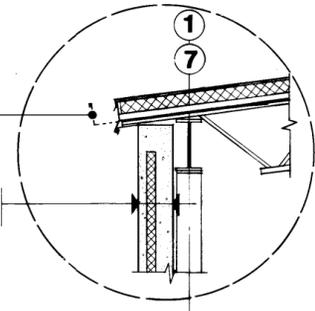
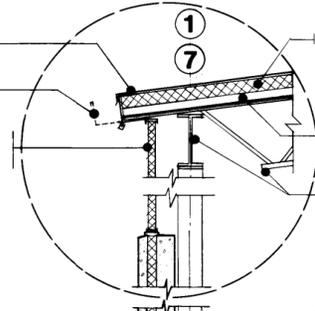


CLERESTORY  
(TRANSLUCENT  
INSULATED PANELS)



GUTTER  
(OPTIONAL AS  
REQUIRED)

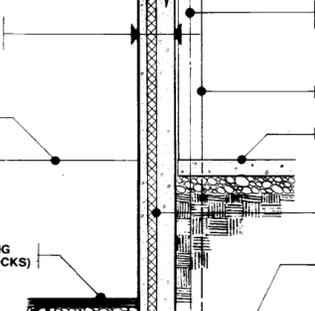
INSULATED  
CONCRETE PANEL  
(NON-BEARING)



ROOFING  
SYSTEM

GUTTER  
(OPTIONAL AS  
REQUIRED)

CLERESTORY  
(TRANSLUCENT  
INSULATED PANEL)



INSULATION

ROOF DECK

PRIMARY  
ROOF FRAMING

LATERAL BRACING  
(AS REQUIRED)

INSULATED  
CONCRETE PANEL  
(NON-BEARING)

DOCK LEVEL

CONCRETE SLAB

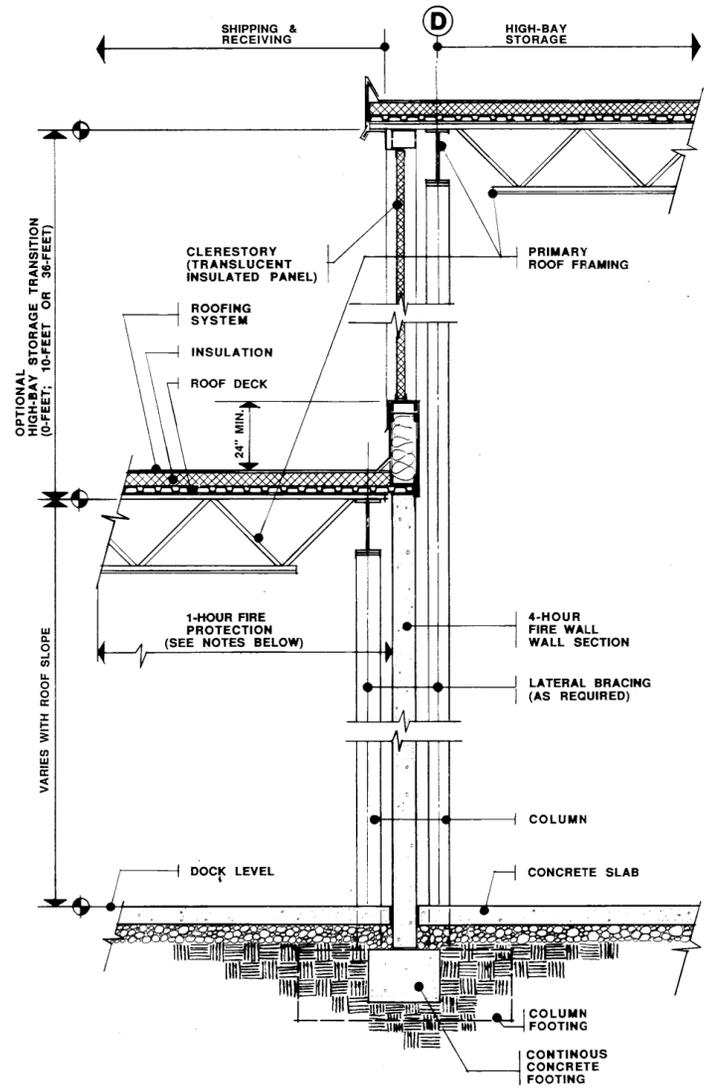
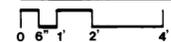
PERIMETER  
INSULATION  
(AS REQUIRED)

COLUMN  
FOOTING

GRAVEL SURFACING  
(CONCRETE AT DOCKS)

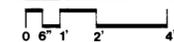
CONCRETE  
FOOTING  
(DISCONTINUOUS  
ACCEPTABLE)

### WALL SECTION



NOTE:  
ONE (1) HOUR FIRE PROTECTION  
REQUIRED AS FOLLOWS:  
• 10 FT. MIN. IF PRIMARY ROOF FRAMING  
IS PARALLEL TO FIRE WALL.  
• FULL SPAN OF PRIMARY ROOF FRAMING  
IF FRAMING IS PERPENDICULAR TO  
FIRE WALL.

### WALL SECTION



### ELECTRICAL REQUIREMENTS

	Connected Load	Estimated Demand Load
<b>A. 24-Ft. High Warehouse:</b>		
Lighting	72.0 KW	72.0 KW
Receptacles	27.0 KW	13.5 KW
HVAC	62.4 KW	37.5 KW
Misc. Power *	33.0 KW	19.8 KW
<b>Total</b>	<b>194.4 KW</b>	<b>142.8 KW</b>
<b>B. 34-Ft. High Warehouse:</b>		
Lighting	85.0 KW	85.0 KW
Receptacles	27.0 KW	13.5 KW
HVAC	77.3 KW	46.4 KW
Misc. Power *	33.0 KW	19.8 KW
<b>Total</b>	<b>222.3 KW</b>	<b>164.7 KW</b>
<b>C. 60-Ft. High Warehouse:</b>		
Lighting	100.0 KW	100.0 KW
Receptacles	27.0 KW	13.5 KW
HVAC	139.6 KW	83.8 KW
Misc. Power *	33.0 KW	19.8 KW
<b>Total</b>	<b>299.6 KW</b>	<b>217.1 KW</b>

\* OH doors, dock levels, etc. Power for materials handling equipment will be determined to supply the MHE installed.

### Electrical Design Objectives

The majority of the Warehouse electrical system load is comprised of lighting, power receptacles, and small motors. The electrical characteristics shall be chosen to supply the electrical requirements in the most economical manner. In general, the medium voltage distribution shall match the characteristics of the available utility source. Low voltage distribution shall be of the highest order consistent with the load served. Where practical, the low voltage distribution shall be 3 phase, 4 wire 277/480 volt wye, with 3 phase, 4 wire 120/208 volt dry type transformer being provided to serve the small motor loads, receptacles and lighting. Lighting and power connected and demand loads are shown elsewhere on this drawing.

The interior lighting levels as established by the Architectural and Engineering Instructions are:

Inactive warehousing	5 FC
Active warehousing	10 FC
Main aisles	15 FC
Office areas	50 FC
Restroom Facilities	20 FC
Lunch/Break Room	25 FC
Shipping and Receiving	20 FC
Management Information Center	50 FC

Special illumination levels may also be required for certain types of materials handling systems, conveyors, control centers, truck interiors, etc. This should be determined at time of final design.

All of the warehouse lighting levels shall be measured 48 inches from the floor. The lighting shall be installed with energy-saving lamps and ballasts. All administrative/logistics areas shall be provided with individual room switches. The warehouse area shall be provided with switches for individual aisle groups, the exact switching configuration to be determined to meet the specific requirements.

All interior areas, other than the Warehouse, shall be illuminated using fluorescent lighting fixtures.

The Warehouse shall be illuminated with HID (high intensity discharge) lighting fixtures with the wattages being chosen to provide the most economical installation.

High pressure sodium is recommended where color resolution is not critical, as it is most energy efficient. Metal halide should be used where color resolution is a factor. Lamp efficiencies (lumens/watt) are as follows:

Mercury Vapor	63
Metal Halide	125
High Pressure Sodium	140

In general, 400 watts shall be used for the 24 and 34 ft. clear height Warehouse areas; 1,000 watts shall be used in the 60 ft. clear height Warehouse areas. When high-intensity discharge lighting is used, emergency supplementary incandescent, fluorescent or integral part quartz lighting of 1 FC shall be provided along all aisles and walkways. This lighting shall be in addition to the regular lighting systems. The lighting shall be energized at any time building power is on but the HID fixture is not capable of producing sufficient illumination.

Supplementary lighting is not a substitution of regular emergency lighting as required per APWA 101, Life Safety Code.

Each loading dock shall be provided with dock lights specifically designed for truck loading and unloading; exact location and fixture type shall be determined by specific loading requirements.

The exterior of the building shall be illuminated for security and shall be designed to provide the most energy-efficient lighting practicable. The truck dock area shall be illuminated to 5 FC with building mounted lighting fixtures. All exterior lighting shall be controlled using a combination of photocell and time clocks, with photocell on - time clock off.

The parking area shall be illuminated to 0.5 FC using pole mounted, cutoff type lighting fixtures. The most cost effective pole height and wattage luminaire shall be used. Concrete pole bases, a minimum of 30 inches high, shall be provided for lighting pole protection.

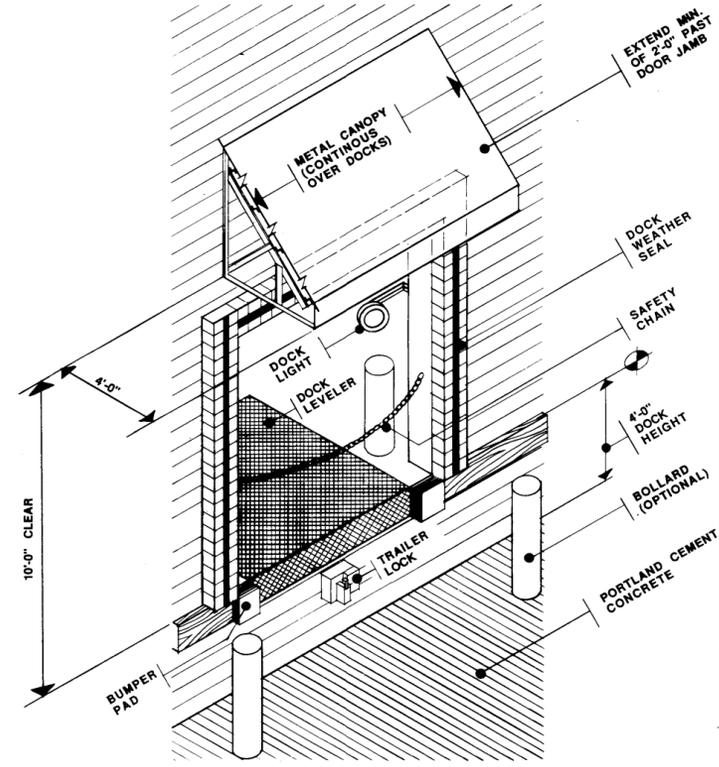
Exit and pathway lighting shall be provided battery powered backup systems delivering a level of 1 FC for a period of 1-1/2 hours after normal lighting failure.

A fire detection and alarm system shall be provided to meet the requirements of the local fire marshal. The means of transmission of fire alarm signals shall be coordinated with the installation fire authority.

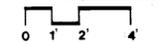
A telephone system shall be provided to all office areas and shipping/receiving. The telephone switching requirements shall be coordinated with the communication authority. An intercom system shall be provided for voice communication between offices, shipping/receiving and all areas of the warehouse. Provide one speaker for each 2,000 sq. ft. of warehouse.

Receptacles shall be installed in all offices, management information center room, lunch/break room, and shipping/receiving areas to meet requirements. Receptacles shall be mounted at + 48 inches in the warehouse and shall be installed at alternate columns of this structural grid.

Battery-charging receptacles shall be provided for fork-lift equipment. NEMA 3R, GFI protected receptacles shall be provided on the building exterior.



### TRUCK DOCK EXAMPLE



Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY  
ENGINEER DISTRICT, SEATTLE  
CORPS OF ENGINEERS  
SEATTLE, WASHINGTON

Designed by: <b>LDC</b>	<b>DEPARTMENT OF THE ARMY FACILITIES STANDARDIZATION PROGRAM DEFINITIVE DESIGN</b>
Drawn by: <b>KNY</b>	
Checked by: <b>LDC/DHH</b>	<b>GENERAL PURPOSE WAREHOUSE</b>
Reviewed by:	Scale: As shown
Submitted by:	Spec. No.
	Contract No. DACA 67-86-D-0029

Sheet number: <b>6</b>	Drawing number: <b>44110-01 44220-01</b>
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