

ESTIMATED ROADWAY QUANTITIES				
	ITEM NO.	DESCRIPTION	QUANTITY	UNIT
④⑨③②③②	714-01.23	STRUCTURAL LIGHTING (RET. WALL NO. 6)	1	LS
	714-01.24	STRUCTURAL LIGHTING (RET. WALL NO.9)	1	LS
	714-02.01	ENCASED CONDUIT (2" PVC, SCHEDULE 80)	1900	L.F.
	714-03.01	DIRECT BURIAL CONDUIT (2" PVC, SCHEDULE 40)	5308	L.F.
	714-04.01	CONDUIT (STRUCTURES - 1" RGS)	1600	L.F.
	714-04.03	CONDUIT (STRUCTURES - 1" EMT)	200	L.F.
	714-05.03	PULL BOXES (TYPE B)	30	EACH
	714-05.05	PULL BOXES (SURFACE MOUNTED JUNCTION BOX - 4"x4")	22	EACH
	714-05.06	PULL BOXES (SURFACE MOUNTED JUNCTION BOX - 6"x6")	3	EACH
	714-05.46	WOOD POLE (40' - CLASS 4)	7	EACH
	714-06.03	CABLE (1/C # 10 AWG)	5400	L.F.
	714-06.06	CABLE (1/C # 4 AWG)	40000	L.F.
	714-08.01	LIGHT STANDARDS (45' M.H., 15' ARM)	37	EACH
	714-08.09	LIGHT STANDARDS (45' M.H., RETAINING WALL MOUNTED)	25	EACH
	714-08.10	LIGHT STANDARDS (45' M.H., BRIDGE MOUNTED)	1	EACH
	714-08.32	REMOVAL OF LIGHT STANDARD & FOUNDATION	56	EACH
	714-08.33	REMOVAL OF EXISTING COBRA HEAD LUMINAIRE	32	EACH
	714-09.03	LUMINAIRES (250 WATT)	25	EACH
	714-09.09	LUMINAIRES (250 WATT OFFSET)	2	EACH
	714-09.10	LUMINAIRES (157 WATT LED)	71	EACH
	714-09.11	LUMINAIRES (107 WATT LED)	6	EACH
	714-09.12	LUMINAIRES (72 WATT LED - UNDERPASS)	4	EACH
	714-09.13	LUMINAIRES (50 WATT LED - UNDERPASS)	14	EACH
	714-10.01	OVERHEAD CONDUCTORS (#6 DPX)	600	L.F.
③④③⑤③⑥③⑦③⑧⑤⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳㉑㉒㉓㉔㉕㉖㉗㉘㉙㉚㉛㉜㉝㉞㉟㊱㊲㊳㊴㊵㊶㊷㊸㊹㊺㊻㊼㊽㊾㊿	714-12.01	CONTROL CENTER (NO. 616)	1	LS
	714-12.02	CONTROL CENTER (NO. 617)	1	LS
	714-12.03	CONTROL CENTER (NO. 618)	1	LS
	714-25.22	INSTALL SVC RISER	1	EACH
	714-25	ELECTRICAL CONNECTION	3	EACH
	716-01.05	TEMPORARY RAISED REFLECTIVE MARKER	300	EACH
	716-01.22	SNOWPLOWABLE PAVEMENT MARKERS (MONO-DIRECTIONAL) (1 COLOR)	28	EACH
	716-01.23	SNOWPLOWABLE MARKERS (BI-DIRECTIONAL)	328	EACH
	716-02.03	PLASTIC PAVEMENT MARKING (CROSS-WALK)	113	LF
	716-02.04	PLASTIC PAVEMENT MARKING (CHANNELIZATION STRIPING)	89	SY
③④③⑤③⑥③⑦③⑧⑤⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳㉑㉒㉓㉔㉕㉖㉗㉘㉙㉚㉛㉜㉝㉞㉟㊱㊲㊳㊴㊵㊶㊷㊸㊹㊺㊻㊼㊽㊾㊿	716-02.05	PLASTIC PAVEMENT MARKING (STOP LINE)	327	LF
	716-02.06	PLASTIC PAVEMENT MARKING (TURN LANE ARROWS)	17	EACH
	716-02.07	PLASTIC PAVEMENT MARKING (24 INCH BARRIER LINE)	1391	LF
	716-02.08	PLASTIC PAVEMENT MARKING (8" DOTTED LINE)	176	LF
	716-02.09	PLASTIC PAVEMENT MARKING (LONGITUDINAL CROSS-WALK)	35	LF
	716-02.11	PLASTIC PAVEMENT MARKING (6" DOTTED LINE)	876	LF
	716-02.12	PLASTIC PAVEMENT MARKING (8IN LINE)	0.9	LM
	716-03.01	PLASTIC WORD PAVEMENT MARKING (ONLY)	5	EACH
	716-04.01	PLASTIC PAVEMENT MARKING (STRAIGHT-TURN ARROW)	1	EACH
	716-04.03	PLASTIC PAVEMENT MARKING (4" DOTTED LINE)	148	LF
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	716-04.14	PLASTIC PAVEMENT MARKING (LANE REDUCTION ARROW)	6	EACH
	716-04.15	PLASTIC PAVEMENT MARKING-BIKE SYMBOL/ARROW SHARED	20	EACH
	716-05.01	PAINTED PAVEMENT MARKING (4 IN LINE)	3.6	LM
	716-05.04	PAINTED PAVEMENT MARKING (CHANNELIZATION STRIPING)	178	SY
	716-05.05	PAINTED PAVEMENT MARKING (STOP LINE)	654	LF
	716-05.06	PAINTED PAVEMENT MARKING (TURN LANE ARROW)	17	EACH
	716-05.07	PAINTED PAVEMENT MARKING (24" BARRIER LINE)	5564	LF
	716-05.09	PAINTED PAVEMENT MARKING (STRAIGHT-TURN ARROW)	2	EACH
	716-05.20	PAINTED PAVEMENT MARKING (6" LINE)	18.0	LM
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	716-05.50	PAINTED PAVEMENT MARKING (8" LINE)	9504	LF
	716-08.30	HYDROBLAST REMOVAL OF PAVEMENT MARKING (LINE)	7.8	LM
	716-12.01	ENHANCED FLATLINE THERMO PVMT MRKNG (4IN LINE)	2.1	LM
	716-12.02	ENHANCED FLATLINE THERMO PVMT MRKNG (6IN LINE)	6.2	LM
	716-13.01	SPRAY THERMO PAVEMENT MARKING (60 mil) (4IN LINE)	1.4	LM
	717-01	MOBILIZATION	1	LS
	730-01.02	REMOVAL OF SIGNAL EQUIPMENT	2	EACH
	730-01.03	MODIFICATION OF EXISTING TRAFFIC SIGNAL EQUIPMENT	1	EACH
	730-02.09	SIGNAL HEAD ASSEMBLY (130 WITH BACKPLATE)	9	EACH
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	730-02.30	SIGNAL HEAD ASSEMBLY (130 A3 WITH BACKPLATE)	3	EACH
	730-03.21	INSTALL PULL BOX (TYPE B)	8	EACH
	730-03.23	INSTALL PULL BOX (FIBER OPTIC-TYPE A)	4	EACH
	730-03.24	INSTALL PULL BOX (FIBER OPTIC-TYPE B)	3	EACH
	730-05.01	ELECTRICAL SERVICE CONNECTION	2	EACH
	730-08.01	SIGNAL CABLE - 3 CONDUCTOR	200	L.F.
	730-08.02	SIGNAL CABLE - 5 CONDUCTOR	1110	L.F.
	730-08.03	SIGNAL CABLE - 7 CONDUCTOR	430	L.F.
	730-08.40	INTERCONNECT CABLE - FIBER OPTIC (SM-12-MM HYBRID)	3750	L.F.
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	730-12.02	CONDUIT 2" DIAMETER (PVC)	7500	L.F.
	730-12.08	CONDUIT 2" DIAMETER (RGS)	1305	L.F.
	730-12.30	TRENCHING	3550	L.F.
	730-13.07	VEHICLE DETECTOR (SIREN ACTIVATED PRIORITY CONTROL)	6	EACH
	730-13.08	VEHICLE DETECTOR (RF)	6	EACH
	730-15.32	CABINET (EIGHT PHASE BASE MOUNTED)	3	EACH
	730-23.30	PEDESTAL POLE (20-ft)	1	EACH

ESTIMATED ROADWAY QUANTITIES																															
		ITEM NO.	DESCRIPTION	QUANTITY	UNIT																										
20		730-23.72	CANTILEVER SIGNAL SUPPORT (1 ARM @ 35')	1	EACH																										
		730-23.80	CANTILEVER SIGNAL SUPPORT (1 ARM @ 40')	1	EACH																										
		730-23.96	CANTILEVER SIGNAL SUPPORT (2 @ 50' & 45')	2	EACH																										
		730-26.11	COUNTDOWN PED SIGNAL WITH AUDIBLE PUSH BUTTON AND 15 IN SIGN	2	EACH																										
	14	730-35.06	BATTERY BACK-UP AND POWER CONDITIONER	3	EACH																										
		27	740-10.03	GEOTEXTILE (TYPE III, EROSION CONTROL)	7,196	S.Y.																									
			740-10.04	GEOTEXTILE (TYPE IV, STABILIZATION)	8,018	S.Y.																									
	4	740-11.03	TEMPORARY SEDIMENT TUBE (18 IN)	15,995	LF																										
		801-01.07	TEMPORARY SEEDING (WITH MULCH)	1,500	UNIT																										
		801-02	SEEDING (WITHOUT MULCH)	1,116	UNIT																										
25		801-03	WATER (SEEDING & SODDING)	111	MG																										
	803-01	SODDING (NEW SOD)	61,752	SY																											
	802-02.32	CUTTINGS: CORNUS AMOMUM (18-24 IN)	471	EACH																											
	802-02.33	CUTTINGS: SAMBUCUS CANADENSIS (18IN-24IN)	471	EACH																											
	802-03.35	CUTTINGS: CEPHALANTUS OCCIDENTALIS (18IN-24IN)	471	EACH																											
	802-02.31	CUTTINGS: SALIX SERICEA (18IN-24IN)	471	EACH																											
	802-15.04	JUNCUS EFFUSUS (SOFT RUSH)	317	EACH																											
	805-01.01	TURF REINFORCEMENT MAT (CLASS I)	831	SY																											
	25	805-12.02	EROSION CONTROL BLANKET (TYPE II)	61,560	SY																										
		805-12.04	EROSION CONTROL BLANKET TYPE IV (EXCELSIOR MAT)	6,000	SY																										
806-02.03		PROJECT MOWING	6	CYCL																											
FOOTNOTES																															
1	INCLUDES 1327 CY FOR TEMPORARY BERM.				29	COST OF REMOVING SEDIMENT FROM EXISTING BOX CULVERTS SHALL NOT BE PAID FOR DIRECTLY BUT INCLUDED IN THE COST OF OTHER ITEMS.																									
2	INCLUDES 30 CY FOR 3@12'X12' BOX CULVERT EXTENSION, 50 CY FOR 12'X6' REINF. CONCRETE BOX CULVERT, AND 13 CY FOR 3'X6' REINF. CONCRETE BOX CULVERT.				30	REMOVE EXISTING SIGNALS AT SR33 AND I-640 WESTBOUND EXIT RAMP, AND OLD BROADWAY AT TAZEWELL PIKE AND GREENWAY DR.																									
3	SEE SUBSECTION 209.07 OF THE STANDARD SPECIFICATIONS FOR MAINTENANCE REPLACEMENT.				31	COST OF CABINET INCLUDES CONTROLLER AND CABINET FOUNDATION. CABINET SHALL BE AN 8 PHASE CABINET FOR A F.O. CLOSED SIGNAL LOOP SYSTEM. CABINET SHALL INCLUDE CONTROLLER AND ALL DEVICES FOR F.O. COMMUNICATION CONTROLLERS SHALL BE NAZTEC ATC.																									
4	MAY BE INCREASED OR DECREASED BY THE T.D.O.T. SUPERVISOR.				32	QUANTITIES OF CABLE AND CONDUIT ARE ENGINEERS ESTIMATED GROUND LINE DISTANCES. THE CONTRACTOR SHOULD ALLOW FOR CABLE AND CONDUIT SPLICES AND MAKE UP AT EACH LIGHT AND PULL BOX.																									
5	INCLUDES 3000 TONS FOR MAINTENANCE OF TRAFFIC AND 9,552 TONS FOR TEMPORARY WIDENING.				33	ITEM TO INCLUDE A BREAKAWAY BASE AND FOUNDATION.																									
6	INCLUDES 317 TONS FOR 3@12'X12' BOX CULVERT EXTENSION, 10,062 TONS FOR 12'X6' REINF. CONCRETE BOX CULVERT, AND 2,690 TONS FOR 3'X6' REINF. CONCRETE BOX CULVERT.				34	TOTAL LUMEN USED 27,500, DESIGN IS BASED ON TYPE III MEDIUM-CUTOFF DISTRIBUTION AND COOPER OVH25SCW3E.																									
7	FOR EROSION CONTROL.				35	TOTAL LUMEN USED 28,000, DESIGN IS BASED ON OFFSET FIXTURE AND HOLOPHANE G250H-P00H-DRXXX.																									
8	INCLUDES 81 CY FOR 3@12'X12' BOX CULVERT EXTENSION, 123 CY FOR 12'X6' REINF. CONCRETE BOX CULVERT, AND 23 CY FOR 3'X6' REINF. CONCRETE BOX CULVERT.				36	TOTAL LUMEN USED 15,620, DESIGN IS BASED ON LED ROADWAY FIXTURE COOPER NVN-AE-03-D-U-T3-10K-4N7-AP.																									
9	INCLUDES 18,720 LBS. FOR 3@12'X12' BOX CULVERT EXTENSION, 23,895 LBS. FOR 12'X6' CULVERT REINF. CONCRETE BOX CULVERT, AND 5,622 LBS. FOR 3'X6' REINF. CONCRETE BOX.				37	TOTAL LUMEN USED 10,504, DESIGN IS BASED ON LED ROADWAY FIXTURE COOPER NVN-AE-02-D-U-T3-10K-4N7-AP.																									
10	TO BE USED IN RAISED MEDIANS WHERE THE WIDTH IS 4' OR LESS, AND RAISED ISLAND AT GREENWAY DRIVE. SEE PROPOSED LAYOUTS FOR LOCATIONS.				38	TOTAL LUMEN USED 4,400, DESIGN IS BASED ON UNDERPASS WALLPACK FIXTURE AND HOLOPHANE W4G-LED-20C-1000-40K-TM3. INCLUDES ALL ITEMS NECESSARY TO INSTALL ON BRIDGE BENT.																									
11	WHERE UNDERDRAIN TIES TO PROPOSED DRAINAGE SYSTEM, THE COST WILL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT THE COST SHALL BE INCLUDED IN THE PRICE BID FOR ITEM 710-02, AGGREGATE UNDERDRAIN (WITH PIPE)				39	INCLUDES ALL MATERIALS AND LABOR FOR INSTALLATION OF THE LIGHTING CONTROL CENTER, INCLUDING SERVICE POLE AND FOUNDATION. SEE DETAIL SHEET 27J.																									
12	TWO TYPE "A" WARNING LIGHTS TO BE MOUNTED ON EACH "ROAD CLOSED" SIGN.				40	THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE LOCAL UTILITY TO OBTAIN THE ESTIMATE FOR ANY CHARGES BY THE UTILITY FOR PROVIDING ELECTRICAL SERVICE TO THE CONTROL CENTER. THESE CHARGES SHALL BE INCLUDED IN THE BID PRICE OF THIS ITEM FOR PAYMENT BY THE CONTRACTOR.																									
13	FOR TEMPORARY PAVEMENT MARKING ON INTERMEDIATE LAYERS OF PAVEMENT AND FOR MAINTENANCE OF TRAFFIC.				41	TO BE USED AS BACKFILL FOR LATERAL UNDERDRAINS ON I-640 AND TO PLUG ABANDONED PIPE.																									
14	FOR EROSION CONTROL.				42	TO BE USED ON BRAMP 2 AT TAZEWELL PIKE (SEE SIGNING AND PAVEMENT MARKING SHEET 22G), AND FOR TEMPORARY LANE CHANNELIZATION DURING CONSTRUCTION.																									
15	THIS ITEMS SHALL BE A PORTABLE ENERGY ABSORBING TERMINAL MEETING THE REQUIREMENTS OF NCHRP 350 FOR TEST LEVEL 3. EXAMPLES WOULD A QUAD-GUARD, A REACT 350 OR A TRACC. THE PAY ITEM WILL INCLUDE FURNISHING AND INSTALLING ALL COMPONENTS AS SHOWN IN THE MANUFACTURER'S DRAWINGS.				43	FOR ROCK EXCAVATION ADJACENT TO RAMP 1. BLASTING OF ROCK SHALL NOT BE PERMITTED. ITEM INCLUDES ALL MONITORING OF ADJACENT STRUCTURES INCLUDING THE KUB PUMP STATION. SEE SHEET 7A, 10A FOR DETAILS AND LIMITS OF ROCK EXCAVATION.																									
16	REMOVE SIGN AND SUPPORT ON 55± SIGNS.				44	INCLUDES MILLING OF I-640 WB INSIDE SHOULDER TO REMOVE RUMBLE STRIPS DURING CONSTRUCTION, AND FINAL MILLING OF I-640, SR33, AND OLD BROADWAY AS INDICATED IN THE TYPICAL SECTIONS AND PROPOSED LAYOUTS.																									
17	COST OF SIGNAL HEADS SHALL INCLUDE MOUNTING HARDWARE. SIGNAL HEADS SHALL BE BLACK IN COLOR WITH ALUMINUM TOP SECTION AND TWO POLYCARBONATE BOTTOM SECTIONS, HAVING A 12-INCH SIGNAL FACE AND BLACK POLYCARBONATE VACUUM FORM BACKPLATES WITH LOUVRES.				45	INCLUDES 2,255 L.F. OF 2" CONDUIT WITH PULL WIRES, 44 ANCHOR BOLTS, AND 3 JUNCTION BOXES TO BE INSTALLED IN RETAINING WALL NO. 1.																									
18	CONTRACTOR IS RESPONSIBLE FOR ELECTRICAL SERVICE AND ANY ASSOCIATED FEES.				46	INCLUDES 1,030 L.F. OF 2" CONDUIT WITH PULL WIRES, 24 ANCHOR BOLTS, AND 2 JUNCTION BOXES TO BE INSTALLED IN RETAINING WALL NO. 3.																									
19	SEE DETAIL SHEET 2W.				47	INCLUDES 300 L.F. OF 2" CONDUIT WITH PULL WIRES, 8 ANCHOR BOLTS, AND 2 JUNCTION BOXES TO BE INSTALLED IN RETAINING WALL NO. 5.																									
20	ANY COST ASSOCIATED WITH THE FOUNDATION AND POLE DESIGN SHALL BE INCLUDED IN THIS ITEM. ITEM INCLUDES FOUNDATION AND POLE INSTALLATION.				48	INCLUDES 205 L.F. OF 2" CONDUIT WITH PULL WIRES, 4 ANCHOR BOLTS, AND 2 JUNCTION BOXES TO BE INSTALLED IN RETAINING WALL NO. 6.																									
21	MODIFICATION IS THE INSTALLATION OF A PEDESTAL POLE AND PEDESTRIAN SIGNALS.				49	INCLUDES 750 L.F. OF 2" CONDUIT WITH PULL WIRES, 16 ANCHOR BOLTS, AND 2 JUNCTION BOXES TO BE INSTALLED IN RETAINING WALL NO. 9.																									
22	FOR EROSION CONTROL - BANK STABILIZATION OF STR-4 DOWNSTREAM OF 12'X6' RCBC.				50	TOTAL LUMEN USED 5,000, DESIGN IS BASED ON UNDERPASS PENDANT FIXTURE AND HOLOPHANE PLED2-5L-4K-AS-UN-NA-G-L1. INCLUDES STRUCTURAL HANGERS PER DETAIL.																									
23	FOR APRONS AT PIPE OUTLETS AND EROSION CONTROL.				51	BID PRICE INCLUDES ALL SALVAGE VALUE OF MATERIAL. SEE TABULATED QUANTITIES SHEET 2Q FOR REMOVAL OF BUILDINGS AND OBSTRUCTIONS DESCRIPTION BLOCK.																									
24	THE COST OF TYING PROPOSED PIPES INTO EXISTING CATCH BASINS WILL NOT BE MEASURED AND PAID FOR DIRECTLY BUT INCLUDED IN THE COST OF THE PIPE.																														
25	FOR BANK STABILIZATION ALONG STREAM 1 ADJACENT TO RETAINING WALL 1. SEE SHEETS 2U - 2U4 FOR DETAILS.																														
26	TO BE USED ON SR33, RAMP 2, AND RAMP 3 CUT SLOPES ADJACENT TO PONDS. SEE SOILS SHEET 28Z AND CROSS-SECTIONS FOR DETAILS AND LOCATIONS.																														
27	TO BE USED IN I-640, RAMP 2, RAMP 3 AND ADDISON FILL EMBANKMENT ADJACENT TO PONDS. SEE SOILS SHEETS 28W-28Y AND CROSS-SECTIONS FOR DETAILS AND LOCATIONS.																														
28	TACK COAT FOR OGFC SHALL BE HOT APPLIED, ASPHALT CEMENT OF PERFORMANCE GRADE PG76-22 OR NON-TRACKING, HOT-APPLIED, POLYMER MODIFIED TACK COAT (NTHAP), PG 76-22 BINDER SHALL MEET THE REQUIREMENTS OF SECTION 904.01 OF THE STANDARD SPECIFICATIONS. NTHAP SHALL MEET THE FOLLOWING MATERIAL REQUIREMENTS:																														
<table><tr><th colspan="4">Specifications for Non-Tracking, Hot-Applied, Polymer Modified Tack (NTHAP)</th></tr><tr><th>Test Requirement</th><th>Test Method</th><th>Minimum</th><th>Maximum</th></tr><tr><td>Rotational Viscosity @ 149 °C, cP</td><td>T 316</td><td>-----</td><td>3,000</td></tr><tr><td>Penetration @ 25 °C (77 °F), 100 g 5 Sec.</td><td>T 49</td><td>-----</td><td>25</td></tr><tr><td>Softening Point, °C</td><td>T 53</td><td>70</td><td>-----</td></tr><tr><td>Dynamic Shear, G* sin δ</td><td>T 315</td><td>1.0 kPa @ 82 °C</td><td>-----</td></tr></table>						Specifications for Non-Tracking, Hot-Applied, Polymer Modified Tack (NTHAP)				Test Requirement	Test Method	Minimum	Maximum	Rotational Viscosity @ 149 °C, cP	T 316	-----	3,000	Penetration @ 25 °C (77 °F), 100 g 5 Sec.	T 49	-----	25	Softening Point, °C	T 53	70	-----	Dynamic Shear, G* sin δ	T 315	1.0 kPa @ 82 °C	-----		
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TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2016	NH-I-640-7(161)	2A1

KNOX