

P:\ADRV\2021\21-006 FAI-113474 Pickerington\_SRTS\Construction Plans\Final Tracings\05-06\_General Notes.dgn 3/14/2022 11:09:35 AM bwood

ITEM 630 - SIGNING, MISC.: SOLAR-POWERED RECTANGULAR FLASHING BEACON (RRFB) SIGN ASSEMBLY

THIS WORK SHALL CONSIST OF FURNISHING AND INSTALLING A SOLAR POWERED RECTANGULAR RAPID FLASHING BEACON (RRFB) SIGN ASSEMBLY. THE FLASHING UNIT SHALL BE SOLAR POWERED, PEDESTRIAN ACTIVATED, AND 2-SIDED WITH TWO LED ARRAY BASED YELLOW INDICATIONS ON EACH SIDE. MULTIPLE UNITS SHALL BE WIRELESSLY CONTROLLED AND SYNCHRONIZED. THE UNIT SHALL BE COMPLIANT WITH THE MOST CURRENT OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD) AND FHWA INTERIM APPROVAL FOR RRFBs (IA-21).

GENERAL REQUIREMENTS

EACH RRFB SHALL CONSIST OF TWO RAPIDLY FLASHED RECTANGULAR-SHAPED YELLOW INDICATIONS HAVING LED ARRAY BASED LIGHT SOURCE.

EACH RRFB SHALL BE A COMPLETE ASSEMBLY, CONSISTING OF BUT NOT LIMITED TO, SIGNAGE, SIGN MOUNTING HARDWARE, INDICATIONS AND ELECTRICAL COMPONENTS (WIRING, SOLID-STATE CIRCUIT BOARDS, ETC.).

EACH RRFB SHALL CONTAIN A PEDESTRIAN INDICATION LIGHT VISIBLE BY THE PEDESTRIAN IN THE DIRECTION OF TRAVEL.

FUNCTIONAL REQUIREMENTS

EACH RRFB SHALL UTILIZE SOLAR POWER.

EACH RRFB SHALL BE ACTIVATED BY ADA COMPLIANT PUSHBUTTONS.

THE RRFB SHALL BE NORMALLY DARK, SHALL INITIATE OPERATION ONLY UPON PEDESTRIAN ACTUATION, AND SHALL CEASE OPERATION AFTER A PREDETERMINED TIME LIMIT (BASED ON OMUTCD PROCEDURES).

EACH REMOTE RRFB SHALL BE WIRELESSLY ACTIVATED.

ALL RRFB LIGHT INDICATIONS SHALL BE WIRELESSLY SYNCHRONIZED (ALL LIGHTS WILL TURN ON WITHIN 120 MSEC AND REMAIN SYNCHRONIZED THROUGHOUT THE DURATION OF THE FLASHING CYCLE).

THE UNIT SHALL BE CAPABLE OF RUNNING 14 DAYS WITHOUT SUNLIGHT.

MATERIALS

FURNISH A COMPLETE ASSEMBLY, CONSISTING OF BUT NOT LIMITED TO, SIGNAGE, SIGN MOUNTING HARDWARE, INDICATIONS, AND ELECTRICAL COMPONENTS (WIRING, SOLID-STATE CIRCUIT BOARDS, ETC.). THE RRFB ASSEMBLY INCLUDES THE FOLLOWING ITEMS:

1. RRFB INDICATIONS

- A. EACH RRFB INDICATION LENS SHALL BE A MINIMUM SIZE OF APPROXIMATELY 5" WIDE X 2" HIGH.
- B. THE RRFB INDICATIONS SHALL BE ALIGNED HORIZONTALLY, WITH THE LONGER DIMENSION OF THE INDICATION HORIZONTAL. THERE SHALL BE TWO INDICATIONS ON THE FRONT AND TWO INDICATIONS ON THE BACK.
- C. EACH RRFB SHALL BE SUPPLIED WITH ALL REQUIRED HARDWARE TO INSTALL ASSEMBLY. ALL EXPOSED HARDWARE SHALL BE ANTI-VANDAL.
- D. EACH RRFB SHALL BE LOCATED BETWEEN THE BOTTOM OF THE CROSSING WARNING SIGN AND THE TOP OF THE SUPPLEMENTAL DOWNWARD DIAGONAL ARROW PLAQUE.

- E. THE LIGHT INTENSITY OF THE YELLOW INDICATIONS SHALL MEET THE MINIMUM CLASS 1 SPECIFICATIONS OF SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) STANDARD J595 (DIRECTIONAL FLASHING OPTICAL WARNING DEVICES FOR AUTHORIZED EMERGENCY, MAINTENANCE, AND SERVICE VEHICLES) DATED JANUARY, 2005.
- F. TO MINIMIZE EXCESSIVE GLARE DURING NIGHTTIME CONDITIONS, AN AUTOMATIC SIGNAL DIMMING DEVICE SHALL BE USED TO REDUCE THE BRILLIANCE OF THE RRFB INDICATIONS.
- G. A SMALL LED CONFIRMATION LIGHT DIRECTED AT AND VISIBLE TO PEDESTRIANS IN THE CROSSWALK SHALL BE INSTALLED INTEGRAL TO THE RRFB OR PUSHBUTTON TO GIVE CONFIRMATION THAT THE RRFB IS IN OPERATION.
- H. THE PEDESTRIAN CONFIRMATION LIGHT SHALL BE NO SMALLER THAN 2" IN DIAMETER AND CONTAIN A MINIMUM ILLUMINANCE OF 100 LUX MEASURED AT 30 CM.

2. SIGNS

- A. ALL SIGN ASSEMBLIES SHALL USE ANTI-VANDAL FASTENERS TO MOUNT COMPONENTS TO SIGN AND SIGN TO FIXTURE.
- B. PEDESTRIAN PUSHBUTTONS SIGNS SHALL BE PROVIDED AND INCLUDE THE LEGEND "PUSH BUTTON TO TURN ON WARNING LIGHTS". SIGNS SHOULD BE MOUNTED ADJACENT TO OR INTEGRAL WITH EACH PEDESTRIAN PUSHBUTTON.
- C. TWO SETS OF SIGNS SHALL BE REQUIRED PER UNIT FOR VIEW FROM EACH APPROACH.
- D. ASSURE SIGN MEETS THE REQUIREMENTS OF C&MS 630.

3. CONTROL CONDUIT

- A. THE CONTROL CIRCUIT SHALL HAVE THE CAPABILITY OF INDEPENDENTLY FLASHING UP TO TWO INDEPENDENT OUTPUTS. THE LED LIGHT OUTPUTS AND FLASH PATTERN SHALL BE COMPLETELY PROGRAMMABLE.
- B. THE CONTROL CIRCUIT SHALL BE SEALED WATERTIGHT TO ELIMINATE DIRT CONTAMINATION AND ALLOW FOR SAFE HANDLING IN ALL WEATHER CONDITIONS.
- C. THE LEDS SHALL BE SEALED AGAINST DUST AND MOISTURE INTRUSION AS PER THE REQUIREMENTS OF NEMA STANDARD 250-1991 FOR TYPE 4 ENCLOSURE AND TO PROTECT ALL INTERNAL LED AND ELECTRICAL COMPONENTS.

4. BATTERY AND SOLAR PANELS

- A. BATTERY UNIT SHALL BE A 12VDC, 35 AHR MINIMUM, SEALED GEL OR AGM LEAD ACID BATTERY. BATTERIES SHALL HAVE A WRITTEN TWO YEAR FULL REPLACEMENT WARRANTY.
- B. THE SOLAR PANEL SHALL PROVIDE A MINIMUM OF 40 WATTS PEAK TOTAL OUTPUT.
- C. THE SOLAR PANEL SHALL BE MOUNTED TO AN ALUMINUM PLATE AND BRACKET AT AN ANGLE OF 45 DEGREES - 60 DEGREES TO PROVIDE MAXIMUM OUTPUT.
- D. ALL FASTENERS USED SHALL BE ANTI-VANDAL.

5. WIRELESS RADIO

- A. RADIO CONTROL SHALL OPERATE ON A 900 MHZ FREQUENCY HOPPING SPREAD SPECTRUM NETWORK, WI-FI OR APPROVED EQUAL.
- B. RADIO SHALL INTEGRATE COMMUNICATION OF RRFB CONTROL CIRCUIT TO ACTIVATE SIGN FROM PUSHBUTTON INPUT.
- C. THE RADIO SHALL BE SYNCHRONIZED SO ALL OF THE REMOTE RRFB LIGHT INDICATIONS WILL TURN ON WITHIN 120 MSEC OF EACH OTHER AND REMAIN SYNCHRONIZED THROUGH-OUT THE DURATION OF THE FLASHING CYCLE.

6. PUSHBUTTON

- A. THE PUSHBUTTON SHALL BE CAPABLE OF CONTINUOUS OPERATION OVER A TEMPERATURE RANGE OF - 30 DEGREES F TO +165 DEGREES F.
- B. PUSHBUTTON SHALL BE ADA COMPLIANT.

- 7. PEDESTAL SHAFT AND BASE - MOUNT ON A STANDARD 4.5-INCH OD ALUMINUM PEDESTAL POLE WITH BREAKAWAY BASE. A 14 FOOT POLE SHALL BE PROVIDED AND FIELD ADJUSTED AND CAPPED TO MAINTAIN THE PROPER SIGN MOUNTING HEIGHTS, UNLESS SPECIFIED OTHERWISE IN THE PLANS. POLE AND BASE MANUFACTURER SHALL BE LISTED ON ODOT'S QUALIFIED PRODUCTS LIST.

CONSTRUCTION

THE RRFB SHALL BE ASSEMBLED AND CONSTRUCTED BY THE CONTRACTOR AS SHOWN AND SPECIFIED ON THE PLANS.

WARRANTY

WARRANTY SHALL BE TWO YEARS FROM THE DATE OF FINAL ACCEPTANCE.

MEASUREMENT

THE DEPARTMENT WILL MEASURE THE ITEM COMPLETE IN PLACE, INCLUDING ALL MATERIALS, TESTING, LABOR AND SOFTWARE FOR A FULLY FUNCTIONAL UNIT.

PAYMENT

PAYMENT WILL BE AT THE CONTRACT UNIT PRICE PER EACH FOR ITEM 630 "SIGNING MISC.: SOLAR POWERED RECTANGULAR RAPID FLASHING BEACON (RRFB) SIGN ASSEMBLY".

CALCULATED  
BJW  
CHECKED  
RRB

GENERAL NOTES

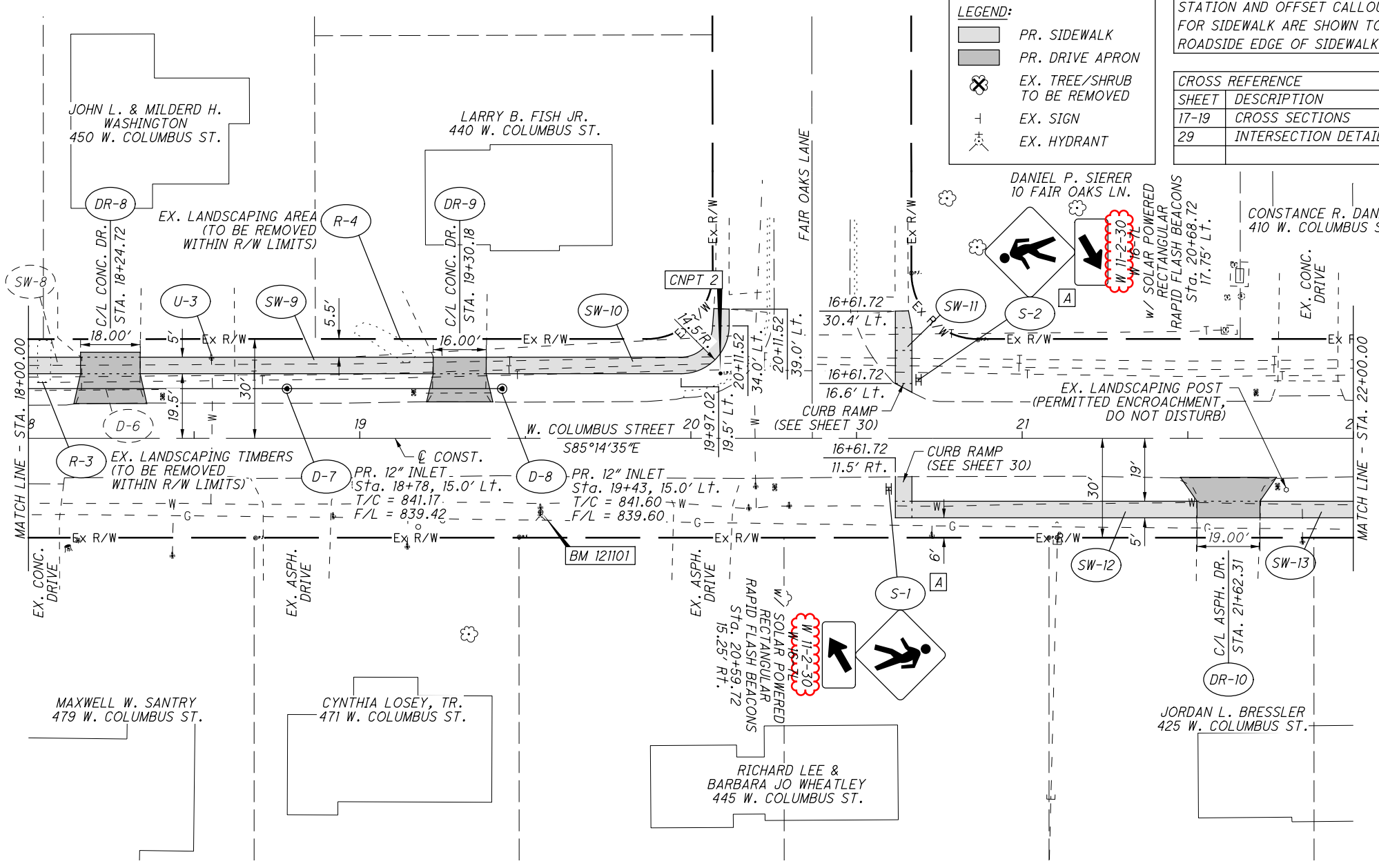
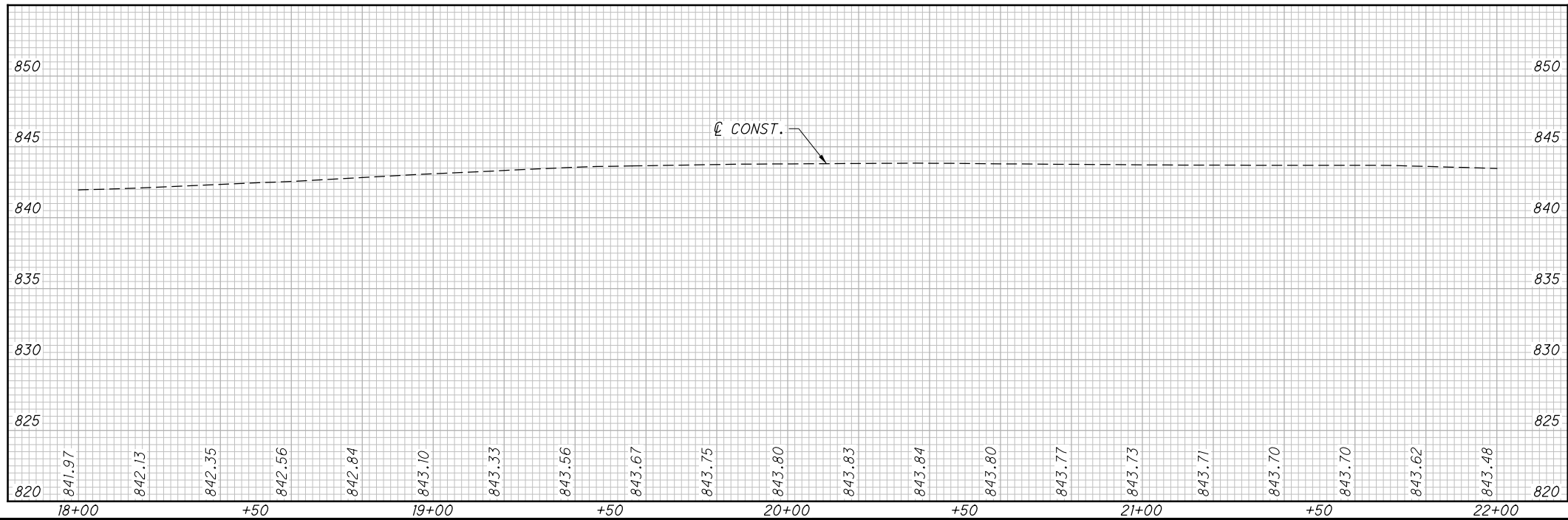
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SHEET NUM.											PART.	ITEM	ITEM	GRAND	UNIT	DESCRIPTION	SEE SHEET NO.	
8	9	10	11	12	13	14	15-28	29	30	31	01/SAE/O T	EXT	TOTAL					
<b>ROADWAY</b>																		
											LS	201	11000	LS	CLEARING AND GRUBBING	6		
53	95	63									211	202	35100	211	FT	PIPE REMOVED, 24" AND UNDER	6	
	1										1	202	98100	1	EACH	REMOVAL MISC.: LANDSCAPING STONE REMOVED	6	
		1									1	202	98100	1	EACH	REMOVAL MISC.: LANDSCAPING TIMBER REMOVED	6	
										189	189	202	98300	189	SY	REMOVAL MISC.: ASPHALT DRIVEWAY REMOVED	6	
										522	522	202	98300	522	SY	REMOVAL MISC.: CONCRETE DRIVEWAY REMOVED	6	
										25	25	202	98300	25	SY	REMOVAL MISC.: GRAVEL DRIVEWAY REMOVED	6	
37		52			168						257	202	98400	257	SF	REMOVAL MISC.: LANDSCAPING AREA REMOVED	6	
											452	203	10000	452	CY	EXCAVATION		
											38	203	20000	38	CY	EMBANKMENT		
										782	782	204	10000	782	SY	SUBGRADE COMPACTION		
1,669	1,631	1,564	1,732	1,680	2,426	2,912					13,614	608	10000	13,614	SF	4" CONCRETE WALK		
		120	64			25					209	608	52000	209	SF	CURB RAMP		
LS											LS	SPECIAL	69020030	LS		UTILITY COORDINATION AND RELOCATION	8	
<b>EROSION CONTROL</b>																		
											974	659	00500	974	SY	SEEDING AND MULCHING, CLASS 1		
											9,928	832	30000	9,928	EACH	EROSION CONTROL		
<b>DRAINAGE</b>																		
											50	611	00400	50	FT	4" CONDUIT, TYPE E	6	
											50	611	01400	50	FT	6" CONDUIT, TYPE E	6	
											20	611	02000	20	FT	8" CONDUIT, TYPE C	6	
											20	611	04600	20	FT	12" CONDUIT, TYPE C	6	
80	218	143									441	611	04901	441	FT	12" CONDUIT, TYPE D, AS PER PLAN (DITCH ENCLOSURE)	4	
											1	611	99150	1	EACH	INLET ADJUSTED TO GRADE		
											1	611	99654	1	EACH	MANHOLE ADJUSTED TO GRADE		
2	3	2									7	611	99900	7	EACH	DRAINAGE STRUCTURE, MISC.: 12" x 12" INLET TEE	4	
<b>PAVEMENT</b>																		
										131	131	304	20000	131	CY	AGGREGATE BASE		
											752	752	452	10010	752	SY	6" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC 1P	
<b>WATER WORK</b>																		
	1	1	2								4	638	10800	4	EACH	VALVE BOX ADJUSTED TO GRADE		
			1								1	638	98000	1	EACH	WATER WORK, MISC.: FIRE HYDRANT EXTENDED AND ADJUSTED TO GRADE	11	
<b>TRAFFIC CONTROL</b>																		
		2	1			1					2	630	85100	2	EACH	REMOVAL OF GROUND MOUNTED SIGN AND REEJECTION		
											2	630	97700	2	EACH	SIGNING, MISC.: SOLAR-POWERED RECTANGULAR FLASHING BEACON (RRFB) SIGN ASSEMBLY	10	
								10	12		22	644	00500	22	FT	STOP LINE		
								110	60		170	644	00620	170	FT	CROSSWALK LINE, 12"		
<b>INCIDENTALS</b>																		
											LS	614	11000	LS		MAINTAINING TRAFFIC		
											LS	623	10000	LS		CONSTRUCTION LAYOUT STAKES AND SURVEYING		
											LS	624	10000	LS		MOBILIZATION		

**GENERAL SUMMARY**

**FAI-CR9-1.60  
FAI-TR222-00.00**



**LEGEND:**

- PR. SIDEWALK
- PR. DRIVE APRON
- EX. TREE/SHRUB TO BE REMOVED
- EX. SIGN
- EX. HYDRANT

STATION AND OFFSET CALLOUTS FOR SIDEWALK ARE SHOWN TO THE ROADSIDE EDGE OF SIDEWALK.

**CROSS REFERENCE**

SHEET	DESCRIPTION
17-19	CROSS SECTIONS
29	INTERSECTION DETAILS

**PLAN NOTES:**

A CONTRACTOR TO INSTALL MANUALLY ACTIVATED PUSH BUTTON ON SIDE OF SIGN POST NEAREST TO SIDEWALK



REF NO.	STATION		SIDE	DESCRIPTION	SQ. FT.	EA	TOTALS CARRIED TO GENERAL SUMMARY	
	FROM	TO						
SW-8	18+00.00	18+15.72	LT	VALVE BOX ADJUSTED TO GRADE		1	1	
SW-9	18+33.72	19+22.18	LT	SIGNING, MISC.: SOLAR-POWERED RECTANGULAR FLASHING BEACON (RRFB) SIGN ASSEMBLY		2	2	
SW-10	19+38.18	20+11.52	LT					
SW-11	20+61.72	20+66.72	LT	DRAINAGE STRUCTURE, MISC.: 12"x12" INLET TEE	57	1	1	
SW-12	20+61.72	21+52.81	RT	12" CONDUIT, TYPE D, AS PER PLAN (DITCH ENCLOSURE)	430	1	143	
SW-13	21+71.81	22+00.00	RT	CURB RAMP	141	1	120	
U-3	18+55	20+60	LT	4" CONCRETE WALK			1,564	
S-1	20+69	20+69	RT	REMOVAL, MISC.: LANDSCAPING AREA REMOVED			52	
S-2	18+00	18+78	LT	REMOVAL, MISC.: LANDSCAPING TIMBER REMOVED		1	1	
D-6	18+78	19+43	LT					
D-7	18+78	19+43	LT					
D-8	19+43	19+43	LT					
R-3	18+05	19+12	LT					
R-4	19+12	19+12	LT					
<b>TOTALS CARRIED TO GENERAL SUMMARY</b>							<b>1</b>	<b>1</b>

**PLAN AND PROFILE**  
**STA. 18+00.00 TO STA. 22+00.00**

**FAI-CR9-1.60**  
**FAI-TR222-00.00**