




**ATTENTION: TP&D, DESIGN, CONSTRUCTION, MAINTENANCE AND
TRAFFIC OPERATIONS ENGINEERS
MEMORANDUM**

SPECIAL PROVISION AND/OR SPECIFICATION CHANGE MEMORANDUM 14-12

TO: District Engineers

Date: February 10, 2012

FROM: John F. Obr, P. E. 
Construction Division Director

SUBJECT: Statewide Special Specification 8852 (04), "Illumination Maintenance"

The above-referenced special specification has been approved for statewide use for non-federal aid maintenance projects using Item 8852 beginning with the May 2012 letting.

This special specification provides for maintaining, installing, or replacing the various appurtenances relating to existing illumination systems.

Please disseminate this information to your Transportation Planning & Development, Construction, Maintenance, and Traffic Operations Engineers.

cc: TxDOT Specification Committee
Federal Highway Administration
Associated General Contractors

SPECIAL SPECIFICATION**8852****Illumination Maintenance**

1. **Description.** Maintain, install, repair or replace the various appurtenances related to existing illumination systems.
2. **Licenses and Certification.** Electrical licensing and electrical certification requirements must be in accordance with Item 7 and all applicable special provisions to Item 7.
3. **Materials.** Unless otherwise noted on the plans, the Department will only furnish luminaires, luminaire poles, mast arms, anchor bolts and transformer bases. Assume responsibility for all materials furnished by the Department. Use material furnished by the Department for this contract only.

Furnish all materials required to repair breaks or shorts in electrical conductors and cables. This shall include, but not be limited to, all concrete, ground boxes, wire mesh, conduit, conductors, and pipe casing. Ensure materials furnished by the Contractor meet all of TxDOT standards and specification requirements.

Return unused or removed salvageable material to the Department upon completion of work and prior to final payment, at location shown on the plans or as directed. Dispose of any unsalvageable material in accordance with federal, state, and local regulations.

When performing maintenance on luminaires, verify if fixtures are covered under the manufacturer's warranty. If warranty applies, coordinate with the Department and follow any necessary procedures to have the manufacturer replace or repair fixtures.

4. **Equipment.** Furnish all equipment, tools and machinery necessary for the proper prosecution of the work. This will include, but is not limited to, an aerial device capable of reaching, installing and erecting all overhead lights and poles, trenching machine, boring machine, underground conductor detectors, underground fault detectors and splicing tools.

The equipment, tools, and machinery must be on the work site, in good repair and operating condition, prior to beginning work. If at any time any equipment is defective to the point that it may affect the quality of the work, that equipment must be immediately repaired or replaced.

5. **Work Methods.** Conform to the latest edition of the National Electric Code (NEC) as adopted by the Texas Department of Licensing and Regulations, local utility requirements, the requirements of this Item, and the pertinent requirements of the following Items:
 - Item 104, "Removing Concrete"
 - Item 400, "Excavation and Backfill for Structures"
 - Item 416, "Drilled Shaft Foundations"

- Item 421, “Hydraulic Cement Concrete”
- Item 431, “Pneumatically Placed Concrete”
- Item 432, “Riprap”
- Item 440, “Reinforcing Steel”
- Item 476, “Jacking, Boring or Tunneling Pipe or Box”
- Item 610, “Roadway Illumination Assemblies”
- Item 613, “High Mast Illumination Poles”
- Item 614, “High Mast Illumination Assemblies”
- Item 616, “Performance Testing of Lighting Systems”
- Item 618, “Conduit”
- Item 620, “Conductors”
- Item 621, “Tray Cable”
- Item 622, “Duct Cable”
- Item 624, “Ground Boxes”
- Item 627, “Treated Timber Poles”
- Item 628, “Electrical Services”
- Item 652, “Highway Sign Lighting Fixtures”

Perform work on this contract as directed. Maintain existing roadway illumination systems as directed. Perform a monthly inspection to determine if any maintenance of the illumination system are needed and provide a detailed report to the Engineer. Provide proper maintenance or repairs within 48 hours of notification. Submit completed maintenance log as directed. Coordinate electric power issues with local utility company.

The term “duct cable” as used herein must consist of a complete assembly of conductors enclosed in a high density polyethylene duct.

All maintenance, installation, removal or replacement activities located near any overhead or underground utilities must be accomplished using established industry and utility safety practices. Consult with the appropriate utility company prior to beginning such work.

Maintain, install, repair or replace the following items in accordance with the details as shown in the plans, the NEC and as directed by the Engineer:

A. Conduit. Install, remove, or replace conduits in accordance with Item 618, “Conduit.” Use 90 degree “sweep” type elbow on conduits entering a ground box or foundation.

B. Electrical Conductors. Install, remove, or replace electrical conductors in accordance with Item 620, “Electrical Conductors.”

Installation or replacing of conductors in aerial runs includes the strapping of cable as required. This work is subsidiary to this item.

C. Tray Cable. Install, remove, or replace tray cable in accordance with Item 621, “Tray Cable.”

- I. Install, Remove or Replace Induction Fluorescent Fixture.** Install, remove or replace induction fluorescent fixture.
- J. Install, Remove or Replace LED Fixture.** Install, remove or replace LED fixture.
- K. Replace Luminaires.** Replace luminaires.
- L. Replace High Mast Luminaires.** Replace high mast luminaires.
- M. Replace Luminaire Pole.** Replace luminaire pole. Removing and re-installing existing luminaires and arm(s) is subsidiary to this item.
- N. Replace Luminaire Arm(s) –** Replace luminaire arm(s).
- O. Maintenance of Roadway Illumination.** Maintenance of roadway illumination assemblies includes the replacement of lamps, fuses, fuse holder, starting aid, photocells, ballasts, and other work required to keep lights operational. Re-level the fixture. Clean the reflector and inside and outside of lens with an approved cleaning solution.
- P. Maintenance of High Mast Illumination.** Maintenance of high mast illumination assemblies includes lowering the ring assembly and the replacement of lamps, fuses, fuse holder, starting aid, photocells, ballasts, and other work required to keep lights operational. Re-aim the lights and clean the lenses and reflectors as directed. Clean the reflector and inside and outside of lens with an approved cleaning solution. Maintain mechanical and electrical equipment as directed.
- Q. Maintenance of Overhead Sign Lighting.** Maintenance of overhead sign lighting for large signs mounted over the roadway includes replacing the ballast, lamps, fuses and lamp sockets in order to properly restore the lighting to satisfactory operation. Installations must be in accordance with the details shown on the plans or as directed. Clean the reflector and inside and outside of lens with an approved cleaning solution.
- R. Maintenance of Underpass Fixtures.** Maintenance of HPS underpass fixtures includes the replacement of lamps, fuses, fuse holder, starting aid, photocells, ballasts, and other work required to keep lights operational. Re-level the fixture. Clean the reflector and inside and outside of lens with an approved cleaning solution.
- S. Maintenance of Induction Fluorescent Fixtures.** Maintenance of induction fluorescent fixtures includes the replacement of lamps, fuses, fuse holder, starting aid, photocells, ballasts, and other work required to keep lights operational. Re-level the fixture. Clean the reflector and inside and outside of lens with an approved cleaning solution.
- T. Maintenance of LED Fixtures.** Maintenance of LED fixtures includes the replacement of LED modules, drivers, fuses, fuse holder, photocells and other work required to keep lights operational. Re-level the fixture. Clean the reflector and inside and outside of lens with an approved cleaning solution.

- D. Duct Cable.** Install, remove, or replace duct cable in accordance with Item 622, “Duct Cable.”
- E. Conduit or Duct Cable Repair and Conductor Splices.** Notify the Engineer when an underground break in duct cable or conduit must be located; or if a short in a conductor must be located.

Expose the break or short, install the ground box, repair the conduit or duct cable, perform the electrical splices and backfill. Backfill in accordance with the construction methods of Item 400, “Excavation and Backfill for Structures.” New ground boxes will be paid for under, “Install Ground Box.”

When a ground box is not needed, expose the break or short, repair conduit or duct cable, remove damaged conductors and install new conductors. Conduit and duct cable repairs will include the replacement of up to 3 ft. of conduit or duct cable, regardless of the number of conduits in trench. Only one repair will be considered for payment per trench. If more than 3 ft. of conduit or duct cable needs to be replaced the additional will be paid for under “Replace Underground Conduit” or “Replace Duct Cable.” Replacement of conductors will be paid for under “Install or Replace Conductor.” Backfill in accordance with the construction methods of Item 400, “Excavation and Backfill for Structures.”

An electrical splice will include the replacement of up to 3 ft. of conductor, regardless of the number of conductors in the conduit. Only one splice will be considered for payment per conduit. If more than 3 ft. of conductor needs to be replaced the additional will be paid for under “Install or Replace Conductor.”

All above-ground conduit repairs which are to be performed in conjunction with a bid item will be considered subsidiary to the pertinent bid item. Above-ground conduit repairs not to be performed in conjunction with a bid item will include the replacement of up to 3 ft. of conduit per repair. If more than 3 ft. of conduit must be replaced, the additional will be paid for under “Replace Above-ground Conduit.”

- F. Bore Operations.** Road bore operations are required for placement of underground wiring under the roadway and will be in accordance with the construction methods for boring as outlined in Item 476, “Jacking, Boring or Tunneling Pipe or Box.” The depth of the bore will be a minimum of 60 in. below the roadway surface (and a minimum of 36 in. below the ditch flow-line) extending 10 ft. outside the edge of the roadway or as directed. Placement of conduit for the length of the bore will be considered subsidiary to this bid item. Electrical conductors will be paid for under the bid item “Install or Replace Conductor.”
- G. Install, Remove or Replace Roadway Illumination Assembly.** Install, remove or replace roadway illumination assemblies. This will include the base, pole, luminaire arm(s), luminaire (high pressure sodium) and required wiring.
- H. Install, Remove or Replace Underpass Luminaire.** Install, remove or replace underpass luminaires. This will include the luminaire (high pressure sodium), junction box, mounting hardware and required wiring.

U. Scheduled Preventive Maintenance of Roadway Illumination Assembly. Inspect and perform the following listed items according to the schedule provided by the Engineer:

1. Inspect and maintain all foundation anchor bolts, nuts and washers.
2. Prep and touch up rust spots with cold galvanizing spray.
3. Replace lamp and clean fixtures as directed.
4. Replace ballast as directed.
5. Level fixture.
6. Inspect electrical system.
7. Repair short or open circuits as directed.

V. Scheduled Preventive Maintenance of High Mast Assembly. Complete and sign “Luminaire Preventive Maintenance for High Mast Lighting” reports. Fill out forms legibly and completely. List all materials used at each location.

Inspect and perform the following listed items according to the schedule provided by the Engineer:

1. Inspect and fill gearbox lubrication reservoir.
2. Lubricate grease fittings.
3. Adjust brake mechanism to proper torque.
4. Inspect cable drum.
5. Inspect all wire rope and cables for deterioration or wear.
6. Inspect safety chains.
7. Lower ring and inspect mechanism.
8. Inspect all foundation anchor bolts, nuts and washers.
9. Inspect welds around baseplate and ground sleeve for visible cracks.
10. Prep and touch up rust spots with cold galvanizing spray.
11. Replace lamps and clean fixtures as directed.
12. Replace ballasts as directed.
13. Replace aviation warning lamps as directed.
14. Inspect electrical system.
15. Repair short or open circuits as directed.

16. Raise ring to proper position.

W. Replace Electrical Services. Replace electrical services in accordance with Item 628, “Electrical Services.”

X. Replace Service Pole. The replacement of service poles will consist of the removal of the existing service pole, the installation of the new pole and related electrical service equipment, installation of conduit including the elbow below ground for underground service feed or the weatherhead for overhead service feed, and connecting and installing electrical service. Install in accordance with Item 628, “Electrical Services.”

Y. Install Ground Box. Install ground boxes in conformance with the details shown on the plans and Item 624, “Ground Boxes.” When shown on the plans, provide a Class “A” concrete apron conforming to Item 421, “Hydraulic Cement Concrete.” Place ground box to line and grade as approved by the Engineer. All wiring connections required inside the ground box will be considered subsidiary to this bid item.

Z. Remove Ground Box. Remove and replace fill under ground box with approved fill to at least 6 in. below conduit level. Remove conductors from conduit back to the point of termination. Conduit must be uncovered to a sufficient distance so that 90-degree bends can be removed and conduit reconnected. Clean conduit as per Item 618, “Conduit,” and pull and terminate new conductors. Conduit replaced within 5 ft. of the ground box will be subsidiary to this Item. Cleaning of conduit and pulling of conductors will be paid under “Install or Replace Conductor.” Backfill in accordance with the construction methods of Item 400, “Excavation and Backfill for Structures.” If more than 5 ft. of conduit or duct cable needs to be replaced the additional will be paid for under “Replace Underground Conduit” or “Replace Duct Cable.”

If applicable, ground box removal includes removing the existing riprap apron.

AA. Install Foundation. Install foundation for roadway illumination assemblies as shown on the plans and in accordance with the materials and construction methods outlined in Item 416, “Drilled Shaft Foundations.”

BB. Remove Foundation. Remove foundations in accordance with Item 610, “Roadway Illumination Assemblies” and Item 104, “Removing Concrete.” Backfill in accordance with the construction methods of Item 400, “Excavation and Backfill for Structures.”

CC. Replace Transformer Base. Replace transformer base in accordance with the plans or as directed. The removal of the pole, mast arm, and luminaire for replacement of the transformer base only will be considered subsidiary to the pertinent bid items.

DD. Replace Transformer Base Cover. Replace damaged or missing covers on existing transformer bases.

EE. Replace Hand Hole Cover. Replace damaged or missing covers on existing illumination poles.

FF. Install Ground Rod. The installation of ground rods will include running a properly sized copper grounding conductor to the ground connection.

- GG. Replace Ballast.** Replace ballast for pole mounted, underpass, sign and wall pack fixtures in accordance with the details shown on the plans or as directed.
- HH. Replace Ballast (High Mast Lighting).** Replace ballast for high mast fixtures.
- II. Install or Replace Fused Disconnect.** Install or replace fused disconnect.
- JJ. Replace Lamp Socket.** Replace lamp socket for pole mounted, underpass and wall pack fixtures.
- KK. Replace Lamp.** Replace lamps for pole mounted, underpass, sign and wall pack fixtures. Clean the reflector and inside and outside of lens with an approved cleaning solution.
- LL. Replace Lamp (High Mast Lighting).** Replace lamp for individual high mast fixtures. Clean the reflector and inside and outside of lens with an approved cleaning solution.
- MM. Replace Wall Pack Luminaires.** Replace wall pack luminaires on structures, rest areas and maintenance warehouses and other facilities.
- NN. Replace Lens.** Replace pole mounted, underpass, sign, wall pack or high mast luminaire lenses.
- OO. Replace Wall Pack Guard.** Replace wall pack guard.
- PP. Replace Fuses.** Replace fuses for pole mounted, underpass, sign and wall pack fixtures, and fused disconnects.
- QQ. Replace Fuse Holders.** Replace fuse holder for pole mounted, underpass, sign and wall pack fixtures.
- RR. Replace Breakaway Fuse Holders.** Replace breakaway fuse.
- SS. Replace Starting Aid.** Replace starting aid for pole mounted, underpass, sign and wall pack fixtures.
- TT. Replace Photocells and Brackets.** Replace photocells and brackets.
- UU. Replace Control Transformer.** Replace the control transformer.
- VV. Replace Control Circuit.** Replace the control circuit.
- WW. Replace Aviation Warning Fixtures.** Replace the aviation warning fixtures.
- XX. Replace Aviation Warning Lamp.** Replace the aviation warning fixture lamp
- YY. Replace Hand-Off-Auto Switch.** Replace three position Hand-Off-Automatic control switch.
- ZZ. Replace Contactor.** Replace electromagnetic contactors.
- AAA. Replace Meter Bases.** Replace meter bases according to electrical service providers requirements.

BBB. Replace Time Clocks. Replace time clocks.

CCC. Replace Breaker Panel. Replace breaker panel.

DDD. Install or Replace Circuit Breaker. Install or replace circuit breakers.

EEE. Replace Flexible Power Cable or Cord. Replace flexible power cable or cord.

FFF. Replace Twist Lock Connectors. Replace twist lock connectors.

GGG. Replace Safety Chains. Replace safety chains.

HHH. Raise and Lower Ring (High Mast Lighting). Raise and lower ring in order to perform various maintenance and repair items.

III. Re-strap Existing Conduit. Re-strap existing conduit in accordance with the details shown on the plans or as directed.

JJJ. Replace Missing Nuts, Washers, and Other Hardware. Replace missing nuts washers, and other miscellaneous hardware.

KKK. Troubleshoot for Repairs. Troubleshoot location as directed by Engineer to identify work needed for repairs.

LLL. Project Inspections. Inspect and review the project to determine if any items are in need of repair and provide the Engineer with a list of these items. Make repairs to those items approved by the Engineer. All repairs will be paid for by their respective pay items.

6. Measurement. This Item will be measured as follows.

A. Conduit – by the foot of conduit installed, removed or replaced. This will include the installation of all hardware necessary to attach and connect the conduit, and any excavation, backfill and compaction.

1. Install Above-ground Conduit
2. Remove Above-ground Conduit
3. Replace Above-ground Conduit
4. Install Underground Conduit
5. Remove Underground Conduit
6. Replace Underground Conduit

B. Electrical Conductors – by the foot of electrical conductor installed, removed or replaced.

1. Install Conductor
2. Remove Conductor
3. Replace Conductor

C. Tray Cable – by the foot of tray cable installed, removed or replaced.

1. Install Tray Cable
 2. Remove Tray Cable
 3. Replace Tray Cable
- D. Duct Cable** – by the foot of duct cable installed, removed or replaced. This will include excavation, backfill and compaction.
1. Install Duct Cable
 2. Remove Duct Cable
 3. Replace Duct Cable
- E. Conduit or Duct Cable Repair and Conductor Splices**
1. Install Electrical Splice – by each electrical splice installed per conduit.
 2. Repair Above-ground Conduit – by each conduit location repaired. This will include the installation of all hardware necessary to attach and connect the conduit
 3. Repair Underground Conduit – by each conduit location repaired. This will include excavation, placement of conduit, backfill and compaction.
 4. Repair Underground Duct Cable – by each duct cable location repaired. This will include excavation, placement of duct cable, backfill and compaction.
- F. Road Bore** – by the foot of road bore. This will include conduit installed.
- G. Install, Remove or Replace Roadway Illumination Assembly** – by each assembly installed, removed or replaced. This item includes all wiring and hardware connections above the foundation.
1. Install Roadway Illumination Assembly
 2. Remove Roadway Illumination Assembly
 3. Replace Roadway Illumination Assembly
- H. Install, Remove or Replace Underpass Luminaire** – by each luminaire installed, removed or replaced.
1. Install Underpass Luminaire
 2. Remove Underpass Luminaire
 3. Replace Underpass Luminaire
- I. Install, Remove or Replace Induction Fluorescent Fixture** – by each fixture installed, removed or replaced.
1. Install Induction Fluorescent Fixture
 2. Remove Induction Fluorescent Fixture
 3. Replace Induction Fluorescent Fixture

- J. Install, Remove or Replace LED Fixture** – by each fixture installed, removed or replaced.
 - 1. Install LED Fixture
 - 2. Remove LED Fixture
 - 3. Replace LED Fixture
- K. Replace Luminaires** – by each luminaire replaced.
- L. Replace High Mast Luminaires** – by each high mast luminaire replaced.
- M. Replace Luminaire Pole** – by each pole replaced.
- N. Replace Luminaire Arm(s)** – by each luminaire arm replaced.
- O. Maintain Roadway Illumination** – by each luminaire pole maintained.
- P. Maintain High Mast Illumination** – by each high mast pole maintained.
- Q. Maintain Overhead Sign Lighting** – by each sign light maintained.
- R. Maintain Underpass Fixture** – by each underpass fixture maintained.
- S. Maintain Induction Fluorescent Fixture** – by each induction fluorescent fixture maintained.
- T. Maintain LED Fixture** – by each LED fixture maintained.
- U. Scheduled Preventive Maintenance (Roadway Illumination Assembly)** – by each roadway illumination pole. (Replacing lamp and ballast is subsidiary to this bid item.)
- V. Scheduled Preventive Maintenance (High Mast Assembly)** – by each high mast pole regardless of the number of luminaires on the ring. (Replacing lamps and ballast is subsidiary to this bid item.)
- W. Replace Electrical Service** – by the each electrical service replaced.
- X. Replace Service Pole (Timber, Steel, or Concrete)** – by each service pole replaced.
 - 1. Replace Timber Service Pole
 - 2. Replace Steel Service Pole
 - 3. Replace Concrete Service Pole
- Y. Install Ground Box** – by each ground box installed.
 - 1. Install Ground Box
 - 2. Install Ground Box w/ Apron
- Z. Remove Ground Box** – by each ground box removed.
- AA. Install Foundation** – by each foundation installed.

- BB. Remove Foundation** – by each foundation removed.
- CC. Replace Transformer Base** – by each base replaced.
- DD. Replace Transformer Base Cover** – by each cover replaced.
- EE. Replace Hand Hole Cover** – by each cover replaced.
- FF. Install Ground Rod** – by each ground rod installed.
- GG. Replace Ballast** – by each ballast replaced.
- HH. Replace Ballast (High Mast Lighting)** – by each high mast ballast replaced.
- II. Install or Replace Fused Disconnect** – by each fused disconnect installed or replaced.
1. Install Fused Disconnect
 2. Replace Fused Disconnect
- JJ. Replace Lamp Socket** – by each lamp socket replaced for pole mounted, underpass and wall pack fixtures.
1. Replace Lamp Socket for pole mounted fixtures
 2. Replace Lamp Socket for underpass fixtures
 3. Replace Lamp Socket for wall pack fixtures
- KK. Replace Lamp** – by each lamp replaced for pole mounted, underpass and wall pack fixtures.
1. Replace Lamp for pole mounted fixtures
 2. Replace Lamp for underpass fixtures
 3. Replace Lamp for wall pack fixtures
- LL. Replace Lamp (High Mast Lighting)** – by each lamp replaced.
- MM. Replace Wall Pack Luminaire** – by each wall pack replaced.
- NN. Replace Lens** – by each lens replaced
1. Replace Lens for pole mounted fixture
 2. Replace Lens for underpass fixture
 3. Replace Lens for wall pack fixture
 4. Replace Lens for high mast fixture
- OO. Replace Wall Pack Guard** – by each guard replaced.
- PP. Replace Fuse** – by each fuse replaced.
- QQ. Replace Fuse Holder** – by each fuse holder replaced.
- RR. Replace Breakaway Fuse Holder** – by each breakaway fuse holder replaced.

SS. Replace Starting Aid – by each starting aid replaced.

TT. Replace Photocell and Bracket – by each photocell and bracket replaced.

UU. Replace Control Transformer – by each transformer replaced.

1. Replace Control Transformer for High Mast
2. Replace Control Transformer for Electrical Service

VV. Replace Control Circuit – by each control circuit replaced.

1. Replace Control Circuit for High Mast
2. Replace Control Circuit for Electrical Service

WW. Replace Aviation Warning Fixture – by each fixture replaced.

XX. Replace Aviation Warning Lamp – by each lamp replaced.

YY. Replace Hand-Off-Auto Switch – by each H-O-A control switch replaced.

ZZ. Replace Contactor – by each electromagnetic contactor replaced.

AAA. Replace Meter Base – by each meter base replaced.

BBB. Replace Time Clock – by each time clock replaced.

CCC. Replace Breaker Panel – by each breaker panel replaced.

DDD. Install or Replace Circuit Breaker – by each circuit breaker installed or replaced.

1. Install Circuit Breaker
2. Replace Circuit Breaker

EEE. Replace Flexible Power Cable or Cord – by foot of cable or cord replaced.

FFF. Replace Twist Lock Connector – by each twist lock connector replaced.

GGG. Replace Safety Chain – by foot of chain replaced.

HHH. Raise and Lower Ring (High Mast Lighting) – by each ring raised and lowered (not part of scheduled preventive maintenance).

III. Re-strap Existing Conduit – by each strap installed.

JJJ. Replace Missing Nuts, Washers, and Other Hardware – by each nut, washer, or miscellaneous hardware replaced.

KKK. Troubleshoot for Repairs – by the man-hour of troubleshooting.

LLL. Project Inspections – by the month.

Payment. The work performed and the materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit prices bid for the

various designations. This price is full compensation for furnishing all material, equipment, labor, fines, tools and incidentals necessary to complete the work.

Lane closures will be paid for under Special Specification "Lane Closures."