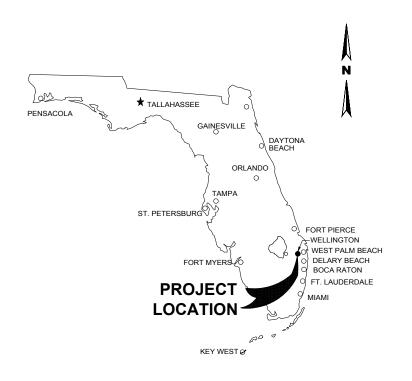


# VILLAGE OF WELLINGTON UTILITIES TELEMETRY BACKHAUL SYSTEM UPGRADE

VILLAGE PROJECT No. 201709



VICINIT	Y MAP
NTS	

Sheet List Table							
Sheet Number	Sheet Title						
	GENERAL						
G-01	COVER PAGE						
	ELECTRICAL						
E-01	ELECTRICAL LEGENDS, SYMBOLS, AND GENERAL NOTES						
E-02	LOCATION MAP						
E-03	WATER PLANT ELECTRICAL SITE PLAN						
E-04	PHOTOGRAPHS — SHEET 1						
E-05	PHOTOGRAPHS — SHEET 2						
E-06	PHOTOGRAPHS, SCHEDULES AND RISER DIAGRAMS						
E-07	INSTALLATION DETAILS						

# **VILLAGE COUNCIL & ADMINISTRATORS**

MARK E. LUTHER, PE

ANNE GERWIG JOHN T. McGOVERN MICHAEL J. NAPOLEONE MICHAEL DRAHOS TANYA SISKIND PAUL SCHOFIELD **JAMES BARNES** 

SHANNON LaROCQUE, P.E.

**MAYOR** VICE MAYOR COUNCILMAN COUNCILMAN COUNCILWOMAN VILLAGE MANAGER ASST. VILLAGE MANGER UTILITY DIRECTOR



ALL EXISTING UTILITIES SHOWN ON THESE PLANS ARE TO BE CONSIDERED APPROXIMATE & SHOULD BE VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF WORK OPERATIONS

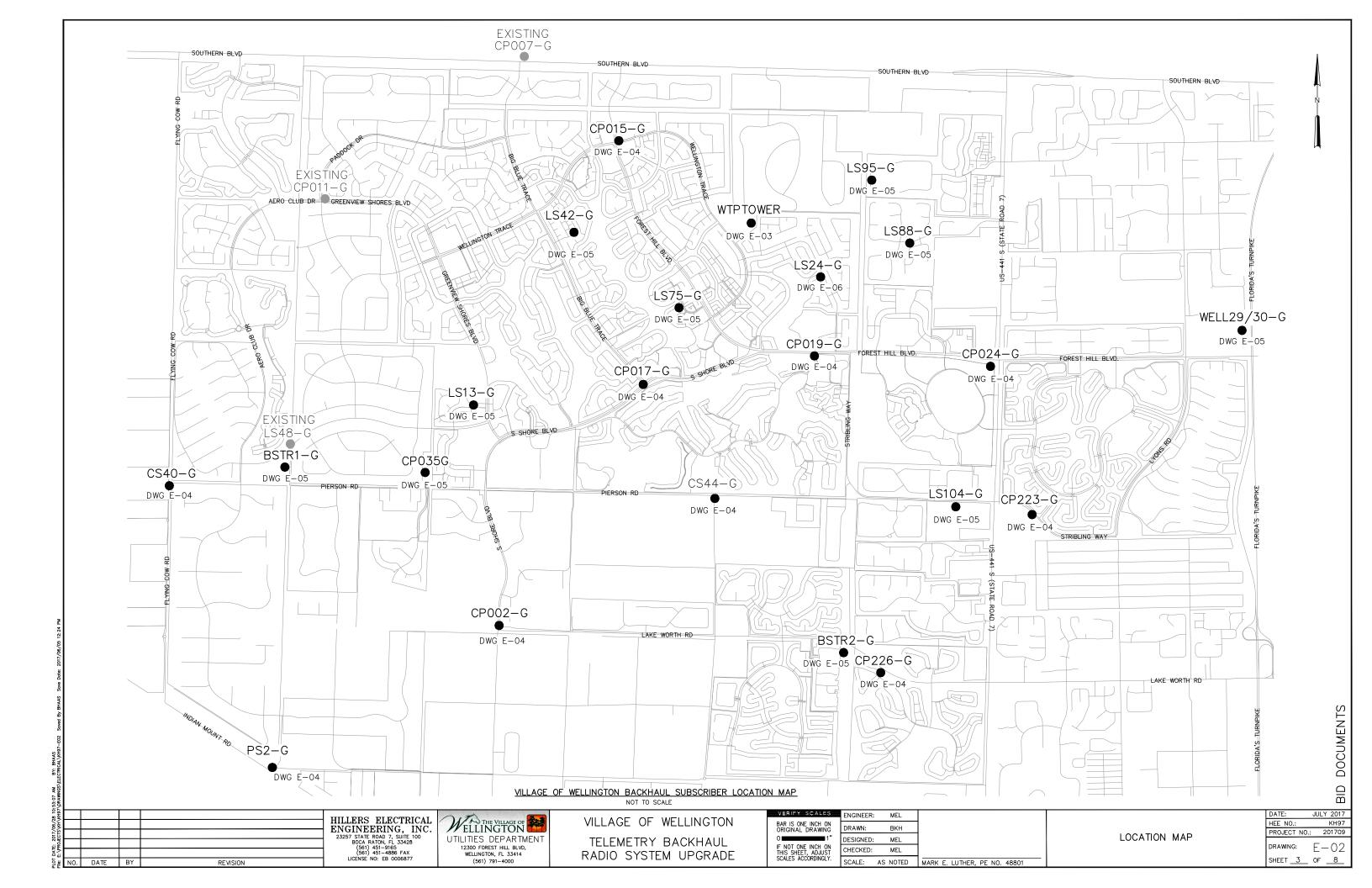
REPRODUCTION:
ATTENTION IS DIRECTED TO THE FACT THAT THESE
PLANS MAY HAVE BEEN REDUCED IN SIZE BY
REPRODUCTION. THIS MUST BE CONSIDERED WHEN
OBTAINING SCALED DATA.

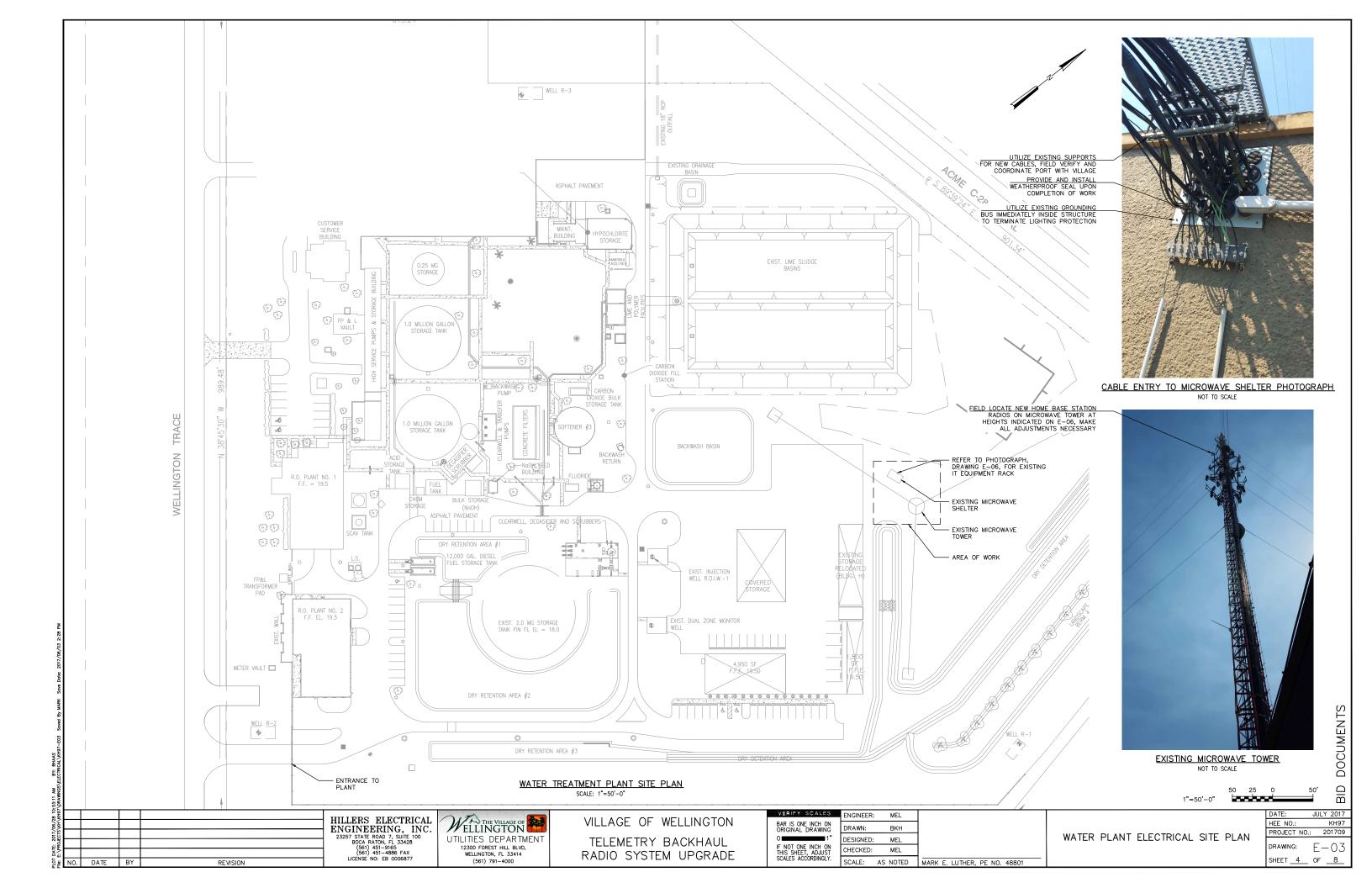
HILLERS ELECTRICAL ENGINEERING, INC.

PROJECT No. KH97

**JULY 2017** 

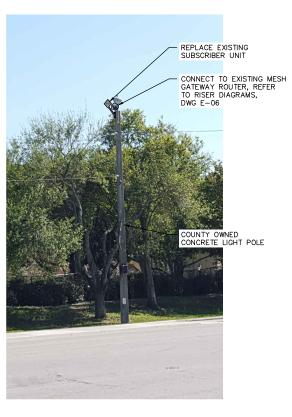
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION		ABBREVI	ATIONS			
<b>△</b>	CONNECTION POINT TO EQUIPMENT SPECIFIED,	•	GROUND ROD	ABBREVIA		ABBREVI	ATIONS DESCRIPTION	GENERAL NOTES AND	<u>SPECIFICATIONS</u>
	FURNISHED AND INSTALLED UNDER OTHER DIVISIONS. RACEWAY, CONDUCTOR AND CONNECTION IN DIVISION 16. COORDINATE FINAL CONNECTION WITH EQUIPMENT SUPPLIER.	s	WALL SWITCH: 2- DOUBLE POLE P- PILOT LIGHT 3- THREE WAY K- KEY OPERATED 4- FOUR WAY D- DIMMER	A AC AFF AL	AMMETER, AMPERE, AMBER ALTERNATING CURRENT ABOVE FINISHED FLOOR ALUMINUM	MDS MDP MH	MAIN SERVICE DISCONNECT SWITCH MAIN DISTRIBUTION PANEL MAINTENANCE ACCESS HOLE	STATION ANTENNAS AND S CONFIGURATION REQUIRED	LL INCLUDE ALL MATERIALS AND LABOR REQUIRED TO REPLACE EXISTING BACKHAUL TELEMETRY BASE SUBSCRIBER UNITS AS INDICATED ON THE DRAWINGS AND SPECIFICATIONS. PROVIDE ALL SERVICES AND FOR A COMPLETE AND WORKING BACKHAUL TELEMETRY SYSTEM IN PLACE. ITEMS NOT SHOWN BUT OR COMPLETION OF THE WORK SHALL BE INCLUDED.
1"C,2#12,1#12G 1"C,1-25/C TYPE 1	INDICATES RACEWAY AND CIRCUIT CONDUCTORS. FIRST NUMBER IS RACEWAY SIZE. THE FOLLOWING NUMBERS ARE THE CONDUCTOR QUANTITIES, SIZES, AND TYPES	S	WP— WEATHERPROOF CRE— CORROSION RESISTANT  MANUAL MOTOR STARTER SWITCH  CONVENIENCE RECEPTACLE — DUPLEX UNLESS SPECIFIED	ALT AM AS ATS	ALTERNATE AUTO-MANUAL AMMETER SWITCH, AUTOMATIC TRANSFER	MS MIN N NC	MOTOR STARTER MINIMUM NEUTRAL NORMALLY CLOSED	THE CONTRACTOR IS RESP OCCUPATIONAL SAFETY AN	IONSIBLE FOR ENSURING ALL WORK COMPLIES WITH ASSOCIATED REQUIREMENTS SET FORTH BY THE ID HEALTH ADMINISTRATION (OSHA), NATIONAL ASSOCIATION OF TOWER ERECTORS (NATE) STANDARDS, OTECTION CODE AND ANSI/ASSE A10.48-2106 CRITERIA FOR SAFETY PRACTICES WITH THE CONSTRUCTION,
	MAJOR ELECTRICAL COMPONENT OR DEVICE - NAME OR IDENTIFYING SYMBOL AS SHOWN.	=======================================	OTHERWISE WP- WEATHERPROOF C- CLOCK HANGER TL- TWIST LOCK CRE- CORROSION RESISTANT		SWITCH	NEMA	NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION		AND MAINTENANCE OF COMMUNICATIONS STRUCTURES. PROVIDE ALL NECESSARY SIGNAGE WHERE
25MCC1	PANELBOARD	#	CONVENIENCE RECEPTACLE — QUADRUPLEX UNLESS SPECIFIED OTHERWISE WP— WEATHERPROOF C— CLOCK HANGER TL— TWIST LOCK CRE— CORROSION RESISTANT	BRKR C CB	BREAKER CONDUIT, CONTACTOR CIRCUIT BREAKER	NO NP NTS	NORMALLY OPEN NAMEPLATE NOT TO SCALE	4. THE SAFETY OF TOWER CL CLIMBING PERSONNEL FOR EQUIPMENT IS IN GOOD RE	IMBING PERSONNEL IS CRITICAL. THE CONTRACTOR SHALL PROVIDE THE SERVICES OF CERTIFIED TOWER ALL WORK ON THE MICROWAVE TOWER. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING SAFETY PAIR.
←}— ∪ <u>H1</u> 5KW — <u>IIC</u>	TELEPHONE TERMINAL CABINET	<b>=</b>	CONVENIENCE RECEPTACLE — DUPLEX UNLESS SPECIFIED OTHERWISE — FLUSH IN FLOOR CONVENIENCE RECEPTACLE, PEDESTAL OR ABOVE COUNTER	CKT CMP CPT	CIRCUIT CENTRAL MONITORING PNL CONTROL POWER TRANSFORMER	OCA OCR OL	OPEN-CLOSE (D) OPEN-CLOSE-AUTO OPEN-CLOSE-REMOTE OVERLOAD RELAY	FUNCTIONAL RF MONITOR TIME INSTALLERS WILL BE	E TRAINED FOR WORKING IN RADIO FREQUENCY (RF) ENVIRONMENTS AND SHALL BE EQUIPPED WITH A AND WEAR APPROPRIATELY RATED RF PROTECTIVE EQUIPMENT. COORDINATE WITH CARRIERS ON DATE AND WORKING ON THE TOWER. MAKE ALL ARRANGEMENTS TO ENSURE REDUCED RF TRANSMISSION LEVELS
	UNRMINAATERNAOU9N SIOX SCHEDULE	$\phi \phi \phi$	DUPLEX, UNLESS INDICATED OTHERWISE  MULTI-OUTLET ASSEMBLY RECEPTACLES	CR CT	CONTROL RELAY CURRENT TRANSFORMER	00 00A	ON-OFF ON-OFF-AUTO	WHILE INSTALLERS ARE ON  6. APPROPRIATE SAFE—GAUR	N THE TOWER. DS SHALL BE TAKEN TO PROTECT TOWER CLIMBERS AND PLANT PERSONNEL FROM INJURY. PROVIDE ALL
(10)	WOUND-ROTOR MOTOR, HORSEPOWER INDICATED	30 🛆	RECEPTACLE, SPECIAL PURPOSE - AMPERAGE	EHD EF EG	ELECTRIC HAND DRYER EXHAUST FAN EQUIPMENT GROUND	OOR OSC P	ON-OFF-REMOTE OPEN-STOP-CLOSE POLE		UIPMENT (PPE) REQUIRED FOR CLIMBING AN OPERATIONAL MICROWAVE TOWER IN ACCORDANCE WITH TIFY THE VILLAGE OF APPLICABLE PRECAUTIONS FOR GROUND PERSONNEL TO TAKE WHILE TOWER WORK IS
5	MOTOR, SQUIRREL CAGE INDUCTION — HORSEPOWER INDICATED		AS INDICATED  TELEPHONE/DATA RECEPTACLE (OUTLET BOX ONLY) WITH  1" CONDUIT TO TELEPHONE TERMINAL CABINET (TTC)	EMH EPB ETM	ELECTRICAL MAHHOLE ELECTRICAL PULL BOX ELAPSED TIME METER	PB PE PH	PULL BOX PHOTOCELL PHASE		BE IN ACCORDANCE WITH THE 2011 NATIONAL ELECTRICAL CODE (NFPA 70) AND 2017 NATIONAL (NESC), LOCAL CODES, CITY CODES, ALL PALM BEACH COUNTY CODES AND 2014 FLORIDA BUILDING CODE COUNTY AND ADMINISTRATION OF THE PARTY OF T
☐(1/2)☐	DC MOTOR, HORSEPOWER INDICATED		TELEPHONE/DATA RECEPTACLE (FLUSH IN FLOOR OUTLET BOX ONLY) WITH 1" CONDUIT TO TELEPHONE TERMINAL CABINET	DISC DODE DOE	DISCONNECT DELAY UPON DE-ENERGIZATION DELAY UPON ENERGIZATION	PM PNL PR	PHASE MONITOR PANELBOARD PAIR POTENTIAL TRANSFORMER		OBTAIN ALL NECESSARY PERMITS, INSPECTIONS AND APPROVALS AND TO INCLUDE ALL FEES AS PART OF
	LUMINAIRE - SEE SCHEDULE	N	(TTC) TELEPHONE RECEPTACLE (OUTLET BOX 48" AFF ONLY) WITH	FC FDR FM	FULLY CLOSED FEEDER FLOW METER	PT PVC QNTY	POLYVINYL CHLORIDE CONDUIT QUANTITY		COORDINATE HIS WORK WITH THE ENGINEER AND OWNER.  BEFORE SUBMITTING HIS BID. VISIT THE SITE OF THE PROJECT AND BECOME FAMILIAR WITH THE EXISTING
2	LUMINAIRE - SEE SCHEDULE	₩ T	3/4" CONDUIT TO TELEPHONE TERMINAL CABINET (TTC)  COAXIAL CABLE RECEPTACLE (OUTLET BOX INSTALLED 18" AFF ONLY)	FS FT FUT	FLOAT SWITCH FLOW TRANSMITTER FUTURE	RPC R RCPT	REMOTE POWER CENTER RED RECEPTACLE	CONDITIONS. NO ALLOWAN	BEFORE SUBMITTING HIS BILLY INSTIT HE STILE OF THE PROJECT AND BECOME FAMILIAR WITH THE EASTING CE WILL BE MADE FOR EXISTING CONDITIONS OR FALUER OF THE CONTRACTOR TO OBSERVE THEM.  ERIAL SHALL BE UNUSED AND U.L. LISTED. ALL REFERENCES TO A PARTICULAR MANUFACTURER ARE GIVEN
3.0	LUMINAIRE AND POLE — SEE SCHEDULE		WITH 1" CONDUIT TO TELEPHONE TERMINAL CABINET (TTC)  GENERAL CONTROL OR WIRING DEVICE. NEMA 4X	FVNR	FULL VOLTAGE NON-REVERSING STARTER	R/I RMS	RESISTANCE TO CURRENT CONVERTER ROOT MEAN SQUARE	ON AN "APPROVED EQUAL	
(4) (2)	WALL MOUNTED LUMINAIRE - SEE SCHEDULE		ENCLOSURE UNLESS INDICATED OTHERWISE. LETTER SYMBOLS OR ABBREVIATIONS INDICATE TYPE OF DEVICE.	G GALV GFI	GREEN, GROUND GALVANIZED GROUND FAULT INTERRUPTER	RS RTU SC	RIGID STEEL CONDUIT REMOTE TELEMETRY UNIT SURGE CAPACITOR	ALL DEFECTIVE WORK TO	ONSIDE TO TEST ALL SYSTEMS INSTALLED OR MUDIFIED UNDER THIS PROJECT AND REPAIR OR REPLACE THE SATISFACTION OF THE ENGINEER AND OWNER.  O AND INSTALLED BY THE CONTRACTOR SHALL BE GUARANTEED AGAINST DEFECTS IN MATERIAL AND
(5) -	FLOOD LIGHTS - AIM IN THE DIRECTION SHOWN  EXIT LIGHTS - SEE SCHEDULE	30	NONFUSED DISCONNECT SWITCH, SIZE INDICATED, 3 POLE UNLESS INDICATED OTHERWISE, NEMA 1 ENCLOSURE, WP = WEATHERPROOF (NEMA 4X)	GEN GFR GND	GENERATOR GROUND FAULT RELAY GROUND	SF SMH	SUPPLY FAN SIGNAL MAINTENANCE ACCESS HOLE	WORKMANSHIP FOR A PER	IOD OF ONE YEAR FROM DATE OF ACCEPTANCE.  BE COPPER. NO ALUMINUM ALLOWED UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
4	EMERGENCY LIGHTING FIXTURE	60/40 F	FUSED DISCONNECT SWITCH, SIZE INDICATED (60/40, 60 = SWITCH RATING: 40 = FUSE RATING)	GRS HH HID	GALVANIZED RIGID STEEL HANDHOLE HIGH INTENSITY DISCHARGE	SPB SS	SIGNAL PULL BOX STAINLESS STEEL, SELECTOR SWITCH		E SUBMITTED FOR ALL ELECTRICAL & CONTROL EQUIPMENT AND MATERIAL AND SHALL INCLUDE THE JPE CLEARLY INDICATING WHICH PRODUCT WILL BE PROVIDED AND THAT PRODUCT COMPLIES WITH THE CAN THE DEADMINGS
S <sub>a</sub> or 1	7 SMALL LETTER SUBSCRIPT AT SWITCH AND LUMINAIRE 0 INDICATES SWITCHING, SUBSCRIPT NUMBER		3 POLE UNLESS INDICATED OTHERWISE, NEMA 1 ENCLOSURE, WP = WEATHERPROOF (NEMA 4X)	HOA HOR	HAND-OFF-AUTO HAND-OFF-REMOTE	SSRV	SOLID STATE REDUCED  VOLTAGE STARTER  SWITCH	16. THE DRAWINGS ARE NOT I	NTENDED TO SHOW THE EXACT LOCATION OF CONDUIT RUNS. THESE ARE TO BE COORDINATED WITH THE CONFLICTS ARE AVOIDED PRIOR TO INSTALLATIONS.
—— <b>&gt;</b> 5LP1−3	AT LUMINAIRE INDICATES CIRCUIT IN PANELBOARD.  HOME RUN — DESTINATION SHOWN	2 🛛	STARTER MAGNETIC NEMA SIZE INDICATED, NEMA 1 ENCLOSURE, UNLESS INDICATED OTHERWISE. SEE CONTROL DIAGRAM.	IC I &c C	INSTANTANEOUS CLOSE INSTRUMENTATION AND	SYM TC TDR	SYMMETRICAL TIMED CLOSE	COORDINATE EXACT LOCAT	MENT, PANELS ETC. ARE SHOWN FOR ILLUSTRATION PURPOSES. CONTRACTOR SHALL VERIFY AND TON AND SIZE WITH ALL SUBCONTRACTORS AND EQUIPMENT SUPPLIERS PRIOR TO ANY INSTALLATION AND WITH CORRESPONDING CONDUIT STUB-UPS.
or		2	COMBINATION (FUSE OR CIRCUIT BREAKER AS INDICATED). MAGNETIC STARTER, NEMA SIZE INDICATED,	JB K	CONTROL JUNCTION BOX KEY INTERLOCK	TDAD TDAE	TIME DELAY RELAY TIME DELAY AFTER DE—ENERGIZATION	18. NOT ALL CONDUITS SHOW	NO N RISER AND ONE-LINE DIAGRAMS ARE SHOWN ON BUILDING LAYOUTS. CONTRACTOR SHALL SUPPLY S AS SHOWN ON RISER AND ONE-LINE DIAGRAMS.
—— or —////_G	CONCEALED CONDUIT AND CONDUCTORS*  NOTE:  * ALL UNMARKED CONDUIT RUNS CONSIST OF		NEMA 1 ENCLOSURE UNLESS INDICATED OTHERWISE. SEE CONTROL SCHEMATIC DIAGRAM.  CONTACT — NORMALLY OPEN WITH NEMA SIZE	KW LA	KILOWATT LIGHTNING ARRESTER	TJB	TIME DELAY AFTER ENERGIZATION TERMINAL JUNCTION BOX		VOLTAGE SIGNALS SUCH AS 4-20MA, TELEPHONE COMMUNICATION, FIRE ALARM COMMUNICATION. POWER ISS INSTRUMENTATION CONDUIT PERPENDICULARLY AT RIGHT ANGLES WITH 6" SEPARATION.
	TWO NO.12 CONDUCTORS W/GROUND IN CONDUIT. RUNS MARKED WITH CROSSHATCHES INDICATE NUMBER OF NO.12 CONDUCTORS. CROSSHATCH		INDICATED OR COIL IDENTIFICATION AS APPLICABLE  — CONTACT — NORMALLY CLOSED WITH NEMA SIZE	LC LLS LS	LIGHTING CONTACTOR LIQUID LEVEL SWITCH LIMIT SWITCH	TR TS	TIMED OPEN TRIPLE, TIMING RELAY THERMAL SWITCH	20. CONDUCTOR PULLING TENS TO MEET MANUFACTURER'S	SIONS SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATION. CONTRACTOR SHALL INSTALL PULL BOXES 5 REQUIREMENTS.
	WITH SUBSCRIPT "G" INDICATES GREEN GROUND WIRE. SIZE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODE.	x_	INDICATED OR COIL IDENTIFICATION AS APPLICABLE  OVERLOAD RELAY HEATER	LT FLEX LTG LP	LIQUID TIGHT FLEX CONDUIT LIGHTING LIGHTING PANEL	TSP TURB TYP	TWISTED SHIELDED PAIR TURBIDITY TYPICAL	21. MINIMUM DISTANCE ALLOW <u>VOLTAGE</u> <u>DISTANCE</u> 4160V 3 FT	ED BETWEEN POWER CONDUITS AND INSTRUMENTATION CONDUITS SHALL BE:
	YCX=YARD CONDUIT NO.	<u> </u>	- MAGNETIC STARTER WITH NEMA SIZE INDICATED	LR M	LOCAL-REMOTE, LATCHING RELAY  MAGNETIC CONTACTOR COIL	UVR V	UNDER VOLTAGE RELAY VOLTMETER, VOLT	480V 2 FT 120V 1 FT	
	O CONDUIT DOWN, X IS CONDUIT NO. O CONDUIT UP	100/M	<ul> <li>CIRCUIT BREAKER, MAGNETIC, TRIP SHOWN, 3 POLE UNLESS INDICATED OTHERWISE</li> </ul>	MA MANUF MCC	MANUAL—AUTO MANUFACTURER MOTOR CONTROL CENTER	VFD VS WP	VARIABLE FREQUENCY DRIVE VOLTMETER SWITCH WEATHERPROOF	HOUR SPAN DRY RESISTAN	TALLED IN ACCORDANCE WITH NEC, ARTICLE 250. THE GROUNDING SYSTEM TEST SHALL NOT EXCEED A 48 ICC OF 10 OHMS. ADDITIONAL GROUNDING TO MEET THIS REQUIREMENT SHALL BE INSTALLED AT NO EXTRA MIDDING CONNECTIONS SHALL NOT BE PAINTED. ALL GROUNDING CONNECTIONS SHALL BE EXOTHERMIC CATED. OTHERWISE
	CONDUIT, STUBBED AND CAPPED AS SHOWN UNDERGROUND CONDUIT	400	CIRCUIT BREAKER, THERMAL MAGNETIC TRIP SHOWN,     3 POLE UNLESS INDICATED OTHERWISE.	MCP LII	MOTOR CIRCUIT PROTECTOR  NE WEIGHTS	XFMR	TRANSFORMER		IRE SIZED PER NEC SHALL BE PULLED IN ALL ELECTRICAL CONDUITS, POWER AND CONTROL, WHETHER OR
——FPL ——	EXPOSED CONDUIT  FP&L SERVICE DUCTBANK	400 400	<ul> <li>CIRCUIT BREAKER WITH CURRENT LIMITING FUSES, TRIP AND FUSE RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.</li> </ul>					24. PROVIDE CONDUIT DUCT S	
82 ——SI ——	TELEPHONE DUCTBANK INSTRUMENTATION & CONTROL DUCTBANK	400 225	FUSED SWITCH, SWITCH AND FUSE CURRENT RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.		PROPOSED  EXISTING				BE USED TO TERMINATE ALL MOTORS AND OTHER VIBRATING EQUIPMENT TED CORROSIVE AREAS SHALL BE NEMA 4X 316 STAINLESS STEEL.
——————————————————————————————————————	HIGH VOLTAGE DUCTBANK (5KV) LOW VOLTAGE DUCTBANK (120-480V)	100	SWITCH - CURRENT RATING INDICATED, 3 POLE	_	—— FUTURE				R STAINLESS STEEL SHALL BE CONSTRUED AS MEANING OF 316 STAINLESS STEEL, UNLESS OTHERWISE
G — G	GROUND WIRE, 4/0 UNLESS OTHERWISE NOTED	<u> </u>		1//	DEMOLITION			28. FEEDER CONDUCTORS ARE CODE—ENERGY CONSERVA	SIZED FOR MAXIMUM VOLTAGE DROP OF 2 PERCENT AT DESIGN LOAD PER THE 2014 FLORIDA BUILDING 10N-C405.7.3.1
ives in the second seco	ERING FACILITIES  BON MONOXIDE DETECTOR			//.	///.			29. BRANCH CIRCUIT CONDUCT BUILDING CODE ENERGY C	ORS ARE SIZED FOR MAXIMUM VOLTAGE DROP OF 3 PERCENT AT DESIGN LOAD PER THE 2014 FLORIDA ONSERVATION-C405.7.3.2
Panos XX	PULSE VARIABLE FREQUENCY DRIVE	— ·						DEPICTING THE COMPLETED DISTRIBUTION AND FLOOR	IDE TO THE OWNER WITHIN 30 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE RECORD DRAWINGS D INSTALLATION AS INSTALLED INCLUDING A SINGLE LINE DIAGRAM OF THE BUILDING ELECTRICAL PLANS INDICATING THE LOCATION AND AREA SERVED BY ALL INSTALLED DISTRIBUTIONS PER THE 2014  CREGY CONSERVATION—C405.7.4.1
KH97-EG	ulse variable frequency drive	NOTE: THIS IS A STANDARD L	LEGEND SHEET. SOME SYMBOLS OR ABBREVIATIONS					31. CONTRACTOR SHALL PROV	IDE TO THE OWNER OPERATING AND MAINTENANCE MANUALS (O&M MANUALS) FOR ALL EQUIPMENT PER
ELECTRIC BITS OF THE CONTROL OF THE		MAY APPEAR ON THIS	SHEET AND NOT BE UTILIZED ON PROJECT.					THE MANUALS SHALL INC 1. SUBMITTAL C MAINTENANC	SLUDE: ATA STATING EQUIPMENT RATING AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING E.
\pramission am								2. O&M MANUA ACTIONS SHA	S FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, REQUIRED ROUTINE MAINTENANCE ALL BE CLEARLY IDENTIFIED. ADDRESSES OF AT LEAST ONE QUALIFIED SERVICE AGENCY
WHY WHY		HILLERS ELECT ENGINEERING	TRICAL VILLAGE OF VILLAGE OF VILLAGE (	OF WE	LLINGTON BAR IS	FY SCALES S ONE INCH ON NAL DRAWING	ENGINEERI IIIEE	-	DATE: JULY 2017 HEE NO.: KH97
Projects		23257 STATE ROAD 7, SU BOCA RATON, FL 33 (561) 451-9165	UTILITIES DEPARTMENT TELEMET		CKHAUL 0 IF NOT	ONE INCH ON CHEET, ADJUST	DESIGNED: MEL		ELECTRICAL LEGENDS, SYMBOLS, AND GENERAL NOTES  PROJECT NO.: 201709 DRAWING: F — ()1
A DATE BY	REVISION	(561) 451-4886 F LICENSE NO: EB 0006	FAX   WELLINGTON, FL 33414   □Λ□□□□□	STEM	UPGRADE THIS S	SHEET, ADJUST S ACCORDINGLY.		LUTHER, PE NO. 48801	SHEET <u>2</u> OF <u>8</u>







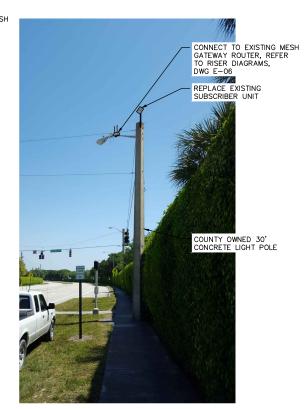
CP015-G PHOTOGRAPH NOT TO SCALE



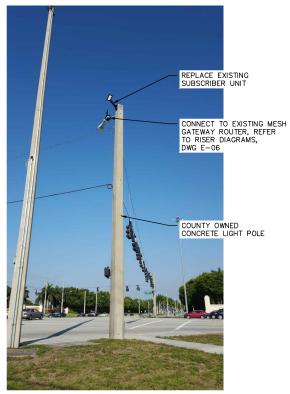
CP017-G PHOTOGRAPH NOT TO SCALE



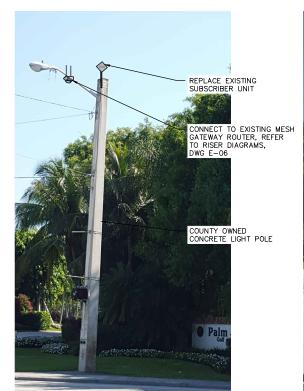
CP002-G PHOTOGRAPH NOT TO SCALE



CP226-G PHOTOGRAPH NOT TO SCALE



CP024-G PHOTOGRAPH NOT TO SCALE



CP019-G PHOTOGRAPH



CP223-G PHOTOGRAPH NOT TO SCALE



CS40-G PHOTOGRAPH NOT TO SCALE



CS44-G PHOTOGRAPH NOT TO SCALE



PS2-G PHOTOGRAPH NOT TO SCALE

OTES:

REFER TO DRAWING E-02 FOR LOCATION MAP.

REFER TO TABLE ON DRAWING E-06 FOR EQUIPMENT SPECIFICATIONS 2. REFER TO TABLE
ON DRAWING E-06
FOR EQUIPMENT
SPECIFICATIONS
AND MOUNTING
DETAILS.

BID

VERIFY SCALE VILLAGE OF WELLINGTON BAR IS ONE INCH ORIGINAL DRAWIN IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

ES	ENGINEER:	MEL							
ON NG	DRAWN:	BKH							
<b>∎</b> 1"	DESIGNED:	MEL							
ON JST	CHECKED:	MEL							
GLY.	SCALE:	AS NOTED	MARK	E.	LUTHER,	PE	NO.	48801	_

PHOTOGRAPHS - SHEET 1

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DATE:	JULY 2017
HEE NO.:	KH97
PROJECT NO	.: 201709
DRAWING:	E-04
SHEET 5	OF <u>8</u>

REVISION

HILLERS ELECTRICAL
ENGINEERING, INC.
23257 STATE ROAD 7, SUITE 100
BOCA RATON, FL 33428
(561) 451-4886 FAX
LICENSE NO: EB 0006877 WELLINGTON E UTILITIES DEPARTMENT
12300 FOREST HILL BLVD,
WELLINGTON, FL 33414 (561) 791-4000

TELEMETRY BACKHAUL RADIO SYSTEM UPGRADE



LS42-G PHOTOGRAPH NOT TO SCALE



LS13-G PHOTOGRAPH NOT TO SCALE



LS75-G PHOTOGRAPH NOT TO SCALE



NOT TO SCALE



LS95-G PHOTOGRAPH NOT TO SCALE



LS104-G PHOTOGRAPH



BSTR1-G PHOTOGRAPH NOT TO SCALE



BSTR2-G PHOTOGRAPH



WELL 29/30-G PHOTOGRAPH

NOT TO SCALE



CP035-G PHOTOGRAPH NOT TO SCALE

NOTES:

1. REFER TO DRAWING E-02 FOR LOCATION MAP.

2. REFER TO TABLE ON DRAWING E-06 FOR EQUIPMENT SPECIFICATIONS AND MOUNTING DETAILS.

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	NΩ	DATE	RY	REVISION

HILLERS ELECTRICAL
ENGINEERING, INC.
23257 STATE ROAD 7, SUITE 100
BOCA RATON, FL. 33428
(561) 451-4886 FAX
LICENSE NO: EB 0006877

WELLINGTON E UTILITIES DEPARTMENT 12300 FOREST HILL BLVD, WELLINGTON, FL 33414 (561) 791-4000

VILLAGE OF WELLINGTON TELEMETRY BACKHAUL RADIO SYSTEM UPGRADE

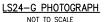
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

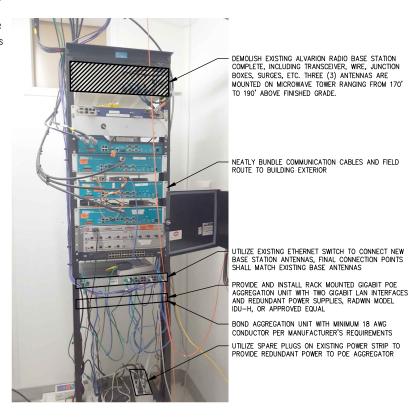
ENGINEER:	MEL						
DRAWN:	BKH						
DESIGNED:	MEL						
CHECKED:	MEL						
SCALE:	AS NOTED	MARK	E.	LUTHER,	PE	NO.	48801

ENT SPECIFICA DUNTING DETAI		BID
DATE:	JULY	2017
HEE NO.:		KH97
PROJECT NO.:	20	01709
DRAWING:	E-	05
SHEET 6	OF	8

DOCUMENTS

PHOTOGRAPHS - SHEET 2

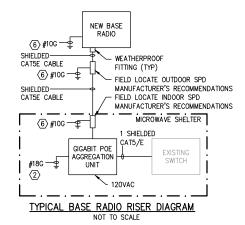




PHOTOGRAPH - EXISTING IT EQUIPMENT RACK NOT TO SCALE



NOT TO SCALE



	VILLAGE OF WELLINGING TELEMETRY BACKHAUL SYSTEM									
	SITE	LATITUDE	LONGITUDE	ADDRESS/INTERSECTION/LOCATION	MOUTNING LOCATION	HEIGHT AFG	UNIT TYPE	RADWIN MODEL	BASE	NOTES/REMARKS
	WTPTOWER	26.665342	-80.232450	VILLAGE OF WELLING WATER TREATMENT PLANT WEST BASE STATION ANTENNA	MICROWAVE TOWER	180'	HBU	RW-5BG5-0649	-	EXISTING
	WTPTOWER	26.665342	-80.232450	VILLAGE OF WELLING WATER TREATMENT PLANT SOUTH-EAST BASE STATION ANTENNA	MICROWAVE TOWER	180'	HBU	RW-5BG5-0649	-	PROVIDE AND INSTALL LIGHTNING PROTECTION PER MANUFACTURER'S RECOMMENDATIONS. MOUNT TO EXISTING MICROWAVE TOWER.  REFER TO HBS MOUNTING DETAIL FOR MICROWAVE TOWER, SHEET E-07.
	WTPTOWER	26.665342	-80.232450	VILLAGE OF WELLING WATER TREATMENT PLANT SOUTH-WEST BASE STATION ANTENNA	MICROWAVE TOWER	180'	HBU	RW-5BG5-0649		PROVIDE AND INSTALL LIGHTNING PROTECTION PER MANUFACTURER'S RECOMMENDATIONS. MOUNT TO EXISTING MICROWAVE TOWER.  REFER TO HBS MOUNTING DETAIL FOR MICROWAVE TOWER, SHEET E-07.
	WTPTOWER	26.665342	-80.232450	VILLAGE OF WELLING WATER TREATMENT PLANT EAST BASE STATION ANTENNA	MICROWAVE TOWER	180'	HBU	RW-5BG5-0649	-	PROVIDE AND INSTALL LIGHTNING PROTECTION PER MANUFACTURER'S RECOMMENDATIONS. MOUNT TO EXISTING MICROWAVE TOWER. REFER TO HBS MOUNTING DETAIL FOR MICROWAVE TOWER, SHEET E-07.
4	CP015-G	26.673732	-80.247943	FOREST HILL BLVD / WELLINGTON TRACE (NORTH)	CONCRETE LIGHT POLE	45'	HSU	RW-55A0-0150	WEST	REUSE EXISTING MOUNTING BRACKET ON LIGHT POLE. REFER TO HSU MOUNTING DETAIL FOR 1" POLES, SHEET E-07.
4	CP017-G	26.648170	-80.244540	SOUTH SHORE BLVD / BIG BLUE TRACE	CONCRETE LIGHT POLE	45'	HSU	RW-55A0-0150	SOUTH	REUSE EXISTING MOUNTING BRACKET ON LIGHT POLE. REFER TO HSU MOUNTING DETAIL FOR 1" POLES, SHEET E-07.
4	CP002-G	26.622980	-80.261566	SOUTH SHORE BLVD / LAKE WORTH RD	STEEL LIGHT POLE	45'	HSU	RW-55A0-0150	SOUTH	REUSE EXISTING MOUNTING BRACKET ON LIGHT POLE. REFER TO HSU MOUNTING DETAIL FOR 1" POLES, SHEET E-07.
4	CP226-G	26.618338	-80.216954	LAKE WORTH RD / PANTHER RUN ELEMENTARY	CONCRETE LIGHT POLE	45'	HSU	RW-55A0-0150	SOUTH	REUSE EXISTING MOUNTING BRACKET ON LIGHT POLE. REFER TO HSU MOUNTING DETAIL FOR 1" POLES, SHEET E-07.
4	CP024-G	26.650646	-80.203790	FOREST HILL BLVD / STATE RD 7	CONCRETE LIGHT POLE	45'	HSU	RW-55A0-0150	EAST	REUSE EXISTING MOUNTING BRACKET ON LIGHT POLE. REFER TO HSU MOUNTING DETAIL FOR 1" POLES, SHEET E-07.
4	CP019-G	26.651480	-80.225020	FOREST HILL BLVD / POLO CLUB RD	CONCRETE LIGHT POLE	45'	HSU	RW-55A0-0150	EAST	REUSE EXISTING MOUNTING BRACKET ON LIGHT POLE. REFER TO HSU MOUNTING DETAIL FOR 1" POLES, SHEET E-07.
	CS40-G	26.638328	-80.299544	CS40 - 2750 FLYING COW RANCH RD	ANTENNA MAST	40'	HSU	RW-55A0-0150	WEST	MOUNT TO EXISTING 1" POLE MOUNTED ON ANTENNA MAST. REFER TO HSU MOUNTING DETAIL FOR ANTENNA MASTS, SHEET E-07.
	CS44-G	26.636404	-80.236384	CS44 - 11990 PIERSON RD	ANTENNA MAST	40'	HSU	RW-55A0-0150	SOUTH	MOUNT TO CORNER OF ANTENNA MAST. REFER TO HSU MOUNTING DETAIL FOR ANTENNA MASTS, SHEET E-07.
	PS2-G	26.593562	-80.271351	PS2 - 6090 140TH AVE S	CONCRETE LIGHT POLE	35'	HSU	RW-55A0-0150	SOUTH	REUSE EXISTING MOUNTING BRACKET ON LIGHT POLE. REFER TO HSU MOUNTING DETAIL FOR 1" POLES, SHEET E-07.
	LS42-G	26.664480	-80.252580	LS42 - 1160 EMERALD FOREST DR	CONCRETE POLE	35'	HSU	RW-55A0-0150	WEST	REUSE EXISTING MOUNTING BRACKET ON LIGHT POLE. REFER TO HSU MOUNTING DETAIL FOR 1" POLES, SHEET E-07.
	LS13-G	26.646056	-80.264523	LS13 - 13972 FOLKSTONE CIR	STEEL POLE	30'	HSU	RW-55A0-0150	WEST	MOUNT TO 3" POLE WITH STAINLESS STEEL PIPE STRAPS. REFER TO HSU MOUNTING DETAIL FOR STEEL POLES, SHEET E-07.
	LS75-G	26.656290	-80.240360	LS75 -12060 SUNSET POINT CT	STEEL POLE	30'	HSU	RW-55A0-0150	SOUTH	MOUNT TO 3" POLE WITH STAINLESS STEEL PIPE STRAPS. REFER TO HSU MOUNTING DETAIL FOR STEEL POLES, SHEET E-07.
(5)	LS88-G	26.662860	-80.213694	LS88 - 10560 OLD HAMMOCK WAY	STEEL POLE	25'	HSU	RW-55A0-0150	EAST	MOUNT TO 3" POLE WITH STAINLESS STEEL PIPE STRAPS. REFER TO HSU MOUNTING DETAIL FOR STEEL POLES, SHEET E-07.
(5)	LS95-G	26.669690		LS95 - 249 BERENGER WALK	STEEL POLE	25'	HSU	RW-55A0-0150	EAST	MOUNT TO 3" POLE WITH STAINLESS STEEL PIPE STRAPS. REFER TO HSU MOUNTING DETAIL FOR STEEL POLES, SHEET E-07.
	LS104-G	26.633803	-80.209980	LS104 - 10298 STRIBLING WAY	ANTENNA MAST	20'	HSU			MOUNT TO EXISTING 1" POLE MOUNTED ON ANTENNA MAST. REFER TO HSU MOUNTING DETAIL FOR ANTENNA MASTS, SHEET E-07.
	BSTR1-G	26.639355		BOOSTER STA 1 - 2901 OUSLEY FARM RD	ANTENNA MAST	35'	HSU			MOUNT TO CORNER OF ANTENNA MAST. REFER TO HSU MOUNTING DETAIL FOR ANTENNA MASTS, SHEET E-07.
	BSTR2-G	26.620251		BOOSTER STA 2 - 11011 LAKE WORTH RD	ANTENNA MAST	50'	HSU			MOUNT TO CORNER OF ANTENNA MAST. REFER TO HSU MOUNTING DETAIL FOR ANTENNA MASTS, SHEET E-07.
	WELL29/30-G	26.652850		BEHIND PALM BEACH CENTRAL HS, FOREST HILL BLVD/TURNPIKE	ANTENNA MAST	35'	HSU			MOUNT TO CORNER OF ANTENNA MAST. REFER TO HSU MOUNTING DETAIL FOR ANTENNA MASTS, SHEET E-07.
	CP035-G	26.639557		FLEET MAINTENANCE BUILDING	ROOF MOUNTED POLE	35'	HSU			MOUNT TO EXISTING 1" POLE. REUSE EXISTING MOUNTING HARDWARE. REFER TO HSU MOUNTING DETAIL FOR 1" POLES, SHEET E-07.
	LS24-G	26.660185	-80.224271	LS24 – 1415 BIRKDALE DR	STEEL POLE	30'	HSU	RW-55A0-0150	WEST	MOUNT TO 3" POLE WITH STAINLESS STEEL PIPE STRAPS. REFER TO HSU MOUNTING DETAIL FOR STEEL POLES, SHEET E-07.

## CONSTRUCTION SEQUENCING NOTES:

- 1. THE EXISTING TELEMETRY BACKHAUL BASE STATION RADIOS SHALL REMAIN IN SERVICE TO THE GREATEST EXTENT POSSIBLE DURING REPLACEMENT OF SUBSCRIBER RADIOS.
- 2. THE NEW BACKHAUL BASE STATION RADIOS SHALL FIRST BE PLACED INTO SERVICE SO THAT NEW SUBSCRIBER UNITS ARE ABLE TO COMMUNICATE UPON INSTALLATION.
- 3. PRIOR TO DECOMMISSIONING THE CONTRACTOR SHALL FIELD VERIFY EXISTING FREQUENCY SETTINGS FOR EACH SUBSCRIBER RADIO, DOCUMENT THE THE RESULTS AND PROVIDE THEM TO THE OWNER. ADJUST NEW RADIOS TO MATCH FREQUENCY FOR EACH SITE TO THE GREATEST EXTENT POSSIBLE.
- 4. PRIOR TO DECOMMISSIONING THE CONTRACTOR SHALL UTILIZE OWNER'S EXISTING SOFTWARE TO PERFORM THROUGHPUT TEST FOR EACH EXISTING SUBSCRIBER RADIO, DOCUMENT THE RESULTS AND PROVIDE THEM TO THE OWNER. THE RESULTS WILL ESTABLISH BASELINE PERFORMANCE REQUIREMENTS FOR NEW SUBSCRIBER UNITS.
- 5. THE CONTRACTOR SHALL COORDINATE EXISTING SUBSCRIBER RADIO DECOMMISSIONING WITH THE OWNER, FOR EACH SHUTDOWN, SUBMIT A SHUTDOWN NOTICE TO THE ENGINEER AND VILLAGE FOR APPROVAL. NOTICE SHALL INCLUDE DATE, NAME/LOCATION OF SUBSCRIBER RADIO, AND TIME LENGTH OF THE OUTAGE. MULTIPLE SUBSCRIBER RADIOS MAY BE SCHEDULED TO BE REPLACED IN A SINGLE DAY PROVIDED EACH NEW RADIO IS FULLY FUNCTIONAL TO THE VILLAGE'S SATISFACTION PRIOR TO ADVANCING TO THE NEXT.
- 6. ONCE ALL SUBSCRIBER RADIOS HAVE BEEN REPLACED, THE EXISTING BASE STATIONS MAY BE REMOVED FROM

- THE CONTRACTOR SHALL PROVIDE ALL LABOR, RENTALS, MATERIALS, PROGRAMMING AND CONFIGURATION SERVICES NECESSARY TO ACCESS AND REPLACE THE EXISTING ALVARION BREEZEACCESS TELEMETRY BACKHAUL SYSTEM AND PLACE INTO RELIABLE SERVICE A NEW RADWIN BASED SYSTEM COMPLETE IN PLACE AND AS DESCRIBED IN THE DRAWINGS AND SPECIFICATIONS. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO ADJUSTMENT OF ANTENNA AZIMUTH/HEIGHT, RADIO OUTPUT POWER LEVELS AND BASE/SUBSCRIBER CONFIGURATION PARAMETERS.
- 2. A RADWIN 5000 JET BASE RADIO WITH THREE SUBSCRIBER RADIOS IS CURRENTLY OPERATIONAL. THE NEW TELEMETRY BACKHAUL EQUIPMENT SHALL BE INTEGRATED WITH THE EXISTING RADWIN SYSTEM. VERIFY BASE AND SUBSCRIBER SOFTWARE AND FIRMWARE COMPATIBILITY WITH EXISTING, AND PROVIDE EQUIPMENT WITH COMPATIBLE
- THE CONTRACTOR SHALL COORDINATE INSTALLATION REQUIREMENTS WITH THE RADIO MANUFACTURER AND MAKE ALL NECESSARY ADJUSTMENTS WITHOUT ADDITIONAL COST TO THE VILLAGE.
- 4. INSTALL SURGE PROTECTIVE DEVICES IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 5. INSTALL GROUNDING IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- 6. ALL OUTDOOR CONNECTIONS TO NEW AND EXISTING EQUIPMENT SHALL BE WEATHER PROTECTED USING MANUFACTURER'S RECOMMENDED MATERIALS AND METHODS. NEW AND EXISTING HARDWARE SHALL BE PROTECTED FROM WATER INGRESS.
- 7. THE CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS NECESSARY FOR RIGID SUPPORT OF NEW BASE STATION AND SUBSCRIBER RADIOS TO EXISTING POLES/MASTS. ALL MOUNTING HARDWARE SHALL BE 316 STAINLESS STEEL UNLESS SPECIFICALLY NOTED OTHERWISE.
- 8. THE CONTRACTOR SHALL COORDINATE ALL REQUIRED MOVEMENT OF TRAFFIC ACTIVITIES WITH THE OWNER AT NO ADDITIONAL COST.

## KEYED NOTES

- (1) BOND TO EXISTING GROUND BUS LOCATED ON MICROWAVE SHELTER EXTERIOR. REFER TO PHOTOGRAPH ON DRAWING E-03.
- ② BOND TO EXISTING IT EQUIPMENT RACK LOCATED INSIDE MICROWAVE SHELTER. REFER TO PHOTOGRAPH THIS DRAWING.
- 3 REFER TO MOUNTING DETAIL.
- (4) CONTRACTOR SHALL PROVIDE MAINTENANCE OF TRAFFIC PLAN AS REQUIRED BY LOCAL GOVERNMENTAL AGENCIES.
- (5) SITE IS LOCATED WITHIN A PRIVATE HOME OWNER'S ASSOCIATION. COORDINATE ACCESS WITH THE VILLAGE OF WELLINGTON.

DOCUMENTS

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HILLERS ELECTRICAL ENGINEERING, INC. 23257 STATE ROAD 7, SUITE 10 BOCA RATON, FL 33428 (561) 451-9165 (561) 451-4886 FAX LICENSE NO: EB 0006877

REVISION

WELLINGTON E UTILITIES DEPARTMENT 12300 FOREST HILL BLVD, WELLINGTON, FL 33414 (561) 791-4000

VILLAGE OF WELLINGTON TELEMETRY BACKHAUL RADIO SYSTEM UPGRADE

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

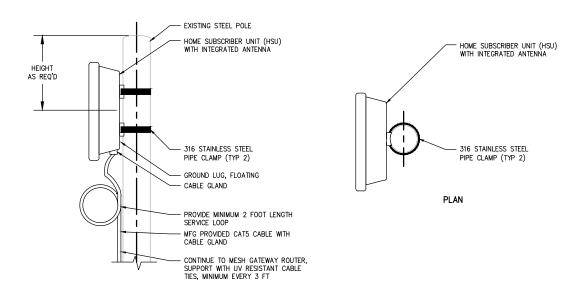
ENGINEER:	MEL
DRAWN:	ВКН
DESIGNED:	MEL
CHECKED:	MEL
SCALE:	AS NOTED

MARK F. LUTHER, PF NO. 48801

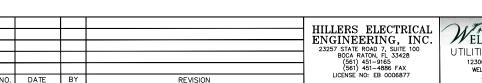
PHOTOGRAPHS, SCHEDULES AND RISER DIAGRAMS

JULY 2017 HEE NO 201709 PROJECT NO. DRAWING: E - 06SHEET 7 OF 8

### MOUNTING DETAIL 1 HOME BASE UNIT (HBU) RADIO MOUNTING DETAIL MICROWAVE TOWER NOT TO SCALE



## MOUNTING DETAIL 3 HOME SUBSCRIBER UNIT (HSU) RADIO MOUNTING DETAIL STEEL POLE



ELEVATION



VILLAGE OF WELLINGTON TELEMETRY BACKHAUL RADIO SYSTEM UPGRADE

VERIFY SCALES	ENGINE
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWN
01"	DESIGN
IF NOT ONE INCH ON THIS SHEET, ADJUST	CHECKE
SCALES ACCORDINGLY.	SCALE:

AS REQ'D

EER: MEL BKH NED: MEL ŒD: MEL

AS NOTED MARK E. LUTHER, PE NO. 48801

- EXISTING ANTENNA MAST/POLE

HOME SUBSCRIBER UNIT (HSU)

- 316SS M5X10, CSK, PHILIPS SCREW (TYP 2)

- MFG. MOUNTING ADAPTER KIT IF REQ'D

WITH INTEGRATED ANTENNA

- MFG. STANDARD SMALL CLAMP

- 316SS M8X70 HEX BOLT (TYP 2)

- 316SS M8 FLAT WASHER (TYP 2)

- PROVIDE MINIMUM 2 FOOT LENGTH

- MFG PROVIDED CAT5 CABLE WITH CABLE GLAND

- CONTINUE TO MESH GATEWAY ROUTER, SUPPORT WITH UV RESISTANT BLACK CABLE TIES, MINIMUM EVERY 3 FT

MOUNTING DETAIL 2

HOME SUBSCRIBER UNIT (HSU) RADIO MOUNTING DETAIL

ANTENNA MAST AND 1" POLE

- GROUND LUG, FLOATING

- CABLE GLAND

SERVICE LOOP

ELEVATION

- 316SS M8 FLAT WASHER SPRING (TYP 2)

HEE NO. PROJECT NO.: INSTALLATION DETAILS DRAWING:

HOME SUBSCRIBER UNIT (HSU)
WITH INTEGRATED ANTENNA

316SS M8 FLAT WASHER SPRING

MFG. STANDARD SMALL CLAMP

MFG. STANDARD LARGE CLAMP

PLAN

- 316SS M8X40 HEX BOLT

- 316SS M8 FLAT WASHER

- MFG. MOUNTING ADAPTER KIT IF REQ'D

BID JULY 2017 201709 E - 07SHEET <u>8</u> OF <u>8</u>

DOCUMENTS