PLANS FOR

INTERSECTION IMPROVEMENTS CENTENNIAL AVENUE CORRIDOR

CENTENNIAL AVENUE AND HILLSIDE AVENUE
CENTENNIAL AVENUE AND MYRTLE STREET
CENTENNIAL AVENUE & WALL STREET – PAT FOSSELLA STREET

TOWNSHIP OF CRANFORD, UNION COUNTY

PUBLIC UTILITIES

SERVICE	OWNER	CONTACT INFORMATION
GAS	ELIZABETHTOWN GAS COMPANY 520 GREEN LANE UNION, NJ 07083	PHONE: 908-662-8321 CONTACT: GREGORY J. BALINT
ELECTRIC	PSE&G (ELECTRIC DIVISION) 472 WESTON CANAL ROAD SOMERSET, NJ 08873	PHONE: (732) 764-3074 CONTACT: JAMES QUANVIE
WATER	NJ AMERICAN WATER 1341 NORTH AVE PLAINFIELD, NJ 07061	PHONE: 908-791-3418 CONTACT: SCOTT SCHREIBER
PHONE	VERIZON COMMUNICATION 445 GEORGES ROAD NORTH BRUNSWICK, NJ 08902	PHONE: 732-418-5601 CONTACT: KRZYSZTOF OGRODNIK
CABLE TV	COMCAST CABLEVISION OF NJ 800 RAHWAY AVE UNION CITY, NJ 07083	PHONE: 908-623-6190 CONTACT: RICH GUGULSKI
SEWER	RAHWAY VALLEY SEWERAGE AUTHORITY 1050 EAST HAZELWOOD AVE RAHWAY, NJ 07065	PHONE: 732-388-0868 CONTACT: MIKE BRINKER

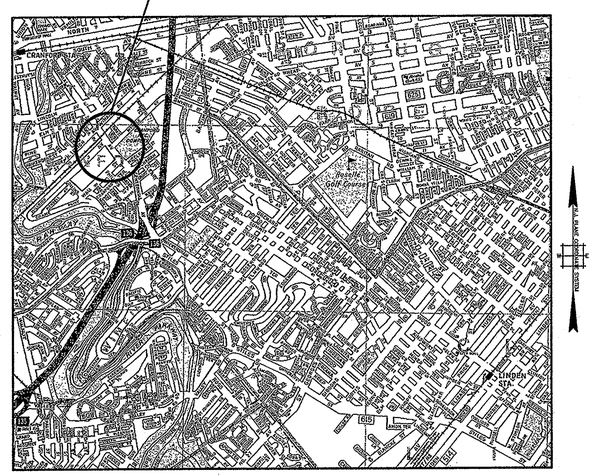
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE EXACT LOCATION AND DEPTH OF UTILITIES AT ALL AREAS OF WORK PRIOR TO CONSTRUCTION.

IN ADDITION, THE CONTRACTOR SHOULD CALL:

GARDEN STATE UNDERGROUND
PLANT LOCATION SERVICE
PLAINFIELD, NJ
800-272-1000

BIDDERS ARE ADVISED TO VERIFY THE ABOVE INFORMATION AS ITS ACCURACY AND COMPLETENESS ARE NOT GUARANTEED BY THE COUNTY.

PROJECT LOCATION


CRANFORD
NORTH
Nomahegan Park
Nomahegan Park Golf Course
Cranford Golf Club
Lincoln Park
Cranford Reservoir
Rahway River
Rahway River Park
Kenilworth
Hillside
Roselle Park
Roselle
Linden
Elizabeth
Union County Airport
Rahway River Park
Rahway River Park
Rahway River Park

PAY ITEM No.	DESCRIPTION	UNIT	CONTRACT QUANTITY	PLAN QUANTITY	IF & WHERE DIRECTED	AS-BUILT QUANTITY	DISTRIBUTION – PLAN SHEET QUANTITY								
							CP-1	CP-2	TSS-1	TSS-2	TSS-3	E-1	E-2	E-3	TC-ALL STAGES
1	CONSTRUCTION LAYOUT	LS	1												
2	MONUMENT	UNIT	3	3			2	1							
3	INLET FILTER TYPE 1	SF	45	45			45								
4	INLET FILTER TYPE 2, 2' X 4'	UNIT	5	5			1	4							
5	SILT FENCE	LF	900	835	65		555	280							
6	BREAKAWAY BARRICADE	UNIT	55	48	7										48
7	DRUM	UNIT	140	120	20										120
8	TRAFFIC CONE	UNIT	50		50										
9	CONSTRUCTION SIGNS	SF	900	824	76										824
10	TRAFFIC DIRECTOR, FLAGGER	HR	600		600										
11	CLEARING SITE	LS	1												
12	NO ITEM														
13	EXCAVATION, TEST PIT	CY	20		20										
14	EXCAVATION, UNCLASSIFIED	CY	445	404	41		342	62							
15	DENSE GRADED AGGREGATE BASE COURSE, 4" THICK	SY	750	695	55		552	143							
16	HMA MILLING, 3" OR LESS	SY	6,500	5,863	637		3,217	2,646							
17	HOT MIX ASPHALT PAVEMENT REPAIR	TON	25		25										
18	HOT MIX ASPHALT 19M64 BASE COURSE	TON	275	251	24		198	53							
19	HOT MIX ASPHALT 9.5M64 SURFACE COURSE	TON	865	794	71		456	338							
20	NO ITEM														
21	INLET CASTING, TYPE B, WITH TYPE N-ECO CURB & BICYCLE SAFE GRATE	UNIT	6	6			3	3							
22	BICYCLE SAFE GRATE	UNIT	2	2			1	1							
23	FUEL PRICE ADJUSTMENT	LS	1		1										
24	ASPHALT PRICE ADJUSTMENT	LS	1		1										
25	NO ITEM														
26	CONCRETE SIDEWALK, 4" THICK	SY	500	448	52		308	140							
27	CONCRETE DRIVEWAY, REINFORCED, 6" THICK	SY	10	7	3			7							
28	GRAVEL DRIVEWAY	SY	5	3	2			3							
29	DETECTABLE WARNING SURFACE	SY	16	14	2		7	7							
30	10" X 20" CONCRETE VERTICAL CURB	LF	1,200	1,067	133		692	375							
31	NO ITEM														
32	PAINT CONCRETE CURBING	LF	1,000		1,000										
33	TRAFFIC STRIPES, LONG LIFE, THERMOPLASTIC	LF	10,450	9,997	453				3,665	2,671	3,661				
34	TRAFFIC MARKINGS, LONG LIFE, THERMOPLASTIC	UNIT	30	24	6				13	6	5				
35	RPM, MONO-DIRECTIONAL, WHITE LENS	UNIT	10	10					4	3	3				
36	RPM, MONO-DIRECTIONAL, AMBER LENS	UNIT	24	24					14	8	2				
37	RPM, BI-DIRECTIONAL, AMBER LENS	UNIT	12	12					2		10				
38	NO ITEM														
39	NO ITEM														
40	NO ITEM														
41	REGULATORY AND WARNING SIGN	SF	190	177	13				64	80	33				
42	POLE MOUNTED SIGN	SF	8	8								8			
43	MAST ARM SIGN, TYPE SF	SF	17	17								5	12		
44	MAST ARM SIGN, TYPE DF	SF	59	59								17	17	25	
45	NO ITEM														
46	NO ITEM														
47	2" RIGID METALLIC CONDUIT, EARTH	LF	90	83	7							24	25	34	
48	4" SCHEDULE 80 PVC, EARTH	LF	410	362	48							99	117	146	
49	4" SCHEDULE 80 PVC, ROADWAY	LF	470	425	45							150	122	153	
50	NO ITEM														
51	NO ITEM														
52	17" X 30" JUNCTION BOX	UNIT	9	9								2	3	4	
53	24" X 36" JUNCTION BOX	UNIT	3	3								1	1	1	
54	FOUNDATION, TYPE SFT	UNIT	5	5								1	2	2	
55	FOUNDATION, TYPE SFT-H	UNIT	5	5								2	1	2	
56	FOUNDATION, TYPE P-MC	UNIT	3	3								1	1	1	
57	FOUNDATION, TYPE SPF	UNIT	15	15								3	4	8	
58	METER CABINET, TYPE T	UNIT	3	3								1	1	1	
59	SERVICE WIRE, NO. 6 AWG	LF	470	429	41							132	135	162	
60	GROUND WIRE, NO. 8 AWG	LF	1,400	1,247	153							371	378	498	
61	CONTROLLER ASSEMBLY, 12 PHASE WITH BATTERY BACKUP SYSTEM	UNIT	3	3								1	1	1	
62	BATTERY BACKUP SYSTEM AT RARITAN ROAD AND CENTENNIAL AVENUE	UNIT	1												
63	UC-SMA15-TB2-1 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	UNIT	1	1								1			
64	UC-SMA15-TB2-2 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	UNIT	1	1										1	
65	UC-SMA20-TB2-1 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	UNIT	1	1									1		
66	UC-SMA20-TB2-2 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	UNIT	2	2									1	1	
67	UC-SMA25-TB4-2 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	UNIT	3	3								1		2	
68	UC-SMA30-TB4-2 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	UNIT	2	2								1	1		
69	TRAFFIC SIGNAL ASSEMBLY, TYPE C-1	UNIT	4	4								2	1	1	
70	TRAFFIC SIGNAL ASSEMBLY, TYPE MM-1	UNIT	8	8								2	3	3	
71	PEDESTRIAN SIGNAL ASSEMBLY, TYPE W-1	UNIT	3	3								2		1	
72	PEDESTAL ASSEMBLY, TYPE P-1-D(12')	UNIT	1	1								1			
73	PEDESTAL ASSEMBLY, TYPE PW-1	UNIT	12	12								2	3	7	
74	PEDESTAL ASSEMBLY, TYPE P-1-W-1-D(12')	UNIT	1	1									1		
75	PEDESTRIAN PUSH BUTTON ASSEMBLY, R10-3e	UNIT	16	16								4	4	8	
76	NO ITEM														
77	TRAFFIC SIGNAL CABLE, 2 CONDUCTOR	LF	2,000	1,779	221							398	449	932	
78	TRAFFIC SIGNAL CABLE, 5 CONDUCTOR	LF	2,000	1,773	227							398	449	926	
79	TRAFFIC SIGNAL CABLE, 10 CONDUCTOR	LF	3,700	3,346	354							1,001	1,013	1,332	
80	VIDEO DETECTION SYSTEM	UNIT	3	3								1	1	1	
81	PRIORITY CONTROL SYSTEM	UNIT	3	3								1	1	1	
82	NO ITEM														
83	TOPSOILING, 4" THICK	SY	600	541	59		447	94							
84	FERTILIZING & SEEDING, TYPE A-3	SY	600	541	59		447	94							
85	STRAW MULCHING	SY	600	541	59		447	94							

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

ESTIMATE – DISTRIBUTION OF QUANTITIES

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365

EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497
4/8/13 DATE

DESIGNED BY BPK/IK | DRAWN BY IK/JL | CHECKED BY BPK
PROJECT NO. UNCO-00390 | CADD FILE UN390-DQ0 | FIELD BK. # UNCO-XX

DRAWING DOQ-1

SHEET 2 OF 31

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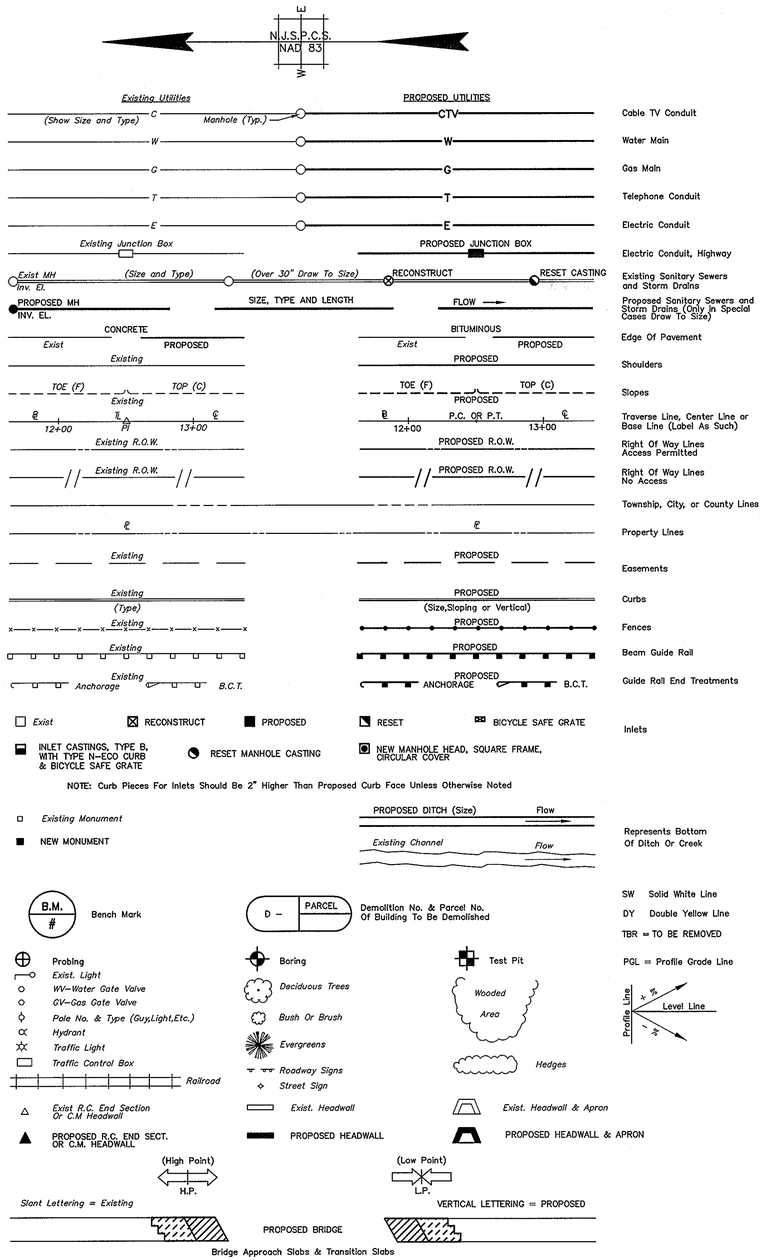
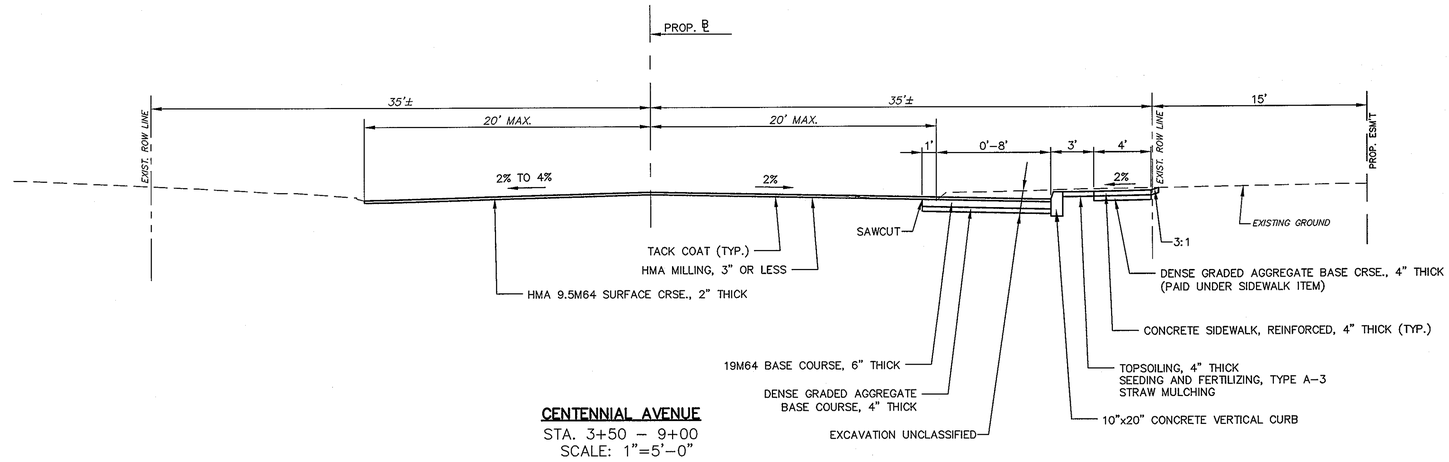
FILE NAME: H:\UNCO\00390\Plans\UNC00390-DQ0.dwg
PLOT DATE: Apr 05, 2013 – 9:21am

STANDARD LEGEND



SOIL EROSION AND SEDIMENT CONTROL LEGEND

- A1 INLET FILTER, CURB TYPE INLET FRAME
- A3 INLET FILTER, CURB AND FLAT TYPE INLET FRAME AT LOW POINTS
- C1 SILT FENCE



CENTENNIAL AVENUE
STA. 3+50 – 9+00
SCALE: 1"=5'-0"

GENERAL NOTES:

1. NO SEPARATE PAYMENT SHALL BE MADE TO SAWCUT EXISTING PAVEMENT, DRIVEWAYS, OR SIDEWALKS. INCLUDE ALL COSTS IN THE VARIOUS ITEMS IN THE PROPOSAL.

2. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL PROPERTY CORNERS DURING CONSTRUCTION. ANY PROPERTY CORNERS DISTURBED SHALL BE RESET AT THE EXPENSE OF THE CONTRACTOR.

3. THE CONTRACTOR SHALL CONTACT THE UTILITY COMPANIES TO COORDINATE ANY WORK THAT MAY NEED TO BE CONDUCTED WITHIN THE PROJECT LIMITS.

4. THE CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE PATTERNS ON ROADWAYS, IN YARDS, AND PRIVATE PROPERTIES ALONG PROPOSED PAVEMENT AND SIDEWALK INSTALLATIONS.

5. HEDGES, BUSHES, LANDSCAPE TIES, STONE EDGING, SIGNS, LANDSCAPE MATERIAL, FENCES, AND EDGING MATERIAL FOR DRIVEWAYS AND SIDEWALKS SHALL BE RESET OR REPLACED AS DIRECTED BY THE ENGINEER. NO SEPARATE PAYMENT SHALL BE MADE. INCLUDE ALL COSTS IN THE VARIOUS ITEMS IN THE PROPOSAL.

6. ALL TREES ADJACENT TO OR WITHIN THE LIMITS OF WORK ARE NOT TO BE DISTURBED UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL PROTECT TREES DURING ALL CONSTRUCTION RELATED ACTIVITIES.

7. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATIONS AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. UTILITY LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL LOCATIONS PRIOR TO CONSTRUCTION. ALL EXISTING UTILITIES MUST BE MAINTAINED AND KEPT OPERATIONAL AT ALL TIMES DURING CONSTRUCTION EXCEPT AS AUTHORIZED BY THE UTILITY COMPANY. ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES MUST BE PROTECTED FROM DAMAGE AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE TO SUPPORT UTILITY POLES ADJACENT TO EXCAVATION AREAS UNTIL THE AREAS ARE BACKFILLED AND STABILIZED.

8. CONTRACTOR IS RESPONSIBLE FOR SURVEYING ALL ELEVATIONS NECESSARY FOR THE INSTALLATION OF CONCRETE CURB RAMPS AND SHALL RECEIVE APPROVAL FROM THE ENGINEER PRIOR TO PLACEMENT OF ANY CONCRETE. ANY RAMPS PLACED WITHOUT SUCH APPROVAL AND WHICH ARE NOT ADA COMPLIANT SHALL BE REPLACED AT CONTRACTOR'S EXPENSE.

9. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2007 NJDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AS AMENDED HEREIN.

10. ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY.

11. TOPOGRAPHIC AND EXISTING FEATURES ARE BASED ON GROUND SURVEY.

12. ALL SOIL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO GROUND DISTURBANCE AND IN ACCORDANCE WITH THE CURRENT STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY.

13. MATERIAL EXCAVATED FROM PAVEMENT AREAS SHALL BE REPLACED WITH PAVING MATERIAL AND COMPACTED THAT SAME DAY.

14. TRAFFIC SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION IN ACCORDANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND TYPICAL NJDOT PROCEDURES.

STANDARD ABBREVIATIONS

LC	LOCKING COVER	PC	POINT OF CURVATURE	INV.	INVERT	L.O.M.	LIMIT OF MILLING
℄	BASE LINE	PT	POINT OF TANGENCY	L.S.	LUMP SUM	L.O.P.	LIMIT OF PAVING
AGG.	AGGREGATE	PI	POINT OF INTERSECTION	L.F.	LINEAR FEET	EP	EDGE OF PAVEMENT
C	CUT	PVC	POINT OF VERTICAL CURVATURE	LT.	LEFT	EXIST.	EXISTING
F	FILL	PVT	POINT OF VERTICAL TANGENCY	MIN.	MINIMUM	NO.	NUMBER
DC	DEPRESSED CURB	PVI	POINT OF VERTICAL INTERSECTION	M.H.	MANHOLE	R	RADIUS
DWY	DRIVEWAY	POL	POINT ON LINE	℘	PROPERTY LINE	T.B.R.	TO BE REMOVED
C. TO C.	CENTER TO CENTER	A.D.	ALGEBRAIC DIFFERENCE	PROP.	PROPOSED	TYP.	TYPICAL
FERT.	FERTILIZER	K	RATE OF VERTICAL CURVATURE	RCCP	REINFORCED CONCRETE CULVERT PIPE	UN	UNIT
GRD	GRADED	VC	VERTICAL CURVE (LENGTH)	R.C.E.S.	REINFORCED CONCRETE END SECTION	U.E.H.	USE EXISTING HEAD
C.R.	COUNTY ROUTE	BIT.	BITUMINOUS	R.R.S.P.	RIP RAP STONE PROTECTION	S.C.F.	SEDIMENT CONTROL FENCE
P.G.L.	PROFILE GRADE LINE	CONC	CONCRETE	R.O.W.	RIGHT OF WAY	NJAWC	NEW JERSEY AMERICAN WATER COMPANY
PVMT.	PAVEMENT	CRSE.	COURSE	S.F.	SQUARE FEET	L	LENGTH
REIN.	REINFORCED	CP	CONTROL POINT	S.M.	STREET NAME SIGN	N	NORTH
RT.	RIGHT	C.Y.	CUBIC YARD	S.O.D.	SUBBASE OUTLET DRAIN	S	SOUTH
SW,SDWK	SIDEWALK	EX	EXISTING	SURF.	SURFACE	E	EAST
VAR.	VARIES, VARIABLE	GR	GRATE	STAB.	STABILIZED	W	WEST
FT.	FEET	ELEV.	ELEVATION	S.Y.	SQUARE YARD		
				STA.	STATION		

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

LEGEND, GENERAL NOTES AND TYPICAL SECTION

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365

EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
Edward R. Klump 4/8/13
DATE
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. 0E37497

DESIGNED BY	DRAWN BY	CHECKED BY	DRAWING
BPK/IK	IK/JL	BPK	LGD-1
PROJECT NO. UNCO-00390	CADD FILE UN390-LEG	FIELD BK. # UNCO-XX	SHEET 3 OF 31

FILE NAME: H:\UNCO\00390\Plans\UNC00390-LEG.dwg
PLOT DATE: Apr 05, 2013 - 9:21am

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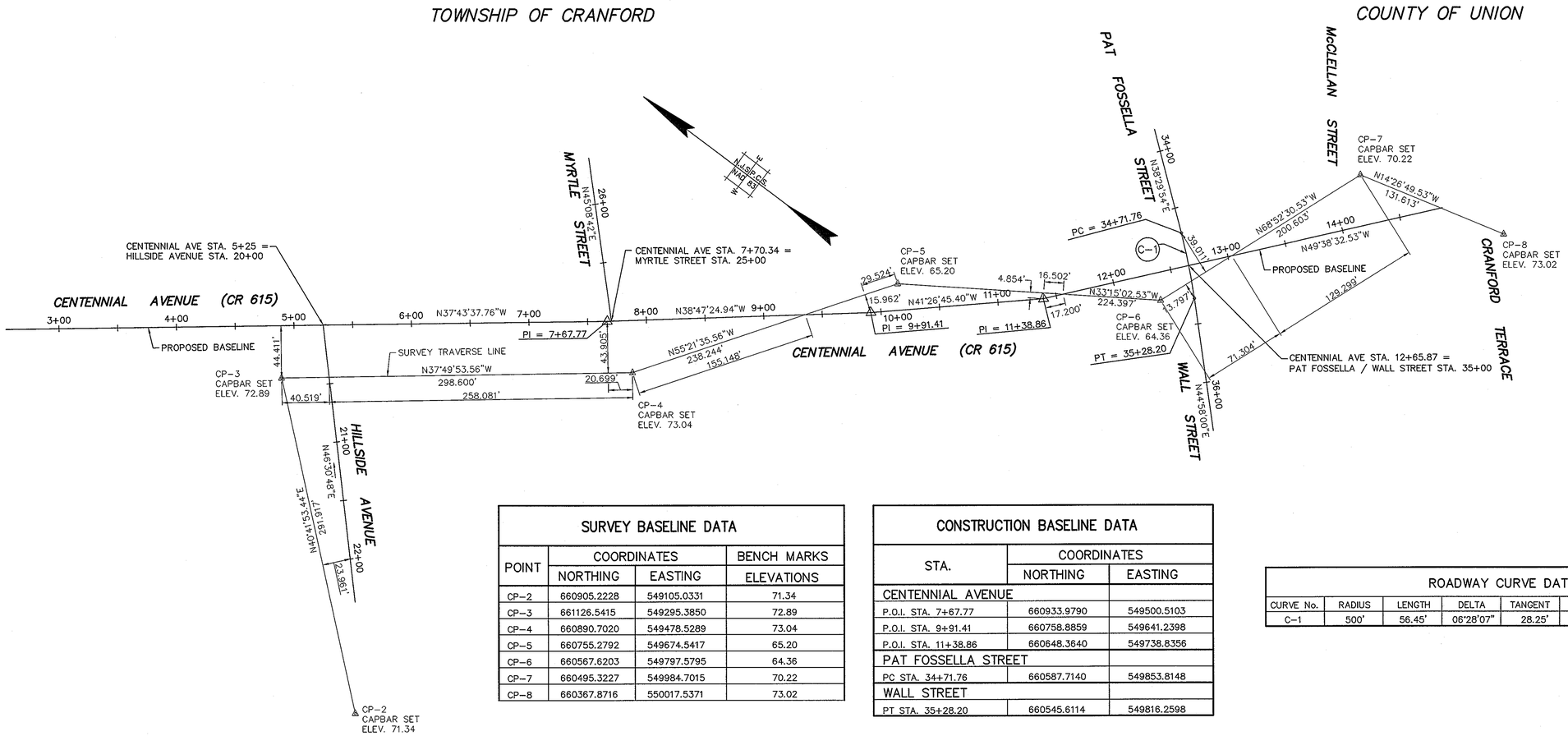


SURVEY BASELINE DATA

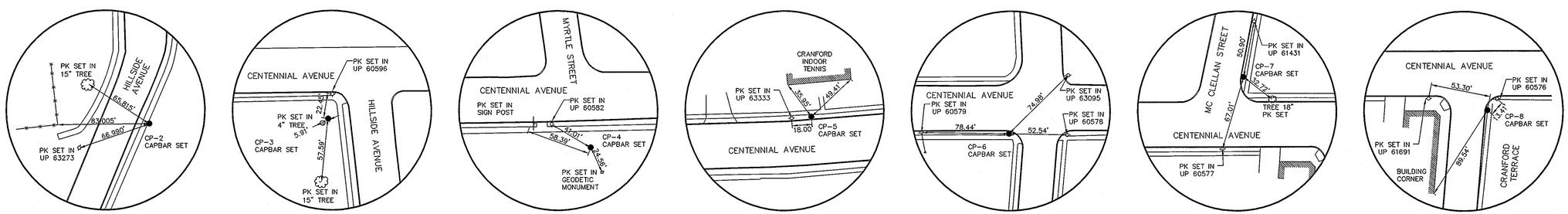
POINT	COORDINATES		BENCH MARKS
	NORTHING	EASTING	ELEVATIONS
CP-2	660905.2228	549105.0331	71.34
CP-3	661126.5415	549295.3850	72.89
CP-4	660890.7020	549478.5289	73.04
CP-5	660755.2792	549674.5417	65.20
CP-6	660567.6203	549797.5795	64.36
CP-7	660495.3227	549984.7015	70.22
CP-8	660367.8716	550017.5371	73.02

CONSTRUCTION BASELINE DATA

STA.	COORDINATES	
	NORTHING	EASTING
CENTENNIAL AVENUE		
P.O.I. STA. 7+67.77	660933.9790	549500.5103
P.O.I. STA. 9+91.41	660758.8859	549641.2398
P.O.I. STA. 11+38.86	660648.3640	549738.8356
PAT FOSSELLA STREET		
PC STA. 34+71.76	660587.7140	549853.8148
WALL STREET		
PT STA. 35+28.20	660545.6114	549816.2598

ROADWAY CURVE DATA

CURVE No.	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CENTER POINT	
						NORTHING	EASTING
C-1	500'	56.45'	06°28'07"	28.25'	56.42'	660,898.9595	549,462.5012



CP-2 N.T.S. CP-3 N.T.S. CP-4 N.T.S. CP-5 N.T.S. CP-6 N.T.S. CP-7 N.T.S. CP-8 N.T.S.

GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 inch = 50 ft.

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

BASELINE TIES CENTENNIAL AVENUE CORRIDOR

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365

EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497
4/8/13 DATE

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK

PROJECT NO. UNCO-00390 | CADD FILE UNCO390-TIE | FIELD BK. # UNCO-XX

DRAWING T-1

SHEET 4 OF 31

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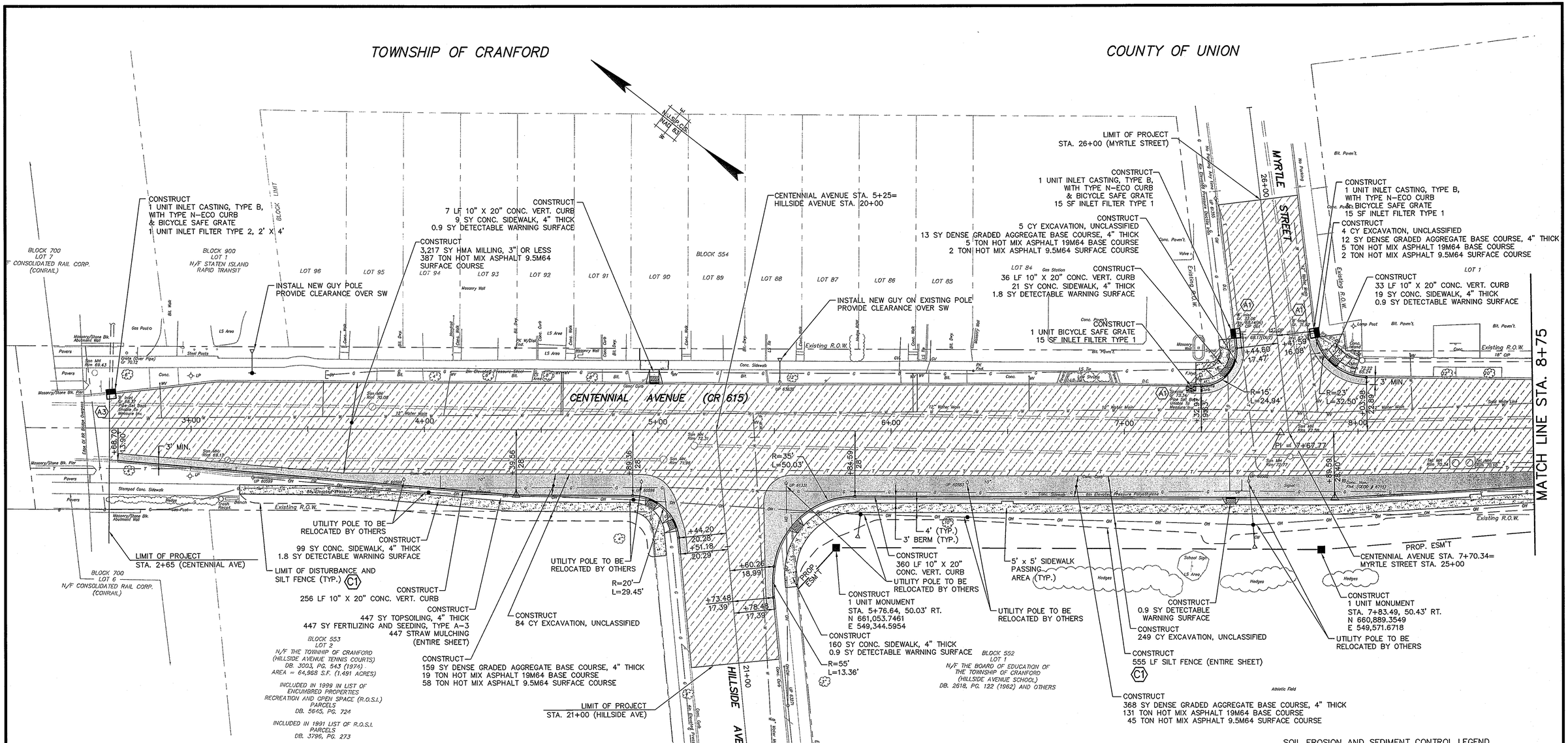

TO BE CONSTRUCTED

ITEM No.	DESCRIPTION	EST. QTY.	UNIT
2	MONUMENT	2	UNIT
3	INLET FILTER TYPE 1	45	SF
4	INLET FILTER TYPE 2, 2'X4'	1	UNIT
5	SILT FENCE	555	LF
14	EXCAVATION, UNCLASSIFIED	342	CY
15	DENSE GRADED AGGREGATE BASE COURSE 4" THICK	552	SY
16	HMA MILLING, 3" OR LESS	3,217	SY
18	HOT MIX ASPHALT 19M64 BASE COURSE	198	TON
19	HOT MIX ASPHALT 9.5M64 SURFACE COURSE	456	TON
21	INLET CASTING, TYPE B, WITH TYPE N-ECO CURB & BICYCLE SAFE GRATE	3	UNIT
22	BICYCLE SAFE GRATE	1	UNIT
26	CONCRETE SIDEWALK, 4" THICK	308	SY
29	DETECTABLE WARNING SURFACE	7.2	SY
30	10" x 20" CONCRETE VERTICAL CURB	692	LF
83	TOPSOILING, 4" THICK	447	SY
84	FERTILIZING & SEEDING, TYPE A-3	447	SY
85	STRAW MULCHING	447	SY

UTILITY NOTES:

1. PSE&G AND VERIZON CO-OWN THE UTILITY POLES ON CENTENNIAL AVENUE.
2. PSE&G, VERIZON AND CABLEVISION TO COORDINATE RELOCATION SCHEDULES.
3. NEW POLE LOCATIONS MUST BE AT LEAST 18" FROM THE FACE OF THE CURB TO THE FACE OF THE UTILITY POLE AND MUST MAINTAIN A MINIMUM 3 FT. SIDEWALK CLEARANCE TO MEET ADA REQUIREMENTS.
4. THE COUNTY DOES NOT PROVIDE EASEMENTS FOR GUY WIRES OR AERIAL FACILITIES WHICH WILL ENCROACH UPON PRIVATE PROPERTY. EACH UTILITY COMPANY IS RESPONSIBILE TO ACQUIRE EASEMENTS AS NECESSARY.
5. ALL UTILITY COMPANIES ARE RESPONSIBLE TO RESET THEIR UTILITY MANHOLES AND VALVE BOXES.

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

SOIL EROSION AND SEDIMENT CONTROL LEGEND

A1 INLET FILTER, CURB TYPE INLET FRAME

A3 INLET FILTER, CURB AND FLAT TYPE INLET FRAME AT LOW POINTS

C1 SILT FENCE

REFER TO SHEETS SE-1 AND SE-2 FOR DETAILS.

NOTE: NO STAGING OR STOCKPILING WILL BE ALLOWED ON SITE.

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

CONSTRUCTION PLAN
STA. 2+65 TO STA. 8+75

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
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EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497
4/8/13 DATE

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK

PROJECT NO. UNCO-00390 | CADD FILE UNCO390-CP | FIELD BK. # UNCO-XX

DRAWING CP-1

SHEET 5 OF 31

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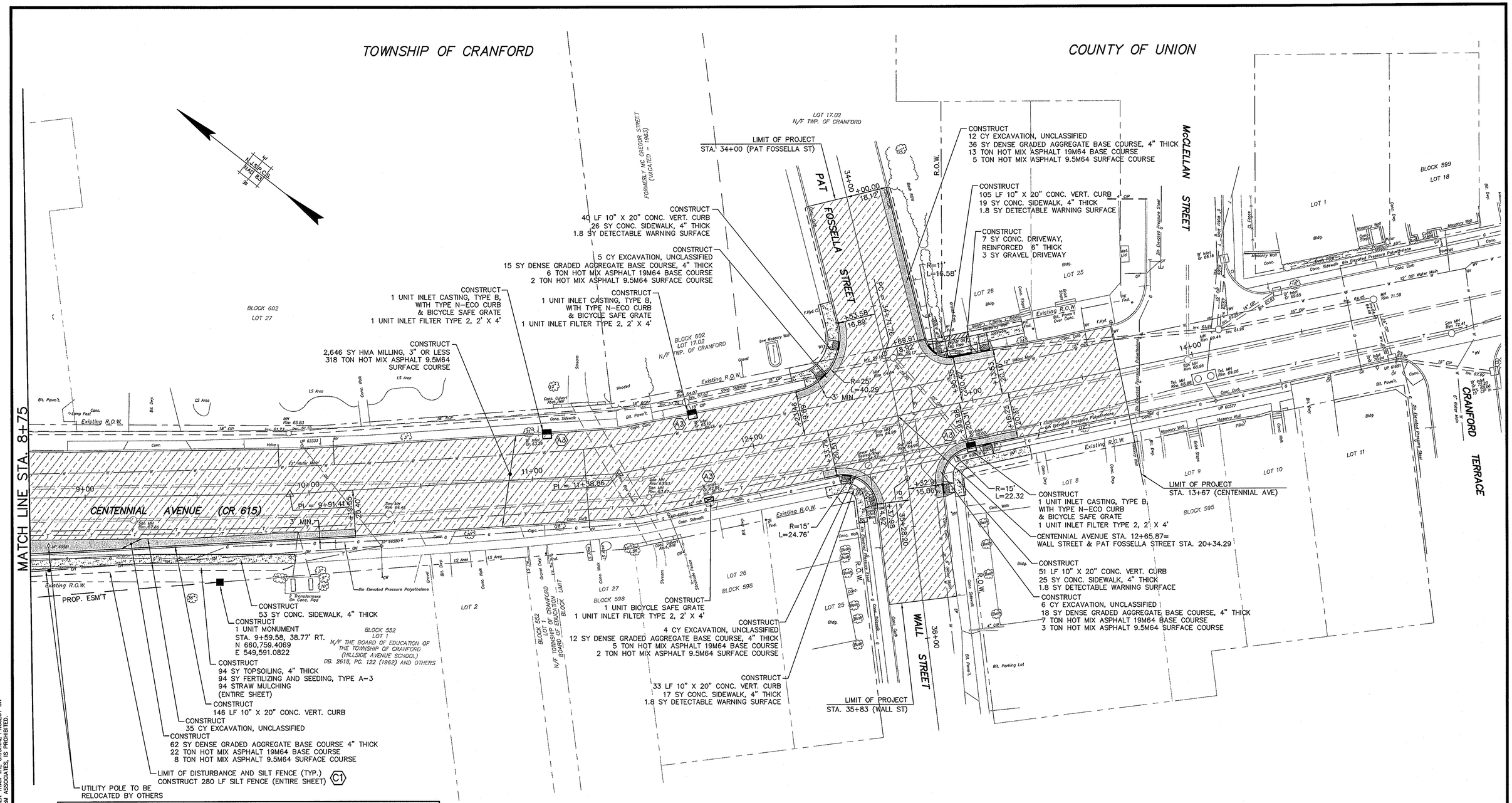
FILE NAME: H:\UNCO\00390\Plans\UNC0390-CP.dwg
PLOT DATE: Apr 05, 2013 - 9:21am



TO BE CONSTRUCTED

ITEM No.	DESCRIPTION	EST. QTY.	UNIT
2	MONUMENT	1	UNIT
4	INLET FILTER TYPE 2, 2'X4'	4	UNIT
5	SILT FENCE	280	LF
14	EXCAVATION, UNCLASSIFIED	62	CY
15	DENSE GRADED AGGREGATE BASE COURSE 4" THICK	143	SY
16	HMA MILLING, 3" OR LESS	2,646	SY
18	HOT MIX ASPHALT 19M64 BASE COURSE	53	TON
19	HOT MIX ASPHALT 9.5M64 SURFACE COURSE	338	TON
21	INLET CASTING, TYPE B, WITH TYPE N-ECO CURB & BICYCLE SAFE GRATE	3	UNIT
22	BICYCLE SAFE GRATE	1	UNIT
26	CONCRETE SIDEWALK, 4" THICK	140	SY
27	CONCRETE DRIVEWAY, REINFORCED, 6" THICK	7	SY
28	GRAVEL DRIVEWAY	3	SY
29	DETECTABLE WARNING SURFACE	7.2	SY
30	10" x 20" CONCRETE VERTICAL CURB	375	LF
83	TOPSOILING, 4" THICK	94	SY
84	FERTILIZING & SEEDING, TYPE A-3	94	SY
85	STRAW MULCHING	94	SY

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

CONSTRUCTION PLAN STA. 8+75 TO STA. 13+67

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
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EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
Edward R. Klump 4/8/13 DATE
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK

PROJECT NO. UNCO-00390 | CADD FILE UNCO390-CP | FIELD BK. # UNCO-XX

DRAWING CP-2

SHEET 6 OF 31

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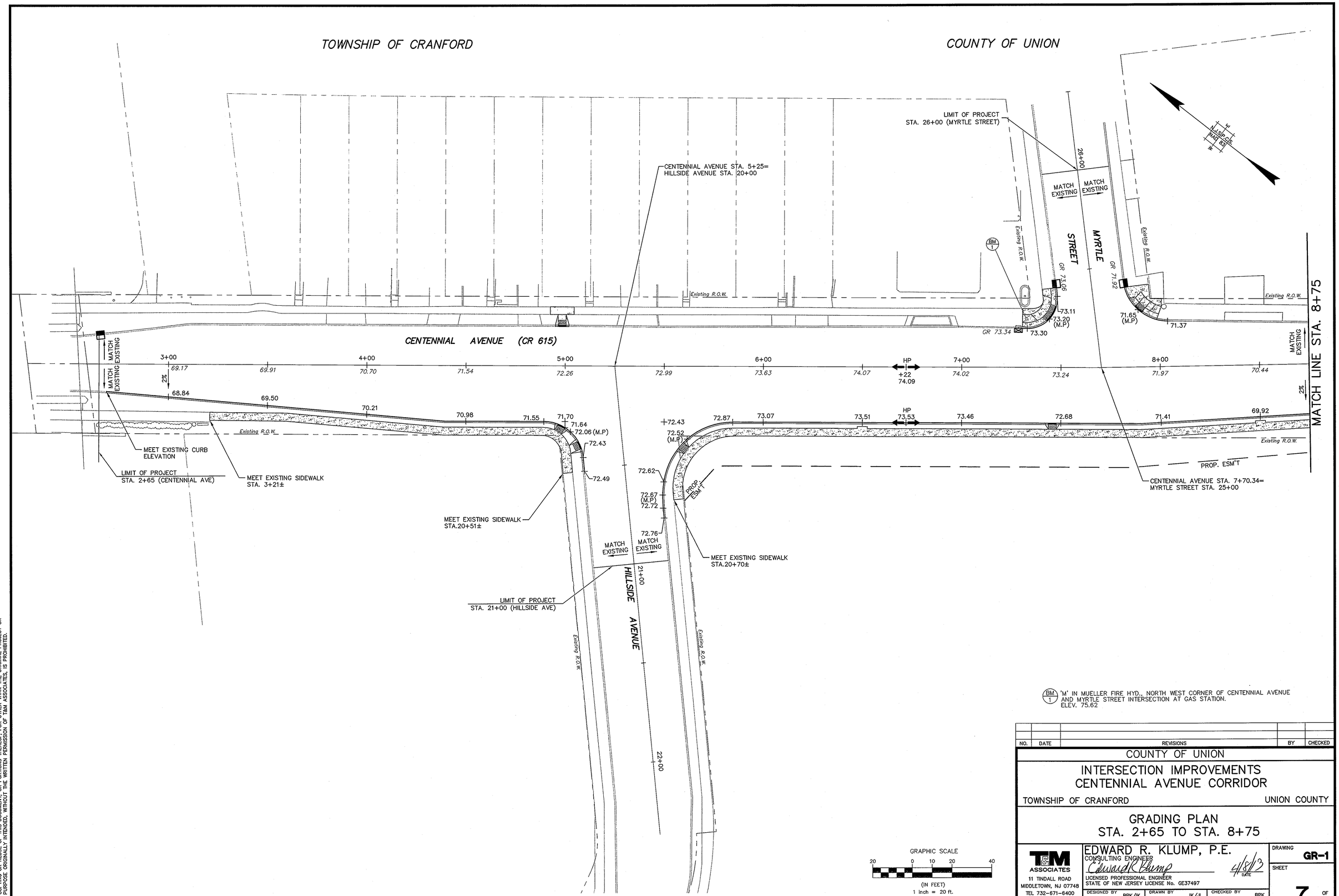

BM 1 'M' IN MUELLER FIRE HYD., NORTH WEST CORNER OF CENTENNIAL AVENUE AND MYRTLE STREET INTERSECTION AT GAS STATION. ELEV. 75.62

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

GRADING PLAN
STA. 2+65 TO STA. 8+75

T&M ASSOCIATES
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MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365

EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
Edward R Klump 4/8/13
DATE
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497

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PROJECT NO. UNCO-00390	CADD FILE UN390-GR	FIELD BK. # UNCO-XX

DRAWING GR-1
SHEET 7 OF 31

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TOWNSHIP OF CRANFORD

COUNTY OF UNION

MATCH LINE STA. 8+75

CENTENNIAL AVENUE (CR 615)

PAT FOSSELLA STREET

WALL STREET

McCLELLAN STREET

CRANFORD TERRACE

LIMIT OF PROJECT
STA. 34+00 (PAT FOSSELLA ST)

LIMIT OF PROJECT
STA. 35+83 (WALL ST)

LIMIT OF PROJECT
STA. 13+67 (CENTENNIAL AVE)

MEET EXISTING SIDEWALK
STA. 34+44±

CENTENNIAL AVENUE STA. 12+65.87=
WALL STREET & PAT FOSSELLA
STREET STA. 20+34.29

MEET EXISTING SIDEWALK
STA. 12+23±

SEE GRADING DETAIL BELOW

MEET EXISTING SIDEWALK
STA. 13+29±

MEET EXISTING SIDEWALK
STA. 13+21±

MEET EXISTING SIDEWALK
STA. 35+39±

MEET EXISTING SIDEWALK
STA. 12+28±

MEET EXISTING SIDEWALK
STA. 35+45±

MEET EXISTING CURB
ELEVATION

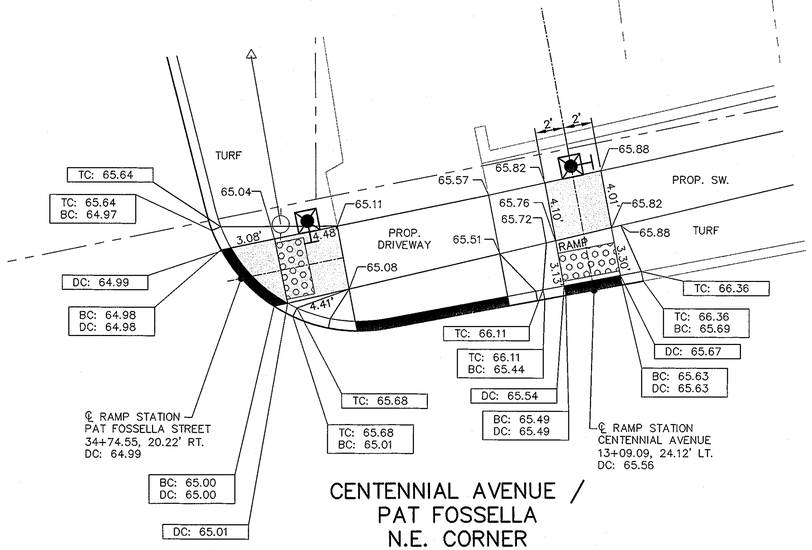
MEET EXISTING SIDEWALK
STA. 9+92±

PROP. ESM'T

Existing R.O.W.

MATCH EXISTING

BM 2 — TOP OPERATING NUT, FIRE HYD. NORTH WEST CORNER OF CENTENNIAL AVENUE AND MC CLELLAN STREET INTERSECTION. ELEV. 70.62



CENTENNIAL AVENUE /
PAT FOSSELLA
N.E. CORNER
SCALE: 1"=5'-0"

LEGEND:

- LANDING
- DETECTABLE WARNING SURFACE
- APS
- DEPRESSED CURB

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

GRADING PLAN
STA. 8+75 TO STA. 13+67

T&M ASSOCIATES
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FAX 732-671-7365

EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
4/8/13 DATE
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK
PROJECT NO. UNCO-00390	CADD FILE UN390-GR	FIELD BK. # UNCO-XX

DRAWING GR-2
SHEET 8 OF 31

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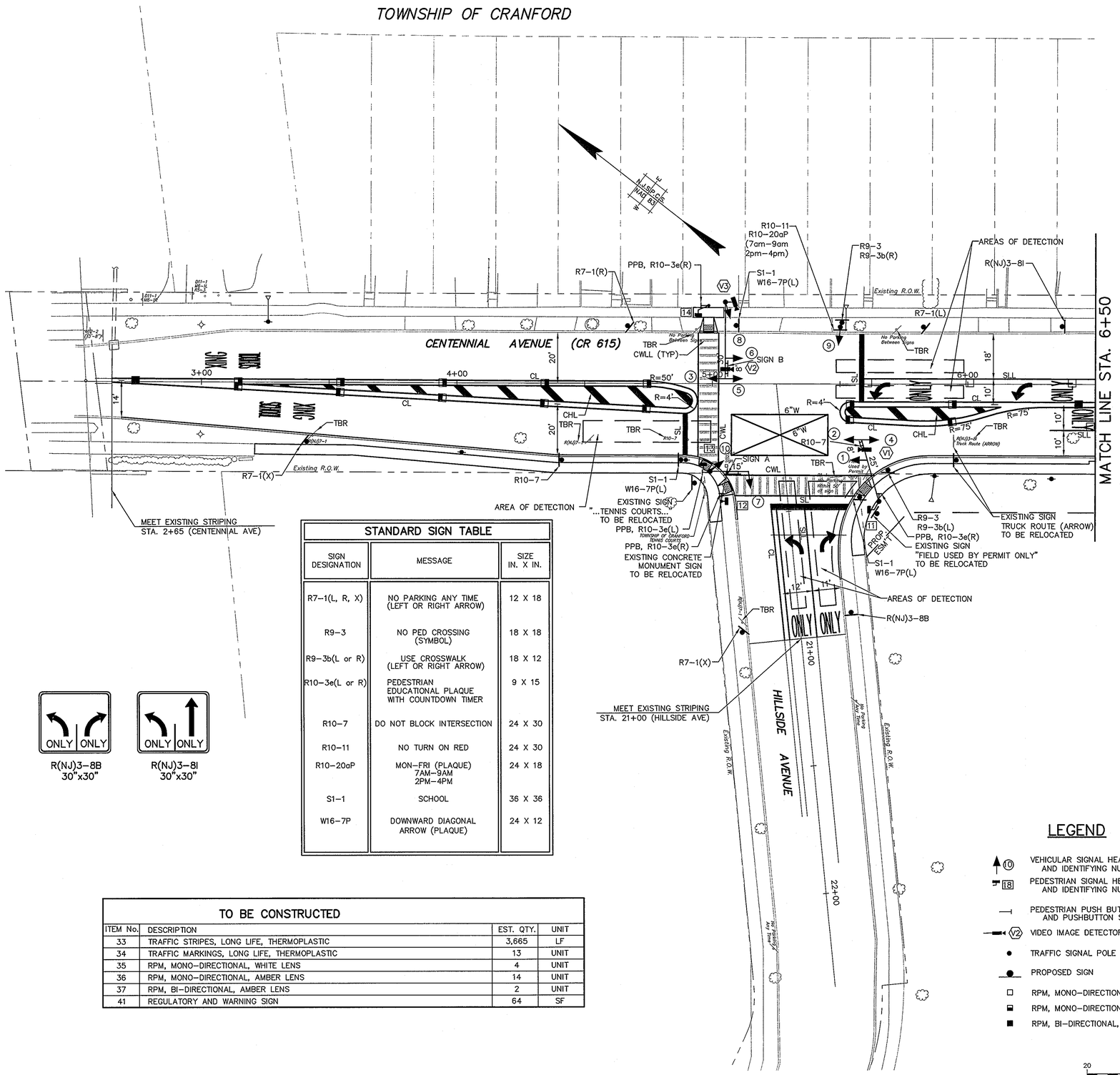


STANDARD SIGN TABLE

SIGN DESIGNATION	MESSAGE	SIZE IN. X IN.
R7-1(L, R, X)	NO PARKING ANY TIME (LEFT OR RIGHT ARROW)	12 X 18
R9-3	NO PED CROSSING (SYMBOL)	18 X 18
R9-3b(L or R)	USE CROSSWALK (LEFT OR RIGHT ARROW)	18 X 12
R10-3e(L or R)	PEDESTRIAN EDUCATIONAL PLAQUE WITH COUNTDOWN TIMER	9 X 15
R10-7	DO NOT BLOCK INTERSECTION	24 X 30
R10-11	NO TURN ON RED	24 X 30
R10-20aP	MON-FRI (PLAQUE) 7AM-9AM 2PM-4PM	24 X 18
S1-1	SCHOOL	36 X 36
W16-7P	DOWNWARD DIAGONAL ARROW (PLAQUE)	24 X 12

R(NJ)3-8B
30"x30"

R(NJ)3-8I
30"x30"

TO BE CONSTRUCTED

ITEM No.	DESCRIPTION	EST. QTY.	UNIT
33	TRAFFIC STRIPES, LONG LIFE, THERMOPLASTIC	3,665	LF
34	TRAFFIC MARKINGS, LONG LIFE, THERMOPLASTIC	13	UNIT
35	RPM, MONO-DIRECTIONAL, WHITE LENS	4	UNIT
36	RPM, MONO-DIRECTIONAL, AMBER LENS	14	UNIT
37	RPM, BI-DIRECTIONAL, AMBER LENS	2	UNIT
41	REGULATORY AND WARNING SIGN	64	SF

LEGEND

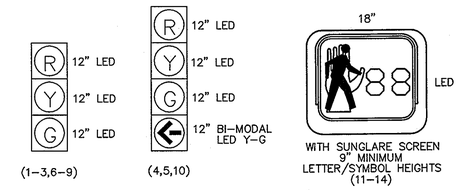
- VEHICULAR SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN PUSH BUTTON AND PUSHBUTTON SIGN
- VIDEO IMAGE DETECTOR
- TRAFFIC SIGNAL POLE
- PROPOSED SIGN
- RPM, MONO-DIRECTIONAL, WHITE LENS
- RPM, MONO-DIRECTIONAL, AMBER LENS
- RPM, BI-DIRECTIONAL, AMBER LENS

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

SIGNAL LEGEND



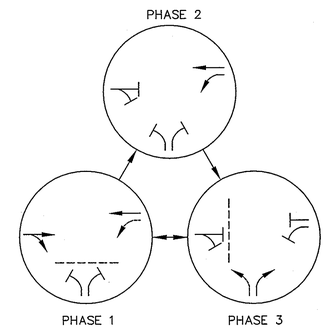
OVERHEAD STREET NAME SIGNS

SIGN A (DUAL FACE)
84" X 18"

SIGN B (DUAL FACE)
54" X 18"

1. ALL STREET NAME SIGNS SHALL HAVE WHITE LEGEND ON GREEN BACKGROUND, EXCEPT COUNTY ROUTE MARKER, WHICH SHALL HAVE YELLOW LEGEND ON BLUE BACKGROUND.
2. STREET NAME LETTERING TO BE 9" B, AND "St/Ave" 6" B.

PHASING DIAGRAM



NOTES

1. TRAFFIC SIGNAL HEADS 1 – 7 TO BE MOUNTED AT A MIN. HEIGHT OF 15'-6".
   TRAFFIC SIGNAL HEADS 8 – 10 TO BE MOUNTED AT A MIN. HEIGHT OF 12'-0".
2. PEDESTRIAN SIGNAL HEADS 11–14 TO BE MOUNTED AT 8 FT.
3. SIGNAL HEADS 4, 5 AND 6 SHALL BE OPTICALLY PROGRAMMED TO RESTRICT VISIBILITY AT THE NORTHOUND STOP BAR AT THE MYRTLE STREET INTERSECTION.
4. UNLESS OTHERWISE INDICATED, PAVEMENT MARKINGS SHALL CONFORM TO THE FOLLOWING:

   (CL) CENTER LINE – 4 INCH WIDE DOUBLE SOLID YELLOW LINES SPACED 6" APART.
   (CHL) CROSS HATCH LINES – 24 INCH WIDE SOLID WHITE LINE, SPACED 12 FEET APART AT 45 DEGREES.
   (CWL) CROSS WALK LINES – 8 INCH WIDE SOLID WHITE LINE, SPACED 8 FEET APART.
   (CWLL) CROSS WALK LONGITUDINAL LINES – 12 INCH WIDE SOLID WHITE LINE, SPACED 3 FEET O.C (TYP.)
   (SL) STOP LINES – 24 INCH SOLID WHITE LINE.
   (SLL) SOLID LANE LINE – 8 INCH WIDE WHITE LINE.
5. EXISTING STRIPING THAT DOES NOT CONFORM TO THIS PLAN SHALL BE REMOVED BY APPROVED METHOD.

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

TRAFFIC SIGNAL, STRIPING AND SIGNING PLANS CENTENNIAL AVENUE & HILLSIDE AVENUE

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
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FAX 732-671-7365

EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497
DATE 4/8/13

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK

PROJECT NO.	CADD FILE	FIELD BK. #
UNCO-00390	UNCO390-TSS	UNCO-XX

DRAWING TSS-1

SHEET 9 OF 31

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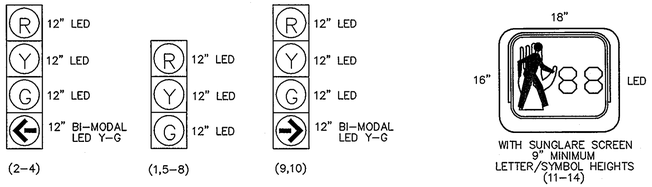
PLOT DATE: Apr 05, 2013 – 9:21am

TOWNSHIP OF CRANFORD

COUNTY OF UNION

SIGNAL LEGEND



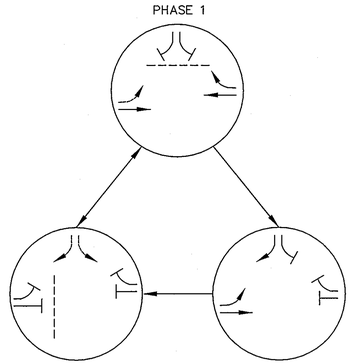
OVERHEAD STREET NAME SIGNS

SIGN A (DUAL FACE) 84" X 18"

SIGN C (DUAL FACE) 48" X 18"

1. ALL STREET NAME SIGNS SHALL HAVE WHITE LEGEND ON GREEN BACKGROUND, EXCEPT COUNTY ROUTE MARKER, WHICH SHALL HAVE YELLOW LEGEND ON BLUE BACKGROUND.
2. STREET NAME LETTERING TO BE 9" B, AND "St/Ave" 6" B.

PHASING DIAGRAM



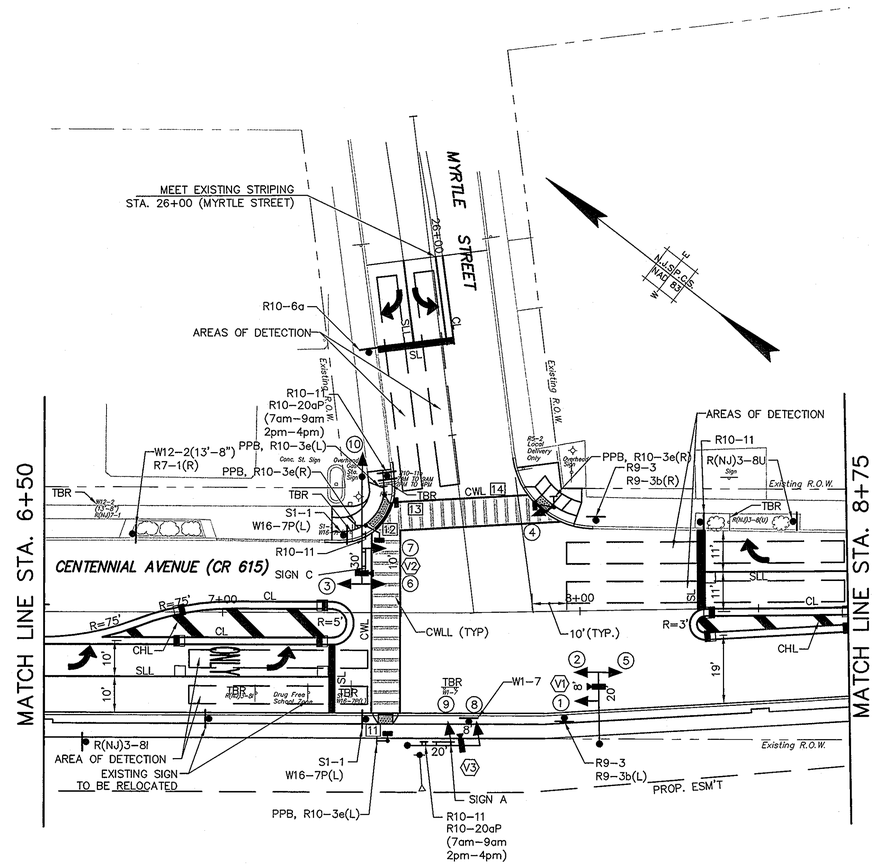
NOTES

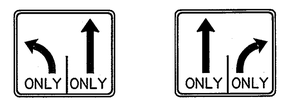
1. TRAFFIC SIGNAL HEADS 1 – 3 AND 5 – 9 TO BE MOUNTED AT A MIN. HEIGHT OF 15'–6". TRAFFIC SIGNAL HEADS 4 AND 10 TO BE MOUNTED AT A MIN. HEIGHT OF 12'–0".
2. PEDESTRIAN SIGNAL HEADS 11–14 TO BE MOUNTED AT 8 FT.
3. SIGNAL HEADS 1, 2 AND 3 SHALL BE OPTICALLY PROGRAMMED TO RESTRICT VISIBILITY AT THE SOUTHBOUND STOP BAR AT THE HILLSIDE AVENUE INTERSECTION.
4. UNLESS OTHERWISE INDICATED, PAVEMENT MARKINGS SHALL CONFORM TO THE FOLLOWING:

   (CL) CENTER LINE – 4 INCH WIDE DOUBLE SOLID YELLOW LINES SPACED 6" APART.
   (CHL) CROSS HATCH LINES – 24 INCH WIDE SOLID WHITE LINE, SPACED 12 FEET APART AT 45 DEGREES.
   (CWL) CROSS WALK LINES – 8 INCH WIDE SOLID WHITE LINE, SPACED 8 FEET APART.
   (CWLL) CROSS WALK LONGITUDINAL LINES – 12 INCH WIDE SOLID WHITE LINE, SPACED 3 FEET O.C (TYP.)
   (SL) STOP LINES – 24 INCH SOLID WHITE LINE.
   (SLL) SOLID LANE LINE – 8 INCH WIDE WHITE LINE.
5. EXISTING STRIPING THAT DOES NOT CONFORM TO THIS PLAN SHALL BE REMOVED BY APPROVED METHOD.

TO BE CONSTRUCTED

ITEM No.	DESCRIPTION	EST. QTY.	UNIT
33	TRAFFIC STRIPES, LONG LIFE, THERMOPLASTIC	2,671	LF
34	TRAFFIC MARKINGS, LONG LIFE, THERMOPLASTIC	6	UNIT
35	RPM, MONO-DIRECTIONAL, WHITE LENS	3	UNIT
36	RPM, MONO-DIRECTIONAL, AMBER LENS	8	UNIT
41	REGULATORY AND WARNING SIGN	80	SF





R(NJ)3-8I 30"x30"

R(NJ)3-8U 30"x30"

LEGEND

- VEHICULAR SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN PUSH BUTTON AND PUSHBUTTON SIGN
- VIDEO IMAGE DETECTOR
- TRAFFIC SIGNAL POLE
- PROPOSED SIGN
- RPM, MONO-DIRECTIONAL, WHITE LENS
- RPM, MONO-DIRECTIONAL, AMBER LENS
- RPM, BI-DIRECTIONAL, AMBER LENS

STANDARD SIGN TABLE

SIGN DESIGNATION	MESSAGE	SIZE IN. X IN.
R7-1(L, R, X)	NO PARKING ANY TIME (LEFT OR RIGHT ARROW)	12 X 18
R9-3	NO PED CROSSING (SYMBOL)	18 X 18
R9-3b(L or R)	USE CROSSWALK (LEFT OR RIGHT ARROW)	18 X 12
R10-3e(L or R)	PEDESTRIAN EDUCATIONAL PLAQUE WITH COUNTDOWN TIMER	9 X 15
R10-6a	STOP HERE ON RED	24 X 30
R10-11	NO TURN ON RED	24 X 30
R10-20aP	MON-FRI (PLAQUE) 7AM-9AM 2PM-4PM	24 X 18
S1-1	SCHOOL	36 X 36
W1-7	TWO-DIRECTION LARGE ARROW	48 X 24
W12-2	LOW CLEARANCE (13'-8")	36 X 36
W16-7P	DOWNWARD DIAGONAL ARROW (PLAQUE)	24 X 12

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

TRAFFIC SIGNAL, STRIPING AND SIGNING PLANS
CENTENNIAL AVENUE & MYRTLE STREET

T&M ASSOCIATES
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MIDDLETOWN, NJ 07748
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CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497
4/8/13 DATE

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK
PROJECT NO. UNCO-00390	CADD FILE UNC0390-TSS	FIELD BK. # UNCO-XX

DRAWING TSS-2

SHEET 10 OF 31

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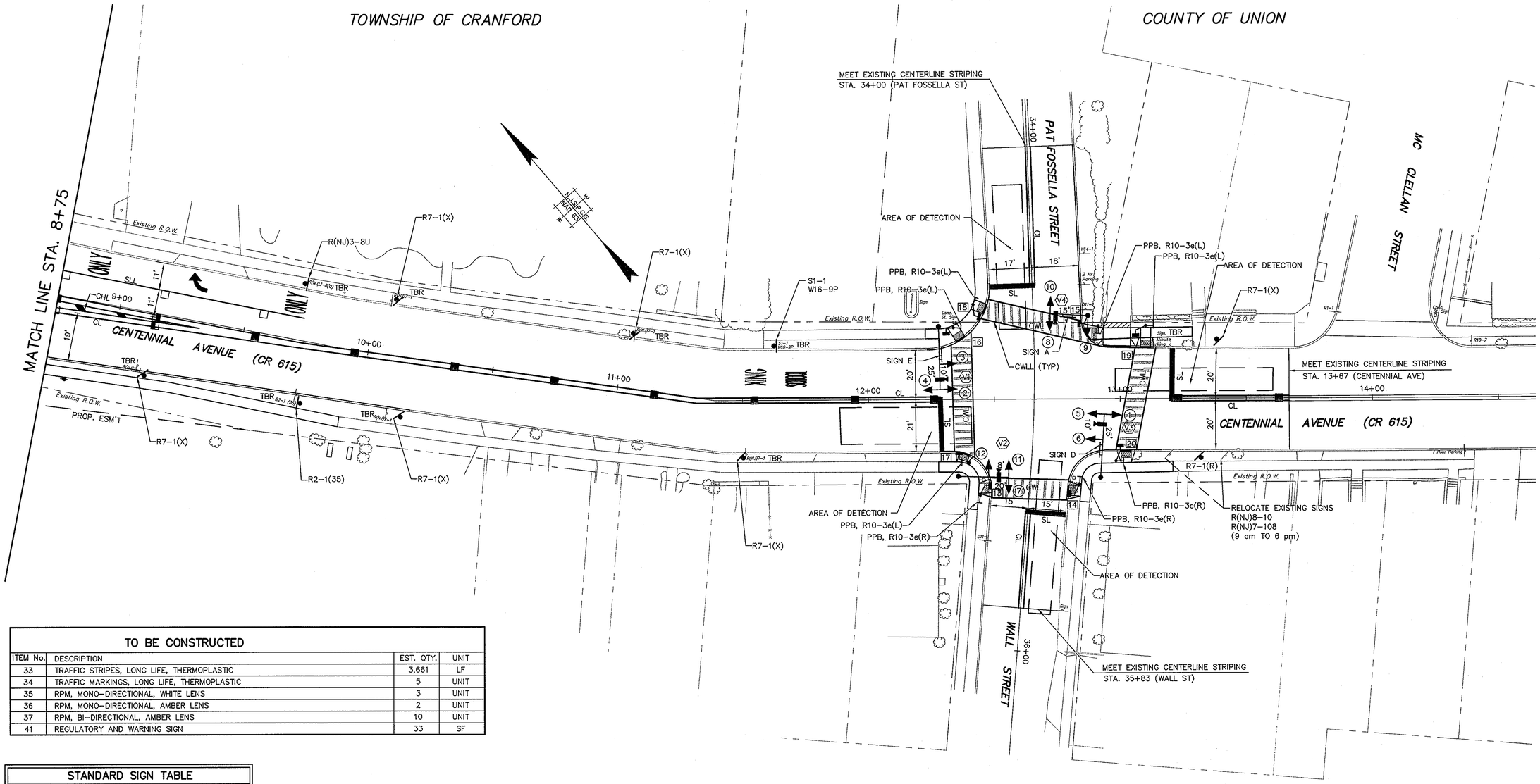


TO BE CONSTRUCTED

ITEM No.	DESCRIPTION	EST. QTY.	UNIT
33	TRAFFIC STRIPES, LONG LIFE, THERMOPLASTIC	3,661	LF
34	TRAFFIC MARKINGS, LONG LIFE, THERMOPLASTIC	5	UNIT
35	RPM, MONO-DIRECTIONAL, WHITE LENS	3	UNIT
36	RPM, MONO-DIRECTIONAL, AMBER LENS	2	UNIT
37	RPM, BI-DIRECTIONAL, AMBER LENS	10	UNIT
41	REGULATORY AND WARNING SIGN	33	SF

STANDARD SIGN TABLE

SIGN DESIGNATION	MESSAGE	SIZE IN. X IN.
R2-1 (35)	SPEED LIMIT (35)	24 X 30
R7-1(L, R, X)	NO PARKING ANY TIME (LEFT OR RIGHT ARROW)	12 X 18
R10-3e(L or R)	PEDESTRIAN EDUCATIONAL PLAQUE WITH COUNTDOWN TIMER	9 X 15
S1-1	SCHOOL	36 X 36
W16-9P	AHEAD (PLAQUE)	24 X 12

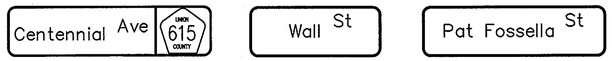
R(NJ)3-8U
30"x30"

NOTES

1. TRAFFIC SIGNAL HEADS 1 – 8 AND 10 –12 TO BE MOUNTED AT A MIN. HEIGHT OF 15'-6". TRAFFIC SIGNAL HEAD 9 TO BE MOUNTED AT A MIN. HEIGHT OF 12'-0".
2. PEDESTRIAN SIGNAL HEADS 13–20 TO BE MOUNTED AT 8 FT.
3. UNLESS OTHERWISE INDICATED, PAVEMENT MARKINGS SHALL CONFORM TO THE FOLLOWING:

   (CL) CENTER LINE – 4 INCH WIDE DOUBLE SOLID YELLOW LINES SPACED 6" APART.
   (CHL) CROSS HATCH LINES – 24 INCH WIDE SOLID WHITE LINE, SPACED 12 FEET APART AT 45 DEGREES.
   (CWL) CROSS WALK LINES – 8 INCH WIDE SOLID WHITE LINE, SPACED 8 FEET APART.
   (CWLL) CROSS WALK LONGITUDINAL LINES – 12 INCH WIDE SOLID WHITE LINE, SPACED 3 FEET O.C (TYP.)
   (SL) STOP LINES – 24 INCH SOLID WHITE LINE.
   (SLL) SOLID LANE LINE – 8 INCH WIDE WHITE LINE.
4. EXISTING STRIPING THAT DOES NOT CONFORM TO THIS PLAN SHALL BE REMOVED BY APPROVED METHOD.

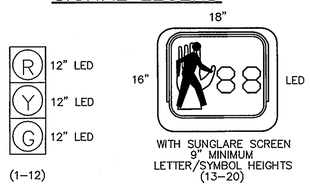
OVERHEAD STREET NAME SIGNS



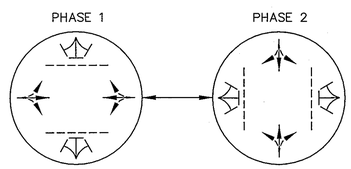
SIGN A (DUAL FACE) 84" X 18"
SIGN D (DUAL FACE) 48" X 18"
SIGN E (DUAL FACE) 66" X 18"

1. ALL STREET NAME SIGNS SHALL HAVE WHITE LEGEND ON GREEN BACKGROUND, EXCEPT COUNTY ROUTE MARKER, WHICH SHALL HAVE YELLOW LEGEND ON BLUE BACKGROUND.
2. STREET NAME LETTERING TO BE 9" B, AND "St/Ave" 6" B.

SIGNAL LEGEND



PHASING DIAGRAM



LEGEND

- VEHICULAR SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN PUSH BUTTON AND PUSHBUTTON SIGN
- VIDEO IMAGE DETECTOR
- TRAFFIC SIGNAL POLE
- PROPOSED SIGN
- RPM, MONO-DIRECTIONAL, WHITE LENS
- RPM, MONO-DIRECTIONAL, AMBER LENS
- RPM, BI-DIRECTIONAL, AMBER LENS

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

TRAFFIC SIGNAL, STRIPING AND SIGNING PLANS CENTENNIAL AVENUE & WALL STREET– PAT FOSSELLA STREET

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365

EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497
4/8/13 DATE

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK

PROJECT NO.	CADD FILE	FIELD BK. #
UNCO-00390	UNCO390-TSS	UNCO-XX

DRAWING TSS-3

SHEET 11 OF 31

FILE NAME: H:\UNCO\00390\Plans\UNCO390-TSS.dwg
PLOT DATE: Apr 05, 2013 - 9:21am

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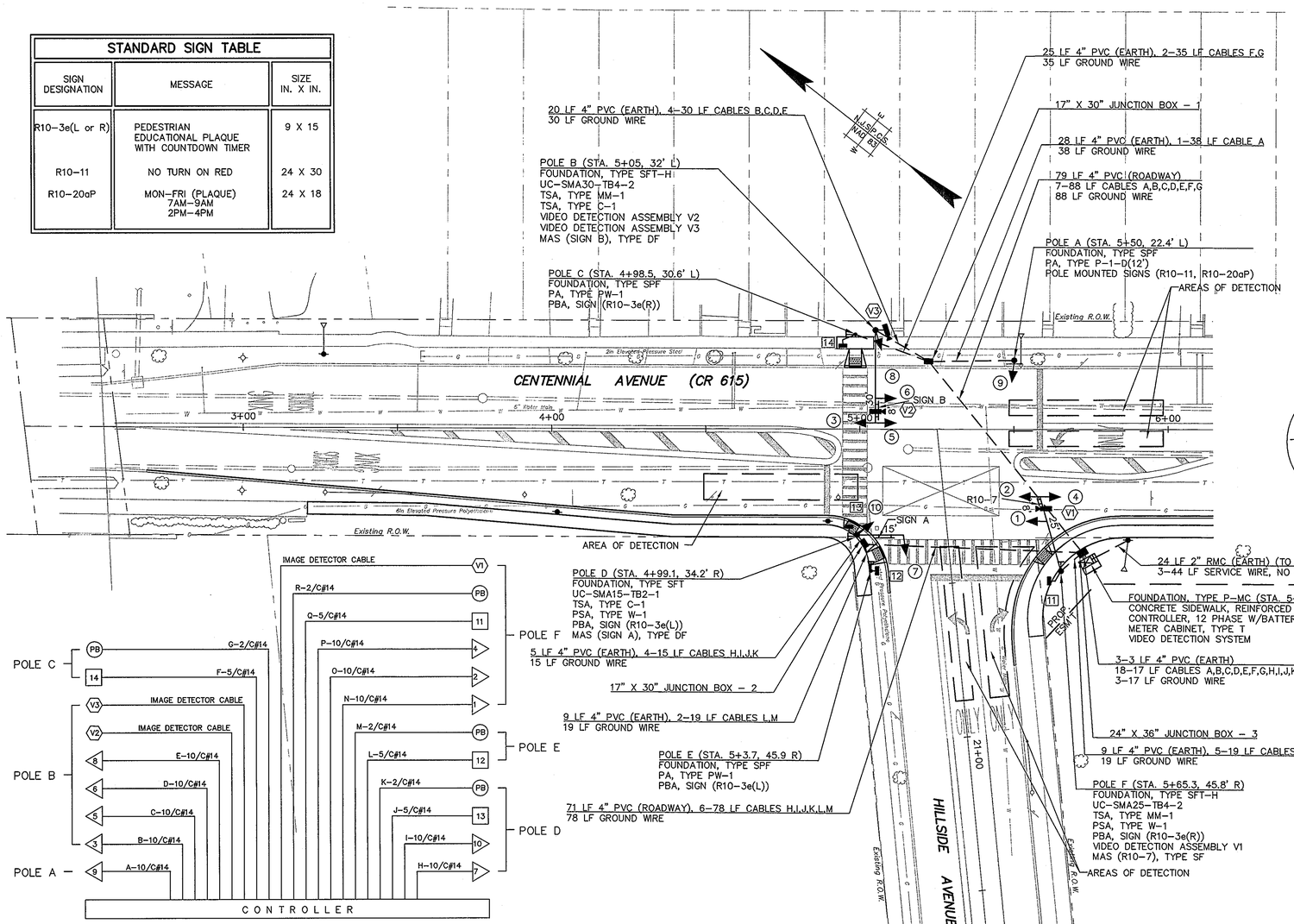
TOWNSHIP OF CRANFORD

COUNTY OF UNION

STANDARD SIGN TABLE

SIGN DESIGNATION	MESSAGE	SIZE IN. X IN.
R10-3e(L or R)	PEDESTRIAN EDUCATIONAL PLAQUE WITH COUNTDOWN TIMER	9 X 15
R10-11	NO TURN ON RED	24 X 30
R10-20aP	MON-FRI (PLAQUE) 7AM-9AM 2PM-4PM	24 X 18

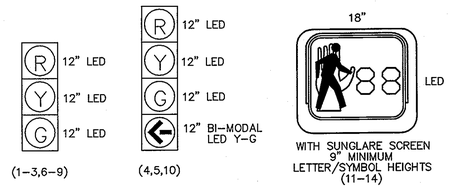


BLOCK WIRING DIAGRAM

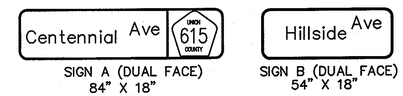
NOTES:

1. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", CURRENT EDITION.
2. TREE BRANCHES SHALL BE TRIMMED AS NECESSARY AT THE DIRECTION OF THE ENGINEER.
3. ALL TRAFFIC SIGNAL INDICATIONS AND PEDESTRIAN SIGNALS SHALL BE LED.
4. FOUNDATION LAYOUT SHALL BE APPROVED IN THE FIELD BY THE ENGINEER PRIOR TO INSTALLATION.
5. ALL ALUMINUM ALLOY SIGNAL STANDARDS SHALL BE A MINIMUM OF 32 INCHES FROM FACE OF CURB TO CENTER OF STANDARD. ONE FACE OF THE BASE SHALL BE SET PARALLEL TO CURB FACE.
6. TRAFFIC SIGNAL HEADS 1 - 7 TO BE MOUNTED AT A MIN. HEIGHT OF 15'-6". TRAFFIC SIGNAL HEADS 8 -10 TO BE MOUNTED AT A MIN. HEIGHT OF 12'-0". PEDESTRIAN SIGNAL HEADS 11-14 TO BE MOUNTED AT 8 FT.
7. SIGNAL HEADS 4, 5 AND 6 SHALL BE OPTICALLY PROGRAMMED TO RESTRICT VISIBILITY AT THE NORTHBOUND STOP BAR AT THE MYRTLE STREET INTERSECTION.
8. ALL SIGNAL FACES SHALL BE EQUIPPED WITH BACKPLATES.
9. WIRE CODING TO CONFORM WITH CURRENT STANDARDS IN USE BY THE COUNTY OF UNION.
10. #8 AWG, INSULATED (COLORED GREEN) GROUND WIRE SHALL BE INSTALLED CONTINUOUS THROUGHOUT THE TRAFFIC SIGNAL SYSTEM AND SECURED TO ALL GROUND RODS, CABINETS, AND TRAFFIC SIGNAL BASES.
11. CONTRACTOR SHALL COORDINATE AND OBTAIN ELECTRICAL SERVICE FOR THE INTERSECTION.
12. CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF SIGNAL DEVICES AND SIGNS. TEST PITS SHALL BE REQUIRED AT LOCATIONS OF SIGNAL POLE FOUNDATIONS AS DIRECTED BY THE ENGINEER PRIOR TO CONSTRUCTION OF CURB RAMPS, SIDEWALK, AND FOUNDATIONS.
13. THE PRIORITY CONTROL SYSTEM SHALL PROVIDE PREEMPTION DEVICES CAPABLE OF DETECTION ALONG ALL APPROACHES TO THE INTERSECTION.
14. MOUNTING LOCATIONS FOR THE IMAGE DETECTORS AND PREEMPTION DEVICES SHALL BE DETERMINED BY THE MANUFACTURER'S REPRESENTATIVE TO ASSURE PROPER OPERATION.

SIGNAL LEGEND

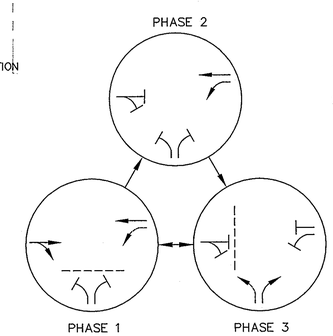


MAST ARM SIGNS



1. ALL STREET NAME SIGNS SHALL HAVE WHITE LEGEND ON GREEN BACKGROUND, EXCEPT COUNTY ROUTE MARKER, WHICH SHALL HAVE YELLOW LEGEND ON BLUE BACKGROUND.
2. STREET NAME LETTERING TO BE 9" B, AND "St/Ave" 6" B.

PHASING DIAGRAM



TO BE CONSTRUCTED

ITEM No.	DESCRIPTION	EST. QTY.	UNIT
42	POLE MOUNTED SIGN	8	SF
43	MAST ARM SIGN, TYPE SF	5	SF
44	MAST ARM SIGN, TYPE DF	17	SF
47	2" RIGID METALLIC CONDUIT, EARTH	24	L.F.
48	4" SCHEDULE 80 PVC, EARTH	99	L.F.
49	4" SCHEDULE 80 PVC, ROADWAY	150	L.F.
52	17" X 30" JUNCTION BOX	2	UNIT
53	24" X 36" JUNCTION BOX	1	UNIT
54	FOUNDATION, TYPE SFT	1	UNIT
55	FOUNDATION, TYPE SFT-H	2	UNIT
56	FOUNDATION, TYPE P-MC	1	UNIT
57	FOUNDATION, TYPE SPF	3	UNIT
58	METER CABINET, TYPE T	1	UNIT
59	SERVICE WIRE, NO. 6 AWG	132	L.F.
60	GROUND WIRE, NO. 8 AWG	371	L.F.
61	CONTROLLER ASSEMBLY, 12 PHASE WITH BATTERY BACKUP SYSTEM	1	UNIT
63	UC-SMA15-TB2-1 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	1	UNIT
67	UC-SMA25-TB4-2 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	1	UNIT
68	UC-SMA30-TB4-2 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	1	UNIT
69	TRAFFIC SIGNAL ASSEMBLIES, TYPE C-1	2	UNIT
70	TRAFFIC SIGNAL ASSEMBLIES, TYPE MM-1	2	UNIT
71	PEDESTRIAN SIGNAL ASSEMBLY, TYPE W-1	2	UNIT
72	PEDESTAL ASSEMBLY, TYPE P-1-D(12')	1	UNIT
73	PEDESTAL ASSEMBLY, TYPE PW-1	2	UNIT
75	PEDESTRIAN PUSH BUTTON ASSEMBLY, R10-3e	4	UNIT
77	TRAFFIC SIGNAL CABLE, 2 CONDUCTOR	398	L.F.
78	TRAFFIC SIGNAL CABLE, 5 CONDUCTOR	398	L.F.
79	TRAFFIC SIGNAL CABLE, 10 CONDUCTOR	1,001	L.F.
80	VIDEO DETECTION SYSTEM W/MODEM	1	UNIT
81	PRIORITY CONTROL SYSTEM	1	UNIT

LEGEND

- VEHICULAR SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN PUSH BUTTON AND PUSHBUTTON SIGN
- VIDEO IMAGE DETECTOR
- TRAFFIC SIGNAL POLE

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

ELECTRICAL PLAN
CENTENNIAL AVENUE & HILLSIDE AVENUE

T&M ASSOCIATES
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STATE OF NEW JERSEY LICENSE No. GE37497

4/8/13
DATE

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK
PROJECT NO. UNCO-00390	CADD FILE UNCO390-TSS	FIELD BK. # UNCO-XX

DRAWING EL-1

SHEET 12 OF 31

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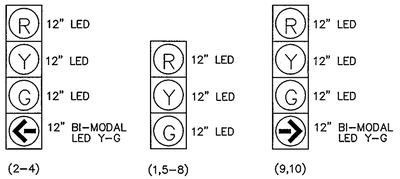
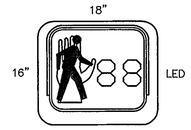
FILE NAME: H:\UNCO\00390\Plans\UNC0390-EL.dwg
PLOT DATE: Apr 05, 2013 - 9:21am

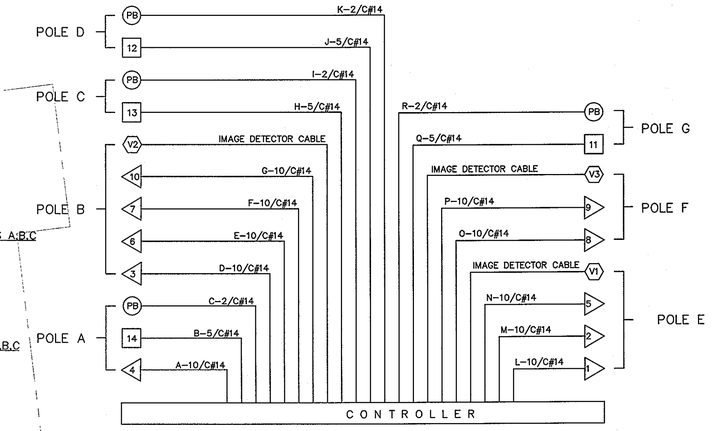
SIGNAL LEGEND



TOWNSHIP OF CRANFORD



COUNTY OF UNION



BLOCK WIRING DIAGRAM

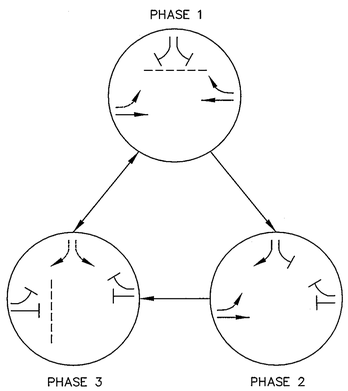
MAST ARM SIGNS

SIGN A (DUAL FACE)
84" X 18"

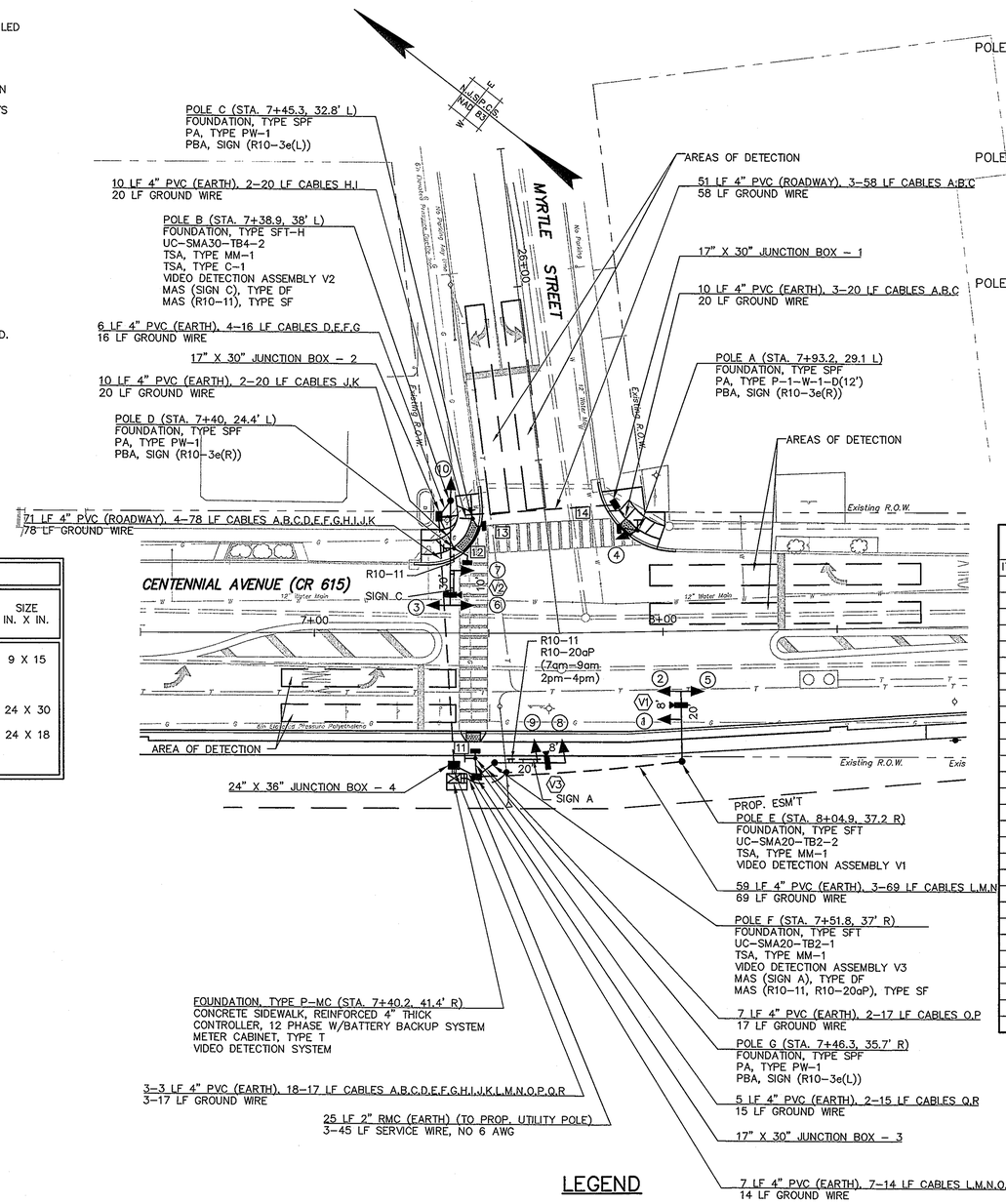
SIGN C (DUAL FACE)
48" X 18"

1. ALL STREET NAME SIGNS SHALL HAVE WHITE LEGEND ON GREEN BACKGROUND, EXCEPT COUNTY ROUTE MARKER, WHICH SHALL HAVE YELLOW LEGEND ON BLUE BACKGROUND.
2. STREET NAME LETTERING TO BE 9" B, AND "St/Ave" 6" B.

PHASING DIAGRAM



STANDARD SIGN TABLE		
SIGN DESIGNATION	MESSAGE	SIZE IN. X IN.
R10-3e(L or R)	PEDESTRIAN EDUCATIONAL PLAQUE WITH COUNTDOWN TIMER	9 X 15
R10-11	NO TURN ON RED	24 X 30
R10-20aP	MON-FRI (PLAQUE) 7AM-9AM 2PM-4PM	24 X 18



TO BE CONSTRUCTED

ITEM No.	DESCRIPTION	EST. QTY.	UNIT
43	MAST ARM SIGN, TYPE SF	12	SF
44	MAST ARM SIGN, TYPE DF	17	SF
47	2" RIGID METALLIC CONDUIT, EARTH	25	L.F.
48	4" SCHEDULE 80 PVC, EARTH	117	L.F.
49	4" SCHEDULE 80 PVC, ROADWAY	122	L.F.
52	17" X 30" JUNCTION BOX	3	UNIT
53	24" X 36" JUNCTION BOX	1	UNIT
54	FOUNDATION, TYPE SFT	2	UNIT
55	FOUNDATION, TYPE SFT-H	1	UNIT
56	FOUNDATION, TYPE P-MC	1	UNIT
57	FOUNDATION, TYPE SPF	4	UNIT
58	METER CABINET, TYPE T	1	UNIT
59	SERVICE WIRE, NO. 6 AWG	135	L.F.
60	GROUND WIRE, NO. 8 AWG	378	L.F.
61	CONTROLLER ASSEMBLY, 12 PHASE WITH BATTERY BACKUP SYSTEM	1	UNIT
65	UC-SMA20-TB2-1 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	1	UNIT
66	UC-SMA20-TB2-2 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	1	UNIT
68	UC-SMA30-TB4-2 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	1	UNIT
69	TRAFFIC SIGNAL ASSEMBLIES, TYPE C-1	1	UNIT
70	TRAFFIC SIGNAL ASSEMBLIES, TYPE MM-1	3	UNIT
73	PEDESTAL ASSEMBLY, TYPE PW-1	3	UNIT
74	PEDESTAL ASSEMBLY, TYPE P-1-W-1-D(12')	1	UNIT
75	PEDESTRIAN PUSH BUTTON ASSEMBLY, R10-3e	4	UNIT
77	TRAFFIC SIGNAL CABLE, 2 CONDUCTOR	449	L.F.
78	TRAFFIC SIGNAL CABLE, 5 CONDUCTOR	449	L.F.
79	TRAFFIC SIGNAL CABLE, 10 CONDUCTOR	1,013	L.F.
80	VIDEO DETECTION SYSTEM W/MODEM	1	UNIT
81	PRIORITY CONTROL SYSTEM	1	UNIT

NOTES:

1. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM WITH THE "MANUAL ON. UNIFORM TRAFFIC CONTROL DEVICES", CURRENT EDITION.
2. TREE BRANCHES SHALL BE TRIMMED AS NECESSARY AT THE DIRECTION OF THE ENGINEER.
3. ALL TRAFFIC SIGNAL INDICATIONS AND PEDESTRIAN SIGNALS SHALL BE LED.
4. FOUNDATION LAYOUT SHALL BE APPROVED IN THE FIELD BY THE ENGINEER PRIOR TO INSTALLATION.
5. ALL ALUMINUM ALLOY SIGNAL STANDARDS SHALL BE A MINIMUM OF 32 INCHES FROM FACE OF CURB TO CENTER OF STANDARD. ONE FACE OF THE BASE SHALL BE SET PARALLEL TO CURB FACE.
6. TRAFFIC SIGNAL HEADS 1 - 3 AND 5 - 9 TO BE MOUNTED AT A MIN. HEIGHT OF 15'-6". TRAFFIC SIGNAL HEADS 4 AND 10 TO BE MOUNTED AT A MIN. HEIGHT OF 12'-0". PEDESTRIAN SIGNAL HEADS 11-14 TO BE MOUNTED AT 8 FT.
7. SIGNAL HEADS 1, 2 AND 3 SHALL BE OPTICALLY PROGRAMMED TO RESTRICT VISIBILITY AT THE SOUTHBOUND STOP BAR AT THE HILLSIDE AVENUE INTERSECTION.
8. ALL SIGNAL FACES SHALL BE EQUIPPED WITH BACKPLATES.
9. WIRE CODING TO CONFORM WITH CURRENT STANDARDS IN USE BY THE COUNTY OF UNION.
10. #8 AWG, INSULATED (COLORED GREEN) GROUND WIRE SHALL BE INSTALLED CONTINUOUS THROUGHOUT THE TRAFFIC SIGNAL SYSTEM AND SECURED TO ALL GROUND RODS, CABINETS, AND TRAFFIC SIGNAL BASES.
11. CONTRACTOR SHALL COORDINATE AND OBTAIN ELECTRICAL SERVICE FOR THE INTERSECTION.
12. CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF SIGNAL DEVICES AND SIGNS. TEST PITS SHALL BE REQUIRED AT LOCATIONS OF SIGNAL POLE FOUNDATIONS AS DIRECTED BY THE ENGINEER PRIOR TO CONSTRUCTION OF CURB RAMPS, SIDEWALK, AND FOUNDATIONS.
13. THE PRIORITY CONTROL SYSTEM SHALL PROVIDE PREEMPTION DEVICES CAPABLE OF DETECTION ALONG ALL APPROACHES TO THE INTERSECTION.
14. MOUNTING LOCATIONS FOR THE IMAGE DETECTORS AND PREEMPTION DEVICES SHALL BE DETERMINED BY THE MANUFACTURER'S REPRESENTATIVE TO ASSURE PROPER OPERATION.
15. THE EXISTING TRAFFIC SIGNAL MUST BE KEPT IN OPERATION DURING INTERSECTION IMPROVEMENTS.

LEGEND

- VEHICULAR SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN PUSH BUTTON AND PUSHBUTTON SIGN
- VIDEO IMAGE DETECTOR
- TRAFFIC SIGNAL POLE

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

ELECTRICAL PLAN
CENTENNIAL AVENUE & MYRTLE STREET

T&M ASSOCIATES
11 TINDALL ROAD
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EDWARD R. KLUMP, P.E.
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STATE OF NEW JERSEY LICENSE No. GE37497

4/8/13
DATE

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK

PROJECT NO.	CADD FILE	FIELD BK. #
UNCO-00390	UNCO390-TSS	UNCO-XX

DRAWING EL-2

SHEET 13 OF 31

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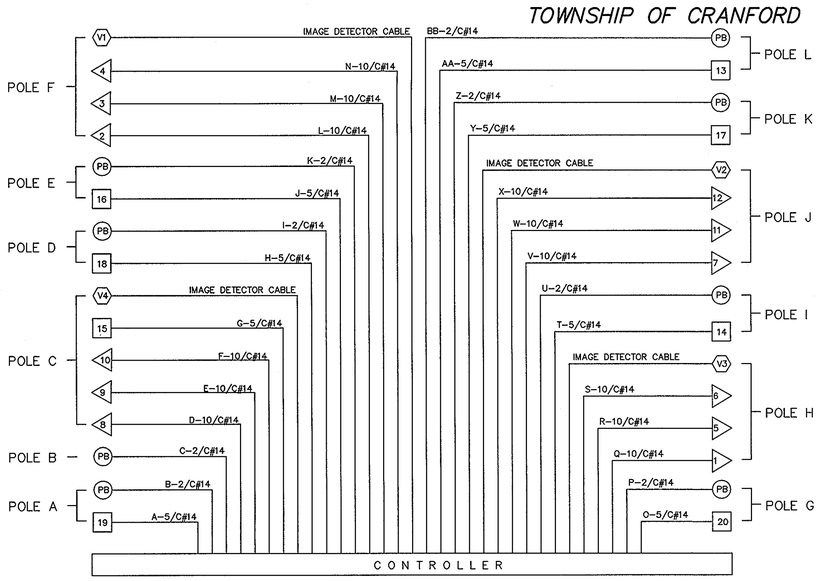
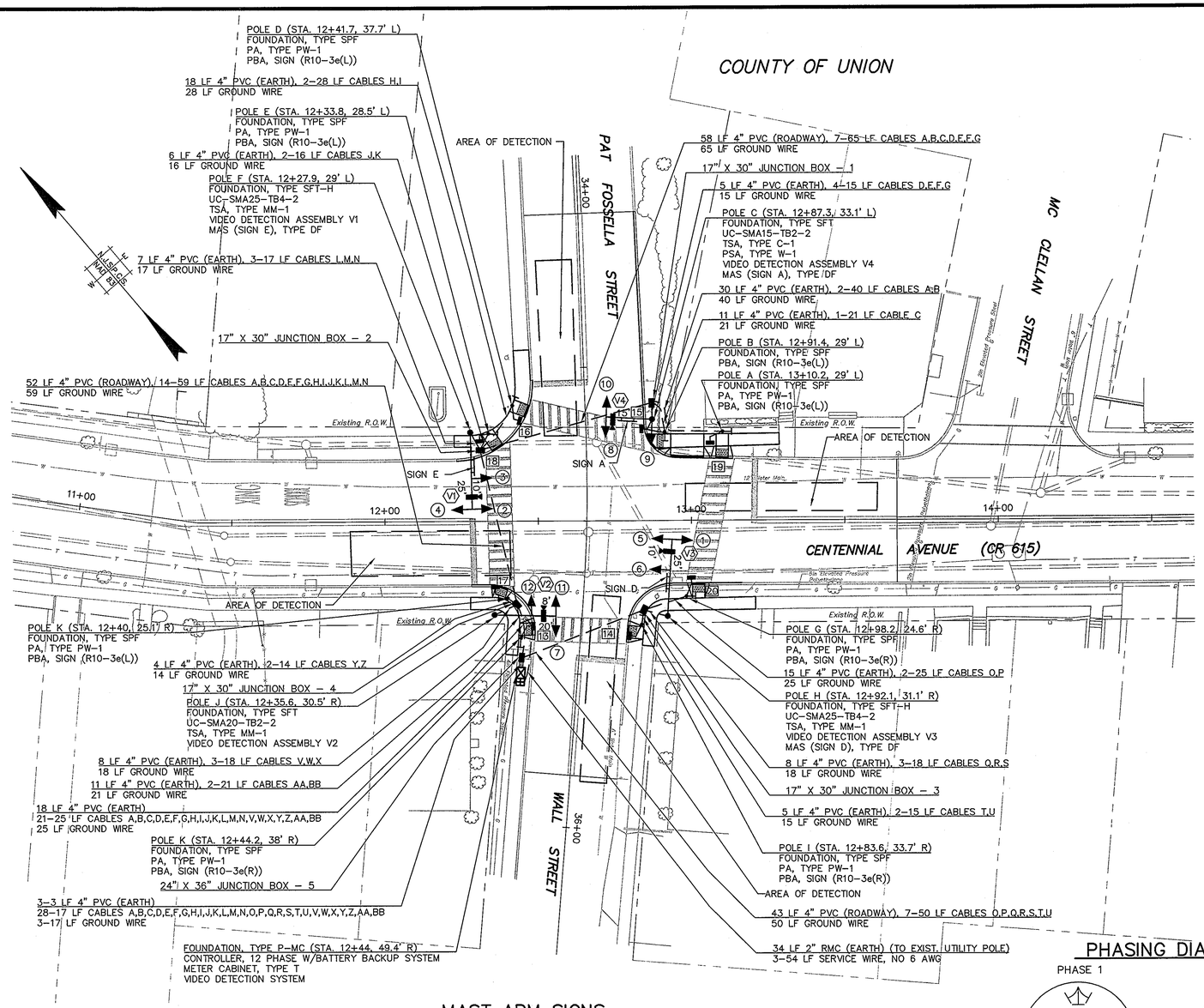
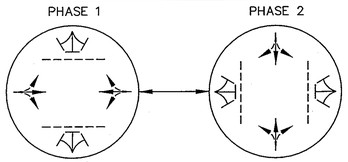
PLOT DATE: Apr 05, 2013 - 9:21am



BLOCK WIRING DIAGRAM



PHASING DIAGRAM



TO BE CONSTRUCTED

ITEM No.	DESCRIPTION	EST. QTY.	UNIT
44	MAST ARM SIGN, TYPE DF	25	SF
47	2" RIGID METALLIC CONDUIT, EARTH	34	L.F.
48	4" SCHEDULE 80 PVC, EARTH	146	L.F.
49	4" SCHEDULE 80 PVC, ROADWAY	153	L.F.
52	17" X 30" JUNCTION BOX	4	UNIT
53	24" X 36" JUNCTION BOX	1	UNIT
54	FOUNDATION, TYPE SFT	2	UNIT
55	FOUNDATION, TYPE SFT-H	2	UNIT
56	FOUNDATION, TYPE P-MC	1	UNIT
57	FOUNDATION, TYPE SPF	8	UNIT
58	METER CABINET, TYPE T	1	UNIT
59	SERVICE WIRE, NO. 6 AWG	162	L.F.
60	GROUND WIRE, NO. 8 AWG	498	L.F.
61	CONTROLLER ASSEMBLY, 12 PHASE WITH BATTERY BACKUP SYSTEM	1	UNIT
64	UC-SMA15-TB2-2 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	1	UNIT
66	UC-SMA20-TB2-2 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	1	UNIT
67	UC-SMA25-TB4-2 SINGLE MEMBER ARM AND SHAFT ASSEMBLY	2	UNIT
69	TRAFFIC SIGNAL ASSEMBLIES, TYPE C-1	1	UNIT
70	TRAFFIC SIGNAL ASSEMBLIES, TYPE MM-1	3	UNIT
71	PEDESTRIAN SIGNAL ASSEMBLY, TYPE W-1	1	UNIT
73	PEDESTAL ASSEMBLY, TYPE PW-1	7	UNIT
75	PEDESTRIAN PUSH BUTTON ASSEMBLY, R10-3e	8	UNIT
77	TRAFFIC SIGNAL CABLE, 2 CONDUCTOR	932	L.F.
78	TRAFFIC SIGNAL CABLE, 5 CONDUCTOR	926	L.F.
79	TRAFFIC SIGNAL CABLE, 10 CONDUCTOR	1,332	L.F.
80	VIDEO DETECTION SYSTEM W/MODEM	1	UNIT
81	PRIORITY CONTROL SYSTEM	1	UNIT

NOTES:

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2. TREE BRANCHES SHALL BE TRIMMED AS NECESSARY AT THE DIRECTION OF THE ENGINEER.
3. ALL TRAFFIC SIGNAL INDICATIONS AND PEDESTRIAN SIGNALS SHALL BE LED.
4. FOUNDATION LAYOUT SHALL BE APPROVED IN THE FIELD BY THE ENGINEER PRIOR TO INSTALLATION.
5. ALL ALUMINUM ALLOY SIGNAL STANDARDS SHALL BE A MINIMUM OF 32 INCHES FROM FACE OF CURB TO CENTER OF STANDARD. ONE FACE OF THE BASE SHALL BE SET PARALLEL TO CURB FACE.
6. TRAFFIC SIGNAL HEADS 1 – 8 AND 10 –12 TO BE MOUNTED AT A MIN. HEIGHT OF 15'–6". TRAFFIC SIGNAL HEAD 9 TO BE MOUNTED AT A MIN. HEIGHT OF 12'–0". PEDESTRIAN SIGNAL HEADS 13–20 TO BE MOUNTED AT 8 FT.
7. ALL SIGNAL FACES SHALL BE EQUIPPED WITH BACKPLATES.
8. WIRE CODING TO CONFORM WITH CURRENT STANDARDS IN USE BY THE COUNTY OF UNION.
9. #8 AWG, INSULATED (COLORED GREEN) GROUND WIRE SHALL BE INSTALLED CONTINUOUS THROUGHOUT THE TRAFFIC SIGNAL SYSTEM AND SECURED TO ALL GROUND RODS, CABINETS, AND TRAFFIC SIGNAL BASES.
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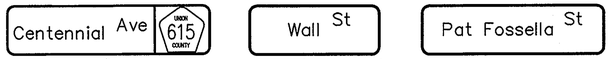
14. THE EXISTING TRAFFIC SIGNAL MUST BE KEPT IN OPERATION DURING INTERSECTION IMPROVEMENTS.

STANDARD SIGN TABLE

SIGN DESIGNATION	MESSAGE	SIZE IN. X IN.
R10-3e(L or R)	PEDESTRIAN EDUCATIONAL PLAQUE WITH COUNTDOWN TIMER	9 X 15

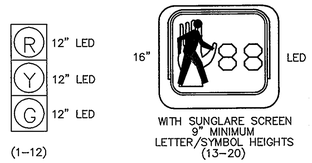
MAST ARM SIGNS



SIGN A (DUAL FACE) 84" X 18"
SIGN D (DUAL FACE) 48" X 18"
SIGN E (DUAL FACE) 66" X 18"

1. ALL STREET NAME SIGNS SHALL HAVE WHITE LEGEND ON GREEN BACKGROUND, EXCEPT COUNTY ROUTE MARKER, WHICH SHALL HAVE YELLOW LEGEND ON BLUE BACKGROUND.
2. STREET NAME LETTERING TO BE 9" B, AND "St/Ave" 6" B.

SIGNAL LEGEND



LEGEND

- VEHICULAR SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN SIGNAL HEAD AND IDENTIFYING NUMBER
- PEDESTRIAN PUSH BUTTON AND PUSHBUTTON SIGN
- VIDEO IMAGE DETECTOR
- TRAFFIC SIGNAL POLE

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

ELECTRICAL PLAN CENTENNIAL AVENUE & WALL STREET– PAT FOSSELLA STREET

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STATE OF NEW JERSEY LICENSE No. GE37497

4/8/13 DATE

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK

PROJECT NO. UNCO-00390 | CADD FILE UNCO390-TSS | FIELD BK. # UNCO-XX

DRAWING EL-3

SHEET 14 OF 31

FILE NAME: H:\UNCO\00390\Plans\UNCO390-EL.dwg
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LEGEND

- BREAKAWAY BARRICADES
- BREAKAWAY BARRICADES WITH SIGN
- CONSTRUCTION SIGNS
- DRUMS
- CONE
- PRECAST CONCRETE CURB CONSTRUCTION BARRIER (TYPE SPECIFIED)
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC DIRECTOR, FLAGGER
- TRAILER MOUNTED MOUNTED ARROW BOARD SHOWING CAUTION MODE
- LEFT RIGHT BOTH — ILLUMINATED FLASHING ARROW MOUNTED ON TOWING VEHICLE SHOWING ARROW PATTERN (Left, Right, Both)
- TRAFFIC CONTROL TRUCK WITH MOUNTED CRASH CUSHION AND ARROW BOARD SHOWING CAUTION MODE
- LEFT RIGHT BOTH — TRAFFIC CONTROL TRUCK WITH MOUNTED CRASH CUSHION AND ARROW BOARD SHOWING ARROW PATTERN (Left, Right, Both)
- TEMPORARY CRASH CUSHION, INERTIAL BARRIER SYSTEM
- TEMPORARY CRASH CUSHION, (all other approved)
- BUFFER ZONE
- WORK AREA
- PAINT STRIPING TRUCK OR OTHER OPERATING VEHICLE

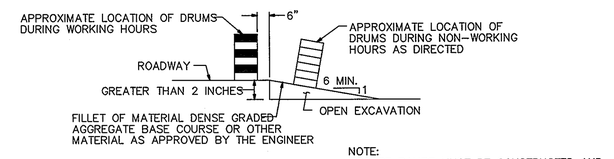
GENERAL NOTES:

1. ADVANCE WARNING SIGNS, DISTANCES, AND TAPER LENGTHS MAY BE EXTENDED, AT DIRECTION OF THE ENGINEER, TO ADJUST FOR REDUCED VISIBILITY DUE TO HORIZONTAL AND VERTICAL CURVATURE OF THE ROADWAY.
2. PRIOR TO ANY ROAD CONSTRUCTION, TRAFFIC CONTROL SIGNS AND DEVICES SHALL BE IN PLACE.
3. RAMPS AND/OR SIDE STREETS ENTERING THE ROADWAY AFTER THE FIRST ADVANCE WARNING SIGN SHALL BE PROVIDED WITH AT LEAST ONE W20-IF SIGN (ROAD WORK AHEAD) AS A MINIMUM.
4. ALL EXISTING ROAD SIGNS, PAVEMENT MARKINGS AND/OR PLOWABLE PAVEMENT REFLECTORS WHICH CONFLICT WITH THE PROPOSED TRAFFIC CONTROL PLAN SHALL BE COVERED, REMOVED OR RELOCATED AS DIRECTED BY THE ENGINEER.
5. CONFLICTING OR NON-OPERATING SIGNAL INDICATIONS ON EITHER THE EXISTING, INTERIM, OR PROPOSED TRAFFIC SIGNAL SYSTEMS SHALL BE BAGGED OR COVERED.
6. MAINTENANCE AND PROTECTION OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES – PART VI "STANDARDS AND GUIDES FOR TRAFFIC CONTROL FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY, AND INCIDENT MANAGEMENT OPERATIONS", UNLESS OTHERWISE NOTED IN THE PLANS AND SPECIFICATIONS, AND SHALL BE APPROVED BY THE ENGINEER.
7. THE CONTRACTOR SHALL SUBMIT A PLAN FOR THE SAFE ACCESS OF CONSTRUCTION VEHICLES THROUGHOUT THE WORK SITE WHERE SPACE CONSTRAINTS PREVENT THE USE OF LANE CLOSURES. THE PLAN SHALL BE SUBMITTED TO THE ENGINEER IN ACCORDANCE WITH SECTION 617 OF THE STANDARD SPECIFICATIONS.
8. TRAFFIC SAFETY SERVICES SHALL BE USED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR TRAFFIC CONTROL, SECTION 159.
9. ALL EXCAVATED AREAS WITHIN OR ADJACENT TO THE ROADWAY SHALL BE BACKFILLED AND PLACED ON A MINIMUM 6H : 1V SLOPE PRIOR TO THE END OF EACH WORK DAY. OTHER EXCAVATED AREAS WITHIN THE CLEAR ZONE ARE TO BE EITHER BACKFILLED OR A PRECAST CONCRETE CURB CONSTRUCTION BARRIER SET TEMPORARILY IN PLACE TO SHIELD VEHICULAR AND PEDESTRIAN TRAFFIC.
10. WHERE REQUIRED, THE CONTRACTOR SHALL MAKE PROVISIONS FOR MAINTAINING PEDESTRIAN CROSSING LOCATIONS AND TYPE AS DIRECTED BY THE ENGINEER.
11. TRAFFIC CONTROL DEVICES FOR LANE CLOSURES INCLUDING SIGNS, CONES, BARRICADES, ETC. SHALL BE PLACED PER THE APPROVED TRAFFIC CONTROL PLAN SUBMITTED BY THE CONTRACTOR, PER SPECIFICATION 159.03.01. SIGNS SHALL NOT BE PLACED WITHOUT ACTUAL LANE CLOSURES AND SHALL BE IMMEDIATELY REMOVED UPON REMOVAL OF THE CLOSURES.
12. CONES MAY BE SUBSTITUTED FOR DRUMS AND INSTALLED UPON THE APPROVAL OF THE ENGINEER.

	RECOMMENDED TAPER LENGTH AND SPACING FOR CHANNELIZING TAPERS						RECOMMENDED SPACING ALONG TANGENTS
	REGULATORY APPROACH SPEED OF TRAFFIC MILES/HOUR	MINIMUM TAPER RATIO IN LENGTH PER FOOT OF WIDTH	MINIMUM TAPER LENGTH L – FOR LANE WIDTHS 10'	11'	12'	MAXIMUM DEVICE (B) SPACING ALONG TAPERS IN FEET	MAXIMUM DEVICE (D) SPACING ALONG TANGENTS IN FEET
HILLSIDE AVE, MYRTLE ST, WALL ST	25	10.5:1	105	115	125	25	50
	30	15:1	150	165	180	30	60
CENTENNIAL AVE (C.R. 615)	35	20.5:1	205	225	245	35	70
	40	27:1	270	300	325	40	80
	45	45:1	450	495	540	45	90
	50	50:1	500	550	600	50	100
	55	55:1	550	605	660	55	110
	60	60:1	600	660	720	60	120
	65	65:1	650	715	780	65	130

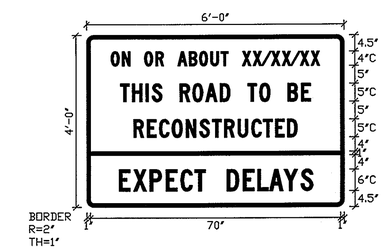
NOTE:

THE MAXIMUM DEVICE SPACING ALONG CURVES SHALL BE AS DEFINED FOR TAPERS (B) IN THE ABOVE TABLE.



NOTE:
ESCAPE RAMPS MUST BE CONSTRUCTED AND MAINTAINED DURING NON-WORKING HOURS WHERE A VERTICAL DROP GREATER THAN 2 INCHES EXISTS ADJACENT TO TRAVELED LANE.

ESCAPE RAMP DETAIL



SIGN "A"
NOT TO SCALE

TEMPORARY CONSTRUCTION SIGN SUMMARY TABLE FOR BOTH LOCATIONS					
SIGN DESIGNATION	MESSAGE	SIZE IN. x IN.	AREA IN SQ. FT.	REQUIRED QUANTITY IN NUMBER	TOTAL AREA IN SQ. FT.
G20-2A	END ROAD WORK	48x24	8.0	8	64.00
W1-6(L or R)	LEFT or RIGHT LARGE ARROW	48x24	8.0	18	144.00
W1-4(aL or aR)	LEFT or RIGHT MERGE SYMBOL	48x48	16.0	7	112.00
W5-1(S)	ROAD NARROWS	48x48	16.0	7	112.00
W20-1(A)	ROAD WORK 1500 FT	48x48	16.0	7	112.00
W20-1(F)	ROAD WORK AHEAD	48x48	16.0	7	112.00
SIGN 'A'	ON OR ABOUT XX/XX/XXXX THIS ROAD TO BE RECONSTRUCTED EXPECT DELAYS	72X48	24.0	7	168.00
				CONSTRUCTION SIGN TOTAL	824.00

SEQUENCE OF CONSTRUCTION

STAGE 1

1. INSTALLATION OF TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH MUTCD STANDARDS.
2. SITE CLEARING OF AREAS WHERE ROADWAYS AND IMPROVEMENTS ARE PROPOSED.
3. CONSTRUCTION OF FULL DEPTH PAVEMENT, CURB, AND SIDEWALK WITHIN WIDENING AREAS.
4. CONSTRUCTION OF PROPOSED TRAFFIC SIGNAL EQUIPMENT. EXISTING TRAFFIC SIGNAL EQUIPMENT AND HARDWARE WILL CO-EXIST WITH NEW TRAFFIC SIGNALS UNTIL NEW TRAFFIC SIGNALS ARE TURNED ON.
5. CONSTRUCTION OF DRAINAGE FACILITIES.
6. CONSTRUCTION OF ALL PROPOSED CURBS AND SIDEWALKS.
7. CONSTRUCTION OF EXCAVATION, DENSE GRADED AGGREGATE AND HOT MIX ASPHALT BASE COURSES.

STAGE 2

1. INSTALLATION OF ADVANCE WARNING SIGNS AND ANY OTHER TRAFFIC CONTROL DEVICES REQUIRED FOR THE MILLING, PAVING AND STRIPING OPERATIONS.
2. CONSTRUCTION OF MILLING.
3. FINAL PAVING OF HOT MIX ASPHALT 9.5M64 SURFACE COURSE IN ALL PAVEMENT AREAS.
4. INSTALLATION OF PERMANENT SIGNS AND STRIPING.
5. OPERATE SIGNAL SYSTEMS UPON APPROVAL OF INSTALLATION.
6. REMOVE ALL CONSTRUCTION SIGNS AND OTHER MAINTENANCE DEVICES.

TO BE CONSTRUCTED (ALL STAGES)			
ITEM No.	DESCRIPTION	EST. QTY.	UNIT
6	BREAKAWAY BARRICADE	48	UNIT
7	DRUM	120	UNIT
9	CONSTRUCTION SIGNS	824	SF

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

TRAFFIC CONTROL DETAILS

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365

EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
Edward R Klump 4/8/13
DATE
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK
PROJECT NO. UNCO-00390	CADD FILE UNCO390-TC.DWG	FIELD BK. # UNCO-XX

DRAWING TC-1

SHEET 15 OF 31

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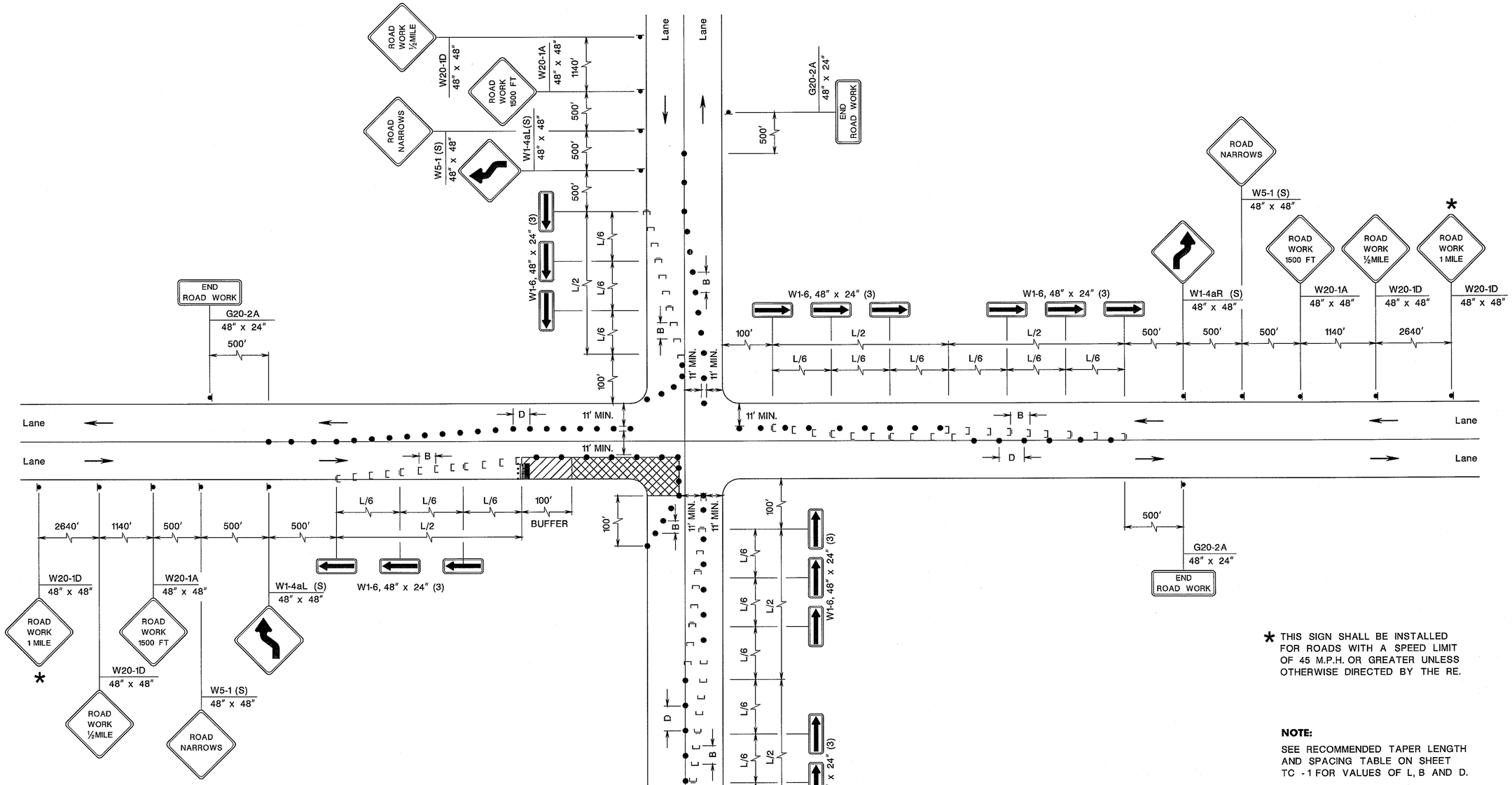
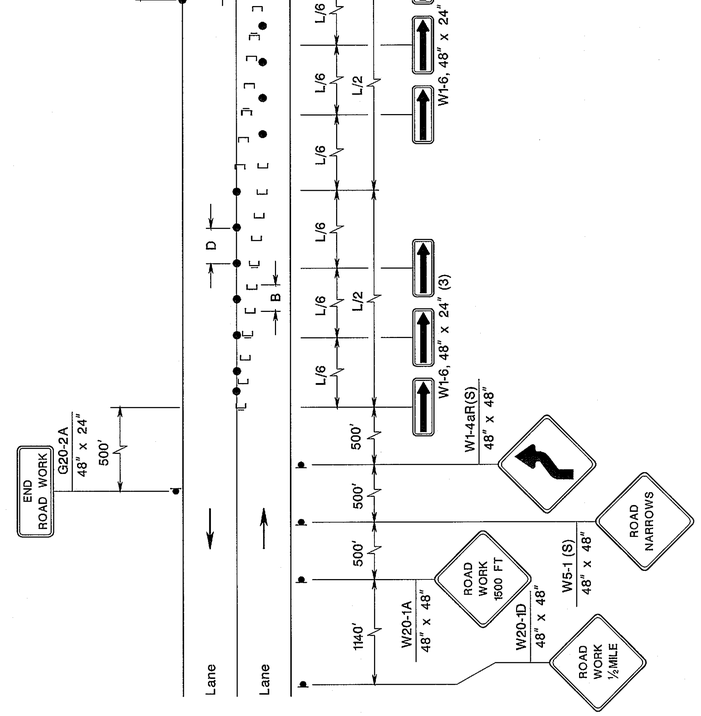


2 LANES, UNDIVIDED, INTERSECTION



NJDOT STANDARD DETAIL TCD–5

* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TC -1 FOR VALUES OF L, B AND D.

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

TRAFFIC CONTROL DETAILS

T&M ASSOCIATES
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MIDDLETOWN, NJ 07748
TEL 732-671-6400
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EDWARD R. KLUMP, P.E.
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Edward R. Klump 4/8/13
DATE
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497

DESIGNED BY	DRAWN BY	CHECKED BY
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PROJECT NO.	CADD FILE	FIELD BK. #
UNCO-00390	UNCO390-TC.DWG	UNCO-XX

DRAWING TC-2

SHEET 16 OF 31

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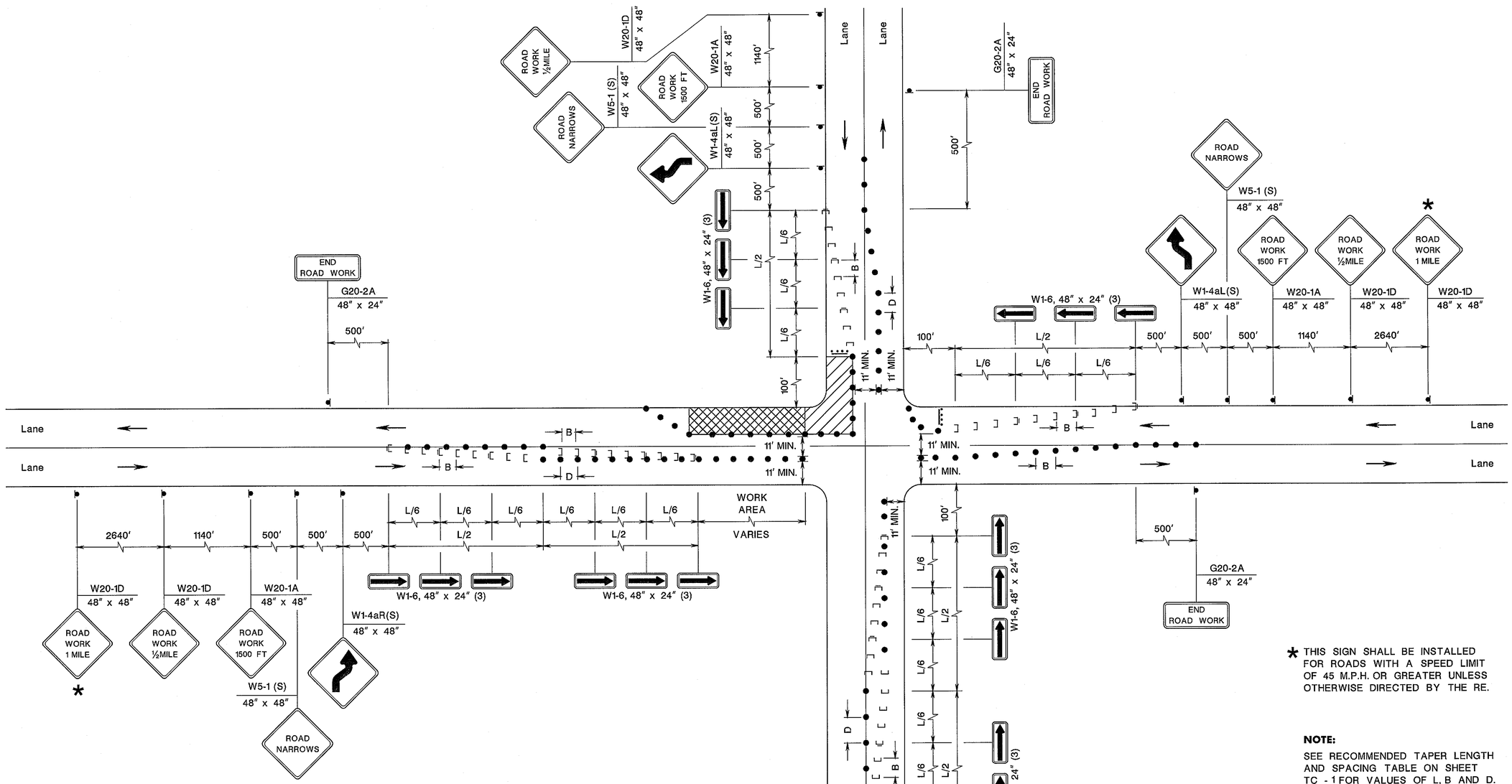
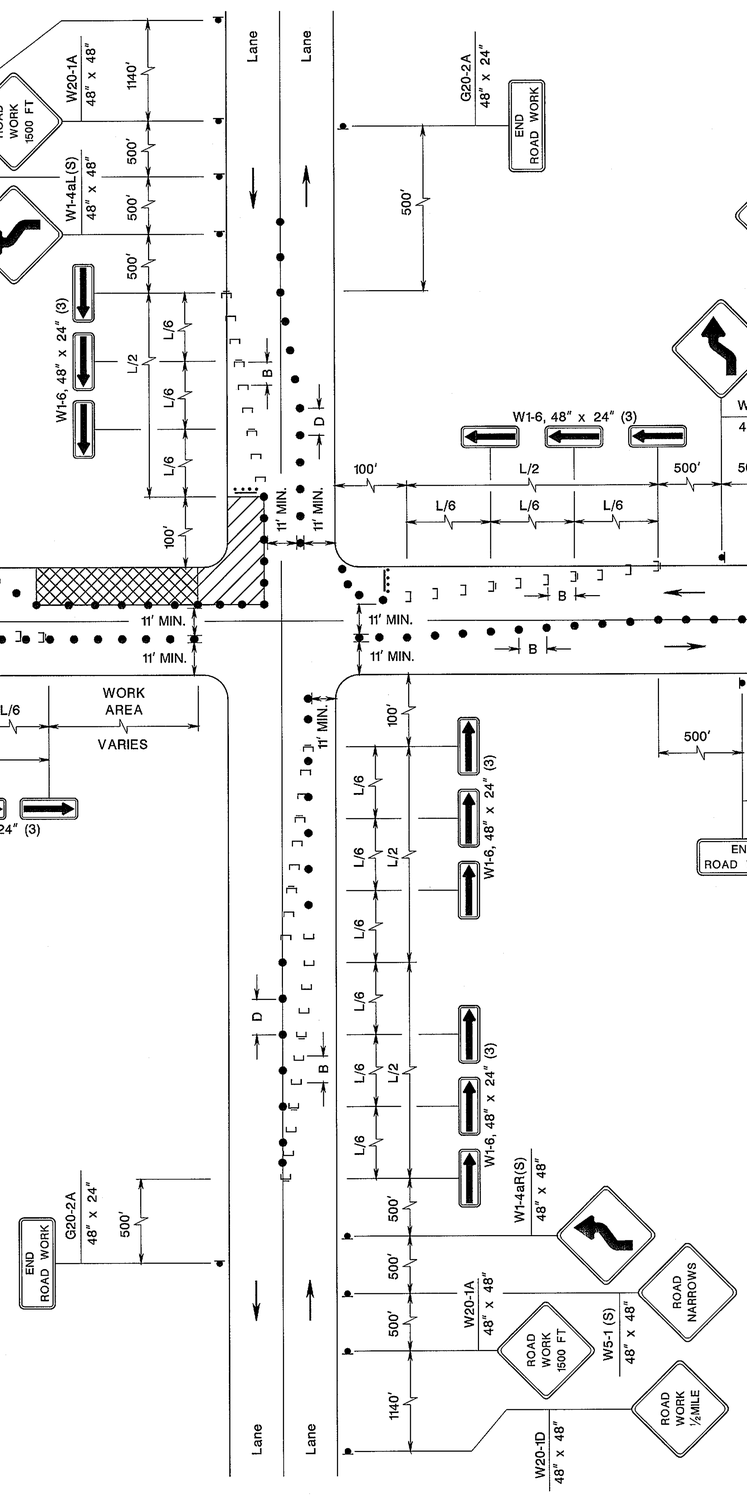


2 LANES, UNDIVIDED, INTERSECTION



* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TC - 1 FOR VALUES OF L, B AND D.

N.T.S.

NJDOT STANDARD DETAIL TCD-7

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COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

TRAFFIC CONTROL DETAILS

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EDWARD R. KLUMP, P.E.
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LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497

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PROJECT NO. UNCO-00390 — CADD FILE UNCO390-TC.DWG — FIELD BK. # UNCO-XX

DRAWING TC-3

SHEET 17 OF 31

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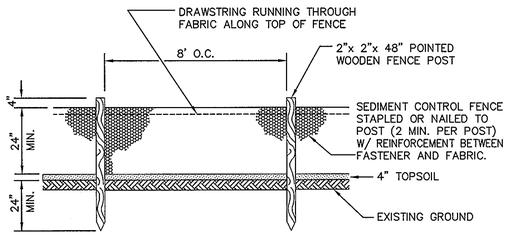
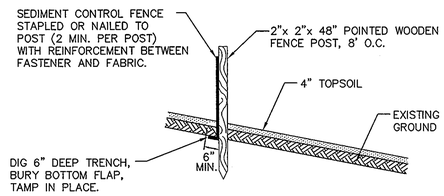


FRONT ELEVATION

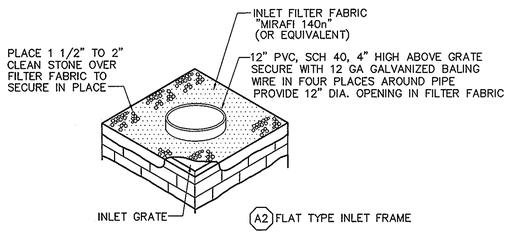


SIDE ELEVATION

(C1) PLAN SYMBOL

SILT FENCE

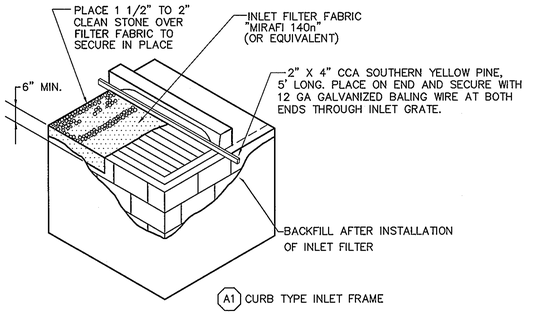
NOT TO SCALE



(A2) FLAT TYPE INLET FRAME

GENERAL NOTES:

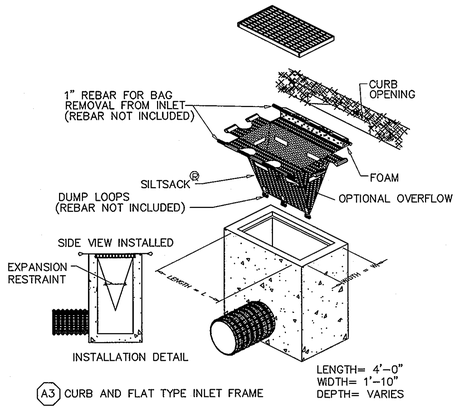
1. CONTRACTOR TO CLEAN INLET FILTER AFTER EVERY STORM.
2. FILTER FABRIC, WOOD PIECE OR PVC PIPE TO BE REMOVED AFTER PAVING OR FINAL GRADING AND ESTABLISHMENT OF VEGETATION.



(A1) CURB TYPE INLET FRAME

INLET FILTER, TYPE 1

NOT TO SCALE



(A3) CURB AND FLAT TYPE INLET FRAME

INLET FILTER, TYPE 2

NOT TO SCALE

SOIL EROSION AND SEDIMENT CONTROL NOTES

1. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
2. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN THIRTY (30) DAYS, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY RECEIVE A TEMPORARY SEEDING, IF THE SEASON PREVENTS THE ESTABLISHMENT OF TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF TWO (2) ONS PER ACRE, ACCORDING TO THE STATE STANDARDS.
3. PERMANENT VEGETATION IS TO BE SEEDED OR SODDED ON ALL EXPOSED AREAS WITHIN TEN (10) DAYS AFTER FINAL GRADING. MULCH WILL BE USED FOR PROTECTION UNTIL EEDING IS ESTABLISHED.
4. ALL WORK IS TO BE DONE IN ACCORDANCE WITH THE STATE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL OF NEW JERSEY.
5. A SUB-BASE COURSE WILL BE APPLIED IMMEDIATLEY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS TO STABILIZE STREETS, ROADS, DRIVEWAYS, AND PARKING AREAS. IN AREAS WHERE NO UTILITIES ARE PRESENT, THE SUB-BASE SHALL BE INSTALLED WITHIN FIFTEEN (15) DAYS OF PRELIMINARY GRADING.
6. IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING, ALL CRITICAL AREAS SUBJECT TO EROSION (I.E. STEEP SLOPES AND ROADWAY EMBANKMENTS) WILL RECEIVE TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH OR A SUITABLE EQUIVALENT, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO STATE STANDARDS.
7. ANY STEEP SLOPES RECEIVING PIPELINE INSTALLATION WILL BE BACKFILLED AND STABILIZED DAILY, AS THE INSTALLATION PROCEEDS (I.E. SLOPES GREATER THAN 3:1).
8. TRAFFIC CONTROL STANDARDS REQUIRE THE INSTALLATION OF A 50'X30'X1" PAD OF 1 1/2" OR 2" STONE, AT ALL CONSTRUCTION DRIVEWAYS, IMMEDIATELY AFTER INITIAL SITE DISTURBANCE.
9. THE SOMERSET-UNION SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED IN WRITING FOURTY-EIGHT (48) HOURS IN ADVANCE OF ANY LAND DISTURBING ACTIVITY.
10. AT THE TIME THE SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER SHALL BE REMOVED OR TREATED IN SUCH A WAY THAT IT WILL PERMANENTLY ADJUST THE SOIL CONDITIONS AND RENDER IT SUITABLE FOR VEGETATIVE GROUND COVER. IF THE REMOVAL OR TREATMENT OF THE SOIL WILL NOT PROVIDE SUITABLE CONDITIONS, NON-VEGETATIVE MEANS OF PERMANENT GROUND STABILIZATION WILL HAVE TO BE EMPLOYED.
11. IN THAT N.J.S.A. 4:24-39 ET.SEQ. REQUIRES THAT NO CERTIFICATE OF OCCUPANCY BE ISSUED BEFORE THE PROVISIONS OF THE CERTIFIED PLAN FOR SOIL EROSION AND SEDIMENT CONTROL HAVE BEEN COMPLIED WITH FOR PERMANENT MEASURES, ALL SITE WORK FOR SITE PLANS AND ALL WORK AROUND INDIVIDUAL LOTS IN SUBDIVISIONS, WILL HAVE TO BE COMPLETED PRIOR TO THE DISTRICT ISSUING A REPORT OF COMPLIANCE FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE MUNICIPALITY.
12. CONDUIT OUTLET PROTECTION MUST BE INSTALLED AT ALL REQUIRED OUTFALLS PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.
13. ANY CHANGES TO THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLANS WILL REQUIRE THE SUBMISSION OF REVISED SOIL EROSION AND SEDIMENT CONTROL PLANS TO THE DISTRICT FOR RECERTIFICATION. THE REVISED PLANS MUST MEET ALL CURRENT STATE SOIL EROSION AND SEDIMENT CONTROL STANDARDS.
14. THE SOMERSET-UNION SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED OF ANY CHANGES IN OWNERSHIP.
15. MULCHING IN THE STANDARDS IS REQUIRED FOR OBTAINING A CONDITIONAL REPORT OF COMPLIANCE. CONDITIONS ARE ONLY ISSUED WHEN THE SEASON PROHIBITS SEEDING.
16. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL ADJACENT ROADS CLEAN DURING THE LIFE OF THE CONSTRUCTION PROJECT.
17. THE DEVELOPER SHALL BE RESPONSIBLE FOR REMEDIATING ANY EROSION OR SEDIMENT PROBLEMS THAT ARISE AS A RESULT OF ONGOING CONSTRUCTION AT THE REQUEST OF THE SOMERSET-UNION SOIL CONSERVATION DISTRICT.
18. HYDROSEEDING IS A TWO-STEP PROCESS. THE FIRST STEP INCLUDES SEED, FERTILIZER, LIME, ETC., ALONG WITH MINIMAL AMOUNTS OF MULCH TO PROMOTE CONSISTENCY, GOOD SEED TO SOIL CONTACT, AND GIVE A VISUAL INDICATION OF COVERAGE. UPON COMPLETION OF THE SEEDING OPERATION, HYDRO-MULSH SHALL BE APPLIED AT A RATE OF 1500 LBS. PER ACRE IN THE SECOND STEP. THE USE OF HYDRO-MULCH, AS OPPOSED TO STRAW, IS LIMITED TO OPTIMUM SEEDING DATES AS LISTED IN THE STANDARDS.

SOMERSET - UNION SOIL CONSERVATION DISTRICT
SOMERSET COUNTY 4-H CENTER
308 MILLTOWN ROAD
BRIDGEWATER, NJ 08807
TEL. (908) 526-2701
FAX. (908) 526-7017

PROPOSED CONSTRUCTION SEQUENCE	APPROX. DURATION:
1. APPLICATION OF PROPER MEASURES FOR THE CONTROL OF SOIL EROSION & SEDIMENT CONTROL.	4 DAYS
2. CLEARING OF THE SITE.	4 DAYS
3. TEMPORARY STABILIZATION OF AREAS INITIALLY DISTURBED. STABILIZATION TO BE ACCOMPLISHED BY USE OF TEMPORARY SEEDING AND/OR STRAW MULCHING OR EQUIVALENT MATERIAL AT A RATE OF TWO TONS PER ACRE, ACCORDING TO STATE STANDARDS.	3 DAYS
4. INSTALLATION OF TRAFFIC SIGNAL EQUIPMENT IMPROVEMENTS	45 DAYS
5. TEMPORARY STABILIZATION OF DISTURBED AREA IN A ROUGH GRADED CONDITION SHALL BE MAINTAINED BY SEEDING AND /OR MULCHING UNTIL PROPER WEATHER CONDITIONS EXIST FOR THE ESTABLISHMENT OF A PERMANENT VEGETATIVE COVER.	3 DAYS
6. MAINTENANCE OF SOIL EROSION PROCEDURES.	3 DAYS
7. CONSTRUCTION OF CONCRETE CURB AND MATERIALS FOR ROADWAY AND DRIVEWAY/SIDEWALK CONSTRUCTION.	60 DAYS
8. INSTALLATION OF TOPSOILING, FERTILIZING, SEEDING, AND MULCHING.	4 DAYS
9. REMOVAL OF SOIL EROSION AND SEDIMENT CONTROL DEVICES AFTER ESTABLISHED VEGETATIVE GROWTH HAS OCCURRED.	4 DAYS

THE TOTAL ESTIMATED TIME OF CONSTRUCTION IS 130 DAYS

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

SOIL EROSION AND SEDIMENT CONTROL NOTES & DETAILS

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365

EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497
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BPK/IK	IK/JL	BPK
PROJECT NO. UNCO-00390	CADD FILE UNCO390-SE	FIELD BK. # UNCO-XX

DRAWING SE-1

SHEET 18 OF 31

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STANDARD FOR TEMPORARY VEGETATIVE COVER FOR SOIL STABILIZATION

Definition

Establishment of temporary vegetative cover on soils exposed for periods of two to 6 months which are not being graded, not under active construction or not scheduled for permanent seeding within 60 days.

Purpose

To temporarily stabilize the soil and reduce damage from wind and water erosion until permanent stabilization is accomplished.

Water Quality Enhancement

Provides temporary protection against the impacts of wind and rain, slows the overland movement of stormwater runoff, increases infiltration and retains soil and nutrients on site, protecting streams or other stormwater conveyances.

Where Applicable

On exposed soils that have the potential for causing off-site environmental damage.

Methods and Materials

I. Site Preparation

A. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and mulch anchoring. All grading should be done in accordance with Standards for Land Grading, p. 19-1.

B. Install needed erosion control practices or facilities such as diversions, grade stabilization structures, channel stabilization measures, sediment basins, and waterways. See Standards 11 through 42.

C. Immediately prior to seeding, the surface should be scarified 6" to 12" where there has been soil compaction. This practice is permissible only where there is no danger to underground utilities (cables, irrigation systems, etc.).

II. Seedbed Preparation

A. Apply ground limestone and fertilizer according to soil test recommendations such as those offered by Rutgers Co-operative Extension. Soil sample mailers are available from the local Rutgers Cooperative Extension offices. Fertilizer shall be applied at the rate of 500 pounds per acre or 11 pounds per 1,000 square feet of 10-20-10 or equivalent with 50% water insoluable nitrogen unless a soil test indicates otherwise. Apply limestone at the rate of 2 tons/acre unless soil test indicates otherwise. Calcium carbonate is the equivalent and standard for measuring the ability of liming materials to neutralize soil acidity and supply calcium and magnesium to grasses and legumes. Table below is a general guideline for limestone application.

SOIL TEXTURE	TONS/ACRE	LBS./1,000 SQ. FT.
Clay, clay loam, and high organic soil	3	135
Sandy loam, loam, silt loam	2	90
Loamy sand, sand	1	45

Pulverized dolomitic limestone is preferred for most soils south of the New Brunswick-Trenton line.

B. Work lime and fertilizer into the soil as nearly as practical to a depth of 4 inches with a disc, springtooth harrow, or other suitable equipment. The final harrowing or discing operation should be on the general contour. Continue tillage until a reasonably uniform seedbed is prepared.

C. Inspect seedbed just before seeding. If traffic has left the soil compacted, the area must be retilled as above.

D. Soils high on sulfides or having a pH of 4 or less refer to Standard for Management of High Acid Producing Soils, pg. 1-1 of the Standards for Soil Erosion and Sediment Control in New Jersey.

III. Seeding

A. Select seed from recommendations in Table.

SEED TYPES	SEEDING RATES 1/ (pounds)		OPTIMUM SEEDING DATE 2/ Based on Plant Hardiness Zone 3/			OPTIMUM SEED DEPTH 4/- (inches)
	Per Acre	Per 1,000 Sq. Ft.	ZONE 5	ZONE 6	ZONE 7	
COOL SEASON GRASSES						
Perennial ryegrass	100	1.0	3/15-6/1 8/1-9/15	3/1-5/15 8/15-10/1	2/15-5/1 8/15-10/15	0.5
Spring Oats	86	2.0	3/15-6/1 8/1-9/15	3/1-5/15 8/15-10/1	2/15-5/1 8/15-10/15	1.0
Winter Barley	96	2.2	8/1-9/15	8/15-10/1	8/15-10/15	1.0
Winter Cereal Rye	112	2.8	8/1-11/1	8/1-11/15	8/1-12/15	1.0
WARM SEASON GRASSES						
Pearl millet	20	0.5	6/1-8/1	5/15-8/15	5/1-9/1	1.0
Millet (German or Hungarian)	30	0.7	6/1-8/1	5/15-8/15	5/1-9/1	1.0
Weeping lovegrass	5	0.2	6/1-8/1	5/15-8/15	5/1-9/1	0.25

1/ Seeding rate for warm season grass, shall be adjusted to reflect the amount of Pure Line Seed (PLS) as determined by a germination test result. No adjustment is required for cool season grasses.
2/ May be planted throughout summer if soil moisture is adequate or can be irrigated
3/ Plant Hardiness Zone (see below)
4/ Twice the depth for sandy soils

Zone 5b (-10 to -15) Portions of Sussex and Warren Counties

Zone 6a (-5 to -10) Portions of Sussex, Warren, Passaic, Morris, Somerset and Hunterdon counties.

Zone 6b (0 to -5) Portions of Bergen, Camden, Essex and Gloucester, Hunterdon, Mercer, Middlesex, Hudson, Monmouth, Ocean, Burington, Morris, Passaic, Somerset, Union, Atlantic, Cumberland, & Cape May counties.

Zone 7a (5 to 0) Portions of Camden, Gloucester, Salem, Cumberland, Cape May, Atlantic, Burlington, Ocean, and Monmouth counties.

Zone 7b (10 to 5) Portions of Cape May, Atlantic, Ocean and Monmouth counties.

B. Conventional Seeding - Apply seed uniformly by hand, cyclone (centrifugal) seeder, drop seeder, drill or cultipacker seeder. Except for drilled, hydroseeded or cultipacked seedings, seed shall be incorporated into the soil, to a depth of 1/4 to 1/2 inch, by raking or dragging. Depth of seed placement may be 1/4 inch deeper on coarse textured soil.

C. Hydroseeding is a broadcast seeding method usually involving a truck or trailer mounted tank, with an agitation system and hydraulic pump for mixing seed, water and fertilizer and spraying the mix onto the prepared seedbed. Mulch shall not be included in the tank with seed. Short fibered mulch may be applied with a hydroseeder following seeding. Hydroseeding is not a preferred seeding method because seed and fertilizer are applied to the surface and not incorporated into the soil. Poor seed to soil contact occurs reducing seed germination and growth. Hydroseeding may be used for areas too steep for conventional equipment to traverse or too obstructed with rocks, stumps, etc.

D. After seeding, firming the soil with a corrugated roller will assure good seed-to-soil contact, restore capillarity, and improve seeding emergence. This is the preferred method. When performed on the contour, sheet erosion will be minimized and water conservation on site will be maximized.

IV. Mulching

Mulching is required on all seeding. Mulch will insure against erosion before grass is established and will promote faster and earlier establishment. (The existence of vegetation sufficient to control soil erosion shall be deemed compliance with this mulching requirement.)

A. Straw or Hay. Unrotted small grain straw, hay free of seeds, or salt hay to be applied at the rate of 1-1/2 to 2 tons per acre (70 to 90 pounds per 1,000 square feet), except that where a crimper is used instead of liquid mulch-binder (tackifying or adhesive agent), the rate of application is 3 tons per acre. Mulch chopper-blowers must not grind the mulch. Hay mulch is not recommended for establishing fine turf or lawns due to the presence of weed seed.

Application. Spread uniformly by hand mechanically so that approximately 85% of the soil surface will be covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000 square feet sections and distribute 70 to 90 pounds within each section.

Anchoring should be accomplished immediately after placement to minimize loss by wind or water. This may be done by one of the following methods, depending upon the size of the area, steepness of slopes, and costs.

1. Peg and Twine - Drive 8 to 10 inch wooden pegs to within 2 to 3 inches of the soil surface every 4 feet in all directions. Stakes may be driven before or after applying mulch. Secure mulch to soil surface by stretching twine between pegs in a criss-cross and a square pattern. Secure twine around each peg with two or more round turns.

2. Mulch Nettings - Staple paper, jute, cotton, or plastic nettings to the soil surface. Use a degradable netting in areas to be mowed.

IV. Mulching (continued)

3. Crimper (mulch anchoring tool) - A tractor-drawn implement, somewhat like a disc-harrow, especially designed to push or cut some of the broadcast long fiber mulch 3 to 4 inches into the soil so as to anchor it and leave part standing upright. This technique is limited to areas traversable by a tractor, which must operate on the contour of slopes. Straw mulch rate must be 3 tons per acre. No tackifying or adhesive agent is required.

4. Liquid Mulch-Binders - May be used to anchor salt hay or straw mulches.

a. Applications should be heavier at edges where wind catches the mulch, in valleys, and at crests of banks. Remainder of area should be uniform in appearance.

b. Use one of the following:

(1) Emulsified asphalt - (SS-1, CSS-1, CMS-2, MS-2, RS-1, RS-2, CRS-1, and CRS-2).
Apply 0.04 gal./sq. yd. or 194 gal./acre on flat slopes less than 8 feet high. On slopes 8 feet or more high, use 0.075 gal./sq. yd. or 363 gal./acre. These materials may be difficult to apply uniformly and will discolor surfaces.

(2) Organic and Vegetable Based Binders - Naturally occurring, powder based, hydrophilic materials when mixed with water formulates a gel and when applied to mulch under satisfactory curing conditions will form membranad networks of insoluble polymers. The vegetable gel shall be physiologically harmless and not result in a phytotoxic effect or impede growth of turfgrass. Use at rates and weather conditions as recommended by the manufacturer to anchor mulch materials. Many new products are available, some of which may need further evaluation for use in this state.

(3) Synthetic binders - High polymer synthetic emulsion, miscible with water when diluted and following application to mulch, drying and curing shall no longer be soluble or dispersible in water. It shall be applied at rates recommended by the manufacturer and remain tacky until germination of grass.

B. Wood-fiber or paper-fiber mulch. Shall be made from wood, plant fibers or paper containing no growth or germination inhibiting materials, used at the rate of 1,500 pounds per acre (or as recommended by the product manufacturer) and may be applied by a hydroseeder. This mulch shall not be mixed in the tank with the seed. Use is limited to flatter slopes and during optimum seeding periods in spring and fall.

C. Pelletized mulch. Compressed and extruded paper and/or wood fiber product, which may contain co-polymers, tackifiers, fertilizers and coloring agents. The dry pellets, when applied to a seeded area and watered, form a mulch mat. Pelletized mulch shall be applied in accordance with the manufacturers recommendations. Mulch may be applied by hand or mechanical spreader at the rate of 60-75 lbs/1,000 square feet and activated with 0.2 to 0.4 inches of water. This material has been found to be beneficial for use on small lawn or renovation areas, seeded areas where weed-seed free mulch is desired or on sites where straw mulch and tackifier agent are not practical or desirable.

Applying the full 0.2 to 0.4 inches of water after spreading pelletized mulch on the seed bed is extremely important for sufficient activation and expansion of the mulch to provide soil coverage.

STANDARD FOR MANAGEMENT OF HIGH ACID PRODUCING SOILS

Definition

Identifying high acid producing soil which may be exposed during excavation and land grading activities and practices for its burial. High acid producing soils are soils with a pH of 4 or less or contain iron sulfide.

Purpose

To prevent or limit exposure, exposure time and spreading by equipment or rainfall on and off site and minimize erosion, sedimentation and acid leachate related damages.

By its exposure to air, soils containing iron sulfide, characterized by pyrite or marcasite nuggets or green sands, causes chemical oxidation to occur producing sulfuric acid and results in soil pH levels falling to pH 3 and lower. Most vegetation is incapable of growth at this pH level. Adjacent land and receiving waters will be negatively impacted by the acid leachate. Calcium containing materials such as sidewalks, culverts and other structures and some metallic materials are also susceptible to degradation. Agricultural limestone materials applied at rates of 8 tons per acre have resulted in only a temporary buffering effect and "liming-only" is therefore not considered an acceptable mitigation practice.

Water Quality Enhancement

Protects on site soils and offsite streams and lakes from sulfuric acid leachate which creates soil pH conditions unsuitable for growth of vegetation.

Where Applicable

This practice is applicable to any high acid producing soil materials. Such materials have been found in the Coastal Plain areas of Burlington, Camden, Gloucester, Mercer, Middlesex, Monmouth, Ocean and Salem Counties.

Planning Criteria

Early recognition and burial, removal or disposal of high acid producing soils is essential for limiting the amount of acidic material produced.

Review a surface geology map for the proposed site to investigate the presence of geologic formations which commonly contain high acid producing deposits. The geologic formations are as follows:

Englishtown Sand	Navesink Formation
Kirkwood Formation	Raritan Formation
Magothy Formation	Red Bank Sand
Marshalltown Formation	Woodbury Clay
Merchantville Formation	

Figure 1-1 on Page 1-3 shows areas where these deposits may be present.

Contact the local Soil Conservation District to determine the historical presence of high acid producing soils in the vicinity of the proposed development site.

High acid producing soils may be present in undisturbed soils at varying depths including near the soil surface to excavations or deep disturbances. Its presence on a site may be significant or limited in the soil profile. High acid producing soils are commonly black, dark brown, gray or greenish with silvery pyrite or marcasite nuggets or flaked. Alternatively, sandy soils or reddish, yellowish or light to medium brown soil materials are usually free of high acid producing deposits.

Methods and Materials

1. Limit the excavation area and exposure time when high acid producing soils are encountered.
2. Topsoil stripped from the site shall be stored separately from temporarily stockpiled high acid producing soils.
3. Stockpiles of high acid producing soil should be located on level land to minimize its movement, especially when this material has a high clay content.
4. Temporarily stockpiled high acid producing soil material to be exposed more than 30 days should be covered with properly anchored, heavy grade sheets of polyethylene where possible. If not possible, stockpiles shall be covered with a minimum of 3 to 6 inches of wood chips to minimize erosion of the stockpile. Silt fence shall be installed at the toe of slope to contain movement of the stockpiled material. Topsoil shall not be applied to the stockpiles to prevent topsoil contamination with high acid producing soil.
5. High acid producing soils with a pH of 4 or less, or containing iron sulfide (including borrow from cuts), shall be ultimately placed or buried with limestone applied at the rate of 6 tons per acre (or 275 pounds per 1,000 square feet of surface area) and covered with a minimum of 12 inches of soil with a pH of 5 or more except as follows:
a. Areas where trees or shrubs are to be planted shall be covered with a minimum of 24 inches of soil with a pH of 5 or more.
b. Disposal areas shall not be located within 24 inches of any surface of a slope or bank, such as berms, stream banks, ditches and others to prevent potential lateral leaching damages.
6. Equipment used for movement of high acid producing soils should be cleaned at the end of each day to prevent spreading of high acid soil materials to other parts of the site, into streams or stormwater conveyances and to protect machinery from accelerated rusting.
7. Non-vegetative erosion control practices (stone tracking pads, strategically placed limestone check dam, silt fence, wood chips) should be installed to limit the movement of high acid producing soils from, around or off the site.
8. Following burial or removal of high acid producing soil, topsoiling and seeding of the site (see Temporary Vegetative Cover for Soil Stabilization, pg. 7-1, Permanent Vegetative Cover for Soil Stabilization, pg. 4-1 and Topsoiling, pg. 8-1), monitoring should continue for approximately 6 to 12 months to assure there is adequate stabilization and that no high acid soil problems emerge. If problems still exist, the affected area must be treated as indicated above to correct the problem.
9. Monitoring of areas where high acid producing soil has been placed or buried should be performed for at least 2 years or longer if problems occur, to assure there is no migration of potential acid leachate.

STANDARD FOR PERMANENT VEGETATIVE COVER FOR SOIL STABILIZATION

Definition

Establishment of permanent vegetative cover on exposed soils where perennial vegetation is needed for long term protection.

Purpose

To permanently stabilize the soil, assuring conservation of soil and water, and to enhance the environment.

Water Quality Enhancement

Slows the overland movement of stormwater runoff, increases infiltration and retains soil and nutrients on site, protecting streams or other stormwater conveyances.

Where Applicable

On exposed soils that have a potential for causing off-site environmental damage.

Methods and Materials

I. Site Preparation

A. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and mulch anchoring. All grading should be done in accordance with Standards for Land Grading, p. 19-1.

B. Install needed erosion control practices or facilities such as diversions, grade stabilization structures, channel stabilization measures, sediment basins, and waterways. See Standards 11 through 42.

C. Immediately prior to seeding, the surface should be scarified 6" to 12" where there has been compaction. This practice is permissible only where there is no danger to underground utilities (cables, irrigation systems, etc.).

II. Seedbed Preparation

A. Apply ground limestone and fertilizer according to soil test recommendations such as those offered by Rutgers Co-operative Extension. Soil sample mailers are available from the local Rutgers Cooperative Extension offices. Fertilizer shall be applied at the rate of 500 pounds per acre or 11 pounds per 1,000 square feet of 10-20-10 or equivalent with 50% water insoluable nitrogen unless a soil test indicates otherwise. Apply limestone in accordance with the table below and the results of soil testing. Calcium carbonate is the equivalent and standard for measuring the ability of liming materials to neutralize soil acidity and supply calcium and magnesium to grasses and legumes. Table below is a general guideline for limestone application rates.

SOIL TEXTURE	TONS/ACRE	LBS./1,000 SQ. FT.
Clay, clay loam, and high organic soil	3	135
Sandy loam, loam, silt loam	2	90
Loamy sand, sand	1	45

Pulverized dolomitic limestone is preferred for most soils south of the New Brunswick-Trenton line.

B. Work lime and fertilizer into the soil as nearly as practical to a depth of 4 inches with a disc, springtooth harrow, or other suitable equipment. The final harrowing or discing operation should be on the general contour. Continue tillage until a reasonably uniform seedbed is prepared.

C. Immediately prior to seeding, the surface should be scarified 6" to 12" where there has been soil compaction. This practice is permissible only where there is no danger to underground utilities (cables, irrigation systems, etc.).

D. High acid producing soil.
Soils having a pH of 4 or less or containing iron sulfide shall be covered with a minimum of 12 inches of soil having a pH of 5 or more before initiating seedbed preparation. See standard for Management of High Acid Producing Soils.

III. Seeding

A1. Permanent seed mix shall be as follows:

Seed mixture Type "G"

Kind of Seed	Minimum Purity-%	Minimum Germination-%	Application Rate Pounds/Acre
'Millennium' Tall Fescue	95	80	150
'Brooklawn' Kentucky Bluegrass	95	85	50
'Manhattan 4' Perennial Rye	95	85	50
		Total	250 Pounds/Acre

Turf Seeding Mixture Type 'G' shall be placed near the conclusion of construction and shall be accomplished via silt or drill seeder methods only. The seeds shall then be very lightly covered with screened topsoil, to a depth of no more than two to threes the diameter of seed, or $\frac{1}{4}$" maximum.

Finished seeded areas shall be smooth and shall conform to the prescribed lines and elevations. All seeded areas shall be mulched with straw, free from any weed seeds whatsoever, and held in place with a binder, both as specified in G1 and G2 below. Hay shall not be utilized.

G1. Binders

I. Binders for mulch shall be one of the following:
1. Emulsified asphalt, grades CSS-1, CSS-1h, SS-1, or SS-1h.
2. Fiber mulch made from wood or plant fibers containing no growth or germination inhibiting materials.
3. Synthetic plastic emulsion shall be miscible with all normally available water when diluted to any proportions. After drying, the synthetic plastic binder shall no longer be soluble or dispersible in water but shall remain tacky until the grass seed has germinated. The plastic binder shall be physiologically harmless and shall not have phytotoxic or crop-damaging properties.
4. Vegetable based gels which can be classified as naturally occuring powder-based hydrophilic additives formulated to provide gels, which applied under curing conditions shall form membrance networks of water insoluble polymers. The vegetable gel shall be physiologically harmless and shall not have phytotoxic or crop-damaging properties.

II. Mulch

Straw shall be stalks of oats, wheat, rye, or barley relatively free from seeds, noxious weeds, and other foreign material.
Wood cellulose fiber shall consist of wood cellulose fibers having no growth or germination inhibiting material.
Shredded wood mulch shall be produced by a shredding machine that produces a wood particle varying in size from 5/8 to 3 inches.
Wood chip mulch shall be produced by wood chipping machine which produces a wood particle varing in size from 5/8 to 3 inches.
Shredded wood mulch and wood chip mulch shall not be decomposed and shall be clean and hard and shall not contain leaves, twigs, wood shaving, dirt, stones, toxic material, or other foreign material. The source of the material shall not be wood pallets, chemically treated wood, or materials form building demolition. The pH shall be above 3.0.
Select wood chips produced from clearing operations that are reasonably in conformance with the above are acceptable.
Sample of shredded or wood chip mulch shall be submitted for approval before delivery to the project. Visual inspection of each shipment of shredded or wood chip mulch will be made upon delivery to the project.
Shredded hardwood bark mulch shall be derived from the bark of hardwood trees and shall be twice shredded a fine textur. It shall not contain leaves, twigs, wood shavings, dirt, stones, weed seeds, toxic material, or other foreign material.
Each shipment of shredded or wood chip mulch and shredded hardwood bark mulch shall be accompanied by a delivery slip, furnished at the time of delivery, and a certification. This certification shall include a statement to the effect that the material was not derived from wood pallets, chemically treated wood, or material from building demolition.
Stone shall be coarse aggregate, approximately size No. 4. Sample shall be sumbitted for approval of size and color.
Gravel shall be uncrushed washed gravel, approximately size No. 4. Sample shall be submitted for approval of size and color.

G2. Construction Requirements

Seeded area shall be mulched within seven days. Seed areas shall be mulched with straw uniformly spread in a layer 1 to $1\frac{1}{2}$ inches thick, loose measurement, and shall be bound in place with one of the following binders:
1. Emulsified Asphalt. Emulsified asphalt shall be applied at the rate of 240 gallons per acre.
2. Fiber Mulch. Fiber mulch shall be mixed with water and applied by hydraulic equipment. The fiber mulch shall be used as recommended by the manufacturer except that no less than 400 pounds of the dry product shall be used per acre. The mixture shall be evenly distributed over the straw mulch.
3. Synthetic Plastic Emulsion. Synthetic plastic emulsion shall be applied by hydraulic pressure equipment at rate of 30 gallons (264 pounds) of undiluted material per acre. The synthetic binder shall be diluted in water at ratio of 1:15. Application of synthetic binder shall not be made during rain or in freeze weather.
4. Vegetable-Based Gels. Vegetable-based dels shall be mixed with water and applied by hydraulic pressure equipment. The vegetables-base gels shall be used as recommended by the manufacturer except that no less than 40 pounds of the dry material shall be thoroughly mixed with 750 gallons of water per acre. Application of vegetable-based gels shall not be made during rain or in freezing weather.
When immediate protection of newly graded slopes is necessary at other than during optimum seeding seasons, straw mulch shall be applied with a temporary seed mixture.
Straw mulch shall be left in place and allowed to disintergrate.
If, before Acceptance, any straw mulch is dipiaced before the grass has made a growth of $1\frac{1}{2}$ inches, the area shall be refertilized, reseeded, and remulched without additional compensation.
The specified plant pits of individual trees or shrubs, including the saucer to its outer edge and the entire beds, where material is planted in beds, shall be mulched with a 3 to 4-inch layer of wood chips, stone, gravel, or shedded hardwood bark, as directed. For Hemerocallis beds, the entire area shall be mulched with a 2-inch layer of wood mulch. In naturalized areas, each Hemerocallis plant shall be individually mulched with a 2-inch layer of wood mulch. For perennial beds, the area shall be mulched with a 2-inch layer of wood mulch. If, before Acceptance, any mulch is displaced, the planting area shall be remulched without additional compensation.

A. Water Tolerance mix shall be as follows:

Kind of Seed	Minimum Purity-%	Minimum Germination-%	% of Total Weight Mixture	Planting Rate Pounds/Acre
Deertongue	95	85	32	20
Redtop	92	85	4	2
Wild rye (Elymus)	98	85	24	15
Switchgrass	95	85	40	25

B. Conventional Seeding - Apply seed uniformly by hand, cyclone (centrifugal) seeder, drop seeder, drill or cultipacker seeder. Except for drilled, hydroseeded or cultipacked seedings, seed shall be incorporated into the soil within 24 hours of seedbed preparation to a depth of 1/4 to 1/2 inch, by raking or dragging. Depth of seed placement may be 1/4 inch deeper on coarse textured soil.

C. Hydroseeding is a broadcast seeding method usually involving a truck or trailer mounted tank, with an agitation system and hydraulic pump for mixing seed, water and fertilizer and spraying the mix onto the prepared seedbed. Mulch shall not be included in the tank with seed. Short fibered mulch may be applied with a hydroseeder following seeding. Hydroseeding is not a preferred seeding method because seed and fertilizer are applied to the surface and not incorporated into the soil. Poor seed to soil contact occurs reducing seed germination and growth. Hydroseeding may be used for areas too steep for conventional equipment to traverse or too obstructed with rocks, stumps, etc.

D. After seeding, firming the soil with a corrugated roller will assure good seed-to-soil contact, restore capillarity, and improve seeding emergence. This is the preferred method. When performed on the contour, sheet erosion will be minimized and water conservation on site will be maximized.

IV. Mulching

Mulching is required on all seeding. Mulch will insure against erosion before grass is established and will promote faster and earlier establishment. (The existence of vegetation sufficient to control soil erosion shall be deemed compliance with this mulching requirement.)

A. Straw or Hay. Unrotted small grain straw, hay free of seeds, or salt hay to be applied at the rate of 1-1/2 to 2 tons per acre (70 to 90 pounds per 1,000 square feet), except that where a crimper is used instead of liquid mulch-binder (tackifying or adhesive agent), the rate of application is 3 tons per acre. Mulch chopper-blowers must not grind the mulch. Hay mulch is not recommended for establishing fine turf or lawns due to the presence of weed seed.

Application. Spread uniformly by hand mechanically so that approximately 85% of the soil surface will be covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000 square feet sections and distribute 70 to 90 pounds within each section.

Anchoring should be accomplished immediately after placement to minimize loss by wind or water. This may be done by one of the following methods, depending upon the size of the area, steepness of slopes, and costs.

1. Peg and Twine - Drive 8 to 10 inch wooden pegs to within 2 to 3 inches of the soil surface every 4 feet in all directions. Stakes may be driven before or after applying mulch. Secure mulch to soil surface by stretching twine between pegs in a criss-cross and a square pattern. Secure twine around each peg with two or more round turns.

2. Mulch Nettings - Staple paper, jute, cotton, or plastic nettings to the soil surface. Use a degradable netting in areas to be mowed.

3. Crimper (mulch anchoring tool) - A tractor-drawn implement, somewhat like a disc-harrow, especially designed to push or cut some of the broadcast long fiber mulch 3 to 4 inches into the soil so as to anchor it and leave part standing upright. This technique is limited to areas traversable by a tractor, which must operate on the contour of slopes. Straw mulch rate must be 3 tons per acre. No tackifying or adhesive agent is required.

4. Liquid Mulch-Binders - May be used to anchor salt hay or straw mulches.

a. Applications should be heavier at edges where wind catches the mulch, in valleys, and at crests of banks. Remainder of area should be uniform in appearance.

(1) Organic and Vegetable Based Binders - Naturally occurring, powder based, hydrophilic materials when mixed with water formulates a gel and when applied to mulch under satisfactory curing conditions will form membranad networks of insoluble polymers. The vegetable gel shall be physiologically harmless and not result in a phytotoxic effect or impede growth of turfgrass. Use at rates and weather conditions as recommended by the manufacturer to anchor mulch materials. Many new products are available, some of which may need further evaluation for use in this state.

(2) Synthetic binders - High polymer synthetic emulsion, miscible with water when diluted and following application to mulch, drying and curing shall no longer be soluble or dispersible in water. It shall be applied at rates recommended by the manufacturer and remain tacky until germination of grass.

B. Wood-fiber or paper-fiber mulch. Shall be made from wood, plant fibers or paper containing no growth or germination inhibiting materials, used at the rate of 1,500 pounds per acre (or as recommended by the product manufacturer) and may be applied by a hydroseeder. This mulch shall not be mixed in the tank with the seed. Use is limited to flatter slopes and during optimum seeding periods in spring and fall.

C. Pelletized mulch. Compressed and extruded paper and/or wood fiber product, which may contain co-polymers, tackifiers, fertilizers and coloring agents. The dry pellets, when applied to a seeded area and watered, form a mulch mat. Pelletized mulch shall be applied in accordance with the manufacturers recommendations. Mulch may be applied by hand or mechanical spreader at the rate of 60-75 lbs/1,000 square feet and activated with 0.2 to 0.4 inches of water. This material has been found to be beneficial for use on small lawn or renovation areas, seeded areas where weed-seed free mulch is desired or on sites where straw mulch and tackifier agent are not practical or desirable.

Applying the full 0.2 to 0.4 inches of water after spreading pelletized mulch on the seed bed is extremely important for sufficient activation and expansion of the mulch to provide soil coverage.

V. Irrigation (where feasible)

If soil moisture is deficient, and mulch is not used, supply new seedings with adequate water (a minimum of 1/4 inch twice a day until vegetation is well established). This is especially true when seedings are made in abnormally dry or hot weather or on droughty sites.

VI. Topdressing

Since slow release nitrogen fertilizer (water insoluble is prescribed in Section II.A. Seedbed preparation in this standard, no follow-up of topdressing is mandatory. An exception may be made where gross nitrogen deficiency exists to the extent that turf failure may develop. In that instance, topdress with 10-10-10 or equivalent at 400 pounds per 1,000 square feet.

VII. Establishing Permanent Vegetative Stabilization

The quality of permanent vegetation rests with the contractor. The timing of seeding, preparing the seedbed, applying nutrients, mulch and other management are essential. The seed application rate is required when a Report of Compliance is requested prior to actual establishment of permanent vegetation. Up to 50% reduction in application rates may be used when permanent vegetaion is established prior to requesting a Report of Compliance from the district. This rate applies to all methods of seeding. Establishing permanent vegetation means 80% vegetative cover (of the seeded species) and mowed once.

NOTE: NO STAGING AND STOCKPILING IS PROPOSED.

STANDARD FOR STABILIZATION WITH MULCH ONLY

Definition

Stabilizing exposed soils with non-vegetative material.

Purpose

To protect exposed soil surfaces from erosion damage and to reduce offsite environmental damage.

Water Quality Enhancement

Provides temporary mechanical protection against wind or rainfall induced soil erosion until permanent vegetative cover may be established.

Where Applicable

This practice is applicable to areas subject to erosion, where the season and other conditions may not be suitable for growing an erosion resistant cover or where stabilization is needed for a short period until more suitable protection can be applied.

Method and Materials

1. Site Preparation

A. Grade as neededand feasible to permit the use of conventional equipment and mulch anchoring. All grading should be done in accordance with Standards for Land Grading, pg. 19-1.

B. Install needed erosion control practices or facilities such as diversions, grade stabilization structures, channel stabilization measures, sediment basins, and waterways. See Standards 11 through 42.

2. Protective Materials

A. Unrotted small-grain straw, or salt hay 2.0 to 2.5 tons per acre is spread uniformly at 90 to 115 pounds per 1,000 square feet and anchored with a mulch anchoring tool, liquid mulch binders, or netting tie down. Other suitable materials may be used if approved by the Soil Conservation District.

B. Asphalt emulsionis recommended at the rate of 600 to 1,200 gallons per acre. This is suitable for a limited period of time where travel by people, animals, or machines is not a problem.

C. Synthetic or organic soil stabilizers may be used under siutable conditions and in quantities as recommended by the manufacturer.

D. Wood-fiber or paper-fiber mulch at the rate of 1,500 pounds per acre (or according to the manufacturer's requirements) may be applied by a hydroseeder.

E. Mulch netting, such as paper jute, excelsior, cotton, or plastic, may be used.

F. Woodchips applied uniformly to a minimum depth of 2 inches may be used. Woodchips will not be used on areas where flowing water could wash them into an inlet and plug it.

G. Gravel, crushed stone, or slag at the rate of 9 cubic yards per 1,000 sq. ft. applied uniformly to a minimum depth of 3 inches may be used. Size 2 or 3 (ASTM C-33) is recommended.

3. Mulch anchoring should be accomplished immediately after placement of hay or straw mulch to minimize loss by wind or water. This may be done by one of the following methods, depending upon the size of the area and steepness of slopes.

A. Peg and Drive - Drive 8 to 10 inch peg to within 2 to 3 inches of the soil surface every 4 feet in all directions. Stakes may be driven before of after applying mulch. Secure mulch to soil surface by stretching twine between pegs in a cris-cross and square pattern. Secure twine around each peg with two or more round turns.

B. Mulch nettings - Staple paper, cotton, amd plastic nettings over mulch. Use a epradable netting in areas to be mowed. Netting is usually available in rolls 4 feet wide and 300 feet long.

C. Crimper Mulch Anchoring Coulter Tool - A tractor-drawn implement especially desinged to punch and anchor mulch into the soil surface. This practice affards maximum erosion control, but its use is limited to those slopes upon which the tractor can operate safely. Soil penetration should be about 3 to 4 inches. On sloping land, the operation should be on the contour.

D. Liquid Mulch - Binders

1. Application should be havier at edge where wind catches the mulch, in valleys, and at crests of banks. Remainder of area should be uniform in appearance.

2. Use one of the following:

a. Emulsified Asphalt - (SS-1, CSS-1, CMS-2, MS-2, RS-1, RS-2, CRS-1, and CRS-2). Apply 0.04 gal/sq/yd or 194 gal/acre on flat areas and on slopes less than 8 ft of more high, use 0.075 gal/sq/yd or 363 gal/acre. This materials may be difficult to apply uniformly and will discolor surfaces.

b. Organic and Vegetable Based Binders - Naturally occuring, powder based hydrophilic material that mixed with water formulates a gel and when applied to mulch under satisfactory curing conditions will form membrane networks of insoluble polymers. The vegetable gel shall be physiologically harmless and not result in a phytotoxic effect of impede growth of turfgrass. Vegetable based gels shall be applied at rates and weather conditions recommended by the manufacturer.

c. Synthetic Binders - High polymer synthetic emulsion, miscible with water when diluted and following application to mulch, drying and curing shall no longer be soluble or dispersible in water. It shall be applied at rates and weather conditions recommended by the manufacturer and remain tacky until germination of grass.

NOTE: All page numbers and Standards references refer to "Standards for Soil Erosion and Sediment Control in New Jersey", July 1999, by the NEW JERSEY STATE SOIL CONSERVATION COMMITTEE.

NO.	DATE	REVISIONS	BY	CHECKED

COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

SOIL EROSION AND SEDIMENT CONTROL
NOTES & DETAILS

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EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
Edward R Klump 4/8/13 DATE
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STATE OF NEW JERSEY LICENSE No. GE37497

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DRAWING SE-2

SHEET 19 OF 31

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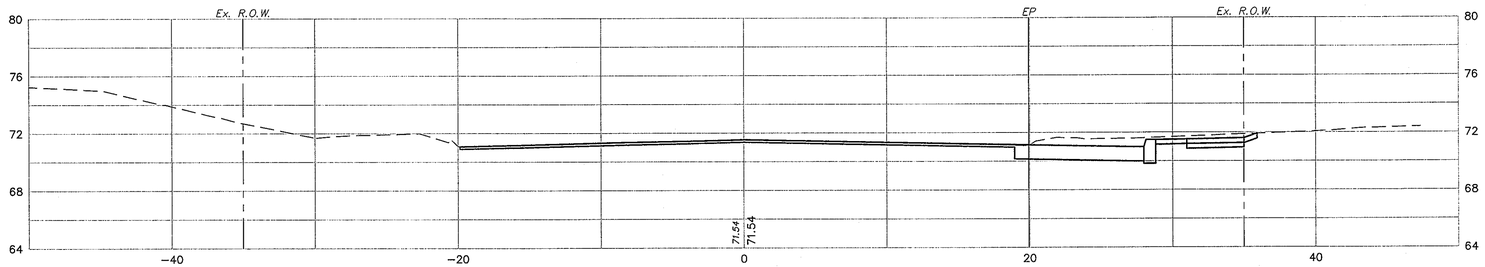
4+50



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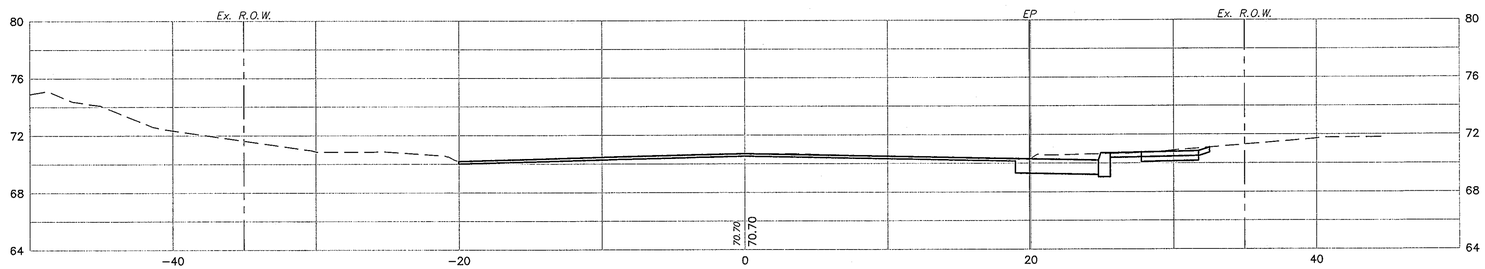

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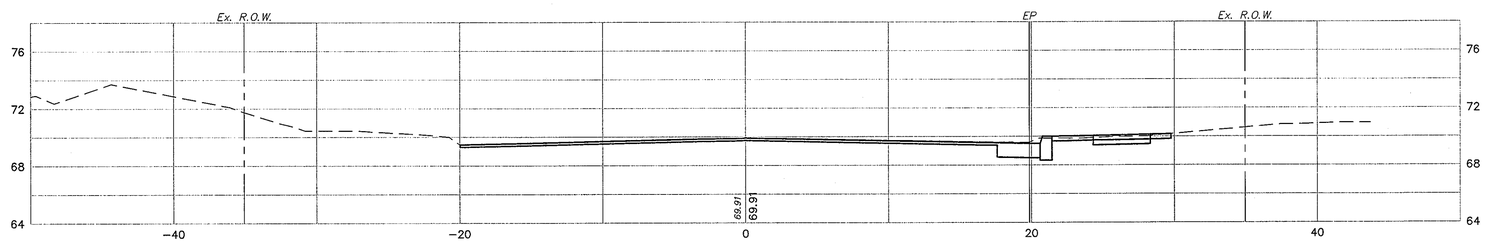

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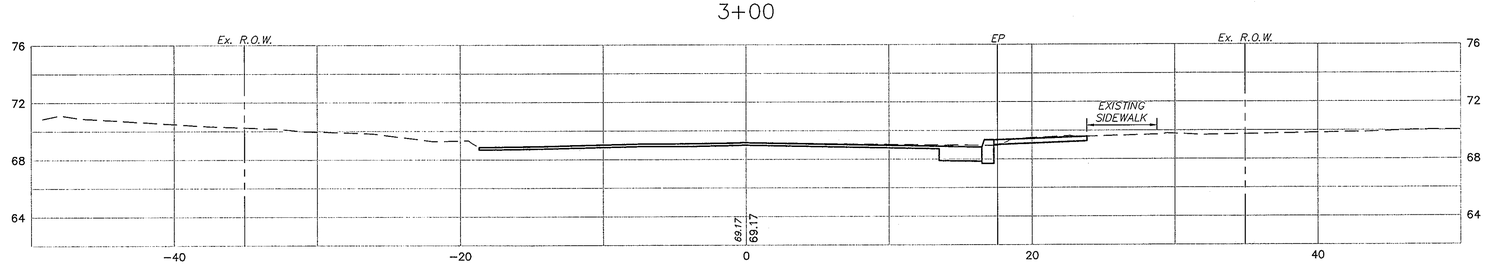

GRAPHIC SCALE

5 0 2.5 5 10

(IN FEET)
1 inch = 5 ft.

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SHEET 20 OF 31

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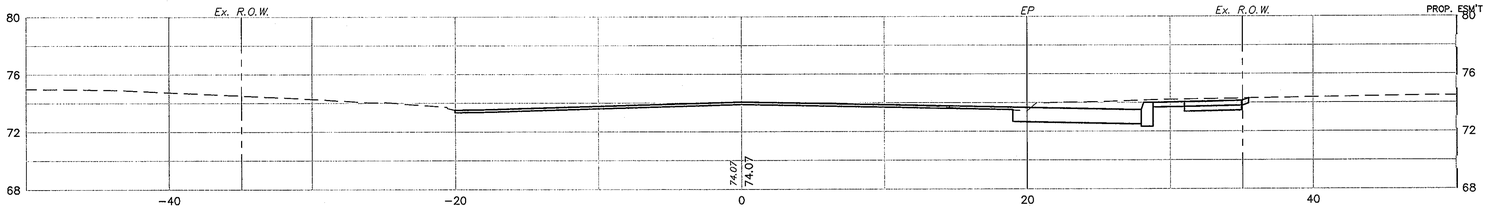

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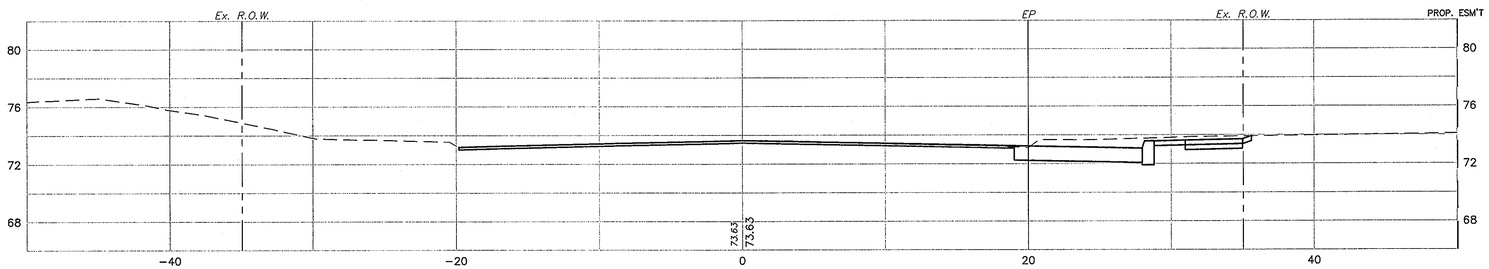

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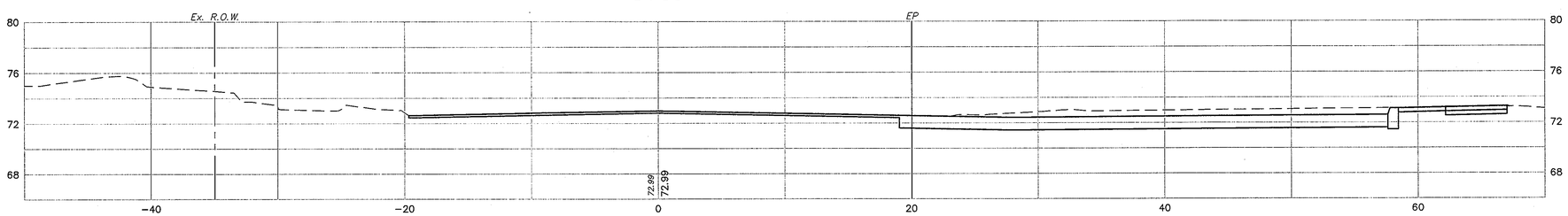

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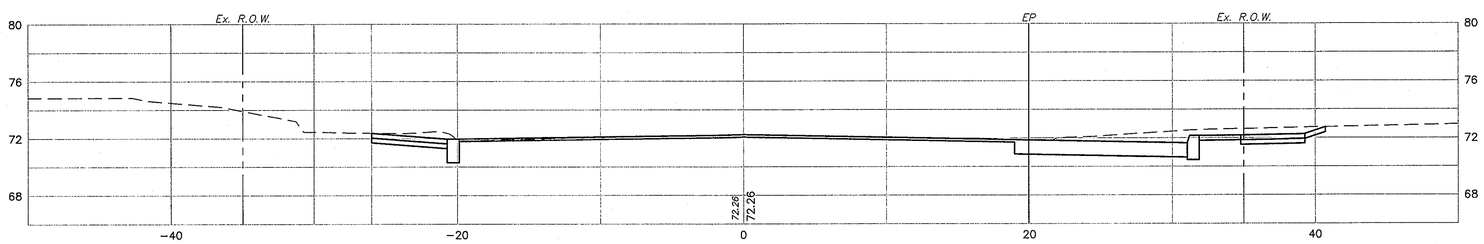

GRAPHIC SCALE

5 0 2.5 5 10

(IN FEET)
1 inch = 5 ft.

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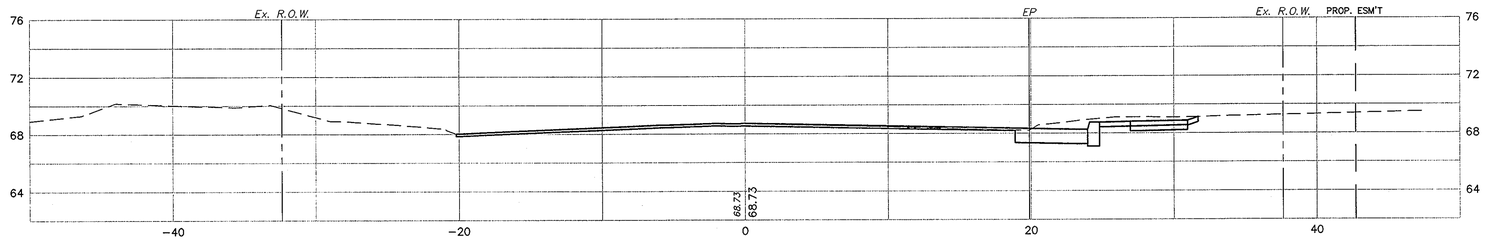
9+00



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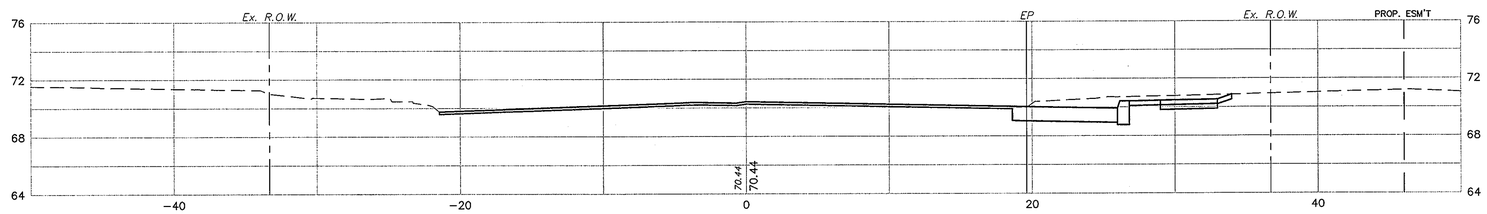

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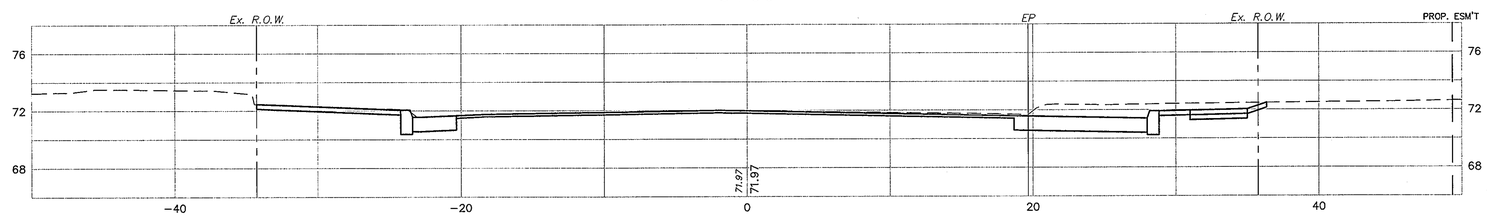

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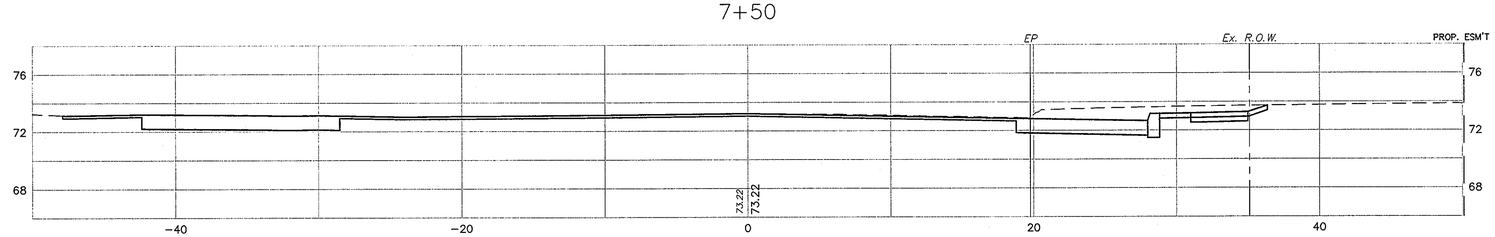

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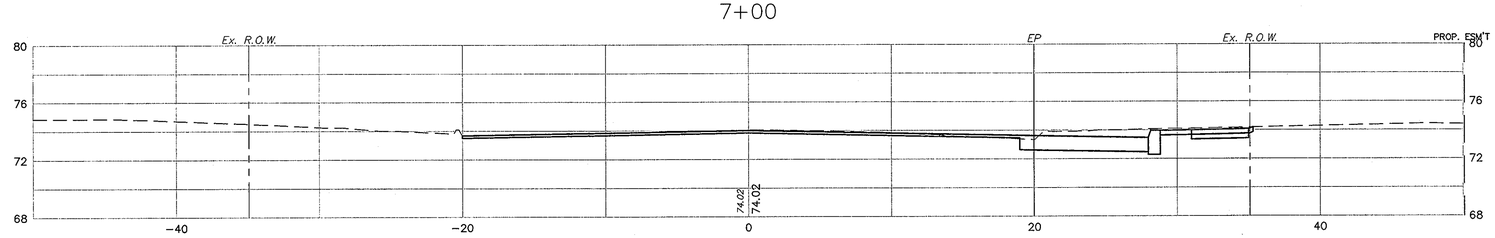

GRAPHIC SCALE

5 0 2.5 5 10

(IN FEET)
1 inch = 5 ft.

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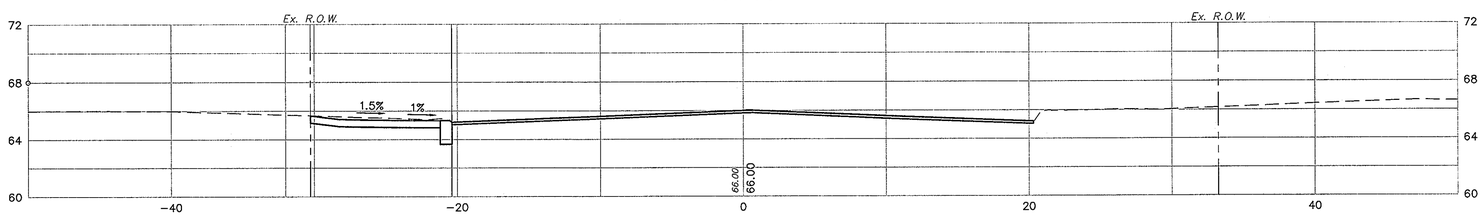
13+00



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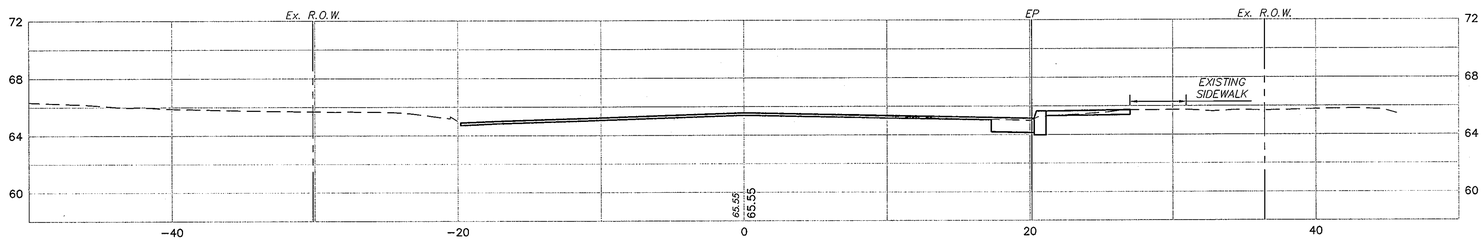

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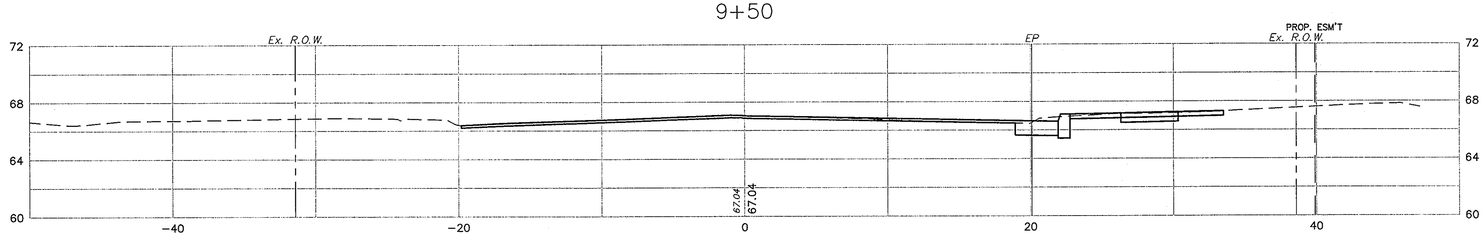

GRAPHIC SCALE

5 0 2.5 5 10

(IN FEET)
1 inch = 5 ft.

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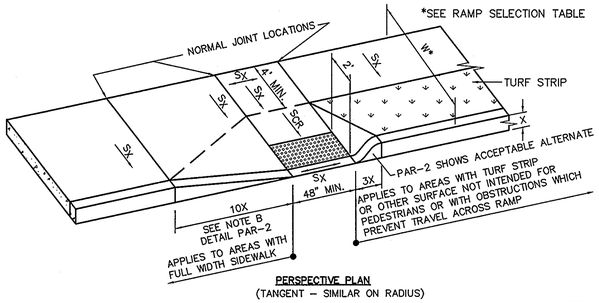
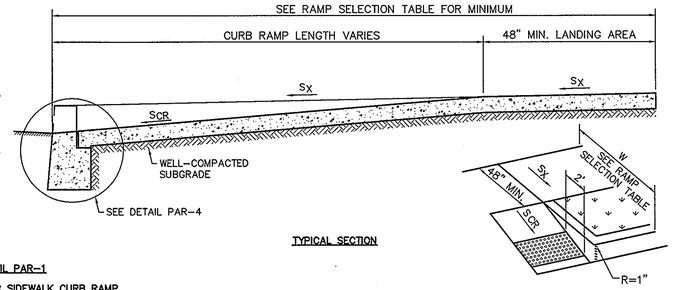


PERSPECTIVE PLAN
(TANGENT – SIMILAR ON RADIUS)



TYPICAL SECTION

DETAIL PAR-1

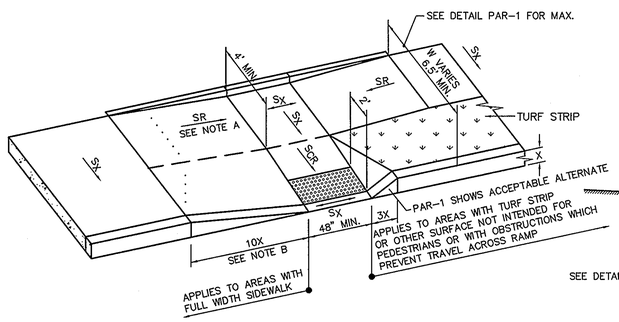
PERPENDICULAR PUBLIC SIDEWALK CURB RAMP

NOT TO SCALE

DETAIL PAR-1A

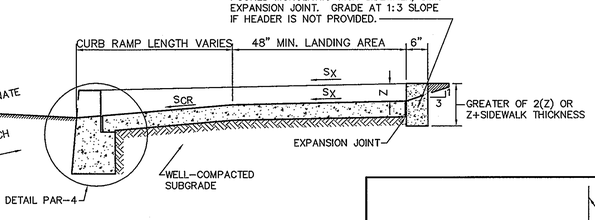
ALTERNATIVE CURB TRANSITION

WHERE SHOWN OR DIRECTED
NOT TO SCALE



PERSPECTIVE PLAN
(TANGENT – SIMILAR ON RADIUS)

PROVIDE CONCRETE CURB TYPE RETAINING HEADER WHERE Z IS GREATER THAN 2" OR WHERE SHOWN ON PLANS OR AS DIRECTED BY ENGINEER. NO SEPARATE PAYMENT FOR HEADER, INCLUDE IN COST OF SIDEWALK, 4" THICK. IF HEADER IS POURED MONOLITHIC WITH SIDEWALK, OMIT EXPANSION JOINT. GRADE AT 1:3 SLOPE IF HEADER IS NOT PROVIDED.



TYPICAL SECTION

DETAIL PAR-2

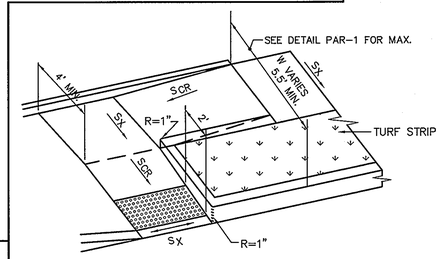
COMBINATION (PERPENDICULAR AND PARALLEL) PUBLIC SIDEWALK CURB RAMP

(APPLIES TO RAMPS WHERE DETAILS PAR-1 AND PAR-3 DO NOT APPLY)
NOT TO SCALE

NOTES:

A. TYPICAL MINIMUM RAMP LENGTH USING DESIGN (NOMINAL) OR MAXIMUM S_R FOR CURB HEIGHT (X) OF 6" OR LESS (SHOWN WITH DOTTED LINE). HOWEVER, FOR EASE OF CONSTRUCTION AND IMPROVED APPEARANCE BEGIN SLOPE AT EXPANSION JOINT OPPOSITE BEGINNING OF CURB TRANSITION UNLESS OTHERWISE DIRECTED BY ENGINEER. SLOPE WILL USUALLY BE MUCH LESS THAN 1:12. CONSULT ENGINEER WHEN IT IS NOT.

B. MAXIMUM SLOPE OF A SIDE FLARE WHERE PEDESTRIAN CIRCULATION IS POSSIBLE IS 10:1 MEASURED ALONG THE CURB LINE; NOT RELATIVE TO A LEVEL LINE.

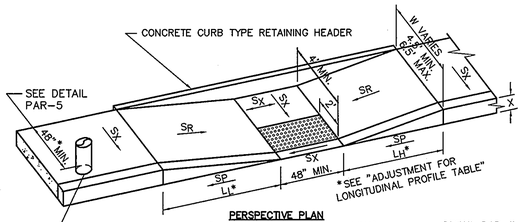


DETAIL PAR-2A

ALTERNATIVE CURB TRANSITION

WHERE SHOWN OR DIRECTED
NOT TO SCALE

PROVIDE CONCRETE CURB TYPE RETAINING HEADER UNLESS OTHERWISE DIRECTED BY ENGINEER. NO SEPARATE PAYMENT FOR HEADER, INCLUDE IN COST OF CONCRETE SIDEWALK, 4" THICK. IF HEADER IS POURED MONOLITHIC WITH SIDEWALK, OMIT EXPANSION JOINT. GRADE AT 1:3 SLOPE IF HEADER IS NOT PROVIDED.



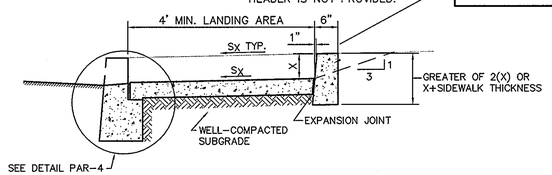
PERSPECTIVE PLAN
(TANGENT – SIMILAR ON RADIUS)

DETAIL PAR-3

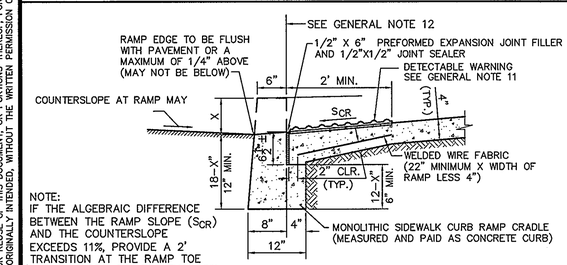
PARALLEL PUBLIC SIDEWALK CURB RAMP

(NO TURF SEPARATION STRIP)

NOT TO SCALE

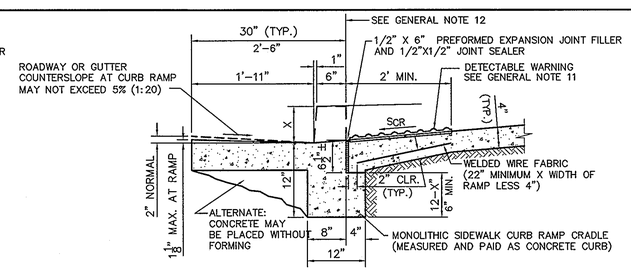


TYPICAL SECTION



NOTE:
IF THE ALGEBRAIC DIFFERENCE BETWEEN THE RAMP SLOPE (S_{CR}) AND THE COUNTERSLOPE EXCEEDS 11%, PROVIDE A 2' TRANSITION AT THE RAMP TOE WITH A SLOPE OF LESS THAN 2%.

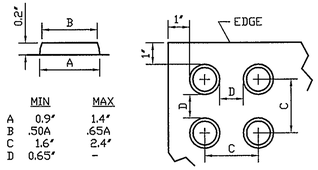
(USED WITH CONCRETE VERTICAL CURB)



(USED WITH CONCRETE COMBINATION CURB AND GUTTER)

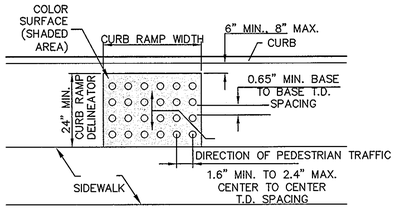
DETAIL PAR-4

MONOLITHIC SIDEWALK CURB RAMP CRADLE

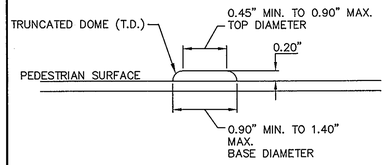


DETAIL – DETECTABLE WARNING

(SEE GENERAL NOTE 11)
NOT TO SCALE



PLAN VIEW



ELEVATION

DETECTABLE WARNING SURFACE

ADJUSTMENT FOR LONGITUDINAL PROFILE TABLE

LONGITUDINAL PROFILE (S ∂(%))	MINIMUM LENGTH OF 14H : 1V CURB TRANSITION (FEET/INCHES)															
	CURB HEIGHT (FACE) (INCHES)															
	3"		4"		5"		6"		7"		8"		9"		10"	
	HIGH SIDE (L_H)	LOW SIDE (L_L)	HIGH SIDE (L_H)	LOW SIDE (L_L)	HIGH SIDE (L_H)	LOW SIDE (L_L)	HIGH SIDE (L_H)	LOW SIDE (L_L)	HIGH SIDE (L_H)	LOW SIDE (L_L)	HIGH SIDE (L_H)	LOW SIDE (L_L)	HIGH SIDE (L_H)	LOW SIDE (L_L)	HIGH SIDE (L_H)	LOW SIDE (L_L)
SEE NOTE 2	3'6"	3'6"	4'9"	4'9"	5'10"	5'10"	7'0"	7'0"	8'2"	8'2"	9'5"	9'5"	10'6"	10'6"	11'8"	11'8"
0.2	3'7"	3'5"	4'10"	4'6½"	6'0"	5'8"	7'2"	6'10"	8'4"	7'11"	9'7"	9'1"	10'10"	10'2½	12'0"	11'4"
0.3	3'8"	3'4"	4'10½	4'6"	6'1"	4'7"	7'4"	6'8½"	8'6"	7'10"	9'9"	8'11"	10'11"	10'1"	12'2"	11'2"
0.4	3'8½"	3'3½"	4'11"	4'5"	6'2"	5'6"	7'5"	6'7½"	8'8"	7'9"	9'11"	8'10"	11'2"	9'11"	12'4"	11'0"
0.5	3'9"	3'3"	5'0"	4'4"	6'3"	5'5"	7'6"	6'6½"	8'9"	7'7½"	10'0"	8'9"	11'3"	9'10"	12'6"	10'11"
0.75	3'11"	3'2½"	5'2½"	4'3"	6'6"	5'4"	7'10"	6'5"	9'1½"	7'6"	10'5"	8'6½"	11'9"	9'7½"	13'0"	10'8"
1.00	4'1"	3'1"	5'5"	4'1"	6'9½"	5'1½"	8'2"	6'1½"	9'6"	7'2"	10'10"	8'2"	12'2"	9'2"	13'7"	10'2"
1.50	4'5"	2'11"	5'11"	3'10"	7'4"	4'10	8'10"	5'9½"	10'4"	6'9"	11'10"	7'8½"	13'4"	8'8"	14'9"	9'7"
2.00	4'10"	2'9"	6'6"	3'7½"	8'1"	4'7"	9'8½"	5'5½"	11'4"	6'4½"	12'11"	7'3½"	14'7"	8'2"	15'*	9'1½"
2.50 (NOTE 3)	5'4½"	2'7"	7'2"	3'5½"	9'0"	4'4"	10'9"	5'2"	12'6"	6'0½"	14'4"	6'11"	15'*	7'9"		8'7½"
3.00 "	6'0"	2'5½"	8'0"	3'3½"	10'0"	4'1½"	12'0"	4'11"	14'1"	5'9"	15'*	6'7"		7'4½"		8'3"
3.50 "	6'10"	2'4"	9'2"	3'1½"	11'5"	3'11"	13'8"	4'8"	15'*	5'6"		6'3"		7'0½"		7'10"
4.00 "	7'11"	2'3"	10'7"	3'0"	13'3"	3'9"	15'*	4'6"		5'3"		6'0"		6'9"		7'6"
4.50 "	9'5"	2'2"	12'7"	2'10½	15'*	3'7"		4'3½"		5'0"		5'8½"		6'5"		7'2"
5.00 "	11'7"	2'0½"	15'*	2'9"		3'5"		4'1½"		4'10"		5'6"		6'2"		6'10"
5.50 "	15'*	1'11½"		2'7½"		2'7½"		3'11½"		4'7½"		5'3"		5'11"		6'7"

*MAXIMUM RAMP LENGTH IS 15'. SEE NOTE 2, SIDEWALK DESIGN SLOPE AND TOLERANCES TABLE.

NOTES:
1. INTERPOLATE BETWEEN SLOPES SHOWN AS REQUIRED.
2. NO ADJUSTMENT FOR PROFILE SLOPES LESS THAN 0.2%.
3. CROSS SLOPE OF PUBLIC SIDEWALK CURB RAMP AT GUTTER SHOULD NOT BE GREATER THAN 2% (1:48) OR AS DIRECTED BY ENGINEER.
4. CONSULT ENGINEER FOR PROFILE SLOPES GREATER THAN 5.5%.

RAMP SELECTION TABLE

CURB FACE (X) (INCHES)	W NOT MORE THAN 6.5'	W (FEET) 8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0
3	DETAIL PAR-3 APPLIES												
4		8.5											
5			10.0										
6				11.75									
7					13.25								
8						14.75							
9							16.25						
10								17.75					19.25

DETAIL PAR-1 APPLIES

DETAIL PAR-2 APPLIES

SIDEWALK DESIGN SLOPE AND TOLERANCES TABLE

SYMBOL	DESCRIPTION	SLOPES (NOTE 1) DESIGN (NOMINAL)	MINIMUM	MAXIMUM
S_X	CROSS SLOPE OF PUBLIC SIDEWALK OR CROSS SLOPE OF CURB RAMP	1:60 1.67% 3/4" PER 4' 3/16" PER 1' (NOTE 3)	1:72 1.4% 5/8" PER 4' <3/16" PER 1' (NOTE 3)	1:48 2% 1" PER 4' 1/4" PER 1' (NOTE 3)
S_{CR}	LONGITUDINAL (RUNNING) SLOPE OF PUBLIC SIDEWALK CURB RAMP	1:14 7.1% 3 1/2" PER 4' (APPROX 7/8" PER 1')	1:48 2% 1" PER 4' 1/4" PER 1'	1:12 8.33% 1" PER 1'
S_R	LONGITUDINAL (RUNNING) SLOPE OF PARALLEL SIDEWALK CURB RAMP	1:14 7.1% 3 1/2" PER 4' (APPROX 7/8" PER 1')	1:48 2% 1" PER 4' 1/4" PER 1'	1:12 8.33% 1" PER 1' (NOTE 2)

WHEN THE ABOVE MAXIMUM S_{CR} OR S_R CANNOT BE ACHIEVED IN THE ALTERATION OF EXISTING FACILITIES THE ENGINEER, AFTER DETERMINING THAT ALTERNATE CURB RAMP ARRANGEMENTS WHICH WOULD ACHIEVE A MAXIMUM S_{CR} OR S_R OF 1:12 ARE NOT FEASIBLE, MAY PERMIT THE FOLLOWING MAXIMUM S_{CR} OR S_R:
10% (1:10) FOR A MAXIMUM RISE OF 6"
12.5% (1:8) FOR A MAXIMUM RISE OF 3"

NOTES:

1. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, CONSTRUCTION WHICH DOES NOT CONFORM TO THE TOLERANCES SPECIFIED (ie. WHICH EXCEEDS THE MAXIMUM OR IS LESS THAN THE MINIMUM) WILL BE REMOVED AND REPLACED WITHOUT COST TO THE OWNER.
2. THE MAXIMUM LENGTH FOR A PARALLEL PUBLIC SIDEWALK CURB RAMP SHALL BE 15 FEET. MAXIMUM LONGITUDINAL (RUNNING) SLOPE LIMITS (S_R) DO NOT APPLY IF LENGTH IS 15 FEET OR GREATER.
3. CROSS SLOPE OF CURB RAMP (S_X) TO MATCH ROADWAY PROFILE SLOPES (S_P) OF 1:48 (2%) OR LESS. IF S_P EXCEEDS 1:48 (2%), A TRANSITION MUST BE PROVIDED AT CURB RAMPS TO MAINTAIN S_X EQUAL TO OR LESS THAN 1:48 (2%). EXCEPTION: THIS DOES NOT APPLY AT MID-BLOCK CROSSINGS WHERE S_X AT CURB RAMPS MAY MATCH S_P, EVEN IF GREATER THAN 1:48 (2%).

GENERAL NOTES:

1. CONCRETE FOR CURBS, SIDEWALKS, CURB RAMPS AND MONOLITHIC CURB RAMP CRADLES SHALL BE NJDOT CLASS B.
2. CURB AND MONOLITHIC CURB RAMP CRADLES SHALL BE POURED IN A SEPARATE OPERATION FROM SIDEWALKS AND CURB RAMPS UNLESS OTHERWISE PERMITTED BY THE ENGINEER.
3. EXPANSION JOINTS WITH PREFORMED EXPANSION JOINT FILLER CONFORMING TO AASHTO M33, PREFORMED EXPANSION JOINT FILLER FOR CONCRETE (BITUMINOUS TYPE), SHALL BE PROVIDED AS FOLLOWS:
   3.1 1/2" THICK AT LONGITUDINAL INTERVALS OF APPROXIMATELY TWENTY FEET (20') AND BETWEEN ALL SIDEWALK CURB RAMPS AND MONOLITHIC CURB RAMP CRADLES.
   3.2 1/4" THICK BETWEEN CURB AND SIDEWALK, AROUND ALL STRUCTURES OR APPURTENANCES, SUCH AS MANHOLES, JUNCTION BOXES AND UTILITY POLES, AND ADJACENT TO ANY FIXED STRUCTURE.
4. EXPANSION JOINT MATERIAL SHALL BE TRIMMED AS TO BE SLIGHTLY BELOW THE SURFACE OF THE CONCRETE.
5. JOINT SEALER WHERE SHOWN OR REQUIRED SHALL CONFORM TO NJDOT SPECIFICATION 914. HOT-POURED JOINT SEALER SHALL CONFORM TO ASTM D 6690. COLD-APPLIED JOINT SEALER SHALL CONFORM TO ASTM D 5893, TYPE SL OR TYPE NS.
6. TOOLED JOINTS SHALL BE PROVIDED WITH A GROOVING TOOL SO AS TO DIVIDE THE CONCRETE SURFACE INTO BLOCKS AS CLOSELY APPROACHING A SQUARE AS PRACTICABLE. GROOVES SHALL BE CUT TO A DEPTH OF AT LEAST 1/2 INCH AND SHALL BE FINISHED WITH AN EDGING TOOL HAVING A RADIUS OF 1/4 INCH.
7. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, EXPANSION AND TOOLED JOINTS IN CONCRETE SURFACES SHALL BE ALIGNED WITH JOINTS IN CURBS.
8. WELDED WIRE FABRIC SHALL BE 6X6–6X6 (OLD DESIGNATION), 6X6–W2.9XW2.9 (NEW DESIGNATION) IN ACCORDANCE WITH ASTM A–185.
9. PUBLIC SIDEWALK CURB RAMPS, LANDINGS, BLENDED TRANSITIONS AND GUTTERS WITHIN THE PEDESTRIAN ACCESS ROUTE SHALL NOT CONTAIN GRATINGS, COVERS, UTILITY BOXES OR SIMILAR OBSTRUCTIONS. OUTSIDE OF THE ABOVE AREAS, GRATINGS IN PUBLIC SIDEWALKS MAY HAVE OPENINGS NO GREATER THAN 1/2 INCH WIDE MEASURED PARALLEL TO DIRECTION OF TRAVEL.
10. ALL PUBLIC SIDEWALK CURB RAMPS SHALL BE PROVIDED WITH A SLIP–RESISTANT BROOM FINISH ORIENTED PERPENDICULAR TO THE TRAVEL DIRECTION.
11. DETECTABLE WARNING SURFACES SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 606 OF THE SPECIFICATIONS AND THE SPECIAL PROVISIONS WHICH INCLUDE A LIST OF ACCEPTABLE SYSTEMS. UNLESS A SPECIFIC DETECTABLE WARNING SYSTEM IS REQUIRED BY THE SPECIAL PROVISIONS, THE CONTRACTOR MAY SELECT THE SYSTEM TO BE USED. ONLY ONE SYSTEM MAY BE USED ON ANY PROJECT. THE COLOR OF THE DETECTABLE WARNING SYSTEM SHALL BE AS REQUIRED BY THE SPECIAL PROVISIONS OR AS DIRECTED BY THE ENGINEER.
12. IF NO CURB IS PROVIDED, THE EDGE OF THE DETECTABLE WARNING SURFACE SHALL BE AT LEAST 6" BUT NOT MORE THAN 8" FROM THE EDGE OF THE RAMP. THIS SHALL APPLY TO THE CORNERS OF THE DETECTABLE WARNING FOR RAMPS ON A RADIUS.
13. DETECTABLE WARNING SIZE, GEOMETRY AND SPACING TO CONFORM TO SECTION 705 OF DEPARTMENT OF JUSTICE STANDARDS FOR ACCESSIBLE DESIGN (2010).

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COUNTY OF UNION

INTERSECTION IMPROVEMENTS
CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

CONSTRUCTION DETAILS

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EDWARD R. KLUMP, P.E.
CONSULTING ENGINEER
Edward R. Klump 4/8/13 DATE
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497

DESIGNED BY BPK/IK | DRAWN BY IK/JL | CHECKED BY BPK
PROJECT NO. UNCO-00390 | CADD FILE UN390-CD | FIELD BK. # UNCO-XX

DRAWING CD-1

SHEET 24 OF 31

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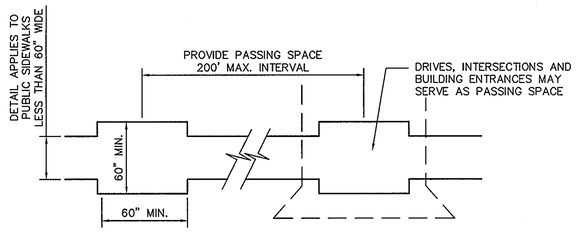
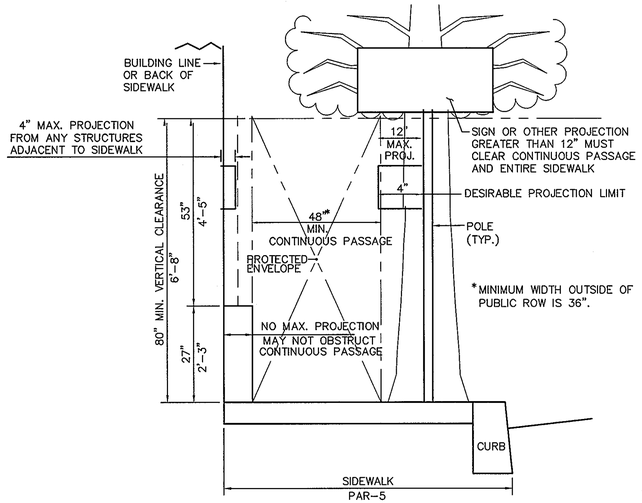


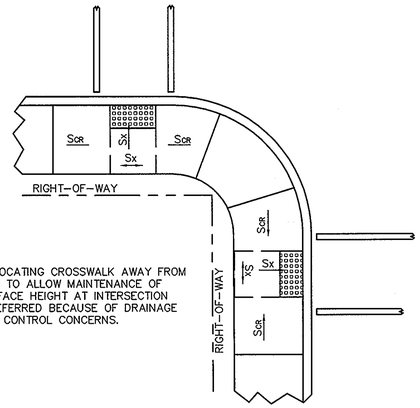
PASSING SPACE – PUBLIC SIDEWALK DETAIL

NOT TO SCALE



PROTECTED ENVELOPE – PUBLIC SIDEWALK DETAIL

NOT TO SCALE

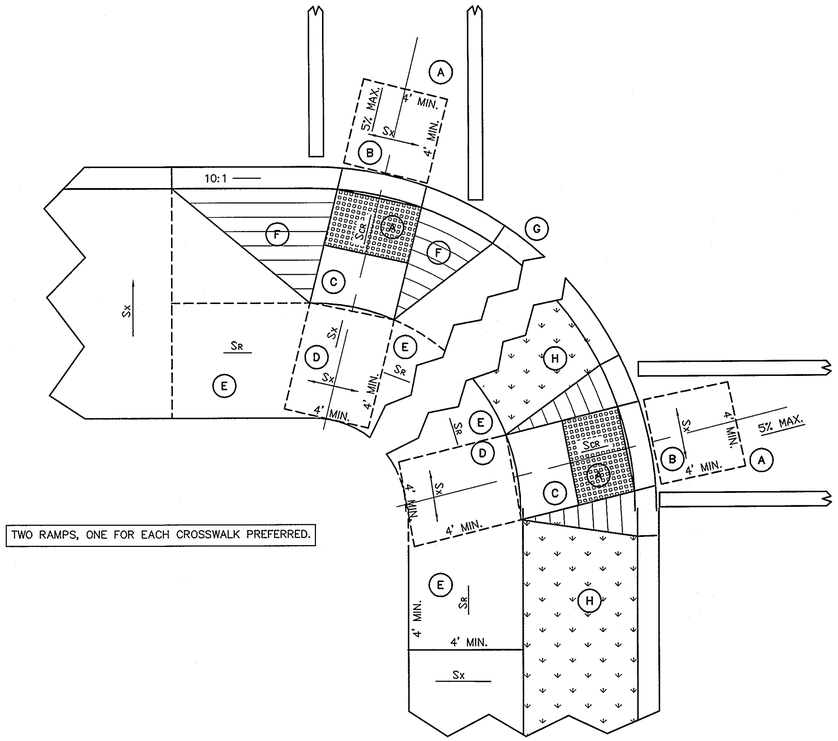


NOTE 1: EXPLORE RELOCATING CROSSWALK AWAY FROM INTERSECTION TO ALLOW MAINTENANCE OF SOME CURB FACE HEIGHT AT INTERSECTION WHICH IS PREFERRED BECAUSE OF DRAINAGE AND TRAFFIC CONTROL CONCERNS.

TYPICAL ARRANGEMENTS FOR PARALLEL RAMPS

ROW RESTRICTED

NOT TO SCALE



TWO RAMPS, ONE FOR EACH CROSSWALK PREFERRED.

PUBLIC SIDEWALK CURB RAMPS LAYOUT PRINCIPLES

CONTRACTOR SHALL CONSTRUCT ALL PUBLIC SIDEWALK CURB RAMPS IN ACCORDANCE WITH THESE PRINCIPLES. WHEN CONDITIONS DO NOT PERMIT COMPLIANCE, CONSULT ENGINEER.

(A) LOCATE A 4' X 4' LANDING AREA WITHIN CROSSWALK AT TOE OF RAMP CROSS SLOPE SX 1:48 (2%). MAXIMUM COUNTERSLOPE S_{CR} AT TOE OF RAMP 1:20 (5%) MAXIMUM.

(B) RAMP TO BE PERPENDICULAR (RADIAL) TO CURB LINE (OR ROADWAY EDGE), NO LIP AT STREET – CURB TOP TO SLOPE WITH RAMP.

(C) OBSERVE S_{CR} LIMITS: 1:48 (2%) MINIMUM, 1:12 (8.3%) MAXIMUM IN NEW CONSTRUCTION. OBSERVE SX LIMITS: 1:48 (2%) MAXIMUM. SEE SIDEWALK DESIGN SLOPE AND TOLERANCES TABLE. PROVIDE DETECTABLE WARNING SURFACE.

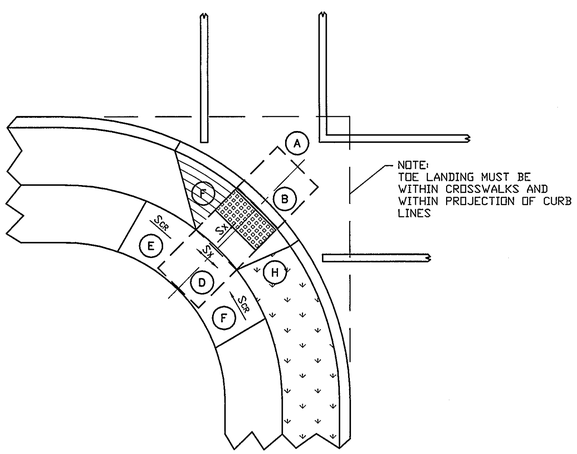
(D) PROVIDE A 4' X 4' LANDING AREA AT TOP. OBSERVE SX LIMITS 1:48 (2%) MAXIMUM IN ANY DIRECTION. SEE SIDEWALK DESIGN SLOPE AND TOLERANCES TABLE.

(E) PROVIDE TRANSITION RAMPS AS REQUIRED. OBSERVE SR LIMITS. SEE SIDEWALK DESIGN SLOPE AND TOLERANCES TABLE.

(F) WHEN PEDESTRIAN TRAVEL ACROSS RAMP IS POSSIBLE, PROVIDE 10:1 MAXIMUM TRANSITION AT CURB LINE (OR ROADWAY EDGE).

(G) PROVIDE CURB FACE ON RADIUS AT INTERSECTION TO THE EXTENT POSSIBLE IN PREFERENCE TO DEPRESSING ENTIRE RADIUS.

(H) WHEN PEDESTRIAN TRAVEL ACROSS RAMP IS OBSTRUCTED BY TURF OR OTHER ELEMENTS, PROVIDE 18" LONG CURB TRANSITION. SEE DETAIL PAR-2.



SINGLE DIAGONAL CURB RAMP

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CENTENNIAL AVENUE CORRIDOR

TOWNSHIP OF CRANFORD — UNION COUNTY

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CONSULTING ENGINEER
Edward R. Klump 4/8/13
DATE
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497

DESIGNED BY	DRAWN BY	CHECKED BY
BPK/IK	IK/JL	BPK
PROJECT NO. UNCO-00390	CADD FILE UN390-CD	FIELD BK. # UNCO-XX

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SHEET 25 OF 31

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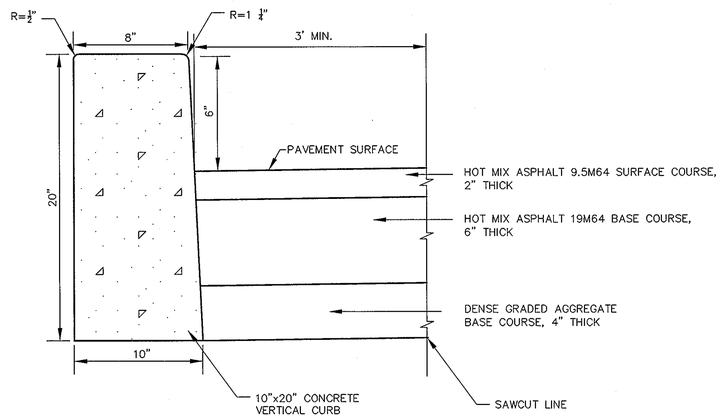
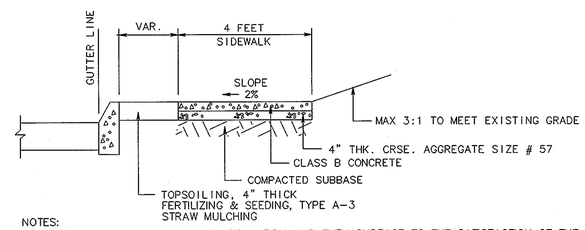


NOTE:

1. HOT MIX ASPHALT BASE COURSE TO BE CONSTRUCTED IN LAYERS NOT MORE THAN 3" COMPACTED THICKNESS.

TYPICAL PAVEMENT SECTION AND CURB INSTALLATION

NOT TO SCALE

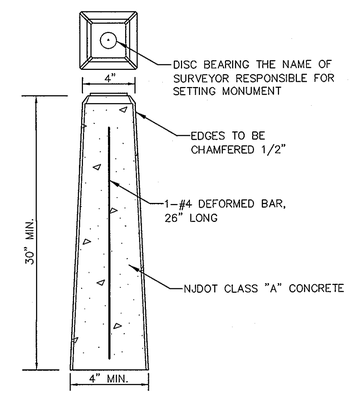


NOTES:

1. SUBBASE SHALL BE COMPACTED TO A FIRM AND EVEN SURFACE TO THE SATISFACTION OF THE ENGINEER.
2. ALL CONCRETE SHALL BE AIR-ENTRAINED AND CONTAIN AN AIR CONTENT OF 6% ±1.5%
3. CONCRETE SHALL BE STRUCK OFF WITH A TRANSVERSE TEMPLATE AND FINISHED WITH FLOATS AND STRAIGHTEDGES UNTIL A SMOOTH SURFACE HAS BEEN OBTAINED.
4. THE SURFACE SHALL BE FINISHED WITH A WOODEN FLOAT AND BRUSHED WITH A WET, SOFT-HAIRED BRUSH.
5. ALL EDGES SHALL BE FINISHED AND ROUNDED WITH AN EDGING TOOL HAVING A RADIUS OF 1/4 INCH.
6. PREFORMED EXPANSION JOINT FILLER, 1/4" INCH THICK, SHALL BE FORMED AROUND ALL APPURTENANCES, SUCH AS MANHOLES AND UTILITY POLES, EXTENDING INTO OR THROUGH THE CONCRETE.
7. THE SURFACE OF THE CONCRETE SHALL BE SO FINISHED AS TO DRAIN COMPLETELY AT ALL TIMES.
8. VERIFICATION STRENGTH OF CONCRETE, CLASS B AIR ENTRAINED TO BE 4500 PSI

CONCRETE SIDEWALK, 4" THICK

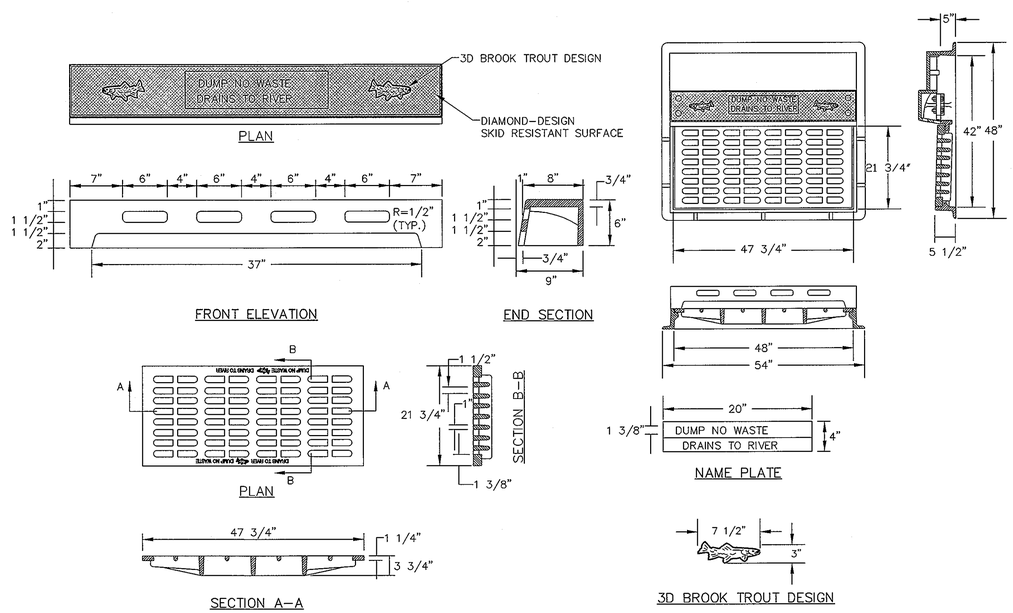
NOT TO SCALE



NOTE: MONUMENTS TO BE SET FLUSH WITH GROUND.

CONCRETE MONUMENT

NOT TO SCALE



INLET CASTING, TYPE 'B' WITH CURB PIECE TYPE 'N-ECO' & BICYCLE SAFE GRATE

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CONSULTING ENGINEER
Edward R. Klump — 4/8/13 DATE
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE37497

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PROJECT NO. UNCO-00390	CADD FILE UN390-CD	FIELD BK. # UNCO-XX

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SHEET 26 OF 31

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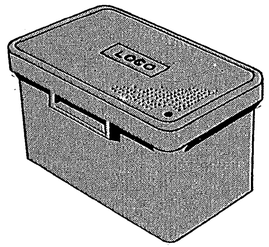
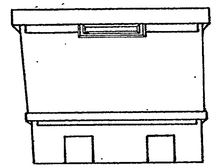
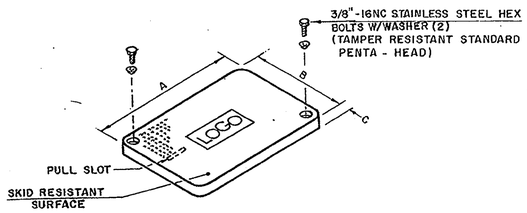


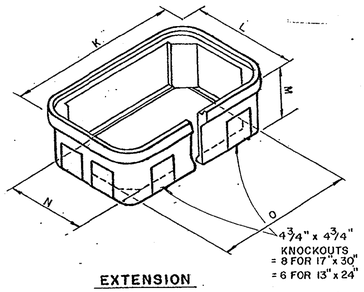
PG STYLE SPLICE BOX
(NO BASE)



I BOX & EXTENSION SIDE VIEW
(NO BASE)

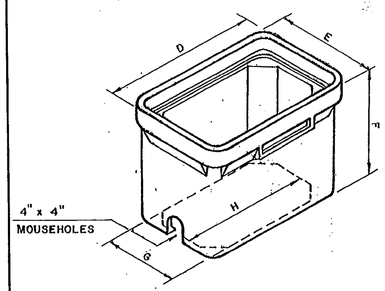


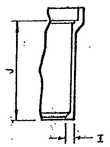
COVER



EXTENSION

NOTE: EXTENSION FOR USE UNDER BOX ONLY





SPLICE BOX CORNER DETAIL

EXTENSION CORNER DETAIL

SPLICE BOX DIMENSIONS

LOGO FOR COVER SHALL BE "TRAFFIC SIGNAL"
REFER TO THE PLANS AND SPECIFICATIONS
FOR REQUIRED COVER COLORS

BOXES (STACKABLE)

DIMENSION (IN INCHES)

SIZE	A	B	C	D	E	F	G	H	I	J
13" x 24"	23 1/4	13 3/4	2	25	15 1/2	18	11 3/4"	21 1/4	1 1/4	16
17" x 30"	30 1/2	17 1/2	2	32 1/4	19 1/4	24	15 1/2	28 1/2	1 1/4	22
24" x 36"	35 5/8	24	3	37 5/8	26	24	22 1/4	33 7/8	2	21

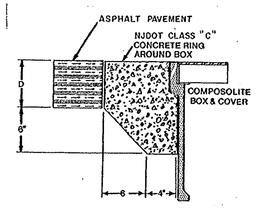
EXTENSIONS

DIMENSION (IN INCHES)

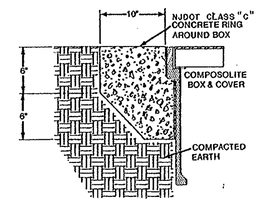
SIZE	K	L	M	N	O	P	Q
13" x 24"	23 3/4	14 1/4	8 3/4	11 3/4	21 1/4	8	1
17" x 30"	30 7/8	17 7/8	8 3/4	15 3/8	28 3/8	8	1
24" x 36"	37 1/8	25 1/2	8 3/4	21 3/4	33 1/2	8	1

SPLICE BOX DETAILS

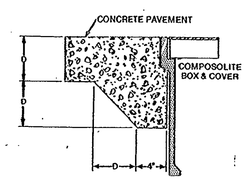
Panel Vault & Box Installation Procedure



IN ASPHALT PAVEMENTS



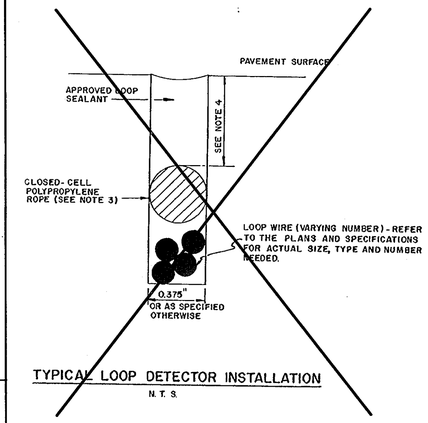
IN COMPACTED EARTH



IN CONCRETE PAVEMENTS

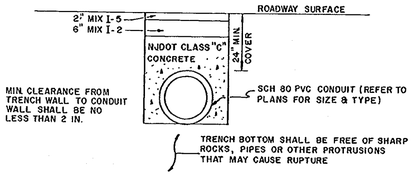
ALL BOXES SHALL BE SET FLUSH WITH SIDEWALK OR GRASS

Notes:
1. Concrete encasement to be to be NJDOT Class "C" or Better
2. Concrete encasement ring dimension, D, to be equal to design pavement depth.
3. Pavement and subgrade to be as shown on the engineering plans.
4. Quazite does not recommend the use of concrete or polymer concrete boxes in high volume traffic applications.
5. 3/4" Gravel or other suitable material to be placed at the bottom of box
6. All covers shall be heavy duty (15 kips over a 10 in sq., min test load)
7. Holes made in the splice box or extension walls to accommodate the various size conduits shall be made using a GB Knockout Punch Driver or masonary hole saw.
8. Cable racks and hooks shall be provided for 17" x 30" and 24" x 36" splice boxes (4 required).

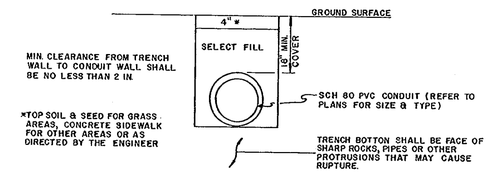


TYPICAL LOOP DETECTOR INSTALLATION

N. T. S.

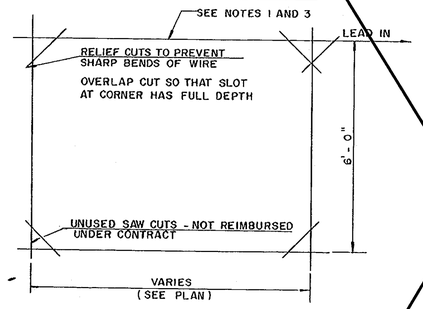


CONDUIT INSTALLATION DETAIL, CUR RUNS



CONDUIT INSTALLATION DETAIL, TYPE CUG RUNS

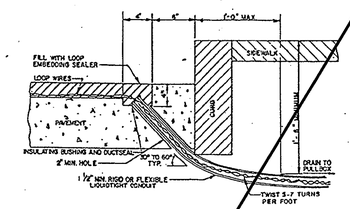
CHAMFER CUT CORNER TREATMENT



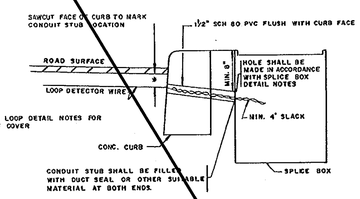
TYPICAL LOOP LAYOUT

LOOP DETECTOR NOTES:

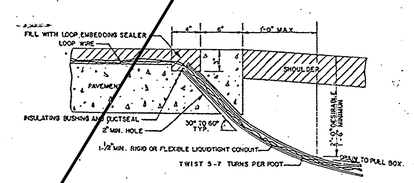
1. MINIMUM DEPTH OF SAW CUT SHALL BE FOUR (4) INCHES. WIDTH OF SAW CUT SHALL BE 3/8 INCH UNLESS OTHERWISE SPECIFIED.
2. LOOPS SHALL BE TESTED FOR INDUCTANCE PRIOR TO SEALING TO ENSURE PROPER INDUCTANCE VALUES. THE CONTRACTOR SHALL CONSULT THE ENGINEER IF ACTUAL VALUES ARE LESS THAN THOSE STATED ON THE TRAFFIC SIGNAL ELECTRICAL PLAN.
3. A BLUNT FLAT OBJECT (i.e. WOODEN SPATULA) SHALL BE USED TO SET THE LOOPS IN THE TRENCH. TIE DOWNS SHALL BE USED TO PREVENT THE LOOP WIRES FROM FLOATING TO THE TOP. A BACKER ROD (CLOSED - CELL POLYETHYLENE ROPE) SHALL BE INSTALLED ALONG THE FULL LOOP PERIMETER PRIOR TO SEALING SEE FIGURE BELOW.
4. MINIMUM DEPTH OF COVER FOR LOOP WIRE PLACED IN TRENCH SHALL BE TWO INCHES FOR LOOPS CUT IN MILLED SURFACES AND THREE INCHES IN NON-MILLED SURFACES.
5. LOOP SLOTS SHALL BE WET CUT USING AN APPROPRIATE DIAMOND BLADE AND SAW TO PRODUCE THE REQUIRED SLOT WIDTH AND DEPTH. SLOTS SHALL BE BLOWN CLEAN WITH COMPRESSED AIR AND DRY PRIOR TO LOOP WIRE INSTALLATION.



LOOP LEAD-IN UNDER CURB SECTION



LOOP LEAD - IN THRU CURB



LOOP LEAD-IN AT PAVEMENT EDGE

LOOP DETECTOR DETAIL

LDS UC 42018

REVISION	BY	C'K'D	DATE
REVISED LOOP NOTES, DELETED MAG. DETAIL, ADDED CONDUIT DETAIL	NPE	FDD	10/14/97
ADDED LOOP DETECTOR DETAILS	WRP	FDD	2/6/90

ELECTRICAL DETAILS

TRAFFIC SIGNAL AND INTERSECTION IMPROVEMENTS

CITY OF ELIZABETH — COUNTY OF UNION, NJ

LOOP DETECTOR; MAGNETOMETER & SPLICE BOX DETAILS

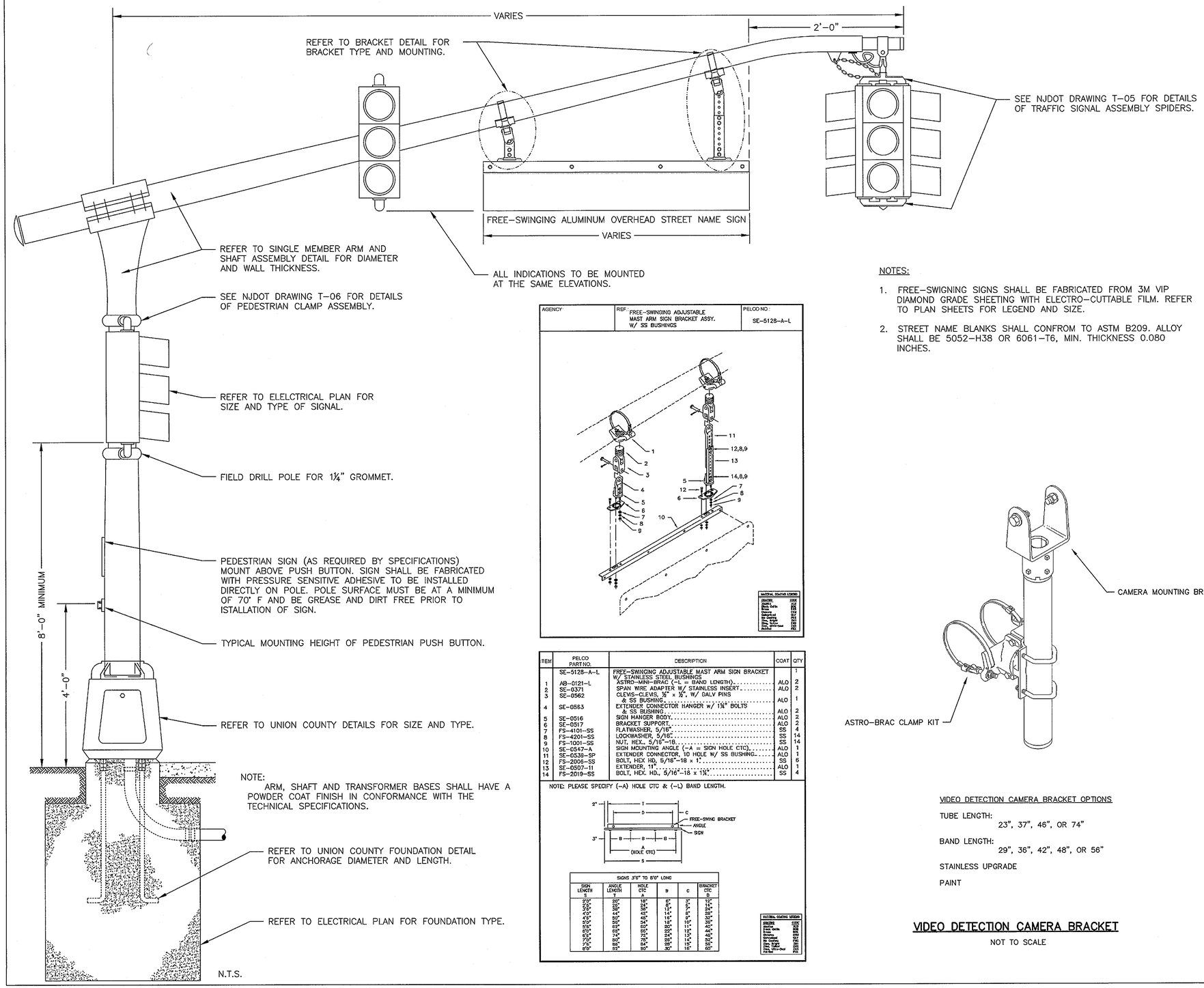
DIVISION OF ENGINEERING, LAND AND FACILITIES PLANNING
COUNTY OF UNION, NJ

ARMAND A. FIORLETTI P.E., L.S.
PROFESSIONAL ENGINEER & LAND SURVEYOR

COUNTY ENGINEER
NJ LIC. NO. 9587

DATE _____

MAP NO. — SHEET NO. 27 OF 31



SAFETY CHAIN REQUIREMENTS FOR TRAFFIC SIGNALS

FURNISH:

42" LG. ¼" HOT DIPPED GALVANIZED COILPROOF STRAIGHT LINK CHAIN.
1 5/16" X 2½" LG. STAINLESS STEEL HEX HEAD BOLT.
2 5/16" STAINLESS STEEL HEX NUTS.
2 5/16" STAINLESS STEEL FLAT WASHERS.
1 5/16" STAINLESS STEEL LOCK WASHER.

NOTES:

1. FREE-SWIGNING SIGNS SHALL BE FABRICATED FROM 3M VIP DIAMOND GRADE SHEETING WITH ELECTRO-CUTTABLE FILM. REFER TO PLAN SHEETS FOR LEGEND AND SIZE.
2. STREET NAME BLANKS SHALL CONFROM TO ASTM B209. ALLOY SHALL BE 5052-H38 OR 6061-T6, MIN. THICKNESS 0.080 INCHES.

AGENCY:	REF.: FREE-SWINGING ADJUSTABLE MAST ARM SIGN BRACKET ASSY. W/ SS BUSHINGS	PELCO NO.: SE-5128-A-L

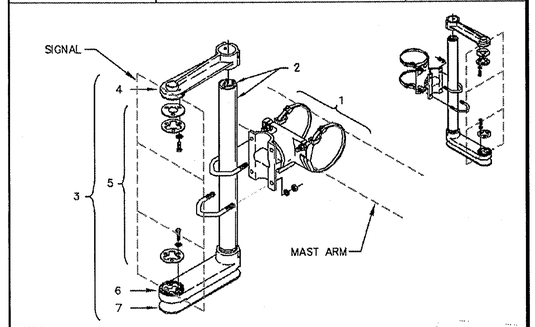
ITEM	PELCO PART NO.	DESCRIPTION	COAT	QTY
	SE-5128-A-L	FREE-SWINGING ADJUSTABLE MAST ARM SIGN BRACKET W/ STAINLESS STEEL BUSHINGS		1
1	AB-0121-L	ASTRO-MINI-BRAC (-L = BAND LENGTH)	ALO	2
2	SE-0371	SPAN WIRE ADAPTER W/ STAINLESS INSERT	ALO	2
3	SE-0562	CLEVIS-CLEVIS, ½" x ½", W/ GALV PINS & SS BUSHING	ALO	1
4	SE-0563	EXTENDER CONNECTOR HANGER w/ 1¼" BOLTS & SS BUSHING	ALO	2
5	SE-0516	SIGN HANGER BODY	ALO	2
6	SE-0517	BRACKET SUPPORT	ALO	2
7	FS-4101-SS	FLATWASHER, 5/16"	SS	4
8	FS-4201-SS	LOCKWASHER, 5/16"	SS	14
9	FS-1001-SS	NUT, HEX., 5/16"-18	SS	14
10	SE-0547-A	SIGN MOUNTING ANGLE (-A = SIGN HOLE CTC)	ALO	1
11	SE-0539-SP	EXTENDER CONNECTOR, 1D HOLE W/ SS BUSHING	ALO	1
12	FS-2006-SS	BOLT, HEX HD, 5/16"-18 x 1"	SS	6
13	SE-0507-11	EXTENDER, 11"	ALO	1
14	FS-2019-SS	BOLT, HEX. HD., 5/16"-18 x 1¼"	SS	4

NOTE: PLEASE SPECIFY (-A) HOLE CTC & (-L) BAND LENGTH.

SIGNS 3'6" TO 8'0" LONG					
SIGN LENGTH S	ANGLE LENGTH T	HOLE CTC A	B	C	BRACKET CTC D
2'0"	20"	18"	6"	3"	12"
2'6"	26"	24"	6"	3"	18"
3'0"	34"	32"	8"	4"	24"
3'6"	40"	38"	10"	5"	30"
4'0"	46"	44"	11"	6"	36"
4'6"	52"	50"	12"	6"	38"
5'0"	58"	56"	13"	7"	40"
5'6"	63"	60"	13"	7"	42"
6'0"	69"	66"	13"	7"	44"
6'6"	75"	72"	13"	7"	46"
7'0"	80"	78"	13"	7"	52"
7'6"	85"	84"	13"	7"	56"
8'0"	92"	90"	13"	7"	60"

MATERIAL COATING LEGEND	
COATING	CODE
Aluminum	ALO
Black Oxide	BOX
Brass	BRS
Chrome	CRM
Galvanized	GLV
No Coating	PNC
Zinc, Bright	ZN1
Zinc, Yellow	ZN2
Zinc, Olive-Drab	ZN3
Painted	PAI

AGENCY:	REF.: STANDARD ASTRO-BRAC ASSEMBLY FOR 3, 4 OR 5 SECTION SIGNAL*	PELCO NO.: AB-0116-L-L



NOTE:

FOR AB-0116-3-L, 3 SECTION ASSY., REPLACE ITEM 2 WITH AB-2003-46 GUSSET TUBE (46") W/ VINYL INSERT (44")

FOR AB-0116-4-L, 4 SECTION ASSY., REPLACE ITEM 2 WITH AB-2003-58 GUSSET TUBE (58") W/ VINYL INSERT (56")

FOR AB-0116-5-L, 5 SECTION ASSY., REPLACE ITEM 2 WITH AB-2003-74 GUSSET TUBE (74") W/ VINYL INSERT (72")

STANDARD BAND LENGTHS ARE 29" WHICH WILL FIT 4" TO 8.6" DIA.

ITEM	PELCO PART NO.	DESCRIPTION	COAT	QTY
	AB-0116-L-L	STANDARD ASTRO-BRAC ASSY. FOR 3, 4 OR 5 SECTION SIGNAL*		1
1	AB-3004-L	STD. ASTRO-BRAC CLAMP KIT (-L = BAND LENGTH)	ALO	1
2	AB-2003-L	GUSSET TUBE W/ VINYL INSERT (-L = TUBE LENGTH)	ALO	1
3	AB-4000	STANDARD ARM KIT	–	1
4	AB-0214	STANDARD UPPER ARM, 9"	ALO	1
5	AB-0205	HARDWARE KIT, STANDARD ARM	ZN2	1
6	AB-0215	STANDARD LOWER ARM, 9"	ALO	1
7	AB-0216	PLASTIC COVER, LOWER ARM	PNC	1

VIDEO DETECTION CAMERA BRACKET OPTIONS

TUBE LENGTH:
23", 37", 46", OR 74"

BAND LENGTH:
29", 36", 42", 48", OR 56"

STAINLESS UPGRADE

PAINT

VIDEO DETECTION CAMERA BRACKET

NOT TO SCALE

MATERIAL COATING LEGEND	
COATING	CODE
Aluminum	ALO
Black Oxide	BOX
Brass	BRS
Chrome	CRM
Galvanized	GLV
No Coating	PNC
Zinc, Bright	ZN1
Zinc, Yellow	ZN2
Zinc, Olive-Drab	ZN3
Painted	PAI

REVISED OVERHEAD STREET NAME SIGN DETAIL	NPE	FD	10/16/97
REVISION	BY	C'K'D	DATE

ELECTRICAL DETAILS

TRAFFIC SIGNAL AND INTERSECTION IMPROVEMENTS

CITY OF ELIZABETH — COUNTY OF UNION, NJ

TYPICAL INSTALLATION DETAIL

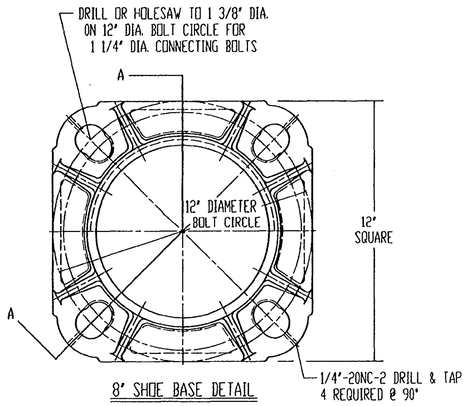
DIVISION OF ENGINEERING
COUNTY OF UNION, NJ

TIMOTHY R. METTLEN, P.E.
ASSISTANT COUNTY ENGINEER

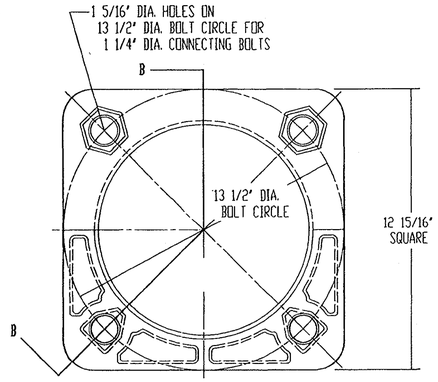
N.J. LIC. No. 42290

DATE 05/09/07

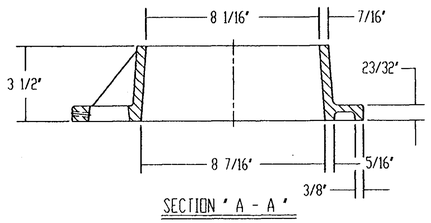
BRIDGE NO. — MAP NO. — SHEET NO. 28 OF 31



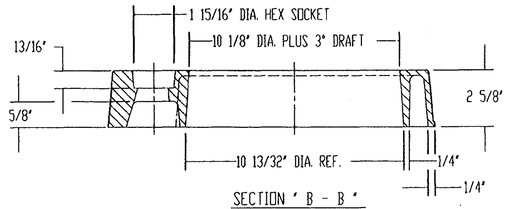
8" SHOE BASE DETAIL



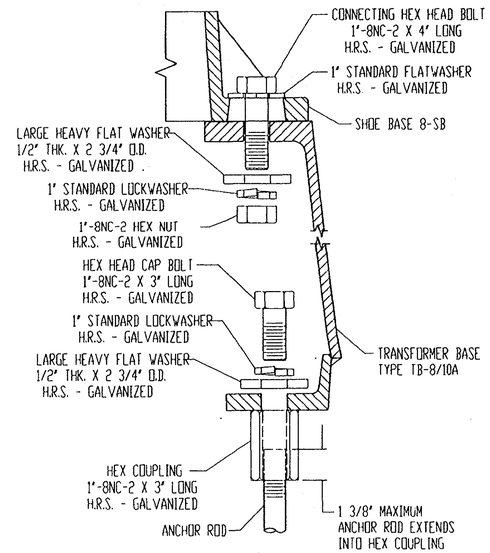
10" SHOE BASE DETAIL
USED WITH 20' ARM



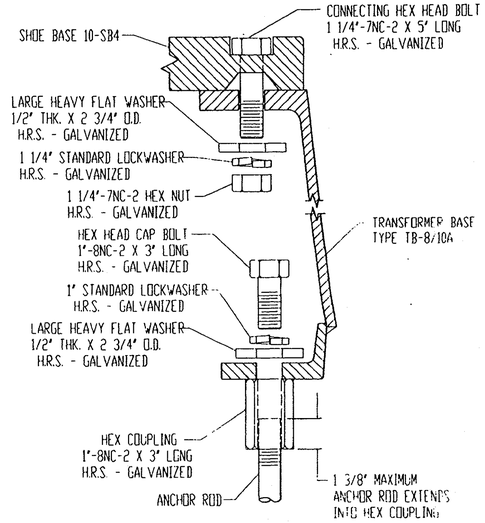
SECTION " A - A "



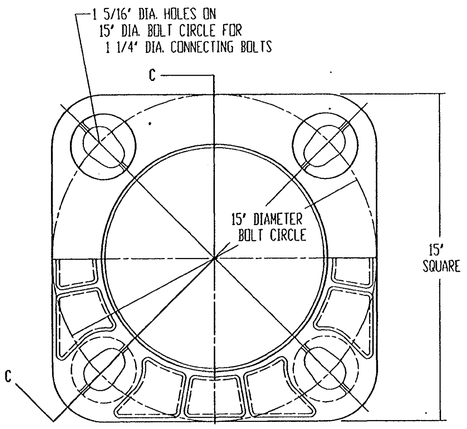
SECTION " B - B "



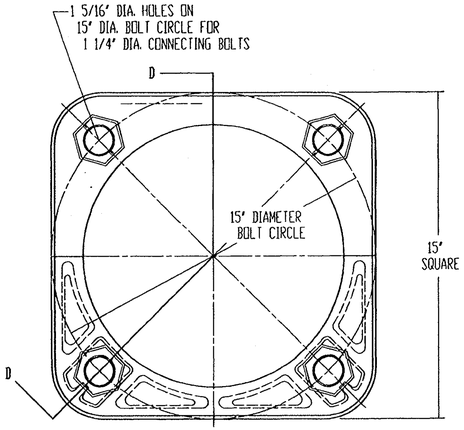
TRANSFORMER BASE HARDWARE INSTALLATION
8" O.D. SIGNAL POLE ASSEMBLY



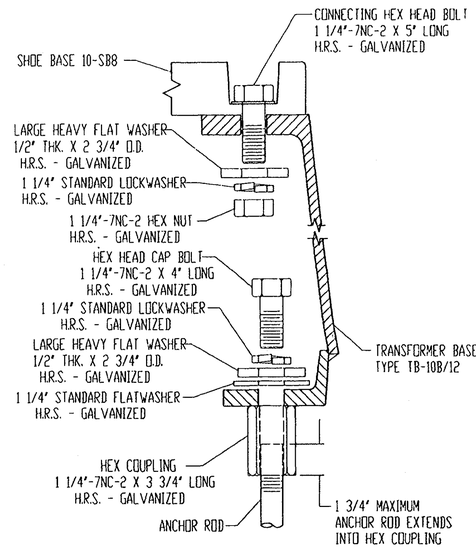
TRANSFORMER BASE HARDWARE INSTALLATION
10" O.D. SIGNAL POLE ASSEMBLY USED WITH 20' ARM



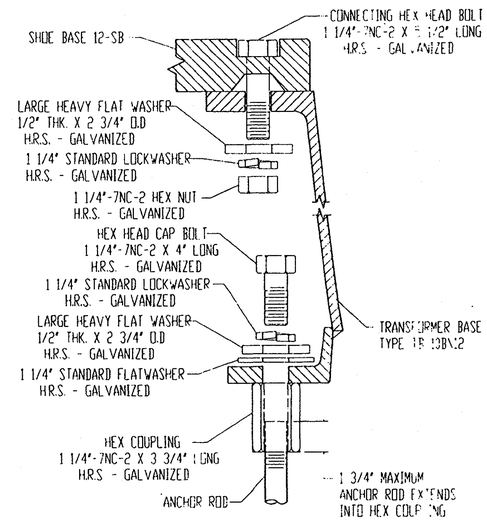
10" SHOE BASE DETAIL
USED WITH 25' ARM



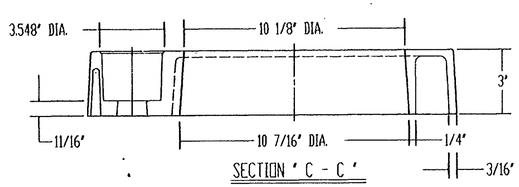
12" SHOE BASE DETAIL



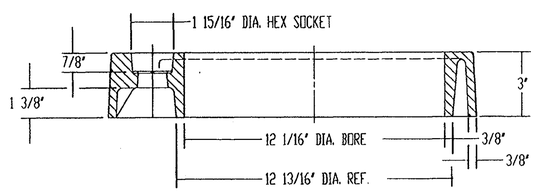
TRANSFORMER BASE HARDWARE INSTALLATION
10" O.D. SIGNAL POLE ASSEMBLY
USED WITH 25' ARM



TRANSFORMER BASE HARDWARE INSTALLATION
12" O.D. SIGNAL POLE ASSEMBLY



SECTION " C - C "



SECTION " D - D "

LDS UC 42020

REVISION	BY	CK'D	DATE

ELECTRICAL DETAILS

TRAFFIC SIGNAL AND INTERSECTION IMPROVEMENTS

CITY OF ELIZABETH — UNION COUNTY, NJ

SHOE BASE AND TRANSFORMER BASE

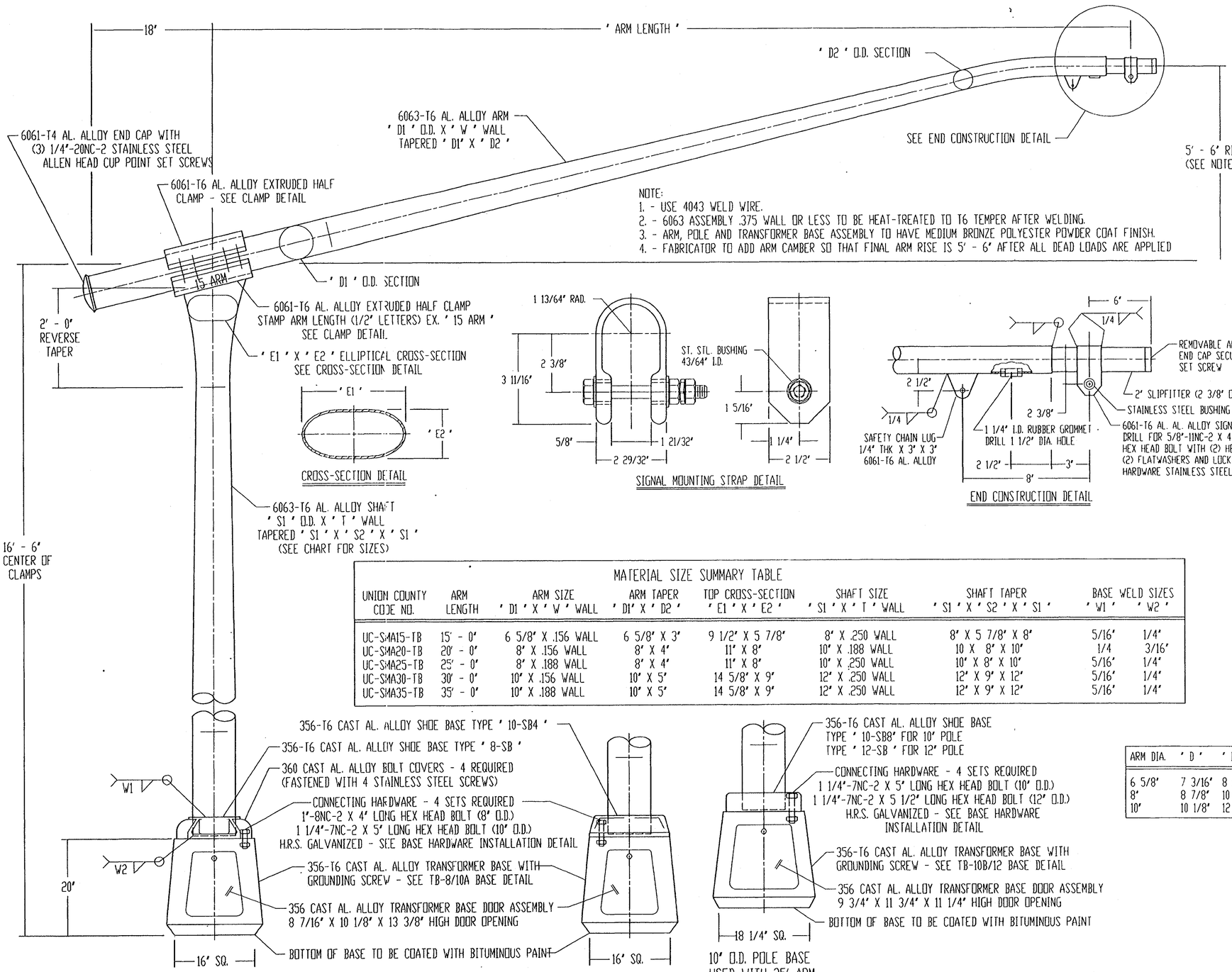
DIVISION OF ENGINEERING, LAND AND FACILITIES PLANNING
COUNTY OF UNION, NJ

ARMAND A. FIORLETTI P.E., L.S.
PROFESSIONAL ENGINEER & LAND SURVEYOR

COUNTY ENGINEER
NJ LIC. NO. 9587

DATE

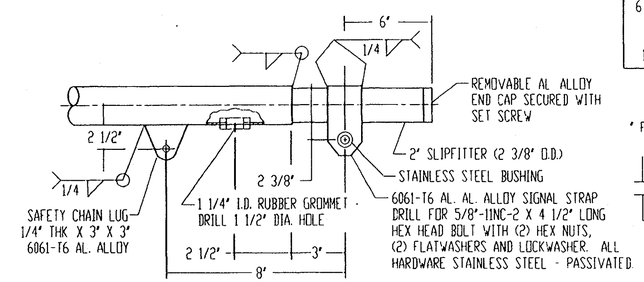
MAP NO. — SHEET NO. 29 OF 31



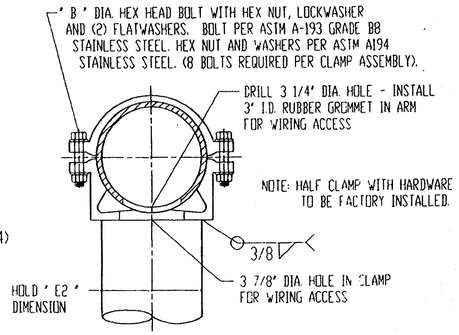
NOTE:
1. - USE 4043 WELD WIRE.
2. - 6063 ASSEMBLY .375 WALL OR LESS TO BE HEAT-TREATED TO T6 TEMPER AFTER WELDING.
3. - ARM, POLE AND TRANSFORMER BASE ASSEMBLY TO HAVE MEDIUM BRONZE POLYESTER POWDER COAT FINISH.
4. - FABRICATOR TO ADD ARM CAMBER SO THAT FINAL ARM RISE IS 5' - 6' AFTER ALL DEAD LOADS ARE APPLIED

CROSS-SECTION DETAIL

SIGNAL MOUNTING STRAP DETAIL

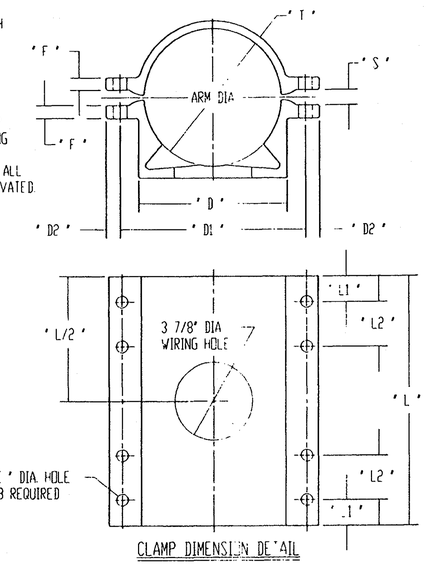


END CONSTRUCTION DETAIL



CLAMP DETAIL

ARM SIZE	' E2 '	' B '
6 5/8' O.D. X .156 WALL	5 7/8'	5/8'
8' O.D. X .156 WALL	8'	5/8'
8' O.D. X .188 WALL	8'	5/8'
10' O.D. X .188 WALL	9'	3/4'



CLAMP DIMENSION DETAIL

ARM DIA.	' D '	' D1 '	' D2 '	' F '	' S '	' T '	' L '	' L1 '	' L2 '	' E '
6 5/8'	7 3/16'	8 5/8'	5/8'	5/8'	13/16'	3/8'	12'	1 11/16'	2 1/8'	11/16'
8'	8 7/8'	10 5/8'	5/8'	3/4'	3/4'	11/16'	14'	1 3/16'	1 15/16'	11/16'
10'	10 1/8'	12 1/8'	7/8'	1 1/4'	2'	5/8'	18'	1 1/4'	2 3/4'	13/16'

MATERIAL SIZE SUMMARY TABLE

UNION COUNTY CODE NO.	ARM LENGTH	ARM SIZE ' D1 ' X ' W ' WALL	ARM TAPER ' D1' X ' D2 '	TOP CROSS-SECTION ' E1 ' X ' E2 '	SHAFT SIZE ' S1 ' X ' T ' WALL	SHAFT TAPER ' S1 ' X ' S2 ' X ' S1 '	BASE WELD SIZES ' W1 '	' W2 '
UC-SMA15-TB	15' - 0'	6 5/8' X .156 WALL	6 5/8' X 3'	9 1/2' X 5 7/8'	8' X .250 WALL	8' X 5 7/8' X 8'	5/16'	1/4'
UC-SMA20-TB	20' - 0'	8' X .156 WALL	8' X 4'	11' X 8'	10' X .188 WALL	10 X 8' X 10'	1/4	3/16'
UC-SMA25-TB	25' - 0'	8' X .188 WALL	8' X 4'	11' X 8'	10' X .250 WALL	10' X 8' X 10'	5/16'	1/4'
UC-SMA30-TB	30' - 0'	10' X .156 WALL	10' X 5'	14 5/8' X 9'	12' X .250 WALL	12' X 9' X 12'	5/16'	1/4'
UC-SMA35-TB	35' - 0'	10' X .188 WALL	10' X 5'	14 5/8' X 9'	12' X .250 WALL	12' X 9' X 12'	5/16'	1/4'

8' O.D. POLE BASE

10' O.D. POLE BASE USED WITH 20' ARM

10' O.D. POLE BASE USED WITH 25' ARM & 12' O.D. POLE BASE

LDS UC 42021

REVISION	BY	CK'D	DATE

ELECTRICAL DETAILS

TRAFFIC SIGNAL AND INTERSECTION IMPROVEMENTS

CITY OF ELIZABETH — UNION COUNTY, NJ

SINGLE MEMBER ARM AND SHAFT ASSEMBLY DETAILS

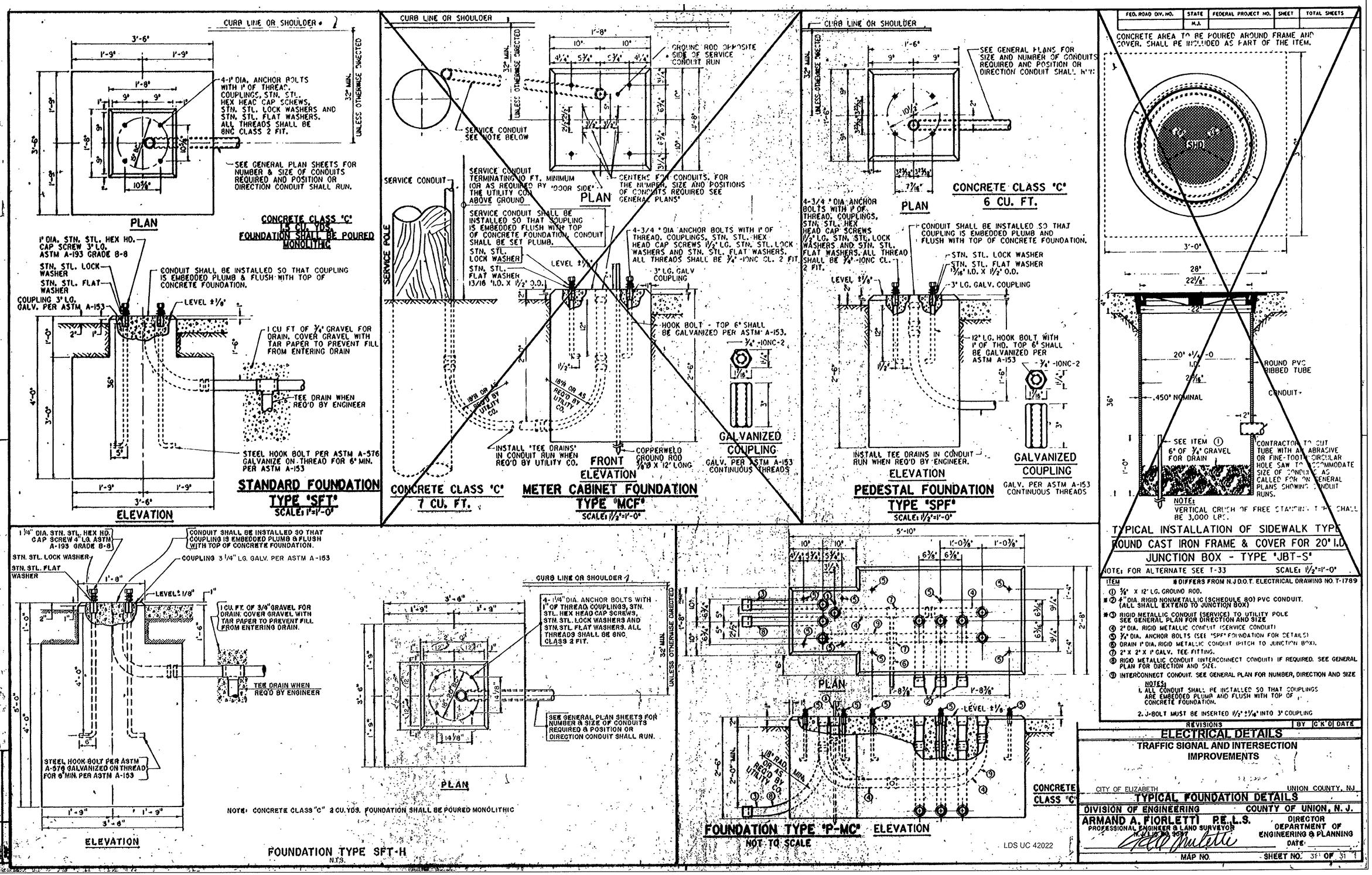
DIVISION OF ENGINEERING, LAND AND FACILITIES PLANNING
COUNTY OF UNION, NJ

ARMAND A. FIORLETTI P.E., L.S.
PROFESSIONAL ENGINEER & LAND SURVEYOR

COUNTY ENGINEER
NJ LIC. NO. 9587

DATE

MAP NO. — SHEET NO. 30 OF 31



FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
	N.J.			

REVISIONS | BY | C'K'D | DATE

ELECTRICAL DETAILS

TRAFFIC SIGNAL AND INTERSECTION IMPROVEMENTS

CITY OF ELIZABETH — UNION COUNTY, NJ

TYPICAL FOUNDATION DETAILS

DIVISION OF ENGINEERING — COUNTY OF UNION, N. J.

ARMAND A. FIORLETTI P.E., L.S.
PROFESSIONAL ENGINEER & LAND SURVEYOR
N.J. LIC. NO. 30,307

DIRECTOR
DEPARTMENT OF ENGINEERING & PLANNING

DATE:

MAP NO. — SHEET NO. 31 OF 31