

114-A-4

Bedford St.

Discontinuance of Bedford and Concord

USM

## K. NOISE

### K.1 SUMMARY

As a school, the University of Southern Maine – Portland Campus is classified as a protected location. The following information is provided to show that the proposed facilities will not significantly increase the noise level at the campus. The site is adjacent to I-295, which has an existing ambient noise level that has not been quantified for this application.

### K.2 TYPE, SOURCE AND LOCATION OF NOISE

The potential sources of noise at the project site will consist of noise generated during the construction of the project and noise generated during the operation of the facilities.

- Construction Noise: Noise generated during the construction (between Winter 2006 and Summer 2009) will consist of noise associated with the pile driving activities, light and heavy machinery, and various forms of construction related equipment. This noise generation will be limited to normal working hours, typically 6 a.m. to 7 p.m. It is anticipated that pile driving will take place over as short duration as possible.
- Facility Operation: There will be two air handling units in a rooftop mechanical room penthouse. The noise generated by the air handling units has been evaluated in the attached letter from Harriman Associates to the City of Portland Planning Office, dated December 22, 2006. MeDEP standards for control of noise have also been attached.
- Noise Generation from Boilers and Generators: A 100kW emergency generator will be located in the basement of the Wishcamper Center, and so will have a minimal noise impact at the site. The generator exhaust louver and make-up air louver are located in a below-grade well adjacent to the south side of the building. The emergency generator will be run for testing purposes for 15 minutes once per week.

### K.3 USES, ZONING, AND PLANS

The USM Portland Campus is located in Residential (R-5) and Business Community (B-2) zoning districts in the City of Portland. The University property is also in Portland's University of Southern Maine overlay zone. Existing land uses abutting the project area include residential, commercial, and other onsite university administrative and educational uses.

### K.4 MINOR NATURE OF IMPACT

The anticipated sound impact of the proposed University Commons project is expected to be compatible with the existing zoning districts. Noise resulting from the construction and operation of the proposed facilities will be of similar nature as those currently in existence at the project site.

### K.5 ATTACHMENTS

Letter from Harriman Associates to City of Portland Planning Office, dated December 22, 2006

Maine Department of Environmental Protection Chapter 375, Section 10 Control of Noise

## HARRIMAN ASSOCIATES

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Building communities  
since 1870

December 22, 2006

City of Portland  
Planning & Development Department  
389 Congress Street  
Room 308  
Portland, Maine 04101  
Attn: Shukria Wiar

Re: USM Portland Commons  
Portland, ME  
Project No. 05155  
DEP NOISE REQUIREMENTS

Dear Shukria:

The Osher Lifelong Learning Institute and The Wishcamper Center for the Muskie School of Public Service will be located in the new 56,000 square foot facility at the Portland Campus of the University of Southern Maine. Located on Bedford Street between the Glickman Library and the Abromson Community Education Center, the new building will include lecture rooms, seminar rooms, classrooms, offices, and associated support facilities. The HVAC systems and their acoustical effects have been reviewed to ensure sound levels to not intrude on the surrounding area.

Heating and cooling is achieved through a geothermal system consisting of a series of water source heat pumps. Typically, equipment such as condensing units and chillers that contain refrigeration compressors are the source of excessive sound levels. For this particular project the water source heat pumps contain compressors which are located in the basement of the building. Heat is rejected through the 1500' deep geothermal wells located around the perimeter of the building. The basement is located below grade with only an areaway creating any exposure to the outside. Given their location and separation from the outside, sound transmission from the water source heat pumps will be negligible.

The only other sources of sound are the air handlers that are located in the penthouse of the 4 story structure. The sound transmission from the air handler fans at the intake louvers has been calculated at approximately 76 dBA. Sound levels are calculated on a logarithmic scale which reduces levels by 6 dBA per doubling of distance. The distance to the nearest residential property line is 600 feet which will reduce the sound level to 41 dBA. As a point of reference a quiet office, library, or quiet residential area typically measures 40 dBA. A refrigerator or rainfall measures 50 dBA.

HARRIMAN ASSOCIATES

City of Portland  
December 22, 2006  
Page 2 of 2

The limits in DEP Site Law apply to "Protected Locations" which in this case are primarily the residences which are accessible from the site by foot. A worst case scenario for an existing quiet neighborhood can be summarized as follows:

55 dBA between 7:00 a.m and 7:00 p.m.  
45 dBA between 7:00 p.m. and 7:00 a.m.

The 41 dBA calculated at the property line is well within the DEP parameters.

If you have any questions or concerns do not hesitate to contact me.

Sincerely,  
Harriman Associates



Jeffrey Cormier, P.E.

jscor

cc: Dave Early, Carol Potter, Barry Sheff, Dave Senus

**Chapter 375:****NO ADVERSE ENVIRONMENTAL EFFECT STANDARD OF THE SITE LOCATION LAW**

SUMMARY: These regulations describe the scope of review of the Board in determining a developer's compliance with the "no adverse effect on the natural environment" standard of the Site Location Law (38 M.R.S.A. Section 484(3)); the information which shall be submitted, when appropriate, within an application for approval; and, the terms and conditions which the Board may impose on the approval of an application to ensure compliance with the standard.

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NOTE: In determining whether the developer has made adequate provision for fitting the development harmoniously into the existing natural environment and that the development will not adversely affect existing uses, scenic character, or natural resources in the municipality or in neighboring municipalities, the Board has identified several specific areas of concern which are dealt with in detail below.

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**10. Control of Noise**

**A. Preamble.** The Board recognizes that the construction, operation and maintenance of developments may cause excessive noise that could degrade the health and welfare of nearby neighbors. It is the intent of the Board to require adequate provision for the control of excessive environmental noise from developments proposed after the effective date of this regulation.

**B. Applicability**

- (1) This regulation applies to proposed developments within municipalities without a local quantifiable noise standard and in unorganized areas of the State. When a proposed development is located in a municipality which has duly enacted by ordinance an applicable quantifiable noise standard, which (1) contains limits that are not higher than the sound level limits contained in this regulation by more than 5 dBA, and (2) limits or addresses the various types of noises contained in this regulation or all the types of noises generated by the development, that local standard, rather than this regulation, shall be applied by the Board within that municipality for each of the types of sounds the ordinance regulates. This regulation applies to developments located within one municipality when the noise produced by the development is received in another municipality and, in these cases, the Board will also take into consideration the municipalities' quantifiable noise standards, if any.
- (2) This regulation applies to expansions and modifications of developments when such expansions and modifications are proposed after the effective date of this regulation and subject to site location approval, but only to the noise produced by the proposed expansion or modification of the development, unless (1) the existing development was constructed since 1-1-70 and (2) at the time of construction, the existing development was too small to require site location approval. In situations where conditions (1) and (2) above apply, then this regulation applies to the whole development (both existing facility and proposed expansion or modification). This regulation also applies to expansions and modifications of existing developments when such expansions and modifications require an amendment to the

development's Site Law permit, but only to the noise produced by the expansion or modification.

- (3) This regulation does not apply to existing developments or portions of existing developments constructed prior to 1-1-70 or approved under the Site Law prior to the effective date of this regulation. This regulation does not apply to relicensing of existing solid waste facilities previously approved under the Site Law.
- (4) The sound level limits contained in this regulation apply only to areas that are defined as protected locations, and to property lines of the proposed development or contiguous property owned by the developer, whichever are farther from the proposed development's regulated sound sources.
- (5) The sound level limits contained in this regulation do not apply to noise received within the development boundary.

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NOTE: The Board will reconsider the effect and operation of the regulation one year from its effective date.

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### C. Sound Level Limits

#### (1) Sound From Routine Operation of Developments.

(a) Except as noted in subsections (b) and (c) below, the hourly sound levels resulting from routine operation of the development and measured in accordance with the measurement procedures described in subsection H shall not exceed the following limits:

(i) At any property line of the development or contiguous property owned by the developer, whichever is farther from the proposed development's regulated sound sources:

75 dBA at any time of day.

(ii) At any protected location in an area for which the zoning, or, if unzoned, the existing use or use contemplated under a comprehensive plan, is not predominantly commercial, transportation, or industrial;

60 dBA between 7:00 a.m. and 7:00 p.m.  
(the "daytime hourly limit"), and  
50 dBA between 7:00 p.m. and 7:00 a.m.  
(the "nighttime hourly limit").

(iii) At any protected location in an area for which the zoning, or, if unzoned, the existing use or use contemplated under a comprehensive plan, is predominantly commercial, transportation, or industrial:

70 dBA between 7:00 a.m. and 7:00 p.m.  
(the "daytime hourly limit"), and

60 dBA between 7:00 p.m. and 7:00 a.m.  
(the 'nighttime hourly limit').

- (iv) For the purpose of determining whether the use of an unzoned area is predominantly commercial, transportation, or industrial (e.g. non-residential in nature), the Department shall consider the municipality's comprehensive plan, if any. Furthermore, the usage of properties abutting each protected location shall be determined, and the limits applied for that protected location shall be based upon the usage occurring along the greater portion of the perimeter of that parcel; in the event the portions of the perimeter are equal in usage, the limits applied for that protected location shall be those for a protected location in an area for which the use is not predominantly commercial, transportation, or industrial.
- (v) When a proposed development is to be located in an area where the daytime pre-development ambient hourly sound level at a protected location is equal to or less than 45 dBA and/or the nighttime pre-development ambient hourly sound level at a protected location is equal to or less than 35 dBA, the hourly sound levels resulting from routine operation of the development and measured in accordance with the measurement procedures described in subsection H shall not exceed the following limits at that protected location:

55 dBA between 7:00 a.m. and 7:00 p.m.  
(the "daytime hourly limit"), and  
45 dBA between 7:00 p.m. and 7:00 a.m.  
(the "nighttime hourly limit").

For the purpose of determining whether a protected location has a daytime or nighttime pre-development ambient hourly sound level equal to or less than 45 dBA or 35 dBA, respectively, the developer may make sound level measurements in accordance with the procedures in subsection H or may estimate the sound-level based upon the population density and proximity to local highways. If the resident population within a circle of 3,000 feet radius around a protected location is greater than 300 persons, or the hourly sound level from highway traffic at a protected location is predicted to be greater than 45 dBA in the daytime or 35 dBA at night (as appropriate for the anticipated operating schedule of the development), then the developer may estimate the daytime or nighttime pre-development ambient hourly sound level to be greater than 45 dBA or 35 dBA, respectively.

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NOTE: Highway traffic noise can be predicted using the nomograph method of FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108, December, 1978.

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- (vi) Notwithstanding the above, the developer need not measure or estimate the pre-development ambient hourly sound levels at a protected location if he demonstrates, by estimate or example, that the hourly sound levels resulting from routine operation of the development will not exceed 50 dBA in the daytime or 40 dBA at night.

- (b) If the developer chooses to demonstrate by measurement that the daytime and/or nighttime pre-development ambient sound environment at any protected location near the development site exceeds the daytime and/or nighttime limits in subsection 1(a)(ii) or 1(a)(iii) by at least 5 dBA, then the daytime and/or nighttime limits shall be 5 dBA less than the measured daytime and/or nighttime pre-development ambient hourly sound level at the location of the measurement for the corresponding time period.
- (c) For any protected location near an existing development, the hourly sound level limit for routine operation of the existing development and all future expansions of that development shall be the applicable hourly sound level limit of 1(a) or 1(b) above, or, at the developer's election, the existing hourly sound level from routine operation of the existing development plus 3 dBA.
- (d) For the purposes of determining compliance with the above sound level limits, 5 dBA shall be added to the observed levels of any tonal sounds that result from routine operation of the development.
- (e) When routine operation of a development produces short duration repetitive sound, the following limits shall apply:
- (i) For short duration repetitive sounds, 5 dBA shall be added to the observed levels of the short duration repetitive sounds that result from routine operation of the development for the purposes of determining compliance with the above sound level limits.
- (ii) For short duration repetitive sounds resulting from scrap metal, drop forge and metal fabrication operations or developments which the Board determines, due to their character and/or duration, are particularly annoying or pose a threat to the health and welfare of nearby neighbors, 5 dBA shall be added to the observed levels of the short duration repetitive sounds that result from routine operation of the development for the purposes of determining compliance with the above sound level limits, and the maximum sound level of the short duration repetitive sounds shall not exceed the following limits:
- (a) At any protected location in an area for which the zoning, or, if unzoned, the existing use or use contemplated under a comprehensive plan, is not predominantly commercial, transportation, or industrial:
- 65 dBA between 7:00 a.m. and 7:00 p.m., and  
55 dBA between 7:00 p.m. and 7:00 a.m.
- (b) At any protected location in an area for which the zoning, or, if unzoned, the existing use or use contemplated under a comprehensive plan, is predominantly commercial, transportation, or industrial:
- 75 dBA between 7:00 a.m. and 7:00 p.m., and  
65 dBA between 7:00 p.m. and 7:00 a.m.



- (c) The methodology described in subsection 1(a)(iv) shall be used to determine whether the use of an unzoned area is predominantly commercial, transportation, or industrial.
- (d) If the developer chooses to demonstrate by measurement that the pre-development ambient hourly sound level at any protected location near the development site exceeds 60 dBA between 7:00 a.m. and 7:00 p.m., and/or 50 dBA between 7:00 p.m. and 7:00 a.m., then the maximum sound level limit for short duration repetitive sound shall be 5 dBA greater than the measured pre-development ambient hourly sound level at the location of the measurement for the corresponding time period.
- (e) For any protected location near an existing development, the maximum sound level limit for short duration repetitive sound resulting from routine operation of the existing development and all future expansions and modifications of that development shall be the applicable maximum sound level limit of (e)(ii)(a) or (e)(ii)(b) above, or, at the developer's election, the existing maximum sound level of the short duration repetitive sound resulting from routine operation of the existing development plus 3 dBA.

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NOTE: The maximum sound level of the short duration repetitive sound shall be measured using the fast response [ $L_{AFmax}$ ]. See the definition of maximum sound level.

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(2) Sound From Construction of Developments

- (a) The sound from construction activities between 7:00 p.m. and 7:00 a.m. is subject to the following limits:
- (i) Sound from nighttime construction activities shall be subject to the nighttime routine operation sound level limits contained in subsections 1(a) and 1(b).
  - (ii) If construction activities are conducted concurrently with routine operation, then the combined total of construction and routine operation sound shall be subject to the nighttime routine operation sound level limits contained in subsections 1(a) and 1(b).
  - (iii) Higher levels of nighttime construction sound are permitted when a duly issued permit authorizing nighttime construction sound in excess of these limits has been granted by:
    1. the local municipality when the duration of the nighttime construction activity is less than or equal to 90 days,
    2. the local municipality and the Board when the duration of the nighttime construction activity is greater than 90 days.
- (b) Sound from construction activities between 7:00 a.m. and 7:00 p.m. shall not exceed the following limits at any protected location:

Duration of Activity	Hourly Sound Level Limit
12 hours	87 dBA

8 hours	90 dBA
6 hours	92 dBA
4 hours	95 dBA
3 hours	97 dBA
2 hours	100 dBA
1 hour or less	105 dBA

- (c) All equipment used in construction on development sites shall comply with applicable federal noise regulations and shall include environmental noise control devices in proper working condition, as originally provided with the equipment by its manufacturer.

(3) Sound From Maintenance Activities

- (a) Sound from routine, ongoing maintenance activities shall be considered part of the routine operation of the development and the combined total of the routine maintenance and operation sound shall be subject to the routine operation sound level limits contained in subsection 1.
- (b) Sound from occasional, major, scheduled overhaul activities shall be subject to the construction sound level limits contained in subsection 2. If overhaul activities are conducted concurrently with routine operation and/or construction activities, the combined total of the overhaul, routine operation and construction sound shall be subject to the construction sound level limits contained in subsection 2.

(4) Sound From Production Blasting

Sound exceeding the limits of subsection 1 and resulting from production blasting at a mine or quarry shall be limited as follows:

- (a) Blasting shall not occur in the period between sundown and sunrise the following day or in the period between the hours of 7:00 p.m. and 7:00 a.m., whichever is greater. In addition, no routine production blasting shall be allowed in the daytime on Sundays.
- (b) Blasting shall not occur more frequently than four times per day.
- (c) Sound from blasting shall not exceed the following limits at any protected location:

Number of Blasts Per Day	Sound Level Limit
1	129 dBL
2	126 dBL
3	124 dBL
4	123 dBL.

Blast sound shall be measured in peak linear sound level (dBL) with a linear response down to 5 Hz.

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NOTE: See Bureau of Mines Report of Investigations 8485 for information on airblast sound levels and pertinent scaled distances.

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(5) Exemptions

Sound associated with the following shall be exempt from regulation by the Board:

- (a) Railroad equipment which is subject to federal noise regulations.
- (b) Aircraft operations which are subject to federal noise regulations.
- (c) Registered and inspected vehicles:
  - (i) while operating on public ways, or
  - (ii) which enter the development to make a delivery or pickup and which are moving, starting or stopping, but not when they are parked for over 60 minutes in the development.
- (d) Watercraft while underway.
- (e) Residential developments, except during construction of such developments.
- (f) Bells, chimes and carillons.
- (g) occasional sporting, cultural, religious or public events allowed by the local municipality where the only affected protected locations are contained within that municipality.
- (h) The unamplified human voice and other sounds of natural origin.
- (i) Firing, fishing and aquacultural activity.
- (j) Forest management, harvesting and transportation activities.
- (k) Making, maintaining and grooming snow where the only affected protected locations are contained within the general boundaries of a ski area development.
- (l) Snow removal, landscaping and street sweeping activities.
- (m) Emergency maintenance and repairs.
- (n) Warning signals and alarms.
- (o) Safety and protective devices installed in accordance with code requirements.
- (p) Test operations of emergency equipment occurring in the daytime and no more frequently than once per week.

- (q) Boiler start-up, testing and maintenance operations occurring no more frequently than once per month.
- (r) Major concrete pours that must extend after 7:00 p.m., when started before 3:00 p.m.
- (s) Sounds from a regulated development received at a protected location when the generator of the sound has been conveyed a noise easement for that location. This exemption shall only be for the specific noise, land and term covered by the easement.
- (t) A force majeure event and other causes not reasonably within the control of the owners or operators of the development.

(6) Noise Abatement Structures.

Noise abatement structures of a non-permanent nature in any one location for a duration of less than one year and erected for the sole purpose of noise control shall not be considered structures as defined in 38 M RSA subsection 482(6).

**D. Submissions**

(1) Developments with Minor Sound Impact.

An applicant for a proposed development with minor sound impact may choose to file as part of the site location application a statement attesting to the minor nature of the anticipated sound impact of their development. An applicant proposing an expansion or modification of an existing development with minor sound impact may follow the same procedure as described above. For the purpose of this regulation, a development or an expansion or modification of an existing development with minor sound impact means a development where the developer demonstrates, by estimate or example, that the regulated sound from routine operation of the development will not exceed 5 dBA less than the applicable limits established under subsection C. It is the intent of this subsection that an applicant need not conduct sound level measurements to demonstrate that the development or an expansion or modification of an existing development will have a minor sound impact.

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NOTE: Examples include subdivisions without structures, office buildings, storage buildings which will not normally be accessed at night, and golf courses.

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(2) Other Developments

Technical information shall be submitted describing the applicant's plan and intent to make adequate provision for the control of sound. The applicant's plan shall contain information such as the following, when appropriate:

- (a) Maps and descriptions of the land uses, local zoning and comprehensive plans for the area potentially affected by sounds from the development.

- (b) A description of major sound sources, including tonal sound sources and sources of short duration repetitive sounds, associated with the construction, operation and maintenance of the proposed development, including their locations within the proposed development.
- (c) A description of the daytime and nighttime hourly sound levels and, for short duration repetitive sounds, the maximum sound levels expected to be produced by these sound sources at protected locations near the proposed development.
- (d) A description of the protected locations near the proposed development.
- (e) A description of proposed major sound control measures, including their locations and expected performance.
- (f) A comparison of the expected sound levels from the proposed development with the sound level limits of this regulation.
- (g) A comparison of the expected sound levels from the proposed development with any quantifiable noise standards of the municipality in which the proposed development will be located and of any municipality which may be affected by the noise.

#### **E. Terms and Conditions**

The Board may, as a term or condition of approval, establish any reasonable requirement to ensure that the developer has made adequate provision for the control of noise from the development and to reduce the impact of noise on protected locations. Such conditions may include, but are not limited to, enclosing equipment or operations, imposing limits on hours of operation, or requiring the employment of specific design technologies, site design, modes of operation, or traffic patterns.

The sound level limits prescribed in this regulation shall not preclude the Board under Chapter 375.15 from requiring a developer to demonstrate that sound levels from a development will not unreasonably disturb wildlife or adversely affect wildlife populations. In addition, the sound level limits shall not preclude the Board, as a term or condition of approval, from requiring that lower sound level limits be met to ensure that the developer has made adequate provision for the protection of wildlife.

## F. Variance From Sound Level Limits

The Board recognizes that there are certain developments or activities associated with development for which noise control measures are not reasonably available. Therefore, the Board or Commissioner may grant a variance from any of the sound level limits contained in this rule upon (1) a showing by the applicant that he or she has made a comprehensive assessment of the available technologies for the development and that the sound level limits cannot practicably be met with any of these available technologies, and (2) a finding by the Board that the proposed development will not have an unreasonable impact on protected locations. In addition, a variance may be granted by the Board or Commissioner if (1) a development is deemed necessary in the interest of national defense or public safety and the applicant has shown that the sound level limits cannot practicably be met without unduly limiting the development's intended function, and (2) a finding is made by the Board or Commissioner that the proposed development will not have an unreasonable impact on protected locations. The Board or Commissioner shall consider the request for a variance as part of the review of a completed Site Location of Development Law application. In granting a variance, the Board or Commissioner may, as a condition of approval, impose terms and conditions to ensure that no unreasonable sound impacts will occur.

## G. Definitions

Terms used herein are defined below for the purpose of this noise regulation.

- (1) **AMBIENT SOUND:** At a specified time, the all-encompassing sound associated with a given environment, being usually a composite of sounds from many sources at many directions, near and far, including the specific development of interest.
- (2) **CONSTRUCTION:** Activity and operations associated with the development or expansion of a project or its site.
- (3) **EMERGENCY:** An unforeseen combination of circumstances which calls for immediate action.
- (4) **EMERGENCY MAINTENANCE AND REPAIRS:** Work done in response to an emergency.
- (5) **ENERGY SUM OF A SERIES OF LEVELS:** Ten times the logarithm of the arithmetic sum of the antilogarithms of one-tenth of the levels. [Note: See Section H(4.2).]
- (6) **EXISTING DEVELOPMENT:** A development constructed before 1-1-70 or a development approved under the Site Law prior to the effective date of this regulation or a proposed development for which the site location application is complete for processing on or before the effective date of this regulation. Any development with a site location approval which has been remanded to the Board by a court of competent jurisdiction for further proceedings relating to noise limits or noise levels prior to the effective date of these regulations shall not be deemed an existing development and these regulations shall apply to the existing noise sources at that development.

- (7) **EXISTING HOURLY SOUND LEVEL:** The hourly sound level resulting from routine operation of an existing development prior to the first expansion that is subject to this regulation.
- (8) **EQUIVALENT SOUND LEVEL:** The level of the mean-square A-weighted sound pressure during a stated time period, or equivalently the level of the sound exposure during a stated time period divided by the duration of the period.

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NOTE: For convenience, a one hour equivalent sound level should begin approximately on the hour.

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- (9) **HISTORIC AREAS:** Historic sites administered by the Bureau of Parks and Recreation of the Maine Department of Conservation, with the exception of the Arnold Trail.
- (10) **HOURLY SOUND LEVEL:** The equivalent sound level for one hour measured or computed in accordance with this regulation.
- (11) **LOCALLY-DESIGNATED PASSIVE RECREATION AREA:** Any site or area designated by a municipality for passive recreation that is open and maintained for public use and which:
- (a) has fixed boundaries,
  - (b) is owned in fee simple by a municipality or is accessible by virtue of public easement,
  - (c) is identified and described in a local comprehensive plan, and
  - (d) has been identified and designated at least nine months prior to the filing of the applicant's Site Location of Development application.
- (12) **MAXIMUM SOUND LEVEL:** Ten times the common logarithm of the square of the ratio of the maximum sound to the reference sound of 20 micropascals. Symbol:  $L_{AFmax}$ .
- (13) **MAXIMUM SOUND:** Largest A-weighted and fast exponential-time-weighted sound during a specified time interval. Unit: pascal (Pa).
- (14) **RESIDENCE:** A building or structure, including manufactured housing, maintained for permanent or seasonal residential occupancy providing living, cooking and sleeping facilities and having permanent indoor or outdoor sanitary facilities, excluding recreational vehicles, tents and watercraft.
- (15) **PRE-DEVELOPMENT AMBIENT:** The ambient sound at a specified location in the vicinity of a development site prior to the construction and operation of the proposed development or expansion.
- (16) **PROTECTED LOCATION:** Any location, accessible by foot, on a parcel of land containing a residence or planned residence or approved residential subdivision, house of worship, academic school, college, library, duly licensed hospital or nursing home near the

development site at the time a Site Location of Development application is submitted; or any location within a State Park, Baxter State Park, National Park, Historic Area, a nature preserve owned by the Maine or National Audubon Society or the Maine Chapter of the Nature Conservancy, The Appalachian Trail, the Moosehorn National Wildlife Refuge, federally-designated wilderness area, state wilderness area designated by statute (such as the Allagash Wilderness Waterway), or locally-designated passive recreation area; or any location within consolidated public reserve lands designated by rule by the Bureau of Public Lands as a protected location.

At protected locations more than 500 feet from living and sleeping quarters within the above noted buildings or areas, the daytime hourly sound level limits shall apply regardless of the time of day.

Houses of worship, academic schools, libraries, State and National Parks without camping areas, Historic Areas, nature preserves, the Moosehorn National Wildlife Refuge, federally-designated wilderness areas without camping areas, state wilderness areas designated by statute without camping areas, and locally-designated passive recreation areas without camping areas are considered protected locations only during their regular hours of operation and the daytime hourly sound level limits shall apply regardless of the time of day.

Transient living accommodations are generally not considered protected locations; however, in certain special situations where it is determined by the Board that the health and welfare of the guests and/or the economic viability of the establishment will be unreasonably impacted, the Board may designate certain hotels, motels, campsites and duly licensed campgrounds as protected locations.

This term does not include buildings and structures located on leased camp lots, owned by the applicant, used for seasonal purposes.

For purposes of this definition, (1) a residence is considered planned when the owner of the parcel of land on which the residence is to be located has received all applicable building and land use permits and the time for beginning construction under such permits has not expired, and (2) a residential subdivision is considered approved when the developer has received all applicable land use permits for the subdivision and the time for beginning construction under such permits has not expired.

- (17) **QUANTIFIABLE NOISE STANDARD:** A numerical limit governing noise from developments that has been duly enacted by ordinance by a local municipality.
- (18) **ROUTINE OPERATION:** Regular and recurrent operation of regulated sound sources associated with the purpose of the development and operating on the development site.
- (19) **SHORT DURATION REPETITIVE SOUNDS:** A sequence of repetitive sounds which occur more than once within an hour, each clearly discernible as an event and causing an increase in the sound level of at least 6 dBA on the fast meter response above the sound level observed immediately before and after the event, each typically less than ten seconds in duration, and which are inherent to the process or operation of the development and are foreseeable.



- (20) **SOUND COMPONENT:** The measurable sound from an audibly identifiable source or group of sources.
- (21) **SOUND LEVEL:** Ten times the common logarithm of the square of the ratio of the frequency-weighted and time-exponentially averaged sound pressure to the reference sound of 20 micropascals. For the purpose of this regulation, sound level measurements are obtained using the A-weighted frequency response and fast dynamic response of the measuring system, unless otherwise noted.
- (22) **SOUND PRESSURE:** Root-mean-square of the instantaneous sound pressures in a stated frequency band and during a specified time interval. Unit: pascal (Pa).
- (23) **SOUND PRESSURE LEVEL:** Ten times the common logarithm of the square of the ratio of the sound pressure to the reference sound pressure of 20 micropascals.
- (24) **TONAL SOUND:** for the purpose of this regulation, a tonal sound exists if, at a protected location, the one-third octave band sound pressure level in the band containing the tonal sound exceeds the arithmetic average of the sound pressure levels of the two contiguous one-third octave bands by 5 dB for center frequencies at or between 500 Hz and 10,000 Hz, by 8 dB for center frequencies at or between 160 and 400 Hz, and by 15 dB for center frequencies at or between 25 Hz and 125 Hz.

Additional acoustical terms used in work associated with this regulation shall be used in accordance with the following American National Standards Institute (ANSI) standards:

ANSI S12.9-1988 - American National Standard Quantities and Procedures for Description and Measurements of Environmental Sound, Part 1;

ANSI S3.20-1973 - American National Standard Psychoacoustical Terminology;

ANSI S1.1-1960 - American National Standard Acoustical Terminology.

## **H. Measurement Procedures**

(1) **Scope.** These procedures specify measurement criteria and methodology for use, with applications, compliance testing and enforcement. They provide methods for measuring the ambient sound and the sound from routine operation of the development, and define the information to be reported. The same methods shall be used for measuring the sound of construction, maintenance and production blasting activities. For measurement of the sound of production blasting activities for comparison with the limits of subsection C(4)(c), these same methods shall be used with the substitution of the linear sound level for the A-weighted sound level.

### **(2) Measurement Criteria**

#### **2.1 Measurement Personnel**

Measurements shall be supervised by personnel who are well qualified by training and experience in measurement and evaluation of environmental sound, or by personnel trained to operate under a specific measurement plan approved by the Board or Commissioner.

## 2.2 Measurement Instrumentation

- (a) A sound level meter or alternative sound level measurement system used shall meet all of the Type 1 or 2 performance requirements of American National Standard Specifications for Sound Level Meters, ANSI S1.4-1983.
- (b) An integrating sound level meter (or measurement system) shall also meet the Type 1 or 2 performance requirements for integrating/averaging in the International Electrotechnical Commission Standard on Integrating-Averaging Sound Level Meters, IEC Publication 804 (1985).
- (c) A filter for determining the existence of tonal sounds shall meet all the requirements of American National Standard Specification for Octave-Band and Fractional Octave-Band Analog and Digital Filters, ANSI S1.11-1986 for Order 3, Type 3-D performance.
- (d) An acoustical calibrator shall be used of a type recommended by the manufacturer of the sound level meter and that meets the requirements of American National Standard Specification for Acoustical Calibrators, ANSI S1.40-1984.
- (e) A microphone windscreen shall be used of a type recommended by the manufacturer of the sound level meter.

## 2.3 Calibration

- (a) The sound level meter shall have been calibrated by a laboratory within 12 months of the measurement, and the microphone's response shall be traceable to the National Bureau of Standards.
- (b) Field calibrations shall be recorded before and after each measurement period and at shorter intervals if recommended by the manufacturer.

## 2.4 Measurement Location, Configuration and Environment

- (a) Except as noted in subsection (b) below, measurement locations shall be at nearby protected locations that are most likely affected by the sound from routine operation of the development.
- (b) For determining compliance with the 75 dBA property line hourly sound level limit described in subsection C(1)(a)(i), measurement locations shall be selected at the property lines of the proposed development or contiguous property owned by the developer, as appropriate.
- (c) The microphone shall be positioned at a height of approximately 4 to 5 feet above the ground, and oriented in accordance with the manufacturer's recommendations.

- (d) Measurement locations should be selected so that no vertical reflective surface exceeding the microphone height is located within 30 feet. When this is not possible, the measurement location may be closer than 30 feet to the reflective surface, but under no circumstances shall it be closer than 6 feet.
- (e) When possible, measurement locations should be at least 50 feet from any regulated sound source on the development.
- (f) Measurement periods shall be avoided when the local wind speed exceeds 12 mph and/or precipitation would affect the measurement results.

2.5 Measurement Plans. Plans for measurement of pre-development ambient sound or post-development sound may be discussed with the Department staff.

### (3) Measurement of Ambient Sound

#### 3.1 Pre-Development Ambient Sound

Measurements of the pre-development ambient sound are required only when the developer elects to establish the sound level limit in accordance with subsections C(1)(b) and C(1)(e)(ii)(d) for a development in an area with high ambient sound levels, such as near highways, airports, or pre-existing developments; or when the developer elects to establish that the daytime and nighttime ambient hourly sound levels at representative protected locations exceed 45 dBA and 35 dBA, respectively.

- (a) Measurements shall be made at representative protected locations for periods of time sufficient to adequately characterize the ambient sound. At a minimum, measurements shall be made on three different weekdays (Monday through Friday) during all hours that the development will operate. If the proposed development will operate on Saturdays and/or Sundays, measurements shall also be made during all hours that the development will operate.
- (b) Measurement periods with particularly high ambient sounds, such as during holiday traffic activity, significant insect activity or high coastline waves, should generally be avoided.
- (c) At any measurement location the daytime and nighttime ambient hourly sound level shall be computed by arithmetically averaging the daytime and nighttime values of the measured one hour equivalent sound levels. Multiple values, if they exist, for any specific hour on any specific day shall first be averaged before the computation described above.

#### 3.2 Post-Development Ambient Sound

- (a) Measurements of the post-development ambient one hour equivalent sound levels and, if short duration repetitive sounds are produced by the development, the maximum sound levels made at nearby protected locations and during representative routine operation of

the development that are not greater than the applicable limits of subsection C clearly indicate compliance with those limits.

- (b) Compliance with the limits of subsection C(1)(b) may also be demonstrated by showing that the post-development ambient hourly sound level, measured in accordance with the procedures of subsection 3.1 above during routine operation of the development, does not exceed the pre-development ambient hourly sound level by more than one decibel, and that the sound from routine operation of the development is not characterized by either tonal sounds or short duration repetitive sounds.
  - (c) Compliance with the limits of subsection C(1)(e)(ii)(d) may also be demonstrated by showing that the post development maximum sound level of any short duration repetitive sound, measured in accordance with the procedures of subsection 3.1 above, during routine operation of the development, does not exceed the pre-development ambient hourly sound level by more than five decibels.
  - (d) If any of the conditions in (a), (b) or (c) above are not met, compliance with respect to the applicable limits must be determined by measuring the sound from routine operation of the development in accordance with the procedures described in subsection 4.
- (4) Measurement of the Sound from Routine Operation of Developments.

#### 4.1 General

- (a) Measurements of the sound from routine operation of developments are generally necessary only for specific compliance testing purposes in the event that community complaints result from operation of the development, for validation of an applicant's calculated sound levels when requested by the Board or Commissioner, for determination of existing hourly sound levels for an existing development or for enforcement by the Department.
- (b) Measurements shall be obtained during representative weather conditions when the development sound is most clearly noticeable. Preferable weather conditions for sound measurements at distances greater than about 500 feet from the sound source include overcast days when the measurement location is downwind of the development and inversion periods (which most commonly occur at night).
- (c) Measurements of the development sound shall be made so as to exclude the contribution of sound from development equipment that is exempt from this regulation.

#### 4.2 Measurement of the Sound Levels Resulting from Routine Operation of the Development.

- (a) When the ambient sound levels are greater than the sound level limits, additional measurements can be used to determine the hourly sound level that results from routine operation of the development. These additional measurements may include diagnostic measurements such as measurements made close to the development and extrapolated to the protected location, special checkmark measurement techniques that include the

separate identification of audible sound sources, or the use of sound level meters with pause capabilities that allow the operator to exclude non-development sounds.

- (b) For the purposes of computing the hourly sound level resulting from routine operation of the development, sample diagnostic measurements may be made to obtain the one hour equivalent sound levels for each sound component.
  - (c) Identification of tonal sounds produced by the routine operation of a development for the purpose of adding the 5 dBA penalty in accordance with subsection C(1)(d) requires aural perception by the measurer, followed by use of one-third octave band spectrum analysis instrumentation. If one or more of the sounds of routine operation of the development are found to be tonal sounds, the hourly sound level component for tonal sounds shall be computed by adding 5 dBA to the one hour equivalent sound level for those sounds.
  - (d) Identification of short duration repetitive sounds produced by routine operation of a development requires careful observations. For the sound to be classified as short duration repetitive sound, the source(s) must be inherent to the process or operation of the development and not the result of an unforeseeable occurrence. If one or more of the sounds of routine operation of the development are found to be short duration repetitive sounds, the hourly sound level component for short duration repetitive sounds shall be computed by adding 5 dBA to the one hour equivalent sound level for those sounds. If required, the maximum sound levels of short duration repetitive sounds shall be measured using the fast response  $[L_{AFmax}]$ . The duration and the frequency of occurrence of the events shall also be measured. In some cases, the sound exposure levels of the events may be measured. The one hour equivalent sound level of a short duration repetitive sound may be determined from measurements of the maximum sound level during the events, the duration and frequency of occurrence of the events, and their sound exposure levels.
  - (e) The daytime or nighttime hourly sound level resulting from routine operation of a development is the energy sum of the hourly sound level components from the development, including appropriate penalties, (see (c) and (d) above). If the energy sum does not exceed the appropriate daytime or nighttime sound level limit, then the development is in compliance with that sound level limit at that protected location.
- (5) Reporting Sound Measurement Data. The sound measurement data report should include the following:
- (a) The dates, days of the week and hours of the day when measurements were made.
  - (b) The wind direction and speed, temperature, humidity and sky condition.
  - (c) Identification of all measurement equipment by make, model and serial number.
  - (d) The most recent dates of laboratory calibration of sound level measuring equipment.
  - (e) The dates, times and results of all field calibrations during the measurements.

- (f) The applicable sound level limits, together with the appropriate hourly sound levels and the measurement data from which they were computed, including data relevant to either tonal or short duration repetitive sounds.
  - (g) A sketch of the site, not necessarily to scale, orienting the development, the measurement locations, topographic features and relevant distances, and containing sufficient information for another investigator to repeat the measurements under similar conditions.
  - (h) A description of the sound from the development and the existing environment by character and location.
- 

STATUTORY AUTHORITY: 38 M.R.S.A., Section 343

EFFECTIVE DATE: November 1, 1979  
Section 10 amended: November 21, 1989  
Section 9 amended: June 12, 1991

EFFECTIVE DATE (ELECTRONIC CONVERSION): May 4, 1996

AMENDED: Section 9 amended: September 22, 2001  
Section 15 amended January 18, 2006 – filing 2006-12

## L. SOLID WASTE MANAGEMENT PLAN AND RECYCLABLE MATERIALS

The following statement is made in accordance with City of Portland Code of Ordinance, Chapter 14 Land Use, Section 14-525(c)(4) and (13).

### L.1 MUNICIPAL SOLID WASTE

Municipal solid waste will be generated and handled wholly by the University for each building in the development. Receptacles will be provided at each distinct building for that building's solid waste disposal needs.

The municipal solid waste generation estimates for the Wishcamper Center and Osher Map Library are given in Table L.1 below. The University currently contracts waste removal with Waste Management of Maine, a licensed waste service provider. In 2005, approximately 41% of the solid waste collected on campus was recycled, 47% was incinerated at Regional Waste Systems (ecomaine) in Portland, and the remainder disposed of at Crossroads Landfill in Norridgewock, Maine. Crossroads Landfill is a fully permitted Subtitle D solid waste disposal facility. Waste Management has the available capacity to meet the solid waste handling needs of University Commons through collection, recycling and disposal of waste.

**TABLE L.1: UNIVERSITY COMMONS ESTIMATED SOLID WASTE GENERATION (TONS PER YEAR)**

	<b>Wishcamper Center</b>	<b>Osher Map Library/ Glickman Renovation</b>
Construction Debris (during initial construction)	77	35
General Municipal Solid Waste	35	1.5
Recyclables		
Paper	9.4	0.4
Cardboard	2.9	0.1
Glass, Cans, Aluminum	1.5	0.1
Plastic	1.2	0.1

Estimates in Table L.1 were derived by several means. Construction/Demolition debris calculations are described below. General municipal solid waste and recyclables for the classroom and office space in each building were generated based on square footage values using typical numbers published in EPA and other State Planning literature. The estimated general municipal solid waste generated by the library addition will add to the solid waste currently generated by the existing library.

The solid waste generated by the Future Building has not been analyzed at this time, as the intended use, programming and conceptual design for this building is not yet set. At such time that conceptual design of this building is advanced, additional information can be provided with regard to solid waste generation.

## L.2 CONSTRUCTION/DEMOLITION DEBRIS

As part of the LEED certification for this project, the contractor will be responsible for Construction Waste Management. Construction Waste Management is intended to divert construction, demolition, and land clearing debris from landfill disposal; redirect recyclable recovered resources back to the manufacturing process; and redirect reusable materials to appropriate sites. The waste estimates within this section do not take into account the additional Construction Waste Management responsibilities of the contractor. This is conservative approach at estimating. The success of the Contractor is in part due to the specific materials to be demolished. In summary, we do not anticipate that all of the construction or demolition debris that is estimated below will need to be disposed.

All construction and demolition debris will be handled by a licensed waste service provider, and will be delivered to a fully permitted solid waste disposal facility.

### L.2.1 Construction Debris

The construction contractor will be responsible for contracting with the waste management service that will handle the construction waste and demolition debris (CDD) from the proposed project. It is anticipated that construction remnants will be placed in 30 cubic yard containers that will be transported and disposed of at a licensed processing or disposal facility in accordance with applicable laws and regulations.

Waste services during construction will likely be handled by Troiano Waste Services. Mixed debris to be landfilled will be sent to a Pine Tree facility in either Hampden or Old Town. Concrete and masonry will be sent to Commercial Paving and Recycling. Cardboard waste will be sent to Goodman & Sons in Scarborough. Metals will be sent to New England Metal Recycling in Portland. Should Troiano not be chosen for this project, another licensed waste service provider will be used.

As part of the construction of the buildings, waste and excess materials will be produced as is typical of any construction project. The estimated amount of construction debris is based on the floor space (see the Table below) of each building to be constructed. The renovations envisioned for the existing first floor of the Glickman Library (approximately 4,400 sq ft) have also been factored into the calculation.

**TABLE L.2: FLOOR SPACE ESTIMATE FOR CONSTRUCTION DEBRIS AND DEMOLITION QUANTITY CALCULATION**

Project Element	Floor Space
Wishcamper Center	57,400 sq. ft.
Osher Map Library/Glickman Renovation	22,400 sq. ft.
Future Building	96,720 sq. ft.
Total	176,520 sq. ft.

The estimated tonnage of construction debris, based on an industry standard of 2.77 pounds per square foot of constructed floor space, is calculated below.

$$176,520 \text{ sq. ft.} \times 2.77 \text{ lbs/sq. ft.} = 488,960 \text{ lbs.} = \mathbf{244 \text{ tons}}$$



## **L.2.2 Demolition Debris**

The estimated volume of demolition debris is 4,029 cubic yards. This is based on an estimate of the floor, roof, and wall space of the four buildings that will be removed from the site. The demolition debris also includes several of the library's first floor interior walls and the loading dock.

The computations of waste volumes are estimates only. Contractors will measure the actual waste volumes at the time of construction and will not rely on estimates provided in this Section.

The demolition contractor for the proposed project will likely be Portland Diversified Services. During demolition, mixed debris that can not be recycled will be sent to KTI in Auburn, Maine. Wood wastes will be sent to Environmental Return Resource Corp., in Epping, NH. Pavement will be sent to Commercial Paving and Recycling in Scarborough for recycling. Contaminated soils will be brought to Commercial Paving and Recycling. Concrete and masonry will be crushed on site and sent to Aggregate Recycling Corp., in Elliot, Maine, for reuse as aggregate on other construction sites.

## **L.3 RECYCLABLES**

The University of Southern Maine has a very good recycling program. In 2005, the University recycled 41%, by weight, of their solid waste stream. USM's recycling program will be expanded to include the University Commons Recycling Policy

## **L.4 RECYCLING POLICY**

A recycling program will be implemented for the University Commons project as an expansion and reflection of the University's current recycling program. A copy of the University of Maine System, Office of Finance and Treasurer Administrative Practice Letter No. 37 issued on March 18, 1997 regarding the University Waste Reduction and Recycling program is attached at the end of this section. Indoor recycling receptacles will be located in close proximity to the solid waste containers.

The applicant has an established relationship with Waste Management of Maine and will likely contract with this firm for solid waste and recycling management services for the project; however, the applicant reserves the right to contract with any licensed solid waste service provider.

The contracted service provider will be responsible for the timely collection and removal of the recyclable materials from USM's campus. The existing schedule for pick-up will be adjusted based on actual demand.

The estimated quantity of recycled materials generated from University Commons is given in the following table:

**TABLE L-3: RECYCLABLE MATERIAL ESTIMATED GENERATION (TONS PER YEAR)\***

	<b>Wishcamper Center</b>	<b>Osher Map Library</b>
<b>RECYCLABLES</b>		
PAPER	9.4	0.4
CARDBOARD	2.9	0.1
GLASS, CANS, ALUMINUM	1.5	0.1
PLASTIC	1.2	0.1

\*Estimates were gathered using EPA and State government published data of historical recycle rates per square foot

The recyclable material generated by the Future Building has not been analyzed at this time, as the intended use, programming and conceptual design for this building is not yet set. At such time that conceptual design of this building is advanced, additional information can be provided with regard to recyclable material generation.

## **L.5 ATTACHMENTS**

Administrative Practice Letter #37 – Waste Reduction and Recycling

Letter from USM Recycling Coordinator to USM Facilities Management, dated April 14, 2006, describing solid waste and recycling at the USM Portland campus for 2005

UNIVERSITY OF MAINE SYSTEM  
OFFICE OF FINANCE AND TREASURER

## ADMINISTRATIVE PRACTICE LETTER NO. 37

- Issue 1
- Date 03/18/97

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**SUBJECT: WASTE REDUCTION AND RECYCLING****GENERAL**

The Maine Legislature has passed the following laws regarding various aspects of resource management:

38 M.R.S.A. § 2132 requires that effective January 1, 1998, 50% of the waste material generated must be recycled or composted.

38 M.R.S.A. § 2137 requires that the University of Maine System establish and implement waste reduction and recycling programs for materials used in the course of its operations, with periodic evaluations of existing programs and development of necessary new programs for recycling or to reduce the generation of solid waste by the campuses.

5 M.R.S.A. § 1812-B requires that by October 1, 1993, not less than 50% of the total dollar amount spent in each fiscal year on paper and paper products purchased by the University of Maine System shall be spent on paper and paper products with recycled content which meets or exceeds the standards established for that paper or paper product category in CPG (60 FR 21370/EPA530-Z-95-007) and Paper Products RMAN (61FR 26985/EPA530-Z-96-005).

38 M.R.S.A. § 1652 and 39 M.R.S.A. c. 16-A prohibit the use of polystyrene foam food and drink containers and plastic beverage stirrers by State Facilities as defined by Title 14. The University of Maine System is included in this definition and extends the prohibition to all events sponsored by the University or occurring on University property.

In accordance with the provisions of these laws, and in an attempt to curb increasing costs, the University of Maine System is committed to a resource management strategy which reduces to a minimum the production of waste material while reusing, recycling or composting as much as possible of the materials remaining.

**REQUIREMENTS**

Each campus shall establish policies which assure that:

- a. Paper generation is reduced through duplex copying of all multi-page correspondence, reports, exams and papers; increased use of electronic mail; replacing mass mailings of newsletters or notices to individuals with departmental or bulletin board mailings;
- b. Photocopiers purchased or leased by or on behalf of the University include the capacity to make duplex copies either automatically or manually;
- c. Paper and paper products purchased meet or exceed State and Federal Recycled Content Procurement Guidelines. Stationary, offset, reprographic, tablet, and check safety papers, envelopes, bathroom tissue, paper towels and paper napkins make up the majority of campus paper purchases, but procurement guidelines exist for many other types of papers and paper products. A copy of the procurement guidelines may be obtained from the campus purchasing agent.

In order to obtain competitive prices for paper or paper products, purchases may be made by individual campuses, in cooperation with other campuses or through the State contract;

- d. Used toner cartridges are refilled/remanufactured, or that they are returned to the manufacturer for recycling if the technology is not available to refill them;
- e. Use of disposable products (pens, food service items, etc.) is reduced to a minimum in favor of reusable or refillable items;
- f. Information about the waste management policies and programs is provided to students and employees on an on-going basis;
- g. University waste management and recycling policies extend to all vendors, contractors, groups and individuals operating in or on University-owned or operated facilities. If non-recyclable materials are generated by non-University groups using campus facilities, the groups shall be responsible for the wastes by either removing the wastes from campus at the completion of their activity or by paying a waste disposal fee to the campus waste management department. Recyclable materials generated by non-University entities operating on campuses may be recycled through the campus by making arrangements with the campus waste management staff prior to the event;
- h. Annual Waste Management and Recycling reports are submitted to the System Office of Facilities no later than July 15 of each year on forms provided by the Office of Facilities.

**APPROVED**

B. Russell Smith

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f Financial Officer and Treasurer



UNIVERSITY OF  
SOUTHERN MAINE

April 14, 2006

To: Carol Potter

Subject: Solid Waste Figures for your overview.

The University of Southern Maine prepares an annual Solid Waste and Recycling Report identifying its waste stream including materials, weights, percentages by materials, and recycling percentages. The Solid Waste summary of January 20, 2006 states that during the year of 2005, the University of Southern Maine Portland Campus (including several of its off campus sites) generated 2,383,300 pounds of solid waste including 178,800 pounds of construction and demolition debris. Of the total solid waste 877,338 or 41 % was recycled. Regional Waste Systems incinerated 1,095,780 pounds. Waste Management of Maine hauled the remaining un-recycled solid waste for disposal at their Norridgewok landfill.

Sincerely,

Brett Hallett  
Recycling Coordinator / Crew leader  
Environmental Services

Cc: File

Facilities Management  
96 Falmouth Street P.O. Box 9300 Portland ME 04104-9300  
(207) 780-4160 TTY (207) 780-5646 Fax (207) 780-4538  
[bhallett@usm.maine](mailto:bhallett@usm.maine)

A Member of the University of Maine System

## M. OFF-SITE FACILITIES

The following statement is made in accordance with City of Portland Code of Ordinances, Chapter 14 Land Use, Section 14-525(c)(5).

### M.1 SEWER / WASTEWATER DISPOSAL

Currently, wastewater disposal for the site is handled by the City of Portland combined sewer in the area. Each existing building on the site has its own sewer service tying into the system at various points along Bedford, Winslow and Conant Streets.

As a result of the proposed project, a new 10" sewer will be constructed to serve the Wishcamper Center, which will flow into the Bedford Street sewer. This new sewer will also collect wastewater from the existing Abromson Center. The two sections of Bedford Street sewer will be connected, allowing for the discontinuance of the sewer along Winslow and Conant Streets. No additional wastewater is anticipated as a result of the Osher Map Library, and therefore the existing sanitary sewer service for the Glickman Family Library will be maintained as it currently exists.

An estimate of the wastewater discharge expected to be generated by the proposed project was developed. The State of Maine Subsurface Disposal Rules were consulted along with historical data from similar use buildings (college/universities) to estimate the amount of wastewater anticipated to be generated from the development. Ultimately, 5 gallons per day per occupant was used. Using that per occupant figure, the estimated wastewater discharge for the site is expected to be about 6,375 gallons per day (GPD), as tabulated in Table M-1.

Anticipated average daily wastewater demand for each building and for the project site will be as follows:

**TABLE M-1: AVERAGE DAILY WASTEWATER DISCHARGED**

Building	Number of Occupants per Day	Average Daily Wastewater Generated (GPD)
<b>Wishcamper Center</b>	<b>1,275</b>	<b>6,375</b>
<b>Osher Map Library</b>	<b>n/a</b>	<b>0</b>
<b>Total</b>	<b>1275</b>	<b>6,375</b>

The wastewater generation for the Future Building has not been analyzed at this time, as the intended use, programming and conceptual design for this building is not yet set. At such time that conceptual design of this building is advanced, additional information can be provided with regard to wastewater generation. The sanitary sewer service manhole for the Wishcamper Center has been located in close proximity to the future building so that the construction of the Future Building can access this service manhole with limited disruption of the improvements constructed as part of the Wishcamper Center.

#### M.1.1 Municipal and Utility Review

In the City of Portland, wastewater is handled by two different entities. The City is responsible for most of the gravity sanitary sewer collection system. The Portland Water District (PWD) operates the majority of the interceptors, pump stations, and the wastewater treatment plant. Because wastewater collection,

conveyance and treatment must be evaluated against capacity and accepted by the City and the PWD, we contacted both organizations by way of letter to ensure the collection system and treatment plant have adequate capacity to handle wastewater discharged from the site. PWD was able to confirm that there is adequate capacity at the treatment plant to accommodate the proposed project. Likewise, the City confirmed that there is adequate capacity in the collection system to accommodate the project. These letters and responses are attached to this section.

### **M.1.2 Sewer / Wastewater Disposal Conclusion**

The proposed project will discharge sanitary wastewater to the municipal sewer system. Given the current uses and extent of development on the property and the capacity to serve these uses, there is adequate capacity within the collection system and at the wastewater treatment plant to collect and treat the wastewater that will be generated by this project. The available capacity has been confirmed by the City and the PWD.

### **M.1.3 Sewer / Wastewater Disposal Attachments**

Letter from Woodard & Curran to City of Portland, dated August 8, 2006.

Letter from Woodard & Curran to the Portland Water District, dated August 8, 2006

Letter from Portland Water District to Woodard & Curran, dated August 10, 2006.

Letter from City of Portland to Woodard & Curran, dated January 25, 2007.

## **M.2 WATER SUPPLY**

The Portland Water District (PWD) supplies public water to the City of Portland. The existing water main along Winslow Street will be replaced with a service in the driveway along the east side of the Parking Garage. A service will branch off this main to serve the Wishcamper Center. No additional water usage is anticipated as a result of the Osher Map Library. The existing water service to the Glickman Family Library will be adequate as it currently exists.

The average daily water demand for the proposed project is expected to be approximately 6,375 gallons per day (GPD), as tabulated in Table M-2.

Anticipated average daily water demands for each building and for the project site are as follows:

**TABLE M-2: AVERAGE DAILY WATER USAGE**

Building	Number of Occupants per Day	Average Daily Water Demand (GPD)
<b>Wishcamper Center</b>	<b>1,275</b>	<b>6,375</b>
<b>Osher Map Library</b>	<b>n/a</b>	<b>0</b>
<b>Total</b>	<b>1,275</b>	<b>6,375</b>

Water demand for the site was based on the estimates for wastewater generation. There are no additional water demands (irrigation or other) that need to be considered. It was assumed that an equal amount of water demand from the water system will be returned as wastewater.

In addition to the above-mentioned demand, fire service will be provided to the Wishcamper Center by way of an 8" service. The fire service is not considered part of the daily demand, but is analyzed by the PWD with regard to pressure and capacity at the project location.

The water demand for the Future Building has not been analyzed at this time, as the intended use, programming and conceptual design for this building is not yet set. At such time that conceptual design of this building is advanced, additional information can be provided with regard to water demand. The service for domestic water use has been sized off of the main in Bedford Street to account for a Future Building using conservative sizing calculations. Both the fire suppression service and domestic service will be extended to a location where construction of the Future Building can access these services without disrupting the improvements constructed as part of the Wishcamper Center.

### **M.2.1 Utility Capacity**

The PWD was contacted regarding the projected water usage requirements and a letter confirming the ability to serve the proposed facility was been requested. A response was received confirming there is adequate capacity within the water distribution system to accommodate the proposed project.

### **M.2.2 Water Supply Conclusion**

It is our opinion that, given the current uses and extent of development on the property and the PWD's capacity to serve these uses, there is adequate capacity within the existing water distribution system and treatment plant to supply the daily and emergency (fire service) flows that are required by this project. Copies of our ability to serve request and the PWD's response have been attached to this section.

### **M.2.3 Water Supply Attachments**

Letter from Woodard & Curran to the Portland Water District, dated August 8, 2006.

Letter from the Portland Water District to Woodard & Curran, dated November 1, 2006.

## **M.3 OFFSITE STREETS**

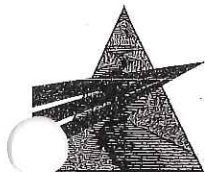
Gorrill-Palmer Consulting Engineers, Inc. prepared an analysis of and recommendations for the five-approach intersection at Deering Avenue, Brighton Avenue and Falmouth. The results of this analysis are contained with the Traffic Impact and Parking Study prepared by Gorrill-Palmer, revised February 2007, attached to Sections H&I of this Application. A figure depicting the Brighton Avenue closure is included within this section of the Application.

### **M.3.1 Off-Site Streets Attachments**

Drawing No. 1 Proposed Brighton Avenue Closure, prepared by Gorrill-Palmer, dated January 2007.

Fig. 1 Campus Center Parking Lot Entrance Realignment, prepared by Woodard & Curran, dated 1/22/07.





August 8, 2006

Mr. Frank Brancely  
City of Portland  
Department of Public Works  
55 Portland Street  
Portland, Maine 04104

Re: University Commons Project at University of Southern Maine – Wastewater Treatment

Dear Mr. Brancely:

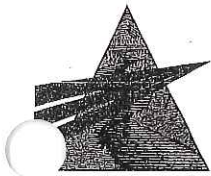
We have prepared Major Site Plan and Site Location of Development review documents for the development of the University Commons project for the University of Southern Maine along Bedford Street in Portland. These documents will be submitted to the City of Portland Planning Department and Maine Department of Environmental Protection, respectively.

This project consists of ten parcels of land located between Bedford Street and the I-295 corridor. All parcels are either owned by the University or the parcel landowner has entered into a Purchase & Sale Agreement with the University. As part of the project, the University intends to request the City to vacate both Winslow Street and Conant Street. The project work limits are shown on the enclosed USGS Topographic Map.

The project will include the construction of a four-story, 55,700 SF resource and learning center known as the Osher Lifelong Learning Institute and the Wishcamper Center for the Muskie School of Public Service (OLLI/Wishcamper). The OLLI/Wishcamper building will provide a number of facilities including classrooms, activity spaces, administrative functions and research staff offices. Wastewater will be collected from the building by a service connection off a new sewer main to be located in a driveway along the east edge of the existing Parking Garage. This new sewer will replace the existing sewer main that runs along Winslow Street and Conant Street. We are working with the Public Works Department to ensure the new sewer and associated easements are acceptable to the City.

The project also will include an 11,800 SF two-story expansion to the Osher Map Library, located in the Glickman Family Library, known as the OML Expansion. The OML Expansion will provide space to accommodate the recent growth of the Osher Map Library collection. No additional wastewater is anticipated from the OML Expansion.

To estimate the wastewater generated by the project, the State of Maine Subsurface Disposal Rules were consulted along with historical data from similar use buildings (college/universities) from which a figure of 5 gallons per occupant per day was obtained. Anticipated average daily wastewater generated by the building will be as follows:



Mr. Frank Brancely, City of Portland  
August 8, 2006  
Page 2

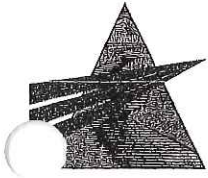
**Table 1-1: Average Daily Wastewater Generation**

Building	Number of Occupants per Day	Average Daily Wastewater Generated (GPD)
OLLI/Wishcamper	1,275	6,375
OML Expansion	n/a	0
<b>Total</b>	<b>1,275</b>	<b>6,375</b>

It should also be noted that during rainfall events, stormwater from the site drains to existing sewer structures at three different areas of the site: just south of the existing parking garage; Bedford Street; and Forest Avenue. In the proposed condition, stormwater will continue to be collected on site, by catch basins and bio-retention cells, and directed to these three different areas of the existing combined sewer system. As a result of the proposed project, the rate of post-development stormwater run-off to the combined sewer will decrease from the pre-development condition. The following table indicates the anticipated stormwater runoff rates in cubic feet per second (cfs) for both the pre-development and post-development conditions as determined through modeling using the HydroCAD software.

**Table 1-2: Runoff Summary**

STUDY POINT	PEAK RUNOFF 2 Year (CFS)	PEAK RUNOFF 10 Year (CFS)	PEAK RUNOFF 25 Year (CFS)
Behind PG (Pre-Development)	11.96	19.64	23.22
Behind PG (Post-Development)	10.47	18.30	21.99
CHANGE IN RUNOFF	<b>-1.49</b>	<b>-1.34</b>	<b>-1.23</b>
Bedford Street (Pre-Development)	2.64	4.19	4.92
Bedford Street (Post-Development)	2.12	3.46	4.09
CHANGE IN RUNOFF	<b>-0.52</b>	<b>-0.73</b>	<b>-0.83</b>
Forest Avenue (Pre-Development)	2.37	3.82	4.50
Forest Avenue (Post-Development)	1.74	2.94	3.50
CHANGE IN RUNOFF	<b>-0.63</b>	<b>-0.88</b>	<b>-1.00</b>



**WOODARD & CURRAN**  
Engineering • Science • Operations


Mr. Frank Brancely, City of Portland  
August 8, 2006  
Page 3

The Major Site Plan review process requires the submission of information that demonstrates there is sufficient collection and treatment capacity to serve the proposed development. Our office would like to request an "Ability to Serve" letter from the City of Portland Public Works Department stating the City's sewer collection system in the vicinity of the project has the capacity to convey the wastewater discharge generated by this development.

Please contact me at (207) 774-2112 if you have any questions or if you need additional information. Thank you very much for your assistance.

Sincerely,

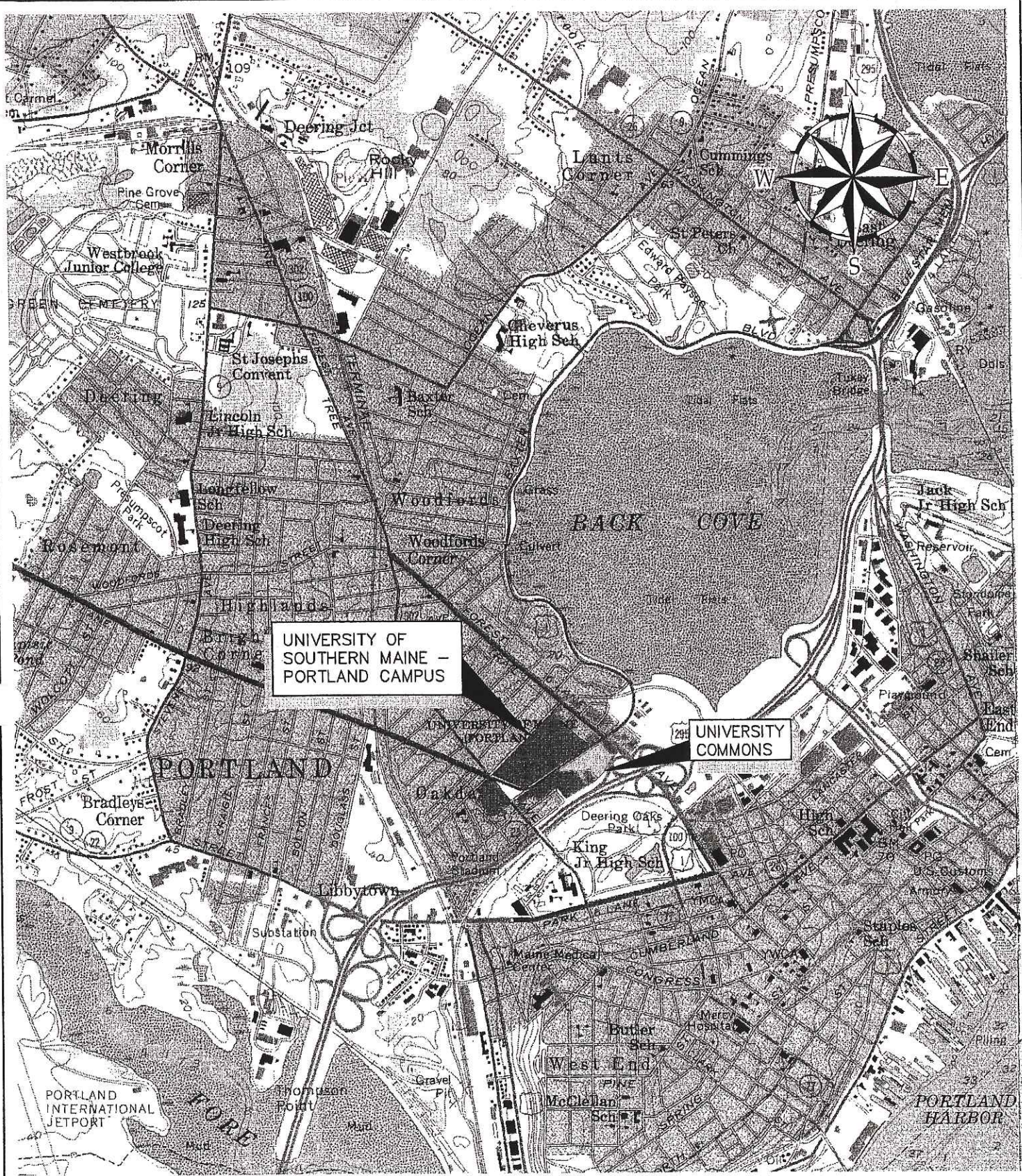
WOODARD & CURRAN INC.

  
Kenneth Volock, P.E.  
Engineer

KRV/djt  
203840

Enclosure

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UNIVERSITY OF SOUTHERN MAINE - PORTLAND CAMPUS

UNIVERSITY COMMONS

**NOTE:**

SOURCE: UNITED STATES GEOLOGICAL SURVEY, 1:24,000 QUADRANGLE, 7.5 MINUTE SERIES - PORTLAND WEST

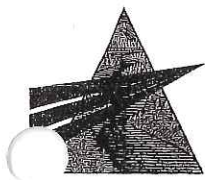


**WOODARD & CURRAN**  
 Engineering · Science · Operations  
 PORTLAND, MAINE 800-426-4262

<b>LOCATION MAP</b>	
DESIGNED BY: JBC	CHECKED BY: BSS
DRAWN BY: JBC	20384001-U001.1.dwg

UNIVERSITY OF SOUTHERN MAINE PORTLAND CAMPUS
UNIVERSITY COMMONS

JOB NO: 203840.01
DATE: JULY 2006
SCALE: AS NOTED
Figure 1



August 8, 2006

Mike Greene  
Portland Water District  
225 Douglass Street  
P.O. Box 3553  
Portland, Maine 04104-3553

Re: University Commons at University of Southern Maine – Wastewater Treatment

Dear Mr. Greene:

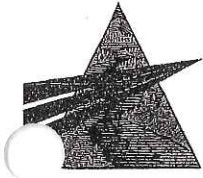
We have prepared Major Site Plan and Site Location of Development review documents for the development of the University Commons project for the University of Southern Maine along Bedford Street in Portland. These documents will be submitted to the City of Portland Planning Department and Maine Department of Environmental Protection, respectively.

This project consists of ten parcels of land located between Bedford Street and the I-295 corridor. All parcels are either owned by the University or the parcel landowner has entered into a Purchase & Sale Agreement with the University. As part of the project, the University intends to request the City to vacate both Winslow Street and Conant Street. The project work limits are shown on the enclosed USGS Topographic Map.

The project will include the construction of a four-story, 55,700 SF resource and learning center known as the Osher Lifelong Learning Institute and the Wishcamper Center for the Muskie School of Public Service (OLLI/Wishcamper). The OLLI/Wishcamper building will provide a number of facilities including classrooms, activity spaces, administrative functions and research staff offices. Wastewater will be collected from the building by a service connection off a new sewer main to be located in a driveway along the east edge of the existing Parking Garage. This new sewer will replace the existing sewer main that runs along Winslow Street and Conant Street.

The project also will include an 11,800 SF two-story expansion to the Osher Map Library, located in the Glickman Family Library, known as the OML Expansion. The OML Expansion will provide space to accommodate the recent growth of the Osher Map Library collection. No additional wastewater is anticipated from the OML Expansion.

To estimate the wastewater generated by the project, the State of Maine Subsurface Disposal Rules were consulted along with historical data from similar use buildings (college/universities) from which a figure of 5 gallons per occupant per day was obtained. Anticipated average daily wastewater generated by the building will be as follows:



Mike Greene, Portland Water District  
August 8, 2006  
Page 2

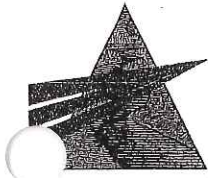
**Table 1-1: Average Daily Wastewater Generation**

Building	Number of Occupants per Day	Average Daily Wastewater Generated (GPD)
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OML Expansion	n/a	0
<b>Total</b>	<b>1,275</b>	<b>6,375</b>

It should also be noted that during rainfall events, stormwater from the site drains to existing sewer structures at three different areas of the site: just south of the existing parking garage; Bedford Street; and Forest Avenue. In the proposed condition, stormwater will continue to be collected on site, by catch basins and bio-retention cells, and directed to these three different areas of the existing combined sewer system. As a result of the proposed project, the rate of post-development stormwater run-off to the combined sewer will decrease from the pre-development condition. The following table indicates the anticipated stormwater runoff rates in cubic feet per second (cfs) for both the pre-development and post-development conditions as determined through modeling using the HydroCAD software.

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**WOODARD & CURRAN**  
Engineering • Science • Operations

Mike Greene, Portland Water District  
August 8, 2006  
Page 3

The Major Site Plan review process requires the submission of information that demonstrates there is sufficient collection and treatment capacity to serve the proposed development. Our office would like to request an "Ability to Serve" letter from the Portland Water District stating the City Wastewater Treatment Plant has the capacity to treat the wastewater discharge generated by this development.

Please contact me at (207) 774-2112 if you have any questions or if you need additional information. Thank you very much for your assistance.

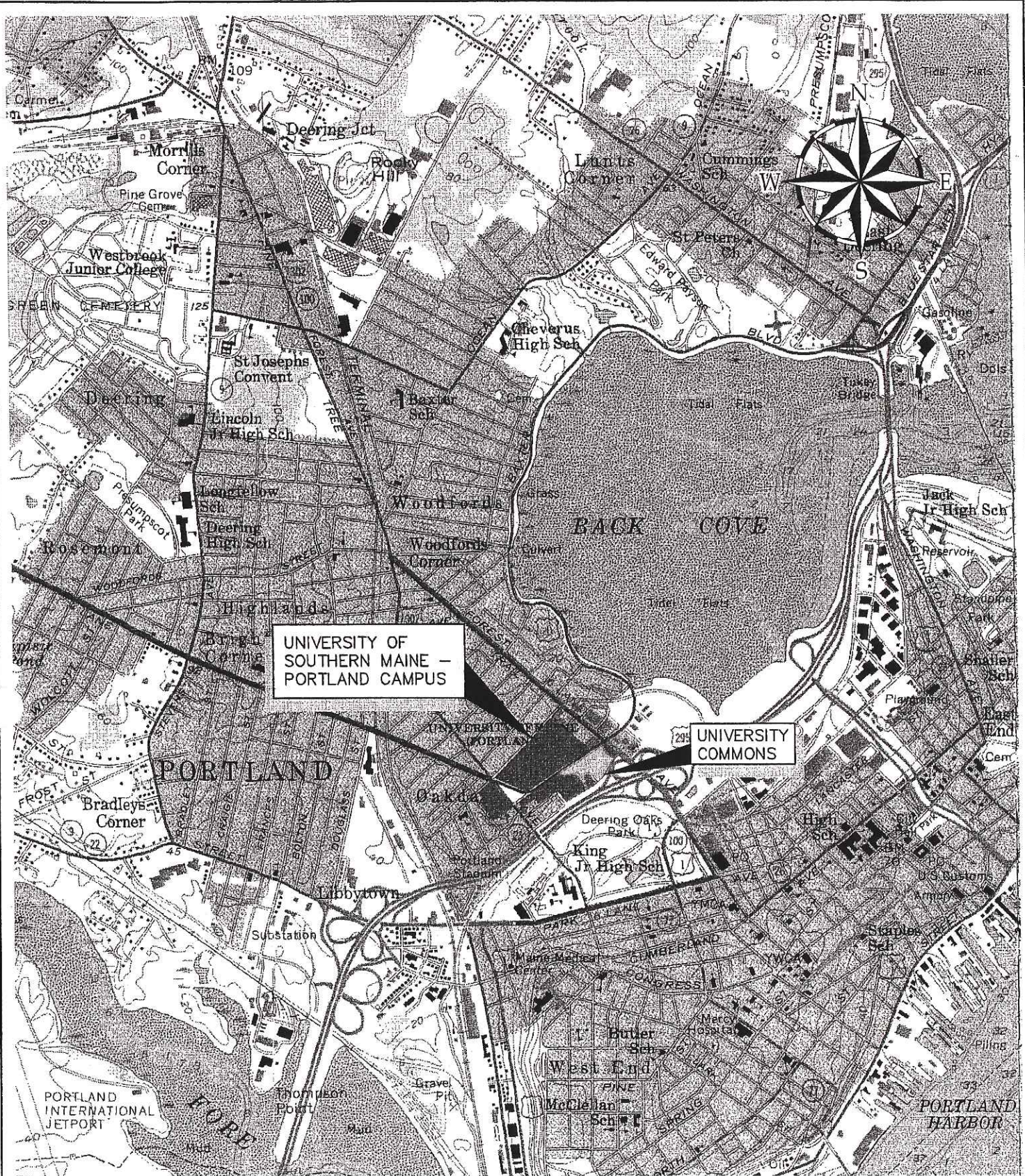
Sincerely,

WOODARD & CURRAN, INC.

Kenneth Volock, P.E.  
Engineer

KRV/djt  
203840

Enclosure



UNIVERSITY OF SOUTHERN MAINE - PORTLAND CAMPUS

UNIVERSITY COMMONS

**NOTE:**

SOURCE: UNITED STATES GEOLOGICAL SURVEY, 1:24,000 QUADRANGLE, 7.5 MINUTE SERIES - PORTLAND WEST







## Portland Water District

FROM SEBAGO LAKE TO CASCO BAY

August 10, 2006

Kenneth Volock, P.E.  
Woodard & Curran  
41 Hutchins Drive  
Portland, Maine 04102

**Re: University Commons at USM – Wastewater Treatment**

Dear Mr. Volock,

In response to your letter dated August 8, 2006, please accept this letter as confirmation that there is adequate capacity at the Portland Water District's East End Wastewater Treatment Facility to accommodate the estimated 6,375 gallons per day of sewage that will be generated once the Osher Lifelong Learning Institute and the Wishcamper Center for the Muskie School of Public Service facility is developed. It is understood that the expansion of the Osher Map Library will not result in any increase of wastewater from the project.

Your letter went on to explain that stormwater collected from the project site will result in a net reduction of stormwater feeding the interceptor system operated by the Portland Water District, thus reducing stormwater flow to our pump stations and ultimately the treatment facility.

Average daily design flow at the facility is 19.8 million gallons per day (mgd). Daily flow to the facility since 2001 has averaged 18.33 million gallons a day.

If you should have any further questions, please contact me at 207-523-5262.

Regards,

Portland Water District  
Michael Greene  
Plant/Systems Manager, Wastewater

C: S. Rose, Maine DEP  
Eric Labelle, City of Portland



# PORTLAND MAINE

*Strengthening a Remarkable City, Building a Community for Life* • [www.portlandmaine.gov](http://www.portlandmaine.gov)

**Public Works Department**  
Michael J. Bobinsky, Director

25 January 2007

Mr. Kenneth Volock, P.E.  
Woodard & Curran,  
41 Hutchins Drive,  
Portland, Maine 04102

**RE: The Capacity to Handle the Anticipated Wastewater Flows,  
From the Proposed "University Commons" Project at the University of Southern Maine, 38  
Bedford Street.**

Dear Mr. Volock:

The proposed installation of ten-inch PVC sanitary sewer pipe, to be installed at Bedford Street, as part of the "University Commons" project has adequate capacity to **transport**, while The Portland Water District sewage treatment facilities, located off Marginal Way, have adequate capacity to **treat** the anticipated wastewater flows of **9,390 G.P.D.**, from the proposed project.

<b>Anticipated Wastewater Flows from the Proposed "University Commons" Project:</b>		
626 Proposed Staff/Students, @ 15 G.P.D. Staff/Students	=	<u>9,390 GPD</u>
<b>Total Proposed Increase in Wastewater Flows for this Project</b>	=	<b>9,390 GPD</b>

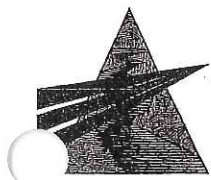
The City combined sewer overflow (C.S.O.) abatement consent agreement, with the U.S.E.P.A. and with the Maine D.E.P., requires C.S.O. abatement, as well as storm water mitigation, from all projects, in order to offset any increase in sanitary flows.

If The City can be of further assistance, please call 874-8846.

Sincerely,  
**CITY OF PORTLAND**

Charles M Moore  
Engineering Technician

cc: Alexander Q. Jaegerman, Director, Department of Planning, and Urban Development, City of Portland  
Shukria Wiar, Planner, Department of Planning, and Urban Development, City of Portland  
Katherine Earley, P.E., Engineering Manager, City of Portland  
Bradley A. Roland, P.E., Environmental Projects Engineer, City of Portland  
Stephen K. Harris, Assistant Engineer, City of Portland  
Jane Ward, Administrative Assistant, City of Portland  
Desk file



August 8, 2006

Jay Hewett, Chief Engineer  
Portland Water District  
225 Douglass Street  
P.O. Box 3553  
Portland, Maine 04104-3553

Re: University Commons at University of Southern Maine – Water Demand

Dear Mr. Hewett:

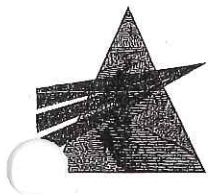
We have prepared Major Site Plan and Site Location of Development review documents for the development of the University Commons project for the University of Southern Maine along Bedford Street in Portland. These documents will be submitted to the City of Portland Planning Department and Maine Department of Environmental Protection, respectively.

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The project will include the construction of a four-story, 55,700 SF resource and learning center known as the Osher Lifelong Learning Institute and the Wishcamper Center for the Muskie School of Public Service (OLLI/Wishcamper). The OLLI/Wishcamper building will provide a number of facilities including classrooms, activity spaces, administrative functions and research staff offices. Water will be supplied to the building by a service branched off the new service main to be located in a driveway along the east edge of the existing Parking Garage. This new service will replace the service that currently runs along Winslow Street.

The project also will include an 11,800 SF two-story expansion to the Osher Map Library, located in the Glickman Family Library, known as the OML Expansion. The OML Expansion will provide space to accommodate the recent growth of the Osher Map Library collection. No additional water usage is anticipated from the OML Expansion.

The water demand for the project was based on the estimates for the wastewater generation. It was assumed that an equal amount of water demand from the water system will be returned as wastewater. Wastewater was estimated at a rate of 5 gallons per occupant per day. Anticipated average daily water demand generated by the building will be as follows:



Jay Hewett, Portland Water District  
August 8, 2006  
Page 2

**Table 5-1: Average Daily Water Usage**

<b>Building</b>	<b>Number of Occupants per Day</b>	<b>Average Daily Water Demand (GPD)</b>
OLLI/Wishcamper	1,275	6,375
OML Expansion	n/a	0
<b>Total</b>	<b>1,275</b>	<b>6,375</b>

The Major Site Plan review process requires the submission of information that demonstrates the proposed development will have sufficient water supply. Our office is requesting an "Ability to Serve" letter from the Portland Water District based on the above mentioned water demand.

Please contact me at (207) 774-2112 if you have any questions or if you need additional information. Thank you very much for your assistance.

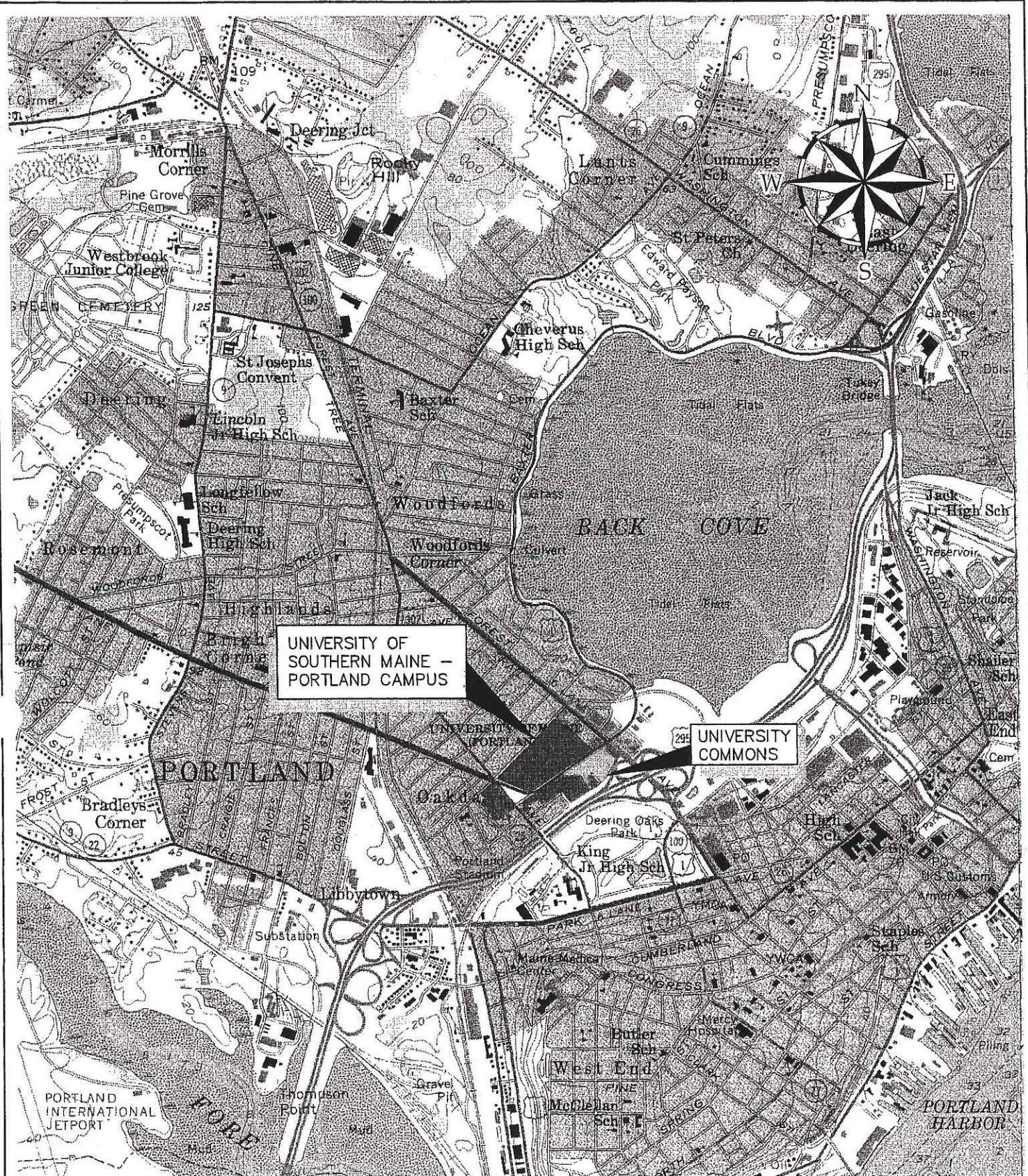
Sincerely,

WOODARD & CURRAN INC.

Kenneth Volock, P.E.  
Engineer

KRV/djt  
203840

Enclosure



UNIVERSITY OF SOUTHERN MAINE - PORTLAND CAMPUS

UNIVERSITY COMMONS

**NOTE:**

SOURCE: UNITED STATES GEOLOGICAL SURVEY, 1:24,000 QUADRANGLE, 7.5 MINUTE SERIES - PORTLAND WEST





## Portland Water District

FROM SEBAGO LAKE TO CASCO BAY

November 1, 2006

Mr. Kenneth Volock, P.E.  
Woodard & Curran  
41 Hutchins Drive  
Portland, Maine 04101

Re: University Commons at USM, Portland

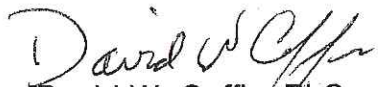
Dear Sir:

The Portland Water District has a 20" water main in Bedford Street, Portland, near the proposed site. A test on a nearby hydrant produced the following results: static pressure 96 psi; pito pressure 81 psi; with a flow of 1510 gpm. With these results in mind, the District feels we have sufficient capacity available to serve this proposed project and meet all normal fire protection and domestic water service demands. **Please notify your plumber of these results so that they can design your system to best fit the available pressure.**

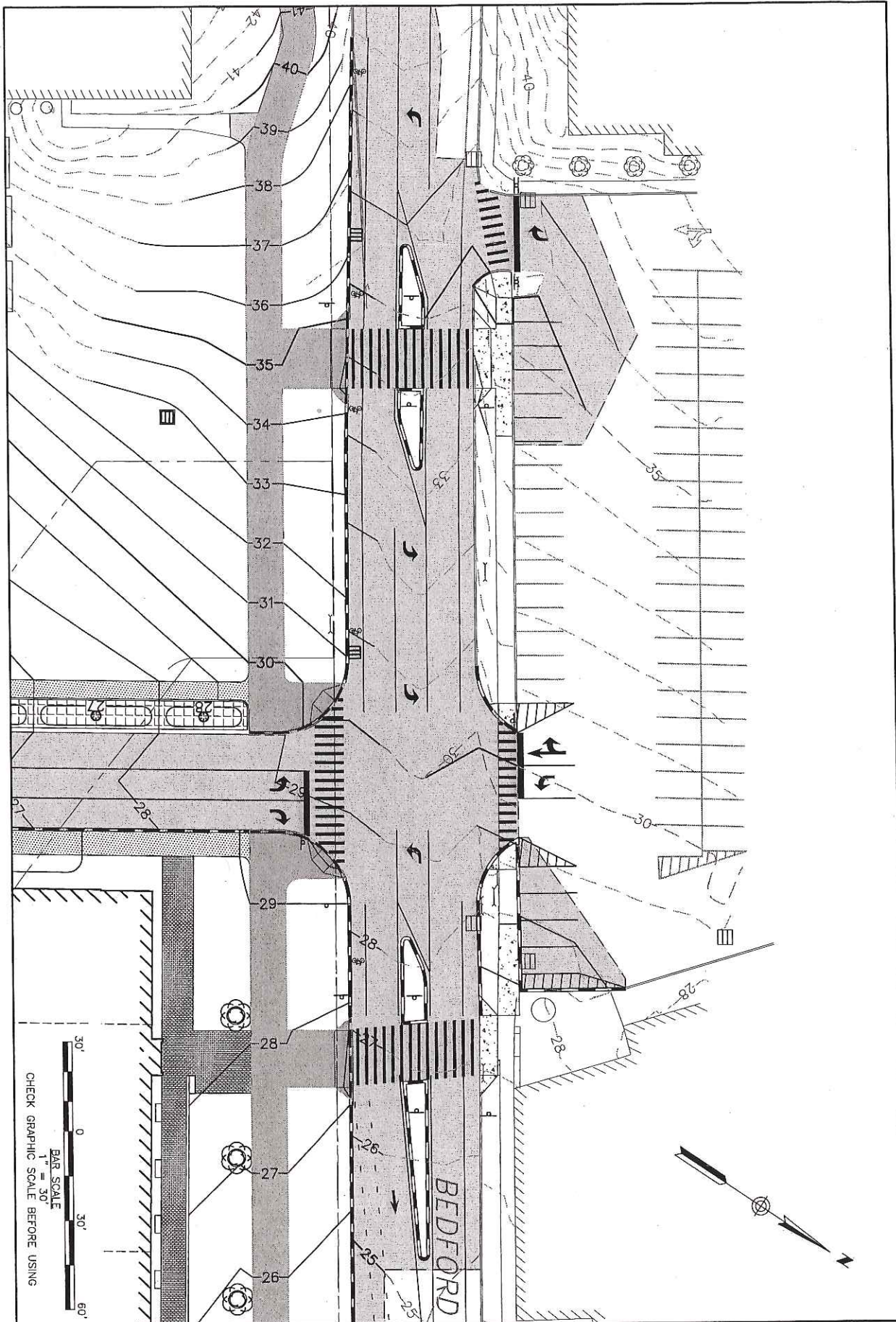
With certification by the developer that all required permits have been received, we look forward to serving this project.

Sincerely,

PORTLAND WATER DISTRICT

  
David W. Coffin, PLS  
Engineering Supervisor





30'  
0  
30'  
60'

BAR SCALE  
1" = 30'

CHECK GRAPHIC SCALE BEFORE USING

University of Southern Maine  
Portland, Maine

University Commons

JOB NO: 20384001  
DATE: 1/22/2007  
SCALE: 1"=30'

Fig. 1

**Campus Center Parking Lot  
Entrance Realignment**

DESIGNED BY: DAS  
DRAWN BY: DAS

CHECKED BY: DAS  
20384001-Parking\_Lot.dwg

**WOODARD & CURRAN**  
Engineering • Science • Operations

Portland, Maine  
1-800-426-4262

## N. SIGNAGE PLAN

The Applicant has presented exterior Building Signage within the elevations contained within Section Q of this Application.



## **O. CONSTRUCTION SEQUENCING PLAN**

The following statement is made in accordance with City of Portland Code of Ordinances, Chapter 14 Land Use, Section 14-525(c)(7).

The University proposes to commence construction of the project in the fall of 2006 and finish the project by the fall of 2009. The attached University Commons Sequence of Construction provides a timeline of the major aspects of construction. The sequence of construction is further depicted on sheets C102, C103 and C104 Construction Staging Plans, also included with this section.

### **O.1 ATTACHMENTS**

University Commons – Sequence of Construction

C102 Construction Staging Plan

C103 Construction Staging Plan

C104 Construction Staging Plan



**Project:** University of Southern Maine  
Site Lighting  
Portland, ME

**Date:** February 9, 2007

The proposed design for site lighting at the University of Southern Maine includes lighting for the areas surrounding the Osher Lifelong Learning Institute and Wishcamper Center for the Muskie School. This area includes pedestrian pathways along the Bedford Street side of the building and between the building and the Osher Map Library, the parking lot adjacent to the Wishcamper Center, and roadway lighting along the road leading from Bedford Street to the parking garage, the parking lot, and the surrounding the future building site.

The goal of the exterior site lighting is to address the safety needs of the campus by providing adequate light levels while using visually appealing and appropriate fixtures. Illuminance levels have been calculated using AGI32 software and documented on a separate site plan photometric drawing. The lighting plan meets or exceeds the following standards with respect to light levels and uniformity, fixture lamping, fixture max height restrictions, "cutoff" reflector requirements, and general quality of light:

- The standards contained in Section XV of the City of Portland Zoning Ordinance
- The recommendations of the Illuminating Engineering Society of North America
- LEED SS Credit 8: Light Pollution Reduction - Zone LZ3 - Medium (Commercial/Industrial, High-Residential)

The site lighting plan includes four fixture types and two lamp types. All walking paths are illuminated with pole fixtures designated as DL1 on the site lighting plans. The proposed fixture is mounted to a round aluminum pole standing 12'-0" tall with a "cutoff" optical system, Dark Platinum finish, and a 100w ED17 medium base metal halide lamp.

The pathway adjacent to the building on the Bedford Street side between the Osher and the Wishcamper entrances is illuminated with a steplight fixture mounted into the wall at 2.5 feet above grade. This is designated as type DL2. It is approximately 10" square and uses a 39w T6 G12 metal halide lamp.

The parking lot is illuminated by a pole fixture designated as DL6 on the lighting plan. This fixture has a Type IV forward throw distribution with "Full Cutoff" optics. The finish is Platinum Silver and the height is 14'-0." The fixture houses a 100w ED17 medium base metal halide lamp.

The roadway fixtures, type DL7, look identical to the parking lot fixtures but have a different distribution pattern. This fixture type has a Type II wide distribution. The finish, lamp, and height are the same as type DL6.

USM, PORTLAND, ME

LIGHTING FIXTURE SCHEDULE - EXTERIOR

REVISED:9.1.06  
10.30.06, 11.7.06  
11.22.06, 02.08.07

TYPE	MANUF.	PART#	LAMP	MOUNTING / NOTES
DL1	INVUE	MSA-100-MH-VOLTS-5S-FG-DP WITH ARX5T12NDP-5	100WATT MH MED. BASE	POLE MOUNTED EXTERIOR MH LUMINAIRE
DL2	BEGA	3042MH-524	39WATT CMH/T6	RECESSED WALL / STEP LIGHT
DL6	KIM LIGHTING	ISA-SAR4-100MHVOLTS-PS-P WITH 14' POLE TO MATCH	100 ED17 CLEAR	POLE MOUNTED EXTERIOR MH LUMINAIRE
DL7	KIM LIGHTING	ISA-SAR2-100MHVOLTS-PS-P WITH 14' POLE TO MATCH	100 ED17 CLEAR	POLE MOUNTED EXTERIOR MH ROADWAY LUMINAIRE

Sladen Feinstein  
Integrated Lighting Inc.

73 Hemenway Street  
Boston, MA 02115  
617-267-9500  
www.sladenfeinstein.com

# ORDERING INFORMATION

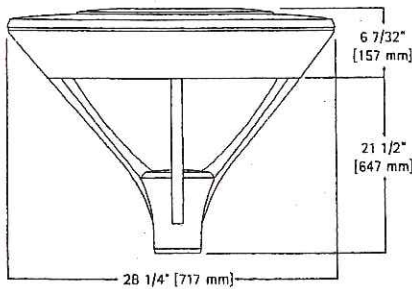
Sample Number: MSA-400-MH-MT-3S-FG-BK-L

<b>MSA</b>	<b>100</b>	<b>MH</b>	<b>VOLTS</b>	<b>5S</b>	<b>FG</b>	<b>DP</b>			
<b>Product Family</b> MSA=MESA	<b>Lamp Wattage *</b> HID 50=50W 70=70W 100=100W 150=150W 175=175W 250=250W 320=320W * 350=350W * 400=400W * <b>Compact Fluorescent</b> 42=42W * 57=57W * <sup>1</sup> 114=(2) 57W * 140=(2) 70W * <b>Electrodeless Fluorescent</b> 85=85W *	<b>Lamp Type</b> MH=Metal Halide MP=Pulse Start Metal Halide HPS=High Pressure Sodium CF=Compact Fluorescent * QL=Electrodeless Fluorescent  <b>Voltage **</b> 120=120V 208=208V 240=240V 277=277V 347=347V 480=480V DT=Dual-Tap Wired 277V ** MT=Multi-Tap Wired 277V ** TT=Triple-Tap Wired 347V **	<b>Distribution</b> 2S=Type II 3S=Type III 4S=Type IV 5S=Type V SL=Forward Throw Spill Light Eliminator  <b>Lens Type</b> FG=Flat Glass FR=Frosted Flat Glass SG=Sag Glass FRS=Frosted Sag Glass VS=Polycarbonate Vandal Shield **	<b>Colors</b> (add as suffix/must specify) ** BK=Black AP=Grey BZ=Bronze WH=White DP=Dark Platinum GM=Graphite Metallic GN=Hartford Green	<b>Options</b> (add as suffix) F=Single Fuse (120, 277, or 347V / Specify Voltage) FF=Double Fuse (208, 240 or 480V / Specify Voltage) Q=Quartz Restrike ** EM=Quartz Restrike with Delay (Also Strikes at Cold Start) ** EM/SC=Quartz Emergency Separate Circuit ** 42CF/EM=Emergency Battery Backup ** R=NEMA Twistlock Photocontrol Receptacle PC=Button Photocontrol DS=Dual Fluorescent Switching Control ** HS=House Side Shield ** L=Lamp Included	<b>Accessories</b> (order separately/ replace XX with color suffix) DLI VA6028-XX=Dual Mount Arm VA6029-XX=Wall Mount Arm OA/RA1016=Photocontrol—Multi-tap OA/RA1027=Photocontrol—480V OA/RA1201=Photocontrol—Multi-tap 347V			

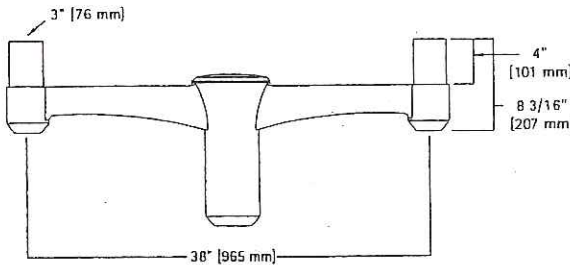
NOTES: 1 Slipfits over 3" O.D. tenon. 2 50-175W HID lamps use medium-base lampholders. 250-400W HID lamps use mogul-base lampholders. 3 320 and 350W Pulse Start Metal Halide only. 4 400W Metal Halide requires reduced envelope ED-28 lamps. 5 Compact Fluorescent lamp only. Available in Type 3S, 4S and 5S distributions only. 6 Nominal M.O.L. lamp length of 57W CFL not to exceed 7". 7 Dual 57 and 70W Compact Fluorescent lamp available in Type 4S distribution only. 8 Electrodeless Fluorescent lamp option available in Type 3S and 5S distributions only. 120V only. 9 Compact Fluorescent ballasts contain internal fusing. No supplemental fusing is necessary. CF ballasts are 120 through 277V. 10 Products also available in non-US voltages and 50Hz for international markets. Consult factory for availability and ordering information. 11 Dual-Tap is 120/277V wired 277V. Multi-Tap is 120/208/240/277V wired 277V. Triple-Tap ballast is 120/277/347V wired 347V. 12 Maximum wattage of 250W HID. 13 RAL and custom color matches available. Consult your INVUE Lighting Systems Representative. 14 Quartz options not available with SL optic. 15 Battery backup provides 90 minutes of supplemental light at 80% of initial rated lamp lumens. Type 3S, 4S, 5S optics only. Must specify 42W Compact Fluorescent lamp. 16 Dual switching requires dual 57W or dual 70W Compact Fluorescent lamps, and allows independent switching control of each lamp through use of two (2) electronic ballasts. Allows 50% power reduction. 17 House side shield not available on 5S or SL optics.

## DIMENSIONS

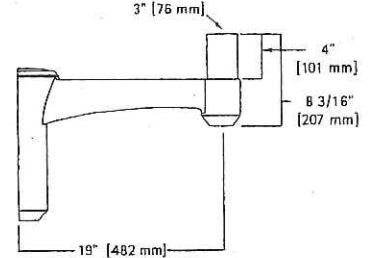
MESA [EPA 1.1]



Dual Mount Arm [EPA 1.36]



Wall Mount Arm



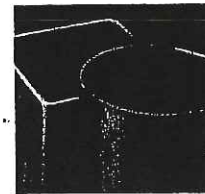
## WATTAGE TABLE

	MSA
Metal Halide	50, 70, 100, 175, 250, 400W
Pulse Start Metal Halide	250, 320, 350, 400W
High Pressure Sodium	50, 70, 100, 150, 250, 400W
Compact Fluorescent	42, 57, (2) 57, (2) 70W
Electrodeless Fluorescent	85W

## SHIPPING DATA

	MSA
Net. Weight (lbs.)	50
E.P.A.	1.1

NOTE: The above are approximate weights and volumes.



## POLES

INVUE Lighting Systems offers a comprehensive package of steel, aluminum and decorative poles to suit any site lighting application. Consult the INVUE Poles brochure for ordering information and product specifications.

## STANDARD COLORS

 BK Black	 AP Grey	 BZ Bronze	 WH White	 DP Dark Platinum	 GM Graphite Metallic	 GN Hartford Green
---	--	--	---	--	---	--

## APPLICATIONS DEPARTMENT

Let the application experts at Cooper Lighting design your next lighting layout. Aided by the latest computer simulation software and a comprehensive lighting background, our Application Engineers can design, analyze, and provide statistical layouts for any lighting application. Whether the design criteria calls for Illuminance, Luminance, or Small Target Visibility (STV) compliance, Cooper Lighting can provide the fixture layout and supporting documentation necessary to help secure your next project.

## INVUE WEBSITE

Visit [invuelighting.com](http://invuelighting.com) for the latest product information from INVUE Lighting Systems. With instant access to IES photometric files, PDF product specification sheets, new product announcements, and other helpful specification tools, the INVUE Lighting website is an invaluable resource for getting information to customers-quickly.

# ARX=ORDERING INFORMATION



The following information illustrates the correct way to enter an order for ARS4T08NGMA1V. The ordering designation is detailed as follows.

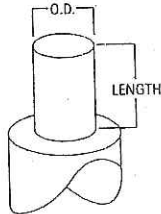
Aluminum A	Round R	Straight X	Shaft Dia. (at base) 4	Wall Thickness T	Mounting Height (ft.) 08	Base Type N	Colors GM	Fixture Mounting + Type A	No. + Location of Arms 1	Accessories (Vibration Damper) V
---------------	------------	---------------	---------------------------------	------------------------	-----------------------------------	-------------------	--------------	------------------------------------	-----------------------------------	---

Mtg. Height (Ft.)	Catalog Number <sup>2</sup>	Wall Thickness (In.)	Shaft Dia. (In.)	Bolt Proj. (In.)	Bolt Circle Dia. (In.)	Anchor Bolt D x AB x H (In.)	Net. Wt. (Lbs.)	EPA (Sq. Ft.) <sup>2,4</sup> At Pole Top				EPA (Sq. Ft.) <sup>2,4</sup> 18" Above Pole Top				Max. Fixture Load—Include Bracket (Lbs.)
								70	80	90	100	70	80	90	100	
8	ARX4T08NBZ	.125	4	1 7/8	6 3/4	3/4 x 17 x 3	20	18.9	14.2	10.9	8.6	15.6	11.7	9.0	7.1	100
10	ARX4T10NBZ	.125	4	1 7/8	6 3/4	3/4 x 17 x 3	24	14.0	10.3	7.8	6.0	11.9	8.8	6.6	5.1	100
12	ARX4T12NBZ	.125	4	1 7/8	6 3/4	3/4 x 17 x 3	27	10.6	7.6	5.6	4.2	9.2	6.6	4.9	3.7	100
12	ARX5T12NBZ <sup>1</sup>	.125	5	1 7/8	7 3/4	3/4 x 17 x 3	33	17.9	13.2	10.2	8.2	15.6	11.5	9.0	7.1	100
15	ARX4T15NBZ	.125	4	1 7/8	6 3/4	3/4 x 17 x 3	33	7.0	4.8	3.2	2.3	6.3	4.3	2.9	2.0	100
15	ARX5T15NBZ	.125	5	1 7/8	7 3/4	3/4 x 17 x 3	40	12.5	9.0	6.9	5.4	11.2	8.0	6.1	4.8	100
18	ARX4M18NBZ <sup>1</sup>	.188	4	1 7/8	6 3/4	3/4 x 17 x 3	54	8.1	5.5	3.7	2.5	7.3	5.0	3.3	2.3	100
18	ARX5M18NBZ	.188	5	1 7/8	7 3/4	3/4 x 17 x 3	66	14.4	10.3	7.9	6.2	13.1	9.4	7.2	5.6	150
20	ARX5M20NBZ	.188	5	1 7/8	7 3/4	3/4 x 17 x 3	73	11.7	8.2	6.2	4.8	10.8	7.5	5.7	4.4	150

- NOTES: 1 Factory installed vibration dampeners.  
 2 The above is our standard offering. Where higher EPA/wind speed capability or mounting height is required, other shaft dimensions and/or wall thickness are available. Consult INVue Lighting Representative for pricing and lead times. The above E.P.A. capacities are based on loading from (1994) and pole drag coefficients from (2001) American Association of State Highway and Transportation Officials Specification.  
 3 Catalog item includes one set of anchor bolts, single nuts and (2) leveling shims.  
 4 EPAs based on shaft properties with wind normal to flat. EPAs calculated using base wind velocity as indicated plus 30% gust factor.

### MOUNTING OPTIONS=FIXED TENON [add as suffix]

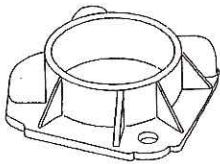
Designation Number	O.D. (in.)	Length (in.)
1	2 3/8"	3 1/2"
2	2 3/8"	4"
5	3"	4"
4	4"	6"



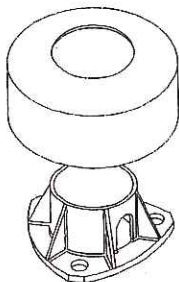
### ACCESSORIES

- C=Convenience Outlet
- E=GFI Convenience Outlet
- F=Vibration Pad
- G=Ground Lug
- V=Vibration Damper
- D=Base Cover ("A" Base Only)

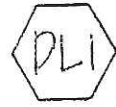
### STANDARD BASE [Round Aluminum Pole only] Type A=6", 7", 8" or 10"



### STANDARD BASE [Round Aluminum Pole only] Type N=4", 5", or 6" [Standard with Base Cover]



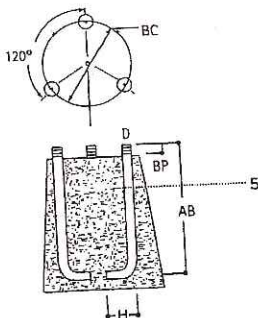
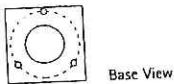
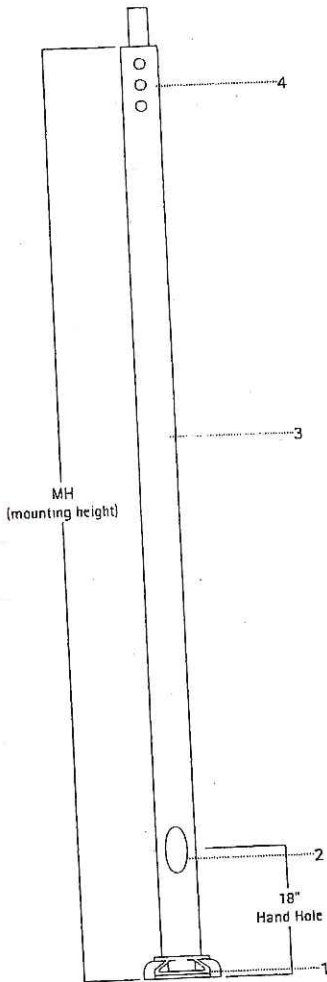
# ARX=ALUMINUM ROUND STRAIGHT



8'-20' Mounting Height

## SPECIFICATION FEATURES

- 1 356-T6 cast aluminum alloy shoe base with aluminum alloy bolt covers or base cover dependent upon base type.
- 2 Flush hand hole assembly 2 3/8" x 4 1/2" for 4" and 3" x 5" for 5" shafts with ground lug located opposite opening drilled and tapped. Ground lug located opposite hand hole opening drilled and tapped for 3/8" 16NC-2 grounding screw.
- 3 Straight round shaft 6063-T6 aluminum alloy finished in premium TGIC polyester powder coat.
- 4 Drilled or Tenon (specify).
- 5 Anchor bolt per ASTM A576 with (1) nut, (1) flat washer, and (2) shims. Nuts, washers and threaded portion of bolt are hot dip galvanized.



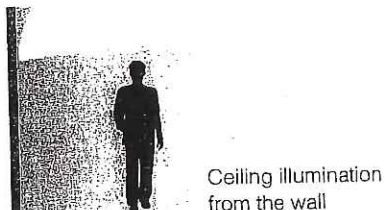
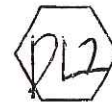
POLE COMPATIBILITY MATRIX	DRILL PATTERN	EPA + MOUNTING CONFIGURATIONS					
		Single w/Arm	2 @ 180°	2 @ 90°	3 @ 90°	3 @ 120°	4 @ 90°
PRODUCT	TENON	[1]	[2]	[5]	[3]	[6]	[4]
ICON SMALL	A	0.69	1.38	1.38	1.84	1.84	2.07
ICON MEDIUM	C	1.09	2.18	2.18	2.86	2.86	3.20
ICON SMALL STRUCTURAL MOUNT	J	0.71	1.42	1.42	1.90	1.90	2.14
ICON MEDIUM STRUCTURAL MOUNT	K	1.11	2.22	2.22	2.92	2.92	3.27
SLIDE	4*	2.97	---	---	---	---	---
FLITE	4*	1.56	---	---	---	---	---
VISION SMALL	E	1.27	2.54	2.54	3.60	3.60	4.13
VISION MEDIUM	M	1.6	3.20	3.20	4.50	4.50	5.55
VISION SMALL STRUCTURAL MOUNT	F	1.28	2.56	2.56	3.63	3.63	4.17
VISION MEDIUM STRUCTURAL MOUNT	G	1.82	3.64	3.64	4.96	4.96	5.62
ASCENT SMALL	A	0.85	1.70	1.70	2.35	2.35	2.68
ASCENT MEDIUM	C	1.35	2.70	2.70	3.83	3.83	4.56
STRUT SMALL	A	1.03	2.06	2.06	2.89	2.89	3.49
STRUT MEDIUM	C	1.64	3.28	3.28	4.70	4.70	5.77
X-FORM SMALL	E	1.15	2.30	2.30	3.20	3.20	3.81
X-FORM MEDIUM	M	2.1	4.20	4.20	6.00	6.00	7.50
MESA	5**	1.1	3.56	---	---	---	---
EPIC MEDIUM	4*	Consult EPIC brochure for system EPA data					
EPIC LARGE	4*	Consult EPIC brochure for system EPA data					

\* Fits 4" O.D. by 6" long tenon or slipfits over 4" ARX or SRX pole. \*\* Fits 3" O.D. by 4" long tenon.

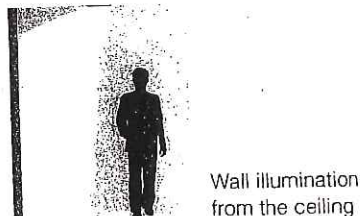
## THREE BOLT ANCHORAGE [see ordering information]

- BC=Bolt Circle
- BP=Bolt Projection
- AB=Bolt Dimensions
- D=Bolt Diameter
- H=Bolt Dimensions

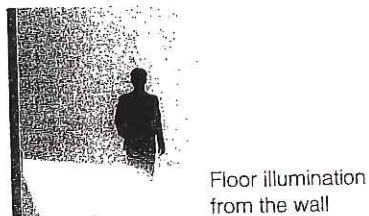
NOTE: Specifications and dimensions subject to change without notice.



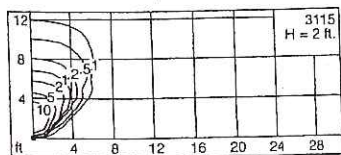
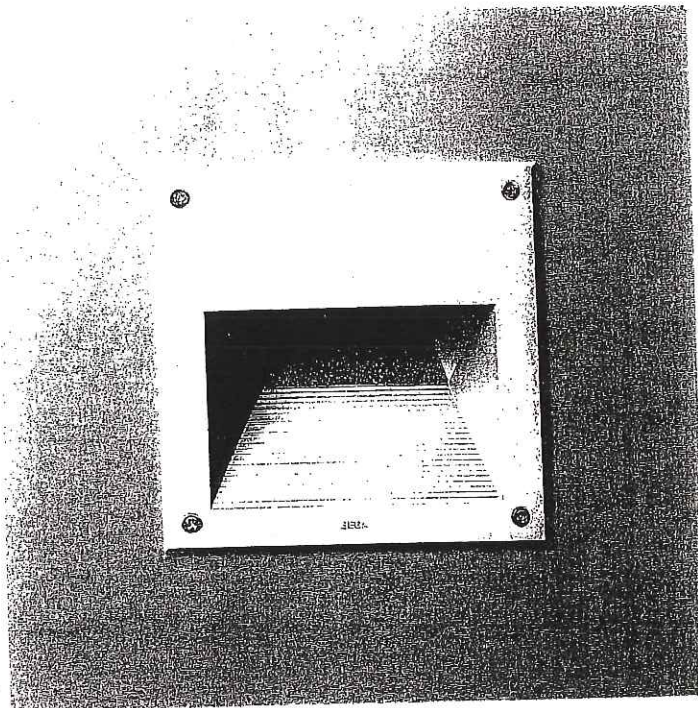
Ceiling illumination from the wall



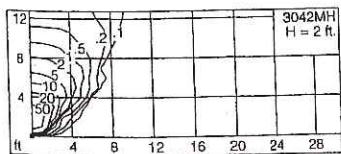
Wall illumination from the ceiling



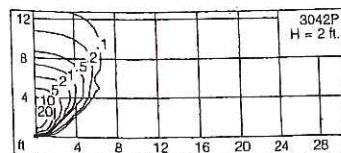
Floor illumination from the wall



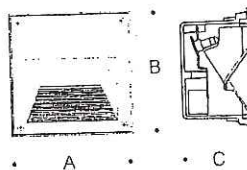
3115  
H = 2 ft.



3042MH  
H = 2 ft.



3042P  
H = 2 ft.



Die cast aluminum faceplate with step baffle. Clear tempered glass. Full internal reflector for asymmetrical distribution. Flush stainless steel fasteners. U.L. listed, suitable for wet locations. IP 65. Color: Standard BEGA finishes.

	Lamp	Lumen	A	B	C
3115	Recessed ADA 1 60W T4 G9,120V	780	7½	7½	4
3042P	Recessed ADA 1 18W CF quad-4p	1250	9½	9½	5½
3042MH	Recessed ADA 1 39W T6 G12 MH	3300	9½	9½	5½
2315MH	Recessed ADA 1 70W T6 G12 MH	6600	11½	11½	6½
522	CPC, Concrete Protection Cover for 3115				
524	CPC, Concrete Protection Cover for 3042P, 3042MH				





**KIM LIGHTING**

**SAR**

The Archetype®

revision 3/17/03 • sar.pdf

Type:  
Job:  
Catalog number:

ISA/SAR4110DMH 1PS-P1

Mtg. Fixture Electrical Module Finish Options  
See page 2 See pages 3-4

Optional  
Vertical  
Slipfitter Mount  
See page 5

Approvals:

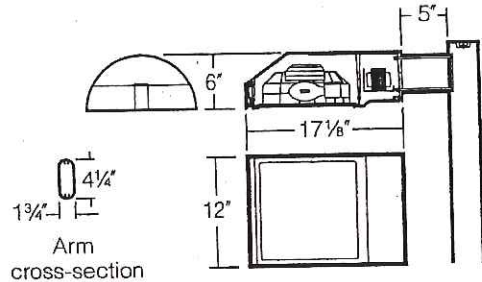


Date:  
Page: 1 of 5

Select pole from Kim Pole Catalog. If pole is provided by others indicate O.D. for arm fitting.

## Specifications

70 to 175 watt  
Medium Base Lamps  
Maximum Fixture weight (150HPS) = 25 lb



**Housing:** One piece low copper (less than .6%) die-cast aluminum alloy with integral cooling ribs over the optical chamber and electrical compartment. Solid barrier wall separates optical and electrical compartments. Double-thick wall with gussets on the support-arm mounting end. The fixture's housing forms a half cylinder with 58° front face plane providing a recess to allow a flush single-latch detail. All hardware is stainless steel or electro-zinc plated steel.

**Lens Frame:** One piece low copper (less than .6%) die-cast aluminum alloy lens frame with 1" minimum depth around the gasket flange. Integral hinges with stainless steel pins provide no-tool mounting and removal from housing. Single die-cast aluminum cam-latch provides positive locking and sealing of the optical chamber by a one piece extruded and vulcanized silicone gasket. Clear 3/16" thick tempered glass lens retained by eight steel clips with full silicone gasketing around the perimeter.

**Reflector Module:** Specular Alzak® optical segments are rigidly mounted within a die-cast aluminum enclosure that attaches to the housing as a one-piece module. Reflector module is field rotatable in 90° increments. MH and HPS sockets are porcelain 4KV pulse rated medium base. All reflector modules are factory prewired with quick-disconnect plug and include silicone seal at the penetration of the internal barrier wall in the luminaire housing.

**Electrical Module:** All electrical components are UL and CSA recognized, mounted on a single plate and factory prewired with quick-disconnect plugs. Electrical module attaches to housing with no-tool hinges and latches, accessible by opening the lens frame only. All ballasts are high power factor rated -20°F. starting.

**Support Arm:** One piece extruded aluminum with internal bolt guides and fully radiussed top and bottom. Luminaire-to-pole attachment is by internal draw bolts, and includes a pole reinforcing plate with wire strain relief. Arm is circular cut for specified round pole.

**Optional Wall Mounting:** Fixture mounts to 3" or 4" Junction Boxes by a cast aluminum adapter plate with fixture mounting bolts.

**NOTE:** Junction Box in wall must provide adequate fixture support. See NEC sections 370-13, 17 and 410-14, 16. Quick-disconnect plug and wiring are provided to allow field connections prior to fixture mounting.

**Finish:** Super TGIC thermoset polyester powder coat paint, 2.5 mil nominal thickness, applied over a chromate conversion coating; 2500 hour salt spray test endurance rating. Standard colors are Black, Dark Bronze, Light Gray, Platinum Silver, or White. Custom colors are available and subject to additional charges, minimum quantities and longer lead times. Consult representative.

**Certification:** UL Listed to U.S. and Canadian safety standards for wet locations. Fixture manufacturer shall employ a quality program that is certified to meet the ISO 9001:2000 standard.

**CAUTION:** Fixtures must be grounded in accordance with local codes or the National Electrical Code. Failure to do so may result in serious personal injury.

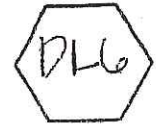


Type:  
Job:

Page: 2 of 5



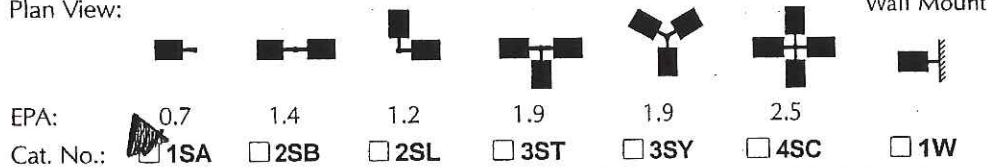
## Standard Features



### Mounting

3SY configuration is available for round poles only.

Plan View:

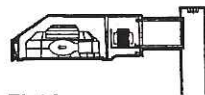


EPA: 0.7 1.4 1.2 1.9 1.9 2.5  
Cat. No.:  1SA  2SB  2SL  3ST  3SY  4SC  1W

### Fixture

Cat. No. designates fixture and light distribution.

See the Kim Site/Roadway Optical Systems Catalog for detailed information on reflector design and application.



Flat Lens



Type II



Type III



Type IV  
Forward Throw  
Full Cutoff



Type V  
Square  
Full Cutoff

Light Distribution:

Full Cutoff

Full Cutoff

Cat. No.:

SAR2

SAR3

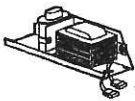
SAR4

SAR5

### Electrical Module

HPS = High Pressure Sodium

MH = Metal Halide



Lamp Watts	Lamp Type	Line Volts
150	HPS	120

Cat. Nos. for Electrical Modules available:

	<input type="checkbox"/> 70HPS120 <input type="checkbox"/> 70HPS208 <input type="checkbox"/> 70HPS240 <input type="checkbox"/> 70HPS277 <input type="checkbox"/> 70HPS347	<input type="checkbox"/> 100HPS120 <input type="checkbox"/> 100HPS208 <input type="checkbox"/> 100HPS240 <input type="checkbox"/> 100HPS277 <input type="checkbox"/> 100HPS347	<input type="checkbox"/> 150HPS120 <input type="checkbox"/> 150HPS208 <input type="checkbox"/> 150HPS240 <input type="checkbox"/> 150HPS277 <input type="checkbox"/> 150HPS347	
Lamp	ED-17, Clear	ED-17, Clear	ED-17, Clear	
Socket	Medium Base	Medium Base	Medium Base	
ANSI Ballast Type	S-62	S-54	S-55	
	<input type="checkbox"/> 70MH120 <input type="checkbox"/> 70MH208 <input type="checkbox"/> 70MH240 <input type="checkbox"/> 70MH277 <input type="checkbox"/> 70MH347	<input type="checkbox"/> 100MH120 <input type="checkbox"/> 100MH208 <input type="checkbox"/> 100MH240 <input type="checkbox"/> 100MH277 <input type="checkbox"/> 100MH347	<input type="checkbox"/> 150MH120 <input type="checkbox"/> 150MH208 <input type="checkbox"/> 150MH240 <input type="checkbox"/> 150MH277 <input type="checkbox"/> 150MH347	<input type="checkbox"/> 175MH120 <input type="checkbox"/> 175MH208 <input type="checkbox"/> 175MH240 <input type="checkbox"/> 175MH277 <input type="checkbox"/> 175MH347
Lamp	ED-17, Clear	ED-17, Clear	ED-17, Clear	ED-17, Clear
Socket	Medium Base	Medium Base	Medium Base	Medium Base
ANSI Ballast Type	M-98	M-90	M-102	M-57

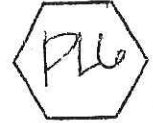
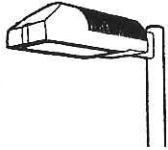
### Finish

Super TGIC powder coat paint over a chromate conversion coating.

Color: Black Dark Bronze Light Gray Platinum Silver White Custom Color<sup>1</sup>  
Cat. No.:  BL-P  DB-P  LG-P  PS-P  WH-P  CC-P

<sup>1</sup>Custom colors subject to additional charges, minimum quantities and extended lead times. Consult representative. Custom color description: \_\_\_\_\_

Type:  
Job:



## Optional Features

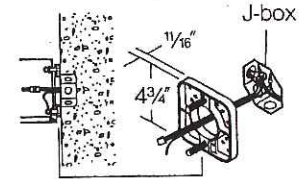
### Wall Mounting

Cat. No. **1W**

Select from Mounting on page 2.

Fixture mounts to 3" or 4" Junction Boxes by a cast aluminum adapter plate with fixture mounting bolts.

**NOTE:** Junction Box in wall must provide adequate fixture support. See NEC sections 370-13, 17 and 410-14, 16. Quick-disconnect plug and wiring are provided to allow field connections prior to fixture mounting.



Wall mount using adapter plate 3" or 4" J-box in wall (by others)

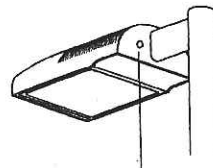
### Photocell Control

Cat. No. (See right)

No Option

Fixture supplied with an internal photocell with the sensor on the fixture end facing the pole. For multiple-fixture pole mountings, one fixture has a photocell to operate the others. Not available if wall mounted (**1W**).

Cat. No.	Line Volts:
<input type="checkbox"/> <b>A-30</b>	120V
<input type="checkbox"/> <b>A-31</b>	208V
<input type="checkbox"/> <b>A-32</b>	240V
<input type="checkbox"/> <b>A-33</b>	277V
<input type="checkbox"/> <b>A-35</b>	347V

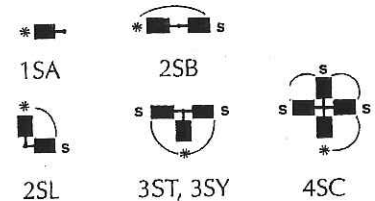


Photocell Sensor

Mounting Configuration:

\* – Fixture with Photocell Sensor  
S – slave unit(s)

No fixture wattage limit.

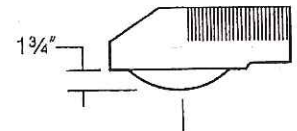


### Convex Glass Lens

Cat. No.  **CGL**

No Option

The 3/16" thick clear convex tempered glass lens replaces the standard flat glass lens. Provides increased lens presence and provides a subtle improvement in uniformity where pole spacing is extreme. Increases effectiveness of houseside shielding.



Convex Glass Lens

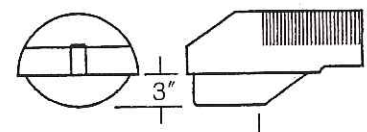
### Polycarbonate Lens

Cat. No.  **LS**

No Option

Fixture supplied with a one piece vacuum formed, clear, UV stabilized convex polycarbonate, fully gasketed, replacing the standard tempered glass lens.

**CAUTION:** Use only when vandalism is anticipated to be high. Useful life is limited by UV discoloration from sunlight and metal halide lamps.



Polycarbonate Lens



Type:

Job:

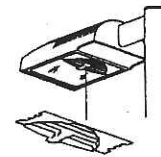


### Optional Features

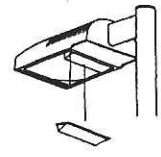


**Houseside Shield**  
 Cat. No. (See right)  
 No Option

**(Types II, III, and IV only).** Fixtures with the standard flat glass lens are available with stamped aluminum louvers that pass streetside light and block houseside light, and a blackened panel added to the reflector to reduce houseside reflections. Fixtures with the optional convex glass lens are available with a formed aluminum shield that passes streetside light and blocks houseside light, and a black anodized panel added to the reflector to reduce houseside reflections. Use with clear lamps only, as coated lamps reduce effectiveness.



**HS**  
for flat lens

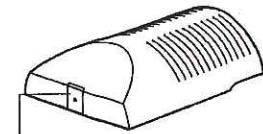


**HSC**  
for convex lens or polycarbonate lens

Cat. No.  
 **HS** Recommended for use with clear lamps only. Effectiveness is reduced for coated lamps. Not for use with Type V light distributions.  
 **HSC** For use with all fixtures with convex glass lens. Not for use with Type V light distributions.

**Tamper-Resistant Latch**  
 Cat. No.  TL  
 No Option

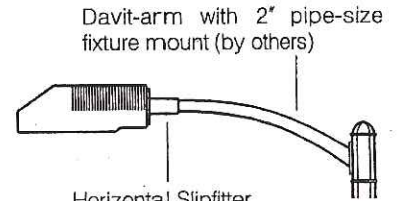
Standard die-cast latch is provided with a captive 10-32 stainless steel flat socket-head screw to prevent unauthorized opening.  
**NOTE:** Required only for vandal protection in locations where fixtures can be reached by unauthorized persons.



Tamper-Resistant Latch

**Horizontal Slipfitter Mount**  
 Cat. No.  HSF  
 No Option

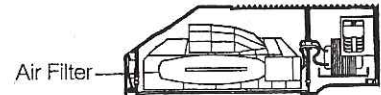
Replaces standard mounting arm with a slipfitter which allows fixture to be mounted to a horizontal pole davit-arm with 2" pipe-size mounting end (2 3/8" O.D.). Cast aluminum clamp-type slipfitter with set screw anti-rotation lock. Bolts to housing from inside the electrical compartment using mounting holes for the standard support arm. Davit-arm must be field drilled at a set screw location to insure against fixture rotation. Finished to match fixture and arm.



Horizontal Slipfitter Mount by Kim

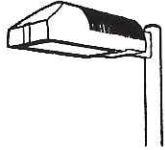
**Special Options for Street Lighting**  
 Cat. No.  AF  
 No Option

**Air Filter (AF):** Allows for ventilation through the optical chamber, filtering all air particles above 500 microns. Multi-layer disc assembly mounted on solid wall between optical compartment and latch cavity.



Air Filter

Type:  
 Job:



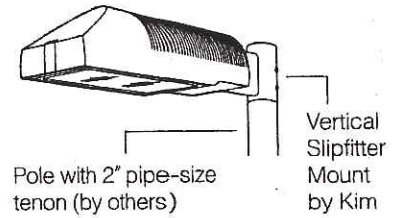
## Optional Features


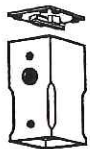


**Vertical Slipfitter Mounts**  
 Cat. No. includes Mounting  
 Cat. No. (See right)  
 No Option

Allows fixture with standard support arm to be mounted to poles having a 2" pipe-size tenon (2 3/8" O.D. x 4 1/2" min. length). All mounting configurations can be used (1SA, 2SB, 2SL, 3ST, 3SY, 4SC). 4" square or round die-cast aluminum with flush cap, secured by four 3/8" stainless steel set point allen screws, finished to match fixture and arm.

**NOTE:** 3SY only available on round slipfitter.



Cat. No. <input type="checkbox"/> VSF-1SA <input type="checkbox"/> VSF-2SB <input type="checkbox"/> VSF-2SL <input type="checkbox"/> VSF-3ST <input type="checkbox"/> VSF-3SY <input type="checkbox"/> VSF-4SC	 Round	Stainless steel set screws	 Square	Cat. No. <input type="checkbox"/> SVSF-1SA <input type="checkbox"/> SVSF-2SB <input type="checkbox"/> SVSF-2SL <input type="checkbox"/> SVSF-3ST <hr/> <input type="checkbox"/> SVSF-4SC	Mounting Configuration <b>1SA</b> - single arm mount <b>2SB</b> - 2 at 180° <b>2SL</b> - 2 at 90° <b>3ST</b> - 3 at 90° <b>3SY</b> - 3 at 120° <b>4SC</b> - 4 at 90°
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**KIM LIGHTING**



**SAR**

The Archetype®

revision 3/17/03 • sar.pdf

Type:  
Job:  
Catalog number:

Approvals:

1 SA 1 SAR 2 100 MH VOLTS PSE

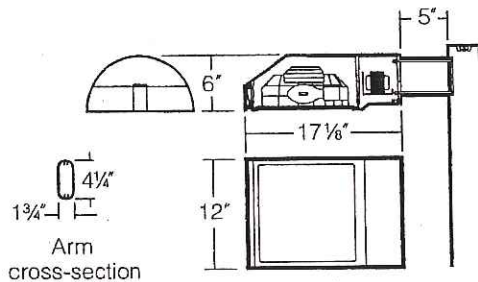
Mtg.	Fixture	Electrical Module	Finish	Options	Optional Vertical Slipfitter Mount
				See pages 3-4	See page 5
See page 2					

Date:  
Page: 1 of 5

Select pole from Kim Pole Catalog. If pole is provided by others indicate O.D. for arm fitting.

## Specifications

70 to 175 watt  
Medium Base Lamps  
Maximum Fixture weight (150HPS) = 25 lb



**Housing:** One piece low copper (less than .6%) die-cast aluminum alloy with integral cooling ribs over the optical chamber and electrical compartment. Solid barrier wall separates optical and electrical compartments. Double-thick wall with gussets on the support-arm mounting end. The fixture's housing forms a half cylinder with 58° front face plane providing a recess to allow a flush single-latch detail. All hardware is stainless steel or electro-zinc plated steel.

**Lens Frame:** One piece low copper (less than .6%) die-cast aluminum alloy lens frame with 1" minimum depth around the gasket flange. Integral hinges with stainless steel pins provide no-tool mounting and removal from housing. Single die-cast aluminum cam-latch provides positive locking and sealing of the optical chamber by a one piece extruded and vulcanized silicone gasket. Clear 3/16" thick tempered glass lens retained by eight steel clips with full silicone gasketing around the perimeter.

**Reflector Module:** Specular Alzak® optical segments are rigidly mounted within a die-cast aluminum enclosure that attaches to the housing as a one-piece module. Reflector module is field rotatable in 90° increments. MH and HPS sockets are porcelain 4KV pulse rated medium base. All reflector modules are factory prewired with quick-disconnect plug and include silicone seal at the penetration of the internal barrier wall in the luminaire housing.

**Electrical Module:** All electrical components are UL and CSA recognized, mounted on a single plate and factory prewired with quick-disconnect plugs. Electrical module attaches to housing with no-tool hinges and latches, accessible by opening the lens frame only. All ballasts are high power factor rated -20°F. starting.

**Support Arm:** One piece extruded aluminum with internal bolt guides and fully radiussed top and bottom. Luminaire-to-pole attachment is by internal draw bolts, and includes a pole reinforcing plate with wire strain relief. Arm is circular cut for specified round pole.

**Optional Wall Mounting:** Fixture mounts to 3" or 4" Junction Boxes by a cast aluminum adapter plate with fixture mounting bolts.

**NOTE:** Junction Box in wall must provide adequate fixture support. See NEC sections 370-13, 17 and 410-14, 16. Quick-disconnect plug and wiring are provided to allow field connections prior to fixture mounting.

**Finish:** Super TGIC thermoset polyester powder coat paint, 2.5 mil nominal thickness, applied over a chromate conversion coating; 2500 hour salt spray test endurance rating. Standard colors are Black, Dark Bronze, Light Gray, Platinum Silver, or White. Custom colors are available and subject to additional charges, minimum quantities and longer lead times. Consult representative.

**Certification:** UL Listed to U.S. and Canadian safety standards for wet locations. Fixture manufacturer shall employ a quality program that is certified to meet the ISO 9001:2000 standard.

**CAUTION:** Fixtures must be grounded in accordance with local codes or the National Electrical Code. Failure to do so may result in serious personal injury.



Hubbell  
Lighting, Inc.



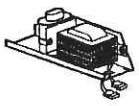
Type:

Job:

Page: 2 of 5



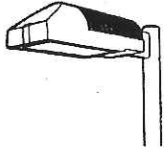
## Standard Features

<p><b>Mounting</b> 3SY configuration is available for round poles only.</p>	<p>Plan View:</p>  <p>EPA: 0.7    1.4    1.2    1.9    1.9    2.5</p> <p>Cat. No.: <input checked="" type="checkbox"/> 1SA    <input type="checkbox"/> 2SB    <input type="checkbox"/> 2SL    <input type="checkbox"/> 3ST    <input type="checkbox"/> 3SY    <input type="checkbox"/> 4SC    <input type="checkbox"/> 1W</p>																																																												
<p><b>Fixture</b> Cat. No. designates fixture and light distribution. See the Kim Site/Roadway Optical Systems Catalog for detailed information on reflector design and application.</p>	<p>Flat Lens</p>  <p>Light Distribution: Type II    Type III    Type IV Forward Throw    Type V Square</p> <p>Full Cutoff    Full Cutoff    Full Cutoff    Full Cutoff</p> <p>Cat. No.: <input checked="" type="checkbox"/> SAR2    <input type="checkbox"/> SAR3    <input type="checkbox"/> SAR4    <input type="checkbox"/> SAR5</p>																																																												
<p><b>Electrical Module</b> HPS = High Pressure Sodium MH = Metal Halide</p>  <p>Lamp    Watts    Type    Line Volts</p> <p>150    HPS    120</p>	<p>Cat. Nos. for Electrical Modules available:</p> <table border="1"> <tr> <td><input type="checkbox"/> 70HPS120</td> <td><input type="checkbox"/> 100HPS120</td> <td><input type="checkbox"/> 150HPS120</td> </tr> <tr> <td><input type="checkbox"/> 70HPS208</td> <td><input type="checkbox"/> 100HPS208</td> <td><input type="checkbox"/> 150HPS208</td> </tr> <tr> <td><input type="checkbox"/> 70HPS240</td> <td><input type="checkbox"/> 100HPS240</td> <td><input type="checkbox"/> 150HPS240</td> </tr> <tr> <td><input type="checkbox"/> 70HPS277</td> <td><input type="checkbox"/> 100HPS277</td> <td><input type="checkbox"/> 150HPS277</td> </tr> <tr> <td><input type="checkbox"/> 70HPS347</td> <td><input type="checkbox"/> 100HPS347</td> <td><input type="checkbox"/> 150HPS347</td> </tr> <tr> <td>Lamp</td> <td>ED-17, Clear</td> <td>ED-17, Clear</td> </tr> <tr> <td>Socket</td> <td>Medium Base</td> <td>Medium Base</td> </tr> <tr> <td>ANSI Ballast Type</td> <td>S-62</td> <td>S-54</td> </tr> </table> <table border="1"> <tr> <td><input type="checkbox"/> 70MH120</td> <td><input type="checkbox"/> 100MH120</td> <td><input type="checkbox"/> 150MH120</td> <td><input type="checkbox"/> 175MH120</td> </tr> <tr> <td><input type="checkbox"/> 70MH208</td> <td><input type="checkbox"/> 100MH208</td> <td><input type="checkbox"/> 150MH208</td> <td><input type="checkbox"/> 175MH208</td> </tr> <tr> <td><input type="checkbox"/> 70MH240</td> <td><input type="checkbox"/> 100MH240</td> <td><input type="checkbox"/> 150MH240</td> <td><input type="checkbox"/> 175MH240</td> </tr> <tr> <td><input type="checkbox"/> 70MH277</td> <td><input type="checkbox"/> 100MH277</td> <td><input type="checkbox"/> 150MH277</td> <td><input type="checkbox"/> 175MH277</td> </tr> <tr> <td><input type="checkbox"/> 70MH347</td> <td><input type="checkbox"/> 100MH347</td> <td><input type="checkbox"/> 150MH347</td> <td><input type="checkbox"/> 175MH347</td> </tr> <tr> <td>Lamp</td> <td>ED-17, Clear</td> <td>ED-17, Clear</td> <td>ED-17, Clear</td> </tr> <tr> <td>Socket</td> <td>Medium Base</td> <td>Medium Base</td> <td>Medium Base</td> </tr> <tr> <td>ANSI Ballast Type</td> <td>M-98</td> <td>M-90</td> <td>M-102</td> </tr> <tr> <td></td> <td></td> <td></td> <td>M-57</td> </tr> </table>	<input type="checkbox"/> 70HPS120	<input type="checkbox"/> 100HPS120	<input type="checkbox"/> 150HPS120	<input type="checkbox"/> 70HPS208	<input type="checkbox"/> 100HPS208	<input type="checkbox"/> 150HPS208	<input type="checkbox"/> 70HPS240	<input type="checkbox"/> 100HPS240	<input type="checkbox"/> 150HPS240	<input type="checkbox"/> 70HPS277	<input type="checkbox"/> 100HPS277	<input type="checkbox"/> 150HPS277	<input type="checkbox"/> 70HPS347	<input type="checkbox"/> 100HPS347	<input type="checkbox"/> 150HPS347	Lamp	ED-17, Clear	ED-17, Clear	Socket	Medium Base	Medium Base	ANSI Ballast Type	S-62	S-54	<input type="checkbox"/> 70MH120	<input type="checkbox"/> 100MH120	<input type="checkbox"/> 150MH120	<input type="checkbox"/> 175MH120	<input type="checkbox"/> 70MH208	<input type="checkbox"/> 100MH208	<input type="checkbox"/> 150MH208	<input type="checkbox"/> 175MH208	<input type="checkbox"/> 70MH240	<input type="checkbox"/> 100MH240	<input type="checkbox"/> 150MH240	<input type="checkbox"/> 175MH240	<input type="checkbox"/> 70MH277	<input type="checkbox"/> 100MH277	<input type="checkbox"/> 150MH277	<input type="checkbox"/> 175MH277	<input type="checkbox"/> 70MH347	<input type="checkbox"/> 100MH347	<input type="checkbox"/> 150MH347	<input type="checkbox"/> 175MH347	Lamp	ED-17, Clear	ED-17, Clear	ED-17, Clear	Socket	Medium Base	Medium Base	Medium Base	ANSI Ballast Type	M-98	M-90	M-102				M-57
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ANSI Ballast Type	M-98	M-90	M-102																																																										
			M-57																																																										
<p><b>Finish</b> Super TGIC powder coat paint over a chromate conversion coating.</p>	<p>Color: Black    Dark Bronze    Light Gray    Platinum Silver    White    Custom Color<sup>1</sup></p> <p>Cat. No.: <input type="checkbox"/> BL-P    <input type="checkbox"/> DB-P    <input type="checkbox"/> LG-P    <input checked="" type="checkbox"/> PS-P    <input type="checkbox"/> WH-P    <input type="checkbox"/> CC-P</p> <p><sup>1</sup>Custom colors subject to additional charges, minimum quantities and extended lead times. Consult representative. Custom color description: _____</p>																																																												



Type:

Job:



### Optional Features

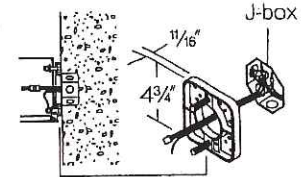
**Wall Mounting**

Cat. No. **1W**

Select from Mounting on page 2.

Fixture mounts to 3" or 4" Junction Boxes by a cast aluminum adapter plate with fixture mounting bolts.

**NOTE:** Junction Box in wall must provide adequate fixture support. See NEC sections 370-13, 17 and 410-14, 16. Quick-disconnect plug and wiring are provided to allow field connections prior to fixture mounting.



Wall mount using adapter plate 3" or 4" J-box in wall (by others)

**Photocell Control**

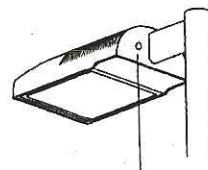
Cat. No. (See right)

No Option

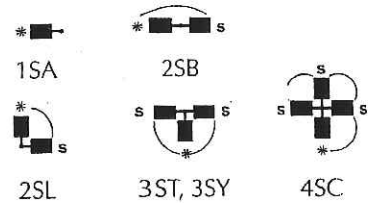
Fixture supplied with an internal photocell with the sensor on the fixture end facing the pole. For multiple-fixture pole mountings, one fixture has a photocell to operate the others. Not available if wall mounted (**1W**).

Mounting Configuration:  
\* – Fixture with Photocell Sensor  
S – slave unit(s)  
No fixture wattage limit.

- |                                      |             |
|--------------------------------------|-------------|
| Cat. No.                             | Line Volts: |
| <input type="checkbox"/> <b>A-30</b> | 120V        |
| <input type="checkbox"/> <b>A-31</b> | 208V        |
| <input type="checkbox"/> <b>A-32</b> | 240V        |
| <input type="checkbox"/> <b>A-33</b> | 277V        |
| <input type="checkbox"/> <b>A-35</b> | 347V        |



Photocell Sensor

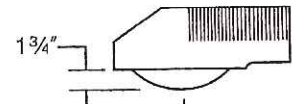


**Convex Glass Lens**

Cat. No.  CGL

No Option

The 3/16" thick clear convex tempered glass lens replaces the standard flat glass lens. Provides increased lens presence and provides a subtle improvement in uniformity where pole spacing is extreme. Increases effectiveness of houseside shielding.



Convex Glass Lens

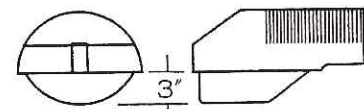
**Polycarbonate Lens**

Cat. No.  LS

No Option

Fixture supplied with a one piece vacuum formed, clear, UV stabilized convex polycarbonate, fully gasketed, replacing the standard tempered glass lens.

**CAUTION:** Use only when vandalism is anticipated to be high. Useful life is limited by UV discoloration from sunlight and metal halide lamps.



Polycarbonate Lens





Type:

Job:



### Optional Features

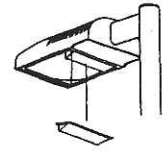
**Houseside Shield**

Cat. No. (See right)  
 No Option

(Types II, III, and IV only). Fixtures with the standard flat glass lens are available with stamped aluminum louvers that pass streetside light and block houseside light, and a blackened panel added to the reflector to reduce houseside reflections. Fixtures with the optional convex glass lens are available with a formed aluminum shield that passes streetside light and blocks houseside light, and a black anodized panel added to the reflector to reduce houseside reflections. Use with clear lamps only, as coated lamps reduce effectiveness.



**HS**  
for flat lens



**HSC**  
for convex lens or polycarbonate lens

Cat. No.

**HS** Recommended for use with clear lamps only. Effectiveness is reduced for coated lamps. Not for use with Type V light distributions.

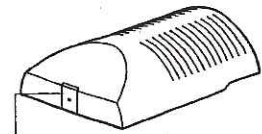
**HSC** For use with all fixtures with convex glass lens. Not for use with Type V light distributions.

**Tamper-Resistant Latch**

Cat. No.  TL  
 No Option

Standard die-cast latch is provided with a captive 10-32 stainless steel flat socket-head screw to prevent unauthorized opening.

**NOTE:** Required only for vandal protection in locations where fixtures can be reached by unauthorized persons.



Tamper-Resistant Latch

**Horizontal Slipfitter Mount**

Cat. No.  HSF  
 No Option

Replaces standard mounting arm with a slipfitter which allows fixture to be mounted to a horizontal pole davit-arm with 2" pipe-size mounting end (2 3/8" O.D.). Cast aluminum clamp-type slipfitter with set screw anti-rotation lock. Bolts to housing from inside the electrical compartment using mounting holes for the standard support arm. Davit-arm must be field drilled at a set screw location to insure against fixture rotation. Finished to match fixture and arm.

Davit-arm with 2" pipe-size fixture mount (by others)

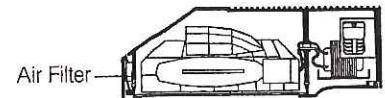


Horizontal Slipfitter Mount by Kim

**Special Options for Street Lighting**

Cat. No.  AF  
 No Option

**Air Filter (AF):** Allows for ventilation through the optical chamber, filtering all air particles above 500 microns. Multi-layer disc assembly mounted on solid wall between optical compartment and latch cavity.

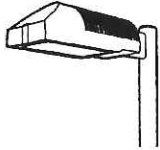


Air Filter



Type:

Job:



### Optional Features

#### Vertical Slipfitter Mounts

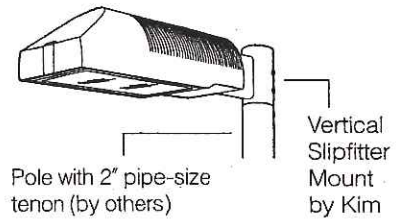
Cat. No. includes Mounting

Cat. No. (See right)

No Option

Allows fixture with standard support arm to be mounted to poles having a 2" pipe-size tenon (2 3/8" O.D. x 4 1/2" min. length). All mounting configurations can be used (1SA, 2SB, 2SL, 3ST, 3SY, 4SC). 4" square or round die-cast aluminum with flush cap, secured by four 3/8" stainless steel set point allen screws, finished to match fixture and arm.

**NOTE:** 3SY only available on round slipfitter.

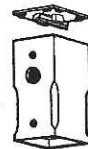


- Cat. No.
- VSF-1SA
  - VSF-2SB
  - VSF-2SL
  - VSF-3ST
  - VSF-3SY
  - VSF-4SC



Round

Stainless steel set screws



Square

- Cat. No.
- SVSF-1SA
  - SVSF-2SB
  - SVSF-2SL
  - SVSF-3ST
  - SVSF-4SC

- Mounting Configuration
- 1SA** - single arm mount
  - 2SB** - 2 at 180°
  - 2SL** - 2 at 90°
  - 3ST** - 3 at 90°
  - 3SY** - 3 at 120°
  - 4SC** - 4 at 90°