



ARCHITECTURE
ENGINEERING

April 29, 2014

Re: **DELAWARE STATE POLICE – TROOP 3 – BID PACK II**
Kent County, Delaware
2011116.00

ADDENDUM SIX (Final Addendum)

The addendum forms a part of the contract documents and modifies the original bidding documents dated April 7, 2014 as noted below.

GENERAL

- 1) Bidding Schedule
 - a. **Last Addendum Issued** – Tuesday April 29.
 - b. **Bids Due / Bid Opening** – Friday May 2, at **9:00 am** local time

CLARIFICATIONS

- 1) Question: Request bid extension due to Addendum 06 being issued on Tuesday April 29th.
RESPONSE: The Bid Date/Time will not be extended as Last Day for Addendum was noted in Addendum 02 as Tuesday April 29th which supersedes the 4 day requirement listed in the instruction to bidders paragraph 3.4.3.
- 2) Question: The countertop support steel shown on the Architectural drawing (ref. 8/A401) refers us to the structural but no detail is found. Please advise of the size and material to be used.
RESPONSE: See revised detail 8/A401 issued with this addendum.
- 3) Question: Drawing A404 not included in set, please advise.
RESPONSE: See drawing A404 issued with this addendum.
- 4) Question: Are the overhead fluid / power reels as well as the 55 gal fluid drums and pumps to be provided within contract?
RESPONSE: The overhead fluid / power reels are to be provided by contractor. The basis of design is the Sampson 1650 Double Pedestal Arm Hose Reels. Provide four (4) model 1665 (2 Compressed Air / 2 Windshield Washer Fluid), Four (4) model 1676 (2 Oil / 2 Transmission Fluid). Refer to drawings for mounting locations. 55 gal fluid drums and pumps are N.I.C – to be provided by owner.
- 5) Question: Structural drawings are missing the details for the generator platform and generator pad, please provide.
RESPONSE: See drawing S303 issued with this addendum.
- 6) Question: Hardware Set 45 appears to be missing lockset.
RESPONSE: Hardware Set 45 revised per this addendum to include Storeroom Lock.



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- 7) Question: Is there plastic laminate countertop with supports intended at elevation 6/A703 in room A168?
RESPONSE: See revised elevation 6/A703 as well as revised casework schedule A601 issued with this addendum.
- 8) Question: Do the Fin No. Walls and Ceiling Finish Number refer to the Color Schedule Drawing A605? If so, then Locker Rooms (130A and 131A) have Fin No 7 for the walls. There is no 7 on the Color Schedule, please advise.
RESPONSE: Yes, the Fin No. refers to the Color Schedule on A605 with the exception of “9” in the Ceiling Finish location, which refers to general note 9 regarding hold down clips. The wall fin no for rooms 130A and 131A have been revised to “1” per this addendum.
- 9) Question: Several rooms have two (2) Fin No’s for the walls, are these for accent walls? If so, which wall(s) as none are indicated on Finish Floor Plans.
RESPONSE: Rooms A102, A103, A130 & A131 have accent walls noted on sheets A105A. Refer to revised A105A issued per this addendum for accent wall locations for rooms, A106, A123, A124, A125, A126, A140, A142, and A143 which shall use PT-2. Corridor B100’s wall finish tag should be PT-1.
- 10) Question: There does not appear to be any water flow switches in the main building, is this correct?
RESPONSE: There is a note on Drawing FA101A pointing into the Fire Pump room that states “Pump Run, Phase Reversal, Loss of Power, Water Flow Indicator, (6) Tamper Switches, 10 MZAM’s total”
- 11) Question: Should the strobe in corridor B100 near room B117 be changed to a horn / strobe?
RESPONSE: As the drawings show, there is a strobe within 15 feet of the end of the corridor B100. There is no code requirement to have Horn within 15 feet of the end of the corridor. The Contractor is responsible for proper audio levels in the system.
- 12) Question: Should the FACP currently noted to be installed in Room 104 be moved to Office 103 with a smoke detector installed in Office 103?
RESPONSE: Drawing FA103 has been revised to show the FACP in the Office 103. No smoke is required as this will be a fully suppressed building. Please note revised FA101 has been included in this addendum to show the revised locations of the FACP and FRA.
- 13) Question: The holding cell area has one (1) horn/strobe in Hall B108, the rest of the areas B109, B121, B122, B127, and B132 are strobe only, is this correct?
**RESPONSE: Yes it is correct. The area in question is a restrain care area that can house a variety of occupants including psychiatric. It has been our experience at the State Hospital that audio fire alarms are anxiety provoking and the State Code Officials approved visual alarms only in specific areas. The NFPA 72 code allows for this condition as follows:
18.4.4.2 Where approved by the authority having jurisdiction or other governing codes or standards, the requirements for audible signaling shall be permitted to be reduced or eliminated when visible signaling is provided in accordance with Section 18.5.*
In addition, it is understood that the area is under constant supervision by staff who must release the occupants from their cells in the event of an alarm. Obviously the FMO needs to approve this at the time of shop drawings but we had the indication that they would.**



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- 14) Question: Is Kohler an Acceptable Manufacturer for the Engine Generator as specified in Section 263213?
RESPONSE: Kohler is rejected per Specification Section 016000 paragraph 3.01 E
- 15) Question: Are Kohler Bypass Isolation Transfer Switches acceptable for the ATS's as specified in sections 263601 (ATS-1), 263602 (ATS-2), and 263603 (ATS-3)?
RESPONSE: Kohler is rejected per Specification Section 016000, 3.01E
- 16) Question: Drawing E-113 indicates a generator docking station and a manual transfer switch. There are no written specifications referring to this equipment. Please provide written specifications to this equipment being scoped. In addition, is Kohler an acceptable manufacturer for the Manual Transfer switch?
RESPONSE: Kohler is rejected per Specification Section 016000, 3.01E
- 17) Question: Are there power requirements for the fire dampers shown on M102A and M102B? There does not appear to be power for these on the electrical drawings.
RESPONSE: Power is not required for the fire dampers. They are the fusible link type.
- 18) Question: "GP-A" Panel Schedule on Drawing E123 states it is located in the electric room, drawing E114 states this panel is located in the generator and furnished with generator. Please clarify this panel's location and furnish responsibility.
RESPONSE: Panel GP-A is furnished with the generator, and is located in the generator enclosure.
- 19) Question: Please confirm the State provided UPS unit will be located in the Tele/Data room next to the UPS Panel. There is no detail or note showing the installation of this piece of equipment.
RESPONSE: The State has not selected the UPS at this time. The intent is to locate the UPS in the Tele/Data Room.
- 20) Question: The Device Symbols at the following locations on Drawing E105 are not identified; GTE Storage A175, Patrol B104, and KDU Storage A120. Please advise.
RESPONSE: Provide Wiremold 3000 series raceway with quantity of duplex receptacles indicated.
- 21) Question: Drawings show the Generator Annunciator located in the Electric Room and at the Front Desk, Please advise which location is correct.
RESPONSE: The Generator Annunciator Panel is located at the front desk.
- 22) Question: On Drawing E105, Tele-Data A150 Room, There is missing circuit information for the AC- (2 Locations). Please provide required information.
RESPONSE: See drawing E-105, rev D.
- 23) Question: Section 122413 – Roller Window Shades. There are manual and motor operated shades specified, where are each located?
RESPONSE: Section 122413 DELETED per this addendum, Manual and Motor Operated shades are not required.
- 24) Question: Is Stand 'N Seam Architectural Roofing Manufactured by Fabral Metal Wall and Roof Systems an acceptable product / manufacturer for the Standing Seam Roof Panels.
RESPONSE: Stand 'N Seam Architectural Roofing Manufactured by Fabral is NOT APPROVED as project requires panels longer than the stated maximum length.
- 25) Question: Is the Sargent 80 series exit device an acceptable substitution?
RESPONSE: The Sargent 80 Series Exit Device is NOT APPROVED.



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- 26) Question: Is the Sargent Degree Key System an acceptable substitution?
RESPONSE: The Sargent Degree Key System is NOT APPROVED. Best Key System must be used to match facility standard.
- 27) Question: Is the Securitron CEPT an acceptable substitution?
RESPONSE: Subject to compliance with the contract documents, the Securitron CEPT is an acceptable product(s).
- 28) Question: Is the Graham Serenity Sound Solution Door system an acceptable substitution?
RESPONSE: Subject to compliance with the contract documents, and the manufacturer is required to the match veneer type, finish, etc of the standard Wood Door's within the facility, the Graham Security Sound Door system is an acceptable product(s).
- 29) Question: Drawing detail 3/A402 is typical through a cell bench and indicates shackle point on both masonry partition and the face of the concrete bench. Please advise if there is a specific type of shackle loop inset to be utilized and provide number / spacing requirements.

RESPONSE: Detail 3/A402 has been revised per this addendum to identify basis-of-design shackle point and spacing requirements.
- 30) Question: The following light fixture substitution request have been reviewed and their status is listed below:
RESPONSE:
- 1) **TYPE BB – Vision 3 Lighting – Model WM1 –**
Subject to requirements of Contract documents, this product is **APPROVED**.
 - 2) **TYPE FF – Contech Lighting – TLT Tapelight Series –**
Subject to requirements of Contract documents, this product is **APPROVED**.
 - 3) **TYPE GG – Tivolilighting – Platinum Cove –**
Subject to requirements of Contract documents, this product is **APPROVED**.
 - 4) **TYPE EE – Edison Price Lighting– LED LS DL –**
NOT APPROVED, provide luminaire with remodel housing.
 - 5) **TYPE L – Litecontrol – Wall /Slott 6000 –**
Subject to requirements of Contract documents, provide luminaire with 3500K color temp and flange for sheetrock installation. this product is **APPROVED**.
 - 6) **TYPE M – Pinnacle Architectural Lighting– EDGFE ET4D –**
NOT APPROVED
 - 7) **TYPE Q – Acclaim Lighting– DynaGraze Interior SO –**
NOT APPROVED – Provide same product manufacturer as for Type R
 - 8) **TYPE R – Acclaim Lighting– DynaCove Interior –**
NOT APPROVED – Provide luminaire with 6' section increments
 - 9) **TYPE Y – SPI Lighting– STILE – SIW144740 –**
Subject to requirements of Contract documents, this product is **APPROVED**.



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PROJECT MANUAL VOLUMES 1, 2 AND 3

- 1) TABLE OF CONTENTS
 - a. DELETE SECTION - 122413 ROLLER WINDOW SHADES
 - b. ADD SECTION 263604 - NON-AUTOMATIC TRANSFER SWITCH
 - c. ADD SECTION 264300 – BSD – SURGE PROTECTIVE DEVICES
 - d. ADD SECTION 312000 – EARTH MOVING
- 2) SECTION 004100 – BID FORM
 - a. REVISE Bid Form to include Alternate 06. See attached BID FORM.
- 3) SECTION 012300 - ALTERNATES
 - a. ADD Paragraph 3.1.F :
 - 3.1.F Alternate No. 06: Provide Alternate Light Fixtures in lieu of Base Bid Light Fixtures
 - 1. Base Bid: Provide LED fixtures “I”, “I-1”, “K” & “K-1”.
 - 2. Alternate: Provide T8 fixtures “I”, “I-1”, “K” & “K-1”, see cut sheets included with Addendum 06.
- 4) SECTION 087100 – DOOR HARDWARE
 - a. DELETE Hardware Set 12 and REPLACE with the following:

Hardware Set No. 12

For use on door #(s):

B126-2

Provide each SGL door(s) with the following:

Qty	EA	Description	Catalog Number	Finish	Mfr
1	EA	CONT. HINGE	224HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10	689	VON
1	EA	ELEC PANIC HARDWARE	RX-CD-98-L-996-06	626	VON
1	EA	DELAYED EXIT LOGIC CONTROLLER	DE5101	US32D	VON
1	EA	SFIC MORTISE CYL.	80-132	626	SCH
1	EA	SFIC RIM CYLINDER	80-159	626	SCH
2	EA	PERMANENT CORE	KEYED TO EXIST. SYSTEM	626	BES
1	EA	MAGNETIC LOCK	M490P ATS/LED	628	SCE
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	DRIP CAP	17	AL	NGP
1	SET	SEALS	5050B	BRN	NGP
1	EA	THRESHOLD	896S	AL	NGP
	EA	DOOR POSITION SWITCH	FURNISHED BY SECURITY VENDOR		

DOOR OPERATION:

- 1. Door normally closed and secure by delayed egress system.
- 2. Pushing on exit device bar will signal delayed egress system, alarm will sound and door will release after 15 seconds.



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- 3. Card reader on inside will silence alarm for authorized egress.
- 4. Key switch on delayed egress module will reset alarm.
- 5. Delayed egress system must be wired to fire alarm system for immediate release.
- 6. Exterior trim key override will only allow entry if delayed exit system is deactivated.

- b. REVISE Door Hardware Set # 16 – DELETE Door A110/1
- c. REVISE Door Hardware Set # 45 – ADD “1 EA / STOREROOM LOCK / L9080HD 06A / 626 / SCH
- d. ADD Door Hardware Set # 53

Hardware Set No. 53

For use on door #(s):

A110/1

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	L9070HD 06A	626	SCH
1	EA	PERMANENT CORE	KEYED TO EXIST. SYSTEM	626	BES
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	WALL STOP	WS406CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

- 5) SECTION 122413 – ROLLER WINDOW SHADES
 - a. DELETE SECTION 122413 – Roller Window Shades
- 6) SECTION 263604 – NON-AUTOMATIC TRANSFER SWITCH
 - a. ADD Section 263604 – Non-Automatic Transfer Switch
- 7) SECTION 264300 – BSD-SURGE PROTECTIVE DEVICES
 - a. ADD Section 264300 – BSD-Surge Protective Devices
- 8) SECTION 312000 – EARTH MOVING
 - a. ADD Section 312000 – Earth Moving

DRAWINGS VOLUMES I AND II

- 1) DRAWING S102A – FLOOR & ROOF FRAMING PLAN – AREA A
 - a. ADD Floor Access Point opening and framing per attached revised plan
- 2) DRAWING S102B – P.H. ROOF FRAMING PLAN
 - a. ADD W16x26 per attached revised plan over penthouse access point opening.
- 3) DRAWING S303 – GENERATOR PAD AND PLATFORM
 - a. ADD plans and details for generator pad, service platform and penthouse access point perimeter.
- 4) DRAWING A105A – FINISH FLOOR PLAN – AREA A
 - a. 1/A105A – ADD Accent Wall Notes



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- 5) DRAWING A105B – FINISH FLOOR PLAN – AREA B
 - a. REVISE Wall Finish to “PT-1” at Corridor B100
- 6) DRAWING A401 – ENLARGED PLANS AND SECTIONS
 - a. 8/A401 – REVISE Toilet Counter Detail
- 7) DRAWING A402 – ENLARGED PLANS SECTIONS AND ELEVATION AT HOLDING
 - a. 3/A402 – REVISE Detail.
- 8) DRAWING A404 – ENLARGED MILLWORK PLANS AND DETAILS
 - a. ADD Sheet A404 – Enlarged Millwork Plans and Details
- 9) DRAWING A502 – WALL DETAILS
 - a. 10/A502 – REVISE Details
- 10) DRAWING A508 – ENTRANCE SIGN DETAILS
 - a. 1/A508 – REVISE Pier Detail
 - b. 3/A508 – REVISE Pier Detail
 - c. 5/A508 – REVISE Wall Section
 - d. 6/A508 – REVISE Wall Section
 - e. ADD 12/A508 – Transverse Wall Section at Entrance Sign
- 11) DRAWING A601 - FINISH SCHEDULE, CASEWORK SCHEDULE AND TILE PATTERNS
 - a. REVISE Finish Schedule: A130A – REVISE Wall Fin to “1”
 - b. REVISE Finish Schedule: A131A – REVISE Wall Fin to “1”
 - c. REVISE Casework Schedule: ADD B-18 / 100 / 36” w x 24” h x12” d / 3
- 12) DRAWING A701 – INTERIOR ELEVATIONS
 - a. 3/A701 – ADD WD Panel Reveal Layout
- 13) DRAWING A703 – INTERIOR ELEVATIONS
 - a. 6/A703 – REVISE Millwork
- 14) DRAWING M401 – MECHANICAL ROOM EQUIPMENT PLAN
 - a. 1/M401 – REVISE Layout
- 15) DRAWING M601 – MECHANICAL SCHEDULES
 - a. REVISE Ductless Split System Unit Schedule
- 16) DRAWING FA101A – FIRE ALARM PARTIAL FIRST FLOOR PLAN
 - a. REVISE locations of FRA and FACP panels.
- 17) DRAWING FA103 – FIRE ALARM MAINTENANCE BUILDING
 - a. REVISE locations of FACP panel.
- 18) DRAWING E105 – ELECTRICAL FIRST FLOOR PLAN POWER
 - a. ADD power for Mechanical Equipment.
- 19) DRAWING E106 – ELECTRICAL MEZZANINE PLANS BOILER ROOM HVAC - POWER



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- a. ADD/REVISE power for Mechanical Equipment.
- 20) DRAWING E107 – ELECTRICAL MAINTENANCE BUILDING POWER
 - a. REVISE Panels / Transformers
- 21) DRAWING E113 – ELECTRICAL MAIN DISTRIB. PANEL MDP SINGLE LINE DISTRIBUTION DIAGRAM
 - a. REVISE PANEL RP-D
- 22) DRAWING E114 – ELECTRICAL EMERG. DISTRIB. PANEL EDP-1 SINGLE LINE DISTRIBUTION DIAGRAM
 - a. REVISE PANEL EP-E
- 23) DRAWING E115 – ELECTRICAL EMERG. DISTRIB. PANEL EDP-2 SINGLE LINE DISTRIBUTION DIAGRAM
 - a. REVISE Single Line Diagram
- 24) DRAWING E117 – ELECTRICAL DISTRIB PENAL DP-1 SINGLE LINE DISTRIBUTION DIAGRAM
 - a. REVISE Single Line Diagram
- 25) DRAWING E119 – ELECTRICAL EMER. MOTOR CONTROL ECENTER EMCC-1 SINGLE LINE DISTRIBUTION DIAGRAM
 - a. REVISE Single Line Diagram
- 26) DRAWING E123 – ELECTRICAL PANEL SCHEDULES
 - a. REVISE Panels GP-A and RP-D
- 27) DRAWING E123A – ELECTRICAL MAINTENANC BUILDING - PANEL SCHEDULES
 - a. REVISE Panel EP-E



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Attachments:

SECTION 004100 – BID FORM
SECTION 263604 – NON-AUTOMATIC TRANSFER SWITCH
SECTION 264300 – BSD-SURGE PROTECTIVE DEVICES
SECTION 312000 – EARTH MOVING
LIGHT FIXTURE CUT SHEETS FOR ALTERNATE FIXTURES “T”, “T1”, “K”, “K1”
DRAWING S102A – FLOOR & ROOF FRAMING PLAN – AREA A
DRAWING S102B – P.H. ROOF FRAMING PLAN
DRAWING S303 – GENERATOR PAD AND PLATFORM
DRAWING A105A – FINISH FLOOR PLAN – AREA A
DRAWING A105B – FINISH FLOOR PLAN – AREA B
DRAWING A401 – ENLARGED PLANS AND SECTIONS
DRAWING A402 – ENLARGED PLANS SECTIONS AND ELEVATION AT HOLDING
DRAWING A404 – ENLARGED MILLWORK PLANS AND DETAILS
DRAWING A502 – WALL DETAILS
DRAWING A508 – ENTRANCE SIGN DETAILS
DRAWING A601 - FINISH SCHEDULE, CASEWORK SCHEDULE AND TILE PATTERNS
DRAWING A701 – INTERIOR ELEVATIONS
DRAWING A703 – INTERIOR ELEVATIONS
DRAWING M401 – MECHANICAL ROOM EQUIPMENT PLAN
DRAWING M601 – MECHANICAL SCHEDULES
DRAWING FA103 – FIRE ALARM MAINTENANCE BUILDING
DRAWING E105 – ELECTRICAL FIRST FLOOR PLAN POWER
DRAWING E106 – ELECTRICAL MEZZANINE PLANS BOILER ROOM HVAC – POWER
DRAWING E107 – ELECTRICAL MAINTENANCE BUILDING POWER
DRAWING E113 – ELECTRICAL MAIN DISTRIB. PANEL MDP SINGLE LINE DISTRIBUTION DIAGRAM
DRAWING E114 – ELECTRICAL EMERG. DISTRIB. PANEL EDP-1 SINGLE LINE DISTRIBUTION DIAGRAM
DRAWING E115 – ELECTRICAL EMERG. DISTRIB. PANEL EDP-2 SINGLE LINE DISTRIBUTION DIAGRAM
DRAWING E117 – ELECTRICAL DISTRIB PENAL DP-1 SINGLE LINE DISTRIBUTION DIAGRAM
DRAWING E119 – ELECTRICAL EMER. MOTOR CONTROL ECENTER EMCC-1 SINGLE LINE
DISTRIBUTION DIAGRAM
DRAWING E123 – ELECTRICAL PANEL SCHEDULES
DRAWING E123A – ELECTRICAL MAINTENANC BUILDING - PANEL SCHEDULES

201111600_BPII_Addendum_06.doc

DELAWARE STATE POLICE NEW TROOP 3 – BID PACK II - BUILDINGS
KENT COUNTY, DELAWARE
CONTRACT # MJ450600001

BID FORM

For Bids Due: Until 9:00 am (Local Time) **To:** State of Delaware, Office of Management and Budget
May 2, 2014 Division of Facilities Management
540 S. DuPont Highway, Suite 1
Dover, Delaware 19901
Attn: Rich Glazeski

Name of Bidder: _____

Delaware Business License No.: _____ **Taxpayer ID No.:** _____

(Other License Nos.): _____

Phone No.: () _____ - _____ **Fax No.:** () _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

\$ _____
(\$)

ALTERNATES

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An “ADD” or “DEDUCT” amount is indicated by the crossed out part that does not apply.

ALTERNATE No. 1: Construction of Maintenance Building and associated construction. Refer to drawings and specifications for scope.

Add/Deduct: _____
(\$)

ALTERNATE No. 2: Provide Asphalt Shingle Roof and Modified Bitumen Roofing in Lieu of Standing Seam Metal Roofing. Refer to drawings and specifications for scope.

Add/Deduct: _____
(\$)

ALTERNATE No. 3: Provide Rubber Base and VCT Flooring in Lieu of Wood Base and Resinous Flooring at Corridors. Refer to drawings and specifications for scope.

Add/Deduct: _____
(\$ _____)

ALTERNATE No. 4: Provide insulated metal panel in lieu of standard metal panel at Maintenance Building. Refer to drawings and specifications for scope.

Add/Deduct: _____
(\$ _____)

ALTERNATE No. 5: Provide Alternate Bricks in Lieu of Base Bid Bricks. Refer to drawings and specifications for scope.

Add/Deduct: _____
(\$ _____)

ALTERNATE No. 6: Provide Alternate Light Fixtures in lieu of Base Bid Light Fixtures.

Add/Deduct: _____
(\$ _____)

DELAWARE STATE POLICE NEW TROOP 3
KENT COUNTY, DELAWARE
CONTRACT # MJ450600001

BID FORM

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for sixty (60) days from the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within _____ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ **By:** _____
(SEAL) (Authorized Signature)

(Title)
Date: _____

ATTACHMENTS

- Sub-Contractor List
- Non-Collusion Statement
- Bid Security
- (Others as Required by Project Manuals)

DELAWARE STATE POLICE NEW TROOP 3
KENT COUNTY, DELAWARE
CONTRACT # MJ4506000001

BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor **must be listed for each category** where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the *Owner*, **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.**

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>	<u>Subcontractors tax payer ID # or Delaware Business license #</u>
1. <u>Concrete</u>	_____	_____	_____
2. <u>Masonry</u>	_____	_____	_____
3. <u>Electrical</u>	_____	_____	_____
4. <u>Mechanical</u>	_____	_____	_____
5. <u>Plumbing</u>	_____	_____	_____
6. <u>Roofing</u>	_____	_____	_____
7. <u>Steel Erection</u>	_____	_____	_____
8. <u>Painting</u>	_____	_____	_____

- 9. **Drywall** _____
- 10. **Resinous Floor Systems** _____
- 11. **Resilient Floor Systems** _____
- 12. **Carpet Floor Systems** _____
- 13. **Ceilings** _____
- 14. **Millwork / Casework** _____
- 15. **Storefront / Curtainwall** _____
- 16. **Pre-Eng. Metal Building** _____
- 17. **Fire Alarm** _____
- 18. **Fire Sprinkler** _____
- 19. **Ballistic Materials** _____
- 20. **Insulating Air Barrier** _____

DELAWARE STATE POLICE NEW TROOP 3
KENT COUNTY, DELAWARE
CONTRACT # MJ450600001

BID FORM
NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date (*to the Office of Management and Budget, Division of Facilities Management*).

All the terms and conditions of (*Project or Contract Number*) have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

SECTION 263604
NON-AUTOMATIC TRANSFER SWITCH

PART 1 GENERAL**1.01 SCOPE**

- A. Furnish and install automatic transfer switch (7NTS) with 3 poles, 1600 amps, 480 volt, and withstand and close-on rating of 42,000 AIC minimum. Each automatic transfer shall consist of an inherently double throw power transfer switch mechanism and a microprocessor controller to provide automatic operation. All automatic transfer & by-pass isolation switches and controllers shall be the products of the same manufacturer.

1.02 CODES AND STANDARDS

- A. The automatic transfer switches and controls shall conform to the requirements of:
- B. UL 1008 - Standard for Transfer Switch Equipment
- C. IEC 947-6-1 Low-voltage Switchgear and Control gear; Multifunction equipment; Automatic Transfer Switching Equipment
- D. NFPA 70 - National Electrical Code; National Fire Protection Association; Most recent edition adopted by the Authority Having Jurisdiction, including all applicable amendments and supplements.
- E. NFPA 99 - Essential Electrical Systems for Health Care Facilities
- F. NFPA 110 - Emergency and Standby Power Systems
- G. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- H. NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches
- I. UL 508 Industrial Control Equipment

1.03 ACCEPTABLE MANUFACTURERS

- A. Non-Automatic transfer switch shall be ASCO 7000 Series. Non-Automatic transfer switch may also be provided by Russelectric or MTU. Any alternate shall be submitted for approval to the consulting engineer at least 10 days prior to bid. Bids must list any deviations from this specification.
- B. ASCO Series 7000, Part number 7NTSA31600N5XC

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide catalog sheets showing voltage, switch size, ratings and size of switching and overcurrent protective devices, operating logic, short circuit rating, dimensions, and enclosure details.
- C. Manufacturer's Instructions: Indicate application conditions, and limitations of use stipulated by the product testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of product.
- D. Operation Data: Instructions for operating equipment under emergency conditions when engine generator is running.
- E. Maintenance Data: Routine preventative maintenance and lubrication schedule. List special tools, maintenance materials, and replacement parts.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70
- B. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience and with service facilities within 100 miles of the project site.

- C. Supplier Qualifications: Authorized distributor of specified manufacturer with three years documented experience.
- D. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- E. The transfer switch manufacturer shall maintain a national service organization of company-employed personnel located throughout the contiguous United States. The service center's personnel shall be factory trained and shall be on call 24 hours a day, 365 days a year.
- F. The manufacturer shall maintain records of each switch, by serial number for a minimum of 20 years.

PART 2 PRODUCTS

2.01 MECHANICALLY HELD TRANSFER SWITCH

- A. The transfer switch shall be electrically operated and mechanically held. The electrical operator shall be a momentarily energized, single-solenoid mechanism. Main operators which include overcurrent disconnect devices, linear motors or gears shall not be acceptable. The switch shall be mechanically interlocked to ensure only two possible positions, normal or emergency.
- B. All transfer switch sizes shall use only one type of main operator for ease of maintenance and commonality of parts.
- C. The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life.
- D. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented, blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts.
- E. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. Switches rated 600 amps and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars.
- F. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof, which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.
- G. Where neutral conductors are to be solidly connected as shown on the plans, a neutral conductor plate with fully rated AL-CU pressure connectors shall be provided.

2.02 MICROPROCESSOR CONTROLLER

- A. The controller's sensing and logic shall be provided by a single built-in microprocessor for maximum reliability, minimum maintenance, and the ability to communicate serially through an optional serial communication module. (ASCO accessory 72E)
- B. A single controller shall provide twelve selectable nominal voltages for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to $\pm 1\%$ of nominal voltage. Frequency sensing shall be accurate to $\pm 0.2\%$. The panel shall be capable of operating over a temperature range of -20 to +60 degrees C and storage from -55 to +85 degrees C.
- C. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance. Sensing and control logic shall be provided on multi-layer printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers. The panel shall be enclosed with a protective cover and be mounted separately from the transfer switch unit for safety and ease of maintenance. The protective cover shall include a built-in pocket for storage of the operator's manuals.
- D. All customer connections shall be wired to a common terminal block to simplify field-wiring connections.

- E. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:
- | | | |
|----|------------------------|--|
| 1. | EN 55011:1991 | Emission standard - Group 1, Class A |
| 2. | EN 50082-2:1995 | Generic immunity standard, from which: |
| 3. | EN 61000-4-2:1995 | Electrostatic discharge (ESD) immunity |
| 4. | ENV 50140:1993 | Radiated Electro-Magnetic field immunity |
| 5. | EN 61000-4-4:1995 | Electrical fast transient (EFT) immunity |
| 6. | EN 61000-4-5:1995 | Surge transient immunity |
| 7. | EN 61000-4-6:1996 | Conducted Radio-Frequency field immunity |
| 8. | IEEE472 (ANSI C37.90A) | Ring Wave Test. |

2.03 ENCLOSURE

- A. The NTS shall be furnished in a Type 1 enclosure unless otherwise shown on the plans.
- B. All standard and optional door-mounted switches and pilot lights shall be 16-mm industrial grade type or equivalent for easy viewing & replacement. Door controls shall be provided on a separate removable plate, which can be supplied loose for open type units.

2.04 COMPONENTS

- A. Indicating Lights: Mount in cover of enclosure to indicate NORMAL SOURCE AVAILABLE, ALTERNATE SOURCE AVAILABLE, and SWITCH POSITION.
- B. "Push-to-Test feature on all pilot light indicators. ASCO accessory 99
- C. Return to Normal Switch: Mount in cover of enclosure to initiate manual transfer from alternate source to normal source.
- D. Transfer Switch Auxiliary Contacts: Additional auxiliary contacts to indicate switch position: 2 normally open; 2 normally closed. ASCO accessory 14A/14B
- E. Alternate Source Monitor: Monitor alternate source voltage and frequency; inhibit transfer when voltage is below 85 percent or frequency varies more than 3 percent from rated nominal value.
- F. Neutral: Solid with fully rated terminals. (AL-CU) UL Listed.
- G. Enclosure: ICS 10, Type 1, finished with manufacturer's standard gray enamel.
- H. Serial Communications: Provide serial communications module for remote communications to ASCO POWERQUEST products. ASCO accessory 72A
- I. Certification of compliance with the American Recovery & Reinvestment ACT (Buy American Provision) ASCO accessory 131
- J. Microprocessor based ASCO 5200 Series Power Manager: Provides real time measurements of the three phase power system. Eight Digital Inputs, Four Relay Outputs. RS485 (2) or (4) wire serial capability. Include Modbus RTU, Ethernet Compatible. Measurements to include:
1. Voltage: Line to Line: VAB, VBC, VCA, V average, Line to Neutral: VAN, VBN, VCN, Vaverage.
 2. Frequency: 45.0-66.0 Hertz
 3. Current: IA, IB, IC, I average
 4. Unbalance %: Voltage, Amps.
 5. Real Power: KWA, KWB, KWC, KWNET
 6. Reactive Power: KVARA, KVARB, KVARC, KVARNET
 7. Apparent Power: KVAA, KVAB, KVAC, KVANET
 8. Real Energy: KWHIMPORT, KWHEXPORT, KWHNET
 9. Reactive Energy: KVARHIMPORT, KVARHEXPORT, KVARHNET
 10. Power Factor: PFA, PFB, PFC, PFNET
- K. Controller Display and Keypad.
1. A four line, 20 character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial

communications input port. The following parameters shall only be adjustable via DIP switches on the controller:

- a. Nominal line voltage and frequency Controller.
 - b. Single or three phase sensing
 - c. Operating parameter protection
 - d. Transfer operating mode configuration (Open Transition)
2. All instructions and controller settings shall be easily accessible, readable and accomplished without the use of codes, calculations, or instruction manuals.

PART 3 OPERATION

3.01 CONTROLLER DISPLAY AND KEYPAD

- A. A four line, 20 character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial communications input port. The following parameters shall only be adjustable via DIP switches on the controller:
- 1. Nominal line voltage and frequency
 - 2. Single or three phase sensing
 - 3. Operating parameter protection
 - 4. Transfer operating mode configuration
 - 5. (Open transition, Closed transition or Delayed transition)
- B. All instructions and controller settings shall be easily accessible, readable and accomplished without the use of codes, calculations, or instruction manuals.

3.02 VOLTAGE, FREQUENCY AND PHASE ROTATION SENSING

- A. Voltage and frequency on both the normal and emergency sources (as noted below) shall be continuously monitored, with the following pickup, dropout and trip setting capabilities (values shown as % of nominal unless otherwise specified):
- | B. Parameter | Sources | Dropout / Trip | Pickup / Reset |
|----------------------|---------|----------------|------------------|
| C. Undervoltage | N&E,3f | 70 to 98% | 85 to 100% |
| D. Overvoltage | N&E,3f | 102 to 115% | 2% below trip |
| E. Underfrequency | N&E | 85 to 98% | 90 to 100% |
| F. Overfrequency | N&E | 102 to 110% | 2% below trip |
| G. Voltage unbalance | N&E | 5 to 20% | 1% below dropout |
- H. Repetitive accuracy of all settings shall be within $\pm 0.5\%$ over an operating temperature range of -20°C to 60°C .
- I. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad or remotely via serial communications port access.
- J. The controller shall be capable (when activated by the keypad or through the serial port) of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or CBA).
- K. Source status screens shall be provided for both normal & emergency to provide digital readout of voltage on all 3 phases, frequency, and phase rotation.

3.03 POWER MANAGER

- A. Furnish Power Managers at locations shown to monitor all functions specified below.
- 1. The Power Managers shall be listed to UL 3111-1, CSA, CE Mark, and industrially rated for an operating temperature range of -20 C to 60 C .
 - 2. The Power Manager shall be accurate to 1% measured, 2% computed values and display resolution to 1%. Voltage and current for all phases shall be sampled simultaneously to assure high accuracy in conditions of low power factor or large waveform distortions (harmonics).

3. The Power Manager shall be capable of operating without modification at nominal frequencies of 45 to 66 Hz and over a control power input range of 20 - 32 VDC.
4. Each Power Manager shall be capable of interfacing with an optional communications module to permit information to be sent to central location for display, analysis, and logging.
5. The Power Manager shall accept inputs from industry standard instrument trans-formers (120 VAC secondary PTs and 5A secondary CTS.) Direct phase voltage connections, 800 VAC and under, shall be possible without the use of PT's.
6. The Power Manager shall be applied in single, 3-phase, or three & four wire circuits. A fourth CT input shall be available to measure neutral or ground current.
7. All setup parameters required by the Power Managers shall be stored in non-volatile memory and retained in the event of a control power interruption.
8. The following metered readings shall be communicated by the Power Manager, via serial communication, when equipped with optional serial communications module:
 - a. Current, per phase RMS and neutral.
 - b. Current Unbalance %
 - c. Voltage, phase-to-phase and phase-to-neutral
 - d. Voltage Unbalance %
 - e. Real power (KW), per phase and 3-phase total
 - f. Apparent power (KVA), per phase and 3-phase total
 - g. Reactive power (KVAR), per phase and 3-phase total
 - h. Power factor, 3-phase total & per phase
 - i. Frequency
 - j. Accumulated Energy, (MWH, MVAH, and MVARH)
- B. The following energy readings shall be communicated by the Power Manager:
 1. Accumulated real energy KWH
 2. Accumulated reactive energy KVAH
 3. Accumulated apparent energy KVARH
- C. NOTE: For real and reactive energy reported values, separate total for energy flow from each source shall be stored, including the arithmetic sum.
- D. Power Manager Input/Output Options.
 1. Power Managers shall be equipped with the following I/O
 - a. Provide (8) solid state status inputs.
 - b. Provide four (4) relay output contacts

3.04 ADDITIONAL FEATURES

- A. A SPDT contact, rated 5 amps at 30 VDC, shall be provided for a low-voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.
- B. Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the NTS is connected to the normal source and one contact closed, when the NTS is connected to the emergency source.
- C. LED indicating lights (16 mm industrial grade, type 12) shall be provided; one to indicate when the NTS is connected to the normal source (green) and one to indicate when the NTS is connected to the emergency source (red).
- D. LED indicating lights (16 mm industrial grade, type 12) shall be provided and energized by controller outputs. The lights shall provide true source availability of the normal and emergency sources, as determined by the voltage sensing trip and reset settings for each source.
- E. The following features shall be built-in to the controller, but capable of being activated through keypad programming or the serial port only when required by the user:

- F. Provide the ability to select “commit/no commit to transfer” to determine whether the load should be transferred to the emergency generator if the normal source restores before the generator is ready to accept the load.
- G. Terminals shall be provided for a remote contact which opens to signal the NTS to transfer to emergency and for remote contacts which open to inhibit transfer to emergency and/or retransfer to normal. Both of these inhibit signals can be activated through the keypad or serial port.
- H. An Inphase monitor shall be provided in the controller. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The inphase monitor shall be specifically designed for and be the product of the NTS manufacturer. The inphase monitor shall be equal to ASCO Feature 27.
- I. The controller shall be capable of accepting a normally open contact that will allow the transfer switch to function in a non-automatic mode using an external control device.
- J. System Status - The controller LCD display shall include a “System Status” screen which shall be readily accessible from any point in the menu by depressing the “ESC” key a maximum of two times. This screen shall display a clear description of the active operating sequence and switch position. For example,
 - 1. Normal Failed
 - 2. Load on Normal
 - 3. TD Normal to Emerg
 - 4. 2min15s
- K. Controllers that require multiple screens to determine system status or display “coded” system status messages, which must be explained by references in the operator’s manual, are not permissible.
- L. Self Diagnostics - The controller shall contain a diagnostic screen for the purpose of detecting system errors. This screen shall provide information on the status input signals to the controller which may be preventing load transfer commands from being completed.
- M. Communications Interface - The controller shall be capable of interfacing, through an optional serial communication module, with a network of transfer switches, locally (up to 4000 ft.) or remotely through modem serial communications. Standard software specific for transfer switch applications shall be available by the transfer switch manufacturer. This software shall allow for the monitoring, control and setup of parameters.
- N. Data Logging - The controller shall have the ability to log data and to maintain the last 99 events, even in the event of total power loss. The following events shall be time and date stamped and maintained in a non-volatile memory:
 - 1. Event Logging
 - a. Data and time and reason for transfer normal to emergency.
 - b. Data and time and reason for transfer emergency to normal.
 - c. Data and time and reason for engine start.
 - d. Data and time engine stopped.
 - e. Data and time emergency source available.
 - f. Data and time emergency source not available.
 - 2. Statistical Data
 - a. Total number of transfers.
 - b. Total number of transfers due to source failure.
 - c. Total number of days controller is energized.
 - d. Total number of hours both normal and emergency sources are available.
- O. Communications Module - A full duplex RS485 interface shall be installed in the NTS controller to enable serial communications. The serial communications shall be capable of a direct connect or multi-drop configured network. This module shall allow for the seamless integration of existing or new communication transfer devices. The serial communication interface shall be equal to ASCO Accessory 72.

3.05 PART 4 ADDITIONAL REQUIREMENTS**3.06 WITHSTAND AND CLOSING RATINGS**

- A. The NTS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the NTS terminals with the type of overcurrent protection shown on the plans.
- B. The NTS shall be UL listed in accordance with UL 1008 and be labeled in accordance with that standard's 1½ and 3 cycle, long-time ratings. NTS's which are not tested and labeled with 1½ and 3 cycle (any breaker) ratings and have series, or specific breaker ratings only, are not acceptable.

3.07 TESTS AND CERTIFICATION

- A. The complete ATS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements.
- B. Upon request, the manufacturer shall provide a notarized letter certifying compliance with all of the requirements of this specification including compliance with the above codes and standards, and withstand and closing ratings. The certification shall identify, by serial number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of the submittal, shall be included in the certification.
- C. The NTS manufacturer shall be certified to ISO 9001 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, installation and servicing in accordance with ISO 9001.

3.08 SERVICE REPRESENTATION

- A. The NTS manufacturer shall maintain a national service organization of company-employed personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.
- B. The manufacturer shall maintain records of each switch, by serial number, for a minimum of 20 years.

END OF SECTION

SECTION 264300
SURGE PROTECTIVE DEVICES

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Surge protective devices for service entrance locations.

1.02 RELATED REQUIREMENTS

- A. Section 260526 - Grounding and Bonding.
- B. Section 262413 - Switchboards.
- C. Section 262416 - Panelboards.
- D. Section 262419 - Motor Control Centers.

1.03 ABBREVIATIONS AND ACRONYMS

- A. EMI/RFI: Electromagnetic Interference/Radio Frequency Interference.
- B. SPD: Surge Protective Device.

1.04 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2008.
- C. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; International Electrical Testing Association; 2013 (ANSI/NETA ATS).
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate size and location of overcurrent device compatible with the actual surge protective device and location to be installed. Notify DEDC, LLC of any conflicts or deviations from the contract documents to obtain direction prior to ordering equipment.

1.06 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Include detailed component information, voltage, surge current ratings, repetitive surge current capacity, voltage protection rating (VPR) for all protection modes, maximum continuous operating voltage (MCOV), nominal discharge current (I-n), short circuit current rating (SCCR), connection means including any required external overcurrent protection, enclosure ratings, outline and support point dimensions, weight, service condition requirements, and installed features.
 - 1. SPDs with EMI/RFI filter: Include noise attenuation performance.
- C. Shop Drawings: Include wiring diagrams showing all factory and field connections with wire and circuit breaker/fuse sizes.
- D. Certificates: Manufacturer's documentation of listing for compliance with the following standards:
 - 1. UL 1449.
 - 2. UL 1283 (for Type 2 SPDs).
- E. Field Quality Control Test Reports.
- F. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- G. Operation and Maintenance Data: Include information on status indicators and recommended maintenance procedures and intervals.

- H. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in State of Delaware OMB- Department of Facilities Management's name and registered with manufacturer.
- I. Project Record Documents: Record actual connections and locations of surge protective devices.

1.07 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.08 DELIVERY, STORAGE, AND PROTECTION

- A. Store in a clean, dry space in accordance with manufacturer's written instructions.

1.09 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.10 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Manufacturer's Warranty: Provide minimum five year warranty covering repair or replacement of surge protective devices showing evidence of failure due to defective materials or workmanship.
- C. Exclude surge protective devices from any clause limiting warranty responsibility for acts of nature, including lightning, stated elsewhere.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Schneider Electric; Square D Brand Surgellogic Products as indicated under product article(s) below; www.surgellogic.com.
- B. Factory-installed, Internally Mounted Surge Protective Devices:
 - 1. Same as manufacturer of equipment containing surge protective device, to provide a complete listed assembly including SPD.
- C. Source Limitations: Furnish surge protective devices produced by a single manufacturer and obtained from a single supplier.

2.02 ALL SURGE PROTECTIVE DEVICES

- A. Description: Factory-assembled surge protective devices (SPDs) for 60 Hz service, listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated; system voltage as indicated on the drawings.
- B. Protected Modes:
 - 1. Wye Systems: L-N, L-G, N-G, L-L.
- C. UL 1449 Voltage Protection Ratings (VPRs):
 - 1. Equivalent to basis of design.
- D. UL 1449 Maximum Continuous Operating Voltage (MCOV): Not less than 115% of nominal system voltage.
- E. Enclosure Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - 1. Indoor clean, dry locations: Type 1.

2.03 SURGE PROTECTIVE DEVICES FOR SERVICE ENTRANCE LOCATIONS

- A. Unless otherwise indicated, provide factory-installed, internally mounted SPDs.
- B. List and label as complying with UL 1449, Type 1 when connected on line side of service disconnect overcurrent device and Type 1 or 2 when connected on load side of service disconnect overcurrent device.
- C. Provide SPDs utilizing field-replaceable modular or non-modular protection circuits.
- D. Surge Current Rating: Not less than 120 kA per mode/240 kA per phase.
- E. UL 1449 Nominal Discharge Current (I-n): 20 kA.
- F. UL 1449 Short Circuit Current Rating (SCCR): Not less than the available fault current at the installed location as indicated on the drawings.
- G. Diagnostics:
 - 1. Protection Status Monitoring: Provide indicator lights to report the protection for each phase.
 - 2. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.
- H. Basis of Design: Schneider Electric; Square D Brand SurgeLogic Products; www.surgeLogic.com.
 - 1. Factory-installed, Internally Mounted Surge Protective Devices:
 - a. IMA Series: Replaceable modules; 200 kA SCCR; individually fused MOVs, thermal fusing; dry contacts; EMI/RFI filtering; surge counter; duty cycle tested for 20,000 impulses; 10 year warranty.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that the service voltage and configuration marked on the SPD are consistent with the service voltage and configuration at the location to be installed.
- B. Verify system grounding and bonding is in accordance with Section 260526, including bonding of neutral and ground for service entrance and separately derived systems where applicable. Do not energize SPD until deficiencies have been corrected.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Perform work in a neat and workmanlike manner in accordance with NECA 1.
- B. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- C. Unless indicated otherwise, connect service entrance surge protective device on load side of service disconnect main overcurrent device.
- D. Do not energize SPD until bonding of neutral and ground for service entrance and separately derived systems is complete in accordance with Section 260526 where applicable. Replace SPDs damaged by improper or missing neutral-ground bond.

3.03 FIELD QUALITY CONTROL

- A. Perform inspection, testing, and adjusting in accordance with Section 014000.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS Section 7.19.1.
- D. Procure services of a qualified manufacturer's representative to observe installation and assist in inspection, testing, and adjusting. Include manufacturer's reports with field quality control submittals.

3.04 CLEANING

- A. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Preparing subgrades for slabs-on-grade.
- 2. Excavating and backfilling for buildings and structures.
- 3. Drainage course for concrete slabs-on-grade.

B. Related Sections:

- 1. Section 033000 "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

- 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
- 2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

- 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional

excavation and replacement material will be paid for according to Contract provisions for unit prices.

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. (0.57 cu. m) or more in volume that exceed a standard penetration resistance of 100 blows/2 inches (97 blows/50 mm) when tested by a geotechnical testing agency, according to ASTM D 1586.

I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

J. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

K. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

L. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Geotextiles.
2. Warning tapes.

B. Samples for Verification: For the following products, in sizes indicated below:

1. Geotextile: 12 by 12 inches (300 by 300 mm).
2. Warning Tape: 12 inches (300 mm) long; of each color.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.

- C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.6 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.
- B. Preexcavation Conference: Conduct conference at Project site.

1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
 - 1. Do not proceed with work on adjoining property until directed by Architect.
- C. Utility Locator Service: Notify "Miss Utility" for area where Project is located before beginning earth moving operations.
- D. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, are in place.
- E. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- F. Do not direct vehicle or equipment exhaust towards protection zones.
- G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
 - 1. Satisfactory soils must be approved by Geotechnical Engineer.
 - 2. Liquid Limit: Per Geotechnical Engineer.
 - 3. Plasticity Index: Per Geotechnical Engineer.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
- I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.
- J. Sand: ASTM C 33; fine aggregate.
- K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 GEOTEXTILES

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
1. Survivability: Class 2; AASHTO M 288.
 2. Grab Tensile Strength: 157 lbf (700 N); ASTM D 4632.
 3. Sewn Seam Strength: 142 lbf (630 N); ASTM D 4632.
 4. Tear Strength: 56 lbf (250 N); ASTM D 4533.
 5. Puncture Strength: 56 lbf (250 N); ASTM D 4833.
 6. Apparent Opening Size: No. 60 (0.250-mm) sieve, maximum; ASTM D 4751.
 7. Permittivity: 0.2 per second, minimum; ASTM D 4491.
 8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.
- B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
1. Survivability: Class 2; AASHTO M 288.
 2. Grab Tensile Strength: 247 lbf (1100 N); ASTM D 4632.
 3. Sewn Seam Strength: 222 lbf (990 N); ASTM D 4632.
 4. Tear Strength: 90 lbf (400 N); ASTM D 4533.
 5. Puncture Strength: 90 lbf (400 N); ASTM D 4833.
 6. Apparent Opening Size: No. 60 (0.250-mm) sieve, maximum; ASTM D 4751.
 7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
 8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.3 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; colored as follows:
1. Red: Electric.
 2. Yellow: Gas, oil, steam, and dangerous materials.
 3. Orange: Telephone and other communications.
 4. Blue: Water systems.
 5. Green: Sewer systems.
- B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
1. Red: Electric.
 2. Yellow: Gas, oil, steam, and dangerous materials.
 3. Orange: Telephone and other communications.

4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Pile Foundations: Stop excavations 6 to 12 inches (150 to 300 mm) above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

3.6 SUBGRADE INSPECTION

- A. Notify Owner's Geotechnical Engineer when excavations have reached required subgrade.
- B. If Owner's Geotechnical Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade as directed by Owner's Geotechnical Engineer to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 1. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Architect.
 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use satisfactory soil material.
 - 3. Under steps and ramps, use engineered fill.
 - 4. Under building slabs, use engineered fill.
 - 5. Under footings and foundations, use engineered fill.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 6 inches (150 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 - 2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 92 percent.
 - 3. Under turf or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.
 - 4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Turf or Unpaved Areas: Plus or minus 1 inch (25 mm).
 - 2. Walks: Plus or minus 1 inch (25 mm).
 - 3. Pavements: Plus or minus 1/2 inch (13 mm).
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.

3.14 SUBSURFACE DRAINAGE

- A. Subdrainage Pipe: Specified in Section 334600 "Subdrainage."
- B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch (150-mm) course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches (300 mm) of filter material, placed in compacted layers 6 inches (150 mm) thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).
 - 1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698.

- C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches (300 mm) of final subgrade, in compacted layers 6 inches (150 mm) thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).
1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698.
 2. Place and compact impervious fill over drainage backfill in 6-inch- (150-mm-) thick compacted layers to final subgrade.

3.15 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 2. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
 3. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
 4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.16 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 2. Determine that fill material and maximum lift thickness comply with requirements.
 3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.
- B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

- E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 500 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 25 feet or less of wall length, but no fewer than two tests.
 3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 25 feet or less of trench length, but no fewer than two tests.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000



FEATURES & SPECIFICATIONS

INTENDED USE — RT85 is designed for applications that require the extremely energy efficient delivery of comfortable volumetric light from a lay-in fixture that is appealing and shallow in depth and where room-side ballast access is required. Ideal for offices, schools, hospitals and numerous other commercial applications. Certain airborne contaminants can diminish integrity of acrylic.

[Click here for Acrylic Environmental Compatibility table for suitable uses.](#)

CONSTRUCTION — Rugged, steel reflectors with embossed facets. Painted after fabrication. Door frame hinges from either side.

Fixtures may be mounted end-to-end.

OPTICS — Delivers volumetric lighting by filling the entire volume of space with light, providing the ideal amount to walls, cubicles, work surfaces and people.

Luminous characteristics are carefully managed at high angles, distributing just enough intensity to deliver the volumetric effect.

98% reflective Alanod MIRO® silver optical assembly efficiently redirects lamp output to the refractor.

Regressed refractive system obscures and softens the lamp and smoothly washes the reflector with light.

Linear faceted reflector softens and distributes light into the space and minimizes the luminance ratio between the fixture and the ceiling.

Mechanical cut-off across the reflector and fresnel refraction along the refractor provide high angle shielding and a quiet ceiling.

Sloped endplates provide a balanced fixture to ceiling ratio while enhancing the perception of fixture depth.

ELECTRICAL — Standard or high-efficiency, CEE premium, instant-start, ≤ 10% THD, universal voltage and sound rated A are available as quick-ship items.

Optional program-start and step-dimming ballasts available.

MAINTENANCE — Lamps accessed by unlatching trim and allowing it to hinge open for easy maintenance. Ballast is accessed from below by removing channel cover.

LISTINGS — UL Listed to U.S. and Canadian standards.

WARRANTY — Fixture guaranteed for one year against mechanical defects in manufacture. Complete warranty terms located at:

www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

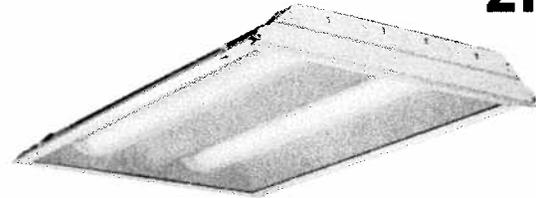
Protected by one or more of US Patents Nos. 7,229,192; D541,467; D541,468; D544,633; D544,634; D544,992; D544,933 and additional patent pending.

Note: Specifications subject to change without notice.

Catalog Number	2RT8S217MVOLTBINPL835HT8
Notes	Add #6 Deduct Alternate
Type	I



2RT8S



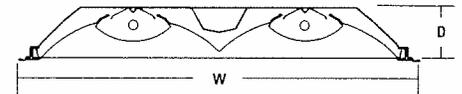
2 X 2
2 Lamps
T8

Specifications

Length: 24 (61.0)

Width: 24 (61.0)

Depth: 3-1/4 (8.1)



All dimensions are inches (centimeters) unless otherwise specified.

ORDERING INFORMATION

For shortest lead times, configure products using **bolded options**.

Example: 2RT8S 2 17 MVOLT BILP L835HT8

2RT8S		2	17	MVOLT	BINP	L835HT8	
Series	Trim type	Number of lamps	Wattage	Voltage	Ballast	Lamp	Options
2RT8S	(blank) Lay-in grid F Overlapping flanged	2	17 17W T8 (24")	MVOLT ¹ 347	BILP IS, high efficiency, .78 bf (low) ² BINP IS, high efficiency, .88 bf (normal) ² GEB10IS IS, .88 ballast factor BSNP PS, step-dimming, high efficiency, .88 bf (normal) ^{2,3}	L835HT8 1400 lumen long life, 3500° K LP735 1300 lumen, 3500° K	GLR Fast-blow fuse ⁴ EL Emergency battery pack (nominal 300 lumens) EL14 Emergency battery pack (nominal 1200 lumens) ⁵ PWS1836 6' prewire, 3/8" diameter, 18 gauge, 3-wires ⁶ PWS1846 6' prewire, 3/8" diameter, 18 gauge, 4-wires ⁷ QFC Quick-flex fixture cable, factory installed prewired cable (RELOC*) ⁴

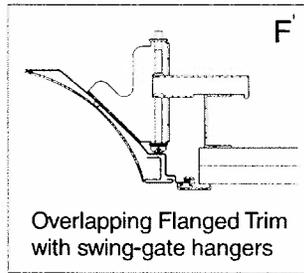
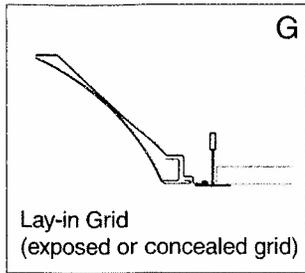
Notes

- MVOLT standard for 120V-277V applications.
- NEMA premium ballast to qualify for many utility rebates.
- Not available with 347 volt.
- Must specify voltage, 120 or 277.
- Increases fixture depth.
- For use with standard ballast.
- For use with step-dimming ballast.

2RT8S Volumetric Recessed Lighting 2' x 2'

MOUNTING DATA

Continuous row mounting of flanged units requires CRE and CRM trim options (see Options).



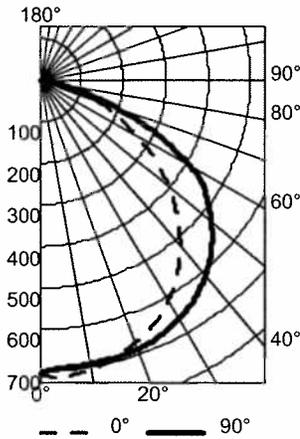
T8 Energy Comparison				
System	Lamp Type	Ballast Factor	Input Watts	Watts Saved Compared to 2-lamp T8
2RT8B 2-lamp BINP T8	F17T8	0.88	31	28

NOTES:

- 1 Recommended rough-in dimensions for F-trim fixtures 24"x24" (Tolerance is +1/4"-0"). Swing-gate range 1-3/16" to 3-15/16". Swing-gate span 23-3/8" to 26-11/16". Fixture swing-gate points require additional 1-1/16" over nominal fixture height.

PHOTOMETRICS

2RT8B 217, (2) F0=17 lamps, 1400 lumens per lamp, s/m 1.3 (along) 1.4 (across), test no. LTL18501



CP Summary

	0°	90°
0°	705	705
5°	713	693
15°	690	691
25°	645	677
35°	567	640
45°	461	575
55°	334	481
65°	207	307
75°	97	99
85°	16	9
90°	0	0

Coefficients of Utilization

pf	20%								
	80%			70%			50%		
pc	70%	50%	30%	50%	30%	10%	50%	30%	10%
pw	ROR								
0	96	96	96	94	94	94	90	90	90
1	88	84	81	82	79	77	79	77	74
2	80	73	68	72	67	63	69	65	61
3	73	64	58	63	57	52	61	56	51
4	67	57	50	56	49	44	54	48	44
5	61	51	43	50	43	38	48	42	37
6	56	46	38	45	38	33	43	37	33
7	52	41	34	41	34	29	39	33	29
8	49	38	31	37	30	26	36	30	26
9	45	34	28	34	28	23	33	27	23
10	42	32	25	31	25	21	30	25	21

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0° - 30°	567	21.4	26.5
0° - 40°	945	35.7	44.2
0° - 60°	1718	64.8	80.4
0° - 90°	2137	80.6	100.0
90° - 180°	0	0.0	0.0
0° - 180°	2137	80.6	100.0

Efficiency: 80.6%

*The LER (Luminaire Efficacy Rating) is the lumens per watt rating for this fixture. It is used to compare the energy efficiency of various products. This photometric report is based upon IES testing procedures, as stated in LM-41-1998.



2RT8S-2X2



FEATURES & SPECIFICATIONS

INTENDED USE — RT8S is designed for applications that require the extremely energy efficient delivery of comfortable volumetric light from a lay-in fixture that is appealing and shallow in depth and where room-side ballast access is required. Ideal for offices, schools, hospitals and numerous other commercial applications. Certain airborne contaminants can diminish integrity of acrylic.

[Click here for Acrylic Environmental Compatibility table for suitable uses.](#)

CONSTRUCTION — Rugged, steel reflectors with embossed facets. Painted after fabrication. Door frame hinges from either side.

Fixtures may be mounted end-to-end.

OPTICS — Delivers volumetric lighting by filling the entire volume of space with light, providing the ideal amount to walls, cubicles, work surfaces and people.

Luminous characteristics are carefully managed at high angles, distributing just enough intensity to deliver the volumetric effect.

98% reflective Alano M^{RO} silver optical assembly efficiently redirects lamp output to the refractor.

Regressed refractive system obscures and softens the lamp and smoothly washes the reflector with light.

Linear faceted reflector softens and distributes light into the space and minimizes the luminance ratio between the fixture and the ceiling.

Mechanical cut-off across the reflector and fresnel refraction along the refractor provide high angle shielding and a quiet ceiling.

Sloped endplates provide a balanced fixture to ceiling ratio while enhancing the perception of fixture depth.

ELECTRICAL — Standard or high-efficiency, CEE premium, instant-start, ≤ 10% THD, universal voltage and sound rated A are available as quick-ship items.

Optional program-start and step-dimming ballasts available.

MAINTENANCE — Lamps accessed by unlatching trim and allowing it to hinge open for easy maintenance. Ballast is accessed from below by removing channel cover.

LISTINGS — UL Listed to U.S. and Canadian standards.

WARRANTY — Fixture guaranteed for one year against mechanical defects in manufacture. Complete warranty terms located at:

www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

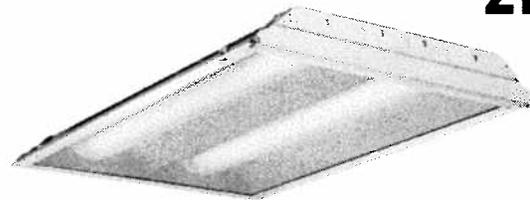
Protected by one or more of US Patents Nos. 7,229,192; D541,467; D541,468; D544,633; D544,634; D544,992; D544,933 and additional patent pending.

Note: Specifications subject to change without notice.

Catalog Number	2RT8S217MVOLTBINPL835HT8EL14
Notes	Add #6 Deduct Alternate
Type	11



2RT8S



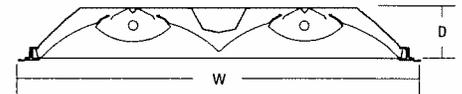
2 X 2
2 Lamps
T8

Specifications

Length: 24 (61.0)

Width: 24 (61.0)

Depth: 3-1/4 (8.1)



All dimensions are inches (centimeters) unless otherwise specified.

ORDERING INFORMATION

For shortest lead times, configure products using **bolded options**.

Example: 2RT8S 2 17 MVOLT BILP L835HT8

2RT8S		2	17	MVOLT	BINP	L835HT8	EL14
Series	Trim type	Number of lamps	Wattage	Voltage	Ballast	Lamp	Options
2RT8S	(blank) Lay-in grid F Overlapping flanged	2	17 17W T8 (24")	MVOLT ¹ 347	BILP IS, high efficiency, .78 bf (low) ² BINP IS, high efficiency, .88 bf (normal) ² GEB10IS IS, .88 ballast factor BSNP PS, step-dimming, high efficiency, .88 bf (normal) ^{3,2}	L835HT8 1400 lumen long life, 3500° K LP735 1300 lumen, 3500° K	GLR Fast-blow fuse ⁴ EL Emergency battery pack (nominal 300 lumens) EL14 Emergency battery pack (nominal 1200 lumens) ⁵ PWS1836 6' prewire, 3/8" diameter, 18 gauge, 3-wires ⁶ PWS1846 6' prewire, 3/8" diameter, 18 gauge, 4-wires ⁷ QFC_ Quick-flex fixture cable, factory installed prewired cable (RELOC [®]) ⁴

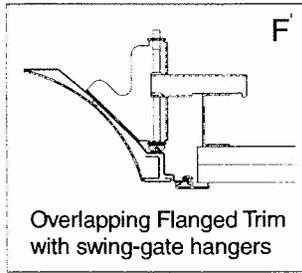
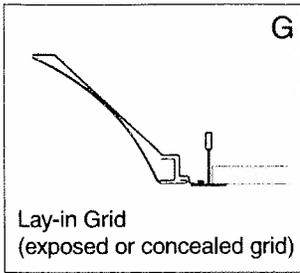
Notes

- MVOLT standard for 120V-277V applications.
- NEMA premium ballast to qualify for many utility rebates.
- Not available with 347 volt.
- Must specify voltage, 120 or 277.
- Increases fixture depth.
- For use with standard ballast.
- For use with step-dimming ballast.

2RT8S Volumetric Recessed Lighting 2' x 2'

MOUNTING DATA

Continuous row mounting of flanged units requires CRE and CRM trim options (see Options).



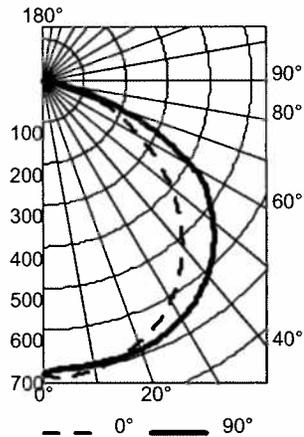
T8 Energy Comparison				
System	Lamp Type	Ballast Factor	Input Watts	Watts Saved Compared to 2-lamp T8
2RT8B 2-lamp BINP T8	F17T8	0.88	31	28

NOTES:

- 1 Recommended rough-in dimensions for F-trim fixtures 24"x24" (Tolerance is +1/4"-0"). Swing-gate range 1-3/16" to 3-15/16". Swing-gate span 23-3/8" to 26-11/16". Fixture swing-gate points require additional 1-1/16" over nominal fixture height.

PHOTOMETRICS

2RT8B 217, (2) F0=17 lamps, 1400 lumens per lamp, s/m 1.3 (along) 1.4 (across), test no. LTL18501



CP Summary		
	0°	90°
0°	705	705
5°	713	693
15°	690	691
25°	645	677
35°	567	640
45°	461	575
55°	334	481
65°	207	307
75°	97	99
85°	16	9
90°	0	0

ROR	Coefficients of Utilization									
	pf	80%			70%			50%		
		pc	70%	50%	30%	50%	30%	10%	50%	30%
0	96	96	96	94	94	94	90	90	90	
1	88	84	81	82	79	77	79	77	74	
2	80	73	68	72	67	63	69	65	61	
3	73	64	58	63	57	52	61	56	51	
4	67	57	50	56	49	44	54	48	44	
5	61	51	43	50	43	38	48	42	37	
6	56	46	38	45	38	33	43	37	33	
7	52	41	34	41	34	29	39	33	29	
8	49	38	31	37	30	26	36	30	26	
9	45	34	28	34	28	23	33	27	23	
10	42	32	25	31	25	21	30	25	21	

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0° - 30°	567	21.4	26.5
0° - 40°	945	35.7	44.2
0° - 60°	1718	64.8	80.4
0° - 90°	2137	80.6	100.0
90° - 180°	0	0.0	0.0
0° - 180°	2137	80.6	100.0

Efficiency: 80.6%

*The LER (Luminaire Efficacy Rating) is the lumens per watt rating for this fixture. It is used to compare the energy efficiency of various products. This photometric report is based upon IES testing procedures, as stated in LM-41-1998.



2RT8S-2X2



Advantage T8

F17T8 ADV835 ALTO

Philips Advantage T8 lamps are an energy-efficient solution and offer high lumen output.

Product data

• General Characteristics

Base	Medium Bi-Pin [Medium Bi-Pin Fluorescent]
Base Information	Green Base
Bulb	T8
Energy Saving	Energy Saving
Rated Avg Life [12-Hr Prog St]	36000 hr
Rated Avg Life [12-Hr Inst St]	30000 hr
Rated Avg Life [3-Hr Prog St]	30000 hr
Rated Avg Life [3-Hr Inst St]	24000 hr

• Light Technical Characteristics

Color Code	Advantage 835 [CCT of 3500K]
Color Rendering Index	85 Ra8
Color Designation	Advantage 835
Color Temperature	3500 K
Initial lumen	1450 Lm
Design Mean Lumens	1405 Lm

• Electrical Characteristics

Watts	17 W
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• Environmental Characteristics

Mercury (Hg) Content	1.7 mg
Picogram per Lumen Hour	50 p/LuHr

• Product Dimensions

Nominal Length [inch]	24
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• Product Data

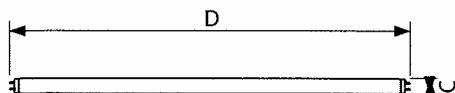
Product number	281311
Full product name	F17T8 ADV835 ALTO
Short product name	F17T8/ADV835 ALTO 30PK
Pieces per Sku	1
eop_pck_cfg	30
Skus/Case	30
Bar code on pack	46677281311
Bar code on case	50046677281316
Logistics code(s)	927850083602
eop_net_weight_pp	0.001 kg

PHILIPS

Dimensional drawing



G13



F17T8 ADV835 ALTO



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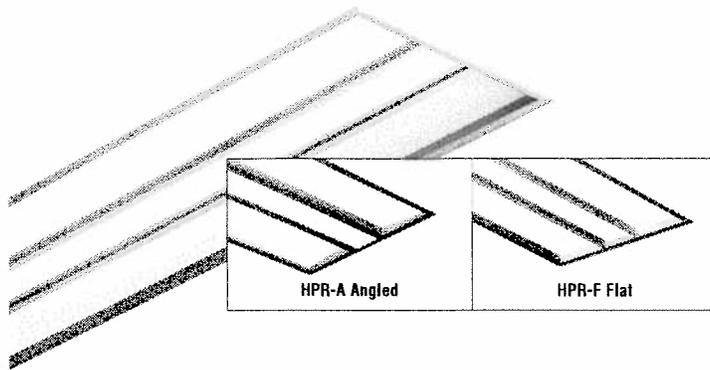
Specifications are subject to change without notice. Trademarks are the property of
Koninklijke Philips N.V. (Royal Philips) or their respective owners.

www.philips.com/lighting

2014, February 1
data subject to change

FINELITE

High Performance Recessed (HPR) 1x4 & 1x2



Date 4/29/14

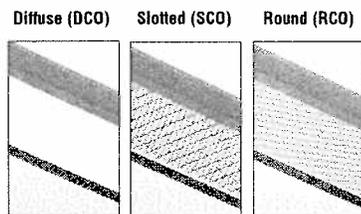
Project DSP Troop 3

Type K

Comments
Addendum #6
Deduct Alternate

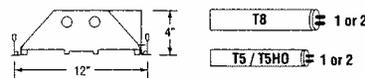
DESCRIPTION

HPR is a highly effective recessed luminaire delivering excellent visual comfort and outstanding performance for offices, schools, healthcare, and retail applications. Advanced optical designs make HPR a powerful solution for low-ceiling applications and eliminate the shadows common to other recessed products.



CENTER SHIELDING OPTIONS:

HPR is available with three different center-shielding options: a diffuse center optic, a slotted center optic, and a round center optic.



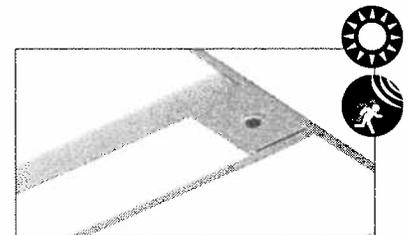
DIMENSIONS / LIGHT ENGINE:

Available in 1, 2, T8, T5, or T5HO lamps.



BIAX LAMP OPTIONS:

Available in 1 lamp FT 40, 50, or 55W high lumen T5 cross sections for 1x2 only.

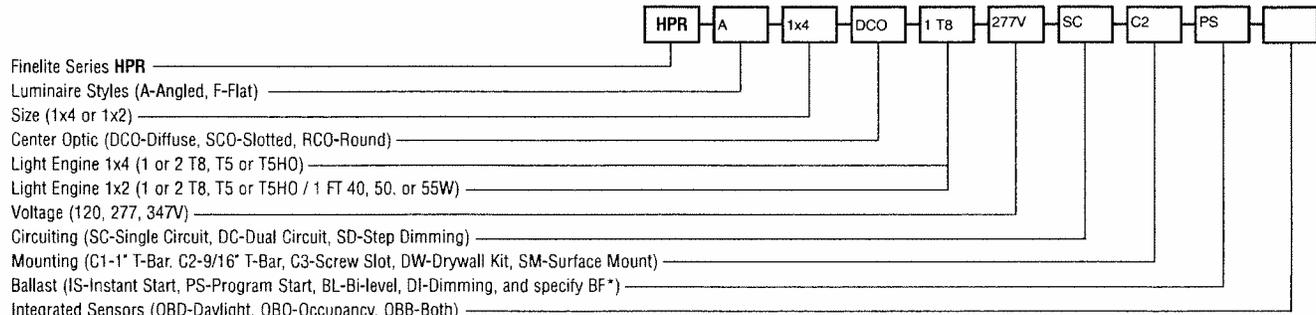


INTEGRATED SENSORS:

HPR can be specified with integrated daylight or occupancy sensors.

ORDERING GUIDE

Sample Number: HPR - F - 1x2 - DCO - 1T8 - 277 - SC - C1 - IS.88 - OBO



* Standard 0.88 for T8 lamps, 1.0 for T5 or T5HO. Contact factory for available ballast factors.
Contact factory for Master/Satellite and factory-supplied whip options.



BUY AMERICAN ACT OF 2009 COMPLIANT

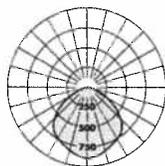
FINELITE

High Performance Recessed (HPR) 1x4 & 1x2

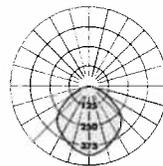
PHOTOMETRY



HPR-F: 1 T8-DCO (1x4)
Efficiency: 78.0%
LSI Report: 25829



HPR-F: 1 T8-DCO (1x2)
Efficiency: 77.2%
LSI Report: 25834



CANDLEPOWER SUMMARY						
	0.0	22.5	45	67.5	90	Flux
0	882	882	882	882	882	
5	883	879	878	876	872	84
10	871	866	861	855	850	
15	852	844	833	825	819	235
20	825	814	798	790	786	
25	788	775	761	760	761	353
30	744	729	719	732	738	
35	690	675	676	699	708	429
40	628	616	628	655	662	
45	559	551	570	591	593	439
50	484	479	498	509	506	
55	406	404	417	417	410	367
60	328	328	334	325	316	
65	253	253	235	240	231	245
70	184	184	179	166	159	
75	122	122	116	105	99	121
80	69	69	62	54	50	
85	26	25	18	16	16	26
90	0	0	0	0	0	

CANDLEPOWER SUMMARY						
	0.0	22.5	45	67.5	90	Flux
0	417	417	417	417	417	
5	418	417	413	410	410	40
10	412	409	404	400	398	
15	402	398	389	384	383	110
20	388	381	371	366	365	
25	370	361	351	350	352	164
30	347	337	330	335	340	
35	320	310	308	319	326	197
40	289	280	285	298	304	
45	255	248	256	268	272	199
50	219	214	223	230	232	
55	181	179	186	188	187	164
60	145	144	148	145	143	
65	111	110	111	106	104	108
70	80	79	78	73	71	
75	52	52	49	45	43	52
80	28	28	25	21	20	
85	10	9	6	6	6	10
90	0	0	0	0	0	

— Refer to www.finelite.com for additional photometry and product information.

SPECIFICATIONS

CONSTRUCTION: Fixture assembly constructed using die-formed 20-gauge cold-rolled steel housing and ends. All components are hard-tooled to tolerances of 0.010". Ballast compartment is accessed from below. Optical system retained using hinged door frame assembly to provide easy access to ballast compartment and for re-lamping from below without the need of tools. Seismic brackets are integrated into the fixture assembly. Additional wire entrances are positioned on the ends of the housing to allow easy wiring access for the installer.

REFLECTORS: Die-formed 20-gauge cold-rolled steel reflectors are finished in 96 LG high reflectance matte white powder coat paint.

OPTICAL SYSTEM: Optical system components include side lens panels and a center optic element held in place with a frame constructed from die-formed cold-rolled steel. The side lenses are UV-stabilized and impact-resistant frosted virgin acrylic, 0.080" thick. Available parallel to the ceiling plane.

Available options for the center optic elements:

Diffuse Center Optic: UV-stabilized and impact-resistant frosted virgin acrylic. Optional Soft Glow Optic (SGO) available for T8 only.

Slotted Center Optic: Die-formed cold-rolled steel panel with 1/16" x 1/2" rectangular hole pattern. Virgin acrylic overlay.

Round Center Optic: Die-formed cold-rolled steel panel with precision-punched 1/16" round hole pattern arranged in staggered formation. Virgin acrylic overlay.

LIGHT ENGINE: Available in 1 or 2 T8, T5, or T5HO lamp cross sections. Available in 1 lamp FT 40, 50, or 55W high lumen TT5 cross sections for 1x2 only.

BALLAST: UL listed Class P. low profile electronic instant-start ballast <10% THD, 0.88 BF standard for T8 lamps. Electronic program-start ballasts <10% THD, 1.0 BF standard for T5/T5HO lamps. Electronic ballasts <10% THD, standard BF for FT lamps. Contact factory for available BF's. Optional adders: program-start ballasts (standard for T5/T5HO), 347V, emergency battery packs, dimming or bi-level ballasts (controls by others).

ELECTRICAL: Fixtures and electrical components are ETL listed conforming to UL1598 in the USA, and Canada and ETL listed certified to CAN/CSA C22.2 No. 250.0. In accordance with NEC code 410.73 (G) this luminaire contains an internal ballast disconnect. IC-Rated. Optional Chicago Plenum available. Contact factory.



INTEGRATED SENSORS: Refer to Occupancy Sensor and Daylight Sensor tech sheets for more info.

MOUNTING: Standard flange design works with most lay-in ceiling types. Integral pryout tabs secure luminaire to ceiling grid from above. Fixture offers tie-in locations for tie-wire on all corners. Consult local code for appropriate tie-wire recommendations. Drywall Kit available. Surface mount version available; refer to separate tech sheet.

FEED: 18-gauge wire standard.

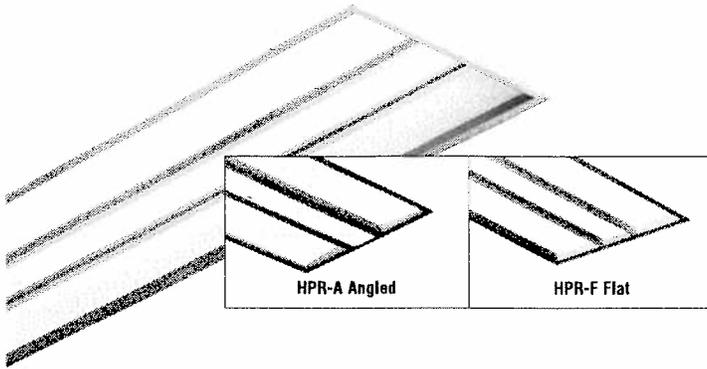
FINISH: Housing and door assembly painted with 96 LG high reflectance matte white powder coat paint. Available in matte white only.

WIRING: Master / Satellite wiring available. Contact factory for configuration options. Optional whips (with flex connectors) supplied in a max. of 11' lengths.

WEIGHT: Maximum weight: 1x4 - 25 lbs.
Maximum weight: 1x2 - 12 lbs.

FINELITE

High Performance Recessed (HPR) 1x4 & 1x2



Date 4/29/14

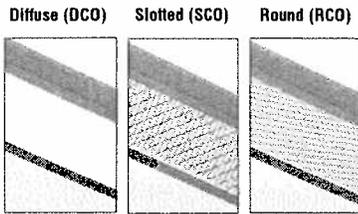
Project DSP Troop 3

Type K1

Comments
Addendum #6
Deduct Alternate

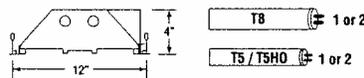
DESCRIPTION

HPR is a highly effective recessed luminaire delivering excellent visual comfort and outstanding performance for offices, schools, healthcare, and retail applications. Advanced optical designs make HPR a powerful solution for low-ceiling applications and eliminate the shadows common to other recessed products.



CENTER SHIELDING OPTIONS:

HPR is available with three different center-shielding options: a diffuse center optic, a slotted center optic, and a round center optic.



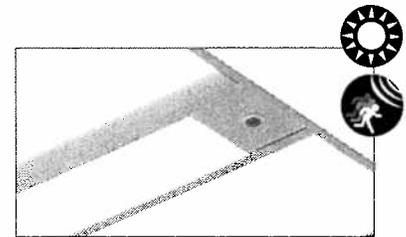
DIMENSIONS / LIGHT ENGINE:

Available in 1, 2, T8, T5, or T5HO lamps.



BIAX LAMP OPTIONS:

Available in 1 lamp FT 40, 50, or 55W high lumen T5 cross sections for 1x2 only.

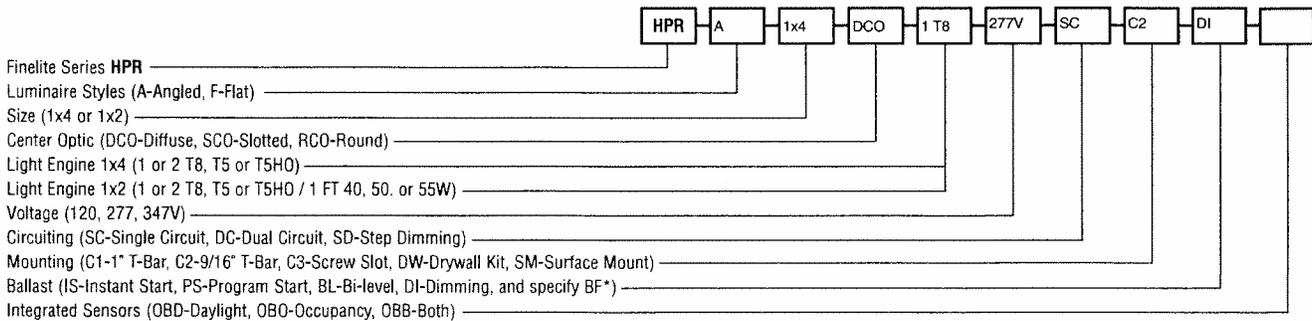


INTEGRATED SENSORS:

HPR can be specified with integrated daylight or occupancy sensors.

ORDERING GUIDE

Sample Number: HPR - F - 1x2 - DCO - 1T8 - 277 - SC - C1 - IS.88 - OBO

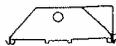


* Standard 0.88 for T8 lamps, 1.0 for T5 or T5HO. Contact factory for available ballast factors.
Contact factory for Master/Satellite and factory-supplied whip options.

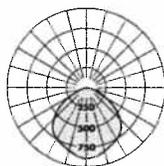
FINELITE

High Performance Recessed (HPR) 1x4 & 1x2

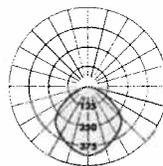
PHOTOMETRY



HPR-F: 1 T8-DCO (1x4)
Efficiency: 78.0%
LSI Report: 25829



HPR-F: 1 T8-DCO (1x2)
Efficiency: 77.2%
LSI Report: 25834



CANDLEPOWER SUMMARY						
	0.0	22.5	45	67.5	90	Flux
0	882	882	882	882	882	
5	883	879	878	876	872	84
10	871	866	861	855	850	
15	852	844	833	825	819	235
20	825	814	798	790	786	
25	788	775	761	760	761	353
30	744	729	719	732	738	
35	690	675	676	699	708	429
40	628	616	628	655	662	
45	559	551	570	591	593	439
50	484	479	498	509	506	
55	406	404	417	417	410	367
60	328	328	334	325	316	
65	253	253	235	240	231	245
70	184	184	179	166	159	
75	122	122	116	105	99	121
80	69	69	62	54	50	
85	26	25	18	16	16	26
90	0	0	0	0	0	

CANDLEPOWER SUMMARY						
	0.0	22.5	45	67.5	90	Flux
0	417	417	417	417	417	
5	418	417	413	410	410	40
10	412	409	404	400	398	
15	402	398	389	384	383	110
20	388	381	371	366	365	
25	370	361	351	350	352	164
30	347	337	330	335	340	
35	320	310	308	319	326	197
40	289	280	285	298	304	
45	255	248	256	268	272	199
50	219	214	223	230	232	
55	181	179	186	188	187	164
60	145	144	148	145	143	
65	111	110	111	106	104	108
70	80	79	78	73	71	
75	52	52	49	45	43	52
80	28	28	25	21	20	
85	10	9	6	6	6	10
90	0	0	0	0	0	

— Refer to www.finelite.com for additional photometry and product information.

SPECIFICATIONS

CONSTRUCTION: Fixture assembly constructed using die-formed 20-gauge cold-rolled steel housing and ends. All components are hard-tooled to tolerances of 0.010". Ballast compartment is accessed from below. Optical system retained using hinged door frame assembly to provide easy access to ballast compartment and for re-lamping from below without the need of tools. Seismic brackets are integrated into the fixture assembly. Additional wire entrances are positioned on the ends of the housing to allow easy wiring access for the installer.

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OPTICAL SYSTEM: Optical system components include side lens panels and a center optic element held in place with a frame constructed from die-formed cold-rolled steel. The side lenses are UV-stabilized and impact-resistant frosted virgin acrylic, 0.080" thick. Available parallel to the ceiling plane.

Available options for the center optic elements:

Diffuse Center Optic: UV-stabilized and impact-resistant frosted virgin acrylic. Optional Soft Glow Optic (SGO) available for T8 only.

Slotted Center Optic: Die-formed cold-rolled steel panel with 1/16" x 1/2" rectangular hole pattern. Virgin acrylic overlay.

Round Center Optic: Die-formed cold-rolled steel panel with precision-punched 1/16" round hole pattern arranged in staggered formation. Virgin acrylic overlay.

LIGHT ENGINE: Available in 1 or 2 T8, T5, or T5HO lamp cross sections. Available in 1 lamp FT 40, 50, or 55W high lumen TT5 cross sections for 1x2 only.

BALLAST: UL listed Class P, low profile electronic instant-start ballast <10% THD, 0.88 BF standard for T8 lamps. Electronic program-start ballasts <10% THD, 1.0 BF standard for T5/T5HO lamps. Electronic ballasts <10% THD, standard BF for FT lamps. Contact factory for available BF's. Optional adders: program-start ballasts (standard for T5/T5HO), 347V, emergency battery packs, dimming or bi-level ballasts (controls by others).

ELECTRICAL: Fixtures and electrical components are ETL listed conforming to UL1598 in the USA, and Canada and ETL listed certified to CAN/GSA C22.2 No. 250.0. In accordance with NEC code 410.73 (G) this luminaire contains an internal ballast disconnect. IC-Rated. Optional Chicago Plenum available. Contact factory.



INTEGRATED SENSORS: Refer to Occupancy Sensor and Daylight Sensor tech sheets for more info.

MOUNTING: Standard flange design works with most lay-in ceiling types. Integral pryout tabs secure luminaire to ceiling grid from above. Fixture offers tie-in locations for tie-wire on all corners. Consult local code for appropriate tie-wire recommendations. Drywall Kit available. Surface mount version available; refer to separate tech sheet.

FEED: 18-gauge wire standard.

FINISH: Housing and door assembly painted with 96 LG high reflectance matte white powder coat paint. Available in matte white only.

WIRING: Master / Satellite wiring available. Contact factory for configuration options. Optional whips (with flex connectors) supplied in a max. of 11' lengths.

WEIGHT: Maximum weight: 1x4 - 25 lbs. Maximum weight: 1x2 - 12 lbs.



Advantage T8

F32T8 ADV835 ALTO

Philips Advantage T8 lamps are an energy-efficient solution and offer high lumen output.

Product data

• General Characteristics

Base	Medium Bi-Pin [Medium Bi-Pin Fluorescent]
Base Information	Green Base
Bulb	T8
Energy Saving	Energy Saving
Rated Avg Life [12-Hr Prog St]	36000 hr
Rated Avg Life [12-Hr Inst St]	30000 hr
Rated Avg Life [3-Hr Prog St]	30000 hr
Rated Avg Life [3-Hr Inst St]	24000 hr

• Light Technical Characteristics

Color Code	Advantage 835 [CCT of 3500K]
Color Rendering Index	85 Ra8
Color Designation	Advantage 835
Color Temperature	3500 K
Initial lumen	3100 Lm
Design Mean Lumens	3000 Lm

• Electrical Characteristics

Watts	32 W
-------	------

• Environmental Characteristics

Mercury (Hg) Content	1.7 mg
Picogram per Lumen Hour	24 p/LuHr

• Product Dimensions

Nominal Length [inch]	48
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• Footnotes

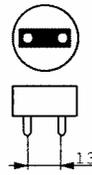
Footnotes Fluorescent/CFL	920 [Circle E- The encircled E means this bulb meets Federal minimum efficiency standards.]
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• Product Data

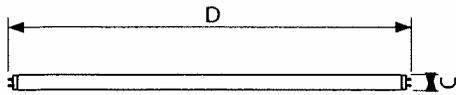
Product number	280818
Full product name	F32T8 ADV835 ALTO
Short product name	F32T8/ADV835 ALTO 30PK
Pieces per Sku	1
eop_pck_cfg	30
Skus/Case	30
Bar code on pack	46677280819
Bar code on case	50046677280814
Logistics code(s)	927869783603
eop_net_weight_pp	0.001 kg

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Dimensional drawing



G13



F32T8 ADV835 ALTO



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