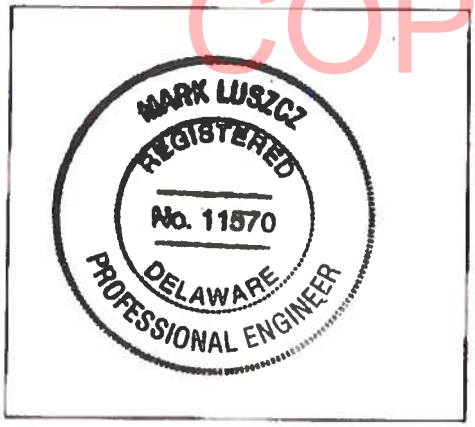
STATE OF DELAWARE

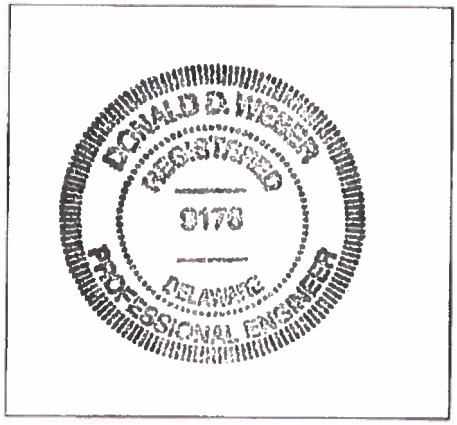
DEPARTMENT OF TRANSPORTATION

TRAFFIC SECTION

SPECIFICATIONS FOR

DOT 1228 – TRAFFMAINT
EMERGENCY HIGHWAY ITS AND TRAFFIC MAINTENANCE





RECOMMENDED:

9/14/12

Assistant Chief Traffic Engineer

APPROVED:

9/17/12

Chief Traffic Engineer

CONTRACT DESCRIPTION

This contract is to provide the material, equipment and labor for the maintenance and alteration of signalized intersections, signal coordination systems, pedestrian signals, and other traffic components or devices statewide. The work includes both on-call emergencies and maintenance repairs. The specific work sites are not listed herein, but will be assigned as available by the Delaware Department of Transportation Traffic Section. Most assigned tasks are anticipated to be completed within one Working Day.

This is a non-exclusive contract. Although the Contract may include tasks in all three counties of Delaware, other Contractors may be performing work related to Traffic Signals and other facilities operated and maintained by DelDOT's Traffic Division. Such work by others is not associated with this contract.

PROJECT NOTES

1. STANDARDS

All work will be done in accordance with the Delaware Department of Transportation Standard Specifications for Road and Bridge Construction, dated August 2001, as amended by the Supplemental Specifications; Standard Construction Details including all revisions up to the date of advertisement; Project Specific Plan Details; the Special Provisions; the most current edition of the Delaware MUTCD; and any plans included in specific work orders. If during the course of the Contract, changes to the standards are made and are to be implemented on this Contract, the Department will send the changes to the Contractor in advance of requiring their use.

2. CONTRACTOR REQUIREMENTS

A. Master Electrician Special

The Contractor shall provide a Delaware-licensed Master Electrician Special, who shall be qualified to direct work near energized primary circuits up to 34 KV and who shall be directly responsible for the workmanship as provided in Title 24, Chapter 14 of the Delaware Code. This Master Electrician - Special shall certify all of the work performed. The name, qualifications, and copy of the license shall be submitted and approved by the Engineer prior to beginning work on the contract.

B. Point of Contact

Upon award of the contract, the Contractor shall submit to the Engineer the name of a principle point of contact for the project including home and cell telephone numbers and/or pager number.

C. Deployment of Multiple Crews

Contractor crews may be required to be deployed to perform work at multiple work sites throughout the state simultaneously. The work locations and number of crews to be deployed shall be coordinated with the Engineer on a weekly basis.

D. Crew Composition

A crew shall consist of a foreman who is a Journeyman Electrician and/or has a minimum five years of experience in related work and sufficient personnel to complete the work, unless an exception is granted in writing by the Engineer. The minimum size of any crew is two people. A loop installation crew and a restoration crew do not need a Journeyman Electrician or someone with five years of experience as the foreman. Crews for aerial work must have a Journeyman Electrician as the foreman. Names and qualifications of all proposed Journeyman Electricians shall be submitted for approval prior to beginning work on the contract.

E. Contractor's Equipment and Resources

The Contractor shall provide a complete list of equipment and materials that will be available to perform the tasks outlined in this contract. All self-propelled equipment and vehicles shall be identified with the Contractor's company name, location of home office (city and state), phone number, and the electrical registration number of Licensed Master Electrician Special. This shall include any leased or rented equipment or vehicle that is in use for this contract for 14 or more continuous calendar days. Said information shall be visible on 2 (two) opposing sides of the equipment or vehicle. All equipment assigned to the contract shall be equipped with safety devices meeting the requirements of the Delaware MUTCD. The Contractor must have the capability of providing as many as 4 each bucket and/or line trucks concurrently if required at large intersections, such as those involving a suspended box span.

The Department reserves the right to inspect the Contractor's facilities, equipment, materials, and resources that will be available to perform the

tasks outlined in this contract. The Department shall provide the Contractor with notification a minimum of seven (7) days prior to such an inspection.

F. Applicable Standards

All work performed under this contract shall comply with all applicable National Electrical Code, National Electrical Safety Code and industry and Bellcore standards to the extent not precluded by these specifications. Construction methods and techniques used by the Contractor shall be in accordance with the recommended practices and procedures published by leading industry manufacturers and trade associations, such as Bellcore Blue Book of Construction Practices.

The Contractor shall also follow all applicable local laws and standards. The Contractor shall be aware of all standards and their application within Delaware. Ignorance or lack of knowledge shall not be an excuse for improper work to occur. Any work constructed in violation of any applicable code shall be corrected and re-installed properly at the Contractor's expense.

3. BIDDING PROCEDURE AND CONTRACT AWARD

The Delaware Department of Transportation will accept bids on Contract No. DOT1228 - TRAFFICMAINT. The Department may award contracts to multiple contractors, based upon the lowest responsive, responsible bids received for the contract.

4. CONTRACT TERM

This contract duration shall be a period of one year from date of the Initial Notice to Proceed with the option to be extended for four (4) additional one-year periods. Each such one-year extension must be approved by both parties in writing at least 60 days prior to expiration of the existing contract. The Performance Bond shall be submitted with the contract execution and shall be subject to renewal for extension periods. Failure on the part of the contractor to submit the Performance Bond for the extension period prior to the last working day before end of the previous period shall result in the contract being cancelled.

It shall be the contractor's responsibility to obtain the forms necessary to renew the Performance Bond each year the contract is in force.

5. PRICE ADJUSTMENT

Extension to future years is dependent on legislative appropriations for these Fiscal Years and agreement on succeeding year's pricing as described herein. The bid prices in the contract must be guaranteed for the first year of the contract. In future year contract extensions the contractor may request an increase in unit prices. The contractor shall be required to request any price increases prior to the extension of the contract. The bid prices in the contract extension shall be guaranteed for the period of the contract extension. If the difference requested exceeds the change in the Nationwide All Urban Consumer Price Index (CPI-U), U.S. city average for the same period, approval of any price adjustment offered the contractor above the CPI-U will be at the discretion of the Engineer. The Department retains the right to cancel the future year extension if an acceptable agreement cannot be reached with the contractor on the price adjustment.

6. ALTERATIONS IN QUANTITIES

The quantities given in the proposal are approximate only, and will be the basis for comparing bids. Depending on fund availability, the Department reserves the right to increase or decrease the quantities of any and all items specified in this contract. Such additions or deletions shall not be cause for an increase or decrease in any contract unit bid prices, regardless of whether or not an item is classified as a "Major Item" (10% of the total contract value) as defined in Standard Specification 101.46. Negotiated prices will be the preferred method of establishing payment for new items added to the contract. Force Account payment, per Standard Specification 109.04 may be utilized if negotiated prices prove to be unsuccessful. Negotiated prices for new unit items will remain in effect for the original term of the contract, but will be eligible for renegotiation if the contract is extended (see "Price Adjustment" above).

7. ASSIGNMENT OF WORK

Work will be assigned to the Contractor on a work order basis by the Department. All work order assignments will be at the discretion of the Engineer. Issuance of each work order constitutes the notice to proceed with the work described on the work order. Actual work shall begin on each task no later than seven (7) Calendar Days following assignment of the task.

The Engineer shall establish the location of the work sites, and the order in which the work sites are to be pursued. The Department may direct the Contractor to suspend work at a particular location and reassign crews due to emergencies or other high priority work at no additional cost to the Engineer.

8. LIQUIDATED DAMAGES

Liquidated damages as defined in Sections 108.08 and 108.09 of the Standard Specifications will not be assessed on this contract. However, failure of the Contractor to begin work assignments within the 7 Calendar Day timeframe listed in Item 7 above, or failure to diligently pursue work assignments, may result in DelDOT crews performing the work with those itemized costs deducted by use of a negative change order from payments due the Contractor.

If applicable, verification of non-availability of materials from at least three (3) independent sources shall be supplied by the Contractor in writing to the ITS Maintenance Supervisor immediately after the receipt of a work order or at such time as they are notified that anticipated materials will not be available as scheduled. If there is a verified non-availability of materials, no penalty shall be assessed unless the Contractor fails to complete the revised work order in a timely manner.

9. PROSECUTION AND PROGRESS OF WORK

Work assignments will be issued to the Contractor in the form of a letter along with all necessary sketches, engineering drawings and any additional special provisions required. At times, depending upon the nature and complexity of the work assignments, field meetings may be necessary at certain site locations.

The Contractor shall have sufficient work forces and Bid Item materials in stock to perform any issued assignment.

10. EMERGENCY WORK

Emergency services must be available 24 hours per day 7 days per week without exception during the period of this contract. The Contractor shall have continuously available a work crew and at least one pole line vehicle capable of setting the largest pole required by this contract and one separate aerial vehicle capable of lifting 2 workers and their tools to the working height of that pole in each area. The Contractor shall have under his control a reasonable inventory of materials normally supplied under the terms of this contract for immediate use under this provision. Should the Contractor fail to provide the crews, equipment, and materials required under this provision within 180 minutes, DelDOT crews may perform the work with those itemized costs deducted by use of a negative change order from payments due the Contractor. All pay items that are not "supply only" and that are used for after-hours emergency work will be allowed a 15% surcharge.

11. NIGHT WORK

The Department may require Night Work to minimize traffic conflicts on some work sites. The Contractor should anticipate night time operations being required for work above, or affecting traffic lanes on multi-lane, high volume locations. All pay items which are not "furnish only" that are used for Night Work shall be allowed a 15% surcharge. Type I and Type II truck mounted attenuators, plastic drums, temporary barricades Type III, temporary warning signs, message boards, arrow panels, and portable light assemblies shall be paid under separate items in this contract for their use and shall not be subject to the 15% surcharge for night work.

Night work shall be defined as work being performed from the hours of 8:00 p.m. to 6:00 a.m.

Construction work started prior to night work hours that carries over into those hours shall not be paid as night work unless authorized by the Engineer in writing before work is started.

12. INSPECTION AND PROJECT CONTROL

Upon the completion of each individual work assignment, the foreman and inspector shall reconcile the quantities of work completed.

Method for Contractor's Invoice Submission – All work for this contract will be paid per assignment upon receipt of an invoice from the contractor in accordance with the following schedule:

The contractor will submit one invoice per work assignment at the completion of the assignment.

All invoices shall contain the following information. Failure to include any of the information on the invoice may result in the invoice being returned to the contractor.

- Contractor name, address and federal ID number.
- Project location, Department contract and/or Federal Aid contract numbers.
- Invoice number and date.
- Inspector Daily Report (IDR)
- Material Certifications, Source of Supply and Bill of Lading
- The following statement:

  In accordance with Chapter 8, Title 17 of the Delaware Code (Annotated Revised 1974, and as amended), the undersigned contractor certifies that payment to all Subcontractors and/or suppliers has been made as required

and as detailed on the "Proof of Payment" form (CN-91). It is understood that no subsequent payment will be made to the Contractor until the "Proof of Payment" form for the previous pay period has been submitted and received by DelDOT's DBE Office.

Signature	Date	Title

All invoices must be accompanied by the inspector's daily reports (IDR), all Material Certifications, Bill of Lading and source of supply for all materials used. Any discrepancy between measured quantities and contractor's quantities must be resolved prior to submitting an invoice for payment.

The contractor may request an exception to this policy in writing to the project engineer due to circumstances beyond his control such as project shutdowns and/or revisions.

13. MAINTENANCE OF TRAFFIC

The only payment for maintenance of traffic shall be the separate pay items identified in the bid tabs. No separate payment will be made for the use of traffic cones. Traffic cones and/or the work associated with their use, such as set up, removal, cleaning, etc. shall be incidental to the work for which they protect.

For those items that are paid on an Each-Day basis, only one such payment will be made per day per unit, even if the item is used in multiple work sites or work orders in the same day. This applies to items such as plastic drums and truck mounted attenuators, but is not limited to these items.

Work hours may be restricted on some work orders as dictated by traffic volumes and/or roadway conditions.

All traffic control devices shall be in new or refurbished condition, shall comply with the Delaware MUTCD and with NCHRP Report 350 or MASH and shall be approved by the Engineer before installation. Traffic control devices shall be maintained in good condition for the duration of use.

The Contractor shall maintain vehicular, bicycle and pedestrian traffic through the project's work zones in a manner that will reasonably provide the least practicable obstruction to all road users and provide paths for all road users, including, but not limited to, the passage through the work zone of persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA) Title II, paragraph 35.130.

The project manager shall be responsible for coordinating with the Traffic Section relating to any impacts to Traffic Section facilities (including but not limited to traffic loops, junction wells etc.) at least 4 weeks in advance of the start of the activity. Prior to initiating any work on this contract (or sites), the Project Manager shall be responsible for preparing and submitting for approval of the Safety Section, a Maintenance of Traffic Plan. Sufficient time shall be provided for the review and approval of the plan. The Maintenance of Traffic Plan shall include proposed time restrictions on the closure of travel lanes subject to the approval of the Safety Section.

The Project Manager is responsible for ensuring any required documents and analysis as part of the adopted Work Zone Safety and Mobility Procedures and Guidelines has been completed prior to any work starting on this contract.

14. BASIS OF PAYMENT

The Contractor may bill the Department when the work order is completed. Payment will be issued to the Contractor monthly on a mutually agreed upon date.

Payment of said invoice shall not relieve the Contractor from obligations incurred in warranting the quality of the workmanship and materials, or for restoration at the work site. A One Year Warranty on all materials, installation, and workmanship will be in effect for each work location starting on the acceptance date of each individual location. Specific work items may carry a longer Warranty Period. In these cases, the longer of one year or the otherwise specified warranty period will govern for those particular items. The Contractor shall provide contact information for an employee responsible for arranging any warranty work during the one year period. Any repairs required during the warranty period, including Maintenance of Traffic Items, shall be provided at no additional cost to the Department. Should any emergency repairs be required during the warranty period to work that was originally performed under this contract, contact will immediately be made with the Contractor and a response to the site of the emergency must be made within 3 hours of the time of contact. Should the Contractor be unable to respond to the emergency within the 3 hour timeframe, then the Department will pursue other means to make the repairs and deduct the costs from the Contract by means of a "negative" change order. Final acceptance as evidenced in writing after the completion of the entire contract or at such time as practical determination of the quality of the workmanship and materials can be made by the Engineer, will be necessary before any bonds or parts of bonds will be released.

15. ELECTRICAL TESTING BY DELDOT

The Contractor is advised that DelDOT may, at their discretion, perform independent electrical testing of the highway lighting system, signal system, and/or related electrical work items.

The Intelligent transportation system (ITS) is comprised of all Contract items for traffic control devices including but not limited to, conduits, junction wells, cables, load centers, transformers, cabinet pads, pole bases, poles, signal heads, pedestrian heads, and service installations.

The ITS will be considered defective if any of the following conditions are discovered by visual inspection or by inspection with testing equipment within the warranty period:

1. Defective lamps, LED's, or ballasts
2. Failure to operate, in whole or in part.
3. Power wire grounding less than ten megaohms.
4. Shifts in pole and/or foundation alignment.
5. Short circuits or open circuits anywhere within the system.
6. Deterioration of finishes, plating, or paint not normal and customary in the environment in which the equipment is installed.
7. Settlement of trench backfill.
8. Defective fuses.
9. Defective or improperly installed splices.

These conditions listed shall not be considered all inclusive.

The Department reserves the right to conduct initial and periodic ITS inspections after the Contractor has completed work. The initial inspection will be to determine if initial performance requirements are met. Periodic reviews may be conducted through the warranty period to determine the sustained ability of the system to meet the stated performance requirements.

All defective areas identified by the Department during initial or periodic inspections shall be documented and the information will be shared with the Contractor. Necessary repairs or replacements shall be made by the Contractor at no additional cost to DelDOT. All ITS repairs shall begin immediately following the notice to the Contractor of the defect unless weather limitations prevent the corrective work. The Department shall be given notification before the Contractor begins corrective work and shall be allowed full access to the areas being repaired.

When requirements, responsibilities, and furnishing of materials are outlined in the details and notes on the Plans and in the paragraphs preceding the "Basis of Payment" paragraph in the Standard Specifications or Special Provisions, no

interpretation shall be made that such stipulations are excluded because reiteration is not made in the "Basis of Payment" paragraph.

16. GENERAL WORK ELEMENTS

A. Backfill in trenches, around forms and junctions wells, or at any other place shall be completed thoroughly, using a power tamper, in lifts of not more than 8 inches loose measurement as it is being placed, in accordance with Standard Specification Subsection 202.05 (c). Any paving material or fill removed for trenching shall be replaced in kind.

B. At the Contractor's expense, all holes and trenches shall be protected from accidental entry by vehicles and pedestrians with steel plates or other approved materials as required by the Engineer. Should the Contractor fail to provide adequate protection to the surroundings of a work site or should the operations be carried out in such a way as to allow or cause damage to any roadway, street, sidewalk, the property of any utility, or other private or public property, and should the repair not be undertaken in a timely manner, then it may be necessary for the Department to protect the area and/or make the repair. If so, the cost shall be deducted from monies due the Contractor.

C. All concrete, including pole bases and cabinet bases, shall be finished to match any adjacent concrete. If no match is required, the surface area shall be broom finished and edged.

D. No ground rod shall be driven into earth without a proper protective cap to prevent damage to the threads. If the threaded end of the sectional ground rod is damaged, it will be replaced at the expense of the Contractor.

E. Material substitutions must be submitted in writing to the Engineer at least 10 calendar days prior to use in order to allow time for review and approval by the Engineer. Faxes or e-mails are not acceptable methods of submission. A scanned, signed letter in "pdf format" will be acceptable.

F. Work within waters/wetlands shall not begin on locations requiring environmental permits until all applicable permits have been obtained by the Department.

G. Traffic signal loops shall be installed within one week of receipt of work order unless otherwise directed by the Engineer.

H. If seeding is required for restoration of a work area, the cost shall be incidental to Item 732004, Topsoil. If topsoil is not required, the cost of seeding shall be incidental to the item requiring restoration.

I. Signal heads, pedestrian signal indications, and signs that are in place, but not in service, shall be entirely covered with opaque burlap with costs incidental to the various maintenance of traffic items.

17. MATERIALS

A. Damaged

Once the Department transfers material or equipment to the Contractor, any damage to or loss of that material or equipment which occurs from handling or transport, or from any other source or way, shall be the sole responsibility of the Contractor and the value thereof shall be deducted from any monies due the Contractor.

B. Supplied By or Returned To the Department

The Department's Sign Shop, 14 Sign Shop Road, Dover, DE 19901, and/or the Department's Canal District Shop, 250 Bear-Christiana Road, Bear, DE 19701 are the sites where items to be supplied by the Department are available and where items to be returned are to be delivered. Any reference in the Plans or Special Provisions to the Dover Sign Shop shall, for this contract, mean either the Dover Sign Shop or the Canal District Shop according to the direction provided by the Engineer.

C. Supplied By the Contractor

All materials supplied by the Contractor shall be new and unused and, where applicable, all materials and equipment supplied shall be UL approved. Catalog cuts and/or shop drawings shall accompany all requests for material source approval. 6 sets of such requests shall be sent to DelDOT's Traffic Sign Shop (att'n ITS Maintenance Manager). Following initial review by Traffic, 5 sets of the submittal will be forwarded to DelDOT's Materials and Research Section for final approval. Following their review and approval, 2 sets will be returned to the Contractor, one set will be retained by Materials and Research, and 2 sets will be returned to DelDOT's Traffic Sign Shop. If more approved copies are desired, the Contractor may elect to submit extras for review.

D. Transportation

Materials and/or equipment shall be transported in a legal fashion and shall be protected from damage or loss.

18. EROSION AND SEDIMENT CONTROL

The provisions of Section 110 of the Standard Specifications on erosion and sediment control apply to this contract. Those areas that have been disturbed for signal work shall be restored immediately after the ground disturbing portion of the work has been completed. Restoration of long runs of conduit for fiber optic installation shall be restored at the end of each work day. Silt fences will not be required.

19. RIGHT OF WAY

It is anticipated that all work will occur within DelDOT's existing right of way or easement areas. Should the need occur to trespass onto private property; it will be the responsibility of the Project manager to secure such trespass needs.

It is anticipated that all work will occur within DelDOT's right of way. Should the need occur to trespass onto railroad property, including the highway-rail crossing; it will be the responsibility of the project manager to contact the railroad chief engineer and obtain written authorization before entering.

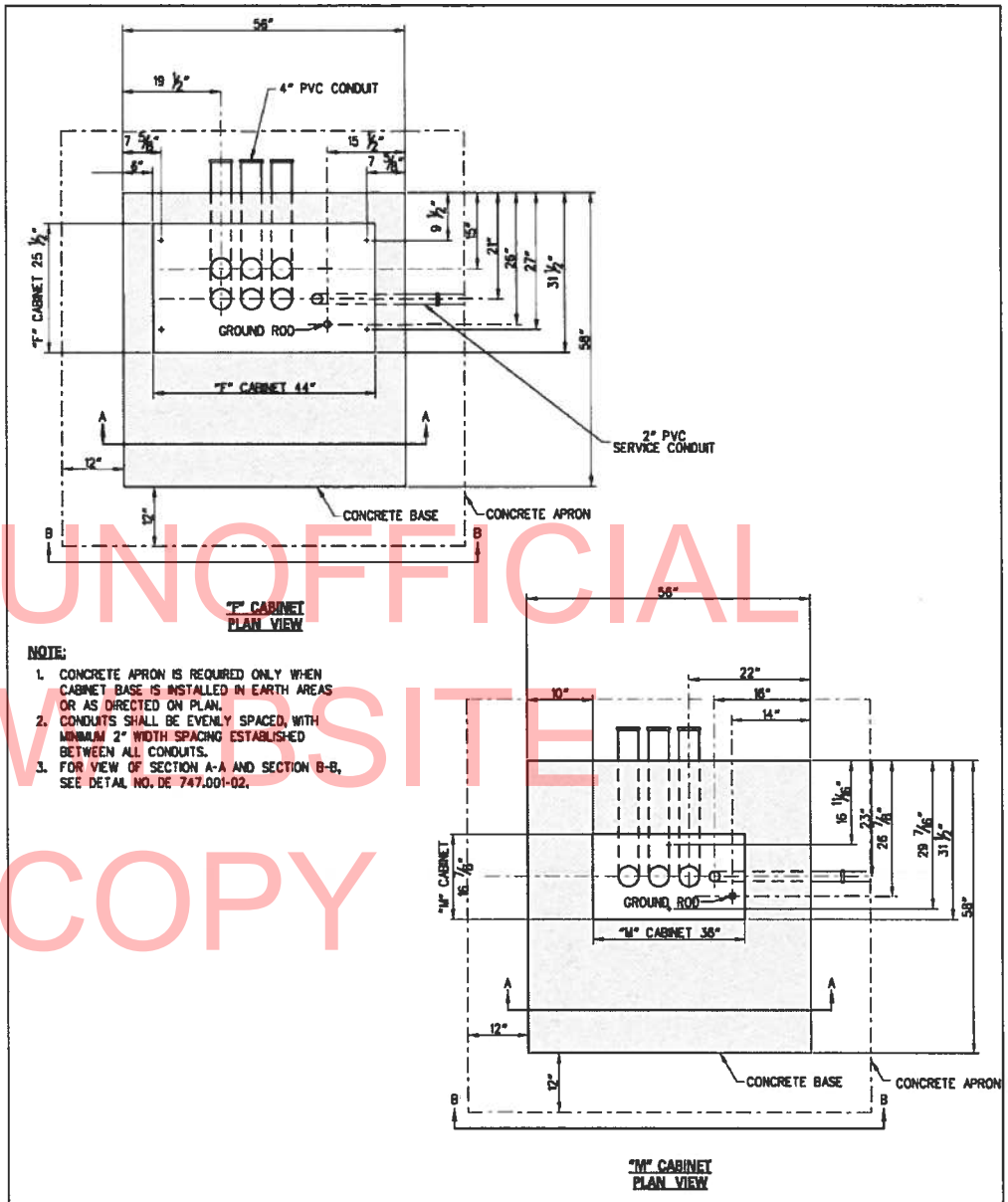
The Contractor shall give a one (1) week notice to the Property Owner when any fixture, shrub, or other object must be removed from the Right of Way or Easement area. If the Owner has not attempted to salvage this property, the Contractor shall remove it without obligation. Compensation shall be incidental to the Contract.

20. ENVIRONMENTAL

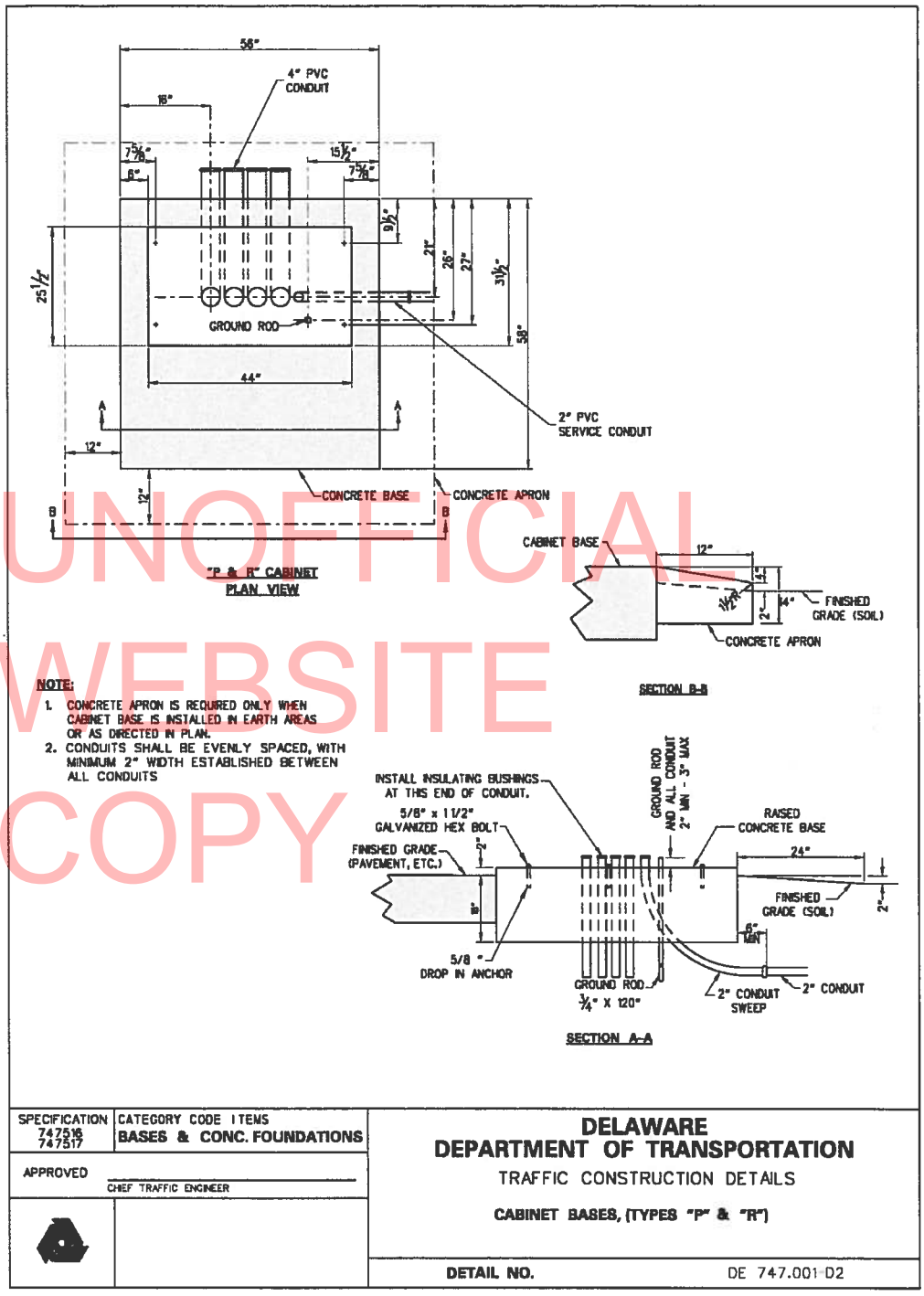
No Environmental Permits are required for this work provided no jurisdictional wetlands or waters are impacted. If there is any question as to whether or not a water or wetland is jurisdictional, contact the DelDOT Environmental Section at 302-760-2264.

21. UTILITIES

No Utility relocation involvement is anticipated. Should any conflicts be encountered during construction requiring adjustment and/or relocation of the agencies' existing facilities, the necessary relocation work shall be accomplished by the respective agencies' forces, as directed by the Engineer. Any adjustments and/or relocations of Municipally Owned facilities shall be done by the State's Contractor in accordance with the respective agencies' Standard Specifications as directed by the Engineer.



SPECIFICATION 747514 747515	CATEGORY CODE ITEMS BASES & CONC. FOUNDATIONS	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		CABINET BASES (TYPES "M" & "P")
		DETAIL NO. DE 747.001-01



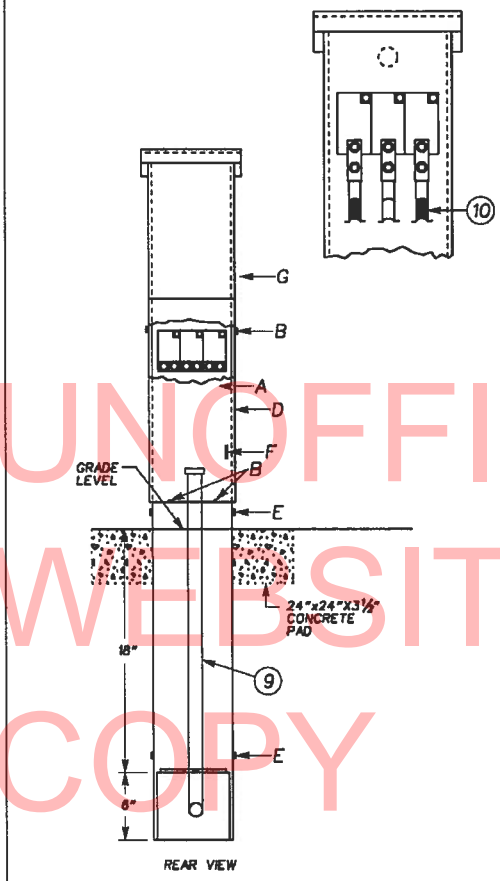
SPECIFICATION	CATEGORY CODE ITEMS
747516 747517	BASES & CONC. FOUNDATIONS

APPROVED _____
CHIEF TRAFFIC ENGINEER

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS

CABINET BASES, (TYPES "P" & "R")

DETAIL NO. DE 747.001-02



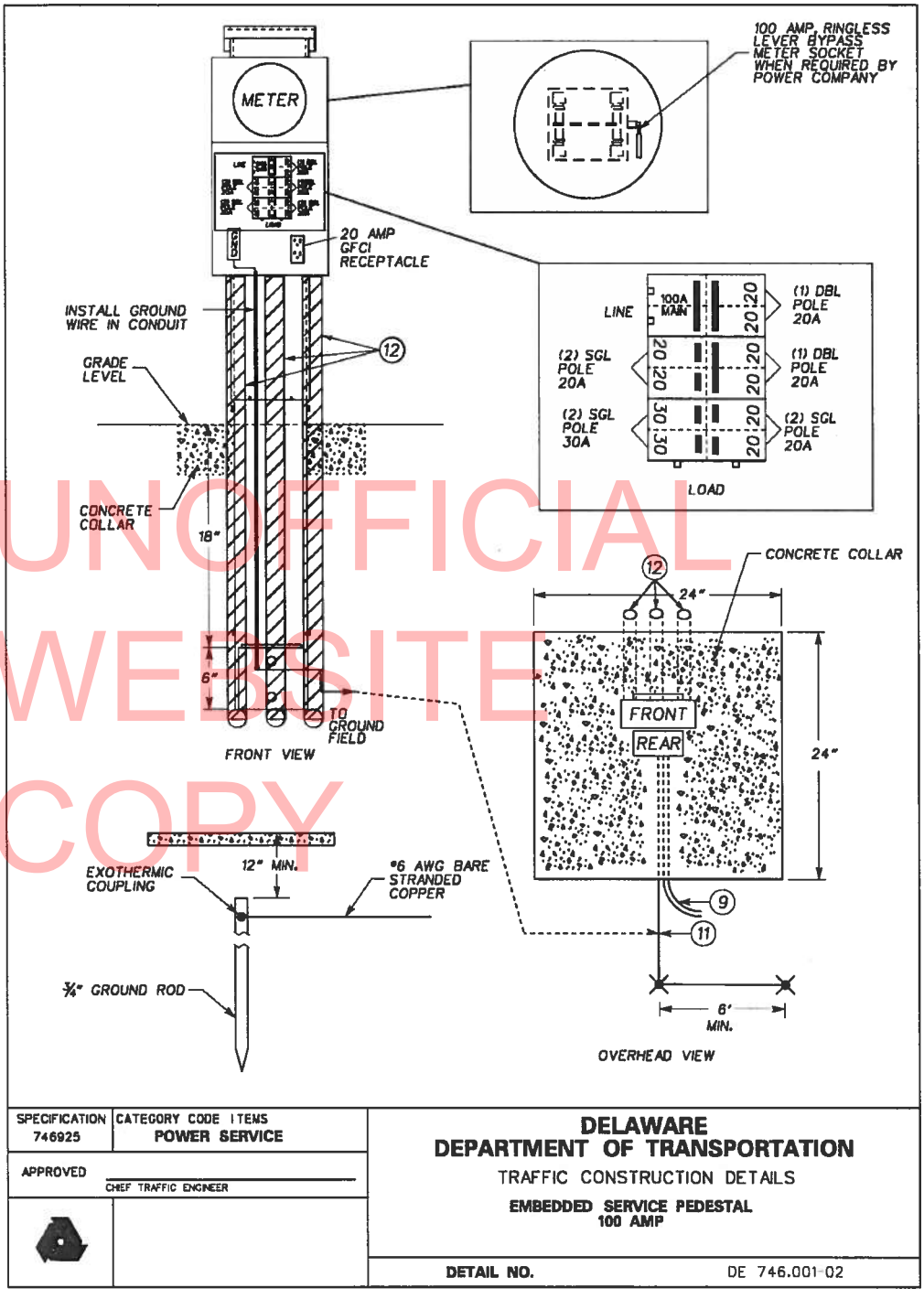
CONSTRUCTION NOTES

1. REMOVE COVER "A" BY REMOVING (4) SCREWS "B". SLIDE COVER SLIGHTY TOWARDS BOTTOM OF POST (ALLOWING TOP OF COVER TO CLEAR TOP RETAINING BRACKET) & PULL COVER AWAY FROM POST.
2. REMOVE COVER "D" BY REMOVING (4) SCREWS "E". PULL COVER AWAY FROM POST.
3. LOCATION "G" - WHEN LOAD CONDUCTORS EXIT THE BOTTOM OF THE POST, REMOVE THE SMALL HORIZONTAL BARRIER AND ROTATE 90° TO FORM A VERTICAL BARRIER INSIDE THE POST. RE-ASSEMBLE USING THE SAME SCREW AND MOUNTING HOLE.
4. LAY WIRES IN AND ATTACH TO TERMINAL BAR. (SEE WIRING DIAGRAM IN POST TROUGH FOR TORQUE AND WIRE SIZE INFORMATION.)
5. REPLACE COVER "D" ON POST AND FASTEN WITH (4) SCREWS "E".
6. REPLACE COVER "A" ON POST AND FASTEN WITH (4) SCREWS "B".
7. TO PADLOCK COVER "A", UTILIZE HASP "F".
8. CONCRETE COLLAR SHALL BE APPROXIMATELY. 24"x24" AND 3.5" MINIMUM THICKNESS. ENSURE PAD IS FLUSH WITH GROUND.
9. INSTALL CORRECTLY SIZED SCHEDULE 80 PVC CONDUIT (eg. LINE SIDE CONDUIT SIZE TO BE AS PER LOCAL ELECTRICAL POWER COMPANY'S REQUIREMENTS. VERIFY SIZE WITH UTILITY COMPANY PRIOR TO INSTALLATION) INCLUDING 90° ELBOWS.
10. ATTACH CORRECTLY SIZED (eg. 2/0 AWG) COPPERWIRE, LUGGED, FROM TERMINATION POINT SHOWN THROUGH PROPERLY SIZED CONDUIT TO POWER POLE TO BE UTILIZED. RUN CORRECTLY SIZED PVC CONDUIT (eg. 4") RISER AT LEAST 10" UP POLE AND LEAVE 30' OF CABLE COILED AT TOP OF RISER TO BE UTILIZED BY POWER COMPANY.
11. GROUNDING IS MADE USING #6 BARE STRANDED COPPERWIRE FROM GROUNDING POINT IN BREAKER PANEL TO THE EXTERNAL GROUND FIELD.
12. INSTALL THREE (3) 2" PVC CONDUITS FROM BOTTOM OF PANEL AS SHOWN.

SPECIFICATION	CATEGORY CODE ITEMS
746925	POWER SERVICE
APPROVED _____ CHIEF TRAFFIC ENGINEER	

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS
EMBEDDED SERVICE PEDESTAL
100 AMP

DETAIL NO. DE 746.001-01

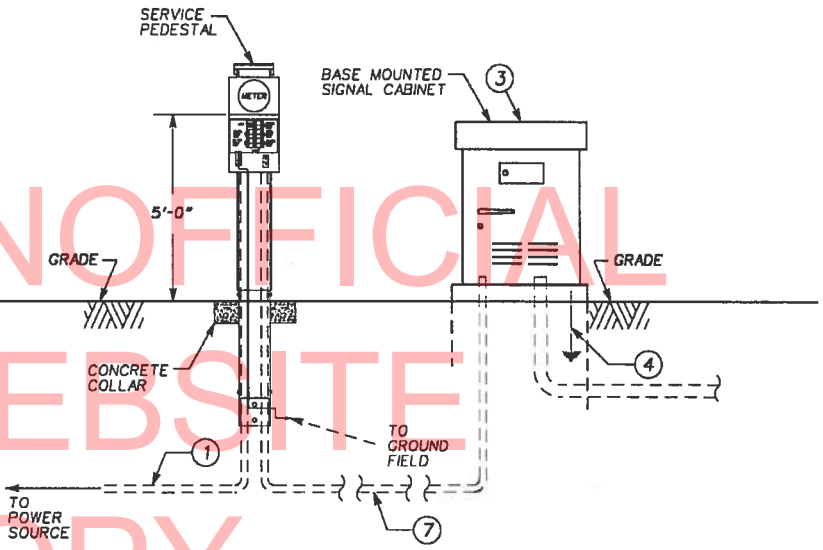


SPECIFICATION	CATEGORY CODE ITEMS
746925	POWER SERVICE

APPROVED _____
CHIEF TRAFFIC ENGINEER

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS
EMBEDDED SERVICE PEDESTAL
100 AMP

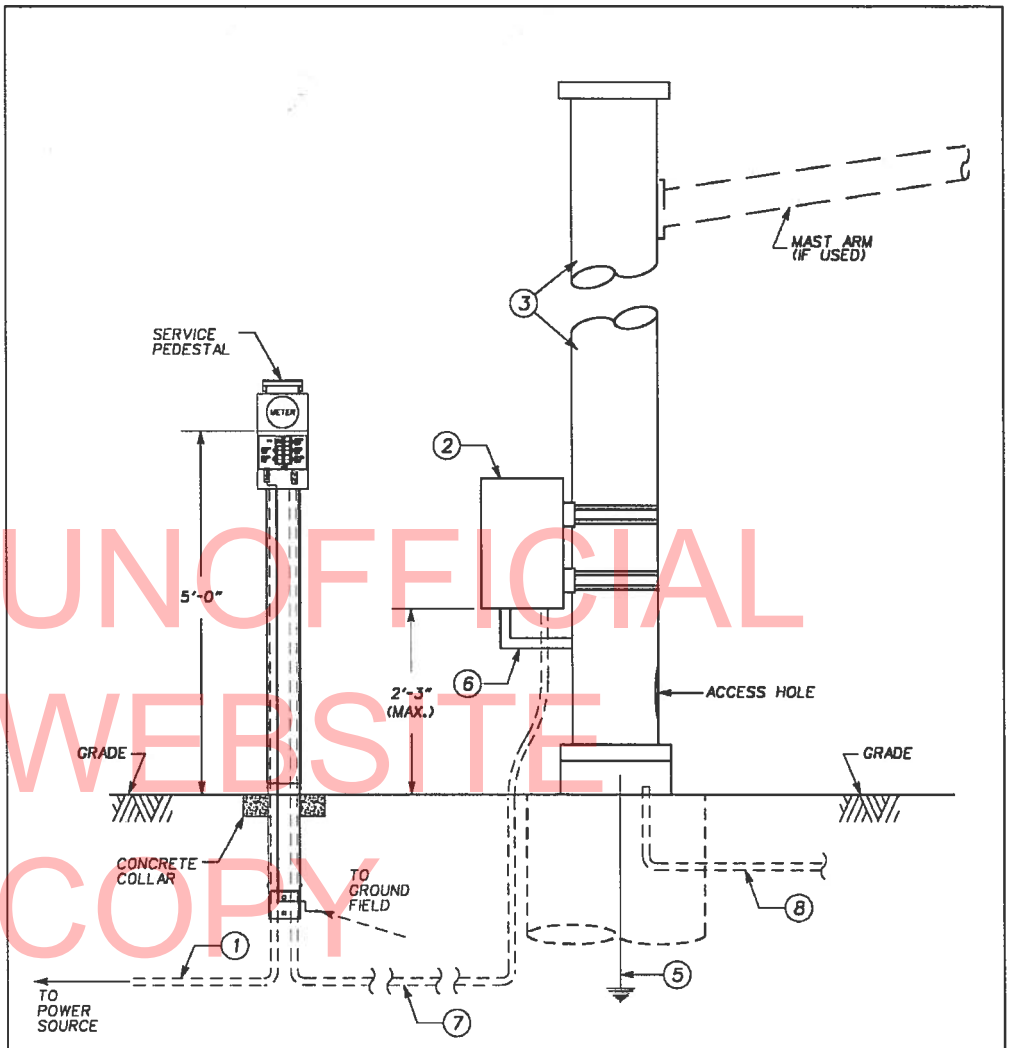
DETAIL NO. DE 746.001-02



NOTES:

1. REFER TO APPROPRIATE UTILITY TYPICAL FOR CONSTRUCTION DETAILS AND NOTES ASSOCIATED WITH THIS SHEET.
2. INSTALLATION OF EQUIPMENT BETWEEN SERVICE PEDESTAL AND CONTROLLER CABINET SHALL BE AS PER CONTRACT DRAWINGS/DETAILS
3. SEE EMBEDDED SERVICE PEDESTAL TYPICAL FOR INSTALLATION AND GROUNDING.

SPECIFICATION 746926	CATEGORY CODE ITEMS POWER SERVICE	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		ELECTRICAL SERVICE EQUIPMENT METERED BASE-MOUNTED CABINET
		DETAIL NO. DE 746.002-01



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3. SEE EMBEDDED SERVICE PEDESTAL TYPICAL FOR INSTALLATION AND GROUNDING.

SPECIFICATION	CATEGORY CODE ITEMS
746926	POWER SERVICE
APPROVED _____ CHIEF TRAFFIC ENGINEER	

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS
ELECTRICAL SERVICE EQUIPMENT
METERED POLE-MOUNTED CABINET

DETAIL NO. DE 746.002-02

CONSTRUCTION DETAILS

POWER COMPANY FURNISHES AND INSTALLS:

1. UNDERGROUND ELECTRIC SERVICE FEED. THE CONTRACTOR SHALL REFER TO THE CONTRACT. DOCUMENTS FOR DETAILS RELATED TO THE ELECTRIC SERVICE FEED INSTALLATION.

CONTRACTOR FURNISHES AND/OR INSTALLS:

2. POLE MOUNTED, BAND TO POLE WITH TWO (2) - ¾" WIDTH, .030" THICK STAINLESS STEEL BANDS PER FURNISHED BRACKET.

3. STEEL POLE.

4. BONDING SHALL BE BY A SINGLE CONTINUOUS #6 AWG BARE STRANDED COPPER WIRE RUN THROUGH EACH OF THE SERVICE PEDESTAL GROUND ROD CLAMPS TO THE SERVICE PEDESTAL GROUNDING LUG TO THE SERVICE PEDESTAL NEUTRAL BAR TO THE CONDUIT TO THE CONTROLLER CABINET TO THE CONTROLLER GROUNDING BAR TO THE CONTROLLER CABINET GROUND ROD CLAMP TO THE CONDUIT TO THE NEAREST JUNCTION WELL GROUND ROD CLAMP.

5. BONDING SHALL BE BY A SINGLE CONTINUOUS #6 AWG BARE STRANDED COPPER WIRE RUN THROUGH EACH OF THE SERVICE PEDESTAL GROUND ROD CLAMPS TO THE SERVICE PEDESTAL GROUNDING ROD CLAMPS TO THE SERVICE PEDESTAL NEUTRAL BAR TO THE CONDUIT TO THE CONTROLLER CABINET TO THE CONTROLLER CABINET GROUNDING BAR TO THE 3" NIPPLE INSULATED BONDING BUSHING ON THE CONTROLLER CABINET BOTTOM TO THE STEEL POLE GROUNDING LUG TO THE GROUNDING ROD GROUNDING CLAMPS TO THE CONDUIT TO THE NEAREST JUNCTION WELL GROUND LUG CLAMP.

6. 3" "LB" CONDUIT BODY MOUNTED ONTO 3" COUPLING ON STEEL POLE. PLACE 3" GALVANIZED STEEL RIGID CONDUIT NIPPLES ON BOTH "LB" CONDUIT BODY ENDS. PLACE DOUBLE LOCK NUTS ON NIPPLE END ENTERING THE CONTROLLER CABINET BOTTOM FOLLOWED BY AN INSULATED BONDING BUSHING.

7. USE DIRECT CONDUIT FROM SERVICE PEDESTAL TO CONTROLLER CABINET FOR GROUNDING CONDUCTOR AND SERVICE WIRE INSTALLATION AS PER CONTRACT DOCUMENTS.

8. USE DIRECT CONDUIT FROM STEEL POLE TO JUNCTION WELL FOR GROUNDING CONDUCTOR INSTALLATION.

NOTES:

A. ALL EXPOSED GALVANIZED STEEL RIGID CONDUIT ENDS SHALL BE WIRE BRUSHED, CLEANED OF ANY RESIDUE, AND AN INORGANIC ZINC COMPOUND APPLIED.

B. ALL GALVANIZED STEEL RIGID CONDUIT INSULATED BONDING BUSHINGS SHALL HAVE BONDING LUGS OF "LAY-IN" TYPE DESIGN.

C. ALL CONDUIT BODIES FOR USE WITH GALVANIZED STEEL RIGID CONDUIT SHALL BE CADMIUM PLATED MALLEABLE IRON WITH NEOPRENE GASKETS, SHEET ALUMINUM COVERS AND STAINLESS STEEL COVER BOLTS.

D. GROUND ROD CLAMPS SHALL BE ONE PIECE CAST BRONZE APPROVED FOR DIRECT BURIAL INSTALLATION.

E. BASED ON THE SERVICE FEED FROM THE SERVICE PEDESTAL TO THE CONTROLLER CABINET, THE WIRE COLORS WILL BE THE FOLLOWING:

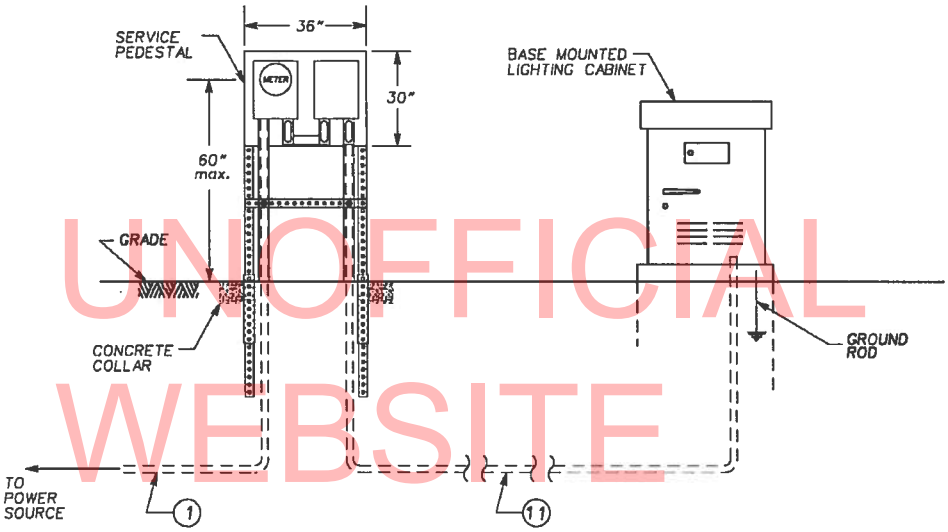
FEED VOLTAGE	COLOR
SINGLE PHASE, 2 WIRE	W (NEUTRAL), B (PHASE)
SINGLE PHASE, 3 WIRE	W (NEUTRAL), B (PHASE) R (PHASE)
3 PHASE, 4 WIRE	W (NEUTRAL), B (PHASE) R (PHASE), BL (PHASE)

SPECIFICATION 746926	CATEGORY CODE ITEMS POWER SERVICE
APPROVED _____ CHIEF TRAFFIC ENGINEER	

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS

ELECTRICAL SERVICE EQUIPMENT
METERED POLE & BASE MOUNTED CABINET
(CONSTRUCTION NOTES)

DETAIL NO. DE 746.002-03



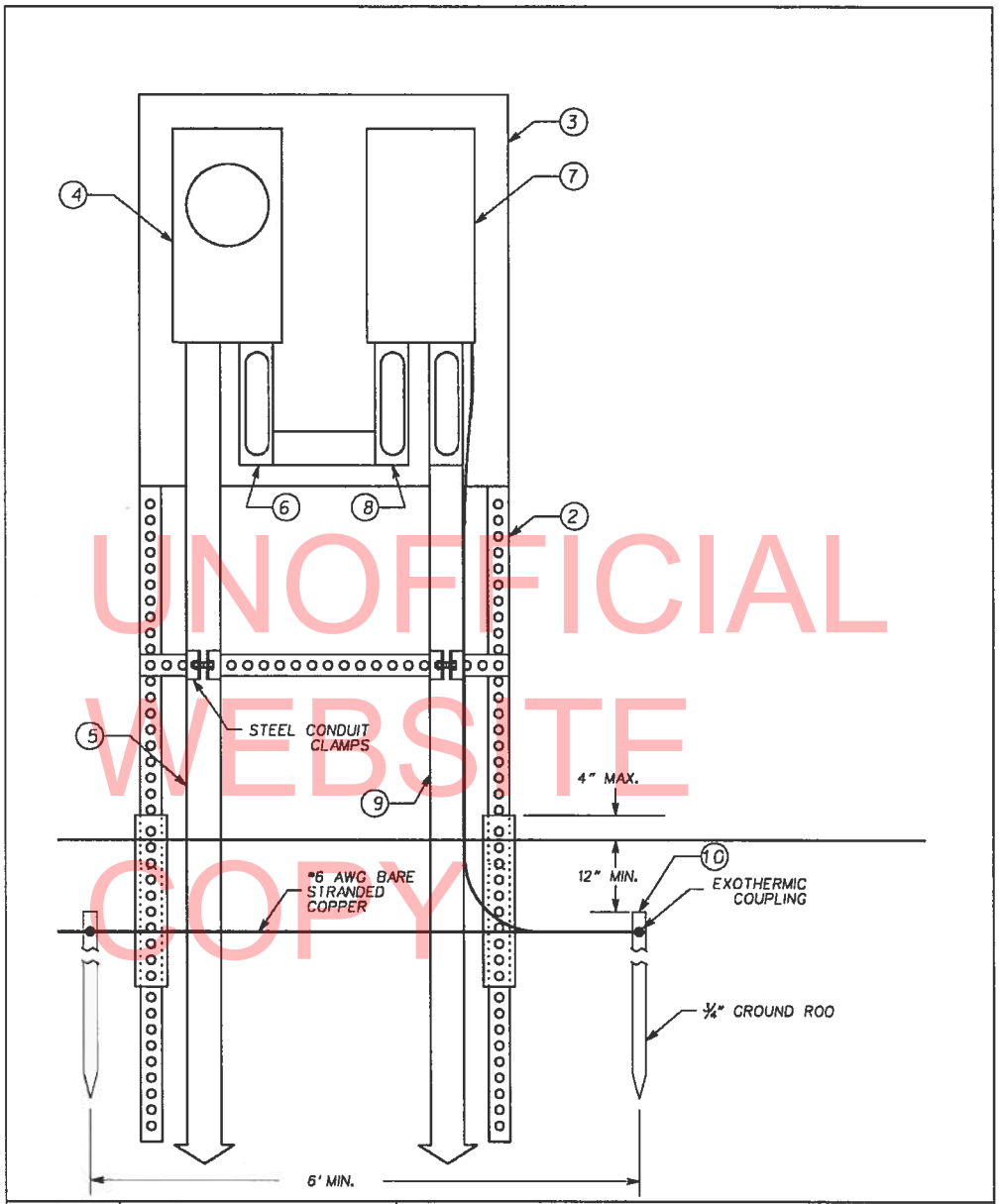
SPECIFICATION	CATEGORY CODE ITEMS
746926 747513	POWER SERVICE
APPROVED _____ CHIEF TRAFFIC ENGINEER	

DELAWARE
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONSTRUCTION DETAILS

ELECTRICAL UTILITY SERVICE EQUIPMENT
UNDERGROUND ELECTRICAL POWER CONNECTION
(LIGHTING)

DETAIL NO. DE 746.003-01



SPECIFICATION	CATEGORY CODE ITEMS
746926 747513	POWER SERVICE
APPROVED _____ CHIEF TRAFFIC ENGINEER	

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS
ELECTRICAL SERVICE EQUIPMENT
UNDERGROUND ELECTRICAL POWER CONNECTION
(LIGHTING)

DETAIL NO. DE 746.003-02

CONSTRUCTION DETAILS

POWER COMPANY FURNISHES AND INSTALLS:

WATTHOUR METER

CONTRACTOR FURNISHES AND/OR INSTALLS:

1. UNDERGROUND ELECTRIC SERVICE FEED. THE CONTRACTOR SHALL REFER TO THE CONTRACT DOCUMENTS FOR DETAILS RELATED TO THE ELECTRIC SERVICE FEED INSTALLATION.

2. INSTALL SQUARE TUBES TO BE FORMED FROM GALVANIZED SHEET STRUCTURAL (PHYSICAL) QUALITY, ASTM A 446, GRADE A, COATING DESIGNATION G 90 REGULAR SPANGLE. OR HOT ROLLED CARBON SHEET STEEL STRUCTURAL (PHYSICAL) QUALITY, ASTM A 570, GRADE 33.

   A. NOMINAL OUTSIDE DIMENSION. (INCHES)

2 X 2	+/- .008
2 1/4 X 2 1/4	+/- .010
2 1/2 X 2 1/2	+/- .010

   B. ALL FOUR SIDES ARE TO HAVE EVENLY SPACED 1/2" DIAMETER HOLES ON 1" CENTERS THE ENTIRE LENGTH OF THE TUBE.

   C. TOLERANCE ON HOLE SIZE IS +/- 1/64". TOLERANCE ON HOLE SPACING IS +/- 1/8" IN 20 FEET.

   D. STANDARD CORNER RADIUS SHALL BE 5/32" +/- 1/64".

   E. THE FASTENERS TO BE SUPPLIED UNDER THIS SPECIFICATION SHALL BE 5/16" GRADE 5 UNC CORNER BOLTS WITH CADMIUM OR ZINC PLATING.

3. INSTALL 30"X 36" ALUMINUM PANEL ON SIGN POST WITH 5/16" GRADE 5 UNC BOLTS AND NYLON LOCK NUTS. ALUMINUM PANEL SHALL BE 0.08 THICK, 5052-H38 ALLOY CONFORMING TO ASTM B-209.

4. MOUNT 200 AMPERE RATED METER SOCKET (OR AS SUPPLIED BY LOCAL UTILITY COMPANY) WITH FOUR (4) 5/16" UNC STAINLESS STEEL BOLTS WITH NYLON LOCK NUTS DRILLED THROUGH THE METER SOCKET BACK INTO THE ALUMINUM BACK PLATE. THE BOLT LOCATIONS SHALL BE INSTALLED ONE INCH ABOVE THE BOTTOM AND ONE INCH BELOW THE TOP.

5. PLACE 3" PVC CONDUIT FOR SERVICE. PLACE PVC CONDUIT ENTERING THE METER SOCKET'S LOWEST LEFT SIDE OPENING. PLACE DOUBLE LOCK NUTS ON THE THREADED END ENTERING THE METER SOCKET SIDE FOLLOWED BY AN THREADED BUSHING. ATTACH CONDUIT TO SUPPORT BRACKET WITH GALVANIZED STEEL CONDUIT CLAMPS AT 3' BELOW THE METER SOCKET. PLACE THE SPECIFIED NUMBER OF COPPER TYPE THWN WIRES FROM THE METER SOCKET LINE SIDE TERMINALS TO THE UTILITY POLE OR TRANSFORMER. (COLORED WHITE FOR AC NEUTRAL, BLACK FOR ONE SIDE OF THE AC+ AND RED FOR THE REMAINING AC+ SIDE FOR 120/240V) (COLORED GREY FOR AC NEUTRAL, BROWN FOR AC+, ORANGE FOR AC+, YELLOW FOR AC+ FOR 277/480V).

6. PLACE 2 1/2" PVC CONDUIT NIPPLE INTO AN THREADED BUSHING MOUNTED ONTO THE DISCONNECT SWITCH BOTTOM LEFT SIDE. THE NIPPLE SHALL ENTER THE 2 1/2" LB BODY AT THE RIGHT-MOST BOTTOM OPENING OF THE METER SOCKET. ALSO TO THE SAME LATERAL ORIENTATION TO THE DISCONNECT SWITCH. PLACE DOUBLE LOCK NUTS ON THE NIPPLE END ENTERING THE METER SOCKET BOTTOM FOLLOWED BY AN THREADED BUSHING. PLACE INDIVIDUAL COPPER TYPE THWN WIRE FROM THE METER SOCKET LOAD SIDE TERMINALS TO THE DISCONNECT SWITCH LINE SIDE TERMINALS. (COLORED WHITE FOR AC NEUTRAL; BLACK FOR ONE SIDE OF THE AC+ AND RED FOR THE REMAINING AC+ SIDE FOR 120/240V.) (GREY AC NEUTRAL, BROWN AC+, ORANGE AC+ AND YELLOW AC+ FOR 277/480V.)

7. MOUNT DISCONNECT SWITCH WITH FOUR (4) 5/16" UNC STAINLESS STEEL BOLTS WITH NYLON LOCK NUTS DRILLED THROUGH THE DISCONNECT SWITCH BACK INTO THE ALUMINUM BACK PLATE THE BOLT LOCATIONS SHALL BE AT ONE INCH BELOW THE TOP AND ONE INCH ABOVE THE BOTTOM.

8. PLACE 2 1/2" PVC CONDUIT NIPPLES ON BOTH "LB" CONDUIT BODY ENDS. LOCATE THE DISCONNECT SWITCH NIPPLE OPENING TO ALLOW THE "LB" CONDUIT BODY TO BE FLUSH TO THE CENTER IN RESPECT TO THE METER SOCKET CONDUIT BODY. PLACE DOUBLE LOCK NUTS ON THE NIPPLE END ENTERING THE DISCONNECT SWITCH BOTTOM FOLLOWED BY AN INSULATED BONDING BUSHING.

9. PLACE 3" PVC CONDUIT ON THE DISCONNECT SWITCH BOTTOM RIGHT SIDE. PLACE DOUBLE LOCK NUTS ON BOTH THREADED ENDS ENTERING THE DISCONNECT SWITCH AND FOLLOWED BY THREADED BUSHINGS. CLAMP CONDUIT TO SUPPORT BRACKET WITH A GALVANIZED STEEL CONDUIT CLAMP AT A DISTANCE MIDWAY ALONG THE VERTICAL CONDUIT FROM THE DISCONNECT SWITCH BOTTOM. PLACE INDIVIDUAL COPPER TYPE THWN WIRE FROM THE DISCONNECT SWITCH LOAD SIDE TERMINALS TO THE CABINET TERMINALS. (COLORED WHITE FOR AC NEUTRAL, BLACK FOR ONE SIDE OF THE AC+, RED FOR AC+ FOR 120/240V.) (GREY AC NEUTRAL, BROWN AC+, ORANGE AC+, YELLOW AC+ FOR 277/480V.)

10. GROUND ROD WITH ONE PIECE CAST BRONZE GROUND ROD CLAMP. BONDING SHALL BE BY A SINGLE CONTINUOUS #6 AWG BARE STRANDED COPPER WIRE RUN FROM THE GROUND ROD ALONG THE CONDUIT. (DRILL 1/4" HOLE) INTO THE DISCONNECT TO THE DISCONNECT SWITCH NEUTRAL BAR TO THE CONDUIT TO THE CABINET. TO THE CABINET GROUNDING BAR. TO THE GROUND ROD CLAMP.

11. USE DIRECT CONDUIT FROM SERVICE PEDESTAL TO CONTROLLER CABINET FOR GROUNDING CONDUCTOR AND SERVICE WIRE INSTALLATION AS PER CONTRACT DOCUMENTS.

SPECIFICATION	CATEGORY CODE ITEMS
746928 747513	POWER SERVICE

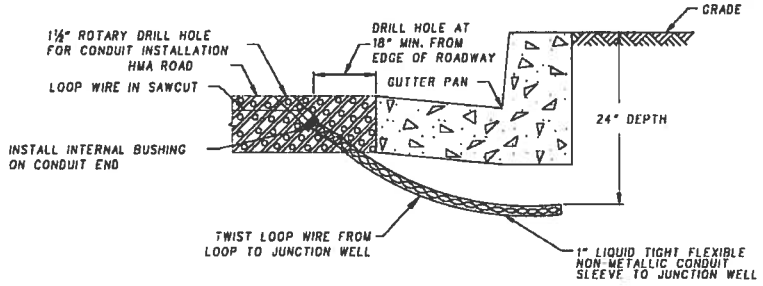
APPROVED _____
CHIEF TRAFFIC ENGINEER

DELAWARE
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONSTRUCTION DETAILS

ELECTRICAL SERVICE EQUIPMENT
UNDERGROUND ELECTRICAL POWER CONNECTION
(LIGHTING)

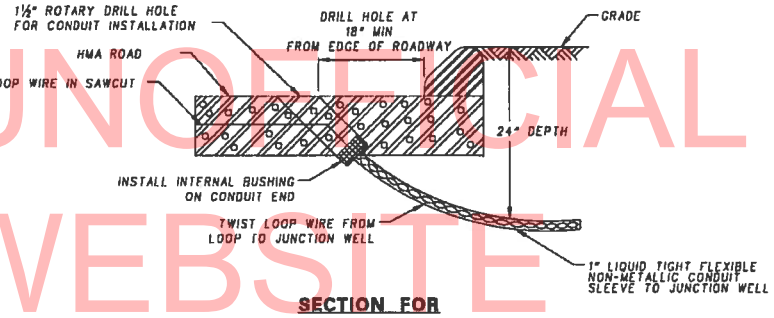
DETAIL NO. DE 746.003-03



SECTION FOR

HMA OR CONCRETE ROAD WITH COMBINATION CONCRETE CURB AND GUTTER

REFER TO LOOP DETECTOR INSTALLATION DETAILS FOR FURTHER INFORMATION.



SECTION FOR

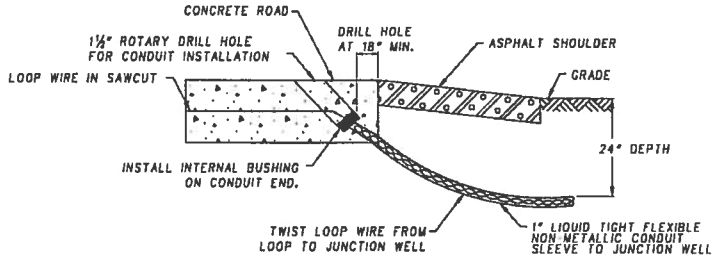
HMA ROAD WITH HMA CURB

REFER TO LOOP DETECTOR INSTALLATION DETAILS FOR FURTHER INFORMATION.

NOTES:

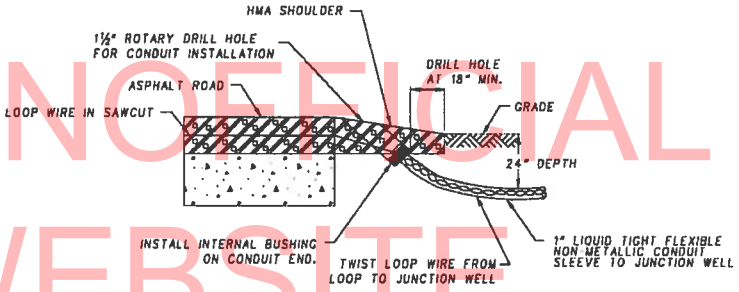
1. LIQUID TIGHT FLEXIBLE NON METALLIC CONDUIT SHALL BE USED WHERE THE DISTANCE BETWEEN THE DRILLED HOLE FOR CONDUIT SLEEVE AND JUNCTION WELL IS ≤ 6'. ALL OTHER CONDUIT SLEEVES SHALL BE 1" RIGID GALVANIZED STEEL UNLESS OTHERWISE SPECIFIED.
2. INSTALL DUCT SEAL IN BOTH CONDUIT SLEEVE ENDS.
3. SLEEVE AND SAWCUT SHALL NOT DAMAGE OR CONTACT CURB AND GUTTER.
4. SEPARATE 1" ELECTRICAL CONDUIT SLEEVES SHALL BE REQUIRED FOR EACH LOOP SPACED 1'-0" MINIMUM APART IN ROADWAY.
5. CONTRACTOR SHOULD AVOID WHEEL PATH IN THE ROADWAY WHILE DRILLING FOR CONDUIT INSTALLATION.

SPECIFICATION 746923 746924	CATEGORY CODE ITEMS DETECTION	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		LOOP DETECTOR HOME-RUN INSTALLATION
		DETAIL NO. DE 746.004-01



SECTION FOR
CONCRETE ROAD WITH HMA SHOULDER

REFER TO LOOP DETECTOR INSTALLATION DETAILS FOR FURTHER INFORMATION.



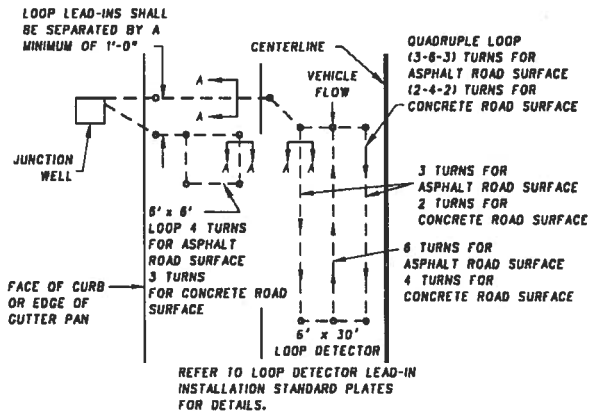
SECTION FOR
HMA ROAD AND SHOULDER

REFER TO LOOP DETECTOR INSTALLATION DETAILS FOR FURTHER INFORMATION.

NOTES:

1. LIQUID TIGHT FLEXIBLE NON METALLIC CONDUIT SHALL BE USED WHERE THE DISTANCE BETWEEN THE DRILLED HOLE FOR CONDUIT SLEEVE AND JUNCTION WELL IS ≤ 6'. ALL OTHER CONDUIT SLEEVES SHALL BE 1" GALVANIZED UNLESS OTHERWISE SPECIFIED.
2. INSTALL DUCT SEAL IN BOTH CONDUIT SLEEVE ENDS.
3. SEPARATE 1" ELECTRICAL CONDUIT SLEEVES SHALL BE REQUIRED FOR EACH LOOP SPACED 1'-0" MINIMUM APART IN ROADWAY.
4. CONTRACTOR SHOULD AVOID WHEEL PATH IN THE ROADWAY WHILE DRILLING FOR CONDUIT INSTALLATION.

SPECIFICATION 746923 746924	CATEGORY CODE ITEMS DETECTION	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		LOOP DETECTOR HOME-RUN INSTALLATION
		DETAIL NO. DE 746.004-02



LOOP DETECTOR SAWCUT TYPICAL

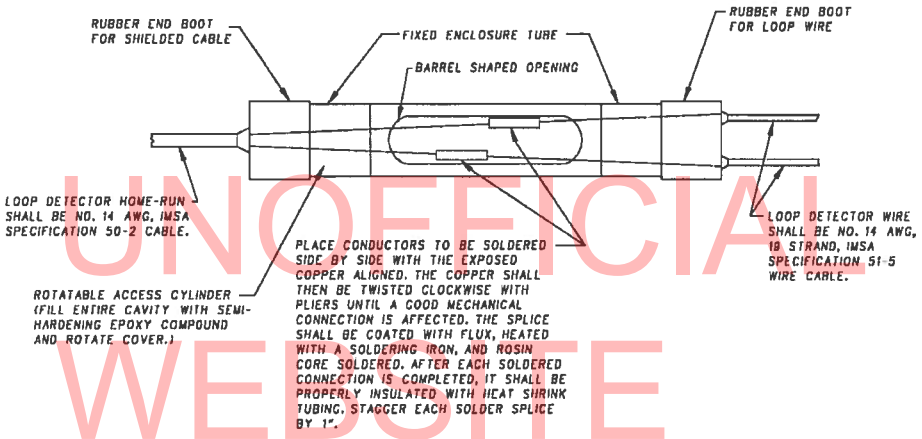
SECTION A-A CONCRETE SURFACE

SECTION A-A ASPHALT SURFACE

NOTES:

1. WHEN A PROPOSED LOOP DETECTOR SAWCUT CROSSES A LATERAL ROADWAY JOINT OR VALVE COVER (ie. MANHOLE, JUNCTION WELL, ETC.), LOOP DETECTOR INSTALLATION SHALL BE MODIFIED INTO TWO SEPARATE LOOP DETECTORS WHICH SHALL NOT TRAVERSE JOINTS OR VALVE COVERS.
2. THE LOOPS SHALL BE PLACED IN THE CENTER OF THE LANE UNLESS OTHERWISE NOTED ON PLANS.
3. PRESENCE LOOP DETECTORS ARE TO BE PLACED 12' BEHIND THE EXISTING OR PROPOSED STOP LINE.
4. LOOP DETECTOR AND LEAD-IN SAWCUTS SHALL BE 5/8".
5. 1½" DRILL HOLES SHALL BE USED AT ALL CHANGES IN SAWCUT DIRECTIONS.
6. 2" DEPTH FOR CONCRETE ROAD SURFACE OR 4 1/2 " DEPTH FOR ASPHALT ROAD SURFACE.

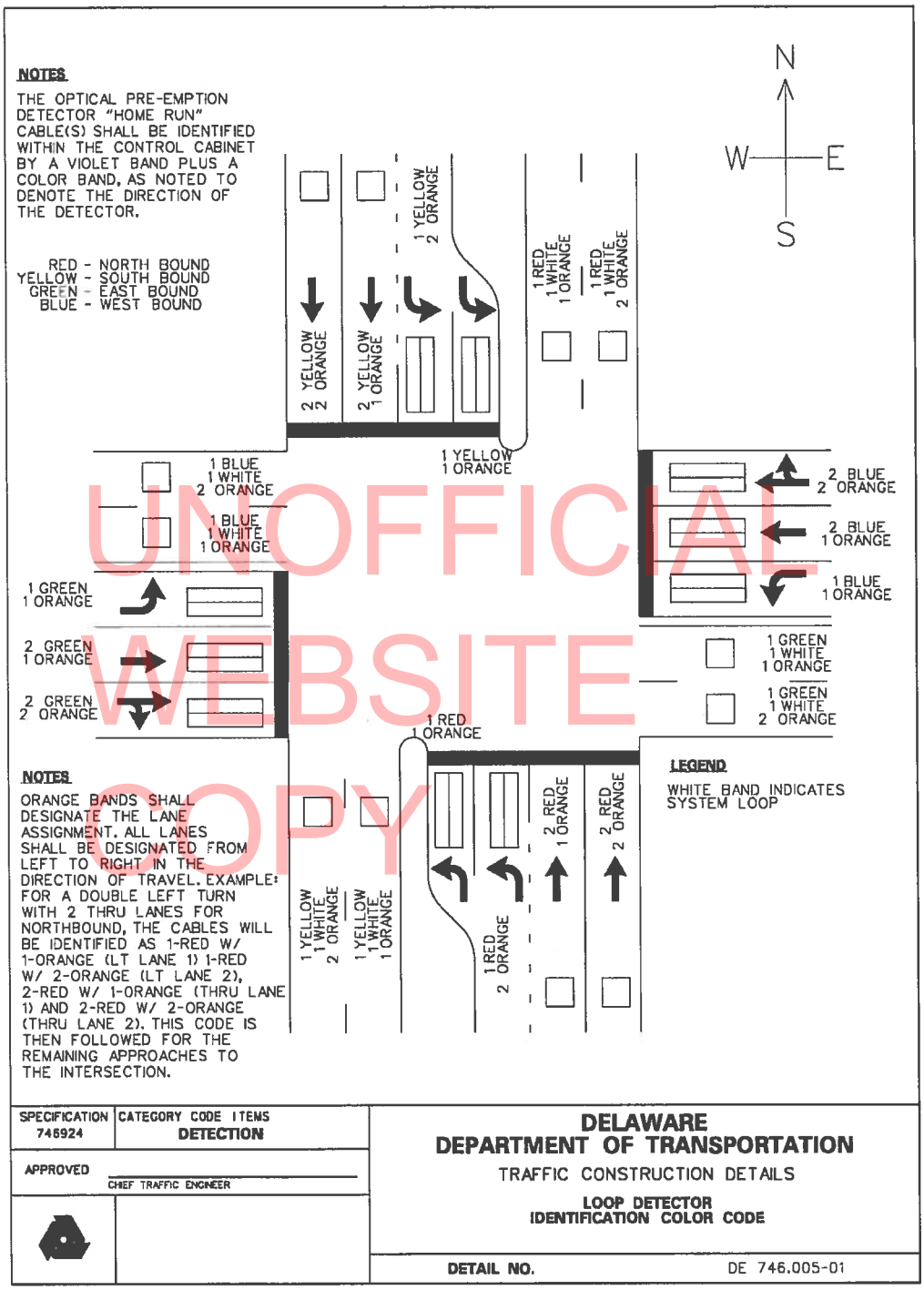
SPECIFICATION 746924	CATEGORY CODE ITEMS DETECTION	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		LOOP DETECTOR INSTALLATION
		DETAIL NO. DE 746.004-03

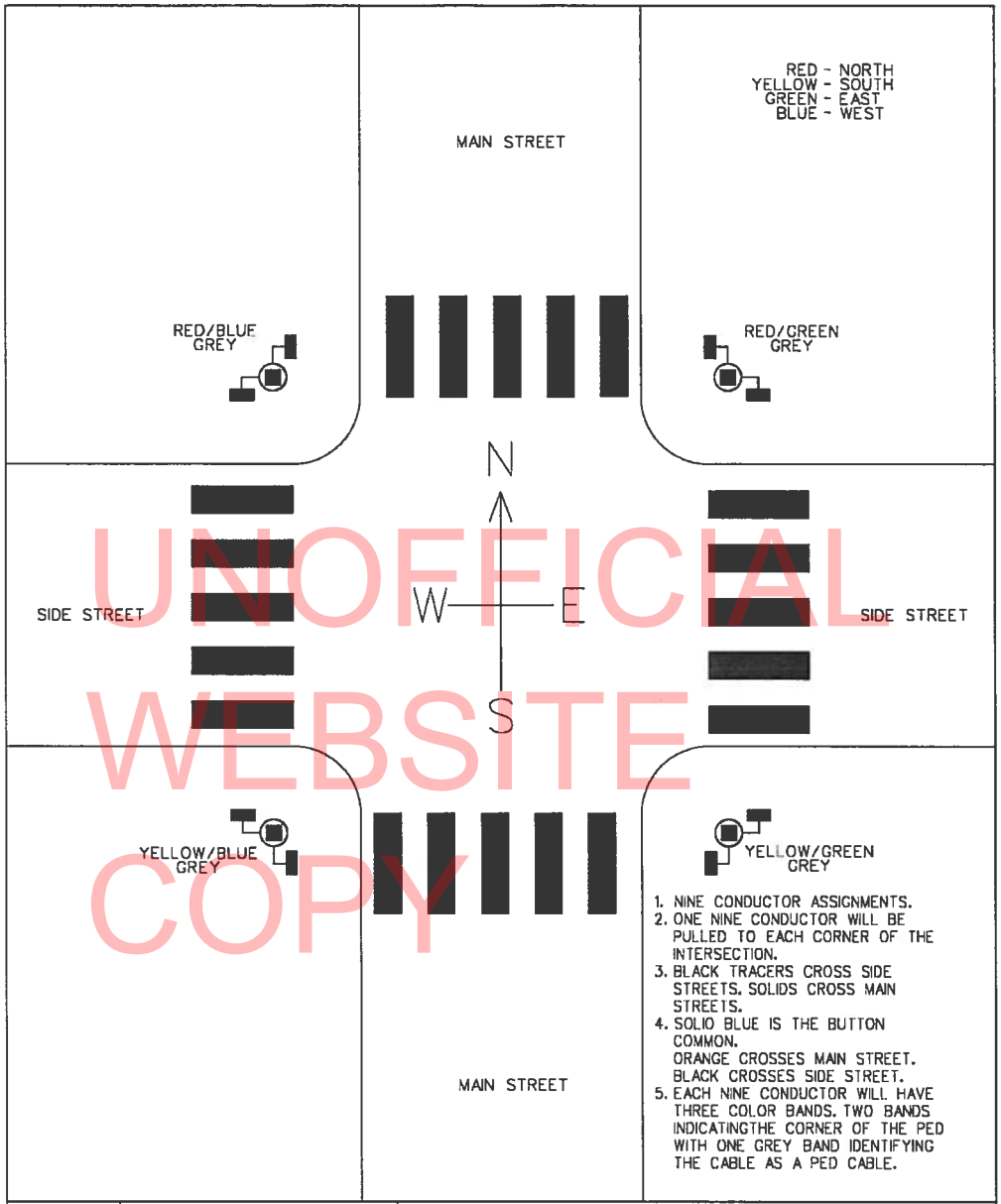


NOTE:

BARREL SIZE SHALL BE 1" TO 1½" DIAMETER AND 4" TO 6" LENGTH. ALL SPLICE KIT CONNECTIONS SHALL BE DONE IN JUNCTION WELLS ONLY.

SPECIFICATION 746924	CATEGORY CODE ITEMS DETECTION	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		SPLICE KIT FOR LOOP DETECTOR WIRE AND LOOP DETECTOR HOME-RUN
		DETAIL NO. DE 746.004-04



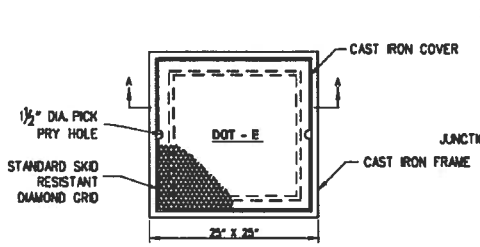


1. NINE CONDUCTOR ASSIGNMENTS.
2. ONE NINE CONDUCTOR WILL BE PULLED TO EACH CORNER OF THE INTERSECTION.
3. BLACK TRACERS CROSS SIDE STREETS. SOLIDS CROSS MAIN STREETS.
4. SOLIO BLUE IS THE BUTTON COMMON.
   ORANGE CROSSES MAIN STREET.
   BLACK CROSSES SIDE STREET.
5. EACH NINE CONDUCTOR WILL HAVE THREE COLOR BANDS. TWO BANDS INDICATINGTHE CORNER OF THE PED WITH ONE GREY BAND IDENTIFYING THE CABLE AS A PED CABLE.

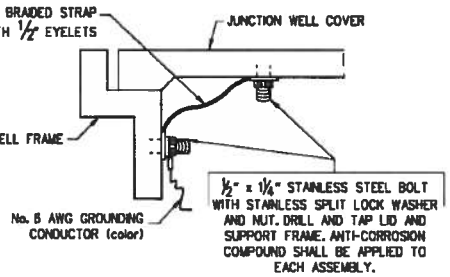
SPECIFICATION 746924	CATEGORY CODE ITEMS DETECTION
APPROVED _____ CHIEF TRAFFIC ENGINEER	

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS
PEDESTRIAN CROSSING IDENTIFICATION COLOR CODE

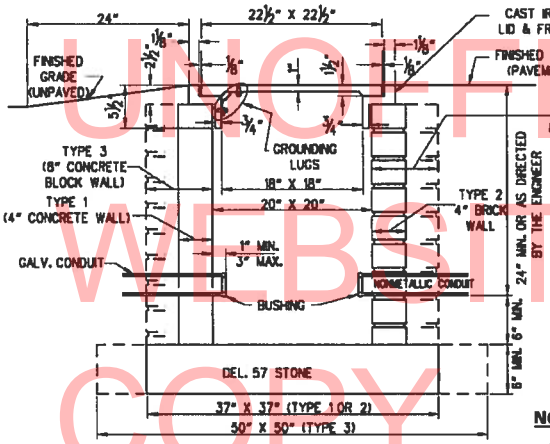
DETAIL NO. DE 746.005-02



PLAN VIEW



DETAIL "A"



SECTION A-A

NOTES:

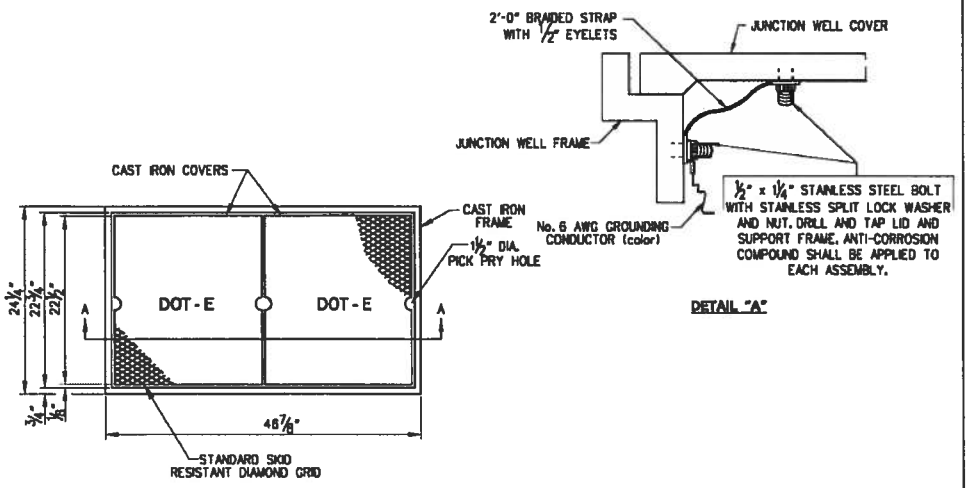
1. TYPE 1 CONDUIT JUNCTION WELL SHALL BE PRECAST CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" DIAMETER COMPLETELY THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.
2. TYPES 2 AND 3 CONDUIT JUNCTION WELLS SHALL BE BRICK AND WILL CONFORM TO STANDARD SPECIFICATIONS FOR BRICK MASONRY. JOINTS SHALL BE CONCAVE TYPE. TYPE 2 WALLS WILL BE A NOMINAL 4" THICK. TYPE 3 WALL WILL BE A NOMINAL 8" THICK.
3. JUNCTION WELLS SHALL NOT BE PLACED UNDER ANY TYPE OF PAVEMENT.
4. ALL CONDUIT JUNCTION WELLS SHALL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM CONDUIT JUNCTION WELL.
5. ALL CRACKS, GAPS, OR OPENINGS IN JUNCTION WELL WALL SHALL BE SEALED WITH CONCRETE.

SPECIFICATION 744520	CATEGORY CODE ITEMS JUNCTION WELLS
APPROVED _____ CHIEF TRAFFIC ENGINEER	

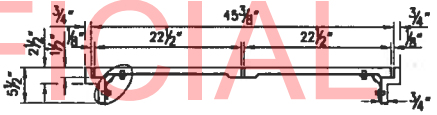
DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS

CONDUIT JUNCTION WELL, TYPE 1, 2, & 3

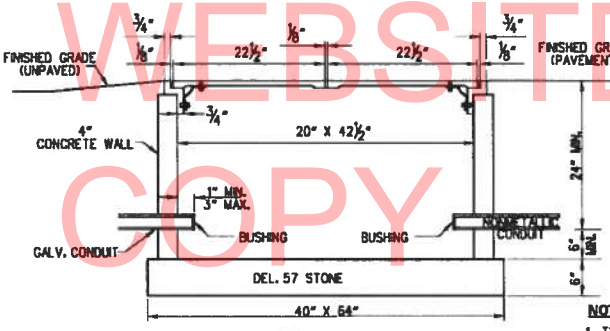
DETAIL NO. DE 744.001-01



PLAN VIEW



SECTION A-A



SECTION A-A

NOTES:

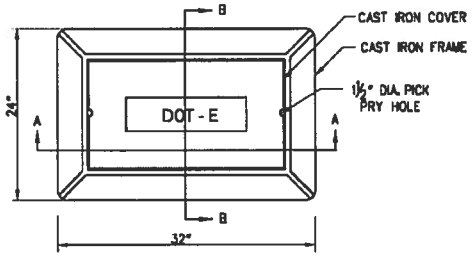
1. TYPE 4 CONDUIT JUNCTION WELL SHALL BE PRECAST CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" DIAMETER COMPLETELY THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.
2. ALL CONDUIT JUNCTION WELLS CONSTRUCTED SHALL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM CONDUIT JUNCTION WELL.
3. ALL CRACKS, GAPS, OR OPENINGS IN JUNCTION WELL WALL SHALL BE SEALED WITH CONCRETE.

SPECIFICATION 744523	CATEGORY CODE ITEMS JUNCTION WELLS
APPROVED _____ CHIEF TRAFFIC ENGINEER	

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS

CONDUIT JUNCTION WELL, TYPE 4

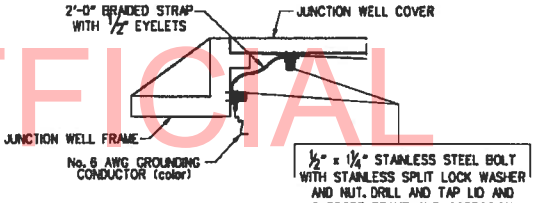
DETAIL NO. DE 744.001-02



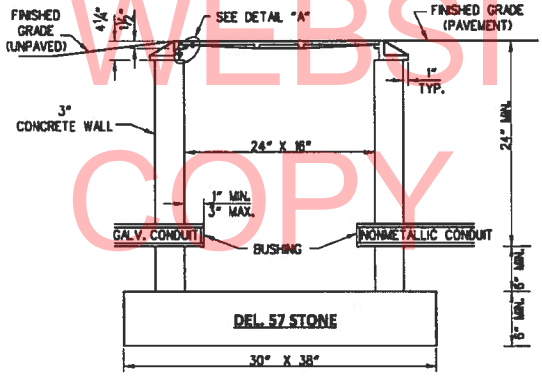
PLAN VIEW

NOTES:

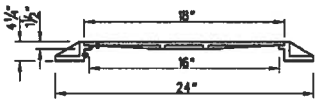
1. TYPE 5 CONDUIT JUNCTION WELL SHALL BE PRECAST CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" DIAMETER COMPLETELY THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.
2. ALL CONDUIT JUNCTION WELLS CONSTRUCTED SHALL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM CONDUIT JUNCTION WELL.
3. ALL CRACKS, GAPS, OR OPENINGS IN JUNCTION WELL WALL SHALL BE SEALED WITH CONCRETE.



DETAIL "A"



SECTION B-B

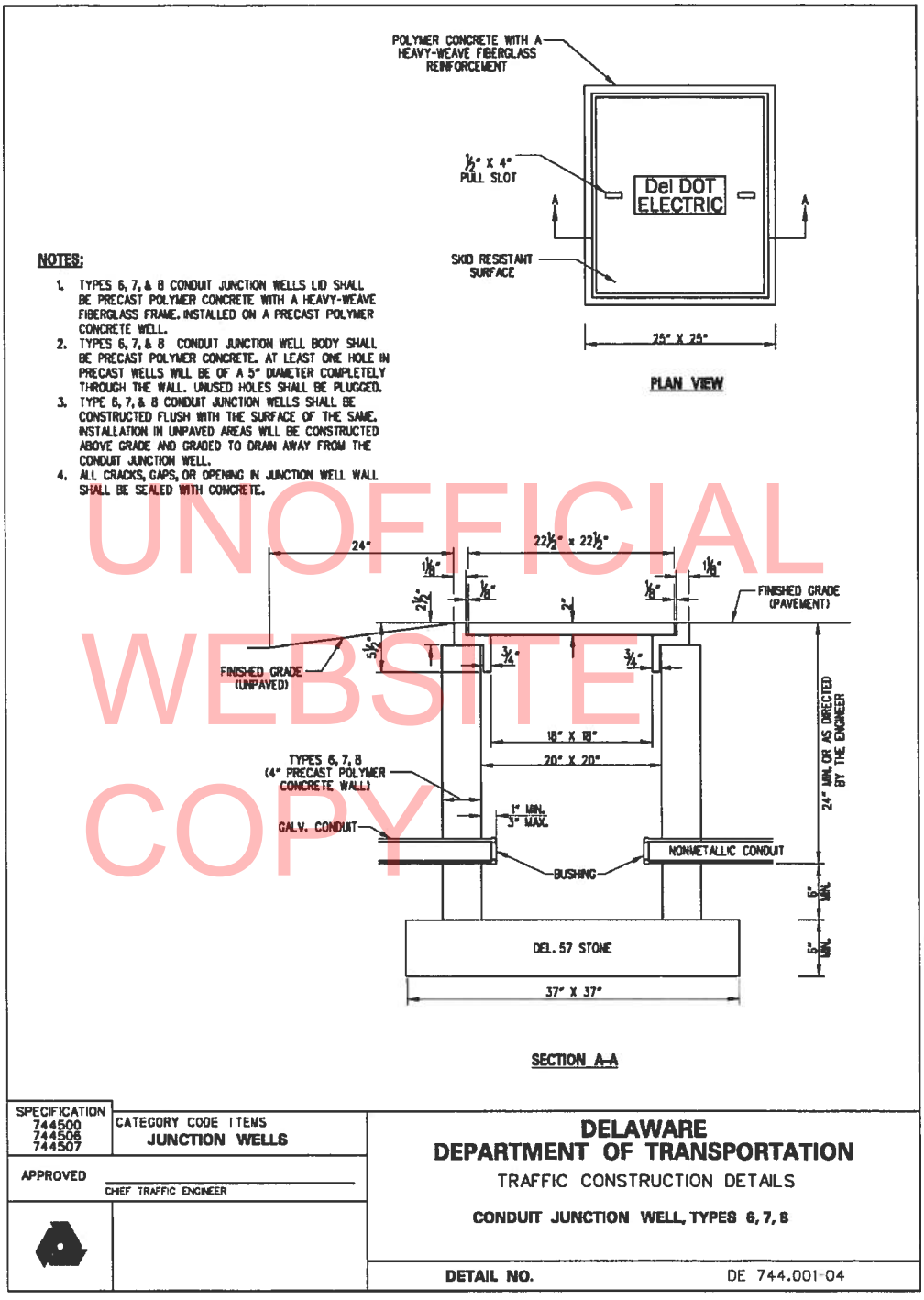


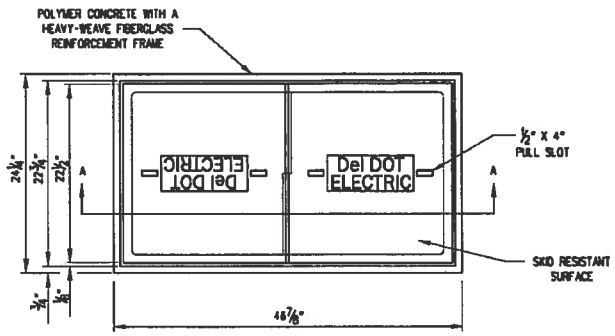
SECTION B-B

SPECIFICATION 744524	CATEGORY CODE ITEMS JUNCTION WELLS
APPROVED _____ CHIEF TRAFFIC ENGINEER	

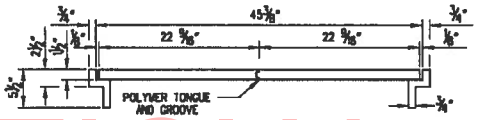
DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS
CONDUIT JUNCTION WELL, TYPE 5

DETAIL NO. DE 744.001-03

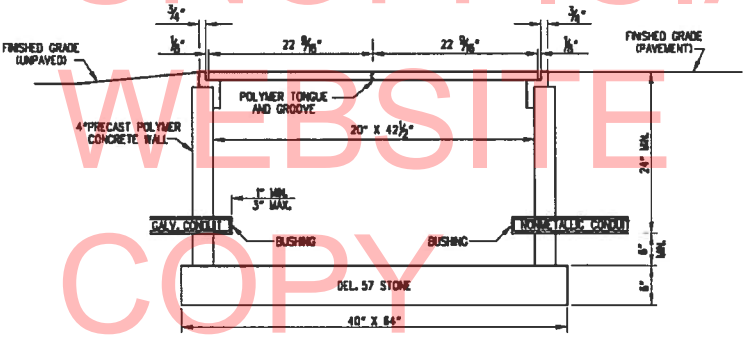




PLAN VIEW



SECTION A-A



SECTION A-A

NOTES:

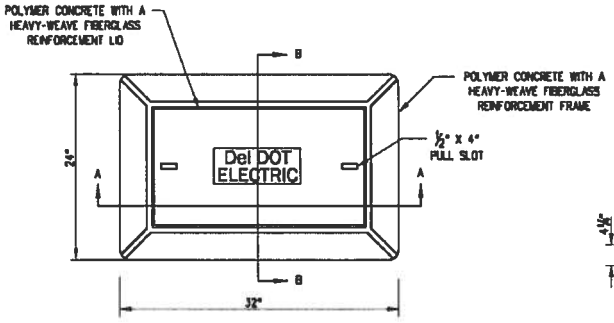
1. TYPE 9 CONDUIT JUNCTION WELL LID SHALL BE PRECAST POLYMER CONCRETE WITH A HEAVY-WEAVE FIBERGLASS FRAME. INSTALLED ON A PRECAST POLYMER CONCRETE WELL.
2. TYPE 9 CONDUIT JUNCTION WELL BODY SHALL BE PRECAST POLYMER CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" DIAMETER COMPLETELY THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.
3. TYPE 9 CONDUIT JUNCTION WELLS SHALL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM THE CONDUIT JUNCTION WELL.
4. ALL CRACKS, GAPS, OR OPENINGS IN JUNCTION WELL WALL SHALL BE SEALED WITH CONCRETE.

SPECIFICATION 744508	CATEGORY CODE ITEMS JUNCTION WELLS
APPROVED _____ CHIEF TRAFFIC ENGINEER	

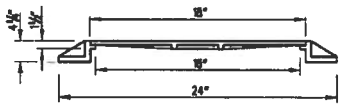
DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS

CONDUIT JUNCTION WELL, TYPE 9

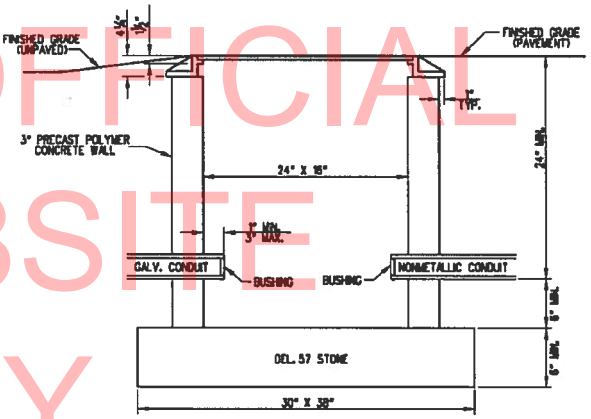
DETAIL NO. DE 744.001-05



PLAN VIEW



SECTION B-B



SECTION A-A

NOTES:

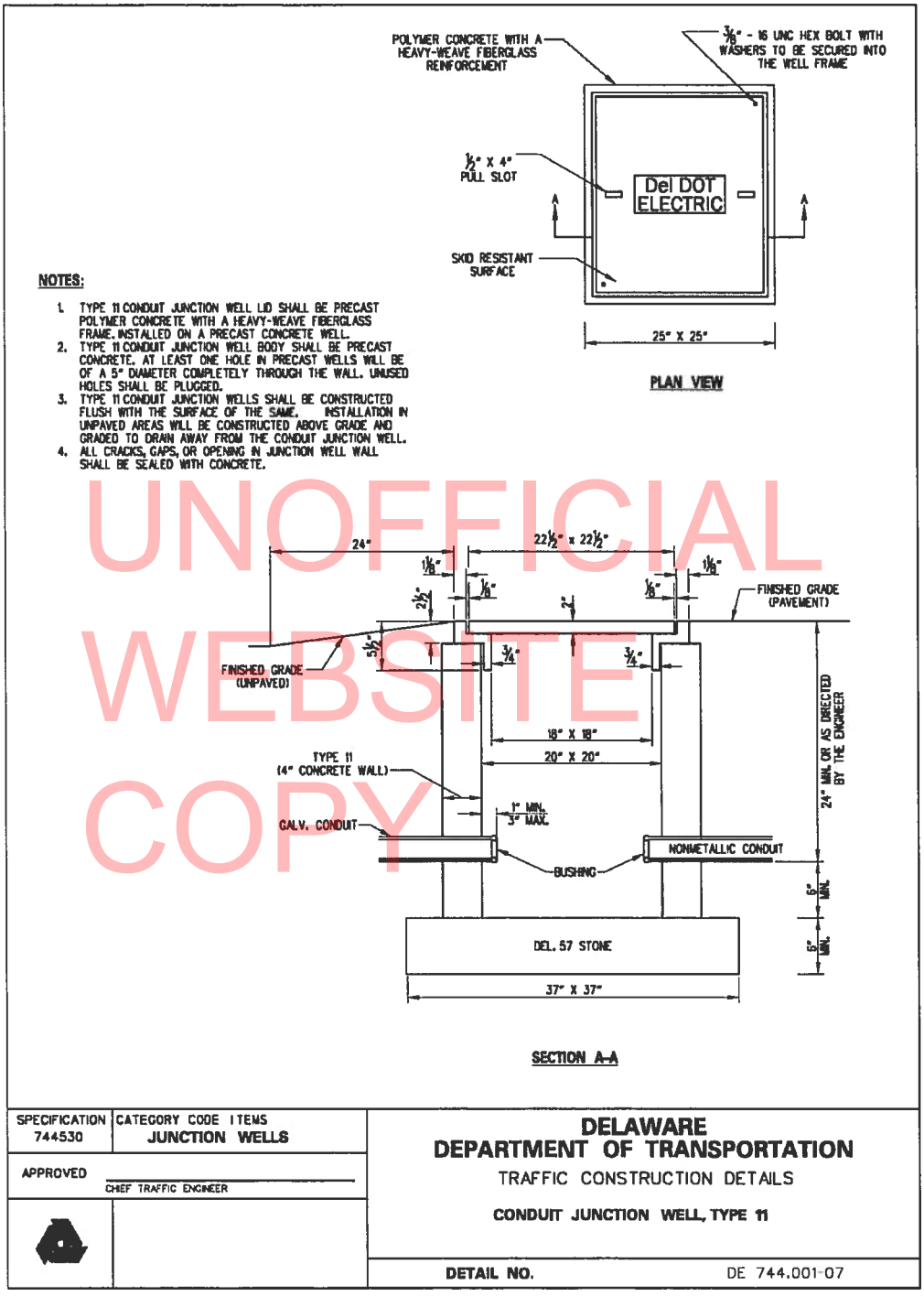
1. TYPE 10 CONDUIT JUNCTION WELL LID SHALL BE PRECAST POLYMER CONCRETE WITH A HEAVY-WEAVE FIBERGLASS FRAME, INSTALLED ON A PRECAST POLYMER CONCRETE WELL.
2. TYPE 10 CONDUIT JUNCTION WELL BODY SHALL BE PRECAST POLYMER CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" DIAMETER COMPLETELY THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.
3. TYPE 10 CONDUIT JUNCTION WELLS SHALL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM THE CONDUIT JUNCTION WELL.
4. ALL CRACKS, GAPS, OR OPENINGS IN JUNCTION WELL WALL SHALL BE SEALED WITH CONCRETE.

SPECIFICATION	CATEGORY CODE ITEMS
744509	JUNCTION WELLS
APPROVED _____ CHIEF TRAFFIC ENGINEER	

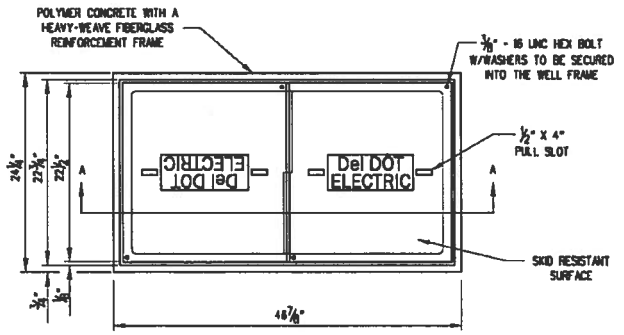
DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS

CONDUIT JUNCTION WELL, TYPE 10

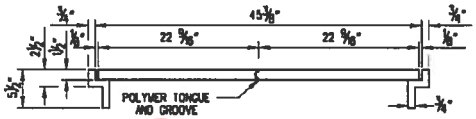
DETAIL NO. DE 744.001-06



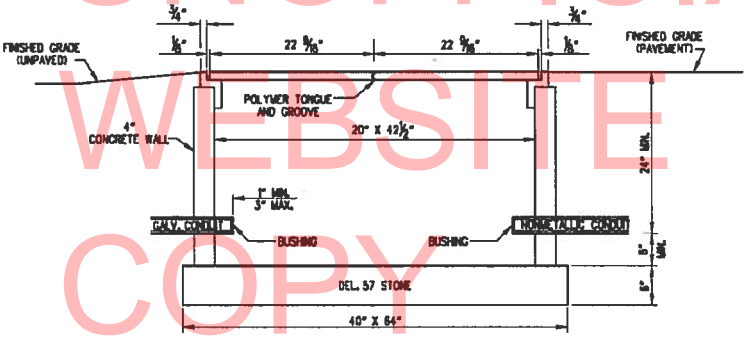
SPECIFICATION 744530	CATEGORY CODE ITEMS JUNCTION WELLS	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		CONDUIT JUNCTION WELL, TYPE 11
		DETAIL NO. DE 744.001-07



PLAN VIEW



SECTION A-A



SECTION A-A

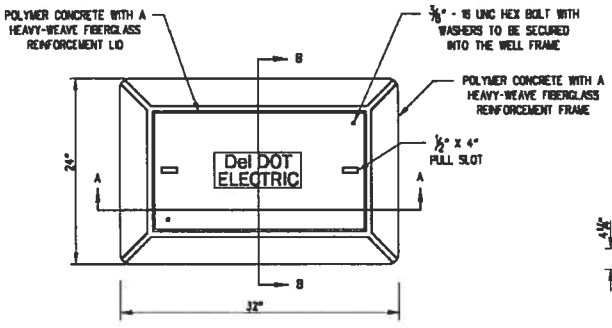
NOTES:
1. TYPE 14 CONDUIT JUNCTION WELL LID SHALL BE PRECAST POLYMER CONCRETE WITH A HEAVY-WEAVE FIBERGLASS FRAME, INSTALLED ON A PRECAST CONCRETE WELL.
2. TYPE 14 CONDUIT JUNCTION WELL BODY SHALL BE PRECAST CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" DIAMETER COMPLETELY THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.
3. TYPE 14 CONDUIT JUNCTION WELLS SHALL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM THE CONDUIT JUNCTION WELL.
4. ALL CRACKS, GAPS, OR OPENINGS IN JUNCTION WELL WALL SHALL BE SEALED WITH CONCRETE.

SPECIFICATION 744531	CATEGORY CODE ITEMS JUNCTION WELLS
APPROVED _____ CHIEF TRAFFIC ENGINEER	

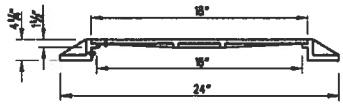
DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS

CONDUIT JUNCTION WELL, TYPE 14

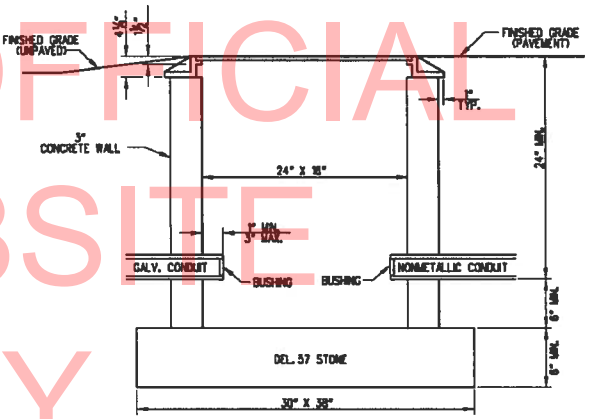
DETAIL NO. DE 744.001-08



PLAN VIEW



SECTION B-B



SECTION A-A

NOTES:

1. TYPE 15 CONDUIT JUNCTION WELL L10 SHALL BE PRECAST POLYMER CONCRETE WITH A HEAVY-WEAVE FIBERGLASS FRAME, INSTALLED ON A PRECAST CONCRETE WELL.
2. TYPE 15 CONDUIT JUNCTION WELL BODY SHALL BE PRECAST CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" DIAMETER COMPLETELY THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.
3. TYPE 15 CONDUIT JUNCTION WELLS SHALL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM THE CONDUIT JUNCTION WELL.
4. ALL CRACKS, GAPS, OR OPENINGS IN JUNCTION WELL WALL SHALL BE SEALED WITH CONCRETE.

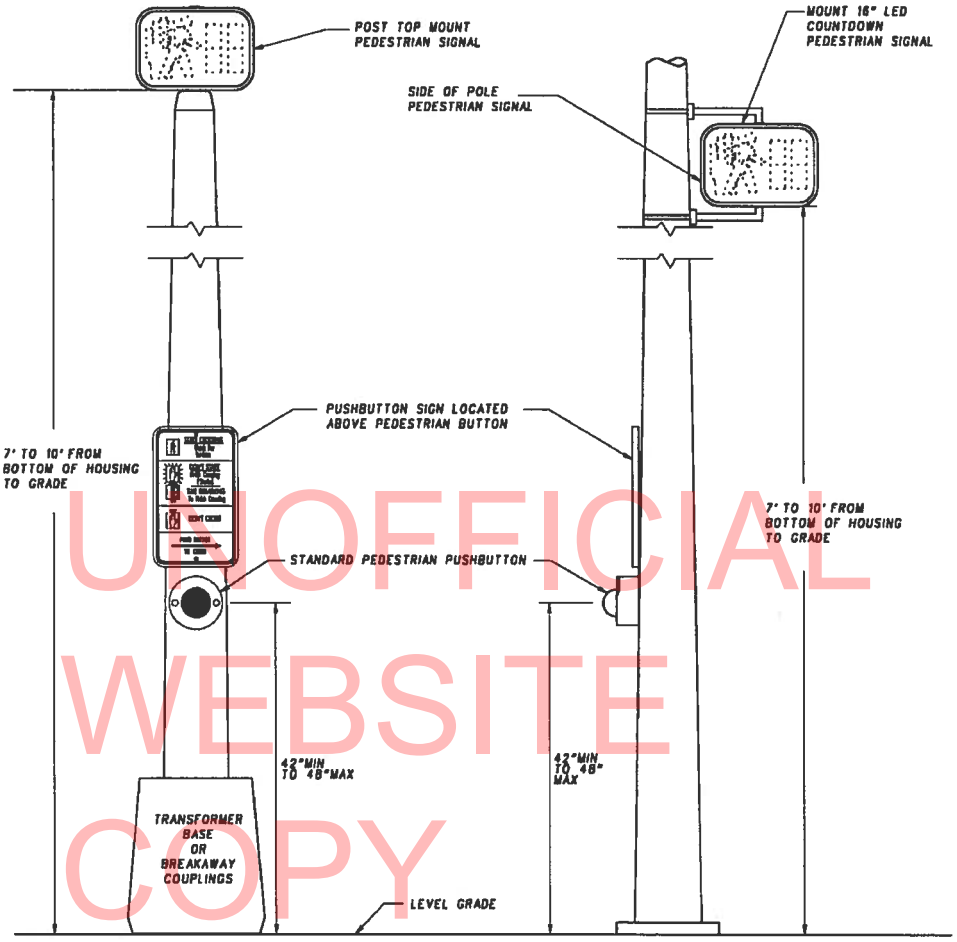
SPECIFICATION	CATEGORY CODE ITEMS
744532	JUNCTION WELLS

APPROVED _____
CHIEF TRAFFIC ENGINEER

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS

CONDUIT JUNCTION WELL, TYPE 15

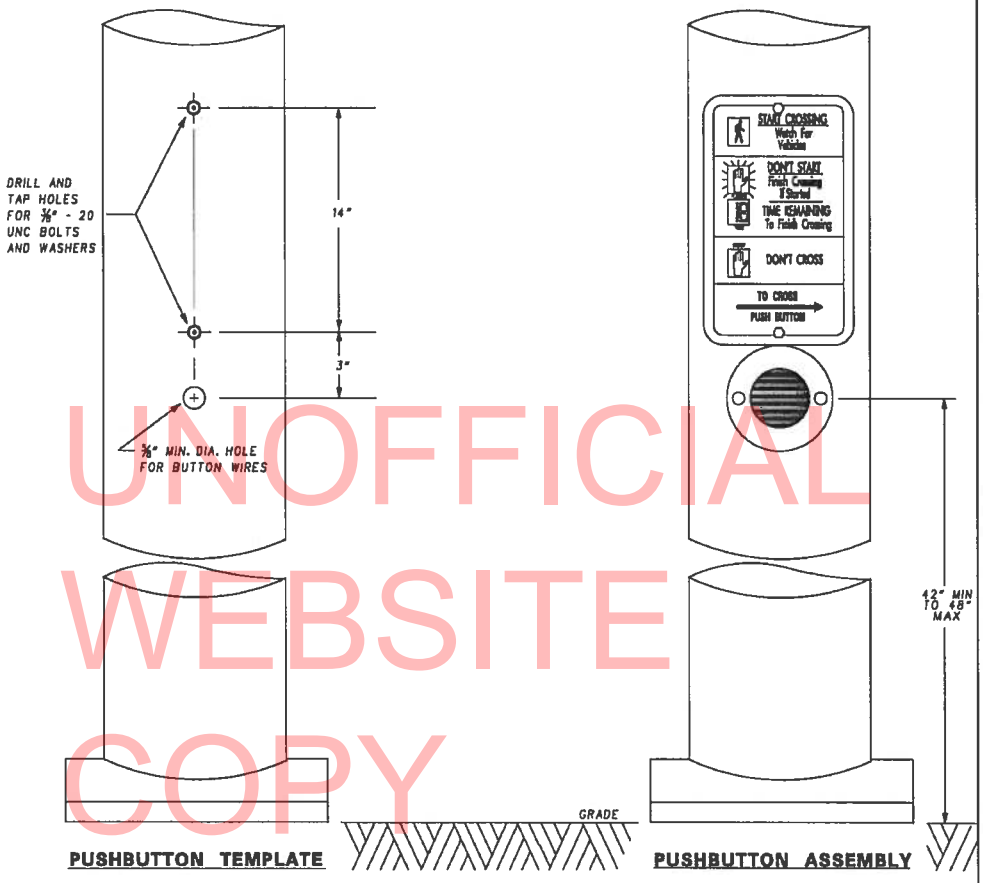
DETAIL NO. DE 744.001-09



NOTES:

1. WHEN CUTTING IS REQUIRED, CONTRACTOR SHALL CONFIRM PROPER HEIGHT OF PEDESTAL IS MAINTAINED PRIOR TO CUTTING POLE.
2. REFER TO POLE MOUNTING FOR PEDESTRIAN SIGNAL HEADS STANDARD PLATES FOR DETAILS.

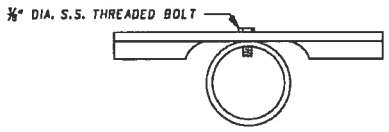
SPECIFICATION 746935 746947	CATEGORY CODE ITEMS MISC. DETAILS	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		STANDARD PEDESTRIAN SIGNAL PUSHBUTTON LOCATION ON POLE
		DETAIL NO. DE 746.010-01



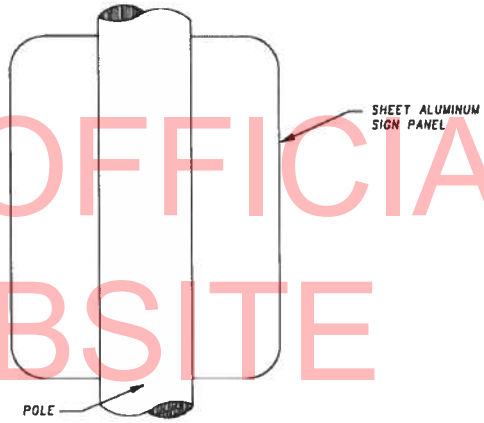
NOTES:

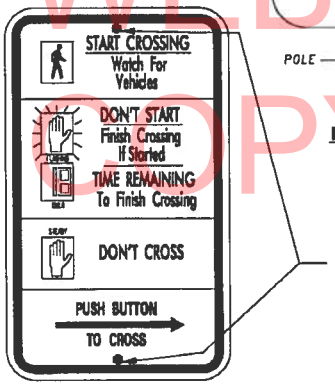
1. PUSHBUTTON ASSEMBLY SHALL BE SECURED TO WOOD POLES WITH 2½" LAG BOLTS.

SPECIFICATION 746937 746949	CATEGORY CODE ITEMS MISC. DETAILS	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		PEDESTRIAN PUSHBUTTON ASSEMBLY
		DETAIL NO. DE 746.010-02



SIGN ATTACHMENT DETAIL
VERTICAL POLE INSTALLATION ONLY
FOR PUSHBUTTON SIGN
(PLAN VIEW)



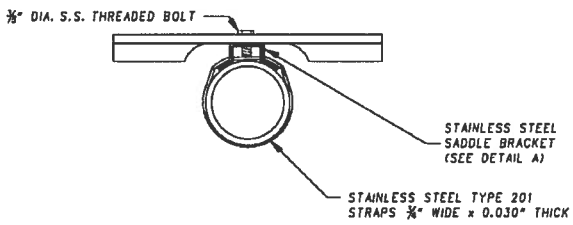


BACK OF SIGN

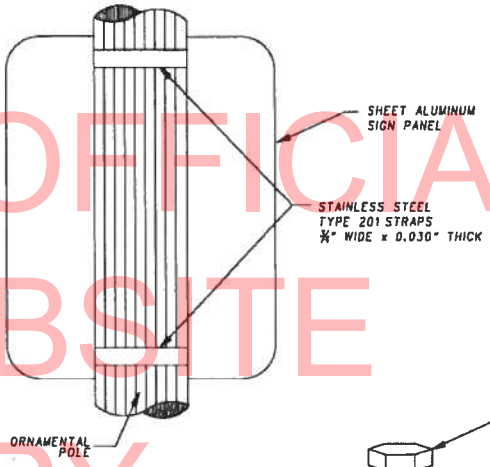
⅜" DIA. BOLTS (DRILL AND TAP) SHALL NOT COVER SIGN TEXT.

FRONT OF SIGN

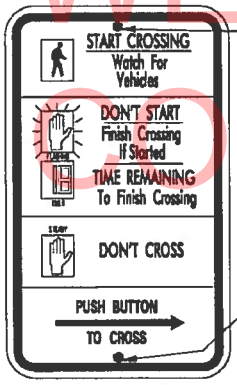
SPECIFICATION 746937	CATEGORY CODE ITEMS MISC. DETAILS	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		PUSHBUTTON SIGN DETAIL
		DETAIL NO. DE 746.010-03



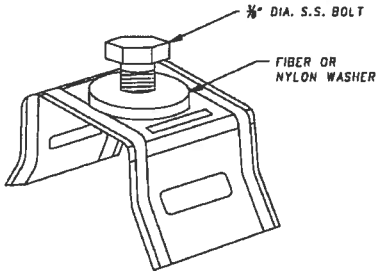
SIGN ATTACHMENT DETAIL
VERTICAL POLE INSTALLATION ONLY
FOR PUSHBUTTON SIGN
(PLAN VIEW)



BACK OF SIGN



FRONT OF SIGN

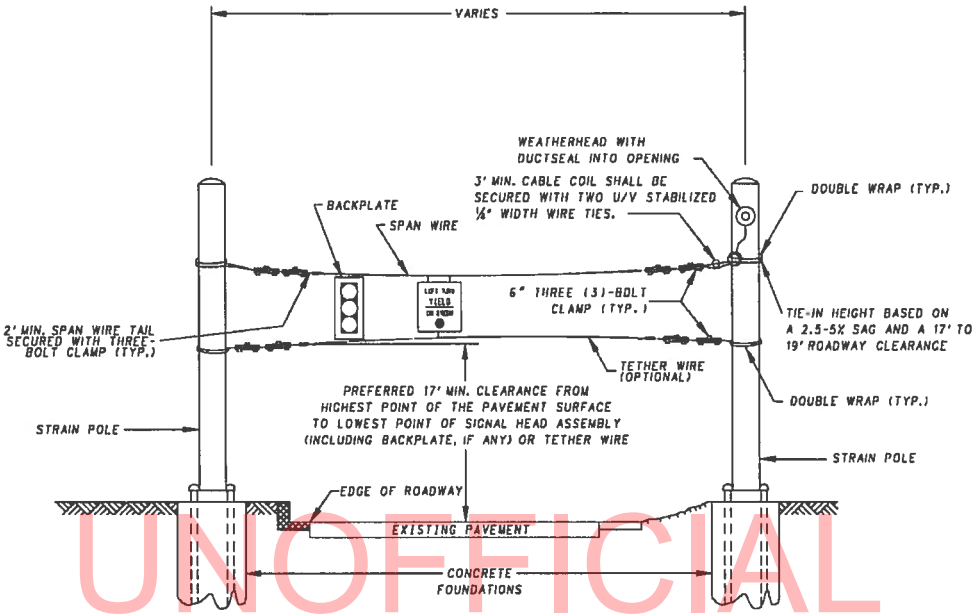


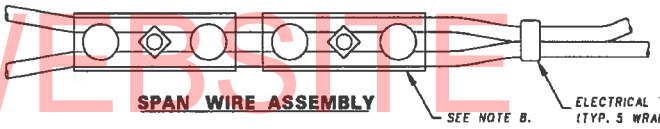
DETAIL A
STAINLESS STEEL SADDLE BRACKET

SPECIFICATION 746937	CATEGORY CODE ITEMS MISC. DETAILS
APPROVED _____ CHIEF TRAFFIC ENGINEER	

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS
PUSHBUTTON SIGN BANDING DETAIL FOR ORNAMENTAL POLE

DETAIL NO. DE 746.010 04

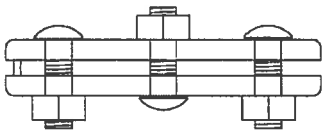




SPAN WIRE ASSEMBLY

NOTES:

1. ALL WIRES SHALL BE LASHED WITH FIVE (5) WRAP (12" O.C.) ELECTRICAL TAPE ACROSS SPAN WIRE.
2. POLES SHALL BE RAKED AS SPECIFIED BY THE PROJECT ENGINEER.
3. POLE PLACEMENT SHOULD BE OUTSIDE OF THE CLEAR ZONE BASED ON THE GUIDELINES OF THE MOST RECENT AASHTO ROADSIDE DESIGN GUIDE.
4. SPAN WIRE SHALL BE PLACED UNDER ALL RISERS.
5. SPAN WIRE SHALL BE 7/16" SEVEN (7)-WIRE GAL. STEEL STRAND. (STRENGTH SHALL BE SIEMENS-MARTIN 6,950 LBS.)
6. TETHER WIRE SHALL BE 1/4" SEVEN (7)-WIRE GAL. STEEL STRAND. (STRENGTH SHALL BE SIEMENS-MARTIN 3,150 LBS.)
7. TWO (2) THREE-BOLT CLAMPS SHALL BE USED FOR EACH END OF THE SPANS.



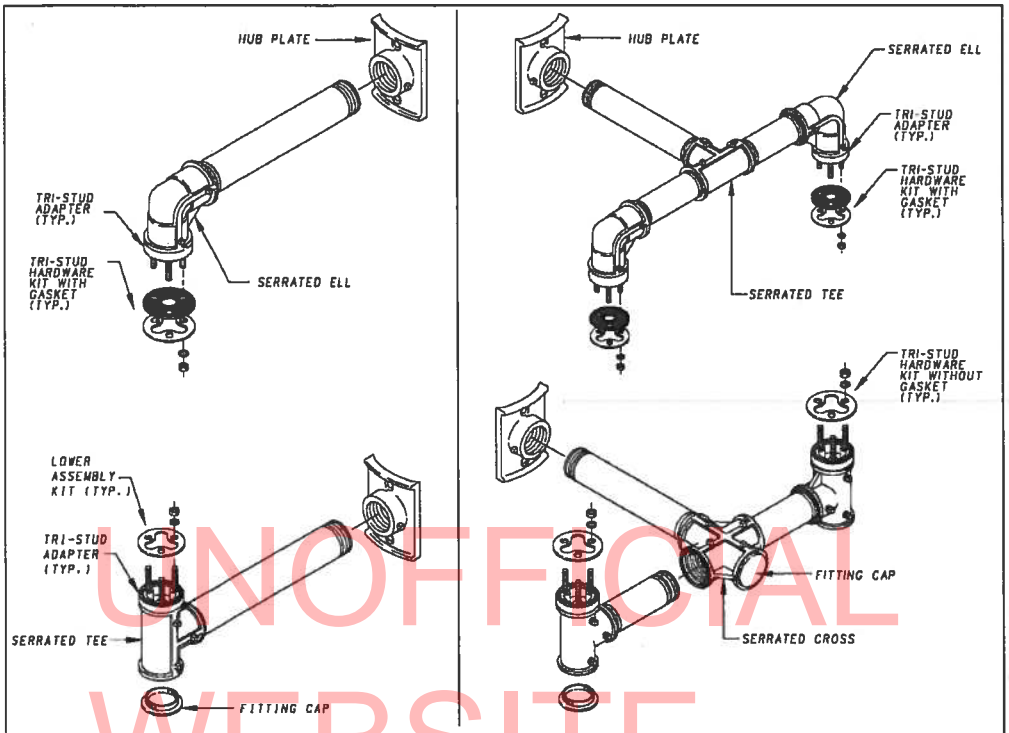
3-BOLT CLAMP

SPECIFICATION	CATEGORY CODE ITEMS
746504 746506	OVERHEAD
APPROVED _____ CHIEF TRAFFIC ENGINEER	

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS

PLACEMENT OF STRAIN POLE AND INCIDENTAL HARDWARE

DETAIL NO. DE 746.011-01

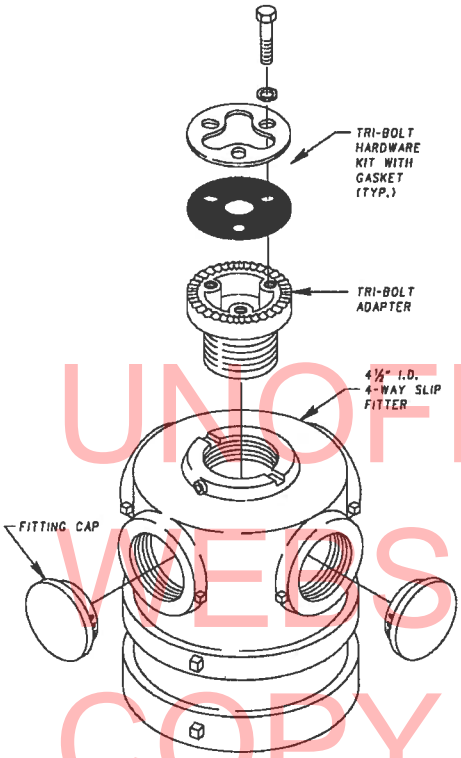


ONE-WAY SIDE POLE MOUNTING **TWO-WAY SIDE POLE MOUNTING**

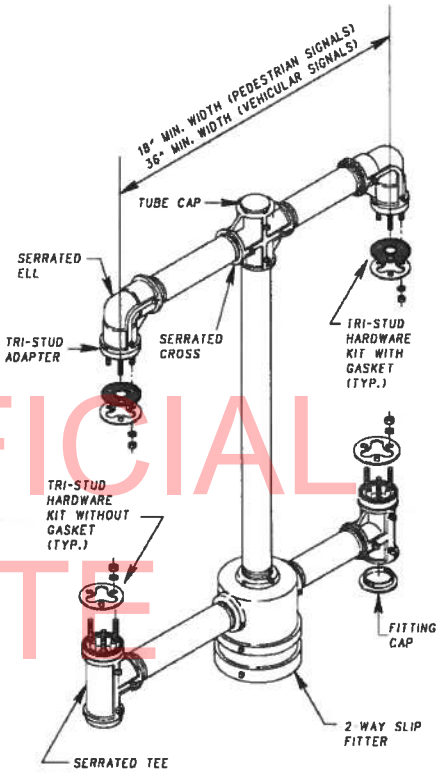
NOTES:

1. THE TOP HUB PLATE SHALL BE ROTATED UPWARD WHEN THE SIGNAL HEAD IS MOUNTED ON A WOOD POLE.
2. A 1" DIA. HOLE SHALL BE DRILLED IN THE METAL POLE FOR WIRING AT BOTTOM PLATE.
3. THE UPPER ARM SHALL CONSIST OF A SERRATED ELL, 12" NIPPLE, GASKET AND TRI-STUD ADAPTER.
   - THE SERRATED ELL SHALL HAVE A SERRATED 72 TOOTH BOSS ON ONE END WITH TRI-STUD MOUNTING. THE OUTSIDE DIAMETER OF THE SERRATION SHALL NOT EXCEED 2 3/8". THE NON-SERRATED END OF THE ELL SHALL BE NOTCHED TO ACCEPT A SEPARATE SERRATED LOCKRING. THE ELL SHALL BE THREADED 1 1/2" NPS ON BOTH ENDS. THE ELL SHALL HAVE A MINIMUM 3/8" WIDTH BOSS THAT EXTENDS THE ENTIRE LENGTH OF BOTH SIDES, ON ONE SIDE OF THE BOSS AT EACH END OF THE ELL SHALL BE A 1/4" - 20 THREADED OPENING FOR A SETSCREW.
   - A 1 1/2" X 12" EXTRUDED NIPPLE SHALL HAVE 1 1/2" NPS THREADS ON BOTH ENDS. THE NIPPLE SHALL HAVE A "BRUSHED" FINISH.
4. THE LOWER ARM SHALL CONSIST OF A SERRATED TEE, 12" NIPPLE AND TRI-STUD ADAPTER.
   - THE SERRATED TEE SHALL BE FABRICATED LIKE THE ELL EXCEPT THE TEE IS TO HAVE SERRATIONS ON TWO (2) THREADED OPENINGS 90° APART. THE NON-SERRATED END SHALL COME STANDARD WITH A PLASTIC KNOCKOUT PIN.
   - THE 1 1/4" X 12" NIPPLE SHALL BE THE SAME AS ABOVE.
5. FOR WOOD POLE MOUNTING:
   - ATTACHMENT STRAPS FOR WOOD POLE SHALL BE 3/4" WIDTH, TYPE 201, STAINLESS STEEL.
   - ATTACHMENT BOLTS FOR WOOD POLE SHALL BE STAINLESS STEEL 3/8" DIA. x 2 1/2" LENGTH.

SPECIFICATION 746929 746932 746935	CATEGORY CODE ITEMS SIGNAL HEADS	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		SIDE POLE MOUNTING FOR VEHICULAR AND PEDESTRIAN SIGNAL HEADS
		DETAIL NO. DE 746.006-01



TOP POLE MOUNTING FOR ONE, TWO, THREE & FOUR-WAY SIGNAL



TOP POLE MOUNTING FOR TWO-WAY SIGNAL

NOTES:

1. ALL CAST MOUNTING HARDWARE SHALL BE ALODINE FINISHED ALUMINUM.
2. ALL BOLTS SHALL BE STAINLESS STEEL.

SPECIFICATION 746929 746932 746935	CATEGORY CODE ITEMS SIGNAL HEADS	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		TOP POLE MOUNTING FOR VEHICULAR AND PEDESTRIAN SIGNAL HEAD
		DETAIL NO. DE 746.006-02

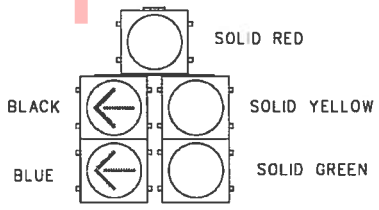
WIRING COLOR CODE FOR #14/16 SIGNAL CABLE FOR SIGNAL HEADS

MAIN STREET SIGNALS	WIRE COLORS	SIGNAL INDICATION
	SOLID RED	RED
	SOLID ORANGE	YELLOW
	SOLID GREEN	GREEN
	SOLID WHITE	GROUND

SIDE STREET SIGNALS	WIRE COLORS	SIGNAL INDICATION
	BLACK TRACER/RED	RED
	BLACK TRACER/ORANGE	YELLOW
	BLACK TRACER/GREEN	GREEN
	BLACK TRACER/WHITE	GROUND

NON-PERMISSIVE LEFT TURN SIGNALS	MAIN STREET WIRE COLORS	SIDE STREET WIRE COLORS	SIGNAL INDICATION
	WHITE TRACER/RED	BLACK/RED TRACER	RED
	WHITE TRACER/ORANGE	SOLID BLACK	YELLOW
	WHITE TRACER/GREEN	SOLID BLUE	GREEN
	WHITE TRACER/BLUE	BLUE/BLACK TRACER	GROUND

5 SECTION SIGNAL ARROWS	MAIN STREET WIRE COLORS	SIDE STREET WIRE COLORS	SIGNAL INDICATION
	SOLID BLUE	BLACK/RED TRACER	YELLOW ARROW
	SOLID BLACK	BLUE/BLACK TRACER	GREEN ARROW

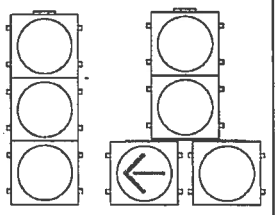


SPECIFICATION 746922	CATEGORY CODE ITEMS SIGNAL HEADS	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		SIGNAL WIRE CABLE IDENTIFICATION COLOR CODE
		DETAIL NO. DE 746.007-01

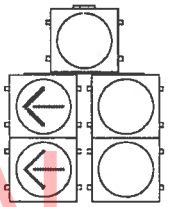
WIRING COLOR CODE FOR #14/9 TCC

MAST ARM:

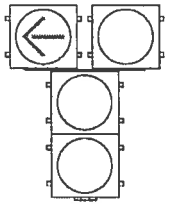
MAIN STREET	WIRE COLORS	SIGNAL INDICATION
	SOLID RED	RED
	SOLID YELLOW	YELLOW
	SOLID GREEN	GREEN
	SOLID WHITE	GROUND



MAIN STREET PERMISSIVE LEFT	WIRE COLORS	SIGNAL INDICATION
	SOLID BLACK	YELLOW
	SOLID BLUE	GREEN
	SOLID WHITE	NEUTRAL



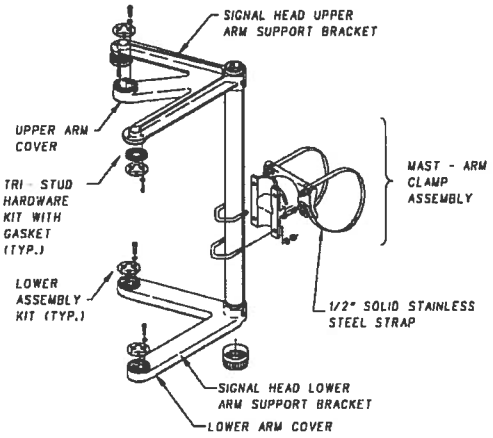
MAIN STREET FLASHING TOP "T"	WIRE COLORS	SIGNAL INDICATION
	BLACK/RED TRACER	RED
	SOLID WHITE	NEUTRAL



NOTES

1. HEAD CABLE SHALL BE MARKED WITH THE COLOR DESIGNATED FOR EACH DIRECTION OF TRAVEL. RED/NORTH, YELLOW/SOUTH, GREEN/EAST, BLUE/WEST.
2. SIDE STREET SIGNAL HEADS SHALL BE SPLICED INTO THE BLACK TRACER WIRES INSTEAD OF SOLID COLOR WIRES.
3. ALL SIGNAL HEADS INSTALLED ON MAST ARMS SHALL HAVE OWN SIGNAL CABLE AND SHALL BE SPLICED AT THE BASE.

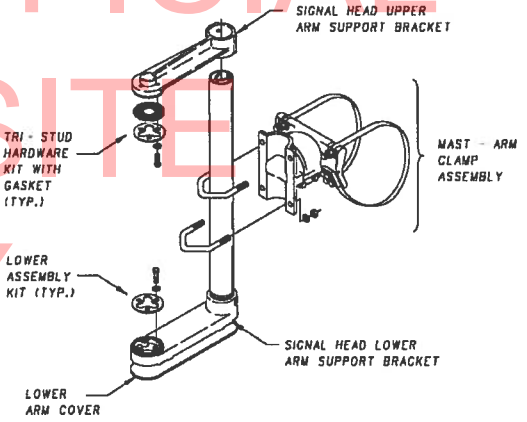
SPECIFICATION 746921	CATEGORY CODE ITEMS SIGNAL HEADS	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		SIGNAL WIRE CABLE IDENTIFICATION COLOR CODE
		DETAIL NO. DE 746.007-02



ONE-WAY, FIVE – SECTION
12" SIGNAL HEADS

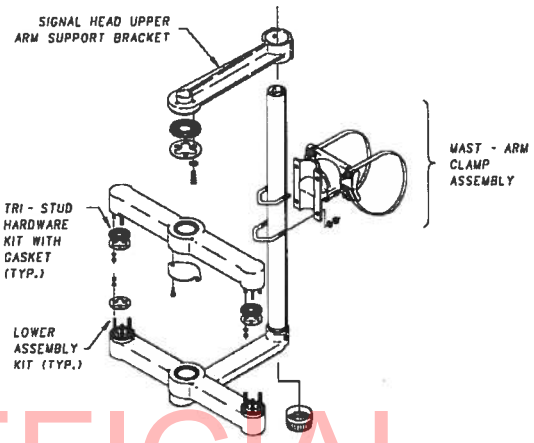
NOTES:

1. ALL CAST MOUNTING HARDWARE SHALL BE ALUMINUM WITH ALODINE FINISH.
2. ALL BOLTS SHALL BE STAINLESS STEEL.
3. BRACKET SHALL ADJUST IN FOUR DIRECTIONS.
4. UPPER AND LOWER ARMS SHALL BE CAST FROM 319 ALUMINUM ALLOY.
5. VERTICAL SUPPORT TUBE SHALL BE DOUBLE GUSSETED "C" SHAPED AND EXTRUDED FROM 6063 - T6 ALUMINUM ALLOY.
6. MAST ARM CLAMP ASSEMBLY SHALL BE CAST FROM 356 - T6 ALUMINUM ALLOY.
7. STRANDED BANDS SHALL BE A MINIMUM 1/2" STAINLESS STEEL,FABRICATED IN ONE PIECE.
8. CUT VERTICAL SUPPORT TUBE TO PROJECT 1" ABOVE SIGNAL HEAD TOP SUPPORT BRACKET.
9. WHEN ASSEMBLED, THE RECEIVING AND INDENTED PORTION OF THE CLAMP ASSEMBLY SHALL CONSIST OF TWO MIRRORED HALVES. THE CLAMP ASSEMBLY SHALL BE INVERSELY TIGHTENED AROUND THE MAST ARM OR POLE.
10. THE PROTRUDING PORTION OF THE CLAMP ASSEMBLY, WHICH FITS IN THE RECEIVING AND INDENTED PORTION, SHALL HAVE AN INTEGRALLY CAST FLANGE TO PREVENT SEPARATION FROM THE RECEIVING AND INDENTED SECTION.



ONE-WAY, THREE OR FOUR – SECTION
8" OR 12" SIGNAL HEADS

SPECIFICATION 746929 746932	CATEGORY CODE ITEMS SIGNAL HEADS	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		SIGNAL HEAD MOUNTING DETAILS RIGID MOUNT
		DETAIL NO. DE 746.008-01

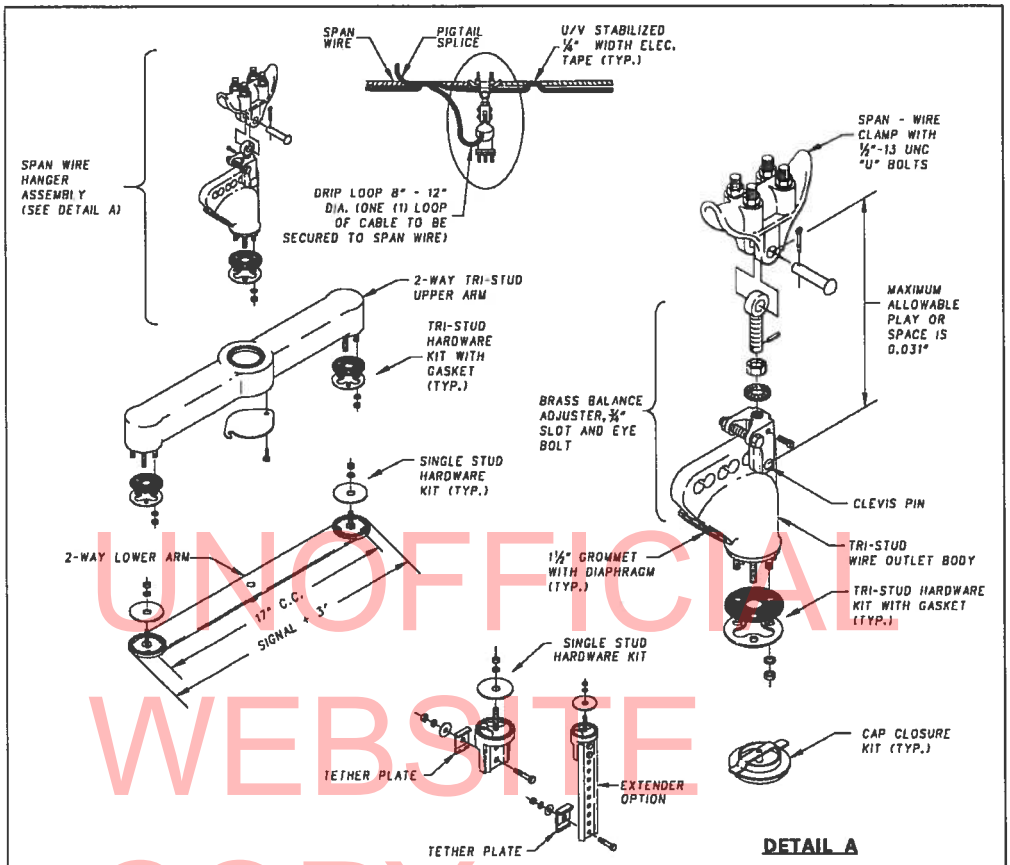


ONE-WAY, FOUR OR FIVE - SECTION 8" OR 12" SIGNAL HEADS

NOTES:

1. ALL CAST MOUNTING HARDWARE SHALL BE ALUMINUM WITH ALODINE FINISH.
2. ALL BOLTS SHALL BE STAINLESS STEEL.
3. BRACKET SHALL ADJUST IN FOUR DIRECTIONS.
4. UPPER AND LOWER ARMS SHALL BE CAST FROM 319 ALUMINUM ALLOY.
5. VERTICAL SUPPORT TUBE SHALL BE DOUBLE GUSSETED "C" SHAPED AND EXTRUDED FROM 6063 - T6 ALUMINUM ALLOY.
6. MAST ARM CLAMP ASSEMBLY SHALL BE CAST FROM 356 - T6 ALUMINUM ALLOY.
7. STRANDED BANDS SHALL BE A MINIMUM 1/2" STAINLESS STEEL,FABRICATED IN ONE PIECE.
8. CUT VERTICAL SUPPORT TUBE TO PROJECT 1" ABOVE SIGNAL HEAD TOP SUPPORT BRACKET.
9. WHEN ASSEMBLED, THE RECEIVING AND INDENTED PORTION OF THE CLAMP ASSEMBLY SHALL CONSIST OF TWO MIRRORED HALVES. THE CLAMP ASSEMBLY SHALL BE INVERSELY TIGHTENED AROUND THE MAST ARM OR POLE.
10. THE PROTRUDING PORTION OF THE CLAMP ASSEMBLY, WHICH FITS IN THE RECEIVING AND INDENTED PORTION, SHALL HAVE AN INTEGRALLY CAST FLANGE TO PREVENT SEPARATION FROM THE RECEIVING AND INDENTED SECTION.

SPECIFICATION 746929 746932	CATEGORY CODE ITEMS SIGNAL HEADS	DELAWARE DEPARTMENT OF TRANSPORTATION
APPROVED _____ CHIEF TRAFFIC ENGINEER		TRAFFIC CONSTRUCTION DETAILS
		SIGNAL HEAD MOUNTING DETAILS RIGID MOUNT
		DETAIL NO. DE 746.008-02



INVERTED "T" SIGNAL HEAD SPAN WIRE ASSEMBLY

NOTES:

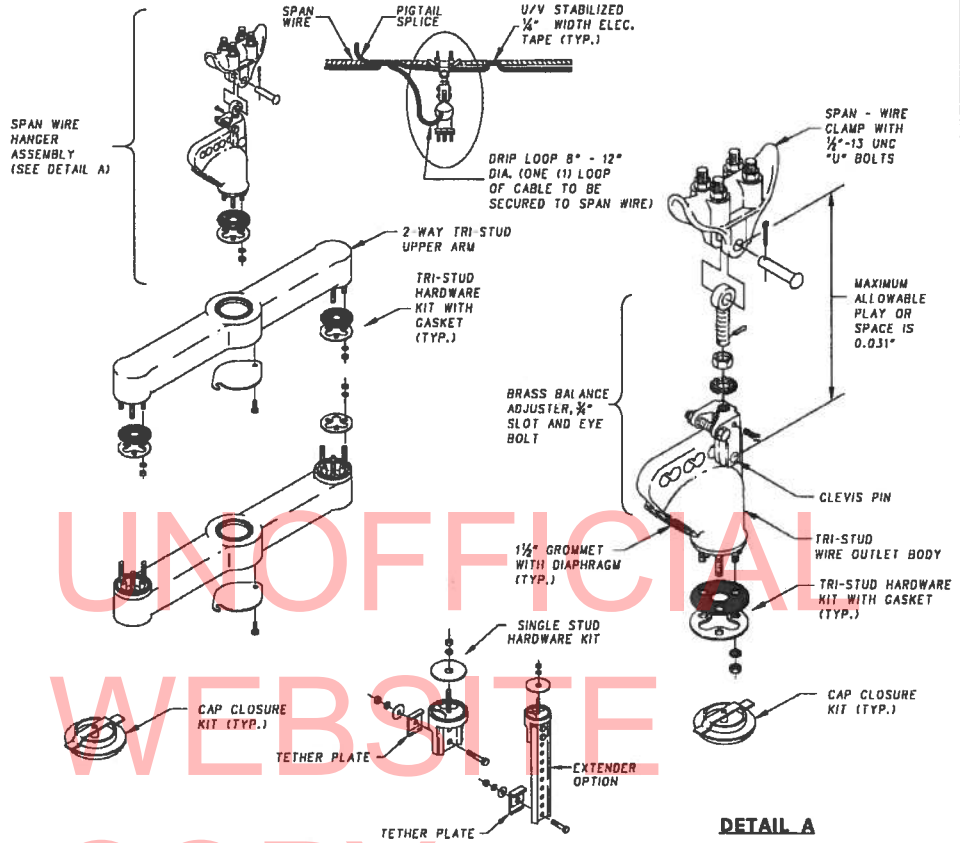
1. UPPER AND LOWER - ARM SHALL HAVE 17" CENTER-TO-CENTER SIGNAL MOUNTING DIMENSION.
2. UPPER - ARM SHALL HAVE A MINIMUM 1½" OPENING THROUGHOUT FOR EASE OF WIRING AND INSTALLATION.
3. UPPER - ARM ATTACHMENT END SHALL BE SERRATED AND HAVE THREE (3) SIGNAL CENTERING BOSSES EXTENDING ⅛" FROM SERRATIONS.
4. UPPER ARM SHALL HAVE SERRATIONS AT SIGNAL ATTACHMENT END, AND TOP CENTER OPENING SHALL HAVE 72 TOOTH DESIGN (TO MATCH SIGNAL HEAD).
5. UPPER - ARM SHALL HAVE THREE (3) STAINLESS STEEL STUDS WHICH SHALL BE CAST INTO EACH SIGNAL ATTACHMENT END. THE STUDS SHALL BE ⅜" - 16 AND EXTEND 1½" BEYOND THE SERRATION (± ⅛").
6. UPPER - ARM SHALL HAVE 3½" CENTER OPENING TO ALLOW FOR WIRE ACCESS.
7. UPPER - ARM CENTER OPENING SHALL HAVE AN INSPECTION COVER THAT IS CAPABLE OF BEING OPENED WITHOUT THE REMOVAL OF ANY SCREWS. THE COVER SHALL ROTATE ABOUT THE AXIS OF ONE END AND BE SECURED AT THE OTHER END.
8. LOWER - ARM SHALL HAVE HALF CIRCLE SERRATIONS ON BOTTOM FOR TETHER HARDWARE.
9. ORIENT WIRE OUTLET BODY IN SAME DIRECTION AS SIGNAL FACES.

SPECIFICATION	CATEGORY CODE ITEMS
746930 746933	SIGNAL HEADS

APPROVED _____
CHIEF TRAFFIC ENGINEER

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS
SPAN WIRE MOUNTING FOR 3 OR 5 SECTION VEHICULAR SIGNAL HEADS

DETAIL NO. DE 746.008-03



"T" SIGNAL HEAD SPAN WIRE ASSEMBLY

NOTES:

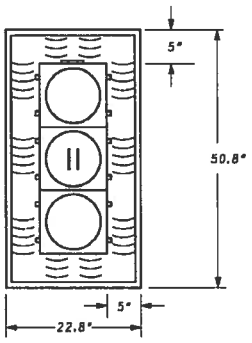
1. UPPER AND LOWER - ARM SHALL HAVE 17" CENTER-TO-CENTER SIGNAL MOUNTING DIMENSION.
2. UPPER - ARM SHALL HAVE A MINIMUM 1½" OPENING THROUGHOUT FOR EASE OF WIRING AND INSTALLATION.
3. UPPER - ARM ATTACHMENT END SHALL BE SERRATED AND HAVE THREE (3) SIGNAL CENTERING BOSSES EXTENDING ⅜" FROM SERRATIONS.
4. UPPER ARM SHALL HAVE SERRATIONS AT SIGNAL ATTACHMENT END, AND TOP CENTER OPENING SHALL HAVE 72 TOOTH DESIGN (TO MATCH SIGNAL HEAD).
5. UPPER - ARM SHALL HAVE THREE (3) STAINLESS STEEL STUDS WHICH SHALL BE CAST INTO EACH SIGNAL ATTACHMENT END. THE STUDS SHALL BE ⅜" - 16 AND EXTEND 1½" BEYOND THE SERRATION (+ ⅛").
6. UPPER - ARM SHALL HAVE 3½" CENTER OPENING TO ALLOW FOR WIRE ACCESS.
7. UPPER - ARM CENTER OPENING SHALL HAVE AN INSPECTION COVER THAT IS CAPABLE OF BEING OPENED WITHOUT THE REMOVAL OF ANY SCREWS. THE COVER SHALL ROTATE ABOUT THE AXIS OF ONE END AND BE SECURED AT THE OTHER END.
8. LOWER - ARM SHALL HAVE HALF CIRCLE SERRATIONS ON BOTTOM FOR TETHER HARDWARE.
9. ORIENT WIRE OUTLET BODY IN SAME DIRECTION AS SIGNAL FACES.

SPECIFICATION	CATEGORY CODE ITEMS
746930 746933	SIGNAL HEADS

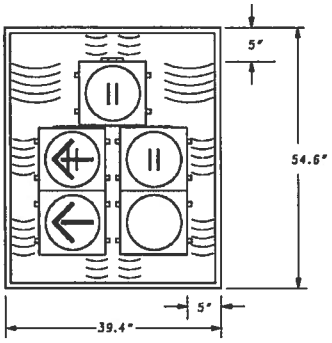
APPROVED _____
CHIEF TRAFFIC ENGINEER

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS
SPAN WIRE MOUNTING FOR 4 SECTION "T" VEHICULAR SIGNAL HEADS

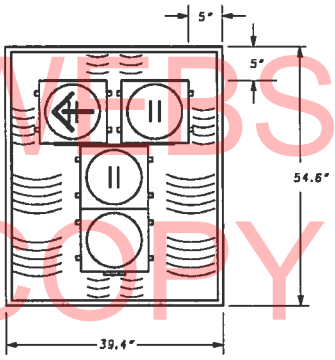
DETAIL NO. DE 746.008-04



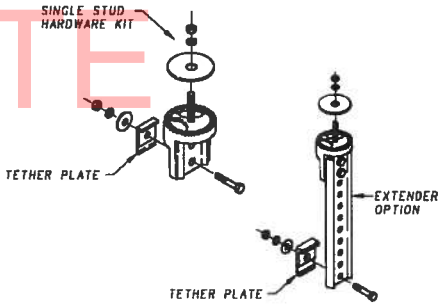
ONE-WAY
THREE – SECTION
12" SIGNAL HEADS



ONE-WAY, FIVE-SECTION
12" SIGNAL HEADS



ONE-WAY
FOUR – SECTION
12" SIGNAL HEADS



TETHER ASSEMBLY

NOTES:

1. ALL BOLTS SHALL BE STAINLESS STEEL.
2. ALL BACKPLATES SHALL BE POWDER-COATED ALUMINUM.

LEGEND:

|| LOCATION OF TERMINAL BLOCK

SPECIFICATION	CATEGORY CODE ITEMS
746892	SIGNAL HEADS
APPROVED _____ CHIEF TRAFFIC ENGINEER	

DELAWARE
DEPARTMENT OF TRANSPORTATION
TRAFFIC CONSTRUCTION DETAILS
SIGNAL HEAD BACKPLATE DETAILS

DETAIL NO. DE 746.009-01

22. ITEM NUMBERS BY CATEGORY

To assist locating a particular item, the item numbers included in this contract have been divided into categories, as shown in the following table.

ITEM	DESCRIPTION	UOM	QTY
	CABINETS AND CABINET BASES		
747515	Cabinet Base Type M	EA	4
747516	Cabinet Base Type P	EA	10
	CABLE AND SPLICES		
746906	Furnish & Install 4- conductor #18 AWG Shielded Opticom Cable	LF	1,000
746907	Furnish & Install 1- conductor #2 AWG Stranded Copper	LF	100
746908	Furnish & Install 1- conductor #4 AWG Stranded Copper	LF	100
746909	Furnish & Install 1- conductor #6 AWG Stranded Copper	LF	100
746910	Furnish & Install 1- conductor #8 AWG Stranded Copper	LF	100
746911	Furnish & Install 1- conductor #10 AWG Stranded Copper	LF	100
746912	Furnish & Install 1- conductor #14 AWG Stranded Copper	LF	100
746913	Furnish & Install 2-Conductor #14 AWG Aluminum Shielded Cable	LF	5,000
746914	Furnish & Install #6 Bare Stranded Copper ground	LF	500
746915	Furnish & Install #8/2 wire UF W/ground	LF	250
746916	Furnish & Install #8/3 wire UF W/ground	LF	50
746918	Furnish & Install #2/0 AWG Stranded Copper	LF	500
746919	Furnish & Install #4/0 AWG Stranded Copper	LF	200
746920	Furnish & Install 14/4 Traffic Control Cable	LF	250
746921	Furnish & Install 14/9 Traffic Control Cable	LF	2,500
746922	Furnish & Install 14/16 Traffic Control Cable	LF	2,500
746923	Furnish & Install a 1" Flexible Non-Metallic Liquidtight Conduit Detector Sleeve with Loop Wire	LF	800
746924	Furnish & Install Loop Wire 1-conductor # 14 AWG encased in ¼" Flexible Tubing in a Loop Sawcut	LF	8,000
	CONDUIT		
745601	Furnish & Install up to 3" Flexible Metallic-Liquidtight Conduit	LF	50
745602	Furnish & Install up to 4" Schedule 80 HDPE Conduit (Bore)	LF	1,000
745603	Furnish & Install up to 4" Schedule 80 PVC Conduit (Open Cut)	LF	100
745604	Furnish & Install up to 4" Schedule 80 PVC Conduit (Trench)	LF	2,000
745605	Furnish & Install up to 4" Schedule 80 PVC Conduit (On Structure)	LF	100
745606	Furnish & Install up to 4" Galvanized Steel Conduit (Trench)	LF	100
745607	Furnish & Install up to 4" Galvanized Steel Conduit (Bore)	LF	100
745608	Furnish & Install up to 4" Galvanized Steel Conduit (Open Cut)	LF	100
745609	Furnish & Install up to 4" Galvanized Steel Conduit (On Structure)	LF	100
745610	Furnish & Install up to 4" Nonmetallic Pole Riser Shield	LF	100

	ELECTRIC SERVICE		
746925	Furnish & Install Embedded Metered Service Pedestal (100 AMP)	EA	5
746926	Furnish & Install Electrical Utility Service Equipment 120/240	EA	1
	JUNCTION WELLS		
744520	Conduit Junction Well, Type 1, Precast Concrete	EA	5
744523	Conduit Junction Well, Type 4, Precast Concrete	EA	2
744524	Conduit Junction Well, Type 5, Precast Concrete	EA	2
744500	Conduit Junction Well, Type 6, Precast Polymer Concrete	EA	1
744506	Conduit Junction Well, Type 7, Precast Polymer Concrete	EA	2
744507	Conduit Junction Well, Type 8, Precast Polymer Concrete	EA	1
744508	Conduit Junction Well, Type 9, Precast Polymer Concrete	EA	1
744509	Conduit Junction Well, Type 10, Precast Polymer Concrete	EA	1
744530	Conduit Junction Well, Type 11, Precast Concrete / Polymer Lid-Frame	EA	50
744531	Conduit Junction Well, Type 14, Precast Concrete / Polymer Lid-Frame	EA	10
744532	Conduit Junction Well, Type 15, Precast Concrete / Polymer Lid-Frame	EA	5
744533	Furnish & Install Frame and Lid, for Junction Well, Type 1	EA	3
744534	Furnish & Install Frame and Lid, for Junction Well, Type 4	EA	3
744535	Furnish & Install Frame and Lid, for Junction Well, Type 5	EA	3
744536	Furnish & Install Precast Polymer Cover for Junction Well, Type 6	EA	1
744537	Furnish & Install Precast Polymer Cover for Junction Well, Type 7	EA	2
744538	Furnish & Install Precast Polymer Cover for Junction Well, Type 8	EA	1
744539	Furnish & Install Precast Polymer Cover for Junction Well, Type 9	EA	1
744540	Furnish & Install Precast Polymer Cover for Junction Well, Type 10	EA	1
744541	Furnish & Install Frame and Lid, for Junction Well, Type 11	EA	3
744542	Furnish & Install Frame and Lid, for Junction Well, Type 14	EA	3
744543	Furnish & Install Frame and Lid, for Junction Well, Type 15	EA	3
744544	Adjust or Repair Existing Conduit Junction Well	EA	20
744545	Bonding & Grounding Existing Junction Well	EA	10
	MISCELLANEOUS		
763684	Performance and Payment Bond, Open End Signal Contract	LS	1
	MAINTENANCE OF TRAFFIC		
743003	Arrow Panels, Type C	EA-DY	100
743004	Furnish & Maintain Portable Changeable Message Board	EA-DY	140
743005	Furnish & Maintain Portable Light Assembly (Flood Lights)	EA-DY	50
743006	Plastic Drums	EA-DY	3,000
743007	Traffic Officers	HR	400
743009	Furnish and Maintain Truck-Mounted Attenuator, Type I	EA-DY	10
743010	Furnish And Maintain Truck Mounted Attenuator, Type II	EA-DY	100
743024	Temporary Warning Signs and Plaques	EA-DY	800
743050	Flagger, New Castle County, State	HR	250
743051	Flagger, Kent County, State	HR	85

743052	Flagger, Sussex County, State	HR	170
743056	Flagger, New Castle County, Federal	HR	50
743057	Flagger, Kent County, Federal	HR	20
743058	Flagger, Sussex County, Federal	HR	35
743062	Flagger, New Castle County, State, Overtime	HR	25
743063	Flagger, Kent County, State, Overtime	HR	10
743064	Flagger, Sussex County, State, Overtime	HR	20
743065	Flagger, New Castle County, Federal, Overtime	HR	5
743066	Flagger, Kent County, Federal, Overtime	HR	2
743067	Flagger, Sussex County, Federal, Overtime	HR	4
	POLES, MAST ARMS, POLE BASES		
746831	Installation of Pedestal Pole	EA	80
746697	Installation of Wood Pole	EA	2
746590	Furnish & Install Ground Rod	EA	2
746832	Furnish & Install Weatherhead, up to 3", on Steel Pole	EA	4
746850	Pole Base Type 4	EA	40
	SIGNAL HEADS, PEDESTRIAN BUTTONS, EMERGENCY PREEMPTION		
746929	Furnish & Install 8" LED Signal Head Section, Rigid Mount	EA	4
746930	Furnish & Install 8" LED Signal Head Section, Span Mount	EA	6
746931	Furnish & Install 8" LED Traffic Signal Head Indication Module	EA	20
746932	Furnish & Install 12" LED Signal Head Section, Rigid Mount	EA	60
746933	Furnish & Install 12" LED Signal Head Section, Span Mount	EA	120
746934	Furnish & Install 12" LED Traffic Signal Head Indication Module	EA	200
746892	Furnish & Install Signal Head Backplate	EA	5
746935	Furnish and Install 16" LED Countdown Pedestrian Signal	EA	80
746936	Furnish & Install 16" LED Pedestrian Signal Head Indication Module	EA	20
746937	Furnish & Install Pedestrian Pushbutton with Sign	EA	120
746763	Realign or Slide Existing Signal Head	EA	50
746775	Furnish & Install Opticom Emergency Preemption Detector	EA	20
746943	Furnish 8" LED Signal Head Section,	EA	15
746944	Furnish 8" LED Traffic Signal Head Indication Module	EA	45
746945	Furnish 12" LED Signal Head Section	EA	90
746946	Furnish 12" LED Traffic Signal Head Indication Module	EA	120
746947	Furnish 16" LED Countdown Pedestrian Signal	EA	40
746948	Furnish 16" LED Pedestrian Signal Head Indication Module	EA	20
746949	Furnish Pedestrian Pushbutton Assembly	EA	60
	SIGNS		
746938	Install Overhead Sign	EA	10
746950	Furnish Solar-Powered Radar Speed Sign	EA	15
	SOIL		
732004	Topsoil	TON	50
736001	Sodding	SY	200

	SPAN, MESSENGER, AND GUY WIRE		
746501	Furnish & Install Down Guy and Anchor	EA	20
746504	Furnish & Install Span Wires, 7/16"	LF	1,000
746506	Furnish & Install Span Wires, 1/4"	LF	250
746703	Furnish & Install Dead End Messenger Wire Attachment	EA	2
746704	Adjustment of Span or Messenger Wire	EA	10
746706	Transfer of Existing Span or Messenger Attachment	EA	5
	REMOVAL		
746939	Traffic Control Device Equipment Turn on, Pick up, Removal & Maintenance, Type I	EA	5
746940	Traffic Control Device Equipment Turn on, Pick up, Removal & Maintenance, Type II	EA	3
746941	Traffic Control Device Equipment Turn on, Pick up, Removal & Maintenance, Type III	EA	2