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naos
Naos Design
Group Of
Mississippi,
PLLC.

MARC BREETZ,
ARCHITECT

645 Lakeland East Drive
Suite 101
Flowood, Mississippi 39232
(p) 303.759.5777
(f) 720.360.4261

ARCHITECT OF RECORD



CDS
COMMERCIAL DESIGN SYSTEMS,
INC.

13825 SW GALEBREATH DRIVE
SHERWOOD, OREGON 97140
503.885.7900 / (503) 825.8002

INTERIOR DECOR



Pickering
Pickering Firm, Inc.
Architecture - Engineering
Planning - Surveying

6775 Lenox Center Court, Suite 300
Memphis, TN 38115
901.728.9319

ENGINEER OF RECORD:
STRUCTURAL
MECHANICAL
ELECTRICAL
CIVIL ENGINEER



V-SOFT
INFRASTRUCTURE
11280 CHESTER
ROAD
CINCINNATI, OH
45244
T: 513-900-3819
LOW VOLTAGE



telgian
TELGIAN CORPORATION
10230 SOUTH 50TH PLACE
SUITE 100
PHOENIX, AZ 85044
T: (677) 536-4425
HTTP://WWW.TELGIAN.COM
FIRE PROTECTION

ISSUE LOG

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JOB: 2018041 SCALE: N.T.S.

SHEET NO.

TSD-1

TRAFFIC SIGNAL
GENERAL NOTES

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TRAFFIC SIGNAL GENERAL NOTES

- POLES, SIGNAL HEADS, EQUIPMENT BOXES, PULLBOXES AND CONDUIT LOCATIONS MAY BE VARIED SLIGHTLY TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER. HOWEVER, SIGNAL HEAD OR POLE LOCATIONS SHALL BE WITHIN REQUIREMENTS OUTLINED IN THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND HIGHWAY DESIGN AND OPERATIONAL PRACTICES RELATED TO HIGHWAY SAFETY.
- THE CONTRACTOR SHALL PROVIDE MAST ARM POLE DESIGN CERTIFICATION AND CALCULATIONS AS OUTLINED IN SECTION 722.02 OF STANDARD SPECIFICATIONS. DESIGN STANDARD FOR MAST ARMS POLES SHALL BE 2013 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS. USE FATIGUE CATEGORY II, USE 50 YEAR DESIGN SERVICE LIFE AND DO NOT CONSIDER GALLOPING OR TRUCK-INDUCED GUSTS. WIND AND ICE LOADS VARIABLE BASED UPON MAPS IN THE 2013 AASHTO SPECIFICATION. USE UPSWEPT MAST ARMS UNLESS OTHERWISE NOTED ON PLANS. SEE TSD 3.
- DETERMINATION OF REQUIRED SIZES, LENGTHS AND GAUGES OF TYPE I - XI STEEL POLES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR IN ACCORDANCE WITH THE PLANS AND SECTION 722.02 OF THE STANDARD SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED IN PLANS OR SPECIFICATIONS.
- TRAFFIC SIGNAL MAST ARM POLES SHALL BE HOT DIPPED GALVANIZED WITH FINISH APPROVED BY THE ENGINEER.
- TRAFFIC SIGNAL MAST ARM POLES REQUIRING LUMINAIRES ARE DESIGNATED BY (L). ALL LUMINAIRES SHALL BE LED UNLESS OTHERWISE NOTED ON PLANS.
- STAINLESS STEEL TAG ATTACHED TO THE POLE SHAFT USING 3/16 INCH STAINLESS STEEL POP RIVETS WITH PROPERTIES AND INFORMATION AS FOLLOWS:
- MINIMUM 1/16 INCH THICKNESS
- MINIMUM 1/4 INCH STAMPED LEGEND WITH FOLLOWING INFORMATION:
-- MANUFACTURER NAME
-- MONTH / YEAR OF MANUFACTURE
-- UNIQUE IDENTIFYING NUMBER FOR FUTURE MANUFACTURER REFERENCE
-- EXTERNAL PROJECT NUMBER FROM THE PLANS COVER SHEET (EXAMPLE: STP-XXXX-XX...)
TAG TO BE INSTALLED ON SHAFT SIDE OPPOSITE THE MAINLINE HIGHWAY AND LOCATED APPROXIMATELY 48 INCHES ABOVE THE TOP OF BASE PLATE.
- THE TOP OF THE STRAIN POLE FOUNDATION SHALL BE 6" ABOVE THE GROUND. THE CONTRACTOR SHALL PROVIDE POLES OF SUFFICIENT LENGTH PLUS 2 FEET TO PROVIDE REQUIRED VERTICAL CLEARANCE OF THE TRAFFIC SIGNAL HEADS WITHOUT EXTENDING THE FOUNDATION ABOVE THE GROUND LINE OF THE POINT WHERE THE POLE IS LOCATED, EVEN THOUGH THIS MAY BE BELOW THE FINISHED GRADE OF THE ROADWAY.
- ALL STRAIN POLES AT AN INTERSECTION SHALL BE THE SAME DIAMETER AND UTILIZE THE SAME BOLT CIRCLE SPACING.
- POLE FOUNDATIONS AND BASE MOUNTED CABINET FOUNDATIONS, GRADE SHALL BE ESTABLISHED TO ±3" OF EDGE OF PAVEMENT ELEVATION UNLESS APPROVED BY SIGNAL PROJECT ENGINEER.
- TRAFFIC SIGNAL HEADS SHALL BE BLACK IN COLOR UNLESS OTHERWISE NOTED ON PLANS WITH BLACK BACK PLATES
- PEDESTRIAN HEADS SHALL BE BLACK IN COLOR UNLESS OTHERWISE NOTED ON PLANS.
- PEDESTRIAN PUSHBUTTONS SHALL BE EITHER STANDARD PUSHBUTTONS OR APS (ACCESSIBLE PEDESTRIAN SYSTEM) STYLE AS NOTED ON PLANS. SIGNS TO BE INCLUDED IN PAY ITEM FOR PEDESTRIAN PUSHBUTTONS AT NO ADDITIONAL COST. SIDE OF POLE LOCATIONS OF PUSHBUTTONS MAY BE FIELD ADJUSTED. PUSHBUTTON HARDWARE SHALL BE BLACK IN COLOR UNLESS OTHERWISE NOTED ON PLANS.
- FIELD DRILL AND TAP EXISTING POLES WHERE PEDESTRIAN SIGNALS AND PUSHBUTTONS ARE REQUIRED ON PLANS. (ABSORBED ITEM).
- TRAFFIC SIGNAL CABINETS AND CONTROLLERS SHALL BE WIRED TO PROVIDE FOR ALL PHASES INCLUDING FUTURE PHASES IN ACCORDANCE WITH THE PHASE SEQUENCE DIAGRAM.
- ALL TRAFFIC SIGNAL CONTROLLERS SHALL BE ETHERNET READY, AND COMPATIBLE WITH MDOT'S EXISTING TRAFFIC SIGNAL MANAGEMENT SOFTWARE. ALL TRAFFIC SIGNAL CONTROLLER FIRMWARE SHALL BE CAPABLE OF DELAYING THE ONSET OF THE FLASHING YELLOW ARROW. ALL MMU'S SHALL BE ETHERNET READY, 16 CHANNEL, AND CAPABLE OF RUNNING 12 DIFFERENT MODES OF FLASHING YELLOW ARROW OPERATION. THE CONTRACTOR SHALL COORDINATE WITH MDOT FOR IP ADDRESSES ON ALL NETWORKABLE DEVICES. DEVICES INCLUDE BUT NOT LIMITED TO: CONTROLLER, MMU WITH SDLC CABLE (CONFLICT MONITOR), AND DETECTION UNITS. TRAFFIC SIGNAL CONTROLLER CABINET SHALL HAVE A 16 LOAD BAY FACILITY, REAR ACCESS DOOR, LAPTOP TRAY, AND DUAL POSITION INTERNAL LED LIGHTING. ALL TRAFFIC SIGNAL CONTROLLER CABINETS SHALL HAVE A 5 POSITION CARD RACK AND ONE 175 WATT MINIMUM POWER SUPPLY AND 4 AVAILABLE SLOTS UNLESS OTHERWISE NOTED ON PLANS. SEE 907-632.02.6.1.
- FOR PROTECTED/PERMITTED LEFT TURN PHASING USING TYPE 2 FYA TRAFFIC SIGNAL HEADS, OPERATION SHALL BE AS FOLLOWS: THE PROTECTED PHASE OF THIS OPERATION SHALL DISPLAY A SOLID GREEN ARROW, FOLLOWED BY A SOLID YELLOW ARROW, AND ENDING WITH A SOLID RED ARROW. THE PERMITTED PORTION OF THIS OPERATION SHALL START WITH A FLASHING YELLOW ARROW, FOLLOWED BY A SOLID YELLOW ARROW, AND ENDING WITH A SOLID RED ARROW. THERE SHALL BE A DELAY (AS DIRECTED BY THE ENGINEER) BETWEEN THE END OF THE PROTECTED PORTION OF THIS OPERATION AND THE BEGINNING OF THE PERMITTED PORTION OF THIS OPERATION. DURING THIS DELAY, THE OPPOSING PHASE THRU HEADS ARE CAPABLE OF DISPLAYING A GREEN BALL. SIGNAL CONTROLLER WITH FIRMWARE NECESSARY TO ACCOMPLISH THIS DELAY SHALL BE PROVIDED.
- POLES AND FOUNDATIONS OF EXISTING SIGNAL INSTALLATION REMOVALS SHALL BE CUT OFF 6" BELOW GROUND, REMOVED AND AREA RESTORED TO MATCH ADJACENT SURFACE AS DIRECTED BY THE ENGINEER.
- ALL REMOVED EXISTING TRAFFIC SIGNAL EQUIPMENT SHALL BECOME THE PROPERTY OF THE CONTRACTOR, UNLESS SPECIFIC ITEMS ARE NOTED IN THE PLANS TO BE SALVAGED AS DIRECTED BY THE ENGINEER.
- THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ELECTRICAL SERVICE FROM THE POWER COMPANY SERVICE POINT TO THE POWER SERVICE PEDESTAL. FOR SPAN WIRE INSTALLATION, POWER SHALL RUN FROM THE POWER COMPANY SERVICE POINT AERIAL TO THE SIGNAL POLE NEAREST THE CONTROLLER, THE SERVICE SHALL THEN RUN TO THE CONTROLLER, AS SHOWN ON THE PLANS. FOR MAST ARM INSTALLATION, POWER SHALL RUN FROM THE POWER COMPANY SERVICE POINT UNDERGROUND DIRECTLY TO THE POWER SERVICE PEDESTAL, THEN TO THE CONTROLLER CABINET, AS SHOWN ON THE PLANS.
- POWER SERVICE METER SHALL NOT BE MOUNTED ON THE CONTROLLER CABINET OR MAST ARM POLE SHAFTS. A SEPARATE POWER SERVICE PEDESTAL FOR MOUNTING THESE ITEMS IS REQUIRED. (SEE TSD-6 & TSD-7).
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE THE NECESSARY ARRANGEMENTS WITH THE LOCAL POWER COMPANY TO PROVIDE THE POWER SUPPLY ASSEMBLY FOR ANY NEW INSTALLATION. THE CONTRACTOR SHALL PAY FOR, AT NO COST TO THE DEPARTMENT, ALL DEPOSITS, HOOK-UP CHARGES, OR OTHER SERVICE FEES REQUIRED BY THE POWER COMPANY FOR THE ESTABLISHMENT OF NEW SERVICE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF THE MONTHLY SERVICE BILL DURING THE LIFE OF THE PROJECT. THE COST OF ALL SUCH FEES SHALL BE CONSIDERED INCIDENTAL AND ABSORBED WITHIN EXISTING PAY ITEMS. THE DEPARTMENT OR THE LOCAL AGENCY WILL BE RESPONSIBLE FOR PAYMENT OF THE MONTHLY SERVICE BILL FOR THE NEW POWER SERVICE INSTALLATION AFTER PROJECT ACCEPTANCE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SWAP THE ELECTRICAL SERVICE ACCOUNT OVER TO THE DEPARTMENT AFTER PROJECT ACCEPTANCE. WHEN ELECTRIC POWER SERVICE EXISTS AND IS USED FOR THE OPERATION OF AN EXISTING SYSTEM, THE MONTHLY SERVICE FEES SHALL CONTINUE TO BE PAID BY THE DEPARTMENT OR THE LOCAL AGENCY. IF THE EXISTING POWER SERVICE IS INTENDED FOR USE WITH A NEW SIGNAL SYSTEM, THEN ANY SERVICE CHARGE FEES

SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SIMILARLY, IF AN EXISTING POWER SERVICE IS TO BE DISCONNECTED, ANY SERVICE CHARGE FEES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE COST OF ALL SUCH FEES SHALL BE CONSIDERED INCIDENTAL AND ABSORBED WITHIN EXISTING PAY ITEMS.

22. WHEN CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY SIGNALS TO ACCOMMODATE ROADWAY CONSTRUCTION, IT SHALL BE PAID FOR UNDER PAY ITEM 619-H1, TRAFFIC SIGNAL, LUMP SUM, UNLESS OTHERWISE NOTED ON PLANS.

23. VEHICLE LOOP ASSEMBLIES SHALL BE INSTALLED IN THE TOP LAYER OF BINDER OR EXISTING SURFACE BEFORE THE FINISH SURFACE COURSE IS APPLIED (BASED ON 2" FINAL LIFT MAXIMUM).

24. WHEN RADAR, VIDEO, OR MULTI-SENSOR DETECTION IS USED, THE SYSTEM MAY REQUIRE BOTH STOP BAY AND ADVANCE DETECTION. TSI PLANS SHOW A GENERIC LAYOUT FOR DETECTION; DETECTOR MAY BE RELOCATED PER MANUFACTURER'S RECOMMENDATION. THERE SHALL BE NO EXTRA PAY FOR MOVING OF DETECTORS OTHER THAN CABLE LENGTHS. MANUFACTURER TO HAVE FACTORY REP ON SITE DURING INSTALLATION UNLESS CERTIFIED BY THE MANUFACTURER. DETECTION CABLE WILL BE MEASURED BY THE LINEAR FOOT, MEASURED HORIZONTALLY ALONG THE CONDUIT, MESSENGER CABLE OR MAST ARM AND VERTICALLY ALONG THE POLE. DETECTION CABLE FOR CAMERAS, THE POWER AND VIDEO CABLE MAY BE IN THE SAME SCKET. ALL DETECTION UNITS SHALL BE NETWORKABLE DEVICES AND BE ON THE MDOT NETWORK IF NOTED ON PLANS.

25. ALL GROUNDING EQUIPMENT SHALL BE COST ABSORBED.

26. MESSENGER CABLE AND OTHER SUPPORTING DEVICES WHERE REQUIRED SHALL BE ABSORBED IN THE PAY ITEMS FOR SIGNAL CABLE.

27. THE CONTRACTOR SHALL STAKE THE LOCATION OF EACH POLE FOUNDATION AND NOTIFY THE PROJECT ENGINEER FOR CONCURRENCE IN THE LOCATION BEFORE PROCEEDING WITH THE PURCHASE OF THE POLE.

28. THE CONTRACTOR SHALL BE REQUIRED TO ADEQUATELY AND COMPLETELY COVER TRAFFIC SIGNAL HEADS DURING TIMES THAT THEY ARE NOT IN OPERATION WITH A DURABLE, OUTDOOR-HARDENED MATERIAL THAT CONTRASTS WITH THE COLOR OF THE HEAD THAT CLEARLY DESIGNATES THAT THE SIGNAL IS NOT IN "STOP AND GO" MODE. HEAD COVERS ARE TO BE APPROVED BY THE ENGINEER.

29. A NEW TRAFFIC SIGNAL INSTALLATION SHALL BE PUT IN FLASH OPERATION FOR A PERIOD OF THREE (3) TO SEVEN (7) DAYS PRIOR TO THE ACTIVATION OF THE SIGNAL'S "STOP AND GO" OPERATION. ACTIVATION OF NEW TRAFFIC SIGNALS SHALL BE DURING A MID-WEEK WEEKDAY (TUESDAY - THURSDAY) DURING A NON-PEAK TIME AND SHALL BE COORDINATED WITH THE ENGINEER. UPON INITIAL INSPECTION AND ACCEPTANCE TESTING OF THE NEW TRAFFIC SIGNAL INSTALLATION, THE CONTRACTOR SHALL REQUEST THE START OF THE 30 DAY BURN-IN PERIOD TO COMMENCE, AS OUTLINED IN SUBSECTION 631.03.4 OF THIS SPECIFICATION. ANY NOTED DEFICIENCIES FOUND WITHIN THAT 30 DAY PERIOD SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER. THE 30 DAY BURN-IN PERIOD MUST COMMENCE WITHIN THE CONTRACT TIME, AND BEFORE SUBSTANTIAL COMPLETION OF THE PROJECT IS GRANTED.

30. CONTRACTOR IS RESPONSIBLE FOR SCHEDULING FINAL INSPECTION MEETING WITH DISTRICT OFFICE, PROJECT OFFICE AND TRAFFIC ENGINEERING FOR SIGNAL PORTION OF THE PROJECT.

DATE	BY	REVISION

**TRAFFIC SIGNAL
GENERAL NOTES**

FILENAME: FinalTSD_3.13.18.dgn	WORKING NUMBER TSD-1
DESIGN TEAM	CHECKED
DATE	DATE
	SHEET NUMBER 3