN ADDED TO NOTATION, INDICATES AUTO. EXAMPLE: HOA = HAND/OFF/AUTO
2. "R", WHEN ADDED TO NOTATION, INDICATES REMOTE. EXAMPLE: HOR = HAND/OFF/REMOTE

ANALYSIS INSTRUMENTS

EXPOSED PROBE OR GAS DETECTOR

TAPPED OR SAMPLED

IN–LINE (FLOW THROUGH)

NOTE XXX:

COL = COLOR		CDG = CARBON DIOXIDE GAS	
CG = COMBUSTIBLE GAS		CH4 = METHANE	
CLG = CHLORINE GAS		CLR = CHLORINE RESIDUAL	
COG = CARBON MONOXIDE GAS		DO = DISSOLVED OXYGEN	
HC = HYDROCARBONS		HUM = HUMIDITY	
H2S = HYDROGEN SULFIDE		MHO = CONDUCTIVITY	
NH4 = AMMONIA		N2G = NITROGEN GAS	
OG = OXYGEN GAS		OZG = OZONE GAS	
PH = pH		SD = SOLIDS DENSITY	
SO2 = SULPHUR DIOXIDE GAS		SS = SUSPENDED SOLIDS	
TOC = TOTAL ORGANIC CARBON		TRB = TURBIDITY	

EQUIPMENT SYMBOLS

CENTRIFUGAL PUMP (DRY PIT)	CENTRIFUGAL COMPRESSOR OR BLOWER
RECIPROCATING PUMP (PD)	RECIPROCATING COMPRESSOR (PD)
ROTARY PUMP (PD)	ROTARY COMPRESSOR (PD)
CENTRIFUGAL PUMP (WET PIT)	MOTOR
SCREW PUMP	MIXER
HEAT EXCHANGER	EJECTOR

NOTE XX: BLANK = CONSTANT SPEED; 2S = TWO SPEED; VS = VARIABLE SPEED

INSTRUMENT TAGGING

LLLL = FUNCTIONAL INSTRUMENT IDENTIFICATION FROM TABLE

NNNN = LOOP NUMBER

COMMONLY USED INSTRUMENT IDENTIFICATION LETTER COMBINATIONS DEVELOPED FROM CHART AT LEFT (UNLESS NOTED AS CUSTOM SYMBOL):

COMBINATION	DESCRIPTION
AE	ANALYZER PRIMARY ELEMENT
FE	FLOW PRIMARY ELEMENT
LE	LEVEL PRIMARY ELEMENT
PE	PRESSURE PRIMARY ELEMENT
FCV	FLOW CONTROL VALVE (FINAL ELEMENT)
FIT	FLOW INDICATING TRANSMITTER
LIT	LEVEL INDICATING TRANSMITTER
AIT	ANALYSIS INDICATING TRANSMITTER
PIT	PRESSURE INDICATING TRANSMITTER
FAL	FLOW ALARM LOW
LAH	LEVEL ALARM HIGH
FI	FLOW INDICATOR
PI	PRESSURE INDICATOR
LI	LEVEL INDICATOR
FIR	FLOW INDICATING RECORDER
FIRQ	FLOW INDICATING RECORDER WITH TOTALIZER
FIC	FLOW INDICATING CONTROLLER
KC	TIMER
CR	CONTROL RELAY
I/I	CURRENT TO CURRENT CONVERTER (LOOP ISOLATOR)
FY	FLOW COMPUTING RELAY
UT	TELEPHONE DIALER
MN	MOTOR STATUS
MO	MOTOR OVERLOAD
FMR	FM RADIO (CUSTOM SYMBOL)
RTU	REMOTE TERMINAL UNIT (CUSTOM SYMBOL)
MTU	MASTER TERMINAL UNIT (CUSTOM SYMBOL)
PS	POWER SUPPLY (CUSTOM SYMBOL)
I/O	INPUT/OUTPUT MODULE (CUSTOM SYMBOL)
PT	PRESSURE TRANSDUCER (CUSTOM SYMBOL)
A/D	ANALOG TO DIGITAL CONVERTER (CUSTOM SYMBOL)
D/A	DIGITAL TO ANALOG CONVERTER (CUSTOM SYMBOL)
PCM	PUMP CONTROL MODULE (CUSTOM SYMBOL)
TSG	THUMBWHEEL SETPOINT GENERATOR (CUSTOM SYMBOL)
MNC	MOTOR CALLED FOR
MNF	MOTOR FAILED
DFA	DATA FAIL ALARM

MISCELLANEOUS SYMBOLS

DIAPHRAGM SEAL	TRANSIENT SUPPRESSOR
RUPTURE DISK (PRESSURE RELIEF)	SIGHT GLASS NOTE: X W = WATER A = AIR
RUPTURE DISK (VACUUM RELIEF)	FLOW STRAIGHTENER
(REGULATED SIDE) PRESSURE REGULATOR	DIFFERENTIAL PRESSURE REGULATOR
PRESSURE GAUGE	ANTENNA (GENERIC)
VENT TO ATMOSPHERE	INTERLOCK LOGIC
	RESET
AIR GAP	SQUARE ROOT EXTRACTOR
	SIGNAL CONTINUATION WHERE X = 1,2,3,ETC.
SNUBBER	

GENERAL INSTRUMENT OR FUNCTION SYMBOLS

	DISCRETE INSTRUMENT	SHARED DISPLAY/ SHARED CONTROL	COMPUTER FUNCTION
FIELD MOUNTED	○	□	⬡
FRONT OF PANEL MOUNTED	⊖	⊟	⬡
INTERIOR OF PANEL MOUNTED	⊖	⊟	⬡
MOTOR CONTROL CENTER MOUNTED	⊖	⊟	⬡
INSTRUMENTS SHARING A COMMON HOUSING	○○	□□	⬡⬡
ANNUNCIATOR	⊡	□	⬡

PRIMARY ELEMENT SYMBOLS

FLOW

ELECTROMAGNETIC	
ULTRASONIC IN–LINE	
ULTRASONIC CLAMP–ON OR DOPPLER	
VENTURI	
ORIFICE PLATE	
PROPELLER OR TURBINE	
VORTEX SHEDDING	
TARGET	
PITOT TUBE	
ROTAMETER	
FLUME	
WEIR	
UNCLASSIFIED FLOW ELEMENT: X = E SWITCH: X = S	

LEVEL

BUBBLE TUBE	
ULTRASONIC	
CAPACITANCE	
ELECTRODES (WITH HOLDER)	
FLOAT	
UNCLASSIFIED LEVEL ELEMENT: X = E SWITCH: X = S	

TEMPERATURE

TEMPERATURE WITH WELL	

ACTUATOR SYMBOLS

PNUEMATIC	ELECTROPNEUMATIC
HYDRAULIC	ELECTROHYDRAULIC
ELECTRIC NOTE XX = PZ, HZ OR MZ INDICATES ACTUATOR WITH POSITIONER	
PRESSURE OR VACUUM RELIEF SPRING OR WEIGHT LOADED	
MANUAL	
SOLENOID	

NOTE: ON LOSS OF PRIMARY POWER (PNEUMATIC OR ELECTRICAL)

XX:FO = FAIL OPEN
FC = FAIL CLOSED
FI = FAIL TO INTERMEDIATE POSITION
BLANK = FAIL TO LAST POSITION

VALVE & GATE SYMBOLS

	BUTTERFLY VALVE, DAMPER OR LOUVER
	CHECK VALVE
	GLOBE, GATE, PINCH OR OTHER IN–LINE VALVE
	BALL VALVE
	THREE WAY VALVE (ARROWS INDICATE FLOW PATTERN)
	TELESCOPING VALVE
	SLUICE GATE
	PREFABRICATED SLIDE GATE

INSTRUMENT LINE SYMBOLS

(LINES TO BE DRAWN FINE IN RELATION TO PROCESS PIPING LINES)

CONNECTION TO PROCESS	
PNEUMATIC SIGNAL	
ELECTRIC	OR
HYDRAULIC SIGNAL	
CAPILLARY TUBE	
ELECTROMAGNETIC OR SONIC SIGNAL (GUIDED)	
ELECTROMAGNETIC OR SONIC SIGNAL (NOT GUIDED)	
INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)	
MECHANICAL LINK	

ABREVIATIONS/ACRONYMS

AS	AIR SUPPLY	ES	ELECTRIC SUPPLY
GS	GAS SUPPLY	HS	HYDRAULIC SUPPLY
WS	WATER SUPPLY	CO	CONTACT OUTPUT
CI	CONTACT INPUT	PD	POSITIVE DISPLACEMENT
FMR	FM RADIO	MTU	MASTER TERMINAL UNIT
RTU	REMOTE TERMINAL UNIT		

GENERAL NOTES:

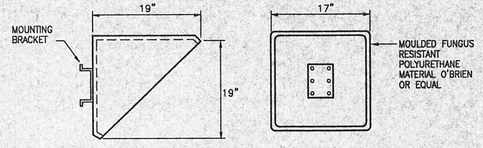
SEE DIVISION 13, 14 OF THE SPECIFICATIONS FOR FURTHER INSTRUMENTATION REQUIREMENTS.

THIS IS A GUIDE TO READING INSTRUMENT SOCIETY OF AMERICA (ISA) FORMAT P&ID OR LOOP DIAGRAMS. THESE SYMBOLS AND TECHNIQUES ARE MOSTLY EXTRACTED FROM ISA STANDARD S5.1. THIS IS NOT HOWEVER, A COMPLETE OR EXACT DUPLICATION OF S5.1. NOT ALL SYMBOLS SHOWN ARE USED ON THIS PROJECT. SOME SYMBOLS MAY BE USED THAT ARE NOT SHOWN. CONTACT THE ENGINEER OR THE ISA STANDARD S5.1 FOR CLARIFICATIONS.

PROJECT NOTE:

POWER SUPPLIES SHALL BE PROVIDED AS REQUIRED FOR PROPER LOOP OPERATION WITH 2 WIRE TRANSMITTERS.

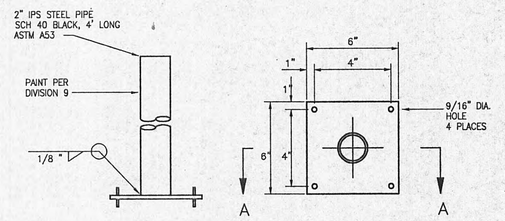
	FLOW STREAM CONNECTION NOT SHOWN ON OTHER DRAWINGS
XXXX	FLOW STREAM CONNECTION SHOWN ON ANOTHER DRAWING. XXXX IS SHEET NUMBER WHERE SHOWN.
	DIGITAL INPUT (DISCRETE)
	DIGITAL OUTPUT (DISCRETE)
	PULSE TRAIN INPUT
F	PULSE OUTPUT (MOMLENTARY UNLESS F IS PRESENT – F MEANS PULSE TRAIN OUTPUT)
	ANALOG INPUT
	ANALOG OUTPUT



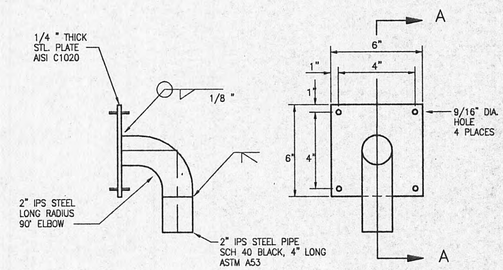
SUNSHADE DETAIL (ICS1.1 (TYP.))

NOT TO SCALE

- REQUIRED FOR ALL OUTSIDE MOUNTED TRANSMITTERS.
- DIMENSIONS SHOWN ARE MINIMUM. SUPPLIER SHALL COORDINATE WITH EQUIPMENT PROVIDED TO ASSURE PROPER SIZE AT NO EXTRA COST.



FLOOR STAND



WALL BRACKET

INSTRUMENT MOUNTING BRACKETS (ICS1.4 (TYP.))

NOT TO SCALE

- MOUNT BRACKETS USING NON MAGNETIC STAINLESS STEEL ANCHOR BOLTS.
- PAINT ENTIRE BRACKET PRIOR TO INSTALLATION, INCLUDING CONCEALED SURFACES.

GRW PROJECT NO. 7601–10

SYMBOL SHEET

WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY

REVISIONS

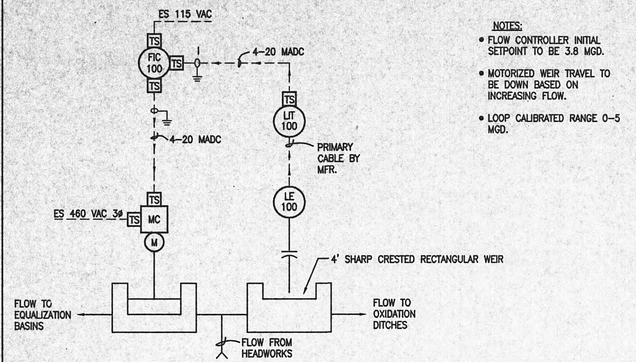
MICHELLE L. HOWARD — REGISTERED ENGINEER — AGRICULTURAL — No. 001058 — STATE OF TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: GLW	DATE: 8–1–02
DRAWN: JMG	SCALE: AS NOTED
REVIEWED: GLW	SHEET NO. ICS–1
APPROVED: TMH	

Tue, 01 Oct 2002 – 4:27pm
FILE NAME: u:\3041\08–HARRIMAN WWTP\cadd\working\3041–ICS1.dwg

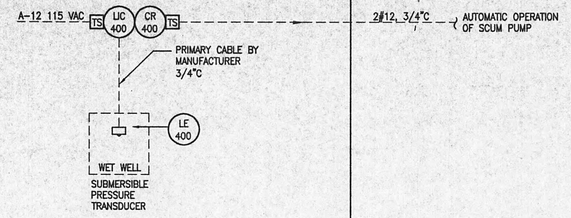
FIELD INSTRUMENTS



NOTES:
- FLOW CONTROLLER INITIAL SETPOINT TO BE 3.8 MGD.
- MOTORIZED WEIR TRAVEL TO BE DOWN BASED ON INCREASING FLOW.
- LOOP CALIBRATED RANGE 0–5 MGD.

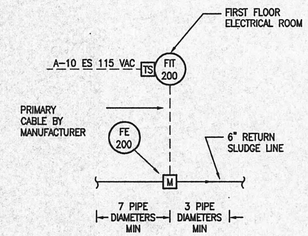
LOOP 100 –ADJUSTABLE WEIR FLOW CONTROLS
1 SYSTEM REQUIRED

ELECTRICAL ROOM–RAS/WAS BUILDING | MCC–RWB



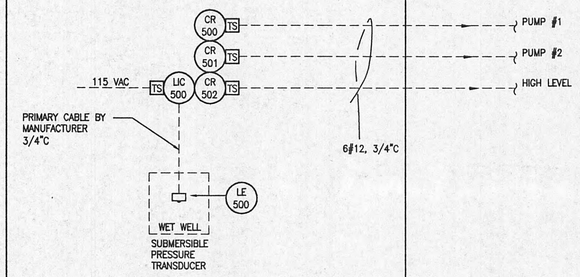
LOOP 400 – SCUM PUMP WET WELL LEVEL
• 1 SYSTEM REQUIRED

FIELD INSTRUMENTS



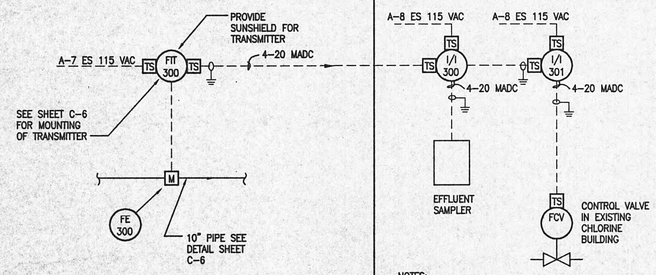
LOOP 200 – RETURN SLUDGE FLOW
• 1 SYSTEM REQUIRED

UTILITY PUMP STATION | UTILITY PUMP CP



LOOP 500 – UTILITY PUMP STATION
• 1 SYSTEM REQUIRED

FIELD INSTRUMENTS | RAS/WAS /CHLORINE BUILDING



NOTES:
- LOOP ISOLATORS TO BE LOCATED IN A NEMA 1 ENCLOSURE INSIDE THE RAS/WAS ELECTRICAL ROOM.

LOOP 300 – INTERMEDIATE FLOW MONITORING
• 1 SYSTEM REQUIRED

NO.	DESCRIPTION	DATE	BY

REVISIONS

GRW PROJECT NO. 7601–10

LOOP DIAGRAMS

WASTEWATER TREATMENT PLANT UPGRADE
HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: GLW	DATE: 8–1–02
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APPROVED: TMH	

SUPPLY/EXHAUST FAN SCHEDULE

MARK	LOCATION	TYPE FAN	CFM	S.P. IN W.C.	RPM	DRIVE	HP OR WATTS	VOLTS/ PHASE	REMARKS
EF-1	RETURN/WASTE SLUDGE BLDG. ELECTRICAL RM.	CENTRIFUGAL SIDEWALL EXHAUSTER	2,720	0.25	811	BELT	1/3	120/1	GREENHECK, OR EQUAL, MODEL GWB-18-3 W/WALL GRILLE & GRAVITY BACKDRAFT DAMPER. MOUNT 7'-4" A.F.F.
EF-2	RETURN/WASTE SLUDGE BLDG. FIRST FLOOR	CENTRIFUGAL SIDEWALL EXHAUSTER	1,965	0.25	1190	BELT	1/3	120/1	GREENHECK, OR EQUAL, MODEL GWB-14-3 W/WALL GRILLE & GRAVITY BACKDRAFT DAMPER. MOUNT 7'-4" A.F.F.
EF-3	RETURN/WASTE SLUDGE BLDG. FIRST FLOOR	CENTRIFUGAL SIDEWALL EXHAUSTER	3,660	0.25	751	BELT	1/2	120/1	GREENHECK, OR EQUAL, MODEL GWB-21-5 W/WALL GRILLE & GRAVITY BACKDRAFT DAMPER. MOUNT 7'-4" A.F.F.
EF-4	BELT FILTER PRESS BLDG.	SIDEWALL PROPELLER	3,630	0.25	934	BELT	1/2	120/1	GREENHECK, OR EQUAL, MODEL SBE-IH24-5 W/WALL COLLAR, MOTOR SIDE GUARD, BACKDRAFT DAMPER & WEATHERHOOD. MOUNT 10' A.F.F.

LOUVER SCHEDULE

MARK	LOCATION	SIZE-INCHES WxHxD	FREE AREA SQ. FT.	CFM	VELOCITY FPM	HEAD LOSS IN W.G.	REMARKS
L-1	RETURN/WASTE SLUDGE BLDG. ELECTRICAL RM.	32x32x6	2.91	2720	935	0.11	RUSKIN, OR EQUAL, MODEL ELC6375DAF COMBINATION LOUVER W/MOTOR OPERATOR & KYNAR FINISH. MOUNT 2' A.F.F. INTERLOCK W/EF-1.
L-2	RETURN/WASTE SLUDGE BLDG. FIRST FLOOR	32x24x4	2.39	1965	822	0.08	RUSKIN, OR EQUAL, MODEL ELF375D STATIONARY LOUVER W/KYNAR FINISH. MOUNT 2' A.F.F. INTERLOCK DUCT OBD W/EF-3.
L-3	RETURN/WASTE SLUDGE BLDG. FIRST FLOOR	40x32x4	4.39	3660	833	0.08	RUSKIN, OR EQUAL, MODEL ELF375D STATIONARY LOUVER W/KYNAR FINISH. MOUNT 4' A.F.F.
L-4	BELT FILTER PRESS BLDG.	36x36x6	3.68	3630	986	0.13	RUSKIN, OR EQUAL, MODEL ELC6375DAF COMBINATION LOUVER W/MOTOR OPERATOR & KYNAR FINISH. MOUNT 3' A.F.F. INTERLOCK W/EF-4.

ELECTRIC HEATER SCHEDULE

MARK	LOCATION	UNIT TYPE	MIN. BTUH.	KW	CFM	THROW FT.	°F TEMP. RISE	VOLTS/ PHASE	REMARKS
EUH-1	RETURN/WASTE SLUDGE BLDG. ELECTRICAL RM.	ELECTRIC WALL FIN	3,413	1.0	–	–	–	120/1	TRANE, OR EQUAL, MODEL EWFB, TYPE DBT, SINGEL ELEMENT, 250 WATTS/FT; 4' LONG W/BUILT-IN T-STAT, DISCONNECT & END CAPS
EUH-2	RETURN/WASTE SLUDGE BLDG. FIRST FLOOR	HOSE-DOWN UNIT HEATER	11,200	3.3	400	20	26	480/3	TRANE, OR EQUAL, MODEL UHRA-033DAAT W/BUILT-IN THERMOSTAT & STAINLESS STEEL MOUNTING BRACKET. MOUNT 6' A.F.F.
EUH-3	RETURN/WASTE SLUDGE BLDG. FIRST FLOOR	HOSE-DOWN UNIT HEATER	34,130	10.0	700	28	45	480/3	TRANE, OR EQUAL, MODEL UHRA-103DAAT W/BUILT-IN THERMOSTAT & STAINLESS STEEL MOUNTING BRACKET. MOUNT 6' A.F.F.
EUH-4	RETURN/WASTE SLUDGE BLDG. BASEMENT	HOSE-DOWN UNIT HEATER	51,200	15.0	700	28	68	480/3	TRANE, OR EQUAL, MODEL UHRA-153DAAT W/BUILT-IN THERMOSTAT & STAINLESS STEEL MOUNTING BRACKET. MOUNT 6' A.F.F.
EUH-5	RETURN/WASTE SLUDGE BLDG. BASEMENT	HOSE-DOWN UNIT HEATER	25,600	7.5	400	20	60	480/3	TRANE, OR EQUAL, MODEL UHRA-073DAAT W/BUILT-IN THERMOSTAT & STAINLESS STEEL MOUNTING BRACKET. MOUNT 6' A.F.F.
EUH-6	BELT FILTER PRESS BLDG.	HOSE-DOWN UNIT HEATER	25,600	7.5	400	20	60	480/3	TRANE, OR EQUAL, MODEL UHRA-073DAAT W/BUILT-IN THERMOSTAT & STAINLESS STEEL MOUNTING BRACKET. MOUNT 6' A.F.F.
EUH-7	BELT FILTER PRESS BLDG.	HOSE-DOWN UNIT HEATER	25,600	7.5	400	20	60	480/3	TRANE, OR EQUAL, MODEL UHRA-073DAAT W/BUILT-IN THERMOSTAT & STAINLESS STEEL MOUNTING BRACKET. MOUNT 6' A.F.F.

GENERAL LEGEND

- APPEARS ON SHEET WHERE SECTION IS CUT
- B / H-4 — SECTION IDENTIFICATION LETTER; SHEET WHERE SECTION IS DRAWN
- APPEARS ON THE SHEET WHERE SECTION IS DRAWN
- D / H-4 — SECTION OR DETAIL IDENTIFICATION LETTER; SHEET WHERE DRAWN
- ENLARGED AREA OR PARTIAL PLAN SYMBOL (ON SHEET WHERE INDICATED AND SHEET WHERE DRAWN)
- B / P3.2 — IDENTIFICATION LETTER; SHEET WHERE DRAWN
- A — PLAN MATCH LINE SYMBOL
- CONNECTION OF NEW WORK TO EXISTING
- LINE OR EQUIPMENT TO BE REMOVED
- 123 — ROOM NUMBER
- 9'-6" — CEILING HEIGHT
- AFF — ABOVE FINISHED FLOOR
- TOS, BOS — TOP OF STEEL, BOTTOM
- TOB, BOB — TOP OF BEAM, BOTTOM
- TOJ, BOJ — TOP OF JOIST, BOTTOM
- TOC, BOC — TOP OF CONCRETE, BOTTOM
- TOP, BOP — TOP OF PIPE, BOTTOM
- BOD — BOTTOM OF DECK
- OBD — OPPOSED BLADE DAMPER
- SS — STAINLESS STEEL

MECHANICAL LEGEND

- 20x16 — NEW DUCT – 1ST FIGURE IS DIMENSION SHOWN
- SUPPLY OR OUTSIDE AIR DUCTWORK; PLAN, UP & DOWN
- RETURN OR EXHAUST DUCTWORK
- ROUND DUCTWORK; PLAN, UP AND DOWN
- AIR FLOW; DIRECTION
- M — MOTOR OPERATED DAMPER; PLAN, ONE LINE DIAGRAM
- AIR TURNING VANES; PLAN, ONE LINE DIAGRAM
- DUCT TRANSITION; PLAN, ONE LINE DIAGRAM
- FLEXIBLE DUCT CONNECTOR; PLAN
- T — THERMOSTAT, OR TEMP. CONTROLLER
- HORIZONTAL UNIT HEATER
- ROOF EXHAUST HOOD, EXHAUST FAN
- ROOF INTAKE HOOD, SUPPLY FAN

GENERAL NOTES

1. GENERAL NOTES, WHEREVER THEY ARE FOUND, APPLY TO ALL WORK IN THE PROJECT, UNLESS OTHERWISE INDICATED. SHEET NOTES, UTILIZING NOTE SYMBOLS, APPLY ONLY TO THE SHEET ON WHICH THEY ARE FOUND, UNLESS OTHERWISE STATED. THE MEANING OF NOTE SYMBOLS AND NUMBERS VARIES FROM SHEET TO SHEET.
2. CONTRACTOR SHALL UTILIZE ALL INFORMATION IN THE CONTRACT DOCUMENTS FOR PROVIDING THE WORK. CONTRACTOR SHALL UTILIZE DETAILS AND FLOW DIAGRAMS FOR THE WORK WHERE APPROPRIATE, WHETHER OR NOT THEY ARE SPECIFICALLY REFERENCED ON THE PLANS OR SUPPORTING DRAWINGS.
3. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND CONTRACT DOCUMENTS ARE TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE ANY WORK RELATING TO THOSE CONDITIONS IS PERFORMED.
4. LEGENDS OR LISTS OF SYMBOLS AND ABBREVIATIONS ARE GENERAL IN NATURE AND MAY CONTAIN ITEMS NOT USED IN THE CONTRACT DOCUMENTS. IF ANY SUCH ITEMS ARE FOUND WHICH ARE NOT DEFINED ON THE PLANS OR IN THE SPECIFICATIONS, THE ENGINEER SHALL BE CONTACTED FOR CLARIFICATION BEFORE THE BID.
5. CONTRACTOR SHALL MAINTAIN A SET OF PROJECT RECORD DRAWINGS AT THE JOB SITE AND SHALL BE RESPONSIBLE FOR MAKING CLEAR, NEAT CHANGES TO THE DRAWINGS, REFLECTING CHANGES TO THE WORK AND VARIANCE IN EXISTING CONDITIONS.
6. PROVIDE ALL MISCELLANEOUS STEEL, AS REQUIRED, TO SUPPORT ALL MECHANICAL DUCT AND PIPING SYSTEMS AND EQUIPMENT. HANG ALL EQUIPMENT FROM STRUCTURE WITH MINIMUM OF TWO TRAPEZE ASSEMBLIES OR FOUR INTEGRAL MOUNTING POINTS WITH VIBRATION ISOLATORS ON ALL FOUR SUPPORTS. DO NOT HANG ANYTHING FROM STEEL, COMPOSITION OR WOODEN DECKS. NON-ROOF CONCRETE DECKS MAY BE USED ONLY WITH PERMISSION OF THE ENGINEER. DO NOT HANG ANYTHING FROM MECHANICAL OR ELECTRICAL ITEMS.
7. NO CONCRETE RIBS OR JOISTS SHALL BE CUT WITHOUT SPECIFIC PERMISSION FROM THE ENGINEER. ALL ROOF OR FLOOR DECK PENETRATIONS IN WAFFLE STRUCTURE SHALL BE IN THE THIN-SLAB DEPRESSIONS IN THE STRUCTURE UNLESS OTHERWISE SHOWN.
8. NO STEEL STRUCTURAL MEMBERS SHALL BE CUT, BURNED, WELDED OR DRILLED WITHOUT SPECIFIC PERMISSION OF THE ENGINEER.
9. NO WOODEN STRUCTURAL MEMBERS SHALL BE CUT OR DRILLED EXCEPT AS INDICATED IN THE CONTRACT DOCUMENTS OR AS APPROVED BY THE ENGINEER.
10. CONSULT ROOF PLAN AND STRUCTURAL DRAWINGS FOR PLACEMENT OF ROOF MOUNTED EQUIPMENT. PROVIDE ALL NECESSARY ROOF CURBS, EQUIPMENT RAILS AND BASES AND ANY ADDITIONAL REQUIRED FRAMING IN COORDINATION WITH STRUCTURAL AND ROOFING WORK.
11. ALL EQUIPMENT, DUCT, PIPING AND ACCESSORIES INSTALLED OUTSIDE OR OTHERWISE EXPOSED TO THE ELEMENTS SHALL BE ADEQUATELY WEATHERPROOFED, IN KEEPING WITH THE SPECIFICATIONS. ALL FERROUS METAL FRAMING COMPONENTS SHALL BE STAINLESS STEEL OR HOT-DIP GALVANIZED.
12. DO NOT CHANGE PATH OF PIPING OR DUCT RUNS, ADD TURNS OR OFFSETS OR CHANGE DUCT DIMENSIONS OR PIPE SIZE WITHOUT FIRST CONSULTING THE ENGINEER. PIPE SIZES SHOWN ON DRAWINGS ARE NOMINAL UNLESS OTHERWISE INDICATED. ALL DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE DIMENSIONS FOR SHOP OR FIELD-FABRICATED DUCT AND NOMINAL SIZES FOR FACTORY FABRICATED DUCT.
13. CONTRACTOR SHALL CERTIFY AT THE TIME OF OWNER OCCUPANCY THAT ALL BELT-DRIVEN EQUIPMENT HAS BEEN CHECKED FOR BELT TIGHTNESS AFTER WEAR-IN PERIOD.
14. ALL EXISTING EQUIPMENT SHUTDOWNS OR INTERRUPTIONS OF UTILITY SERVICE REQUIRED FOR COMPLETION OF THE WORK SHALL BE SCHEDULED IN ADVANCE, AS REQUIRED BY THE OWNER.
15. COORDINATE ALL PIPING AND DUCTWORK WITH BOTH NEW AND EXISTING MECHANICAL AND ELECTRICAL WORK, INCLUDING HVAC, PLUMBING, ELECTRICAL, FIRE ALARM AND COMMUNICATIONS.
16. CONTRACTOR IS RESPONSIBLE FOR MAKING ALL REQUIRED CONNECTIONS FOR A COMPLETE SYSTEM. CONNECTIONS OF NEW WORK TO EXISTING IS USUALLY INDICATED BY SPECIAL SYMBOL (SEE LEGEND). SYMBOLS MISSING FROM THE DRAWINGS DO NOT EXCUSE THE CONTRACTOR FROM PROVIDING THE WORK.
17. ALL DUCTWORK AND SHEET METAL SHALL BE PROVIDED AS INDICATED AND SHALL BE MANUFACTURED AND SHOP- OR FIELD-FABRICATED, AS A MINIMUM, IN ACCORDANCE WITH THE RECOMMENDATIONS AND DETAILS OF SMACNA, UNLESS SPECIFICALLY INDICATED OTHERWISE.
18. FANS SHALL BE PROVIDED AS INDICATED BY GREENHECK, CARNES, COOK OR APPROVED EQUAL. GRILLES, REGISTERS AND DIFFUSERS SHALL BE PROVIDED AS INDICATED BY TITUS, TUTTLE AND BAILEY, CARNES OR APPROVED EQUAL. LOUVERS, HOODS AND PENTHOUSES SHALL BE PROVIDED AS INDICATED BY GREENHECK, AIRSTREAM, LOUVERS AND DAMPERS, CARNES, RUSKIN OR APPROVED EQUAL. PROVIDE FIRE AND SMOKE DAMPERS IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA AND THE TENNESSEE BUILDING CODE.
19. USE TURNING VANES, PER SMACNA CONSTRUCTION GUIDELINES, FOR ALL MITERED RECTANGULAR TURNS OF 45 DEGREES OR MORE.
20. PROVIDE ALL CONTROLS NECESSARY TO OPERATE EQUIPMENT AS SHOWN OR DESCRIBED, INCLUDING VALVES, ACTUATORS, THERMOSTATS, DAMPERS, ALL ACCESSORY DEVICES, POWER AND/OR PNEUMATIC SERVICE.
21. PROVIDE DISCONNECTS AND MAGNETIC STARTERS (OR RELAYS WITH OVERLOAD PROTECTION FOR SINGLE PHASE) FOR ALL EQUIPMENT SUPPLIED UNDER DIVISION 15 WHICH IS SPECIFIED TO HAVE FACTORY CONTROL PANEL. POWER WIRING AND CONDUIT TO THESE DEVICES AND BETWEEN THESE DEVICES AND MECHANICAL EQUIPMENT, IF REQUIRED, SHALL BE SUPPLIED UNDER DIVISION 16.

GRW PROJECT NO. 7601-10

MECHANICAL LEGEND GENERAL NOTES, AND SCHEDULES WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. ELY — REGISTERED ENGINEER — AGRICULTURAL — NUMBER — NO. 001022 — STATE OF TENNESSEE — 10-2-02

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGE	DATE: 8-1-02
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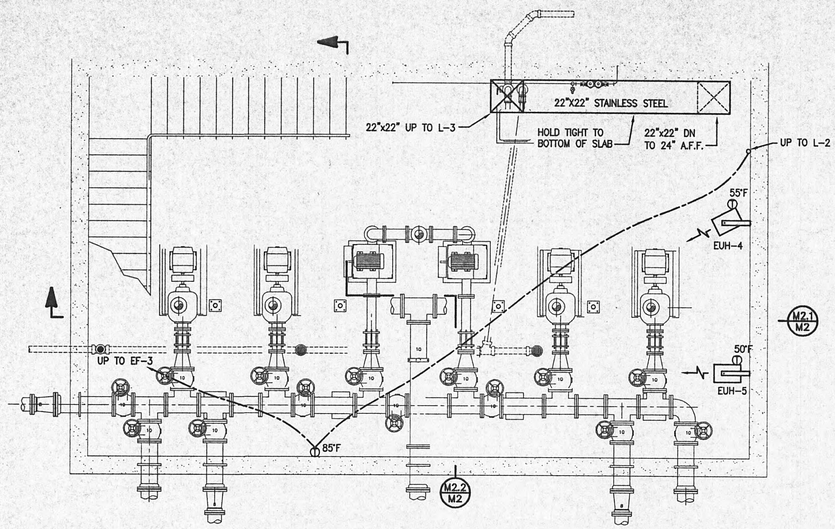

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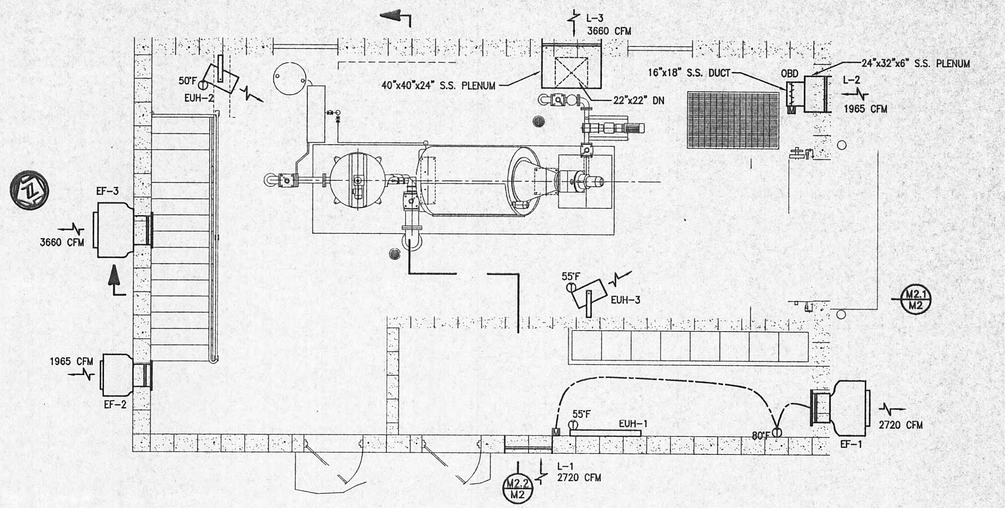

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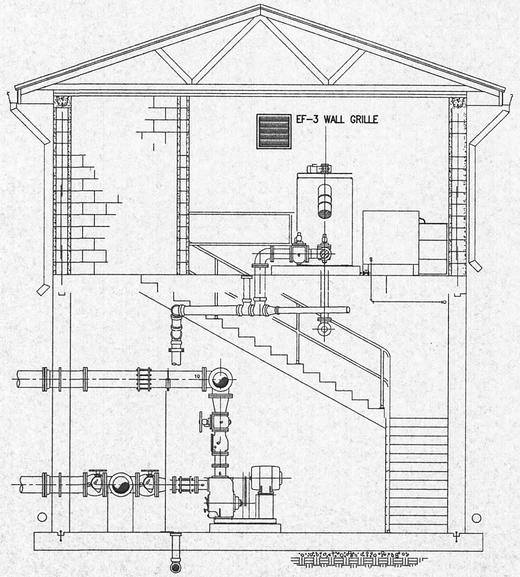

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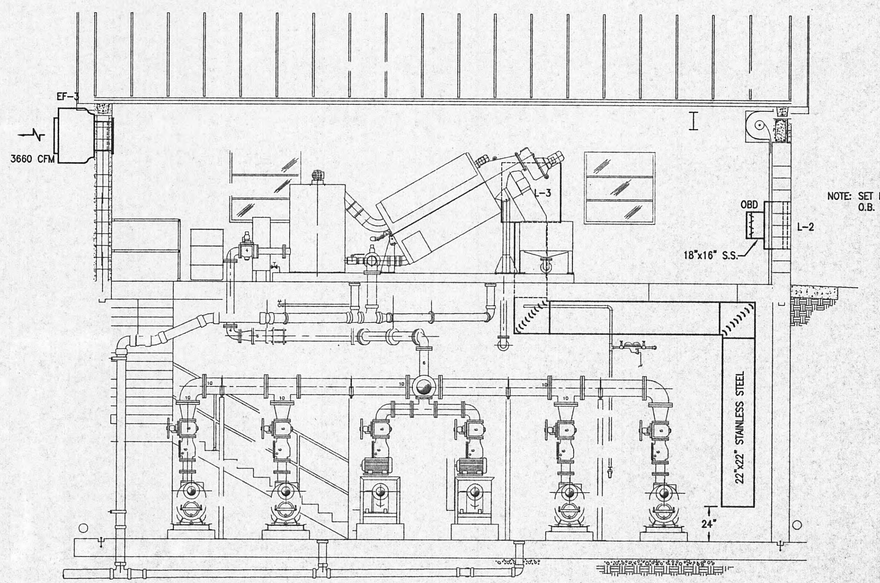

SECTION
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M2.1 M2

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

ROBERT G. ELY
REGISTERED ENGINEER
No. 101603
STATE OF TENNESSEE

GRW PROJECT NO. 7601-10

RETURN/WASTE SLUDGE PUMP BUILDING MECHANICAL PLAN & SECTIONS WASTEWATER TREATMENT PLANT UPGRADE HARRIMAN UTILITY BOARD – HARRIMAN, TENNESSEE

GRW Elrod Dunson, Inc.
Engineers, Architects, Planners
LEXINGTON LOUISVILLE INDIANAPOLIS NASHVILLE KNOXVILLE

DESIGNED: RGE	DATE: 8-1-02
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