Project:	**Police Memorial and North Cove Marina Electrical Vault Resilience Project <u>Construction Management Services</u>**	**Date:**	**10/19/15**
		RE:	**Addendum # 1**
		# of Pages:	**(53 pages)**

The following revisions and/or clarifications are to be made to the scope of work for the Request for Proposals for "**Police Memorial and North Cove Marina Electrical Vault Resilience Project <u>Construction Management Services</u>.**" They are a result of issues discussed at the pre-proposal conference held on 10/06/15 and any questions received to date.

<u>Questions:</u> (answers to all question are shown in Italics immediately after the question)

1) **Can a definitive start date and completion date be established for the duration of construction? Please include a month of closeout.**
   Response: A definitive construction start and completion date cannot be established at this time but it is anticipated that construction will begin in late 2015 and be completed by September of 2016.

2) **It was stated at the Preproposal meeting that no Preconstruction services will be required by the CM. Please confirm.**
   Response: Preconstruction services with regard to design and bidding the construction portion of the project will not be required however the selected Construction Management Firm will be required to provide preconstruction services such as scheduling, phasing and logistics.

3) **Have any addendum been distributed for the construction bid? If so, can they be included as part of the Q/A addendum.**
   Response: Two addendums for the construction RFP have been issued and are included in the Clarifications / Revisions section below.

<u>Clarifications / Revisions:</u>

1. The original deadline for BPCA's response to substantive questions for the Police Memorial and North Cove Marina Electrical Vault Resilience Project Construction Management Services was October 16, 2015. As per this addendum, the due date is changed to October 19, 2015.

2. Construction Services RFP Q/A:
   "Spec section 044200-2 item 2.01 calls for "match coping stone at 9/11 memorial fountains" and "same producer as 9/11 memorial fountains." Please indicate if alternate stone types and other fabricators will be allowed to bid?
   Response: In an effort to maintain a uniform appearance throughout the site alternate stone types and colors will not be accepted however alternate suppliers / producers will be accepted in conformance with Section 01 60 00 of the Technical Specifications."

3. The attached Plans and Specifications are hereby incorporated into the scope of Construction Management Services scope of work to be performed in connection with this RFP. A general list of the plan changes is provided below; however proposers are solely responsible for identifying and incorporating all components of the revised Plans and Specifications in their proposals and adjusting their cost proposals as needed.

Plan Revisions

Sheet #	Description
A 103.00, A 302.00	HATCHES IN STAIR CORRECTED TO REFLECT SINGLE BUILDING CONDITION (2/A 103 AND SECTIONS A AND B ON SHEET A 302)
A 302.00	GRANITE DISTINGUISHED IN SECTION A AND B
ALL SHEETS	TITLE BLOCK EDITED TO SHOW PAGE NUMBER
A-000.00	ZONING AND GENERAL INFORMATION ADDED
A 001.00	DRAWING LIST ADDED
A 001.00	SHEET ADDED TO HOLD ABBREV AND DRAWING LIST
A 002, A 003	SHEET A 001 BECOMES A 002, A002 BECOMES A 003
A 104.00	FLOURESCENT CHOSEN (LIGHTING SCHEDULE)
A 500.00	DETAIL 8 - RECESSED PAVING TRAY ADDED (VISIBLE IN PLAN ON A 002, A 101, A 102)
A 101, A 102	REMOVAL OF NEW DRAINS FROM SCOPE
A 101	RELOCATION OF DRAIN AT DOOR OF EAST VAULT
A 101	REGRADING OF PAVERS ADDED FOR DRAINAGE
A 302.00	DRAINAGE CHANNEL AT STAIRS ADDED (SECTIONS A AND B)
A 101, A 102	EXISTING EAST HATCH AT NORTH COVE VAULT TO BE DEMOLISHED AND REPAVED
L 101	DETAIL 2 - TREE ROOT ZONE PROTECTION
L 102	DETAIL 2 - NEW AND TRANSPLANTING PLANTING DETAIL
F 100 - F 400	FOUNTAIN DRAWINGS ADDED

Technical Specification Revisions:

00 010 10 – TABLE OF CONTENTS: Delete sections with strikeouts: 01 45 33, 26 05 43, 26 05 46, 26 05 54. Sections not used.

Delete Section 08 51 13 – ALUMINUM WINDOWS and replace with Section 08 43 13 – ALIMINUM-FRAMED STOREFRONTS.

00 01 15 – LIST OF DRAWING SHEETS – List of Architectural sheets changed from list of August 28, 2015
04 42 00 – EXTERIOR STONE CLADDING: 1.02 Related Sections, B. Delete "Section 07 62 00 – Sheet Metal Flashing and Trim and replace with Section 07 13 00 – Pre-Applied and Self Adhering Sheet Membrane Waterproofing.

08 43 13 – ALUMINUM-FRAMED STOREFRONT: Added with this addendum to replace Section 08 51 13 - Aluminum Windows.
08 80 00 – GLAZING: Added with this addendum specifying different type of glass to replace previous Section 08 80 00 dated August 28, 2015.

By signing the line below, I am acknowledging that all pages of the addendum have been received, reviewed and understood, and will be incorporated into the proposal and bid price submitted.
This document must be attached to the Proposal for consideration.

_____ _____

Print Name Signature Date

Number of pages received: _____<fill in>

APPLICABLE CODES, STANDARDS, AND ORDINANCES:

CODE, STANDARD, OR ORDINACE:

THE CITY OF NEW YORK - ZONING RESOLUTION
2014 NEW YORK CITY BUILDING CODE
2014 NEW YORK CITY MECHANICAL CODE
2014 NEW YORK CITY PLUMBING CODE
2014 NEW YORK CITY ELECTRICAL CODE
NEW YORK CITY ENERGY CONSERVATION CODE

GENERAL INFORMATION:

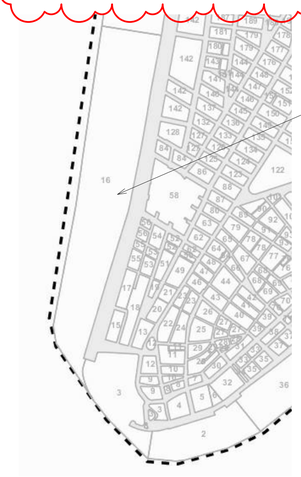
OCCUPANCY :
OCCUPANCY CLASIFICATION: GROUP U - UTILITY AND MISCELLANEOUS
PRIMARY USE: ELECTRICAL SWITCHGEAR FOR ADJACENT PUBLIC SPACES
ACCESSORY USE: NONE

CONSTRUCTION CLASSIFICATION:
CONSTRUCTION TYPE: TYPE IV - HEAVY TIMBER

NYC ZONING INFORMATION:

SEE SITE PLAN FOR ADDITIONAL INFORMATION

2015 NEW YORK CITY ZONING RESOLUTION		**REFERENCE**
GENERAL/LOCATION INFORMATION		
ADDRESS	NEW BUILDING - NO CURRENT ADDRESS	
BLOCK	16	
LOT	3	
ZONING DISTRICT	A - SOUTH RESIDENTIAL NEIGHBORHOOD	MAP 84-A1
FLOOD COMPLIANCE	ZONE VE: 500 YEAR FLOOD = 14' ABOVE NAVD BUILDING ENTRANCES = 14.65' ABOVE NAVD BUILDING FLOOR = 12' ABOVE NAVD INTERIOR EQIP. HEIGHT = 14' ABOVE NAVD	
HEIGHT AND SETBACK INFORMATION		
BUILDING HEIGHT	12' -5" ABOVE PLAZA LEVEL	
HEIGHT RESTRICTIONS	85' MAXIMUM	ZR 84-135
SETBACKS	N/A -SETBACK ONLY TO OCCUR ABOVE 85'	ZR 84-132
FLOOR AREA INFORMATION		
LOT FLOOR AREA RATIO	15	ZR 64-331
LOT SIZE	APPROX. 1,979,625 SQ FT	
PROPOSED BUILDING ZSF	1,000 SQ FT (INCLUDING STAIR)	
OPEN SPACE	N/A	ZR 84-11
REAR YARD	NO REQUIREMENTS	
PARKING		
PARKING REQUIRED	NONE	



KEY PLAN (NTS)

FIRE SEPARATION DISTANCE:

CODE AND EDITION	GROUP OCCUPANCY TYPE	X < 5'-0" SEPERATION	X < 10'-0" SEPERATION	X < 30'-0" SEPERATION	> 30'-0" SEPERATION
2014 NEW YORK CITY BUILDING CODE TABLE 602	U	1 HR	1 HR	1 HR	0 HR

ACTUAL DISTANCE FROM NEAREST BUILDING: 35'-9" TO OUTER BUILDING WALL

FIRE PROTECTION:

SPRINKLER SYSTEM: N/A (NYC BUILDING CODE SECTION 903.2)
ALARM SYSTEM: EXTERNALLY MONITORED WITH SMOKE DETECTORS

BUILDING AREA:

AREA SCHEDULE (GROSS BUILDING)	
EAST VAULT	260 SQ FT
WEST VAULT	260 SQ FT
INTERCONNECTING STAIR	480 SQ FT

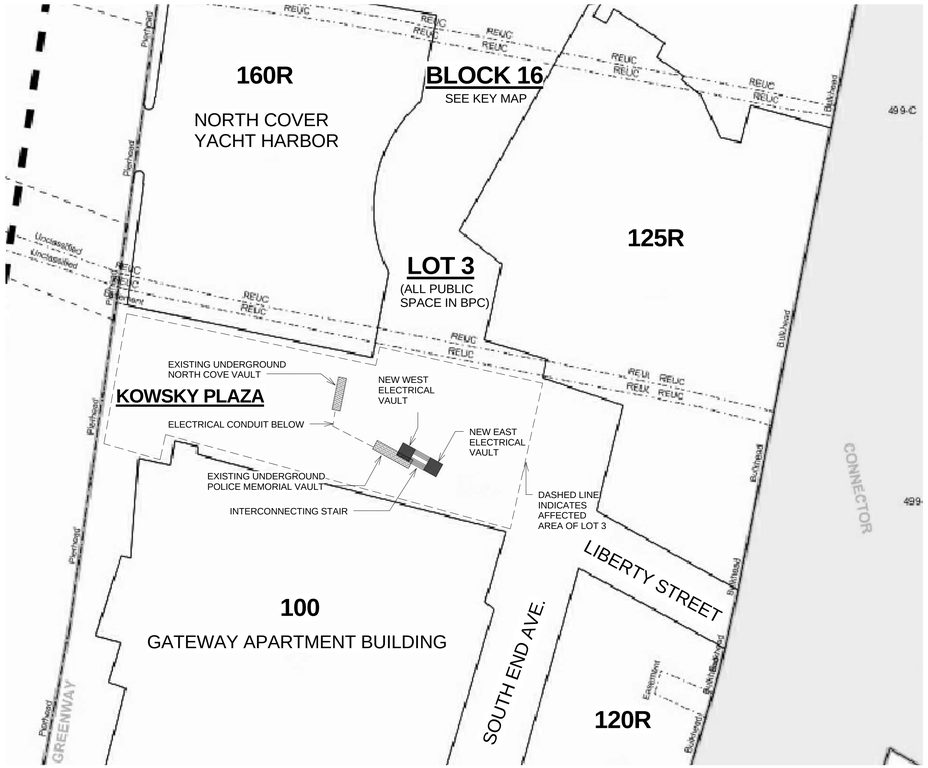
ACCESSIBILITY:

ACCESS VIA FIRE STAIRS ONLY, NON-ACCESSIBLE
USE GROUP U IS EXEMPT FROM ACCESSIBILITY REQUIREMENTS (NYC BC SECTION 1103.2.5)

OCCUPANCY:

ROOM	AREA	NYC OCCUPANCY TYPE	SF/OCCUPANT	TOTAL OCCUPANTS
EAST VAULT	260 SF	MECHANICAL ROOMS	300	1
WEST VAULT	260 SF	MECHANICAL ROOMS	300	1
GRAND TOTAL OCCUPANTS				2

ONE EXIT PROVIDED PER ROOM AS PER TABLE 1015.1: MORE THAN ONE EXIT REQUIRED IF OCCUPANCY EXCEEDS 74 PEOPLE



ZONING REFERNCE MAP (NTS)

TABULAR ANALYSIS:

I, THOMAS HANRAHAN, LICENSED ARCHITECT, CERTIFY TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE 2010

ENERGY ANALYSIS FOR NEW CONSTRUCTION - RESIDENTIAL
CLIMATE ZONE 4

ITEM DESCRIPTION	PROPOSED DESIGN VALUE	CODE PRESRIPTIVE VALUE	SUPPORTING DOCUMENTATION
BUILDING ENVELOPE	N/A	N/A	NYC ECC 101.5.2: THE FOLLOWING BUILDINGS... SHALL BE EXEMPT FROM THE BUILDING THERMAL ENVELOPE PROVISION OF THIS CODE: ...2. THOSE THAT DO NOT CONTAIN CONDITIONED SPACE. SEE M-001, M-102 FOR DETAILS.
HVAC	N/A	N/A	THIS STRUCTURE UTILIZES PASSIVE COOLING AND HEATING WITH THE ASSISTANCE OF FANS. SEE M-001, M-102 FOR DETAILS.
MANUAL LIGHTING CONTROLS	N/A	N/A	NYC ECC C405.2.1, SEE M-001, M-102 FOR DETAILS.
INTERIOR LIGHTING CONTROLS	N/A	N/A	NYC ECC C405.2.1., SEE M-001, M-102 FOR DETAILS.
LIGHT REDUCTION CONTROLS	N/A	N/A	NYC ECC C405.2.1.2, SEE M-001, M-102 FOR DETAILS.
INTERIOR LIGHTING POWER	TOTAL PERMANENTLY INSTALLED INTERIOR LIGHTS = 14 14 HIGH EFFICACY LIGHTS = 100% OF TOTAL LIGHTS IN HOUSE > 50% OK	50% MIN HIGH EFFICAC LIGHTS OF TOTAL PERMANENTLY INSTALLED INTERIOR LIGHTS AS PER 505.5.3	A-104.00
EXTERIOR LIGHTING POWER	PROPOSED TOTAL SITE LUMINAIRE = 174 WATTS < 600 WATTS OK	600 WATTS MAX ALLOWABLE NYC ECC 505.6.2(2)	A-104.00

SYMBOL LEGEND

1 View Name 1/8" = 1'-0"	VIEW TITLE	1 SIM A101	SECTION MARKER
1 / A101	VIEW REFERENCE	1t	WINDOW TAG
101	DOOR TAG	1 SIM A101	DETAIL CALLOUT HEAD
1 Ref, Ref, A101, Ref, 1 Ref	ELEVATION TAG	℄	CENTERLINE
1	REVISION TAG	Room name 101 Volume	ROOM TAG

HATCHES AND FILLS

CONCRETE
EARTH
WOOD
RIGID INSULATION
TURF BLOCK

Legend 1
1/4" = 1'-0"

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PROJECT:
Kowsky Plaza Vaults
Battery Park City- North Cove

PROPERTY INFORMATION:

NOTES:

Rev No.	Description	Date
1	Adendum#1	10.05.15

DOB STAMPS AND SIGNATURE:

SEAL AND SIGNATURE:

DATE: 08/31/15
DRAWN BY: SH/AS
CHECKED BY: TH
SHEET TITLE: Site Plan/ Plot Plan
PAGE XXX OF XXX

SHEET NUMBER:
A-000.00

Sheet List		
Sheet Order	Sheet Number	Sheet Name
1	G-000.00	Project Introduction
2	A-000.00	Site Plan/ Plot Plan
3	A-001.00	Drawing Index and Abbreviations
4	A-002.00	Site Plan
5	A-003.00	Site Plan - Existing Vault Level
6	A-101.00	Site Plan
7	A-102.00	Project Plan
8	A-103.00	Structural & Foundation Plans
9	A-104.00	Reflected Ceiling and Site Lighting Plan
10	A-200.00	Elevations
11	A-301.00	Short Sections
12	A-302.00	Long Sections
13	A-500.00	Details
14	A-501.00	Window Elevation Details
15	A-600.00	Infrastructure Diagram
16	D-100.00	Demolition, Excavation and Planting Diagram
17	G-002.00	Rendered Views
18	G-003.00	Material Samples
19	L-1.01	Landscape Restoration Plan
20	L-1.02	Landscape Planting Plan
21	F1.00	Process Schematic
22	F2.00	Schematic
23	F3.00	Controls Ladder Logic Diagram
24	F3.01	Controls Ladder Logic Diagram
25	F3.10	Power Supply & Bonding Details
26	F4.00	Notes
27	S-001.00	General Notes
28	S-002.00	General Notes
29	S-003.00	General Notes
30	S-004.00	General Notes
31	S-005.00	General Wood Notes
32	SO-100.00	Lap Splice Schedules
33	S-100.00	Structural Plans II
34	S-101.00	Full Roof Plan
35	S-200.00	Building Sections and Details
36	S-300.00	Roof Details
37	FO-100.00	Structural Plans
38	FO-200.00	Typical Caisson Details and Schedule
39	FO-300.00	Typical Site Details
40	FO-301.00	Typical Concrete Slab Details
41	FO-302.00	Typical Concrete Slab Details
42	FO-400.00	Typical Wall Details
43	FO-500.00	Typical Grade Beam Details
44	FO-501.00	Typical Grade Beam Details
45	FO-502.00	Grade Beam Schedules
46	P-001.00	Plumbing Symbol List, Notes and Specifications
47	P-300.00	Plumbing Work in Connection with Police Memorial Plaza Pumps and Controllers Reolcation
48	P-301.01	Plumbing Work in Connection with Police Memorial Plaza Pumps and Controllers Reolcation
49	M-001.00	Mechanical Drawing List, Symbol Legend and Specifications
50	M-102.00	Mechanical Floor Plan
51	E-001.00	Electrical Symbol List, Notes, Drawing List and Specifications
52	E-002.00	Electrical Demolition Notes
53	E-100.00	Existing Electrical Services and Distribution Equipment Serving Police Plaza
54	E-200.00	Electrical Modification of Existing Electrical Service and Distribution Equipment Serving Police Plaza and Marine (Flood Resilience)
55	E-300.00	Electrical Work in Connection with Police Memorial Plaza Pumps and Controllers Relocation
56	E-400.00	Electrical Work in Connection with Police memorial Plaza pumps and Controllers Relocation Details
57	E-500.00	Electrical Work in Connection with Police Memorial Plaza pumps and Controllers Relocation Schedulues and Details
58	E-600.00	Electrical One Line Diagram for New utilities West and East Structures
59	E-700.00	Electrical New West and East Utility Structures Details

ABBREVIATIONS:

AC	AIR CONDITIONING
ACC	ACCESSIBLE
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDELING UNIT
ALUM	ALUMINUM
ALT	ALTERNATE
APPROX	APPROXIMATE
ARCH	ARCHITECT(URAL)
AUTO	AUTOMATIC
BLDG	BUILDING
BLKG	BLOCKING
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLO	CLOSET
CLR	CLEAR(ANCE)
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COMM	COMMUNICATION
CONC	CONCRETE
CONT	CONTINUOUS
DEMO	DEMOLISH / DEMOLITION
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DN	DOWN
EA	EACH
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
EL	ELEVATION
ELEV	ELEVATOR
EMER	EMERGENCY
EQ	EQUAL
EQUIP	EQUIPMENT
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EXPD	EXPOSED
EXT	EXTERIOR
FD	FLOOR DRAIN
FDTN	FOUNDATION
FE	FIRE EXTINGUISHER
FIN	FINISH(ED)
FLR	FLOOR
FT	FOOT / FEET
FTG	FOOTING
FURN	FURNISH(ED) / FURNISHINGS
GA	GAUGE
GALV	GALVANIZED
GL	GLASS
GWB	GYPSUM WALL BOARD
GYP	GYPSUM
HDW	HARDWARE
HW	HOLLOW METAL
HORIZ	HORIZONTAL
HP	HIGH POINT
HPC	HIGH PERFORMANCE COATING
HR	HANDRAIL
HSS	HOLLOW STRUCTURAL SECTION
HT	HEIGHT
HVAC	HEATING-VENTILATING-AIR CONDITIONING
INST	INSTALL(ED)
INSUL	INSULATION
INT	INTERIOR
JT	JOINT
LAM	LAMINATED
LGT	LENGTH
LP	LOW POINT
LT	LIGHT
LYWT	LIGHTWEIGHT
MACH	MACHINE
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OPP	OPPOSITE
PCC	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PERF	PERFORATE(D)
PLYWD	PLYWOOD
PREFAB	PREFABRICATED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PLSHD	POLISHED
PNT	PAINT(ED)
QTY	QUANTITY
RAD	RADIUS
RCP	REFLECTED CEILING PLAN
REF	REFER TO / REFERENCE TO
REINF	REINFORCED
REQD	REQUIRED
REV	REVISED / REVISION
RFG	ROOFING
RM	ROOM
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SPEC	SPECIFY / SPECIFICATION
SQ	SQUARE
SST	STAINLESS STEEL
ST	STONE
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURE / STRUCTURAL
SUSP	SUSPENDED
TBD	TO BE DETERMINED
TEMP	TEMPORARY
TEXT	TEXTURE
THK	THICK(NESS)
TOW	TOP OF WALL
TYP	TYPICAL
VIF	VERIFY IN FIELD
WD	WOOD
WT	WEIGHT

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PROJECT:

Kowsky Plaza Vaults

Battery Park City- North Cove

PROPERTY INFORMATION:

NOTES:

Rev No.	Description	Date
1	Adendum#1	10.05.15

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CHECKED BY: Checker

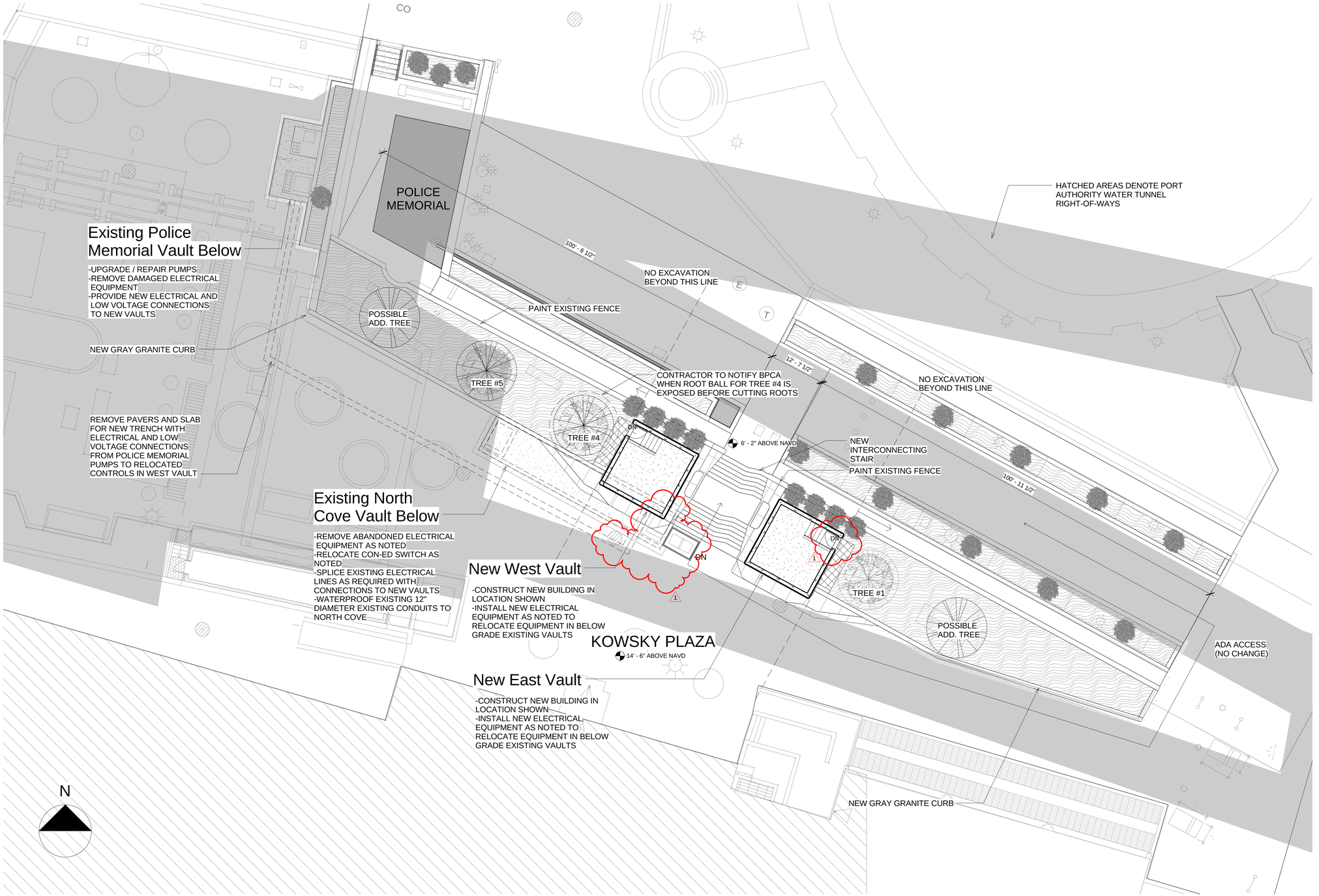
SHEET TITLE:

Drawing Index and Abbreviations

PAGE XXX OF XXX

SHEET NUMBER:

A-001.00



1 Site Plan
3/32" = 1'-0"

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DATE: 08/31/15

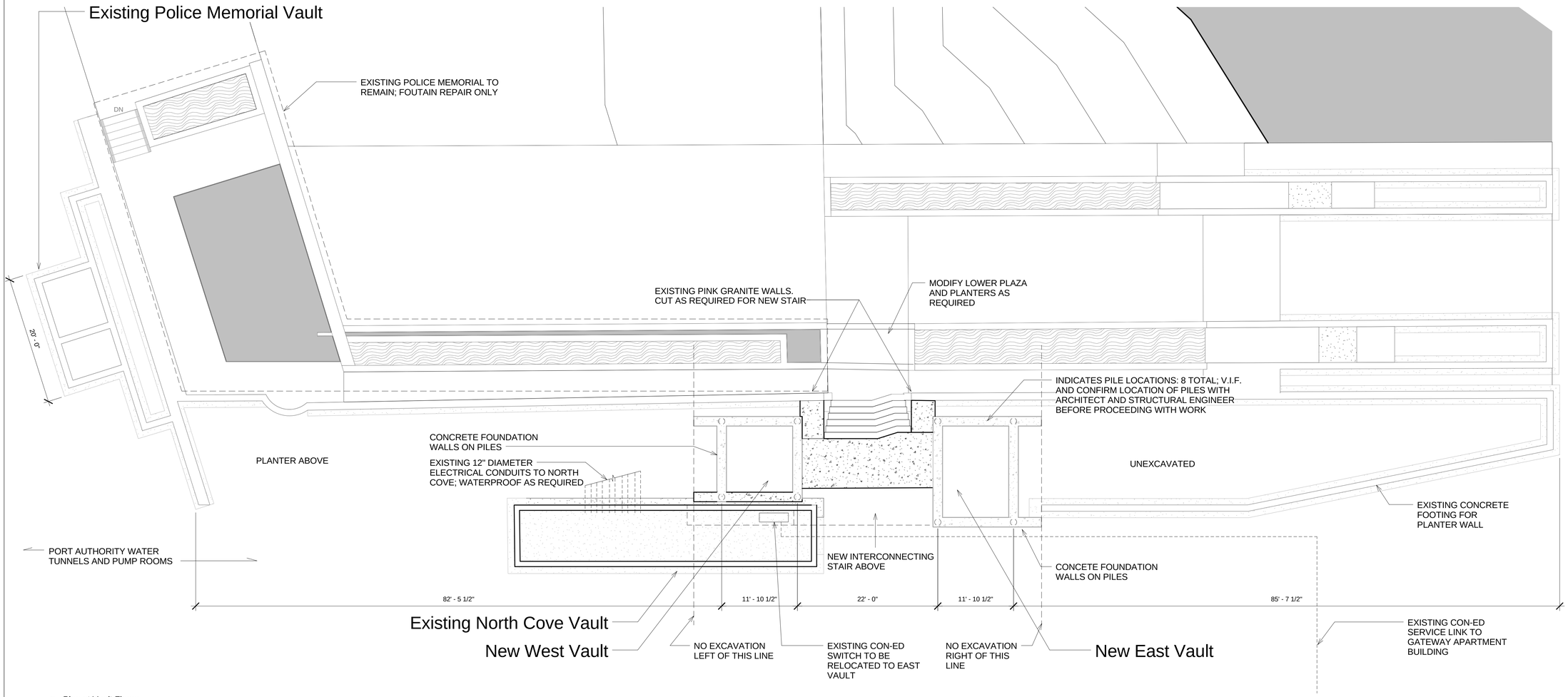
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SHEET TITLE:
Site Plan

PAGE XXX OF XXX

SHEET NUMBER: 1
A-002.00



1 Plan at Vault Floors
1/8" = 1'-0"

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DRAWN BY: SH/AS

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SHEET TITLE:

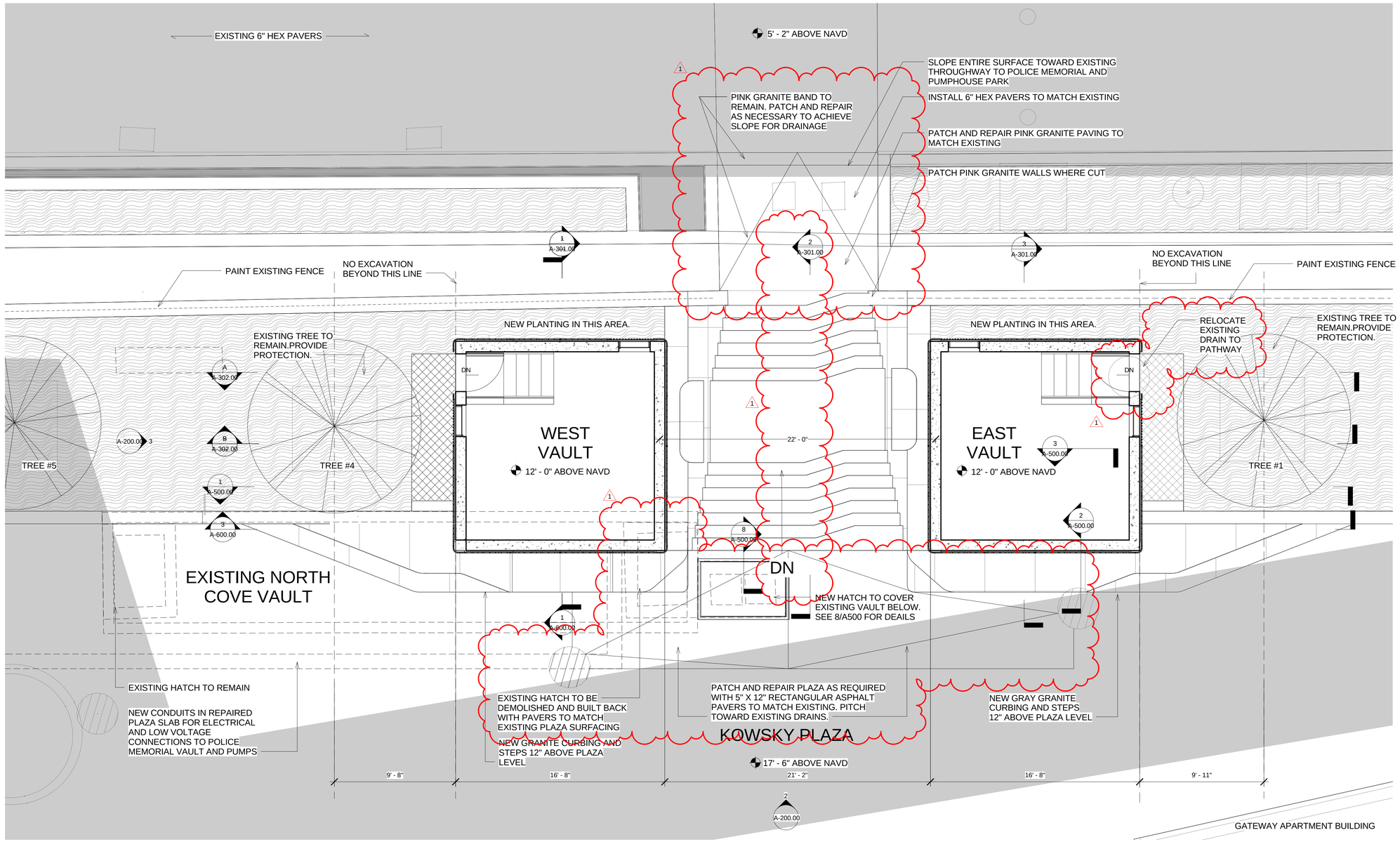
Site Plan - Existing Vault Level

PAGE XXX OF XXX

SHEET NUMBER:

1

A-003.00



1 100 Year Flood - 1/4" = 1'-0"

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Kowsky Plaza Vaults

Battery Park City- North Cove

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SEAL AND SIGNATURE:

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DRAWN BY: AS/SH

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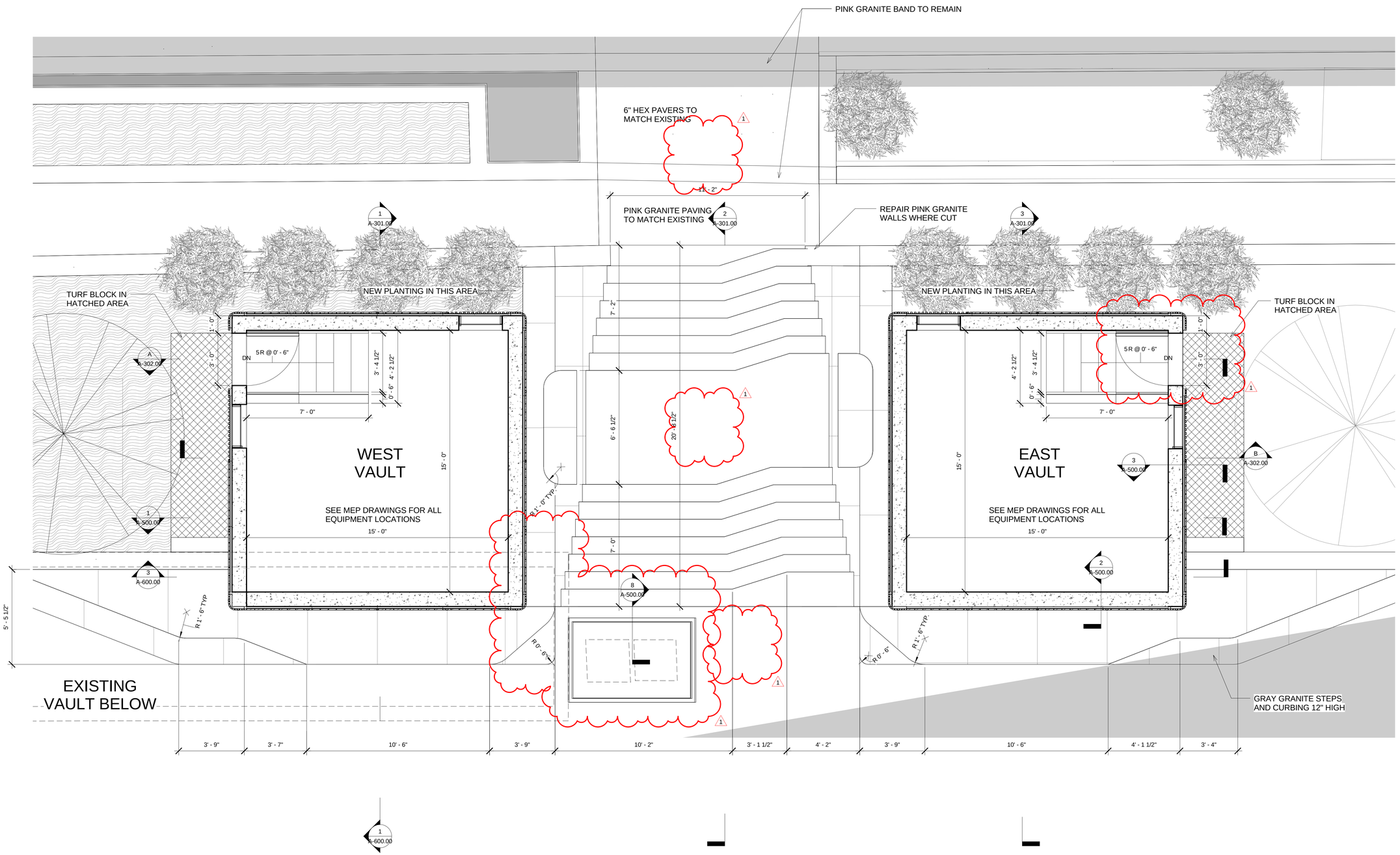
SHEET TITLE:

Site Plan

PAGE XXX OF XXX

SHEET NUMBER:

A-101.00



1 100 Year Flood
3/8" = 1'-0"

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PROJECT:
Kowsky Plaza Vaults
Battery Park City- North Cove

PROPERTY INFORMATION:

NOTES:

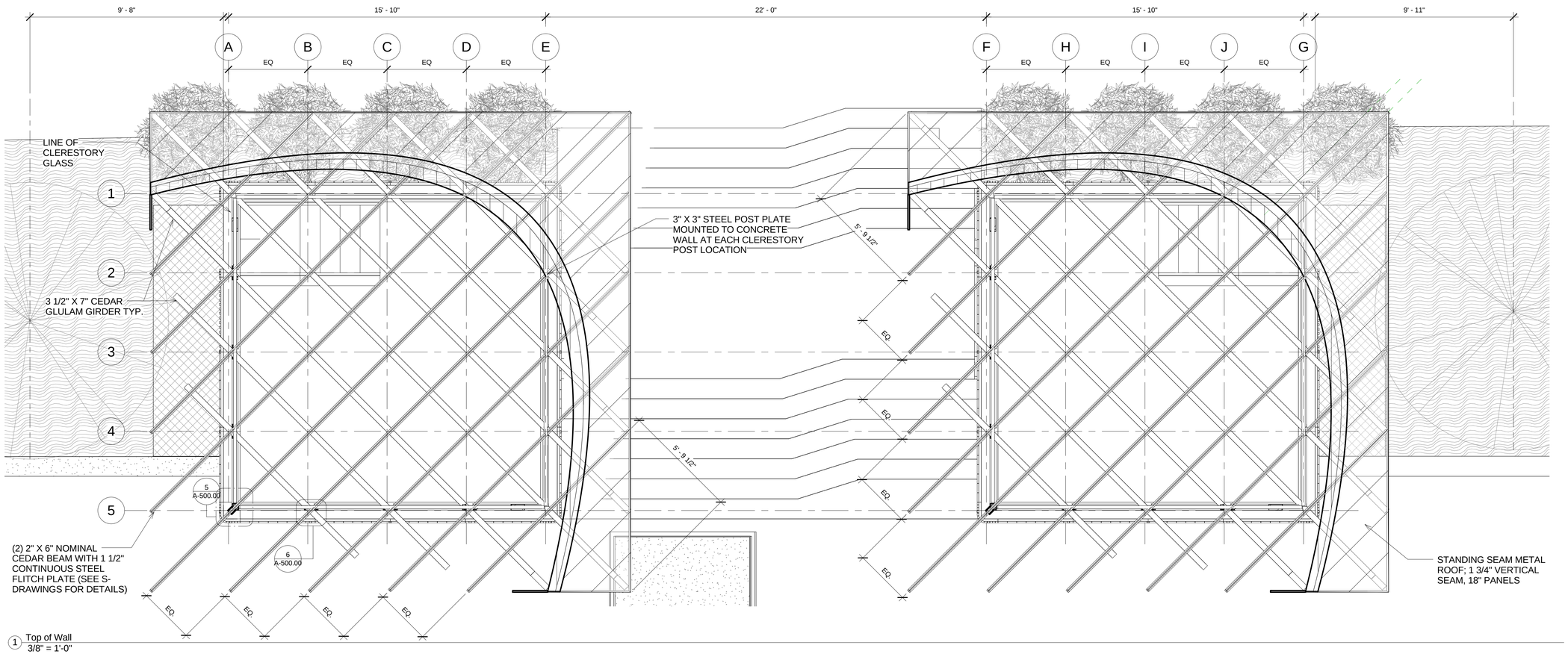
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1	Adendum#1	10.05.15

DOB STAMPS AND SIGNATURE:

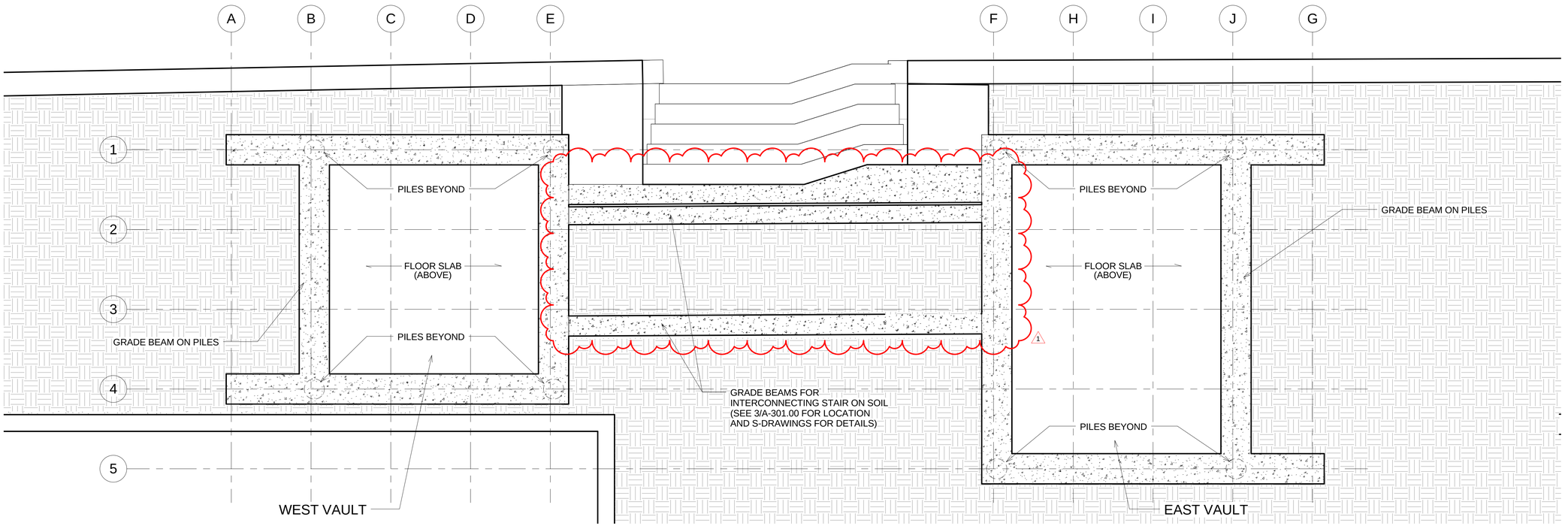
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DATE: 08/31/15
DRAWN BY: AS/SH
CHECKED BY: TH
SHEET TITLE:
Project Plan
PAGE XXX OF XXX

SHEET NUMBER:
A-102.00



1 Top of Wall
3/8" = 1'-0"



2 Plan at Vault Floors
3/8" = 1'-0"

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PROJECT:

Kowsky Plaza Vaults

Battery Park City- North Cove

PROPERTY INFORMATION:

NOTES:

Rev No.	Description	Date
1	Adendum#1	10.05.15

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SEAL AND SIGNATURE:

DATE: 08/31/15

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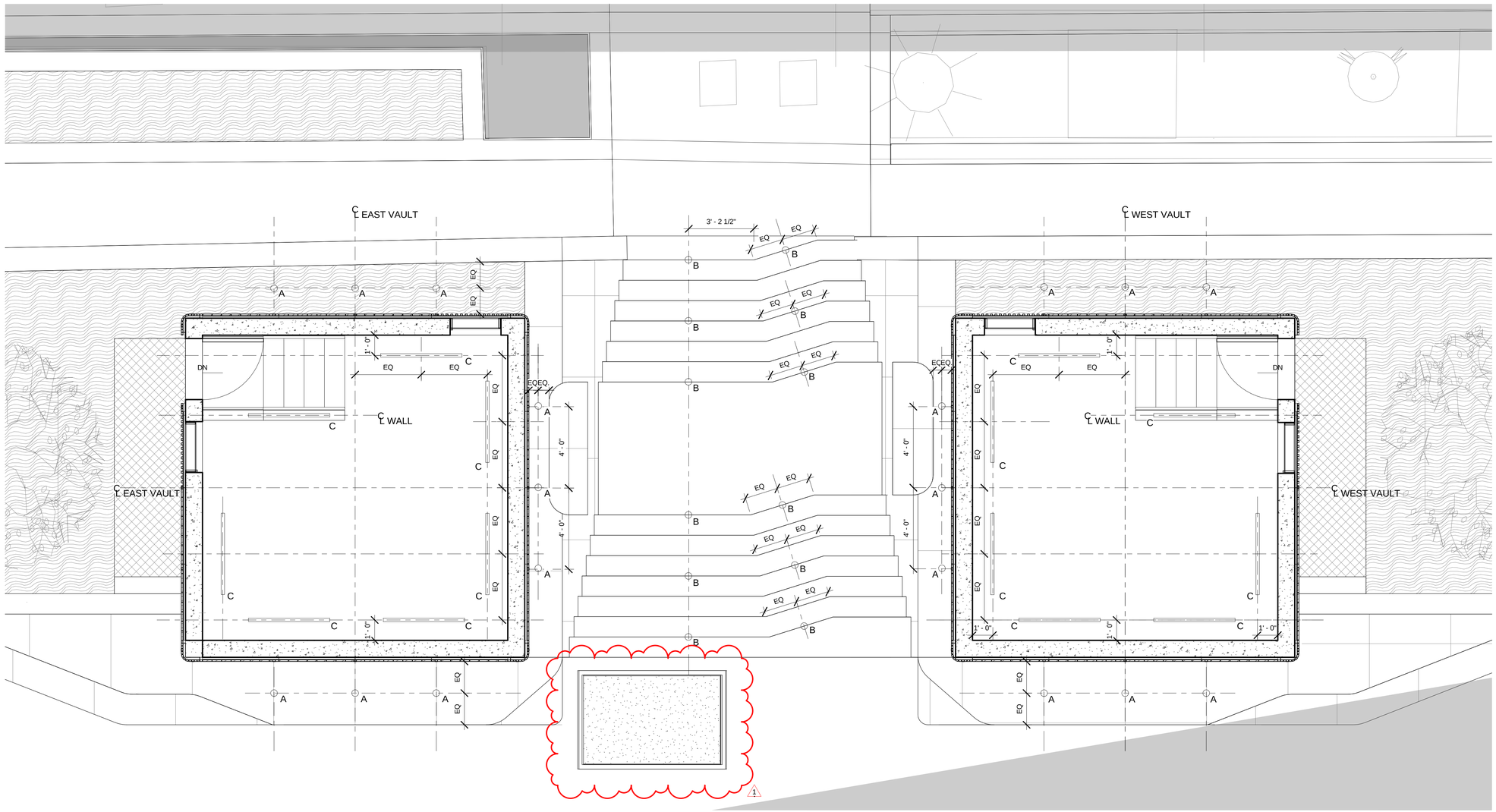
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Structural & Foundation Plans

PAGE XXX OF XXX

SHEET NUMBER:

A-103.00



1 Site Lighting
3/8" = 1'-0"

Keynote	Description	Manufacturer	Model	Dimensions	Notes
A	DECK MOUNTED PLAZA LIGHT	DECO LIGHTING	SIG7-LED-1-9-W-25	4.09" X 4.25" X 3.54"	
B	STEP LIGHT IN RISERS	DECO LIGHTING	SIG7-LED-2-9-W-15	2.72" X 3.81" X 2.36"	FLUSH MOUNT IN RISER
C	UPTURNED FLOURESCENT LIGHT	BARTCO LIGHTING	BFLSA-28/120/DL	1.95" X 1" X 46.06"	

1

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SEAL AND SIGNATURE:

DATE: 08/31/15

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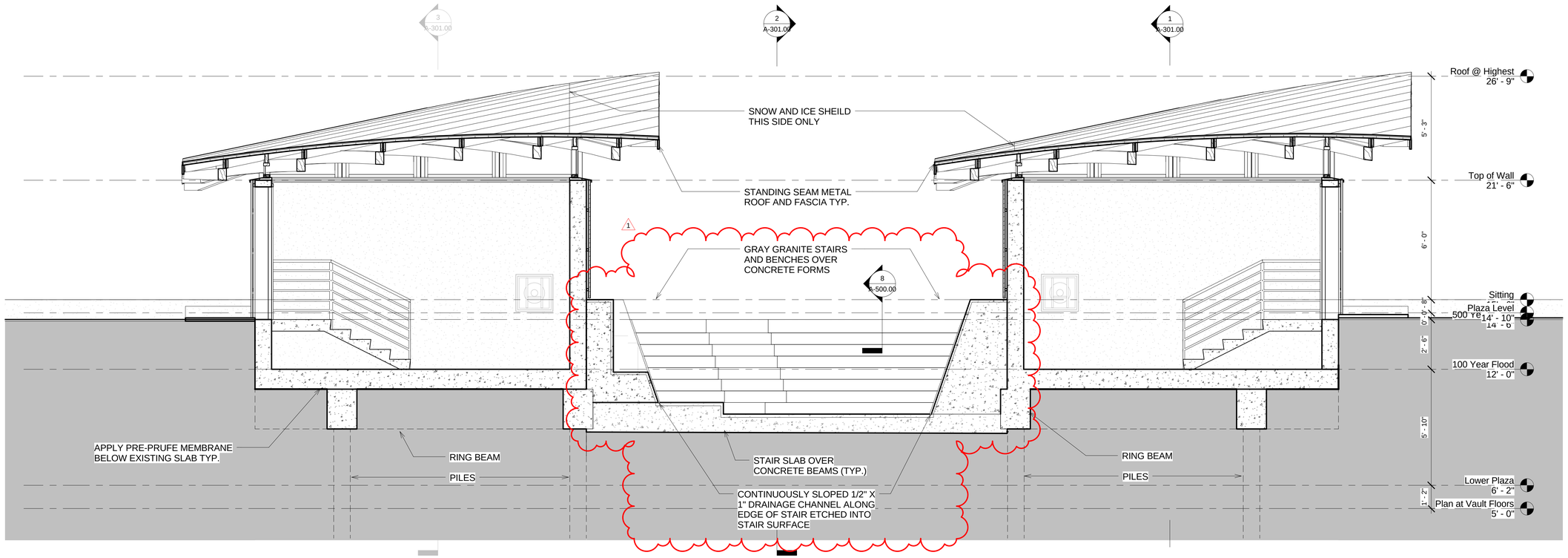
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Reflected Ceiling and Site Lighting Plan

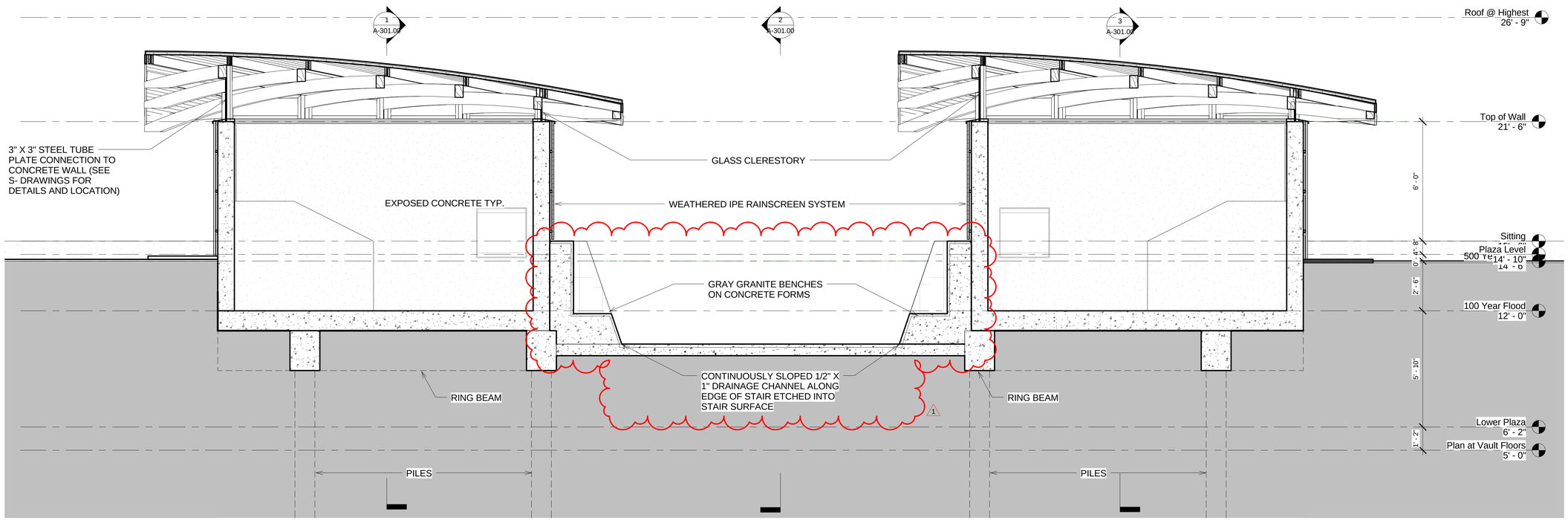
PAGE XXX OF XXX

SHEET NUMBER:

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A Section A
3/8" = 1'-0"



B Section B
3/8" = 1'-0"

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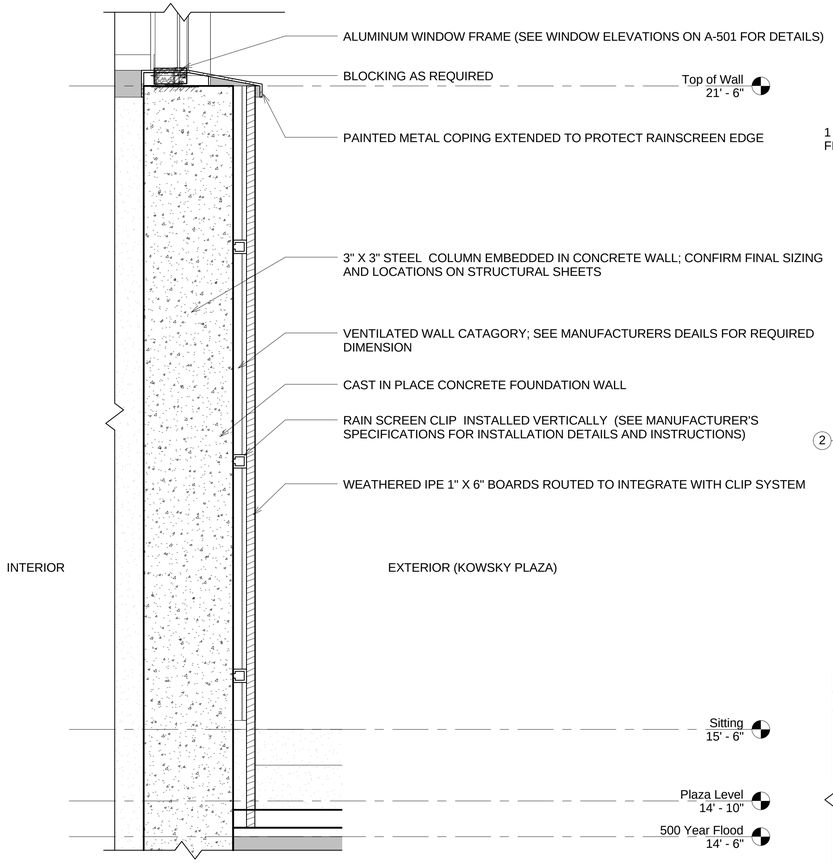
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Long Sections

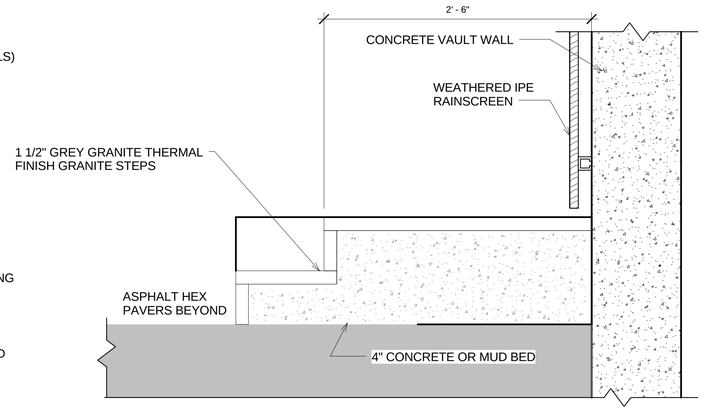
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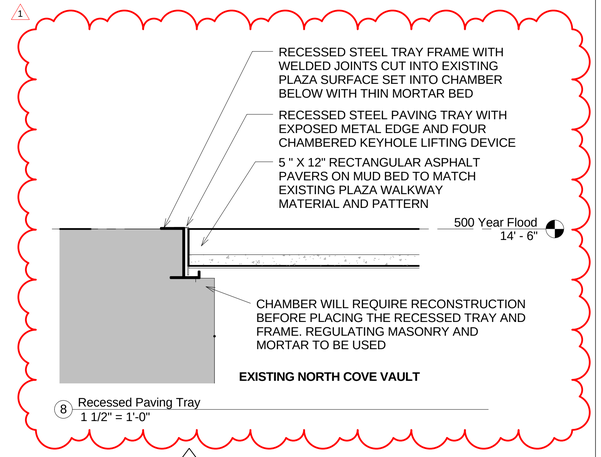
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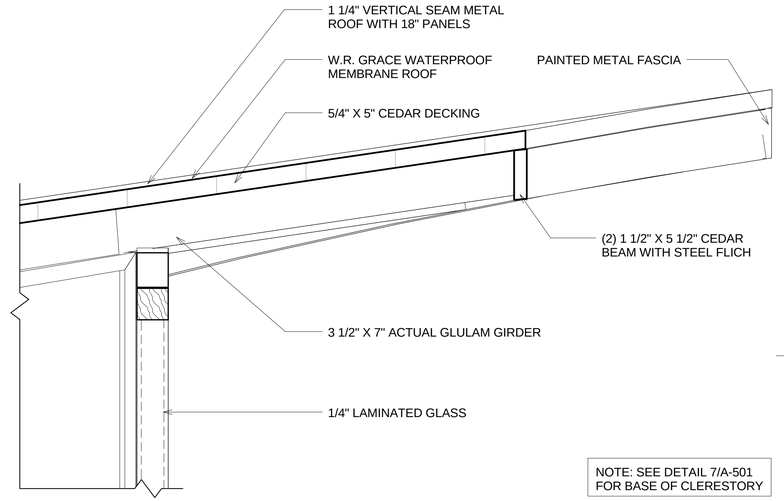
1 Wall Detail
1 1/2" = 1'-0"



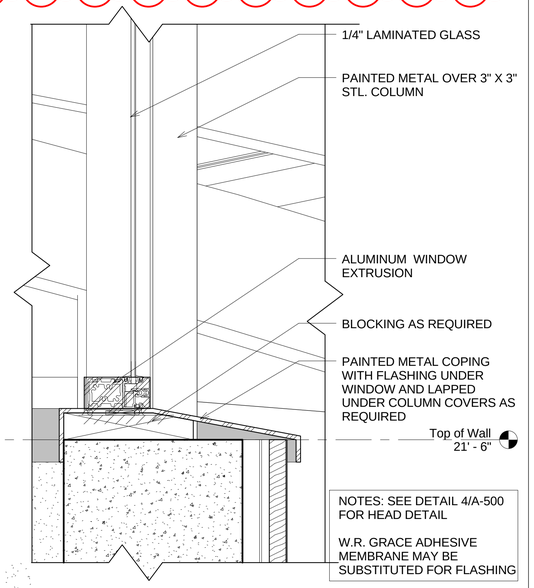
2 Typical Stair and Curbing Detail
1 1/2" = 1'-0"



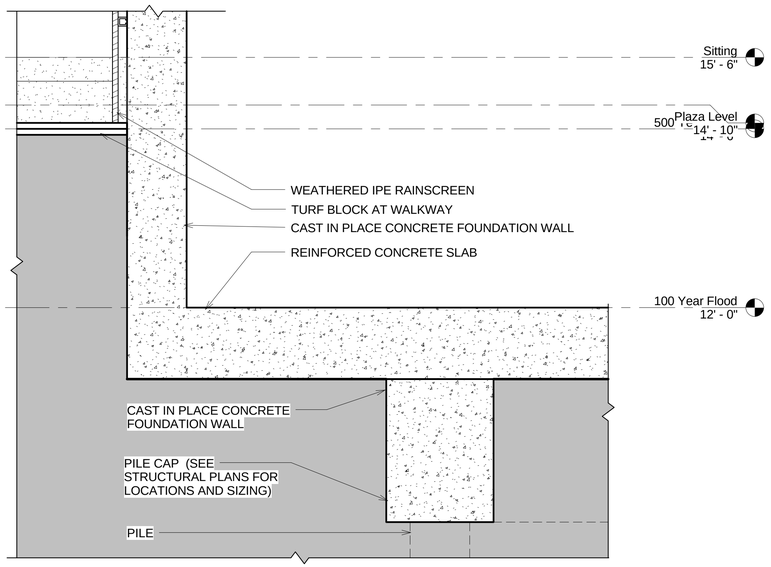
8 Recessed Paving Tray
1 1/2" = 1'-0"



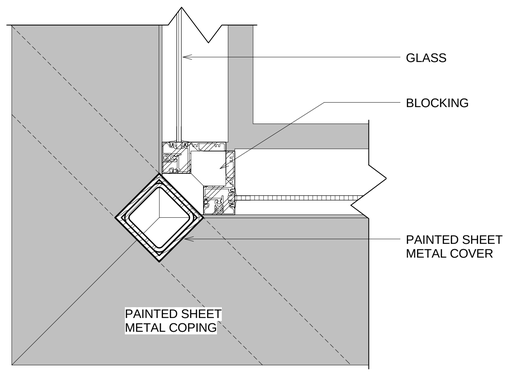
4 Post to Beam Connection
1 1/2" = 1'-0"



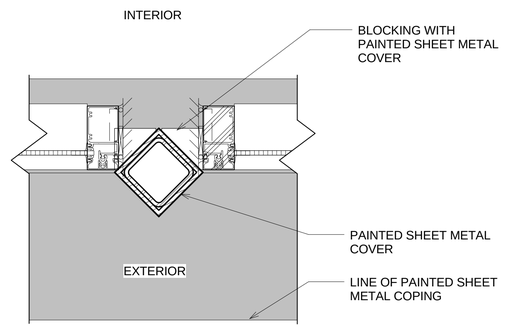
7 Window Sill and Head
3" = 1'-0"



3 Floor Detail
1" = 1'-0"



5 Window Plan Detail at Corner
3" = 1'-0"



6 Window Plan Detail Typ.
3" = 1'-0"

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PROJECT:

Kowsky Plaza Vaults

Battery Park City- North Cove

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Details

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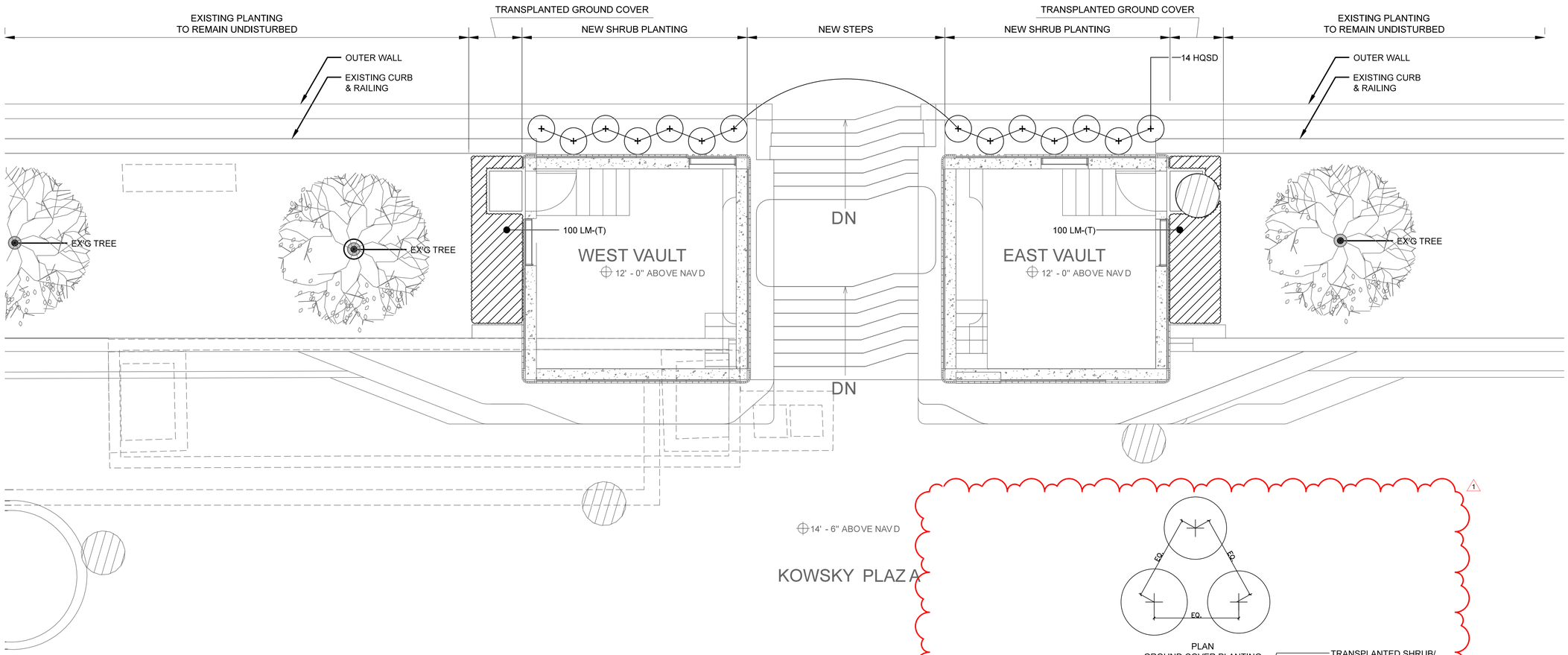
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GENERAL NOTES

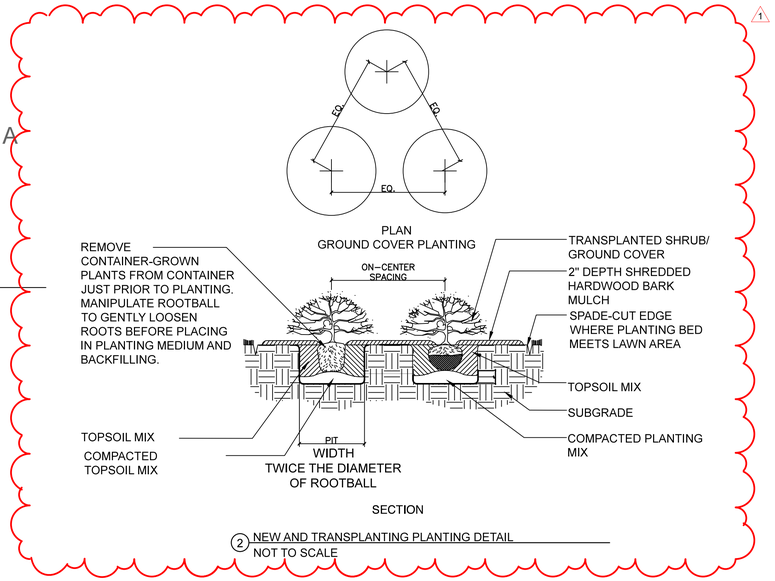
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2. REFER TO SPECIFICATION SECTION 329300 FOR PLANTING REQUIREMENTS.
3. REFER TO SPECIFICATION SECTION 329300 FOR TRANSPLANTING REQUIREMENTS.
4. TRANSPLANTED MATERIALS TO BE PLANTED UNDER WARRANTY. REPLACE ANY TRANSPLANTED MATERIALS

PLANT MATERIALS LIST

QUANTITY	ABBREV	BOTANICAL NAME	COMMON NAME	SIZE	SPEC	NOTES
14	HQSD	HYDRANGEA QUERCIFOLIA VAR. "SIKES DWARF"	"SIKES DWARF" OAKLEAF HYDRANGEA	2 GAL	CONT	NOTES
200	LM-(T)	(TRANSPLANTED) LIRIOPE MUSCARI	LIRIOPE ("LILYTURF"); TRANSPLANTED	1 GAL	CONT	SOURCE FROM TRANSPLANTING; 9" OC STAGGERED SPACING
QUANTITY	ABBREV	BOTANICAL NAME	COMMON NAME	SIZE	SPEC	NOTES
QUANTITY	ABBREV	BOTANICAL NAME	COMMON NAME	SIZE	SPEC	NOTES



1 PLANTING & TRANSPLANTING PLAN
1/4" = 1'-0"



2 NEW AND TRANSPLANTING PLANTING DETAIL
NOT TO SCALE

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PROJECT:
Kowsky Plaza
Vaults
Battery Park City - North Cove

PROPERTY INFORMATION:

NOTES:

Rev No.	Description	Date
1		

DOB STAMPS AND SIGNATURE:

SEAL AND SIGNATURE:
REGISTERED LANDSCAPE ARCHITECT
ELIZABETH J. KENNEDY
026-001449-01
STATE OF NEW YORK

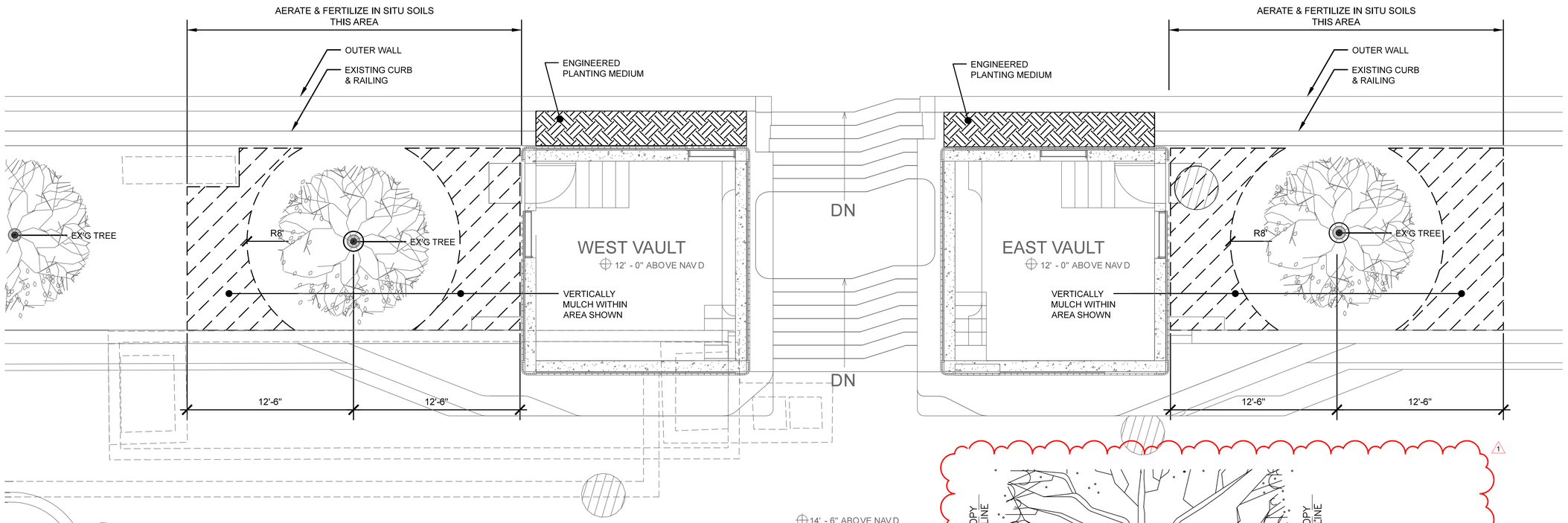
DATE: 31 August, 2015
DRAWN BY: GFF
CHECKED BY: EJK

SHEET TITLE:
LANDSCAPE
PLANTING
PLAN

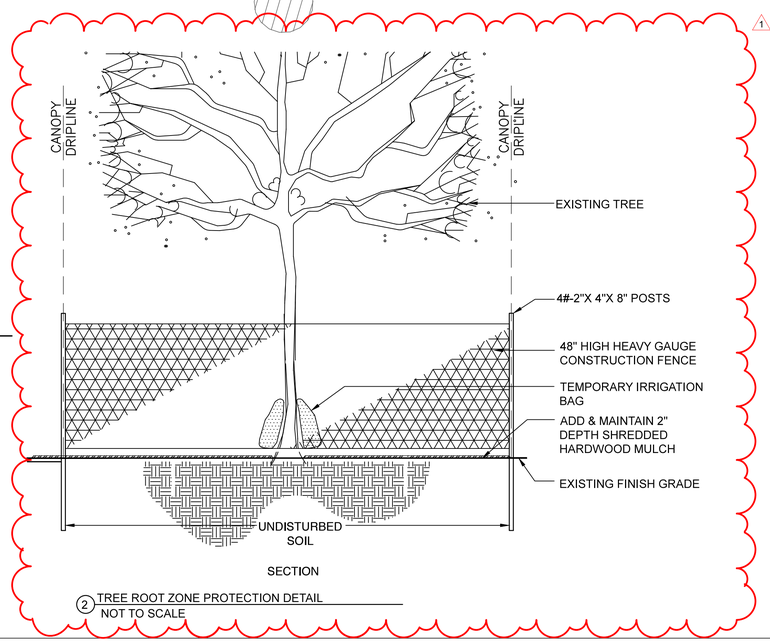
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GENERAL NOTES

1. COORDINATE NEW PLANTING AND RESTORATION WORK WITH TREE REMOVAL AND PROTECTION UNDER SPECIFICATION SECTION 015390.
2. REFER TO SPECIFICATION SECTION 329300 FOR PLANTING REQUIREMENTS.
3. REFER TO SPECIFICATION SECTION 329300 FOR TRANSPLANTING REQUIREMENTS.
4. TRANSPLANTED MATERIALS TO BE PLANTED UNDER WARRANTY. REPLACE ANY TRANSPLANTED MATERIALS



1 LANDSCAPE PREPARATION PLAN
1/4" = 1'-0"



2 TREE ROOT ZONE PROTECTION DETAIL
NOT TO SCALE

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PROJECT:
Kowsky Plaza Vaults
Battery Park City - North Cove

PROPERTY INFORMATION:

NOTES:

Rev No.	Description	Date

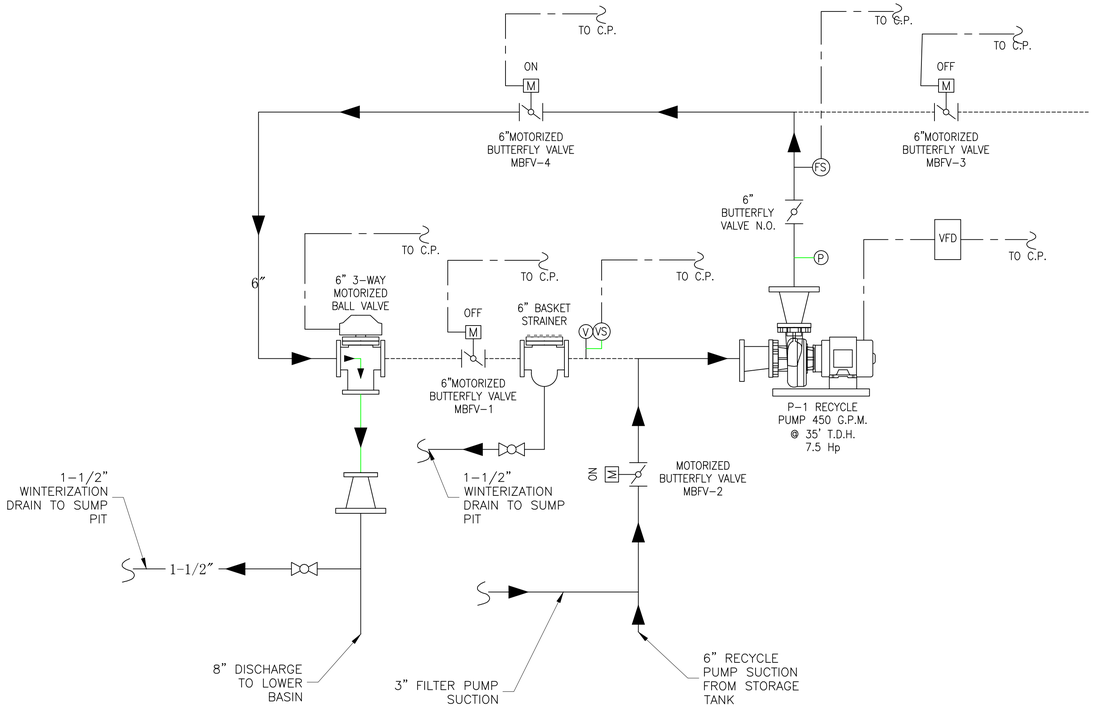
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REGISTERED LANDSCAPE ARCHITECT ELIZABETH J. KENNEDY 104-001449-01 STATE OF NEW YORK

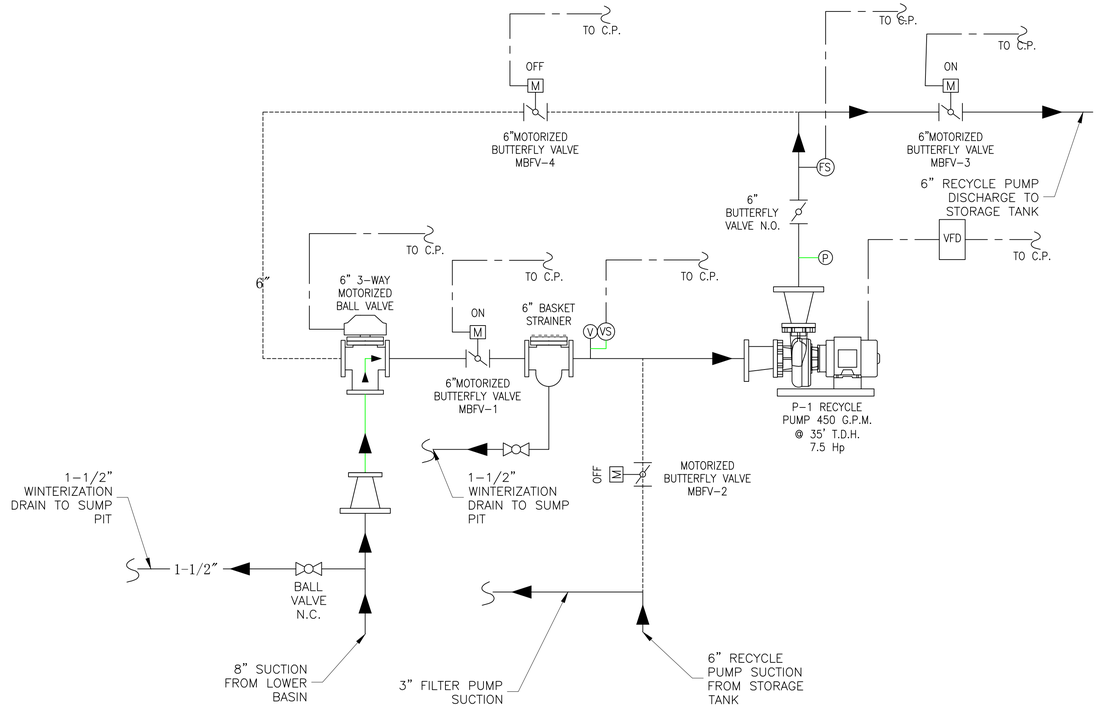
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DRAWN BY: GFF
CHECKED BY: EJK

SHEET TITLE:
LANDSCAPE RESTORATION PLAN

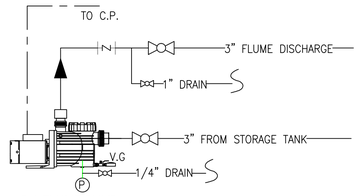
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BASIN FILL WHILE FLUME PUMP IS RUNNING

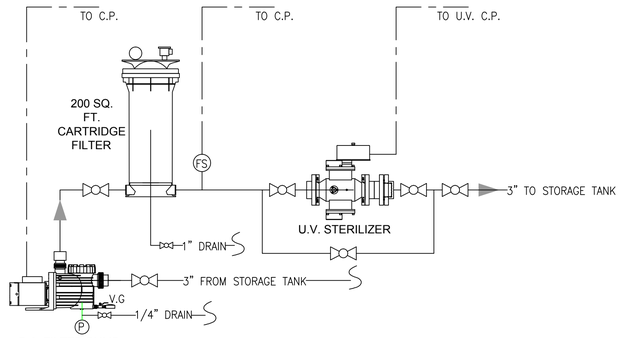


BASIN DRAIN WHILE FLUME PUMP IS OFF



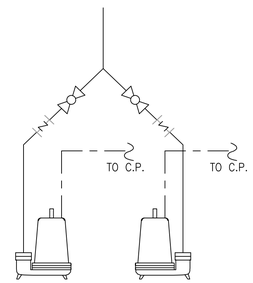
P-2 FLUME PUMP
2 Hp, 208V, 3Ø
110 G.P.M. @ 60'
T.D.H.

FLUME PUMP



P-3 FILTER PUMP
1 Hp, 120V, 1Ø
78 G.P.M.. @ 60'
T.D.H.

FILTER SYSTEM



P-4 SUMP PUMP
1/2 Hp, 120V, 1Ø
30 G.P.M. @ 20'

P-5SUMP PUMP
1/2 Hp, 120V, 1Ø
30 G.P.M. @ 20'

SUMP PUMPS

SYMBOL KEY

SYMBOL DESCRIPTION	SYMBOL
BALL VALVE	
BUTTERFLY VALVE	
ELECTRIC ACTUATOR BUTTERFLY VALVE	
CHECK VALVE	
REDUCER	
3 WAY BALL VALVE	
FLOW METER	
CHEMICAL FEED PUMP	
FEATURE/FILTER PUMP	
SKIMMER	
GAUGE PANEL	
U.V. SANITIZER	
SIGHTGLASS	
SAND FILTER	
PRESSURE GAUGE	PG
FLOW SENSOR	
SOLENOID VALVE	S
WATER FLOW ARROW	

PUMP SCHEDULE

TAG	FEATURE	MODEL NO.	MANUFACTURER	HP	VOLTAGE	ø	RPM	GPM	'T.D.H.	F.L.A.
P-1	RECYCLE PUMP	4AC	BELL & GOSSETT	7.5	208 V.	3	1750	450	35'	18.4
P-2	FLUME PUMP	WFK-8	PENTAIR	2	208 V.	3	3450	110	60'	7.1
P-3	FILTER PUMP	WFE-4	PENTAIR	1	120 V.	1	3450	78	60'	14.8
P-4	SUMP PIT	SP-50	BARNES	1/2	120 V.	1	3450	30	20'	10
P-5	SUMP PIT	SP-50	BARNES	1/2	120 V.	1	3450	30	20'	10

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NOTE:

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NOTE:

REFER TO FOUNTAIN STRUCTURAL DETAILS AND ARCHITECTURAL/HARDSCAPE PLANS FOR CONSTRUCTION INFORMATION, INCLUDING SLOPES, ELEVATIONS, FINISHES, FINAL EQUIPMENT LOCATIONS ETC. THAT ARE NOT SHOWN ON THESE PLANS.

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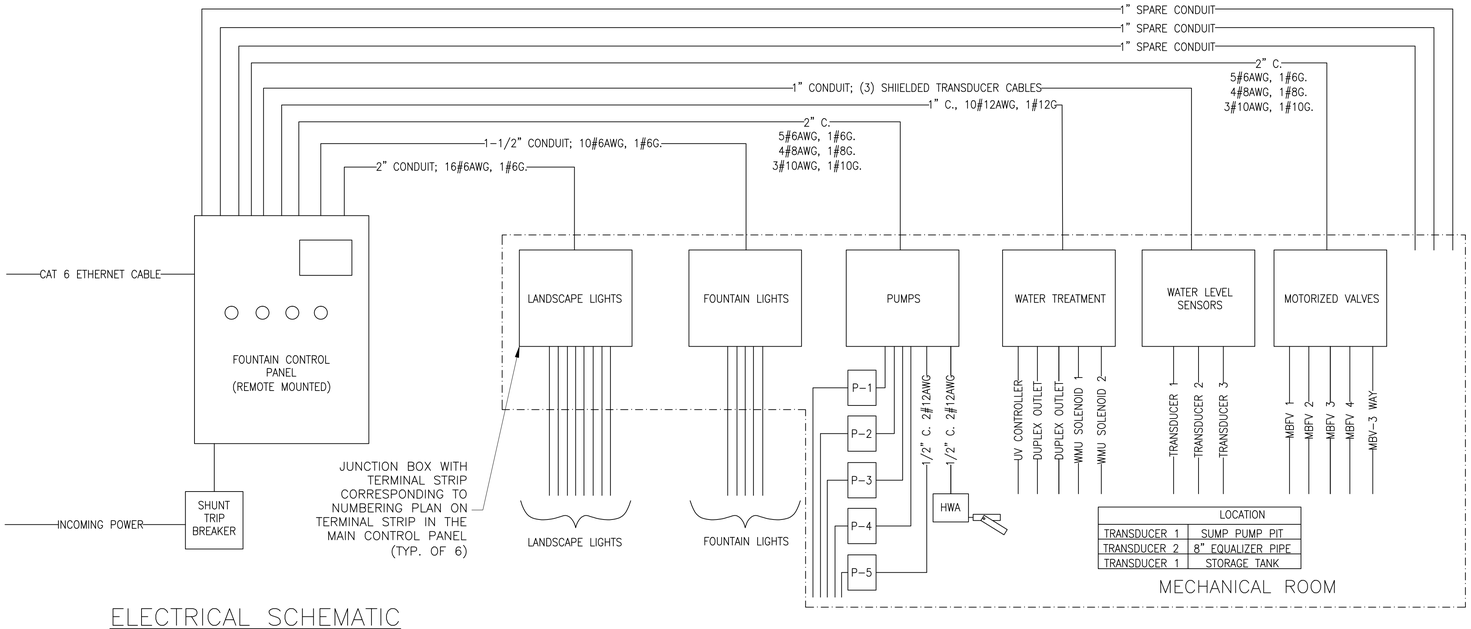
SHEET TITLE:
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DATE: 2015.08.26
DRAWN BY: JWT
CHECKED: DELTA

REVISIONS

PROJECT NUMBER	SHEET NUMBER
H2615	F1.00

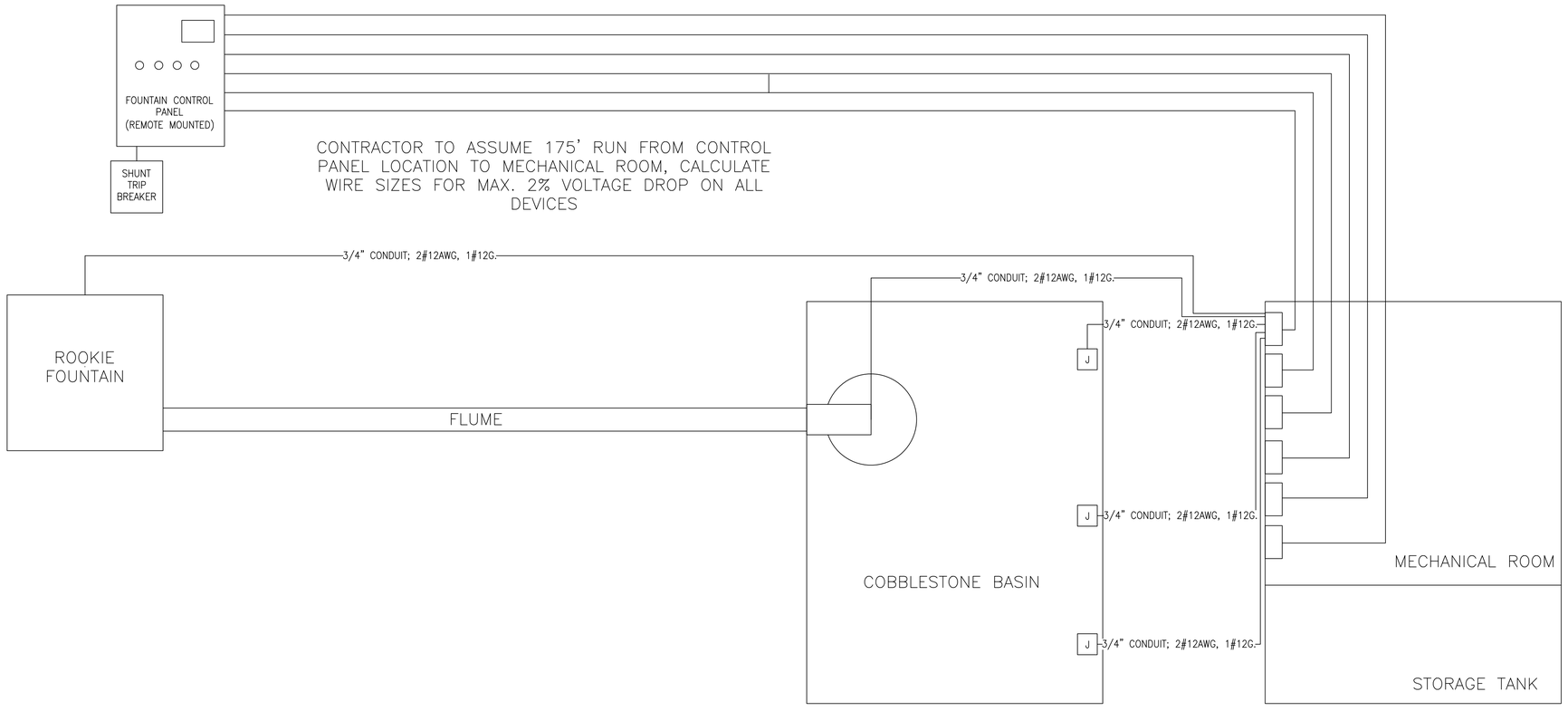
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ELECTRICAL SCHEMATIC

PUMP SCHEDULE

TAG	FEATURE	MODEL NO.	MANUFACTURER	HP	VOLTAGE	ø	RPM	GPM	'T.D.H.	F.L.A.
P-1	RECYCLE PUMP	4AC	BELL & GOSSETT	7.5	208 V.	3	1750	450	35'	18.4
P-2	FLUME PUMP	WFK-8	PENTAIR	2	208 V.	3	3450	110	60'	7.1
P-3	FILTER PUMP	WFE-4	PENTAIR	1	120 V.	1	3450	78	60'	14.8
P-4	SUMP PIT	SP-50	BARNES	1/2	120 V.	1	3450	30	20'	10
P-5	SUMP PIT	SP-50	BARNES	1/2	120 V.	1	3450	30	20'	10



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NOTE:

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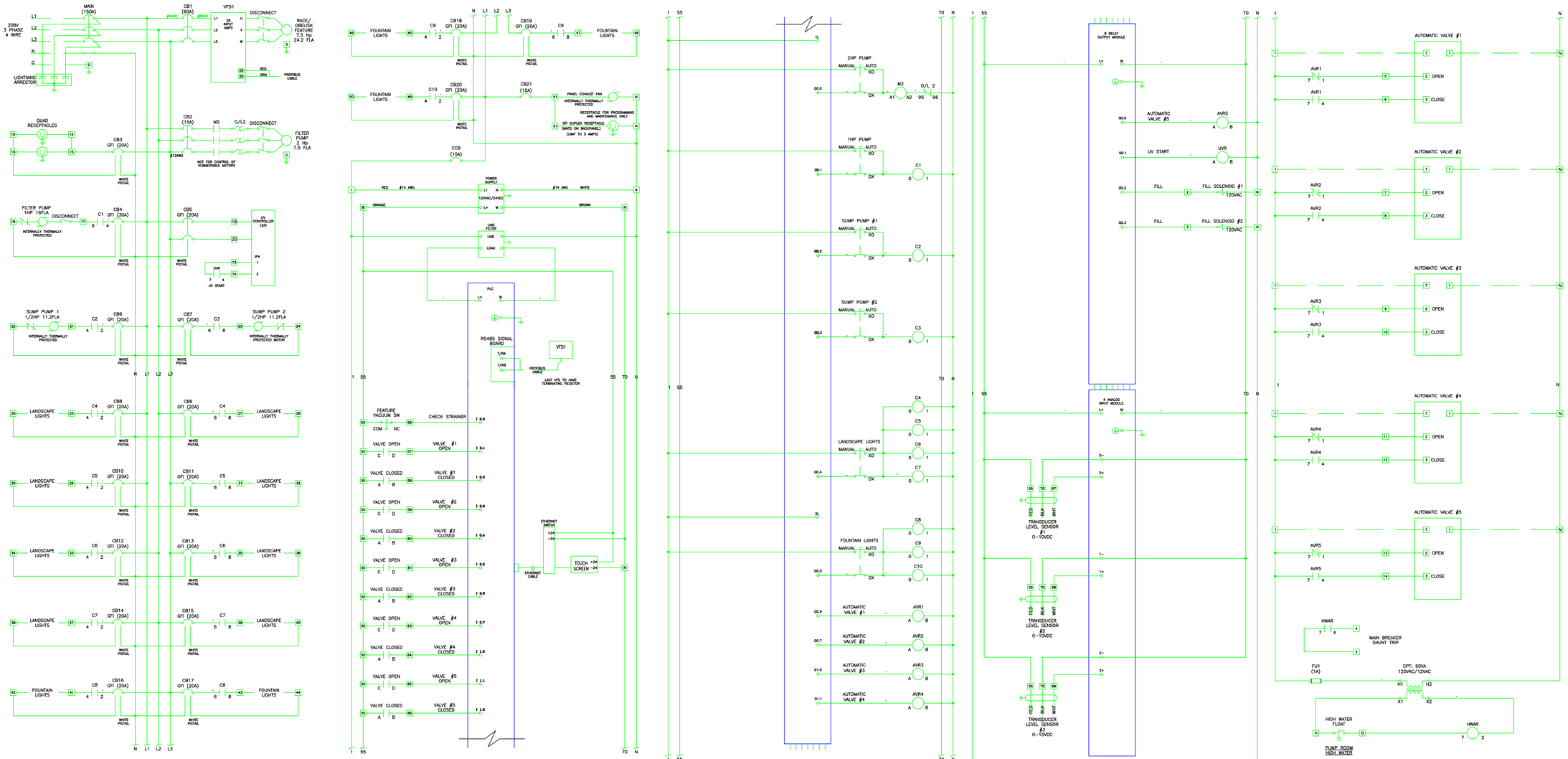
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SCHEMATIC

DATE: 2015.08.26
DRAWN BY: JWT
CHECKED: DELTA

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PROJECT NUMBER	SHEET NUMBER
H2615	F2.00

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NOTE:

ALL VOLTAGE DROP CALCULATIONS ASSUME 3%VD FROM CONTROL PANEL TO LOAD AND 2%VD FROM SERVICE TO CONTROL PANEL. ALL CONDUIT TO USE LONG RADIUS ELBOWS IN ALL TURNS.

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NEW YORK, NY

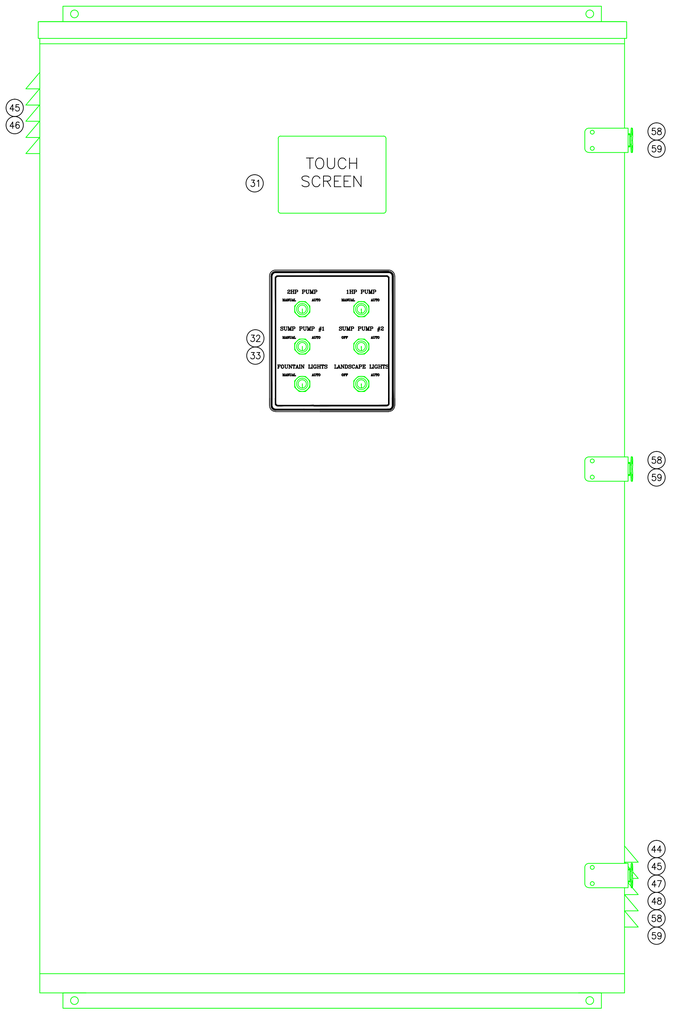
SHEET TITLE:
CONTROLS LADDER LOGIC DIAGRAM

DATE: 2015.08.26
DRAWN BY: JWT
CHECKED: DELTA

REVISIONS

PROJECT NUMBER	SHEET NUMBER
H2615	F3.00

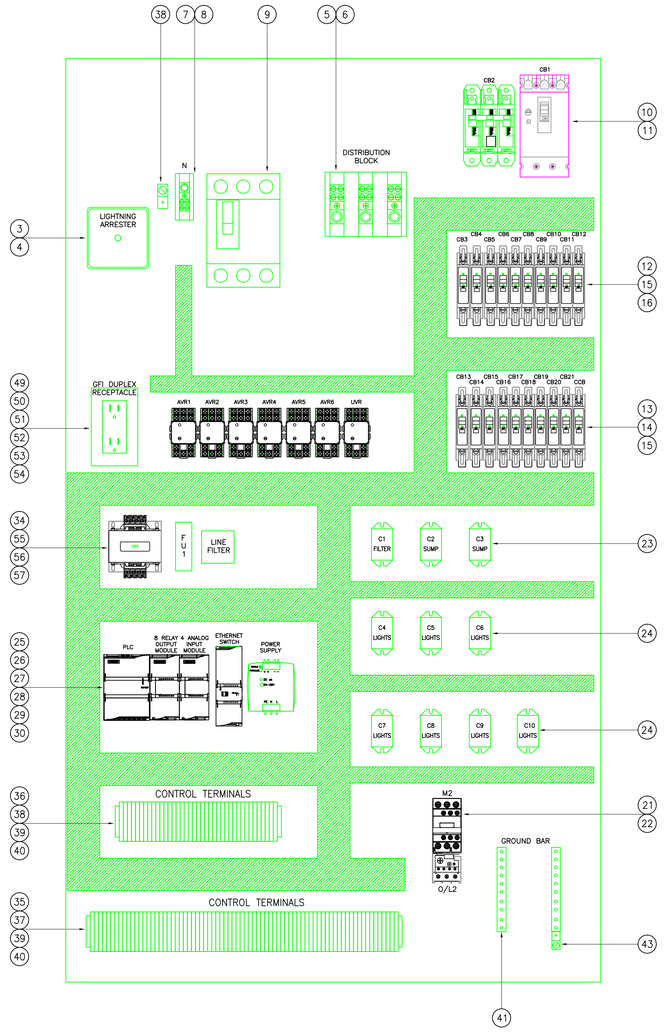
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① FRONT VIEW

NOTES: ENCLOSURE – NEMA 3R, 60"Hx36"Wx12"D, FABRICATED FROM GALVANIZED STEEL.

BACKPANEL – FABRICATED FROM COLD ROLLED STEEL, PAINTED WHITE.



② BACKPANEL LAYOUT

PROJECT	New York City Police Memorial	DATE	08/27/15
		JOB#	.

BILL OF MATERIAL

ITEM	PART NUMBER	MANUFACTURER	DESCRIPTION	QTY.
1	A60R3612HCR	Hoffman	Enclosure, N3R, Painted Steel	1
2	A60P36	Hoffman	Backpanel	1
3	SDSA3650	Square D	Lightning Arrester, 600V	1
4	QOSAMK	Square D	Lightning Arrester Bracket	1
5	9080 LBA363206	Square D	Distribution Block, 3P	1
6	9080 LB33	Square D	Distribution Block Cover, 3P	1
7	9080 LBA163104	Square D	Distribution Block, 1P	1
8	9080 LB31	Square D	Distribution Block Cover, 1P	1
9	QJ23B150L	Siemens	Circuit Breaker, 3P, 150A	1
10	ED43B060L	Siemens	Circuit Breaker, 3P, 60A	1
11	BQ3B015L	Siemens	Circuit Breaker, 3P, 15A	1
12	QCGF2020	Siemens	Circuit Breaker, 1P, 15A	1
13	QCR1015	Siemens	Circuit Breaker, 1P, 15A	2
14	QCR1020	Eaton	Circuit Breaker, 1P, 20A	1
15	QCGF1020	Eaton	GFI Circuit Breaker, 1P, 20A	17
16	QCGF1030	Eaton	GFI Circuit Breaker, 1P, 30A	1
17	AMCDIN1	Eaton	GFI Circuit Breaker Mounting Clip	18
18	6SE6440-2UC25-5CA1	Siemens	VFD, 208V, 7.5HP	1
19	6SE6400-0GP00-0CA0	Siemens	Gland Plate	1
20	6SE6400-0BP00-0AA1	Siemens	Basic Operator Panel	1
21	3RT2025-1AK60	Siemens	Contactor, IEC Rated 16A	1
22	3RU2126-1JB0	Siemens	Overload Relay, 3P, 7-10A	1
23	2XC22	WWG	Power Relay, 1PDT, 25A	3
24	2XC20	WWG	Power Relay, 2PDT, 25A	7
25	ML100.100	Puls	Power Supply, 120V/24VDC, 100W	1
26	6ES7214-1BG40-0XB0	Siemens	1200 PLC CPU	1
27	6ES7222-1HF30-0XB0	Siemens	8 Relay Output Relay Module	1
28	6ES7231-4HD30-0XB0	Siemens	4 Analog Input Relay Module	1
29	6ES7241-1CH30-1XB0	Siemens	RS485 Signal Board	1
30	6GK7277-1AA10-0AA0	Siemens	Ethernet Switch	1
31	6AV2124-0GC01-0AX0	Siemens	KTP 700 Comfort HMI	1
32	ZB4BG4	Square D	Selector Sw, 2 Pos, Keyed	6
33	ZB4BZ105	Square D	Contact Block, 1 N.O., 1 N.C.	6
34	E3MC3	Corcom	Line Filter	1
35	2004-1301	Wago	Terminal Block, 1P, Gray	76
36	2004-1304	Wago	Terminal Block, 1P, Blue	39
37	2004-1391	Wago	End Plate, Gray	1
38	2004-1392	Wago	End Plate, Orange	1
39	249-116	Wago	Terminal End Section	4
40	8WA746	Siemens	Angle Bracket	6
41	GBK10	Square D	Ground Bar	2
42	KA26U	Burndy	Ground Lug	1
43	KA2U	Burndy	Ground Lug	1
44	4WT42	WWG	Exhaust Fan	1
45	AVK66	Hoffman	Louver Kit	2
46	AFLT66	Hoffman	Filter Kit	1
47	3RP16	WWG	Fan Guard	1
48	3RP10	WWG	Cord Set	1
49	2x4	Steel City	Handy Box	1
50	ELE15-WH-L	ELE Manufacturing	GFI Duplex Receptacle	1
51	8501KU13M1P14V20	Square D	Relay, 3PDT, 120VAC	6
52	8501NR82	Square D	Relay Base	6
53	8501KP12P14V36	Square D	Relay, 2PDT, 12VAC	1
54	8501NR51	Square D	Relay Base	1
55	FNQ-R-1	Bussman	Fuse, 600V, 1 Amp	1
56	BC6031P	Bussman	Fuse Holder, 600V, 1 Pole	1
57	9070T50D13	Square D	Transformer, 50VA, 120/12VAC	1
58	LH-20119	Fab Tech	Wing Turn Catch	3
59	LH-20120	Fab Tech	Special Strike Wing	3
60	Soft Server	Siemens	Software	1

PRELIMINARY DESIGN
NOT FOR CONSTRUCTION

NOTE:

ALL VOLTAGE DROP CALCULATIONS ASSUME 3%VD FROM CONTROL PANEL TO LOAD AND 2%VD FROM SERVICE TO CONTROL PANEL. ALL CONDUIT TO USE LONG RADIUS ELBOWS IN ALL TURNS.

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NEW YORK CITY POLICE MEMORIAL
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SHEET TITLE:
CONTROLS LADDER LOGIC DIAGRAM

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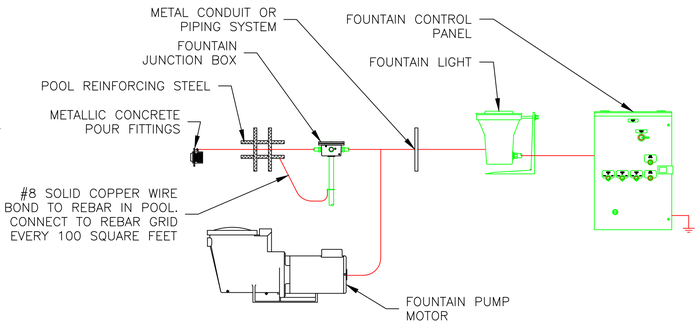
PROJECT NUMBER	SHEET NUMBER
H2615	F3.01

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GENERAL ELECTRICAL NOTES:

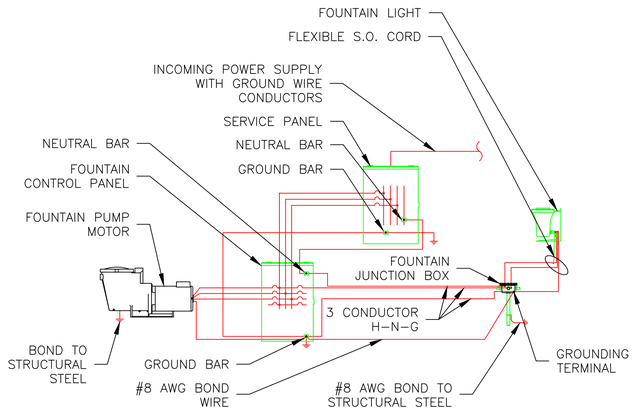
1. THE INSTALLATION OF ELECTRICAL EQUIPMENT AND WIRING IN WATER CAN PRODUCE EXTREME HAZARDS, IT IS THE RESPONSIBILITY OF THE INSTALLING ELECTRICAL CONTRACTOR TO CONSULT & COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE (NEC) PUBLISHED BY THE NATIONAL FIRE PROTECTION ASSOCIATION; QUINCY, MASSACHUSETTS AND SAFETY REGULATIONS PRIOR TO INSTALLATION OF ELECTRICAL EQUIPMENT. IN THE EVENT OF CONFLICTING REQUIREMENTS BETWEEN CONTRACT DOCUMENTS AND ANY LOCAL ELECTRIC CODE OR OTHER GOVERNING ORGANIZATIONS FOR THIS LOCATION, THE MOST STRINGENT SHALL GOVERN AND TAKE PRECEDENCE. IN THIS EVENT, THE ARCHITECT SHALL BE NOTIFIED IMMEDIATELY IN WRITING OF SUCH CONFLICT.
2. IT IS THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL FIELD DIMENSIONS CRITICAL TO FOUNTAIN EQUIPMENT INSTALLATION AND PERFORMANCE AND REPORT ANY DISCREPANCIES, IN WRITING, TO DELTA FOUNTAINS AND THE ENGINEER UPON IMMEDIATE NOTICE.
3. IT IS THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ALL ELECTRICAL EQUIPMENT IS INSTALLED AND WIRED BY A QUALIFIED, LICENSED ELECTRICIAN EXPERIENCED IN FOUNTAIN SYSTEM WIRING. DELTA FOUNTAINS ASSUMES NO RESPONSIBILITY OR LIABILITY WHATSOEVER FOR INSTALLATIONS NOT CARRIED OUT BY A QUALIFIED, LICENSED, ELECTRICIAN AND IN ACCORDANCE WITH OUR SHOP DRAWINGS, AND ALL PROVISIONS OF THE LATEST EDITION OF NEC IN GENERAL, ARTICLE 680 SPECIFICALLY, AND LOCAL SAFETY REGULATIONS. ALL DELTA FOUNTAINS ELECTRICAL CONTROL PANELS INCLUDE GFCI'S WHEN AND WHERE REQUIRED, WHEN FURNISHED.
4. A CLASS 'A' GROUND FAULT CIRCUIT INTERRUPTER (GFCI) MUST BE INSTALLED IN EACH BRANCH CIRCUIT SUPPLYING SUBMERSIBLE OR UNDERWATER FOUNTAIN EQUIPMENT. EQUIPMENT OPERATING AT 15 VOLTS OR LESS MUST BE PROTECTED BY SUITABLE TRANSFORMER U.L. LISTED AND MARKED FOR THE APPLICATION.
5. SUBMERSIBLE/UNDERWATER LIGHTING FIXTURES MUST BE INSTALLED FOR OPERATION AT 150 VOLTS LESS BETWEEN CONDUCTORS. SUBMERSIBLE PUMPS MUST OPERATE AT 300 VOLTS OR LESS BETWEEN CONDUCTORS.
6. WET/DRY LIGHTING FIXTURES MUST BE INSTALLED WITH THE TOP OF THE FIXTURE LENS BELOW THE GRATE AND MUST HAVE THE LENS ADEQUATELY GUARDED TO PREVENT CONTACT BY ANY PERSON.
7. SUBMERSIBLE LIGHTING FIXTURES MUST BE INSTALLED WITH THE TOP OF THE FIXTURE LENS A MINIMUM OF 2" BELOW THE NORMAL OPERATION WATER LEVEL AND MUST HAVE THE LENS ADEQUATELY GUARDED TO PREVENT CONTACT BY ANY PERSON.
8. ALL ELECTRICAL EQUIPMENT WHICH DEPENDS ON SUBMERSION FOR SAFE OPERATION MUST BE PROTECTED AGAINST OVERHEATING BY AN INDEPENDENT LOW WATER CUTOFF DEVICE IF THE WATER LEVEL DROPS BELOW NORMAL OPERATING LEVELS, OR CONTAIN AN INTERNAL THERMAL BIMETALLIC AMBIENT COMPENSATING OVERLOAD.
9. MAXIMUM LENGTH OF EXPOSED CORD IN FOUNTAIN IS LIMITED TO 9'. NO ADDITIONAL CORD OR SPLICES OTHER THAN THOSE MADE IN A WATERTIGHT JUNCTION BOX, ARE TO BE MADE IN THE FOUNTAIN. CORDS EXTENDING BEYOND FOUNTAIN PERIMETER MUST BE ENCLOSED IN APPROVED WIRING ENCLOSURES.
10. ALL SUBMERSIBLE LIGHTS AND PUMPS MUST HAVE SUFFICIENT CORD LENGTH TO ALLOW REMOVAL FROM THE WATER FOR RE-LAMPING AND NORMAL MAINTENANCE. FIXTURES CANNOT BE PERMANENTLY IMBEDDED IN THE FOUNTAIN STRUCTURE SO THAT THE WATER LEVEL MUST BE REDUCED OR THE FOUNTAIN DRAINED FOR RE-LAMPING, MAINTENANCE, OR INSPECTION.
11. SUBMERSIBLE EQUIPMENT MUST BE INHERENTLY STABLE OR BE SECURELY FASTENED IN PLACE WITH NON-CORROSIVE FASTENERS SUITABLE FOR THE PURPOSE.
12. UNDERWATER JUNCTION BOXES MUST BE FILLED WITH AN APPROVED RE-ENTERABLE ELECTRICAL POTTING COMPOUND (WAX OR PARAFFIN IS NOT ACCEPTABLE) PRIOR TO FILLING FOUNTAIN AND, AFTER ALL CIRCUITS HAVE BEEN CHECKED, TO PREVENT THE ENTRY OF MOISTURE, AND BE FIRMLY ATTACHED TO SUPPORTS OR DIRECTLY TO THE FOUNTAIN SURFACE AND BONDED AS REQUIRED. ALL CONDUIT STUBBED UP THROUGH THE FOUNTAIN FLOOR MUST BE STAINLESS STEEL. PVC, RED BRASS, AND EVERDUR ARE NOT ACCEPTABLE AS A CONDUIT SUPPORT STUB FOR SUBMERSIBLE JUNCTION BOXES. ALL CONDUIT ENTRIES MUST BE COMPLETELY SEALED PRIOR TO POTTING TO PREVENT COMPOUND FROM ENTERING CONDUIT SYSTEM. AFTER TESTING, JUNCTION BOXES SHALL BE SEALED WITH SCOTCH 3M RE-ENTERABLE COMPOUND OR OTHER APPROVED FILLING COMPOUND. CONFIRM POTTING COMPOUND HAS CURED BEFORE INSTALLING LID ON JUNCTION/DECK BOXES.
13. ALL ELECTRICAL CONDUIT AND CONDUIT FITTINGS BETWEEN SUBMERSIBLE LIGHT FIXTURE NICHES, JUNCTION BOXES AND CONTROL PANELS WILL BE U.L. LISTED RIGID, NONMETALLIC, PVC NEMA, TC-2 MAX. 90°C, SUNLIGHT RESISTANT FOR ABOVE AND BELOW GROUND USE. ALL CONDUITS SHALL BE PROTECTED AT ALL TIMES FROM POSSIBLE WATER INGRESS. USE ONLY APPROVED PRIMER AND PVC GLUE SUITABLE FOR JOINING ALL PVC CONDUITS AND FITTINGS PER MANUFACTURER'S INSTRUCTIONS.
14. ALL UNDERWATER JUNCTION BOXES MUST BE EQUIPPED WITH THREADED CONDUIT ENTRIES AND COMPRESSION TYPE CORD CONNECTORS FOR CORD ENTRY. STRAIN RELIEF CONNECTORS SERVING NICHE-MOUNTED UNDERWATER LIGHTS SHALL BE CAPABLE OF SEALING BOTH THE FIXTURE CORD AND AN AWG #8 BARE BONDING WIRE WHICH MAY BE REQUIRED BY SOME LOCAL CODES.
15. ALL ELECTRICAL EQUIPMENT MUST BE PROPERLY BONDED AND GROUNDED FOR SAFETY, PER THE LATEST NEC AND LOCAL CODE REQUIREMENTS. ALL BONDING LUGS SHALL BE PROVIDED BY INSTALLING ELECTRICAL CONTRACTOR. INSTALLING CONTRACTOR SHALL VERIFY ALL NECESSARY REQUIREMENTS OF LOCAL INSPECTOR BEFORE INSTALLING, AND NOTIFY DELTA FOUNTAINS OF ANY REQUIRED DEVIATIONS FROM SPECIFICATIONS OR PLANS AND NOTES, AND RESOLVE ALL CONFLICTS BEFORE INSTALLING EQUIPMENT. CONTRACTOR TO INSURE THAT ALL BONDING CODES ARE COMPLIED WITH FOR EACH METAL FOUNTAIN EQUIPMENT COMPONENT.
16. ALL CONDUIT CONNECTIONS BETWEEN DISSIMILAR METALS MUST BE MADE WITH DIELECTRIC FITTINGS, AND SEALED WITH DIELECTRIC THREAD COMPOUND TO PREVENT GALVANIC DEGRADATION.
17. THE INSTALLING ELECTRICAL CONTRACTOR WILL VERIFY THAT ALL ELECTRICAL EQUIPMENT GROUNDS WILL HAVE THE SAME REFERENCE POTENTIAL AND WILL GIVE EVIDENCE OF SUCH TO DELTA FOUNTAINS BEFORE ANY EQUIPMENT IS INITIALLY ENERGIZED.
18. THE INSTALLING CONTRACTOR SHALL SIZE ALL FEED-WIRES LEADING TO FOUNTAIN CONTROL PANEL FOR NO MORE THAN 2% VOLTAGE DROP, AND SHALL NOTIFY DELTA FOUNTAINS BEFORE THE CONTROL PANEL IS FABRICATED IF WIRE IS UPSIZED SUCH THAT EXTRA LARGE WIRE LUGS ARE REQUIRED. IT IS THE RESPONSIBILITY OF ELECTRICAL CONTRACTOR TO PROVIDE ANY DISCONNECT REQUIRED BY LOCAL CODE REQUIREMENTS.
19. THE FOUNTAIN CONTROL PANEL SHALL BE ADEQUATELY PROTECTED FROM DEBRIS AND STORED PROPERLY DURING CONSTRUCTION AND PRIOR TO INITIAL OPERATION AND SHALL BE VACUUMED CLEAN AND ALL SCREWS FOR TERMINAL CONNECTIONS TIGHTENED.
20. THE ELECTRICAL CONTRACTOR SHALL ENSURE THAT SUPPLY VOLTAGE IS WITHIN 5% OF DESIGN VOLTAGE WHEN ALL EQUIPMENT IS IN OPERATION AND SHALL RE-TAP TRANSFORMER, UP SIZE WIRE, OR SUPPLY A BUCK AND BOOST TRANSFORMER TO GET SUPPLY VOLTAGE TO NECESSARY LEVEL, IF NECESSARY.
21. ANY AND ALL COSTS ASSOCIATED WITH THE ABOVE ARE THE RESPONSIBILITY OF INSTALLING CONTRACTOR.
22. CONDUITS ENTERING FOUNTAIN SYSTEM CONTROL PANELS SHALL BE INSTALLED INTO BOTTOM OF ENCLOSURE IN THE EVENT WATER ENTERS CONDUIT AND FLOWS INTO PANEL THROUGH CONDUIT OPENINGS. A DRAIN OPENING MUST BE MADE IN BOTTOM OF ENCLOSURE PAN TO ALLOW DRAINAGE OF WATER FROM ENCLOSURE IN THE EVENT OF WATER INGRESS. DO NOT MOUNT CONTROL PANEL WHERE IRRIGATION NOZZLES WILL SPRAY DIRECTLY AT PANEL.
23. PULL CORRECT QUANTITY AND SIZE WIRES WITH SEPARATE GROUND THROUGH CONDUIT INTO JUNCTION BOX. MAKE ALL SPLICES AND CONNECTIONS TIGHT AND WELL INSULATED. CONNECT GROUND WIRE TO GROUND LUGS IN JUNCTION BOX. ALL WIRING AND CONDUIT SHALL BE SIZED BY THE ELECTRICAL CONTRACTOR IN ACCORDANCE WITH THE LATEST EDITION OF THE NEC AND ALL ELECTRICAL CODES AND REGULATIONS. WHERE WIRED CONDUIT SIZES ARE SPECIFIED ON THE DRAWINGS, THEY SHALL BE INTERPRETED AS MINIMUM ALLOWABLE SIZES. ALL CONDUCTORS SHALL BE COPPER WITH INSULATION SUITABLE FOR THE PARTICULAR WIRING LOCATION. MINIMUM ACCEPTABLE INSULATION TYPE IS THWN OR BETTER, SUITABLE FOR BOTH DRY AND WET LOCATIONS. CONDUCTOR INSULATION SHALL BE MOISTURE RESISTANT, FLAME RETARDANT THERMOPLASTIC AS APPROVED BY THE NEC. CONDUCTOR SIZING SHALL BE BASED ON AN AMBIENT TEMPERATURE OF 30 DEGREES CELSIUS AND A CONDUCTOR TEMPERATURE RATING OF 75 DEGREES CELSIUS MAX. PER ARTICLE 310 OF THE NEC. ALL UNDERWATER ELECTRICAL CABLE SHALL EITHER BE ENCASED IN WATERPROOF, SEALED PVC CONDUIT OR SHALL BE RATED FOR CONTINUOUS OPERATION IN UNDERWATER, MARINE ENVIRONMENTS.
24. INSERT EACH SUBMERSIBLE CORD THROUGH THE BRASS CORD SEALS PROVIDED ON THE JUNCTION BOX, AND TIGHTEN COMPLETELY.
25. DO NOT OPERATE SUBMERSIBLE LIGHTS OR PUMPS MORE THAN 10 SECONDS UNLESS COMPLETELY SUBMERGED OR DAMAGE WILL RESULT AND WARRANTIES WILL BE VOIDED.
26. ALL CONDUCTORS FOR FEEDERS WHICH EXCEED 200 FEET IN LENGTH SHALL BE INCREASED 1 TRADE SIZE AND INCREASED AN ADDITIONAL 1 TRADE SIZE FOR EACH ADDITIONAL 100 FEET OF FEEDER CABLE LENGTH.
27. THE INFORMATION SUPPLIED IN THESE DRAWINGS SPECIFIES THE GENERAL REQUIREMENTS OF A COMPLETE FUNCTIONING ELECTRICAL POWER DISTRIBUTION AND CONTROL SYSTEM. THE ELECTRICAL SUBCONTRACTOR SHALL COORDINATE ALL ELECTRICAL INSTALLATION ACTIVITIES WITH THE CONSTRUCTION MANAGER, GENERAL CONTRACTOR, ARCHITECT AND (WITH RESPECT TO WORK PHASE) OTHER SEPARATE CONTRACTORS PERFORMING WORK RELATED TO THE FOUNTAIN INSTALLATION.
28. ALL CONDUCTORS SHALL BE RUN IN RIGID CONDUIT SIZED FOR THE NUMBER OF WIRES CONTAINED WITHIN PER NEC REQUIREMENTS. RIGID CONDUIT SHALL BE CORROSION RESISTANT AND EITHER GALVANIZED STEEL OR RIGID PVC. WHEN CONDUIT IS SUBMERGED OR IN OTHER WET LOCATIONS, RIGID PVC SHALL BE REQUIRED. CONDUCTOR SIZING SHALL BE CORRECTED FOR THE NUMBER OF WIRES TO BE RUN IN A SINGLE CONDUIT OR RACEWAY IN ACCORDANCE WITH THE NEC. ALL CONDUIT LOCATIONS AND ROUTING SHALL BE APPROVED BY THE ARCHITECT BEFORE INSTALLATION.
29. THE WORK TO COMPLETE THE INSTALLATION OF THE FOUNTAIN INCLUDES SUCH NECESSARY MATERIAL AND DEVICES OF A MINOR NATURE THAT MAY NOT BE INDICATED ON THE DRAWINGS OR MENTIONED IN THE SPECIFICATIONS, BUT WHICH ARE NECESSARY FOR THE COMPLIANCE WITH CODES AND FOR THE SUCCESSFUL OPERATION OF THE FEATURE. THE CONTRACTOR SHALL BE ALLOWED NO EXTRA COMPENSATION BECAUSE OF THIS REQUIREMENT.
30. THOROUGHLY TEST ALL FIXTURES, SERVICES AND ALL CIRCUITS FOR PROPER OPERATING CONDITIONS AND FREEDOM FROM GROUNDS AND SHORT CIRCUITS BEFORE ACCEPTANCE IS REQUESTED. ALL EQUIPMENT, APPLIANCES AND DEVICES SHALL BE OPERATED UNDER LOAD CONDITIONS.
31. THERMAL OVERLOAD RELAYS SHALL BE SET AT NOT MORE THAN 115% OF MOTOR FULL LOAD CURRENT AND/OR IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.
32. ALL CONNECTIONS MUST BE RECHECKED BEFORE START UP AND ONE MONTH AFTER STARTUP BY A QUALIFIED TECHNICIAN.
33. ALL G.F.C.I. PROTECTED CIRCUITS MUST HAVE A SEPARATE NEUTRAL.
34. ALL G.F.C.I. BREAKERS HAVE PIGTAILS WIRED TO THE NEUTRAL BAR.
35. CONTRACTOR TO ENSURE THAT ALL BONDING CODES ARE COMPLIED WITH FOR EACH METAL FOUNTAIN EQUIPMENT COMPONENT.
36. WIRES FOR WATER LEVEL SENSOR MUST BE RUN IN A SEPARATE CONDUIT FROM THE FOUNTAIN TO THE CONTROL PANEL.
37. ALL CONDUIT PENETRATIONS THROUGH STRUCTURE WALLS INTO OPEN AREAS BELOW FOUNTAIN STRUCTURE MUST HAVE ALLOWANCES MADE FOR SETTLEMENT.
38. ALL CONDUIT INSTALLATION IN TRADE AREAS BELOW THE FOUNTAINS SHALL BE INSTALLED WITH E.M.T. AND IN THE LEVEL BELOW AND WITH E.M.T. STRAPS PER N.E.C. AND SPECIFICATIONS.
39. FLOOR MOUNTED CONTROL CENTERS AND TRANSFORMERS FOR FOUNTAIN RELATED EQUIPMENT SHALL BE INSTALLED ON A 4" CONCRETE HOUSEKEEPING PAD IF INSTALLED IN AN EQUIPMENT ROOM OR A PVC HOUSEKEEPING PAD IF INSTALLED IN A FIBERGLASS EQUIPMENT ROOM.
40. CONTRACTOR INSTALLING FOUNTAIN MANUFACTURER SUPPLIED DECK BOXES IN CONCRETE FOR FOUNTAIN NICHE LIGHTING IS TO ENSURE THAT ALL OPEN CONDUIT PORTS ARE PLUGGED AND ARE WATERTIGHT PRIOR TO SLAB POUR AROUND DECK BOXES.
41. ALL PENETRATIONS THROUGH OUTSIDE WALLS TO BELOW GRADE SHALL BE SEALED PER BUILDING SPECIFICATIONS. USING "EASY-LINK SEALS" IS RECOMMENDED.
42. ALL CONNECTIONS IN THE FOUNTAIN SHALL BE MADE WITH THE ASSISTANCE OF A PLUMBER, USING TEFLON TAPE OR TEFLON PASTE TO ELIMINATE ALL LEAKS. USE ONLY TAPERED (N.P.T.) BRASS OR STAINLESS STEEL FITTINGS OR NIPPLES. THE USE OF GALVANIZED, PVC OR BLACK STEEL IS UNACCEPTABLE.
43. CONDUITS ARE DRAWN FOR CLARITY AND DO NOT NECESSARILY SHOW EXACT ROUTING. CONTRACTOR SHALL INSTALL CONDUITS IN COMPLIANCE WITH NEC CODE, WHICH THERE SHALL BE NO MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360 DEGREES TOTAL) BETWEEN PULL POINTS, E.G., CONDUIT BODIES AND BOXES.
44. CONTRACTOR SHALL OBTAIN ALL NECESSARY INSTALLATION PERMITS AND INSPECTIONS.
45. ALL COMPONENT ITEMS USED IN THE PRODUCTION OF DELTA FOUNTAINS' PRODUCTS ARE U.L. LISTED WHENEVER SUCH LABELING IS AVAILABLE FROM THE SOURCE EQUIPMENT OR MATERIAL.
46. SHOULD ANY PRODUCT REQUIRE A 'THIRD PARTY' LABEL OR CERTIFICATION AS AN ASSEMBLY (E.G., N.E.C., U.L. OR E.T.L. LISTING) SUCH REQUIREMENTS SHALL BE DETERMINED, CONTRACTED FOR, AND PAID BY OTHERS.
47. DELTA FOUNTAINS SHALL NOT BE RESPONSIBLE OR LIABLE IN ANY MANNER WHATSOEVER FOR SPECIAL LABELING OR CERTIFICATION REQUIREMENTS, INCLUDING THIRD PARTY PRODUCT TESTING UNLESS SPECIFICALLY INCLUDED IN ITS PROPOSALS, QUOTATIONS, DRAWING DESCRIPTIONS AND DETAILS, REGARDLESS OF PROJECT SPECIFICATION OR CODE REQUIREMENTS.

1. ALL METAL PARTS WITHIN 5 FEET OF THE INSIDE WALLS OF FOUNTAIN AND ALL METAL PARTS OF ASSOCIATED ELECTRICAL EQUIPMENT MUST BE BONDED TOGETHER PER NEC 680.
2. ALL BONDING CONDUCTORS SHALL BE BARE #8 SOLID COPPER.
3. ALL BONDING SHALL BE CONTINUOUS WITHOUT SPLICES. ALL CONNECTIONS SHALL BE MADE BY EXOTHERMIC WELD OR FITTING APPROVED FOR SUCH USE IN FOUNTAINS AND POOLS.
4. IF EXPOXY COATED REBAR IS SPECIFIED THE CONTRACTOR MUST USE A #8 SOLID COPPER WIRE GRID FOR BONDING IN THE CONCRETE OF ALL AREAS CONTAINING WATER OR COMING IN CONTACT WITH WATER IN THE FOUNTAIN. CONTRACTOR TO CONFORM TO NEC AND LOCAL JURISDICTIONAL CODE REQUIREMENTS FOR THE BONDING.



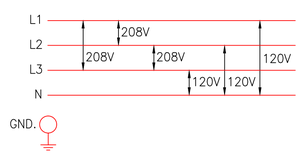
1 F3.00 TYPICAL FOUNTAIN "BONDING" SCHEMATIC NTS

1. ALL METAL PARTS WITHIN 5 FEET OF THE INSIDE WALLS OF FOUNTAIN AND ALL METAL PARTS OF ASSOCIATED ELECTRICAL EQUIPMENT MUST BE BONDED TOGETHER PER NEC 680 (SEE BONDING SCHEMATIC ABOVE).



2 F3.00 TYPICAL FOUNTAIN "GROUNDING" SCHEMATIC NTS

CONTROL SYSTEM POWER REQUIREMENT:
120/208 VOLT, THREE PHASE, 4-WIRE + GND.



3 F3.00 ELECTRICAL POWER SUPPLY OPTIONS NTS

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NEW YORK CITY POLICE MEMORIAL
NEW YORK, NY

SHEET TITLE:
POWER SUPPLY & BONDING DETAILS

DATE: 2015.08.26
DRAWN BY: JWT
CHECKED: DELTA

REVISIONS
1

PROJECT NUMBER	SHEET NUMBER
H2615	F3.10

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GENERAL NOTES

1. FINAL NOZZLE INSTALLATION AND ADJUSTMENT FOR POSITIONING AND THROTTLING TO ACHIEVED SPECIFIED PERFORMANCES FOR ALL DISPLAY DISCHARGE POINTS TO BE PERFORMED BY INSTALLING CONTRACTOR.
2. THE EQUIPMENT ROOM LOCATION IS SHOWN IN GENERAL VICINITY ONLY. VERIFY WITH THE ARCHITECTURAL DRAWINGS FOR THE EXACT LOCATION OF THE EQUIPMENT ROOM AND PROPER ELEVATION.
3. PIPE ROUTING ON THE DRAWINGS IS DIAGRAMMATIC AND IN SOME INSTANCES EXAGGERATED FOR CLARITY. THE CONTRACTOR SHALL DETERMINE THE EXACT ROUTING AT THE SITE TO AVOID CONFLICT WITH SITE CONDITIONS. ANY ROUTING WHICH CREATES A TRAPPED CONDITION IN THE PIPING MUST BE CALLED TO THE ATTENTION OF THE FOUNTAIN CONSULTANT BEFORE THE PIPE IS INSTALLED.
4. ALL PIPING SHALL BE INSTALLED TO PREVENT FREEZING. SYSTEM TO BE DRAINED AND WINTERIZED DURING WINTER MONTHS IF FOUNTAIN IS NOT IN OPERATION.
5. ALL PIPING BETWEEN THE WATER FEATURES AND EQUIPMENT ROOM SHALL BE INSTALLED SLOPED TOWARD THE EQUIPMENT ROOM A MINIMUM OF 2% UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
6. THE WORK TO COMPLETE THE INSTALLATION OF THE FOUNTAIN INCLUDES SUCH NECESSARY MATERIAL AND DEVICES OF A MINOR NATURE THAT MAY NOT BE INDICATED ON THE DRAWINGS OR MENTIONED IN THE SPECIFICATIONS, BUT WHICH ARE NECESSARY FOR THE COMPLIANCE WITH CODES AND FOR THE SUCCESSFUL OPERATION OF THE FEATURE. THE CONTRACTOR SHALL BE ALLOWED NO EXTRA COMPENSATION BECAUSE OF THIS REQUIREMENT.
7. THOROUGHLY TEST ALL FIXTURES, SERVICES AND ALL CIRCUITS FOR PROPER OPERATING CONDITIONS AND FREEDOM FROM GROUNDS AND SHORT CIRCUITS BEFORE ACCEPTANCE IS REQUESTED. ALL EQUIPMENT, APPLIANCES AND DEVICES SHALL BE OPERATED UNDER LOAD CONDITIONS.
8. CONTRACTOR SHALL ENSURE THAT INSTALLATION COMPLIES WITH ALL APPLICABLE NATIONAL, LOCAL CODES AND INTERNATIONAL CODES AND PROJECT SPECIFICATIONS.
9. PRIOR TO ANY FINISHING MATERIALS (I.E. LIGHTS, JETS, COVER PLATES ETC.) BEING INSTALLED, ALL FOUNTAINS SHALL BE TESTED FOR LEAKS FOR A MINIMUM OF 72 HOURS AND ALL WATERPROOFING AND TILE WORK SHALL BE COMPLETED.
10. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
11. CONSULT ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR ADDITIONAL DETAILS NOT SHOWN ON THESE DRAWINGS.
12. WHERE APPLICABLE, ALL WEIRS SHALL BE INSTALLED WITH AN ACCURACY OF "+" OR "–" 1/16" OVER THE ENTIRE WEIR LENGTH. UNLESS OTHERWISE NOTED, REFER TO THE ARCHITECTURE DRAWINGS FOR WEIR DETAILS.
13. CONTRACTOR SHALL PROVIDE ALL CONCRETE WORK AS REQUIRED BY ALL MECHANICAL AND ELECTRICAL FOUNTAIN EQUIPMENT REQUIREMENTS INCLUDING, BUT NOT LIMITED TO, HOUSEKEEPING PADS, LOCK–DOWN SLABS, AND THRUST BLOCKS WHERE INDICATED.
14. CONTRACTOR SHALL PROVIDE ALL UTILITIES SUCH AS POWER SUPPLIES, WATER SUPPLIES, AND SEWER CONNECTIONS UNDER THE BUILDING CONTRACT UP TO THE FOUNTAIN CONTROLS, EQUIPMENT AND/OR FOUNTAIN FITTINGS WHERE INDICATED.
15. CONTRACTOR SHALL PROVIDE AND IS RESPONSIBLE FOR ALL ELEVATION AND X–Y COORDINATES RELATING TO ALL FOUNTAIN EQUIPMENT INCLUDING VAULTS, FOUNTAIN FLOORS, AND PUMPS.
16. CONTRACTOR/INSTALLER IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL DIMENSIONS AT JOBSITE. DELTA FOUNTAINS IS NOT RESPONSIBLE FOR CONSTRUCTION/INSTALLATION MEANS, METHODS, TECHNIQUES, SEQUENCES, STEPS, OR PROCEDURES, OR FOR ANY SAFETY REQUIREMENTS, CODES, PRECAUTIONS, RULES, REGULATIONS, OR PROGRAMS PERTAINING TO THE CONSTRUCTION PROJECT, INCLUDING, BUT NOT LIMITED TO OSHA CONFINED SPACE REQUIREMENTS FOR EQUIPMENT ROOMS.
17. ALL COMPONENT ITEMS USED IN THE PRODUCTION OF OUR PRODUCTS ARE U.L. LISTED WHENEVER SUCH LABELING IS AVAILABLE FROM THE SOURCE EQUIPMENT OR MATERIAL.
18. SHOULD ANY PRODUCT REQUIRE A "THIRD PARTY" LABEL OR CERTIFICATION AS AN ASSEMBLY (E.G., N.E.C., U.L. OR E.T.L. LISTING) SUCH REQUIREMENTS SHALL BE DETERMINED, CONTRACTED FOR, AND PAID BY OTHERS.
19. DELTA FOUNTAINS SHALL NOT BE RESPONSIBLE OR LIABLE IN ANY MANNER WHATSOEVER FOR SPECIAL LABELING OR CERTIFICATION REQUIREMENTS, INCLUDING THIRD PARTY PRODUCT TESTING UNLESS SPECIFICALLY INCLUDED IN ITS PROPOSALS, QUOTATIONS, DRAWING DESCRIPTIONS AND DETAILS, REGARDLESS OF PROJECT SPECIFICATION OR CODE REQUIREMENTS.
20. EQUIPMENT MANUFACTURED, SUPPLIED AND OTHERWISE FURNISHED BY DELTA FOUNTAINS IS PRIMARILY DESIGNED FOR EMBEDMENT OR CASTING DIRECTLY INTO CONCRETE OR GUNITE STRUCTURAL MATERIAL. IT IS NOT DESIGNED FOR NATURAL OR SYNTHETIC LINER OR MEMBRANE INSTALLATION INCLUDING FIBERGLASS OR METAL LINERS, SHELLS, COVERS, OR CLADDING. ANY SUCH REQUIREMENT FOR LINER OR MEMBRANE INSTALLATION OR ADAPTATION IS THE RESPONSIBILITY OF THE SPECIFIER, PURCHASER AND INSTALLER, INCLUDING BUT NOT LIMITED TO FLANGES, CLAMPING DEVICES, GASKETS, FASTENING DEVICES, COATINGS, ADHESIVES OR BONDING AGENTS.
21. FATAL SUCTION ENTRAPMENT CAN OCCUR IF FOUNTAIN MECHANICAL EQUIPMENT AND PIPING IS NOT INSTALLED CORRECTLY AS SHOWN. ANTI–VORTEX PLATES MUST BE SECURELY FASTENED TO SUMPS AND/OR FOUNTAIN FLOOR USING SUITABLE VANDAL RESISTANT SAFETY FASTENERS AND ANCHORS AT ALL TIMES DURING OPERATION OF FOUNTAIN SYSTEM.
22. NOTWITHSTANDING THE CONTRACT DOCUMENTS, INCLUDING ARCHITECT'S FINAL "FOR CONSTRUCTION" PLANS AND SPECIFICATION DATA, THE FOUNTAIN SYSTEM MUST BE INSTALLED IN ACCORDANCE WITH DELTA FOUNTAINS FINAL AND APPROVED SET OF SHOP/INSTALLATION DRAWINGS AND DETAILS OR FOUNTAIN PRODUCT WARRANTY AND SYSTEM PERFORMANCE GUARANTEE IS VOID.
23. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED MEASUREMENTS.
24. DELTA FOUNTAINS RECOMMENDS ALL FOUNTAINS BE PROPERLY WATERPROOFED BY SPECIFIED APPROVED MEANS AND ALL FOUNTAIN COMPONENTS BE PROPERLY SEALED WITH A SUITABLE WATERPROOF CAULKING COMPOUND TO ENSURE A WATERTIGHT FOUNTAIN INSTALLATION.
25. ANY WATERPROOFING DETAILS OR SPECIFICATIONS THAT MAY APPEAR ON DELTA FOUNTAINS PLANS OR EQUIPMENT DETAILS ARE FOR GENERAL REFERENCE ONLY AND SHALL NOT BE INTERPRETED OR RELIED UPON AS A FORMAL SPECIFICATION OR RECOMMENDATION. CONVERSELY, THE ABSENCE OF WATERPROOFING DETAILS OR SPECIFICATION ON DELTA FOUNTAINS PLANS, DETAILS OR PRODUCT SHEETS DO NOT IMPLY THAT WATERPROOFING IS NOT A PROJECT REQUIREMENT.
26. IT IS THE RESPONSIBILITY OF THE PROJECT ARCHITECT/ENGINEER TO SPECIFY ANY AND ALL WATERPROOFING REQUIREMENTS, PRODUCTS, INSTALLATION/APPLICATION MEANS, PROCEDURES, AND OTHER DETAILS AS MAY BE NECESSARY AND REQUIRED FOR THE FOUNTAIN STRUCTURE AND FOUNTAIN COMPONENTS.
27. IT IS THE RESPONSIBILITY OF THE WATERPROOFING CONTRACTOR TO REVIEW THE PROJECT SPECIFICATIONS FOR WATERPROOFING REQUIREMENTS FOR THE FOUNTAIN AND RELATED COMPONENTS AND PROVIDE THE SPECIFIED WATERPROOFING SYSTEMS TO ENSURE WATERPROOF INTEGRITY OF THE FOUNTAIN SYSTEM.
28. IT IS THE RESPONSIBILITY OF THE FOUNTAIN EQUIPMENT INSTALLER TO COORDINATE ALL WATERPROOFING MATERIALS, SYSTEMS, APPLICATIONS, PROCEDURES, MEANS AND METHODS WITH THE WATERPROOFING CONTRACTOR, IN STRICT ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
29. DELTA FOUNTAINS ASSUMES NO RESPONSIBILITY OR LIABILITY WHATSOEVER FOR ANY WATERPROOFING ISSUES RELATED TO ITS DESIGN PACKAGE, SCOPE OF WORK, OR EQUIPMENT SUPPLY UNDER ANY CIRCUMSTANCES. IF THE FOUNTAINS CONTRACTOR/WATERPROOFER HAS QUESTIONS PERTAINING TO WATERPROOFING, THEY SHALL BE DIRECTED TO THE PROJECT ARCHITECT/ENGINEER WHO IS SOLELY RESPONSIBLE FOR SUCH MATTERS.
30. ALL FOUNTAIN SYSTEM EQUIPMENT AND COMPONENTS FURNISHED BY DELTA FOUNTAINS IS DESIGNED AND MANUFACTURED FOR USE IN FRESH WATER APPLICATIONS ONLY. DO NOT INSTALL OR OPERATE ANY EQUIPMENT IN SALT, BRINE, OR BRACKISH WATER OF ANY KIND OR WARRANTY IS VOID.
31. DUE TO OUR CONTINUING PRODUCT IMPROVEMENT, DELTA FOUNTAINS RESERVES THE RIGHT TO CHANGE PRODUCT AND SYSTEM SPECIFICATIONS WITHOUT NOTICE.
32. DELTA FOUNTAINS SHALL NOT BE RESPONSIBLE OR LIABLE FOR ANY CIVIL OR STRUCTURAL DESIGN DRAWINGS, DETAILS, NOTATIONS, OR ANY OTHER ASPECTS OF THE PROJECT REGARDING FOUNTAIN LAYOUT, STRUCTURE OR CONSTRUCTION/BUILDING PRACTICES, INCLUDING, BUT NOT LIMITED TO, SOIL INTEGRITY, CONCRETE DESIGN, SPECIFICATIONS, AND SLAB POUR METHODS, CONCRETE STRUCTURAL WATERPROOFING SPECIFICATIONS, MATERIALS, AND METHODS, ETC. UNLESS OTHERWISE SPECIFICALLY STATED.
33. ANY STRUCTURE DEPICTED OR APPEARING ON OUR PLANS SHALL BE SHOWN SOLELY FOR DIMENSIONAL REFERENCE AND GENERAL STRUCTURAL ORIENTATION IN ORDER TO ADEQUATELY IDENTIFY, COORDINATE, ORIENT, LOCATE AND INSTALL OUR EQUIPMENT PACKAGE, AND SHALL NOT BE RELIED ON FOR ANY OTHER PURPOSES.
34. CLIENT IS ADVISED TO ENLIST THE SERVICES OF A LICENSED PROFESSIONAL ENGINEER FAMILIAR AND EXPERIENCED WITH SUCH WORK WHEN DESIGNING/CONSTRUCTING ANY FOUNTAIN OR EQUIPMENT ROOM STRUCTURE, WHO SHALL ACCEPT COMPLETE RESPONSIBILITY AND LIABILITY FOR ALL STRUCTURAL, GEOTECHNICAL, AND CIVIL ENGINEERING DETAILS PERTAINING TO THE PROJECT.
35. CONTRACTOR IS ADVISED TO ENLIST THE SERVICES OF A LICENSED PROFESSIONAL LANDSCAPE ARCHITECT TO COORDINATE LANDSCAPE, HARDSCAPE, AND TOPOGRAPHICAL ENVIRONMENT SURROUNDING THE FOUNTAIN AREA SO THAT PROPER PLANT MATERIAL AND GROUND COVER IS SPECIFIED TO ENSURE EXCESS DEBRIS WILL BE KEPT AWAY FROM, AND OUT OF THE FOUNTAIN SYSTEM. PROPER SLOPE OF GRADE IS MANDATORY TO KEEP RAIN WATER AND IRRIGATION WATER FROM ENTERING INTO THE FOUNTAIN BASIN AND EQUIPMENT ROOM OR ENCLOSURE.
36. REFER TO MECHANICAL AND ELECTRICAL NOTES ON DRAWINGS FOR FURTHER INFORMATION.
37. THE EQUIPMENT VAULT IS PRE–WIRED AT THE FACTORY FOR TESTING PURPOSES. IN THE EVENT THE LOCAL AUTHORITY, HAVING JURISDICTION OVER THE INSTALLATION OF THE VAULT AND FINAL PASS/FAIL INSPECTION, REQUIRES ANY MODIFICATIONS TO THE CONDUIT OR WIRING AS INSTALLED, THE CONTRACTOR WILL BE RESPONSIBLE FOR MAKING THE CHANGES OR MODIFICATIONS AS REQUIRED TO CONFORM TO ALL LOCAL CODES.

PRESSURE TESTING

1. PERFORM TESTS IN THE PRESENCE OF THE OWNER, ARCHITECT, OR AUTHORIZED REPRESENTATIVE FOR DESIGNATED DURATION WITH NO PRESSURE LOSS OR NOTICEABLE LEAKS.
2. DO NOT INCLUDE EQUIPMENT IN TESTS WHICH COULD BE DAMAGED BY HIGH PRESSURE.
3. FLUSH OUT ALL PIPES WITH CLEAN WATER PRIOR TO PERFORMING LEAK TESTS.
4. PERFORM TESTS AS FOLLOWS:

SYSTEM	TEST PRESSURE	MEDIUM	DURATION
WATER	150 % OF OPERATING PRESSURE	WATER	8 HOURS
DRAINAGE	10FT. OVER HIGHEST PIPE INVERT	WATER	24 HOURS

5. AUTOMATIC MAKE–UP WATER SYSTEMS SHALL BE THOROUGHLY TESTED AND OPERATIVE AT THE TIME OF FINAL OBSERVATION.
6. AFTER THE SYSTEM HAS OPERATED FOR ONE WEEK, CONTRACTOR AND OWNER'S REPRESENTATIVE SHALL INSPECT WATER MAKE–UP RATES AND AGREE THAT WATER USAGE IS APPROPRIATE FOR A SYSTEM OF THIS TYPE, ARE WITHIN LOCAL ORDINANCES OR CODES, AND THAT SUCH RATES ARE NOT INDICATIVE OF EXCESSIVE LEAKAGE FROM SYSTEM. A WATER METER SHALL BE PLACED ON THE FILL LINE FOR THIS PURPOSE, IF NECESSARY TO DOCUMENT PRECISE WATER USAGE.

GENERAL PIPING NOTES

1. IT IS THE INSTALLING CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL FIELD DIMENSIONS CRITICAL TO FOUNTAIN EQUIPMENT INSTALLATION AND PERFORMANCE AND REPORT ANY DISCREPANCIES, IN WRITING TO DELTA FOUNTAINS AND THE ARCHITECT UPON DISCOVERY. REFER TO SPECIFICATION SECTION 3.1 "EXAMINATION" FOR FURTHER INSTRUCTION AND CLARIFICATION.
2. IT IS THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR TO CHECK AND COMPLY WITH ALL APPLICABLE NATIONAL AND LOCAL PLUMBING CODES PRIOR TO INSTALLATION OF EQUIPMENT. LOCAL CODES TAKE PRECEDENCE OVER GENERAL NOTES WHERE DISCREPANCIES OR CONFLICTS EXIST.
3. ALL FOUNTAIN PIPING PENETRATIONS THROUGH ANY CONCRETE WALL OR FLOOR MUST BE MADE WITH STAINLESS STEEL PIPE APPROPRIATE FOR THE APPLICATION, AND MUST BE FLASHED OR FITTED WITH A WATERSTOP FLANGE TO PREVENT LEAKAGE. FOR PIPE PENETRATIONS OVER 4" PIPE SIZE USE BACK TO BACK P.V.C. FLANGES WITH STAINLESS STEEL BOLTS AND HARDWARE FOR WATERSTOP.
4. INTERCONNECTING PIPING AND FITTINGS INSIDE EQUIPMENT ROOM IS SCHEDULE 80 P.V.C.
5. INTERCONNECTING PIPING AND FITTINGS BETWEEN THE FEATURE AND EQUIPMENT ROOM IS SCHEDULE 80 P.V.C. OR COPPER AS SUITABLE FOR THE WORKING PRESSURE OF THE SYSTEM SPECIFICATION REQUIREMENTS AND LOCAL CODES. IF STEEL OR CAST IRON PIPING IS SPECIFIED, IT MUST HAVE HOT–DIPPED GALVANIZED OR COAL TAR EPOXY COATING. REFER TO PROJECT SPECIFICATIONS FOR EXCEPTIONS.
6. ALL PIPE CONNECTIONS BETWEEN DISSIMILAR METALS MUST BE MADE WITH DIELECTRIC FITTINGS AND DIELECTRIC THREAD SEALING COMPOUND TO PREVENT GALVANIC DEGRADATION.
7. SUCTION EYE OF PUMP MUST BE LOCATED BELOW FOUNTAIN FLOOR ELEVATION IF FLOODED–END–SUCTION TYPE, AND NOT MORE THAN 4' ABOVE FOUNTAIN FLOOR ELEVATION IF SELF–PRIMING TYPE. ALL REDUCING FITTINGS MUST BE CONCENTRIC TYPE ON DISCHARGE LINE AND ECCENTRIC TYPE ON SUCTION LINE..
8. SUCTION LINE MUST BE A STRAIGHT RUN INTO THE PUMP EYE OF AT LEAST 8 PIPE DIAMETERS WITH NO LOOPS, HIGH POINTS, OR TRAPS.
9. USE LONG RADIUS ELBOWS ON ALL DIRECTIONAL CHANGES ON SUCTION AND DISCHARGE LINES, IN SOME INSTANCES, PIPING DIAGRAMS ARE EXAGGERATED FOR PURPOSES OF CLARITY. MAKE ALL SUCTION AND DISCHARGE PIPE RUNS USING THE MOST DIRECT ROUTES POSSIBLE AND USING THE MINIMUM NUMBER OF FITTINGS POSSIBLE. SLOPE ALL LINES DOWN TO PUMP, IN ALL CASES, WITH NO LOOPS, TRAPS, OR HIGH POINTS.
10. ON SUCTION LINES USE ONLY LUG TYPE BUTTERFLY VALVES, FULL–PORT, OR GATE TYPE VALVES. DO NOT REGULATE OR ADJUST FLOW FROM SUCTION SIDE OF PUMP. USE SUCTION VALVES FOR EQUIPMENT ISOLATION PURPOSES ONLY.
11. ON DISCHARGE LINES USE ONLY LUG TYPE BUTTERFLY, GLOBE, BALL, PLUG OR OTHER LOW LOSS INFINITELY ADJUSTABLE VALVES FOR ISOLATION AND FLOW REGULATION.
12. AN IN–LINE BASKET STRAINER IS RECOMMENDED ON THE SUCTION SIDE OF PUMPS, WITH BASKET PERFORATIONS PROPERLY SIZED TO PROTECT THE PUMP IMPELLER, AND FOUNTAIN NOZZLE/JET ORIFICES.
13. PROVIDE ADEQUATE OVERFLOW DRAIN AND FILL LINE CAPACITY FOR THE FOUNTAIN SYSTEM.
14. THE PIPING SYSTEM SHALL BE WATER PRESSURE TESTED FOR 24 HOURS PRIOR TO BACKFILLING AND SHALL THEN BE BURIED AND/OR SUPPORTED AS REQUIRED TO PROTECT THE INTEGRITY OF MECHANICAL SYSTEM. (REFER TO PVC INSTALLATION NOTES).
15. INSTALLING CONTRACTOR TO INSTALL THRUST BLOCKS AT ALL PIPING INTERSECTIONS ON SUBTERRANEAN PIPING RUNS.
16. INSTALLING CONTRACTOR IS RESPONSIBLE FOR ALL PIPE SUPPORTS AND HANGERS AS REQUIRED. ALL PIPING IN OPEN AREAS BELOW THE FOUNTAIN SHALL BE INSTALLED FREEHANGING FROM THE CEILING IN THE LEVEL BELOW WITH PIPE HANGERS PER LOCAL CODE AND SPECIFICATIONS.
17. INSTALLER SHALL PROVIDE ADEQUATE ACCESS, LIGHTING, DRAINAGE AND VENTILATION IN EQUIPMENT ROOM TO PREVENT FLOODING, CONDENSATION OR OVERHEATING OF EQUIPMENT, AND COMPLY WITH ALL OSHA CONFINED SPACE REGULATIONS AND REQUIREMENTS, BEFORE, DURING AND AFTER SYSTEM INSTALLATION.
18. ANY PRESSURIZED CITY WATER LINES SUPPLYING THE FOUNTAIN SYSTEM SHALL BE OF TYPE K COPPER AND SHALL BE PROTECTED BY AN APPROVED BACKFLOW PREVENTION DEVICE AND PRESSURE REDUCING VALVE SET AT 50 PSI MAXIMUM PRESSURE AND MINIMUM OF 40 PSI.
19. THE INCOMING WATER SUPPLY LINE PRESSURE MUST NOT EXCEED 50 PSI AND IS PART OF THE BUILDING CONTRACT, NOT THE FOUNTAIN.
20. "P" TRAPS AND VENTS SHALL BE INSTALLED ON ANY DRAIN LINE CONNECTED TO A SANITARY SEWER SYSTEM, WHERE AND WHEN REQUIRED BY PLUMBING CODE, REGARDLESS OF WHETHER SHOWN ON INSTALLATION DRAWINGS.
21. SOIL COMPACTION AROUND SUBTERRANEAN PIPING TO BE COMPACTED IN 6" LIFTS.
22. ALL PIPING TO HAVE MINIMUM 2% SLOPE DOWN FROM FOUNTAIN TO EQUIPMENT ROOM UNLESS OTHERWISE SPECIFIED ON THE CONTRACT DOCUMENTS.
23. PRESSURE TESTING ON ALL PIPE RUNS BETWEEN THE PUMPING EQUIPMENT AND THE FOUNTAIN BASIN SHALL BE PERFORMED BY THE INSTALLING CONTRACTOR AFTER "ROUGH–INS" (PIPES INSTALLED AND STUBBED UP) ARE COMPLETE AND AGAIN BEFORE ANY CONCRETE IS POURED. IT IS RECOMMEND TO MAINTAIN ALL PIPING UNDER PRESSURE DURING THE CONSTRUCTION PHASE TO DETECT ANY DAMAGE EARLY ON. ALL TESTS SHALL USE WATER, NOT AIR FOR PRESSURE TESTING.
24. ALL PENETRATIONS THROUGH OUTSIDE WALLS TO BELOW GRADE SHALL BE SEALED PER BUILDING SPECIFICATIONS. USING "EASY–LINK SEALS" IS RECOMMENDED.
25. ALL PIPING PENETRATIONS THROUGH STRUCTURE WALLS INTO OPEN AREAS BELOW FOUNTAIN STRUCTURE MUST HAVE ALLOWANCES MADE FOR SETTLEMENT.
26. ANY AND ALL COSTS ASSOCIATED WITH ABOVE ARE RESPONSIBILITY OF INSTALLER.
27. ALL PIPING IS ASSUMED TO BE BURIED BELOW GROUND IN ALL CASES, AND NOT INSTALLED ON OR ABOVE GRADE WHERE AN AIR TRAP, LOOP, OR HIGHPOINT COULD BE CREATED.
28. CONTRACTOR SHALL OBTAIN ALL NECESSARY INSTALLATION PERMITS AND INSPECTIONS.
29. ALL WELDED PVC FITTINGS ABOVE 6" DIAMETER SHALL BE FIBERGLASS REINFORCED AND USED ONLY ON NON–PRESSURIZED LINES.

PVC INSTALLATION NOTES

1. UNLESS ARCHITECTS SPECIFICATIONS INDICATE OTHERWISE, THE SUGGESTED MINIMUM PIPING AND FITTING STANDARD RECOMMENDED FOR THIS INSTALLATION IS TYPE 1. PVC TYPE 1 CELL CLASSIFICATION 12454, CONFORMING TO ASTM STANDARD 1784.
2. USE ONLY PURPLE PVC PRIMER MEETING NSF, UPC, AND ASTM #F–656 STANDARDS FOR SOFTENING AND PREPARING FIELD PIPE AND FITTING SURFACES FOR SOLVENT CEMENTING (IPS CORPORATION "WELD–ON TYPE P–70 OR EQUIVALENT). WELD–ON P–70 PRIMER IS A PURPLE COLORED, NON–BODIED, VERY FAST ACTING, WATER THIN SOLVENT SYSTEM. WHEN USED IN CONJUNCTION WITH APPROPRIATE WELD–ON CEMENTS, WILL MAKE CONSISTENTLY STRONG, WELL–FUSED JOINTS. IT IS ESSENTIAL THAT THE JOINING SURFACES OF PIPE AND FITTINGS BE SOFTENED PRIOR TO ASSEMBLY. THE MAIN FUNCTION OF THIS PRIMER IS TO EXPEDITE THE PENETRATION AND SOFTENING OF THESE SURFACES. ITS RATE OF PENETRATION INTO THE JOINING SURFACES IS MUCH MORE RAPID THAN THAT OF CEMENT ALONE. IT IS SUITABLE FOR USE WITH ALL TYPES, SCHEDULES AND CLASSES OF PVC AND CPVC PIPE AND FITTINGS. FOLLOW ALL DIRECTIONS AND INSTRUCTIONS APPEARING ON PRODUCT LABEL.
3. USE ONLY GREY, HEAVY BODIED, MEDIUM SETTING PVC CEMENT MEETING NSF, UPC, AND ASTM #D–2564, STANDARDS FOR SOLVENT CEMENTING PVC PLASTIC PIPE AND FITTINGS (IPS CORPORATION "WELD–ON" TYPE 711 OR EQUIVALENT). WELD–ON 711 GREY, HEAVY BODIED, MEDIUM SET, HIGH STRENGTH SOLVENT CEMENT FOR CEMENTING ALL SCHEDULES AND CLASSES OF PVC PIPE AND FITTINGS THROUGH 12" INCLUDING SCHEDULE 80. WELD–ON 719 GREY OR WHITE, EXTRA HEAVY BODIED, THIXOTROPIC (PASTE–LIKE), HIGH STRENGTH SOLVENT CEMENT FOR CEMENTING ALL SCHEDULES AND CLASSES OF PVC PIPE AND FITTINGS 4" THROUGH 30" INCLUDING SCHEDULE 80. WELD–ON 711 AND 719 FOR USE ON ALL TYPES OF PVC PLASTIC PIPE APPLICATIONS, TYPE I AND TYPE II. IT IS APPROVED FOR USE WITH POTABLE WATER PRESSURE SYSTEMS, IRRIGATION, TURF IRRIGATION, GAS, CONDUIT, INDUSTRIAL PIPE APPLICATIONS, SEWER AND DRAIN, WASTE AND VENT SYSTEMS. FOLLOW ALL DIRECTIONS AND INSTRUCTIONS ON PRODUCT LABEL.
4. PRESSURE TEST ALL WATER PIPING PRIOR TO COMMENCING BACKFILL OPERATIONS. (SEE #4 IN "PRESSURE TESTING" SECTION ABOVE). HYDROSTATIC (WATER) TESTING SHALL BE THE ONLY APPROVED METHOD. DO NOT PRESSURE TEST WITH COMPRESSED AIR AS SEVERE PIPE DAMAGE AND BODILY INJURY CAN OCCUR. DO NOT EXCEED THE RATED OPERATIONAL PRESSURE OF THE PIPING AND/OR FITTINGS CARRYING THE LOWEST PRESSURE RATING. LOCATE AND REPAIR ANY LEAKS AND RETEST (PER #4 IN "PRESSURE TESTING" SECTION ABOVE) PRIOR TO COMPLETION OF BACKFILL OPERATIONS.
5. CONCRETE "THRUST" BLOCKING IS RECOMMENDED AT ALL DIRECTIONAL CHANGES (TEE'S, ELBOWS, ETC.), REDUCER FITTINGS AND LINE TERMINATIONS (BUSHINGS, END CAPS, PLUGS, ETC.) IN FOUNTAIN DISCHARGE PIPING 6" AND LARGER.
6. PERFORM ADEQUATE TRENCHING AND BACKFILL OPERATIONS WHEN INSTALLING PVC PIPING BELOW GRADE. TRENCH WIDTH SHOULD BE MINIMUM OF "PIPE O.D. PLUS 12 INCHES" AND DEEP ENOUGH TO ALLOW PIPING TO BE BURIED A MINIMUM OF 12" BELOW THE MAXIMUM EXPECTED FROST PENETRATION LINE TO AVOID FREEZE DAMAGE. LAY PIPING IN HORIZONTAL, PARALLEL, AND PERPENDICULAR MANNER. AVOID VERTICAL STACKING OF PIPES. SPACE MINIMUM OF 3" APART ON ALL PARALLEL RUNS.
7. USE ONLY CLEAN, FREE–FLOWING, NON–EXPANSIVE BACKFILL MATERIAL (NATURALLY ROUNDED ¼" PEA GRAVEL, 57 STONE, OR SAND) AND BACKFILL IN 6" LIFTS WITH ADEQUATE AND COMPLETE COMPACTION BETWEEN LIFTS TO 90% OF MAXIMUM DENSITY PER ASTM 1557–70. COMPACTION TO EXCESSIVE LOADS SHALL NOT BE PERMITTED. A SECOND PRESSURE TEST ON THE PIPING SYSTEM MUST BE MADE AT THIS TIME TO INSURE THAT PIPING HAS NOT BEEN DAMAGED DURING BACKFILL OPERATIONS (SEE #4 IN "PRESSURE TESTING" SECTION ABOVE).
8. AVOID LAYING SUCTION PIPING IN A MANNER THAT COULD RESULT IN A SUCTION LOOP BEFORE, DURING, OR AFTER BACKFILLING AND COMPACTION. ALWAYS PITCH PIPE IN A DOWNWARD DIRECTION TO AVOID A SUCTION LOOP THAT WILL CAUSE AIR TO BE PERMANENTLY TRAPPED, CAUSING LOSS IN PERFORMANCE OF THE PIPING SYSTEM DUE TO INCREASED FRICTION AND WORK LOAD DEMAND.
9. ANY AND ALL COSTS ASSOCIATED WITH ABOVE ARE RESPONSIBILITY OF INSTALLER.
10. INTERCONNECTING PIPING AND FITTINGS INSIDE EQUIPMENT ROOM IS SCHEDULE 80 P.V.C.

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NEW YORK CITY POLICE MEMORIAL
NEW YORK, NY

SHEET TITLE:
NOTES

DATE: 2015.08.26
DRAWN BY: JWT
CHECKED: DELTA

REVISIONS

PROJECT NUMBER: H2615
SHEET NUMBER: F4.00

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SECTION 08 80 00 - GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass.

B. Glazing gaskets, compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 25 00 - Weather Barriers.

B. Section 07 90 05 - Joint Sealers: Sealant and back-up material.

C. Section 08 43 13 - Aluminum-Framed Storefronts: Glazing furnished by storefront manufacturer.

D. Section 08 51 13 - Aluminum Windows: Glazing furnished by window manufacturer.

E. Section 08 63 00 - Metal-Framed Skylights: Glazing furnished by skylight manufacturer.

F. Section 10 28 00 - Toilet and Bath Accessories: Mirrors.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.

C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

D. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2014.

E. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2012a.

F. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2009.

G. GANA (SM) - GANA Sealant Manual; Glass Association of North America; 2008.

H. GANA (LGRM) - Laminated Glazing Reference Manual; Glass Association of North America; 2009.

I. NYC - Building Code of the City of New York: 2014.

J. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; Insulating Glass Manufacturers Alliance; 1990 (2004).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

C. Samples: Submit two samples 12 by 12 inch in size of glass units.

D. Samples: Submit 2 inch long bead of glazing sealant, color as selected.

E. Certificates: Certify that products meet or exceed specified requirements.

F. Manufacturer's Certificate: Certify that laminated glass meets or exceeds specified requirements.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods. Maintain one copy on site.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.07 MOCK-UP

A. See Section 01 40 00 - Quality Requirements, for additional mock-up requirements.

B. Provide mock-up of typical storefront module including glass.

C. Locate where directed by Architect.

D. Mock-up may remain as part of the Work.

1.08 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

C. Decorative Plastic Glazing Film: Warranty Period: 10 years from date of original installation.

PART 2 PRODUCTS

2.01 GLAZING UNITS

A. Type S-1 - Single Vision Glazing:
   1. Application: All exterior storefront glazing.
   2. Type: Laminated float glass.
   3. Tint: Clear.
   4. Thickness: 1/4 inch.

2.02 EXTERIOR GLAZING ASSEMBLIES

A. Performance Criteria: Select type and thickness of glass to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Design Pressure: Calculated in accordance with applicable codes.
   2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
   3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
   4. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
   5. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
   6. Glass thicknesses listed are minimum.

B. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
   1. In conjunction with vapor retarder and joint sealer materials described in other sections.
   2. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

2.03 GLASS MATERIALS

A. Float Glass Manufacturers:
   1. AGC Glass Company North America, Inc: www.us.agc.com.
   2. Cardinal Glass Industries: www.cardinalcorp.com.
   3. Guardian Industries Corp: www.sunguardglass.com.
   4. Old Castle Glass: oldcastlebe.com
   5. Pilkington North America Inc: www.pilkington.com/na.
   6. PPG Industries, Inc: www.ppg.com.

7. Viracon: www.viracon.com.
8. Substitutions: Refer to Section 01 60 00 - Product Requirements.

B. Float Glass: Provide float glass based glazing unless noted otherwise.
1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.
2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and Kind FT.
3. Thicknesses: As indicated; for exterior glazing comply with requirements indicated for wind load design regardless of thickness indicated.

C. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
1. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
2. Plastic Interlayer:
a. Polyvinyl Butyral (PVB) Interlayer: 0.030 inch thick, minimum.
3. Manufacturers:
a. AGC Flat Glass North America, Inc: www.na.agc-flatglass.com.
b. Cardinal Glass Industries: www.cardinalcorp.com.
c. Viracon, Architectural Glass segment of Apogee Enterprises, Inc: www.viracon.com.
d. Substitutions: Refer to Section 01 60 00 - Product Requirements.

2.04 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Gaskets: Resilient replaceable EPDM rubber extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; black color.

2.05 SOURCE QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Provide shop inspection and testing for all glass.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

A. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.04 FIELD QUALITY CONTROL

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

3.05 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

3.07 SCHEDULE

A. Aluminum-Framed Storefront Glazing: Typical, exterior dry method, and glass thickness as required to comply with performance requirements indicated in Section 08 43 13.

END OF SECTION

SECTION 08 43 13 - ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

1.02 RELATED REQUIREMENTS

A. Section 07 25 00 - Weather Barriers: Sealing framing to weather barrier installed on adjacent construction.

B. Section 07 84 00 - Firestopping: Firestop at system junction with structure.

C. Section 08 80 00 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2012.

B. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; American Architectural Manufacturers Association; 2009 (part of AAMA 501).

C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; American Architectural Manufacturers Association; 2009.

D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.

E. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers; 2011.

F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.

H. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

I. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2000 (Reapproved 2008)

J. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2014.

K. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 PERFORMANCE REQUIREMENTS

A. Design and size components to withstand the following load requirements without damage or permanent set, when tested in accordance with ASTM E 330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
   1. Design Wind Loads: Comply with requirements of the Building code of the City of New York.
   2. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

B. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.

C. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 6.24 psf as measured in accordance with ASTM E 283.

D. Water Leakage: None, when measured in accordance with ASTM E 331 with a test pressure difference of 8.00 lbf/sq ft.

E. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

F. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

G. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

H. Windborne-Debris-Impact-Performance: Shall be tested in accordannce with ASTM E 1886 and information in ASTM E 1886 and information in ASTM E 1996 and/or AAMA 506.
   1. Large-Missile Impact: For aluminum-framed systems located within 30 feet of grade.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

D. Samples: Submit two mullion section samples 4-1/2"x 6" inches in size illustrating finished aluminum surface, glass, infill panels, glazing materials.

E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

F. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

G. Samples: Submit two samples 6 x 6 inches in size illustrating finished aluminum surface, glass, infill panels, glazing materials.

H. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

I. Report of field testing for water leakage.

J. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.07 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at New York State.

B. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

1.08 MOCKUPS

A. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials an execution.
   1. Build mockup of typical fixed lite and adjacent glazed door.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.10 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.11 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide ten year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide ten year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN -- FRAMING FOR MONOLITHIC GLAZING

A. Wind-Borne-Debris Resistance Tested:
   1. Basis of Design: Kawneer Company Inc.; Product EnCORE Framing System: www.kawneer.com..
   2. Vertical Mullion Dimensions: 1-3/4 x 3-9/16 inches.

B. Front/Outside-Set Style:
   1. Basis of Design: Kawneer, EnCORE Framing System.
   2. Vertical Mullion Dimensions: 1-3/4 inches wide by 3-9/16 inches deep..

C. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:

D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MANUFACTURERS

A. Basis of Design: See below under description of products.

B. Aluminum-Framed Storefront and Doors:
   1. Kawneer Company, Inc.; EnCORE Framing System: www.kawneer.com.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Unitized, shop assembly.
   2. Glazing Rabbet: For 1/4 inch monolithic laminated glazing.
   3. Vertical Mullion Dimensions: 1-3/4 inches wide by 3-9/16 inches deep..
   4. Design Wind Load: 30 psf, positive and negative.
   5. Water Leakage Test Pressure Differential: 8 lbf/sq ft.
   6. Air Infiltration Test Pressure Differential: 6.24 psf.
   7. Overall U-Value Including Glazing: 1.02, maximum.
   8. Finish: Superior performing organic coatings.
      a. Factory finish all surfaces that will be exposed in completed assemblies.
      b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
   9. Color: As selected from manufacturer's standards colors.
   10. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   11. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.

12. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
13. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
14. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
15. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
16. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.
17. Preparation for Window Treatments: Provide reinforced interior horizontal head rail.

B. Performance Requirements:
1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
   a. Design Wind Loads: Comply with requirements of ASCE 7.
   b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
2. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, tested by independent agency in accordance with ASTM E1996 for Wind Zone 2 - Enhanced Protection for Large and Small Missile impact and pressure cycling at design wind pressure.
3. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8.00 lbf/sq ft.
4. Air Leakage: Maximum of 0.06 cu ft/min/sq ft of wall area, when tested in accordance with ASTM E283 at 6.24 pounds per square foot pressure differential across assembly.
5. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
6. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at specified differential pressure across assembly in accordance with ASTM E283.
7. Condensation Resistance Factor: Measure in accordance with AAMA 1503 with 1 inch insulating glass installed.
8. Water Leakage: None, when measured in accordance with ASTM E331 at specified pressure differential.
9. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
10. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and inner sheet of infill panel and heel bead of glazing compound.
11. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

2.04 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, drainage holes and internal weep drainage system.
1. Glazing stops: Flush.
2. Cross-Section: As indicated on drawings.

3. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.

B. Glazing: As specified in Section 08 80 00.

2.05 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

C. Fasteners: Stainless steel.

D. Exposed Flashings: Aluminum sheet, 20 gage, 0.032 inch minimum thickness; finish to match framing members.

E. Concealed Flashings: Stainless steel, 26 gage, 0.0187 inch minimum thickness.

F. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.

G. Perimeter Sealant: Type 1 specified in Section 07 90 05.

H. Perimeter Sealant: Type 1 specified in Section 07 92 00

I. Glass: As specified in Section 08 80 00.
   1. Glass in Exterior Framing: Type S-1.

J. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

K. Glazing Accessories: As specified in Section 08 80 00.

L. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.06 FINISHES

A. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
   1. Polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluoropolymer coating system, including minimum 70 percent PVDF color topcoat and minimum total dry film thickness of 0.9 mil; color and gloss as indicated on drawings.
      a. Products:
         1) Kawneer Permafluor: www.kawneer.com.
         2) PPG Metal Coatings; Duranar: www.ppgideascapes.com.
         3) Substitutions: See Section 01 60 00 - Product Requirements.

B. Color: As selected by Architect from manufacturer's standard range.

C. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.07 FABRICATION

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

C. Prepare components to receive anchor devices. Fabricate anchors.

D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.

E. Arrange fasteners and attachments to conceal from view.

F. Reinforce framing members for imposed loads.

G. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
   1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install window wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Coordinate attachment and seal of perimeter air and vapor barrier materials.

I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

J. Install hardware using templates provided.

K. Install glass and infill panels in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.

L. Install perimeter sealant in accordance with Section 07 90 05.

M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.

B. Test installed storefront for water penetration in accordance with ASTM E1105 with a uniform test pressure difference of 2.86 lbf/sq ft. Test shall include a minimum of 3 cycles, each lasting a minimum of 5 minutes.

3.05 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Remove excess sealant by method acceptable to sealant manufacturer.

3.06 PROTECTION

A. Protect installed products from damage during subsequent construction.

END OF SECTION

SECTION 07 25 00 - WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air Barriers: Materials that form a system to stop passage of air through exterior walls and joints around frames of openings in exterior walls.

1.02 RELATED REQUIREMENTS

A. Section 07 46 23 - Wood Siding: Exterior rain screen outside of water resistive air barrier.

B. Section 07 54 00 - Thermoplastic Membrane Roofing: Vapor retarder installed as part of roofing system.

C. Section 07 90 05 - Joint Sealers: Sealant materials and installation techniques.

1.03 DEFINITIONS

A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.

B. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.

1.04 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2006a (Reapproved 2013).

B. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2013.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

D. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.

E. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.

F. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing; ICC Evaluation Service, Inc.; 2012.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
   1. When feasible all air barriers membranes and accessories such as transition membranes, flashing membranes, mastics, sealants, primers and tapes) shall be furnished by the same manufacturer. When products from a variety of manufacturers are used, a letter must be obtained from at least one manufacturer of the products in contact stating the materials proposed for use are permanently chemically compatible and adhesively compatible with adjacent materials proposed for use.

C. Shop Drawings: Provide drawings of special joint conditions.

D. Manufacturer's Installation Instructions: Indicate preparation.

1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

PART 2 PRODUCTS

2.01 WEATHER BARRIER ASSEMBLIES

A. Air Barrier: Behind exterior wood siding:
   1. On outside surface of single wythe concrete exterior walls use air barrier coating.

2.02 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)

A. Air Barrier, Fluid Applied: Vapor permeable, elastomeric waterproofing.

B. Air Barrier Coating:
   1. Material: Water-based acrylic or polymer-modified bitumen, with VOC content of zero.
   2. Acceptable Substrates: Stated by manufacturer as suitable for installation on visibly damp surfaces and concrete that has hardened but is not fully cured ("green" concrete) without requiring a primer.
   3. Dry Film Thickness (DFT): 10 mils (0.010 inch), minimum.
   4. Air Permeance: 0.004 cubic feet per minute per square foot, maximum, when tested in accordance with ASTM E2178.
   5. Water Vapor Permeance: 10 perms, minimum, when tested in accordance with ASTM E96/E96M.
   6. Dry Film Thickness: 40 mils (0.040 inch), minimum.
   7. Air Permeance: 0.004 cubic feet per square foot, maximum, when tested in accordance with ASTM E2178.
   8. Water Vapor Permeance: 12 perms, minimum, when tested in accordance with ASTM E96/E96M.
   9. Elongation: 300 percent, minimum, when tested in accordance with ASTM D412.
   10. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   11. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
   12. VOC Content: 25 g per L or less.
   13. Code Acceptance: Comply with applicable requirements of ICC-ES Acceptance Criteria AC212.
   14. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
   15. Products:
      a. BASF Corporation; ENERSHIELD-HP: www.enershield.basf.com.
      b. DuPont Building Innovations; Tyvek Fluid Applied WB with Tyvek Fluid Applied Flashing and Joint Compound, Sealant for Tyvek Fluid Applied System and StraightFlash: www.dupont.com.
      c. Henry Company; Air-Bloc 31: www.henry.com. Basis of Design.
      d. Hohmann and Barnard, Inc.; Textroflash Liquid VP: www.h-b.com.
      e. Mar-flex Waterproofing & Building Products; Air Barrier 1200VP: www.mar-flex.com.
      f. W.R. Meadows, Inc.; Air-Shield LMP: www.wrmeadows.com.
      g. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 SEALANTS

A. Silicone Sealant: Type 1 as specified in Section 07 90 05.

B. Sealant Backers: As specified in Section 07 90 05.

C. Primers, Cleaners, and Other Sealant Materials: As recommended by sealant manufacturer, appropriate to application, and compatible with adjacent materials.

2.04 ACCESSORIES

A. Sealants, Tapes, and Accessories for Sealing Weather Barrier and Sealing Weather Barrier to Adjacent Substrates: As specified or as recommended by weather barrier manufacturer.

B. Self-Adhesive Sheet Flashing: ASTM D 1970.

C. Thinners and Cleaners: As recommended by material manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the work of this section.

3.02 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation..Ensure gaps are filled, joints struck, CMU is dry, and all snags are gone.

B. Clean and prime substrate surfaces to receive adhesives in accordance with manufacturer's instructions.

3.03 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Air Barriers: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

C. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.

D. Coatings:
   1. Prepare substrate in manner recommended by coating manufacturer; treat joints in substrate and between dissimilar materials as recommended by manufacturer.
   2. At Transition between foundations and walls: Through wall flashing must be draped from above to completely cover this joint and adhered to the face of the foundation wall
   3. Coating shall continuously cover end or edge of concrete floor and roof plank.
   4. Verify proper thickness using a wet mill gauge. Substrate shall not be visible.
   5. Use flashing to seal to adjacent construction and to bridge joints.
   6. Transition membranes shall be installed and sealed before insulation is installed on top. Seams shall be sealed with mastic type liquid membrane or with compatible sealant.
   7. For liquid applied membrane at adjacent building conditions in any locations where continuous air barrier on the exterior of the building cannot be installed, a low VOC product shall be installed on the interior at full height (top of plank to bottom of plank at each floor). This shall happen before any interior framing is installed.
   8. Transition membranes shall be installed and sealed before insulation is installed on top. Seams shall be sealed with mastic type liquid membrane or with compatible sealant.

E. Openings and Penetrations in Exterior Weather Barriers:
   1. Install flashing over entire rough opening, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
   2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with at least 4 inches wide; do not seal sill flange.
   3. At openings to be filled with non-flanged frames, seal weather barrier to all sides of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
   4. At head of openings, install flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.
   5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
   6. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface with sealants compatible with all surfaces. Transition membranes shall be used to patch as necessary with seams sealed appropriately. Gaps shall be filled with backer rod as necessary and sealant compatible with all surfaces. Where smooth surfaces are present, mechanical gasket seals can be used.

F. Construction Joints: Sealing materials spanning joints between construction materials shall allow for expansion and contraction of the construction materials.

3.04 FIELD QUALITY CONTROL

A. Do not cover installed weather barriers until required inspections have been completed.

B. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.

C. Take digital photographs of each portion of the installation prior to covering up.

3.05 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

SECTION 04 42 00 - EXTERIOR STONE CLADDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cut granite veneer at exterior wall bases and stairs.

B. Remove portion of existing pink granite wall cladding at bottom of new stair opening between new vaults.
   1. Sawcut stone to be removed at new stair opening.
   2. Store removed stone and reuse for patching sides of new stair opening.

C. Metal anchors and supports.

D. Sealing exterior joints.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Shelf angles and supports.

B. **Addendum No. 1:**

Section 07 13 00 - Pre-Applied and Self-Adhering Sheet Membrane Waterproofing: Self-Adhering Sheet Membrane Waterproofing on accessible concrete walls below grade.

C. Section 07 92 00 - Joint Sealants: Sealing perimeter and expansion joints in stone work.

1.03 REFERENCE STANDARDS

A. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2015.

B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

C. ASTM C615/C615M - Standard Specification for Granite Dimension Stone; 2011.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

E. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).

F. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2002 (Reapproved 2013).

G. NBGQA (SPEC) - Specifications for Architectural Granite; National Building Granite Quarries Association, Inc.; www.nbgqa.com; Version 14-1, 2014.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on stone, mortar products, and sealant products.

C. Shop Drawings: Indicate layout, pertinent dimensions, anchorages, head, jamb, and sill opening details, and jointing methods.

D. Samples: Submit two stone samples 12 x12 inch in size, illustrating color range and texture, markings, surface finish.

E. Samples: Submit mortar color samples.

F. Installation Instructions: Submit stone fabricator's installation instructions and field erection or setting drawings; indicate panel identifying marks and locations on setting drawings.

1.06 QUALITY ASSURANCE

A. Design anchors and supports under direct supervision of a Professional Structural Engineer, registered in New York State.

1. Design anchors to resist positive and negative wind pressures and other loads as required by applicable code.
2. Design anchor attachment to stone with a factor of safety of 5:1.
3. Design each individual anchor with a factor of safety in the vertical dead-load-bearing direction of 4:1 and in the horizontal lateral-load-bearing direction of 2:1.

B. Perform work in accordance with NBGQA (SPEC).

C. Stone Fabricator: Company specializing in fabricating cut stone with minimum ten years of documented experience.

D. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience.

1.07 MOCK-UP

A. Construct stone wall mock-up, 3 feet long by 2 feet high, including stone anchor accessories, sill and head flashings, corner condition, typical control joint.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store stone panels vertically on edge, resting weight on panel edge.

B. Protect stone from discoloration.

1.09 FIELD CONDITIONS

A. During temporary storage on site, at the end of working day, and during rainy weather, cover stone work exposed to weather with non-staining waterproof coverings, securely anchored.

PART 2 PRODUCTS

2.01 STONE

A. Granite: _____; complying with ASTM C615/C615M.
1. Surface Texture: Thermal.
2. Color: To match coping stone at 9/11 memorial fountains..
3. Acceptable Producers:
a. Same producer as 9/11 memorial fountains.
b. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MORTAR

A. Mortar: As specified in Section 04 05 11 - Masonry Mortaring and Grouting.

2.03 ANCHORS AND ACCESSORIES

A. Anchors and Other Components in Contact with Stone: Stainless steel, ASTM A666, Type 304.
1. Sizes and configurations: As required for vertical and horizontal support of stone and applicable loads.
2. Wire ties are not permitted.

B. Support Components not in Contact with Stone: Stainless steel, ASTM A240/A240M, Type 304.

C. Setting Buttons and Shims: Lead type.

D. Flashings: Stainless steel; See Section 07 62 00 - Sheet Metal Flashing and Trim.

E. Joint Sealant: ASTM C920 silicone sealant with movement capability of at least plus/minus 25 percent and non-staining to stone when tested in accordance with ASTM C1248.

F. Joint Backer Rod: ASTM C1330 open cell polyurethane of size 40 to 50 percent larger in diameter than joint width.

G. Cleaning Solution: Type that will not harm stone, joint materials, or adjacent surfaces.

2.04 STONE FABRICATION

A. Thickness: 1-1/2 inch; Stair treads: Height of riser.

B. Panel Size: As indicated on drawings.

C. Fabrication Tolerances: In accordance with NBGQA (SPEC).

D. Fabricate units for uniform coloration between adjacent units and over the full area of the installation.

E. Where corner detail is not indicated, form external corners to quirk joint profile.

F. Slope exposed top surfaces of stone and horizontal surfaces for natural wash.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that support work and site conditions are ready to receive work of this section.

B. Verify that items built-in under other sections are properly located and sized.

3.02 PREPARATION

A. Clean stone prior to erection. Do not use wire brushes or implements that will mark or damage exposed surfaces.

3.03 INSTALLATION

A. Install flashings of longest practical length and seal watertight to back-up. Lap end joint minimum 6 inches and seal watertight.

B. Set stone with a consistent joint width of 1/2 inch.

C. Install anchors and place setting buttons to support stone and to establish joint dimensions.

D. Joints in Exterior Work: Seal joints with joint sealant over backer rod, following sealant manufacturer's instructions; tool sealant surface to concave profile.

3.04 TOLERANCES

A. Positioning of Elements: Maximum 1/8 inch from true position.

B. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet; 1/2 inch in 50 feet.

C. Maximum Variation Between Face Plane of Adjacent Panels: 1/16 inch.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 feet; 1/4 inch in 10 feet; 1/2 inch maximum.

E. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.

3.05 CUTTING AND FITTING

A. Obtain approval prior to cutting or fitting any item not so indicated on Drawings.

B. Do not impair appearance or strength of stone work by cutting.

3.06 CLEANING

A. Remove excess joint material upon completion of work.

B. Clean soiled surfaces with cleaning solution.

C. Use non-metallic tools in cleaning operations.

END OF SECTION

SECTION 00 01 15 - LIST OF DRAWING SHEETS

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ARCHITECTURAL

G-000.00	PROJECT INFORMATION
G-001.00	RENDERED VIEWS
A-000.00	SITE PLAN / PLOT PLAN
A-001.00	SITE PLAN
A-002.00	SITE PLAN EXISTING VAULT LEVEL
D-100.00	DEMOLITION, EXCAVATION AND PLANTING DETAIL
A 101.00	SITE PLAN
A-102.00	PROJECT PLAN
A-103.00	STRUCTURAL AND FOUNDATION PLANS
A-104.00	REFLECTED CEILING AND SITE LIGHTING PLAN
A-200.00	ELEVATIONS
A 301.00	SHORT SECTIONS
A-302.00	LONG SECTIONS
A-500.00	DETAILS
A-501.00	WINDOW ELEVATION DETAILS
A-600.00	INFRASTRUCTURE DIAGRAM

STRUCTURAL

SO-001.00	GENERAL NOTES
SO-002.00	GENERAL NOTES
SO-003.00	GENERAL NOTES
SO-004.00	GENERAL NOTES
SO-005.00	GENERAL WOOD NOTES
FO-1C1.00	STRUCTURAL PLANS
SO-300.00	LAP SPLICE SCHEDULES
S2-100.00	TYPICAL CAISSON DETAILS AND SCHEDULE
S2-105.00	TYPICAL SLAB ON GRADE DETAILS
S2-107.00	TYPICAL SITE RETAINING WALL DETAILS AND SCHEDULE
S2-110.00	TYPICAL GRADE BEAM DETAILS
S2-110.1	TYPICAL GRADE BEAM DETAILS
S2-111.00	GRADE BEAM SCHEDULES
S3-200.00	TYPICAL CONCRETE SHEARWALL DETAILS
S3-201.00	TYPICAL CONCRETE SHEARWALL DETAILS
S3-201.1	TYPICAL CONCRETE SHEARWALL DETAILS
S4-300.00	TYPICAL CONCRETE SHEARWALL DETAILS
S4-300.1	TYPICAL CONCRETE SLAB DETAILS
S-100.00	STRUCTURAL PLANS II
S-101.00	FULL ROOF PLAN
S-200.00	BUILDING SECTIONS
S-400.00	ROOF DETAILS

PLUMBING

P-001.00	PLUMBING SYMBOLS LIST, NOTES & SPECIFICATIONS
P-300.00	PLUMBING WORK IN CONNECTION WITH POLICE MEMORIAL PLAZA, PUMPS AND CONTROLLERS RELOCATION
P-301.00	PLUMBING WORK IN CONNECTION WITH POLICE MEMORIAL PLAZA, PUMPS AND CONTROLLERS RELOCATION

MECHANICAL

M-001.00 MECHANICAL DRAWING LIST,SYMBOL, NOTES & ABBREVIATIONS
M-102.00 MECHANICAL FLOOR PLANS

ELECTRICAL

E-001.00 ELECTRICAL SYMBOL LIST, NOTES AND ABBREVIATIONS
E-100.00 ELECTRICAL EXISTING ELECTRICAL SERVICES AND DISTRIBUTION EQUIP. SERVING POLICE PLAZA
E-200.00 ELECTRICAL MODIFICATION OF EXISTING ELECT. SERVICE AND DIST. EQUIPMENT SERVING POLICE PLAZA AND MARINE (FLOOD RESILIENCE)
E-300.00 ELECTRICAL ELECT. WORK IN CONNECTION W/ POLICE MEMORIAL PLAZA PUMPS AND CONTROLLERS RELOCATION
E-400.00 ELECTRICAL ELECT. WORK IN CONNECTION W/ POLICE MEMORIAL PLAZA PUMPS AND CONTROLLERS RELOCATION DETAILS
E-500.00 ELECTRICAL ELECT. WORK IN CONNECTION W/ POLICE MEMORIAL PLAZA PUMPS AND CONTROLLERS RELOCATION DETAILS
E-600.00 ELECTRICAL ONE LINE DIAGRAM FOR NEW UTILITIES WEST AND EAST STRUCTURES
E.700.00 ELECTRICAL NEW WEST AND EAST UTILITIES STRCTURE DETAIL

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Geo Tech Consultants, LLC
52 E 2nd Street, Mineola, NY 11501 Tel: 516 355 0168 Fax: 516 355 0271

March 5, 2015

LMW Engineering Group, LLC
2539 Brunswick Ave
Linden, NJ 07036

Attn: Mr. Jieming Wang

Re: Geotechnical Investigation Report
Proposed North Cove Vault
Police Memorial
Battery Park City, NY
GTC Job No.: LMW11915

Dear Mr. Wang:

This report presents the results of a limited geotechnical investigation performed by Geo Tech Consultants (GTC) for the above referenced project. The work was performed in accordance with our proposal dated January 20, 2015 and your subsequent authorization.

The scope of our investigation performed for this project included:

- Installation and full-time inspection of two (2) test borings;
- Engineering analysis of boring data to determine the stratification and physical characteristics of the subsoil, and to develop recommendations for the design and construction of foundation systems for support of the proposed building;
- Preparation of a written report complete with boring data, analysis, conclusions, and recommendations.

1. PROJECT AND SITE DESCRIPTION

The subject property, known as Lot 3, Block 16, of the Borough of Manhattan, New York, is located on the higher portion of the Gateway Plaza, which is at the end of Liberty Street and west of South End Avenue. The level of the higher Gateway Plaza stands at elevation 14.65' (above NAVD), which is base elevation for a 500 year flood.

It is our understanding that the project consists of 2 schemes. Scheme 1 involves the installation of a rectangular-shaped electric vault on the southern end of the Gateway at a location immediately south of an existing underground pump house. The new electric vault

measures 9’ (W) x 9’ (H) x 48’ (L) (or 8’ by 46’ interior) and is to be set to a depth around 4’ below existing grade.

Scheme 2 involves the installation of two square-shaped electrical vaults of 17’ (w) x 17’ (L) x 18’ (H) and a new staircase between them that links the higher Gateway Plaza to the lower Plaza level. Both new vaults are to be established into the ground at a depth of about 12’ below plaza level.

Preliminary design information suggests that the rectangular-shaped electric vault weighs about 650 kips while the square-shaped vault weighs around 400 kips.

2. FIELD EXPLORATION

Two (2) test borings, labeled as B-1 and B-2, were performed as per project requirements on the higher side of the Gateway Plaza adjacent to the sites of the two proposed schemes at the locations as shown on drawing G-001, which is attached at the end of this report. These locations were selected as results of an underground utility survey.

Borings were performed by Craig Test Boring, Inc. of Mays Landing, New Jersey during the period from February 26th, 2015 to February 27th, 2015 and inspected by GTC’s Professional Engineering staff.

The borings were advanced with a standard truck drill rig. Soils encountered were sampled at two (2) feet intervals for the first 12’ and at five (5) foot intervals thereafter. Each soil sample was extracted using a Standard Split-Spoon sampler by performing a Standard Penetration Test (SPT) in accordance with ASTM D 1586. Where encountered, bedrock was cored with NX core barrels.

During drilling operations, extracted soil samples and rock cores were visually examined and classified by our field engineer. The samples were then placed in sealed glass jars and rock cores in wooden boxes. Both samples and rock cores were later returned to driller’s shop for storage.

Detailed descriptions of the soil samples encountered in the borings were documented in the boring logs, which are presented on drawing G-001.

3. SUBSURFACE CONDITIONS

The following provides a general description of the soil profile inferred from the test borings. While the borings may indicate that the subsurface conditions appear to be uniform across the site, it should be recognized that the number of borings was small compared to the size of the site, and that the existence of anomalies cannot be precluded.

3.1 Soil Profile

The test borings installed at this site revealed a soil profile that depicts three distinguishable layers, which are described below in the order of increasing depth.

Stratum F – Fill (NYC Class 7)

Miscellaneous fill was encountered in borings B-1and B-2 to respective depth of 10' and 22' below existing grade. Given the wide variation in the depth of fill encountered between these two closely-spaced borings, one should expect the same in other areas as well.

The fill was described to consist mostly of sands with some concrete, rock and brick fragments, which is a NYC Class 7 material. The fill materials registered dense to very dense compact condition, suggesting that it was placed and compacted in a controlled compacted manner, and may be considered a control fill.

Stratum Ad - Alluvial Deposit – Organic clay, some sand and gravel (OH, NYC Class 6)

Below the fill, the borings encountered alluvial deposit to depths about 55'- 60' below grade. The alluvial deposit consists of organic clay with some sand, silt and gravel, which is consistent with OH Group of the Unified Soil Classification System (USCS). While the material registered generally medium stiff and stiff consistency, it is considered a Class 6 material, according to NYC Building Code.

Stratum Dr – Decomposed Rock (NYC Class 1d)

The alluvial deposit was underlain by a thin layer of decomposed rock that extends between 55'-60' below grade in B-1 and 59'-62' in B-2. The decomposed rock stratum consists of broken rock fragments with trace clay and sand. The material registered very dense compact condition with penetration resistance exceeding 50 blows per foot, matching NYC soil class 1d.

Stratum R – Rock (NYC Class 1b or better)

Bedrock was encountered in both borings at a depth around 59'-62' below existing grade, and was cored with one 5' run at each boring location. Both 5' core runs recovered well and registered Rock Quality Designation (R.Q.D.), between 73% and 90%, matching NYC Class 1b and 1a respectively.

Examination of the retrieved rock core specimen suggests that the bedrock is of slightly fractured gray mica schist.

3.2 Groundwater

Groundwater was observed in both borings at depth around 10' below existing grade. It should be noted that the aforementioned groundwater table was estimate based on observation of the soil samples retrieved from the borings. Accurate groundwater table can only be measured from groundwater observation wells.

It should also be pointed out that groundwater table is known to fluctuate with seasonal, climatic, and tidal conditions, particularly the tidal given the close proximity of the site to the adjacent Hudson River.

4. DISCUSSION AND RECOMMENDATIONS

The test borings revealed a generalized soil profile that consists of 10'-22' of fill, followed by approximately 33'-50' of alluvial organic clay that mix with sand and silt, and then 2'-5' of decomposed rock before reaching competent bedrock at 59'-62' below existing grade.

It should be pointed out that the two test borings installed for this project are located outside the footprint of the proposed vaults due to limited site access and concern over hitting existing underground utilities.

For the purpose of our analysis, it is assumed that the findings from these two borings are representative of the soil conditions below the proposed vaults.

4.1 Feasibility of wall footing support

Our analysis of the boring logs suggests that the existing fill materials encountered in the two borings are marginally suitable for the use of shallow spread footing foundation for support of the proposed construction because it was underlain by inferior soil of organic clay.

The results of our analysis are presented below.

SCHEME 1 - New 9' x 48' electric vault in Gateway

Scheme 1 involves the installation of a new electric vault of 9' x 48' (approximate outside dimension) on the southern end of the Gateway Plaza, at a location approximately 2.5' south of the existing underground WTC river water pump room. The bottom of the pump room is reported to have been established at a depth around 12' below plaza level.

Assuming the subsurface conditions revealed from boring B-1 (where 10' of fill was encountered and followed by 50' of organic clay) are uniform and representative of the soil conditions across the entire length of the proposed vault, then it is possible to support the vault on wall footings bearing on competent fill material.

Wall footings bearing on competent fill material and established at the required frost depth of 4' below grade can be designed for an allowable bearing capacity up to 1 tsf or 2 ksf. Based on this capacity and a wall footing width of 3.5', our analysis suggests that wall footings established at 4' below grade will yield settlements less than 1/2", assuming the underlying organic clay is normally consolidated.

However as the new vault is to be situated 2.5' from the adjacent lower level pump house, portion of the vault will fall into the influence line of the pump house. To avoid exerting pressures on the lower pump house, the north wall footing for the new vault will have to extend to depths below the influence line or to the same level of the adjacent footings, which would bring the bottom of the north wall footing closer to the top of or even into the inferior organic clay layers, resulting in larger settlements.

Our analysis suggests that if the north wall footing were to be established at 12' below grade to bear on organic clay, it could yield settlements ¾" to 1-1/4".

Assuming a 500 yr flood were to occur after the new electric vault has been installed and fully loaded, the vault should have enough weight to overcome the buoyant force resulting from the hydrostatic pressures due to the rising 500 yrs flood water.

SCHEME 2 – Two 17' x 17' Electric Vaults and Stairs

Each of the two electric vaults to be installed under Scheme 2 measures 17' by 17' and about 18' tall. The bottom of the vault will be established at a depth of about 12' below plaza grade.

The soil profile in this area as reveled from boring B-2, which was installed close to but not within the project site, depicts 22' of granular fill, followed by 32' of organic clay, then decomposed rock and bedrock.

If the subsurface conditions revealed from boring B-2 are uniform and representative of the soil conditions below each of the new vaults, then it is possible to support both vaults on wall footings bearing on competent fill material.

Wall footings bearing on competent fill material and established at depth of 12' below grade can be designed for an allowable bearing capacity up to 1 tsf or 2 ksf. Based on this capacity and a wall footing width of 3.0', our analysis suggests that the wall footings established at this level are likely to yield settlements less than 1/2", assuming the underlying organic clay is normally consolidated.

However if the thickness of the fill is much less than 22', then the resulting settlements would be much higher. For instance if the soil conditions encountered in B-1, where fill is only 10' thick, also prevail in this area, then the wall footings for these square vaults will

likely bear on organic clay, which could yield settlements exceeding 1", similar to the north wall footing for the vault of Scheme 1.

Assuming a 500 yr flood were to occur after the new electric vaults have been installed and fully loaded, the vaults should have enough weight to overcome the buoyant force resulting from the hydrostatic pressures due to the rising 500 yrs flood water. The critical period is during the period before the vaults are fully loaded.

Notes:

In any case, if wall footings are to be used for foundation support, it must be placed on at last 2' of controlled compacted fill, either existing competent fill or new fill, over in-situ organic clay material. Wall footing bearing directly on organic clay is not recommended.

In area where new fill is required, the organic material encountered at the subgrade shall be undercut at least 2' and replaced it with new controlled compacted fill. See section 5.3 for fill material specifications and compaction requirements. Natural ¾" crushed stone can be used as control fill but it needs to be wrapped around with a filter fabric such as Mirafi 500X.

All footing subgrade shall be subject to special inspection and shall be approved by a qualified inspector prior to placing concrete. At the discretion of the inspecting engineer, any soft material encountered at the footing bottom that is deemed unsuitable for bearing should be removed and replaced with controlled compacted fill.

4.2 Pile Foundation Support

4.2.1 Caisson Piles

Pile Design Criteria

Wall footings are applicable only if the above estimated settlements are deemed tolerable by the design team and the concern over excessive hydrostatic pressures acting against the vaults during construction is addressed. Otherwise, the vaults should be supported on deep foundations such as caisson piles.

Caisson piles are smaller diameter (generally 8"-12") piles that are installed by drilling, which generates little vibration and noise and thus is favored by reviewing agency.

By design, caisson piles are drilled and socketed into bedrock, deriving bearing capacity through bonding between pile grout and surrounding competent bedrock material.

Based on the soil profile established above, it is our opinion that caisson piles of 8" nominal diameter or larger may be used for this project. The final design capacity should be selected by project structural engineer based on the loading requirements and cost consideration.

Caisson piles are generally contracted out as performance specifications with contractor responsible for design, installation and quality assurance and control. The design of caisson piles shall satisfy both the geotechnical and structural requirements as stipulated in the NYC Building Code. A shop drawing with calculations prepared by contractor's engineer should be submitted to project engineer of record for review and approval prior to installation.

For the estimation of geotechnical capacities of caisson piles, a bonding strength of 200 psi between pile grout and the surrounding competent bedrock of NYC Class 1b or better may be used.

To ensure proper loading transfer from piling material to bedrock, steel casing shall be used and shall extend at least one foot into the competent bedrock. The competency of the bedrock shall be verified by a qualified geotechnical engineer. Visual inspection of the bedrock via video camera is acceptable to DOB.

Uplift capacity for a successfully installed caisson pile can be assumed at a value not to exceed 50% of the allowable compressive capacity it achieved.

Pile Lateral resistance

The lateral resistance of a caisson pile will depend upon its size and penetration depth and material. Our analysis suggests that for caisson pile of 8" in diameter that sockets at least 5' into bedrock can develop an allowable lateral resistance up to 2 tons.

Pile Load Tests

According to NYC Building Code, pile load tests are not required for caisson pile provided the competency of the bedrock where piles embedded are inspected and approved by a qualified geotechnical engineer via video camera or other approved methods.

4.2.2 Driven Piles

Driven piles such as open-end steel pipe piles or H-piles can be considered for use if some vibration and noise associated with the pile driving can be tolerated.

Steel pipe piles or H-piles can be driven to bedrock and designed for capacity suitable for the project.

4.3 Liquefaction Potential

The existing site soil conditions possess slight liquefaction potential. Liquefaction of the in-situ soil is not a concern.

4.4 Site Classification for Seismic Design

The boring data suggest that the in-situ site soil can be classified as site Class E for seismic design purpose.

4.5 Design Groundwater Level

Groundwater was encountered in all borings at a depth of about 10' below existing grade. As the site is to be designed for 500 year flood, design groundwater table should be assumed at the current grade level or elevation 14.65'.

4.6 Lateral Earth Pressures

Permanent basement walls should be designed to withstand long-term, at rest equivalent fluid pressures of 60 pounds per cubic foot (pcf) for the portion of wall above design groundwater level and 90 pcf for wall below design groundwater level.

Temporary walls, such as excavation shoring, if required, should be designed to withstand equivalent fluid pressure of 40 pcf for walls above groundwater level and 80 pcf for wall below groundwater level.

4.7 Damp proofing and Waterproofing

Any portion of the structure that will be submerged in water permanently (below design groundwater) shall be waterproofed, subject to discretion of the designing architect and engineer.

4.8 Dewatering

Dewatering is likely to be required for excavation to be below 7' below existing surface grade. In general, groundwater should be lowered and maintained at a level at least 2' below the bottom of the excavation to allow for placement of concrete.

5. CONSTRUCTION MONITORING

5.1 Protection of Adjacent Structures and Sidewalk

The excavation of the foundation may require shoring, bracing, and underpinning of the adjacent structures and sidewalks, which should be designed by a professional structural engineer engaged by the contractor. The design drawings should be submitted to the project engineer for review and approval prior to installation. The installation work shall be subject to control inspection by a qualified professional engineer as required per NYC Code.

5.2 Pre-construction Survey

It is recommended that a pre-construction survey be conducted to document the existing conditions of the adjacent structures and underground utility systems prior to commencement of any construction activities particularly during pile driving.

5.3 Filing and Backfilling

Filling and backfilling against pile caps shall utilize qualified fill material. Qualified fill should meet the grading requirement for control fill as stipulated in the NYC Building Code. Control fill should be placed in maximum 12" loose lifts and each lift should be compacted to at least 95% of its maximum dry density as determined in accordance with ASTM D1557.

6. LIMITATIONS

The conclusions and recommendations contained in this report are based on the subsurface data obtained during this investigation and on the details stated in this report. Should conditions be encountered which differ specifically from those stated in this report, we should be notified immediately so that our recommendations may be reviewed and/or revised, if necessary.

7. CONSTRUCTION CONSULTATION AND INSPECTION

Due to the nature of the soils and subsurface conditions at this site and the recommendations set forth herein, consultation and inspection services by a qualified soil engineer are recommended for the following:

1. Preparation of the site including all clearing, stripping of undesirable material, and initial proofrolling and compaction of the in-situ soils.

2. Placement of all controlled backfill and/or fill, if any.

3. Special inspection of piling installation.

We trust the above information will allow you to proceed with the design and construction of the proposed vaults.

We thank you for the opportunity of providing this service to you. Should you have any questions regarding this report, or if we can be of further assistance, please do not hesitate to contact us.

Respectfully Submitted
Geo Tech Consultants LLC.

Steve J. J. Lin, P.E.

Attachments:

Drawing G-001 Record of boring logs with boring location plan

LEGEND:

▯ : SPLIT SPOON SAMPLE ▯ : DRILLING THROUGH

⊠ : CORE DRILLING ■ : SHELBY TUBE

: Penetration resistance per 6"

: BORING LOCATION : BORING & WELL

: TEST PIT

NOTES:

1. SOILS WERE SAMPLED USING SPLIT-SPOON SAMPLER BY MEANS OF A 140 POUNDS HAMMER, FREE FALLING A DISTANCE OF 30 INCHES, AUTOMATIC TRIP (OR CATHEAD), IN ACCORDANCE WITH ASTM D1586.
2. THE TOTAL NUMBER BLOWS FOR THE MIDDLE 12 INCHES OF PENETRATIONS IS TERMED AS STANDARD PENETRATION RESISTANCE (N).
3. UNDISTURBED SOIL SAMPLES WERE OBTAINED BY MEANS OF SHELBY TUBE SAMPLING IN ACCORDANCE WITH ASTM D1587.
4. BEDROCK WAS CORED USING NX OR BX DOUBLE CORE BARRELS IN ACCORDANCE WITH ASTM D2113.
5. SOIL DESCRIPTIONS ARE MADE THROUGH VISUAL EXAMINATION OF SOIL SAMPLES IN ACCORDANCE WITH THE PROCEDURES ESTABLISHED IN NYC CODE.
6. SOIL CLASSIFICATIONS ARE PROVIDED USING UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) AS WELL AS 2008 NYC SOIL CLASSIFICATION SYSTEM.
7. GROUND WATER TABLE INDICATED ON THE LOGS REPRESENTED THE LEVEL OF WATER WHERE IT WAS FIRST ENCOUNTERED DURING THE DRILLING.
8. BORING INSTALLED BY CRAIG TEST BORING Co. Inc.

ABBREVIATIONS		
C - COARSE	WH - WHITE	MUTI - MULTI-COLORED
M - MEDIUM	RD - RED	TR - TRACE (1%-10%)
F - FINE	LT - LIGHT	LY - ADJECTIVE (21%-35%)
BN - BLOWN	DK - DARK	& - AND (36%-50%)
GY - GRAY	BLK - BLACK	W.O.H. - WEIGHT OF HAMMER

DENSITY AND CONSISTENCY RELATED TO SPOON BLOWS/FOOT			
SAND		SILT &CLAY	
DENSITY	N VALUE	CONSISTENCY	N VALUE
VERY LOOSE	4 OR LESS	VERY SOFT	1 OR LESS
LOOSE	5 TO 10	SOFT	2 TO 4
MEDIUM DENSE	11 TO 30	MEDIUM STIFF	5 TO 8
DENSE	31 TO 50	STIFF	9 TO 15
VERY DENSE	51 OR MORE	VERY STIFF	16 TO 30
		HARD	31 OR MORE

ROCK QUALITY (ROCK QUALITY DESIGNATION)	
R.Q.D. (%)	ROCK DESCRIPTION
0 - 25	VERY POOR
25 - 50	POOR
50 - 75	FAIR
75 - 90	GOOD
90 - 100	EXCELLENT

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)	
GW	WELL GRADED GRAVEL
GP	POORLY GRADED GRAVEL
GM	SILTY GRAVEL
GC	CLAYEY GRAVEL
SW	WELL GRADED SAND
SP	POORLY GRADED SAND
SM	SILTY SAND
SC	CLAYEY SAND
ML	SILTS OF LOW PLASTICITY
CL	CLAYS OF LOW PLASTICITY
MH	SILTS OF HIGH PLASTICITY
CH	CLAYS OF HIGH PLASTICITY
OH	ORGANIC SILT/CLAY OF HIGH PLASTICITY
PT	PEAT AND HIGH ORGANIC SOIL

STRATA SYMBOL : ROCK | DECOMPOSED ROCK | SANDS | SILTS | CLAYS | PEATS | FILL

2008 NYC CLASSIFICATION SYSTEM			
	CLASS OF MATERIAL		DESCRIPTION
1a	R.Q.D.>85%		HARD SOUND ROCK
1b	85%>R.Q.D>50%		MEDIUM HARD ROCK
1c	50%>R.Q.D>35%		INTERMEDIATE ROCK
1d	R.Q.D<35%		SOFT ROCK
2a		N>30	SANDY GRAVEL AND GRAVELS (SOIL GROUP GW, GP, CONTAINING MORE THAN 10% GRAVEL)
2b		10<N<30	
3a		N>30	GRANULAR SOILS (SOIL GROUP GW, GP, GM & GC AND SOIL GROUP SW SP, AND SM CONTAINING NOT MORE THAN 10% GRAVEL)
3b		10<N<30	
4a		N>30	CLAYS (SOIL GROUP SC, CL & CH)
4b		8<N<30	
4c		4<N<8	
5a		N>30	SILTS AND CLAYEY SILTS (SOIL GROUP ML & MH)
5b		10<N<30	
6		N<10	ORGANIC SILTS, CLAYS, PEATS, SOFT CLAY, LOOSE SANDS AND VARVED SILTS
7			NORMINALLY UNSATISFACTORY MATERIALS CONTROLLED AND UNCONTROLLED FILL

B-1

Ground Surface Elev: Existing Gateway Plaza (14.65'±)

Depth (ft)	Sample No.	Sample Method	Blow Count @ 6"	Soil Strata	Soil Descriptions
0	S1				2' Concrete
	S2		40-100/5"		Cmf sand, sm. rock & brick fr./ bn,moist,v.dense(Fill)(Class 7)
5	S3		10-18 15-11		Same / dense (Fill)(Class 7)
	S4		8-18 100/5"		Same / v. dense (Fill)(Class 7)
	S5		18-17 11-4		Same / m.dense (Fill)(Class 7)
10	S6		4-4 3-4		Organic clay,tr.sand & silt /blk, wet, m. stiff (OH)(Class 6)
15	S7		6-9 6-6		Same, sm. sand / stiff (OH)(Class 6)
20	S8		4-3 2-3		Same, tr. sand / m.stiff (OH)(Class 6)
25	S9		5-11 6-5		Same, sm. sand / v.stiff (OH)(Class 6)
30	S10		2-5 4-4		Same, tr. sand / stiff (OH)(Class 6)
35	S11		3-3 3-4		Same / m. stiff (OH)(Class 6)
40	S12		3-4 5-5		Same / stiff (OH)(Class 4b)
45	S13		5-WOH		Same / v. soft (OH)(Class 6)
50	S14		WOH		Same (OH)(Class 6)
55	S15		WOH		Same (OH)(Class 6)
60	S16		100/1"		Decomposed rock (Class 1d)
62			Cored=60" Rec'd=80% R.Q.D=73%		Gray slightly fractured schist with mica (Class 1b)
67					TEST BORING COMPLETED @ 67'

GWT ▽ 15

Date drilled: 2/26/2015
Groundwater was encountered at 10' below grade

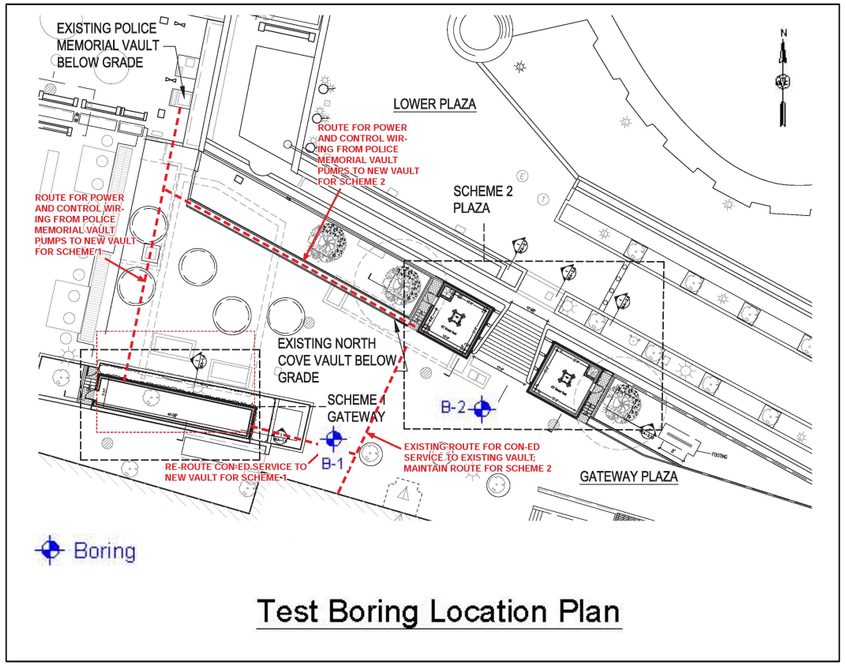
B-2

Ground Surface Elev: Existing Gateway Plaza (14.65'±)

Depth (ft)	Sample No.	Sample Method	Blow Count @ 6"	Soil Strata	Soil Descriptions
0	S1				2' Concrete
	S2		20-22 22-15		Cmf sand, sm.conc.& brick fr./ bn,moist,dense (Fill)(Class 7)
5	S3		13-24 32-22		Same / v. dense (Fill)(Class 7)
	S4		50-50 56-31		Same (Fill)(Class 7)
	S5		7-31 59-40		Same (Fill)(Class 7)
10	S6		25-12 8-12		Same / wet, m. dense (Fill)(Class 7)
15	S7		35-23 24-7		Gravel, sm. conc. & brick fr. / blk, wet, dense (Fill)(Class 7)
20	S8		100/1"		Same / v.dense (Fill)(Class 7)
25	S9		3-6 4-4		Organic clay, tr. gravel / blk, wet, stiff (OH)(Class 6)
30	S10		6-8 5-7		Same, sm. sand & silt / stiff (OH/SP)(Class 6)
35	S11		3-3 25-17		Same, tr. gravel / v. stiff (OH)(Class 6)
40	S12		2-2 3-6		Same, tr. sand & gravel / blk, wet, m. stiff (OH)(Class 6)
45	S13		3-3 3-25		Same (OH)(Class 6)
50	S14		WOH		Same / v. soft (OH)(Class 6)
55	S15		16-100/1"		Decomposed rock, tr. clay (Class 1d)
60			Cored=60" Rec'd=95% R.Q.D=90%		Gray slightly fractured schist with mica (Class 1a)
					TEST BORING COMPLETED @ 64'

GWT ▽ 10

Date drilled: 2/27/2015
Groundwater was encountered at 10' below grade



Test Boring Location Plan

PROJECT:
Battery Park City, New York, NY 10004

CLIENT:
LMW Engineering Group, LLC

Geo Tech Consultants, LLC
52 East 2nd Street, Mineola, NY 11501
Tel: 516-355-0168
Fax: 516-355-0217

DRAWING TITLE:
Record of Boring Logs with Boring Location Plan

SEAL AND SIGNATURE :

DRAWN BY:	L. Yuan
DATE:	3-2-2015
SCALE:	N.T.S.
PROJECT NO.:	LMW11915
DRAWING NO. :	G-001