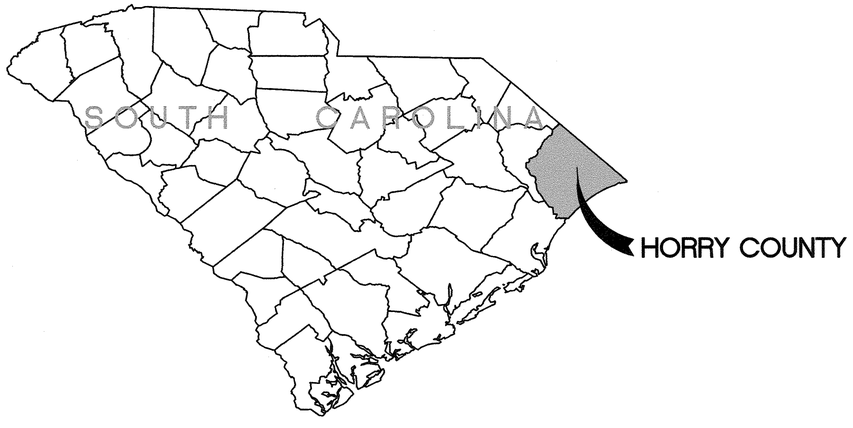
PERRY ROAD
WATER BOOSTER PUMP STATION
(UPGRADE)

GRAND STRAND
WATER & SEWER
AUTHORITY

11x17 ARE TRUE 1/2 SCALE
AS-BUILT
9-5-2008



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

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

HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
MYRTLE BEACH, SOUTH CAROLINA 29577
PHONE: (843) 626-1910 FAX: (843) 626-1745

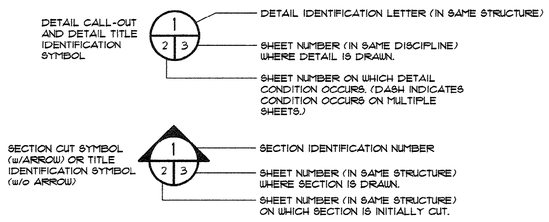
VERSION: 4

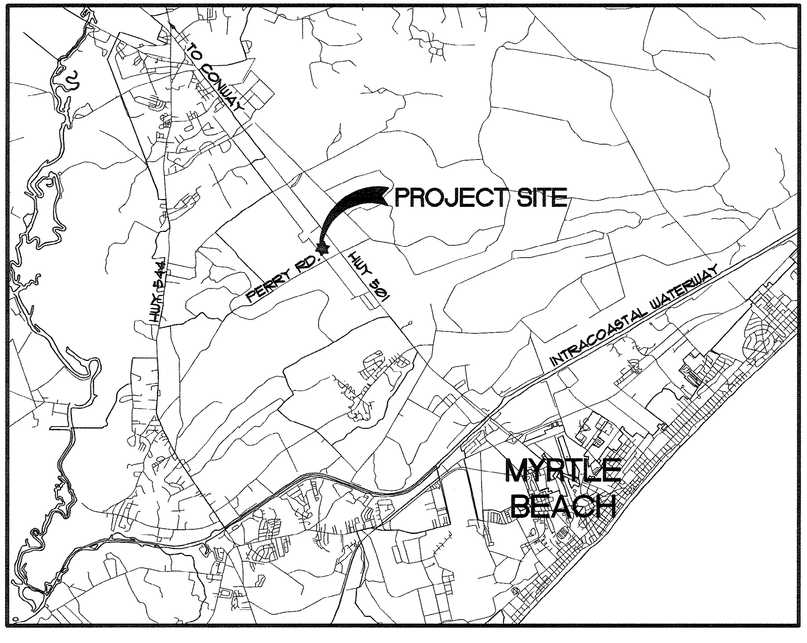
12-350-001/36

GENERAL CONSTRUCTION ABBREVIATIONS

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

SECTION/DETAIL LEGEND





VICINITY MAP
N.T.S.

INDEX OF SHEETS

AS-BUILT 9-5-08

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

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

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

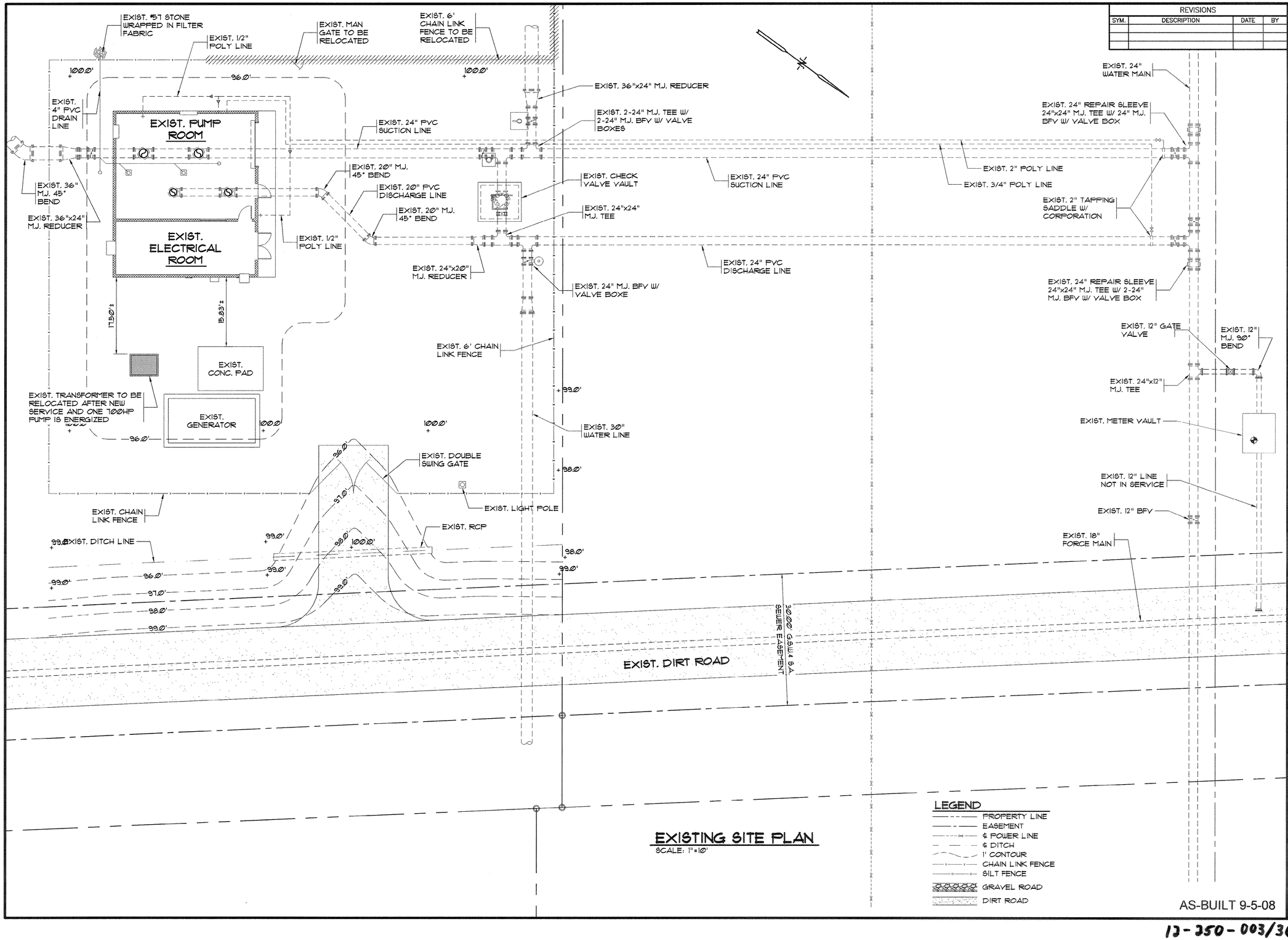
Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1910 FAX: (843) 626-1745

VICINITY MAP AND INDEX

PERRY ROAD PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN
SHEET NO.	2
OF:	15
VERSION:	4

12-350-007/36 W



EXISTING SITE PLAN
SCALE: 1"=10'

AS-BUILT 9-5-08

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

WORKS OF UPCHURCH AND ASSOCIATES, P.A. CERTIFICATE OF AUTHORIZATION No. C00238

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1910 FAX: (843) 626-7745

EXISTING SITE PLAN

PERRY ROAD
PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. 3

OF: 15 VERSION: 4

12-350-003/36 W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

EXIST. 5,000,000 GALLON CLEARWELL

EXIST. 36" D.I.P. CLEARWELL EFFLUENT LINE

EXIST. #57 STONE WRAPPED IN FILTER FABRIC

EXIST. YARD HYDRANT ASSEMBLY W/ 2" GATE VALVE

EXIST. 6' CHAIN LINK FENCE

EXIST. DOUBLE SWING GATE RELOCATED

EXIST. WELL HOUSE

EXIST. 4" PVC DRAIN LINE

EXIST. 1/2" POLY LINE

EXIST. MAN GATE TO BE RELOCATED

EXIST. 36"x24" M.J. REDUCER

EXIST. PUMP STATION

EXIST. 24" PVC SUCTION LINE

EXIST. 2-24" M.J. TEE W/ 2-24" M.J. BFV W/ VALVE BOXES

EXIST. 16" PVC DR 25 DRAIN LINE

EXIST. WELL

EXIST. 36" M.J. 45° BEND

EXIST. 3" CONDUIT (FIBER OPTIC)

EXIST. 36"x24" M.J. REDUCER

EXIST. 20" PVC DISCHARGE LINE

EXIST. CHECK VALVE VAULT

EXIST. 20" M.J. 45° BEND

EXIST. 24"x24" M.J. TEE

EXIST. 24" PVC SUCTION LINE

EXIST. 6' CHAIN LINK FENCE

NEW A/C UNIT CONDENSERS

EXIST. ELECTRICAL ROOM

NEW ELECTRICAL ROOM NO. 2

NEW A/C UNIT CONDENSER

NEW WATER LINE

EXIST. 24" PVC DISCHARGE LINE

NEW CONC. PAD

20' MIN.

NEW BOLLARDS

63.25'

EXIST. 12" WATER LINE

EXIST. 30" WATER LINE

NEW STANDBY DIESEL EMERGENCY GENERATOR SET WITH SUB-BASE FUEL TANK

EXIST. TRANSFORMER TO BE RELOCATED

EXISTING GENERATOR SET

NEW PAD MOUNTED TRANSFORMER

EXIST. TRANSFORMER

EXISTING 16" PVC BLOW-OFF LINE

EXIST. MANGATE RELOCATED

EXIST. DOUBLE SWING GATE TO BE RELOCATED

6'

EXIST. DOUBLE SWING GATE

EXIST. 6' CHAIN LINK FENCE

EXIST. RCP

EXIST. DITCH LINE

LEGEND

- PROPERTY LINE
- EASEMENT
- ¢ POWER LINE
- ¢ DITCH
- 1' CONTOUR
- CHAIN LINK FENCE
- SILT FENCE
- GRAVEL ROAD
- DIRT ROAD

NEW SITE PLAN

SCALE: 1"=10'

30.00' G.S.W.S.A. SEWER EASEMENT

EXIST. DIRT ROAD

AS-BUILT 9-5-08

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

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 12335 JOSEPH W. MCCOLGAN

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1910 FAX: (843) 626-1745

NEW SITE PLAN

PERRY ROAD PUMP STATION

GRAND STRAND WATER & SEWER AUTHORITY

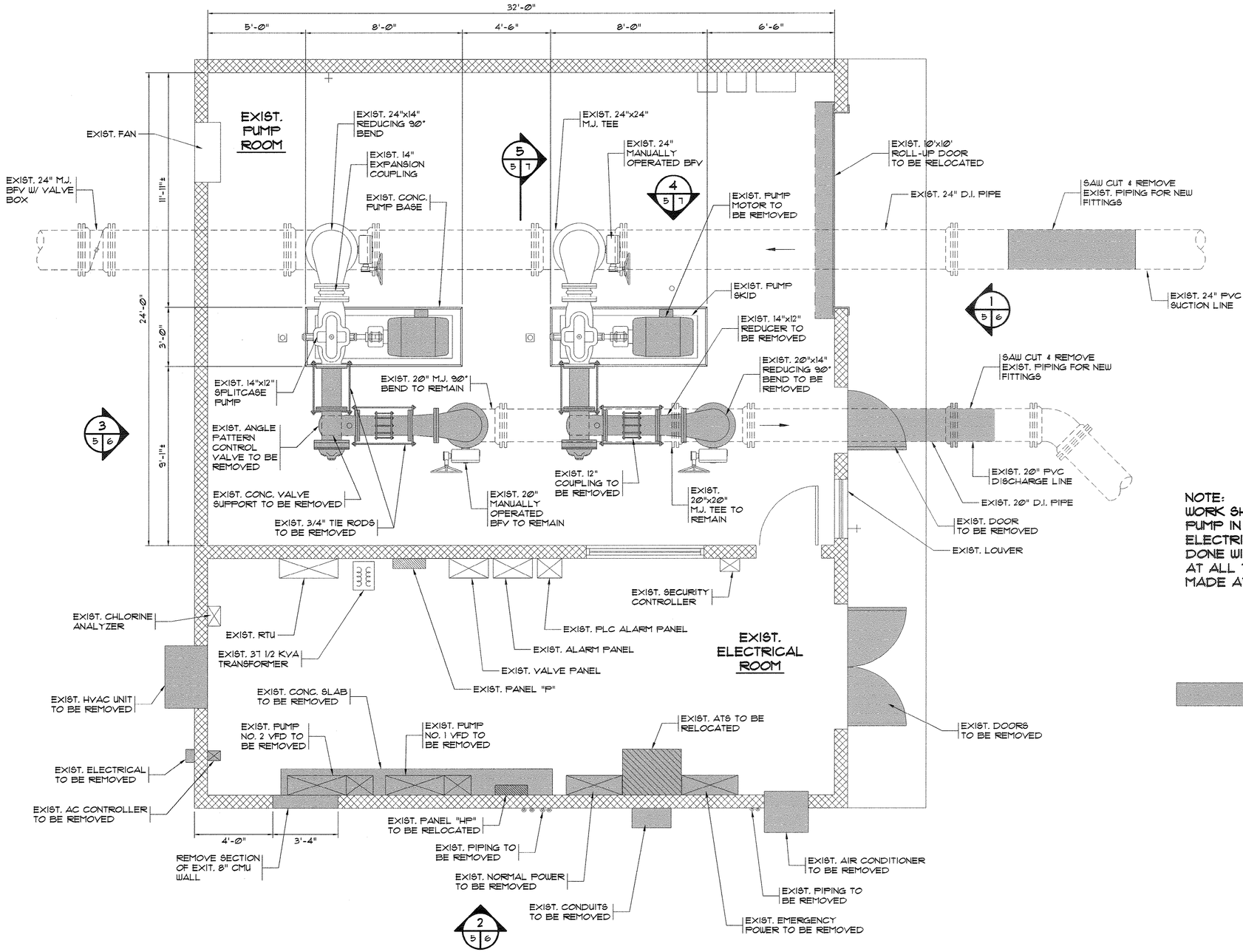
DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. 4

OF: 15 VERSION: 4

13-350-004/36 gw

REVISIONS			
SYM.	DESCRIPTION	DATE	BY



EXISTING PUMP STATION DEMOLITION LAYOUT

SCALE: 3/8" = 1'-Ø"

NOTE:
WORK SHALL BE DONE WITH ONE PUMP IN OPERATION AT ALL TIMES. ELECTRICAL TRANSITION MUST BE DONE WITH ONE PUMP IN OPERATION AT ALL TIMES. EXCEPTIONS MAY BE MADE AT OWNERS DISCRETION.

= INDICATES PORTIONS TO BE REMOVED OR RELOCATED

AS-BUILT 9-5-08

HOBBS, UPCHURCH & ASSOCIATES, P.A. CERTIFICATE OF AUTHORIZATION No. C00239

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE (843) 626-1910 FAX (843) 626-1746

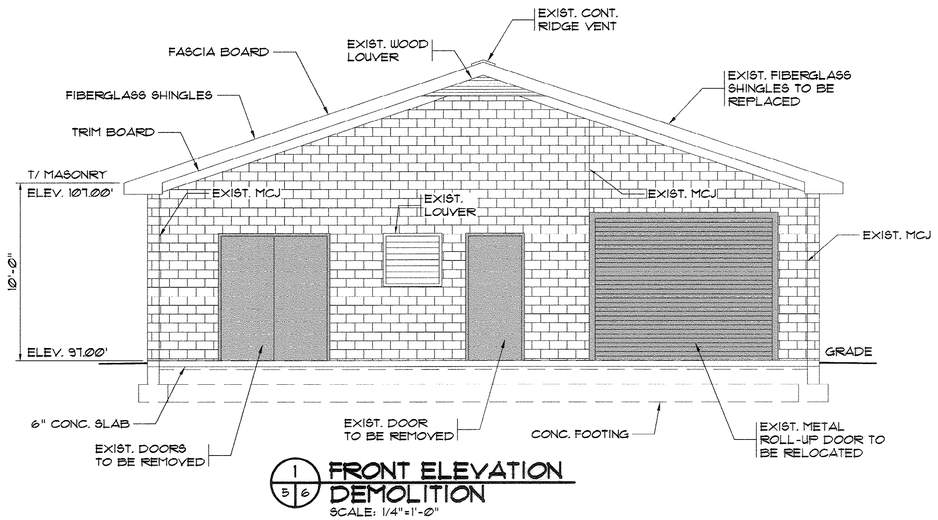
EXISTING PUMP STATION DEMOLITION LAYOUT

PERRY ROAD PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN
SHEET NO.	5
OF:	15
VERSION:	4

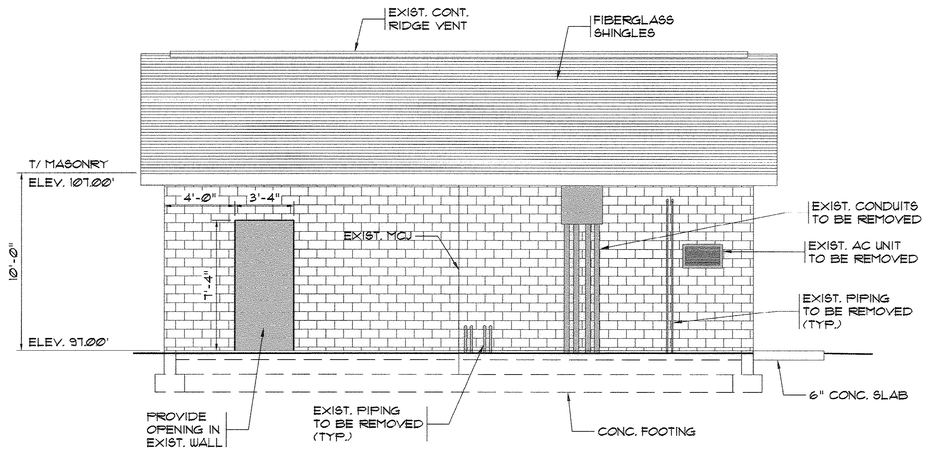
12-250-005/36 W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

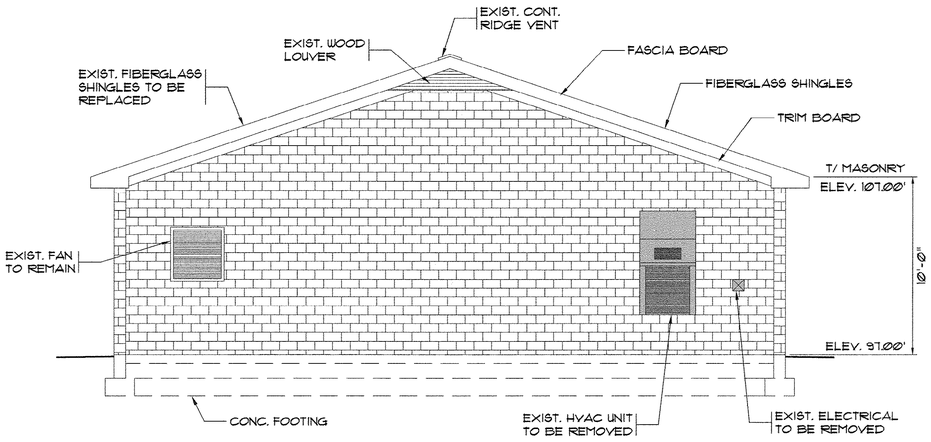


1/5/6 FRONT ELEVATION DEMOLITION
SCALE: 1/4"=1'-0"

= INDICATES PORTIONS TO BE REMOVED OR RELOCATED



2/5/6 SIDE ELEVATION DEMOLITION
SCALE: 1/4"=1'-0"



3/5/6 REAR ELEVATION DEMOLITION
SCALE: 1/4"=1'-0"

AS-BUILT 9-5-08

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

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1170 FAX: (843) 626-1140

EXTERIOR DEMOLITION ELEVATIONS

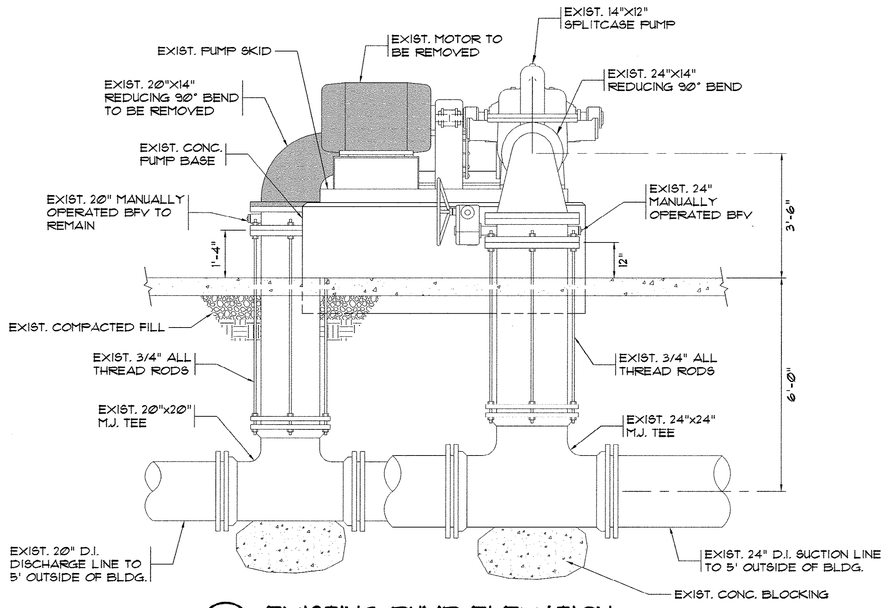
PERRY ROAD PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. 6
OF: 15 VERSION: 4

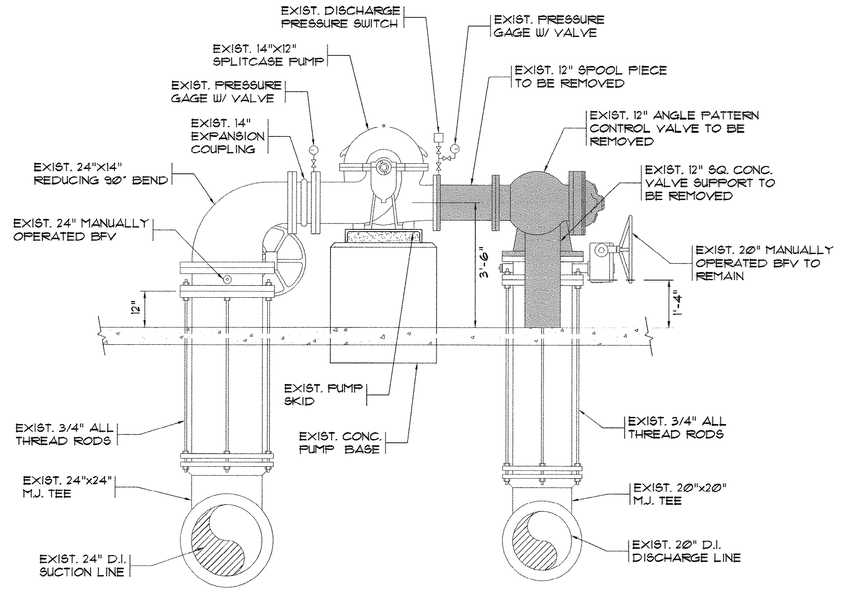
12-250-006/36 W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY



4/5|7 EXISTING PUMP ELEVATION DEMOLITION
SCALE: 1/2" = 1'-0"

= INDICATES PORTIONS TO BE REMOVED



5/5|7 EXISTING PUMP ELEVATION DEMOLITION
SCALE: 1/2" = 1'-0"

AS-BUILT 9-5-08

HOBBS, UPCHURCH & ASSOCIATES, P.A. CERTIFICATE OF AUTHORIZATION No. C00239

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1810 FAX: (843) 626-1748

EXISTING PUMP DEMOLITION ELEVATIONS

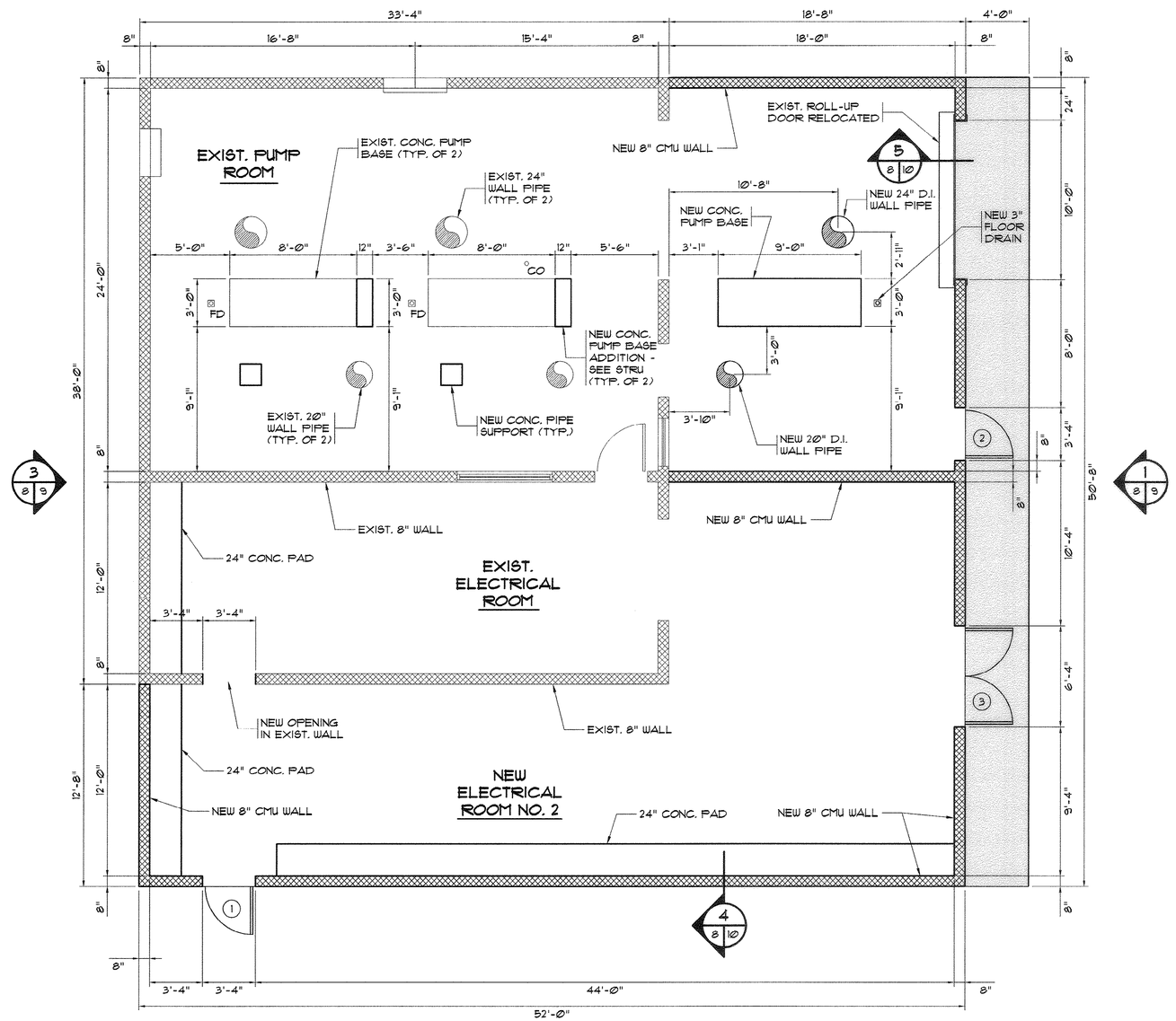
PERRY ROAD PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. 7
OF: 15 VERSION: 4

12-250-007/36 W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY



EXISTING PUMP STATION
ARCHITECTURAL MODIFICATION LAYOUT
SCALE: 1/4" = 1'-0"

AS-BUILT 9-5-08

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE (843) 626-1910 FAX: (843) 626-1745

EXISTING PUMP STATION
ARCHITECTURAL
MODIFICATION LAYOUT

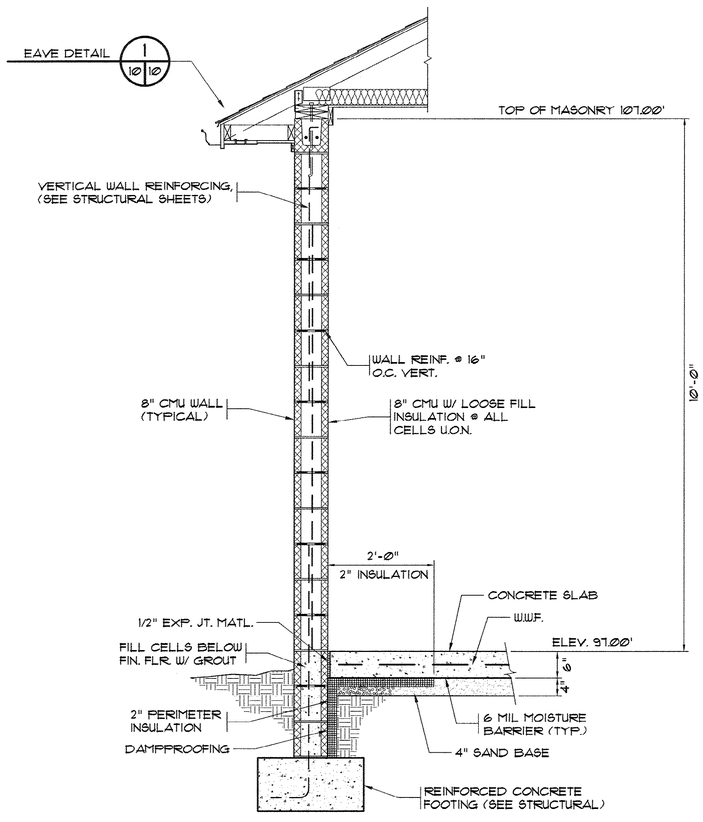
PERRY ROAD
PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN
SHEET NO.	8
OF:	15
VERSION:	4

12-250-008/36 W

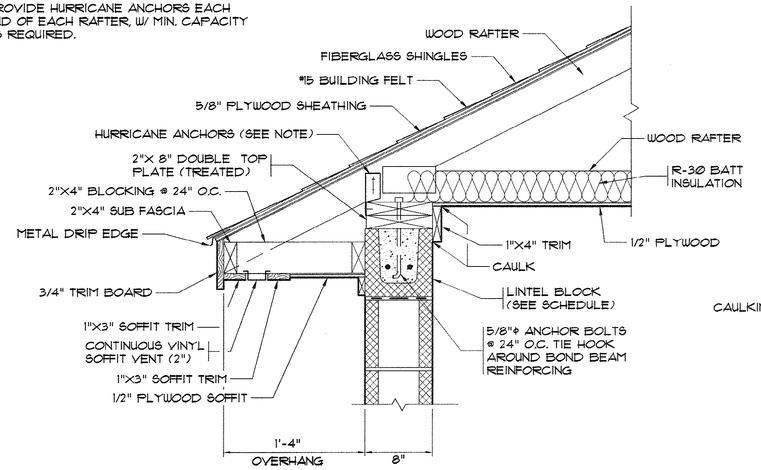
REVISIONS			
SYM.	DESCRIPTION	DATE	BY

NOTE:
PROVIDE HURRICANE ANCHORS EACH END OF EACH RAFTER, W/ MIN. CAPACITY AS REQUIRED.



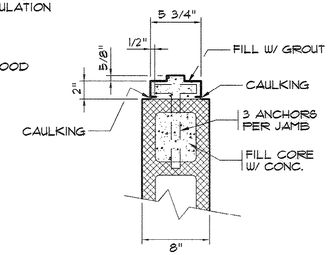
4 | 8|10 TYP. EXTERIOR WALL SECTION

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

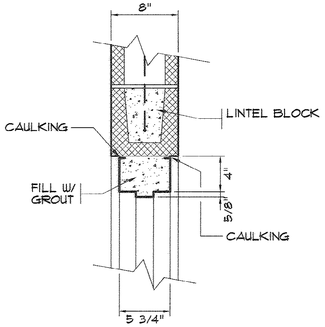


1 | 10|10 TYPICAL EAVE DETAIL

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



JAMB

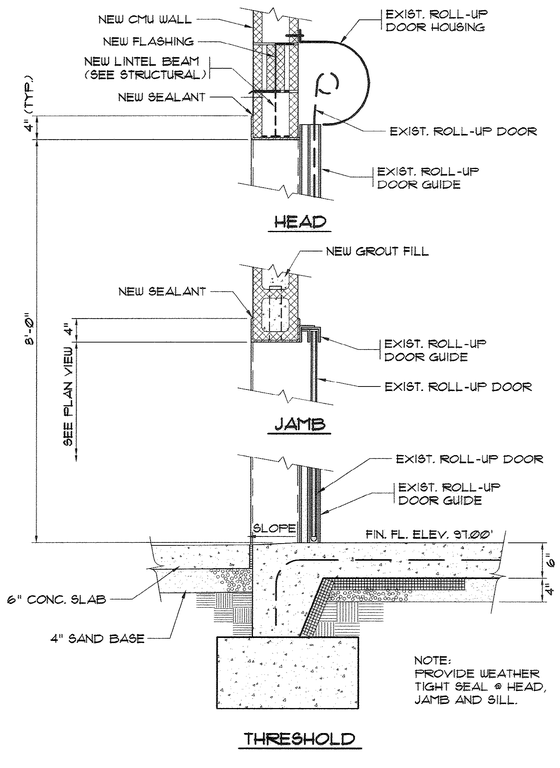


HEAD

DOOR DETAILS

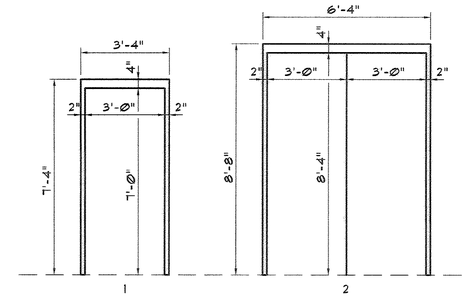
NTS

DOOR SCHEDULE										
NO.	DOOR						FRAME			REMARKS
	SIZE	TYPE	MTL.	GLASS	LOUVER	LABEL	TYPE	MTL.	GLASS	
1	3'X7'X1.75"	A	INSUL. H.M.	NONE	NONE	NONE	1	H.M.	NONE	PAINT DOOR + FRAME
2	3'X7'X1.75"	A	INSUL. H.M.	NONE	NONE	NONE	1	H.M.	NONE	PAINT DOOR + FRAME
3	PR. 3'X8'-8"X1.75"	B	INSUL. H.M.	NONE	NONE	NONE	2	H.M.	NONE	PAINT DOOR + FRAME



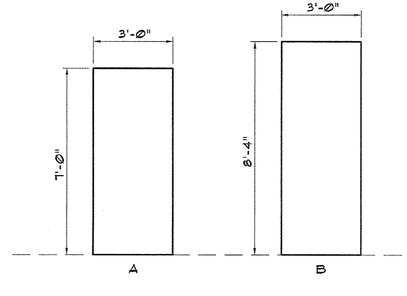
5 | 8|10 TYPICAL SECTION THRU ROLL-UP DOOR

SCALE: 1" = 1'-0"



FRAME ELEVATIONS

NTS



DOOR ELEVATIONS

NTS

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

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1170 FAX: (843) 626-1140

WALL SECTIONS & DOOR DETAILS

PERRY ROAD PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

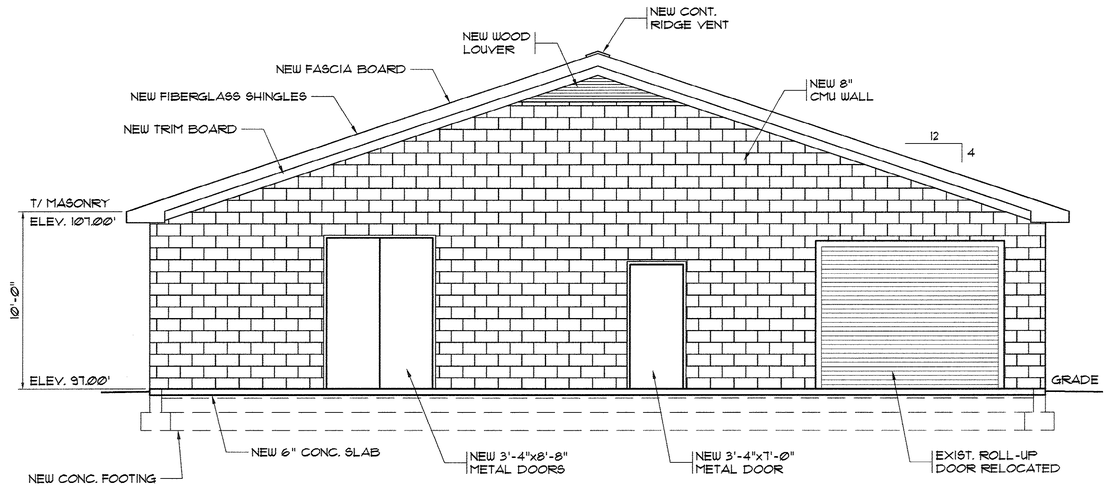
DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. 10
OF: 15 VERSION: 4

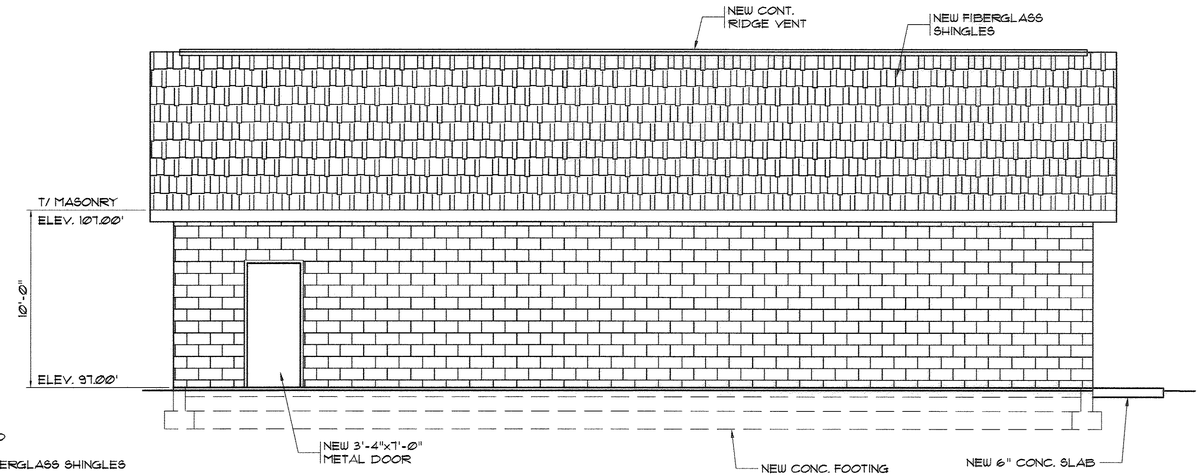
AS-BUILT 9-5-08

12-250-010/36 gw

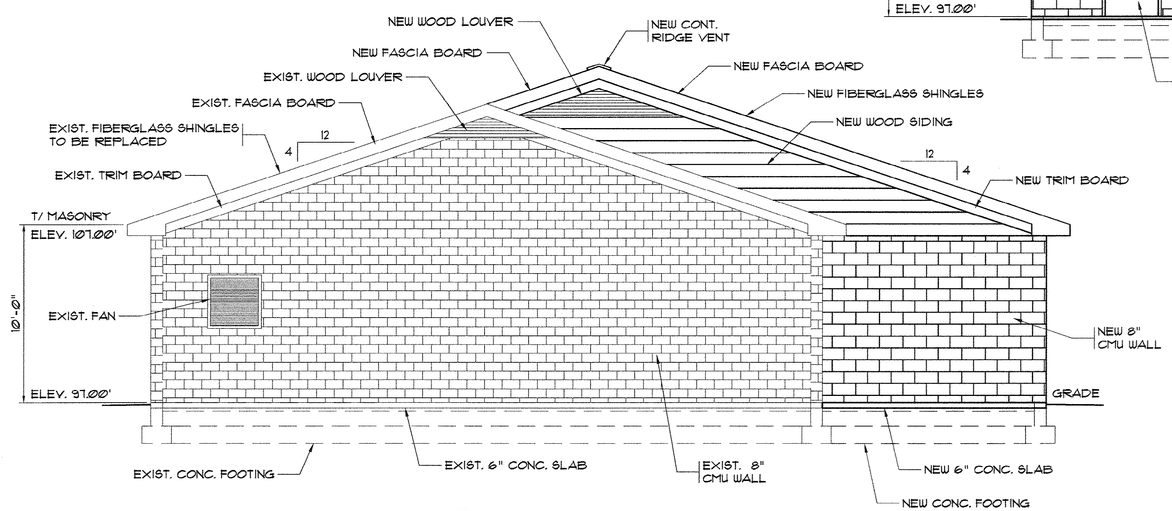
REVISIONS			
SYM.	DESCRIPTION	DATE	BY



1/8 9 FRONT ELEVATION MODIFICATION
SCALE: 1/4"=1'-0"



2/8 9 SIDE ELEVATION MODIFICATION
SCALE: 1/4"=1'-0"



3/8 9 REAR ELEVATION MODIFICATION
SCALE: 1/4"=1'-0"

AS-BUILT 9-5-08

HOBBS, UPCHURCH & ASSOCIATES, P.A. CERTIFICATE OF AUTHORIZATION No. C00235

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 12335 ROBERT W. MCGUCKEN JOSEPH

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE (843) 626-1910 FAX: (843) 626-1745

EXTERIOR MODIFICATION ELEVATIONS

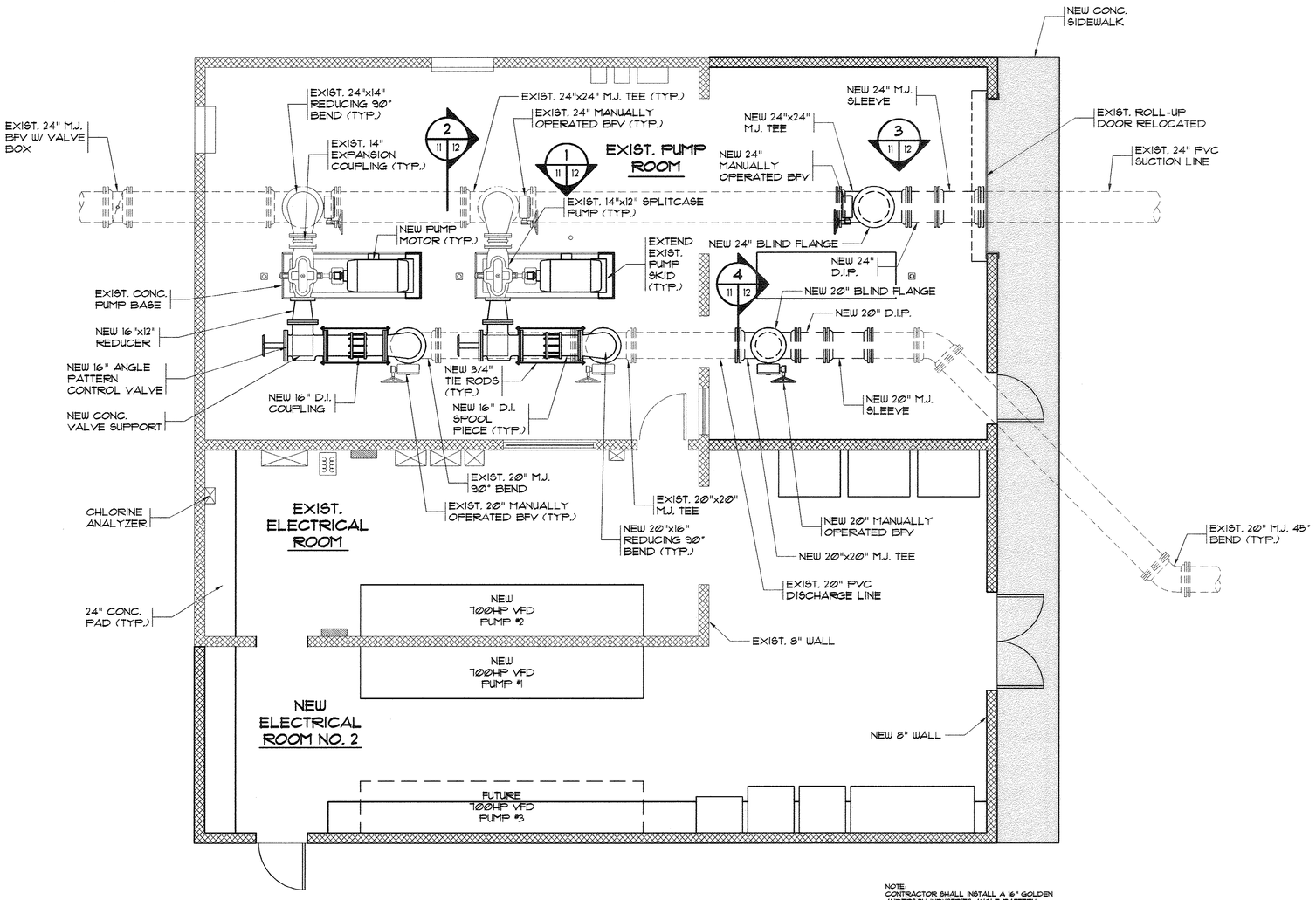
PERRY ROAD PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. 9
OF: 15 VERSION: 4

~~12-009~~
12-250-009/36 W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY



NOTE:
CONTRACTOR SHALL INSTALL A 16" GOLDEN ANDERSON INDUSTRIES ANGLE PATTERN CONTROL VALVE. CONTRACTOR IS RESPONSIBLE FOR ALL MODIFICATIONS TO FULLY INSTALL THE VALVE INCLUDING PIPING, CONTROLS AND VALVE CONTROL PANEL.

EXISTING PUMP STATION MECHANICAL MODIFICATION LAYOUT

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

AS-BUILT 9-5-08

12-250-011/36 W

HOBBS, UPCHURCH & ASSOCIATES, P.A. CERTIFICATE OF AUTHORIZATION No. C00235

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE (843) 626-1910 FAX (843) 626-1748

EXISTING PUMP STATION MECHANICAL MODIFICATION LAYOUT

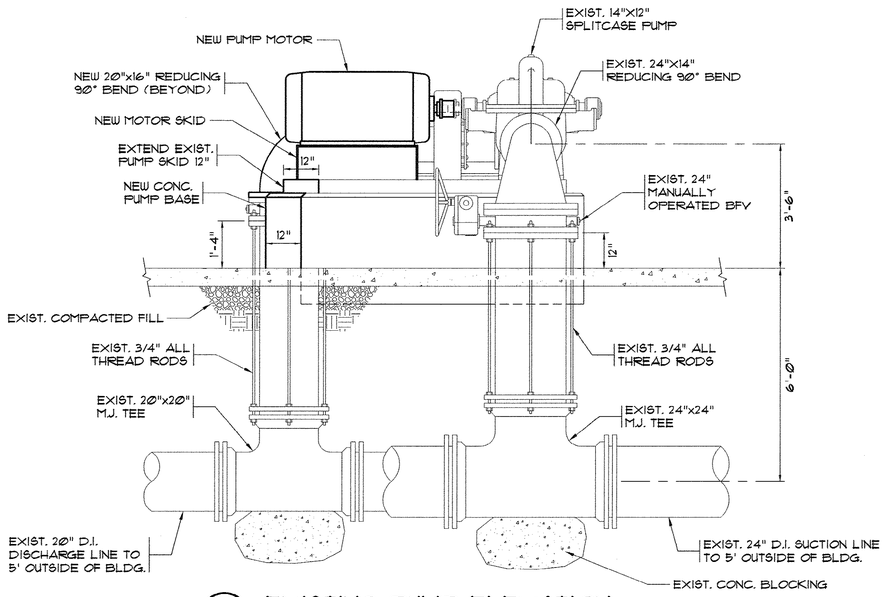
PERRY ROAD PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN

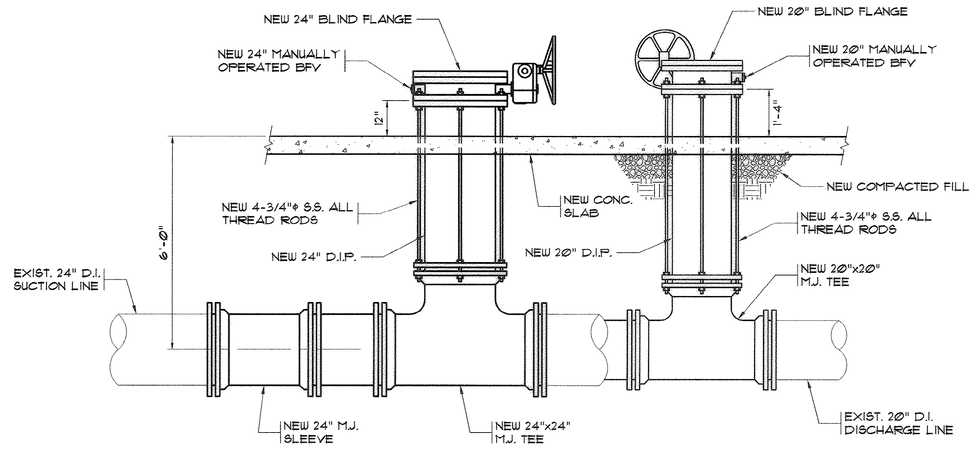
SHEET NO. 11

OF: 15 VERSION: 4

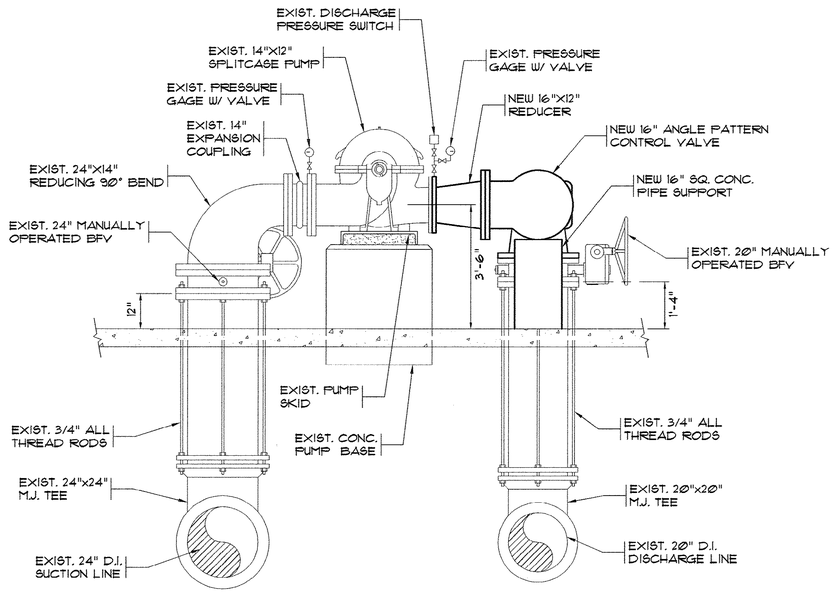
REVISIONS			
SYM.	DESCRIPTION	DATE	BY



1 / 11 | 12 **EXISTING PUMP ELEVATION MODIFICATION**
SCALE: 1/2" = 1'-0"

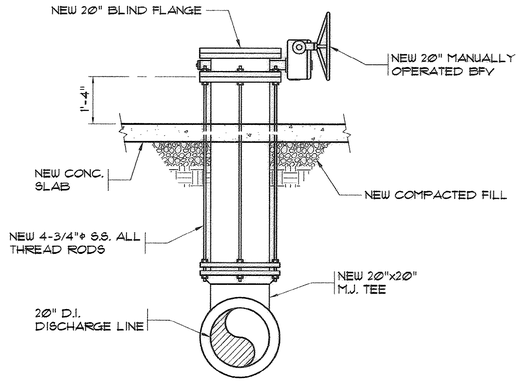


3 / 11 | 12 **PIPE ELEVATION**
SCALE: 1/2" = 1'-0"



2 / 11 | 12 **EXISTING PUMP ELEVATION MODIFICATION**
SCALE: 1/2" = 1'-0"

NOTES:
1. ALL NEW PIPING TO BE INSTALLED WITH MEGA-LUG.



4 / 11 | 12 **PIPE ELEVATION**
SCALE: 1/2" = 1'-0"

AS-BUILT 9-5-08

12-250-012/36 W

HOBBS, UPCHURCH & ASSOCIATES, P.A. CERTIFICATE OF AUTHORIZATION No. C00239

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1910 FAX: (843) 626-1746

EXISTING PUMP MODIFICATION ELEVATIONS & PIPING DETAILS

PERRY ROAD PUMP STATION

GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. 12

OF: 15 VERSION: 4

SEEDBED PREPARATION

1. CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 3 INCHES DEEP OVER ADVERSE SOIL CONDITIONS.

2. RIP THE ENTIRE AREA TO 6" DEPTH.

3. REMOVE ALL LOOSE ROCK, ROOTS AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.

4. APPLY AGRICULTURAL LIME, FERTILIZER AND SUPER PHOSPHATE UNIFORMLY AND MIX WITH SOIL.

5. CONTINUE TILLAGE UNTIL A WELL-PULVERSIZED, FIRM REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.

6. COVER SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING.

7. MULCH IMMEDIATELY AFTER SEEDING.

8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEED WITHIN THE PLANTING SEASON. IF STAND SHOULD BE OVER 60% DAMAGED, REESTABLISH FOLLOWING ORIGINAL LIME, FERTILIZER AND SEEDING RATES.

9. FERTILIZER SHALL BE APPLIED AT THE RATE OF 1000 POUNDS PER ACRE.

10. LIME SHALL BE APPLIED AT THE RATE OF 3000 POUNDS PER ACRE.

11. PERMANENT VEGETATION.

A. SUMMER (MARCH 1 - AUGUST 14)

COMMON BERMUDA (HULLED)	25 lbs./ACRE
GERMAN MILLET	10 lbs./ACRE

B. WINTER (AUGUST 15 - FEBURARY 28)

ANNUAL RYE	40 lbs./ACRE
COMMON BERMUDA (UNHULLED)	30 lbs./ACRE

12. RYE GRAIN AND MILLET SHALL BE ADDED IN ORDER TO ESTABLISH QUICK GROUND COVER FOR EROSION CONTROL PURPOSES.

13. TEMPORARY VEGETATION:

A. (APRIL 1 - AUGUST 15)

ANNUAL SUDAN GRASS (SWEET OF TIFF)	40 lbs./ACRE
BROWN TOP MILLET	50 lbs./ACRE

B. (AUGUST 15 - MARCH 1)

RYE GRAIN	55 lbs./ACRE

14. OAT GRAIN IS TO BE ADDED IF SEEDING DATE IS BETWEEN MARCH 1 AND APRIL 16, AT THE RATE OF 10 POUNDS PER ACRE.

15. OTHER PLANTINGS OR SEEDING AS CONTAINED IN THE CRITICAL AREA STABILIZATION SECTION OF SCS HANDBOOK "EROSION AND SEDIMENT CONTROL IN DEVELOPING AREAS" MAY BE USED PROVIDED THE WORK COMPLIES WITH ALL APPLICABLE SPECIFICATIONS CONTAINED IN SCS HANDBOOK.

16. CONSULT CONSERVATION INSPECTOR ON MAINTENANCE AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED

EROSION CONTROL SEQUENCE OF CONSTRUCTION

1. CLEARING AND GRUBBING THOSE AREAS NECESSARY FOR INSTALLATION OF PERIMETER CONTROLS.

2. INSTALLATION OF SEDIMENT BASINS AND TRAPS.

3. CONSTRUCTION OF PERIMETER CONTROLS.

4. REMAINING CLEARING AND GRUBBING.

5. ROAD GRADING.

6. GRADING FOR THE REMAINDER OF THE SITE.

7. CONSTRUCTION. PROTECT STORM DRAINS UNTIL AFTER COMPLETION OF CONSTRUCTION.

8. FINAL GRADING, LANDSCAPING AND STABILIZATION.

9. REMOVABLE OF SEDIMENT MEASURES.

SOIL EROSION CONTROL NOTES

1. ALL SEDIMENT CONTROL MEASURES SHALL BE INSPECTED ONCE EVERY SEVEN CALENDAR DAYS AFTER ANY STORM EVENT OF GRATER THAN 0.5 INCHES OF PRECIPITATION DURING AND 24-HOURS PERIOD. ALL SEDIMENTS CONTROL FEATURES SHALL BE MAINTAINED UNTIL FINAL STABILIZATION HAS BEEN OBTAINED.

2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE TEMPORARY OR PERMANENTLY CEASED. UNLESS ACTIVITY IN THE PORTION OF THE SITE WILL RESUME WITHIN 21 DAYS.

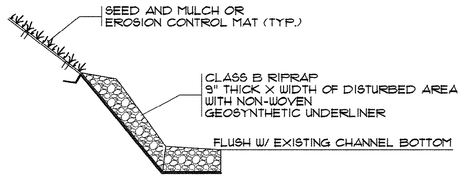
3. PROVIDE SILT FENCE AND/OR OTHER DEVICES, AS MAY BE REQUIRED TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE CONSTRUCTION ACTIVITY.

4. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF SITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.

5. TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR TO DIVERT SEDIMENT LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.

6. IF NECESSARY, SLOPES WHICH EXCEED EIGHT (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO HYDROSEEDING. IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL SLOPE IS BROUGHT TO GRADE.

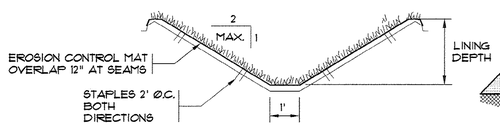
7. COMPLY WITH ALL REQUIREMENTS OF SPECIFICATIONS.



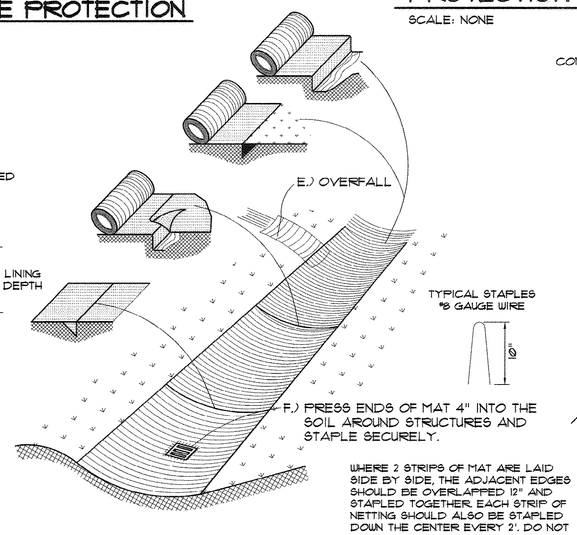
RIP RAP SLOPE PROTECTION

N.T.S.

GRASS (SEEDED) SWALE



EROSION CONTROL MAT SWALE

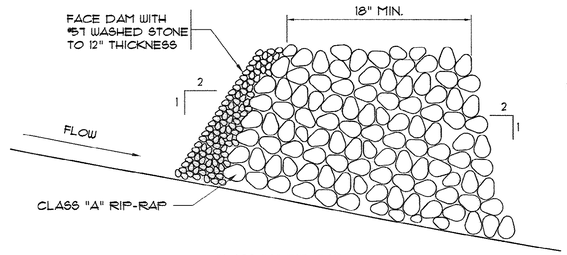


A.) BURY THE TOP OF THE MAT IN A TRENCH 6" OR MORE IN DEPTH.
B.) TAMP THE TRENCH FULL OF SOIL. SECURE WITH STAPLES EVERY 12" ACROSS THE TOP AND EVERY 3' AROUND THE EDGES AND BOTTOM.
C.) OVERLAP
BURY UPPER END OF LOWER STRIP AS IN 'A' AND 'B'. OVERLAP END OF TOP STRIP 18" AND STAPLE EVERY 12" JUST BELOW THE ANCHOR SLOT.
D.) EROSION STOP
FOLD OF MAT BURIED IN SLIT TRENCH AND TAMPED. DOUBLE ROW OF STAPLES.

MAINTENANCE

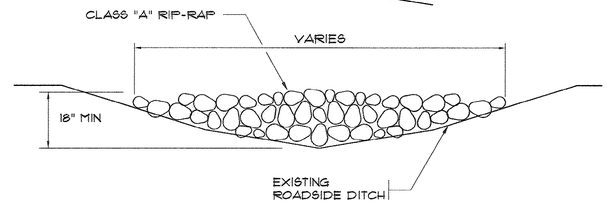
INSPECT ALL MULCHES PERIODICALLY, AND AFTER RAINSTORMS TO CHECK FOR RILL EROSION DISLOCATION, OR FAILURE. WHERE EROSION IS OBSERVED, APPLY ADDITIONAL MULCH. IF WASHOUT OCCURS, REPAIR THE SLOPE GRADE, RESEED, AND REINSTALL MULCH. CONTINUE INSPECTIONS UNTIL VEGETATION IS FIRMLY ESTABLISHED.

DETAILS FOR STABILIZING SWALES



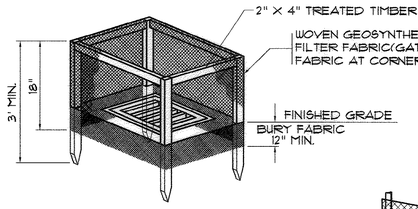
NOTES:

1.) CHECK DAMS SHALL BE REQUIRED ONLY IF TEMPORARY DITCH LINERS DO NOT CONTROL EROSION OR AS DIRECTED BY THE ENGINEER.
2.) CONTRACTOR SHALL REMOVE SEDIMENT ACCUMULATED BEHIND THE DAM TO PREVENT DAMAGE TO CHANNEL VEGETATION.
3.) CONTRACTOR SHALL REMOVE ROCK CHECK DAMS AFTER PERMANENT VEGETATION HAS BEEN ESTABLISHED.



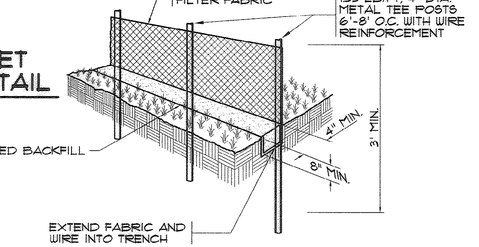
RIP RAP CHECK DAM DETAIL

N.T.S.



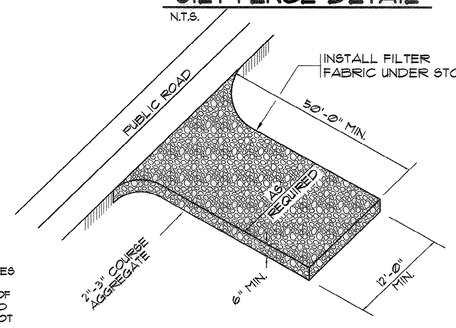
TEMPORARY INLET PROTECTION DETAIL

SCALE: NONE



SILT FENCE DETAIL

N.T.S.



TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

N.T.S.

REVISIONS

SYM.	DESCRIPTION	DATE	BY

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

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1170 FAX: (843) 626-1748

EROSION CONTROL DETAILS

PERRY ROAD PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

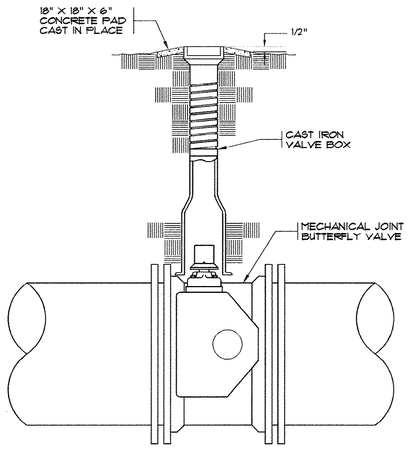
DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. 13
OF: 15 VERSION: 4

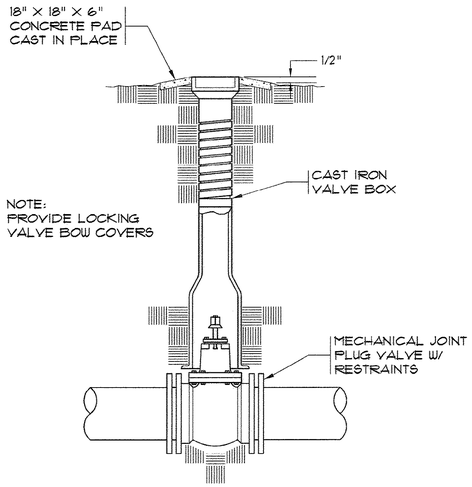
AS-BUILT 9-5-08

12-250-013/36 gw

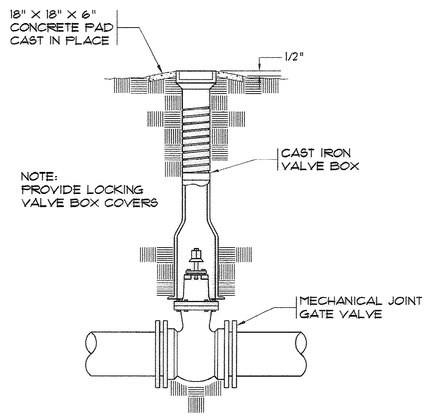
REVISIONS			
SYM.	DESCRIPTION	DATE	BY



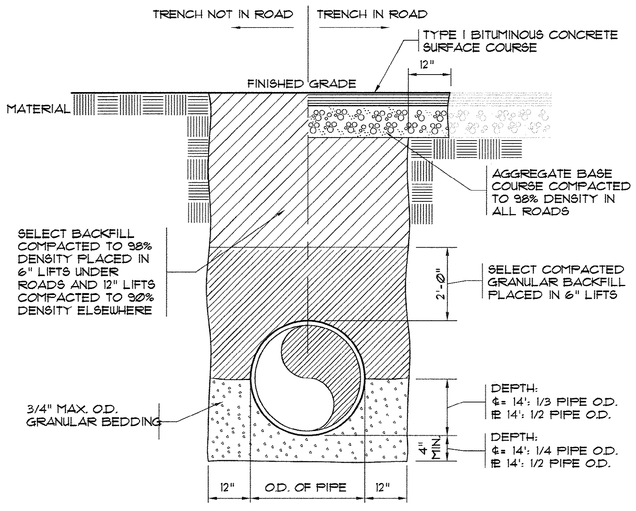
BUTTERFLY VALVE ASSEMBLY
N.T.S.



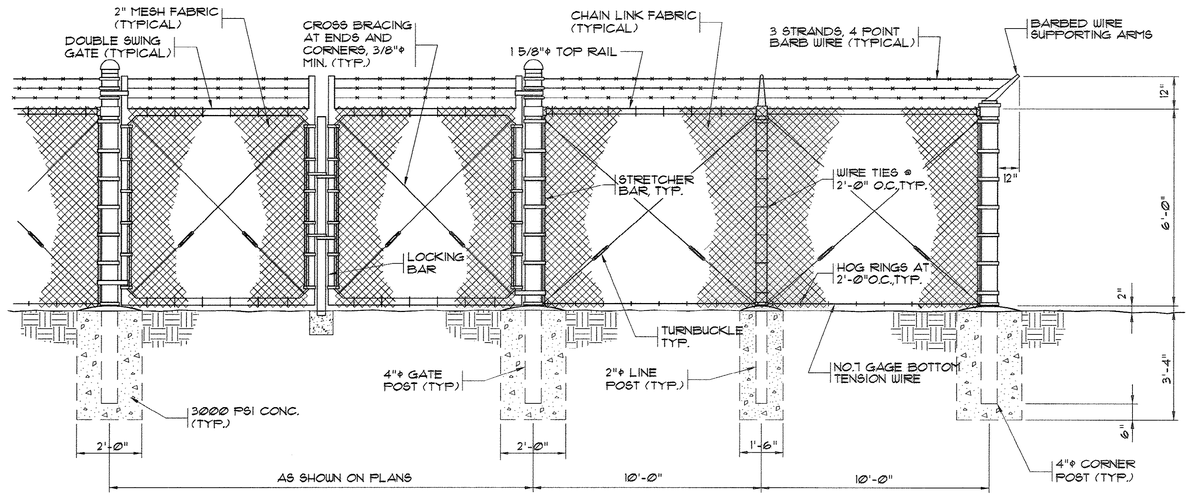
PLUG VALVE ASSEMBLY
N.T.S.



GATE VALVE ASSEMBLY
N.T.S.



PIPE BEDDING DETAIL
NTS



6' CHAIN LINK FENCE W/ DOUBLE SWING GATE DETAIL
N.T.S.

AS-BUILT 9-5-08

12-250-014/36 W

HOBBS, UPCHURCH & ASSOCIATES, P.A. CERTIFICATE OF AUTHORIZATION No. C02039

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE (843) 626-1910 FAX: (843) 626-1745

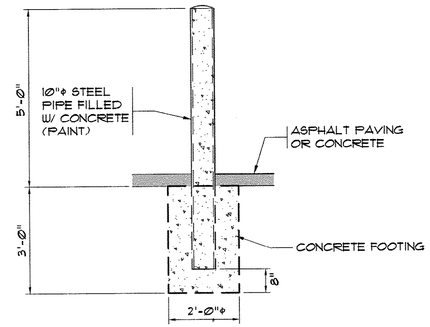
MISCELLANEOUS DETAILS

PERRY ROAD
PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

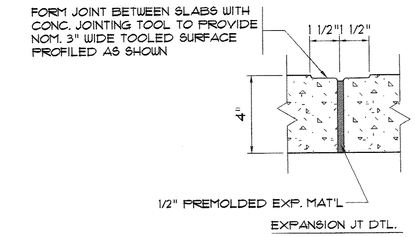
DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN

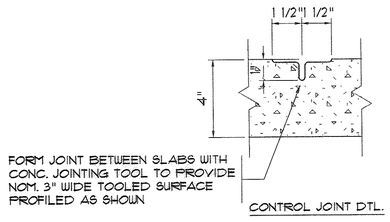
SHEET NO. 14
OF: 15 VERSION: 4

REVISIONS			
SYM.	DESCRIPTION	DATE	BY



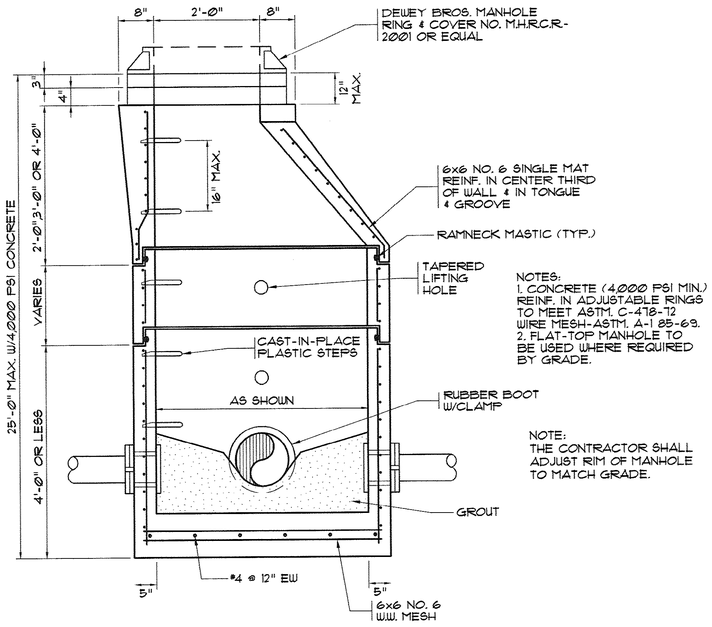
BOLLARD DETAIL
N.T.S.





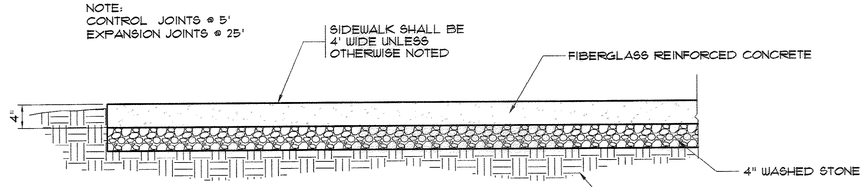
CONTROL JOINT AND EXPANSION JOINT DETAIL
NTS

NOTE:
PROVIDE CONTROL JOINTS IN WALKS @ 5'-0" O.C., PROVIDE EXP. JTS @ MIN. 25'-0" O.C. & @ ALL EDGES W/ OTHER MATERIALS

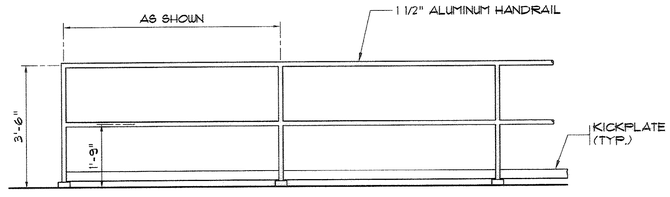


PRECAST MANHOLE DETAIL
N.T.S.

NOTE:
CONTROL JOINTS @ 5'
EXPANSION JOINTS @ 25'



SIDEWALK DETAIL
N.T.S.



TYPICAL HANDRAIL DETAIL
N.T.S.

AS-BUILT 9-5-08

12-250-015/36 W

HOBBS, UPCHURCH & ASSOCIATES, P.A. CERTIFICATE OF AUTHORIZATION No. C09038

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1910 FAX: (843) 626-1745

MISCELLANEOUS DETAILS

PERRY ROAD
PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	ALG
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. 15
OF: 15 VERSION: 4

ELECTRICAL SYMBOL SCHEDULE

SYMBOL	DESCRIPTION
	CONDUIT CONCEALED IN OR ABOVE CEILING: IN OVERHEAD SLAB: OR IN WALL
	CONDUIT CONCEALED IN OR BELOW FLOOR: BELOW GRADE: OR IN WALL
	CONDUIT RUN EXPOSED AS HIGH AS POSSIBLE
	IF SHOWN, CROSS LINES INDICATE NUMBER OF CURRENT CARRYING CONDUCTORS. EQUIPMENT GROUNDING CONDUCTORS ARE GENERALLY NOT INCLUDED IN THE QUANTITY INDICATED.
G	#1/0 THHW/THWN COPPER – 24" BELOW GRADE
	HOME RUN TO PANEL – WITH PANEL AND CIRCUIT DESIGNATION.
	CONDUIT STUB–IN WITH CONNECTION TO EQUIPMENT
J OR PJ	JUNCTION OR PULL BOX. SIZE PER N.E.C.
	FLUORESCENT FIXTURE, CEILING, WALL OR RECESS MOUNTED AS SCHEDULED DRAWN APPROXIMATELY TO SCALE
	WALL OUTLET – INCANDESCENT, COMPACT FLUORESCENT, OR HID FIXTURE AS SCHEDULED.
E	WALL MOUNTED, STANDBY BATTERY POWERED FIXTURE AS SCHEDULED – MOUNT 12" BELOW JOIST. SEE LIGHTING FIXTURE SCHEDULE.
S_3	3–WAY, SINGLE POLE SWITCH – 20A, 120–277V. MOUNT 46" AFF TO TOP AND 2" FROM STRIKE SIDE OF DOOR FRAME.
S_4	4–WAY, SINGLE POLE SWITCH, OTHERWISE SAME AS " S_3 ".
	BRANCH CIRCUIT OR DISTRIBUTION PANELBOARD, AS INDICATED
	CONTROL PANEL
	CONVENIENCE RECEPTACLE – MOUNT 18" AFF. NEMA 5–20R, DUPLEX
	SPECIAL CONFIGURATION OUTLET.
W	WALL TELEPHONE OUTLET, 54" AFF.
	NONFUSIBLE DISCONNECT SWITCH.
	FUSIBLE DISCONNECT SWITCH.
	ENCLOSED CIRCUIT BREAKER.
	COMBINATION MAGNETIC STARTER WITH NONFUSIBLE DISCONNECT.
T	THERMOSTAT, LINE VOLTAGE
Δ–Y	DRY TYPE TRANSFORMER – THREE PHASE, 480–120/208 VOLTS.
M	460 VOLT, 3 PHASE MOTOR – NUMERAL INDICATES HORSEPOWER.
	INDICATES GROUNDING ELECTRODE CONDUCTOR AS REQUIRED BY ARTICLES 250–26 OR 250–81 OF THE NATIONAL ELECTRICAL CODE.
SA	SURGE ARRESTER
GR	GROUND ROD
FAC	FIRE ALARM CONTROL PANEL
	CEILING MOUNTED SMOKE DETECTOR, PHOTOELECTRIC TYPE
DD	DUCT SMOKE DETECTOR
H	CEILING MOUNTED COMBINATION RATE–OF–RISE/FIXED TEMPERATURE FIRE DETECTOR
FD	FIRE ALARM COMBINATION ADA BELL/STROBE APPLIANCE – MOUNT 6'–8" AFF, FROM BOTTOM OF APPLIANCE, OR 0'–6" BELOW CEILING, WHICHEVER IS LESS.
	END OF LINE DEVICE

SYMBOL	DESCRIPTION
MS	DOOR SECURITY MAGNETIC SWITCH. SENTROL 1078 SERIES WITH CLOSED CONTACTS WHEN DOOR IS CLOSED. SEE DETAILS 5 AND 6 ON E–13. WIRE TOGETHER WITH 2#14, 1/2" C. TO SECURITY PANEL. CONNECT AS DIRECTED IN PUMP STATION. SEE DETAILS ON THIS SHEET.
RS	ROLL UP DOOR MONITORING SWITCH. MICROSWITCH BL2N SERIES ENCLOSED SWITCH WITH STRAIGHT PLUNGER OR ROLLER ARM ACTUATOR, AS REQUIRED. MOUNT NEAR FLOOR ON INSIDE OF FRAME. SWITCH IS TO BE "CLOSED" WHEN ROLL–UP DOOR IS CLOSED.
RTU	EXISTING SCADA REMOTE TERMINAL UNIT (RTU). RUN CONDUCTORS AND CABLES, AS REQUIRED BY CONSTRUCTION DOCUMENTS, TO RTU AND CONNECT AS DIRECTED BY OWNER. TAG EACH CONDUCTOR TO INDICATE DEVICE OR EQUIPMENT SERVED AND LEAVE SPARE SLACK AS SPECIFIED.
	NORMALLY OPEN AUXILIARY CONTACT
	NORMALLY CLOSED AUXILIARY CONTACT
CV	ELECTRICALLY ASSISTED CHECK VALVE WITH NORMAL AND EMERGENCY SOLENOID VALVES, LIMIT SWITCHES AND REMOTE VALVE CONTROL PANEL.
SV	SOLENOID VALVE
ZIS	POSITION INDICATING SWITCH
PS	PRESSURE SWITCH DOUBLE POLE TYPE
HO	"HAND–OFF" MAINTAINED CONTACT, REMOTE MOTOR CONTROL STATION TO PREVENT MOTOR FROM STARTING OR BEING ENERGIZED WHEN PUSHED IN THE OFF POSITION. MOUNT 48" AFF.
RVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
A	AMPERE
AFF	ABOVE FINISHED FLOOR – MEASURED FROM FLOOR TO CENTER OF DEVICE, EXCEPT AS OTHERWISE SPECIFICALLY NOTED.
ATS	AUTOMATIC TRANSFER SWITCH
C	CONDUIT
C–FVNR	COMBINATION FVNR AND FUSED SWITCH
DHC	"DATA HIGHWAY" SHIELDED CABLE. SEE SECTION 16158.
F	FUSE
FAC	FIRE DETECTION ALARM PANEL
FVNR	FULL VOLTAGE NON–REVERSIBLE MAGNETIC MOTOR STARTER
G	GROUND
MCB	MAIN CIRCUIT BREAKER
MCM	Kcmil (THOUSAND CIRCULAR MILS)
NEC	NATIONAL ELECTRICAL CODE
N	NEUTRAL, OR NORMAL, AS APPLICABLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
P	POLE
PH	PHASE
RMC	RIGID SCHEDULE 40 METAL CONDUIT
RTU	REMOTE TERMINAL DATA UNIT
RVSS	REDUCED VOLTAGE SOFT–START MOTOR CONTROLLER.
SCIR	SHORT CIRCUIT INTERRUPTING RATING IN RMS AMPS
SO	SPACE ONLY (WITH PROVISIONS FOR FUTURE OVERCURRENT PROTECTIVE DEVICE)
WP	INDICATES DEVICE TO HAVE WEATHERPROOF COVER

CIRCUITING LEGEND

HOMERUNS TO PANELBOARDS ARE SHOWN AS POLES RATHER THAN CIRCUITS. SIMILARLY, PANEL SCHEDULES LIST POLES RATHER THAN CIRCUITS, BUT INDICATE WHICH POLES ARE COMMON TRIP FORMING TWO AND THREE POLE CIRCUITS. HOMERUN DESIGNATIONS INDICATE PANELBOARD AND POLES TO WHICH PHASE WIRES ARE TO BE CONNECTED. NUMBER OF ARROWS INDICATE NUMBER OF CIRCUITS INVOLVED. CROSS HATCHES, SHOWN ONLY WHEN THE NUMBER OF POLES EXCEEDS THE NUMBER OF CIRCUITS, INDICATE THE NUMBER OF WIRES. FOR EXAMPLE:

SYMBOL	NO. OF POLES	CIRCUITS	PHASE WIRES	NEUTRAL
LP–1,	1	1	1	1
LP–1, 3	2	1	2	0
LP–1, 3	2	1	2	1
LP–1, 3, 5	3	1	3	0
LP–1, 3, 5	3	1	3	1
LP–5, 7	2	2	2	1
LP–5, 7, 9	3	3	3	1

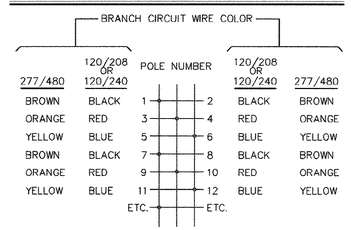
FEEDERS:

NO. ( ) INDICATES QUANTITY OF CONDUITS AND CONDUCTORS IN PARALLEL. SEE NEC 250–122, 250–95, 300–20 AND 310–4 FOR SPECIAL REQUIREMENTS. EXAMPLE: 3(3 #3/0, 1 #1/0 N, 1 1G, 2 1/2"C) REQUIRES THREE 2 1/2" CONDUITS EACH HAVING THREE NO. 3/0 PHASE CONDUCTORS, ONE NO. 1/0 NEUTRAL CONDUCTOR AND ONE NO. 1 GROUNDING CONDUCTOR.

EQUIPMENT GROUNDING CONDUCTORS:

EQUIPMENT GROUNDING CONDUCTORS ARE GENERALLY NOT SHOWN ON CIRCUITING PLANS BUT SHALL BE PROVIDED IN THE SIZES AS SCHEDULED ON N.E.C. TABLE 250–122 ON ALL CIRCUITS.

TYPICAL PANEL DIAGRAM



NEUTRAL

120/240 OR 120/208 VOLTS – WHITE

277/480 VOLTS – WHITE WITH IDENTIFIABLE COLOR STRIPE (NOT GREEN). IF NOT AVAILABLE AT TIME OF INSTALLATION, CLEAR USE OF GRAY WITH ELECTRICAL INSPECTOR.

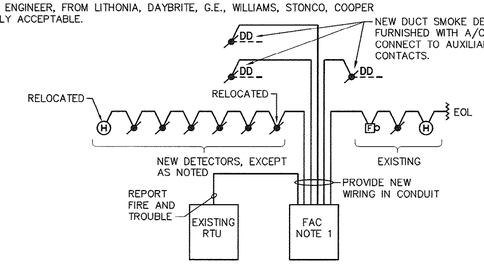
GROUND WIRE SHALL BE GREEN FOR ALL VOLTAGES.

ELECTRICAL DRAWING LIST

LIGHTING FIXTURE SCHEDULE

FIXTURE TYPE	MANUFACTURER & CATALOG INFORMATION	LAMPS QTY.	LAMPS TYPE	LAMPS WATTS	BALLAST QTY.	BALLAST TYPE	BALLAST WATTS	TOTAL WATTS	DESCRIPTION
A	LITHONIA UNS232GEB–LWGCUN	2	F32T8	32	1	ELECTRONIC	58	58	STRIP LIGHT WITH WIRE GUARD – SUSPEND TO BE ALIGNED WITH BOTTOM OF DUCT WORK.
B	LITHONIA	2	F32T8	32	1	ELECTRONIC	58	58	TOTALLY ENCLOSED, CORROSION RESISTANT. MOUNT ON UNISTRUT SPACES ON CEILING.
C	LITHONIA TW SERIES 70S120–PE1 OR EQUIVALENT	1	HPS	70	1	HRHPF	90	90	OUTDOOR WEATHERPROOF FIXTURE WITH POLYCARBONATE LENS, PE SWITCH. MUST MATCH EXISTING ONES IN APPEARANCE AND MOUNTING HEIGHT
E	LITHONIA ELT24HAMVMLD	2	HALOGEN	8	–	–	–	16	EMERGENCY BATTERY LIGHT WITH 90–MINUTE NICKEL–CADMIUM BATTERY.
SA	LUMINAIRE: GE–P17M–10–S–0–A–2–AMN3–GRU + PE SWITCH POLE: GE–ARTA–10–35–5.0–B–SN–A (TYPE III IES DISTRUBUTION) WITH PE SWITCH	1	HPS	100	1	AUTOREG. 120/208/240/277 VOLTS	130	130	POST TOP LIGHT FIXTURE ON 3–INCH DIAMETER SCHEDULE 40 ALUMINUM POLE, 10'–0" LONG. POLE SHALL HAVE 2 1/2" DIAMETER TENON. GRAY FINISH. PROVIDE PE SWITCH. CONNECT TO NEW 120 VOLT CIRCUIT. PROVIDE CONCRETE PAD.

NOTES:
1. EQUIBVALENT FIXTURES, AS JUDGED BY THE ENGINEER, FROM LITHONIA, DAYBRITE, G.E., WILLIAMS, STONCO, COOPER LIGHTING, WIDELITE OR HUBBELL ARE EQUALLY ACCEPTABLE.



1 E1 **FIRE DETECTION RISER DIAGRAM**

NOT TO SCALE

NOTES:
1. IT IS ACCEPTABLE, IF FEASIBLE TO EXPAND AS REQUIRED EXISTING FIRE ALARM CONTROL PANEL TO PROVIDE ADDITIONAL POWER SUPPLY, BATTERY BACKUP AND ZONES AS REQUIRED BY THE NEW ADDITIONS AND MODIFICATIONS WITH MANUFACURER'S, UL AND FM APPROVAL. NEW SMOKE DETECTORS SHALL BE IONIZATION TYPE 24V DC POWER, UL LISTED. PROVIDE NEW WIRING AS DIRECTED BY FAC MANUFACTURER.

OUTLINE OF PHASING OF WORK

GENERAL:
PHASING OF WORK SHALL BE AS REQUIRED TO ACCOMPLISH EXPANSION WHILE MAINTAINING PRESENT REGULAR PUMPING OPERATION AT ALL TIMES, EXCEPT FOR BRIEF SWITCHOVER PROCEDURES AS APPROVED BY THE OWNER.

PRESENT REGULAR PUMPING OPERATION IS THAT PROVIDED BY TWO 300 HP PUMPS WORKING SIMULTANEOUSLY OR ONE 700 HP PUMP IN OPERATION.

PROPOSED PHASING OF WORK

PHASE 1

IDENTIFY EXACT LOCATION OF EXISTING UNDERGROUND NORMAL AND EMERGENCY POWER SERVICES AND PROVIDE ADDITIONAL PROTECTION TO ALLOW CONSTRUCTION OF ADDITION ON TOP.

PROCEED WITH CONSTRUCTION OF BUILDING ADDITION.

INSTALL NEW PAD MOUNTED TRANSFORMER AND COMMERCIAL POWER SERVICE. INSTALL SWITCHBOARD "MSB".

INSTALL NEW EMERGENCY SWITCHBOARD "ESB" AND NEW EMERGENCY POWER SERVICE.

INSTALL NEW HVAC UNIT CU–3/AC–3.

INSTALL NEW ATS'S AND NEW PANELS "NHP" AND "NP".

INSTALL NEW PUMP #3, VFD #3 AND RELATED WIRING.

INSTALL NEW 1500 KW GENERATOR SET.

ENERGIZE AND PUT ON LINE NEW PUMP #3.

INSTALL NEW FAN EF–1 THRU EF–4 AND RELATED CONTROLS

PHASE 2
GENERAL
PHASE 2 IS TO BEGIN AFTER NEW PUMP #3 AND ITS CONTROLS HAVE BEEN PROVEN TO BE WORKING AS INTENDED WITHOUT ANY PROBLEMS.

REMOVE EXISTING UNDERGROUND SERVICES AND SERVICE EQUIPMENT.

REMOVE EXISTING PUMP VFD'S.

REMOVE AND TURN OVER TO OWNER THE EXISTING 1000A ATS.

INSTALL NEW CU–1/AC–1 AND CU–2/AC–2.

REPLACE EXISTING PUMP MOTORS AND VALVES WITH NEW PUMPS, VALVES AND VALVE/PUMP CONTROL PANELS.

INSTALL NEW VFD #1 AND VFD #2.

CONNECT NEW MOTORS TO NEW VFD'S WITH NEW POWER AND CONTROL WIRING.

ARRANGE FOR REMOVAL OF EXISTING PAD MOUNTED TRANSFORMER.

TEST ENERGIZE AND PUT ON LINE NEW EQUIPMENT.

AS-BUILT 9-5-08

12-250-016/36 W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

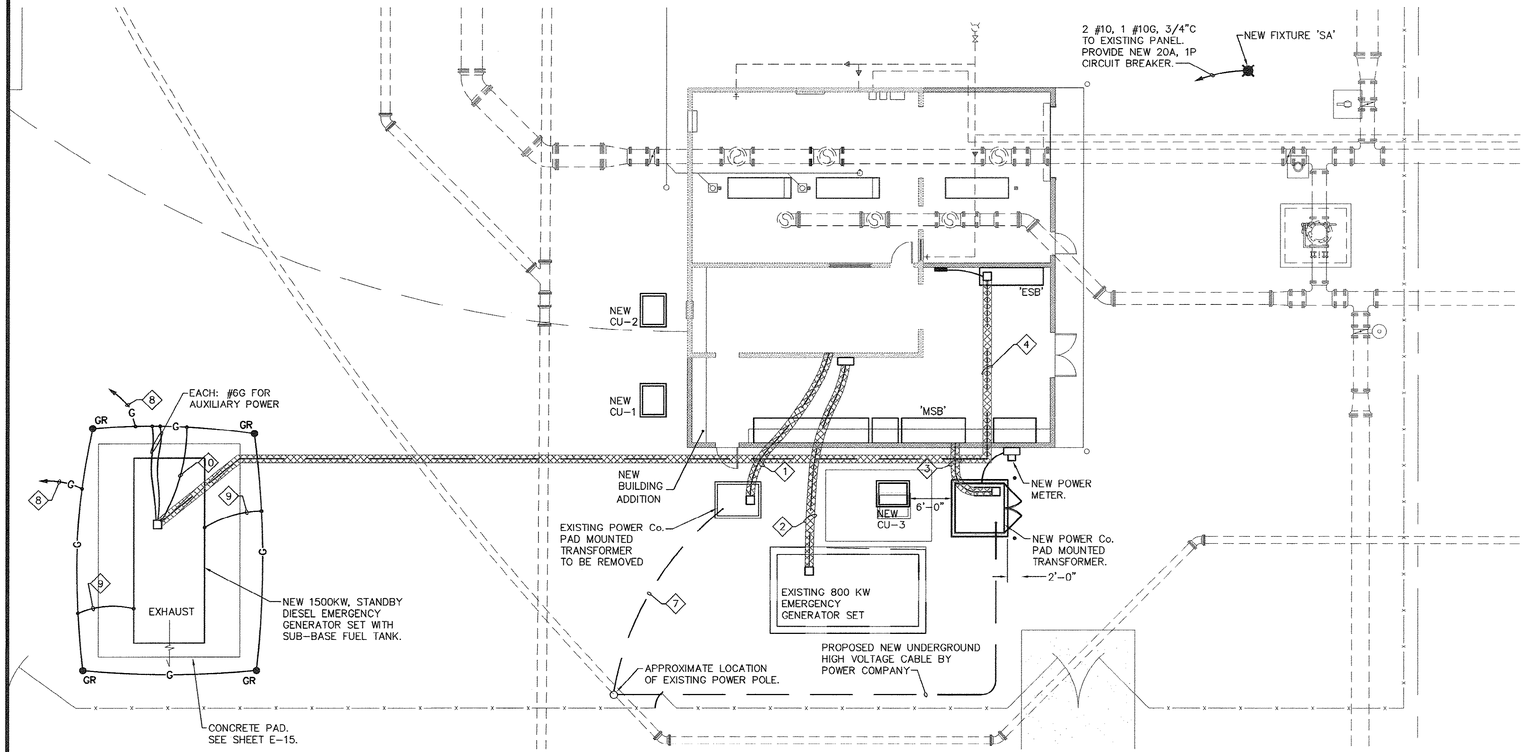
Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692–5616 – Fax: (910) 692–7342

206.046

SYMBOL SCHEDULE, EQUIPMENT SCHEDULES AND DETAILS

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9–5–2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN
SHEET NO.	E-1
OF:	15
VERSION:	4



ELECTRICAL SITE PLAN

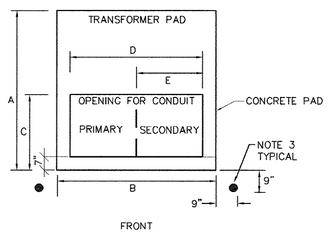
SCALE: 1"=10'-0"

NORTH

1/10" = 1'-0" 5' 0 5' 10' 20'

KEYED NOTES:

1. ASSUMED LOCATION OF EXISTING UNDERGROUND COMMERCIAL POWER SERVICE. KEEP ACTIVE UNTIL THE NEW SERVICE IS INSTALLED AND NEW SERVICE EQUIPMENT IS ENERGIZED AND THE EXISTING COMMERCIAL SERVICE EQUIPMENT IS REMOVED.
2. ASSUMED LOCATION OF EXISTING UNDERGROUND EMERGENCY SERVICE. KEEP ACTIVE UNTIL THE NEW EMERGENCY SERVICE IS INSTALLED AND ENERGIZED AND THE EXISTING EMERGNECY SERVICE EQUIPMENT IS REMOVED. THESE CONDUITS ARE:
   - 3(4-350 MCM, 1 #3/0 G, 3 1/2"C)
   - 8 #14, 2"C FOR START SIGNAL, FUEL LEAK DETECTION AND GENERATOR SET START UP
   - 3 #12, 6 #10,2"C FOR BATTERY CHARGER, BLOCK HEATER AND LIGHTS
   - 2" SPARE CONDUIT
3. NEW UNDERGROUND COMMERCIAL POWER SERVICE. SEE ONE-LINE POWER DIAGRAM.
4. NEW UNDERGROUND EMERGENCY POWER SERVICE, CONTROL AND MONITORING CABLES IN CONCRETE ENCASED CONDUITS.
   POWER: 8(3-500 MCM, 1 #3/0 N, 1-400 MCM G, 4"C)
   - TO NEW EMERGENCY SWITCHBOARD 'ESB'.
   - 3 #4, 1 #6 G, 1 1/4"C TO NEW PANEL 'NHP'.
   - 10|1"C WITH 16|14, CONTROL CABLES FROM NEW ATS'S TO START/STOP ENGINE. VERIFY WITH EMERGENCY SYSTEM SUPPLIER PRIOR TO RUNNING CABLES.
   - ONE 1"C WITH TWO DHC CABLES TO RTU FOR MODBUS NETWORK INTERFACE.
   - ONE 1"C WITH DOOR MONITORING SWITCH CONDUCTORS TO SECURITY PANEL.
   - ONE 1"C WITH CABLES AS REQUIRED TO ELECTRICAL BUILDING FOR GEN SET REMOTE ALARMS ANNUNCIATOR.
   - ONE 1"C SPARE TO ELECTRICAL ROOM.
5. PRIOR TO STARTING ANY WORK, IDENTIFY EXACT PLAN LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND CONDUITS THROUGHOUT THE AREA OF NEW CONSTRUCTION BY DIGGING BY HAND TO EXPOSE THE CONDUITS THROUGH THEIR ROUTE INTO THE BUILDING. AFTER THE EXISTING CONDUITS HAVE BEEN EXPOSED PROVIDE ADDITIONAL CONCRETE PROTECTION TO ALLOW CONSTRUCTION OF NEW ADDITION WHILE PRESERVING INTEGRITY OF EXISTING CONDUITS. NOT ALL EXISTING CONDUITS ARE SHOWN HERE BUT THEY SHALL BE PROTECTED IN THE SAME MANNER.
6. PROPOSED NEW POWER CO. UNDERGROUND PRIMARY FEED.
7. EXISTING UNDERGROUND PRIMARY FEED, ARRANGE FOR REMOVAL.
8. ONE TYPE 'G' GROUNDING CONDUCTOR. CONNECT TO BUILDING GROUND LOOP.
9. 1 #3/0 G, BOND GENERATOR SET HOUSING/TANK AT TWO POINTS.
10. 1 #3/0 G, TO GENERATOR NEUTRAL FOR GROUNDING ELECTRODE CONDUCTOR.

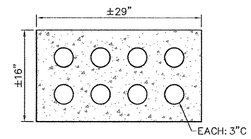


TRANSFORMER PAD DIMENSION SCHEDULE						
RATING	DIMENSION					
	A	B	C	D	E	F
300 KVA	5'-0"	6'-2"	1'-10"	4'-1"	1'-10"	7"
500 KVA	5'-2"	6'-8"	1'-10"	4'-4"	1'-10"	10"
2500 KVA	7'-11"	8'-4"	1'-8"	6'-8"	3'-0"	10"

4 E2E2 NEW TRANSFORMER PAD DIMENSIONS (SEE NOTE 9)

SCALE: NONE

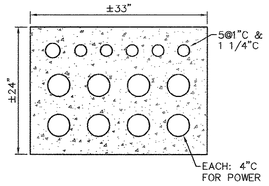
NOTES:
1. PAD SHALL BE PERFECTLY LEVEL WITH SMOOTH FINISH ON TOP. OPENING MUST BE LEFT OPEN.
2. MINIMUM OF 8" THICK, REBAR REINFORCED; MINIMUM OF 6" ABOVE GRADE.
3. THE PAD SHALL BE PROTECTED BY THE FOLLOWING METHOD:
   A. PROTECTED ONLY ON SIDE EXPOSED TO VEHICLES BY POSTS AS SHOWN. MINIMUM 4" CONDUIT, CONCRETE FILLED. SEE DETAIL 3/E2/E13.
4. SHALL BE A MINIMUM OF 3' FROM BUILDING WALL ON SIDES OR BACK WITH A 10' MINIMUM CLEAR AREA IN FRONT. TRANSFORMER FINS MAY EXTEND BEYOND PAD.
5. NOT TO BE PUT IN ENCLOSED AREA INACCESSIBLE TO LINE TRUCK.
6. IF SECONDARY IS PULLED BEFORE TRANSFORMER IS INSTALLED, APPROXIMATELY 6' OF SECONDARY LEADS SHALL BE LEFT ABOVE LEVEL OF PAD (VARIES WITH TRANSFORMER HEIGHT).
7. IN CASES WHERE CUSTOMER IS REQUIRED TO FURNISH PRIMARY CONDUIT: 4" PVC SCHEDULE 40 ELECTRICAL CONDUIT BURIED 3' DEEP WITH A COVER OF 3" OF CONCRETE SHALL BE RUN FROM PAD TO BASE OF RISER POLE WITH A 4" RIGID STEEL CONDUIT INSTALLED ON POLE. (NO CONCRETE COVER NEEDED FOR PVC 4' DEEP OR MORE.) ELBOW AT POLE END MUST BE RIGID STEEL AND PULL STRING SHALL BE INSTALLED IN CONDUIT RUN.
8. CONDUIT SHALL BE FLUSH WITH TOP OF PAD.
9. CONTRACTOR TO VERIFY FINAL POWER CO. REQUIREMENTS PRIOR TO STARTING ANY WORK.



1 E2E2 SECTION THROUGH NEW COMMERCIAL POWER DUCTBANK "3"

SCALE: NONE

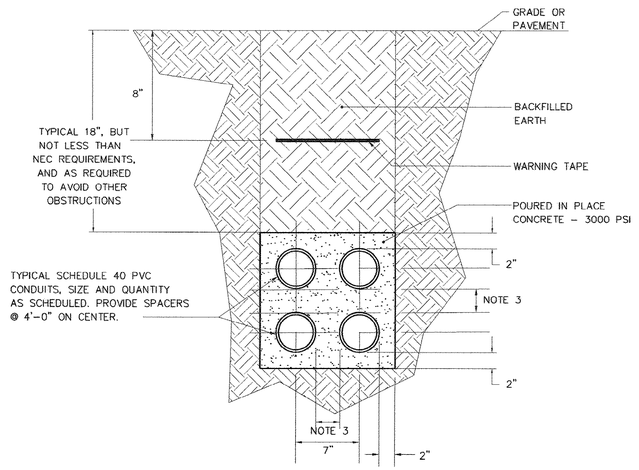
NOTES:
1. REFER TI 3/E2/E2 FOR ADDITIONAL REQUIREMENTS.



2 E2E2 SECTION THROUGH NEW EMERGENCY POWER DUCTBANK "4"

SCALE: NONE

NOTES:
1. REFER TO 3/E2/E2 FOR ADDITIONAL REQUIREMENTS.



3 E2E2 TYPICAL SECTION THROUGH DUCTBANK RUN

SCALE: NONE

NOTES:
1. ALL FEEDERS RUN OUTSIDE REQUIRE CONCRETE ENCASEMENT.
2. CONDUIT STUB-UPS SHALL BE PVC COATED RIGID GALVANIZED STEEL CONDUIT.
3. PROVIDE 3" OR MORE, IF SO NOTED, SEPARATION BETWEEN ADJACENT POWER CONDUITS, 2" SEPARATION BETWEEN SIGNAL CONDUITS.

AS-BUILT 9-5-08

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

206.046

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 - Fax: (910) 692-7402

ELECTRICAL SITE PLAN

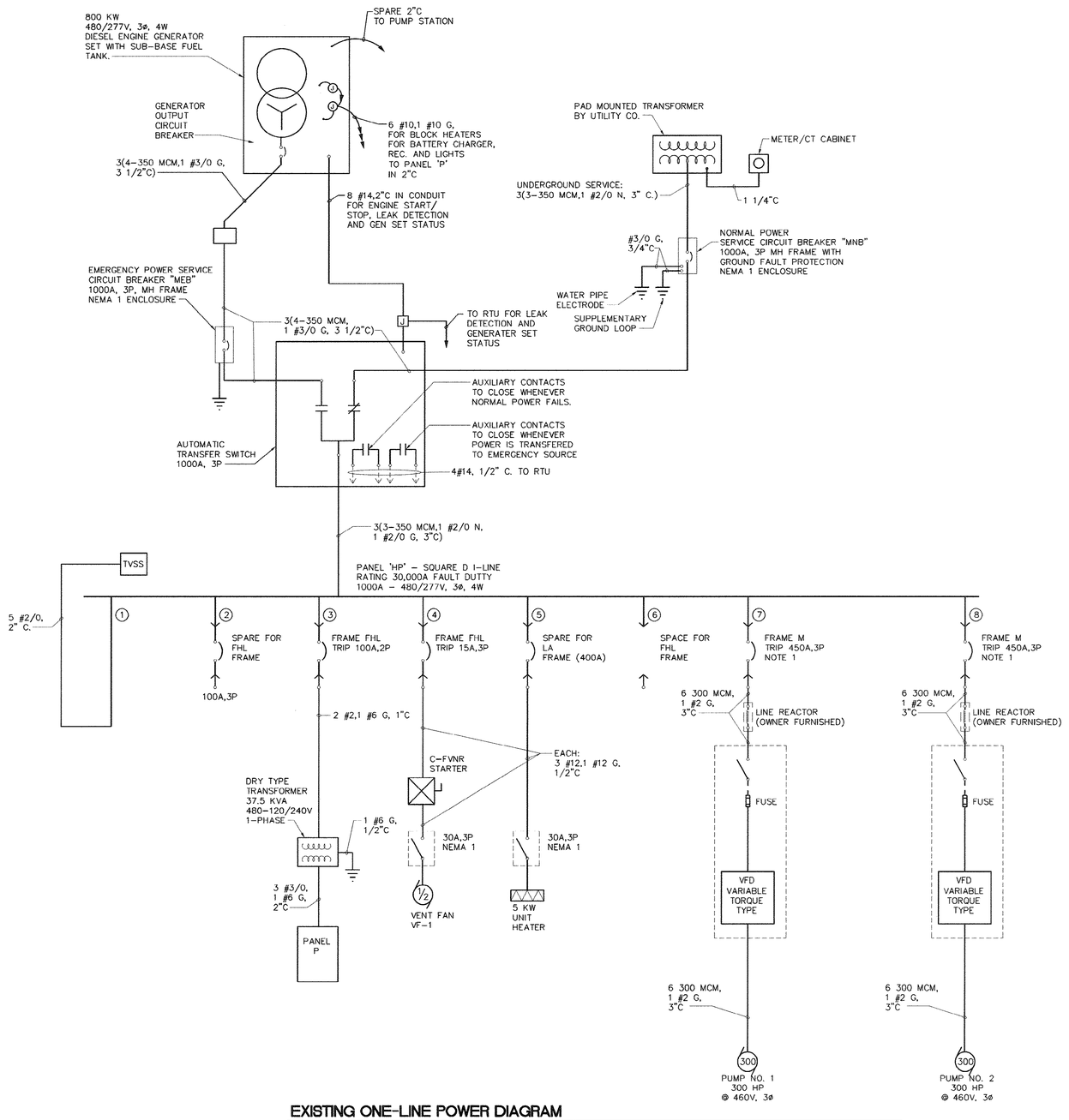
PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN

SHEET NO. E-2

OF: 15 VERSION: 4

12-250-017/36 W



EXISTING ONE-LINE POWER DIAGRAM

NOT TO SCALE

NOTES:
A. BREAKERS FOR EACH PUMP HAVE PROVISIONS FOR PAD LOCKING IN "OFF" POSITION AND AUXILIARY 5A, 120V CONTACTS ON EACH CIRCUIT BREAKER TO OPEN WHEN BREAKER IS IN OPEN POSITION.
B. VERIFY EXACT EXISTING CONDITIONS PRIOR TO STARTING ANY WORK AT THIS SITE.

ONE-LINE DIAGRAM LEGEND - FOR SHEETS E-3 THROUGH E-6

EPM	ELECTRONIC POWER MONITORING SYSTEM WITH AMPERES/PHASE VOLTAGE EACH PHASE-PHASE & PHASE TO NEUTRAL AND ADDITIONAL FEATURES. REFER TO SECTION 16442 FOR REQUIREMENTS.
F	FUSE
1600/1600/3	BOLT-ON CIRCUIT BREAKER: FIRST NUMERAL = FRAME IN AMPERES, SECOND NUMERAL = TRIP IN AMPERES, THIRD NUMERAL = POLES
200/3	POWER SWITCH: RATING IN AMPERES AND POLES AS INDICATED BY NUMERALS
3000/3000/3	DRAW-OUT, POWER CIRCUIT BREAKER CONFORMING TO UL 1066.
	PLUG-IN, MOLDED CASE CIRCUIT BREAKER, OTHERWISE SAME AS BOLT-ON CIRCUIT BREAKER.
GB	GROUNDING BUS
NB	NEUTRAL BUS
	GROUNDING ELECTRODE
13800V/480Y	TRANSFORMER VOLTAGE AND TYPE
300	MOTOR 460V, 3ø, HORSEPOWER RATING AS INDICATED BY NUMERAL
TVSS	TRANSIENT VOLTAGE SUPPRESOR SYSTEM COMPLYING WITH SECTION 16289
ATS	AUTOMATIC TRANSFER SWITCH
E	EMERGENCY (STANDBY GENERATOR SET) SIDE
L,S,I,GF,AM	TYPICAL ELECTRICAL TRIP FUNCTIONS, AS APPLICABLE: L = LONG TIME S = SHORT TIME I = INSTANTANEOUS FLA= FULL LOAD AMOERE GF= GROUND FAULT AM= AMMETER
N	NORMAL (COMMERCIAL) FEED SIDE, OR NEUTRAL, AS APPLICABLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OL	OVERLOAD PROTECTION
RVSS	REDUCED VOLTAGE SOFT STARTER MOTOR CONTROLLER
VFD	VARIABLE FREQUENCY DRIVE CONTROLLER ASSEMBLY. REFER TO SECTION 16161.

AS-BUILT 9-5-08

12-250-018/36 ws

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 - Fax: (910) 692-7342

206.046

EXISTING ONE-LINE POWER DIAGRAM

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN
SHEET NO.	E-3
OF: 15	VERSION: 4

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 – Fax: (910) 692-7342

206.046

EXISTING 800 KW 480/277V, 3ø, 4W DIESEL ENGINE GENERATOR SET WITH SUB-BASE FUEL TANK.
GENERATOR OUTPUT CIRCUIT BREAKER
EXISTING 3 #12,6 #10, 2"C TO PANEL "P"
3(4–350 MCM,1 #3/0 G, 3 1/2"C)
EXISTING 8 #14,2"C IN CONDUIT FOR ENGINE START/ STOP, LEAK DETECTION AND GEN SET STATUS
EXISTING EMERGENCY POWER SERVICE CIRCUIT BREAKER "MEB" 1000A, 3P, MH FRAME NEMA 1 ENCLOSURE
3(4–350 MCM, 1 #3/0 G, 3 1/2"C)
TO RTU FOR LEAK DETECTION AND GENERATER SET STATUS
AUXILIARY CONTACTS TO CLOSE WHENEVER NORMAL POWER FAILS.
AUXILIARY CONTACTS TO CLOSE WHENEVER POWER IS TRANSFERED TO EMERGENCY SOURCE
EXISTING AUTOMATIC TRANSFER SWITCH 1000A, 3P
4#14, 1/2" C. TO RTU
3(3–350 MCM,1 #2/0 N, 1 #2/0 G, 3"C)
EXISTING PANEL 'HP' – SQUARE D I–LINE RATING 30,000A FAULT DUTTY 1000A – 480/277V, 3ø, 4W
5 #2/0, 2" C.
SPARE FOR FHL FRAME
100A,3P
FRAME FHL TRIP 100A,2P
2 #2,1 #6 G, 1"C
DRY TYPE TRANSFORMER 37.5 KVA 480–120/240V 1–PHASE
1 #6 G, 1/2"C
3 #3/0, 1 #6 G, 2"C
PANEL P
NEW PANEL NP
NEW 3 #3,1 #8 G, 1 1/4"C
PROVIDE NEW 100A, 2P CIRCUIT BREAKER
FRAME FHL TRIP 15A,3P
C–FVNR STARTER
30A,3P NEMA 1 REMOVE
VENT FAN VF–1 REMOVE
SPARE FOR LA FRAME (400A)
30A,3P NEMA 1
5 KW UNIT HEATER
EACH: 3 #12,1 #12 G, 1/2"C REMOVE
NEW 3 #12,1 #12 G,1/2"C TO NEW PANEL 'NHP'
SPACE FOR FHL FRAME
FRAME M TRIP 600A,3P
6 300 MCM, 1 #2 G, 3"C
LINE REACTOR
FUSE
EXISTING 200 HP VFD ASSEMBLY
VFD VARIABLE TORQUE TYPE
6 300 MCM, 1 #2 G, 3"C
PUMP NO. 1 300 HP @ 460V, 3ø
FRAME M TRIP 600A,3P
EXISTING 6 300 MCM, 1 #2 G,3"C
EXISTING LINE REACTOR
FUSE
EXISTING 300 HP VFD ASSEMBLY
VFD VARIABLE TORQUE TYPE
EXISTING 6 300 MCM, 1 #2 G, 3"C TO OLD 300 HP PUMP MOTOR
PUMP NO. 2 300 HP @ 460V, 3ø

NEW 1500 KW PRIME, WALK–IN ENCLOSURE 480/277V, 3ø, 4W, STANDBY RATED DIESEL ENGINE GENERATOR SET WITH SUB–BASE FUEL TANK. PROVIDE PAD
#3/0 G, BONDING
3 #1/0, 1 #6 G, 2"C
PANEL 'GP'
25 KVA, 480–140/120V, 1–PHASE TRANSFORMER
100A, 2P, F70A SUITABLE FOR SERVICE ENTRANCE
1 #6 G
1 #6 G
#3/0 G
#3/0 G, BONDING
2 #4,1 #6G, 1 1/4"C TO PANEL 'NHP'
3000A, 3P, GENERATOR OUTPUT CIRCUIT BREAKER
METER/CT CABINET
PAD MOUNTED TRANSFORMER BY UTILITY CO.
UNDERGROUND SERVICE: 3(3–350 MCM,1 #2/0 N, 3" C.)
1 1/4"C
8(3–500 MCM, 1–3/0 N, 1–400 MCM G, 4"C)
MODBUS PLUS INTERFACE
8 #12,8 #12 SPARE,1"C FOR START/ STOP COMMAND
#3/0 G, 3/4"C
EXISTING NORMAL POWER SERVICE CIRCUIT BREAKER "MNB" 1000A, 3P MH FRAME WITH GROUND FAULT PROTECTION NEMA 1 ENCLOSURE
WATER PIPE ELECTRODE
SUPPLEMENTARY GROUND LOOP
EPM
NEW EMERGENCY SERVICE SWITCHBOARD "ESB" – 42,000A SCIR 3000A, 480/277V, 3ø, 4W – MLO SUITABLE FOR SERVICE ENTRANCE
NB
GB
12 1/2"
#3/0 G
1600/ 1600/3 L,S,I,G,AM
1600/ 1600/3 L,S,I,G
400/ 400/3
100/ 60/3
5 #4, 1 1/4" C.
TVSS
TYPE 1
SPARE
3–500 MCM, 1 #3 G, 3"C
EACH: 4(3–350 MCM, 1 #4/0 G, 3"C)
NEW PAD MOUNTED TRANSFORMER BY POWER CO. PROVIDE CONCRETE PAD.
1 1/4"C
NEW METER
NEW 8(3–500 MCM, 1 #3/0 N, 3"C)
NEW NORMAL POWER SERVICE SWITCHBOARD "MSB" 3000A, 480/277V, 3ø, 4W – MLO 65,000A SCIR SUITABLE FOR SERVICE ENTRANCE
16 #14,1"C TO GEN. SET
EACH: 4(3–350 MCM, 1 #4/0 G, 3"C)
EACH: 3–500 MCM, 1 #3 G,3"C
4 #14,1/2"C
E
N
NEW ATS #1 1200A,3P
NEW ATS #2 1200A,3P
NEW ATS #3 1200A,3P
NEW ATS #4 400A,3P
NEW 4(3–350 MCM, 1 #4/0 G, 3"C)
FUTURE PUMP VFD
NEW 4(3–350 MCM, 1 #4/0 G, 3"C)
NEW 700 HP PUMP #3
NEW 3–500 MCM, 1 #3 G, 3"C
NEW PANEL NHP
NEW 3 #10, 1 #10 G, 3/4"C
NEW 3 #12, 1 #12 G, 1/2"C
NEW 3 #10, 1 #10 G, 3/4"C
NEW 30A, 3P NEMA 4X FPN
NEW 30A,3P FPN
NEW CU–3
NEW AC–3
NEW CU–1
NEW AC–1
OUTDOOR UNIT FLA=21.5A MCA=23.9 MOPA=30
INDOOR UNIT FLA=3.4A MCA=15A MOPA=15A
OUTDOOR UNIT FLA=21.5A MCA=23.9 MOPA=30
INDOOR UNIT FLA=3.4A MCA=15A MOPA=15A

KEYED NOTES

1. ONE DHC – 3/4"C TO RTU FOR MODBUS PLUS NETWORK INTEGRATION.
2. PROVIDE FROM EACH NEW ATS: 2 #12,2 #12 SPARE IN CONDUIT AND RUN TO NEW GEN. SET VIA JUNCTION BOX IN 1–INCH CONDUIT WITH A TOTAL OF 8 #12 AND 8 #12 SPARE.
3. 6 #14, 3/4"C TO RTU FOR HARD WIRED STATUS AND ALARM MONITORING.
4. RUN THE FOLLOWING WIRING FROM GEN. SET TO BUILDING:
   –ONE 1"C WITH TWO "DHC" CABLES TO RTU FOR MODBUS NETWORK INTERFACE.
   –ONE 1"C WITH DOOR MONITORING SWITCH CONDUCTORS TO RTU.
   –ONE 1"C WITH CABLES AS REQUIRED TO ELECTRICAL BUILDING FOR REMOTE ALARMS ANNUNCIATOR.
   –ONE 1"C SPARE TO ELECTRICAL BUILDING.
5. PROVIDE PLAQUE: "EMERGENCY SERVICE DISCONNECTS – TOTAL OF SIX – NORMAL POWER DISCONNECTS ARE IN SWITCHBOARD MSB".
6. PROVIDE PLAQUE: "NORMAL SERVICE DISCONNECTS – TOTAL OF SIX – EMERGENCY POWER DISCONNECTS ARE IN SWITCHBOARD ESB".

ONE–LINE POWER RISER DIAGRAM – PHASE 1 WORK

NOT TO SCALE

NOTES:
A. EXISTING EQUIPMENT AND FEEDERS REMAIN, EXCEPT AS OTHERWISE NOTED.
B. REFER TO SHEET E–3 FOR LEGEND.

AS-BUILT 9-5-08

12-250-019/36 W

ONE-LINE POWER DIAGRAM
MODIFICATIONS AND ADDITIONS
PHASE I OF WORK

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9–5–2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN

SHEET NO.
E-4
OF: 15 VERSION: 4

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 - Fax: (910) 692-7342

206.046

EXISTING 800 KW 480/277V, 3ø, 4W DIESEL ENGINE GENERATOR SET WITH SUB-BASE FUEL TANK.

OWNER TO REMOVE AND TAKE POSESSION OF EXISTING EMERGENCY GENERATOR SET

GENERATOR OUTPUT CIRCUIT BREAKER

REMOVE 3 #12,6 #10, 2"C TO PANEL "P"

3(4-350 MCM,1 #3/0 G, 3 1/2"C) - REMOVE

EXISTING 8 #14,2"C IN CONDUIT FOR ENGINE START/ STOP, LEAK DETECTION AND GEN SET STATUS REMOVE

REMOVE PULL BOX

REMOVE EMERGENCY POWER SERVICE CIRCUIT BREAKER "MEB" 1000A, 3P, MH FRAME NEMA 1 ENCLOSURE

3(4-350 MCM, 1 #3/0 G, 3 1/2"C) REMOVE

TO RTU FOR LEAK DETECTION AND GENERATER SET STATUS - REMOVE

EXISTING AUTOMATIC TRANSFER SWITCH 1000A, 3P REMOVE AND TURN OVER TO OWNER

AUXILIARY CONTACTS TO CLOSE WHENEVER NORMAL POWER FAILS.

AUXILIARY CONTACTS TO CLOSE WHENEVER POWER IS TRANSFERED TO EMERGENCY SOURCE

4#14, 1/2" C. TO RTU - REMOVE

METER/CT CABINET TO BE REMOVED

PAD MOUNTED TRANSFORMER BY UTILITY CO. - ARRANGE WITH POWER CO. FOR REMOVAL

UNDERGROUND SERVICE: 3(3-350 MCM,1 #2/0 N, 3" C.) REMOVE

1 1/4"C REMOVE

#3/0 G, 3/4"C

REMOVE NORMAL POWER SERVICE CIRCUIT BREAKER "MNB" 1000A, 3P MH FRAME WITH GROUND FAULT PROTECTION NEMA 1 ENCLOSURE

WATER PIPE ELECTRODE

SUPPLEMENTARY GROUND LOOP

3(3-350 MCM,1 #2/0 N, 1 #2/0 G, 3"C) - REMOVE

REMOVE PANEL 'HP' - SQUARE D I-LINE RATING 30,000A FAULT DUTTY 1000A - 480/277V, 3ø, 4W

TVSS

① SPARE FOR FHL FRAME 100A,3P

② FRAME FHL TRIP 100A,2P

③ FRAME FHL TRIP 15A,3P

④ SPARE FOR LA FRAME (400A)

⑤ SPACE FOR FHL FRAME

⑥ FRAME M TRIP 600A,3P

⑦ 6 300 MCM, 1 #2 G, 3"C REMOVE

⑧ FRAME M TRIP 600A,3P

5 #2/0, 2"C REMOVE

2 #2,1 #6 G, 1"C REMOVE

NEW 2 #2,1 #6 G, 1 1/4"C TO NEW PANEL "NHP"

DRY TYPE TRANSFORMER 37.5 KVA 480-120/240V 1-PHASE REMAIN

1 #6 G, 1/2"C

3 #3/0, 1 #6 G, 2"C REMAIN

PANEL P

NEW PANEL NP

NEW 3 #3,1 #8 G, 1 1/4"C

PROVIDE NEW 100A, 2P CIRCUIT BREAKER

NEW 3 #12,1 #12 G,1/2"C TO NEW PANEL "NHP"

30A,3P NEMA 1

5 KW UNIT HEATER REMAIN

EXISTING 300 HP VFD ASSEMBLY REMOVE

FUSE

VFD VARIABLE TORQUE TYPE

EXISTING 300 HP VFD ASSEMBLY REMOVE

FUSE

VFD VARIABLE TORQUE TYPE

EXISTING 6 300 MCM, 1 #2 G, 3"C TO OLD 300 HP PUMP MOTOR REMOVE

6 300 MCM, 1 #2 G, 3"C - REMOVE

700 NEW PUMP NO. 1 700 HP @ 460V, 3ø

NEW 700 HP PUMP - DISCONNECT AND REMOVE OLD CONDUCTORS AND CONDUIT

700 NEW PUMP NO. 2 700 HP @ 460V, 3ø

NEW 700 HP PUMP - DISCONNECT AND REMOVE OLD CONDUCTORS AND CONDUIT

NEW 1500 KW PRIME, WALK-IN ENCLOSURE 480/277V, 3ø, 4W, STANDBY RATED DIESEL ENGINE GENERATOR SET WITH SUB-BASE FUEL TANK. PROVIDE PAD

#3/0 G, BONDING

PANEL 'GP'

3 #1/0, 1 #6 G, 2"C

25 KVA, 480-140/120V, 1-PHASE TRANSFORMER

100A, 2P, F70A SUITABLE FOR SERVICE ENTRANCE

1 #6 G

1 #6 G

#3/0 G

3000A, 3P, GENERATOR OUTPUT CIRCUIT BREAKER

#3/0 G, BONDING

2 #4,1 #6G, 1 1/4"C TO PANEL 'NHP'

8(3-500 MCM, 1-3/0 N, 1-400 MCM G, 4"C)

MODBUS PLUS INTERFACE

8 #12,8 #12 SPARE,1"C FOR START/ STOP COMMAND

NEW EMERGENCY SERVICE SWITCHBOARD "ESB" - 42,000A SCIR 3000A, 480/277V, 3ø, 4W - MLO SUITABLE FOR SERVICE ENTRANCE

EPM

NB

GB

12 1/2"

#3/0 G

① 1600/1600/3 L,S,I,G,AM

② 1600/1600/3 L,S,I,G,AM

③ 1600/1600/3 L,S,I,G,AM

④ 400/400/3

⑤ 400/400/3 SPARE

⑥ 400/400/3 SPARE

100/60/3

5 #4, 1 1/4" C.

TVSS

TYPE 1

EACH: 4(3-350 MCM, 1 #4/0 G, 3"C)

3-500 MCM, 1 #3 G, 3"C

16 #14,1"C TO GEN. SET

4 #14,1/2"C

① ② ③ NEW ATS #1 1200A,3P

① ② ③ NEW ATS #2 1200A,3P

NEW 4(3-350 MCM, 1 #4/0 G, 3"C)

NEW 18-PULSE VFD MOTOR CONTROL ASSEMBLY FOR NEW 700 HP PUMP #1 PER SECTION 16161 SEE 4/E-4/E-10

NEW 18-PULSE VFD MOTOR CONTROL ASSEMBLY FOR NEW 700 HP PUMP #2 PER SECTION 16161 SEE 4/E-4/E-10

NEW 4(3-350 MCM, 1 #4/0 G, 3"C)

NEW 700 HP PUMP #3

NEW PAD MOUNTED TRANSFORMER BY POWER CO. PROVIDE CONCRETE PAD.

1 1/4"C

NEW METER

NEW 8(3-500 MCM, 1 #3/0 N, 3"C)

NEW EMERGENCY SERVICE SWITCHBOARD "MSB" 3000A, 480/277V, 3ø, 4W - MLO 65,000A SCIR SUITABLE FOR SERVICE ENTRANCE

① 1600/1600/3 L,S,I,G

② 1600/1600/3 L,S,I,G

③ 1600/1600/3 L,S,I,G

④ 400/400/3

⑤ 400/400/3 SPARE

⑥ 400/400/3 SPARE

100/60/3

5 #4, 1 1/4" C.

TVSS

TYPE 1

EACH: 4(3-350 MCM, 1 #4/0 G, 3"C)

EACH: 3-500 MCM, 1 #3 G,3"C

4 #14,1/2"C

① ② ③ NEW ATS #3 1200A,3P

① ② ③ NEW ATS #4 400A,3P

EACH: NEW 3-500 MCM, 1 #3 G, 3"C

NEW PANEL NHP

NEW 3 #10, 1 #10 G, 3/4"C

NEW 3 #12, 1 #12 G, 1/2"C

NEW 3 #10, 1 #10 G, 3/4"C

NEW 30A, 3P NEMA 4X FPN

NEW 30A,3P FPN

NEW CU-3 OUTDOOR UNIT FLA=21.5A MCA=23.9 MOPA=30

NEW AC-3 INDOOR UNIT FLA=3.4A MCA=15A MOPA=15A

NEW CU-2 OUTDOOR UNIT FLA=21.5A MCA=23.9 MOPA=30

NEW AC-2 INDOOR UNIT FLA=3.4A MCA=15A MOPA=15A

NEW CU-1 OUTDOOR UNIT FLA=21.5A MCA=23.9 MOPA=30

NEW AC-1 INDOOR UNIT FLA=3.4A MCA=15A MOPA=15A

FUTURE PUMP VFD

ONE-LINE POWER RISER DIAGRAM - PHASE 2 WORK

NOT TO SCALE

NOTES:

A. REFER TO SHEET E-3 FOR LEGEND.

KEYED NOTES

1. ONE DHC - 3/4"C TO RTU FOR MODBUS PLUS NETWORK INTEGRATION.
2. PROVIDE FROM EACH NEW ATS: 2 #12,2 #12 SPARE IN CONDUIT AND RUN TO NEW GEN. SET VIA JUNCTION BOX IN 1-INCH CONDUIT WITH A TOTAL OF 8 #12 AND 8 #12 SPARE.
3. 6 #14, 3/4"C TO RTU FOR HARD WIRED STATUS AND ALARM MINITORING.
4. RUN THE FOLLOWING WIRING FROM GEN. SET TO BUILDING:
   - ONE 1"C WITH TWO "DHC" CABLES TO RTU FOR MODBUS NETWORK INTERFACE.
   - ONE 1"C WITH DOOR MONITORING SWITCH CONDUCTORS TO RTU.
   - ONE 1"C WITH CABLES AS REQUIRED TO ELECTRICAL BUILDING FOR REMOTE ALARMS ANNUNCIATOR.
   - ONE 1"C SPARE TO ELECTRICAL BUILDING.
5. PROVIDE PLAQUE: "EMERGENCY SERVICE DISCONNECTS - TOTAL OF SIX - NORMAL POWER DISCONNECTS ARE IN SWITCHBOARD MSB".
6. PROVIDE PLAQUE: "NORMAL SERVICE DISCONNECTS - TOTAL OF SIX - EMERGENCY POWER DISCONNECTS ARE IN SWITCHBOARD ESB".

AS-BUILT 9-5-08

ONE-LINE POWER DIAGRAM
MODIFICATIONS AND ADDITIONS
PHASE II OF WORK

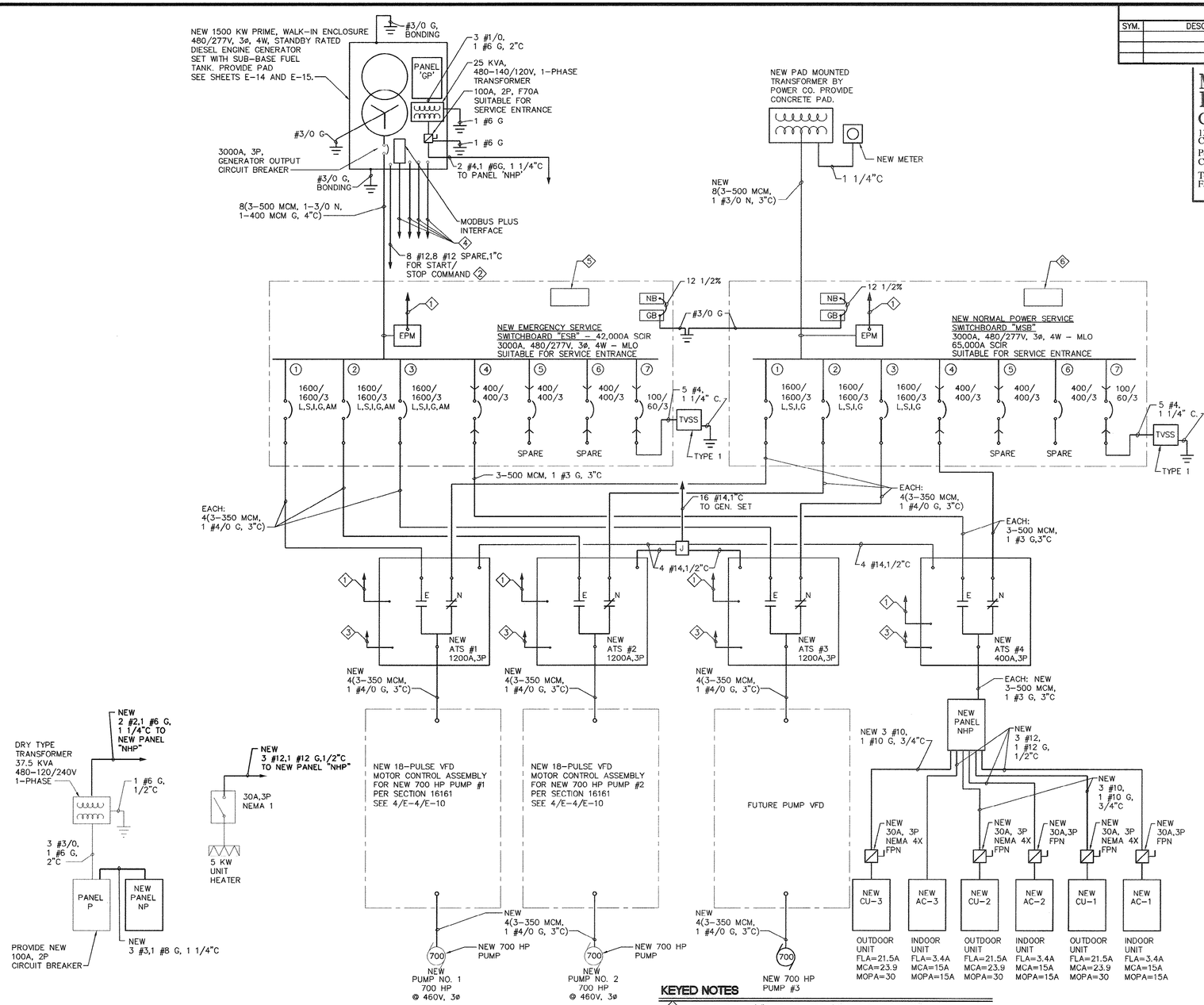
PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN

SHEET NO. E-5

OF: 15 VERSION: 4

12-250-020/36 gw



FINAL ONE-LINE POWER DIAGRAM

NOT TO SCALE

NOTES:

A. REFER TO SHEET E-3 FOR LEGEND.

KEYED NOTES

1. ONE DHC - 3/4"C TO RTU FOR MODBUS PLUS NETWORK INTEGRATION.
2. PROVIDE FROM EACH NEW ATS: 2 #12,2 #12 SPARE IN CONDUIT AND RUN TO NEW GEN. SET VIA JUNCTION BOX IN 1-INCH CONDUIT WITH A TOTAL OF 8 #12 AND 8 #12 SPARE.
3. 6 #14, 3/4"C TO RTU FOR HARD WIRED STATUS AND ALARM MINITORING.
4. RUN THE FOLLOWING WIRING FROM GEN. SET TO BUILDING:
   - ONE 1"C WITH TWO "DHC" CABLES TO RTU FOR MODBUS NETWORK INTERFACE.
   - ONE 1"C WITH DOOR MONITORING SWITCH CONDUCTORS TO RTU.
   - ONE 1"C WITH CABLES AS REQUIRED TO ELECTRICAL BUILDING FOR REMOTE ALARMS ANNUNCIATOR.
   - ONE 1"C SPARE TO ELECTRICAL BUILDING.
5. PROVIDE PLAQUE: "EMERGENCY SERVICE DISCONNECTS - TOTAL OF SIX - NORMAL POWER DISCONNECTS ARE IN SWITCHBOARD MSB".
6. PROVIDE PLAQUE: "NORMAL SERVICE DISCONNECTS - TOTAL OF SIX - EMERGENCY POWER DISCONNECTS ARE IN SWITCHBOARD ESB".

AS-BUILT 9-5-08

12-250-021/36W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 - Fax: (910) 692-7342

206.046

FINAL ONE-LINE POWER DIAGRAM

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN

SHEET NO. E-6

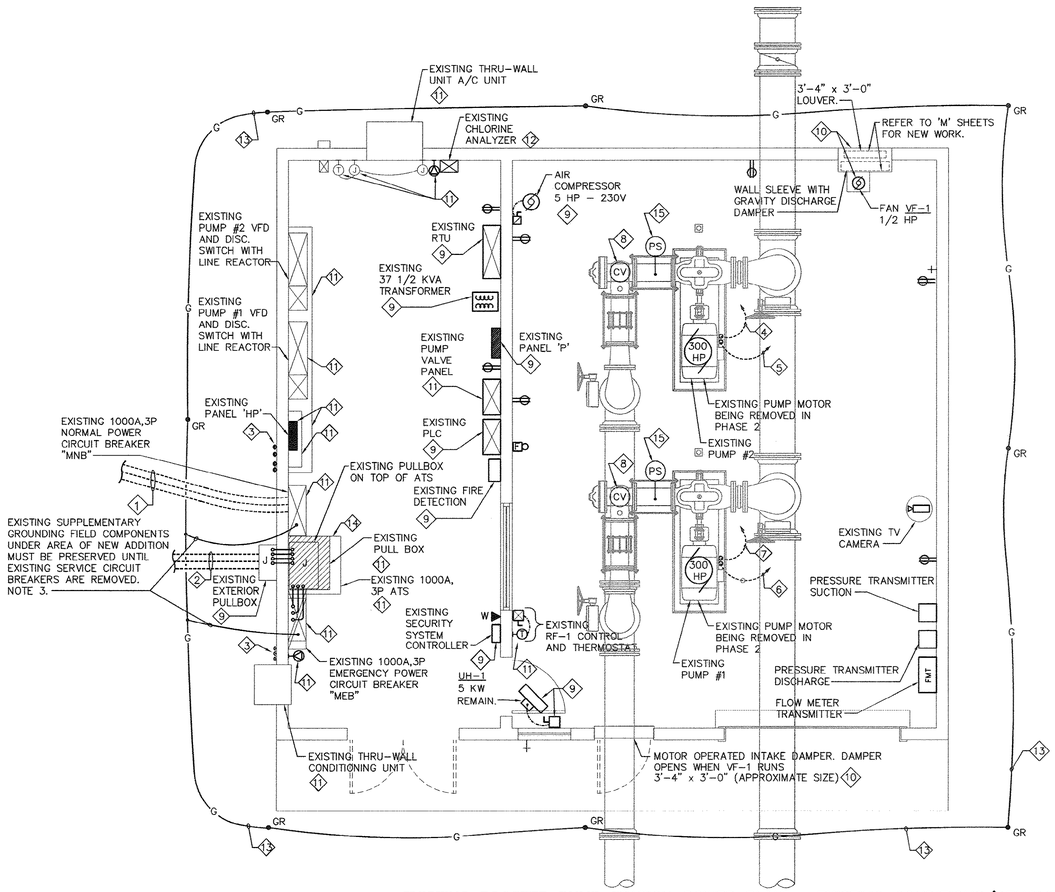
OF: 15 VERSION: 4

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

206.046

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 – Fax: (910) 692-7342



EXISTING BOOSTER PUMP STATION POWER PLAN – EXISTING CONDITIONS/DEMOLITION

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

¼" – 1'-0" 2' 0 2' 4' 8'

NOTES:
1. EXISTING ITEMS AND RELATED POWER AND CONTROLS CIRCUITS REMAIN EXCEPT AS OTHERWISE NOTED.
2. REFER TO SHEET E-11 FOR LIGHTING, FIRE ALARM AND DOOR MONITORING.
3. ALL EXISTING GROUNDING ELECTRODES AND GROUNDING ELECTRODE CONDUCTORS SHALL BE PRESERVED AND MAINTAINED DURING CONSTRUCTION AND LEFT IN PROPER CONDITION IN ACCORDANCE WITH NEC RULES.
4. INFORMATION SHOWN HERE ARE BASED ON INFORMATION CONTAINED IN ORIGINAL CONSTRUCTION BID DOCUMENTS AND IT IS NOT NECESSARILY CORRECT. BIDDER SHALL PERFORM FIELD VISIT PRIOR TO BID TO CHECK VERIFIABLE CONDITIONS AND SHALL INCLUDE IN BID THE COST OF PERFORMING WORK BASED ON EXISTING CONDITIONS.
5. CONTRACTOR SHALL PERFORM A SUBSOIL CONDUIT AND WIRING SURVEY TO PINPOINT LOCATION OF EXISTING UNDERGROUND CIRCUITS PRIOR TO STARTING ANY CONSTRUCTION.

KEYED NOTES:

1. EXISTING U.G. SERVICE CONDUITS FROM PAD MOUNTED TRANSFORMER. EXACT LOCATION IS UNKNOWN. REMOVE DURING PHASE 2.
2. EXISTING U.G. SERVICE CONDUITS FROM 800 KW EMERGENCY GENERATOR SET. EXACT LOCATION IS UNKNOWN. REMOVE DURING PHASE 2.
3. EXISTING PIPING TO BE REMOVED.
4. PUMP #2 POWER CONDUIT STUB-UP FROM PUMP VFD. REMOVE CONDUCTORS DURING PHASE 2.
5. PUMP MOTOR #2 SAFETY CONDUCTORS FROM PUMP VFD. REMOVE CONDUCTORS DURING PHASE 2.
6. PUMP #1 POWER CONDUIT STUB-UP FROM PUMP VFD. REMOVE CONDUCTORS DURING PHASE 2.
7. PUMP MOTOR #1 SAFETY CONDUCTORS FROM PUMP VFD. REMOVE CONDUCTORS DURING PHASE 2.
8. EXISTING ELECTRICALLY ASSISTED PUMP CHECK VALVE – REMAIN.
9. EXISTING ITEM – REMAIN.
10. REMOVE THIS ITEM DURING PHASE 1.
11. REMOVE THIS ITEM DURING PHASE 2.
12. RELOCATE CHLORINE ANALIZER AND RELATED WIRING DURING PHASE 2.
13. APPROXIMATE LOCATION OF EXISTING SUPPLEMENTARY GROUNDING FIELD. REFER TO SHEET E-8 FOR MODIFICATIONS.
14. REMOVE EXISTING EQUIPMENT PAD DURING PHASE 2 AND BUILD NEW CONCRETE PAD FOR VFD FOR 700 HP PUMP #3 MOTOR. REFER TO DETAIL ON SHEET E-12.
15. EXISTING PRESSURE SWITCHES SHALL BE REPLACED WITH NEW MATCHING ONES, EXCEPT WITH 2-POLE CONTACTS, UNDER PHASE 2.

EXISTING POWER PLAN - DEMOLITION

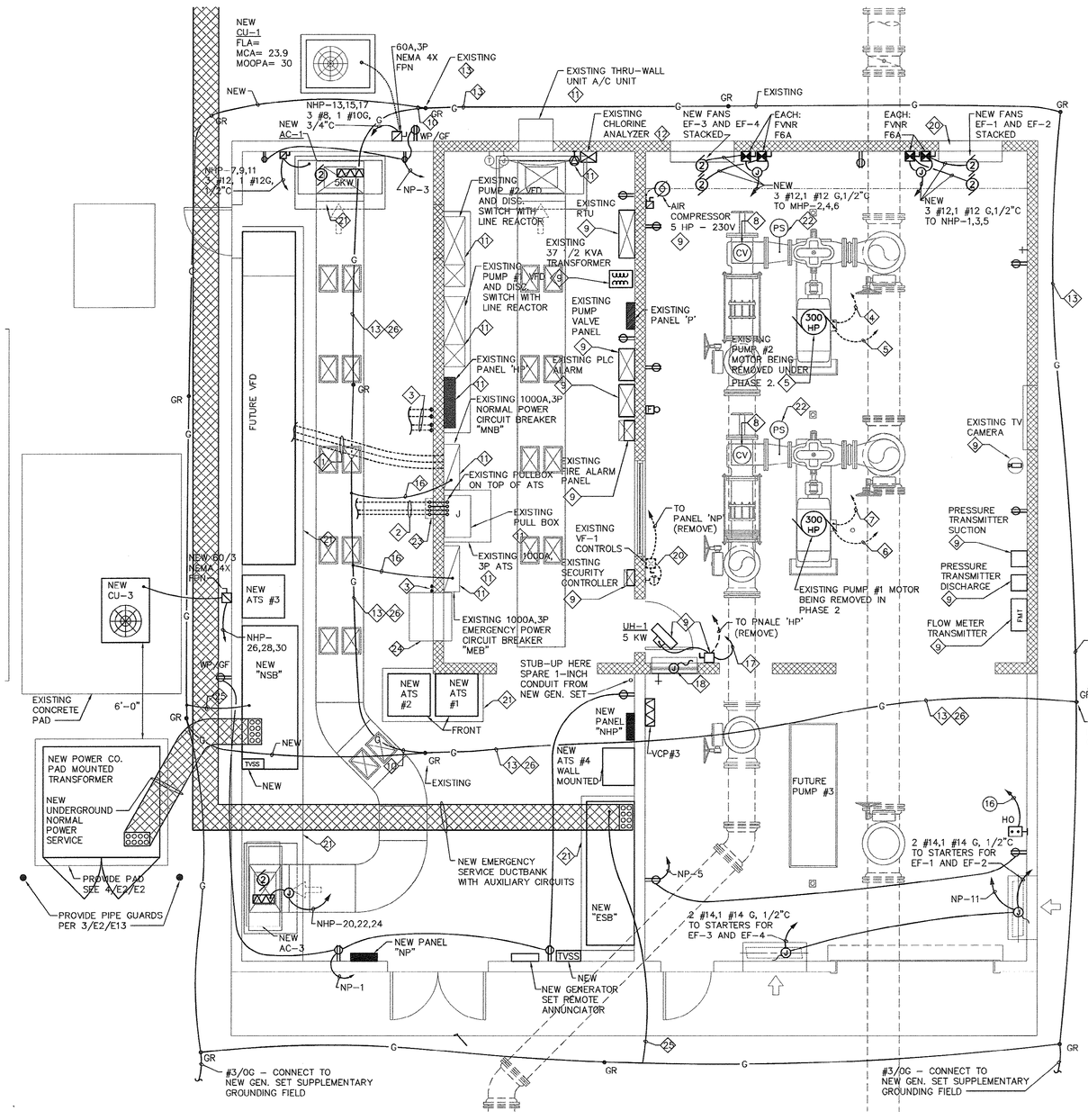
PERRY ROAD WATER
BOOSTER PUMP STATION
UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN

SHEET NO.
E-7
OF: 15 VERSION: 4

AS-BUILT 9-5-08

12-250-022/36 W



BOOSTER PUMP STATION POWER PLAN - PHASE 1 NEW WORK AND PHASE 2 DEMOLITION

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

¼" = 1'-0" 2' 0 2' 4' 8'

NOTES:
A. CONNECT NEW VFD'S FROM OVERHEAD FOR BOTH INPUT AND OUTPUT WIRING. REFER TO ONE-LINE POWER DIAGRAM.

KEYED NOTES:

1. EXISTING U.G. SERVICE CONDUITS FROM PAD MOUNTED TRANSFORMER. EXACT LOCATION IS UNKNOWN. REMOVE DURING PHASE 2.
2. EXISTING U.G. SERVICE CONDUITS FROM 800 KW EMERGENCY GENERATOR SET. EXACT LOCATION IS UNKNOWN. REMOVE ALONG WITH EXTERIOR PULL BOX DURING PHASE 2.
3. EXISTING PIPE TO BE REMOVED DURING PHASE 2.
4. PUMP #2 POWER CONDUIT STUB-UP FROM PUMP VFD. REMOVE CONDUCTORS DURING PHASE 2.
5. PUMP MOTOR #2 SAFETY CONDUCTORS FROM PUMP VFD. REMOVE CONDUCTORS DURING PHASE 2.
6. PUMP #1 POWER CONDUIT STUB-UP FROM PUMP VFD. REMOVE CONDUCTORS DURING PHASE 2.
7. PUMP MOTOR #1 SAFETY CONDUCTORS FROM PUMP VFD. REMOVE CONDUCTORS DURING PHASE 2.
8. REMOVE EXISTING CABLES AND PROVIDE RECEPTACLES.
9. EXISTING ITEM - REMAIN.
10. CONNECT NEW SUPPLEMENTARY GROUNDING FIELD CONDUCTOR TO EXISTING GROUND ROD.
11. REMOVE THIS ITEM DURING PHASE 2.
12. RELOCATE CHLORINE ANALIZER AND RELATED WIRING DURING PHASE 2.
13. APPROXIMATE LOCATION OF EXISTING SUPPLEMENTARY GROUNDING FIELD.
14. #3/0 G, TO "NSB" AND "ESB".
15. PROVIDE SUITABLE GROUNDING FITTING AND BOND WATERPIPE.
16. EXISTING GROUNDING CABLE TO REMAIN UNTIL EQUIPMENT IS REMOVED UNDER PHASE 2.
17. REMOVE UNIT HEATER BRANCH CIRCUIT FROM EXSITING PANEL AND CONNECT IT TO NEW PANEL 'NHP'.
18. REMOVE 120V CONNECTION TO EXISTING DAMPER.
19. PROVIDE MOTOR BOX TERMINAL EXTENSION AS REQUIRED TO ACCOMPLISH MOTOR POWER AND CONTROL CONNECTION.
20. REMOVE EXISTING FAN VF-1 AND RELATED WIRING AND CONTROLS.
21. PROVIDE NEW 4-INCH CONCRETE PAD.
22. EXISTING PRESSURE SWITCH - REPLACE DURING PHASE 2 WITH A SIMILAR ONE WITH TWO POLE CONTACTS (TWO SETS OF CONTACTS).
23. EXISTING OUTDOOR PULL BOX , REMOVE DURING PHASE 2.
24. EXISTING THROUGH THE WALL A/C UNIT - REMOVE DURING PHASE 2.
25. NEW #3/0 G, 3/4"C.
26. MAINTAIN EXISTING SUPPLEMENTARY GROUNDING FIELD CONDUCTORS AND GROUNDING RODS DURING CONSTRUCTION OF ADDITION.
27. NEW PUMP/VALVE CONTROL PANEL.

LEGEND OF POWER CONTROL MONITORING WIRING BETWEEN PUMP CHECK VALVE, PUMP/VALVE CONTROL PANEL, RTU AND PUMP VFD

1. 2 #14, 1 #14G - IN CONDUIT BETWEEN CHECK VALVE EMERGENCY SOLENOID PILOT VALVE AND PUMP CONTROL PANEL "VCP".
2. 2 #14, 1 #14G - IN CONDUIT BETWEEN CHECK VALVE NORMAL SOLENOID PILOT VALVE AND PUMP CONTROL PANEL "VCP".
3. 3 #14, 4 #14 SPARE, 1 #14G IN CONDUIT BETWEEN CHECK VALVE ZONE INDICATING SWITCH ("ZIS") AND RTU FOR VALVE POSITION INDICATION.
4. 4 #14, 1 #14G IN CONDUIT BETWEEN CHECK VALVE ZONE INICATING SWITCH AND "VCP".
5. 2 #14, 4 #14 SPARE, 1 #14G IN CONDUIT BETWEEN "VCP" AND VFD FOR PUMP MOTOR RUN COMMAND.
6. 2 #14, 2 #14 SPARE, 1 #14G IN CONDUIT BETWEEN "VCP" AND RTU FOR "COMMON" ALARM (VALVE FAILURE, POWER FAILURE, PUMP FAILURE).
7. 2 #14, 1 #14G IN CONDUIT BETWEEN PRESSURE SWITCH AT DISCHARGE SIDE OF PUMP AND "VCP".
8. 2 #14, 2 #14 SPARE, 1 #14G IN CONDUIT BETWEEN RTU AND "VCP" FOR RUN COMMAND FROM RTU.
9. 2 #14, 6 #14 SPARE, 1 #14G BETWEEN PUMP MOTOR VFD AND MOTOR FOR 120-VOLT MOTOR ENVIRONMENTAL HEATER, IF ANY.
10. SIX(6) 4-CONDUCTORS #16, SHIELDED CABLES, BELDEN #83704 FROM VFD TO MOTOR FOR HIGH TEMPERATURE AND VIBRATION PROTECTION SYSTEM.
11. 16 #14, 1 #14G IN 3/4"C BETWEEN EACH VFD AND RTU.
12. SIX - SC CABLES - 1"C BETWEEN EACH VFD AND RTU.
13. 2 #14, 1 #14 G BETWEN PRESSURE SWITCH AND RTU FOR REMOTE WATER FLOW SIGNAL.
14. SPARE 3/4"C WITH PULL CORD.
15. POWER CIRCUIT FROM 700 PH MOTOR TO RESPECTIVE VFD: 4(3-350 MCM, 1 #4/0 G, 3"C).
16. 2 #14,1 #14 G FROM "H-O" PUSHBUTTON STATION TO VFD.
17. POWER CIRCUIT FROM 700 PH MOTOR TO RESPECTIVE VFD: 4(3-350 MCM, 1 #4/0 G, 3"C)
18. 120V, 60 HZ. CONTROL POWER CIRCUIT TO PANEL "NP" - 2 #12,1 #12 G, 1/2"C

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 - Fax: (910) 692-7342

206.046

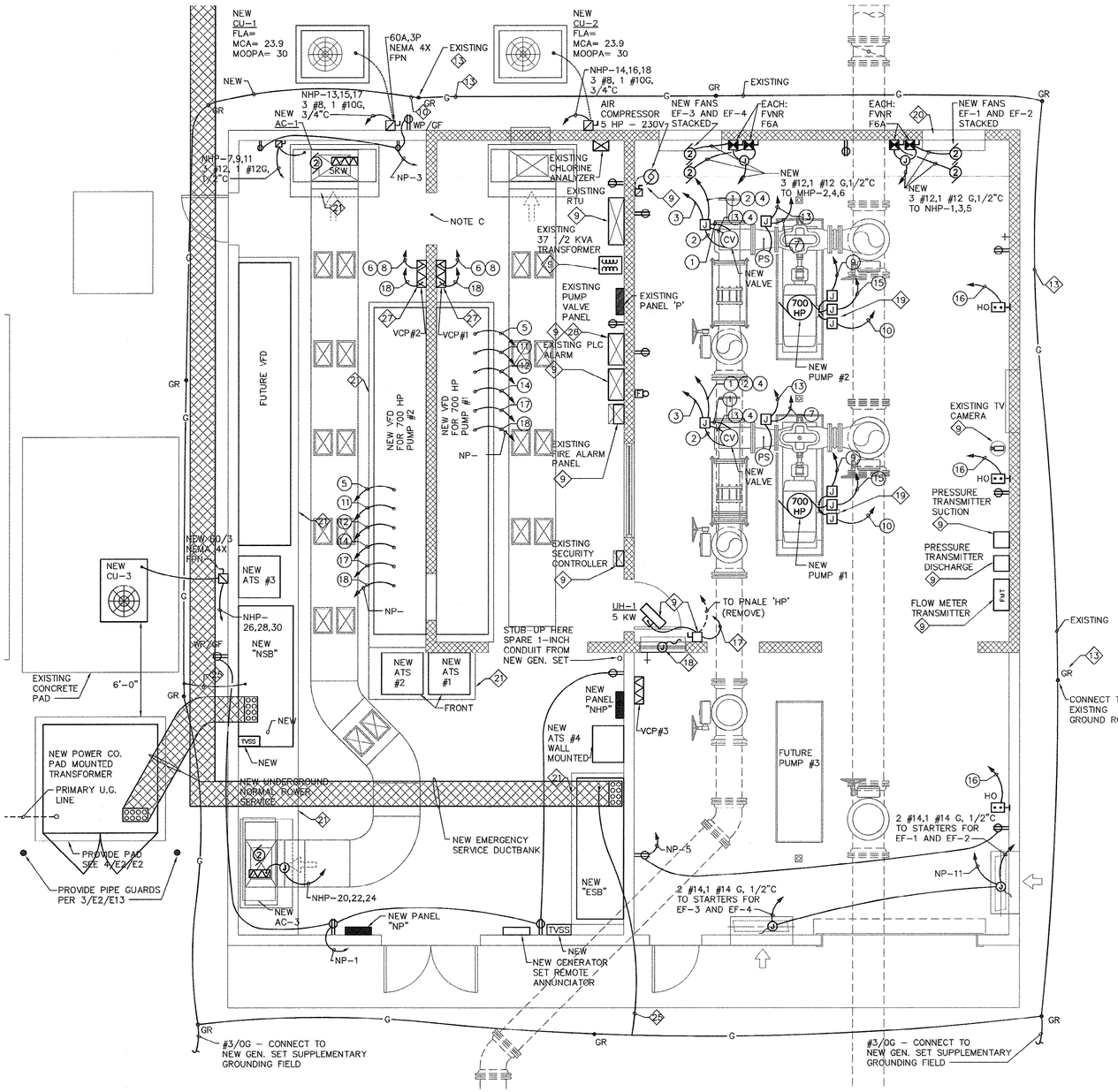
NEW BOOSTER PUMP STATION POWER PLAN PHASE 1 NEW WORK AND PHASE 2 DEMOLITION

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN
SHEET NO.	E-8
OF:	15
VERSION:	4

AS-BUILT 9-5-08

12-250-023/36 W



BOOSTER PUMP STATION POWER PLAN - PHASE 2 NEW WORK

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

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

NOTES:
A. CONNECT NEW VFD'S FROM OVERHEAD FOR BOTH INPUT AND OUTPUT WIRING. REFER TO ONE-LINE POWER DIAGRAM.
B. EXACT LOCATION OF ROUGH-IN POINT FOR VFD'S AND MOTORS SHALL BE ADJUSTED IN ACCORDANCE WITH EQUIPMENT SUBMITTED.
C. CUT NEW OPENING IN EXISTING WALL PRIOR TO INSTALLING NEW EQUIPMENT. PROVIDE DUST BARRIER AT BOTH SIDES OF OPENING TO AVOID DUCT CONTAMINATION OF NEW AND EXISTING EQUIPMENT.

KEYED NOTES:

1. NOT APPLICABLE
2. NOT APPLICABLE
3. NOT APPLICABLE
4. NOT APPLICABLE
5. NOT APPLICABLE
6. NOT APPLICABLE
7. NOT APPLICABLE
8. NOT APPLICABLE
9. EXISTING ITEM - REMAIN.
10. NOT APPLICABLE
11. NOT APPLICABLE
12. NOT APPLICABLE
13. APPROXIMATE LOCATION OF EXISTING SUPPLEMENTARY GROUNDING FIELD.
14. #3/0 G, TO "NSB" AND "ESB".
15. PROVIDE SUITABLE GROUNDING FITTING AND BOND WATERPIPE.
16. NOT APPLICALBE
17. NOT APPLICABLE
18. NOT APPLICABLE
19. PROVIDE MOTOR BOX TERMINAL EXTENSION AS REQUIRED TO ACCOMPLISH MOTOR POWER AND CONTROL CONNECTION.
20. NOT APPLICABLE
21. PROVIDE NEW 4-INCH CONCRETE PAD.
22. EXISTING PRESSURE SWITCH - REPLACE DURING PHASE 2 WITH A SIMILAR ONE WITH DOUE POLE CONTACTS (TWO SETS OF CONTACTS).
23. NOT APPLICABLE
24. NOT APPLICABLE
25. NOT APPLICABLE
26. NOT APPLICABLE
27. NEW PUMP/VALVE CONTROL PANEL.
28. EXISTING PUMP VALVE PANEL SHALL BE REMOVED ONCE THE NEW VALVES AND PUMP VALVE PANELS FOR EXISTING PUMPS #1 AND #2 ARE INSTALLED. REMOVE ALL WIRING RELATED TO THIS PANEL THAT IS NO LONGER NEEDED.

LEGEND OF POWER CONTROL MONITORING WIRING BETWEEN PUMP CHECK VALVE, PUMP/VALVE CONTROL PANEL, RTU AND PUMP VFD

(1) 2 #14, 1 #14G - IN CONDUIT BETWEEN CHECK VALVE EMERGENCY SOLENOID PILOT VALVE AND PUMP CONTROL PANEL "VCP".
(2) 2 #14, 1 #14G - IN CONDUIT BETWEEN CHECK VALVE NORMAL SOLENOID PILOT VALVE AND PUMP CONTROL PANEL "VCP".
(3) 3 #14, 4 #14 SPARE, 1 #14G IN CONDUIT BETWEEN CHECK VALVE ZONE INDICATING SWITCH ("ZIS") AND RTU FOR VALVE POSITION INDICATION.
(4) 4 #14, 1 #14G IN CONDUIT BETWEEN CHECK VALVE ZONE INICATING SWITCH AND "VCP".
(5) 2 #14, 4 #14 SPARE, 1 #14G IN CONDUIT BETWEEN "VCP" AND VFD FOR PUMP MOTOR RUN COMMAND.
(6) 2 #14, 2 #14 SPARE, 1 #14G IN CONDUIT BETWEEN "VCP" AND RTU FOR "COMMON" ALARM (VALVE FAILURE, POWER FAILURE, PUMP FAILURE).
(7) 2 #14, 1 #14G IN CONDUIT BETWEEN PRESSURE SWITCH AT DISCHARGE SIDE OF PUMP AND "VCP".
(8) 2 #14, 2 #14 SPARE, 1 #14G IN CONDUIT BETWEEN RTU AND "VCP" FOR RUN COMMAND FROM RTU.
(9) 2 #14, 6 #14 SPARE, 1 #14G BETWEEN PUMP MOTOR VFD AND MOTOR FOR 120-VOLT MOTOR ENVIRONMENTAL HEATER, IF ANY.
(10) SIX(6) 4-CONDUCTORS #16, SHIELDED CABLES, BELDEN #83704 FROM VFD TO MOTOR FOR HIGH TEMPERATURE AND VIBRATION PROTECTION SYSTEM.
(11) 16 #14, 1 #14G IN 3/4"C BETWEEN EACH VFD AND RTU.
(12) SIX - SC CABLES - 1"C BETWEEN EACH VFD AND RTU.
(13) 2 #14, 1 #14 G BETWEN PRESSURE SWITCH AND RTU FOR REMOTE WATER FLOW SIGNAL.
(14) SPARE 3/4"C WITH PULL CORD.
(15) POWER CIRCUIT FROM 700 PH MOTOR TO RESPECTIVE VFD: 4(3-350 MCM, 1 #4/0 G, 3"C).
(16) 2 #14,1 #14 G FROM "H-O" PUSHBUTTON STATION TO VFD.
(17) POWER CIRCUIT FROM 700 PH MOTOR TO RESPECTIVE VFD: 4(3-350 MCM, 1 #4/0 G, 3"C)
(18) 120V, 60 HZ, CONTROL POWER CIRCUIT TO PANEL "NP" - 2 #12,1 #12 G, 1/2"C

AS-BUILT 9-5-08

12-250-024/36 W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

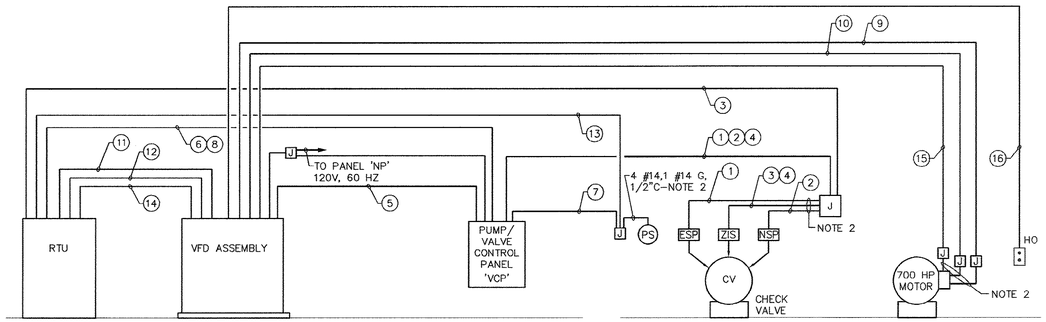
Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 - Fax: (910) 692-7342

206.046

NEW BOOSTER PUMP STATION POWER PLAN PHASE 2 NEW WORK

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

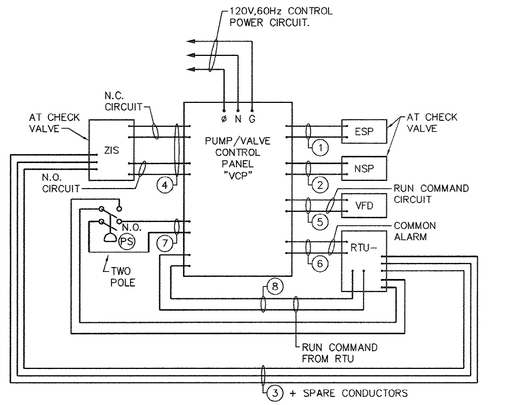
DATE:	9-5-2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN
SHEET NO.	E-9
OF: 15	VERSION: 4



1 E8E10 TYPICAL PUMP WIRING RISER DIAGRAM

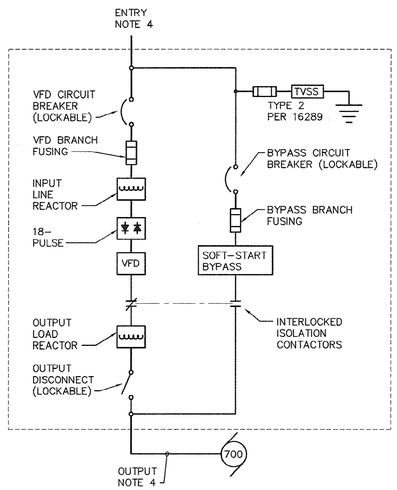
SCALE: NONE

NOTES:
1. WIRING SHALL BE RUN IN 1/2–INCH MINIMUM SIZE CONDUIT, EXCEPT AS OTHERWISE NOTED FOR LARGER CONDUIT.
2. USE LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT FOR FINAL CONNECTION FROM JUNCTION BOX, TO MOTOR OR INSTRUMENT.



2 E8E10 TYPICAL PUMP/VALVE CONTROL PANEL "VCP" WIRING DIAGRAM

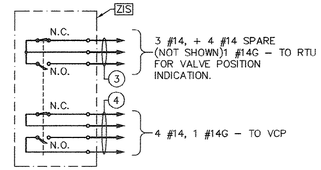
SCALE: NONE



4 E4E10 TYPICAL ONE–LINE POWER DIAGRAM – VFD ASSEMBLY

SCALE: NONE

NOTES:
1. REFER TO SECTION 16161 FOR ADDITIONAL REQUIREMENTS.
2. CONTENTS WITHIN DASHED LINES ARE INSIDE THE SYSTEM ENCLOSURE.
3. TVSS NOT SHOWN BUT WILL BE INCLUDED IN SYSTEM ENCLOSURE (TYPE 2, PTE160 SERICE PER SECTION 16289).
4. PROPOSED WIRING METHOD FOR MOTORS AND VFD IS BASED ON USING OVERHEAD CONDUIT AND TOP ENTRY/EXIT ROUGHIN FOR VFD. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL VFD COORDINATION MODIFICATIONS, AND COSTS REQUIRED TO ACCOMPLISH BOTTOM ENTRY AND/OR EXIT IF SO DESIRED BY CONTRACTOR.



3 E8E10 TYPICAL " ZIS " CONTROL WIRING DIAGRAM

SCALE: NONE

LEGEND OF CONTROL MONITORING WIRING BETWEEN PUMP CHECK VALVE, PUMP CONTROL PANEL, RTU–FPS2 AND PUMP VFD

(1) 2 #14, 1 #14G – IN CONDUIT BETWEEN CHECK VALVE EMERGENCY SOLENOID PILOT VALVE AND PUMP CONTROL PANEL "VCP".

(2) 2 #14, 1 #14G – IN CONDUIT BETWEEN CHECK VALVE NORMAL SOLENOID PILOT VALVE AND PUMP CONTROL PANEL "VCP".

(3) 3 #14, 4 #14 SPARE, 1 #14G IN CONDUIT BETWEEN CHECK VALVE ZONE INDICATING SWITCH ("ZIS") AND RTU FOR VALVE POSITION INDICATION.

(4) 4 #14, 1 #14G IN CONDUIT BETWEEN CHECK VALVE ZONE INICATING SWITCH AND "VCP".

(5) 2 #14, 4 #14 SPARE, 1 #14G IN CONDUIT BETWEEN "VCP" AND VFD FOR PUMP MOTOR RUN COMMAND.

(6) 2 #14, 2 #14 SPARE, 1 #14G IN CONDUIT BETWEEN "VCP" AND RTU FOR "COMMON" ALARM (VALVE FAILURE, POWER FAILURE, PUMP FAILURE).

(7) 2 #14, 1 #14G IN CONDUIT BETWEEN PRESSURE SWITCH AT DISCHARGE SIDE OF PUMP AND "VCP".

(8) 2 #14, 2 #14 SPARE, 1 #14G IN CONDUIT BETWEEN RTU AND "VCP" FOR RUN COMMAND FROM RTU.

(9) 2 #14, 6 #14 SPARE, 1 #14G BETWEEN PUMP MOTOR VFD AND MOTOR FOR 120–VOLT MOTOR ENVIRONMENTAL HEATER, IF ANY.

(10) SIX(6) 4–CONDUCTORS #16, SHIELDED CABLES, BELDEN #83704 FROM VFD TO MOTOR FOR HIGH TEMPERATURE AND VIBRATION PROTECTION SYSTEM.

(11) 16 #14, 1 #14G IN 3/4"C BETWEEN EACH VFD AND RTU.

(12) SIX – SC CABLES – 1"C BETWEEN EACH VFD AND RTU.

(13) 2 #14, 1 #14 G BETWEN PRESSURE SWITCH AND RTU FOR REMOTE WATER FLOW SIGNAL.

(14) SPARE 3/4"C WITH PULL CORD.

(15) POWER CIRCUIT FROM 700 PH MOTOR TO RESPECTIVE VFD: 4(3–350 MCM, 1 #4/0 G, 3"C).

(16) 2 #14,1 #14 G FROM "H–O" PUSHBUTTON STATION TO VFD.

ELECTRICALLY ASSISTED CHECK VALVE SYSTEM COMPONENTS:

(CV) ELECTRICALLY ASSISTED CHECK VALVE WHICH INCLUDES "NSP", "ESP" AND "ZIS" AS DESCRIBED BELOW.

NSP NORMAL SOLENOID PILOT VALVE, 3–WAY TYPE. REQUIRES ENERGIZATION TO OPEN VALVE.

ESP EMERGENCY SOLENOID PILOT VALVE, 2–WAY TYPE. REQUIRES DEENERGIZATION, OR POWER FAILURE TO CLOSE VALVE.

ZIS POSITION INDICATING SWITCH, INCLUDES:
- NO/NC INDICATING CONTACTS FOR REMOTE MONITORING
- NO CONTACT THAT CLOSES TO INDICATE CHECK VALVE IS OPEN
- NC CONTACT THAT OPENS UPON CLOSING VALVE CYCLE WHEN VALVE IS APPROXIMATELY 95% CLOSE AND OPENS THE MOTOR STARTING CIRCUIT.

VCP VALVE PUMP CONTROL PANEL TO BE FURNISHED AS PART OF ELECTRONICALLY ASSISTED CHECK

VFD VALVE. INCLUDES RELAYS, TIMERS, PILOT LIGHT AND SWITCHES IN ADDITION TO:
- HAND–OFF–AUTOMATIC PUMP START SWITCH ('H–O–A').
- VALVE FAILURE CIRCUITS
- POWER FAILURE CIRCUITS
- PUMP FAILURE CIRCUITS

(PS) PRESSURE SWITCH TO PROVIDE PANEL "VCP" WITH INDICATION OF POSITION PRESSURE PRIOR TO OPENING VALVE AND TO SEND SIGNAL TO REMOTE LOCATION VIA SCADA RTU THAT MOTOR IS RUNNING.

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

206.046

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692–5616 – Fax: (910) 692–7342

PUMP CONTROL RISER DIAGRAMS

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

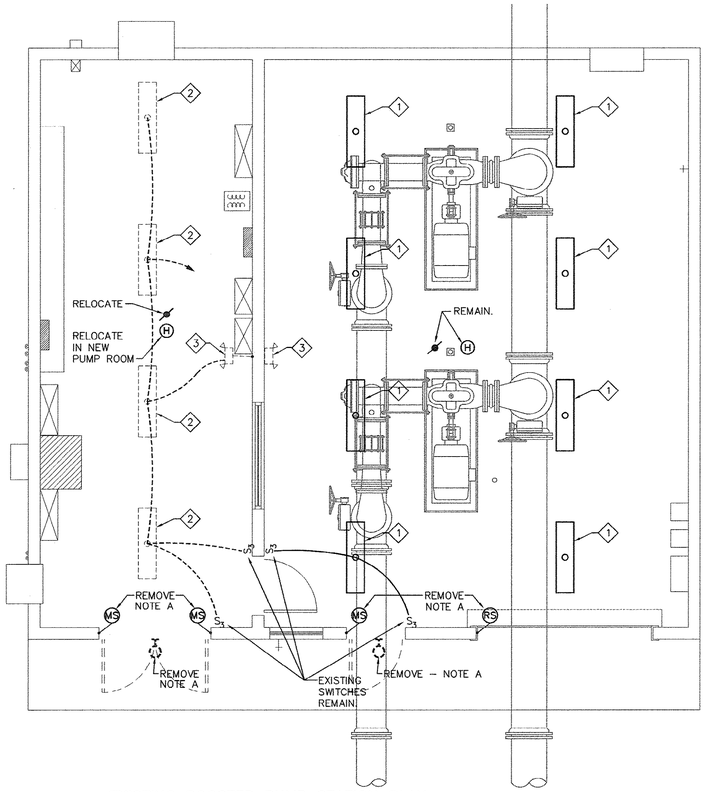
DATE:	9–5–2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN

SHEET NO. E-10

OF: 15 VERSION: 4

AS-BUILT 9-5-08

12-250-025/36 W

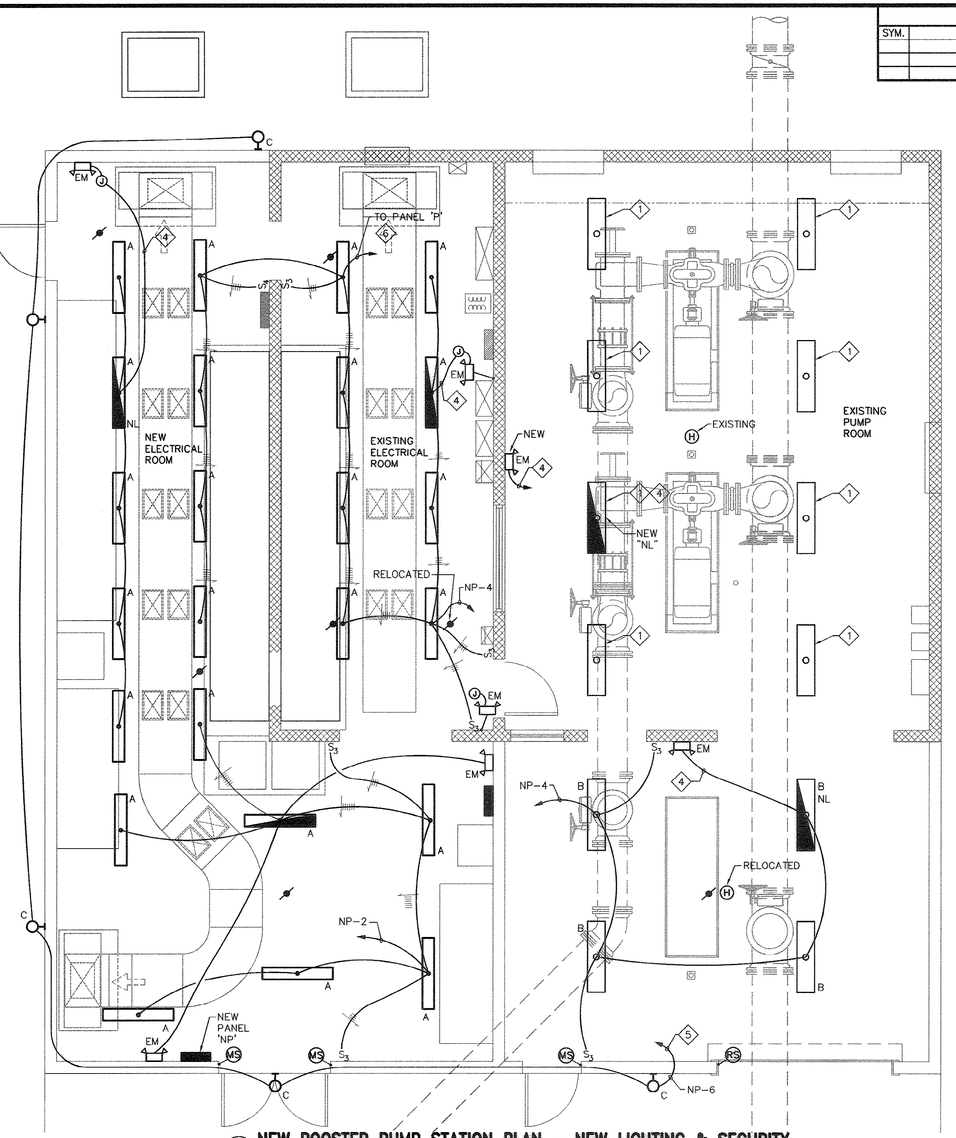


EXISTING BOOSTER PUMP STATION PLAN – EXISTING LIGHTING & SECURITY/DEMOLITION

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

¼" = 1'-0" 2' 0 2' 4' 8'

NOTES:
A. REMOVE WIRING RELATED TO ITEMS BEING REMOVED.



NEW BOOSTER PUMP STATION PLAN – NEW LIGHTING & SECURITY

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

¼" = 1'-0" 2' 0 2' 4' 8'

NOTES:
1. ALL LIGHITNG FIXTURES ARE NEW EXCEPT AS OTHERWISE NOTED.

KEYED NOTES:

1. EXISTING FLUORESCENT FIXTURES – REMAIN.
2. EXISTING FLUORESCENT FIXTURES. REMOVE ALONG WITH RELATED WIRING
3. EXISTING EMERGENCY BATTERY LIGHT REMOVE ALONG WITH RELATED WIRING.
4. CONNECT NEW EMERGENCY BATTERY LIGHTS, AND FLUORESCENT NIGHT LIGHTS)"NL" TO LIGHTING CIRCUIT IN SAME ROOM AHEAD OF ANY SWITCH.
5. EXISTING OUTDOOR LIGHTING FIXTURES SHALL REMAIN. NEW OUTDOOR LIGHT FIXTURE SHALL MATCH EXISTING AS CLOSE TO POSSIBLE. CONNECT NEW FIXTURES TO SAME 120V CIRCUIT AS EXISTING ONES.
6. CONNECT NEW FLUORESCENT LIGHT FIXTURES WITH 2 #12, 1 #12G, 1/2"C TO PANEL 'P'. PROVIDE NEW 120V, 20A CIRCUIT BREAKER.

AS-BUILT 9-5-08

12-250-026/36 WJ

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 – Fax: (910) 692-7342

206.046

LIGHTING AND SECURITY PLANS

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN

SHEET NO. E-11

OF: 15 VERSION: 4

LOAD (KVA) A	LOAD (KVA) B	LOAD (KVA) C	DESCRIPTION	WIRE SIZE	BRKR RAT'G	CKT. NO.	CKT. NO.	BRKR RAT'G	WIRE SIZE	DESCRIPTION	LOAD (KVA) A	LOAD (KVA) B	LOAD (KVA) C
1.8			NEW FANS EF-1 & EF-2	12	20/3	1	2	20/3	12	NEW FANS EF-3 & EF-4	1.8		
	1.8		@ 2 HP	12	.	3	4	.	12	.		1.8	
		1.8	.	12	.	5	6	.	12	.			1.8
2.5			NEW AC-1	12	15/3	7	8	15/3	12	NEW AC-2	2.6		
	2.6		.	12	.	9	10	.	12	.		2.5	
		2.6	.	12		11	12		12	.			2.6
5.5			NEW CU-1	8	40/3	13	14	40/3	8	NEW CU-2	5.5		
	5.5		.	8	.	15	16	.	8	.		5.5	
		5.5	.	8		17	18		8	.			5.5
10.0			PANEL P	3	100/2	19	20	15/3	12	NEW AC-3	2.6		
	10.0		VIA 37 1/3 KVA	3	.	21	22	.	12	.		2.6	
		0.0	SPARE	.	40/3	23	24	.	12	.			2.6
0.0			.	.	.	25	26	40/3	8	NEW CU-3	5.5		
	0.0		.	.	.	27	28	.	8	.		5.5	
		0.0	SPARE	.	15/3	29	30		8	.			5.5
0.0			.	.	.	31	32	50/3	.	SPARE	0.0		
	0.0		.	.	.	33	34	.	.	.		0.0	
		9.8	PANEL GP VIA 25 KVA	4	70/2	35	36	.	.	.			0.0
10.3			.	4	.	37	38	60/3	.	SPARE	0.0		
	0.0		S.O.	.	.	39	40	.	.	.		0.0	
		0.0	S.O.	.	.	41	42	.	.	.			0.0

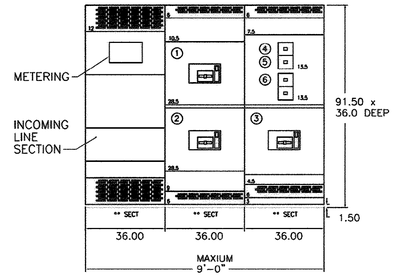
TYPE: BRANCH CIRCUIT
MOUNTING: SURFACE
SUPPLY: 480V, 3-PH, 3W
MAINS: 400 AMP MAIN CIRCUIT BREAKER
SCIR: 65,000 AMPERES
NOTES:
1. WITH EQUIPMENT GROUND BUS.

GROSS PHASE TOTALS
A= 48.1 KVA
B= 37.8 KVA
C= 37.7 KVA

CONNECTED LOAD CURRENT: 149 AMPERES

LIGHTING	0.4 KVA
HEATING	27.5 KVA
A/C MOTORS & HEAT PUMPS	57.3 KVA
AIR HANDLING & EXH FANS	17.5 KVA
RECEPTACLES	0.4 KVA
ELECTRIC WATER HEATING	0.0 KVA
ELEVATORS	0.0 KVA
FOOD PROCESSING	0.0 KVA
PROCESS	0.0 KVA
MISCELLANEOUS	20.6 KVA
TOTAL CONNECTED LOAD	123.7 KVA

PANEL NHP



2 E12E13 SWITCHBOARD "NSB" ELEVATION

SCALE: NONE

NOTES:
1. SWITCHBOARD "ESB" ELEVATION IS SIMILAR TO SWITCHBOARD "NSB".

SWITCHBOARD ESB

SERVICE: 480/277V, 3-PH, 4W
BUSES: 3000 AMPERES
TYPE: FRONT ACCESSIBLE ONLY
S.C. RATING: 42,000 AMPERES

NOTES:
1. SUITABLE FOR SERVICE ENTRANCE.
2. WITH EQUIPMENT GROUND BUS.
3. REFER TO SECTION 16440 AND ONE-LINE POWER DIAGRAM FOR MORE REQUIREMENTS.
4. CIRCUIT BREAKER FOR TVSS IS NOT A POWER DISCONNECT IN ACCORDANCE WITH NEC 230-71.

CONNECTED LOAD (KVA)	
LIGHTING	0.4
HEATING	27.5
A/C & HEAT PUMPS	57.3
AIR HANDLING	17.5
RECEPTACLES	0.4
WATER HEATING	0.0
ELEVATORS	0.0
FOOD PROCESSING	0.0
PROCESS	1398.0
MISCELLANEOUS	20.6
TOTAL (KVA)	1521.7
CONNECTED LOAD: 1830 AMPERES	

UNIT	LOAD SERVED	PROTECTION POLE	PROTECTION FRAME	PROTECTION TRIP	WIRE & CONDUIT	REMARKS	LOAD (KVA) PER PHASE A	B	C
.	MAIN LUGS ONLY	.	-	-	SEE POWER DIAGRAM	ENTRY SECTION	0.0	0.0	0.0
1	PUMP #1	3	1600	1600	SEE POWER DIAGRAM	L,S,I,G,AM	233.0	233.0	233.0
2	PUMP #2	3	1600	1600	SEE POWER DIAGRAM	L,S,I,G,AM	233.0	233.0	233.0
3	PUMP #3 (NON-CONCURRENT)	3	1600	1600	SEE POWER DIAGRAM	L,S,I,G,AM	0.0	0.0	0.0
4	ATS-3/NHP	3	400	400	SEE POWER DIAGRAM	.	48.1	37.8	37.7
5	SPARE	3	400	400	.	.	0.0	0.0	0.0
6	SPARE	3	400	400	.	.	0.0	0.0	0.0
.	TVSS	3	100	60	SEE POWER DIAGRAM	NOTE 4	0.0	0.0	0.0
.	.	.	.	.	.	.	0.0	0.0	0.0

SWITCHBOARD NSB

SERVICE: 480/277V, 3-PH, 4W
BUSES: 3000 AMPERES
TYPE: FRONT ACCESSIBLE ONLY
S.C. RATING: 65,000 AMPERES

NOTES:
1. SUITABLE FOR SERVICE ENTRANCE.
2. WITH EQUIPMENT GROUND BUS.
3. REFER TO SECTION 16440 AND ONE-LINE POWER DIAGRAM FOR MORE REQUIREMENTS.
4. CIRCUIT BREAKER FOR TVSS IS NOT A POWER DISCONNECT IN ACCORDANCE WITH NEC 230-71.

CONNECTED LOAD (KVA)	
LIGHTING	0.4
HEATING	27.5
A/C & HEAT PUMPS	57.3
AIR HANDLING	17.5
RECEPTACLES	0.4
WATER HEATING	0.0
ELEVATORS	0.0
FOOD PROCESSING	0.0
PROCESS	1398.0
MISCELLANEOUS	20.6
TOTAL (KVA)	1521.7
CONNECTED LOAD: 1830 AMPERES	

UNIT	LOAD SERVED	PROTECTION POLE	PROTECTION FRAME	PROTECTION TRIP	WIRE & CONDUIT	REMARKS	LOAD (KVA) PER PHASE A	B	C
.	MAIN LUGS ONLY	.	.	.	SEE POWER DIAGRAM	ENTRY SECTION	514.1	503.8	503.7
1	PUMP #1	3	1600	1600	SEE POWER DIAGRAM	L,S,I,G,AM	233.0	233.0	233.0
2	PUMP #2	3	1600	1600	SEE POWER DIAGRAM	L,S,I,G,AM	233.0	233.0	233.0
3	PUMP #3 (NON-CONCURRENT)	3	1600	1600	SEE POWER DIAGRAM	L,S,I,G,AM	0.0	0.0	0.0
4	ATS-3/ NHP	3	400	400	SEE POWER DIAGRAM	.	48.1	37.8	37.7
5	SPARE	3	400	400	.	.	0.0	0.0	0.0
6	SPARE	3	400	400	.	.	0.0	0.0	0.0
.	TVSS	3	100	60	SEE POWER DIAGRAM	NOTE 4	0.0	0.0	0.0
.	.	.	.	.	.	.	0.0	0.0	0.0

LOAD (KVA) PH1	LOAD (KVA) PH2	DESCRIPTION	WIRE SIZE	BRKR RAT'G	CKT. NO.	CKT. NO.	BRKR RAT'G	WIRE SIZE	DESCRIPTION	LOAD (KVA) PH1	LOAD (KVA) PH2
0.8		RECEPTACLES	12	20/1	1	2	20/1	12	INDOOR LTG.	1.0	
	0.8	RECEPTACLES	12	20/1	3	4	20/1	12	INDOOR LTG.		0.7
0.8		RECEPTACLES	12	20/1	5	6	20/1	12	OUTDOOR LTG.	0.8	
	0.5	VFD #3 CONTROLS	12	20/1	7	8	20/1	.	SPARE		0.0
0.5		VFD #2 CONTROLS	12	20/1	9	10	20/1	.	SPARE	0.0	
	0.5	VFD #1 CONTROLS	12	20/1	11	12	20/1	.	SPARE		0.0
0.0		SPARE	.	20/1	13	14	20/1	.	SPARE	0.0	
	0.0	SPARE	.	20/1	15	16	20/1	.	SPARE		0.0
0.0		SPARE	.	20/1	17	18	20/1	.	SPARE	0.0	
	0.0	SPARE	.	.	19	20	20/1	.	SPARE		0.0
0.0		SPARE	.	.	21	22	20/1	.	SPARE	0.0	
	0.0	SPARE	.	.	23	24	20/1	.	SPARE		0.0
0.0		.	.	.	25	26	.	.	.	0.0	
	0.0	.	.	.	27	28	.	.	.		0.0
0.0		.	.	.	29	30	.	.	.	0.0	
	0.0	.	.	.	31	32	.	.	.		0.0
0.0		.	.	.	33	34	.	.	.	0.0	
	0.0	.	.	.	35	36	.	.	.		0.0
0.0		.	.	.	37	38	.	.	.	0.0	
	0.0	.	.	.	39	40	.	.	.		0.0
0.0		.	.	.	41	42	.	.	.	0.0	

TYPE: BRANCH CIRCUIT
MOUNTING: SURFACE
SUPPLY: 240/120V, 1-PH, 3W
MAINS: 100A M.C.B.
SCIR: 10,000 A
NOTES:
1. WITH EQUIPMENT GROUNDING BUS.

GROSS PHASE TOTALS
PH1= 3.9 KVA
PH2= 2.5 KVA

CONNECTED LOAD: 27 AMPERES

LIGHTING	2.5 KVA
HEATING	0.0 KVA
A/C MOTORS & HEAT PUMPS	0.0 KVA
AIR HANDLING & EXH FANS	0.0 KVA
RECEPTACLES	2.4 KVA
ELECTRIC WATER HEATING	0.0 KVA
ELEVATORS	0.0 KVA
FOOD PROCESSING	0.0 KVA
PROCESS	0.0 KVA
MISCELLANEOUS	1.5 KVA
TOTAL CONNECTED LOAD	6.4 KVA

PANELS NP

REVISIONS SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 - Fax: (910) 692-7342

206.046

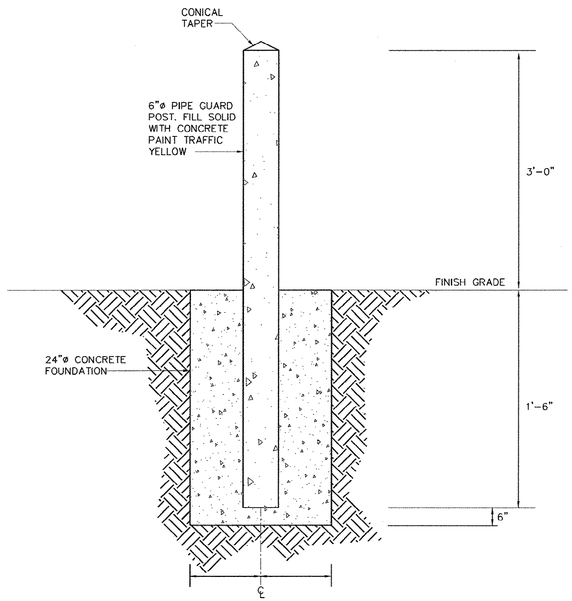
SCHEDULES AND ELEVATION

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE: 9-5-2008
DESIGNED: DL
DRAWN: SMI
CHECKED: DL
SCALE: AS SHOWN
SHEET NO. E-12
OF: 15 VERSION: 4

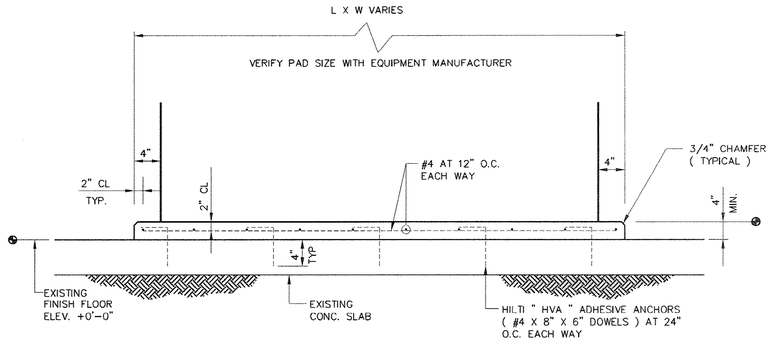
AS-BUILT 9-5-08

12-250-0270/36 W



3 E2.13 PIPE GUARD POST

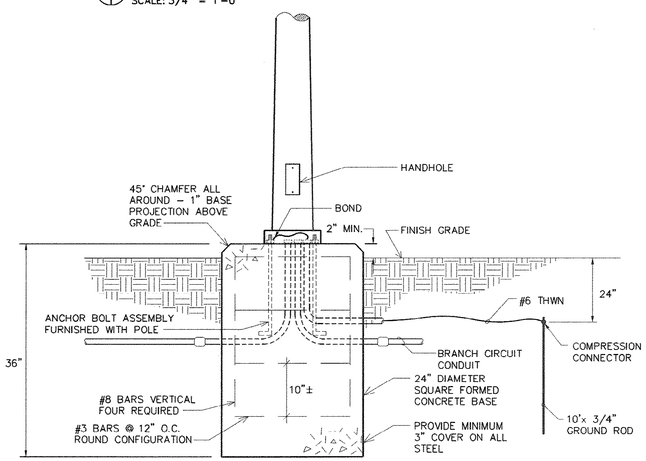
SCALE: NONE

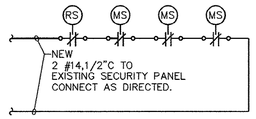


COORDINATE SIZE, LOCATION , AND NUMBER OF INTERIOR CONCRETE EQUIPMENT PADS WITH EQUIPMENT BEING SUBMITTED.

2 E2.13 EQUIPMENT PAD AT EXISTING SLAB

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





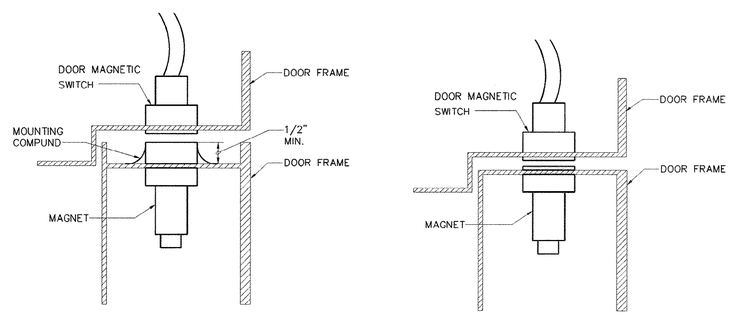
5 E.E13 NEW PUMP STATION EXTERIOR DOORS MONITORING WIRING DIAGRAM

NOT TO SCALE

NOTES:
1. COORDINATE WITH SECURITY SYSTEM PROVIDER PRIOR TO RUNNING ANY WIRING.
2. REFER TO SHEET E-15 FOR NEW GENERATOR SET HOUSING ACCESS DOORS MONITORING.

4 E2.13 BASE DETAIL – FIXTURE TYPES 'SB'

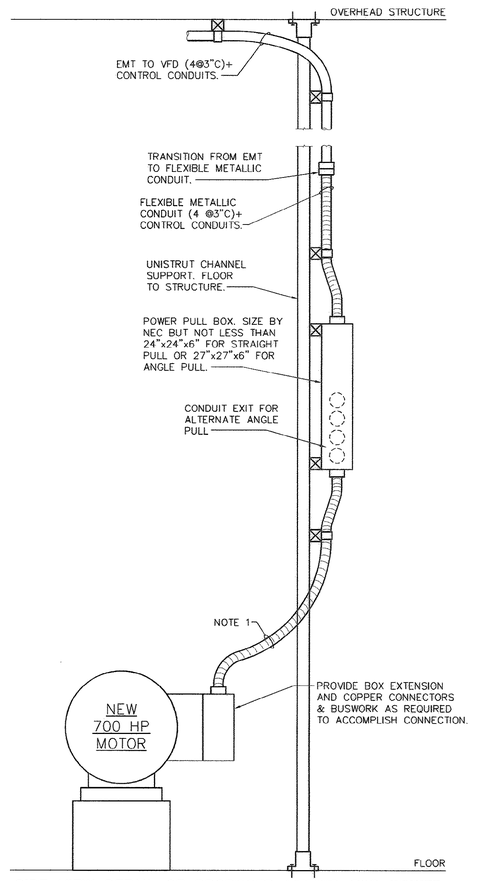
NOT TO SCALE



6 E.E13 TYPICAL "MS" MOUNTING

NOT TO SCALE

NOTES:
1. USE SWITCHES FROM SENTROL, WIDE GAP TYPE, OR APPROVED EQUAL.



1 E8.13 SIDE VIEW DETAIL OF PROPOSED METHID FOR POWER CONNECTION TO NEW PUMP MOTORS

SCALE: NONE

NOTES:
1. FINAL CONNECTION TO MOTOR SHALL BE LIQUID TIGHT FLEXIBLE METALLIC TYPE BONDED PER NEC.
2. CONTROL, SAFETY AND POWER CONDUCTORS SHALL NOT BE INSTALLED IN SAME CONDUIT OR BOX.
3. EXACT LOCATION OF PULL BOXES SHALL BE COORDINATED WITH PUMP MOTOR INSTALLER AND OWNER TO MAKE SURE THAT ACCESS TO PUMP & MOTOR IS NOT HINDERED.
4. REFER TO 4/E8.13/E10 FOR REQUIRED CONTROL AND MONITORING CONDUITS NOT SHOWN HERE.

AS-BUILT 9-5-08

12-250-028/36 W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 - Fax: (910) 692-7342

206.046

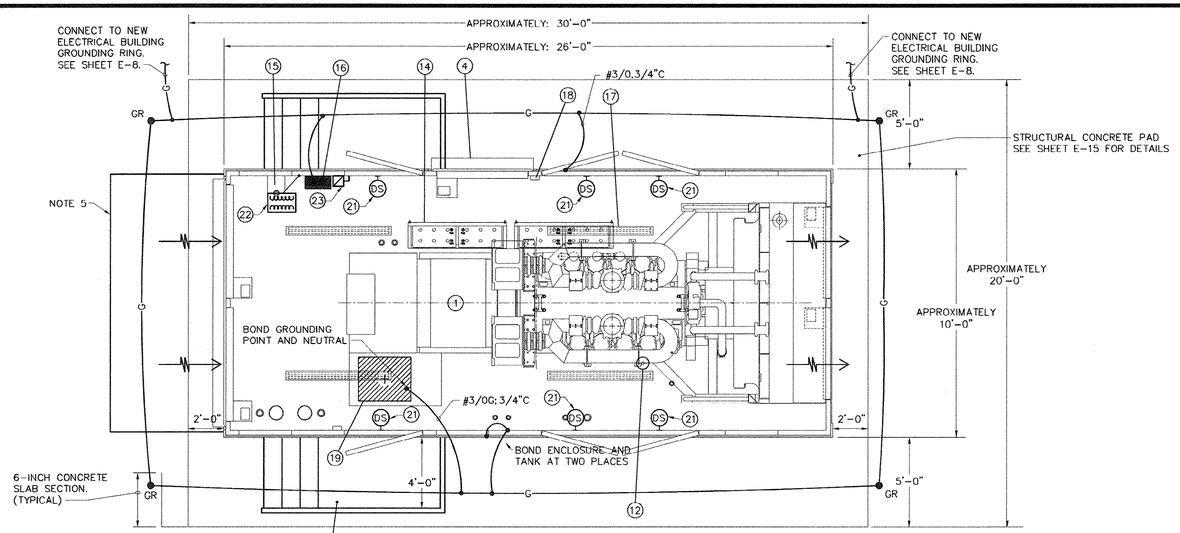
MISCELLANEOUS DETAILS

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN

SHEET NO. E-13

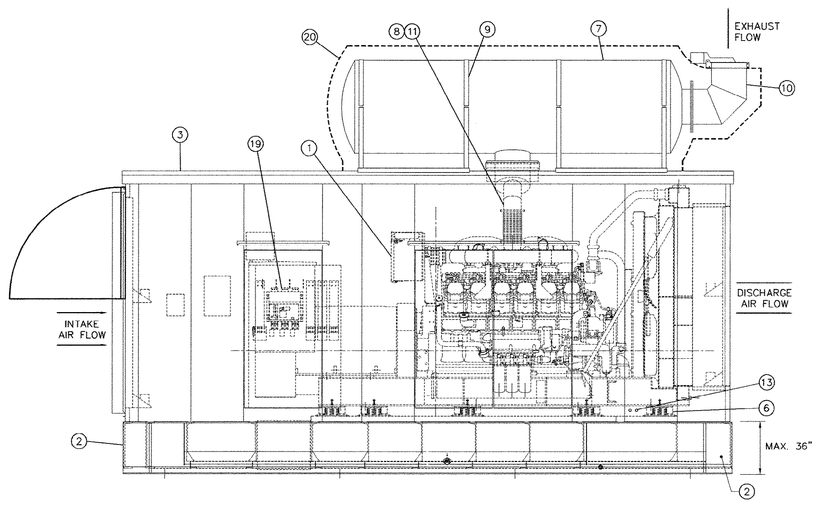
OF: 15 VERSION: 4



ENGINE GENERATOR SET – PLAN VIEW

NOT TO SCALE

COMP	QTY	DESCRIPTION
1	1	1500 KW PRIME RATED DIESEL ENGINE GENERATOR SET.
2	1	PROVIDE UL LABELED "IN-BASE" FUEL TANK WITH CAPACITY FOR 4000-GALLON RATED FUEL TANK. PROVIDE 10% CAPACITY SECONDARY CONTAINMENT TANK, LOW FUEL LEVEL ALARM SWITCHES, SECONDARY CONTAINMENT ALARM SWITCHES AND SIX-POINT LIFT PROVISIONS
3	1	ALUMINUM ENCLOSURE – WITH (2) 36W X 72H AND (2) 72W X 72H ACCESS DOORS AND STAINLESS STEEL DOOR HANDLES AND HINGES (APPROXIMATE DIMENSIONS)
4	3	MOTORIZED AIR INTAKE LOUVER WITH STAINLESS STEEL WIRE MESH BIRDSCREEN
5	2	MOTORIZED RADIATOR DISCHARGE LOUVER
6	10	VIBRATION SPRING ISOLATORS
7	1	EXHAUST SILENCER – CRITICAL GRADE
8	1	WYE TYPE EXHAUST FLEXIBLE CONNECTION WITH RAINSKIRT
9	4	SILENCER MOUNTING BRACKET
10	1	90 DEGREE EXHAUST ELBOW WITH RAINCAP
11	1	THERMAL INSULATION BLANKET GROUP FOR FLEX CONNECTION, MANIFOLDS AND TURBOCHARGER
12	1	FUEL/WATER SEPARATOR
13	1	OIL, WATER AND FUMES DISPOSAL LINES
14	1	BATTERIES, RACKS, CABLES AND 120VAC, 75 WATT HEATER PADS WITH THERMOSTAT
15	1	BATTERY CHARGER – 24VDC, 10 AMP
16	1	WALL MOUNTED PANELBOARD 'GP' AS SCHEDULED ON SHEET E-8.
17	4	INTERIOR FLOURESCENT LIGHT WITH (2) 3-WAY WALL SWITCHES
18	2	DUPLEX RECEPTACLE – 120VAC, 20 AMP, GFI PROECTED
19	1	CIRCUIT BREAKER – 3000 AMP, 3-POLE WITH 24VDC SHUNT TRIP AND GROUND FAULT ALARM.
20	1	INSULATION, AS SPECIFIED, FOR SILENCER AND RELATED PIPING WITH ALUMINUM SHEATHING/WEATHER PROTECTING JACKET
21	1	PROVIDE DOOR MINITORING SWITCHES WITH N.C. CONTACTS.
22	1	480-240/120V, 1-PHASE DRY TYPE TRANSFORMER – 25KVA
23	1	100A, 2P FUSED SWITCH SUITABLE FOR SERVICE ENTRANCE.



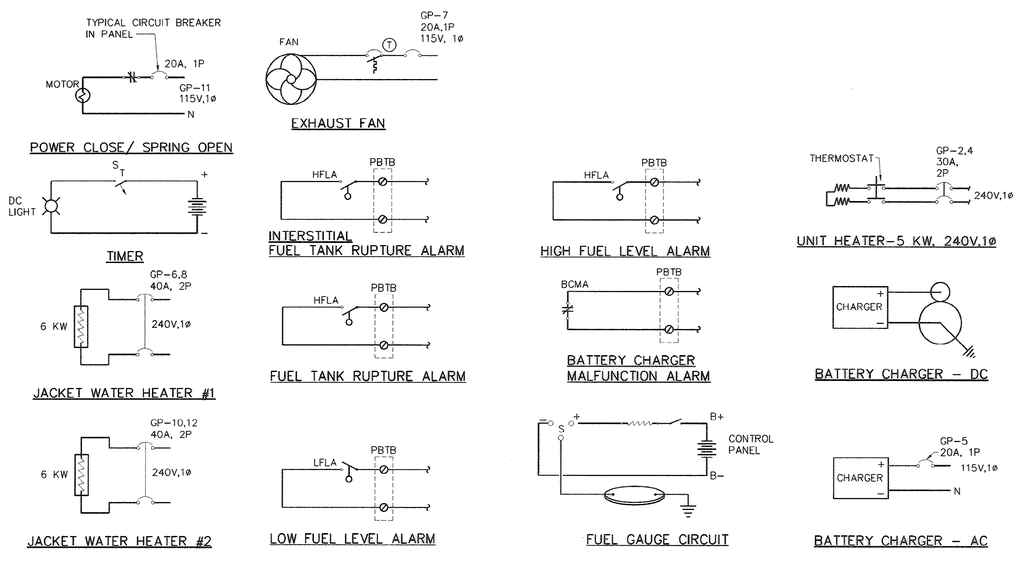
ENGINE GENERATOR SET – RIGHT SIDE VIEW

NOT TO SCALE

NEW GENERATOR SET PREFRABRICATED WALK-IN WEATHERPROOF HOUSING PLAN

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

NOTES:
1. PROVIDE ALL THE NECESSARY GRADING AND EARTH BACKFILLING TO ACCOMPLISH PAD ELEVATIONS INDICATED.
2. EXACT DIMENSIONS SHALL BE ADJUSTED TO FIT ENGINE GENERATOR SET AND EQUIPMENT SUBMITTAL.
3. HOUSING OUTLETS AND HOUSING EQUIPMENT SHALL BE FACTORY PROVIDED WITH EQUIPMENT, CONDUIT, MATERIALS AND METHODS CONFORMING TO THE CONTRACT SPECIFICATIONS. REFER TO SECTION 16610 FOR SPECIFIC REQUIREMENTS RELATED TO SWITCHBOARD AND GENERATOR SET.
4. ALL ELECTRICAL COMPONENTS SHALL BE U.L. LISTED.
5. PROVIDE WEATHER PROTECTIVE HOODS OVER AIR INTAKE LOUVERS TO PREVENT RAIN FROM COMING INTO ENCLOSURE UNDER STORMY CONDITIONS.



GENERATOR SET ENCLOSURE – ACCESSORY WIRING – CONNECT ALL LINE VOLTAGE WIRE TO PANEL

NOT TO SCALE

NOTE:
1. TANK INSTALLER MUST OBTAIN SEPARATE TANK PERMIT TO SATISFY EPA AND STATE EMVIRONMENTAL PROTECTION REGULATIONS.
2. ALARMS SHOWN HERE SHALL BE TRANSMITTED TO RTU VIA MODBUS NETWORK CONNECTION AS SPECIFIED ON SECTION 16610 . IN ADDITION PROVIDE REMOTE ALARM ANNUNCIATOR IN ELECTRICAL BUILDING.
3. PROVIDE ADDITIONAL CIRCUITS AS REQUIRED TO WIRE ALL ELECTRICAL ITEMS IN THE ENCLOSURE.
4. PROVIDE ADDITIONAL ALARMS AND CONTROLS TO SATISFY IBC2003.

AS-BUILT 9-5-08

12-250-029/36 W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 – Fax: (910) 692-7342

206.046

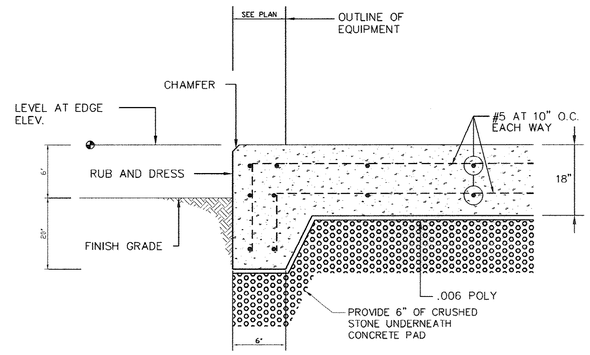
ENGINE GENERATOR SET PLAN AND DETAILS

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN

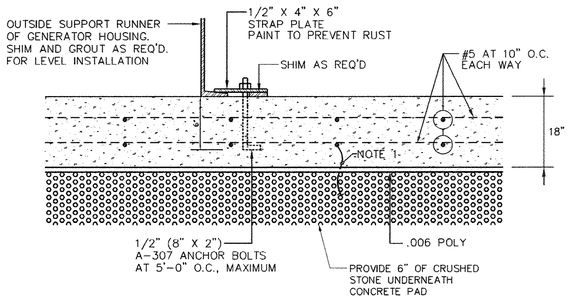
SHEET NO. E-14

OF: 15 VERSION: 4



STRUCTURAL CONCRETE EQUIPMENT PAD

NOT TO SCALE



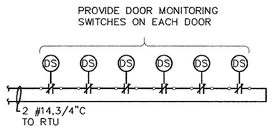
ANCHOR DETAIL

NOT TO SCALE

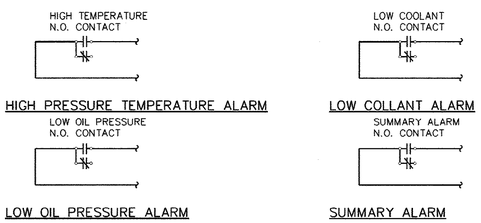
NOTES:
1. CONNECT GROUNDING ELECTRODE TO REBAR UTILIZING A UL LISTED MECHANICAL CONNECTOR.

CONSTRUCTION NOTES FOR GENERATOR SET CONCRETE PAD SITEWORK

1. CLEAR AND GRUB VEGETATION AND OTHER ORGANIC MATTER IN AREA FOR SITE WORK. STRIP TOPSOIL FOR ENTIRE DEPTH AND STOCK PILE FOR RESPREADING AT COMPLETION OF THIS PROJECT.
2. THE CONTRACTOR SHALL EMPLOY A TESTING LABORATORY TO CONFIRM AND TO CERTIFY THE SOIL AND CONCRETE REQUIREMENTS AS INDICATED ON THE DRAWINGS AND IN THE PROJECT SPECIFICATIONS.
3. FILLS AND BACKFILLS SHALL BE COMPACTED AS FOLLOWS:
   A. TOP 12 INCHES = 100 PERCENT PER ASTM D698
   B. ALL OTHERS = 95 PERCENT PER ASTM D698
4. FILL MATERIALS SHALL BE SELECT; FREE OF ANY ORGANIC MATTER, DEBRIS, HARD LUMPS, AND ROCK PARTICLES LARGER THAN 2 INCHES. MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT SHALL BE 100 POUNDS PER CUBIC FOOT AS DETERMINED BY ASTM D698. PLASTICITY INDEX (P.I.) SHALL NOT EXCEED 15.
5. SOIL BEARING PRESSURE USED IN FOUNDATION DESIGN IS 3000 PSF. HAVE SOILS ENGINEER CONFIRM AND CERTIFY BEARING CONDITIONS.
6. ELEVATIONS SHALL BE THE EDGE OF EXTERIOR CONCRETE PAD.
7. ALL DISTURBED LAWN AREAS SHALL BE SEEDED AND GRASSED.
8. ALL CONCRETE WORK SHALL COMPLY WITH ACI 318.
9. CAST-IN-PLACE CONCRETE SHALL BE 4000 PSI, AIR ENTRAINED.
10. REINFORCING STEEL SHALL BE AS FOLLOWS:
    A. REINFORCING BARS: DEFORMED BARS HAVING A MINIMUM YIELD STRENGTH OF 60 KSI (ASTM A615, GRADE 60).
11. CONCRETE COVER FOR REINFORCING SHALL BE AS FOLLOWS:
    A. UNFORMED CONCRETE IN CONTACT WITH THE EARTH = 3 INCHES.
12. CURE CONCRETE FOR A MINIMUM OF SEVEN (7) DAYS WITH LIQUID CURING COMPOUND CONFORMING TO ASTM C-309. ALLOW FOURTEEN (14) DAYS MINIMUM CURING TIME PRIOR TO SETTING GENERATORS.
13. GROUT SHALL BE PRE-MIXED, NON-METALLIC GROUT HAVING A MINIMUM COMPRESSIVE STRENGTH OF 7000 PSI AT 28 DAYS.
14. THE CONTRACTOR SHALL PERFORM A THOROUGH FIELD INSPECTION OF THE EXISTING CONDITIONS PRIOR TO BIDDING THE WORK. THE CONTRACTOR SHALL NOTE AND INCLUDE IN HIS BID ANY EXTRA WORK ITEMS NEEDED TO COMPLETE THIS PROJECT.
15. FIELD VERIFY ALL EXISTING CONDITIONS, ELEVATIONS, AND DIMENSIONS. REPORT FINDINGS AND ANY DISCREPANCIES TO THE ENGINEER FOR EVALUATION PRIOR TO BEGINNING WORK.
16. ALL NEW MATERIALS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR INSTRUCTIONS, AND STANDARD INDUSTRY PRACTICES.
17. CONTRACTOR SHALL ERECT AND MAINTAIN ALL SIGNS, BARRICADES, AND OTHER WARNING DEVICES REQUIRED TO SAFELY PREFORM THE WORK.
18. VERIFY CONCRETE PAD SIZE WITH THE GENERATOR SET SUPPLIER PRIOR TO COMMENCING WORK. DIMENSIONS SHOWN HERE ARE ONLY APPROXIMATE.
19. VERIFY EXACT LOCATION OF PAD WITH OWNER PRIOR TO STARTING.
20. VERIFY SPACING AND LOCATION OF ANCHOR BOLTS WITH THE GENERATOR SUPPLIER AND APPROVED SHOP DRAWINGS.
21. STEEL PLATES AND SHIMS SHALL BE A-36 - HOT DIP GALVANIZED.
22. PROVIDE ALL OF THE NECESSARY EARTH MOVING TO PREPARE SITE FOR GENERATOR PAD.



DOOR MONITORING ALARM



GENERATOR SET ALARMS WIRING DIAGRAMS

NOT TO SCALE

LOAD (KVA) PH1	LOAD (KVA) PH2		DESCRIPTION	WIRE SIZE	BRKR RAT'G	CKT. NO.		CKT. NO.	BRKR RAT'G	WIRE SIZE	DESCRIPTION	LOAD (KVA) PH1	LOAD (KVA) PH2	
0.4			LIGHTING	12	20/1	1		2	30/2	10	UNIT HEATER, 3KW	2.5		
	0.4		RECEPTACLES	12	20/1	3		4		10			2.5	
0.4			BATTERY CHARGER	12	20/1	5		6	40/2	8	JACKET WATER NTR. #1	3.0		
	1.2		FAN	12	20/1	7		8		8	(6 KW)		3.0	
0.5			GEN. HEATER (IF NEEDED)	12	20/1	9		10	40/2	8	JACKET WATER NTR. #2	3.0		
	0.2		DAMPER CONTROLS	12	20/1	11		12	.	8	(6 KW)		3.0	
0.0			SPARE	.	20/1	13		14	15/3	.	SPARE	0.0		
	0.0		SPARE	.	20/1	15		16	.	.	.		0.0	
0.0			SPARE	.	20/1	17		18	.	.	.	0.0		
	0.0		S.O.	.	.	19		20	.	.	S.O.		0.0	
0.0			S.O.	.	.	21		22	.	.	S.O.	0.0		
	0.0		S.O.	.	.	23		24	.	.	S.O.		0.0	
0.0			.	.	.	25		26	.	.	.	0.0		
	0.0		.	.	.	27		28	.	.	.		0.0	
0.0			.	.	.	29		30	.	.	.	0.0		
	0.0		.	.	.	31		32	.	.	.		0.0	
0.0			.	.	.	33		34	.	.	.	0.0		
	0.0		.	.	.	35		36	.	.	.		0.0	
0.0			.	.	.	37		38	.	.	.	0.0		
	0.0		.	.	.	39		40	.	.	.		0.0	
0.0			.	.	.	41		42	.	.	.	0.0		

TYPE: BRANCH CIRCUIT
MOUNTING: SURFACE
SUPPLY: 240/120V, 1-PH, 3W
MAINS: 150A M.C.B.
SCIR: 10,000 A
NOTES:
1. SUITABLE FOR SERVICE ENTRANCE.
2. TO BE PROVIDED AS PART OF GENERATOR SET ENCLOSURE IN CONFORMANCE WITH SECTION 16470.

GROSS PHASE TOTALS
PH1= 9.8 KVA
PH2= 10.3 KVA

PANELS GP

CONNECTED LOAD: 84 AMPERES

LIGHTING	0.4 KVA
HEATING	17.5 KVA
A/C MOTORS & HEAT PUMPS	0.0 KVA
AIR HANDLING & EXH FANS	1.2 KVA
RECEPTACLES	0.4 KVA
ELECTRIC WATER HEATING	0.0 KVA
ELEVATORS	0.0 KVA
FOOD PROCESSING	0.0 KVA
PROCESS	0.0 KVA
MISCELLANEOUS	0.6 KVA
TOTAL CONNECTED LOAD	20.1 KVA

AS-BUILT 9-5-08

12-250-030/36 W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 - Fax: (910) 692-7342

206.046

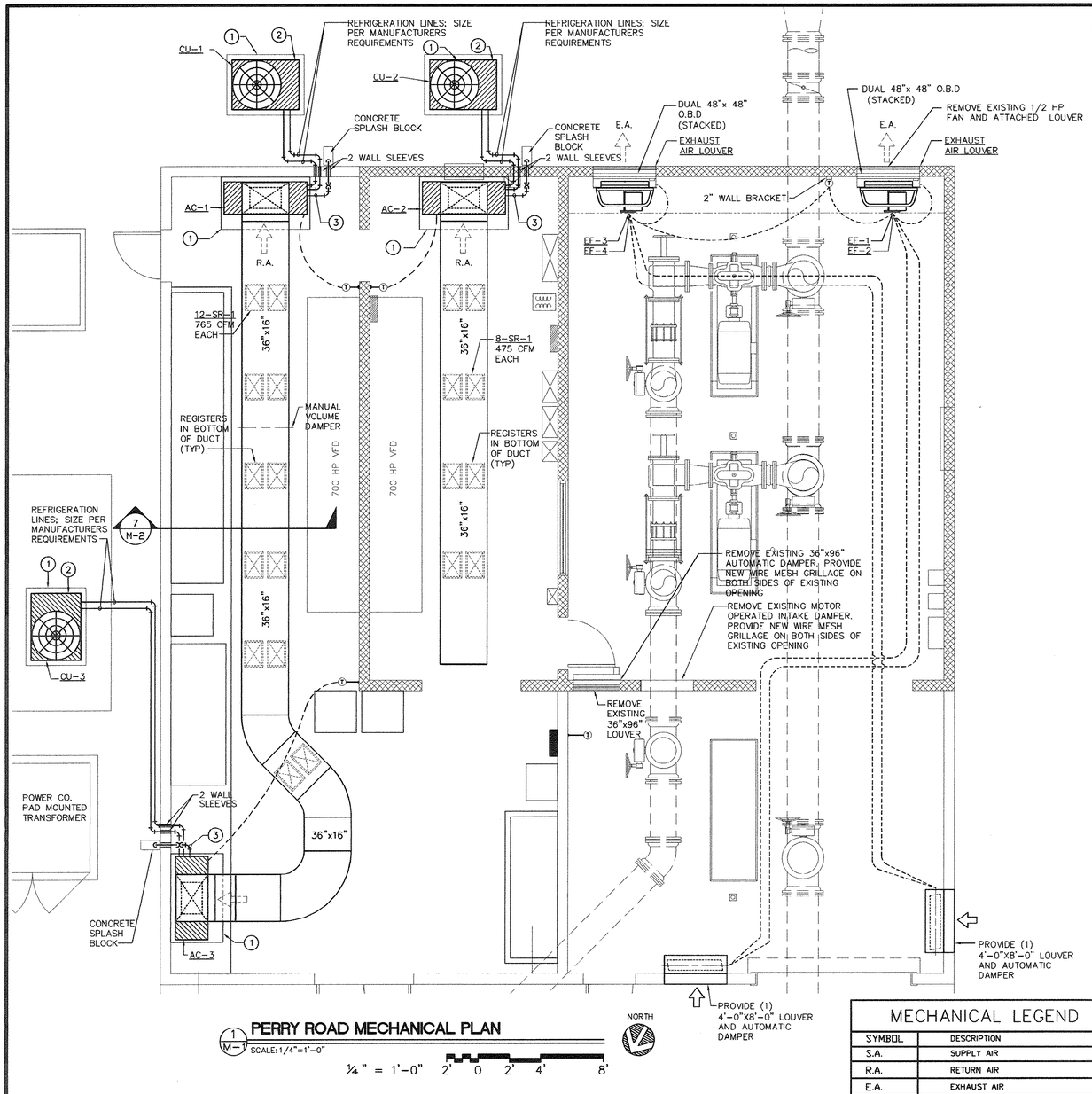
ENGINE GENERATOR SET CONCRETE PAD DETAILS SCHEDULE AND DIAGRAMS

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE

GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	DL
DRAWN:	SMI
CHECKED:	DL
SCALE:	AS SHOWN

SHEET NO.
E-15
OF: 15 VERSION: 4



PERRY ROAD MECHANICAL PLAN

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

¼" = 1'-0" 2' 0 2' 4' 8'

DRAWING LIST

M-1 FLOOR PLAN, MECHANICAL LEGEND, GENERAL NOTES, SCHEDULES.

M-2 MECHANICAL DETAILS CONTROL SEQUENCES.

KEYED NOTES

1. INSTALL ON MINIMUM 4"X4"X1" THICK CORK NEOPRENE PADS ON 6" THICK REINFORCED CONCRETE PAD ON GRADE.
2. CONCRETE PAD TO HAVE RUBBED ¾" CHAMFERED EDGES. PADS TO BE MINIMUM 3,000 LB TEST CONCRETE.
3. 1" PVC CONDENSATE DRAIN CONNECTION WITH 2" TRAP. INSULATE WITH 1/2" THICK ARMAFLEX, PAINT WITH TWO COATS OF WHITE ARMAFLEX PAINT.
4. CONSTRUCT DUCTWORK OF TYPE 3003-H14 TEMPERED ALUMINUM SHEETS TO SMACNA STANDARDS. ALL JOINTS AND SEAMS SHALL BE SEALED WITH MASTIC SUCH AS UNITED DUCT SEALER OR HARDCAST IRON GRIP.
5. AIR CONDITIONING UNITS SHALL BE MANUFACTURED BY TRANE OR APPROVED EQUAL.
6. GRILLE AND REGISTERS SHALL BE MANUFACTURED BY NAILOR OR APPROVED EQUAL.
7. REFRIGERATION PIPING TO BE CONSTRUCTED OF HARD DRAWN "ACR" COPPER TUBING WITH FORGED COPPER FITTINGS. SOLDER WITH 95-5 OR SILFOS LEAD FREE SOLDER EXCEPT AT EXPANSION VALVES. INSULATE REFRIGERANT SUCTION PIPING WITH 3/4" THICK ARMSTRONG ARMAFLEX INSULATION. PAINT WITH TWO COATS OF ARMSTRONG ARMAFLEX WHITE PAINT.
8. PROVIDE LINTELS (PAINTED) ABOVE ALL FRAMED OPENINGS IN MASONRY WALLS.
9. INSULATE DUCT WORK WITH 2" THICK RIGID 4.25 LB DENSITY FIBERGLASS DUCT INSULATION WITH ALUMINUM JACKETING. INSTALL WITH GRIP NAILS OR STICK PINS AT 12"O.C. AND WITH IN 2" OF EACH EDGE. VAPOR SEAL ALL SEAMS AND EDGES WITH 4" WIDE MATCHING ALUMINUM TAPE APPLIED WITH TALCOTE 70 WHITE ADHESIVE. PAINT EXTERIOR WITH 2 COATS OF FLAT WHITE PAINT. PAINT AFTER CLEANING, PREPPING AND PRIMING. PAINT TOP, BOTTOM, SIDES, AND ENDS. DO NOT PAINT STAINLESS STEEL REGISTERS.

MECHANICAL LEGEND

SYMBOL	DESCRIPTION
S.A.	SUPPLY AIR
R.A.	RETURN AIR
E.A.	EXHAUST AIR
O.A.	OUTSIDE AIR
T	THERMOSTAT
SR	SUPPLY REGISTER
—CD—	CONDENSATE DRAIN
—RS—	REFRIGERANT SUCTION
—RL—	REFRIGERANT LIQUID
C.U.	CONDENSING UNIT
A.C.	AIR CONDITIONING UNIT
E.F.	EXHAUST FAN
O.B.D.	OPPOSED BLADE DAMPER
F.C.	FLEXIBLE CONNECTION
------	CONTROL WIRING

NEW AIR DISTRIBUTION DEVICE SCHEDULE

DESIGNATION	NAILOR MODEL NO.	C.F.M. MAX.	PANEL SIZE	NECK SIZE	MATERIAL	REMARKS
SR-1	67DV	765	20"x14"	18"x12"	STAINLESS STEEL	O.B.D. (ADJ THRU FACE)

NEW EXHAUST FAN SCHEDULE

DESIGNATION	CFM	SP IN.WG.	WHEEL DIA. IN.	WHEEL RPM	DRIVE	MOTOR HP	MOTOR RPM	MOTOR VOLTS/PH	SELECTED ON
EF-1	11,000	0.55	36	814	BELT	2	1750	460/3	GREENHECK
EF-2	11,000	0.55	36	814	BELT	2	1750	460/3	GREENHECK
EF-3	11,000	0.55	36	814	BELT	2	1750	460/3	GREENHECK
EF-4	11,000	0.55	36	814	BELT	2	1750	460/3	GREENHECK

1. PROVIDE WITH BLADE AND BELT GUARDS.
2. 200,000 HOUR L10 BEARINGS (GEASEABLE).
3. STATICALLY AND DYNAMICALLY BALANCED.
4. ODD NUMBER OF BLADES, MINIMUM OF 5.

NEW CONDENSING UNIT SCHEDULE

DESIGNATION	TYPE	AMB O.A.°F	CAPACITY NOM. TONS	ELECTRICAL VOLTS/PH	F.L.A.	MCA	MOCP	SELECTED ON
CU-1	AIR COOLED	95°	10 TONS	460/3	12.1A	23.9A	30A	TRANE TTA120
CU-2	AIR COOLED	95°	10 TONS	460/3	12.1A	23.9A	30A	TRANE TTA120
CU-3	AIR COOLED	95°	10 TONS	460/3	12.1A	23.9A	30A	TRANE TTA120

1. PROVIDE TWO COMPRESSORS, SCROLL TYPE.
2. UNITS SHALL HAVE TWO REFRIGERANT CIRCUITS.
3. PROVIDE WITH HEAD PRESSURE CONTROL FOR OPERATION DOWN TO 20 °F.
4. UNITS TO MATCH AC UNIT COOLING COIL REQUIREMENTS.
5. UNIT FINISHES TO BE SUITABLE FOR COASTAL MARINE APPLICATIONS.
6. PROVIDE FILTER-DRIER ASSEMBLIES.
7. INSTALL ON 1" THICK CORK NEOPRENE PADS,(4).

NEW A/C UNIT SCHEDULE

DESIGNATION	TYPE	CFM	E.S.P. IN.WG	COOLING (DX) SUCT. °F	TOTAL BTU/HR	SENSIBLE BTU/HR	NO. OF CIRC.	ELECT. HEAT KW	V/P	FAN DRIVE	FAN HP	FAN V/P	SELECTED ON
A/C-1	VERT	4,590	0.50"	460/3	3.4A	15A	(2)	5.0	460/3ø	3.4A	2	460/3ø	TRANE 2TWE120B3
A/C-2	VERT	4,590	0.50"	460/3	3.4A	15A	(2)	5.0	460/3ø	3.4A	2	460/3ø	TRANE 2TWE120B3
A/C-3	VERT	4,590	0.50"	460/3	3.4A	15A	(2)	5.0	460/3ø	3.4A	2	460/3ø	TRANE 2TWE120B3

1. PROVIDE WITH A RETURN AIR INLET GRILLE (LOUVER BAR).
2. PROVIDE WITH 2 STAGE COOLING ONE STAGE HEATING WALL THERMOSTAT.
3. INSTALL ON THE 1" THICK CORK NEOPRENE VIBRATION ISOLATORS.
4. PROVIDE WITH (4) 16"X25"X2" THICK PLEATED MEDIA FILTERS PER UNIT.
5. PROVIDE BUILT IN DUET TYPE SMOKE DETECTOR WITH EACH A/C UNIT THAT SHALL TURN UNIT OFF IF SMOKE IS DETECTED IN RETURN AIR AND INCLUDE AUXILIARY NC/NC CONTACTS FOR REMOTE ALARM SYSTEM.

AS-BUILT 9-5-08

12-250-031/36 W

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

206.046

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 - Fax: (910) 692-7342

FLOOR PLAN, MECHANICAL LEGEND, GENERAL NOTES, SCHEDULES.

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	BG
DRAWN:	CADD
CHECKED:	RAM
SCALE:	AS SHOWN

SHEET NO. M-1
OF: 2 VERSION: 4

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

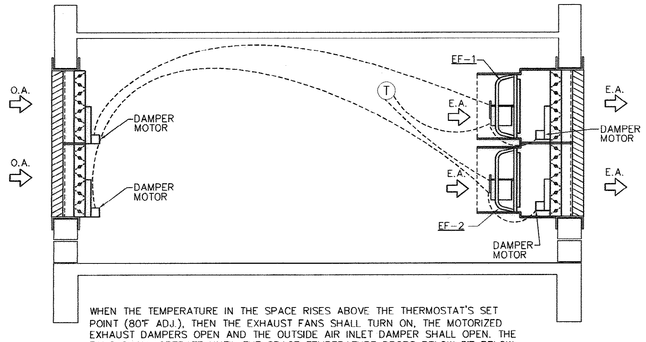
McCracken & Lopez, P.A.
Consulting Engineers
1300 Baxter Street, Suite 350
Charlotte, North Carolina 28204
Post Office Box 32515
Charlotte, North Carolina 28232
Telephone 704/376-7072
Fax 704/376-4465

206.046

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 - Fax: (910) 692-7342

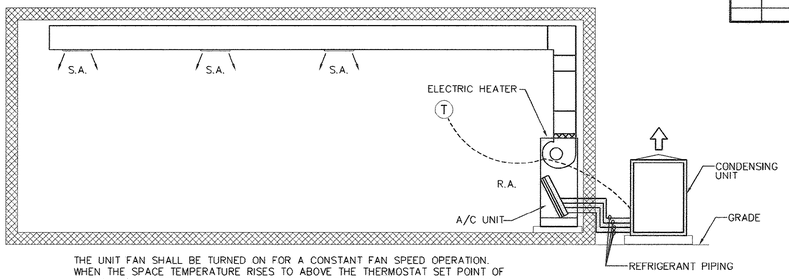
MECHANICAL DETAILS, CONTROL SEQUENCES.

PERRY ROAD WATER BOOSTER PUMP STATION UPGRADE
GRAND STRAND WATER & SEWER AUTHORITY



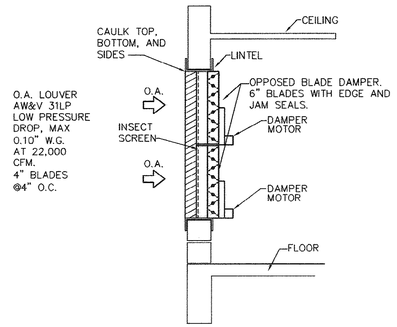
WHEN THE TEMPERATURE IN THE SPACE RISES ABOVE THE THERMOSTAT'S SET POINT (80°F ADJ.), THEN THE EXHAUST FANS SHALL TURN ON, THE MOTORIZED EXHAUST DAMPERS OPEN AND THE OUTSIDE AIR INLET DAMPER SHALL OPEN. THE FANS SHALL OPERATE UNTIL THE SPACE TEMPERATURE DROPS BELOW 3°F BELOW THE SET POINT THEN CYCLE OFF. WHEN THE FANS STOP, THE INTAKE AND EXHAUST DAMPERS SHALL CLOSE.

8/M-2 EXHAUST FAN CONTROL DIAGRAM / SEQUENCE OF OPERATION
NTS

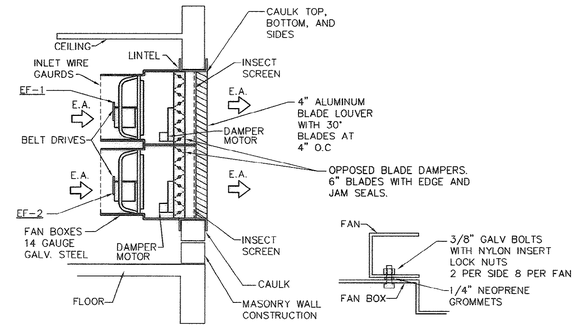


THE UNIT FAN SHALL BE TURNED ON FOR A CONSTANT FAN SPEED OPERATION. WHEN THE SPACE TEMPERATURE RISES TO ABOVE THE THERMOSTAT SET POINT OF 75°F (ADJ.), THE FIRST STAGE OF THE REFRIGERATION SYSTEM SHALL START TO MAINTAIN SPACE CONDITIONS. IF THE SPACE TEMPERATURE CONTINUES TO RISE THE SECOND STAGE OF THE REFRIGERATION SYSTEM SHALL AUTOMATICALLY START. THE REVERSE SHALL OCCUR UPON A DROP IN SPACE TEMPERATURE LESS A DEAD BAND OF 5°F.(ADJ.) IF THE SPACE TEMPERATURE DROPS TO BELOW 65°F(ADJ.) THE UNIT ELECTRIC RESISTANCE HEATER SHALL BE ENGAGED TO MAINTAIN SPACE TEMPERATURE. THE REVERSE SEQUENCE SHALL OCCUR UPON A RISE IN SPACE TEMPERATURE WITH A DEAD BAND OF 3°F

7/M-2 A/C UNIT SCHEMATIC CONTROL DIAGRAM
NTS

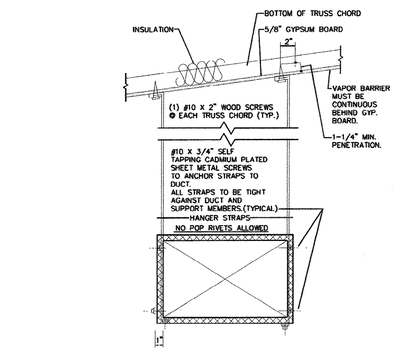


5/M-2 INTAKE LOUVER DETAIL
NTS



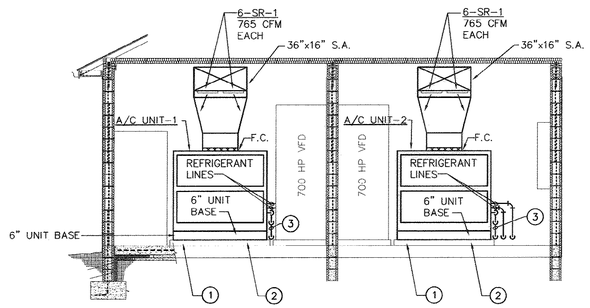
4/M-2 EXHAUST FAN / WALL LOUVER DETAIL
NTS

6/M-2 SUPPLY REGISTER DETAIL
NTS



HANGER SIZES FOR RECTANGULAR DUCT			
MAX. SIDE	HANGER	HORIZONTAL SUPPORT ANGLE	MAXIMUM SPACING
UP TO 34"	1"X18" GAUGE STRAP	NONE REQUIRED	8'-0"

3/M-2 DUCT STRAP HANGER DETAIL
NTS

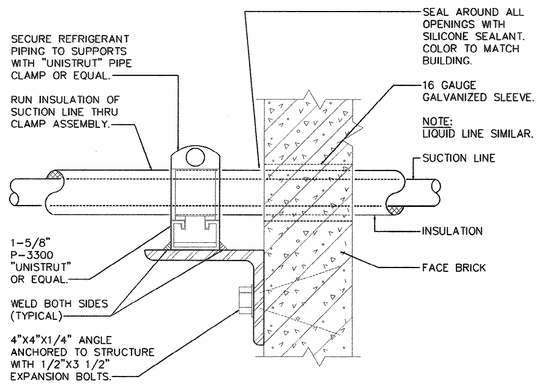


2/M-2 PERRY ROAD MECHANICAL SECTION
SCALE: 1/4"=1'-0"

(1) INSTALL ON 6" HIGH REINFORCED CONCRETE PAD WITH 3/4" CHAMFERED EDGES.

(2) INSTALL UNIT ON (4) 1" THICK CORK NEOPRENE PADS ON CONCRETE PAD.

(3) 2" DEEP CONDENSATE TRAP ASSEMBLY



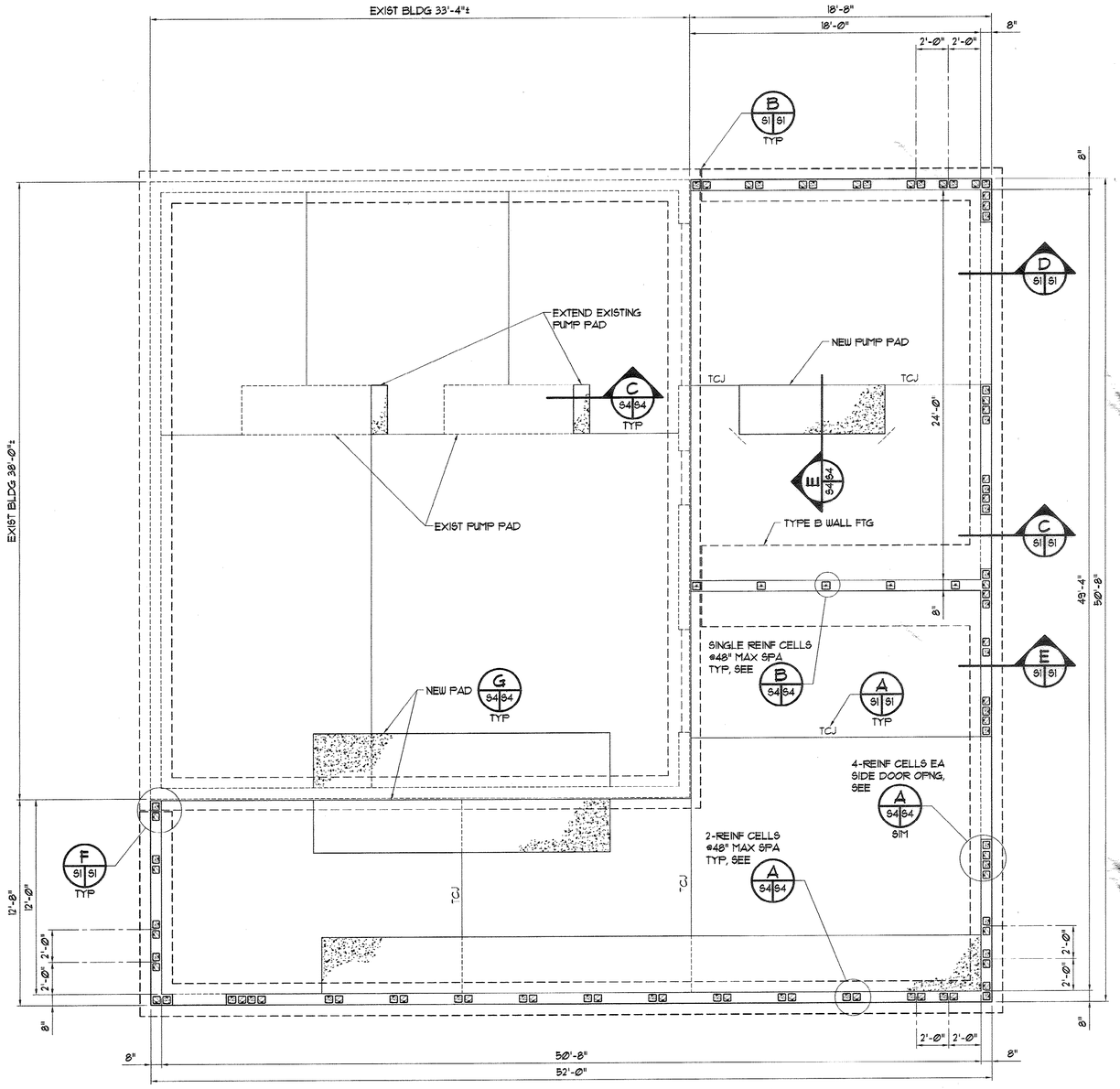
1/M-2 REFRIGERANT PIPE SUPPORT AT WALL
NTS

DATE:	9-5-2008
DESIGNED:	BG
DRAWN:	CADD
CHECKED:	RAM
SCALE:	AS SHOWN

SHEET NO.
M-2
OF: 2 VERSION: 4

AS-BUILT 9-5-08

12-250-032/36W



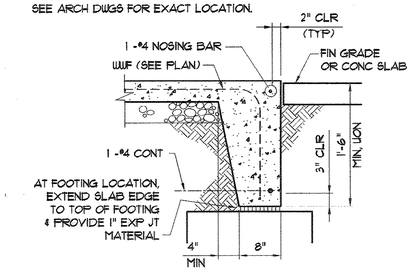
FOUNDATION PLAN

1/4" = 1'-Ø"

NOTE:

1. FIN FLOOR ELEV = 97.00, UON.
2. TOP OF WALL FTG ELEV = 95.00 UON THUS: -XXXX-
3. SEE ARCH DWGS FOR LOCATION OF FLOOR FINISHES REQUIRING DEPRESSED FLOOR SLABS AND FOR LOCATION OF MAS PARTITIONS ON THICKENED SLABS.
4. CONTRACTOR TO VERIFY IN FIELD ALL DIMENSIONS TO EXIST CONSTRUCTION.
5. ALL SLABS SHALL BE 6" THICKNESS, UON.
6. ALL SLABS SHALL BE PLACED OVER VAPOR BARRIER AND 4" COMPACTED STONE OR CLEAN SAND AND REINFORCED w/ 6x6-W2.9x2.9 WWF, UON.
7. STEP FTGS AS REQUIRED TO CLEAR NEW OR EXISTING UTILITIES. CONFIRM LOCATIONS WITH STRUCTURAL ENGINEER.
8. REINFORCED CELL LOCATIONS ARE BASED ON ASSUMED CMU CORE LOCATIONS AND WALL OPENINGS. REINFORCED CELL LOCATIONS MAY VARY SLIGHTLY TO ACCOMMODATE COURSING. COORDINATE WITH ARCH DWGS.
9. FILL ALL MASONRY CELLS WITH MASONRY GROUT BELOW FIN FLOOR.
10. ALL WALL FOOTINGS TYPE A, UON.

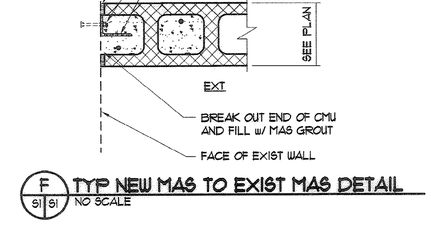
NOTE:
SEE ARCH DWGS FOR EXACT LOCATION.



C S2 | S1 TYP SLAB EDGE REINFORCING

NO SCALE

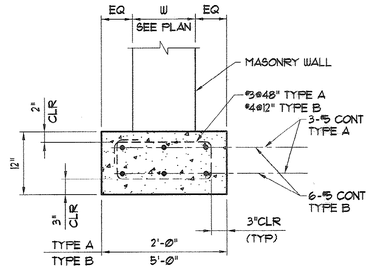
NOTE:
SEE ARCH DWGS FOR EXACT LOCATION.



NOTE:
FOR DETAILS NOT SHOWN SEE C S1 | S1

D S1 | S1 TYP SLAB EDGE REINFORCING AT OVERHEAD DOOR

3/4" = 1'-Ø"

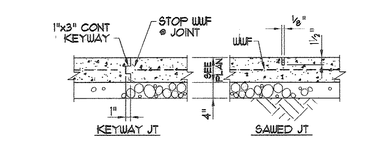


E S1 | S1 TYP WALL FOOTING REINFORCING

NO SCALE

F S1 | S1 TYP NEW MAS TO EXIST MAS DETAIL

NO SCALE

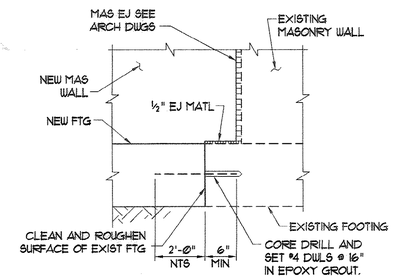


NOTE:

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

A S1 | S1 TYP CONTROL JOINT (TCJ) AT SLAB-ON-GRADE

NO SCALE



B S1 | S1 TYP EXP JOINT AT NEW AND EXISTING FOOTINGS

3/4" = 1'-Ø"

LINTEL SCHEDULE

OPENING	LINTEL		BEARING
Ø'-Ø" TO 1'-4"	PL ⅜x3½	*	8"
1'-4" TO 4'-Ø"	L3½x3½x5/16	*	8"
4'-Ø" TO 6'-8"	L4x3½x5/16 (LLV)	*	8"
6'-8" TO 8'-Ø"	L5x3½x5/16 (LLV)	*	8"

* PER 4" OF WALL THICKNESS

OPENING	6" OR 8" WALL	12" WALL	BEARING
2'-Ø" TO 4'-Ø"	1⅝" 2-#5 2-#5	2-#5 2-#5	8"
4'-Ø" TO 5'-4"	1⅝" 2-#6 2-#5	2-#6 3-#6	8"
5'-4" TO 8'-Ø"	1⅝" 2-#5 2-#6	2-#5 3-#5	16"

CONC MASONRY LINTELS SHALL BE FILLED WITH MASONRY GROUT.

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

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

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

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE (843) 626-1910 FAX (843) 626-1748

FOUNDATION PLAN AND DETAILS

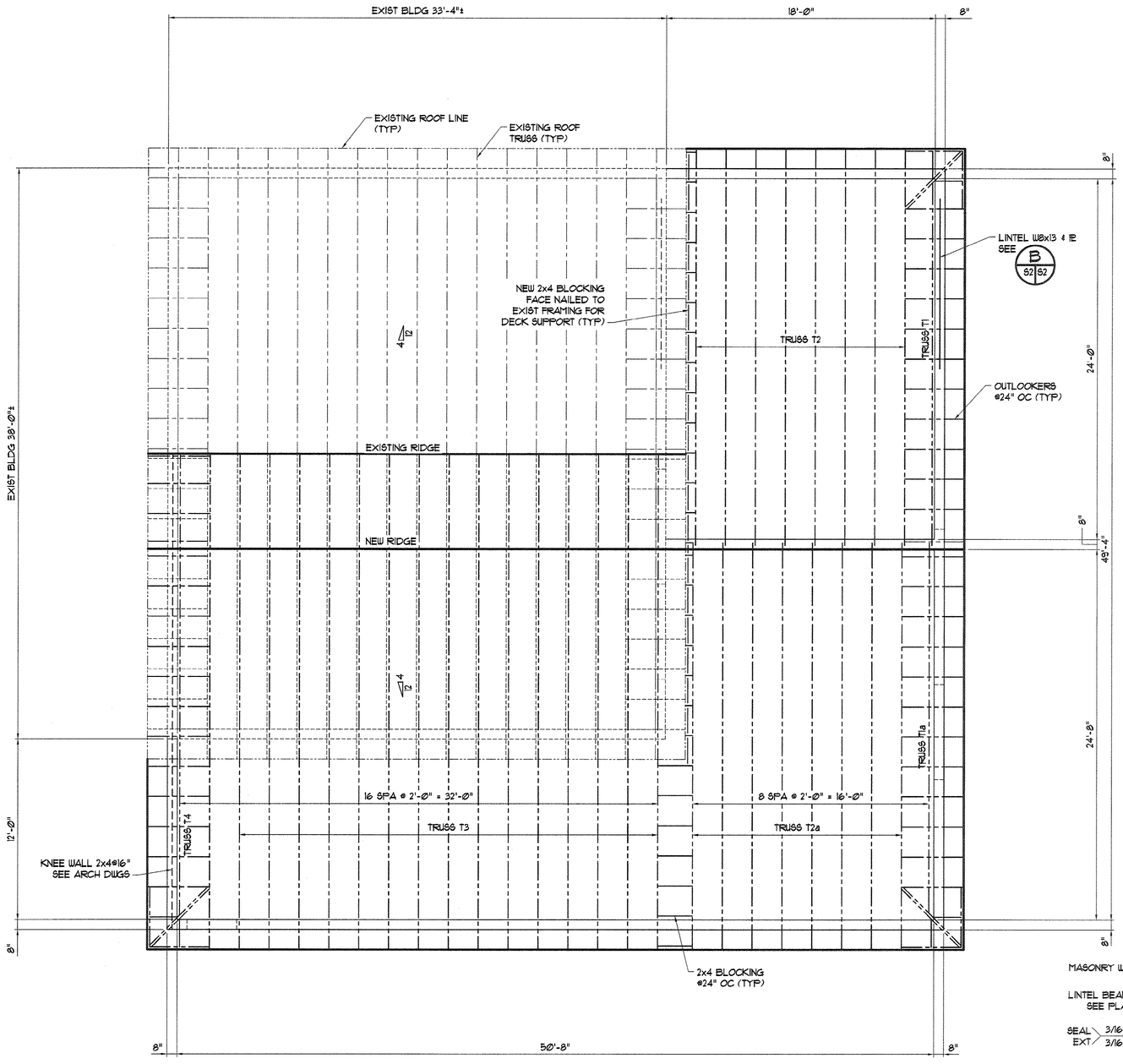
PERRY ROAD PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	DAC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO.
S1
OF: 4 VERSION: 4

AS-BUILT 9-5-08

12-250-033/36 W



ROOF FRAMING PLAN

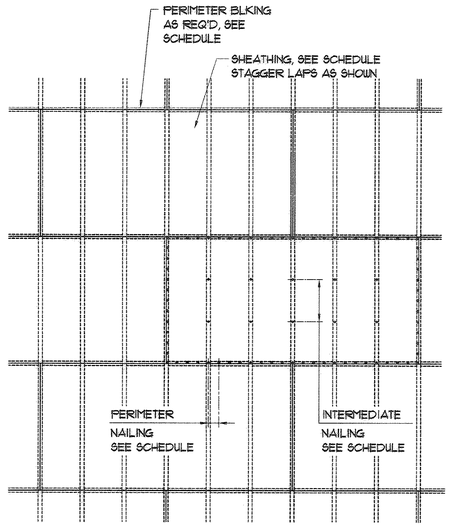
1/4" = 1'-Ø"

NOTE:
1. SEE ARCH DWGS FOR LOCATION AND ELEVATION OF LINTELS.
2. CONTRACTOR TO VERIFY IN FIELD ALL DIMENSIONS TO EXISTING CONSTRUCTION.
3. SEE ARCH AND MECH DWGS FOR LOCATION OF ROOF OPNGS.
4. TRUSSES SPACED AT 2'-Ø" MAX. FRAMING PLAN IS SCHEMATIC AND MAY VARY SLIGHTLY AS REQUIRED BY TRUSS DESIGN.

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

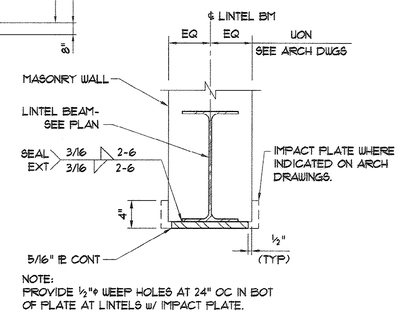
SHEATHING SCHEDULE

LOCATION	THICKNESS	NAILS	BLOCKING	NAIL SPACING	
				PERIMETER	INTERMEDIATE
WALLS	1/2" PLYWOOD	8d	NOT REQ'D	6"	12"
ROOF	5/8" PLYWOOD	10d	NOT REQ'D	6"	12" NOTE 2



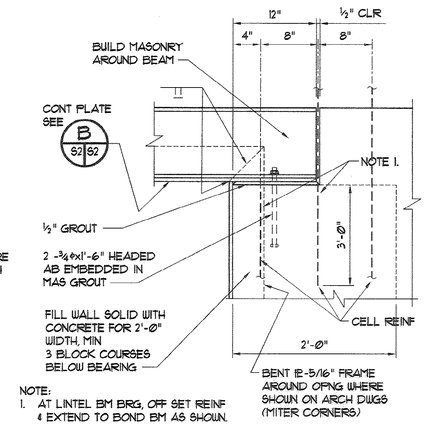
SHEATHING ATTACHMENT DETAIL

NOTE:
1. SHEATHING CONTINUOUS FROM TOP OF MASONRY FOUNDATION WALL TO ROOF FRAMING.
2. PROVIDE BLOCKING AT 2'-Ø" OC FOR 5' MIN WIDTH AROUND PERIMETER, ALL NAILS @ 6" OC.



NOTE:
PROVIDE ½"ø WEEP HOLES AT 24" OC IN BOT OF PLATE AT LINTELS w/ IMPACT PLATE.

B S2 S2 TYP LINTEL DETAIL
NO SCALE



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

A S2 S2 TYP LINTEL BEARING DETAIL
NO SCALE

AS-BUILT 9-5-08

HOBBS, UPCHURCH & ASSOCIATES, P.A. CERTIFICATE OF AUTHORIZATION No. C00239

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1910 FAX: (843) 626-1745

PERRY ROAD
PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

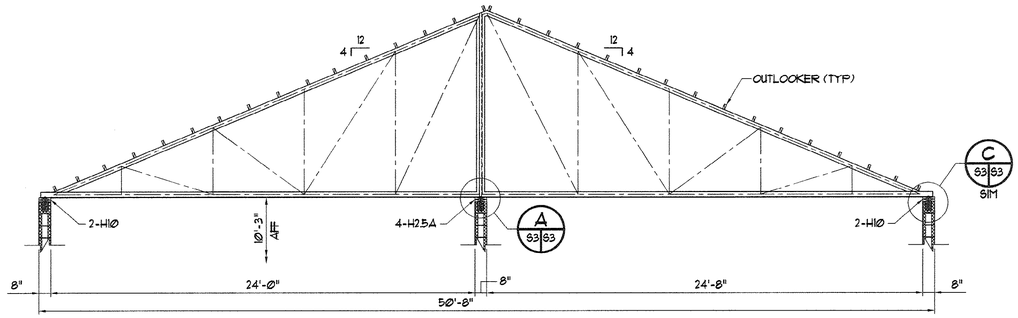
ROOF FRAMING PLAN AND DETAILS

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	DAC
CHECKED:	JWM
SCALE:	AS SHOWN

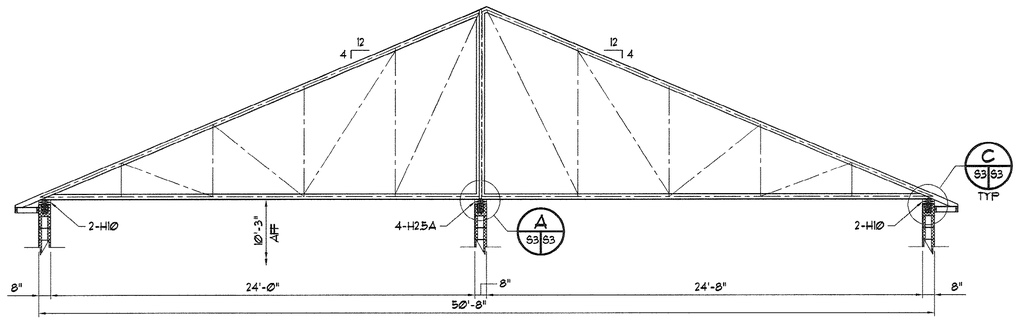
SHEET NO. S2

OF: 4 VERSION: 4

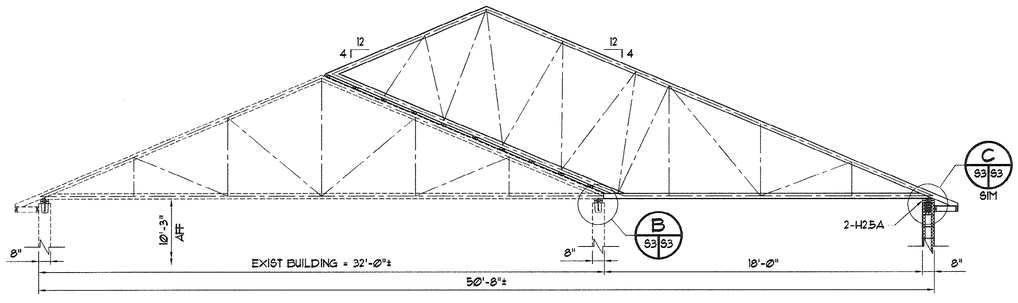
12-250-034/36 W



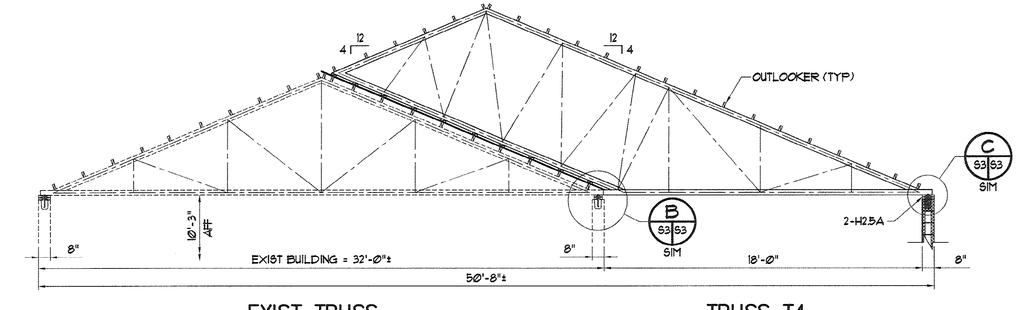
TRUSS T1 TRUSS T1a



TRUSS T2 TRUSS T2a



EXIST TRUSS TRUSS T3



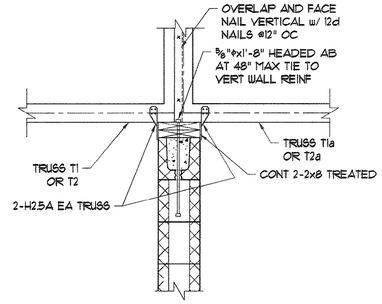
EXIST TRUSS TRUSS T4

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

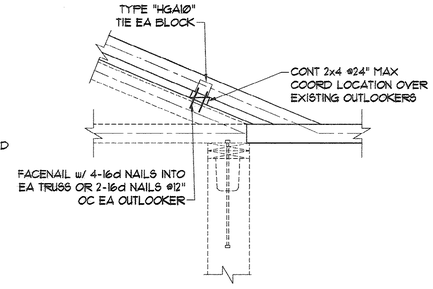
WOOD TRUSS DESIGN NOTES

1. LUMBER IN TRUSSES SHALL BE GRADE MARKED AS FOLLOWS:
   CHORD MEMBERS
   WEB MEMBERS
2. MAXIMUM TRUSS SPACING = 2'-Ø" ON CENTER.
3. CENTROIDAL LINES OF MEMBERS SHALL INTERSECT AT A POINT, U.O.N.
4. ENDS OF ALL COMPRESSION MEMBERS SHALL BE CUT TO FIT INTERSECTING MEMBERS FOR POSITIVE END BEARING.
5. TRUSS DESIGN LOADS
   WIND ASCE 7-02, 125 MPH, WIND IMPORTANCE FACTOR = 1.15, EXPOSURE C
   GCpi = ±Ø.55, DESIGN TRUSSES FOR COMPONENT LOADING
   TOP CHORD DEAD LOAD _____ 10 PSF (6 PSF FOR UPLIFT)
   BOTTOM CHORD DEAD LOAD _____ 5 PSF (8 PSF FOR UPLIFT)
   TOP CHORD LIVE LOAD _____ 20 PSF

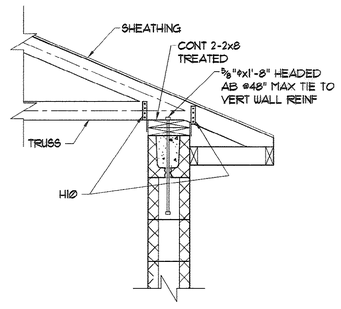
   TRUSSES SHALL BE DESIGNED BY A REGISTERED SOUTH CAROLINA PROFESSIONAL ENGINEER EMPLOYED BY THE TRUSS MANUFACTURER. SUBMIT SEALED CALCULATIONS FOR TRUSS MEMBER AND CONNECTION DESIGN WITH SHOP DRAWINGS.
6. TRUSS JOINT CONNECTIONS SHALL BE MADE BY USING GALVANIZED TOOTHED CONNECTION PLATES.
7. TRUSS WEB MEMBERS SHOWN ARE SCHEMATIC ONLY. PROVIDE VERTICALS AND DIAGONALS AS REQUIRED BY TRUSS DESIGN. CONTRACTOR COORDINATE CLEARANCES REQUIRED FOR MECHANICAL SYSTEMS.



A S3|S3 TRUSS INTERIOR WALL BEARING
NO SCALE



B S3|S3 TRUSS OVERFRAME DETAIL
NO SCALE



C S3|S3 TRUSS EAVE BEARING DETAIL
NO SCALE

AS-BUILT 9-5-08

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

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

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1910 FAX: (843) 626-1740

TRUSS ELEVATIONS AND DETAILS

PERRY ROAD PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	DWN
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. S3

OF: 4 VERSION: 4

12-250-035/36 gw

GENERAL NOTES

A. FOUNDATIONS.
1. MAXIMUM ALLOWABLE SOIL PRESSURE = 2,000 PSF. (PRESUMPTIVE)
2. FOOTING ELEVATIONS SHALL NOT BE RAISED OR LOWERED WITHOUT APPROVAL OF THE ENGINEER.
3. FOOTINGS SHALL BE LOWERED WHEN DIRECTED BY THE ENGINEER TO REACH FIRM, UNDISTURBED SOIL.
4. CONSTRUCTION JOINTS IN WALL FOOTINGS SHALL BE AT LEAST TWO FEET FROM THE INTERSECTION WITH ANOTHER WALL FOOTING.
5. PROVIDE BRACING AGAINST FOUNDATION WALLS TO PREVENT DAMAGE DURING COMPACTION OF FILL INSIDE BUILDING.
6. ALL FILL OR BACKFILL SHALL BE SELECT MATERIAL FREE FROM ROOTS, TRASH, WOOD SCRAPS AND OTHER EXTRANEOUS MATERIALS. PLACE IN LIFTS NOT EXCEEDING 8 INCHES AND COMPACT EACH LIFT TO 95% DENSITY, 98% FOR FINAL FOOT, AT OPTIMUM MOISTURE CONTENT AS MEASURED BY ASTM D698.
7. WHERE SOFT SOILS REQUIRE OVER EXCAVATION FOR BUILDING FOUNDATIONS, OVER EXCAVATED AREAS SHALL BE BACKFILLED WITH COMPACTED #57 OR #67 STONE TO THE DESIGN BEARING ELEVATION.

B. CONCRETE.
1. CONCRETE SHALL DEVELOP 4,000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS.
2. CONCRETE WORK SHALL CONFORM TO ACI 318-02 AND ACI 301-05.
3. PLACE 1/2 INCH EXPANSION JOINT MATERIAL BETWEEN EDGES OF SLABS AND VERTICAL SURFACES UNLESS OTHERWISE NOTED.
4. PROVIDE CONSTRUCTION OR CONTROL JOINTS IN SLABS AT LOCATIONS SHOWN ON DRAWINGS, AT OFFSETS AND CHANGES IN DIRECTION, AND AT 30 FEET MAXIMUM.
5. CHAMFER EXPOSED EDGES OF CONCRETE (AND ALL CORNERS OF ALL COLUMNS) 3/4 INCH, UNLESS OTHERWISE NOTED.
6. CONCRETE SHALL BE CURED A MINIMUM OF 7 DAYS BY ONE OR MORE METHODS SPECIFIED IN ACI 301.
7. SEE FINISH SCHEDULE FOR REQUIRED FLOOR FINISH.

C. REINFORCING STEEL.
1. BARS SHALL CONFORM TO ASTM A615, GRADE 60.
2. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR A497.
3. DETAIL AND FABRICATE REINFORCING STEEL IN ACCORDANCE WITH THE ACI DETAILING MANUAL, SP-66(94).
4. REINFORCING STEEL IN PLACE SHALL BE REVIEWED BY THE ENGINEER PRIOR TO PLACING CONCRETE.
5. PROVIDE BARS AT CORNERS AND INTERSECTIONS OF THE SAME NUMBER AND SIZE AS LONGITUDINAL BARS IN FOOTINGS, GRADE BEAMS AND WALLS.

D. GROUT.
1. PROVIDE NON-SHRINK GROUT UNDER ALL COLUMN BASE PLATES AND BEAM BEARING PLATES. NON SHRINK GROUT SHALL CONFORM TO CORPS OF ENGINEERS SPECIFICATION CRD-C 621-83.
2. GROUT SHALL BE NON-METALLIC AND NON-STAINING.

E. STRUCTURAL STEEL.
1. STRUCTURAL STEEL SHALL CONFORM TO ASTM A572, GRADE 50.
2. STRUCTURAL STEEL PIPE SHALL CONFORM TO ASTM A501.
3. STRUCTURAL STEEL TUBE SHALL CONFORM TO ASTM A500, GR. B (Fy = 46 KSI).
4. STEEL WORK SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS - ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN," OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC., EFFECTIVE JUNE 1, 1989, INCLUDING ALL SUPPLEMENTS, AND THE "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES," EFFECTIVE SEPTEMBER 1, 1986.
5. CONNECTION BOLTS SHALL BE 3/4 INCH DIAMETER CONFORMING TO ASTM A325, TYPE X, UNLESS OTHERWISE NOTED. INSTALL EACH BOLT WITH A HARDENED WASHER (OR LOAD INDICATOR WASHER) UNDER THE NUT OR HEAD, WHICHEVER IS TURNED FOR TIGHTENING ALL CONNECTION BOLTS ARE REQUIRED TO BE TIGHTENED "SNUG-TIGHT" ONLY, UNLESS OTHERWISE SPECIFIED.
6. OVERSIZE HOLES AND SLOTTED HOLES SHALL NOT BE USED FOR BOLTED CONNECTIONS ON THIS PROJECT EXCEPT AT LOCATIONS NOTED ON THE DRAWINGS.
7. WELDING SHALL BE BY WELDERS AND WELDING OPERATORS WHO HAVE BEEN PREVIOUSLY QUALIFIED BY TESTS AS PRESCRIBED IN THE "STRUCTURAL WELDING CODE," AWS D1.1 OF THE AMERICAN WELDING SOCIETY TO PERFORM THE TYPES OF WELDS REQUIRED ON THIS PROJECT.
8. THE CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY BRACING, SHORING AND GUYING OF FRAMING AGAINST WIND, CONSTRUCTION LOADS AND OTHER TEMPORARY FORCES UNTIL SUCH PROTECTION IS NO LONGER REQUIRED FOR THE SAFE SUPPORT OF THE FRAMING.
9. ANCHOR BOLT LENGTHS SHOWN ON THE DRAWINGS SHALL INCLUDE HOOKS OF NOT LESS THAN 3 INCHES IN LENGTH. PROVIDE ONE NUT AND ONE WASHER WITH EACH ANCHOR BOLT UNLESS OTHERWISE NOTED. COLUMNS TO BE ERECTED AND LEVELED WITH LEVELING SHIMS, LEVELING NUTS ARE PROHIBITED.
10. ALL STRUCTURAL STEEL SHALL BE GIVEN ONE SHOP COAT OF PAINT OF NOT LESS THAN 2.0 MILS DRY FILM THICKNESS CONFORMING TO STEEL STRUCTURES PAINTING COUNCIL SSPC PAINT 2, 13 OR 14. CLEAN (WIRE BRUSH) AND SPOT PAINT ALL FIELD WELDS, FIELD CUT EDGES AND SERIOUS ABRASIONS TO THE SHOP COAT WITH PRIMER PAINT.

F. UNIT MASONRY
1. ASSUMED COMPRESSIVE STRENGTH OF LOAD-BEARING CONCRETE MASONRY f'm = 1,500 PSI
2. MASONRY GROUT FILL FOR REINFORCED MASONRY CELLS, LINTELS, BOND BEAMS AND AS SHOWN ON THE DRAWINGS SHALL CONFORM TO ASTM C476. MAXIMUM HEIGHT TO WHICH MASONRY SHALL BE LAID BEFORE FILLING IS 5'-0".
3. ALL LAP SPLICES FOR REINFORCING BARS IN MASONRY WALL SHALL BE 48X BAR DIAMETER, UON.

G. STRUCTURAL LUMBER.
1. STRUCTURAL LUMBER SHALL BE KILN-DRIED, NO 2 DIMENSION OR BETTER, SOUTHERN PINE.
2. PROVIDE WASHERS BETWEEN ALL BOLT HEADS AND WOOD AND BETWEEN ALL NUTS AND WOOD. PLACE ALL BOLT HEADS ON THE SAME SIDE OF THE CONNECTION.
3. LAG BOLTS AND SCREWS SHALL BE PROVIDED WITH LEAD HOLES HAVING A DIAMETER NOT GREATER THAN 70 PERCENT OF THE THREAD DIAMETER OF THE BOLT OR SCREW. ALL LAG BOLTS AND SCREWS SHALL BE INSERTED IN LEAD HOLES BY TURNING AND UNDER NO CIRCUMSTANCES BY DRIVING WITH A HAMMER.
4. THROUGH BOLTS SHALL BE PROVIDED WITH BOLT HOLES WHICH ARE 1/32 TO 1/16 INCH LARGER THAN THE BOLT.
5. ENDS OF ALL COMPRESSION MEMBERS SHALL BE CUT TO FIT INTERSECTING MEMBERS FOR POSITIVE END BEARING.
6. SEE "WOOD TRUSS DESIGN NOTES" FOR ADDITIONAL NOTES.
7. PLYWOOD SHALL BE C-C EXTERIOR, DFPA GRADE MARKED OR EQUIVALENT, OF THE THICKNESSES SHOWN ON THE DRAWINGS.
8. ALL FABRICATED STEEL ASSEMBLIES EXPOSED TO WEATHER AND ALL STEEL FASTENERS, INCLUDING BUT NOT LIMITED TO NAILS AND SPIKES FOR HEAVY TIMBER CONSTRUCTION AND DECKING, ANCHOR BOLTS, CONNECTION BOLTS, NUTS, WASHERS, LAG BOLTS OR SCREWS AND MANUFACTURED ACCESSORIES, EXCEPT SPLIT RINGS AND SHEAR PLATES, SHALL HAVE A GALVANIZED FINISH CONFORMING TO THE APPLICABLE ASTM STANDARD FOR THAT ACCESSORY, ASTM A 123, ASTM A 153, OR OTHER.
9. FABRICATED STEEL ASSEMBLIES NOT GALVANIZED SHALL BE GIVEN TWO SHOP COATS OF PAINT OF NOT LESS THAN 2.0 MILS DRY FILM THICKNESS EACH CONFORMING TO STEEL STRUCTURES PAINTING COUNCIL SSPC PAINT 22, 28, 31, OR 35.
10. FABRICATED ITEMS INDICATED ON THE PLANS ARE DESIGNATED AS PRODUCTS PRODUCED BY THE SIMPSON STRONG TIE COMPANY. PROVIDE ITEMS NOTED OR EQUIVALENT PRODUCTS.

H. DESIGN LOADS.
STRUCTURAL MEMBERS SHALL BE DESIGNED FOR FULL DEAD LOADS AND THE FOLLOWING LIVE LOADS:
1. IMPORTANCE FACTORS: WIND (Iw) = 1.15; SNOW (Is) = 1.2; SEISMIC (Ie) = 1.5
2. LIVE LOADS: ROOF = 20 PSF (REDUCIBLE); FLOOR SLAB ON GRADE = 300 PSF
3. SNOW LOAD: Pg = 10 PSF GROUND SNOW LOAD; Pf = 9.2 PSF, FLAT SNOW LOAD PLUS RAIN SURCHARGE; Ce = 1.0, Ct = 1.10
4. WIND LOAD: BASIC WIND SPEED 125 (ASCE 7-02)
EXPOSURE CATEGORY C, PARTIALY ENCLOSED BUILDING (GCpi = ;0.55)
WIND BASE SHEARS (FOR MWFRS): Vx = 19k (N/S) Vy = 14k (E/W)
COMPONENT AND CLADDING WIND PRESSURES

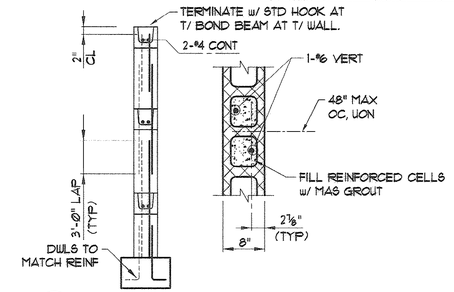
	SURFACE PRESURE (PSF)		
ROOF AREA	10 SF	100 SF	500 SF
NEGATIVE ZONE 1	-48.1	-45.8	-44.8
NEGATIVE ZONE 2	-74.7	-63.1	-58.1
NEGATIVE ZONE 3	-104.6	-90.6	-84.6
POSITIVE ZONES	34.9	30.2	28.2
WALL AREA	20 SF	100 SF	500 SF
NEGATIVE ZONE 4	-48.1	-44.8	-41.5
NEGATIVE ZONE 5	-78.0	-64.7	-51.4
POSITIVE ZONE 4 & 5	49.0	44.0	35.0

5. SEISMIC DESIGN CATEGORY A
COMPLIANCE WITH SECTION 1616.4 ONLY? ____YES __X__NO
6. SEISMIC DESIGN CATEGORY D
PROVIDE THE FOLLOWING SEISMIC DESIGN PARAMETERS:
SEISMIC USE GROUP III
SPECTRAL RESPONSE ACCELERATION Ss = 89.5 %g Sds = 68.1 %g; S1 = 27.5 %g Sd1 = 33.9 %g; Cs = 0.204 R = 5.0
SITE CLASSIFICATION D
BASIC STRUCTURAL SYSTEM
__X__ BEARING WALL ____ DUAL w/SPECIAL MOMENT FRAME
____ BUILDING FRAME ____ DUAL w/INTERMEDIATE R/C OR SPECIAL STEEL
____ MOMENT FRAME ____ INVERTED PENDULUM
SEISMIC BASE SHEAR: V = 49K
ANALYSIS PROCEDURE ____ SIMPLIFIED __X__ EQUIVALENT LATERAL FORCE
7. LATERAL DESIGN CONTROL: SEISMIC __X__ WIND ____

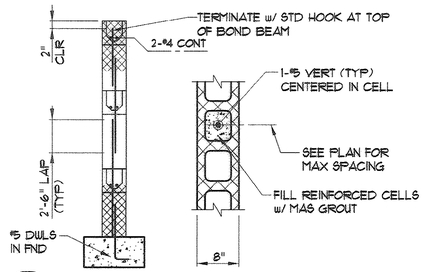
J. DIMENSIONS.
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THE DIMENSIONS OF THE STRUCTURAL DRAWINGS AND ADVISING THE ENGINEER OF ANY DIFFERENCES IN DIMENSIONS BETWEEN THE STRUCTURAL AND ARCHITECTURAL DRAWINGS PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONSTRUCTION DIMENSION BEFORE SUBMITTING THE SHOP DRAWINGS.

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

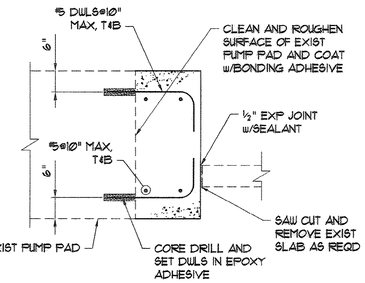
L. CONSTRUCTION SAFETY.
1. THESE STRUCTURAL DRAWINGS DO NOT CONTAIN NECESSARY COMPONENTS FOR SAFETY DURING CONSTRUCTION.



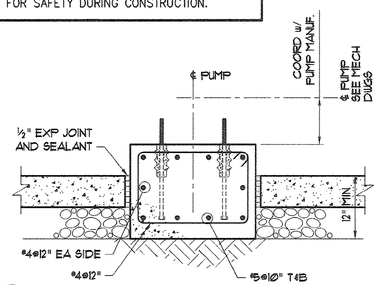
A S4/S4 TYP EXT WALL REINFORCING DETAIL
NO SCALE



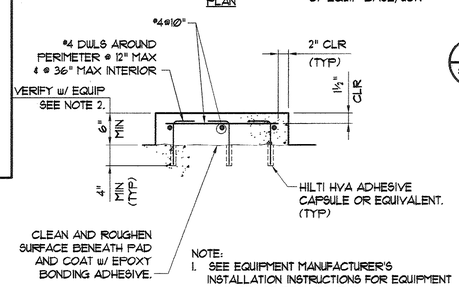
B S4/S4 TYP INT WALL REINFORCING DETAIL
NO SCALE



C S4/S4 PUMP PAD EXTENSION
NO SCALE

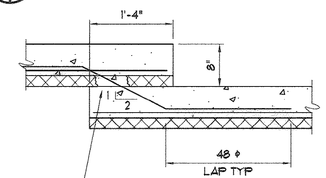


E S4/S4 NEW PUMP PAD - SECTION
NO SCALE



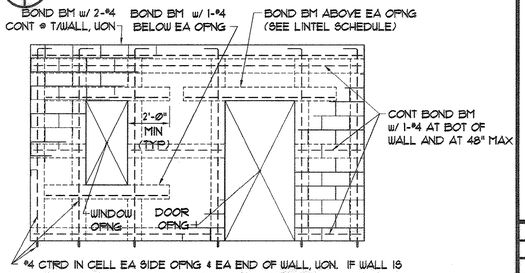
NOTE:
1. SEE EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR EQUIPMENT ANCHORAGE REQUIREMENTS.
2. WHERE PAD EXCEEDS 12" HEIGHT, PROVIDE #4 PERIMETER BARS @ 10" MAX.

G S4/S4 TYPICAL EQUIPMENT PAD
3/4 = 1'-0"



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

F S4/S4 BOND BEAM STEP DETAIL
NO SCALE



#4 CTRD IN CELL EA SIDE OPNG & EA END OF WALL, UON. IF WALL IS ON FTG, DOWEL BARS INTO FTG, OTHERWISE CORE DRILL & SET IN HS EPOXY GROUT (EMBED 3"). TERMINATE AT T/ BOND BM w/ STD HK.

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

D S4/S4 TYP MAS WALL REINF DETAIL
(SEISMIC PERFORMANCE CATEGORY "D")
NO SCALE

AS-BUILT 9-5-08

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

SOUTH CAROLINA PROFESSIONAL ENGINEERS — CERTIFICATE OF AUTHORIZATION — No. C00239 — HOBBS, UPCHURCH & ASSOCIATES, P.A.

SOUTH CAROLINA PROFESSIONAL ENGINEERS — REGISTERED — No. 12335 — JASON W. HOBBS

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers
Myrtle Beach, South Carolina 29577
PHONE: (843) 626-1910 FAX: (843) 626-1745

DETAILS

PERRY ROAD
PUMP STATION
GRAND STRAND WATER & SEWER AUTHORITY

DATE:	9-5-2008
DESIGNED:	JWM
DRAWN:	DAC
CHECKED:	JWM
SCALE:	AS SHOWN

SHEET NO. S4

OF: 4 VERSION: 4

12-250-036/36 JW