ELECTRICAL BONDING

1. ALL STEEL DOORS AND FRAMES SHALL BE ELECTRICALLY BONDED TO THE MAGAZINE REBAR CAGE.

2. ALL STRUCTURAL AND MISCELLANEOUS ITEMS EMBEDDED IN CONCRETE SHALL BE ELECTRICALLY BONDED TO THE REBAR CAGE BY METALLIC WIRE TIES, BRAZING OR WELDING.

3. THE REBAR CAGE SHALL BE MADE ELECTRICALLY CONTINUOUS BY BONDING INDIVIDUAL REINFORCING BARS USING METALLIC WIRE TIES, BRAZING OR WELDING AT A MAXIMUM OF 5’–0” IN ANY DIRECTION.

4. ALL WALL AND CONSTRUCTION JOINTS SHALL BE ELECTRICALLY BONDED. SEE THE ELECTRICAL DRAWINGS FOR DETAILS.

BONDING DETAILS

REVISED: SEPTEMBER 2014  MAGAZINE DETAIL: S–1
GROUND CONNECTION (TYP)
SECONDARY GROUND RING
BOND TO REBAR
#2/0 BARE CU CONDUCTOR TO SECONDARY GROUND RING
2" INSULATOR STANDOFF BUSHING (TYP OF 2)
CU GROUND BAR (1/4" X 4" X 24") WITH (18) 7/16" PREDRILLED HOLES SPACED AT 2" ON CENTER
THREADED INSERT (TYP OF 2)
#2/0 BARE CU CONDUCTOR TO INCOMING CONDUIT OR CIRCUIT (TYP)
1/4" STEEL BOLT (TYP)
SINGLE CONDUCTOR MECHANICAL WIRE CONNECTOR (TYP)
1-1/2" STEEL BOLT (TYP OF 2)
STATIC GROUND INSERT DETAIL NOTES:

1. PROVIDE A REMOVABLE YELLOW MELAMINE PLASTIC TAG THAT ATTACHES TO THE STATIC GROUND INSERT. THE TAG SHALL INCLUDE THE FOLLOWING INFORMATION:

"NOT IN SERVICE. NO MAINTENANCE REQUIRED.

INSTALLATION MEETS STATIC/FACILITY GROUND REQUIREMENT PER NAVSEA OP-5. ACTIVITY SHALL PERFORM TESTING PER NAVSEA OP-5 AND ENACT MAINTENANCE SCHEDULE WHEN THE STATIC/FACILITY GROUND INSERT IS PLACED IN SERVICE.

RETAIN THIS TAG TO REATTACH WHEN REMOVED FROM SERVICE."

STATIC GROUND INSERT DETAIL

REVISED: DECEMBER 2009  MAGAZINE DETAIL: E-2
ORDNANCE GROUND INSERT DETAIL NOTES:

1. PROVIDE A REMOVABLE RED MELAMINE PLASTIC TAG THAT ATTACHES TO THE ORDNANCE GROUND INSERT. THE TAG SHALL INCLUDE THE FOLLOWING INFORMATION:

"NOT IN SERVICE. NO MAINTENANCE REQUIRED.

INSTALLATION MEETS ORDNANCE GROUND REQUIREMENT PER NAVSEA OP-5. ACTIVITY SHALL PERFORM TESTING PER NAVSEA OP-5 AND ENACT MAINTENANCE SCHEDULE WHEN THE ORDNANCE GROUND INSERT IS PLACED IN SERVICE.

RETAIN THIS TAG TO REATTACH WHEN REMOVED FROM SERVICE."

2. MAINTAIN THREADED INSERT ISOLATION. DO NOT ALLOW THE THREADED INSERT TO TOUCH REBAR OR OTHER METALLIC OBJECTS IN THE WALL.
FINISHED FILL GRADE LEVEL

CAST IRON COVER WITH FINGER HOLE (SEE NOTE 2)

1’-0” (MIN.)

3/4” GROUND ROD BONDING CONNECTOR

8”x4’ TERRACOTTA TILE, PVC, OR CONCRETE PIPE FILLED WITH SAND/GRAVEL MIX (SEE NOTE 2)

#2/0 BARE CU GROUND CONDUCTORS (TYP OF 2) (SEE NOTE 1)

3/4” GROUND ROD (LENGTH AS REQUIRED)

ORIGINAL (NATURAL) GRADE

GROUND CONDUCTORS BOLTED (REMOVABLE FOR PERIODIC TESTING) TO THE BONDING CONNECTOR

#2/0 CU CONDUCTOR IN 3/4” PVC CONDUIT BACK TO ORDNANCE GROUND INSERT. SEE "ORDNANCE GROUND INSERT DETAIL" ON SHEET E-3. (TYP ONLY FOR GROUND TEST WELL LOCATED ON THE REAR OF MAGAZINE)

( NOTE TO DESIGNER: CHANGE SHEET E-3 TO PROJECT SPECIFIC SHEET NUMBER)

THE DEPTH OF GROUND ROD BELOW NATURAL GRADE SHALL BE SITE ADAPTED TO SUIT LOCAL SOIL CONDITION. AT NO TIME SHALL THE MINIMUM DEPTH BE LESS THAN 10’-0”.

NOTE 1: MAINTAIN THE GROUND CONDUCTORS ISOLATED FROM THE GROUND ROD UNTIL THE BOND CONNECTION AT THE TOP.

NOTE 2: PROVIDE "TRAFFIC RATED" TEST WELL AND COVER FOR PAVED AREAS.
(NOTE TO DESIGNER: CHANGE SHEETS E-5 AND E-7 TO PROJECT SPECIFIC SHEET NUMBERS)

POWER CABLE REEL

PANELBOARD "P1"

#8 GROUND CONDUCTOR IN 1/2" CONDUIT

JUNCTION BOX

SINGLE POINT GROUND BAR

GROUND STUD

#2/0 BARE CU DOWN CONDUCTOR (TYP)

SECONDARY GROUND RING

#8 GROUNDING ELECTRODE CONDUCTOR

GROUND CONNECTION (TYP)

#2/0 BARE CU DOWN CONDUCTOR (TYP)

GROUND CROSS CONNECT CABLE

(Note to designer: If using magazine without a platform, remove the platform from the detail.)

GROUNDING SECTION DETAIL

REVISED: SEPTEMBER 2014 MAGAZINE DETAIL: E-6
FLAT SURFACE POINT BASE
MADE OF COPPER BRONZE
WITH CLAMP TYPE FASTENER

TOP OF PARAPET

EXPANSION ANCHOR
WITH FLAT HEAD
BOLT 3/8” x 1-1/2”
LONG

5/8” x 24” LONG
SOLID COPPER
LIGHTNING PROTECTION
AIR TERMINAL THREADED
WITH BLUNT TIP

MOUNTING DETAIL

#2/0 BARE CU
CONDUCTOR

CABLE CONNECTION DETAIL XX

LIGHTNING PROTECTION AIR TERMINALS

REVISED: SEPTEMBER 2014
MAGAZINE DETAIL: E-7
1'-0" MAX FROM BOTTOM EDGE OF BUILDING

EXOTHERMIC WELD OR APPROVED COMPRESSION CONNECTION (TYP)

CABLE TO REBAR CONNECTION

#2/0 BARE CU CONDUCTOR (TYP)

REBAR (TYP) TO EARTH ELECTRODE SYSTEM (TYP)

GROUNDING REINFORCING STEEL

#2/0 BARE CU CONDUCTOR (TYP)

CONDUCTOR TO REBAR OR WIREFENCE CONNECTION

EXOTHERMIC WELD OR APPROVED COMPRESSION CONNECTION TYPICAL EVERY 4'-0"

TYPICAL BOND CONNECTION AT EACH CONSTRUCTION JOINT

NOTE 1: ALL REINFORCING STEEL IN BUILDING AND PLATFORM IN FRONT OF MAGAZINE SHALL BE BONDED WITH #2/0 BARE COPPER CONDUCTORS TO EARTH ELECTRODE SYSTEM (SECONDARY GROUND RING).

STRUCTURAL GROUNDING DETAILS

REVISED: SEPTEMBER 2014  MAGAZINE DETAIL: E-8
CONDUCTOR TO WIREMESH CONNECTION IN FLOOR EVERY 4’-0”

CONDUCTOR TO REBAR CONNECTION IN WALL EVERY 4’-0”

EXOTHERMIC WELD OR APPROVED COMPRESSION CONNECTION (TYP)

#2/0 BARE CU CONDUCTOR PROVIDE SUFFICIENT SLACK FOR 1” EXPANSION
Provide in NEMA 1 enclosure. Locate within 6” of panelboard P1.

3-#10 and 1-#10 GND in 1/2” conduit

#8 GND conductor in 1/2” conduit

#8 Grounding electrode conductor

P1
120/240V
1Ø, 3W

JB

SPGB

Coil #8 GND conductor in junction box. Cap end of conductor with wire nut.

#2/0 bare Cu GND conductor

To secondary ground ring

4” conduit for 1Ø, 3W, 240V, power supply. The minimum size wire shall be #2 if the distance from panelboard P1 to the site source of power is no more than 150 ft. Wire sizes for distances of more than 150 ft shall be site adapted.

Note 1: Three feet working clearance must be maintained for the panelboard per NFPA 70. Where maximum storage space in the magazine is critical, panelboard and surge protective devices (SPD) may be located on exterior of magazine. Coordinate with activity, and modify drawings and panelboard enclosure accordingly.

Note 2: Single phase systems identified will be appropriate for most magazines. If larger door motors are used, designer should determine if more expensive, three phase system would be more appropriate and modify riser and drawings accordingly.
GROUNDING RISER DIAGRAM

REINFORCING STEEL IN FLOOR AND WALL (TYP)
LIGHTNING PROTECTION AIR TERMINAL
LIGHTNING PROTECTION AIR TERMINAL
TAKE-UP REEL
TAKE-UP REEL
TAKE-UP REEL
STATIC GROUND

#2/0 BARE CU GND CONDUCTOR
GROUND CONNECTION (TYP)
SECONDARY GROUND RING
#2/0 BARE CU GND CONDUCTOR
GROUND CROSS CONNECT CABLE

#2/0 BARE CU GND CONDUCTOR
MECHANICAL VENTILATOR
MECHANICAL VENTILATOR
ORDNANCE GROUND
STATIC GROUND

COIL #8 GND CONDUCTOR IN JUNCTION BOX, CAP END OF CONDUCTOR WITH WIRE NUT.
#8 GND CONDUCTOR IN 1/2" CONDUIT
PANEL P1
120/240V, 1P, 3W
JUNCTION BOX

#2/0 CU GND CONDUCTOR IN 3/4" PVC CONDUIT
#8 GND CONDUCTOR
#8 GND ELECTRODE CONDUCTOR

GROUND TEST WELL WITH 3/4" CU GND ROD; LENGTH AS REQUIRED (TYP OF 2)
SECONDARY GROUND RING
#2/0 BARE CU GND CONDUCTOR

3/4" CU GND ROD; LENGTH AS REQUIRED (TYP OF 2)

REVISED: SEPTEMBER 2014 MAGAZINE DETAIL: E-11
TYPICAL FOR DOOR #1, DOOR #2, AND DOOR #3

SLIDING DOOR WIRING INSTALLATION DIAGRAM NOTES

1. DESIGN USES 240V SINGLE PHASE POWER FOR THE MOTOR.

2. INCLUDE OPEN AND CLOSE LIMIT SWITCHES TO TURN OFF MOTOR IN THE MOTOR CONTROL CIRCUIT.

3. DOOR CONTROL PUSHBUTTON STATION SHALL BE MOUNTED 48" ABOVE PLATFORM. ROUTE CIRCUIT CONCEALED OUTSIDE OF THE MAGAZINE BACK TO THE COMBINATION REVERSING STARTER VIA THE SERVICE ENTRANCE PENETRATIONS.

4. THE EXACT LOCATION OF DOOR OPERATOR AND LIMIT SWITCHES SHALL BE IN ACCORDANCE WITH DOOR MANUFACTURER’S REQUIREMENTS.

(Note to designer: Modify diagrams to reflect actual project requirements.)
120V, 1φ POWER SUPPLY FROM PANEL P1

WALL MOUNTED HEAT TRACING POWER KIT BOX

4’-0”

1” CONDUIT WITH DRAIN PIPE HEAT TRACING CABLE

FOR DRAIN PIPE HEAT TRACING

REFER TO DWG. S-XXX FOR DRAIN PIPE LOCATION
(NOTE TO DESIGNER: CHANGE SHEET S-XXX TO PROJECT SPECIFIC SHEET NUMBER)

3” DRAIN PIPE

FROST LINE ELEVATION

LENGTH OF PIPE TO BE HEAT TRACED

PROVIDE EXPANSION COUPLING

DRAIN PIPE HEAT TRACING DETAIL

120V, 1φ, POWER SUPPLY TO PANEL P1

WALL MOUNTED POWER KIT BOX

1/2” RIGID STEEL CONDUIT

HEAT TRACING CABLE EMBEDDED IN CONCRETE BELOW DOOR TRENCH

TYPICAL DOOR TRENCH HEAT TRACING WIRING DIAGRAM

HEAT TRACING DETAILS (AT 120 VOLTS)

REVISED: SEPTEMBER 2014 MAGAZINE DETAIL: E-13
(NOTE TO DESIGNER: CHANGE SHEET E-13 TO PROJECT SPECIFIC SHEET NUMBER)
7-#16 stranded cable in 1"c to junction box at snow detector control panel.

FACE OF BUILDING

7'-6"

23 1/2"

JUNCTION BOX

PAVEMENT COLD SENSOR

PAVEMENT HEAT SENSOR

SNOW DETECTION LOCATION DETAIL

REVISED: SEPTEMBER 2014

MAGAZINE DETAIL: E-15
1/2" CONDUIT ROUTED BETWEEN EACH LIGHTING FIXTURE JUNCTION BOX

WALL MOUNTING TYPE FIXTURE TO BE MOUNTED TO STRUCTURAL SUPPORT ANGLE

SECURITY LIGHTING MOUNTING DETAIL

NEMA 3R JUNCTION BOX TO BE MOUNTED TO STRUCTURAL SUPPORT ANGLE

2" SLIPFITTER

WALL MOUNTING TYPE FLOODLIGHT BRACKET TO BE MOUNTED TO STRUCTURAL SUPPORT ANGLE

FLOOD LIGHTING MOUNTING DETAIL

LIGHTING MOUNTING DETAILS

REVISED: SEPTEMBER 2014 MAGAZINE DETAIL: E-16
LUMINAIRE REQUIREMENTS:

1. **HOUSING** — ONE-PIECE, IMPACT-RESISTANT, FIBERGLASS REINFORCED POLYESTER WITH ENCLOSED COLD-ROLLED STEEL WIREWAY.

2. **FINISH** — STEEL REFLECTOR WITH MULTI-STAGE PHOSPHATE BONDING TREATMENT FINISHED WITH HIGH REFLECTANCE (MINIMUM 85%), BAKED WHITE ENAMEL FINISH.

3. **LENS** — 100% CLEAR ACRYLIC/DR OPTICAL DIFFUSER. STIPPLED INTERIOR SURFACES AND SMOOTH EXTERIOR. CLOSED CELL NEOPRENE GASKET WITH STAINLESS STEEL CAM ACTION LATCHES TO SECURE LENS TO HOUSING.

4. **LAMPS** — LINEAR FLUORESCENT T8, TYPICALLY WITH WATTAGES AS INDICATED. SEE LIGHTING FIXTURE SCHEDULE.

5. **BALLAST** — CLASS P, THERMALLY-PROTECTED, HIGH POWER FACTOR (≥ .95), ELECTRONIC TYPE WITH SOUND RATING A. SEE SPECIFICATION OR LIGHTING FIXTURE SCHEDULE FOR BALLAST OPTIONS AND SPECIFICS.

6. **CERTIFICATION** — UL LISTED AND LABELED. SUITABLE FOR DAMP OR WET LOCATION AS DESIGNATED IN LIGHTING FIXTURE SCHEDULE.

7. **PHOTOMETRICS** — MINIMUM VALUE OF COEFFICIENT OF UTILIZATION (CU) AND EFFICIENCY, GIVEN INTERIOR CAVITY REFLECTANCES OF 80-50-20:

<table>
<thead>
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<th>2 LAMP (F32/T8)</th>
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<tr>
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**EFFICIENCY** — 76% 85%

LIGHTING DETAIL A, FIBERGLASS HOUSING
DAMP/WET LOCATION FLUORESCENT

REVISED: SEPTEMBER 2014 MAGAZINE DETAIL: E-17
LUMINAIRE REQUIREMENTS:

1. HOUSING – ONE-PIECE, DIE-CAST ALUMINUM. ALL EXPOSED HARDWARE SHALL BE STAINLESS STEEL.

2. FINISH – MULTI-STAGE PRE-TREATMENT, FINISHED WITH BAKED-ON POLYESTER POWDER COAT. FINISH SHALL PASS 2500 HOUR SALT SPRAY TEST PER ASTM B117. FINISH COLORS INCLUDE DARK BRONZE, GREY OR BLACK WITH CUSTOM COLORS AVAILABLE.

3. REFLECTOR – ONE-PIECE, HYDROFORMED OR SEGMENTED, ANODIZED, SPECULAR OR SEMI-SPECULAR ALUMINUM. PROVIDE WITH NEMA DISTRIBUTION PATTERN AS INDICATED. BUG UPLIGHT RATING SHALL BE U0, WITH BACKLIGHT AND GLARE RATINGS AS DETERMINED BY LIGHTING ZONE INSTALLED.

4. LENS AND FRAME – DIE-CAST ALUMINUM FRAME WITH ONE-PIECE, MOLDED SILICON GASKET. LENS SHALL BE TEMPERED GLASS WITH POLYCARBONATE, VANDAL-RESISTANT OPTION.

5. BALLAST/GENERATOR – TYPE A – ENCAPSULATED, CWA, HIGH POWER FACTOR, CORE AND COIL OR ELECTRONIC FOR METAL HALIDE LIGHT SOURCE; (PROVIDE PULSE START WHEN AVAILABLE).

   TYPE B – SOLID STATE, HIGH POWER FACTOR (≥0.9), HIGH FREQUENCY GENERATOR FOR INDUCTION LIGHT SOURCE.

6. LIGHT SOURCE –

   TYPE A – METAL HALIDE

   TYPE B – INDUCTION VESSEL

7. CERTIFICATION – UL AND/OR ETL LISTED FOR WET LOCATIONS AND RoHS COMPLIANT.

8. OPTIONS – FINISH COLOR, PHOTOCELL, POLYCARBONATE LENS.

9. OTHER – THE ABOVE SKETCH IS A NON-PROPRIETARY GRAPHIC REPRESENTATION OF A LUMINAIRE THAT MAY MEET THE SPECIFICATION REQUIREMENTS AND IS NOT INTENDED TO INDICATE A CERTAIN MANUFACTURER’S PREFERENCE. ALL DIMENSIONS ARE NOMINAL AND VARY PER MANUFACTURER.
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HID/INDUCTION FLOOD LUMINAIRE

REVISED: MARCH 2013 LUMINAIRE PLATE: XL-22