

PHASE 2 – PARKING GARAGE
PORTLAND INTERNATIONAL JETPORT
PARTIAL CERTIFICATE OF OCCUPANCY
GRID LINE 7 THROUGH 13

APPLICATION EXHIBITS

Portland, Maine

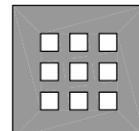
November 17, 2008

Prepared for:

City of Portland
Department of Waterfront &
Transportation
Portland International Jetport
1001 Westbrook Street
Portland, ME

In conjunction with:

The City of Portland
389 Congress Street
City Hall Room 315
Portland, Maine 04101



**DOMENECH
HICKS &
KROCKMALNIC
ARCHITECTS**

155 Massachusetts Ave.
Boston, MA 02115
617-267-6408
Fax 617-267-1990

ISSUED FOR
CONSTRUCTION

CITY OF PORTLAND
PORTLAND, MAINE

DEPARTMENT OF
WATERFRONT AND
TRANSPORTATION



PORTLAND
INTERNATIONAL
JETPORT

PHASE II
PARKING GARAGE

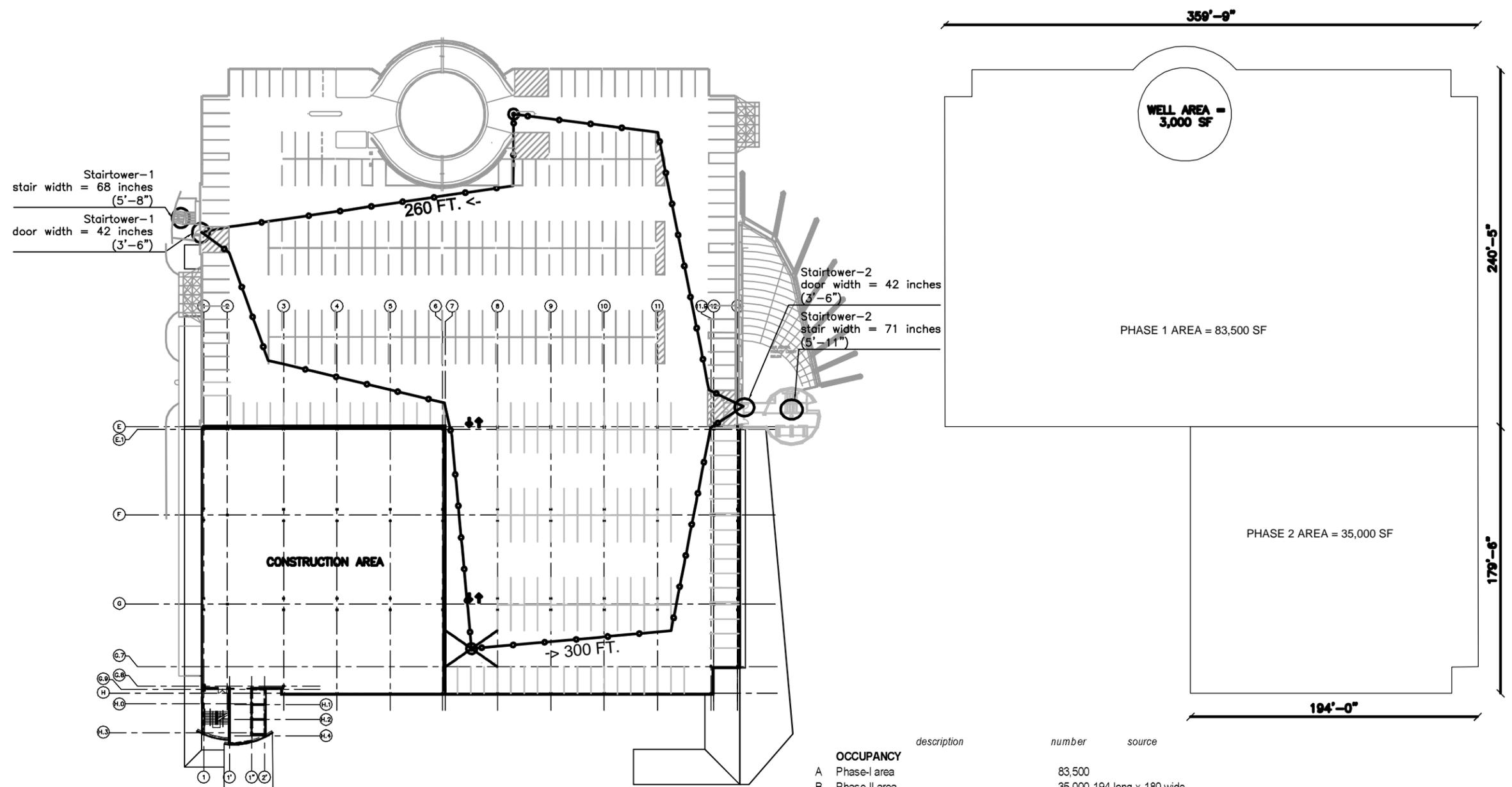
1001 WESTBROOK ST.,
PORTLAND, MAINE

No.	Date	Revision

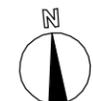
TITLE
**TYPICAL FLOOR PLAN
EGRESS DIAGRAM ON**

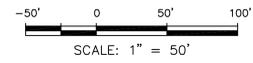
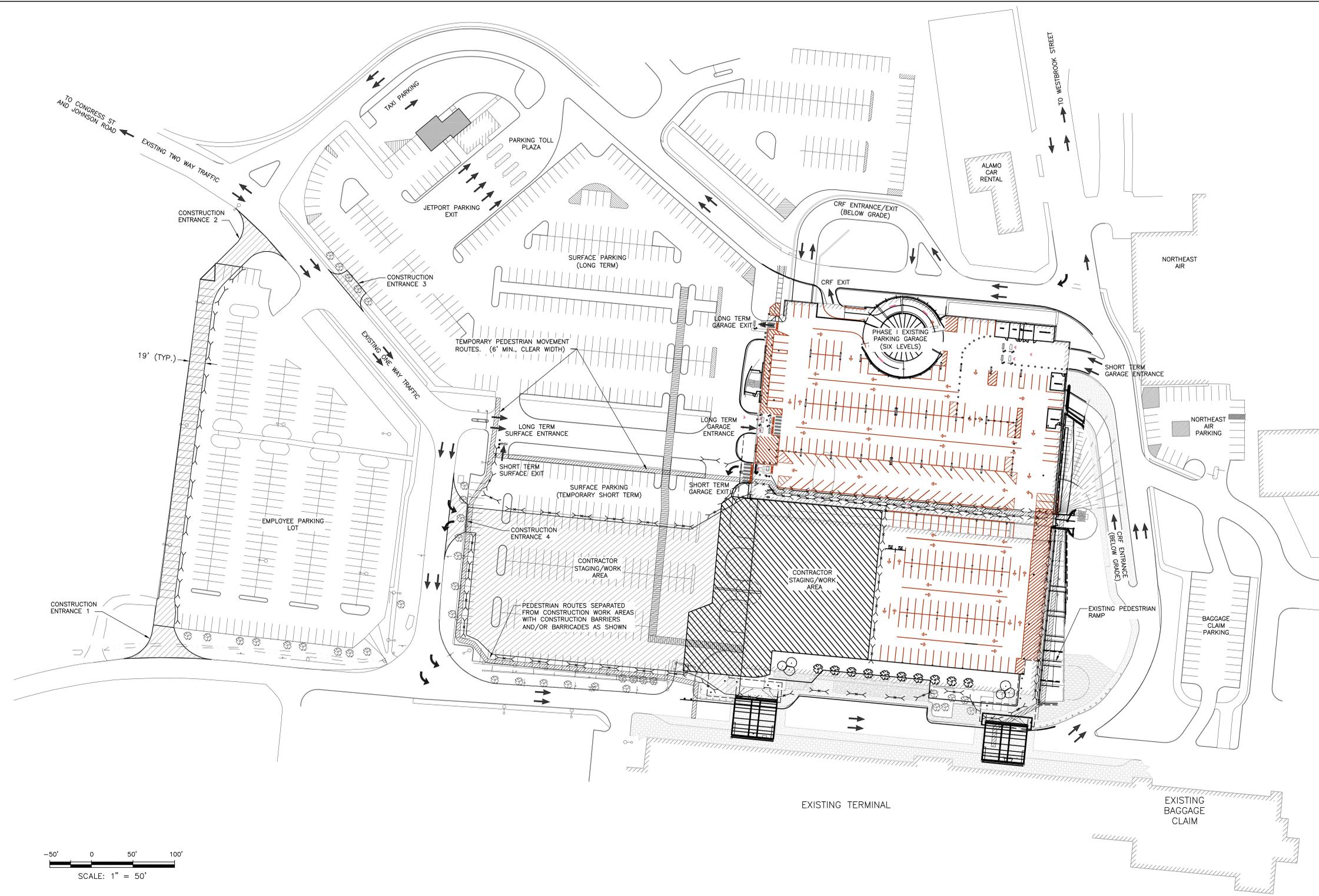
Drawn By	Checked By	Job No.	Date

G-2

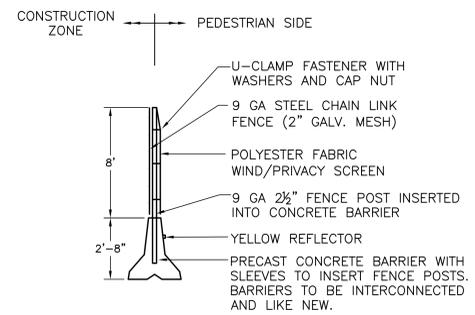


description	number	source
OCCUPANCY		
A Phase-I area	83,500	
B Phase-II area	35,000 194 long x 180 wide	
C Total area	118,500 calculation (A + B)	
D SF/occupant	200 TABLE 1004.1.2	
E occupants based on IBC-2003	583 calculation (C / D)	
K probability factor based on max aircraft size	50%	
S Anticipated maximum occupants	296 calculation (E x K)	
EXIT DOORS		
F Required Doors IN/occupant	0.2 TABLE 1005.1	
G Required aggregate IN	59.3 calculation (S * F)	
H Stairtower-1 door width (IN)	42 As-built conditions	
J Exitstair-1 door width (IN)	42 As-built conditions	
L Supplied aggregate IN	84 calculation (H+J)	
EXIT STAIRS		
M Required Stair IN/occupant	0.3 TABLE 1005.1	
N Required aggregate IN	89.0 calculation (S * M)	
P Stairtower-1 stair width (IN)	71 As-built conditions	
R Exitstair-1 stair width (IN)	68 As-built conditions	
T Supplied aggregate IN	139 calculation (P+R)	





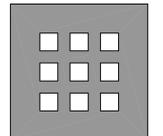
- LEGEND**
- VEHICULAR TRAVELING PUBLIC
 - CONSTRUCTION STAGING AREA
 - TEMPORARY CONSTRUCTION BARRICADE WITH FENCE (SEE DETAIL THIS SHEET) CONTRACTOR SHALL PROVIDE AND MOVE AROUND SITE AS NECESSARY TO ACCOMMODATE SEQUENCE OF WORK.
 - TEMPORARY CONSTRUCTION BARRIER (SEE DETAIL THIS SHEET) CONTRACTOR SHALL PROVIDE AND MOVE AROUND SITE AS NECESSARY TO ACCOMMODATE SEQUENCE OF WORK.
 - PROPOSED PEDESTRIAN MOVEMENTS. CONTRACTOR SHALL PROVIDE TEMPORARY PAVEMENT MARKINGS AND WAY FINDING SIGNAGE AS NEEDED TO ENSURE SAFE AND UNIMPEDED FLOW OF PEDESTRIANS AROUND THE SITE.



TEMPORARY CONSTRUCTION BARRICADE
NOT TO SCALE



TEMPORARY CONSTRUCTION BARRIER
NOT TO SCALE



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155 Massachusetts Ave.
Boston, MA 02115
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JETPORT

PHASE II
PARKING GARAGE

1001 WESTBROOK ST.,
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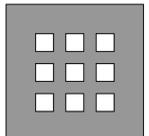
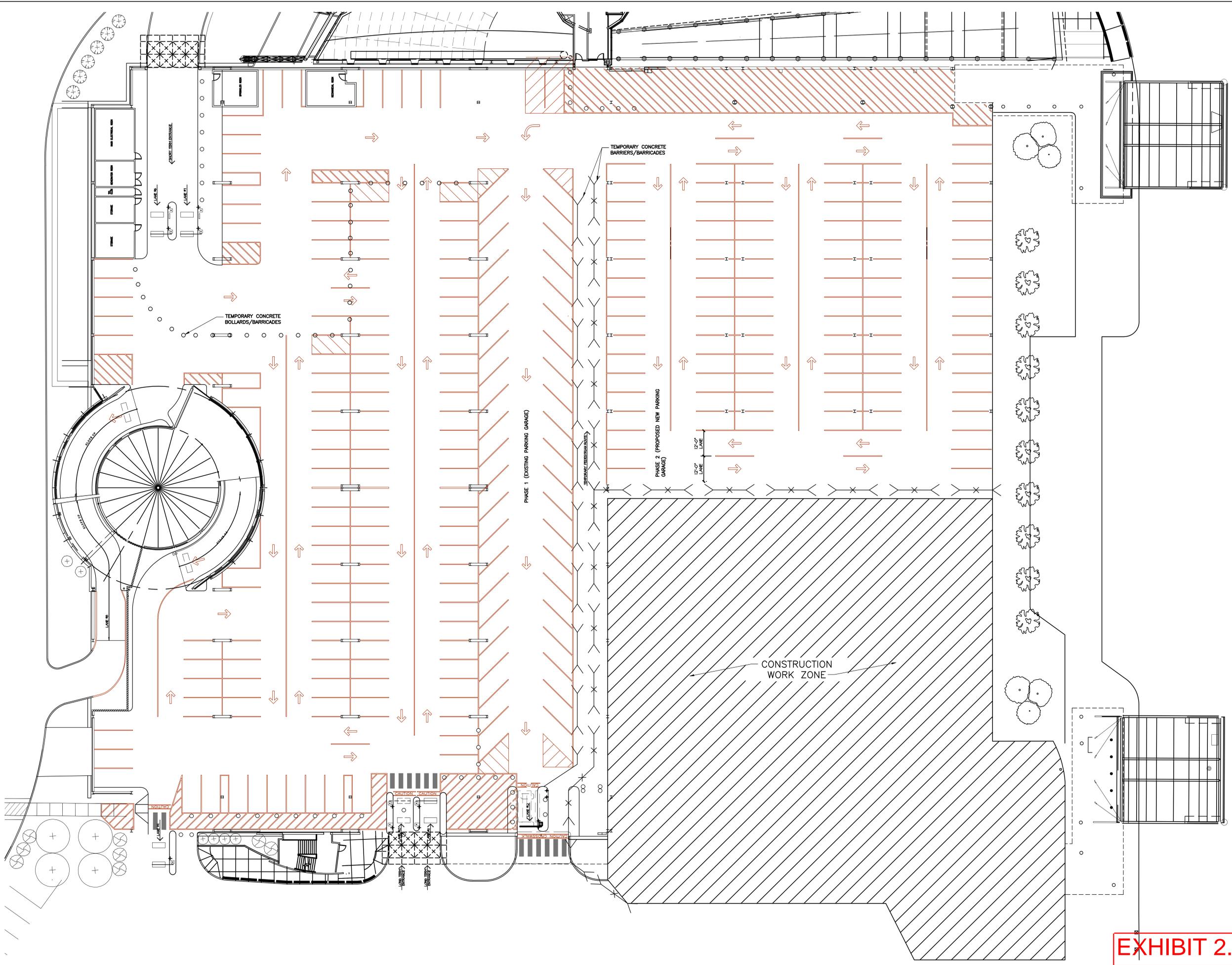
No.	Date	Revision

Title
**FACILITY ENTRY/EXIT
LOCATION SITE PLAN**

Scale AS NOTED	Drawing No. 2-1 Date 9/30/08
File Name	
Drawn By CEJ	
Checked By DPH	
Job No. 8105091.01	

1/16"=1' 5 0 10 20 30 40ft 1/8"=1' 5 0 5 10 15 20ft 1/4"=1' 2 0 2 4 6 8 10ft 1/2"=1' 1 0 1 2 3 4 5ft 3/4"=1' 1 0 1 2 3ft 1"=1' 1 0 1 2ft 1 1/2"=1' 0 1 2ft 3"=1' 0 1ft

If this sheet is less than 30"x42" in size, it has been reduced. Graphic scales must be adjusted accordingly.



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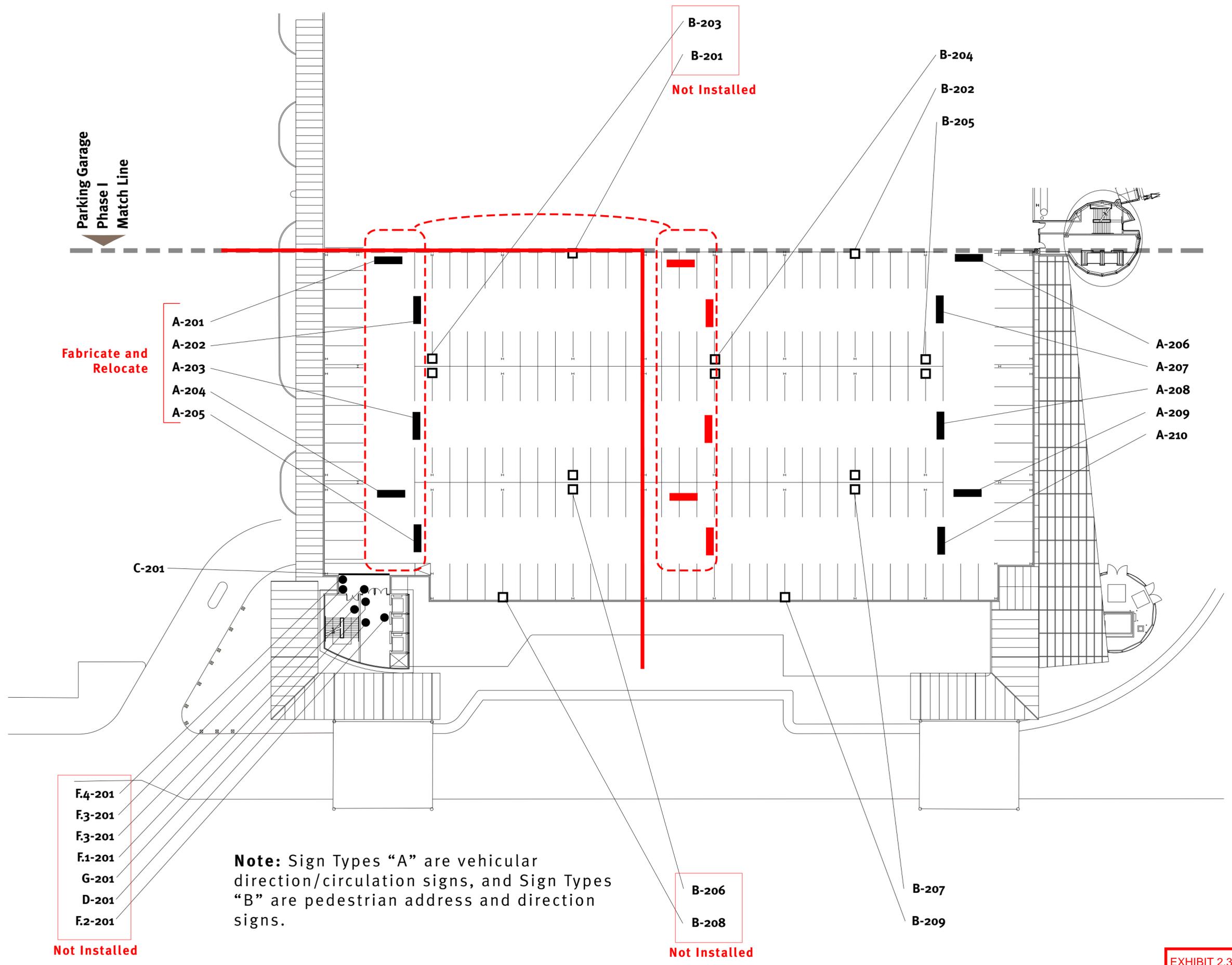
No.	Date	Revision

Title
**GROUND FLOOR VEHICULAR
MOVEMENT PLAN**

Scale
1/16"=1'-0"

File Name FIGURE 2.2	Drawn By CEJ	Checked By DPN	Date 03/08
Job No. 0100001.01	Drawing No. 2.2		

EXHIBIT 2.2



Parking Garage
Phase I
Match Line

Fabricate and
Relocate

F.4-201
F.3-201
F.3-201
F.1-201
G-201
D-201
F.2-201
Not Installed

A-201
A-202
A-203
A-204
A-205

Note: Sign Types "A" are vehicular direction/circulation signs, and Sign Types "B" are pedestrian address and direction signs.

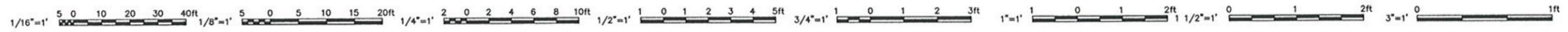
B-203
B-201
Not Installed

B-206
B-208
Not Installed

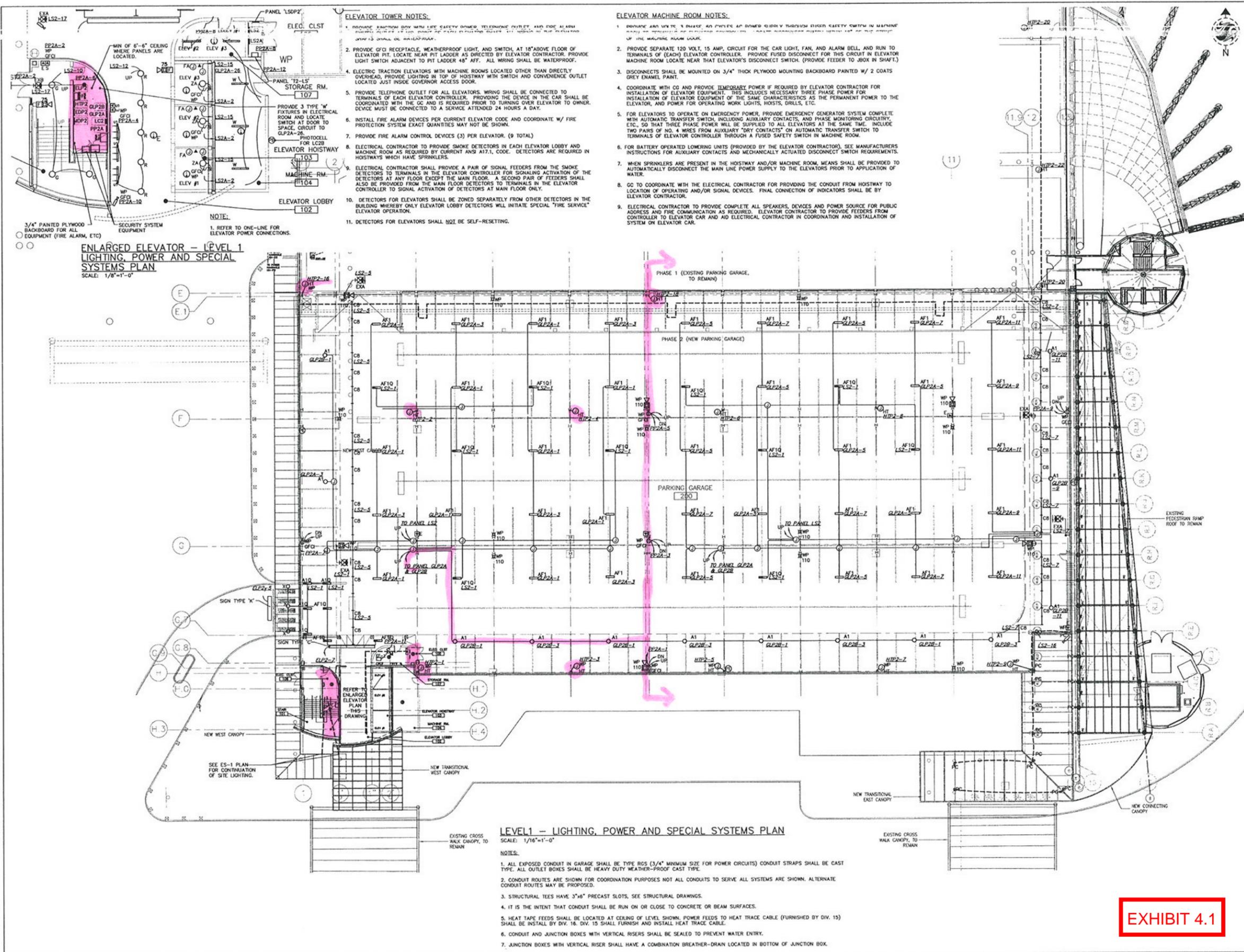
B-204
B-202
B-205

B-207
B-209

A-206
A-207
A-208
A-209
A-210



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- ELEVATOR TOWER NOTES:**
1. PROVIDE EMERGENCY BELL WITH LIFE SAFETY POWER, TELEPHONE OUTLET, AND FIRE ALARM TERMINALS AT EACH ELEVATOR CONTROLLER. PROVIDE FEEDER FOR THIS CIRCUIT IN ELEVATOR HOISTWAY.
 2. PROVIDE GFI RECEPTACLE, WEATHERPROOF LIGHT, AND SWITCH, AT 18" ABOVE FLOOR OF ELEVATOR PIT. LOCATE NEAR PIT LADDER AS DIRECTED BY ELEVATOR CONTRACTOR. PROVIDE LIGHT SWITCH ADJACENT TO PIT LADDER 48" AFF. ALL WIRING SHALL BE WATERPROOF.
 3. PROVIDE 3 TYPE 'W' FIXTURES IN ELECTRICAL ROOM AND LOCATE SWITCH AT DOOR TO SPACE. CIRCUIT TO GCP2A-26.
 4. ELECTRIC TRACTION ELEVATORS WITH MACHINE ROOMS LOCATED OTHER THAN DIRECTLY OVERHEAD, PROVIDE LIGHTING IN TOP OF HOISTWAY WITH SWITCH AND CONVENIENCE OUTLET LOCATED JUST INSIDE GOVERNOR ACCESS DOOR.
 5. PROVIDE TELEPHONE OUTLET FOR ALL ELEVATORS. WIRING SHALL BE CONNECTED TO TERMINALS OF EACH ELEVATOR CONTROLLER. PROVIDING THE DEVICE IN THE CAR SHALL BE COORDINATED WITH THE GC AND IS REQUIRED PRIOR TO TURNING OVER ELEVATOR TO OWNER. DEVICE MUST BE CONNECTED TO A SERVICE ATTENDED 24 HOURS A DAY.
 6. INSTALL FIRE ALARM DEVICES PER CURRENT ELEVATOR CODE AND COORDINATE W/ FIRE PROTECTION SYSTEM EXACT QUANTITIES MAY NOT BE SHOWN.
 7. PROVIDE FIRE ALARM CONTROL DEVICES (3) PER ELEVATOR. (9 TOTAL)
 8. ELECTRICAL CONTRACTOR TO PROVIDE SMOKE DETECTORS IN EACH ELEVATOR LOBBY AND MACHINE ROOM AS REQUIRED BY CURRENT ANSI A17.1, CODE. DETECTORS ARE REQUIRED IN HOISTWAYS WHICH HAVE SPRINKLERS.
 9. ELECTRICAL CONTRACTOR SHALL PROVIDE A PAIR OF SIGNAL FEEDERS FROM THE SMOKE DETECTORS TO TERMINALS IN THE ELEVATOR CONTROLLER FOR SIGNALING ACTIVATION OF THE DETECTORS AT ANY FLOOR EXCEPT THE MAIN FLOOR. A SECOND PAIR OF FEEDERS SHALL ALSO BE PROVIDED FROM THE MAIN FLOOR DETECTORS TO TERMINALS IN THE ELEVATOR CONTROLLER TO SIGNAL ACTIVATION OF DETECTORS AT MAIN FLOOR ONLY.
 10. DETECTORS FOR ELEVATORS SHALL BE ZONED SEPARATELY FROM OTHER DETECTORS IN THE BUILDING WHEREBY ONLY ELEVATOR LOBBY DETECTORS WILL INITIATE SPECIAL "FIRE SERVICE" ELEVATOR OPERATION.
 11. DETECTORS FOR ELEVATORS SHALL NOT BE SELF-RESETTING.

- ELEVATOR MACHINE ROOM NOTES:**
1. PROVIDE 480 VOLT, 3 PHASE, 45 AMP CIRCUIT AS POWER SOURCE THROUGH RIGID SAFETY SWITCH IN MACHINE ROOM.
 2. PROVIDE SEPARATE 120 VOLT, 15 AMP, CIRCUIT FOR THE CAR LIGHT, FAN, AND ALARM BELL, AND RUN TO TERMINALS OF EACH ELEVATOR CONTROLLER. PROVIDE FUSED DISCONNECT FOR THIS CIRCUIT IN ELEVATOR MACHINE ROOM LOCATE NEAR THAT ELEVATOR'S DISCONNECT SWITCH. (PROVIDE FEEDER TO JBOX IN SHAFT.)
 3. DISCONNECTS SHALL BE MOUNTED ON 3/4" THICK PLYWOOD MOUNTING BACKBOARD PAINTED W/ 2 COATS GREY ENAMEL PAINT.
 4. COORDINATE WITH GC AND PROVIDE TEMPORARY POWER IF REQUIRED BY ELEVATOR CONTRACTOR FOR INSTALLATION OF ELEVATOR EQUIPMENT. THIS INCLUDES NECESSARY THREE PHASE POWER FOR INSTALLATION OF ELEVATOR EQUIPMENT OF THE SAME CHARACTERISTICS AS THE PERMANENT POWER TO THE ELEVATOR. AND POWER FOR OPERATING WORK LIGHTS, DRILLS, ETC.
 5. FOR ELEVATORS TO OPERATE ON EMERGENCY POWER, PROVIDE EMERGENCY GENERATOR SYSTEM COMPLETE WITH AUTOMATIC TRANSFER SWITCH, INCLUDING AUXILIARY CONTACTS, AND PHASE MONITORING CIRCUITRY, ETC., SO THAT THREE PHASE POWER WILL BE SUPPLIED TO ALL ELEVATORS AT THE SAME TIME. INCLUDE TWO PAIRS OF NO. 4 WIRES FROM AUXILIARY DRY CONTACTS ON AUTOMATIC TRANSFER SWITCH TO TERMINALS OF ELEVATOR CONTROLLER THROUGH A FUSED SAFETY SWITCH IN MACHINE ROOM.
 6. FOR BATTERY OPERATED LOWERING UNITS (PROVIDED BY THE ELEVATOR CONTRACTOR), SEE MANUFACTURER'S INSTRUCTIONS FOR AUXILIARY CONTACTS AND MECHANICALLY ACTUATED DISCONNECT SWITCH REQUIREMENTS.
 7. WHEN SPRINKLERS ARE PRESENT IN THE HOISTWAY AND/OR MACHINE ROOM, MEANS SHALL BE PROVIDED TO AUTOMATICALLY DISCONNECT THE MAIN LINE POWER SUPPLY TO THE ELEVATORS PRIOR TO APPLICATION OF WATER.
 8. GO TO COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR PROVIDING THE CONDUIT FROM HOISTWAY TO LOCATION OF OPERATING AND/OR SIGNAL DEVICES. FINAL CONNECTION OF INDICATORS SHALL BE BY ELEVATOR CONTRACTOR.
 9. ELECTRICAL CONTRACTOR TO PROVIDE COMPLETE ALL SPEAKERS, DEVICES AND POWER SOURCE FOR PUBLIC ADDRESS AND FIRE COMMUNICATION AS REQUIRED. ELEVATOR CONTRACTOR TO PROVIDE FEEDERS FROM CONTROLLER TO ELEVATOR CAR AND AID ELECTRICAL CONTRACTOR IN COORDINATION AND INSTALLATION OF SYSTEM ON ELEVATOR CAR.

ENLARGED ELEVATOR - LEVEL 1 LIGHTING, POWER AND SPECIAL SYSTEMS PLAN
SCALE: 1/8"=1'-0"

LEVEL 1 - LIGHTING, POWER AND SPECIAL SYSTEMS PLAN
SCALE: 1/16"=1'-0"

- NOTES:**
1. ALL EXPOSED CONDUIT IN GARAGE SHALL BE TYPE RGS (3/4" MINIMUM SIZE FOR POWER CIRCUITS) CONDUIT STRAPS SHALL BE CAST TYPE. ALL OUTLET BOXES SHALL BE HEAVY DUTY WEATHER-PROOF CAST TYPE.
 2. CONDUIT ROUTES ARE SHOWN FOR COORDINATION PURPOSES NOT ALL CONDUITS TO SERVE ALL SYSTEMS ARE SHOWN. ALTERNATE CONDUIT ROUTES MAY BE PROPOSED.
 3. STRUCTURAL TEES HAVE 3"x6" PRECAST SLOTS. SEE STRUCTURAL DRAWINGS.
 4. IT IS THE INTENT THAT CONDUIT SHALL BE RUN ON OR CLOSE TO CONCRETE OR BEAM SURFACES.
 5. HEAT TAPE FEEDS SHALL BE LOCATED AT CEILING OF LEVEL SHOWN. POWER FEEDS TO HEAT TRACE CABLE (FURNISHED BY DIV. 15) SHALL BE INSTALLED BY DIV. 16. DIV. 15 SHALL FURNISH AND INSTALL HEAT TRACE CABLE.
 6. CONDUIT AND JUNCTION BOXES WITH VERTICAL RISERS SHALL BE SEALED TO PREVENT WATER ENTRY.
 7. JUNCTION BOXES WITH VERTICAL RISER SHALL HAVE A COMBINATION BREATHER-DRAIN LOCATED IN BOTTOM OF JUNCTION BOX.

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PHASE II
PARKING GARAGE

1001 WESTBROOK ST.,
PORTLAND, MAINE

No.	Date	Revisions

FILE
LEVEL 1 ELECTRICAL PLAN

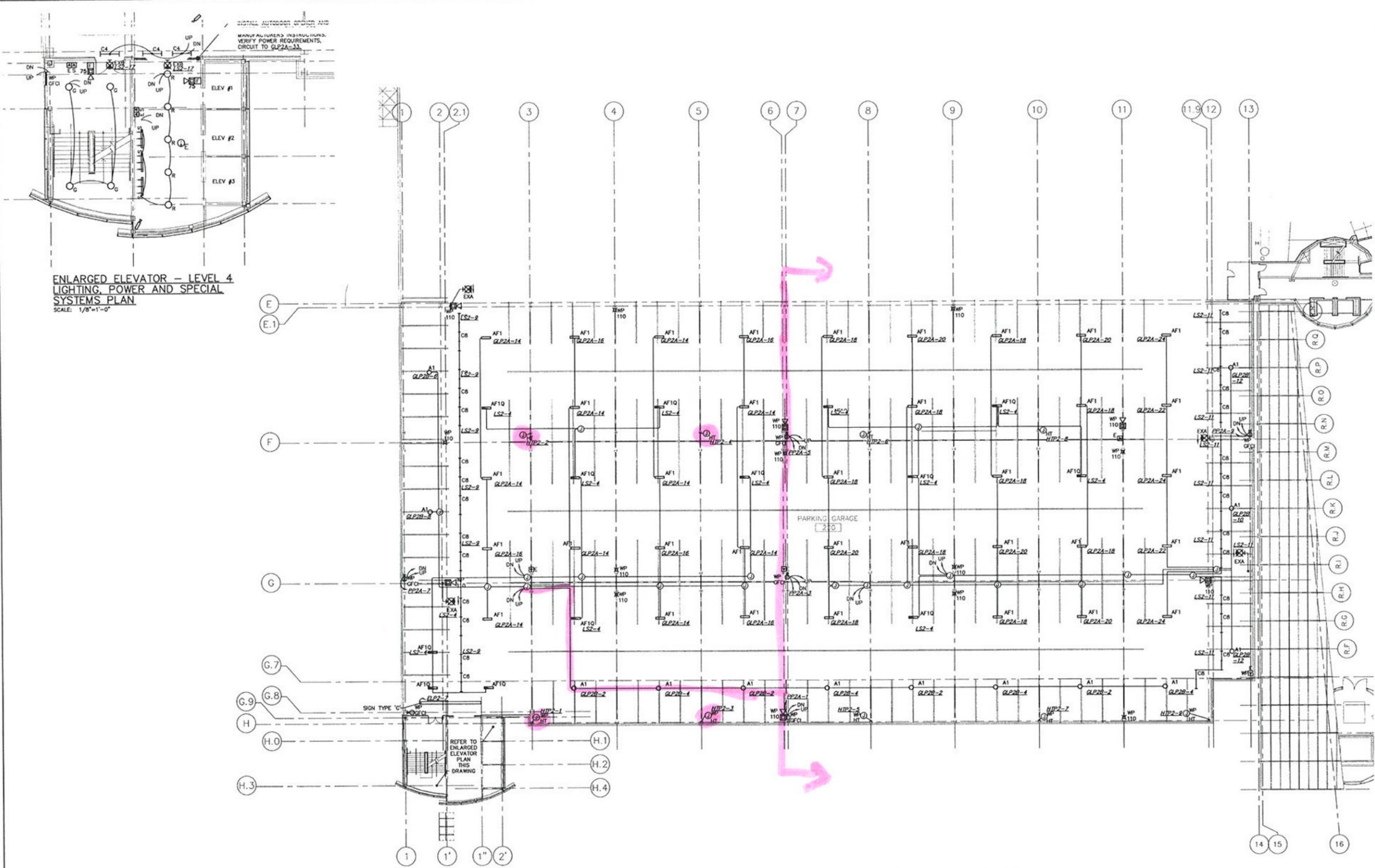
DATE AS SHOWN

Drawn By: M/C
Checked By: M/RJ
Date: 10/21/12
Title: E1-1

EXHIBIT 4.1

1/16"=1' 5 0 10 20 30 40ft 1/8"=1' 5 0 5 10 15 20ft 1/4"=1' 2 0 2 4 6 8 10ft 1/2"=1' 1 0 1 2 3 4 5ft 3/4"=1' 1 0 1 2 3ft 1"=1' 0 1 2ft 1 1/2"=1' 0 1 2ft 3"=1' 0 1ft

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ENLARGED ELEVATOR - LEVEL 4
LIGHTING, POWER AND SPECIAL
SYSTEMS PLAN
SCALE: 1/8"=1'-0"

TYPICAL LEVEL 4 LIGHTING, POWER AND SPECIAL SYSTEMS PLAN
SCALE: 1/16"=1'-0"

- NOTES:
1. ALL EXPOSED CONDUIT IN GARAGE SHALL BE TYPE RGS (3/4" MINIMUM SIZE FOR POWER CIRCUITS) CONDUIT STRAPS SHALL BE CAST TYPE. ALL OUTLET BOXES SHALL BE HEAVY DUTY WEATHER-PROOF CAST TYPE.
 2. CONDUIT ROUTES ARE SHOWN FOR COORDINATION PURPOSES NOT ALL CONDUITS TO SERVE ALL SYSTEMS ARE SHOWN. ALTERNATE CONDUIT ROUTES MAY BE PROPOSED.
 3. STRUCTURAL TEES HAVE 3"x6" PRECAST SLOTS, SEE STRUCTURAL DRAWINGS.
 4. IT IS THE INTENT THAT CONDUIT SHALL BE RUN ON OR CLOSE TO CONCRETE OR BEAM SURFACES.
 5. HEAT TAPE FEEDS SHALL BE LOCATED AT CEILING OF LEVEL SHOWN. POWER FEEDS TO HEAT TRACE CABLE (FURNISHED BY DIV. 15) SHALL BE INSTALL BY DIV. 16. DIV. 15 SHALL FURNISH AND INSTALL HEAT TRACE CABLE.
 6. CONDUIT AND JUNCTION BOXES WITH VERTICAL RISERS SHALL BE SEALED TO PREVENT WATER ENTRY.
 7. JUNCTION BOXES WITH VERTICAL RISER SHALL HAVE A COMBINATION BREATHER-DRAIN LOCATED IN BOTTOM OF JUNCTION BOX.

EXHIBIT 4.2

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PHASE II
PARKING GARAGE
1001 WESTBROOK ST.,
PORTLAND, MAINE

No.	Date	Revision

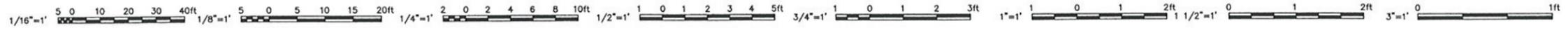
Title: **LEVEL 4
ELECTRICAL PLAN**

Scale: AS SHOWN

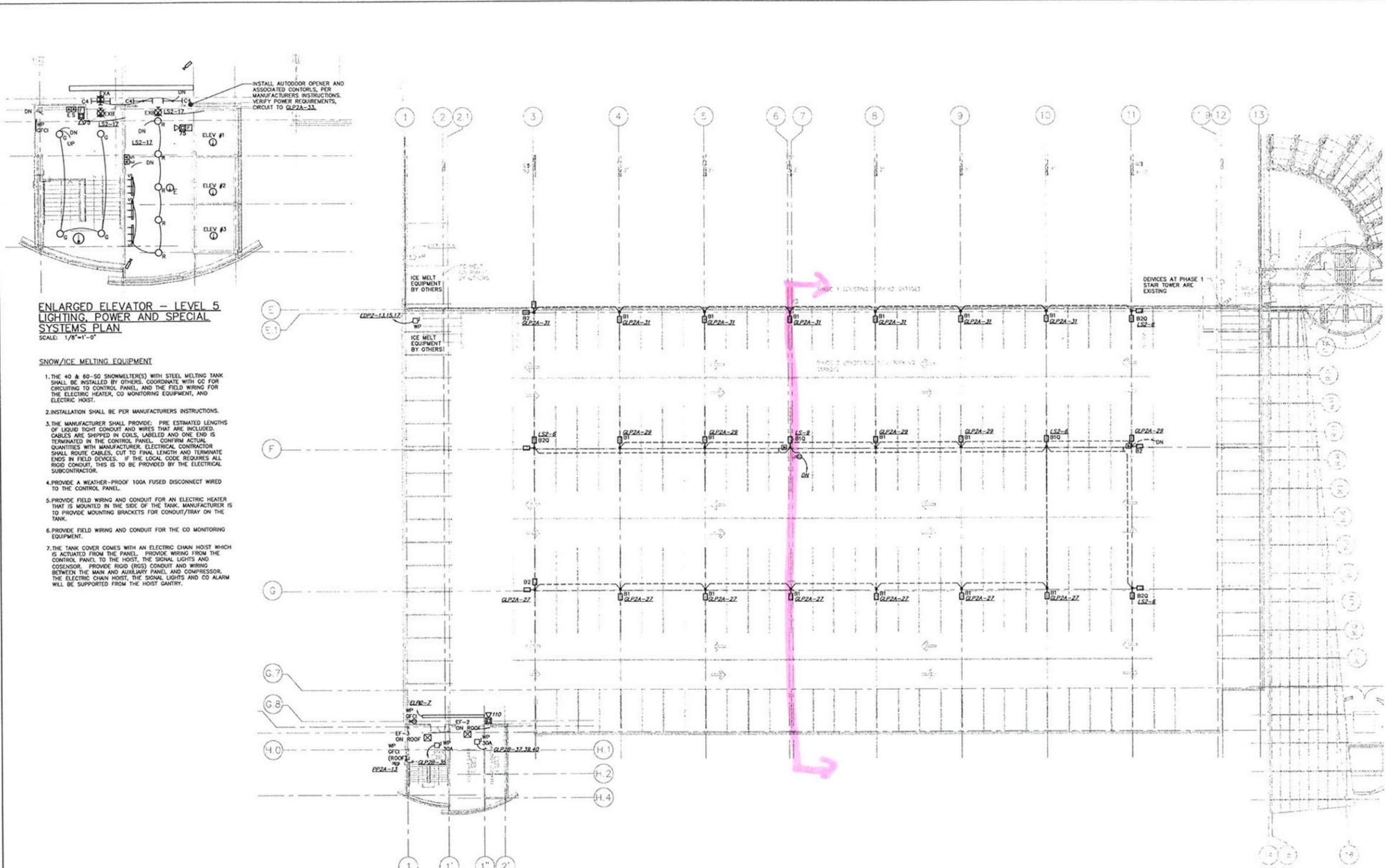
Drawn By: MLC
Checked By: VJW
Job No.: 18521026
Date: 02/25/08

Professional Engineer Seal: STATE OF MAINE, ALLAN M. LITTLE, License No. 11573

Drawing No.: **E1-4**



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ENLARGED ELEVATOR -- LEVEL 5 LIGHTING, POWER AND SPECIAL SYSTEMS PLAN
SCALE: 1/8"=1'-0"

- SNOW/ICE MELTING EQUIPMENT**
1. THE 40 & 60-SQ SNOWMELTER(S) WITH STEEL MELTING TANK SHALL BE INSTALLED BY OTHERS. COORDINATE WITH GC FOR CIRCUITING TO CONTROL PANEL, AND THE FIELD WIRING FOR THE ELECTRIC HEATER, CO MONITORING EQUIPMENT, AND ELECTRIC HOIST.
 2. INSTALLATION SHALL BE PER MANUFACTURERS INSTRUCTIONS.
 3. THE MANUFACTURER SHALL PROVIDE: PRE ESTIMATED LENGTHS OF LIQUID TIGHT CONDUIT AND WIRES THAT ARE INCLUDED. CABLES ARE SHIPPED IN COILS, LABELED AND ONE END IS TERMINATED IN THE CONTROL PANEL. CONFIRM ACTUAL QUANTITIES WITH MANUFACTURER. ELECTRICAL CONTRACTOR SHALL ROUTE CABLES, CUT TO FINAL LENGTH AND TERMINATE ENDS IN FIELD DEVICES. IF THE LOCAL CODE REQUIRES ALL RIGID CONDUIT, THIS IS TO BE PROVIDED BY THE ELECTRICAL SUBCONTRACTOR.
 4. PROVIDE A WEATHER-PROOF 100A FUSED DISCONNECT WIRED TO THE CONTROL PANEL.
 5. PROVIDE FIELD WIRING AND CONDUIT FOR AN ELECTRIC HEATER THAT IS MOUNTED IN THE SIDE OF THE TANK. MANUFACTURER IS TO PROVIDE MOUNTING BRACKETS FOR CONDUIT/TRAY ON THE TANK.
 6. PROVIDE FIELD WIRING AND CONDUIT FOR THE CO MONITORING EQUIPMENT.
 7. THE TANK COVER COMES WITH AN ELECTRIC CHAIN HOIST WHICH IS ACTUATED FROM THE PANEL. PROVIDE WIRING FROM THE CONTROL PANEL TO THE HOIST, THE SIGNAL LIGHTS AND COSENSOR. PROVIDE RIGID (RGS) CONDUIT AND WIRING BETWEEN THE MAIN AND AUXILIARY PANEL AND COMPRESSOR. THE ELECTRIC CHAIN HOIST, THE SIGNAL LIGHTS AND CO ALARM WILL BE SUPPORTED FROM THE HOIST GANTRY.

LEVEL 5 LIGHTING, POWER AND SPECIAL SYSTEMS PLAN
SCALE: 1/16"=1'-0"

- NOTES:**
1. ALL EXPOSED CONDUIT IN GARAGE SHALL BE TYPE RGS (3/4" MINIMUM SIZE FOR POWER CIRCUITS) CONDUIT STRAPS SHALL BE CAST TYPE. ALL OUTLET BOXES SHALL BE HEAVY DUTY WEATHER-PROOF CAST TYPE.
 2. CONDUIT ROUTES ARE SHOWN FOR COORDINATION PURPOSES NOT ALL CONDUITS TO SERVE ALL SYSTEMS ARE SHOWN. ALTERNATE CONDUIT ROUTES MAY BE PROPOSED.
 3. STRUCTURAL TEES HAVE 3"x6" PRECAST SLOTS. SEE STRUCTURAL DRAWINGS.
 4. IT IS THE INTENT THAT CONDUIT SHALL BE RUN ON OR CLOSE TO CONCRETE OR BEAM SURFACES.
 5. HEAT TAPE FEEDS SHALL BE LOCATED AT CEILING OF LEVEL SHOWN. POWER FEEDS TO HEAT TRACE CABLE (FURNISHED BY DIV. 15) SHALL BE INSTALL BY DIV. 16. DIV. 15 SHALL FURNISH AND INSTALL HEAT TRACE CABLE.

EXHIBIT 4.3

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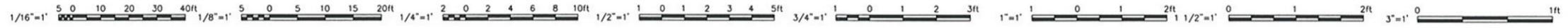


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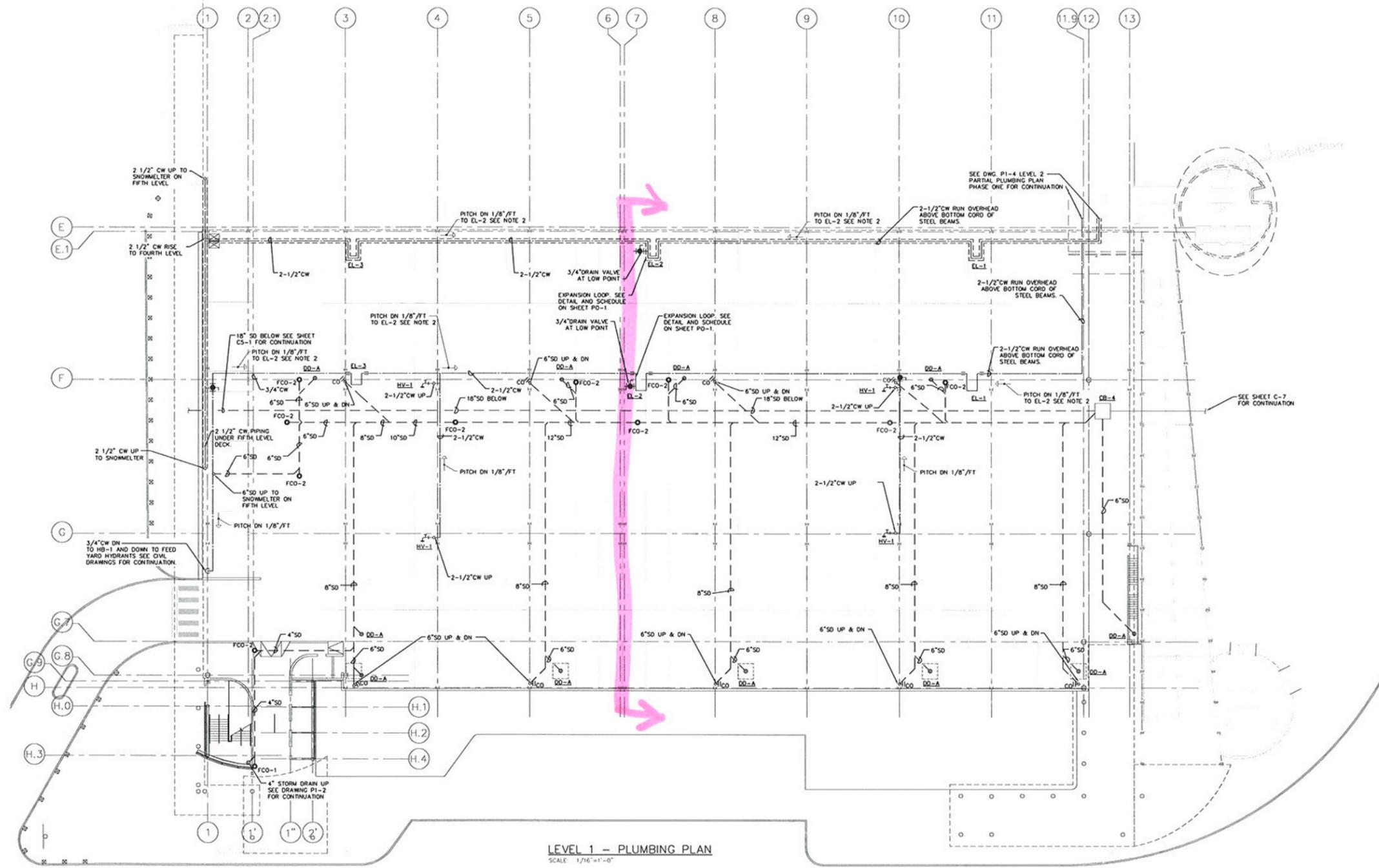
PHASE II PARKING GARAGE
1001 WESTBROOK ST., PORTLAND, MAINE

No.	Date	Revision

Title: **LEVEL 5 ELECTRICAL PLAN**
 Made AS SHOWN
 Drawn By: MLC
 Checked By: WFB
 Job No.: 155310126
 Date: 08/25/08
 Drawing No.: **E1-5**



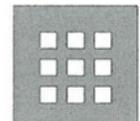
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LEVEL 1 - PLUMBING PLAN
SCALE: 1/16"=1'-0"

- NOTES:**
1. PROVIDE PIPE SLEEVES FOR DOMESTIC WATER PIPING AND STORM DRAINAGE PIPING IN GARAGE PENETRATING PRECAST CONCRETE DECK. SEAL SPACE BETWEEN PIPE AND SLEEVE WITH FIRE RATED SEALANT. TAPER SEALANT UP PIPE ABOVE GARAGE DECK TO SHED WATER.
 2. INSTALL 2 1/2" CW MAIN AND EXPANSION LOOPS EL-2 OVERHEAD ABOVE BOTTOM CHORD OF STEEL BEAMS. PITCH DN AT 1/8" PER FOOT TO LOW POINT AT EXPANSION LOOP EL-2.
 3. ONLY WATER LINE FOR SNOWMELTER IS INSULATED & HEAT TRACED IN EXPOSED AREAS.
 4. RUN HORIZONTAL PIPING AS HIGH AS POSSIBLE BETWEEN STRUCTURAL TEES AND AS CLOSE TO OUTSIDE WALL ON COLUMN LINE H AS POSSIBLE. RUN VERTICAL STORM LEADERS AS CLOSE TO COLUMNS AS POSSIBLE.

EXHIBIT 4.4



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PORTLAND, MAINE

No.	Date	Revision

File: **LEVEL 1 PLUMBING PLAN**

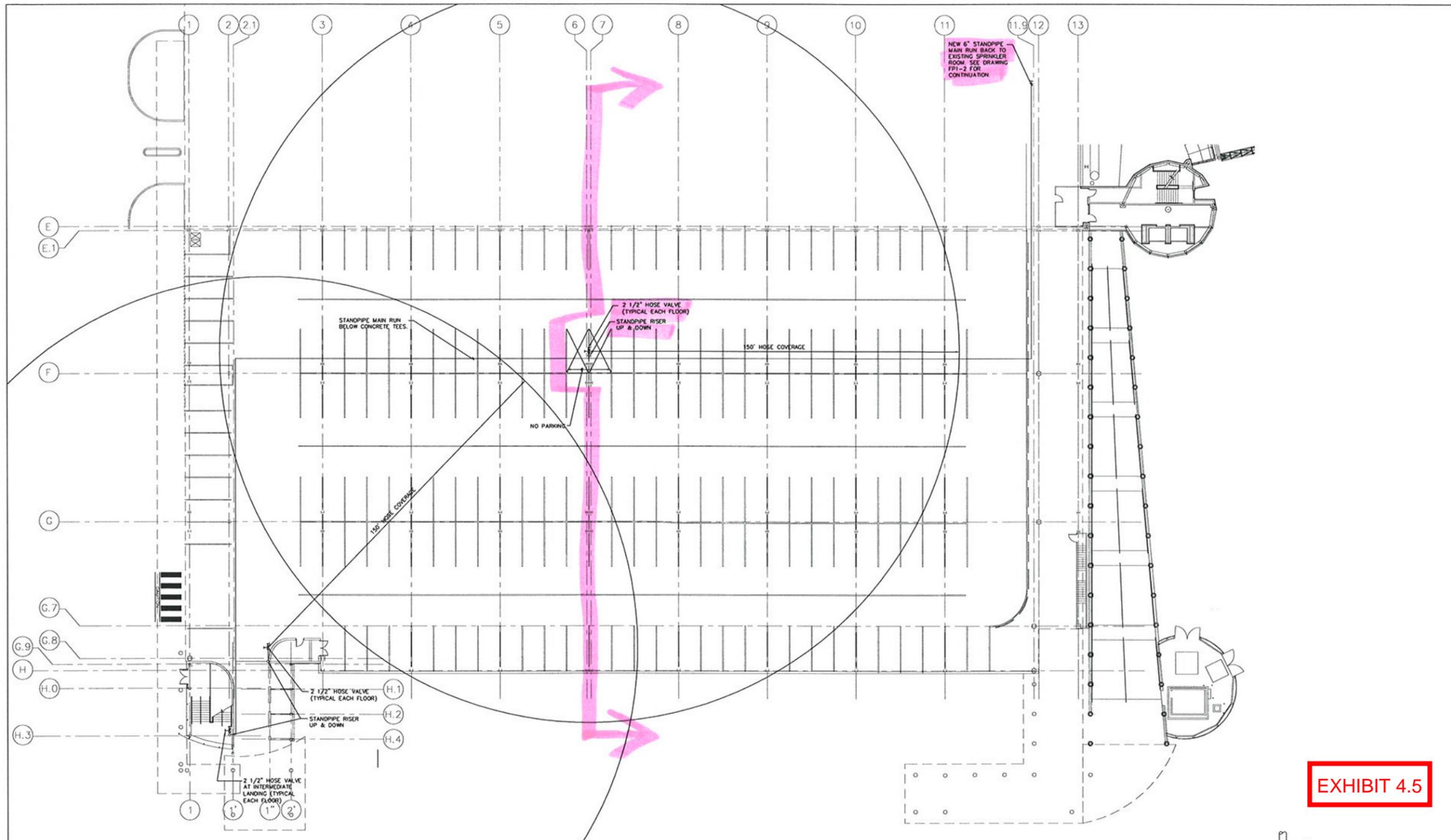
Scale: **AS SHOWN**

Drawn By: **EJD**
Checked By: **KES**
Date: **10/21/2008**

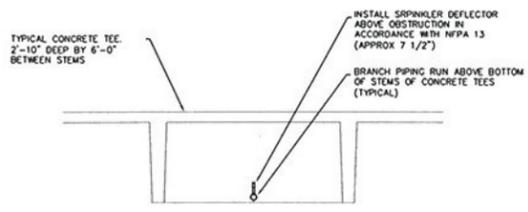
Sheet No.: **P1-1**
Date: **02/25/08**

1/16"=1' 5 0 10 20 30 40ft 1/8"=1' 5 0 10 15 20ft 1/4"=1' 2 0 2 4 6 8 10ft 1/2"=1' 1 0 1 2 3 4 5ft 3/4"=1' 1 0 1 2 3ft 1"=1' 1 0 1 2ft 1 1/2"=1' 0 1 2ft 3"=1' 0 1ft

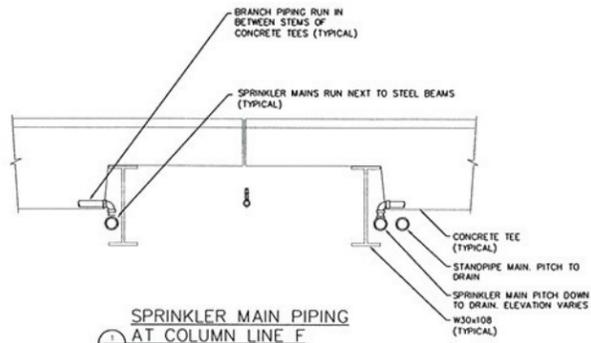
If this sheet is less than 30"x42" in size, it has been reduced. Graphic scales must be adjusted accordingly.



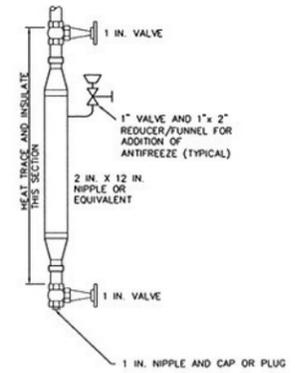
FIRE PROTECTION PLAN - LEVEL 1
SCALE: 1/16"=1'-0"



SPRINKLER BRANCH PIPING CONCRETE TEES (TYPICAL)
SCALE: 1/2"=1'-0"

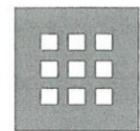


SPRINKLER MAIN PIPING AT COLUMN LINE F
SCALE: 1/2"=1'-0"



TYPICAL AUXILIARY DRAIN DETAIL
SCALE: NOT TO SCALE

EXHIBIT 4.5



**DOMENECH
HICKS &
KROCKMALNIC
ARCHITECTS**

155 Massachusetts Ave.
Boston, MA 02115
617-267-6408
Fax 617-267-1990



Stantec

Stantec Consulting Services Inc
22 Free Street, Suite 205
Portland, ME U.S.A.
04101-3900
Tel: 207.775.3211
Fax: 207.775.6434
www.stantec.com

CONFORMED SET
FOR FIELD USE

CITY OF PORTLAND
PORTLAND, MAINE
DEPARTMENT OF
WATERFRONT AND
TRANSPORTATION



PORTLAND
INTERNATIONAL
JETPORT

PHASE II
PARKING GARAGE

1001 WESTBROOK ST.,
PORTLAND, MAINE

No.	Date	Revision
1	4/15/07	PERMIT SUBMITTAL (RES)

FILE: **LEVEL 1
SPRINKLER/STANDPIPE PLAN**

Drawn By: AS SHOWN	Checked By: RES
File Name: 1	Drawn No: 190210126
Drawn By: EJD	Date: 02/25/08

FP1-1



EXHIBIT 4.7

June 24, 2008

Clint Gendreau
Ledgewood Construction
27 Main Street
South Portland, ME 04106

RE: Portland International Jetport Parking Garage Phase II
Portland, ME

Dear Clint,

Enclosed please find one copy of our Design Submittal Package for the above referenced project along with one copy of the MSDS sheets for the materials listed below:

- MK-6/HY
- Z-106
- Monokote Accelerator

If you have any questions, please call me at the number listed above. We look forward to working with you.

Sincerely,

Kimberly Capen



Portland International Jetport Parking Garage Phase II Portland, ME	Ledgewood Construction 27 Main Street Portland, ME 04106
Section: 07265 Sprayed-on Fireproofing	June 23, 2008

Contents:

1. Fireproofing Design Submittals
 - a. Including document entitled "Guide to Understanding Weight-to-Heated Perimeter Ratios or W/D Ratios"
2. Fireproofing Product Material Data Sheets
 - a. MK-6/HY
 - b. Z-106/HY
3. Fireproofing Material Independent Lab Test Results
 - a. MK-6/HY
 - b. Z-106/HY
4. W.R. Grace Letter confirming absence of asbestos in fireproofing materials
5. W.R. Grace Letter confirming absence of reactive VOC's in fireproofing materials
6. W.R. Grace Letter confirming New England Fireproofing's experience and qualifications

Appendix 1

Guide to Understanding WEIGHT-TO-HEATED PERIMETER RATIOS or W/D RATIOS

Structural steel shapes are identified by Standard A.I.S.C. nomenclature. An example of A.I.S.C. nomenclature is W 36 x 300. A.I.S.C. nomenclature describes the section number (W36) and weight (300 lbs./ft.) of a structural steel column, truss or beam. According to Underwriters Laboratories Inc. (ULI) *Fire Resistance Directory* and UBC Standard No. 7-6, the amount of spray-applied fireproofing protection to structural steel members is a function of the "size" of the member. According to ULI and UBC, the size of a structural member shall be determined based upon a ratio of the weight per lineal foot of the member to the heated perimeter of the member. The heated perimeter is defined as the surface area of a structural member that would be directly exposed to heat in a fire. This ratio is called a W/D ratio. W/D ratios are nothing more than the solution to an equation where the weight per lineal foot (lbs.) of the member is divided by the heated perimeter (inches).

W / D Ratios

W = Weight (lbs.) per lineal foot
D = Heated Perimeter (inches)

To determine the weight per lineal foot of a member, one generally only has to know the last designation in the A.I.S.C. nomenclature. For example, a W36 x 300 weighs 300 pounds per lineal foot. For other shapes such as angles, the weight per lineal foot can be found in the *Manual of Steel Construction ASD* (M016, 9th edition) available from A.I.S.C. (One E. Wacker Dr., Suite 3100, Chicago IL 60601, 312-670-2400). One also needs the *Manual of Steel Construction ASD* to determine the heated perimeter of these members. Figure 1 illustrates commonly used formulas for calculating "D" or the heated perimeter of structural steel members. As you can see in Figure 1, the formula for determining the heated perimeter of a column differs from the formula for a beam. The difference in formulas is required because columns are exposed to fire on all four sides while beams are only exposed to a fire on three sides (the top flange of a beam is not directly exposed to fire when it is directly under the floor or roof deck). Generally, the heated perimeter of diagonal bracing is determined using the same formula as a column since bracing is exposed to fire on all sides.

The ULI *Fire Resistance Directory* and UBC Standard No. 7-6 describes procedures for calculating the heated perimeter to determine the W/D ratio for W, M and S shaped columns and beams.

Why are W/D Ratios Important?

In fire-resistive designs for spray-applied fireproofing in the ULI *Fire Resistance Directory*, a minimum size column or beam is described. For example, the minimum beam size under item one in UL design N-708 is a W8x28. The thickness of fireproofing found in each design is the amount of spray-applied fireproofing protection required to protect the member listed under item one. In most fire-resistive floor assemblies, the minimum size member described in item one is a W8x28 which has a W/D ratio of 0.80. A minimum size member is also found under item one in each of the numerous column, floor and roof assembly designs for spray-applied fireproofing products. The minimum size beam or column in Monokote or Retro-Guard ICBO Evaluation Reports are identical to the equivalent designs in the UL *Fire Resistance Directory*. If the columns and beams on your project have a W/D ratio larger than the W/D ratio for the minimum size member found under item one of the design you selected, equal or less fireproofing thickness is required for those larger members. If the columns and beams on your project have W/D ratios smaller than the W/D ratio for the minimum size member found under item one of the UL design you selected, more fireproofing is required for those smaller members. In other words: the heavier the steel member, the less structural fire protection needed.

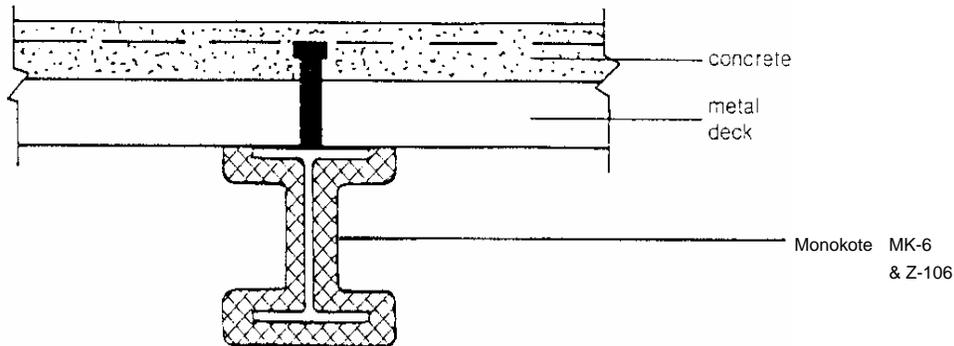
A mathematical formula using W/D ratios appears in the introduction to the ULI *Fire Resistance Directory* ("Adjustment of Sprayed Protection Material Thickness For Unrestrained Beam Ratings For Various Beam Sizes") and UBC Standard No. 7-7. This formula is used to determine what additional thickness of spray-applied fireproofing is required to protect "unrestrained" members with lower W/D ratios than the W/D ratio for the member under item one of the design selected. Likewise, the formula may be used to determine what reduction in thickness of spray-applied fireproofing is available for members with higher W/D ratios than the W/D ratio for the member under item one of the design selected.

SECTION: 07265 Sprayed-on Fireproofing

Date: **June 23, 2008**

Project: **Portland International Jetport
Garage Phase II
Portland, ME**

Beam Fireproofing for Unprotected Floor Assemblies



Hourly Rating: 2 hour(s)

Monokote Thickness: See notes below inch(es)

Reference/Authority

UL Design No. N782 ICBO #1578 Other

Notes: SFRM would be applied to UNPRIMED STRUCTURAL STEEL. See sheets with W/D's for thicknesses (Pages 1-5).

This data, meant to assist you, will not replace your reference to job specifications, engineering drawings and building code regulations.

**From New England Fireproofing
Tel: 207 869-9090 Fax: 207 869-9091**

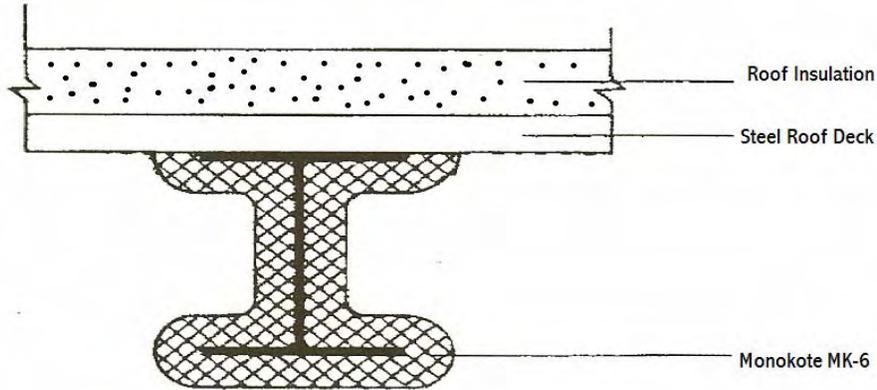
GRACE Construction Products Division

SECTION: 07265 Sprayed-on Fireproofing

Date: **June 23, 2008**

Project: **Portland International
Jetport Garage Phase II
Portland, ME**

**Beam Fireproofing For
Unprotected Roof Assemblies**



Hourly Rating: 2 hour(s)

Monokote Thickness: See notes below inch(es)

Reference/Authority

UL Design No. S735 ICBO #1578 Other

Notes: SFRM would be applied to UNPRIMED STRUCTURAL STEEL. See sheet with W/D's for thicknesses (Page 6.).

This data, meant to assist you, will not replace your reference to job specifications, engineering drawings and building code regulations.

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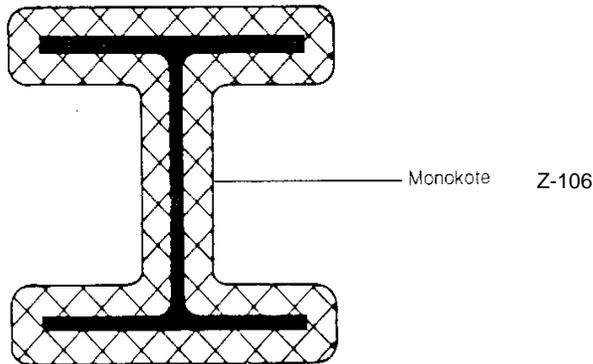
GRACE Construction Products Division

SECTION: 07265 Sprayed-on Fireproofing

Date: **June 23, 2008**

Project: **Portland International Jetport
Garage Phase II
Portland, ME**

Column Fireproofing



Column Size: See notes below

Hourly Rating: 2 hour(s)

Monokote Thickness: See notes below inch(es)

Reference/Authority

UL Design No. X772 ICBO #1578 Other

Notes: SFRM would be applied to UNPRIMED STRUCTURAL STEEL. See sheet with W/D's for column sizes and thicknesses (Page 7).

This data, meant to assist you, will not replace your reference to job specifications, engineering drawings and building code regulations.

**From New England Fireproofing
Tel: 207 869-9090 Fax: 207 869-9091**

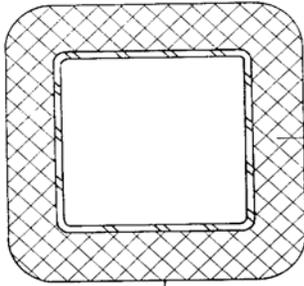
GRACE Construction Products Division

SECTION: 07265 Sprayed-on Fireproofing

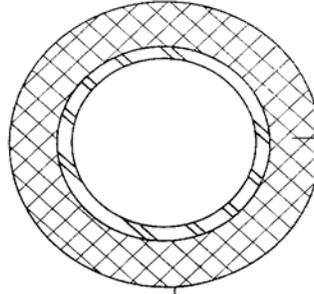
Date: **June 23, 2008**

Project: **Portland International Jetport
Garage Phase II
Portland, ME**

Column Fireproofing: Pipe & Tubular Columns & Braces



**Monokote
MK-6/HY**



**Monokote
MK-6/HY**

Hourly Rating: 2 hour(s)

Monokote Thickness: see notes below inch(es)

Reference/Authority

UL Design No. Y710 Other -

Notes: SFRM would be applied to UNPRIMED STRUCTURAL STEEL. See sheet with A/P's for thicknesses (Page 8).

This data, meant to assist you, will not replace your reference to job specifications, engineering drawings and building code regulations.

**From New England Fireproofing
Tel: 207 869-9090 Fax: 207 869-9091**

GRACE Construction Products Division

New England Fireproofing, Inc.

491 US Route 1 Suite 24

Freeport, ME 04032

Tel: (207) 869-9090

Fax: (207) 869-9091

6/23/2008

Portland International Jetport Garage Phase II

Section: 07265 Sprayed-on Fireproofing

Materials: MK 6 Low Density Cementitious Fireproofing Material by W.R. Grace

Drawing No. : Columns - S1.6

Rating: **UL Y710 for 2 hours**

<u>Members</u>	<u># of Members*</u>	<u>W/D **</u>	<u>Thickness</u>	<u>Notes/Locations</u>
<u>Level 1</u>				
HSS8x8x5/8	2	0.546	3/4"	
HSS12x8x5/5	1	0.553	3/4"	
<u>Level 2</u>				
HSS8x8x5/8	2		3/4"	
HSS12x8x5/5	1		3/4"	
<u>Level 3</u>				
HSS8x8x5/8	2		3/4"	
HSS12x8x5/5	1		3/4"	
<u>Level 4</u>				
HSS8x8x5/8	2		3/4"	
HSS12x8x5/5	1		3/4"	
<u>Level 5</u>				
HSS8x8x5/8	2		3/4"	
HSS12x8x5/8	1		3/4"	* Numbers are approximate and are provided for the benefit of NEF's crew. ** See document entitled "Weight-to-Heated Perimeter Ratios or W/D Ratios" enclosed as part of this submittal.

D A T A S U B M I T T A L

Monokote[®] MK-6[®]/HY[®]

Product Data and Application Instructions

Product Information/Description

Monokote[®] MK-6[®]/HY[®] is a single component, mill-mixed fireproofing plaster which requires only the addition of water on the job site to form a consistent, pumpable slurry. MK-6/HY is designed for use on structural steel columns, beams, joists, trusses and floor and roof decking.

Features/Benefits

Monokote cementitious fireproofing offers many significant advantages to the architect, owner, applicator and building occupant. These include:

- Proven in-place performance
- Low in-place cost
- Fast, efficient application
- UL tested and factory inspected
- Universal Building code compliance (ICBO, SBCCI, BOCA, NBCC, ICC)

Delivery and Storage

- All material to be used for fireproofing shall be delivered in original unopened packages bearing the name of the manufacturer, the brand and proper Underwriters Laboratories Inc. labels for fire hazard and fire resistance classifications.
- The material shall be kept dry until ready for use. Packages of material shall be kept off the ground, under cover and away from sweating walls and other damp surfaces. All bags that have been exposed to water before use shall be discarded. Stock of material is to be rotated and used before its expiration date.

Steel and Concrete Surfaces

- Prior to the application of Monokote MK-6/HY, an inspection shall be made to determine that all steel surfaces are acceptable to receive fireproofing. The steel to be fireproofed shall be free of oil, grease, excess rolling compounds or lubricants, loose mill scale, excess

Performance Characteristics

Physical Properties	Values	Test Method
Dry density, minimum average	240 kg/m ³ (15 pcf)	ASTM E605 UBC STD 7-6
Bond strength	16.2 KPa (339 psf)	ASTM E736
Compression, 10% deformation	68.9 KPa (1,440 psf)	ASTM E761
Air erosion	0.000 g/m ² (0.000 g/ft ²)	ASTM E859
High velocity air erosion	No continued erosion after 4 hours	ASTM E859 UMC STD 6-1
Corrosion	Does not contribute to corrosion	ASTM E937
Bond impact	No cracking, spalling or delamination	ASTM E760
Deflection	No cracking, spalling or delamination	ASTM E759
Resistance to mold growth	No growth after 28 days	ASTM G21
Surface burning characteristics	Flame spread = 0 Smoke developed = 0	ASTM E84
Combustibility	Less than 5 MJ/m ² total, 20 kw/m ² peak heat release	ASTM E1354
Impact penetration	3.3 cm ³	Developed by City of San Francisco
Abrasion resistance	8.3 cm ³	Developed by City of San Francisco

- rust, noncompatible primer, lock down agent or any other substance that will impair proper adhesion. Where necessary, the cleaning of steel surfaces to receive fireproofing shall be the responsibility of the general contractor.
- The project architect shall determine if the painted/primed structural steel to receive fireproofing has been tested in accordance with ASTM E119, to provide the required fire resistance rating.
- Many Fire Resistance Designs allow the use of painted metal floor or roof deck in place of galvanized decking. Painted decking must be UL listed in the specific fire resistance designs and

must carry the UL classification marking. Consult your local Grace sales representative for details.

- Prior to application of Monokote MK-6/HY, a bonding agent, approved by the fireproofing manufacturer, shall be applied to all concrete substrates to receive MK-6/HY.
- Fireproofing to the underside of roof deck assemblies shall be done only after roofing application is complete and roof traffic has ceased.
- No fireproofing shall be applied prior to completion of concrete work on steel decking.

- g. Other trades shall not install ducts, piping, equipment, or other suspended items until the fireproofing is completed and inspected.
- h. Other trades shall install clips, hangers, support sleeves, and other attachments required to penetrate the fireproofing, prior to application of the fireproofing material.

Mixing

- a. Monokote Fireproofing shall be mixed by machine in a conventional, plaster-type mixer or a continuous mixer specifically modified for cementitious fireproofing. The mixer shall be kept clean and free of all previously mixed material. The mixer speed in a conventional mixer shall be adjusted to the lowest speed which gives adequate blending of the material and a mixer density of 640 - 720 kg/m³ (40 - 45 pcf) of material.
- b. Using a suitable metering device and a conventional mixer, all water shall be first added to the mixer as the blades turn. Mixing shall continue until the mix is lump-free, with a creamy texture. All material is to be thoroughly wet. Target density of 688 ± 16 kg/m³ (43 ± 1 pcf) is most desirable. Overmixing Monokote will reduce pumping rate.

Application

- a. Application of Monokote Fireproofing can be made in the following sequence:
 1. For thicknesses of approximately 13 mm (½ in.) or less, apply in one pass.
 2. For thicknesses of 16 mm (5/8 in.) or greater, apply subsequent passes after the first coat has set.

- b. Spatterkote® SK-3 shall be applied to all flat plate cellular deck units and below all bottomless trench headers prior to application of MK-6/HY. Spatterkote shall be applied in accordance with the manufacturer’s application instructions.
- c. Spatterkote SK-3 shall be applied to roof decking where required prior to application of Monokote.
- d. Monokote Fireproofing material shall not be used if it contains partially set, frozen or caked material.
- e. Monokote shall have a minimum average dry, in-place density of 240 kg/m³ (15 lbs/ft³).
- f. Monokote is formulated to be mixed with water at the job site.
- g. Monokote Accelerator is to be used with Monokote MK-6/HY to enhance set characteristics and product yield. The Monokote Accelerator is injected into the Monokote MK-6/HY at the spray gun. Monokote Accelerator shall be mixed and used according to manufacturers recommendations.
- h. Monokote is applied directly to the steel, at various rates of application which will be job dependent, using standard plastering type equipment or continuous mixer/pump units. A spray gun, with a properly sized orifice and spray shield and air pressure at the nozzle of approximately 38 kPa (20 psi), will provide the correct hangability, density and appearance. NOTE: If freshly sprayed Monokote does not adhere properly, it is probably due either to a too wet mix, poor thickness control, or an improperly cleaned substrate.

Temperature and Ventilation

- a. An air and substrate temperature of 4.4°C (40°F) minimum shall be maintained for 24 hours prior to application, during application and for a minimum of 24 hours after application of Monokote.

- b. Provisions shall be made for ventilation to properly dry the fireproofing after application. In enclosed areas lacking natural ventilation, air circulation and ventilation must be provided to achieve a minimum total air exchange rate of 4 times per hour until the material is substantially dry.

Field Tests

- a. The architect will select an independent testing laboratory (for which the owner will pay) to sample and verify the thickness and density of the fireproofing in accordance with the provisions of ASTM E605-93, “Standard Test Method for Thickness and Density of Sprayed Fire-Resistive Material Applied to Structural Members” or Uniform Building Code Standard No. 7-6 “Thickness and Density Determination for Spray Applied Fireproofing.”
- b. The architect will select an independent testing laboratory (for which the owner will pay) to randomly sample and verify the bond strength of the fireproofing in accordance with the provisions of ASTM E736.
- c. Results of the above tests will be made available to all parties at the completion of pre-designated areas which shall have been determined at a pre-job conference.

Safety

- a. Monokote is slippery when wet. The general contractor and applicator shall be responsible for posting appropriate cautionary SLIPPERY WHEN WET signs. Signs should be posted in all areas in contact with wet fireproofing material. Anti-slip surfaces should be used on all working surfaces.
- b. A Material Safety Data Sheet for Monokote MK-6/HY is available upon request by calling 866-333-3SBM (3726).

W. R. Grace & Co.-Conn.
62 Whittemore Avenue
Cambridge, MA 02140-1692
Tel.: (866) 333-3SBM (3726)
Fax: (617) 498-4311

W. R. Grace & Co.-Conn.
Ajax Avenue
Slough, Berks SL1 4BH
United Kingdom
Tel.: 44-(0)-1753-692-929
Fax: 44-(0)-1753-637-616

W. R. Grace (Hong Kong) Limited
Grace Industrial Building
6 On Chuen Street
On Lok Tsuen, Fanling
Tel.: 852-2-675-7898
Fax: 852-2-675-9193

For Technical Assistance call toll free at 866-333-3SBM (3726).

 Visit our web site at www.graceconstruction.com

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W. R. Grace & Co.-Conn. 62 Whittemore Avenue Cambridge, MA 02140

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MK-514H Printed in USA

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4/05 FA/LI/1M

GRACE
Construction Products

D A T A S U B M I T T A L

Monokote® Z-106 and Z-106/HY®

Portland Cement Based, Medium Density, Cementitious Fireproofing

Product Information/Description

Monokote® Z-106 and Z-106/HY® are portland cement based cementitious fireproofing designed to meet specific commercial and industrial fire protection requirements on structural steel members, floor/ceiling and roof/ceiling assemblies.

Monokote Z-106 and Z-106/HY are hard, moisture resistant and suitable for interior areas where resistance to moisture and abrasion is needed. Formulated for use with Grace's patented Injection System, Monokote Z-106/HY offers high-yield and improved application characteristics while providing resistance to repeated physical contact and/or high humidity.

Note: Monokote Z-106 and Z-106/HY afford the same level of fire protection and physical performance. Specifying both Monokote Z-106 and Z-106/HY allows alternatives to provide the most cost effective installation while assuring the specifier of the same high in-place performance characteristics.

Applications

Monokote Z-106 and Z-106/HY can be used for interior, exposed applications where abrasion, high humidity and damage resistance are desired such as:

- Special use areas in commercial buildings
- Transportation terminals
- Convention centers
- Stairwells
- Parking garages
- Elevator shafts
- Light manufacturing areas and facilities
- Mechanical rooms
- Gymnasiums and pool areas
- Correctional facilities

Benefits

Monokote Z-106 and Z-106/HY offer the following advantages to the architect, owner, applicator and building occupant.

- Durability – 100% portland cement binder provides increased durability in interior environments where high-traffic resistance to physical abuse is required.
- Moisture Resistant – Provides excellent resistance to high humidity and condensation.

- Quick Set – HY formulation allows use with Grace patented Injection System for high-yield and quick set.
- Applicator Friendly – Low pumping pressures allow use of small diameter hoses for increased maneuverability and greater pumping distances.
- Non-Toxic – The factory-mixed blend of common portland cement and inert materials require only the addition of water for mixing and application.

Delivery and Storage

- All material to be used for fireproofing shall be delivered in original unopened packages bearing the name of the manufacturer, the brand and proper Underwriters' Laboratories Inc. labels for fire hazard and fire resistance classifications.
- The material shall be kept dry until ready for use. Packages of material shall be kept off the ground, under cover and away from sweating walls and other damp surfaces. All bags that have been exposed to water before use shall be discarded. Stock of material is to be rotated and used before its expiration date.

Recommended Specifications — Medium Density Products

Physical Properties	Z-106	Z-106/HY	Test Method	Laboratory Test* Value
Minimum density	350 kg/m ³ (22 pcf)	350 kg/m ³ (22 pcf)	ASTM E605	See note below**
Minimum bond strength	94.5 kN/m ² (2,000 psf)	94.5 kN/m ² (2,000 psf)	ASTM E736	Greater than 94.5 kN/m ² (2,000 psf)
Minimum compressive strength @ 10% deformation	680 kPa (100 psi)	680 kPa (100 psi)	ASTM E761	Greater than 680 kPa (100 psi)
Deflection and bond impact	No cracking No delamination	No cracking No delamination	ASTM E759 ASTM E760	Pass Pass
Air erosion	0.000 gr/m ² (0.000 gr/sf)	0.000 gr/m ² (0.000 gr/sf)	ASTM E859	0.000 gr/m ² (0.000 gr/sf)
Mold inhibitor	Yes	Yes	ASTM G21	Pass/No growth
Standard color	Gray	Gray		NA

* Actual laboratory tested values meet or exceed Grace's recommended value. Test reports are available on request from your Grace Sales Representative.

** ASTM test methods modified where required, for high density, high performance products

Steel and Concrete Surfaces

- a. Prior to the application of Monokote Z-106 or Z-106/HY Fireproofing, an inspection shall be made to determine that all steel and concrete surfaces are acceptable to receive fireproofing. The steel to be fireproofed shall be free of oil, grease, excess rolling compounds or lubricants, loose mill scale, excess rust, non-compatible primer, lock down agent or any other substance that will impair proper adhesion. Where necessary, the cleaning of steel surfaces to receive fireproofing shall be the responsibility of the general contractor.
- b. Prior to application of Monokote Z-106, a bonding agent approved by the manufacturer shall be applied to all concrete surfaces to receive Z-106.
- c. Prior to application of Monokote Z-106/HY, a bonding agent approved by the fireproofing manufacturer shall be applied to all substrates to receive Z-106/HY.
- d. The project architect shall determine if the painted/primed structural steel to receive fireproofing has been tested in accordance with ASTM E119, to provide the required fire resistance rating.
- e. No fireproofing shall be applied prior to completion of concrete work on steel decking.
- f. Fireproofing to the underside of roof deck assemblies shall be done only after roofing application is complete and roof traffic has ceased.

Mixing

- a. Monokote Z-106 and Z-106/HY Fireproofing shall be mixed by machine in a conventional, plaster-type mixer or a continuous mixer specifically modified for cementitious fireproofing. The mixer shall be kept clean and free of all previously mixed material. The mixer speed in a conventional mixer shall be adjusted to the lowest speed which gives adequate blending of the material and a mixer density of 610 - 690 kg/m³ (38 - 43 pcf).
- b. Using a suitable metering device and a conventional mixer, all water shall be first added to the mixer as the blades turn. Mixing shall continue until the mix is lump-free, with a creamy texture. All material is to be thoroughly

wet. Target density of 610 - 690 kg/m³ (38 - 43 pcf) is most desirable. Overmixing Monokote Z-106 or Z-106/HY will reduce pumping rate and will negatively effect in-place density and mechanical properties.

Application

- a. Application of Monokote Z-106 or Z-106/HY Fireproofing can be made in the following sequence:
 1. Required fire rating thickness will determine if a multi-pass operation is required. If the first pass can be applied at a thickness sufficient to obtain the required rating a second pass will not be required.
 2. Where the full required thickness can not be applied in a single pass, subsequent passes can be applied only after the first coat has set.
- b. Monokote Z-106 and Z-106/HY Fireproofing material shall not be used if they contain partially set, frozen or caked material.
- c. Monokote Z-106 and Z-106/HY shall have a minimum average dry, in-place density of 350 kg/m³ (22 pcf).
- d. Monokote Z-106 and Z-106/HY are formulated to be mixed with water at the job site.
- e. Monokote Accelerator may be used with Monokote Z-106/HY to enhance set characteristics and product yield. The Monokote Accelerator is injected into the Monokote Z-106/HY at the nozzle of the spray gun. Monokote Accelerator shall be mixed and used according to manufacturers recommendations.
- f. Monokote Z-106 and Z-106/HY are applied directly to the steel, at various rates of application which will be job dependent, using standard plastering type equipment or continuous mixer/pump units. A spray gun, with a properly sized orifice and spray shield and air pressure at the nozzle of approximately 0.14 MPa (20 psi), will provide the correct hangability, density and appearance.

Temperature and Ventilation

- a. An air and substrate temperature of 4.4°C (40°F) minimum shall be maintained for 24 hours prior to application, during application and for a minimum of 24 hours after application of Monokote Z-106 or Z-106/HY.

- b. Provisions shall be made for ventilation to properly dry the fireproofing after application. In enclosed areas lacking natural ventilation, air circulation and ventilation must be provided to achieve a minimum total air exchange rate of 4 times per hour until material is substantially dry.

Field Tests

- a. The architect will select an independent testing laboratory (for which the owner will pay) to sample and verify the thickness and density of the fireproofing in accordance with the provisions of ASTM E605 (current edition), "Standard Test Method for Thickness and Density of Sprayed Fire-Resistive Material Applied to Structural Members" or Uniform Building Code Standard No. 7-6 "Thickness and Density Determination for Spray Applied Fireproofing." Where samples are of irregular shape (or sprayed texture), the displacement method (ASTM E605 published in AWCI Technical Manual 12-A) shall be used to determine in-place fireproofing density.
- b. The architect will select an independent testing laboratory (for which the owner will pay) to randomly sample and verify the bond strength of the fireproofing in accordance with the provisions of ASTM E736.
- c. Results of the above tests will be made available to all parties at the completion of pre-designated areas which shall have been determined at a pre-job conference.

Safety

- a. Monokote Z-106 and Z-106/HY are slippery when wet. The general contractor and applicator shall be responsible for posting appropriate cautionary SLIPPERY WHEN WET signs. Signs should be posted in all areas in contact with wet fireproofing material. Anti-slip surfaces should be used on all working surfaces.
- b. Material Safety Data Sheets for Monokote Z-106 and Z-106/HY are available upon request by writing: Grace Construction Products Attn: Environmental Health & Safety Dept. 62 Whittemore Ave. Cambridge, MA 02140

For Technical Assistance call toll free at 866-333-3SBM (3726).

 Visit our web site at www.graceconstruction.com

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W. R. Grace & Co.-Conn. 62 Whittemore Avenue Cambridge, MA 02140

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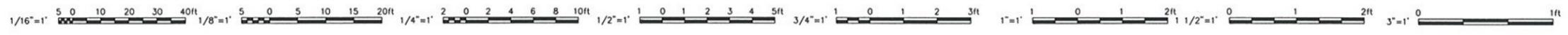
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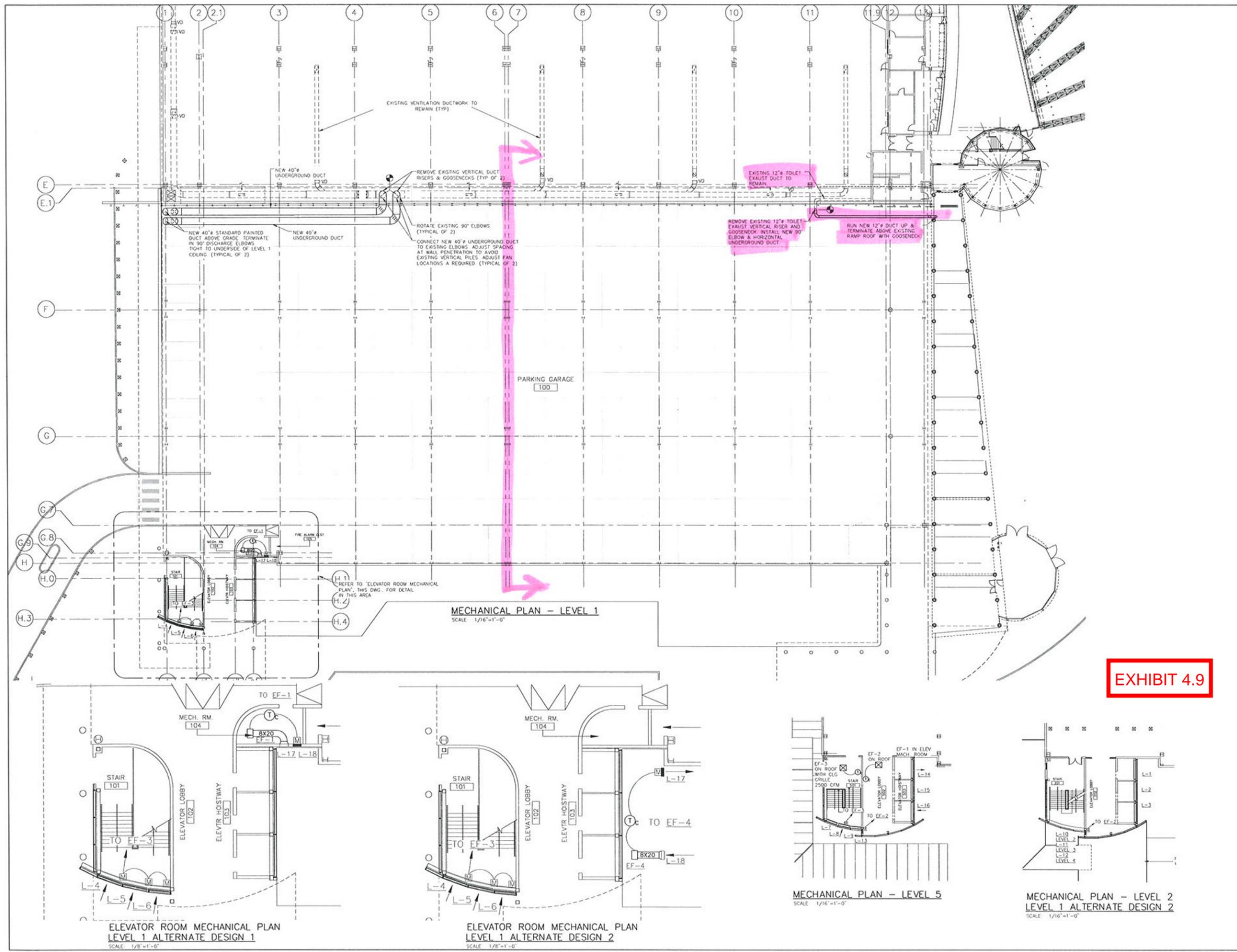
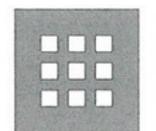


EXHIBIT 4.9



**DOMENECH
HICKS &
KROCKMALNIC
ARCHITECTS**

155 Massachusetts Ave.
Boston, MA 02115
617-267-6408
Fax 617-267-1990



Stantec
Stantec Consulting Services Inc.
22 Free Street, Suite 205
Portland, ME U.S.A.
04101-3500
Tel: 207.775.3211
Fax: 207.775.6434
www.stantec.com

CONFORMED SET
FOR FIELD USE

CITY OF PORTLAND
PORTLAND, MAINE
DEPARTMENT OF
WATERFRONT AND
TRANSPORTATION



PORTLAND
INTERNATIONAL
JETPORT

PHASE II
PARKING GARAGE

1001 WESTBROOK ST.,
PORTLAND, MAINE

No.	Date	Revision

**LEVELS - 1, 2 & 5
MECHANICAL PLAN**

Scale	AS SHOWN
File Name	
Drawn By	EJD
Checked By	RES
Job No.	195210126
Date	02/25/08
	M1-1

**ELEVATOR ROOM MECHANICAL PLAN
LEVEL 1 ALTERNATE DESIGN 1**
SCALE 1/8"=1'-0"

**ELEVATOR ROOM MECHANICAL PLAN
LEVEL 1 ALTERNATE DESIGN 2**
SCALE 1/8"=1'-0"

MECHANICAL PLAN - LEVEL 5
SCALE 1/16"=1'-0"

**MECHANICAL PLAN - LEVEL 2
LEVEL 1 ALTERNATE DESIGN 2**
SCALE 1/16"=1'-0"