

SECTION 04500 - MASONRY RESTORATION

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to the work of this Section

B. The extent of work is shown on the drawings, and keynotes and as described in this specification. The extent of work may be modified, and the price adjusted based on Unit Prices, after sections face with of brick are removed under the work of this project.

1.02 SUMMARY OF WORK

A. Provide all plant, materials, labor and equipment necessary and/or required for the complete execution of the work of this Section including, but not limited to:

1. Repairing cracks in brick masonry by rebuilding across crack. Extent of back-up rebuilding will be based on the inspection mock-up 1.02 A. 1. a.

a. Back-up conditions. Remove sections of the face brick, at one crack and one area scheduled for rebuilding, to determine back-up conditions. Areas to be coordinated with the preservation consultant. These area will be completed and incorporated into the work as part of the mock-up process. Adjust

2. Replacing cracked/damaged/spalled face brick within the work areas. Repair damage to sandstone and

3. Cutting out and repointing all mortar joints exposed in the final construction (including chimneys) including all brick, granite and sandstone. Provide bevelled mortar wash over all projecting window

4. Embedments. Remove fully (do not cut at face) all steel imbedded in masonry walls including fire escapes, brackets, exposed steel lintels, awnings, etc., except steel brackets for structural tie rods. Tooth in all openings with salvaged brick coursed to match surrounding.

5. Attachments. Remove all miscellaneous attachments to masoary including sign fittings, anchors. flashings, vents, ducts pipes, bells, signs, blocking, plywood, fasteners, brackets conduit, repair plates and anchors, except those designated on the drawings, or by the Architect, to remain. Not all instances shown.

6. Remove paint, tar and other larger stains in areas exposed to view

7. Masonry cleaning (limited) at existing granite sills and granite basecourse at all Elevations.

8. Wash down all work areas to remove excess mortar and surface soiling (not restoration masonry cleaning) from face brick/joint edges.

A. To provide a sound and watertight building shell and stabilizing masoury by rebuilding cracks. replacing of cracked brick and repointing selected areas utilizing repair methods and materials that are compatible with the physical characteristics of the existing materials and which visually blend with the surrounding materials when viewed from ten (10) feet.

L04 QUALITY ASSURANCE

A. Masonry restoration specialist: Work shall be performed by a firm having not less than five years successful experience in comparable masonry restoration projects and providing personnel skilled in the processes and operations indicated and required.

B. The Sub-contractor shall take all necessary field measurements prior to fabrication and installation of work and shall assume complete responsibility for accuracy of same

C. Field-Constructed Mock-Ups:Prior to start of general masonry restoration, prepare the following mock-ups on building surfaces where directed by Architect. Obtain acceptance of visual qualities before proceeding with the work. Mock-ups will be used to measure standards of workmanship, finish, texture, color and qualifications of workman. Repeat mock-up procedure as required until acceptance is obtained. Protect and mark acceptable mock-ups, retain in undisturbed condition during construction to be used as a standard for judging completed work.

Crack rebuilding. Mock-up to be completed in phases. Face withe to be removed to determine if the cracks extend into the back-up. Back-up will be rebuilt as necessary based on inspection.

2. Two samples for repointing. Provide one sample demonstrating the method of removing existing mortar and the other for demonstrating the color of the mortar, tooling and finishing of the joint to match existing adjoining work. Each sample shall be at least fifteen square feet.

3. Repair of small brick damage using patching mortar: Two bricks.

4. Granite restoration cleaning: Provide test installations as directed by the Architect. Provide up to four test installations, provide 48 hours notice to the Architects prior to the testing. Repeat test installations as necessary until visually and technically acceptable, in the opinion of the Architect, cleaning results are

1.05 SUBMITTALS

A. Samples shall consist of the following:

1. Samples: Submit prior to mock-up samples for inspection by the Architect of each type of lime, cement, aggregate, excess mortar cleaner and colorant proposed for use. Provide unopened container of each material with manufacturer's original labeling.

2. Samples: Ten (10) bricks showing the full range of color, texture, size and markings characteristic of the material.

B. Product data: Submit manufacturers' technical data and Materials Safety Data Sheet for each product specified or proposed for use including recommendations for their application and use.

LOS DELIVERY STORAGE AND HANDLING

A. Deliver materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturers. Store materials only in designated areas

B. Protect materials during storage and construction. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

C. Deliver replacement masonry units at such time as to assure continuity of installation. Store and handle units at project site or staging area with care to prevent chipping, cracking, distortion, warping, staining, or other damage.

1.07 PROJECT CONDITIONS

A. Protect persons, motor vehicles, all building surfaces (including but not limited to window glass and frames, roofing and flashing, walls, parapets, and doors) and related fixtures, signs, light standards, all metals, fittings and equipment of the building and building site, adjoining properties, landscaping, and related materials from damage

B. Masonry rebuilding, repointing and patching may be carried out only when air temperatures are 45F and above and will remain 40F for not less than 14 days after completion of work.

C. Prevent mortar, adhesives or grout from staining surrounding masonry. Remove any spill immediately. Protect sills, ledges and other projections from mortar droppings by coating with sand. Ne spills shall be permitted to remain at the

D. Cover work at the end of each day and whenever work is not in progress. Extend waterproof covers securely over

1.08 SEQUENCING/SCHEDULING

A. Perform mesonry restoration work in the following sequence:

Complete impection, facade mark-up, and repain/mock-up procedure 1.02 A.1.a.
 Repair, replace and rebuild all damaged masonry.

2. Rake out and repoint mortar joints. Clean-up excess mertas.

A. Provide written warranty ensuring that all replacement masonry units, patching materials, repairs and rebuilt work and mortar joints that are determined to become displaced, enached, spalled, hairlined, discolored or otherwise unacceptable within a period of two (2) years from the date of substantial completion will be replaced in a manner conforming with the requirements of this specification.

PART 2 - PRODUCTS

A. Portland Cement, Type I ASTM C 150, White Portland Cement. Ordinary gray cement may be used if it does not effect color matching or uniformity. Cement must comply with ASTM C 91, not more than 0.30 % water soluble alkali,

B. Hydrated Type S Lime for Masoury Purposes, ASTM C 207. Air entrained lime may not be used

C. Mortar Aggregate. Aggregate will match the existing mortar aggregate as dosely as possible in shape and size. A sample of the existing aggregate shall be taken prior to assembly of the mock up area

D. Water shall be clean and free from deleterious materials. Only potable water may be used.

E. Mortar Pignents. Iron oxide pigments manufactured by SGS (Solomon Grind Chem). Pizer. Lander-Segal or approved equal. Brick mortar shall be red in color, matching sound areas of the original red mortar identified by the Architect. Granite mortar shall be light gray off-white.

1. Pigments to match color of the original mortar. Pigments will only be permitted when colors cannot be successfully matched by varying the brand or color of the cement. Measurements of pigments shall be accurate and record shall be made of exact amount of pigment added to each approved mix.

F. Excess Morrar Solvent: SureKlean 101 (lowest possible concentration) or Hydroclean 455.

A. Face brick, ASTM C 216, Grade SW, Type FBX,

1. Red waterstruck: Stiles and Hart, Vermont Brick Company or Glen-Gary, to match existing.

2. Sound, cleas, salvage brick, acceptable to the Architect, may also be used.

2.03 GRANITE

1. New granite facing a first floor to match existing material in source, color and finish,

2.04 GRANITE MASONRY CLEANING

Based on results of tests. Acceptable products for testing: SureKlean Restoration Cleaner, SureKlean Heavy Duty Restoration Cleaner, Hydroclean Brick, Granite and Terra Cotta Cleaner.

PART 1 - EXECUTION

3.01 INSPECTION AND ACCEPTANCE

A. Examine all surfaces and contiguous elements to receive work of this section and correct, as part of the Work of this Contract, any defects affecting installation. Commencement of work will be construed as complete acceptance of

3.02 MORTAR PREPARATION

A. Mortar proportions. Provide ASTM C 270 Type O mortar by proportion specification: 1 Part by volume Portland Cement

2 Part by volume Lime

7-8 Parts by volume sand, as measured damp. If dry sand is used, compensate volume for expansion of damp sand.

B. Mortar preparation and mixing

I. Carefully measure and well mix together dry the lime, cement and sand. Add any pigments in measured quantities and well dispersed into the other materials.

2. Mix mortar in small batches so that it will be used within one hour after preparation. The minimum amount of water necessary to produce a workable mix shall be used.

3. Prohydrate pointing mortar as follows:

a. Thoroughly mix together all ingredients except water.

b. Mix again adding only enough water to produce a damp unworkable mix which will retain its form when pressed in a ball.

After 20 minutes add sufficient water to bring mortar to proper consistency, somewhat drier than

3.03 MASONRY REBUILDING AND CRACK REPAIR

A. Carefully remove all areas scheduled for rebuilding or crack repair. Cut out full units to permit replacement with full units toothed into existing construction. Mark, protect and store all sound removed brick for reinstallation. Cracked brick and brick with damage larger than 1° in any dimension on the face shall be replaced. Separately identify face and backup bricks for reinstallation in the same use.

1. Remove loose debris and mortar from edges of removal area in preparation for replacement and/or

2. Cracked areas are to be cut out one brick in each direction beyond the area of cracking.

3. Repair back-up to sound condition suitable to receive face masonry by repointing and/or replacing damaged brick, removing and replacing loose, cracked and deteriorated mortar, parging and filling larger

4. Remove and replace all broken headers with full bricks. Where masonry bond is not possible provide adjustable galvanized brick ties, 16° on centers.

5. Inspect any backup timber, such as backup wood limtels, or steel, such as lintels and angles, exposed during brick removal. Report any observed deterioration to the Architec-

B. Support, shore, brace and protect masonry to remain surrounding removal areas.

C. Reinstall brick exactly replicating the bonding and coursing pattern of the original design and blending with the surrounding existing masonry. Match size and profile of existing joints.

I. Lay bricks in full beds of mortar. Fill all bed, head and collar joints. Prewet back-up bricks prior to laying to insure that the units are saturated, but without standing water on the surface

D. Clean all mortar and soil from salvaged brick using bristle brushes and rubbing stones. Chemical mortar removers may be used to supplement if approved by the Architect,

3.04 REMOVALS AND BRICK, STONE, PATCHING

A. Fully remove all embedded steel to the extent feasible, remove, do not burn off. Remove sign and attachment anchors; lead embedments may remain.

B. Replace brick at embeddments with matching brick. Fill holes in brick less than 1" square with pointed mortar colored to match the brick. Replace brick with damage larger than 1" square.

C. Patch damaged sandstone window sills using Jahn patching mortar matched to the color of the sills. Patch cracked in granite with pointing mortar.

3.05 MASONRY REPOINTING

1. All mortar shall be cut back to a depth of at least 2 and one half times the width of the joint or to sound mortar, whichever is greater. Some areas are deeply veid of mortar, or have friable back-fill, and must be completely back-filled. Care must be taken to avoid damage to the masonry units and to prevent widening of joints. Back of the joint shall be cut square. Remove any scalants, tar or other non-nortar joint fillers; remove all trace of scalant to assure bond. All loose material shall be washed from the joints using a hose. Joints shall be wetted before the new mortar is applied, standing water in joints is not nermitted.

Power operated rotary saws may be used when it is demonstrated to the Consultant of satisfactory completion of mock-up installation of joint cutting technique by each mechanic who will be cutting joints. Power cutting will not be permitted at ends of head joints, inside corners and at other locations where it is determined that power cutting is likely to result in damage to the stone due to overcutting. Only single blade saws may be used to cut a single kerf in the center of the joint, all addition removal must be by

B. Mortar preparation and mixing.

I. The lime, coment and sand should be carefully measured and well mixed together day. Any piemen should be added in measured quantities and well dispersed into the other materials. Mortar shall be mixed in small batches so that it will be used within one hour after preparation.

C. Joint filling. Mortar should be packed in thin layers, not exceeding 1/2". Compact and allow each layer to become thumbprint hard before installation of new lift. Filled joints should be tooled to match the original joint profile. No mortar shall extend onto the face of the units.

D. Damo Cure mortar. Mist mortar for at least 4 hours after tooling. In windy or hot weather, review cure procedures with the Architect to ensure that mortar does not cure excessively fast.

E. Clean-up. Excess mortar should be removed from the surface before it sets using a bristle brush or by subbing the surface with burlap or clean sand. Dried mortar shall be removed with chemical mortar remover by written Permission of the Architect.

F. Any joints that develop hairline cracking, become unbonded, are friable after seven day cure period, or are otherwise defective in the opinion of the Architect, shall be cut out and repointed at no cost to the Owner.

END OF SECTION

PROJECT NAME 40 NORRIS STREET

PROJECT ADDRESS

40 NORRIS STREET CAMBRIDGE, MA

CLIENT

Mouhab Z. Rizkallah

ARCHITECT KHALSA DESIGN INC.



17 MALCO STREET, SUITE 400 SOMERVILLE, MA 02143 EPHONE 67-811-862 FAX: 517-811-209

CONSULTANTS-

ANDSCAPE ARCHITECT

BLAIR HINES DESIGN ASSOCIATES 316 HARVARD STREET, STE 25 BROOKLINE MA 62446 T:(17) 738-4160

REGISTRATION

Project number Drawn by

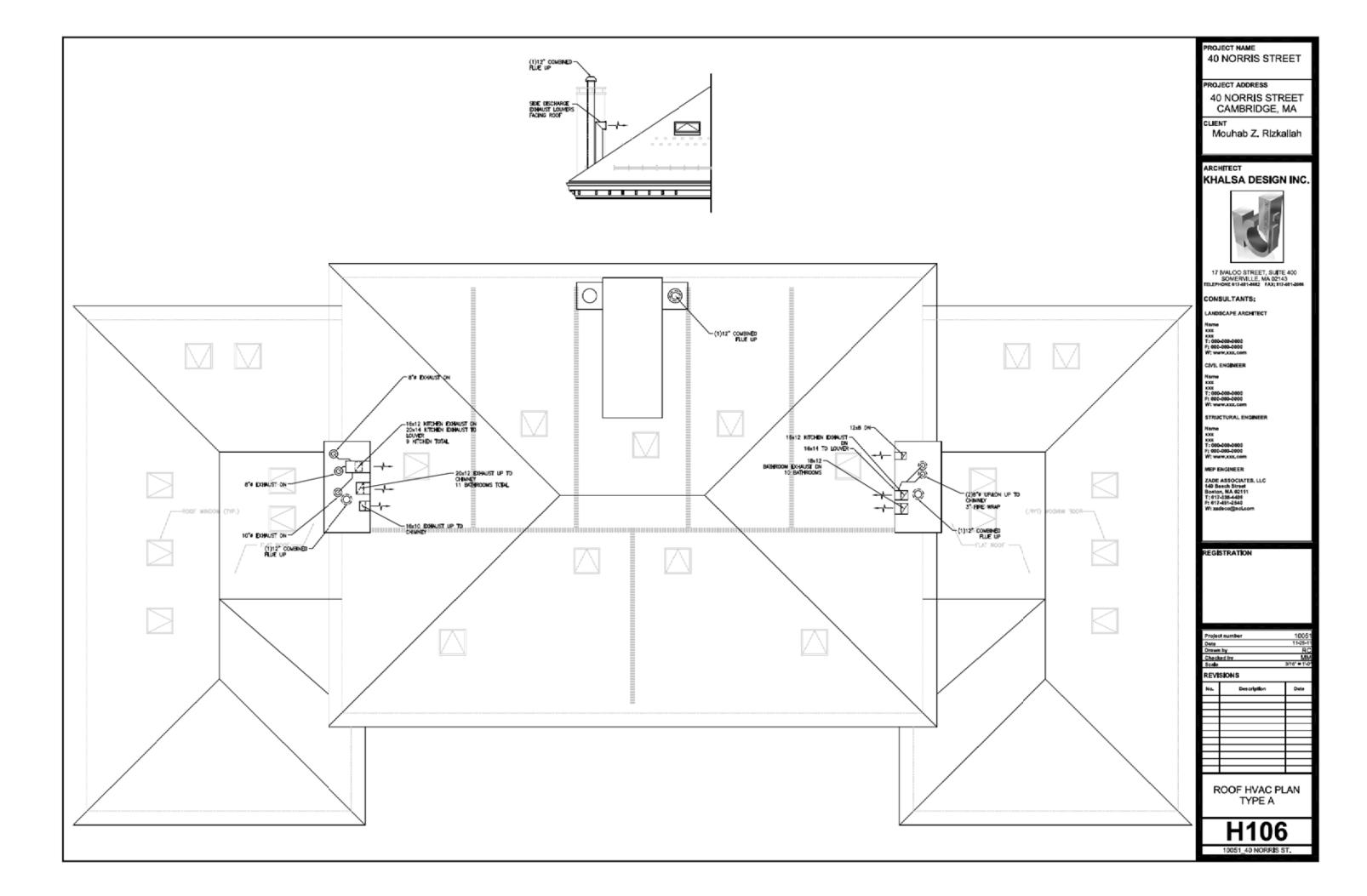
REVISIONS

Date

MASONRY RESTORATION **SPECIFICATIONS**

A305

10051 40 NORRIS ST.





JOB NAME	
TYPE	

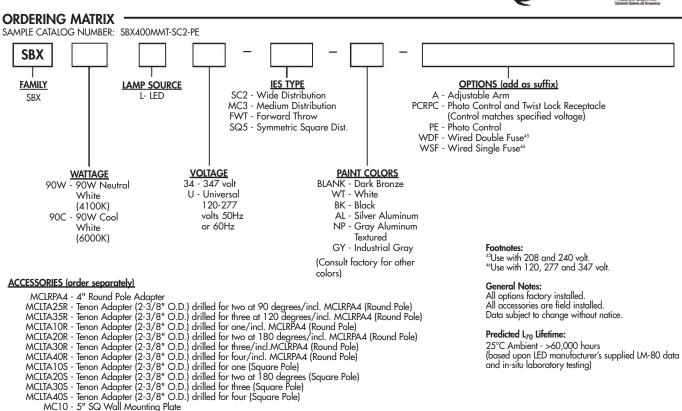
SBX-LED AREA/SITE LIGHT 90 Watt LED

The SBX LED Area/Site Luminaire puts light exactly where you need it, with no spill light. Tough and attractive, this luminaire can light roadways or parking areas with control and precision.





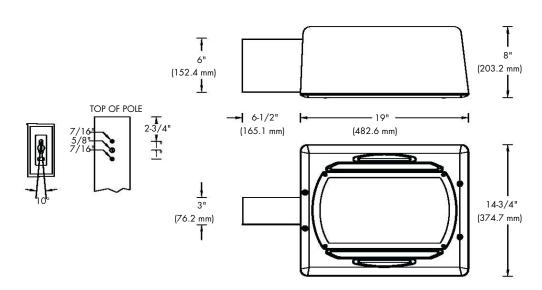




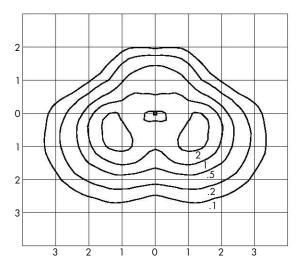
DIMENSIONS

MC10 - 5" SQ Wall Mounting Plate 206WBR - 5" SQ Thru Wire Box MCLARMTLRSC - 6" arm with Twist Lock Photo Control and Shorting Cap

(For additional descriptions of Area/Site Lighting accessories refer to sheet number OA-50020.)



EPA = 1.50 sq. ft. WEIGHT = 36 lbs. (max.)



UNITS SHOWN IN TERMS OF MOUNTING HEIGHT INITIAL FOOTCANDLES SHOWN

CATALOG NUMBER: SBX90CLU-MC3 TEST NUMBER: LSCD699

LAMP: LED WATTAGE: 95 LUMENS: 4411 TILT ANGLE: MOUNTING HEIGHT: 15 FEET

Note: Photometric values based on tests performed in compliance with LM-79

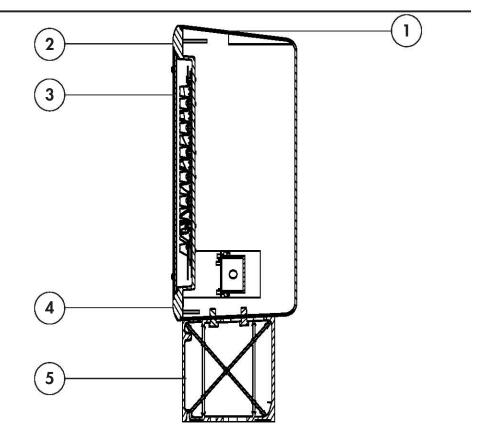
ADDITIONAL TEST NUMBERS

DESCRIPTION/CATALOG NUMBER	TEST NUMBER	WATTAGE	LUMENS
SBX90CLU-SC2	LSCD723	95	4114
SBX90CLU-FWT	LSCD724	95	4312
SBX90CLU-SQ5	LSCD700	95	4314

PRODUCT FEATURES -

Certified to meet UL 1598 standards for wet location and 25°C ambient.

- 1. Rugged one piece die cast aluminum housing.
- 2. Cast aluminum heat sink designed for excellent thermal transfer to extend component life.
- 3. Heat and shock resistant tempered glass lens.
- 4. Polyester powder finish for excellent impact, corrosion and UV resistance.
- 5. Die cast aluminum arm with integral wiring compartment and slide access cover standard. Designed to mount to minimum 4 inch square
- 6. Furnished with 10kV surge protector.
- 7. Components are RoHS compliant.
- 8. LED light engine and driver are field replaceable.
- 5 Year Limited Warranty

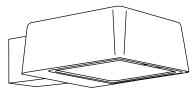




JOB NAME		
TYPE		

SBX400-AREA/SITE LIGHT TYPE III MEDIUM CUTOFF

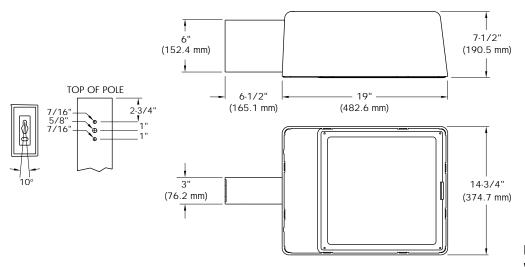
150-400 watt Metal Halide 150-400 watt High Pressure Sodium 150-400 watt Pulse Start Metal Halide



The SBX400 Area/Site Luminaire puts light exactly where you need it, with no spill light. Tough and attractive, this luminaire can light roadways and large areas with control and precision.

ORDERING MATRIX SAMPLE CATALOG NUMBER: SBX400MMT-MC3-PE MC3 SBX **FAMILY LAMP SOURCE** IES TYPE - Metal Halide MC3 -Medium Cutoff Type III SBX High Pressure Sodium Pulse Start Metal Halide (Ballast option must also be specified) WATTAGE **VOLTAGE** OPTIONS (add as suffix) 12 - 120 A - Adjustable Arm 150 - 150 PCRPC - Photo Control and Twist 20 - 208 175 - 175¹ 24 - 240 Lock Receptacle 200 - 20031 27 - 277 (Control matches 250 - 250 34 - 347 specified voltage) 320 - 32030 350 - 35030 48 - 480 PE - Photo Control (not MT - 120/208 available in 480 volt) Footnotes: 400 - 400 240/277 PSC - Pulse Start CWA Standard Metal Halide only. PSR - Pulse Start Reactor Ballast38 ³⁰Pulse Start Metal Halide only. ³¹Not available in standard Metal Halide. TT - 120/277 ACCESSORIES (order separately) WDF - Wired Double Fuse⁴⁵ 347 38Available in 400 watt and below, except for MCLVS - Visor Shield WSF - Wired Single Fuse⁴⁶ 175 watt. 277 volt only. 45 Use with 208, 240 and 480 volt. MCLGS - Glare Shield MCLHSS - House Side Shield MCLRPA4 - 4" Round Pole Adapter MCLTA10R - Tenon Adapter (2-3/8" O.D.) drilled for one/incl. MCLRPA4 (Round Pole) MCLTA20R - Tenon Adapter (2-3/8" O.D.) drilled for two at 180 degrees/incl. MCLRPA4 (Round Pole) MCLTA30R - Tenon Adapter (2-3/8" O.D.) drilled for three/incl.MCLRPA4 (Round Pole) MCLTA40R - Tenon Adapter (2-3/8" O.D.) drilled for four/incl. MCLRPA4 (Round Pole) MCLTA10S - Tenon Adapter (2-3/8" O.D.) drilled for one (Square Pole) MCLTA30S - Tenon Adapter (2-3/8" O.D.) drilled for two at 180 degrees (Square Pole) MCLTA30S - Tenon Adapter (2-3/8" O.D.) drilled for three (Square Pole) MCLTA30S - Tenon Adapter (2-3/8" O.D.) drilled for four (Square Pole) MCLTA40S - Tenon Adapter (2-3/8" O.D.) drilled for four (Square Pole) MCLHSS - House Side Shield 46Use with 120, 277 and 347 volt. General Notes: All options factory installed. Mogul base lamp only. All accessories are field installed. - 5" SQ Wall Mounting Plate MC10 206WBR - 5" SQ Thru Wire Box MCL11A - 11" Arm MCLARMTLRSC - 6" arm with Twist Lock Photo Control and Shorting Cap

DIMENSIONS

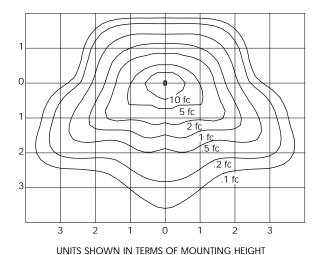


(For additional descriptions of Area/Site Lighting accessories refer to sheet number OA-50020.)

ENERGY DATA

HIGH PRESSURE SODIUM		
HX BALLAST INPUT WATTS		
150 watt-188 watts		
CWA BALLAST INPUT WATTS		
200 watt-240 watts		
250 watt-295 watts		
310 watt-365 watts		
400 watt-464 watts		
METAL HALIDE		
HX BALLAST INPUT WATTS		
150 watt-185 watts		
CWA BALLAST INPUT WATTS		
150 watt-189 watts		
175 watt-210 watts		
200 watt-232 watts		
250 watt-295 watts		
320 watt-368 watts		
350 watt-400 watts		
400 watt-458 watts		
EPA = 1.50 sq. ft.		

WEIGHT = 40 lbs. (max.)



INITIAL FOOTCANDLES SHOWN

MULTIPLYING FACTORS			
MOUNTING	MULTIPLIER		
HEIGHT			
40'	0.39		
35'	0.51		
30'	0.69		
25'	1.00		
20'	1.56		
15'	2.77		

LIGHT LEVEL

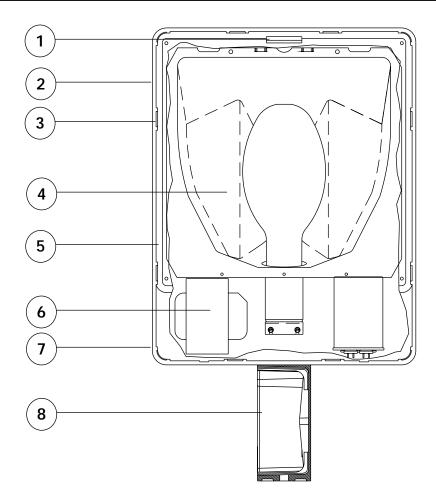
ADDITIONAL TEST NUMBERS

TEST NUMBER
SBX400S3
SBX150S3
SBX175M3

PRODUCT FEATURES -

UL 1598 Listed suitable for wet location and 25°C ambient for all lamp wattages listed.

- 1. Lens frame opens by releasing a stainless steel latch.
- 2. Rugged one piece die cast aluminum housing.
- One-piece hinged, die cast aluminum door with heat and shock resistant tempered glass lens.
- 4. Durable formed reflector with clear anodized finish.
- 5. One piece silicone rubber gasket seals door to housing.
- 6. Swing-down ballast tray allows for easy maintenance of all electrical components.
- Dark bronze polyester powder finish for excellent impact, corrosion and UV resistance.
- Die cast aluminum arm with integral wiring compartment and slide access cover standard. Designed to mount to minimum 4 inch square pole.



Visit our web site at www.daybritelighting.com