

12/2/2014 5:35:57 PM G:\PROJECTS\03517.00 DELDOT AGMT 1223 DOT'S Open End\03517.16 SR1, LITTLE HEAVEN FINAL DESIGN.DGN Files\signal\_bowers14.dgn

**ULTIMATE CONDUIT RUN SCHEDULE**

CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	190'	-	EXISTING (1) 2/*8 UFW/GROUND
x2	1	2"	GALV	15'	-	EXISTING (1) 2/*8 UFW/GROUND
x2A	1	2"	GALV	10'	-	*SEE UTILITY & ITEMS PLANS
x2B	1	2"	GALV	155'	-	*SEE UTILITY & ITEMS PLANS
x2C	1	2"	GALV	25'	-	*SEE UTILITY & ITEMS PLANS
x2D	1	3"	GALV	5'	-	EXISTING (1) 2/*8 UFW/GROUND *SEE UTILITY & ITEMS PLANS
x3	3	4"	PVC	15'	-	EXISTING (6) 4/*18 (18) 2/*14 (6) 5/*14 (7) 19/*14 (1) *6 BSC
x4	1	4"	PVC	20'	-	EXISTING (2) 5/*14 (1) *6 BSC
x5	1	3"	PVC	40'	-	EXISTING (2) 4/*18 (1) 19/*14 (1) *6 BSC
x7	1	2"	GALV	170'	-	*SEE UTILITY & ITEMS PLANS
x7A	1	3"	GALV	55'	-	*SEE UTILITY & ITEMS PLANS
x8	1	4"	PVC	190'	-	EXISTING (1) 2/*14 (1) *6 BSC
x9	1	1.5"	GALV	10'	-	EXISTING (4) 1/*14
x10	1	4"	PVC	105'	-	EXISTING (3) 4/*18 (1) 3) 2/*14 (3) 5/*14 (4) 19/*14 (1) *6 BSC
x11	1	1.5"	GALV	15'	-	EXISTING (4) 1/*14
x12	1	3"	PVC	45'	-	EXISTING (1) 4/*18 (1) 19/*14 (1) *6 BSC
x13	1	4"	PVC	70'	-	EXISTING (2) 4/*18 (1) 12) 2/*14 (2) 5/*14 (3) 19/*14 (1) *6 BSC
x14	1	1.5"	GALV	5'	-	EXISTING (6) 1/*14
x15	1	4"	PVC	125'	-	EXISTING (3) 4/*18 (8) 2) 2/*14 (2) 5/*14 (3) 19/*14 (1) *6 BSC
x16	1	4"	PVC	40'	-	EXISTING (2) 4/*18 (6) 2) 2/*14 (2) 5/*14 (2) 19/*14 (1) *6 BSC
x17	1	4"	HDPE	115'	-	EXISTING (1) 4/*18 (2) 2) 2/*14 (1) 19/*14 (1) *6 BSC
x18	1	1.5"	GALV	40'	-	EXISTING (2) 1/*14
x19	1	4"	PVC	255'	-	EXISTING (1) 2/*14 (1) *6 BSC
x20	1	1.5"	GALV	20'	-	EXISTING (2) 1/*14
x21	1	4"	HDPE	115'	-	EXISTING (2) 4/*18 (5) 2) 2/*14 (1) 15) 1/*14 (2) 19/*14 (1) *6 BSC
x22	1	3"	PVC	15'	-	EXISTING (1) 4/*18 (1) 19/*14 (1) *6 BSC
x23	1	4"	HDPE	160'	-	EXISTING (1) 4/*18 (3) 2) 2/*14 (1) 19/*14 (1) *6 BSC
x24	1	3"	PVC	15'	-	EXISTING (1) 4/*18 (1) 19/*14 (1) *6 BSC
x25	1	4"	HDPE	185'	-	EXISTING (2) 2/*14 (1) *6 BSC
x26	1	1.5"	GALV	10'	-	EXISTING (4) 1/*14
x27	1	1.5"	GALV	10'	-	EXISTING (2) 1/*14
x28	1	3"	PVC	10'	-	EXISTING (1) 4/*18 (1) 19/*14 (1) *6 BSC
x29	1	4"	PVC	30'	-	EXISTING (1) 2/*14 (1) *6 BSC
x30	1	1.5"	GALV	10'	-	EXISTING (2) 1/*14
x31	1	3"	PVC	35'	-	EXISTING (1) 19/*14 (1) *6 BSC
x32	1	1.5"	GALV	5'	-	EXISTING (4) 1/*14
x33	1	1.5"	GALV	10'	-	EXISTING (2) 1/*14
x34	1	4"	PVC	25'	-	EXISTING (1) 2/*14 (1) 15) 1/*14 (1) *6 BSC
x35	1	1.5"	GALV	50'	-	EXISTING (4) 1/*14
x36	1	4"	PVC	115'	-	EXISTING (1) 2/*14 (1) 19/*14 (1) *6 BSC
x37	1	1.5"	GALV	15'	-	EXISTING (2) 1/*14
x38	1	4"	HDPE	185'	-	EXISTING (1) 4/*18 (4) 2) 2/*14 (1) 15) 1/*14 (2) 19/*14 (1) *6 BSC
x39	1	3"	PVC	10'	-	EXISTING (1) 4/*18 (1) 19/*14 (1) *6 BSC
x40	1	2.5"	-	145'	-	*SEE UTILITY AND ITEMS PLANS
x40A	1	2.5"	-	130'	-	*SEE UTILITY AND ITEMS PLANS
x40B	1	2.5"	-	75'	-	*SEE UTILITY AND ITEMS PLANS
x40C	1	2.5"	-	125'	-	*SEE UTILITY AND ITEMS PLANS
x40D	1	2.5"	-	130'	-	*SEE UTILITY AND ITEMS PLANS
x41	1	2.5"	-	145'	-	*SEE UTILITY AND ITEMS PLANS
x41A	1	2.5"	-	130'	-	*SEE UTILITY AND ITEMS PLANS
x41B	1	2.5"	-	75'	-	*SEE UTILITY AND ITEMS PLANS
x41C	1	2.5"	-	125'	-	*SEE UTILITY AND ITEMS PLANS
x41D	1	2.5"	-	130'	-	*SEE UTILITY AND ITEMS PLANS
x42	1	2.5"	PVC	15'	-	EXISTING (1) 5/*14 (1) *6 BSC
x43	1	2.5"	PVC	15'	-	EXISTING (1) 5/*14 (1) *6 BSC
x44	1	2.5"	PVC	15'	-	EXISTING (1) 5/*14 (1) *6 BSC
x45	1	2.5"	PVC	15'	-	EXISTING (1) 5/*14 (1) *6 BSC
x46	1	2.5"	PVC	10'	-	EXISTING (1) 5/*14 (1) *6 BSC
x47	1	2.5"	PVC	5'	-	EXISTING (1) 5/*14 (1) *6 BSC
x48	1	1.5"	GALV	30'	-	EXISTING (2) 1/*14
x63	1	1.5"	GALV	30'	-	EXISTING (4) 1/*14
xF20	1	xx4"	-	20'	-	*SEE UTILITY AND ITEMS PLANS
xF20A	1	3"	-	15'	-	*SEE UTILITY AND ITEMS PLANS
xF21	1	xx4"	-	115'	-	*SEE UTILITY AND ITEMS PLANS
xF22	1	4"	-	20'	-	*SEE UTILITY AND ITEMS PLANS
xF22A	1	3"	-	20'	-	*SEE UTILITY AND ITEMS PLANS
xF59	1	4"	-	260'	-	*SEE UTILITY AND ITEMS PLANS
xF61	1	3"	-	15'	-	*SEE UTILITY AND ITEMS PLANS

**LEGEND**  
 x DENOTES EXISTING  
 xx ALL 4" ITEMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.  
 \* SEE UTILITY AND ITEMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITEMS DEVICES.  
 B-BORE P- ATTACH TO POLE  
 T-TRENCH SM- SINGLE MODE FIBER  
 O-OPEN CUT BSC- BARE STRANDED COPPER

**SIGNAL PHASING**

**SIGNAL HEAD DIAGRAM**

**LEGEND**

(AB)	ABANDON	(OH)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
(CA)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	(OH)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
(CA)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	(PB)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(CO)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	(PB)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(CO)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	(PL)	EXISTING POLE IDENTIFIER (* OF POLE)
(JW)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(PL)	PROPOSED POLE IDENTIFIER (* OF POLE)
(JW)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(RM)	REMOVE BY CONTRACTOR
(MA)	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM)	REMOVE BY OTHERS
(MA)	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM)	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	□	□
LOOP DETECTOR, TYPE 2	□	□
LUMINAIRE	⊙	⊙
MAST ARM	⊙	⊙
MICROWAVE DETECTION	⊙	⊙
OPTICOM RECEIVER	⊙	⊙
OVERHEAD SIGNING	⊙	⊙
PEDESTRIAN POLE/BASE	⊙	⊙
PEDESTRIAN PUSHBUTTON	⊙	⊙
PEDESTRIAN SIGNAL HEAD	⊙	⊙
RIGHT-OF-WAY	---	---
SERVICE PEDESTAL	⊙	⊙
SIGNAL CABINET	⊙	⊙
SIGNAL HEAD	⊙	⊙
SIGNAL POLE/BASE	⊙	⊙
SPAN INSULATOR	⊙	⊙
SPAN WIRE	---	---
UTILITY POLE	⊙	⊙
CAMERA (CCTV)	⊙	⊙

**GENERAL SIGNAL NOTES**

- ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
- POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
- PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
- ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
- ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
- CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

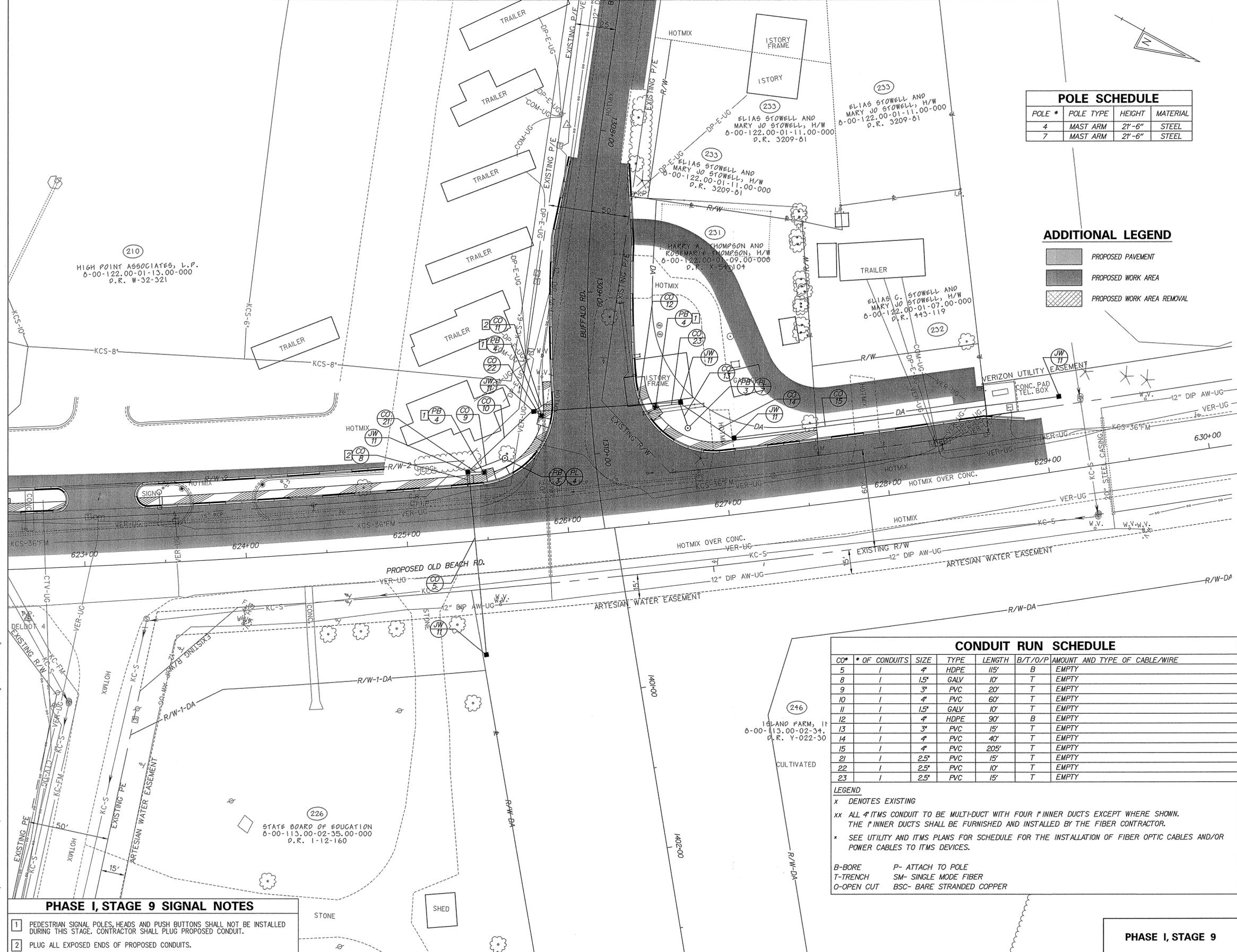
RECOMMENDED \_\_\_\_\_ DATE: \_\_\_\_\_ RECOMMENDED Max SAWITZ DATE: 12/5/14 RECOMMENDED B. D. D. DATE: 12/2/14 APPROVED TRAFFIC ENGINEER John C. H. DATE: 12/5/14 APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER W. J. DATE: 12/9/14



ADDENDUM / REVISIONS

**SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION**

CONTRACT	PERMIT NO.	<b>K145</b>	<b>SIGNAL PLAN</b>	SHEET NO.
T200412202				608
COUNTY	DESIGNED BY:	MSK	<b>SR1 @ BOWERS BEACH RD</b>	TOTAL SHTS.
KENT	CHECKED BY:	BAM		641



**POLE SCHEDULE**

POLE #	POLE TYPE	HEIGHT	MATERIAL
4	MAST ARM	21'-6"	STEEL
7	MAST ARM	21'-6"	STEEL

**ADDITIONAL LEGEND**

[Pattern]	PROPOSED PAVEMENT
[Pattern]	PROPOSED WORK AREA
[Pattern]	PROPOSED WORK AREA REMOVAL

**SIGNAL PHASING**

**SIGNAL HEAD DIAGRAM**

**LEGEND**

(AB)	ABANDON	(OH*)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
(CA)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	(OH)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
(CA)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	(PB)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(CO)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	(PB)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(CO)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	(PL)	EXISTING POLE IDENTIFIER (* OF POLE)
(JW)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(PL)	PROPOSED POLE IDENTIFIER (* OF POLE)
(JW)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(RM)	REMOVE BY CONTRACTOR
(MA)	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM)	REMOVE BY OTHERS
(MA)	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM)	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	[Symbol]	[Symbol]
LOOP DETECTOR, TYPE 2	[Symbol]	[Symbol]
LUMINAIRE	[Symbol]	[Symbol]
MAST ARM	[Symbol]	[Symbol]
MICROWAVE DETECTION	[Symbol]	[Symbol]
OPTICOM RECEIVER	[Symbol]	[Symbol]
OVERHEAD SIGNING	[Symbol]	[Symbol]
PEDESTRIAN POLE/BASE	[Symbol]	[Symbol]
PEDESTRIAN PUSHBUTTON	[Symbol]	[Symbol]
PEDESTRIAN SIGNAL HEAD	[Symbol]	[Symbol]
RIGHT-OF-WAY	[Symbol]	[Symbol]
SERVICE PEDESTAL	[Symbol]	[Symbol]
SIGNAL CABINET	[Symbol]	[Symbol]
SIGNAL HEAD	[Symbol]	[Symbol]
SIGNAL POLE/BASE	[Symbol]	[Symbol]
SPAN INSULATOR	[Symbol]	[Symbol]
SPAN WIRE	[Symbol]	[Symbol]
UTILITY POLE	[Symbol]	[Symbol]
CAMERA (CCTV)	[Symbol]	[Symbol]

**GENERAL SIGNAL NOTES**

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- PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
- ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
- ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MSU UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
- CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

**CONDUIT RUN SCHEDULE**

CO#	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
5	1	4"	HDPE	115'	B	EMPTY
8	1	15"	GALV	10'	T	EMPTY
9	1	3"	PVC	20'	T	EMPTY
10	1	4"	PVC	60'	T	EMPTY
11	1	15"	GALV	10'	T	EMPTY
12	1	4"	HDPE	90'	B	EMPTY
13	1	3"	PVC	15'	T	EMPTY
14	1	4"	PVC	40'	T	EMPTY
15	1	4"	PVC	205'	T	EMPTY
21	1	2.5"	PVC	15'	T	EMPTY
22	1	2.5"	PVC	10'	T	EMPTY
23	1	2.5"	PVC	15'	T	EMPTY

**LEGEND**  
 x DENOTES EXISTING  
 xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.  
 \* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE      P- ATTACH TO POLE  
 T-TRENCH    SM- SINGLE MODE FIBER  
 O-OPEN CUT   BSC- BARE STRANDED COPPER

**PHASE I, STAGE 9 SIGNAL NOTES**

- PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE. CONTRACTOR SHALL PLUG PROPOSED CONDUIT.
- PLUG ALL EXPOSED ENDS OF PROPOSED CONDUITS.

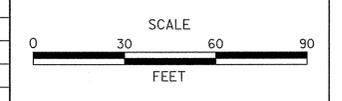
**PHASE I, STAGE 9**

RECOMMENDED \_\_\_\_\_ DATE: \_\_\_\_\_      RECOMMENDED *[Signature]* DATE: 12/5/14      RECOMMENDED *[Signature]* DATE: 12/2/14      APPROVED TRAFFIC ENGINEER *[Signature]* DATE: 12/5/14      APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER *[Signature]* DATE: 12/9/14



ADDENDUM / REVISIONS

NO.	DESCRIPTION



**SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION**

CONTRACT	PERMIT NO.	<b>K303</b>	<b>SIGNAL PLAN</b>	SHEET NO.
T200412202	DESIGNED BY:	MSK		609
COUNTY	CHECKED BY:	BAM		TOTAL SHTS.
KENT			<b>CLAPHAM ROAD @ BUFFALO RD</b>	641

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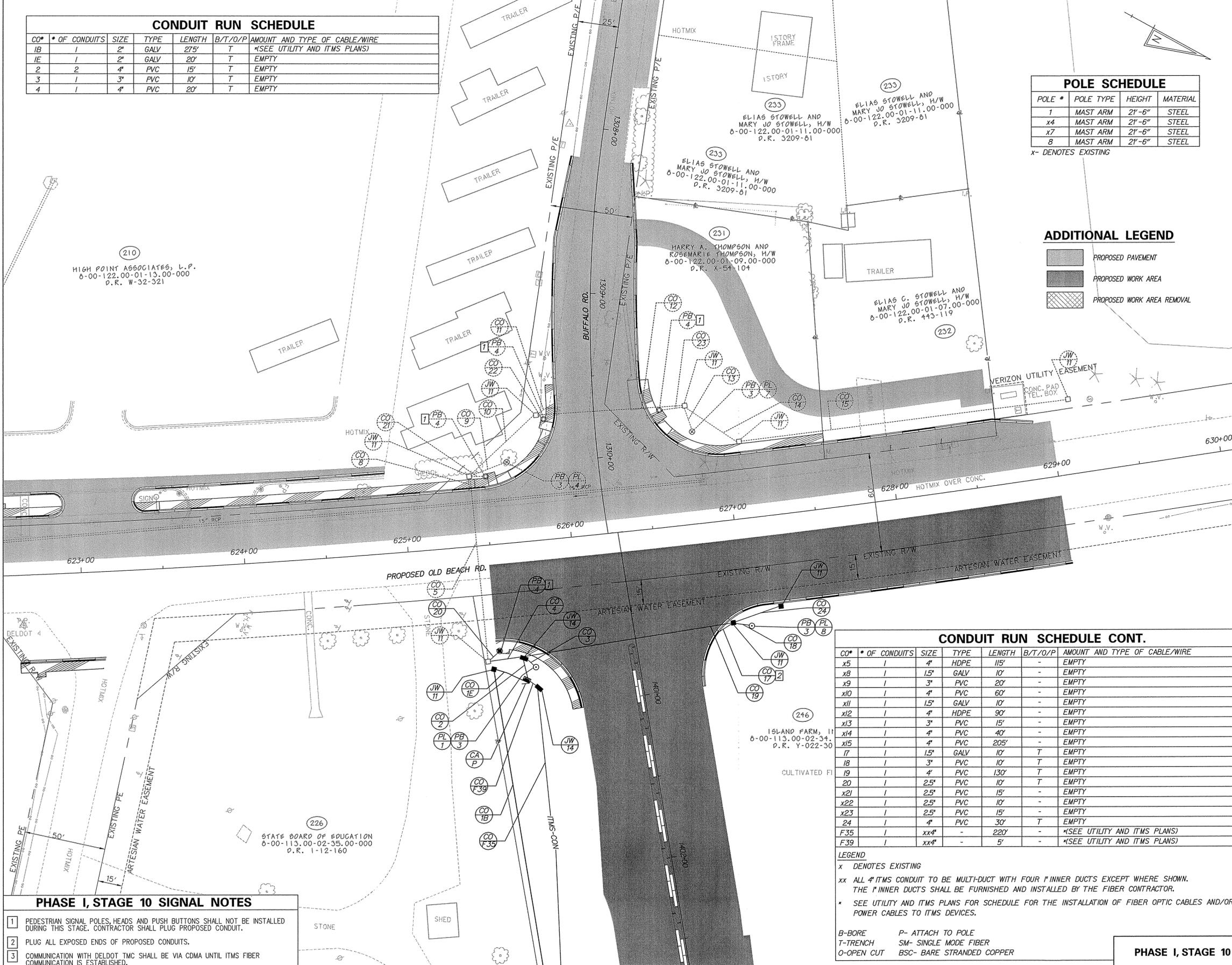
CONDUIT RUN SCHEDULE						
CO#	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
1B	1	2"	GALV	275'	T	*SEE UTILITY AND ITMS PLANS
1E	1	2"	GALV	20'	T	EMPTY
2	2	4"	PVC	15'	T	EMPTY
3	1	3"	PVC	10'	T	EMPTY
4	1	4"	PVC	20'	T	EMPTY

POLE SCHEDULE			
POLE #	POLE TYPE	HEIGHT	MATERIAL
1	MAST ARM	21'-6"	STEEL
x4	MAST ARM	21'-6"	STEEL
x7	MAST ARM	21'-6"	STEEL
8	MAST ARM	21'-6"	STEEL

x- DENOTES EXISTING

**ADDITIONAL LEGEND**

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL



CONDUIT RUN SCHEDULE CONT.						
CO#	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x5	1	4"	HDPE	115'	-	EMPTY
x8	1	1.5"	GALV	10'	-	EMPTY
x9	1	3"	PVC	20'	-	EMPTY
x10	1	4"	PVC	60'	-	EMPTY
x11	1	1.5"	GALV	10'	-	EMPTY
x12	1	4"	HDPE	90'	-	EMPTY
x13	1	3"	PVC	15'	-	EMPTY
x14	1	4"	PVC	40'	-	EMPTY
x15	1	4"	PVC	205'	-	EMPTY
17	1	1.5"	GALV	10'	T	EMPTY
18	1	3"	PVC	10'	T	EMPTY
19	1	4"	PVC	130'	T	EMPTY
20	1	2.5"	PVC	10'	T	EMPTY
x21	1	2.5"	PVC	15'	-	EMPTY
x22	1	2.5"	PVC	10'	-	EMPTY
x23	1	2.5"	PVC	15'	-	EMPTY
24	1	4"	PVC	30'	T	EMPTY
F35	1	xx4"	-	220'	-	*SEE UTILITY AND ITMS PLANS
F39	1	xx4"	-	5'	-	*SEE UTILITY AND ITMS PLANS

- LEGEND**
- x DENOTES EXISTING
  - xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.
  - \* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.
- B-BORE P- ATTACH TO POLE  
 T-TRENCH SM- SINGLE MODE FIBER  
 O-OPEN CUT BSC- BARE STRANDED COPPER

SIGNAL PHASING	
SIGNAL HEAD DIAGRAM	

LEGEND		
	ABANDON	
	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	
	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	
	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	
	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	
	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	
	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	
	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	
	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	
	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)	
	PROPOSED OVERHEAD RUN IDENTIFIER (TYPE OF OVERHEAD RUN)	
	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)	
	PROPOSED POLE BASE IDENTIFIER (* OF POLE)	
	EXISTING POLE IDENTIFIER (* OF POLE)	
	PROPOSED POLE IDENTIFIER (* OF POLE)	
	REMOVE BY CONTRACTOR	
	REMOVE BY OTHERS	
	REMOVE BY TRAFFIC CONTRACTOR	

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL		
LOOP DETECTOR, TYPE 1		
LOOP DETECTOR, TYPE 2		
LUMINAIRE		
MAST ARM		
MICROWAVE DETECTION		
OPTICOM RECEIVER		
OVERHEAD SIGNING		
PEDESTRIAN POLE/BASE		
PEDESTRIAN PUSHBUTTON		
PEDESTRIAN SIGNAL HEAD		
RIGHT-OF-WAY		
SERVICE PEDESTAL		
SIGNAL CABINET		
SIGNAL HEAD		
SIGNAL POLE/BASE		
SPAN INSULATOR		
SPAN WIRE		
UTILITY POLE		
CAMERA (CCTV)		

- GENERAL SIGNAL NOTES**
- ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
  - POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
  - PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJACENT LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
  - ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
  - ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
  - CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

- PHASE I, STAGE 10 SIGNAL NOTES**
- PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE. CONTRACTOR SHALL PLUG PROPOSED CONDUIT.
  - PLUG ALL EXPOSED ENDS OF PROPOSED CONDUITS.
  - COMMUNICATION WITH DELDOT TMC SHALL BE VIA CDMA UNTIL ITMS FIBER COMMUNICATION IS ESTABLISHED.

RECOMMENDED \_\_\_\_\_ DATE: \_\_\_\_\_ RECOMMENDED *John Saindl* DATE: 12/5/14 RECOMMENDED *[Signature]* DATE: 12/2/14 APPROVED TRAFFIC ENGINEER *[Signature]* DATE: 12/5/14 APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER *[Signature]* DATE: 12/9/14



ADDENDUM / REVISIONS

SCALE 0 30 60 90 FEET

**SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION**

CONTRACT	T200412202	PERMIT NO.	K303	SIGNAL PLAN	SHEET NO.	610	
COUNTY	KENT	DESIGNED BY:	MSK		CLAPHAM ROAD @ BUFFALO RD	TOTAL SHTS.	641
CHECKED BY:	BAM						

12/2/2014 6:41 PM G:\PROJECTS\03517.00 (DELDOT AGMT 1223 DOTS Open Enr)\03517.16 SR1, LITTLE HEAVEN FINAL DESIGN.DGN Files\signal\_burford02.dgn

### CONDUIT RUN SCHEDULE

CO#	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
1	1	2"	GALV	15'	T	(1)2"/8 U.F.W./GROUND
1A	1	2"	GALV	235'	T	(1)2"/8 U.F.W./GROUND
x1B	1	2"	GALV	275'	-	*SEE UTILITY & ITMS PLANS
x1E	1	2"	GALV	20'	-	NEW (1)2"/8 U.F.W./GROUND
x2	2	4"	PVC	15'	-	NEW (8)2"/14 (3)4"/18 (3)3"/14 (1)*6 BSC
x3	1	3"	PVC	10'	-	NEW (1)4"/18 (1)3"/14 (1)*6 BSC
x4	1	4"	PVC	20'	-	NEW (4)2"/14 (1)4"/18 (2)3"/14 (1)*6 BSC

### MAST ARM SCHEDULE

MA#	LENGTH OF ARM	* OF SIGNAL HEADS	* OF OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
1	60'	2	1	-	20'-0"
2	60'	4	-	-	20'-0"
3	60'	3	1	-	20'-0"
4	60'	-	1	-	20'-0"

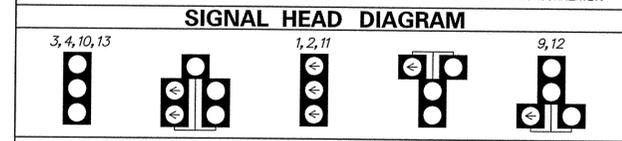
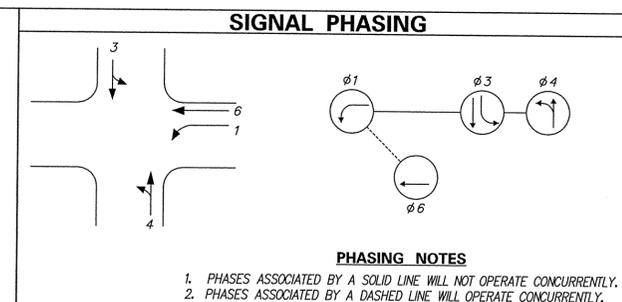
### POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
x1	MAST ARM	21'-6"	STEEL
x4	MAST ARM	21'-6"	STEEL
x7	MAST ARM	21'-6"	STEEL
x8	MAST ARM	21'-6"	STEEL

x- DENOTES EXISTING

### ADDITIONAL LEGEND

- PROPOSED PAVEMENT
- PROPOSED WORK AREA
- PROPOSED WORK AREA REMOVAL



### LEGEND

Symbol	Description	Symbol	Description
(AB)	ABANDON	(OH)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
(CA)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	(OH)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
(CA)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	(PB)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(CO)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	(PB)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(CO)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	(PL)	EXISTING POLE IDENTIFIER (* OF POLE)
(JW)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(PL)	PROPOSED POLE IDENTIFIER (* OF POLE)
(JW)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(RM)	REMOVE BY CONTRACTOR
(MA)	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM)	REMOVE BY OTHERS
(MA)	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM)	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	□	□
LOOP DETECTOR, TYPE 2	□	□
LUMINAIRE	⬆	⬆
MAST ARM	⬆	⬆
MICROWAVE DETECTION	⬆	⬆
OPTICOM RECEIVER	○	○
OVERHEAD SIGNING	⬆	⬆
PEDESTRIAN POLE/BASE	⊙	⊙
PEDESTRIAN PUSHBUTTON	⬆	⬆
PEDESTRIAN SIGNAL HEAD	⬆	⬆
RIGHT-OF-WAY	---	---
SERVICE PEDESTAL	⊞	⊞
SIGNAL CABINET	⊞	⊞
SIGNAL HEAD	⬆	⬆
SIGNAL POLE/BASE	⊙	⊙
SPAN INSULATOR	◇	◇
SPAN WIRE	—XX—	—XX—
UTILITY POLE	⊙	⊙
CAMERA (CCTV)	⬆	⬆

- ### GENERAL SIGNAL NOTES
- ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
  - POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
  - PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
  - ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
  - ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
  - CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

### CONDUIT RUN SCHEDULE CONT.

CO#	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x5	1	4"	HDPE	115'	-	EXISTING [(4)2"/14 (1)4"/18 (2)3"/14] NEW [(3)2"/14 (1)4"/18 (3)3"/14 (1)*6 BSC]
6	1	4"	PVC	190'	T	EMPTY
7	1	1.5"	GALV	15'	T	EMPTY
x8	1	1.5"	GALV	10'	-	EMPTY
x9	1	3"	PVC	20'	-	NEW (1)3"/14 (1)*6 BSC
x10	1	4"	PVC	60'	-	NEW (4)2"/14 (1)4"/18 (1)3"/14 (1)*6 BSC
x11	1	1.5"	GALV	10'	-	NEW (2)1"/14
x12	1	4"	HDPE	90'	-	NEW (3)2"/14 (1)4"/18 (1)3"/14 (1)*6 BSC
x13	1	3"	PVC	15'	-	NEW (1)4"/18 (1)3"/14 (1)*6 BSC
x14	1	4"	PVC	40'	-	NEW (3)2"/14 (1)*6 BSC
x15	1	4"	PVC	205'	-	NEW (1)2"/14 (1)*6 BSC
16	1	1.5"	GALV	10'	T	NEW (2)1"/14
x17	1	1.5"	GALV	10'	-	NEW (4)1"/18
x18	1	3"	PVC	10'	-	NEW (1)4"/18
x19	1	4"	PVC	130'	-	NEW (4)2"/14 (1)4"/18 (1)*6 BSC
x20	1	2.5"	PVC	10'	-	EMPTY
x21	1	2.5"	PVC	15'	-	EMPTY
x22	1	2.5"	PVC	10'	-	EMPTY
x23	1	2.5"	PVC	15'	-	EMPTY
x24	1	4"	PVC	30'	-	NEW (4)1"/14
xF35	1	xx"	-	220'	-	*SEE UTILITY AND ITMS PLANS
xF39	1	4"	-	5'	-	*SEE UTILITY AND ITMS PLANS

**LEGEND**

x DENOTES EXISTING

xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

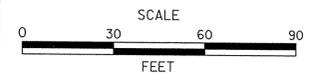
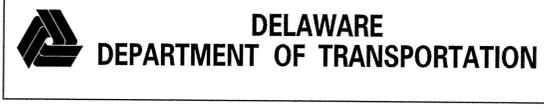
\* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

B-BORE P-ATTACH TO POLE  
 T-TRENCH SM-SINGLE MODE FIBER  
 O-OPEN CUT BSC-BARE STRANDED COPPER

- ### PHASE I, STAGE 13 SIGNAL NOTES
- PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS SHALL NOT BE INSTALLED DURING THIS STAGE. CONTRACTOR SHALL PLUG PROPOSED CONDUIT.
  - EXISTING INTERSECTION OF CLAPHAM ROAD AT SR1 SHALL BE CLOSED DURING THIS STAGE. SOUTHBOUND CLAPHAM ROAD LANE SOUTH OF ITS INTERSECTION WITH BUFFALO ROAD IS OPEN TO LOCAL TRAFFIC ONLY. THERE IS NO ACCESS TO SR1 SOUTH OF THIS INTERSECTION FOR THROUGH TRAFFIC. SOUTHBOUND TRAFFIC TO SR1 AT THIS INTERSECTION MUST USE THE NEW PROPOSED RAMP
  - PLUG ALL EXPOSED ENDS OF PROPOSED CONDUITS.
  - SIGNAL HEAD #11 SHALL BE NON-OPERATIONAL AND COVERED DURING PHASE I, STAGE 13.
  - COMMUNICATION WITH DELDOT TMC SHALL BE VIA CDMA UNTIL ITMS FIBER COMMUNICATION IS ESTABLISHED

**PHASE I, STAGE 13**

RECOMMENDED \_\_\_\_\_ DATE: \_\_\_\_\_ RECOMMENDED *[Signature]* DATE: 12/5/14 RECOMMENDED *[Signature]* DATE: 12/2/14 APPROVED TRAFFIC ENGINEER *[Signature]* DATE: 12/14 APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER *[Signature]* DATE: 12/19/14



**SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION**

CONTRACT	PERMIT NO.	<b>K303</b>	<b>SIGNAL PLAN</b>	SHEET NO.
T200412202	DESIGNED BY:	MSK	<b>CLAPHAM ROAD @ BUFFALO RD</b>	611
COUNTY	CHECKED BY:	BAM		TOTAL SHTS.
KENT				

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### CONDUIT RUN SCHEDULE

CO#	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x1	1	2"	GALV	15'	-	EXISTING (1/2"/#8 U.F.W./GROUND)
x1A	1	2"	GALV	235'	-	EXISTING (1/2"/#8 U.F.W./GROUND)
x1B	1	2"	GALV	275'	-	*SEE UTILITY & ITMS PLANS
x1E	1	2"	GALV	20'	-	EXISTING (1/2"/#8 U.F.W./GROUND)
x2	2	4"	PVC	15'	-	EXISTING [(8)2"/#14 (3)4"/#18 (3)9"/#14 (1)6 BSC] NEW [(5)2"/#14 (1)4"/#18 (4)5"/#14 (1)9"/#14]
x3	1	3"	PVC	10'	-	EXISTING (1)4"/#18 (1)9"/#14 (1)6 BSC
x4	1	4"	PVC	20'	-	EXISTING [(4)2"/#14 (1)4"/#18 (2)9"/#14 (1)6 BSC] NEW [(5)2"/#14 (1)4"/#18 (4)5"/#14]

### MAST ARM SCHEDULE

MA#	LENGTH OF ARM	* OF SIGNAL HEADS	* OF OPTICOM RECEIVERS	SF OF SIGNING	ARM MOUNT HEIGHT
1	60'	2	1	12	20'-0"
2	60'	4	1	9	20'-0"
3	60'	3	1	10	20'-0"
4	60'	4	1	18	20'-0"

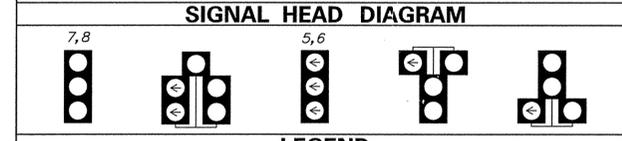
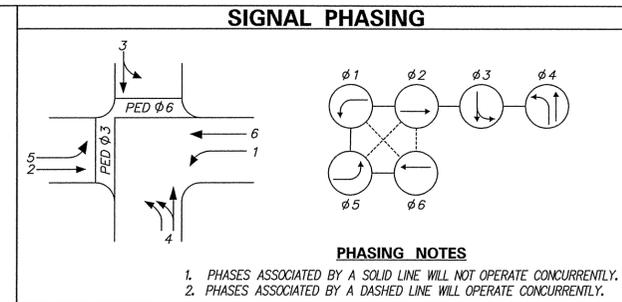
- ### SIGNING LEGEND By State Forces
- REMOVE EXISTING SIGN
  - EXISTING SIGN TO REMAIN
  - PLACE NEW SIGN
  - RENEW EXISTING SIGN
  - REPOSITION EXISTING SIGN

### POLE SCHEDULE

POLE #	POLE TYPE	HEIGHT	MATERIAL
x1	MAST ARM	21'-6"	STEEL
2	PEDESTAL	10'	ALUMINUM
3	PEDESTAL	10'	ALUMINUM
x4	MAST ARM	21'-6"	STEEL
5	PEDESTAL	10'	ALUMINUM
6	PEDESTAL	10'	ALUMINUM
x7	MAST ARM	21'-6"	STEEL
x8	MAST ARM	21'-6"	STEEL

x - DENOTES EXISTING

- ### ADDITIONAL LEGEND
- PROPOSED PAVEMENT
  - PROPOSED WORK AREA
  - PROPOSED WORK AREA REMOVAL



### LEGEND

EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.
LOOP DETECTOR, TYPE 1	[Symbol]
LOOP DETECTOR, TYPE 2	[Symbol]
LUMINAIRE	[Symbol]
MAST ARM	[Symbol]
MICROWAVE DETECTION	[Symbol]
OPTICOM RECEIVER	[Symbol]
OVERHEAD SIGNING	[Symbol]
PEDESTRIAN POLE/BASE	[Symbol]
PEDESTRIAN PUSHBUTTON	[Symbol]
PEDESTRIAN SIGNAL HEAD	[Symbol]
RIGHT-OF-WAY	[Symbol]
SERVICE PEDESTAL	[Symbol]
SIGNAL CABINET	[Symbol]
SIGNAL HEAD	[Symbol]
SIGNAL POLE/BASE	[Symbol]
SPAN INSULATOR	[Symbol]
SPAN WIRE	[Symbol]
UTILITY POLE	[Symbol]
CAMERA (CCTV)	[Symbol]

### GENERAL SIGNAL NOTES

- ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
- POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
- PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
- ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
- ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
- CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

- ### PHASE I, STAGE 15 SIGNAL NOTES
- SLIDE SIGNAL HEADS #3 & #4 TO NEW POSITIONS SHOWN.
  - SIGNAL HEAD #11 SHALL BE UNCOVERED AND MADE OPERATIONAL DURING PHASE I, STAGE 15.
  - INSTALL ALL PEDESTRIAN SIGNAL POLES, HEADS AND PUSH BUTTONS AND ACTIVATE PEDESTRIAN SIGNALS.

### CONDUIT RUN SCHEDULE CONT.

CO#	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
x5	1	4"	HDPE	115'	-	EXISTING [(4)2"/#14 (1)4"/#18 (2)9"/#14] NEW [(3)2"/#14 (1)4"/#18 (3)5"/#14 (1)6 BSC]
x6	1	4"	PVC	190'	-	NEW (2)2"/#14 (1)6 BSC
x7	1	1.5"	GALV	15'	-	NEW (4)1"/#14
x8	1	1.5"	GALV	10'	-	NEW (6)1"/#14
x9	1	3"	PVC	20'	-	EXISTING (1)9"/#14 NEW [(1)4"/#18 (1)6 BSC]
x10	1	4"	PVC	60'	-	NEW (2)5"/#14
x11	1	1.5"	GALV	10'	-	EXISTING (2)1"/#14
x12	1	4"	HDPE	90'	-	NEW (1)5"/#14
x13	1	3"	PVC	15'	-	EXISTING (1)4"/#18 (1)9"/#14 (1)6 BSC
x14	1	4"	PVC	40'	-	EXISTING (3)2"/#14 (1)6 BSC
x15	1	4"	PVC	205'	-	EXISTING (1)2"/#14 (1)6 BSC
x16	1	1.5"	GALV	10'	-	EXISTING (2)2"/#14 (1)6 BSC
x17	1	1.5"	GALV	10'	-	EXISTING (4)1"/#14
x18	1	3"	PVC	10'	-	EXISTING [(1)4"/#18 (1)6 BSC] NEW (1)9"/#14
x19	1	4"	PVC	130'	-	EXISTING [(4)2"/#14 (1)4"/#18 (1)6 BSC] NEW (1)9"/#14
x20	1	2.5"	PVC	10'	-	NEW (1)5"/#14 (1)6 BSC
x21	1	2.5"	PVC	15'	-	NEW (1)5"/#14 (1)6 BSC
x22	1	2.5"	PVC	10'	-	NEW (1)5"/#14 (1)6 BSC
x23	1	2.5"	PVC	15'	-	NEW (1)5"/#14 (1)6 BSC
x24	1	4"	PVC	30'	-	EXISTING (4)1"/#14
xF35	1	xx#	-	220'	-	*SEE UTILITY AND ITMS PLANS
xF39	1	4"	-	5'	-	*SEE UTILITY AND ITMS PLANS

- LEGEND**
- x DENOTES EXISTING
  - xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.
  - \* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.
- B-BORE P- ATTACH TO POLE  
T-TRENCH SM- SINGLE MODE FIBER  
O-OPEN CUT BSC- BARE STRANDED COPPER

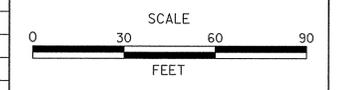
PHASE I, STAGE 15

RECOMMENDED DATE: 12/5/14 RECOMMENDED DATE: 12/2/14 APPROVED TRAFFIC ENGINEER DATE: 12/1/14 APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER DATE: 12/9/14



### ADDENDUM / REVISIONS

NO.	DESCRIPTION



SRI, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	PERMIT NO.	K303	SIGNAL PLAN	SHEET NO.
T200412202	DESIGNED BY:	MSK	CLAPHAM ROAD @ BUFFALO RD	612
COUNTY	CHECKED BY:	BAM		TOTAL SHTS.
KENT				641

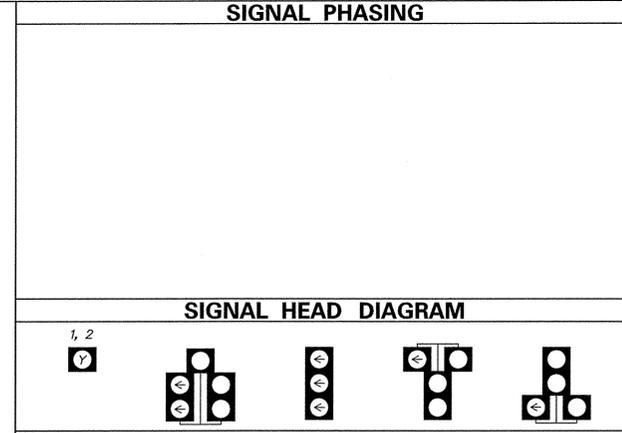
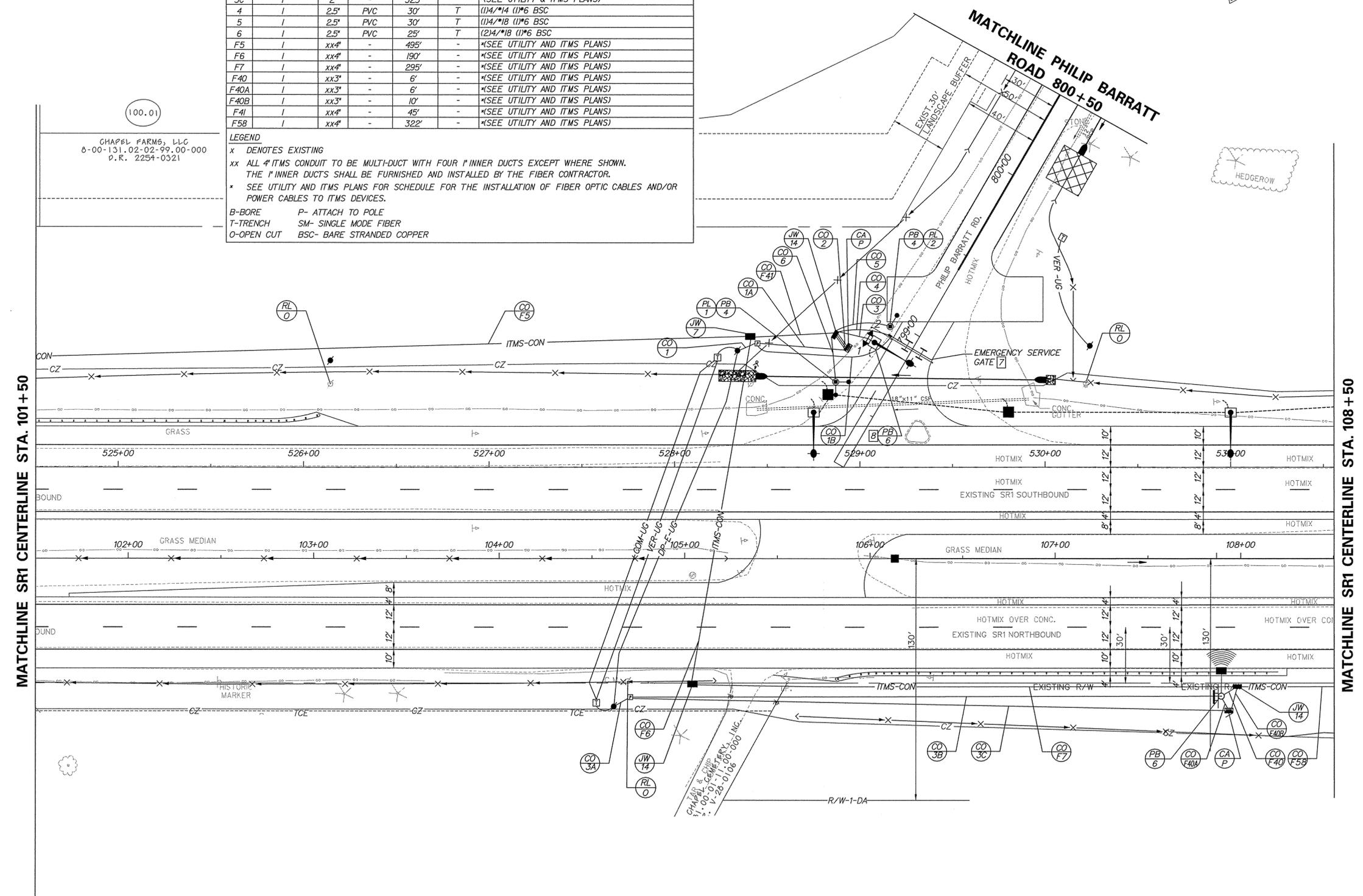
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CONDUIT RUN SCHEDULE CONT.						
CO*	* OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
1	1	2"	GALV	10/30'	T/P	(1)2"/8 U.F.W./GROUND *SEE UTILITY & ITMS PLANS
1A	1	2"	GALV	45'	T	(1)2"/8 U.F.W./GROUND *SEE UTILITY & ITMS PLANS
1B	1	2"	GALV	80'	T	*SEE UTILITY & ITMS PLANS
2	3	4"	PVC	10'	T	(3)4"/18 (1)4"/14 (1)3"/14 *1/2 CNT SM (1)*6 BSC
3	1	2.5"	PVC	15'	T	(1)3"/14 (1)*6 BSC
3A	1	2"	-	10'	-	*SEE UTILITY & ITMS PLANS
3B	1	2"	-	320'	-	*SEE UTILITY & ITMS PLANS
3C	1	2"	-	325'	-	*SEE UTILITY & ITMS PLANS
4	1	2.5"	PVC	30'	T	(1)4"/14 (1)*6 BSC
5	1	2.5"	PVC	30'	T	(1)4"/18 (1)*6 BSC
6	1	2.5"	PVC	25'	T	(2)4"/18 (1)*6 BSC
F5	1	xx#	-	495'	-	*SEE UTILITY AND ITMS PLANS
F6	1	xx#	-	190'	-	*SEE UTILITY AND ITMS PLANS
F7	1	xx#	-	295'	-	*SEE UTILITY AND ITMS PLANS
F40	1	xx3"	-	6'	-	*SEE UTILITY AND ITMS PLANS
F40A	1	xx3"	-	6'	-	*SEE UTILITY AND ITMS PLANS
F40B	1	xx3"	-	10'	-	*SEE UTILITY AND ITMS PLANS
F41	1	xx#	-	45'	-	*SEE UTILITY AND ITMS PLANS
F58	1	xx#	-	322'	-	*SEE UTILITY AND ITMS PLANS

POLE SCHEDULE			
POLE #	POLE TYPE	HEIGHT	MATERIAL
1	PEDESTAL	14'	ALUMINUM
2	PEDESTAL	14'	ALUMINUM

**LEGEND**  
 x DENOTES EXISTING  
 xx ALL 4" ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR 1" INNER DUCTS EXCEPT WHERE SHOWN. THE 1" INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.  
 \* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.  
 B-BORE P- ATTACH TO POLE  
 T-TRENCH SM- SINGLE MODE FIBER  
 O-OPEN CUT BSC- BARE STRANDED COPPER



LEGEND			
(AB)	ABANDON	(OH)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
(CA)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	(OH)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
(CA)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	(PB)	EXISTING POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(CO)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	(PB)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE BASE)
(CO)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	(PL)	EXISTING POLE IDENTIFIER (* OF POLE)
(JW)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(PL)	PROPOSED POLE IDENTIFIER (* OF POLE)
(JW)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(RM)	REMOVE BY CONTRACTOR
(MA)	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM)	REMOVE BY OTHERS
(MA)	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM)	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	□	□
LOOP DETECTOR, TYPE 2	□	□
LUMINAIRE	⊙	⊙
MAST ARM	⊙	⊙
MICROWAVE DETECTION	⊙	⊙
OPTICOM RECEIVER	⊙	⊙
OVERHEAD SIGNING	⊙	⊙
PEDESTRIAN POLE/BASE	⊙	⊙
PEDESTRIAN PUSHBUTTON	⊙	⊙
PEDESTRIAN SIGNAL HEAD	⊙	⊙
RIGHT-OF-WAY	---	---
SERVICE PEDESTAL	⊙	⊙
SIGNAL CABINET	⊙	⊙
SIGNAL HEAD	⊙	⊙
SIGNAL POLE/BASE	⊙	⊙
SPAN INSULATOR	⊙	⊙
SPAN WIRE	XX	XX
UTILITY POLE	⊙	⊙
CAMERA (CCTV)	⊙	⊙

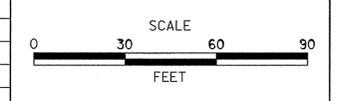
- GENERAL SIGNAL NOTES**
- ALL SIGNAL EQUIPMENT REMOVED FROM A PROJECT IS TO BE RETURNED TO DELDOT TRAFFIC-DOVER, DELAWARE.
  - POLE BASES, CABINET BASE AND CONDUIT JUNCTION WELLS ARE TO BE REMOVED IN ACCORDANCE WITH SECTION 201 AND 202 OF THE STANDARD SPECIFICATIONS OR AS DIRECTED BY ENGINEER. EXISTING CONDUIT IS TO BE ABANDONED.
  - PROPOSED POLE BASES SUPPORTING POLES WITH PEDESTRIAN PUSHBUTTONS SHALL BE CONSTRUCTED IMMEDIATELY ADJACENT TO THE FLAT (50:1 FLATTER) LANDING AREA OF THE CURB RAMP OR SIDEWALK IN ACCORDANCE WITH CURRENT ADA BEST PRACTICES. THESE POLE BASES SHALL BE FLUSH WITH THE ADJOINING LANDING AREA. THE PEDESTRIAN PUSHBUTTON SHOULD BE INSTALLED AT A HEIGHT OF 42 TO 48 INCHES ABOVE THE LANDING AREA/SIDEWALK AND SHALL BE LOCATED SUCH THAT THE MAXIMUM REACH DISTANCE IS 10 INCHES FROM THE LANDING AREA TO THE FACE OF THE PUSHBUTTON. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 7 FEET OR MORE THAN 10 FEET ABOVE SIDEWALK LEVEL.
  - ALL GALVANIZED CONDUIT (GRC) SHALL BE REAMED AND THREADED. ALL GRC SHALL BE THREADED TOGETHER WITH APPROVED COUPLINGS. SET, BOLTED AND COMPRESSION FITTINGS ARE NOT ACCEPTABLE.
  - ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY, AND/OR THE APPROPRIATE UTILITY ENTITY PRIOR TO THE BEGINNING OF CONSTRUCTION FOR THE UTILITY MARKOUTS. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY DELDOT IMMEDIATELY BEFORE CONSTRUCTION.
  - CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

- ADDITIONAL SIGNAL NOTES**
- SIGNAL INSTALLATION TO BE DONE BY DELDOT TRAFFIC CONTRACTOR.
  - THE EMERGENCY SERVICE GATE SIGNAL HEADS SHALL BE MOUNTED ON THE PROPOSED LIGHTING POLE.

RECOMMENDED \_\_\_\_\_ DATE: \_\_\_\_\_ RECOMMENDED Max Saindl DATE: 12/5/14 RECOMMENDED [Signature] DATE: 12/2/14 APPROVED TRAFFIC ENGINEER [Signature] DATE: 12/5/14 APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER [Signature] DATE: 12/9/14



ADDENDUM / REVISIONS	



**SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION**

CONTRACT	PERMIT NO.	<b>K298</b>	<b>SIGNAL PLAN</b> <b>SR1 EMERGENCY EXIT @ OLD BARRATTS CHAPEL RD</b>	SHEET NO.
T200412202	DESIGNED BY:	MSK		614
KENT	CHECKED BY:	BAM		TOTAL SHTS. 641

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**SIGNAL PHASING**

**PHASING NOTES**

- PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
- PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY.

**SIGNAL HEAD DIAGRAM**



**LEGEND**

(AB)	ABANDON	(OP)	EXISTING OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
(CA)	EXISTING CABINET IDENTIFIER (TYPE OF CABINET)	(OR)	PROPOSED OVERHEAD RUN IDENTIFIER (* OF OVERHEAD RUN)
(CA)	PROPOSED CABINET IDENTIFIER (TYPE OF CABINET)	(PB)	EXISTING POLE BASE IDENTIFIER (* OF POLE)
(CO)	EXISTING CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	(PB)	PROPOSED POLE BASE IDENTIFIER (TYPE OF POLE)
(CO)	PROPOSED CONDUIT RUN IDENTIFIER (* OF CONDUIT RUN)	(PI)	EXISTING POLE IDENTIFIER (* OF POLE)
(JW)	EXISTING JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(PI)	PROPOSED POLE IDENTIFIER (* OF POLE)
(JW)	PROPOSED JUNCTION WELL IDENTIFIER (TYPE OF JUNCTION WELL)	(RM)	REMOVE BY CONTRACTOR
(MA)	EXISTING MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM)	REMOVE BY OTHERS
(MA)	PROPOSED MAST ARM IDENTIFIER (LENGTH OF ARM)	(RM)	REMOVE BY TRAFFIC CONTRACTOR

	EXISTING SYMBOL	PROPOSED SYMBOL
JUNCTION WELL	J.W.	■
LOOP DETECTOR, TYPE 1	□	□
LOOP DETECTOR, TYPE 2	□	□
LUMINAIRE	◊	◊
MAST ARM	→	→
MICROWAVE DETECTION	◄	◄
OPTICOM RECEIVER	○	○
OVERHEAD SIGNING	⊥	⊥
PEDESTRIAN POLE/BASE	⊙	⊙
PEDESTRIAN PUSHBUTTON	→	→
PEDESTRIAN SIGNAL HEAD	⊥	⊥
RIGHT-OF-WAY	---	---
SERVICE PEDESTAL	P	P
SIGNAL CABINET	▭	▭
SIGNAL HEAD	→	→
SIGNAL POLE/BASE	⊙	⊙
SPAN INSULATOR	◇	◇
SPAN WIRE	—XX—	—XX—
UTILITY POLE	⊙	⊙
CAMERA (CCTV)	⊥	⊥

**GENERAL SIGNAL NOTES**

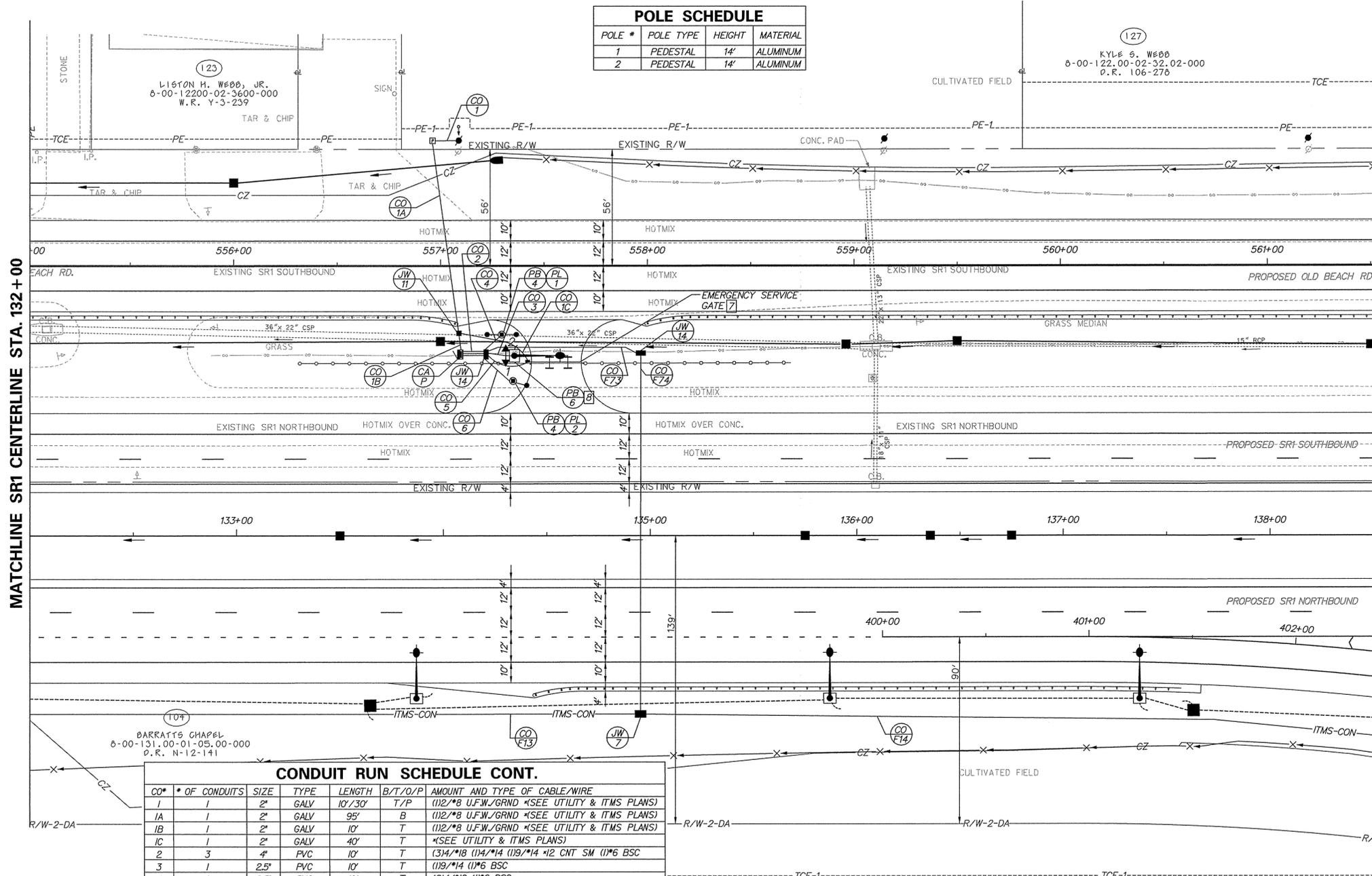
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- CONTRACTOR SHALL COORDINATE WITH TRAFFIC SIGNAL MAINTENANCE FOR THE IDENTIFICATION AND REMOVAL OF ALL UNUSED AND REDUNDANT COPPER CABLE.

**ADDITIONAL SIGNAL NOTES**

- SIGNAL INSTALLATION TO BE DONE BY DELDOT TRAFFIC CONTRACTOR.
- THE EMERGENCY SERVICE GATE SIGNAL HEADS SHALL BE MOUNTED ON THE PROPOSED LIGHTING POLE.

**POLE SCHEDULE**

POLE #	POLE TYPE	HEIGHT	MATERIAL
1	PEDESTAL	14'	ALUMINUM
2	PEDESTAL	14'	ALUMINUM



**CONDUIT RUN SCHEDULE CONT.**

CO#	# OF CONDUITS	SIZE	TYPE	LENGTH	B/T/O/P	AMOUNT AND TYPE OF CABLE/WIRE
1	1	2"	GALV	10'/30'	T/P	(1)2/*8 U.F.W./GRND *(SEE UTILITY & ITMS PLANS)
1A	1	2"	GALV	95'	B	(1)2/*8 U.F.W./GRND *(SEE UTILITY & ITMS PLANS)
1B	1	2"	GALV	10'	T	(1)2/*8 U.F.W./GRND *(SEE UTILITY & ITMS PLANS)
1C	1	2"	GALV	40'	T	*(SEE UTILITY & ITMS PLANS)
2	3	4"	PVC	10'	T	(3)14/*18 (1)14/*14 (1)9/*14 *12 CNT SM (1)*6 BSC
3	1	2.5"	PVC	10'	T	(1)9/*14 (1)*6 BSC
4	1	2.5"	PVC	10'	T	(2)14/*18 (1)*6 BSC
5	1	2.5"	PVC	20'	T	(1)14/*14 (1)*6 BSC
6	1	2.5"	PVC	15'	T	(1)14/*18 (1)*6 BSC
F13	1	xx#	-	595'	-	*(SEE UTILITY AND ITMS PLANS)
F14	1	xx#	-	505'	-	*(SEE UTILITY AND ITMS PLANS)
F73	1	xx#	-	75'	-	*(SEE UTILITY AND ITMS PLANS)
F74	1	xx#	-	175'	-	*(SEE UTILITY AND ITMS PLANS)

**LEGEND**

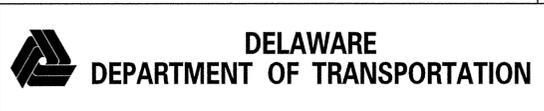
x DENOTES EXISTING

xx ALL # ITMS CONDUIT TO BE MULTI-DUCT WITH FOUR # INNER DUCTS EXCEPT WHERE SHOWN. THE # INNER DUCTS SHALL BE FURNISHED AND INSTALLED BY THE FIBER CONTRACTOR.

\* SEE UTILITY AND ITMS PLANS FOR SCHEDULE FOR THE INSTALLATION OF FIBER OPTIC CABLES AND/OR POWER CABLES TO ITMS DEVICES.

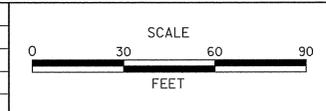
B-BORE P- ATTACH TO POLE  
 T-TRENCH SM- SINGLE MODE FIBER  
 O-OPEN CUT BSC- BARE STRANDED COPPER

RECOMMENDED \_\_\_\_\_ DATE: \_\_\_\_\_ RECOMMENDED *Max SAINTIL* DATE: *12/5/14* RECOMMENDED *R. D. ...* DATE: *12/2/14* APPROVED TRAFFIC ENGINEER *John C. ...* DATE: *12/5/14* APPROVED FOR INSTALLATION CHIEF TRAFFIC ENGINEER *Neil ...* DATE: *12/9/14*



ADDENDUM / REVISIONS

NO.	DATE	DESCRIPTION



**SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION**

CONTRACT	PERMIT NO.	<b>K299</b>
T200412202	DESIGNED BY:	MSK
COUNTY	CHECKED BY:	BAM
KENT		

<b>SIGNAL PLAN</b>		SHEET NO.
<b>SR1 SB EMERGENCY EXIT @ OLD BEACH RD</b>		615
		TOTAL SHTS.
		641

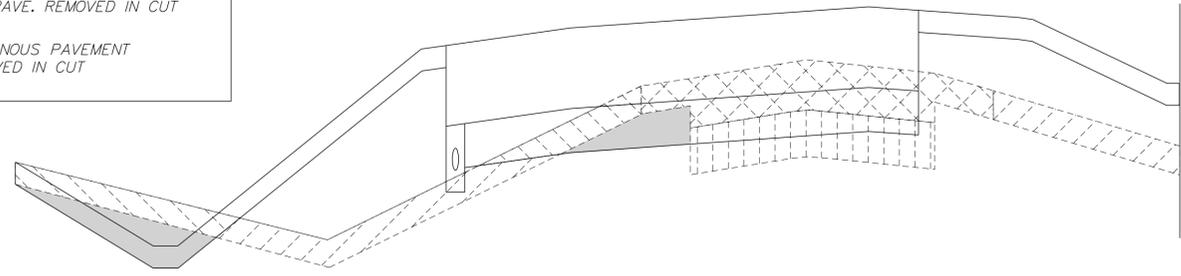
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**LEGEND**

[Solid Grey]	EXCAVATION
[Diagonal Lines /]	TOPSOIL REMOVED IN CUT
[Diagonal Lines \]	TOPSOIL REMOVED UNDER FILL
[Dashed Lines]	PCC PAVE. REMOVED IN CUT
[Cross-hatch]	BITUMINOUS PAVEMENT REMOVED IN CUT

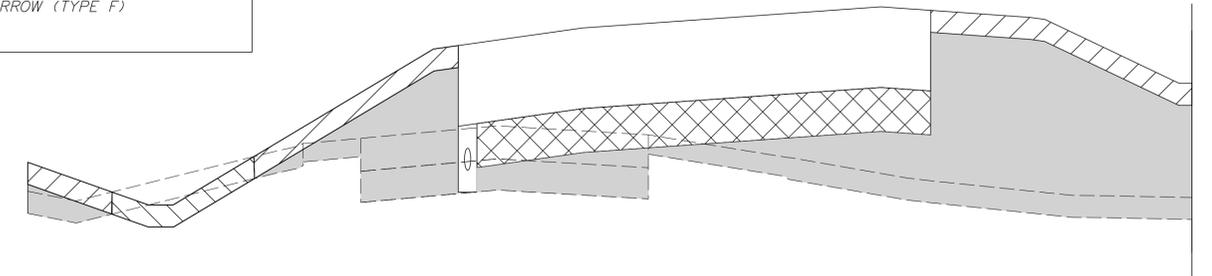
**MATERIAL REMOVED DETAIL**  
N. T. S.



**LEGEND**

[Diagonal Lines /]	TOPSOIL PLACED IN CUT
[Diagonal Lines \]	TOPSOIL PLACED IN FILL
[Cross-hatch]	BORROW (TYPE A)
[Solid Grey]	BORROW (TYPE F)

**MATERIAL PLACED DETAIL**  
N. T. S.



\* ALL VALUES SHOWN ARE IN CUBIC YARDS.

	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	TOTAL
<b>EXCAVATION</b>						
1 FROM CROSS SECTIONS ("TOPSOIL PLACED IN CUT" INCLUDED AND "PCC REMOVED IN CUT AND UNDER FILL" OMITTED)						
A SR 1	11,219.67	5,014.04	20,658.68	32,241.49	0.00	69,133.89
B CLAPHAM ROAD/OLD BEACH ROAD	15,996.23	9,226.58	0.00	0.00	14,603.46	39,826.27
C LITTLE HEAVEN ROAD	0.00	0.00	14,978.67	0.00	0.00	14,978.67
D RAMP A	8,223.55	0.00	0.00	0.00	0.00	8,223.55
E RAMP B	20,301.43	0.00	0.00	0.00	0.00	20,301.43
F PROPOSED BARRATTS CHAPEL ROAD	0.00	18,271.56	0.00	0.00	0.00	18,271.56
G PHILIP BARRATT ROAD	0.00	2,269.93	0.00	0.00	0.00	2,269.93
H OLD BARRATTS CHAPEL DRIVE	0.00	527.56	0.00	0.00	0.00	527.56
I BOWERS BEACH ROAD	0.00	0.00	3,597.87	0.00	0.00	3,597.87
J BUFFALO ROAD	1,108.00	0.00	0.00	0.00	0.00	1,108.00
K MULBERRIE POINT ROAD	0.00	0.00	1,644.40	0.00	0.00	1,644.40
L MULBERRIE POINT CONNECTOR ROAD	0.00	0.00	2,779.34	0.00	0.00	2,779.34
M SOUTH SKEETER NECK ROAD	0.00	0.00	315.12	0.00	0.00	315.12
<b>INTERSECTIONS:</b>						
N BOWERS BEACH ROAD AND OLD BEACH ROAD	0.00	0.00	0.00	0.00	1,080.07	1,080.07
O BOWERS BEACH ROAD AND LITTLE HEAVEN ROAD	0.00	0.00	365.67	0.00	0.00	365.67
P CLAPHAM ROAD AND BUFFALO ROAD	1,052.72	0.00	0.00	0.00	0.00	1,052.72
Q MULBERRIE POINT CONNECTOR ROAD AND LITTLE HEAVEN ROAD	0.00	0.00	8.42	0.00	0.00	8.42
SUBTOTAL FROM CROSS SECTIONS (SUM OF LINES A THRU Q)	57,901.60	35,309.67	44,348.16	32,241.49	15,683.54	185,484.45
2 PLUS TOPSOIL REMOVED UNDER FILL	5,365.65	5,069.54	14,386.86	18,923.92	3,568.14	47,314.11
3 PLUS TOPSOIL REMOVED IN CUT	4,654.63	6,492.94	7,071.14	5,343.92	1,818.84	25,381.47
4 PLUS BITUMINOUS PAVEMENT REMOVED (CUT AND FILL)	3,055.11	1,143.98	1,623.90	21,322.63	3,311.67	30,457.30
5 LESS ROOTMAT REMOVED IN CUT (NOT INCLUDED IN CROSS SECTIONS)	0.00	0.00	0.00	0.00	0.00	0.00
6 LESS ROCK EXCAVATION	0.00	0.00	0.00	0.00	0.00	0.00
7 TOTAL ITEM 202000 - EXCAVATION AND EMBANKMENT	70,977.00	48,016.14	67,430.05	77,831.96	24,382.19	288,637.33
<b>STORMWATER MANAGEMENT POND AND WETLAND MITIGATION</b>						
8 FROM CROSS SECTIONS	47,011.00	45,407.00	7,570.00	10,252.00	0.00	110,240.00
9 PLUS TOPSOIL REMOVED IN CUT AND UNDER FILL	4,376.00	3,790.00	784.00	4,651.00	0.00	13,601.00
10 PLUS TOPSOIL PLACED IN CUT	3,826.00	1,556.00	640.00	4,385.00	0.00	10,407.00
11 PLUS OVEREXCAVATION FOR SEDIMENTATION	0.00	0.00	0.00	0.00	0.00	0.00
12 LESS ROOTMAT REMOVED IN CUT	0.00	0.00	0.00	0.00	0.00	0.00
13 LESS ROCK EXCAVATION	0.00	0.00	0.00	0.00	0.00	0.00
14 TOTAL ITEM 271000 - STORMWATER MANAGEMENT POND	55,213.00	50,753.00	8,994.00	19,288.00	0.00	134,248.00
<b>EXCAVATION AVAILABLE FOR EMBANKMENT</b>						
15 TOTAL EXCAVATION AND EMBANKMENT QUANTITY (ITEM 202000 - LINE 7)	70,977.00	48,016.14	67,430.05	77,831.96	24,382.19	288,637.33
16 PLUS STORMWATER MANAGEMENT POND EXCAVATION (ITEM 271000 - LINE 14)	55,213.00	50,753.00	8,994.00	19,288.00	0.00	134,248.00
17 PLUS EXCAVATION AND BACKFILL FOR STRUCTURES (ITEM 207000)	1,392.00	0.00	0.00	660.00	0.00	2,052.00
18 PLUS EXCAVATION AND EMBANKMENT FOR PIPE TRENCHES (ITEM 208000)	3,841.00	2,677.00	6,540.00	5,140.00	888.00	19,086.00
19 LESS TOPSOIL REMOVED UNDER FILL (LINE 2)	5,365.65	5,069.54	14,386.86	18,923.92	3,568.14	47,314.11
20 LESS TOPSOIL REMOVED IN CUT (LINE 3)	4,654.63	6,492.94	7,071.14	5,343.92	1,818.84	25,381.47
21 LESS TOPSOIL REMOVED FROM STORMWATER MANAGEMENT PONDS (LINE 9)	4,376.00	3,790.00	784.00	4,651.00	0.00	13,601.00
22 LESS BITUMINOUS PAVEMENT REMOVED IN CUT AND UNDER FILL (LINE 4)	3,055.11	1,143.98	1,623.90	21,322.63	3,311.67	30,457.30
23 LESS UNSUITABLE EXCAVATION	2,895.08	1,765.48	2,217.41	1,612.07	784.18	9,274.22
24 LESS MATERIALS USED FOR BORROW TYPE A	20,000.00	18,585.22	0.00	0.00	0.00	38,585.22
25 EXCAVATION AVAILABLE FOR EMBANKMENT FROM THIS PHASE	91,076.52	64,598.96	56,880.75	51,066.42	15,787.36	279,410.01
<b>BORROW, TYPE A</b>						
26 BORROW, TYPE A FOR CAPPING	12,716.99	9,199.09	24,901.14	35,919.16	6,763.81	89,500.18
27 PLUS CAPPING REQUIRED X ADJUSTMENT FACTOR (0.12±)	1,526.04	1,103.89	2,988.14	4,310.30	811.66	10,740.02
28 TOTAL ADJUSTED BORROW, TYPE A REQUIRED	14,243.02	10,302.98	27,889.28	40,229.46	7,575.46	100,240.20
<b>BORROW, TYPE B</b>						
29 BACKFILL FOR MUCK EXCAVATION	3,920.09	0.00	972.83	0.00	0.00	4,892.93
30 PLUS CAPPING REQUIRED X ADJUSTMENT FACTOR (0.20±)	748.02	0.00	194.57	0.00	0.00	978.59
31 TOTAL ADJUSTED BORROW, TYPE B REQUIRED	4,704.11	0.00	1,167.40	0.00	0.00	5,871.51
<b>FURNISHING BORROW, TYPE C</b>						
32 FOR PIPE TRENCH BACKFILL AND STRUCTURE BACKFILL (ITEM 210000)	3,709.68	2,389.34	6,546.68	5,256.00	867.20	18,768.90
33 PLUS BORROW, TYPE C REQUIRED X ADJUSTMENT FACTOR (0.30±)	1,112.90	716.80	1,964.00	1,576.80	260.16	5,630.67
34 TOTAL ADJUSTED BORROW, TYPE C REQUIRED	4,822.58	3,106.14	8,510.68	6,832.80	1,127.36	24,399.57

	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	TOTAL
<b>EMBANKMENT</b>						
35 EMBANKMENT REQUIRED BELOW CAPPING						
A SR 1	5,009.33	584.59	7,555.69	173,717.38	0.00	186,866.99
B PROPOSED CLAPHAM ROAD/OLD BEACH ROAD	3,759.07	1,297.41	0.00	0.00	2,856.20	7,912.68
C LITTLE HEAVEN ROAD	0.00	0.00	18,352.95	0.00	0.00	18,352.95
D RAMP A	222.46	0.00	0.00	0.00	0.00	222.46
E RAMP B	0.00	0.00	0.00	0.00	0.00	0.00
F PROPOSED BARRATTS CHAPEL ROAD	0.00	6,692.45	0.00	0.00	0.00	6,692.45
G PHILIP BARRATT ROAD	0.00	4,884.97	0.00	0.00	0.00	4,884.97
H OLD BARRATTS CHAPEL DRIVE	0.00	536.86	0.00	0.00	0.00	536.86
I BOWERS BEACH ROAD	0.00	0.00	2,644.14	0.00	0.00	2,644.14
J BUFFALO ROAD	87.87	0.00	0.00	0.00	0.00	87.87
K MULBERRIE POINT ROAD	0.00	0.00	16.69	0.00	0.00	16.69
L MULBERRIE POINT CONNECTOR ROAD	0.00	0.00	320.44	0.00	0.00	320.44
M SOUTH SKEETER NECK ROAD	0.00	0.00	439.62	0.00	0.00	439.62
<b>INTERSECTIONS:</b>						
N BOWERS BEACH ROAD AND OLD BEACH ROAD	0.00	0.00	0.00	0.00	797.44	797.44
O BOWERS BEACH ROAD AND LITTLE HEAVEN ROAD	0.00	0.00	501.04	0.00	0.00	501.04
P CLAPHAM ROAD AND BUFFALO ROAD	28.94	0.00	0.00	0.00	0.00	28.94
Q MULBERRIE POINT CONNECTOR ROAD AND LITTLE HEAVEN ROAD	0.00	0.00	479.17	0.00	0.00	479.17
36 PLUS ROOTMAT REMOVED UNDER FILL	0.00	0.00	0.00	0.00	0.00	0.00
37 PLUS SWM POND EMBANKMENT (BELOW TOPSOIL)	1,671.00	432.00	3.00	0.00	0.00	2,106.00
38 PLUS BACKFILL FOR PIPE TRENCHES (OUTSIDE LIMITS OF TYPE C)	0.00	0.00	0.00	0.00	0.00	0.00
39 LESS EXCESS TOPSOIL TO BE PLACED IN OUTER EMBANKMENTS	0.00	0.00	0.00	0.00	0.00	0.00
40 SUBTOTAL EMBANKMENT REQUIRED BELOW CAPPING	10,778.68	14,428.28	30,312.73	173,717.38	3,653.65	232,890.73
41 PLUS EMBANKMENT REQUIRED X ADJUSTMENT FACTOR (0.15)	1,616.80	2,164.24	4,546.91	26,057.61	548.05	34,933.61
42 TOTAL ADJUSTED BORROW, TYPE F REQUIRED	12,395.49	16,592.52	34,859.64	199,774.99	4,201.70	267,824.34
<b>CLAY BORROW</b>						
43 CLAY BORROW, SWM POND, TYPE 1	0.00	7,968.00	0.00	0.00	0.00	7,968.00
44 PLUS BACKFILL X ADJUSTMENTS FACTOR (0.20±)	0.00	1,593.60	0.00	0.00	0.00	1,593.60
45 TOTAL ADJUSTED CLAY BORROW, SWM POND, TYPE 1 REQUIRED (ITEM 274000)	0.00	9,561.60	0.00	0.00	0.00	9,561.60
<b>TOPSOIL SUMMARY</b>						
46 TOPSOIL REMOVED UNDER FILL (LINE 2)	5,365.65	5,069.54	14,386.86	18,923.92	3,568.14	47,314.11
47 PLUS TOPSOIL REMOVED IN CUT (LINE 3)	4,654.63	6,492.94	7,071.14	5,343.92	1,818.84	25,381.47
48 PLUS TOPSOIL REMOVED FROM SWM PONDS (LINE 9)	4,376.00	3,790.00	784.00	4,651.00	0.00	13,601.00
49 SUBTOTAL TOPSOIL AVAILABLE FOR USE	14,396.29	15,352.49	22,242.00	28,918.84	5,386.98	86,296.59
50 LESS TOPSOILING REQUIRED FOR ROADWAY	6,890.75	8,940.38	13,325.52	18,421.84	4,088.03	51,666.53
51 LESS TOPSOILING REQUIRED FOR SWM PONDS	3,826.00	1,556.00	640.00	4,385.00	0.00	10,407.00
52 SUBTOTAL EXCESS (+) TOPSOIL OR NEEDED (-) TOPSOIL	3,679.54	4,856.10	8,276.47	6,111.99	1,298.95	24,223.06
53 LESS TOPSOIL PLACED IN OUTER EMBANKMENTS	0.00	0.00	0.00	0.00	0.00	0.00
54 TOTAL EXCESS (+) TOPSOIL OR NEEDED (-) TOPSOIL	+3,679.54	+4,856.10	+8,276.47	+6,111.99	+1,298.95	+24,223.06
<b>EARTHWORK SUMMARY - MATERIAL BALANCE</b>						
55 TOTAL ADJUSTED BORROW, TYPE A REQUIRED (LINE 28)	14,243.02	10,302.98	27,889.28	40,229.46	7,575.46	100,240.20
56 LESS STOCKPILED EXCAVATION USED AS BORROW, TYPE A	0.00	0.00	5,000.00	33,585.22	0.00	38,585.22
57 TOTAL BORROW, TYPE A REQUIRED FROM OFFSITE SOURCE	14,243.02	10,302.98	27,889.28	6,644.24	7,575.46	61,654.98
58 TOTAL ADJUSTED BORROW, TYPE B REQUIRED (LINE 31)	4,704.11	0.00	1,167.40	0.00	0.00	5,871.51
59 TOTAL ADJUSTED BORROW, TYPE C REQUIRED (LINE 34)	4,822.58	3,106.14	8,510.68	6,832.80	1,127.36	24,399.57
60 TOTAL ADJUSTED CLAY BORROW, SWM POND, TYPE 1 REQUIRED (LINE 46)	0.00	9,561.60	0.00	0.00	0.00	9,561.60
61 EXCAVATION AVAILABLE FOR EMBANKMENT FROM THIS PHASE (LINE 25)	91,076.52	64,598.96	56,880.75	51,066.42	15,787.36	279,410.01
62 LESS TOTAL ADJUSTED EMBANKMENT REQUIRED (LINE 43)	12,395.49	16,592.52	34,859.64	199,774.99	4,201.70	267,824.34
63 TOTAL EXCESS (+) EXCAVATION OR NEEDED (-) BORROW, TYPE F	+78,681.03	+48,006.44	+22,021.10	+148,708.57	+11,585.67	+11,585.67
64 ACCUMULATIVE STOCKPILED EXCAVATION FOR USE AS BORROW, TYPE F	0.00	78,681.03	126,687.47	148,708.57	0.00	11,585.67
65 ACCUMULATIVE STOCKPILED EXCAVATION FOR USE AS BORROW, TYPE A	0.00	20,000.00	38,585.22	33,585.22	0.00	0.00

NOTE: THE EARTHWORK SUMMARY IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE VALUES LISTED IN THE EARTHWORK SUMMARY ARE APPROXIMATE AND ARE NOT TO BE USED AS A BASIS OF FINAL PAYMENT.

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ADDENDUMS / REVISIONS

NOT TO SCALE

**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

CONTRACT	BRIDGE NO.	-	<b>EARTHWORK SUMMARY</b>	SHEET NO.	617
T200412202	DESIGNED BY:	SFP		TOTAL SHTS.	641
COUNTY	CHECKED BY:	WFC			
KENT					

**GENERAL NOTES**

- THIS PROJECT HAS BEEN ISSUED CONSTRUCTION PERMIT #WPCC 3078/14 FROM THE DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL, DIVISION OF WATER, SURFACE WATER DISCHARGES SECTION. THE CONTRACTOR SHALL CONTACT THE SURFACE WATER DISCHARGES SECTION A MINIMUM OF 14 CALENDAR DAYS IN ADVANCE OF STARTING CONSTRUCTION AND FURNISH KENT COUNTY WITH PROOF OF THIS NOTIFICATION BEFORE BEGINNING WORK.
- EQUIPMENT AND/OR STOCKPILE MATERIAL SHALL NOT BE STORED IN THE DRIP LINE AREA OF ANY TREE.
- THE CONTRACTOR SHALL CONTACT KENT COUNTY DEPARTMENT OF PUBLIC WORKS AT 302-744-2430 AT LEAST 48 HOURS IN ADVANCE OF STARTING CONSTRUCTION.
- THE CONTRACTOR SHALL CONTACT MISS UTILITY OF DELMARVA AT 1-800-282-8555 FOR UTILITY LOCATIONS WITHIN AND SURROUNDING CONSTRUCTION AREAS NOT LESS THAN 3 DAYS BEFORE PERFORMING ANY EXCAVATION.
- THE CONTRACTOR SHALL USE ONLY NEW MATERIALS, PARTS, AND PRODUCTS. ALL MATERIALS SHALL BE STORED SO AS TO ASSURE THE PRESERVATION OF THEIR QUALITY AND FITNESS FOR THE INTENDED WORK.
- ALL CONSTRUCTION SHALL BE PERFORMED TO THE SATISFACTION OF THE ENGINEER, KENT COUNTY DEPARTMENT OF PUBLIC WORKS (DPW), DELAWARE DEPARTMENT OF TRANSPORTATION (DELDOT) AND ALL RESPECTIVE UTILITY OWNER/S IN ACCORDANCE WITH ALL APPLICABLE CONTRACT DRAWINGS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS AND ORDERS OF ANY PUBLIC BODY HAVING JURISDICTION. THE CONTRACTOR SHALL ERECT AND MAINTAIN, AS REQUIRED BY THE CONDITIONS AND PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR SAFETY AND PROTECTION IN ACCORDANCE W/APPLICABLE OSHA REGULATION.
- THE CONTRACTOR SHALL INSTALL THE PROPOSED SANITARY SEWER AND FORCE MAINS WITH A MINIMUM OF 3 FT. OF CLEARANCE FROM OTHER EXISTING AND PROPOSED UTILITIES EXCLUDING WATER MAINS. THE CONTRACTOR SHALL MAINTAIN A MINIMUM HORIZONTAL CLEARANCE OF 5 FT. BETWEEN WATER MAINS AND SANITARY SEWERS (BOTH EXISTING AND PROPOSED MAINS). IN CASES WHERE THIS MINIMUM HORIZONTAL CLEARANCE IS NOT SHOWN OR FEASIBLE, THE CONTRACTOR MAY INSTALL THE PROPOSED SANITARY SEWER LESS THAN 5 FT. FROM EXISTING WATER LINES, PROVIDED ALL EXISTING WATER MAINS REMAIN ON AN UNDISTURBED EARTH SHELVE IN A SEPARATE TRENCH FROM THE PROPOSED SANITARY SEWER MAINS AND THERE IS AT LEAST 18 INCHES OF VERTICAL CLEARANCE WITH THE WATER MAIN HIGHER THAN THE SEWER. IF VERTICAL CLEARANCE BETWEEN PROPOSED SANITARY SEWER AND EXISTING WATER MAINS IS LESS THAN 12 INCHES, THE CONTRACTOR SHALL CONCRETE ENCASE THE SANITARY SEWER PIPING A MINIMUM OF 5 FT. ON EACH SIDE OF THE WATER MAIN CROSSING OR 5 FT. BEYOND THE LIMITS WHERE VERTICAL CLEARANCE IS NOT MAINTAINED. PAYMENT FOR PREPARING THE CASEMENT AREA, FURNISHING AND PLACING CLASS B CONCRETE WILL BE MADE UNDER ITEM 602004. THE PAY QUANTITY WILL BE THE NUMBER OF CUBIC YARDS SHOWN ON THE CONCRETE DELIVERY TICKET OR AS OTHERWISE AGREED BY THE ENGINEER.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL MATERIALS FOR APPROVAL TO THE OWNER PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL MATERIALS ORDERED AND INSTALLED PRIOR TO THE OWNER'S REVIEW AND ACCEPTANCE WILL BE AT THE CONTRACTOR'S RISK.
- THE CONTRACTOR SHALL OPEN ONLY THAT SECTION OF TRENCH OR ACCESS PITS WHICH CAN BE BACKFILLED AND STABILIZED AT THE END OF EACH WORKING DAY. STEEL PLATES SHALL BE USED ON ANY TRENCH OR ACCESS PITS WHICH MUST REMAIN OPEN OVERNIGHT. THIS REQUIREMENT DOES NOT APPLY TO AREAS COMPLETELY CLOSED AND SECURE FROM VEHICULAR OR PEDESTRIAN TRAFFIC. COSTS TO FURNISH AND INSTALL THE PLATES ARE INCIDENTAL TO ITEM 743000, MAINTENANCE OF TRAFFIC.
- CONTRACTOR SHALL AT ALL TIMES MAINTAIN A SAFE AND DRY EXCAVATION. AT A MINIMUM THAT INCLUDES SHEETING, SHEET PILES AND SHORING FOR TRENCHES IN ACCORDANCE W/ OSHA REGULATIONS AND SUFFICIENT DEWATERING FOR A DRY SUBGRADE. REFER TO DEL DOT STANDARD SPECIFICATION SECTION 111 FOR DEWATERING REQUIREMENTS.
- "MANHOLE" SHALL INCLUDE PRECAST/POURED IN PLACE STRUCTURE, BEDDING, CONNECTION TO EXISTING AND PROPOSED SANITARY PIPING, FRAME AND COVER AND RELATED APPURTENANCES. SEE MANHOLE DETAILS AND APPLICABLE SPECIFICATIONS.
- SANITARY SEWER PIPE AND FITTINGS SHALL BE TYPE PSM, POLYVINYL CHLORIDE (PVC) MATERIAL WITH MINIMUM CELL CLASSIFICATION OF 12454B AND COMPLYING WITH ASTM D1784. INSIDE NOMINAL DIAMETER AS INDICATED ON THE DRAWINGS.  
SANITARY GRAVITY SEWER PIPE AND FITTINGS - 4 INCHES THROUGH 15 INCHES: ASTM D3034 AND F1336 WITH A MINIMUM WALL THICKNESS OF SDR 35 UNLESS NOTED OTHERWISE ON THE PLANS. ALL PVC PIPE INSIDE STEEL CASING SHALL BE PVC SDR 26. IN THE CASING AREAS, THE SDR 26 PIPE SHALL EXTEND OUTSIDE THE CASING BY AT LEAST ONE PIPE JOINT OR TO THE NEAREST FITTING ON EITHER END OF THE CASING.  
SANITARY GRAVITY SEWER PIPE AND FITTINGS - 18 INCHES THROUGH 24 INCHES: ASTM F679 AND F1336 WITH A MINIMUM WALL THICKNESS CORRESPONDING TO PS46 WHEN COVER IS 15 FEET OR LESS AND PS115 WHEN COVER EXCEEDS 15 FEET.
- SANITARY SEWER FLEXIBLE COUPLINGS SHALL BE RESILIENT, CHEMICAL RESISTANT, THERMOPLASTIC OR WRC APPROVED EPDM RUBBER COUPLING, TWO SERIES 316 STAINLESS STEEL CLAMPS AND STAINLESS STEEL SCREWS AND HOUSINGS.
- PIPE PLUGS SHALL BE DESIGNED FOR PERMANENT INSTALLATION AND SHALL BE REMOVABLE. OBTAIN PLUGS FOR VARIOUS TYPES OF PIPE USED FROM THE RESPECTIVE PIPE MANUFACTURER.
- ALL PVC SANITARY GRAVITY SEWER AND FORCE MAINS SHALL BE MARKED WITH LOCATOR TAPE, LABELED "SANITARY SEWER", INSTALLED 18" ABOVE THE PIPE.
- PVC PRESSURE SEWER PIPE 12" AND SMALLER NOMINAL PIPE SIZE DIAMETER SHALL CONFORM TO ASTM D2241. PVC 1120 (12454-B); SDR 21 FOR WORKING PRESSURE OF 200 PSI.
- DUCTILE IRON PRESSURE SEWER PIPE 3 INCHES TO 12 INCHES NOMINAL PIPE SIZE DIAMETER SHALL CONFORM TO AWWA C151, PRESSURE CLASS 350 PSI; WITH AN INTERIOR OF PROTECTO 401 CERAMIC EPOXY LINING, MINIMUM THICKNESS OF 40 MILS.
- DUCTILE IRON PRESSURE SEWER FITTINGS 3 INCHES TO 12 INCHES NOMINAL PIPE SIZE DIAMETER SHALL CONFORM TO AWWA C153; PRESSURE CLASS 350 PSI WITH AN INTERIOR OF PROTECTO 401 CERAMIC EPOXY LINING MINIMUM THICKNESS OF 40 MILS.
- RUBBER GASKET JOINTS, LUBRICANTS, GLANDS, BOLTS AND NUTS FOR DUCTILE IRON PRESSURE PIPE AND FITTINGS SHALL CONFORM TO AWWA C111, WITH MECHANICAL JOINTS FOR BURIED FITTINGS AND MECHANICAL OR PUSH-ON JOINTS FOR BURIED PIPING.
- ALL PRESSURE SEWER PIPE JOINTS AND FITTING JOINTS SHALL BE RESTRAINED.
- PRESSURE SEWER PIPE AND FITTINGS LOCATED INSIDE STRUCTURES SHALL BE FLANGED (SPECIAL THICKNESS CLASS 53) CONFORMING TO AWWA C110/C115; WITH AN INTERIOR OF PROTECTO 401 CERAMIC EPOXY LINING, MINIMUM THICKNESS OF 40 MILS. PIPING SHALL BE COATED WITH AN EXTERIOR TWO COAT EPOXY PAINT SYSTEM, AFTER INSTALLATION.
- ROUTINE PERIODIC INSPECTIONS DURING CONSTRUCTION WILL BE PROVIDED BY THE OWNER. THESE INSPECTIONS DO NOT RELIEVE THE CONTRACTOR FROM HIS OBLIGATION AND RESPONSIBILITY FOR CONSTRUCTING A SANITARY SEWER SYSTEM IN STRICT ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE OWNER.

- ALL SANITARY SEWERS AND MANHOLES SHALL BE TESTED IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. IN ADDITION ALL MANHOLES SHALL BE VACUUM TESTED IN ACCORDANCE WITH ASTM C1244 AND AS DESCRIBED BELOW:  
  
VACUUM TESTING SHALL BE CARRIED OUT IMMEDIATELY AFTER ASSEMBLY AND PRIOR TO BACKFILLING. ALL LIFT HOLES SHALL BE PLUGGED WITH AN APPROVED NON-SHRINK GROUT, OR RUBBER PLUG. GROUT SHALL NOT BE PLACED IN THE HORIZONTAL JOINTS BEFORE TESTING. ALL PIPES ENTERING THE MANHOLE SHALL BE PLUGGED, TAKING CARE TO SECURELY BRACE THE PLUGS FROM BEING DRAWN INTO THE MANHOLE.  
  
ALL MANHOLES SHALL BE VACUUM TESTED FOR LEAKAGE. A VACUUM OF TEN (10) INCHES OF MERCURY SHALL BE PLACED ON THE MANHOLE AND THE TIME MEASURED FOR THE VACUUM TO DROP TO NINE (9) INCHES OF MERCURY. THE VACUUM SHALL NOT DROP BELOW NINE (9) INCHES OF MERCURY FOR THE FOLLOWING TIME PERIODS FOR EACH SIZE OF MANHOLE:  
FORTY-EIGHT (48) INCHES DIAMETER - SIXTY (60) SECONDS  
SIXTY (60) INCHES DIAMETER - NINETY (90) SECONDS  
  
CONTRACTOR SHALL PROVIDE ALL MATERIAL AND EQUIPMENT NECESSARY FOR TESTING. IF TESTING FAILS, CONTRACTOR SHALL SEAL ALL LEAKS AND RE-TEST UNTIL ACCEPTABLE. THIS TESTING SHALL BE PERFORMED BEFORE BACKFILLING SO THAT ANY LEAKS CAN BE FOUND AND FIXED EXTERNALLY. THE MANHOLE FRAME AND ADJUSTING RINGS SHALL BE IN PLACE WHEN TESTING.

- AFTER TESTING IS COMPLETE AND ALL COMPONENTS OF THE SANITARY SEWER SYSTEM ARE DEEMED ACCEPTABLE TO THE OWNER, THE CONTRACTOR SHALL SUBMIT THE AS-BUILT DRAWINGS TO THE OWNER. ANY DISCREPANCIES NOTED DURING THE FINAL INSPECTION SHALL BE CORRECTED BY THE CONTRACTOR WITHIN 30 DAYS.

- INTERIOR LININGS - WET WELL, METER/VALVE VAULT AND ALL TYPES OF MANHOLE SHALL BE LINED WITH A MODIFIED POLYIMINE EPOXY THAT PROVIDES A 100% SOLIDS, ABRASION RESISTANT AND H2S RESISTANT LINING FOR WASTEWATER IMMERSION AND FUME ENVIRONMENTS. A HI-BUILD THICKNESS SHALL BE ACHIEVED IN THE WETWELL AND METER/VALVE VAULT EQUAL TO 140 MILS IN THREE COATS. MANHOLES SHALL RECEIVE THICKNESS OF 80 MILS IN TWO COATS.

- EXTERIOR COATINGS - WET WELL, METER/VALVE VAULT AND ALL TYPES OF MANHOLE SHALL BE COATED WITH A BITUMASTIC COATING FOR BELOW GRADE WATER PROOFING. THE THICKNESS FOR ALL APPLICATIONS SHALL BE 30 MILS APPLIED IN TWO COATS.

- BASIS OF DESIGN - SPECIFIC MANUFACTURERS AND MODELS ARE LISTED THROUGHOUT THESE DRAWINGS INTENDED AS BASIS OF DESIGN. SEE TECHNICAL SPECIFICATIONS FOR ADDITIONAL PERFORMANCE REQUIREMENTS AND ALTERNATIVES. IN EVERY CASE THE APPROVED MANUFACTURERS AND MODELS MUST BE ACCEPTABLE TO KENT COUNTY AND COMPATIBLE WITH KENT COUNTY STANDARDS AND CURRENT OPERATING PROCEDURES.

- BUTTRESSES/THRUST BLOCKING HAS BEEN DESIGNED BASED ON THE FOLLOWING.  
A. MINIMUM 3,000 PSF PASSIVE SOIL BEARING CAPACITY.  
B. MINIMUM 28 DAY CONCRETE COMPRESSIVE STRENGTH OF 3,000 PSI.  
C. DEPTH FROM FINISHED GRADE TO TOP OF PIPE ASSUMED TO BE 2.5 FT. OR DEEPER.  
D. EXISTING SOIL CONDITIONS ARE NOT SOFT OR ORGANIC.

DIFFERING SITE CONDITIONS AND/OR DIFFERING MATERIAL PROPERTIES SHALL REQUIRE KENT COUNTY DPW APPROVAL OF SPECIAL DESIGN DETAILS PREPARED BY THE DESIGN ENGINEER PRIOR TO INITIATING OR RESUMING CONSTRUCTION ACTIVITIES.

THE CONTRACTOR SHALL ALLOW SUFFICIENT TIME FOLLOWING EXCAVATIONS FOR INSPECTION AND EVALUATION OF EXISTING SOIL SUBGRADE CONDITIONS BY THE CONSTRUCTION ENGINEER (AGENT FOR KENT COUNTY DPW). THE CONSTRUCTION ENGINEER SHALL INSPECT ALL STRUCTURE AND THRUST BLOCKING SUBGRADE AND PIPELINE SUBGRADE FOLLOWING EXCAVATION AND PRIOR TO CONSTRUCTION OF NEW WORK TO CONFIRM DESIGN CONDITIONS ARE MET AND SUBGRADE CONDITIONS ARE SUITABLE FOR CONSTRUCTION. IN THE EVENT THE SOIL BEARING CAPACITY IS LESS THAN THE MINIMUM DESIGN VALUE, THE CONSTRUCTION ENGINEER SHALL CAUSE AFFECTED CONSTRUCTION TO CEASE AND SHALL NOTIFY THE DESIGN ENGINEER FOR RE-DESIGN TO ACCOMMODATE THE REDUCED SOIL BEARING CAPACITY.

IN THE EVENT THE SUBGRADE CONDITION IS UNSTABLE, DUE TO UNSUITABLE MATERIALS AND/OR GROUNDWATER INFILTRATION/INTRUSION INTO THE SURROUNDING SOILS, AS DETERMINED BY THE CONSTRUCTION ENGINEER, THE CONTRACTOR SHALL, AS DIRECTED BY THE CONSTRUCTION ENGINEER, REMOVE THE UNSUITABLE MATERIAL AND FILL WITH SUITABLE APPROVED GRANULAR FILL MATERIAL. COSTS TO REMOVE AND REPLACE UNSUITABLE MATERIAL ARE INCIDENTAL TO THE ITEM FOR WHICH THE EXCAVATION IS BEING PERFORMED.

THRUST BLOCK SHALL BE PROVIDED ALONG FORCE MAIN PIPING AT ALL DIRECTIONAL CHANGES.

- THE CONTRACTOR SHALL MAINTAIN ONE COMPLETE SET OF CONTRACT DRAWINGS ON WHICH HE SHALL NOTE, IN RED, THE ALIGNMENTS AND INVERTS OF ALL UNDERGROUND UTILITIES THAT ARE INSTALLED OR ENCOUNTERED DURING THE EXECUTION OF THE WORK. ALL DISCREPANCIES BETWEEN THE PLAN LOCATIONS AND ELEVATIONS OF BOTH THE EXISTING AND PROPOSED UTILITIES SHALL BE SHOWN ON THE AS-BUILT DRAWINGS TO BE MAINTAINED BY THE CONTRACTOR IN THE FIELD. COSTS TO PREPARE AND SUBMIT ALL AS-BUILTS ARE INCIDENTAL TO THE ITEM BEING RECORDED ON THE AS-BUILT DRAWINGS.

- FOR ALL OF THE WORK ITEMS RELATED TO THE SANITARY SEWER RELOCATIONS, THE HIERARCHY OF CONTRACT DOCUMENTS SHALL, IN THE EVENT OF A CONFLICT, BE:  
PLAN NOTES AND DETAILS TAKE PRECEDENCE OVER  
SPECIAL PROVISIONS WHICH TAKE PRECEDENCE OVER  
REFERENCED DELDOT STANDARD SPECIFICATIONS WHICH TAKE PRECEDENCE OVER  
TECHNICAL SPECIFICATIONS WHICH TAKE PRECEDENCE OVER  
KENT COUNTY STANDARD DETAILS

- ANY TEMPORARY SHEETING AND/OR SHORING SHALL BE REMOVED BY THE CONTRACTOR FOLLOWING ITS USE IN THE FIELD. COSTS ARE INCIDENTAL TO THE ITEM REQUIRING THE PLACEMENT OF THE SHEETING OR SHORING.

- ELECTRIC PANEL AND ELECTRICAL TESTING SHALL BE INCIDENTAL TO ITEM 763687 PUMP HOUSE.

- THE CONTRACTOR SHALL PROVIDE A ONE YEAR WARRANTY ON ALL WORK SHOWN ON THESE SEWER PLANS FROM THE DATE THAT THE KENT COUNTY PUBLIC WORKS DEPARTMENT APPROVES THE WORK. ALL COSTS INCIDENTAL TO THE SEWER ITEMS BEING INSTALLED.

- A PRECONSTRUCTION MEETING FOR THE SEWER RELOCATION WORK IS REQUIRED PRIOR TO THE CONTRACTOR BEGINNING WORK ON ANY SEWER RELOCATION WORK. KENT COUNTY PUBLIC WORKS DEPARTMENT SHALL BE PART OF THE PRECONSTRUCTION MEETING.

**LEGEND**

— 2" w — ⊗ —	WATER LINE WITH VALVE	○ CS	CURB STOP
— 8" S —	EXISTING GRAVITY SEWER	○ CO	CLEAN-OUT
— 6" FM —	EXISTING FORCE MAIN	⊙	EXISTING MANHOLE
— 8" S —	NEW GRAVITY SEWER	⊙	NEW MANHOLE
— 6" FM —	NEW FORCE MAIN	⊙	EXISTING WELL
— 50 —	EXISTING CONTOUR LINE	⊗ 8.00'	EXISTING SPOT ELEVATION
□	EXISTING STRUCTURES	⊗ 8.00'	NEW SPOT ELEVATION
□	NEW STRUCTURES		

**EXISTING UNDERGROUND UTILITIES COORDINATION NOTES:**

- THE LOCATION OF UNDERGROUND UTILITIES AS INDICATED ON PLANS HAS BEEN OBTAINED FROM EXISTING RECORDS. NEITHER THE OWNER OR THE ARCHITECT/ENGINEER ASSUMES ANY RESPONSIBILITY WHATEVER IN RESPECT TO ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION SHOWN. THERE IS NO GUARANTEE, EITHER EXPRESSED OR IMPLIED THAT THE LOCATIONS, SIZE AND TYPE OF MATERIALS OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED DURING CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH UTILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE OWNER OF HIS OPERATIONAL PLANS. IN THE EVENT OF AN UNEXPECTED UTILITY INTERFERENCE DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER. ANY SUCH MAINS AND/OR SERVICES DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED IMMEDIATELY AT HIS EXPENSE.
- PRIOR TO PERFORMING ANY EXCAVATION GREATER THAN 6 INCHES, THE CONTRACTOR SHALL COORDINATE WITH KENT COUNTY DEPARTMENT OF PUBLIC WORKS AND ALL PRIVATE UTILITY COMPANIES TO DETERMINE THE LOCATION OF UNDERGROUND UTILITY LINES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL ORGANIZATIONS THAT CONTROL EXISTING UNDERGROUND UTILITIES IN THE CONSTRUCTION AREA OR WOULD BE AFFECTED BY CONSTRUCTION WORK AROUND THE EXISTING UTILITIES. ANY TEST HOLES REQUIRED WILL BE MEASURED AND PAID UNDER ITEM 208000.
- THE CONTRACTOR SHALL NOT START EXCAVATION UNTIL ALL UTILITY LINE LOCATIONS HAVE BEEN STAKED OR OTHERWISE CLEARLY MARKED AND DOCUMENTATION FURNISHED TO THE OWNER. ALL MARKINGS SHALL BE CONSIDERED APPROXIMATE, AND UTILITIES OTHER THAN THOSE SHOWN SHALL BE CONSIDERED TO EXIST.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DEFINITE LOCATION OF EACH UTILITY WITHIN THE WORK AREA. CARE SHOULD BE EXERCISED DURING EXCAVATION WORK TO AVOID DAMAGING OR DISRUPTING UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING (AT CONTRACTOR'S EXPENSE) DAMAGE TO ANY UTILITY CAUSED BY THE CONTRACTOR'S WORK.
- WHERE EXISTING UNDERGROUND UTILITIES OR OTHER CONSTRUCTION ARE EXPECTED TO BE IN PROXIMITY TO PROPOSED CONSTRUCTION, OR WHEN APPROACHING EXISTING UTILITIES OR STRUCTURES FOR CONNECTIONS, THE CONTRACTOR SHALL DIG TEST PITS TO DETERMINE THE EXACT LOCATION AND INVERTS OF THE EXISTING UTILITY TO ALLOW FOR POSSIBLE CHANGES TO THE PROPOSED UTILITY IN LINE AND/OR GRADE. THE CONTRACTOR SHALL ALSO DIG TEST PITS IN THE LOCATION OF THE PROPOSED CONNECTIONS TO EXISTING UTILITIES AND SHALL MAKE ALL MEASUREMENTS NECESSARY TO ENSURE PROPER CONNECTION. ANY NECESSARY CHANGES IN LINE OR GRADE OF WORK CAUSED BY FAILURE TO TAKE SUCH PRECAUTIONS SHALL BE AT THE EXPENSE OF THE CONTRACTOR.
- WHEN IT IS NECESSARY TO EXCAVATE NEAR OR INTERFERE WITH ANY SEWER LINE, WATER SERVICES, DRAIN PIPE, CATCH BASIN, CULVERT, OR OTHER STRUCTURES, THE CONTRACTOR SHALL MAINTAIN THE SAME IN WORKING ORDER AND SHALL REPAIR AND MAKE GOOD ANY DAMAGE DONE DURING THE PROGRESS OF THE WORK.
- WHERE EXISTING UTILITIES CROSS THE TRENCH EXCAVATION, THEY SHALL BE ADEQUATELY SUPPORTED AND PROTECTED FROM DAMAGE DUE TO CONSTRUCTION. ALL METHODS FOR SUPPORTING AND MAINTAINING THESE UTILITIES SHALL BE SUBJECT TO REVIEW BY OWNER. CARE SHALL BE TAKEN TO ENSURE THAT THE EXISTING UTILITY GRADES AND ALIGNMENT ARE MAINTAINED AND THE PIPE JOINTS ARE NOT DISTURBED. BACKFILL SHALL BE CAREFULLY PLACED AND TAMPED TO PREVENT DAMAGE OR FUTURE SETTLEMENT. ANY DAMAGE OR MISALIGNMENT OF THE UTILITIES DUE TO CONSTRUCTION OR SETTLEMENT SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
- ANY UNPROTECTED CABLE (DIRECT BURIED) ENCOUNTERED THAT IS VERIFIED AS NOT ABANDONED IN PLACE SHALL BE PROTECTED. THE UTILITY OWNER MAY DIRECT THE CABLE BE PLACED IN SPLIT DUCT OF APPROPRIATE SIZE AND CONCRETE ENCASED THROUGH THE AREA OF CONSTRUCTION. CONTRACTOR SHALL TAKE ALL REASONABLE MEASURES TO AVOID HAVING TO CUT AND SPLICE DIRECT BURIED CABLE. THE CONTRACTOR SHALL NOTE SPLIT DUCT PORTIONS ON AS-BUILTS. COSTS ARE INCIDENTAL TO THE ITEM BEING PLACED THAT NECESSITATED THE UTILITY PROTECTION.
- ALL EXCESS EXCAVATED MATERIALS SHALL BE DISPOSED OF OFF COUNTY/STATE PROPERTY, EXCEPT FOR CONTAMINATED SOILS OR LIQUIDS. ALL CONTAMINATED SOILS AND LIQUIDS SHALL BE TRANSPORTED TO AN APPROVED RECEIVING SITE AS APPROVED BY THE ENGINEER, FOR FINAL DISPOSITION. PAYMENT FOR EXCAVATING ANY CONTAMINATED MATERIAL IS INCIDENTAL TO THE ITEM FOR WHICH THE EXCAVATION IS BEING PERFORMED. CONTAMINATED MATERIAL, IF ENCOUNTERED, SHALL BE HANDLED IN ACCORDANCE WITH SPECIAL PROVISION ITEM 202560.
- INTERRUPTION OF EXISTING UTILITIES SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND/OR AT THE DIRECTION OF THE UTILITY OWNER/S.

INDEX OF DRAWINGS		
SHEET	DWG.	NAME
1	G-01	GENERAL NOTES
2	G-02	TABULATION AND SUMMARY SHEET AND SEQUENCE OF CONSTRUCTION
3	I-1	SHEET INDEX
4	S-1	PLAN & PROFILE RELOCATION OF EXISTING GRAVITY SEWER
5	S-2	PLAN & PROFILE RELOCATION OF EXISTING GRAVITY SEWER
6	S-3	PLAN & PROFILE RELOCATION OF EXISTING GRAVITY SEWER
7	S-4	PLAN & PROFILE RELOCATION OF EXISTING GRAVITY SEWER
8	S-5	PLAN & PROFILE RELOCATION OF EXISTING FORCE MAIN SEWER
9	S-6	PLAN & PROFILE RELOCATION OF EXISTING FORCE MAIN SEWER
10	S-7	PLAN & PROFILE RELOCATION OF EXISTING FORCE MAIN SEWER
11	D-1	DETAILS RELOCATION OF EXISTING PUMP STATION AND SEWER CONNECTIONS
12	D-2	DETAILS RELOCATION OF EXISTING PUMP STATION AND SEWER CONNECTIONS
13	M-01	PUMP STATION DETAILS
14	M-02	PUMP STATION PLAN & ELEVATION
15	M-03	PUMP STATION SITE PLAN
16	ST-01	PUMP STATION STRUCTURAL PLANS & DETAILS
17	E00	ELECTRICAL NOTES, SYMBOLS & ABBREVIATIONS
18	E01	ELECTRICAL SITE PLAN
19	E02	PUMP STATION WITH VFD & SINGLE LINE ENCLOSURE
20	E03	RTU AND PC ENCLOSURE
21	E04	PUMP CONTROL SCHEMATIC
22	E05	PUMP CONTROL SCHEMATIC
23	E06	PUMP CONTROL SCHEMATIC
24	E07	PUMP STATION ELECTRICAL DETAILS

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ADDENDUMS / REVISIONS	

**SRI, LITTLE HEAVEN GRADE SEPARATED INTERSECTION**

CONTRACT	BRIDGE NO.	-	<b>SEWER PLANS NOTES &amp; SHEET INDEX</b>
T200412202	DESIGNED BY:	DAW	
COUNTY	CHECKED BY:	SDT	
KENT			
			G-01
			SHEET NO.
			618
			TOTAL SHTS.
			641

**QUANTITY SUMMARY**

Item Number	Description	Quantity
614747	BORE 16" STEEL PIPE CASING	78 LF
614818	BORE 24" STEEL PIPE CASING	248 LF
614906	PLACE 16" STEEL PIPE CASING	233 LF
614907	PLACE 24" STEEL PIPE CASING	44 LF
708577	SANITARY MANHOLE, SPECIAL I	8 EA
708578	SANITARY MANHOLE, SPECIAL II	1 EA
708601	SANITARY MANHOLE, SPECIAL III	1 EA
708602	SANITARY MANHOLE, SPECIAL IV	1 EA
710509	MANHOLE OVER EXISTING SANITARY SEWER	2 EA
753501	INSTALLING SANITARY SEWER, PVC 8"	1028 LF
753503	INSTALLING SANITARY SEWER, PVC 12"	822 LF
753505	INSTALLING SANITARY SEWER PIPE, PVC 18"	30 LF
753510	INSTALLING SANITARY SEWER (FORCE MAIN), PVC 8"	2,146 LF
753516	SANITARY SEWER SYSTEM	LUMP SUM

**SEQUENCE OF CONSTRUCTION**

**A. GENERAL NOTES AND CONTRACTOR REQUIREMENTS FOR COORDINATION**

1. THE CONTRACTOR SHALL COORDINATE WITH THE KENT COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) TO SCHEDULE A TIME DURING THE LOWEST FLOW PERIODS TO CONVERT THE PUMP STATION FROM THE EXISTING OPERATION TO THE NEW OPERATION. ALL INTERCONNECTING PIPE WORK MUST BE COMPLETE AND BE READY TO PLACE INTO OPERATION. THE INTERCONNECTING PIPEWORK SHALL BE CONSTRUCTED AND TESTED TO THE SATISFACTION OF KENT COUNTY DPW. THE CONTRACTOR SHALL BE RESPONSIBLE FOR STAGING TANKER TRUCK EQUIPMENT AND PERSONNEL AS NECESSARY FOR THE PURPOSES OF HAULING EXCESS FLOW FROM THE PUMP STATIONS NO. 8 (LITTLE HEAVEN) AND NO. 18 (BOWERS BEACH) TO THE KENT COUNTY WASTEWATER TREATMENT PLANT SOUTH OF FREDERICA. THE CONTRACTOR SHALL DEMONSTRATE TO THE COUNTY THEY HAVE SUFFICIENT HAULING CAPACITY ON-SITE PRIOR TO DIVERTING FLOW TO THE NEW PUMP STATION.
2. TREATED WATER FOR HYDROSTATIC TESTING CAN BE OBTAINED FROM THE KENT COUNTY WASTEWATER TREATMENT PLANT AND MUST BE CONTAINED AND DISCHARGED INTO THE KENT COUNTY SANITARY SEWER SYSTEM.

**B. STEEL CASING INSTALLATION BENEATH SR-1 AND CLAPHAM ROAD AND ALONG CLAPHAM ROAD (FOR GRAVITY SYSTEM).**

1. PERFORM GUIDED BORE AND JACK ONE (1) 24" STEEL CASING SLEEVE BENEATH EXISTING CLAPHAM ROAD AND ONE (1) 24" STEEL CASING SLEEVE BENEATH SR-1 AS SHOWN ON THE DRAWINGS. OPEN CUT AND INSTALL ONE (1) 24" AND ONE (1) 16" STEEL CASING SLEEVE ALONG EXISTING CLAPHAM ROAD.
2. INSTALL PVC SDR-26 INSIDE THE STEEL SLEEVES AND EXTEND THE PIPING TO AT LEAST ONE PIPE JOINT, OR TO THE LOCATION OF THE NEAREST PIPE FITTING ON BOTH ENDS. SUPPORT THE PIPE WITHIN THE STEEL SLEEVES WITH CASING SPACERS AND INSTALL END SEALS.
3. INSTALL TEMPORARY CAPS AND HYDROSTATICALLY TEST THE PIPING AT THE INSTALLATION OF THE TWO (2) BORED ROADWAY CROSSINGS AND TWO (2) OPEN CUT CROSSINGS.
4. RETEST AS NECESSARY TO RECEIVE KENT COUNTY DPW APPROVAL.

**C. INSTALL GRAVITY SEWER AND MANHOLES**

1. INSTALL PROPOSED GRAVITY PIPE AND MANHOLES TO LIMITS SHOWN ON THE DRAWINGS WITHOUT AFFECTING EXISTING GRAVITY SYSTEM.
2. FOR DOGHOUSE MANHOLES OVER EXISTING GRAVITY, VERIFY STRUCTURAL INTEGRITY OF EXISTING PIPE AT THE CONNECTION LOCATION AND STAGE TANKERS, BYPASS PUMPING AND PERSONNEL AS NECESSARY BEFORE SAWCUTTING THE PIPE. COMPLETE NEW BRICK CHANNEL WORK INSIDE DOGHOUSE MANHOLES. PLUG NEW GRAVITY LINES INSIDE MANHOLE AND MAINTAIN FLOW IN EXISTING SYSTEM.
3. KENT COUNTY DPW TO DIVERT EX. 6" FM FLOW INTO EX. 4" FM UPSTREAM OF MANHOLE 7. COMPLETE THE 6" FORCE MAIN CONNECTION TO MH7. ALLOW FLOW TO CONTINUE IN THE 4" FM TO THE EXISTING PUMP STATION.

**D. INSTALL PROPOSED PUMP STATION**

1. PROVIDE SHEETPILE AS NECESSARY WITHIN THE PUMP STATION SITE TO ALLOW FOR PUMP STATION CONSTRUCTION.
2. INSTALL NEW PUMP STATION, FURNISHING ALL MATERIALS, TOOLS, EQUIPMENT, AND LABOR TO COMPLETE NEW WET WELL, INCLUDING PUMPS, MOTORS, VALVES AND ALL PIPE FITTINGS, NEW VALVE VAULT, EMERGENCY GENERATOR, CONTROLS, TRANSFER SWITCH, ELECTRICAL WORK, ALL SITE WORK, METER SETTING, NON-POTABLE WATER SUPPLY WELL, WATER SERVICE CONNECTION AND PIPING, GRADING AND ALL APPURTENANCES. ALL ROADWAY BASE COURSE AND PAVING WILL BE PAID AT THEIR RESPECTIVE UNIT BID PRICES FROM THE ROADWAY PORTION OF THE CONTRACT.
3. AFTER THE INSTALLATION IS COMPLETE, CONTRACTOR SHALL FULLY TEST AND MAKE SURE PUMP STATION PERFORMS SUFFICIENTLY AND AS DESIGNED BY ENGINEER. CONTRACTOR IS RESPONSIBLE FOR PROVIDING TREATED WATER FROM KENT COUNTY WASTEWATER TREATMENT PLANT FOR TESTING THE PUMP STATION AND MUST BE CONTAINED AND DISCHARGED INTO THE KENT COUNTY SANITARY SEWER SYSTEM.

**E. STEEL CASING INSTALLATION BENEATH PROPOSED SR-1 RAMP, AND CLAPHAM ROAD (FOR FORCE MAIN)**

1. PERFORM GUIDED BORE AND JACK ONE (1) 16" STEEL CASING SLEEVE BENEATH CLAPHAM ROAD AND OPEN CUT AND INSTALL ONE (1) 16" STEEL CASING SLEEVE BENEATH PROPOSED SR-1 RAMP AS SHOWN ON THE DRAWINGS.
2. INSTALL SDR-21 PVC FORCE MAIN PIPING INSIDE THE STEEL SLEEVES AND EXTEND THE PIPING TO AT LEAST ONE PIPE JOINT, OR TO THE LOCATION OF THE NEAREST PIPE FITTING ON BOTH ENDS. SUPPORT THE PIPE WITHIN THE STEEL SLEEVES WITH CASING SPACERS AND INSTALL END SEALS.
3. INSTALL TEMPORARY CAPS AND HYDROSTATICALLY TEST THE FORCE MAIN PIPING AT THE INSTALLATION OF THE ONE (1) BORED ROADWAY CROSSING AND ONE (1) OPEN CUT CROSSING.
4. RETEST AS NECESSARY TO RECEIVE KENT COUNTY DPW APPROVAL.

**F. FORCE MAIN INSTALLATION, TESTING, AND PREPARING CONNECTION TO PROPOSED 36" TIE-IN VIA 12" FORCE MAIN**

1. INSTALL THE FORCE MAINS TO THE LIMITS SHOWN ON THE DRAWINGS INCLUDING THE VALVES, INCREASERS, BENDS, BUTTRESSES AIR RELEASE VALVES AND VAULTS. DO NOT MAKE CONNECTION TO CAPPED 12" STUB (BY OTHERS) OR TO NEW PUMP STATION.
2. INSTALL RESTRAINED TEMPORARY CAPS ON THE TERMINATIONS AS REQUIRED FOR TESTING.
3. RETEST AS NECESSARY TO RECEIVE KENT COUNTY DPW APPROVAL AND ACCEPTANCE.
4. UPON SATISFACTORY HYDROSTATIC AND/OR VISUAL TESTING OF THE FORCE MAINS AND ACCEPTANCE BY THE KENT COUNTY DPW, CONNECT THE NEW 12" FORCE MAIN TO THE CAPPED 12" STUB (ALREADY INSTALLED BY OTHERS) AND TO THE NEW PUMP STATION.

**G. SYSTEM ACTIVATION**

1. UPON APPROVAL FROM KENT COUNTY DPW AND THIS PROJECT'S WORK IS COMPLETED AND TESTED, REMOVE PLUGS FROM NEW GRAVITY LINES WHILE ADDING PLUGS TO EXISTING GRAVITY LINES THUS DIVERTING ALL GRAVITY FLOW TO THE NEW PUMP STATION.
2. OPEN 12" FM VALVE TO ALLOW FLOW INTO NEW 36" FM. KENT COUNTY WILL DIVERT FLOW FROM 4" FM TO 6" FM. CONTRACTOR TO CUT AND CAP THE 4" FM AT THE UPSTREAM END (NEAR PS 18/BOWERS BEACH) AND SIMILARLY AT THE LOWEST POINT IN THE 4" FM'S PROFILE, IN ORDER TO PROMOTE DRAINAGE OF ANY RESIDUAL FLOWS. CONTRACTOR TO REMOVE ALL RESIDUAL MATTER FROM 4" FORCE MAIN TO BE ABANDONED AND CAPPED.
3. CAP/PLUG ALL EXPOSED ENDS AND FILL THE ABANDONED PIPES WITH FLOWABLE FILL EXCEPT FOR THE ABANDONED AND CUT 4" FM.
4. ONCE NEW PUMP STATION IS FULLY OPERATIONAL, THE COUNTY WILL DISMANTLE AND SALVAGE EXISTING SPS 8 EQUIPMENT AND COMPLETE ALL DEMOLITION OF SPS 8 COMPONENTS (THAT THE COUNTY WISHES TO POSSESS).
5. THE CONTRACTOR SHALL COMPLETE CLEANUP AND DISPOSAL OF OTHER PS 8 COMPONENTS AND LEGALLY DISPOSE OF ALL MATERIAL IN ACCORDANCE WITH APPLICABLE LAWS.

**SANITARY SEWER PIPE ITEM SCHEDULES; SR1, LITTLE HEAVEN; DELDOT CONTRACT T200412202**

**SANITARY SEWER MANHOLE SCHEDULE; SR1, LITTLE HEAVEN; DELDOT CONTRACT T200412202**

MH Designation	Item Number	Item Title	MH Type	Top of Lid EL	Depth	Standard Detail Sheet
SAN MH 1	708577	Sanitary Manhole, Special I	48" Precast, Type A2	EL 13.78	12.04 ft	SS-07, SS-15
SAN MH 2	708577	Sanitary Manhole, Special I	48" Precast, Type A2	EL 12.79	10.04 ft	SS-07, SS-15
SAN MH 3A	708577	Sanitary Manhole, Special I	48" Precast, Type A2	EL 19.95	16.28 ft	SS-07, SS-15
SAN MH 3B	708577	Sanitary Manhole, Special I	48" Precast, Type A2	EL 20.74	16.51 ft	SS-07, SS-15
SAN MH 3C	708577	Sanitary Manhole, Special I	48" Precast, Type A2	EL 20.67	15.55 ft	SS-07, SS-15
SAN MH 3D	708577	Sanitary Manhole, Special I	48" Precast, Type A2	EL 21.25	15.38 ft	SS-07, SS-15
SAN MH 4	708601	Sanitary Manhole, Special III	60" Drop Manhole	EL 19.49	15.30 ft	SS-15, SS-21A
SAN MH 5	710509	Install Manhole Over Existing Sanitary Sewer	48" Precast "Doghouse"	EL 18.35	5.24 ft	SS-07, SS-24, SS-15
SAN MH 6	708577	Sanitary Manhole, Special I	48" Precast, Type A2	EL 10.10	7.32 ft	SS-07, SS-15
SAN MH 7	708602	Sanitary Manhole, Special IV	48" Force Main Discharge	EL 11.34	7.18 ft	PS-05, SS-07, SS-15
SAN MH 8	708577	Sanitary Manhole, Special I	48" Precast, Type A2	EL 15.26	8.54 ft	SS-07, SS-15
SAN MH 9	710509	Install Manhole Over Existing Sanitary Sewer	48" Precast "Doghouse"	EL 15.22	7.58 ft	SS-07, SS-24, SS-15
ARV 1	708578	Sanitary Manhole, Special II	48" FM Combination Sewage Air Release/Vacuum Relief Valve & Manhole	EL 19.40	Invert EL 13.37	PS-07, PS-07B, SS-15

Run Designation	Item Number	Pipe Size and Type	Length	Encasement	Invert In	Invert Out	Required Bends
SAN-1	753501	8" PVC Gravity	220 LF	None	EL 7.64 @ MH 9	EL 6.82 @ MH 8	None
SAN-2	753501	8" PVC Gravity	192 LF	None	EL 6.72 @ MH 8	EL 4.61 @ MH 7	None
SAN-3	753503	12" PVC Gravity	163 LF	None	EL 4.16 @ MH 7	EL 2.89 @ MH 6	None
SAN-4	753503	12" PVC Gravity	230 LF	161 LF; 24" Steel Casing (Guided Bore)	EL 2.78 @ MH 6	EL 2.15 @ MH 1	None
SAN-5	753503	12" PVC Gravity	21 LF	None	EL 2.75 @ MH 2	EL 2.56 @ MH 1	None
SAN-6	753503	12" PVC Gravity	199 LF	None	EL 3.67 @ MH 3A	EL 2.89 @ MH 2	None
SAN-7	753503	12" PVC Gravity	101 LF	87 LF; 24" Steel Casing (Guided Bore); 10 LF Concrete Cradle	EL 4.19 @ MH 4	EL 3.77 @ MH 3A	None
SAN-8	753503	12" PVC Gravity	108 LF	43.5 LF; 24" Steel Casing (Open Cut); 5 LF Concrete Cradle	EL 13.11 @ MH 5	EL 12.03 @ MH 4	None
SAN-9	753501	8" PVC Gravity	99 LF	None	EL 4.23 @ MH 3B	EL 3.94 @ MH 3A	None
SAN-10	753501	8" PVC Gravity	269 LF	145 LF; 16" Steel Casing (Open Cut); 5 LF Concrete Cradle	EL 5.12 @ MH 3C	EL 4.33 @ MH 3B	None
SAN-11	753501	8" PVC Gravity	221 LF	None	EL 5.87 @ MH 3D	EL 5.22 @ MH 3C	None
SAN-12	753503	8" PVC Gravity	27 LF	None	EL 7.99 @ Existing MH	EL 7.72 @ MH 3D	None
SAN-13	753505	18" PVC Gravity	30 LF	None	EL 1.74 @ MH 1	EL 1.70 @ Wet Well	PVC to DI Transition into wetwell (Paid asa part of item 763687)
SAN FM-1	753510	8" SDR-21 PVC Pipe, FM	1,200 LF	88 LF 16" Steel Casing (Open Cut)	EL 9.72 @ PVC to DI Transition @ Meter Vault	EL 13.37 @ ARV 1	4 ea bends @ 45 degrees; 1 ea bend @ 22.5 degrees; DI to PVC Transition (Paid as part of Item 763687)
SAN FM-2	753510	8" SDR-21 PVC Pipe, FM	946 LF	78 LF; 16" Steel Casing (Guided Bore)	EL 13.37 @ ARV-1	EL 12.50 @ PVC to DI Transition	4 ea bends @ 45 degrees
SAN FM-3 *	753516	8" Ductile Iron; FM	20 LF (Lump Sum)	None	EL 12.50 @ PVC to DI Transition	EL 12.5 @ 8" - 12" Inverter	PVC to DI Transition
SAN FM-4 *	753516	12" Ductile iron; FM	40 LF (Lump Sum)	None	EL 12.50 @ 8"-12" Inverter	EL 12.80 +/- @ tie-in to existing 12" DI FM	8" - 12" Inverter; 1 Bend @ 45 degrees
SAN FM-5 *	753516	6" SDR-21 PVC Pipe, FM	18 LF (Lump Sum)	None	EL 7.80 @ PVC Transition @ 6" FM	EL 6.80 @ 6" - 10" Inverter	DI to PVC Transition; 2 ea Bends @ 45 degrees
SAN FM-6 *	753516	10" SDR-21 PVC Pipe, FM	5 LF (Lump Sum)	None	EL 6.80 @ 6" - 10" Inverter	EL 6.90 @ MH 7	6" - 10" Inverter

\* Indicates data provided for information only. Payment for all of these items to be included in the Lump Sum Price bid for 753516

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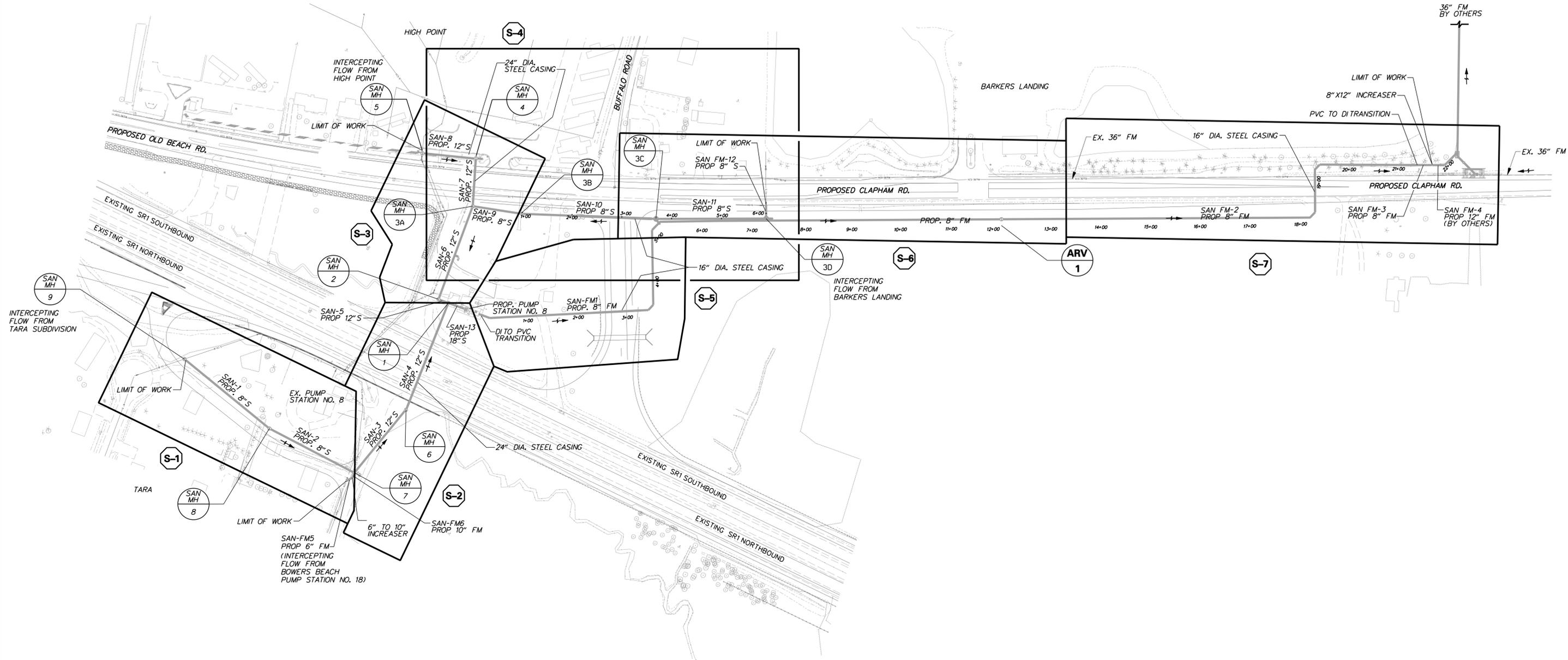
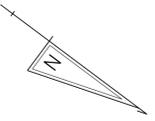
ADDENDUMS / REVISIONS

**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	DAW
COUNTY	CHECKED BY:	SDT
KENT		

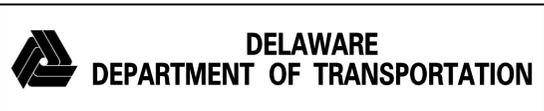
**SEWER PLANS  
SEQUENCE OF CONSTRUCTION  
& SCHEDULES**

G-02
SHEET NO.
619
TOTAL SHTS.
641

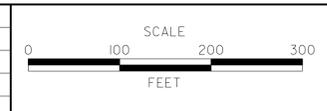


LEGEND	
	SEWER PLAN SHEET

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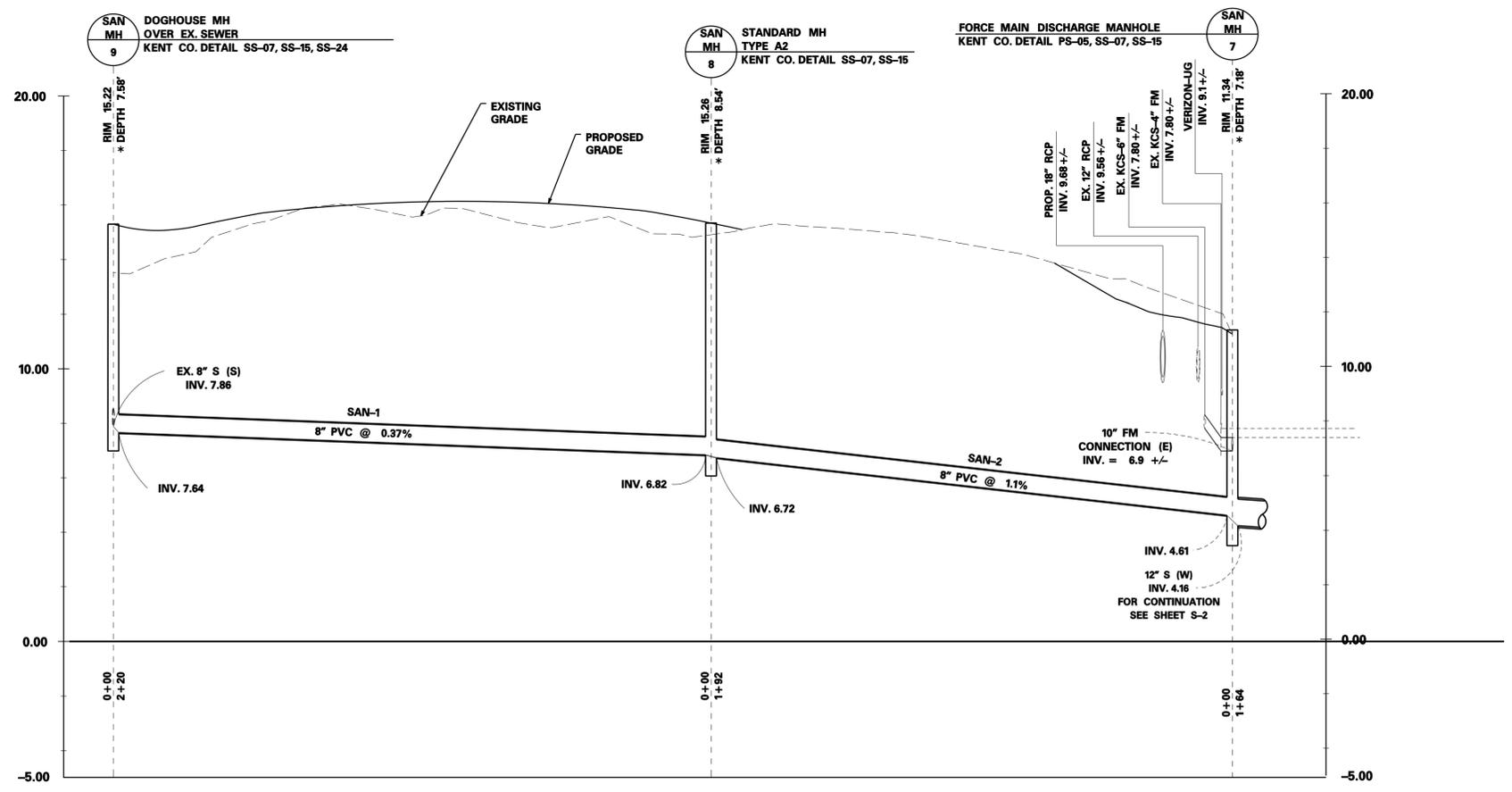
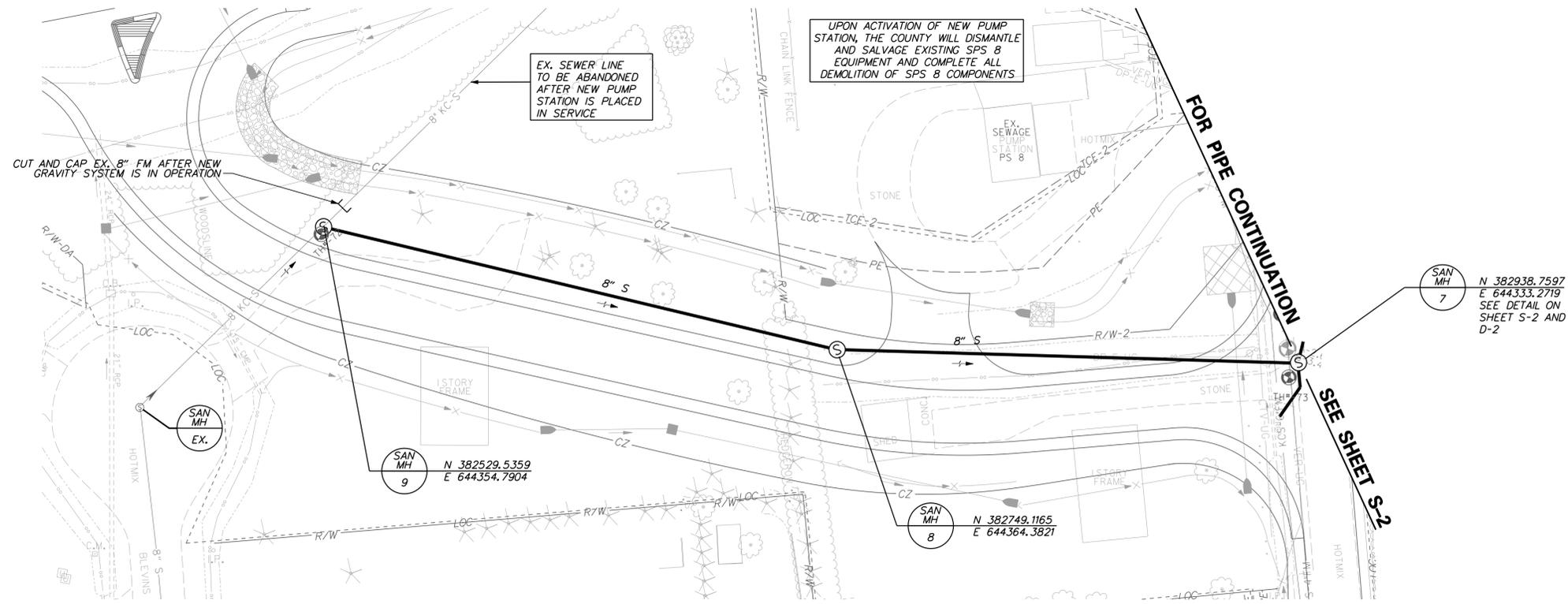
ADDENDUMS / REVISIONS



**SR1, LITTLE HEAVEN**  
**GRADE SEPARATED INTERSECTION**

CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	BP
COUNTY	CHECKED BY:	TM
KENT		

SEWER PLANS SHEET INDEX	
I-01	SHEET NO.
620	TOTAL SHTS.
641	



\* NOTED DEPTH IS FROM RIM TO LOWEST PIPE INVERT. ACTUAL DEPTH OF MANHOLE IS DEPENDENT ON MANHOLE TYPE AND SHALL COMPLY WITH THE REFERENCED STANDARD DETAILS. (TYP)

SEWER LEGEND	
SYMBOL	DESCRIPTION
(S)	PROPOSED SANITARY MANHOLE
→	PROPOSED SEWER PIPE
→→→	PROPOSED SEWER PIPE WITHIN STEEL CASING PIPE
(S)	EXISTING MANHOLE
=== KC-FM ===	EXISTING KENT CO. DPW FORCE MAIN
=== KC-S ===	EXISTING KENT CO. DPW SEWER
(SAN MH EX)	MANHOLE SYMBOL
(ARV MH)	AIR RELEASE AND VACUUM VALVE SYMBOL

UTILITY TEST HOLE SCHEDULE						
NO.	UTILITY	STATION	OFFSET	GRND EL.	COVER	O. D. & MATERIAL
72	KENT CO.	1001+62.07	-24.71'	13.90'	5.37'	8" PVC
73	VERIZON	1101+36.90	11.28'	11.67'	2.43'	1.25" D. B.
73	KENT CO.	1101+36.90	11.28'	11.67'	3.54'	4" PVC

**8" SEWER PROFILE**  
SCALE: HORIZ. 1"=30'  
VERT. 1"=3'

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ADDENDUMS / REVISIONS	

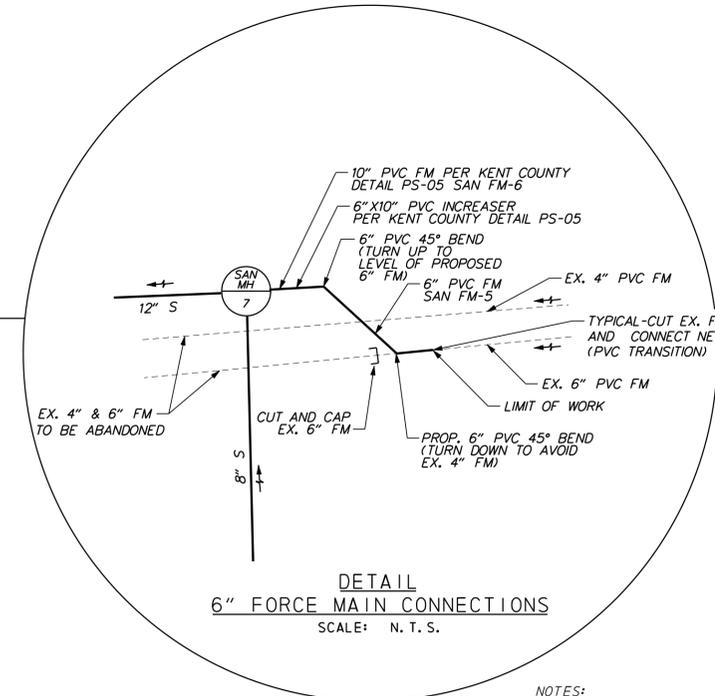
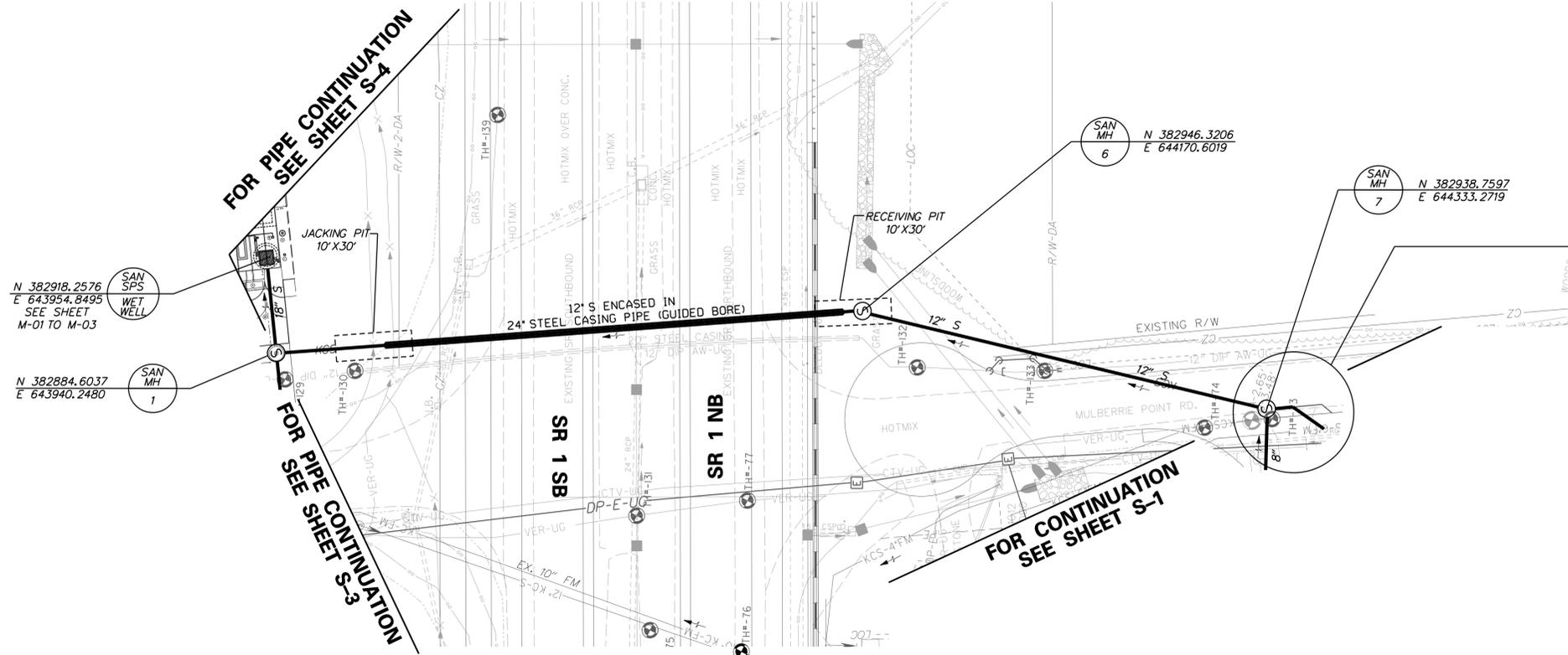


**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	BP
COUNTY	CHECKED BY:	TM
KENT		

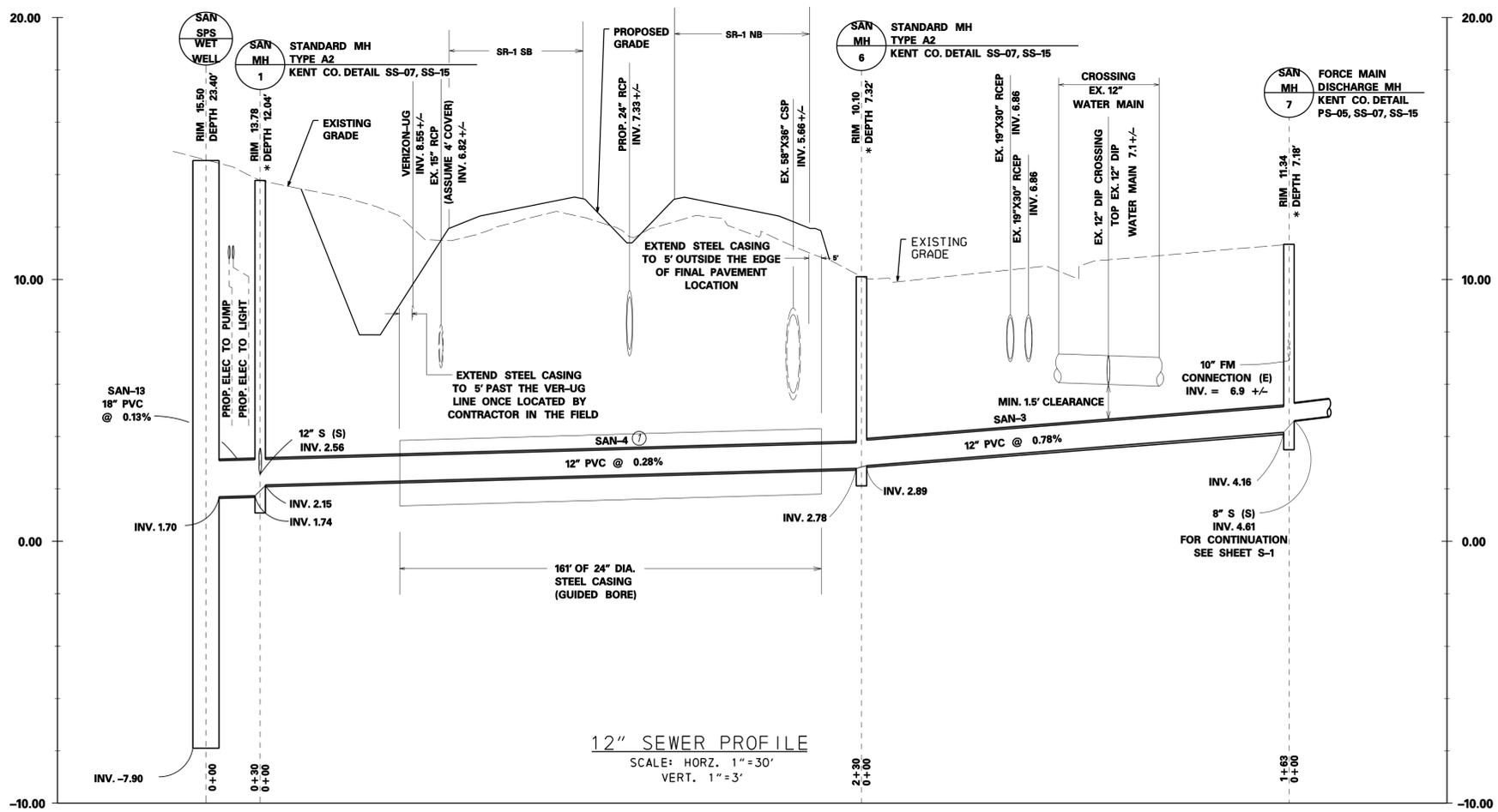
**SEWER PLANS  
PLAN & PROFILE**

S-01
SHEET NO.
621
TOTAL SHTS.
641



- NOTES:
1. KENT COUNTY TO DIVERT FLOW FROM EX. 6" FM TO EX. 4" UPSTREAM OF MANHOLE 7. CONTRACTOR TO STAGE TANKERS, BYPASS PUMPING AND PERSONNEL AS NECESSARY BEFORE CUTTING THE 6" FM.
  2. UPON CONFIRMATION FROM KENT COUNTY THAT UPSTREAM FLOW HAS BEEN DIVERTED AND CONFIRMATION BY CONTRACTOR THAT SUFFICIENT PUMPING CAPACITY EXISTS AT WORK SITE, CUT AND CAP EX. 6" PVC FM AND CONNECT WITH PROP. TRANSITION ADAPTER TO THE PROP. PVC 45° BENDS TO MH7 AS SHOWN. CONTRACTOR TO REMOVE ALL RESIDUAL MATTER FROM FORCE MAIN TO BE ABANDONED BEFORE FILLING WITH FLOWABLE FILL AND CAPPING.
  3. ALL WORK SHOWN TO TRANSITION FROM EXISTING 6" PVC FM TO NEW MH-7 SHALL BE PAID FOR AS PART OF LUMP SUM FOR ITEM 753516

\* NOTED DEPTH IS FROM RIM TO LOWEST PIPE INVERT. ACTUAL DEPTH OF MANHOLE IS DEPENDENT ON MANHOLE TYPE AND SHALL COMPLY WITH THE REFERENCED STANDARD DETAIL. (TYP)



SEWER LEGEND	
SYMBOL	DESCRIPTION
	PROPOSED SANITARY MANHOLE
	PROPOSED SEWER PIPE
	PROPOSED SEWER PIPE WITHIN STEEL CASING PIPE
	EXISTING MANHOLE
	EXISTING KENT CO. DPW FORCE MAIN
	EXISTING KENT CO. DPW SEWER
	MANHOLE SYMBOL
	AIR RELEASE AND VACUUM VALVE SYMBOL

UTILITY TEST HOLE SCHEDULE						
NO.	UTILITY	STATION	OFFSET	GRND EL.	COVER	O.D. & MATERIAL
73	VERIZON	1101+36.90	11.28'	11.67'	2.43'	1.25" D.B.
73	KENT CO.	1101+36.90	11.28'	11.67'	3.54'	4" PVC
74	VERIZON	1101+10.31	12.39'	11.41'	2.66'	1.25" D.B.
74	KENT CO.	1101+10.31	12.39'	11.41'	3.07'	4" PVC
75	KENT CO.	216+55.98	-27.87'	12.78'	6.29'	METAL CASING
76	KENT CO.	216+47.49	7.92'	12.85'	6.76'	10" IRON
77	VERIZON	217+06.54	10.38'	12.54'	4.53'	3" D.B.
130	ARTESIAN	1211+17.01	-69.20'	12.88'	13.36'	METAL (SIZE UNK)
131	VERIZON	1210+60.16	40.99'	12.29'	6.05'	3" D.B.
132	ARTESIAN	1211+17.91	150.99'	10.40'	3.27'	12" METAL
133	ARTESIAN	1211+16.50	200.89'	10.66'	3.51'	12" METAL
139	VERIZON	1212+16.92	-13.15'	11.75'	2.66'	1" BLACK

DRAWINGS NOTES  
 ① SAN-4: ENTIRE RUN OF PIPE BETWEEN MH-1 AND MH-6 SHALL BE SDR-26

1/13/2015 6:32:50 PM G:\PROJECTS\03517.00 ID\DOTS Open End\03517.16 SR1, LITTLE HEAVEN FINAL DESIGN\DWG Files\swr06.dgn



ADDENDUMS / REVISIONS



### SR1, LITTLE HEAVEN GRADE SEPARATED INTERSECTION

CONTRACT	T200412202
COUNTY	KENT
BRIDGE NO.	-
DESIGNED BY:	BP
CHECKED BY:	TM

### SEWER PLANS PLAN & PROFILE

S-02
SHEET NO.
622
TOTAL SHTS.
641

FOR PIPE CONTINUATION SEE SHEET S-4

6" PVC SERVICE LATERAL STUB WITH CLEANOUT INSTALLED AT ROW LINE. INSTALL AT MINIMUM 2% SLOPE IN ACCORDANCE WITH KC STANDARD DETAIL CO-07 AND CO-03. PAYMENT TO BE MADE UNDER ITEM 753516

12" PVC STUB INSTALLED AT MINIMUM 0.30% SLOPE. CAP END OF STUB. PAYMENT TO BE MADE UNDER 753503.

N 382775.8453  
E 643701.72.84

RIM ELEV. SHALL MATCH PROPOSED GRADE  
N 382794.939  
E 643767.439

N 382884.6037  
E 643940.2480

N 382850.4966  
E 643950.5562

N 382682.9273  
E 643757.1440

INV. IN = 13.49  
INV. OUT = 13.04

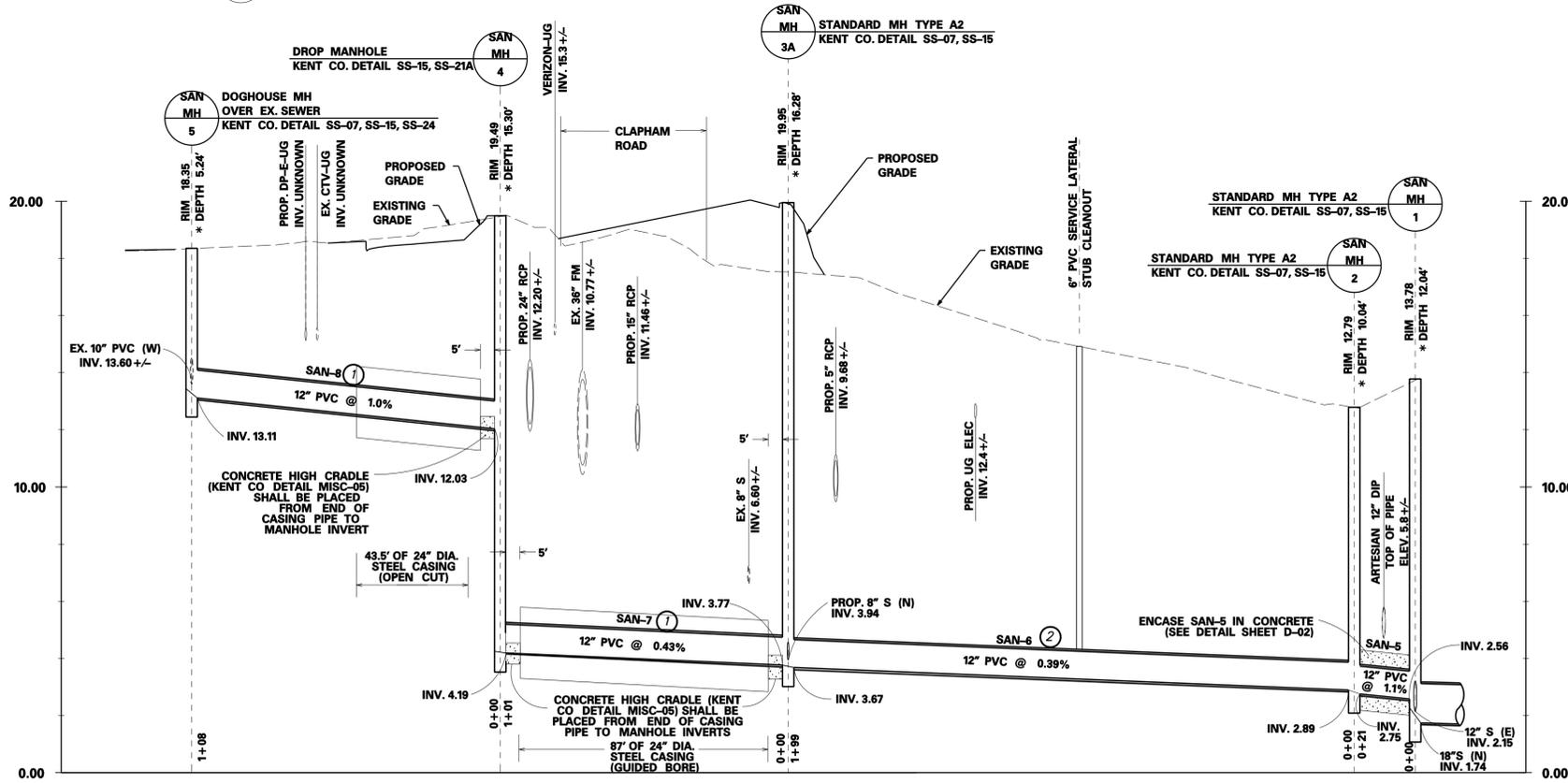
FOR PIPE CONTINUATION  
SEE SHEET S-2



**DRAWING NOTES**

- ① ENTIRE RUN OF PIPE BETWEEN MH-5 AND MH-4 (SAN-8) AND BETWEEN MH-4 AND MH-3A (SAN-7) SHALL BE SDR-26.
- ② SAN-6 THE ENTIRE RUN OF PIPE BETWEEN MH-3A AND MH-2 SHALL BE SDR-35.

\* NOTED DEPTH IS FROM RIM TO LOWEST PIPE INVERT. ACTUAL DEPTH OF MANHOLE IS DEPENDENT ON MANHOLE TYPE AND SHALL COMPLY WITH THE REFERENCED STANDARD DETAIL.(TYP)



SEWER LEGEND	
SYMBOL	DESCRIPTION
	PROPOSED SANITARY MANHOLE
	PROPOSED SEWER PIPE
	PROPOSED SEWER PIPE WITHIN STEEL CASING PIPE
	EXISTING MANHOLE
	EXISTING KENT CO. DPW FORCE MAIN
	EXISTING KENT CO. DPW SEWER
	MANHOLE SYMBOL
	AIR RELEASE AND VACUUM VALVE SYMBOL

UTILITY TEST HOLE SCHEDULE						
NO.	UTILITY	STATION	OFFSET	GRND EL.	COVER	O. D. & MATERIAL
87	KENT CO.	621+93.72	-17.81'	13.47'	4.45'	36" CONCRETE
88	VERIZON	622+05.75	-30.09'	15.23'	2.57'	(6) 4" PVC
89	KENT CO.	622+39.74	-6.78'	14.05'	4.55'	10" IRON
90	KENT CO.	622+36.70	-18.04'	13.86'	4.36'	12" CLAY
90	KENT CO.	622+36.70	-18.04'	12.03'	6.19'	36" CONCRETE
91	VERIZON	623+08.17	-16.60'	15.05'	3.54'	3" D. B.
92	VERIZON	623+57.97	-17.68'	14.52'	4.06'	(6) 4" MULTIDUCT
93	VERIZON	622+86.42	66.64'	12.48'	3.44'	3" D. B.
93	KENT CO.	622+86.42	66.64'	11.60'	4.32'	10" METAL
94	KENT CO.	622+80.58	70.18'	13.44'	2.25'	10" IRON BELL
95	VERIZON	622+73.10	112.63'	11.55'	2.47'	3" D. B.
96	KENT CO.	622+83.98	111.08'	10.92'	3.81'	10" METAL
97	ARTESIAN	623+32.63	124.00'	12.27'	3.89'	12" D. I.
127	KENT CO.	622+82.21	97.41'	14.17'	6.08'	18" TERRA COTTA
128	ARTESIAN	1211+11.90	-113.02'	13.48'	6.94'	METAL (SIZE UNK)
129	ARTESIAN	1211+13.71	-96.61'	13.39'	9.06'	METAL (SIZE UNK)

**12" SEWER PROFILE**

SCALE: HORZ. 1"=30'  
VERT. 1"=3'

ADDENDUMS / REVISIONS

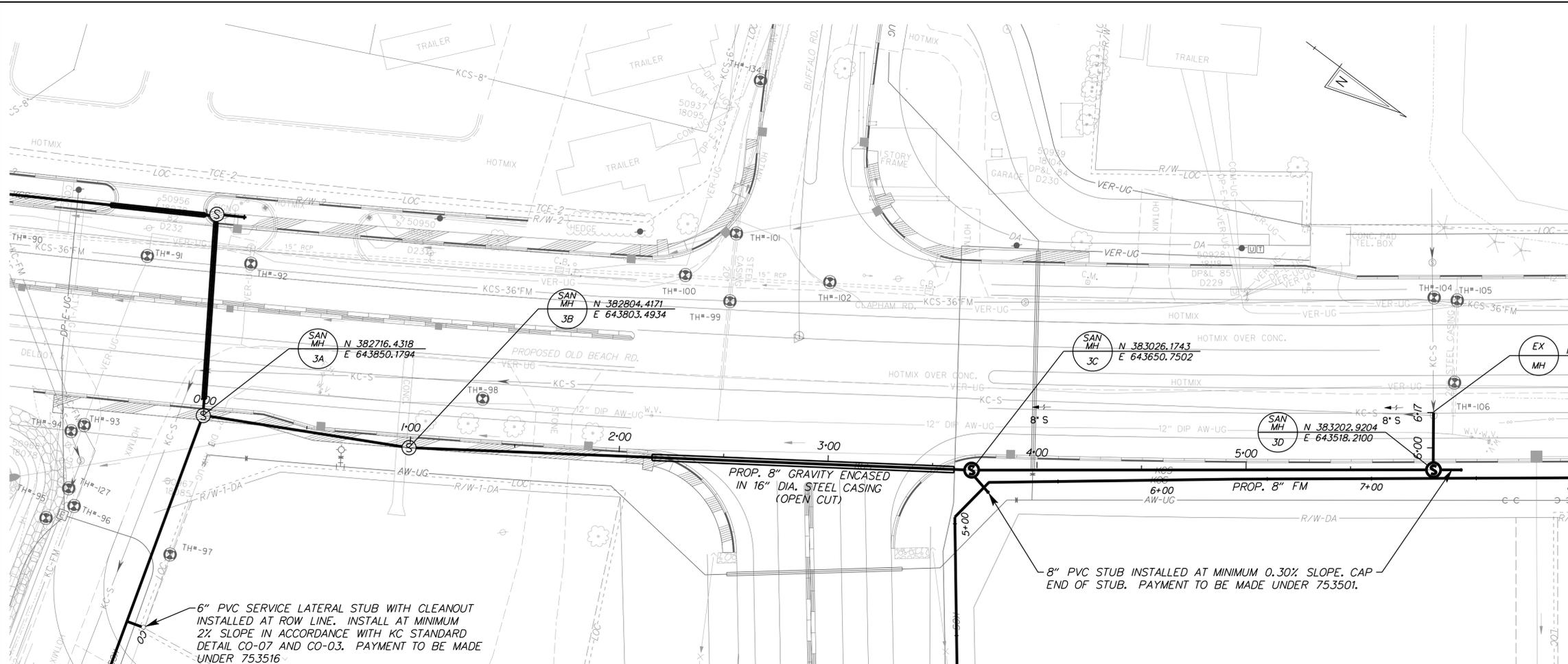


**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	BP
COUNTY	CHECKED BY:	TM
KENT		

**SEWER PLANS  
PLAN & PROFILE**

S-03
SHEET NO.
623
TOTAL SHTS.
641



- DRAWING NOTES**
- ① ENTIRE RUN OF PIPE BETWEEN MH-3A AND MH-3B(SAN-9) AND BETWEEN MH-3B AND MH-3C(SAN-10) SHALL BE SDR-26.
  - \* NOTED DEPTH IS FROM RIM TO LOWEST PIPE INVERT. ACTUAL DEPTH OF MANHOLE IS DEPENDENT ON MANHOLE TYPE AND SHALL COMPLY WITH THE REFERENCED STANDARD DETAIL. (TYP)

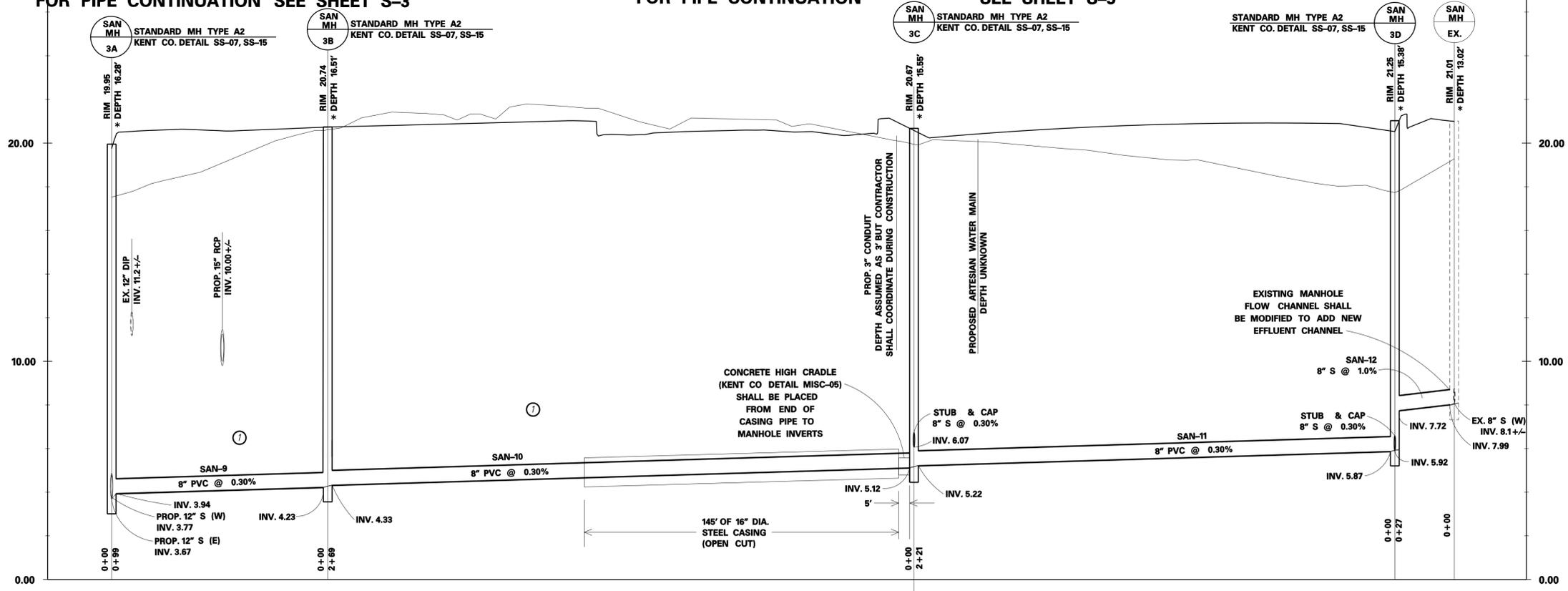
FOR PIPE CONTINUATION SEE SHEET S-6

FOR PIPE CONTINUATION SEE SHEET S-3

FOR PIPE CONTINUATION

SEE SHEET S-5

SEWER LEGEND	
SYMBOL	DESCRIPTION
	PROPOSED SANITARY MANHOLE
	PROPOSED SEWER PIPE
	PROPOSED SEWER PIPE WITHIN STEEL CASING PIPE
	EXISTING MANHOLE
	EXISTING KENT CO. DPW FORCE MAIN
	EXISTING KENT CO. DPW SEWER
	MANHOLE SYMBOL
	AIR RELEASE AND VACUUM VALVE SYMBOL

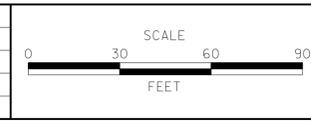


UTILITY TEST HOLE SCHEDULE						
NO.	UTILITY	STATION	OFFSET	GRND EL.	COVER	O. D. & MATERIAL
91	VERIZON	623+08.17	-16.60'	15.05'	3.54'	3" D. B.
92	VERIZON	623+57.97	-17.68'	14.52'	4.06'	(6) 4" MULTIDUCT
93	VERIZON	622+86.42	66.64'	12.48'	3.44'	3" D. B.
93	KENT CO.	622+86.42	66.64'	11.60'	4.32'	10" METAL
94	KENT CO.	622+80.58	70.18'	13.44'	2.25'	10" IRON BELL
95	VERIZON	622+73.10	112.63'	11.55'	2.47'	3" D. B.
96	KENT CO.	622+83.98	111.08'	10.92'	3.81'	10" METAL
97	ARTESIAN	623+32.63	124.00'	12.27'	3.89'	12" D. I.
98	ARTESIAN	624+75	000	17.20'	3.68'	10" D. I.
99	ARTESIAN	625+90	000	14.80'	4.69'	36" CONCRETE
99	ARTESIAN	625+90	000	10.78'	8.71'	D. I.
100	VERIZON	625+60	000	17.59'	1.75'	3" D. B.
101	ARTESIAN	625+90	000	10.10'	9.74'	D. I.
102	VERIZON	626+45	-27.38'	19.78'	3.37'	3" D. B.
104	VERIZON	629+26.32	-25.08'	16.43'	3.71'	2.5" D. B.
104	KENT CO.	629+26.32	-25.08'	14.22'	5.92'	36" CONCRETE
104	KENT CO.	629+26.32	-25.08'	9.50'	10.64'	8" CONCRETE
105	VERIZON	629+37.36	-23.71'	16.42'	3.64'	3" D. B.
105	KENT CO.	629+37.36	-23.71'	14.21'	5.85'	36" F. M.
105	ARTESIAN	629+37.36	-23.71'	10.03'	10.03'	12" D. I.
106	VERIZON	629+35.92	15.53'	17.64'	2.51'	1.25" D. B.
106	ARTESIAN	629+35.92	15.53'	11.19'	8.96'	12" D. I.
127	KENT CO.	622+82.21	97.41'	14.17'	6.08'	18" TERRA COTTA
134	ARTESIAN	N/A	N/A	16.33'	5.08'	12" BLACK METAL

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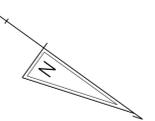
ADDENDUMS / REVISIONS



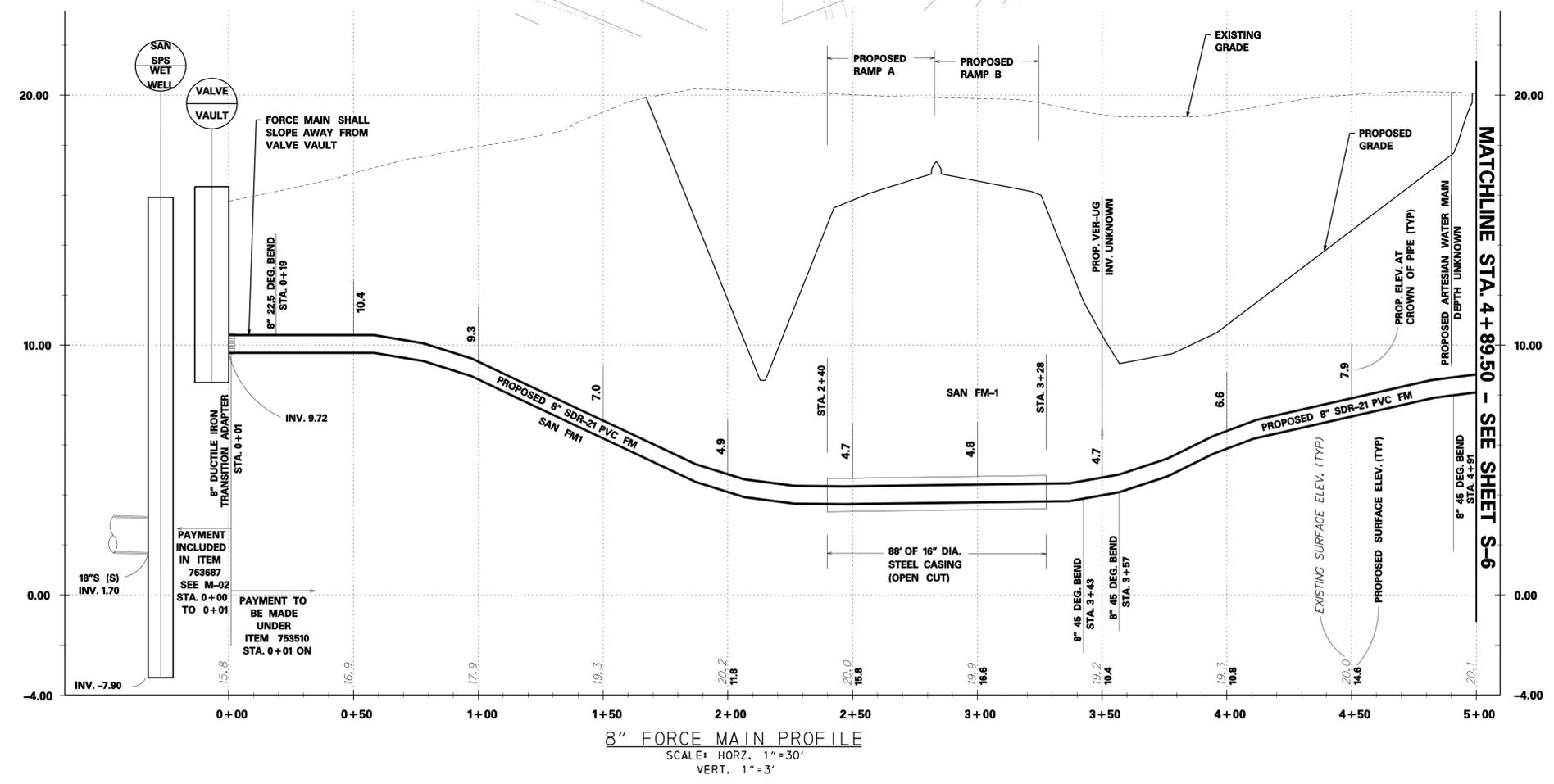
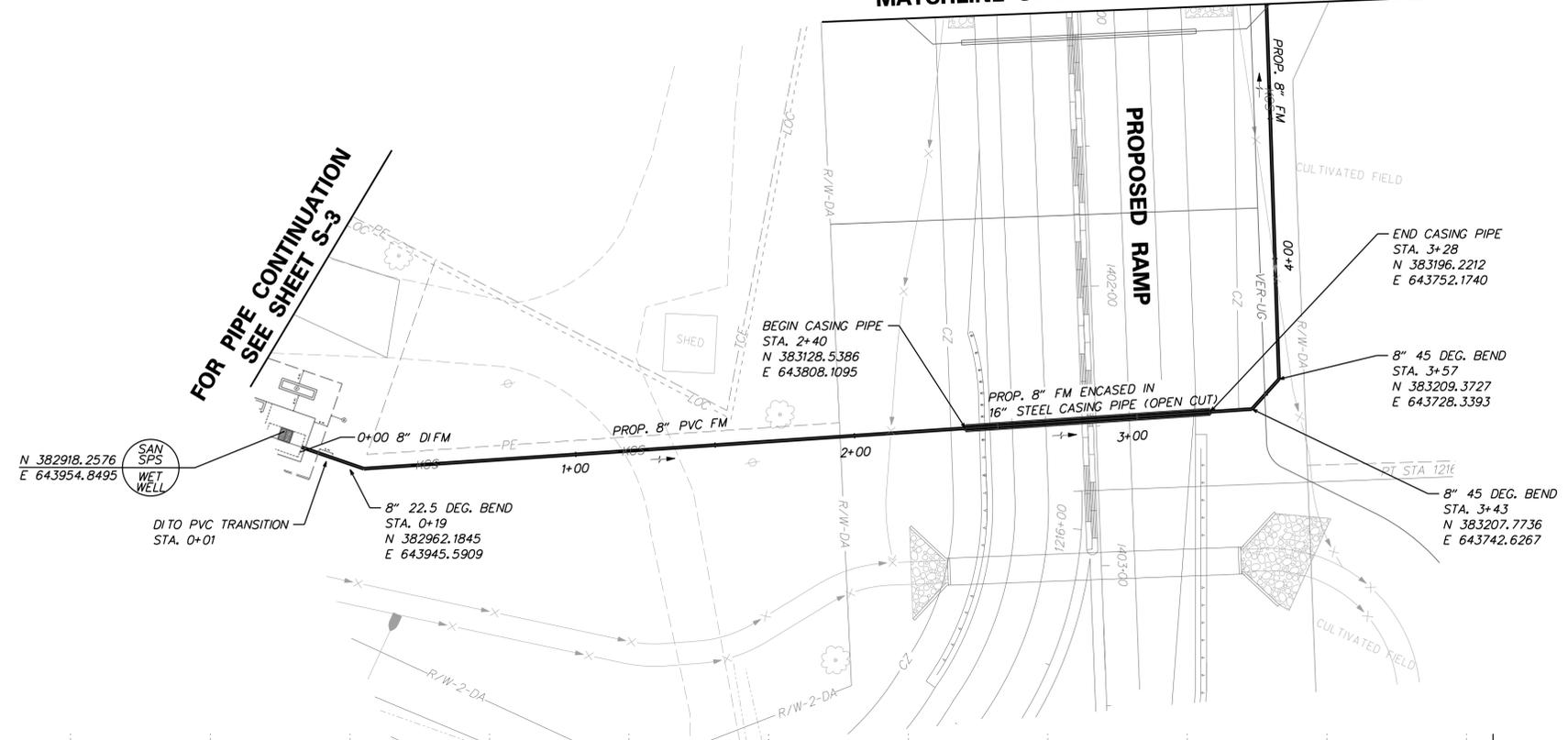
**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	BP
COUNTY	CHECKED BY:	TM
KENT		

SEWER PLANS PLAN & PROFILE	
SHEET NO.	S-04
TOTAL SHTS.	641



MATCHLINE STA. 4+89.50 - SEE SHEET S-6



NOTE:  
STANDARD FORCE MAIN  
MARKER (KC STANDARD  
DETAILS PS-04) SHALL BE  
INSTALLED AT EACH BEND  
IN FORCE MAIN.

SEWER LEGEND	
SYMBOL	DESCRIPTION
	PROPOSED SANITARY MANHOLE
	PROPOSED SEWER PIPE
	PROPOSED SEWER PIPE WITHIN STEEL CASING PIPE
	EXISTING MANHOLE
	EXISTING KENT CO. DPW FORCE MAIN
	EXISTING KENT CO. DPW SEWER
	MANHOLE SYMBOL
	AIR RELEASE AND VACUUM VALVE SYMBOL

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ADDENDUMS / REVISIONS



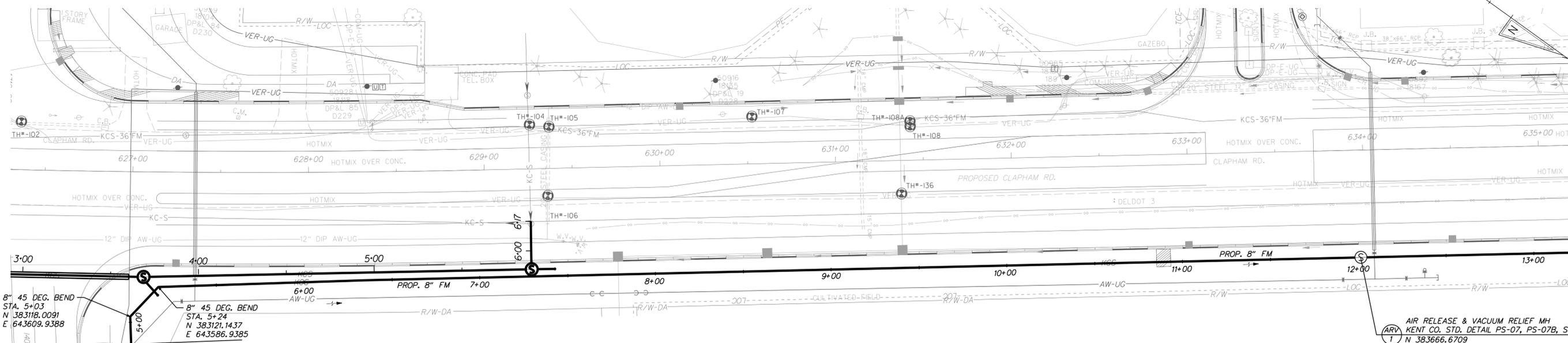
**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	SFP
COUNTY	CHECKED BY:	WFC
KENT		

**SEWER PLANS  
PLAN & PROFILE**

S-05
SHEET NO.
625
TOTAL SHTS.
641

MATCHLINE STA. 13+30 - SEE SHEET S-7

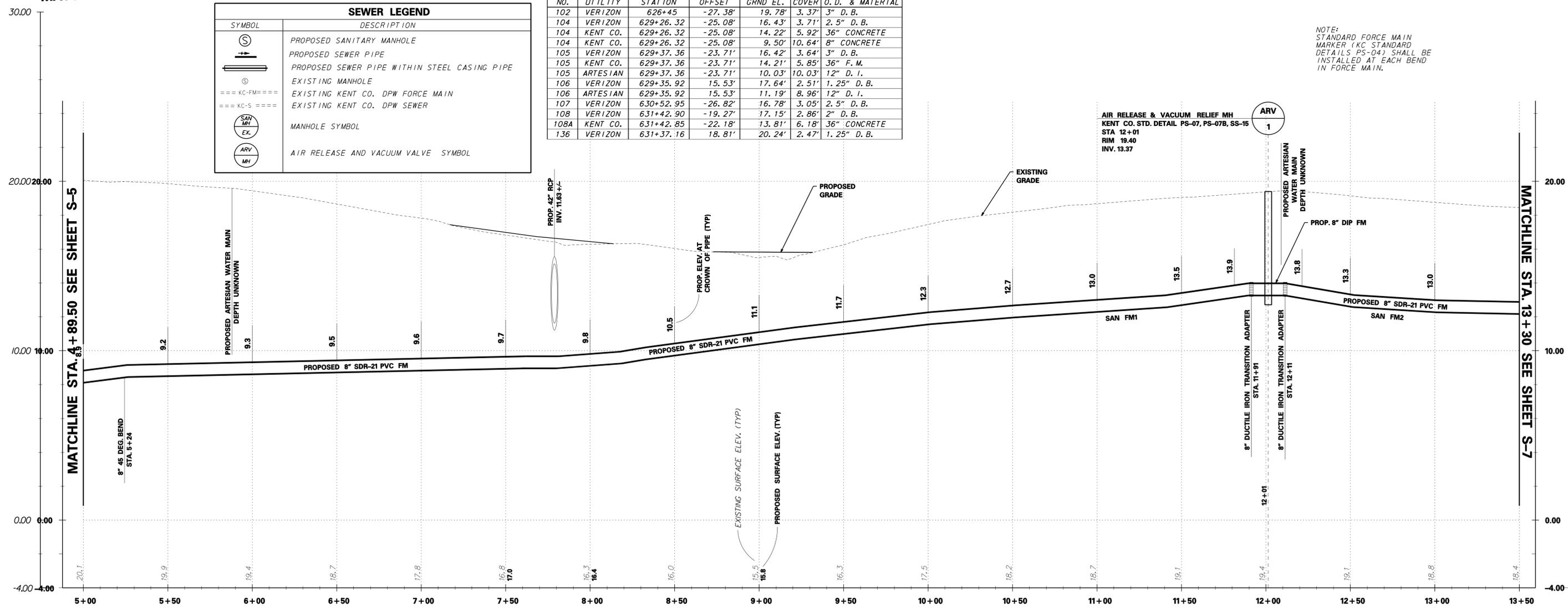


MATCHLINE STA. 4+89.50 - SEE SHEET S-5

SEWER LEGEND	
SYMBOL	DESCRIPTION
	PROPOSED SANITARY MANHOLE
	PROPOSED SEWER PIPE
	PROPOSED SEWER PIPE WITHIN STEEL CASING PIPE
	EXISTING MANHOLE
	EXISTING KENT CO. DPW FORCE MAIN
	EXISTING KENT CO. DPW SEWER
	MANHOLE SYMBOL
	AIR RELEASE AND VACUUM VALVE SYMBOL

UTILITY TEST HOLE SCHEDULE						
NO.	UTILITY	STATION	OFFSET	GRND EL.	COVER	O. D. & MATERIAL
102	VERIZON	626+45	-27.38'	19.78'	3.37'	3" D. B.
104	VERIZON	629+26.32	-25.08'	16.43'	3.71'	2.5" D. B.
104	KENT CO.	629+26.32	-25.08'	14.22'	5.92'	36" CONCRETE
104	KENT CO.	629+26.32	-25.08'	9.50'	10.64'	8" CONCRETE
105	VERIZON	629+37.36	-23.71'	16.42'	3.64'	3" D. B.
105	KENT CO.	629+37.36	-23.71'	14.21'	5.85'	36" F. M.
105	ARTESIAN	629+37.36	-23.71'	10.03'	10.03'	12" D. I.
106	VERIZON	629+35.92	15.53'	17.64'	2.51'	1.25" D. B.
106	ARTESIAN	629+35.92	15.53'	11.19'	8.96'	12" D. I.
107	VERIZON	630+52.95	-26.82'	16.78'	3.05'	2.5" D. B.
108	VERIZON	631+42.90	-19.27'	17.15'	2.86'	2" D. B.
108A	KENT CO.	631+42.85	-22.18'	13.81'	6.18'	36" CONCRETE
136	VERIZON	631+37.16	18.81'	20.24'	2.47'	1.25" D. B.

NOTE:  
STANDARD FORCE MAIN  
MARKER (KC STANDARD  
DETAILS PS-04) SHALL BE  
INSTALLED AT EACH BEND  
IN FORCE MAIN.



8" FORCE MAIN PROFILE  
SCALE: HORZ. 1"=30'  
VERT. 1"=3'

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ADDENDUMS / REVISIONS	

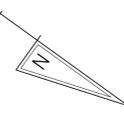


SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION

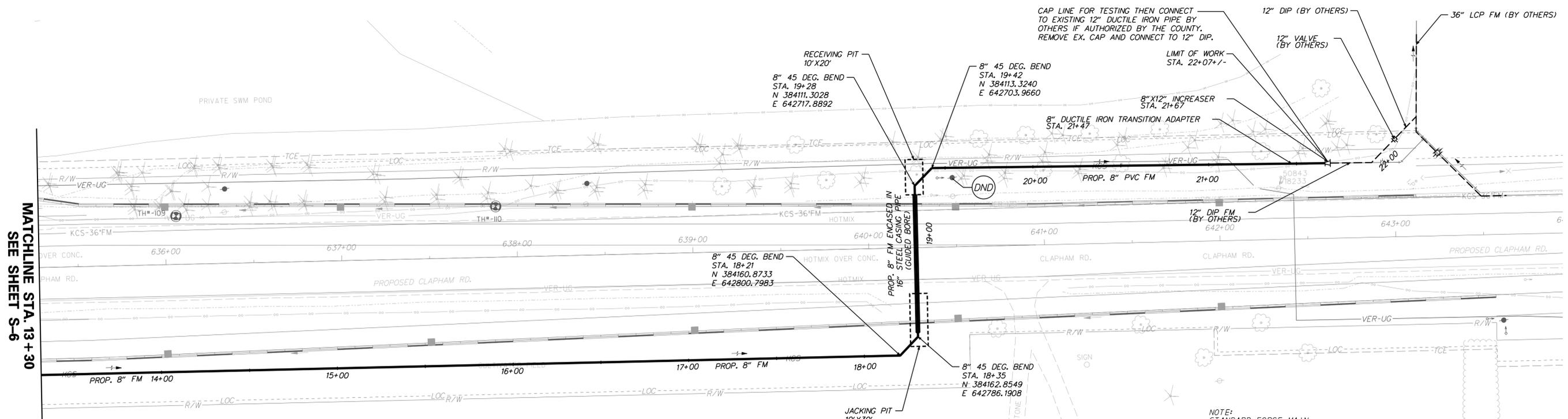
CONTRACT	T200412202	BRIDGE NO.	-
COUNTY	KENT	DESIGNED BY:	BP
		CHECKED BY:	TM

SEWER PLANS  
PLAN & PROFILE

S-06
SHEET NO.
626
TOTAL SHTS.
641



CAP LINE FOR TESTING THEN CONNECT TO EXISTING 12" DUCTILE IRON PIPE BY OTHERS IF AUTHORIZED BY THE COUNTY. REMOVE EX. CAP AND CONNECT TO 12" DIP.



MATCHLINE STA. 13+30 SEE SHEET S-6

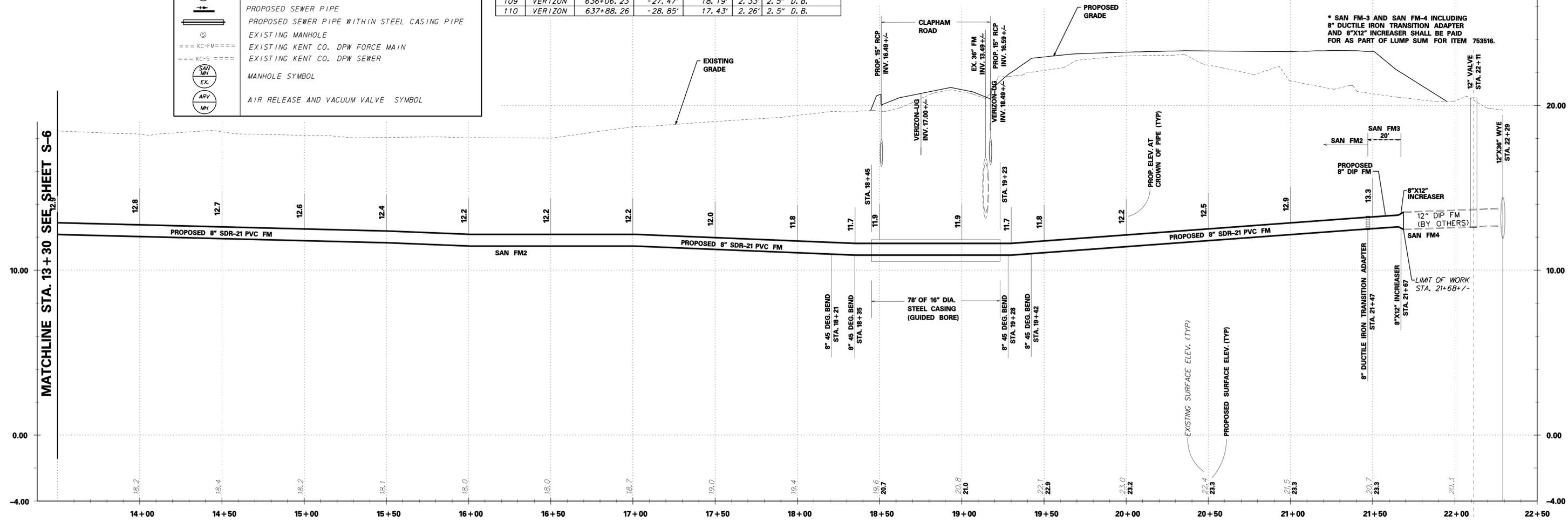
MATCHLINE STA. 13+30 SEE SHEET S-6

SEWER LEGEND	
SYMBOL	DESCRIPTION
	PROPOSED SANITARY MANHOLE
	PROPOSED SEWER PIPE
	PROPOSED SEWER PIPE WITHIN STEEL CASING PIPE
	EXISTING MANHOLE
	EXISTING KENT CO. DPW FORCE MAIN
	EXISTING KENT CO. DPW SEWER
	MANHOLE SYMBOL
	AIR RELEASE AND VACUUM VALVE SYMBOL

UTILITY TEST HOLE SCHEDULE						
NO.	UTILITY	STATION	OFFSET	GRND EL.	COVER	O. D. & MATERIAL
109	VERIZON	636+06.23	-27.47'	18.19'	2.33'	2.5" D. B.
110	VERIZON	637+88.26	-28.85'	17.43'	2.26'	2.5" D. B.

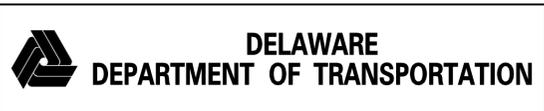
NOTE: STANDARD FORCE MAIN MARKER (KC STANDARD DETAILS PS-04) SHALL BE INSTALLED AT EACH BEND IN FORCE MAIN.

\* SAN FM-3 AND SAN FM-4 INCLUDING 8" DUCTILE IRON TRANSITION ADAPTER AND 8"x12" INCREASER SHALL BE PAID FOR AS PART OF LUMP SUM FOR ITEM 753516.

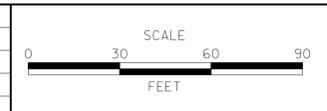


8" FORCE MAIN PROFILE  
SCALE: HORZ. 1"=30'  
VERT. 1"=3'

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ADDENDUMS / REVISIONS	

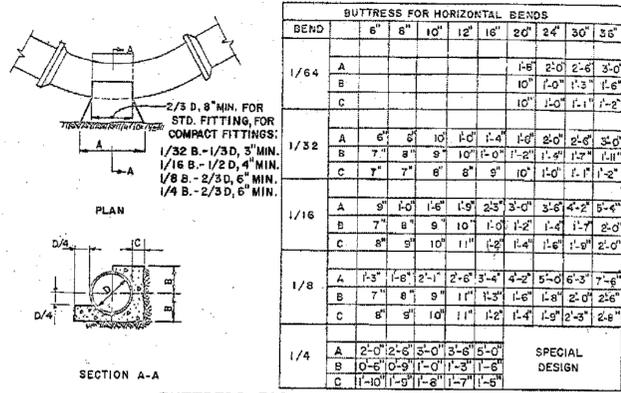


**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

CONTRACT	T200412202	BRIDGE NO.	-
COUNTY	KENT	DESIGNED BY:	BP
		CHECKED BY:	TM

**SEWER PLANS  
PLAN & PROFILE**

S-07
SHEET NO.
627
TOTAL SHTS.
641



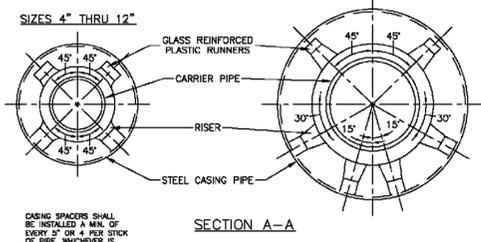
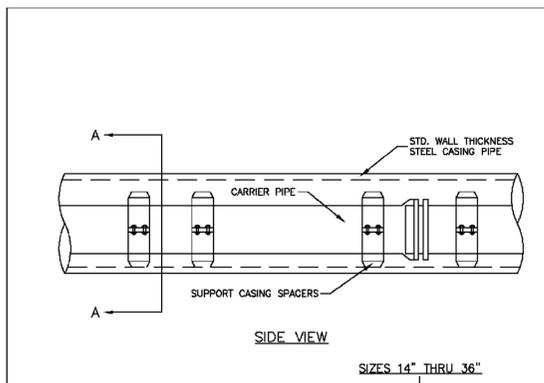
BUTTRESS FOR HORIZONTAL BENDS		BEND	6"	8"	10"	12"	16"	20"	24"	30"	36"
1/64	A							1-6"	2-0"	2-6"	3-0"
	B							10"	1-0"	1-3"	1-6"
	C							10"	1-0"	1-1"	1-2"
1/32	A	6"	8"	10"	12"	16"	20"	24"	2-8"	3-0"	3-0"
	B	7"	8"	9"	10"	1-0"	1-2"	1-4"	1-4"	1-7"	1-11"
	C	7"	7"	8"	9"	10"	1-0"	1-0"	1-0"	1-1"	1-2"
1/16	A	9"	1-0"	1-6"	1-9"	2-3"	3-0"	3-6"	4-2"	5-4"	5-4"
	B	7"	8"	9"	10"	1-0"	1-2"	1-4"	1-4"	1-7"	2-0"
	C	8"	9"	10"	11"	1-2"	1-4"	1-6"	1-6"	1-9"	2-0"
1/8	A	1-3"	1-6"	2-1"	2-6"	3-2"	4-2"	5-0"	6-3"	7-9"	7-9"
	B	7"	8"	9"	11"	1-3"	1-6"	1-8"	2-0"	2-6"	2-6"
	C	8"	9"	10"	11"	1-2"	1-4"	1-6"	1-6"	1-9"	2-8"
1/4	A	2-0"	2-6"	3-0"	3-6"	5-0"					SPECIAL DESIGN
	B	10-6"	10-9"	11-0"	11-3"	11-6"					
	C	11-10"	11-9"	11-8"	11-7"	11-6"					

**BUTTRESS FOR HORIZONTAL BENDS**

Notes  
 1.) All concrete shall be 3000 p.s.i.  
 2.) Buttress dimensions shown are minimum. Dimensions are based upon soil bearing pressure of 3000 p.s.f. and static water pressure of 150 p.s.i. Where pressure exceeds 150 p.s.i. or where soil bearing pressure is less than 3000 p.s.f. special buttress design is required.

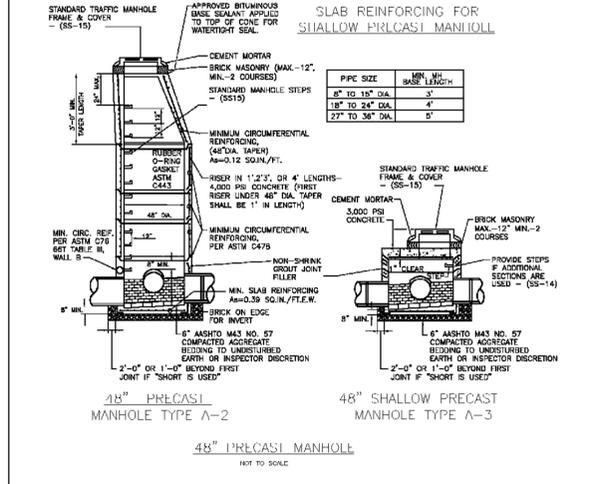
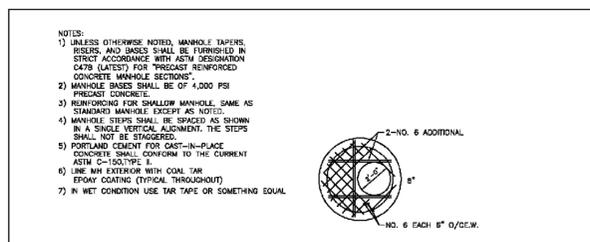
BUTTRESS FOR CAPS		D	6"	8"	10"	12"	16"	20"	24"	30"	36"
E		6"	8"	8"	10"	1-0"	1-4"	1-6"	2-0"	2-0"	2-0"
F		1-0"	1-4"	1-6"	2-0"	2-8"	3-3"	4-0"	4-9"	5-9"	5-9"
G		1-6"	1-11"	2-0"	2-4"	3-9"	4-9"	5-6"	7-6"	8-1"	8-1"

**BUTTRESSES FOR CAPS AND HORIZONTAL AND VERTICAL BENDS**  
N.T.S.

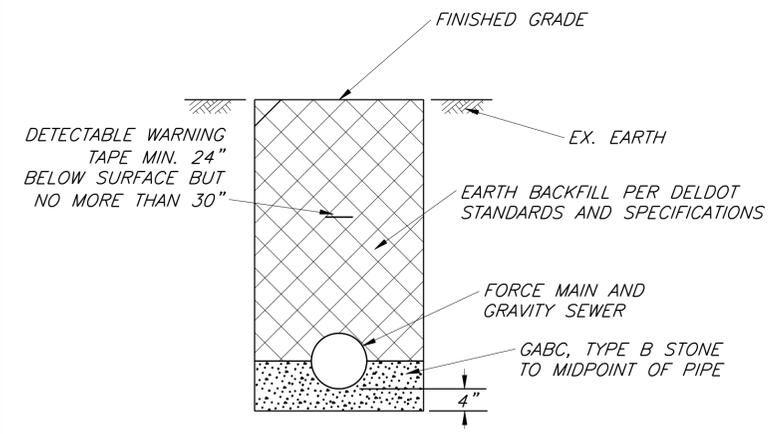


**CASING INSTALLATION**  
NO SCALE

KENT COUNTY	APPROVAL	DEPARTMENT OF PUBLIC WORKS	ISSUED
	DIRECTOR OF PUBLIC WORKS	STANDARD DETAILS	REVISION: 3-27-08
DATE		CASING INSTALLATION	PLATE
			SS-19



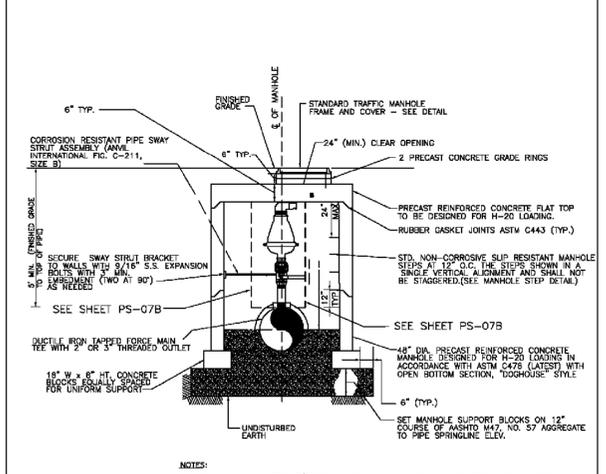
KENT COUNTY	APPROVAL	DEPARTMENT OF PUBLIC WORKS	ISSUED
	DIRECTOR OF PUBLIC WORKS	STANDARD DETAILS	REVISION: 3-27-08
DATE		48" PRECAST MANHOLE	PLATE
			SS-07



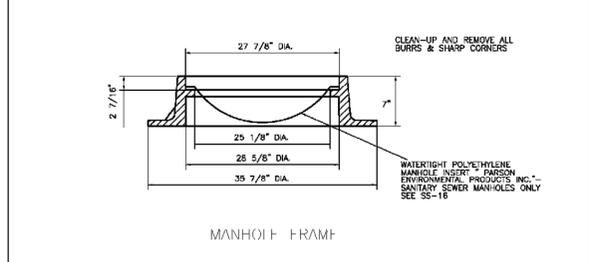
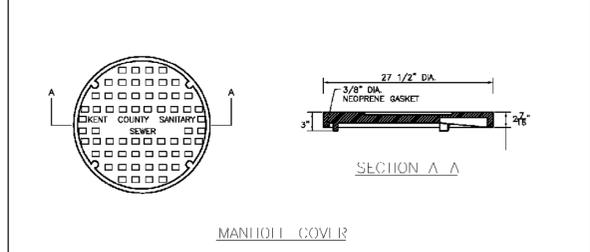
PIPE DIAMETER	MINIMUM TRENCH WIDTH
6"	36"
8"	36"
10"	36"
12"	36"
18"	42"

**TRENCH DETAIL**  
NO SCALE

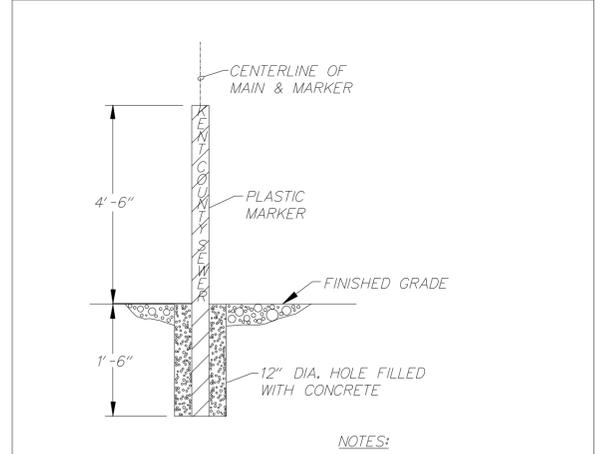
NOTE: REFER TO ROADWAY PATCHING DETAILS FOR TRENCH UNDER A ROADWAY



KENT COUNTY	APPROVAL	DEPARTMENT OF PUBLIC WORKS	ISSUED
	DIRECTOR OF PUBLIC WORKS	STANDARD DETAILS	REVISION: 5-14-08
DATE		COMB. SEWAGE AIR RELIEF VALVE & M.H. DETAIL - PAVED/TRAFFIC AREAS	PLATE
			PS-07



KENT COUNTY	APPROVAL	DEPARTMENT OF PUBLIC WORKS	ISSUED
	DIRECTOR OF PUBLIC WORKS	STANDARD DETAILS	REVISION: 3-27-08
DATE		STANDARD TRAFFIC MANHOLE FRAME AND COVER	PLATE
			SS-15

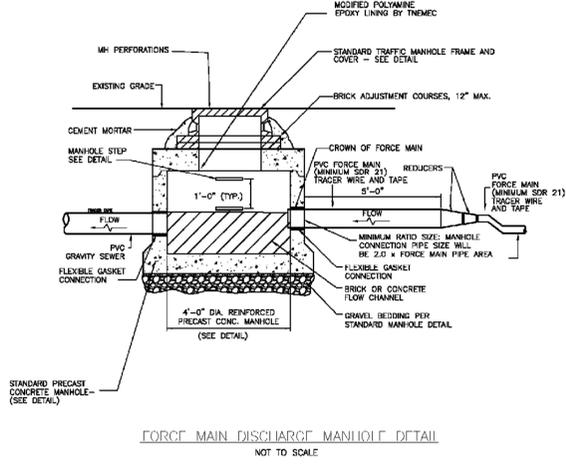


**STANDARD MARKER FOR SEWER FORCE MAINS IN EASEMENTS**  
NOT TO SCALE

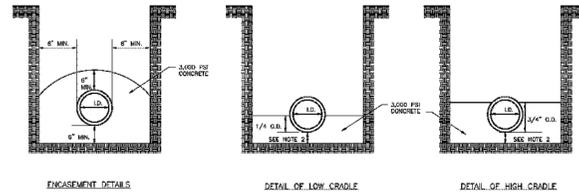
KENT COUNTY	APPROVAL	DEPARTMENT OF PUBLIC WORKS	ISSUED
	DIRECTOR OF PUBLIC WORKS	STANDARD DETAILS	REVISION: 3-27-08
DATE		STANDARD MARKER FOR SEWER FORCE MAINS IN EASEMENTS	PLATE
			PS-04

1/3/2015 10:53:45 PM G:\PROJECTS\03517.00 (DELDOT AGMT 1223 DOTS Open End)\03517.00 SR1.LITTLE HEAVEN FINAL DESIGN\DWG Files\swr12.dgn

- NOTES:
1. LINE MANHOLE INTERIOR 3 COAT SYSTEM MODIFIED POLYAMINE EPOXY BY (THEMEC)
  2. LINE MANHOLE EXTERIOR WITH COAL TAR EPOXY COATING
  3. ELEVATION OF GRAVITY SEWER INVERT SHALL BE MINIMUM 3" ABOVE ELEVATION OF FORCE MAIN CROWN.
  4. PROVIDE SMOOTH UPWARD SLOPING BRICK OR CONCRETE CHANNEL FROM FORCE MAIN TO GRAVITY SEWER.

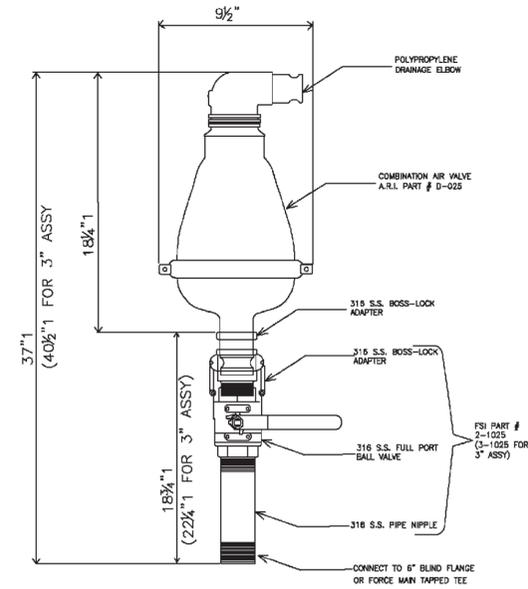


	APPROVAL	DEPARTMENT OF PUBLIC WORKS	ISSUED:
	DIRECTOR OF PUBLIC WORKS	STANDARD DETAILS FORCE MAIN DISCHARGE MANHOLE DETAIL	REVISIONS: 10-6-08 PLATE
	DATE		PS-05

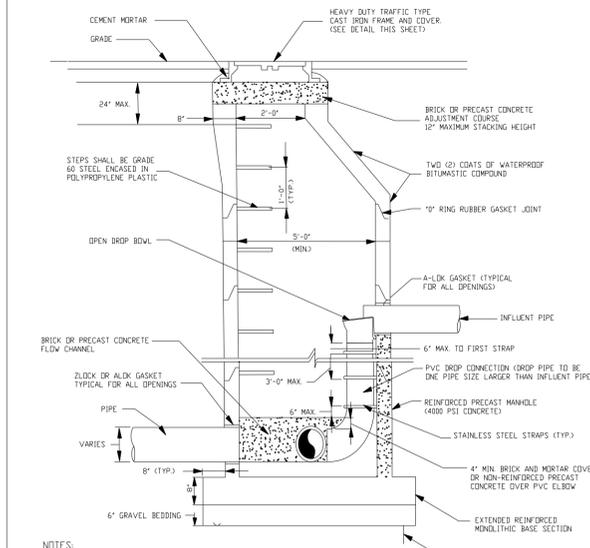


PIPE I.D.	MAXIMUM PAYMENT (SQ. FT. PER LIN. FT. CONC. ENCASEMENT)	PIPE I.D.	MAXIMUM PAYMENT (SQ. FT. PER LIN. FT. CONC. ENCASEMENT)
6"	1.53	6"	1.28
8"	2.55	8"	1.58
10"	3.95	10"	1.86
12"	5.63	12"	2.33
14"	7.29	14"	2.82
16"	9.31	16"	3.42
18"	11.66	18"	4.09
20"	14.35	20"	4.82
22"	17.38	22"	5.61
24"	20.75	24"	6.46
26"	24.46	26"	7.37
28"	28.51	28"	8.34
30"	32.91	30"	9.37
32"	37.66	32"	10.45
34"	42.76	34"	11.59
36"	48.21	36"	12.78
38"	54.01	38"	14.02
40"	60.16	40"	15.31

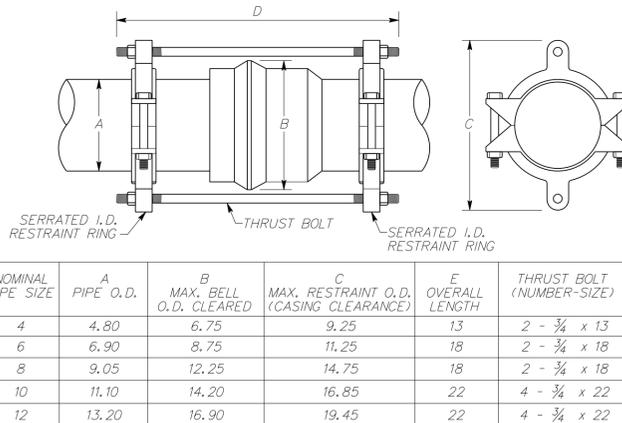
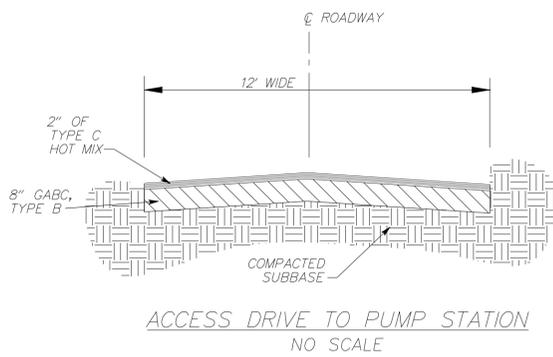
	APPROVAL	DEPARTMENT OF PUBLIC WORKS	ISSUED:
	DIRECTOR OF PUBLIC WORKS	STANDARD DETAILS ENCASEMENT AND CRADLE DETAILS	REVISIONS: PLATE
	DATE		MISC-05



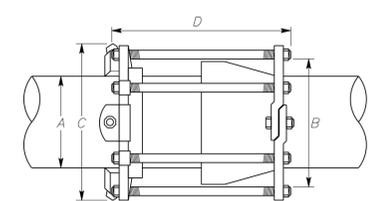
	APPROVAL	DEPARTMENT OF PUBLIC WORKS	ISSUED:
	DIRECTOR OF PUBLIC WORKS	STANDARD DETAILS MODIFIED 2" AIR RELEASE VALVE ASSEMBLY	REVISIONS: 5-14-08 PLATE
	DATE		PS-07B



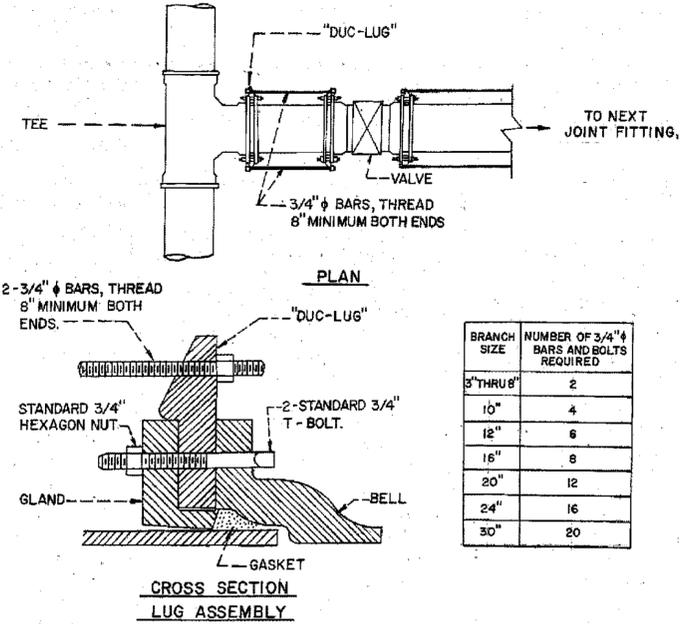
	APPROVAL	DEPARTMENT OF PUBLIC WORKS	ISSUED:
	DIRECTOR OF PUBLIC WORKS	STANDARD DETAILS DROP MANHOLE	REVISIONS: 12-24 PLATE
	DATE		SS-21A (M)



NOMINAL PIPE SIZE	A PIPE O.D.	B MAX. BELL O.D. CLEARED	C MAX. RESTRAINT O.D. (CASING CLEARANCE)	E OVERALL LENGTH	THRUST BOLT (NUMBER-SIZE)
4	4.80	6.75	9.25	13	2 - 3/4 x 13
6	6.90	8.75	11.25	18	2 - 3/4 x 18
8	9.05	12.25	14.75	18	2 - 3/4 x 18
10	11.10	14.20	16.85	22	4 - 3/4 x 22
12	13.20	16.90	19.45	22	4 - 3/4 x 22



NOMINAL PIPE SIZE	A PIPE O.D.	B MAX. BELL O.D. CLEARED	C CASING CLEARANCE (W/NUTS OFF)	D THRUST ROD (QUANTITY - SIZE)
6	6.90	8.60	12.00	6 - 3/4 X 13
8	9.05	10.9	14.15	6 - 3/4 X 13
10	11.10	13.1	16.20	8 - 3/4 X 18
12	13.20	15.4	18.30	8 - 3/4 X 18



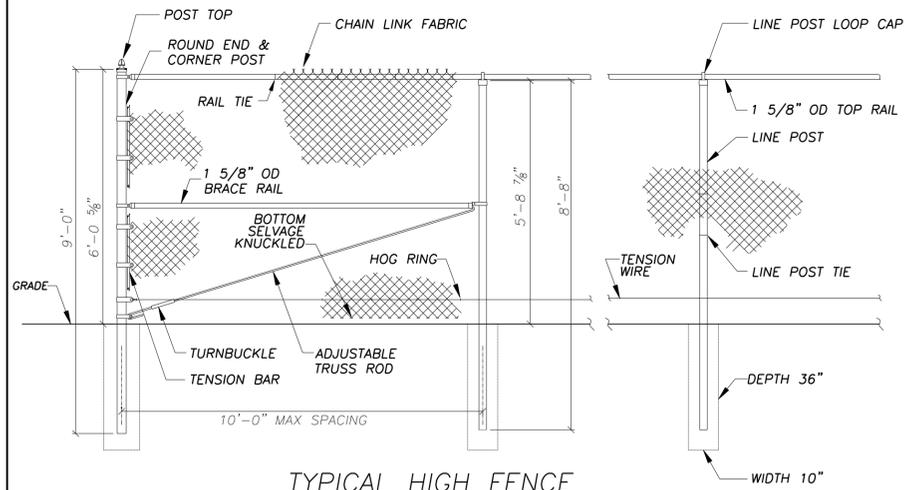
- NOTE:
1. USE MECHANICAL JOINT D.I. FITTINGS ONLY.
  2. APPLY TWO COATS OF BITUMINOUS COATING TO ALL STEEL.

1/3/2015 6:53:41PM G:\PROJECTS\03517.00 (DELDOT AGMT 1223 DOT) Open End\03517.00 (DELDOT AGMT 1223 DOT) HEAVEN FINAL DESIGN\DWG Files\swr13.dgn

ADDENDUMS / REVISIONS	

CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	BP
COUNTY	CHECKED BY:	TM
KENT		

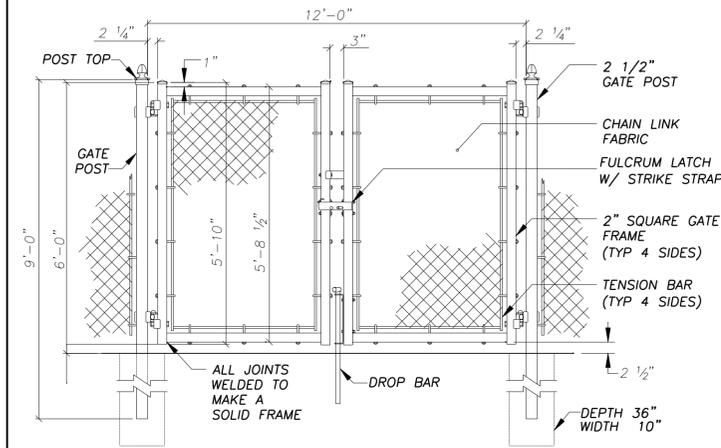
D-02
SHEET NO.
629
TOTAL SHTS.
641



TYPICAL HIGH FENCE  
NO SCALE

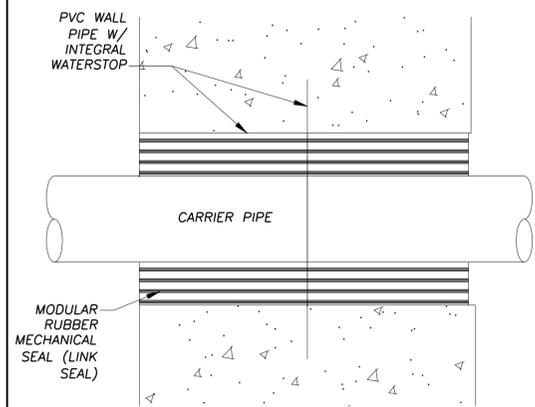


GATE PLAN

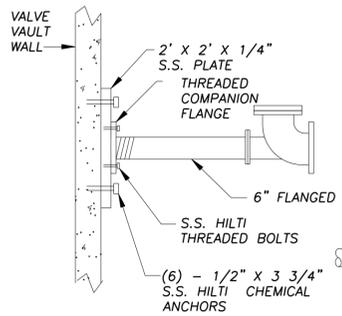


GATE ELEVATION

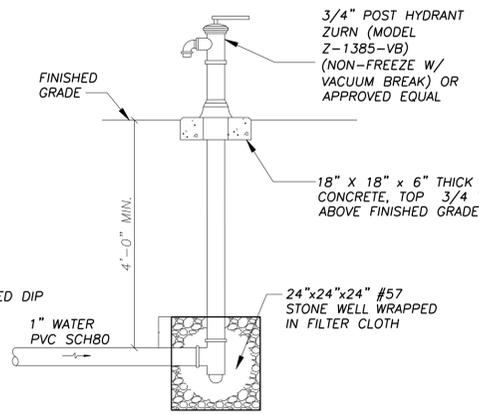
TYPICAL DOUBLE WING GATE DETAIL  
NO SCALE



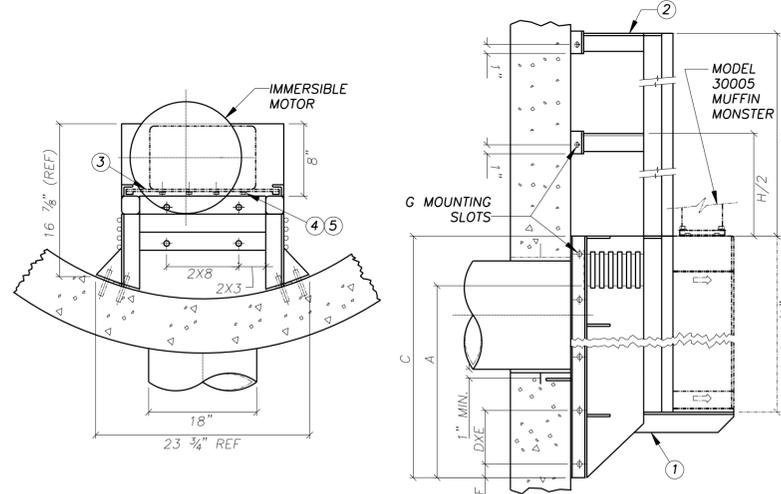
PIPE PENETRATION DETAIL  
NO SCALE



VALVE VAULT PIPE ANCHOR  
NO SCALE



DETAIL-YARD HYDRANT  
NOT TO SCALE

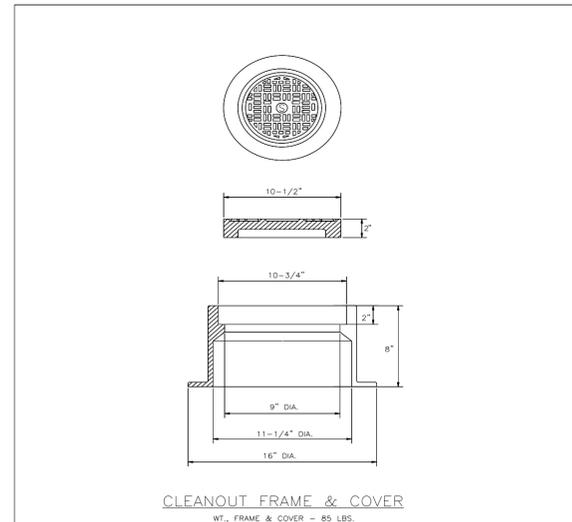


GRINDER MOUNTING DETAIL  
(FOR PUMPING STATIONS WITH LESS THAN 1,000 gpm CAPACITY)  
NO SCALE

PUMP STATION	DIMENSIONS & QUANTITIES						
	A	B	C	D	E	F	G
#8	20 3/4	19 1/2	26 3/4	8	5 15/16	1 1/2	10 + 4*J

PART LIST				
ITEM NO.	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION	SPECIFICATION OR MATERIAL
5	8	30140	LOCKWASHER, SPLIT 3/8	SST
4	8	30249	HHCS 3/8-16 X 3/4	SST
3	1	32523	GUIDE PLATE	
2	1	32598R	GUIDE RAIL-ROUND WALL MOUNT	
1	1	32538R	FRAME-ROUND WALL MOUNT	

- NOTES: UNLESS OTHERWISE SPECIFIED
- ANCHOR BOLTS 1/2 (6) X 3 3/4 (95) MIN NOT PROVIDED BY MANUFACTURER.
  - PROVIDE STAINLESS STEEL LIFTING CHAIN FROM TOP OF MOTOR TO ANCHORAGE IN WET WELL TOP SLAB.
  - H = INDIVIDUAL GUIDE RAIL SECTION HEIGHT (16 FEET MAX). EACH SECTION REQUIRES 4 ANCHOR BOLTS.
  - J = TOTAL QTY OF GUIDE RAIL SECTIONS.
  - PROVIDE CHUTE TO CONVEY SEWAGE FROM INFLUENT PIPE TO GRINDER FACE & FRAME.
  - GRINDER SHALL BE SET AT PROPER ELEVATION(2" BELOW) TO RECEIVE FLOW FROM INFLUENT SEWER.
  - MINIMUM CLEARANCE BETWEEN THE EDGE OF EXISTING INFLUENT PIPE AND THE NEW GRINDER SHALL BE 8 INCHES.
  - MAXIMUM DIMENSION FROM EDGE OF INFLUENT PIPE AND OUTER EDGE OF NEW FRAME OR GRINDER SHALL BE 20 INCHES.
  - THE ACCESS OPENING FOR THE GRINDER SHALL BE POSITIONED TO PERMIT THE GRINDER TO PASS WITH A MINIMUM 3-INCH CLEARANCE ON ALL SIDES.
  - A NEW LANDING SHALL BE PROVIDED FOR PERSONNEL ACCESS TO THE GRINDER UNIT IN PLACE. THE LANDING SHALL BE A STANDOFF LANDING PLATFORM POSITIONED TO PROVIDE PERSONNEL MAINTENANCE ACCESS TO THE GRINDER.
  - ALL GRINDER MOUNTING COMPONENTS (CHUTE, GUIDERAIL, FRAME, ETC.) SHALL BE STAINLESS STEEL.



CLEANOUT FRAME & COVER  
WT. FRAME & COVER = 85 LBS.

- NOTES:
- OUTER FRAME & COVER, MACHINED ON THE BEARING SURFACE.
  - MATERIAL-GRAY IRON ASTM A-48, CLASS 35B.
  - ALL CASTINGS ARE OF HEAVY DUTY AND SUITABLE FOR H-20 LOADING.
  - EAST JORDAN IRON WORKS, INC. MODEL 1565 WITH SOLID COVER OR EQUAL.

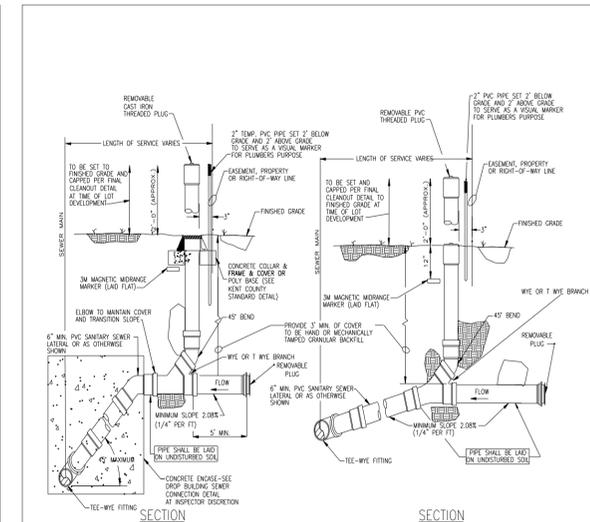
CLEANOUT FRAME & COVER DETAIL  
NOT TO SCALE



APPROVAL  
DIRECTOR OF PUBLIC WORKS  
DATE

DEPARTMENT OF PUBLIC WORKS  
STANDARD DETAILS  
CLEANOUT FRAME & COVER  
DETAIL

ISSUED:  
REVISION:  
11-24-09  
PLATE  
CO-08



SINGLE SEWER CLEANOUT AND MAIN LINE CONNECTION DETAIL  
NOT TO SCALE



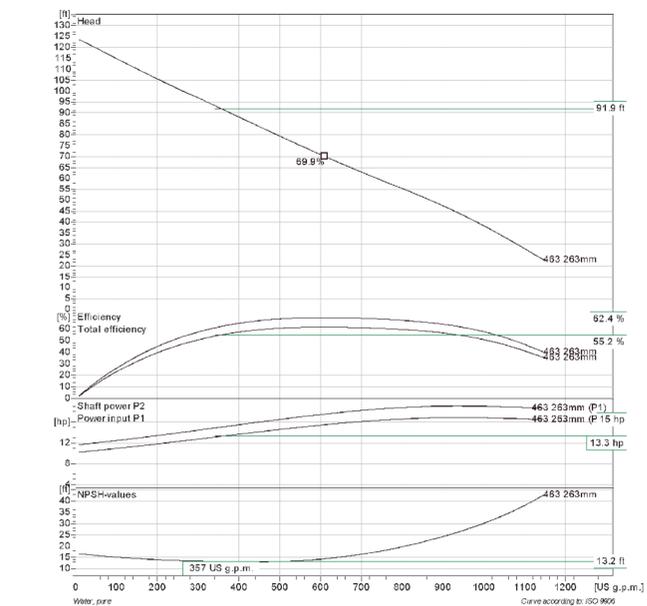
APPROVAL  
DIRECTOR OF PUBLIC WORKS  
DATE

DEPARTMENT OF PUBLIC WORKS  
STANDARD DETAILS  
SINGLE SEWER CLEANOUT  
AND MAIN LINE CONNECTION  
DETAIL

ISSUED:  
REVISION:  
3-27-08  
PLATE  
CO-07

NP 3153 HT 3-463  
Performance curve

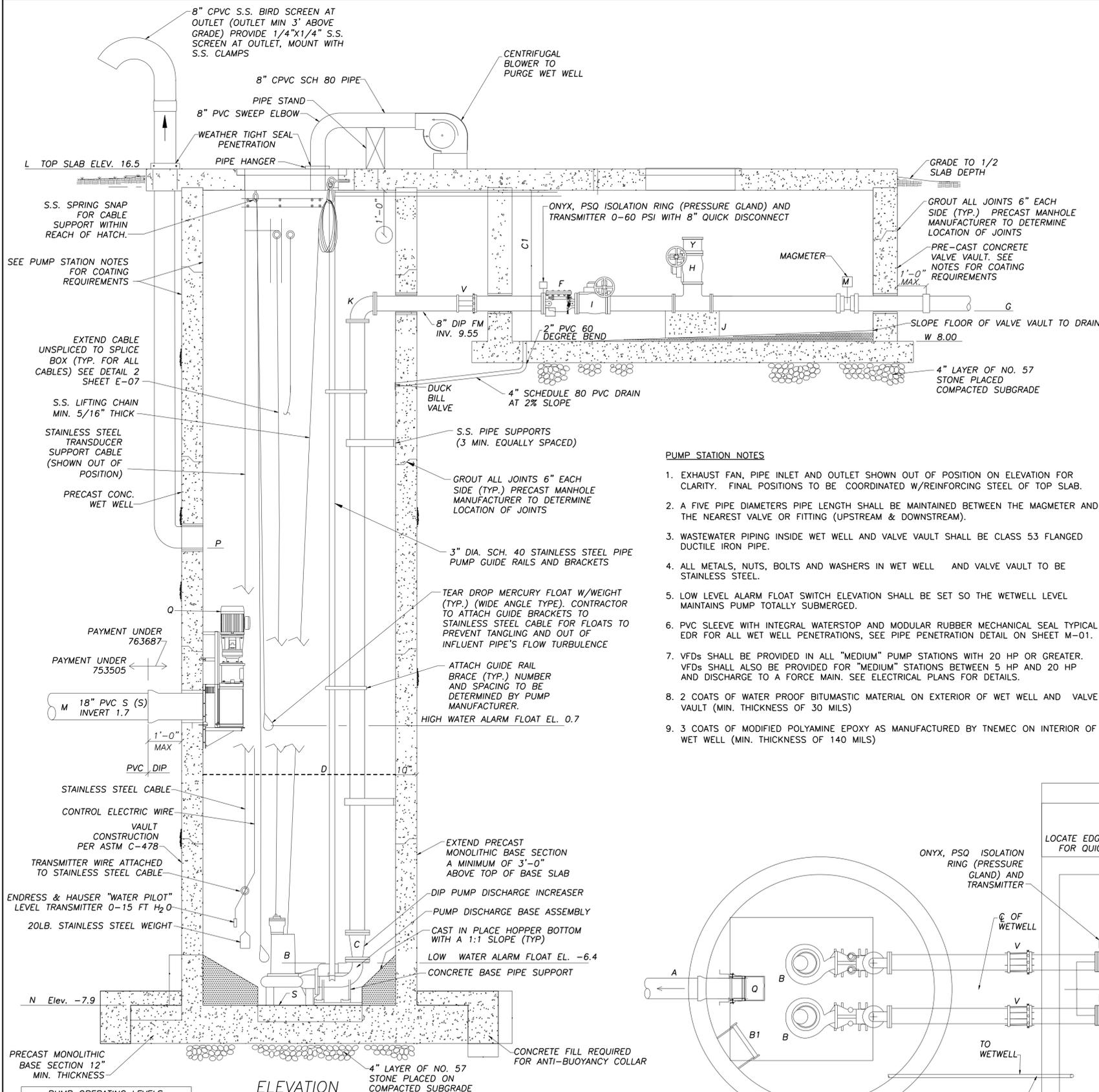
Pump		Motor	
Discharge Flange Diameter	3 15/16 Inch	Motor #	NS153.181 21-16-4AA-W20hp
Suction Flange Diameter	100 mm	Stator variant	1/1 Load 0.79
Impeller diameter	10 1/2"	Frequency	60 Hz
Number of blades	2	Rated voltage	480 V
		Number of poles	4
		Phases	3-
		Rated power	20 hp
		Rated current	26 A
		Starting current	159 A
		Rated speed	1750 rpm
		Efficiency	1/1 Load 87.5 %
			3/4 Load 86.0 %
			1/2 Load 87.5 %



SYSTEM HEAD AND PUMP  
PERFORMANCE CURVE  
NOT TO SCALE

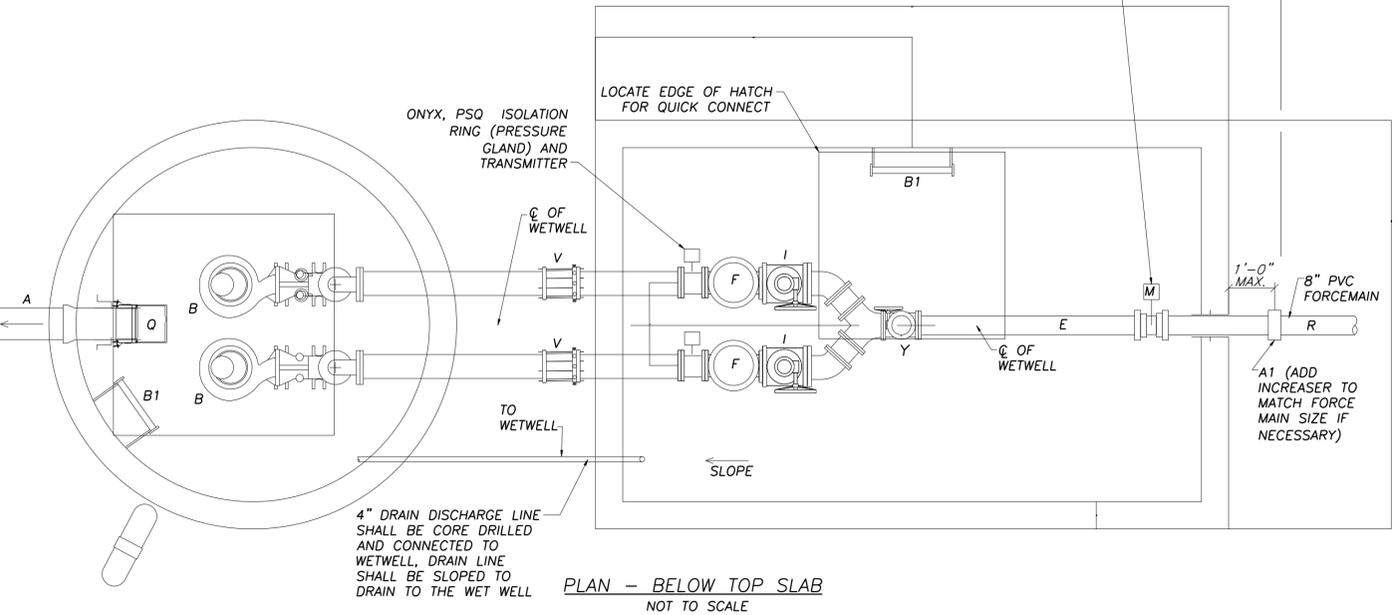
MUFFIN MONSTER SEWAGE GRINDER MODEL #  
30005-0008 WITH 5HP IMMERSIBLE MOTOR  
SCALE: 1"=1'

1/23/2015 8:51:45 AM G:\PROJECTS\03517.00 (DELDOT AGMT 1223 DOT5 Open End)\03517.16 SR1.LITTLE HEAVEN FINAL DESIGN\DWG Files\swr14.dgn

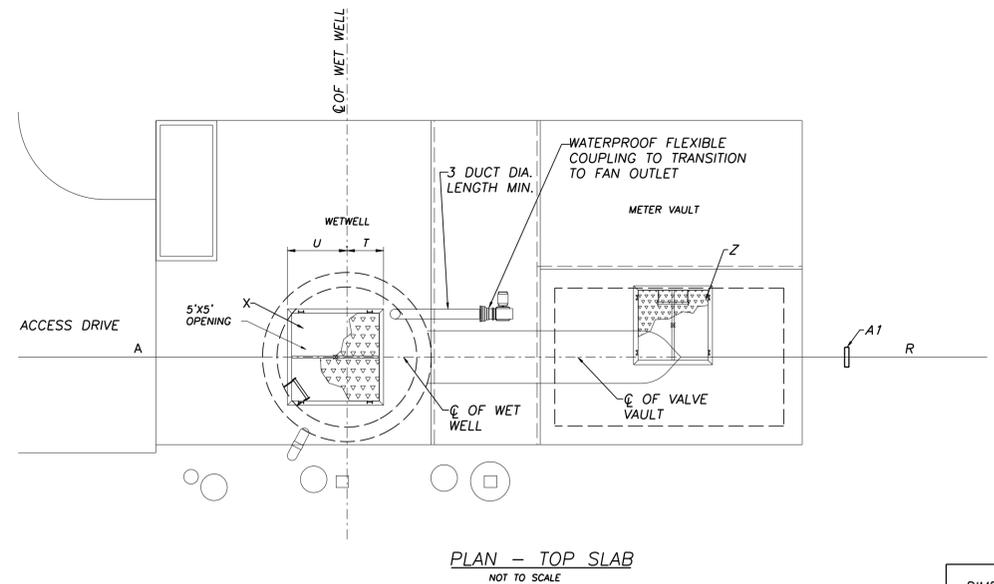


PUMP OPERATING LEVELS	
HIGH LEVEL ALARM FLOAT	0.7
LAG PUMP ON	0.2
LEAD PUMP ON	-0.3
BOTH PUMPS OFF	-5.9
LOW LEVEL ALARM FLOAT	-6.4

**PUMP STATION**  
NOT TO SCALE



**PLAN - BELOW TOP SLAB**  
NOT TO SCALE



**PLAN - TOP SLAB**  
NOT TO SCALE

**PUMP STATION NOTES**

- EXHAUST FAN, PIPE INLET AND OUTLET SHOWN OUT OF POSITION ON ELEVATION FOR CLARITY. FINAL POSITIONS TO BE COORDINATED W/REINFORCING STEEL OF TOP SLAB.
- A FIVE PIPE DIAMETERS PIPE LENGTH SHALL BE MAINTAINED BETWEEN THE MAGMETER AND THE NEAREST VALVE OR FITTING (UPSTREAM & DOWNSTREAM).
- WASTEWATER PIPING INSIDE WET WELL AND VALVE VAULT SHALL BE CLASS 53 FLANGED DUCTILE IRON PIPE.
- ALL METALS, NUTS, BOLTS AND WASHERS IN WET WELL AND VALVE VAULT TO BE STAINLESS STEEL.
- LOW LEVEL ALARM FLOAT SWITCH ELEVATION SHALL BE SET SO THE WETWELL LEVEL MAINTAINS PUMP TOTALLY SUBMERGED.
- PVC SLEEVE WITH INTEGRAL WATERSTOP AND MODULAR RUBBER MECHANICAL SEAL TYPICAL EDR FOR ALL WET WELL PENETRATIONS, SEE PIPE PENETRATION DETAIL ON SHEET M-01.
- VFDs SHALL BE PROVIDED IN ALL "MEDIUM" PUMP STATIONS WITH 20 HP OR GREATER. VFDs SHALL ALSO BE PROVIDED FOR "MEDIUM" STATIONS BETWEEN 5 HP AND 20 HP AND DISCHARGE TO A FORCE MAIN. SEE ELECTRICAL PLANS FOR DETAILS.
- 2 COATS OF WATER PROOF BITUMASTIC MATERIAL ON EXTERIOR OF WET WELL AND VALVE VAULT (MIN. THICKNESS OF 30 MILS)
- 3 COATS OF MODIFIED POLYAMINE EPOXY AS MANUFACTURED BY TNEMEC ON INTERIOR OF WET WELL (MIN. THICKNESS OF 140 MILS)

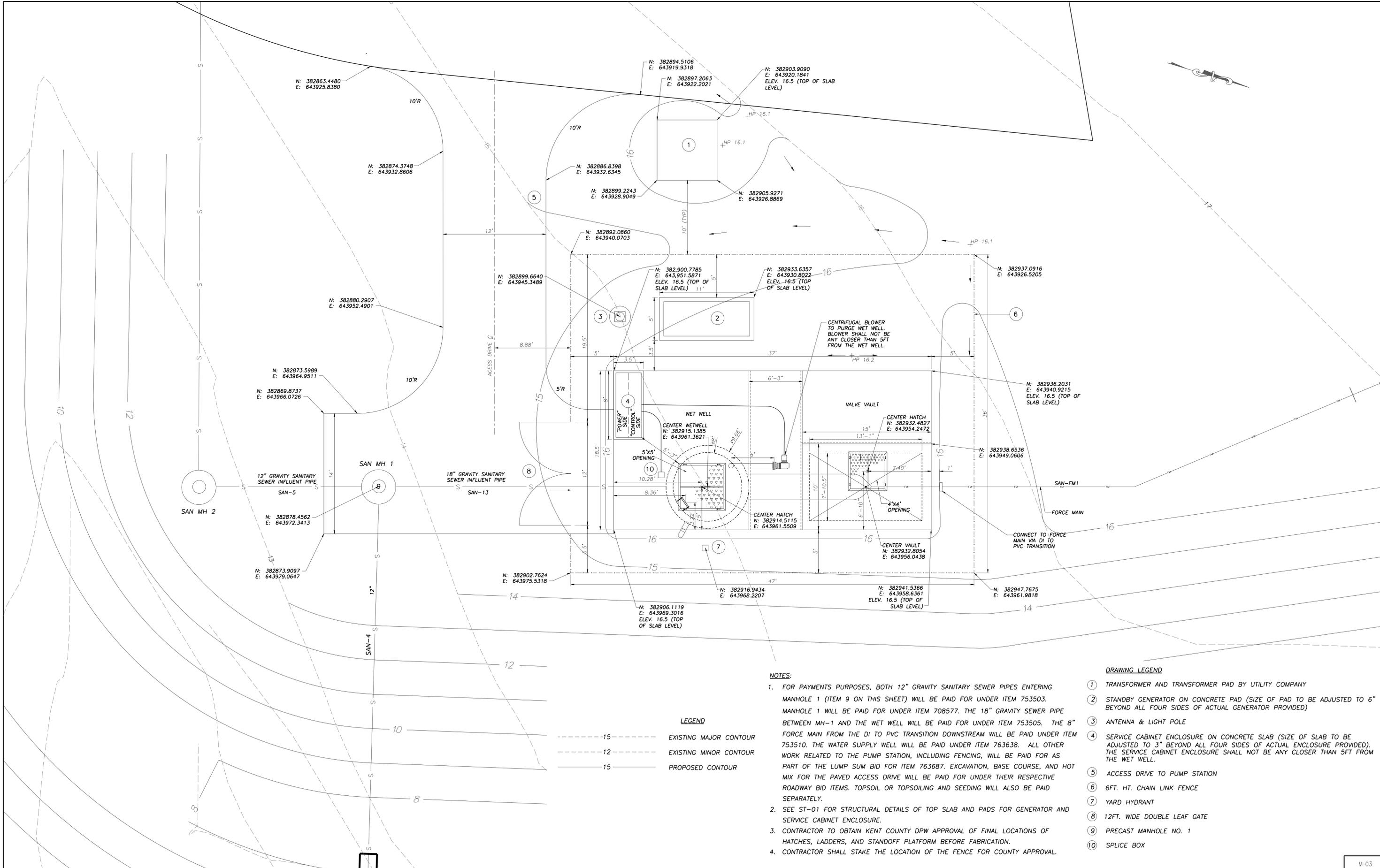
**BLOWER NOTES**

- CHICAGO BLOWER CORP. DESIGN 38-CPB MODEL 1000 W/6" O.D. INLET AND 10" WHEEL.
- USE INLET ELBOW TO PREVENT WATER INFILTRATION AND PROVIDE BLAST GATE ON INLET. PROVIDE INLET SCREEN.
- CONSTRUCTED FOR OUTDOOR USE. BELT DRIVEN.

DESIGNATION	DESCRIPTION	MEDIUM PUMP STATION	DIMENSIONS/SIZES
A	PVC INFLUENT PIPE SIZE	18"	
B	PUMP SIZE, MANUFACTURER & MODEL NUMBER	20HP, FLYGT MODEL NP3153HT3-463	
C	DIP PUMP DISCHARGE INCREASER	4"x8"	
D	WET WELL DIAMETER	8'	
E	DIP FORCE MAIN SIZE	8"	
F	CHECK VALVE	8"	
G	VALVE VAULT PIPE ELEVATION	9.72'	
H	PLUG VALVE	6"	
I	PLUG VALVE	8"	
J	CONCRETE BASE PIPE SUPPORT	16" x 16"	
K	DIP 90° ELBOW	8"	
L	TOP OF SLAB ELEVATION	16.5'	
M	INFLUENT PIPE INVERT ELEV.	1.7'	
N	WET WELL INVERT	-7.9'	
O	GRAVITY DRAIN	4"	
P	BLOWER PIPE OUTLET ELEV (OUTSIDE DROP)	3.00	
Q	GRINDER (FOR MEDIUM PUMP STATIONS)	MUFFIN MONSTER MODEL 30005	
R	PVC FORCE MAIN SIZE	8"	
S	PUMP DISCHARGE BASE ASSEMBLY	4"	
T	WET WELL HATCH DIMENSION (FROM CENTERLINE)	1'-8"	
U	WET WELL HATCH DIMENSION (FROM CENTERLINE)	3'-4"	
V	RESTRAINED M.J. SLEEVE	8"	
W	VALVE VAULT TOP OF CONCRETE FILL	8.00	
X	WET WELL HATCH SIZE	5'x5' DOUBLE LEAF HATCH	
Y	S.S. MALE CAM-LOCK CONNECTOR (WITH CAP)	6"	
Z	VALVE VAULT ACCESS HATCH	4'x4' DOUBLE LEAF HATCH	
A1	DIP TO PVC TRANSITION COUPLING	8"	
B1	ALUMINUM LADDER WITH SAFETY EXTENSION HANDLE	YES	
C1	VALVE VAULT DEPTH	7'-6"	
D1	DIMENSION FROM CENTER TO CENTER DISCHARGE PIPES	36"	

1/22/2015 9:41:03 AM G:\PROJECTS\03517.00 IDELDOT AGMT 1223 DOT15 OPEN ENDR\03517.16 SR1, LITTLE HEAVEN FINAL DESIGN\DWG FILES\SWR15.dgn

1/13/2015 10:54:34 AM G:\PROJECTS\03517.00 ID\DOT AGMT 1223 DOT517.00 SR1, LITTLE HEAVEN FINAL DESIGN\DOT Files\swr16.dgn



**LEGEND**

- 15 ----- EXISTING MAJOR CONTOUR
- 12 ----- EXISTING MINOR CONTOUR
- 15 ----- PROPOSED CONTOUR

**NOTES:**

1. FOR PAYMENTS PURPOSES, BOTH 12" GRAVITY SANITARY SEWER PIPES ENTERING MANHOLE 1 (ITEM 9 ON THIS SHEET) WILL BE PAID FOR UNDER ITEM 753503. MANHOLE 1 WILL BE PAID FOR UNDER ITEM 708577. THE 18" GRAVITY SEWER PIPE BETWEEN MH-1 AND THE WET WELL WILL BE PAID FOR UNDER ITEM 753505. THE 8" FORCE MAIN FROM THE DI TO PVC TRANSITION DOWNSTREAM WILL BE PAID UNDER ITEM 753510. THE WATER SUPPLY WELL WILL BE PAID UNDER ITEM 763638. ALL OTHER WORK RELATED TO THE PUMP STATION, INCLUDING FENCING, WILL BE PAID FOR AS PART OF THE LUMP SUM BID FOR ITEM 763687. EXCAVATION, BASE COURSE, AND HOT MIX FOR THE PAVED ACCESS DRIVE WILL BE PAID FOR UNDER THEIR RESPECTIVE ROADWAY BID ITEMS. TOPSOIL OR TOPSOILING AND SEEDING WILL ALSO BE PAID SEPARATELY.
2. SEE ST-01 FOR STRUCTURAL DETAILS OF TOP SLAB AND PADS FOR GENERATOR AND SERVICE CABINET ENCLOSURE.
3. CONTRACTOR TO OBTAIN KENT COUNTY DPW APPROVAL OF FINAL LOCATIONS OF HATCHES, LADDERS, AND STANDOFF PLATFORM BEFORE FABRICATION.
4. CONTRACTOR SHALL STAKE THE LOCATION OF THE FENCE FOR COUNTY APPROVAL.

**DRAWING LEGEND**

- ① TRANSFORMER AND TRANSFORMER PAD BY UTILITY COMPANY
- ② STANDBY GENERATOR ON CONCRETE PAD (SIZE OF PAD TO BE ADJUSTED TO 6" BEYOND ALL FOUR SIDES OF ACTUAL GENERATOR PROVIDED)
- ③ ANTENNA & LIGHT POLE
- ④ SERVICE CABINET ENCLOSURE ON CONCRETE SLAB (SIZE OF SLAB TO BE ADJUSTED TO 3" BEYOND ALL FOUR SIDES OF ACTUAL ENCLOSURE PROVIDED). THE SERVICE CABINET ENCLOSURE SHALL NOT BE ANY CLOSER THAN 5FT FROM THE WET WELL.
- ⑤ ACCESS DRIVE TO PUMP STATION
- ⑥ 6FT. HT. CHAIN LINK FENCE
- ⑦ YARD HYDRANT
- ⑧ 12FT. WIDE DOUBLE LEAF GATE
- ⑨ PRECAST MANHOLE NO. 1
- ⑩ SPLICE BOX



ADDENDUMS / REVISIONS	

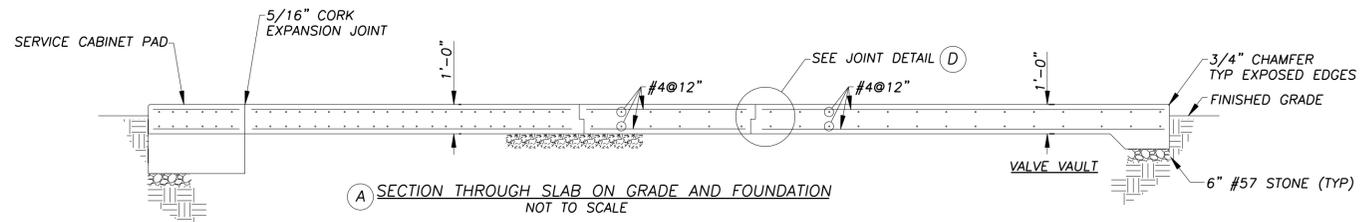


**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

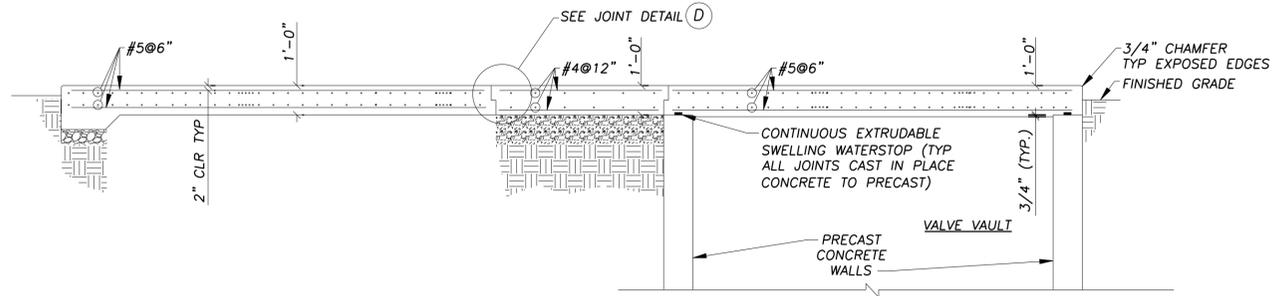
CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	BP/NHN
COUNTY	CHECKED BY:	TSM
KENT		

**SEWER PLANS  
PUMP STATION SITE PLAN**

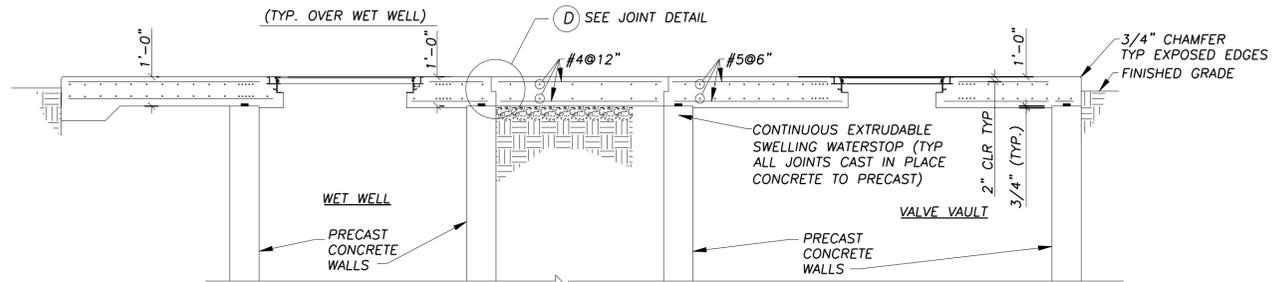
M-03
SHEET NO.
632
TOTAL SHTS.
641



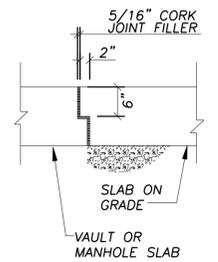
(A) SECTION THROUGH SLAB ON GRADE AND FOUNDATION  
NOT TO SCALE



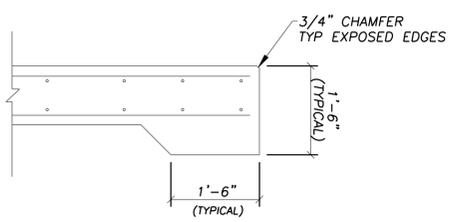
(B) SECTION THROUGH WETWELL AND VALVE VAULT  
NOT TO SCALE



(C) SECTION THROUGH WETWELL AND VALVE VAULT  
NOT TO SCALE

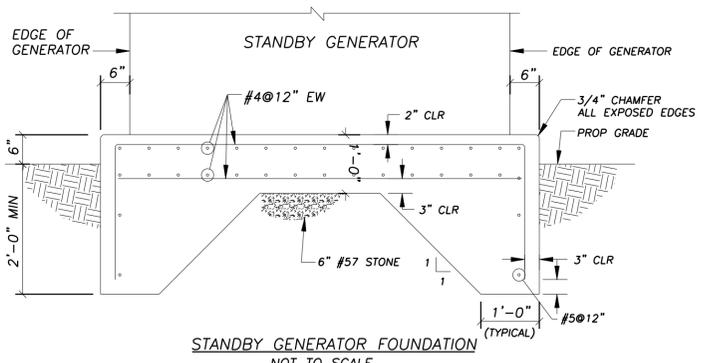


(D) SECTION-JOINT DETAIL  
NOT TO SCALE

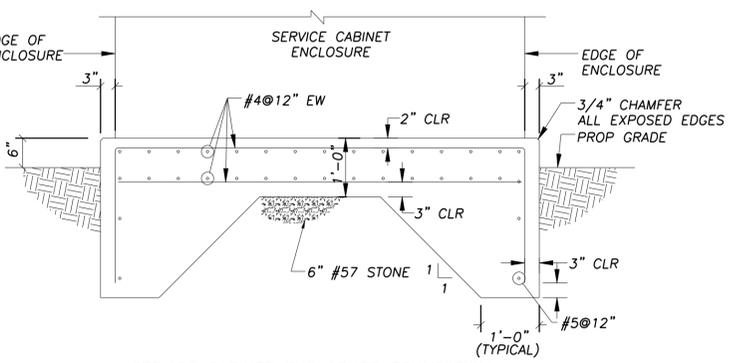


(E) SECTION-THICKENED EDGE DETAIL  
NOT TO SCALE

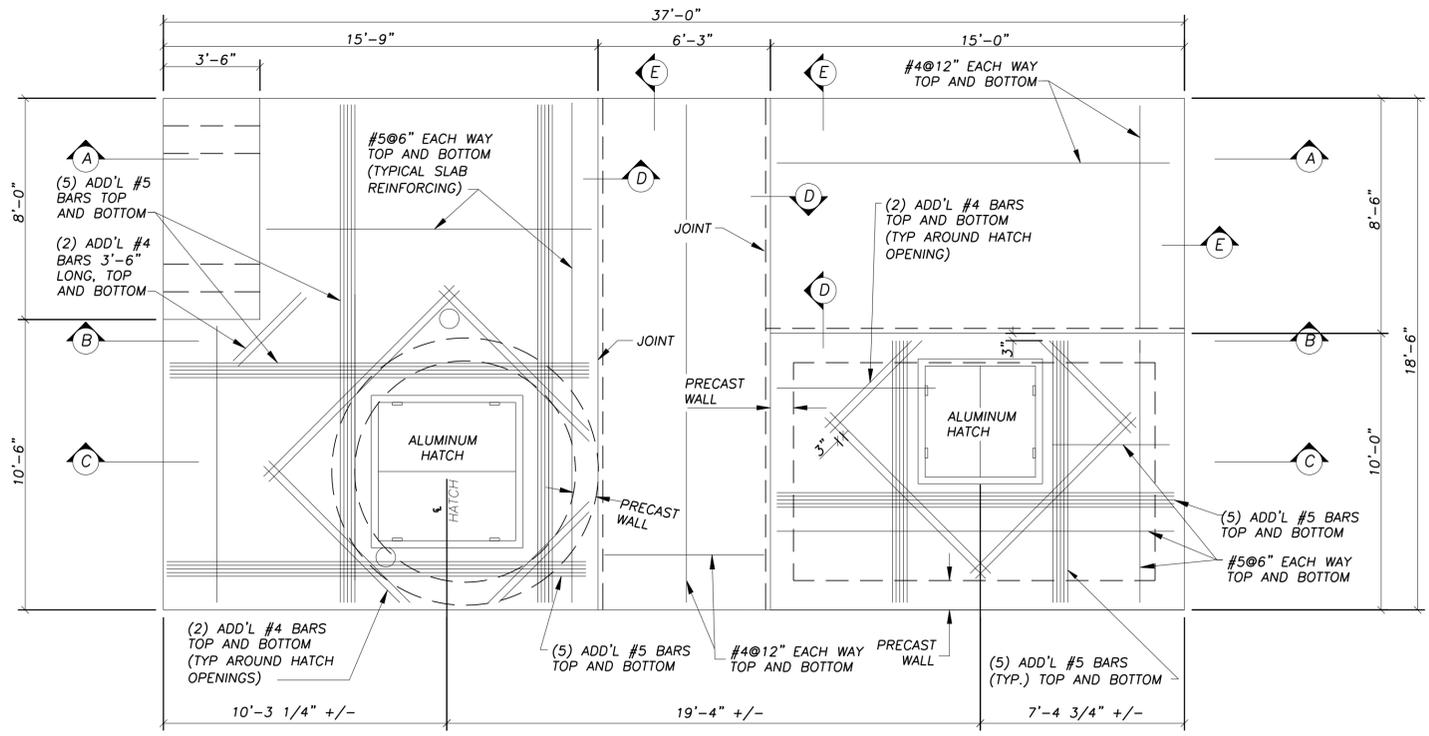
- CAST IN PLACE CONCRETE**
- ALL CONCRETE WORK, INCLUDING FORMING, MIXING, PLACING, AND CURING, SHALL BE IN ACCORDANCE WITH DELDOT STANDARD SPECIFICATIONS 602 AND 812.03 (CLASS B.)
  - MINIMUM COMPRESSIVE STRENGTH, UNLESS NOTED OTHERWISE ON PLANS, AND MAXIMUM WATER CEMENT RATIO SHALL BE AS FOLLOWS:
    - FRAMED SLABS: 4000 PSI (0.45)
    - EXTERIOR EXPOSED PAVEMENT: 4000 PSI (0.50)
  - ALL CONCRETE REINFORCING SHALL CONFORM TO ASTM A615, GRADE 60.
  - WELDED WIRE MESH SHALL CONFORM TO ASTM-A185.
  - REINFORCING SHALL HAVE THE FOLLOWING COVER UNLESS OTHERWISE NOTED:
    - FOOTINGS AND OTHER CONCRETE POURED AGAINST EARTH: 3"
    - FORMED CONCRETE EXPOSED TO EARTH: 1 1/2" FOR #5 BARS AND SMALLER OR 2" FOR BARS LARGER THAN #5
    - INTERIOR FACES OF WALLS: 2"
    - SLAB ON GRADE: REINFORCING TOP THIRD OF THICKNESS
    - BEAMS, COLUMNS: 2"
    - SLABS: 2"
  - ALL EXTERIOR EXPOSED CONCRETE SHALL HAVE A MINIMUM OF 5% AIR ENTRAINED (+/- 1.5%).



STANDBY GENERATOR FOUNDATION  
NOT TO SCALE



SERVICE CABINET ENCLOSURE FOUNDATION  
NOT TO SCALE



PLAN - TOP SLABS FOR VALVE VAULT AND WETWELL  
NOT TO SCALE

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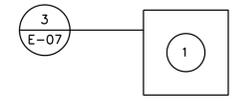
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**REFERENCED NOTES:**

- ① TRANSFORMER AND CONCRETE PAD/FOUNDATION SHALL BE FURNISHED AND INSTALLED BY DELMARVA. COORDINATE WITH DELMARVA POWER COMPANY FOR REQUIREMENTS INCLUDING GROUNDING AND BONDING FOR TRANSFORMER.
- ② 50KW, 480Y/277V STANDBY GENERATOR ON CONCRETE PAD. REFER TO DRAWING ST-01 FOR CONCRETE PAD DETAIL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING CONCRETE PAD SIZED AS REQUIRED FOR THE GENERATOR THAT MEET ALL OF THE REQUIRED CLEARANCES SHOWN IN THE DETAILS AND AS REQUIRED BY CODES AND REGULATIONS.
- ③ LIGHT POLE WITH ANTENNA. SEE DRAWINGS E-02, E-03, E-05 AND E-07 FOR WIRING AND CONDUIT REQUIREMENTS.
- ④ SERVICE CABINET ENCLOSURE ON CONCRETE PAD AT 5' MIN AWAY FROM WETWELL. CONTROL SIDE FACING NORTH. REFER TO DRAWING ST-01 FOR CONCRETE PAD DETAIL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING CONCRETE PAD SIZED AS REQUIRED FOR THE SERVICE CABINET ENCLOSURE THAT MEET ALL OF THE REQUIRED CLEARANCES SHOWN IN THE DETAILS AND AS REQUIRED BY CODES AND REGULATIONS.
- ⑤ PUMP DISCHARGE PRESSURE TRANSMITTER MOUNTED ON ISOLATION RING. PROVIDE CABLE AND CONDUIT SIZED AS REQUIRED TO CONTROL SECTION OF THE SERVICE CABINET.
- ⑥ EFFLUENT FLOW METER. GROUND AS REQUIRED. PROVIDE VENDOR CABLE IN CONDUIT SIZED AS REQUIRED TO FLOW TRANSMITTER.
- ⑦ LEVEL TRANSDUCER SUPPORTED WITH STAINLESS STEEL CABLE AND STAINLESS STEEL WEIGHT. PROVIDE SUPPORT BRACKET AS SHOWN ON SHEET M-02.
- ⑧ FLOAT SWITCHES SUPPORTED WITH STAINLESS STEEL CABLE AND STAINLESS STEEL WEIGHT. PROVIDE SUPPORT BRACKET AS SHOWN ON SHEET M-02.
- ⑨ PUMPS WITH SEAL LEAK AND TEMPERATURE SENSORS. PROVIDE CONDUCTORS AND CONDUITS SIZED AS REQUIRED TO CONTROL SECTION OF THE SERVICE CABINET.
- ⑩ SPICE BOX. PROVIDE CONDUCTORS AND CONCEALED CONDUITS SIZED AS REQUIRED TO SERVICE CABINET ENCLOSURE.
- ⑪ WET WELL BLOWER AT 5' MIN AWAY FROM WETWELL. PROVIDE NEMA 3R MANUAL STARTER.
- ⑫ GRINDER. PROVIDE VENDOR CABLE IN CONDUIT SIZED AS REQUIRED TO GRINDER CONTROL PANEL.
- ⑬ HATCH LIMIT SWITCH (ZS). PROVIDE 3#14 IN 3/4" C TO SERVICE CABINET ENCLOSURE.
- ⑭ LEVEL INSTRUMENT ACCESS PORT WITH LOCKABLE COVER MEETING KENT COUNTY'S REQUIREMENTS.

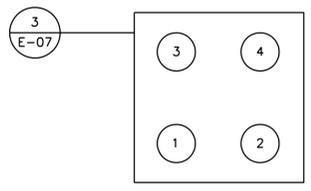
**GENERAL NOTES:**

1. REFER TO GENERAL NOTES ON SHEET E02 FOR FEEDER REQUIREMENTS.
2. FURNISH AND INSTALL ALL EQUIPMENT, CONDUITS, AND WIRING FOR HAZARDOUS LOCATIONS MEETING THE REQUIREMENTS IN NEC ARTICLES 501 AND 504.
3. SEE M SERIES DRAWINGS FOR EQUIPMENT LOCATIONS, ELEVATION, AND OTHER REQUIREMENTS.
4. ALL ELECTRICAL/INSTRUMENTATION AND CONTROL RELATED EXCAVATION, BEDDING, AND BACKFILL WORKS SHALL BE PROVIDED BY THIS CONTRACTOR.
5. UNLESS OTHERWISE INDICATED/NOTED, ALL WIRING SHALL BE IN CONDUITS AND BURIED UNDERGROUND.



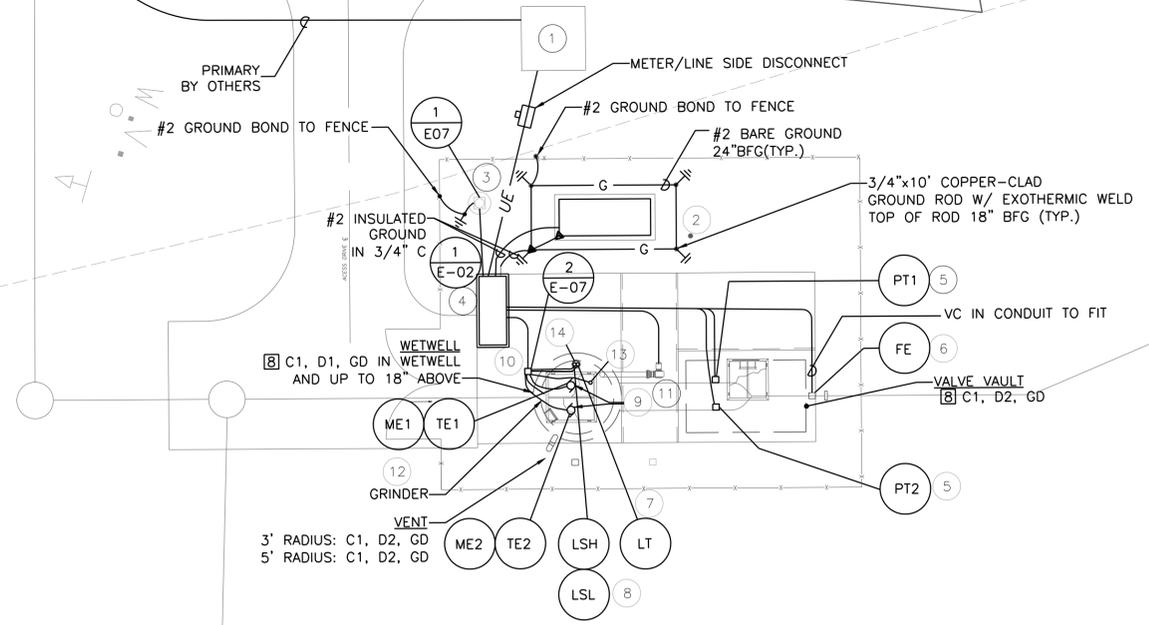
1. DIRECT BURIED 4" PVC SCHEDULE 80 CONDUIT WITH PULL ROPE. CONDUCTORS BY POWER COMPANY (DELMARVA). PROVIDE SPARE CONDUIT IF REQUIRED BY DELMARVA.

**SECTION A-A - DIRECT-BURIED DUCTBANK**



1. 4#4/0, 1#2 GND IN 2-1/2" C FOR STANDBY POWER.
2. 8#12, 1#12 GND IN 3/4" C FOR HEATERS AND GENERAL POWER.
3. 2#8 IN 1" C FOR BATTERY CHARGER CABLE.
4. 20#14 IN 1" C FOR GENERATOR SIGNAL WIRING.

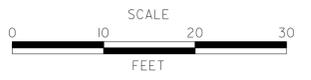
**SECTION B-B - DIRECT-BURIED DUCTBANK**



**1 ELECTRICAL SITE PLAN**  
E-01 SCALE: 1" = 10'-0"



ADDENDUMS / REVISIONS

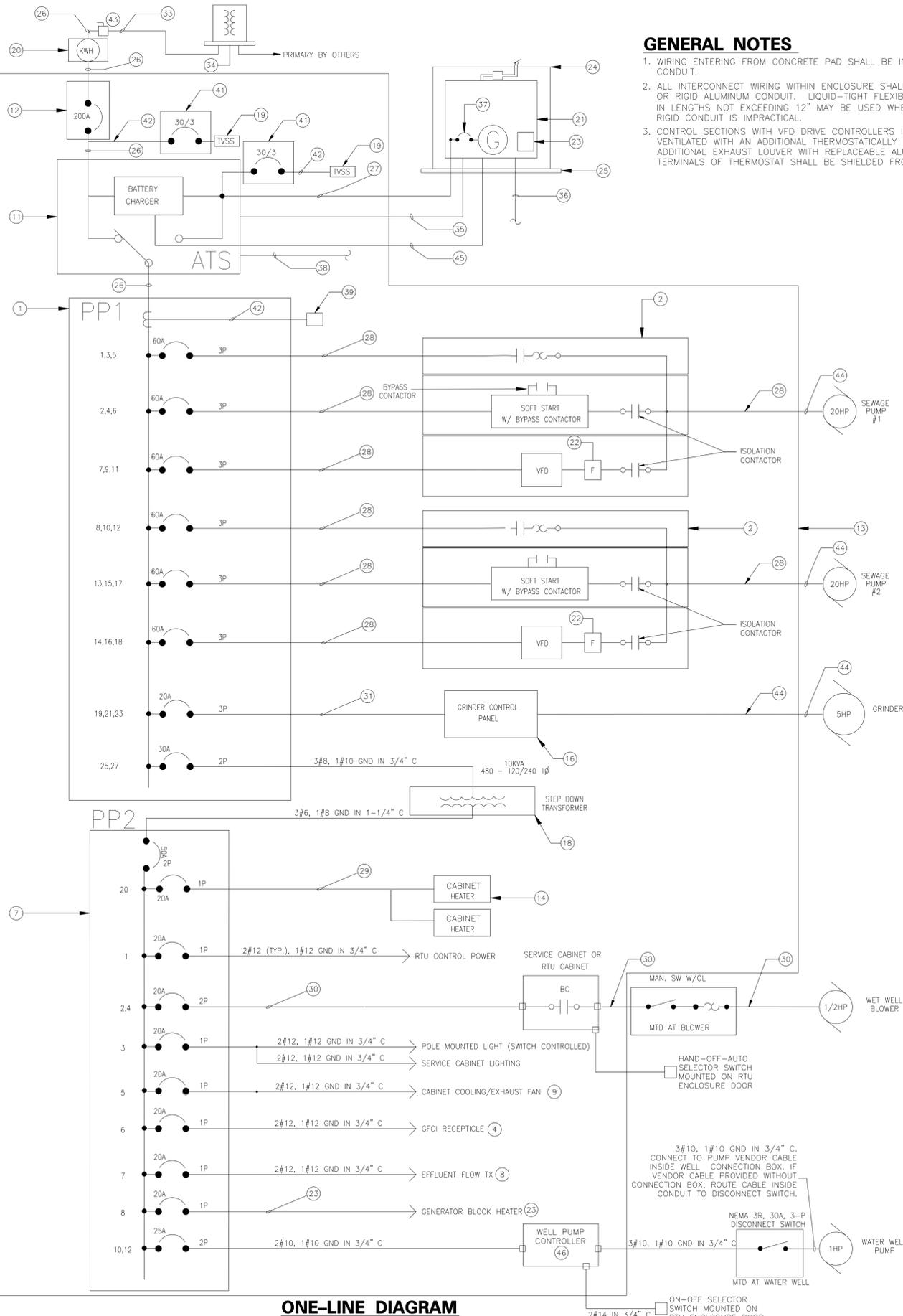


**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	DAW
COUNTY	CHECKED BY:	SDT
KENT		

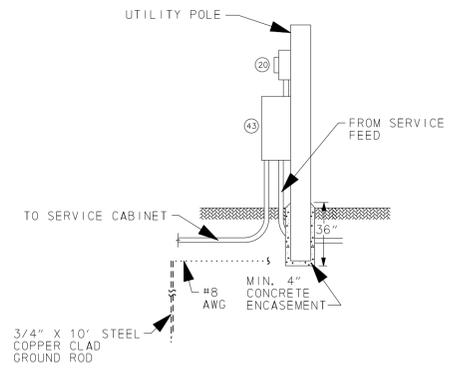
**SEWER PLANS  
ELECTRICAL SITE PLAN**

E-01
SHEET NO.
635
TOTAL SHTS.
641



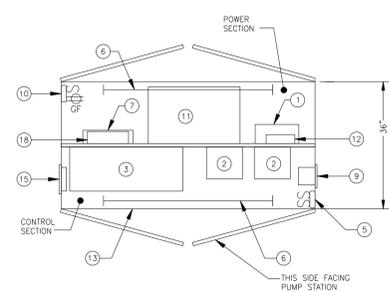
**GENERAL NOTES**

1. WIRING ENTERING FROM CONCRETE PAD SHALL BE IN RIGID GALVANIZED STEEL CONDUIT.
2. ALL INTERCONNECT WIRING WITHIN ENCLOSURE SHALL BE IN SCHEDULE 40 PVC OR RIGID ALUMINUM CONDUIT. LIQUID-TIGHT FLEXIBLE NONMETALLIC CONDUIT IN LENGTHS NOT EXCEEDING 12" MAY BE USED WHERE INSTALLATION OF RIGID CONDUIT IS IMPRACTICAL.
3. CONTROL SECTIONS WITH VFD DRIVE CONTROLLERS INSTALLED SHALL BE VENTILATED WITH AN ADDITIONAL THERMOSTATICALLY CONTROLLED FAN AND AN ADDITIONAL EXHAUST LOUVER WITH REPLACEABLE ALUMINUM FILTER. LIVE TERMINALS OF THERMOSTAT SHALL BE SHIELDED FROM CONTACT.

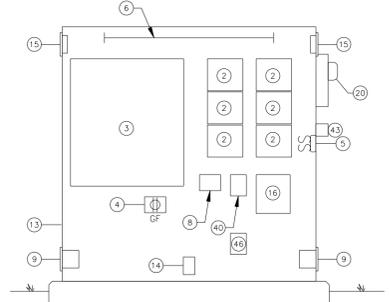


- NOTES:
1. CONTRACTOR TO COORDINATE WITH UTILITY OWNER FOR CABLE AND SERVICE CONNECTION REQUIREMENTS.
  2. PAYMENT SHALL BE INCIDENTAL TO ITEM 763687 PUMP HOUSE.

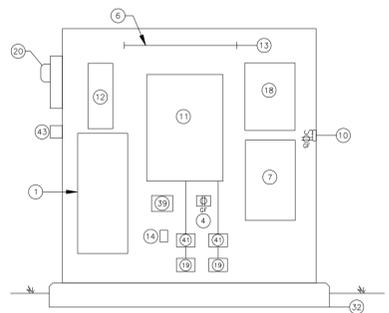
**PRIMARY SERVICE DETAIL**  
N. T. S.



PLAN VIEW-SERVICE CABINET ENCLOSURE  
N.T.S.



CONTROL SIDE ELEVATION-SERVICE CABINET ENCLOSURE  
N.T.S.



POWER SIDE ELEVATION-SERVICE CABINET ENCLOSURE  
N.T.S.

**SERVICE CABINET ENCLOSURE**  
SCALE: NONE

**REFERENCED NOTES**

1. PANEL "PP1", 200A, 480Y/277V 3PH, 4W, 42 POLES, NEMA1, 35KAIC MIN. PROVISION SPACES FOR REMAINING SLOTS.
2. AC DRIVE CONTROLLER WITH BACKUP SOLID STATE SOFT START AND STAND ALONE ACROSS THE LINE STARTERS. DERATE VFD FOR 110°F AMBIENT TEMPERATURE. SQUARE D ALTIVAR 61, CUTLER-HAMMER OR EQUAL.
3. REMOTE TELEMETRY UNIT WITH PUMP CONTROLLER (RTU/PLC) IN NEMA 12 ENCLOSURE WITH 3-POINT LATCH (CLAMP COVERS NOT ACCEPTABLE).
4. 20A/120VAC DUPLEX GFCI RECEPTACLE IN FS BOX WITH COVER.
5. FLOODLIGHT & ENCLOSURE LIGHT SWITCHES IN DUAL-GANG FS BOX; PROVIDE IDENTIFICATION LABELS.
6. 4' LONG SINGLE TUBE FLUORESCENT STRIP LIGHTING FIXTURE WITH LOW TEMPERATURE ELECTRONIC BALLAST.
7. PANEL "PP2", 100A, 120/240V, 1PH, 3W, 30 POLES, NEMA 1, 10KAIC MIN. 5 SPARE 20A, 1P CIRCUIT BREAKERS. PROVISION SPACES FOR REMAINING SLOTS.
8. EFFLUENT FLOW TRANSMITTER (FIT); 24VDC WITH RS-485 SERIAL WIRED TO (3).
9. THERMOSTATICALLY CONTROLLED COOLING FAN.
10. LIGHT SWITCH & 20A/120VAC DUPLEX GFCI RECEPTACLE IN DUAL-GANG FS BOX WITH COVER.
11. 200A, 480Y/277V, 3PH AUTOMATIC TRANSFER SWITCH (POWER MONITORING MODULES ON LOAD SIDE CONDUCTORS).
12. NEMA 1 ENCLOSED MAIN CIRCUIT BREAKER 200A MCB 480V, 35KAIC, SERVICE ENTRANCE LABEL.
13. UL LISTED SERVICE CABINET ENCLOSURE; FREESTANDING NEMA TYPE 3RX, MINIMUM SIZE 90"H X 90"W X 36"D (THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING LARGER SIZE ENCLOSURE AND SHALL BE REQUIRED FOR MAKING NECESSARY ADJUSTMENTS TO THE LENGTH/WIDTH AND NUMBER OF SECTIONS AS REQUIRED FOR INSTALLED EQUIPMENT). ALL DOORS SHALL BE EQUIPPED WITH HEAVY DUTY HOLD-OPEN DOOR STOP (HOFFMAN, APX OR EQUAL). COMPONENT'S LOCATIONS SHOWN ARE REPRESENTATIVE ONLY. ARRANGE THE COMPONENTS AS REQUIRED SO THERE IS NO CONFLICT SUCH AS DOOR CENTER POSTS, ETC. PERFORM ARC-FLASH ANALYSIS AND APPLY ARC-FLASH LABELS ON THE ENCLOSURE DOORS IN COMPLIANCE WITH NFPA 70E. THE ARC-FLASH LABEL SHALL LIST WHAT CLOTHING AND PPE TO WEAR CORRESPONDING TO THE INCIDENT ENERGY LEVEL.
14. THERMOSTATICALLY CONTROLLED ELECTRIC HEATER; QUANTITY/CAPACITIES AS REQUIRED FOR 30°F RISE ABOVE AMBIENT TEMPERATURE.
15. EXHAUST LOUVER PLATE WITH REPLACEABLE ALUMINUM FILTER.
16. GRINDER CONTROL PANEL.
17. NOT USED.
18. DRY TYPE TRANSFORMER - 10KVA, 480-120/240.
19. TRANSIENT VOLTAGE SURGE SUPPRESSOR UNIT (MODULAR) (TYPE II) FOR < 400A SERVICE LEADS TO BE KEPT AS SHORT AS POSSIBLE.
20. POWER METER - CONTRACTOR TO FURNISH AND INSTALL KWH METER SOCKET. COORDINATE WITH DELMARVA POWER COMPANY FOR RESPONSIBILITIES, LOCATION AND REQUIREMENTS.
21. 50KW, 480Y/277V DIESEL GENERATOR WITH 140 GALLON DUAL WALL SUB BASE FUEL TANK. CUMMINS DGHDA, KOHLER OR EQUAL.
22. FILTER TO REDUCE OUTPUT SIGNAL NOISE PER MANUFACTURES RECOMMENDATIONS.
23. BLOCK HEATER - 2#12, 1#12 GND IN 3/4"C.
24. QUIET SITE 1ST STAGE ENCLOSURE.
25. GENERATOR CONCRETE PAD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING CONCRETE PAD SIZED AS REQUIRED FOR THE PROVIDED GENERATOR.
26. 4#4/0, 1#2 GND IN 2-1/2"C.
27. 4#4/0, 1#2 GND IN 2-1/2"C.
28. 3#6, 1#10 GND IN 1"C. 4#14 IN 3/4"C FOR CONTROL CIRCUITS FROM SPLICE BOX TO CONTROL SECTON.
29. 2#12, 1#12 GND IN 3/4"C.
30. 2#12, 1#12 GND IN 3/4"C.
31. 3#12, 1#12 GND IN 3/4"C.
32. SERVICE CABINET ENCLOSURE CONCRETE PAD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING CONCRETE PAD SIZED AS REQUIRED FOR THE PROVIDED SERVICE CABINET ENCLOSURE.
33. PROVIDE DIRECT BURIED 4" PVC SCHEDULE 80 CONDUIT WITH PULL ROPE. EXCAVATION, BEDDING, AND BACKFILL SHALL BE BY THIS CONTRACTOR. CONDUCTORS BY POWER CO.
34. TRANSFORMER AND CONCRETE PAD/FOUNDATION SHALL BE FURNISHED AND INSTALLED BY DELMARVA POWER COMPANY.
35. 8#14 IN 1"C FOR GENERATOR SIGNAL WIRING.
36. GENERATOR CONTROL PANEL ALARM SIGNAL TO PLC.
37. 100% RATED GENERATOR MCB PROVIDED BY GENERATOR MANUFACTURER.
38. CONTROL WIRE TO PLC.
39. POWER LOGIC PM-850 DIGITAL METER IN SEPARATE NEMA 1 ENCLOSURE PROVIDE CT'S IN PP1 BACKBOX. CONNECT TO PLC VIA RS-485.
40. ADDITIONAL DEVICES AS REQUIRED SUCH AS PUMP MOISTURE AND TEMPERATURE MONITORS (MiniCAS II), ETC.
41. NEMA 1 ENCLOSED 3P-30A CIRCUIT BREAKER.
42. 4#10, 1#10 GND IN 3/4"C - 24" MAX. LEAD LENGTH.
43. 200A, 480Y/277V, 3PH METER DISCONNECT AS REQUIRED BY POWER CO (DELMARVA).
44. VENDOR'S CABLE IN CONDUIT SIZED AS REQUIRED.
45. 2#8 IN 1"C FOR BATTERY CHARGER CABLE.
46. WELL PUMP CONTROLLER.

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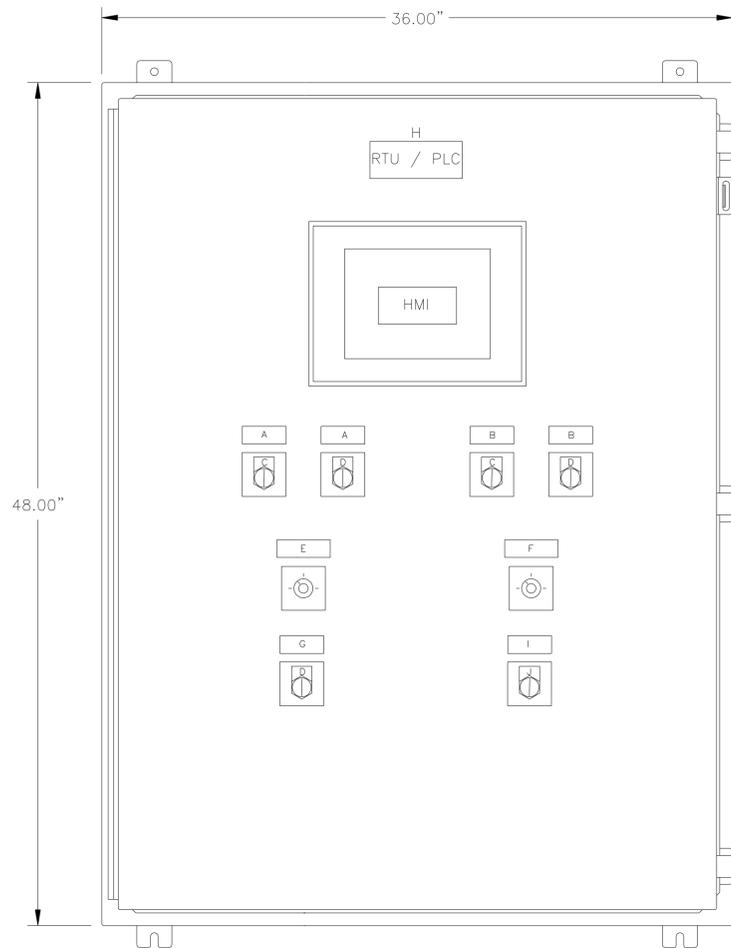
ADDENDUMS / REVISIONS	

**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

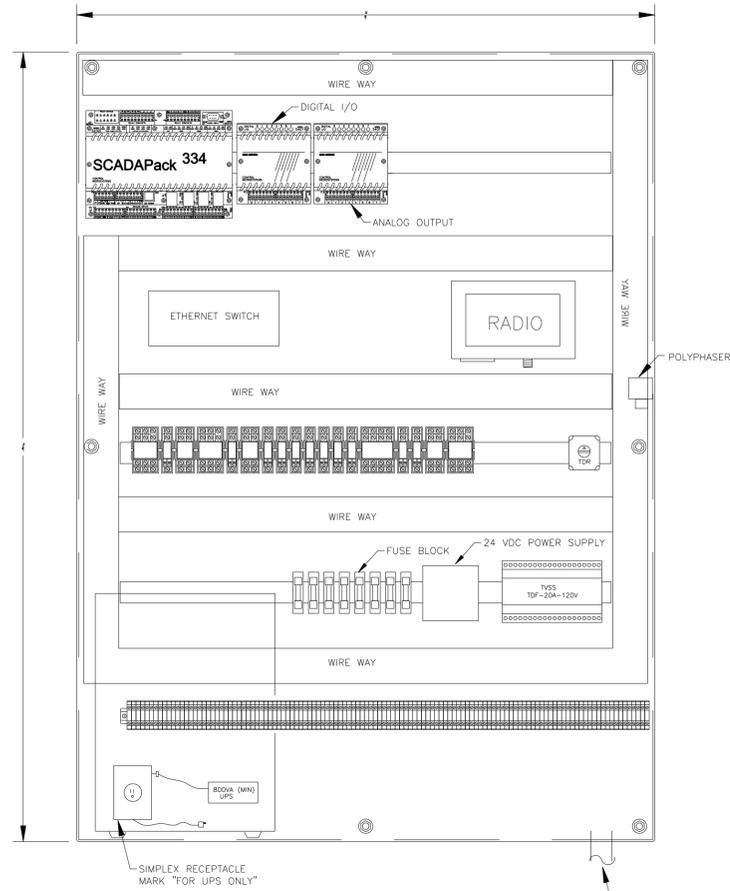
CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	DAW
COUNTY	CHECKED BY:	SDT
KENT		

<b>SEWER PLANS PUMP STATION WITH VFD &amp; SINGLE LINE ENCLOSURE</b>	
SHEET NO.	636
TOTAL SHTS.	641

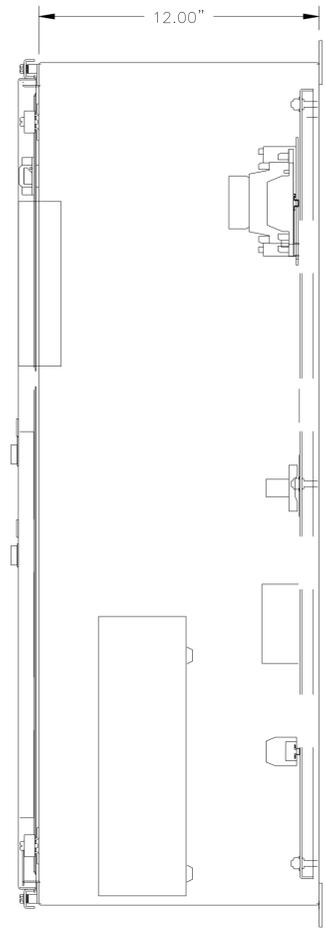
E-02



**FRONT VIEW  
NEMA 12 ENCLOSURE**



**BACK PANEL VIEW**



**END VIEW  
WIREWAY OMITTED FOR CLARITY**

MATERIAL SCHEDULE			
QTY	DESCRIPTION	CATALOG NUMBER	MANUFACTURER
1	ENCLOSURE NEMA 12	C-SD423612	HOFFMAN, HAMMOND OR EQUAL
1	BACK PANEL	C-P4236	HOFFMAN, HAMMOND OR EQUAL
1	SCADAPACK 334 24VDC INPUTS	P3341A00A0	SCHNEIDER
1	32 PT MODULE DIGITAL INPUT 120VAC	5405-120	SCHNEIDER
1	4 PT ANALOG OUTPUT	5302	SCHNEIDER
1	LIGHTNING SUPPRESSOR	IS-50NX-C2	POLYPHASER OR PHOENIX
1	RADIO	SP 900XL-1000	COYOTE DATA COMM
1	BLOWER CONTACTOR (BC)		SCHNEIDER, CH OR EQUAL
A/R	GLASS FUSES	C383THS	CUTLER-HAMMER (CH)
1	SURGE PROTECTOR (TVSS)	TDF-20A-120V	ERICO OR EQUAL
A/R	DT RELAY W/ BASE	TYPE RH	IDEC, OMRON OR EQUAL
A/R	TERMINALS	UK5N	PHOENIX, AB OR EQUAL
A/R	WIRE WAY	2X3, 1.5X3	TYTON OR HOFFMAN
58	TERMINALS	UKK5	PHOENIX, AB OR EQUAL
1	POWER SUPPLY	PSSR-024	IDEC, ACOPIAN OR EQUAL
1	HMI	MMI-8070H	KEP
1	TDR	330-12-300S	TIME MARK OR ATC
A/R	FUSES	3AG1A313, 3AG3A313	LITTELFUSE, BUSSMAN OR EQUAL
A/R	TERMINAL	U5LK65	PHOENIX, AB OR EQUAL
1	UPS	PULSAR 800/560 VA/W	MGE SYSTEMS, EATON OR EQUAL
5	SELECTOR SWITCHES	CLASS 9001 TYPE SK	SQUARE D, CH OR EQUAL
2	SPEED POT	COMPATIBLE WITH VFD	COMPATIBLE WITH VFD
1	5-PORT UNMANAGED ETHERNET SWITCH	FL SFNB 5TX - 2891001	PHOENIX, N-TRON OR EQUAL

FIELD INSTRUMENT SCHEDULE			
QTY	DESCRIPTION	CATALOG NUMBER	MANUFACTURER
1	MAGNETIC FLOW METER WITH RS-485 MODBUS PROTOCOL	MAGMASTER or MAGFLO	ABB OR SIEMENS
1	LEVEL TRANSMITTER	WATER PILOT 0-15' H <sub>2</sub> O	ENDRESS & HAUSER OR SIEMENS
2	PRESSURE TRANSMITTER	0-60 PSI	ONYX
2	ISOLATION RING (PRESSURE GLAND)	PSQ	ONYX OR ASHCROFT
2	FLOAT SWITCHES, TEAR DROP STYLE	ALL NORMALLY OPEN	HYDRAMATIC, SIEMENS
1	HATCH LIMIT SWITCH WITH LEVER ARM AND STEEL ROLLER	CLASS 9006/9007 TYPE C HEAVY INDUSTRIAL CLASS 1, DIV. 1, GROUP D	SQUARE D, CH OR AB

ENGRAVING SCHEDULE		
ID	FIRST LINE / SECOND LINE	
A	PUMP 1	
B	PUMP 2	
C	VFD SS AUX	
D	HAND OFF AUTO	
E	PUMP 1 / SPEED POT	
F	PUMP 2 / SPEED POT	
G	BLOWER	
H	RTU/PLC	
I	WELL PUMP	
J	ON OFF	

**NOTES:**

- RTU/PLC PANEL AND ASSOCIATED CONTROL COMPONENTS SHALL BE PROVIDED AND CONFIGURED BY THE SYSTEMS INTEGRATOR.
- THE SYSTEMS INTEGRATOR SHALL PROVIDE AS-BUILT DRAWINGS DOCUMENTING FINAL INSTALLATION, WIRING, AND PLC CONFIGURATION IN HARD COPY AND ELECTRONIC FORMATS.
- THE SYSTEMS INTEGRATOR SHALL DEVELOP 4 OR MORE HMI SCREENS FOR GRAPHICAL REPRESENTATION OF CONTROL AND STATUS OF PUMPS, WET WELL LEVEL, FLOW, EMERGENCY GENERATOR, GRINDER (IF INCLUDED) AND ALARMS. PROVIDE BAR GRAPHS AND NUMERIC DISPLAY FOR ANALOG SIGNAL INDICATION.
- PLC LOGIC SHALL START AND STOP PUMPS BASED ON WET WELL LEVEL ANALOG INPUT UNDER NORMAL CONDITIONS.
- PLC LOGIC SHALL REQUIRE A MINIMUM OF 30 SECONDS BETWEEN STARTING OF SEPARATE MOTORS UNDER NORMAL AND EMERGENCY POWER. TIMER WILL PROVIDE SIMILAR FUNCTION FOR PUMPS UNDER HARDWIRED (BACK-UP) FLOAT CONTROL.
- THE VFD AND SOFTSTART WIRING SCHEMATICS ARE BASED ON SQUARE D COMPONENTS. IF CUTLER-HAMMER EQUIPMENT IS PROVIDED, THE CONTRACTOR SHALL MAKE ANY NECESSARY MODIFICATIONS FOR A COMPLETE AND WORKING SYSTEM, EQUAL TO THE FUNCTION OF THE SCHEMATICS AS SHOWN.
- LEVEL AND PRESSURE TRANSMITTERS SHALL BE 24VDC LOOP POWERED.
- FLOWMETER MUST HAVE A SELF-POWERED, ACTIVE OUTPUT.
- SEE PLANS, ELEVATION AND DETAILS DRAWING FOR LOCATIONS OF COMPONENTS.
- SYSTEM INTEGRATOR SHALL CONTACT KENT COUNTY ENGINEERING FOR SCADA REGISTER MAPPING AND RADIO CONFIGURATION.
- ISOLATION RING (PRESSURE GLAND) MUST BE FIELD REPLACEABLE.

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ADDENDUMS / REVISIONS

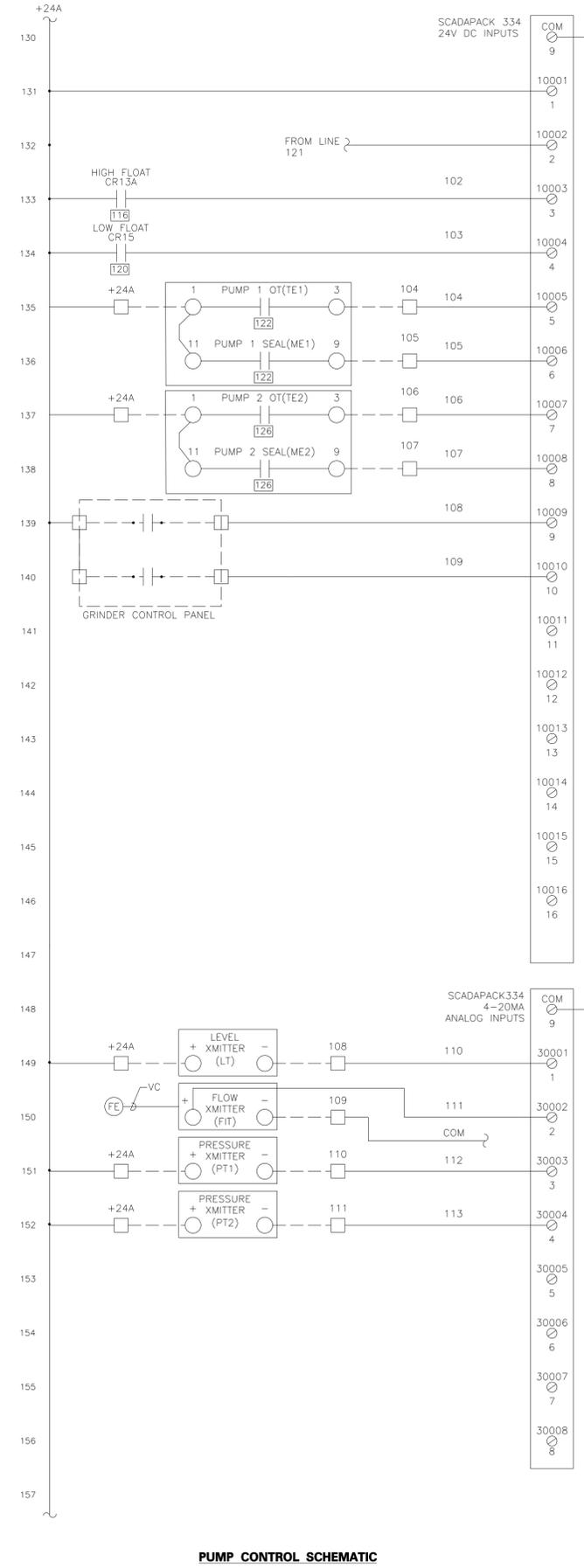
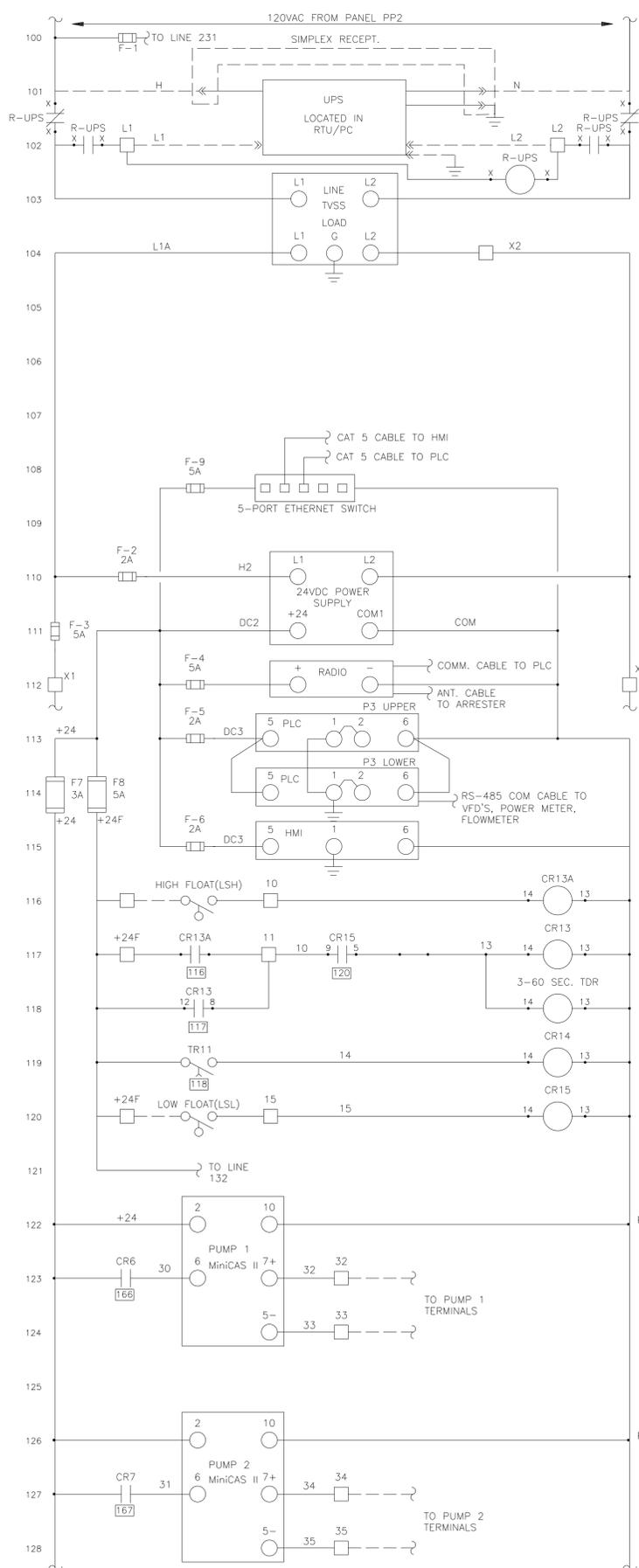
**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	DAW
COUNTY	CHECKED BY:	SDT
KENT		

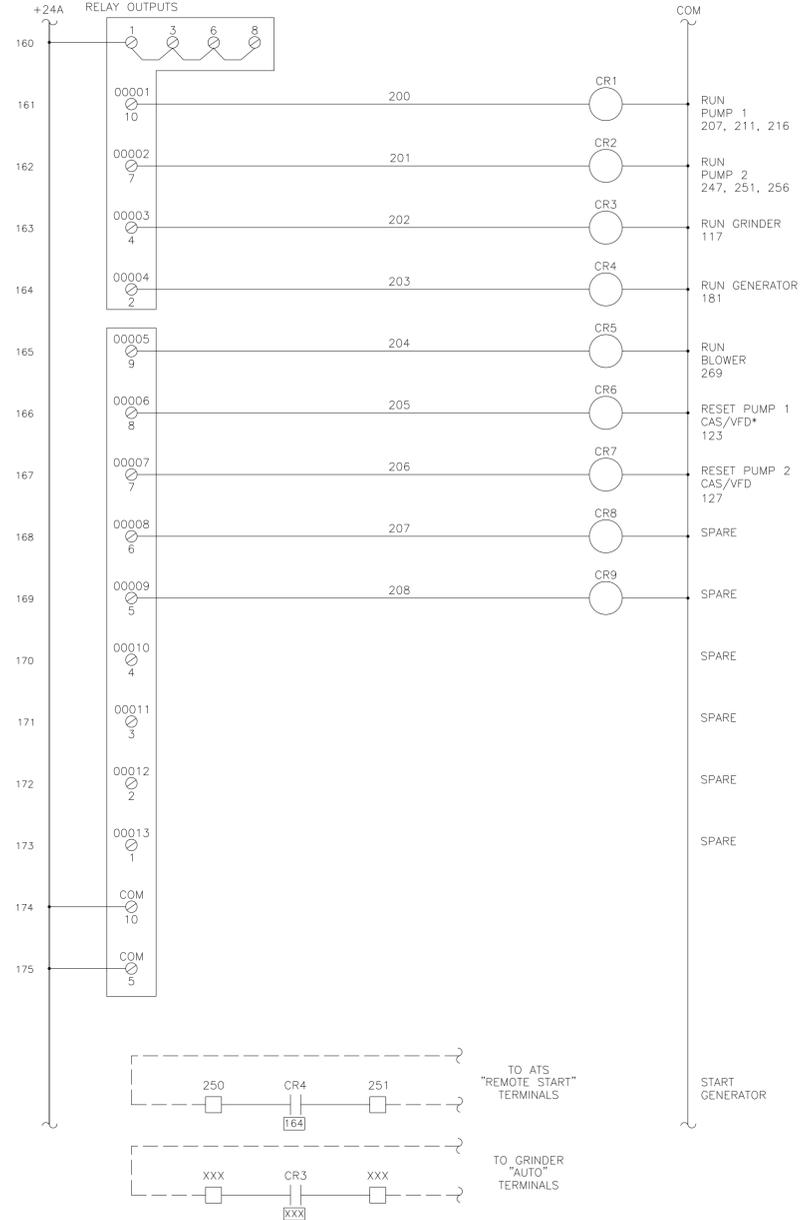
**SEWER PLANS  
RTU AND PC ENCLOSURE**

E-03
SHEET NO.
637
TOTAL SHTS.
641

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 64550.FPM



**PUMP CONTROL SCHEMATIC**



ADDENDUMS / REVISIONS



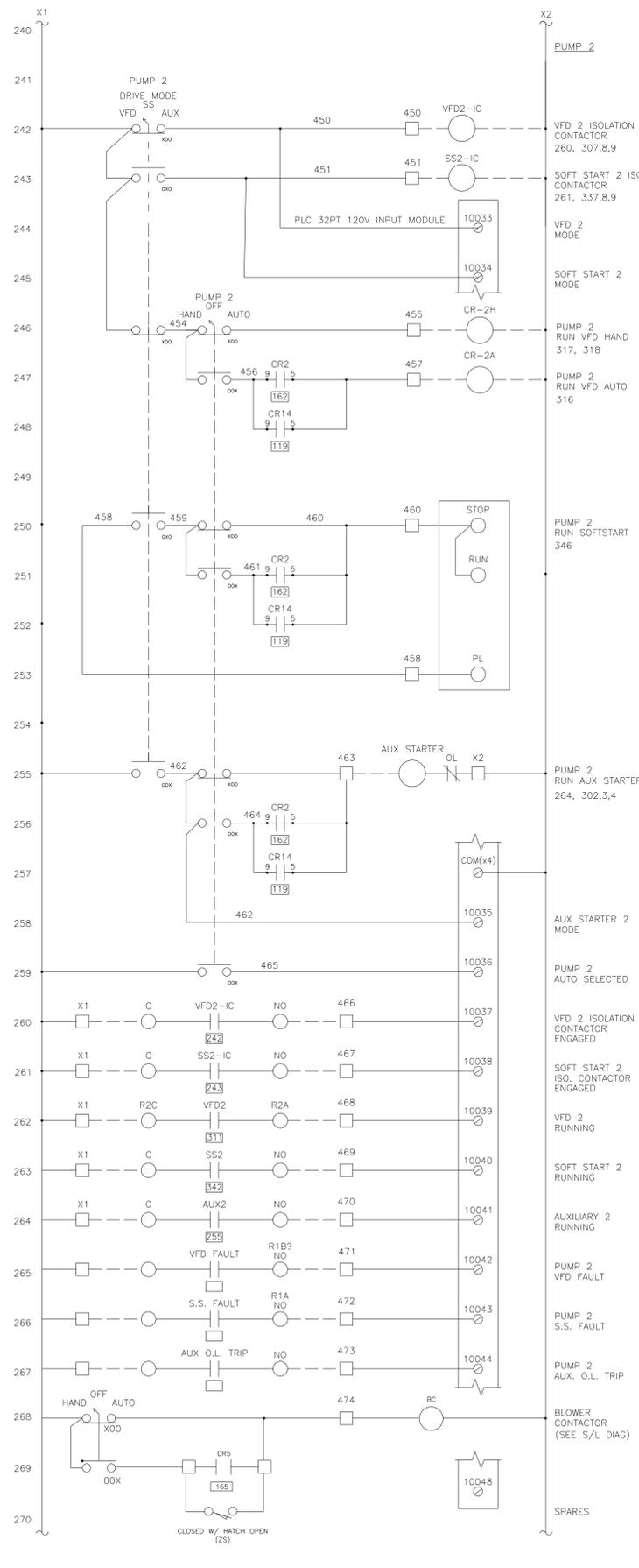
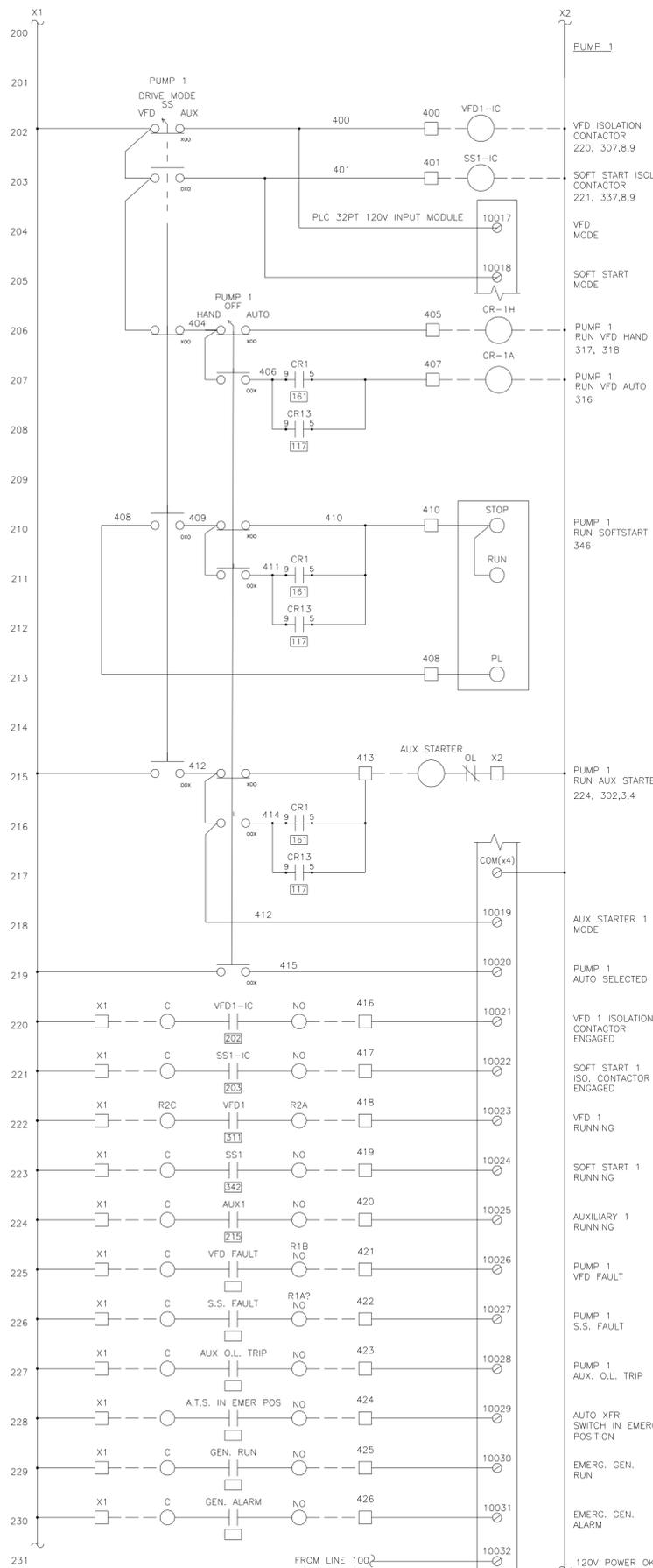
**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	DAW
COUNTY	CHECKED BY:	SDT
KENT		

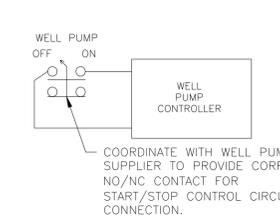
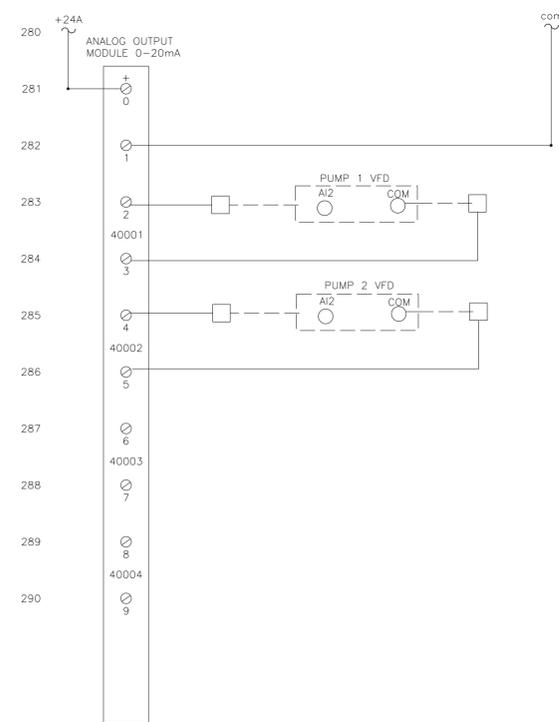
**SEWER PLANS  
PUMP CONTROL SCHEMATIC**

E-04
SHEET NO.
638
TOTAL SHTS.
641

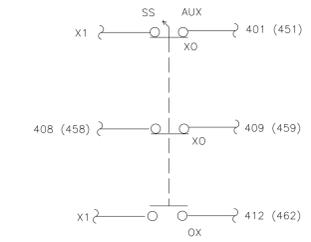
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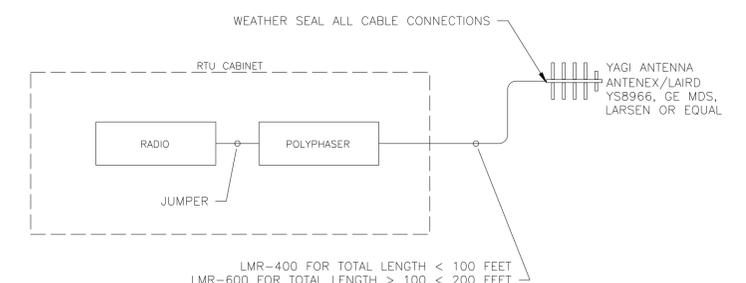
**PUMP CONTROL SCHEMATIC**



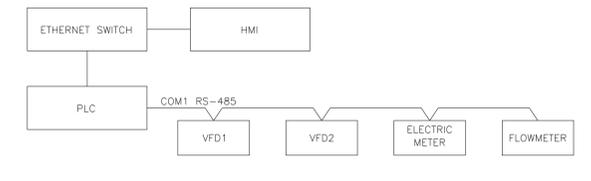
**WELL PUMP CONTROL**



**DRIVE MODE SELECTOR SWITCH WIRING FOR "NO VFD" STATIONS**



**WIRELESS COMMUNICATION RISER**



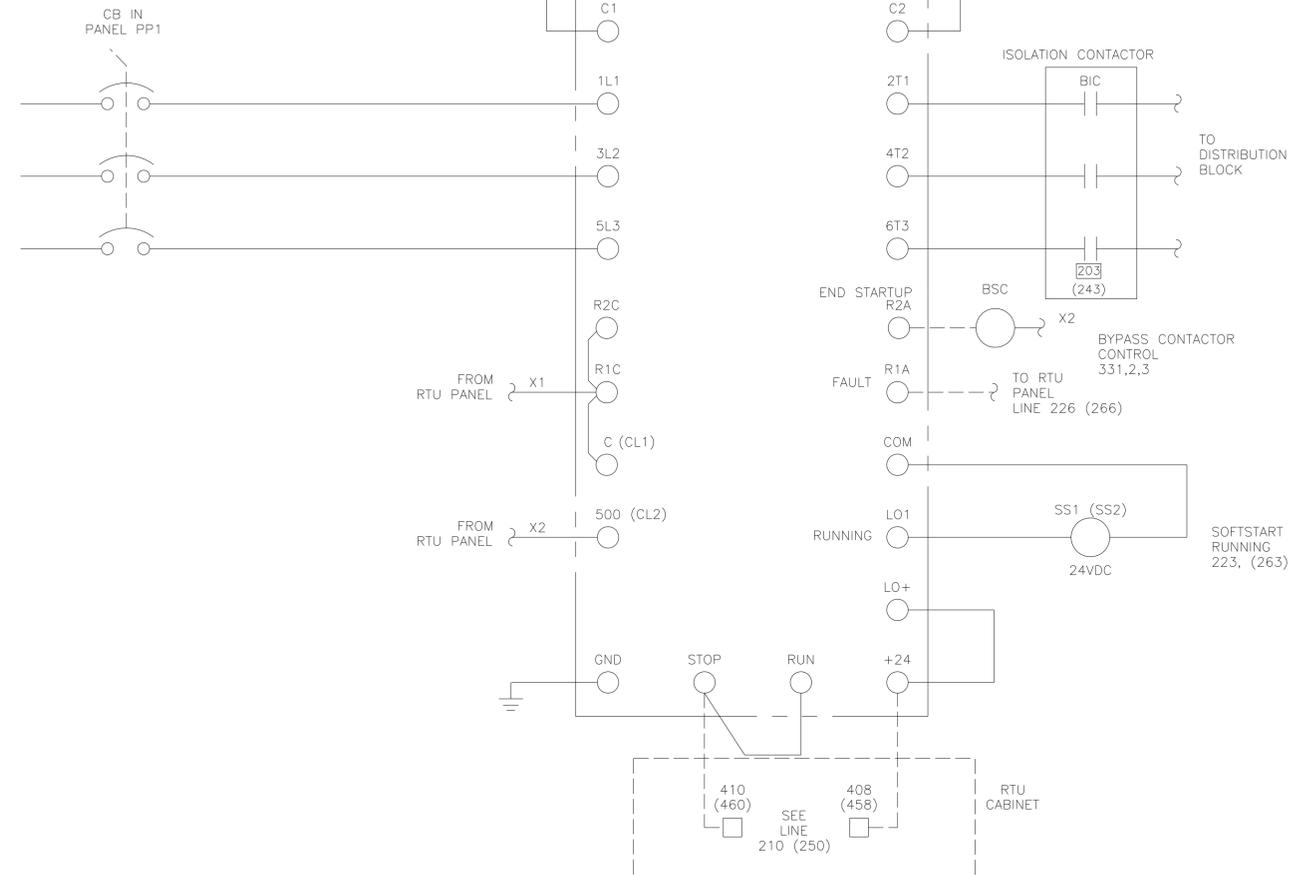
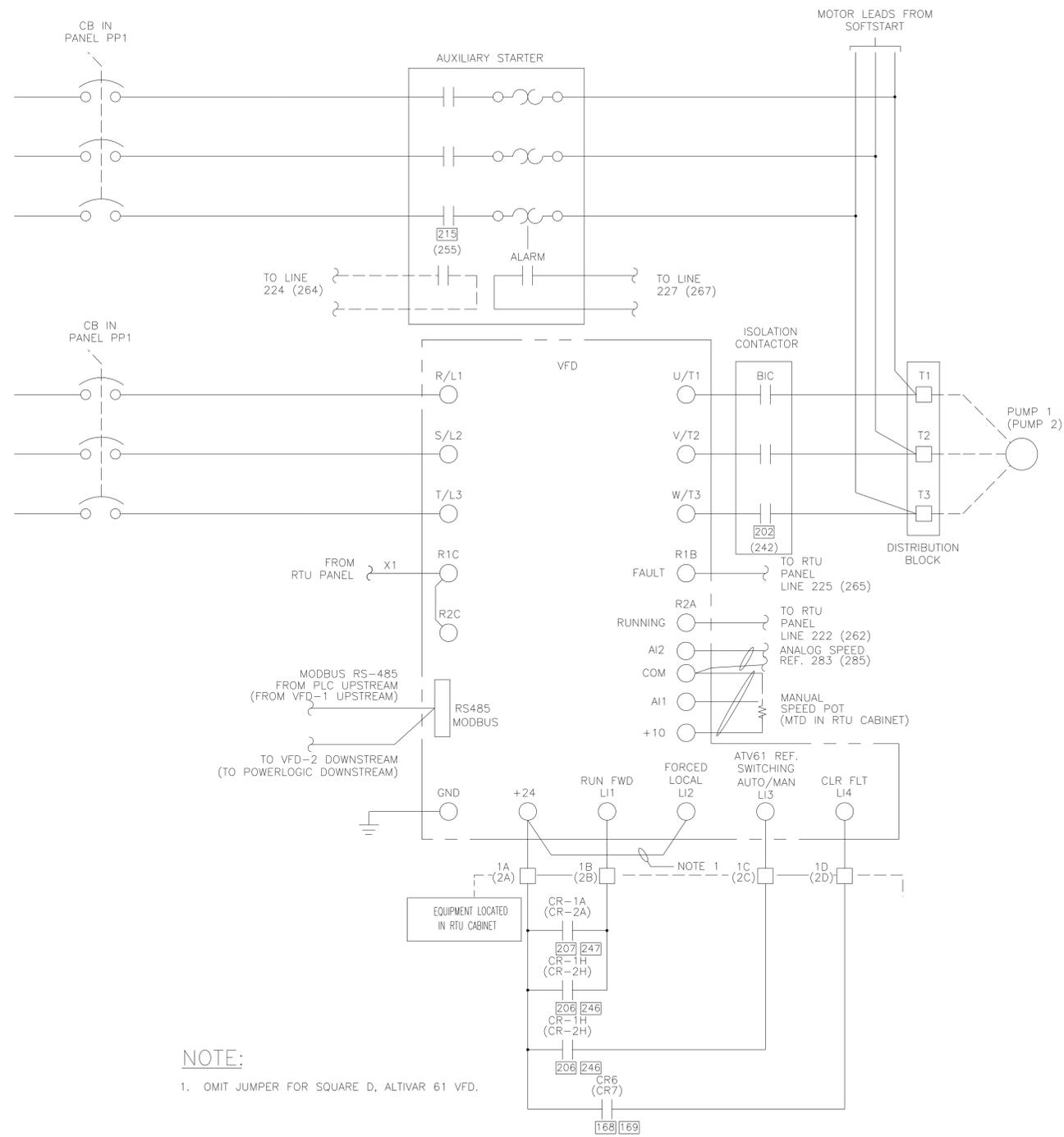
**WIRED COMMUNICATION RISER**

**NOTES:**

1. VFD DATA - VOLTS, AMPS, KW, HZ, % DRIVE HEAT, % MOTOR HEAT, LAST FAULT CURRENT.
2. POWER METER DATA - AMPS (4), VOLTS (6), KW, KWH, POWER FACTOR.
3. FLOW METER DATA - FLOW TOTAL (2)
4. ALL DATA TO BE DISPLAYED ON APPROPRIATE SCREEN IN HMI.

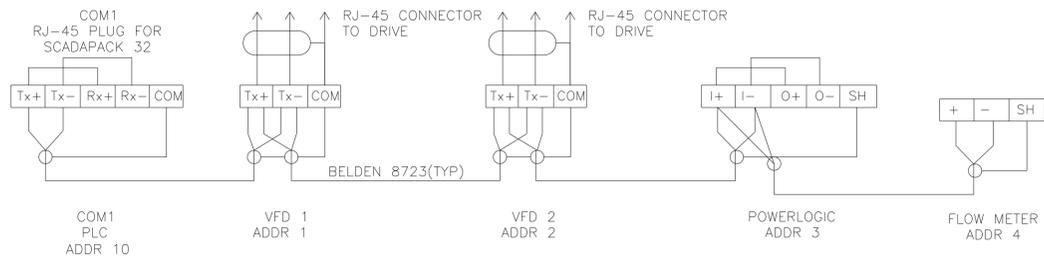
ADDENDUMS / REVISIONS	

CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	DAW
COUNTY	CHECKED BY:	SDT
KENT		



**NOTE:**  
1. OMIT JUMPER FOR SQUARE D, ALTIVAR 61 VFD.

**TYPICAL PUMP CONTROL SCHEMATIC**



**MODBUS COMMUNICATIONS WIRING**

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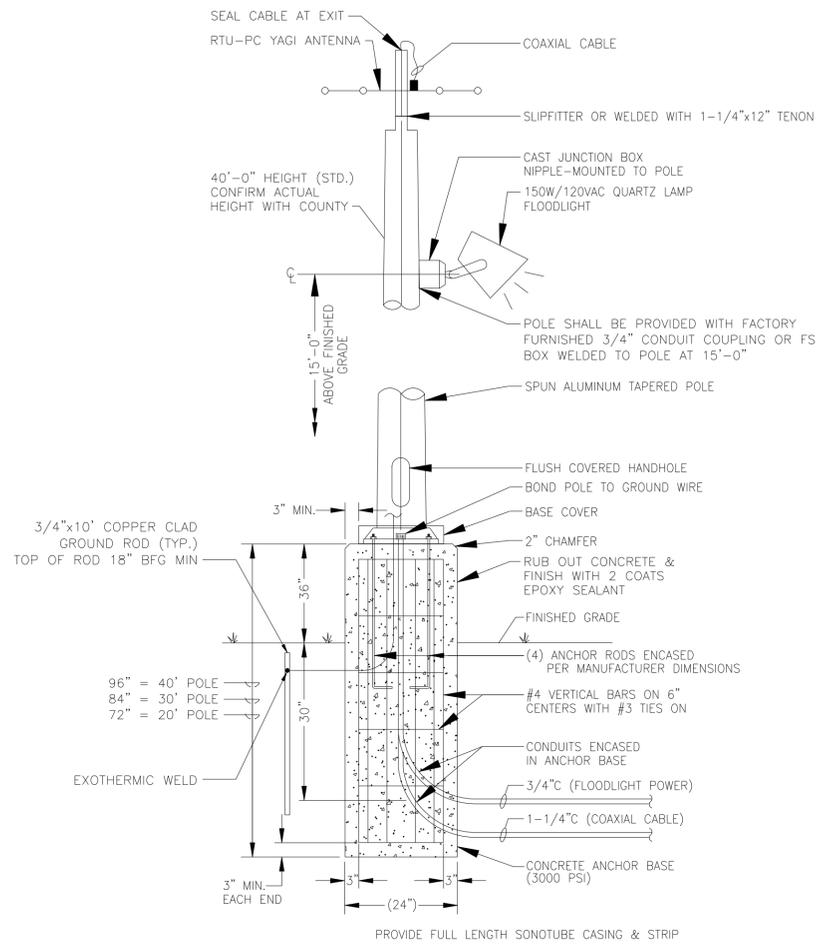
ADDENDUMS / REVISIONS	

**SR1, LITTLE HEAVEN  
GRADE SEPARATED INTERSECTION**

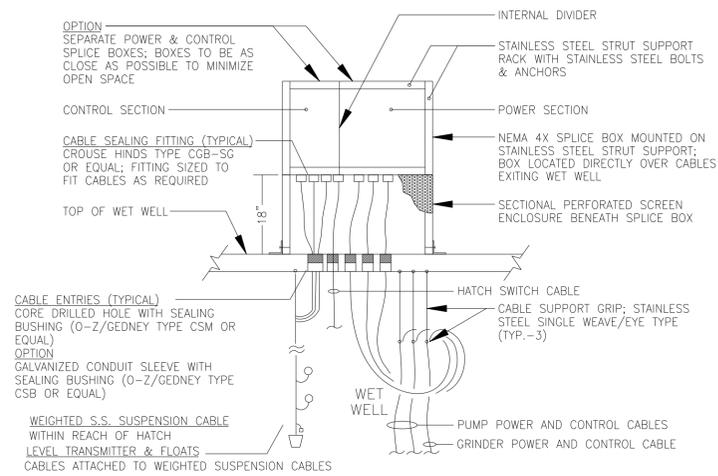
CONTRACT	BRIDGE NO.	-
T200412202	DESIGNED BY:	DAW
COUNTY	CHECKED BY:	SDT
KENT		

**SEWER PLANS  
PUMP CONTROL SCHEMATIC**

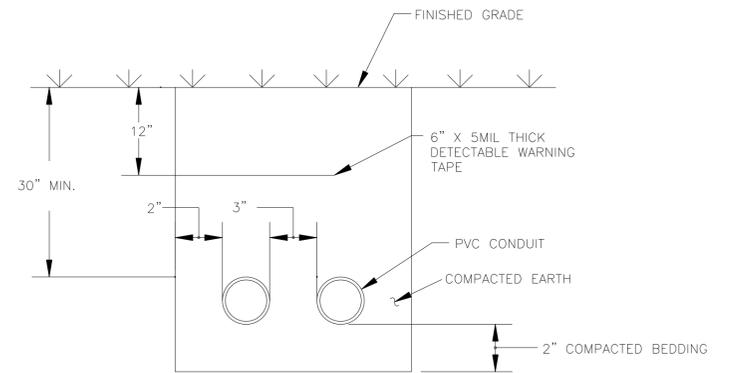
E-06
SHEET NO.
640
TOTAL SHTS.
641



**1 LIGHT POLE ELEVATION**  
E-07 SCALE: NONE



**2 FRONT ELEVATION SPLICE BOX DETAIL**  
E-07 SCALE: NONE



**3 TYPICAL DIRECT - BURIED DUCTBANK DETAIL**  
E-07 SCALE: NONE

NOTES (TYPICAL DUCTBANK DETAIL):

- 1 ADJUST DIMENSION AS NEEDED FOR DIFFERENT NUMBER OF CONDUITS.

1/13/2015 1:00:00 PM C:\PROJECTS\03517.00\DELDOT.AGMT\1223.DOTS\Open End\03517.16 SR1, LITTLE HEAVEN FINAL DESIGN\DWG Files\swr25.dgn