CONNECTICUT RESOURCES RECOVERY AUTHORITY

ADDENDUM NO. 1
Issued May 23, 2008

TO

"REQUEST FOR BIDS FOR ASH LOAD OUT BUILDING AND SITE MODIFICATIONS AT THE MID-CONNECTICUT RESOURCE RECOVERY FACILITY (Bid Number FY08-OP-016)

(RFB Issued MAY 7, 2008)

Note: Bidders are required to acknowledge this and all Addenda in Section 5(a) of the Bid Form.

The date bids are due is unaffected by this Addendum. The date and time for bid submittal remains May 29, 2008 by 3:00 P.M.

This Addendum consists of the following components:

Section 1 – Pre-Bid Meeting Notes and Submitted Written Questions

Section 2 – Clarification/Additions to the Contract Documents – Drawings

Section 3 – Attachments

1. PRE-BID CONFERENCE NOTES AND SUBMITTED WRITTEN QUESTIONS

This part of the Addendum summarizes the discussion at the Pre-Bid Conference held at the Waste Processing Facility (WPF) on May 15, 2008. The clarifications requested at the meeting by the attendees provide further details or address items not specifically found in the Contract Documents.

The following questions were asked either during the Pre-Bid Conference or in writing subsequent to the meeting. A response is provided for each question.

1.	Question	Do you require a Bid Bond for this project?
	Answer	Yes. A Bid Bond is required in conformance with the form shown on Section 3 of the Request for Bid (RFB).
2.	Question	Does the work included with this project impact any wetland area requiring a permit from the local or State agencies?
	Answer	No. This project does not impact on wetlands and does not require any environmental permit.
3.	Question	How many phases are required to demolish the portion of the existing building and construct the new addition?
	Answer	The demolition of portion of the existing building and the construction of the new addition will be executed in two phases for each respective activity. This is required to avoid any interruption to the ash loading operation. During these phases the truck loading operation will be done inside the building in conformance to the existing permit from DEP. No truck loading operation will be allowed outside the ash load out building.
4.	Question	Dwg A 301 indicates new steel columns on existing concrete CIP concrete @ the interior of the building; dwg S 101 indicates new columns on existing piers & ftgs but no details; we assume this means only new concrete columns are at the perimeter of the building, none on the interior - please confirm.
	Answer	*The existing concrete piers and footing are to remain at the interior of the structure and the new frames will be placed at the top of those interior piers and footings along column line B. The new concrete piers, along column line D, formed into the foundation walls at the perimeter will support the other steel frame column.*
5.	Question	Dwg # C 11 indicates pipe size and length for cleaning & lining - confirm only One length gets lining (276 lf of 24").

	Answer	*The pipe sizes and lengths for the cleaning & lining are indicated on the drawings and the only length that gets lining is the 276 LF of 24" dia. pipe.*
6.	Question	Dwg # A 103 indicates use of temporary construction barrier & fence but no real indication of where exactly - interior / exterior - these are expensive so we need exact layout. Note this drawing has large blacked out areas which must refer to or have some notations attached to them, which are not visible
	Answer	*Drawing A-103 has been modified, the shaded areas are the working areas and the location of the barrier curbs has been revised.*
7.	Question	Confirm that Area E is the only intersection where any curb work occurs.
	Answer	*Yes, Area E is the only intersection where any curb work occurs.*
8.	Question	Dwg C 9 indicates traffic cone patterns & spacing @ 25 ft for all work areas - please confirm that this is all that is required for work area protection other than at the ash building
	Answer	*Yes, the traffic cone patterns & spacing @ 25 ft interval for protection of all work area, except for the ash load out building is all that is required.*
9.	Question	Same Dwg C 9 indicates new traffic signage to be supplied & installed - is there any line marking or traffic arrow work ?
	Answer	*There is no pavement marking required in this project.*
10.	Question	Dwg C 10 indicates a layer of existing contaminated soils beneath our work areas - please confirm we should be working above & not into this contaminated layer.
	Answer	*The contaminated soil layer will not be penetrated except for proposed drainage structure, structural foundations, and possibly the segmental retaining wall foundations.*
11.	Question	Please confirm that all excavated surplus materials can be left onsite somewhere.
	Answer	See Section 2 of this Addendum
12.	Question	Dwg C 10 indicates 4 ft of clean fill in disturbed areas - what does this mean? We would use suitable on site excavated materials for all disturbed area fills; why would we excavate to 4 ft

		when we don't have to fill to that depth ?
	Answer	*Detail is being revised to eliminate 4 feet of fill*
13.	Question	There are notes about shoring metal buildings during demo & erection as required; we can have our metal building manufacturer design the new building to be stable as we erect the required halfs - but we cannot be responsible for the construction or stability of the existing structure when we remove the halfs - especially since we don't know its design or current structural condition (deterioration or damage). Ref Dwg A 103
	Answer	*It will be the contractor responsibility to maintain the existing structure or a temporary enclosure at the areas where the ash load out building is to be accessed by CRRA for their ash hauling operation.*
14.	Question	The specified scale manufacturer indicates that we must install the scale decking & rebar, and supply & install the scale concrete deck - no details exist on URS drawings for this work; we assume we must get these from the scale manufacturer? Specified scale manufacturer not supplying scale house with bid.
	Answer	*Yes the specified scale manufacturer will be supplying and installing a scale concrete deck with rebars, protective guide rails and scales. The scale house will be supplied by the General Contractor but if the scale manufacturer wants to supply the scale house as well then CRRA will review their shop drawings to conform with the specifications.*
15.	Question	Please indicate limit or quantity of test pit work required or that we should carry for this bid - number of pits or days of test pit work.
	Answer	*Based on the water and storm pipes as well as the electrical ducts we would anticipate a maximum of 6 test pits*
16.	Question	Dwg S 201 indicates 3/4" steel push plates on new walls - column details indicate corner protection angles, no connection to wall push plates - where do wall push plates start & stop on the new walls, between the columns ?
	Answer	*The 3/4" steel push plates on the new wall shall be located between the concrete pilasters (piers) shown on the drawings. There will be no connection to the push wall plates and the corner protection at the piers/pilasters.*
17.	Question	Dwg M 101 Detail # 4 indicates a lot of work in 20 scale running

		to the attachment to the existing system - more details would be appreciated as well as dimensions and support information.
	Answer	*Dimensions will be added but must be verified by the contractor in the field. The support information is in the Mechanical Duct specifications.*
18.	Question	Dwg # S 102: is width of 24" thick scale pad 16' 6" or 12' 6" ? No cut thru scale pad to give width and sections # 1 & 3 confusing as to which above dimension is required.
	Answer	*The 24" thick foundation is 16'-6" wide while the scale platform is 12' 6" wide including guide rails.*
19.	Question	Are there any pour joints required in the scale base pad length of 75 ft?
	Answer	*The 75 ft length foundation pad does not require a pour joint.*
20.	Question	How much time has been assigned for the completion of this project?
	Answer	A total of 150 days are allowed to complete the Work and have such Work ready for acceptance by CRRA.
21.	Question	What are the safety measures that the contractor must be familiar with prior to starting of the work within the facility?
	Answer	The Operator of the plant Covanta Energy, prior to starting of the Work, will give a safety briefing session to the contractor and subcontractor's personnel that will be involved with the project and will be working on site.
22.	Question	Is a building permit required for this project?
	Answer	Yes, a building permit must be obtained from the City of Hartford together with an approval from the Fire Marshal.
23.	Question	Conventional siding should be replaced with fiberglass–reinforced panels.
	Answer	Yes, Fiberglass-Reinforced Roofing/Siding panels are more effective in corrosive environments and it will be used in this project. **See new Section 13125 Metal Building Systems.**

2. CLARIFICATIONS/ADDITIONS TO THE CONTRACT DOCUMENTS - DRAWINGS

2.1 Excess Soil from excavation generated by the Ash Load Out Project

- With respect to any excess soil generated by the ash load-out modification project, CRRA will be responsible for the characterization and ultimate re-use or disposition of any excess soil.
- The Contractor will be responsible for providing a sufficient number of roll-off containers to stage the excess soil on-site (in a location designated by CRRA) for up to 8 weeks while CRRA awaits soil analytical results and determines the disposition method and location.
- With respect to transportation requirements, it is expected that the excess soil will ultimately be shipped to the Hartford Landfill regardless of the soil's characterization. Therefore, Contractor shall provide a price for transportation of the soil to the Hartford Landfill.

2.2 Potential Soil Contaminants Within the Project

Given the potential to encounter contamination when excavating on-site soils, the CONTRACTOR SHALL CONFORM TO TECHNICAL SPECIFICATION SECTION 01560 - HEALTH, SAFETY, AND EMERGENCY RESPONSE, enclosed herewith, during all soil excavation activities.

With respect to potential soil contaminants of concern, there are two potential constituents of concern that have been identified in various site areas that could also be present in the areas where the Contractor will be excavating soil.

1. Coal ash containing arsenic: When the site was developed in the 1920's, a significant portion of the site was filled with coal ash. The primary constituent of concern in the coal ash is arsenic that is present at concentrations greater than the State's Commercial/Industrial Direct Exposure Criterion of 10 mg/kg.
2. Total Petroleum Hydrocarbons (TPH): During excavation and construction of the ash load-out building in the late 1990's, some TPH-impacted soil was encountered that required removal and disposal as Connecticut-regulated (CR05) special waste.

2.3 REPLACE THE FOLLOWING DRAWINGS:

C4 Site Plans Areas A-B-C-E
C5 Site Plans Area and Ash Load Out BLDG
C6 Site Plan Truck Scale
C10 Site Details
C11 Pipe Cleaning Plan

A-101 Floor Plan and Details
A-103 Staging Plan
A-104 Scale House Floor Plan and Exterior Elevations

A-201 Building Elevations
A-301 Building Sections and Details
A-801 Building Schedules and Details

S-001 Structural General Notes and Abbreviations
S-101 Foundation Plan
S-102 Scale and Scale House Foundation Plans and Details
S-201 Miscellaneous Details and Sections
S-202 Miscellaneous Details and Sections

M-101 Mechanical Floor Plans, Building Section and Details

E-101 Electrical Lighting and Power Plan
E-102 Electrical Site Plan
E-103 Scale House Electrical Plan and Riser Diagram

2.4 REPLACE THE FOLLOWING TECHNICAL SPECIFICATIONS:

Table of Contents
Section 11990 Truck Scale
Section 13125 Metal Building Systems

2.5 ADD THE FOLLOWING TECHNICAL SPECIFICATIONS:

Section 01560 Health, Safety, and Emergency Response
Section 02276 Modular Concrete Retaining Wall
Section 15815 Metal Ducts

3. ATTACHMENTS

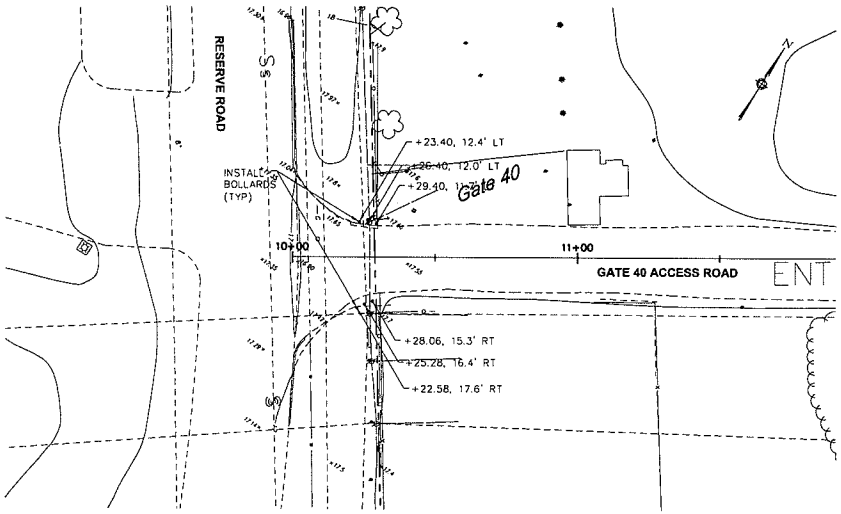
Incorporate into the Contract Documents the following attachments:

(a) Section 5 of the Request For Bids, **"Bid Price Form (Revised)"**

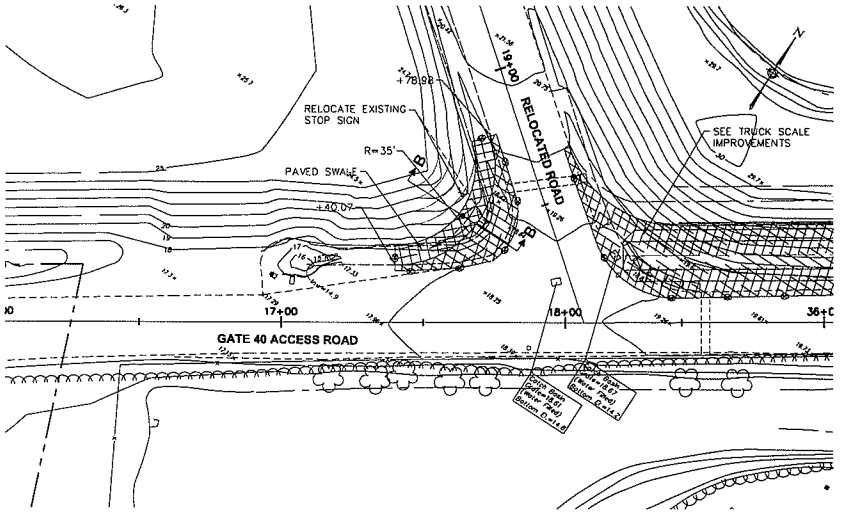
The Bid Price Form has been revised to include lump sum itemized prices for: 1. Ash Load out Building Modifications; 2. Ash Load Out Building/Mechanical Exhaust System; 3. Site Improvements; 4. Unattended Scale House with Electrical Power conduit and Data-Video cable conduit (As shown on plans).

(b) Pre-Bid Conference attendance sign-in sheet.

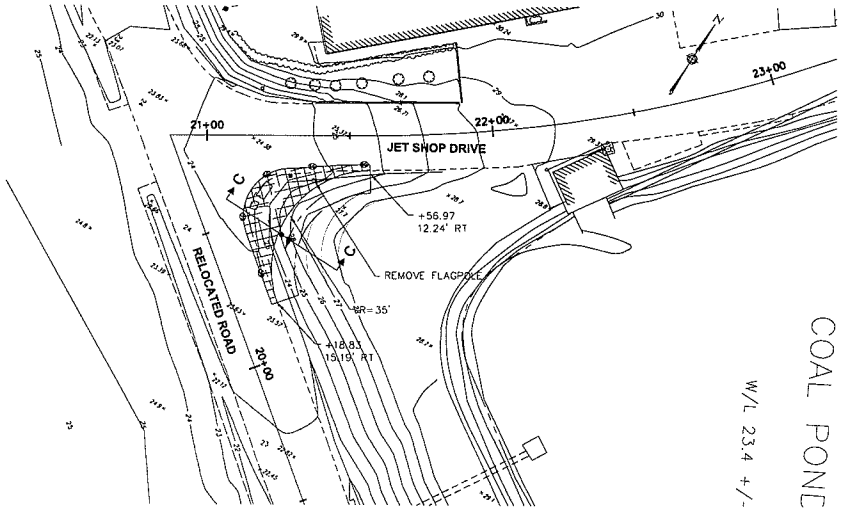
END OF ADDENDUM



AREA A
SCALE: 1"=20'



AREA B
SCALE: 1"=20'



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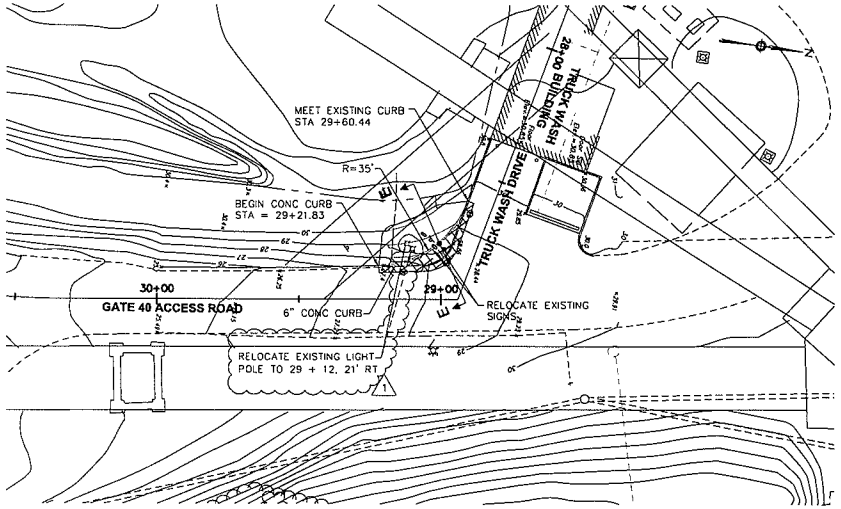
SCALE: 1"=20'



AREA E
SCALE: 1"=20'

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	ADDED LIGHT POLE STATION AND OFFSET

MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

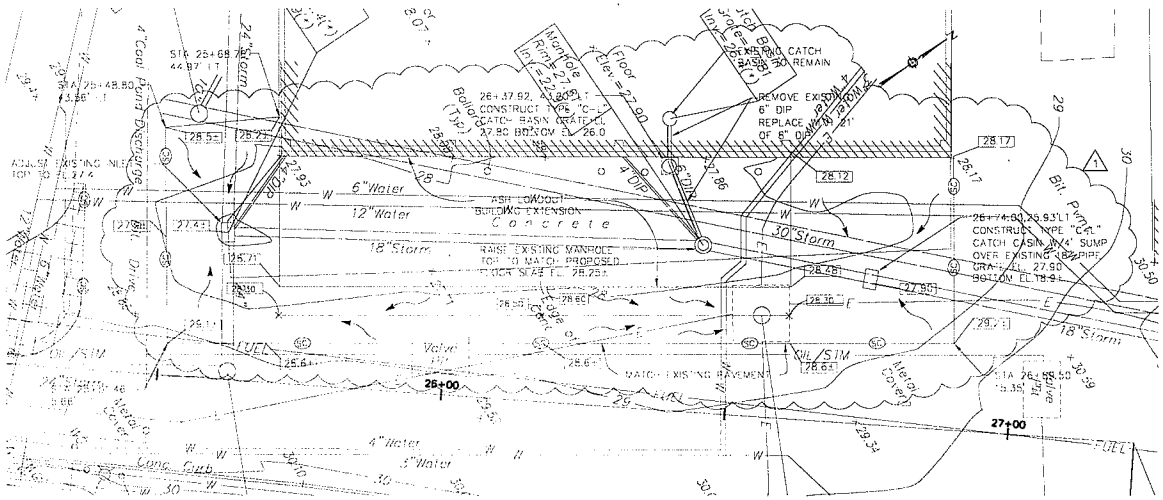
PROJECT NO:	36937668
DRAWN BY:	DS
CHECKED BY:	JS
DATE:	05/14/08
CADD FILE:	AS NOTED

SITE PLANS
AREAS A-B-C-E

C-4

P:\CRRA-Ash building\Site Design\Sheet\Sheets Final\C-04.dwg May 21, 2008 - 3:43 PM

AREA D DETAIL
(NORTH EAST CORNER OF JET SHOP)
SCALE: 1"=10'



ASH LOADOUT BLDG.
SCALE: 1"=10'

XX.X± APPROXIMATE EXISTING ELEVATION
XX.XX PROPOSED ELEVATION

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	ADDED SPOT ELE.
		ADD INLET AND 8" PIPE
		ADDED EXIST. INLET
		AND NOTES
		REVISED WALL NOTES

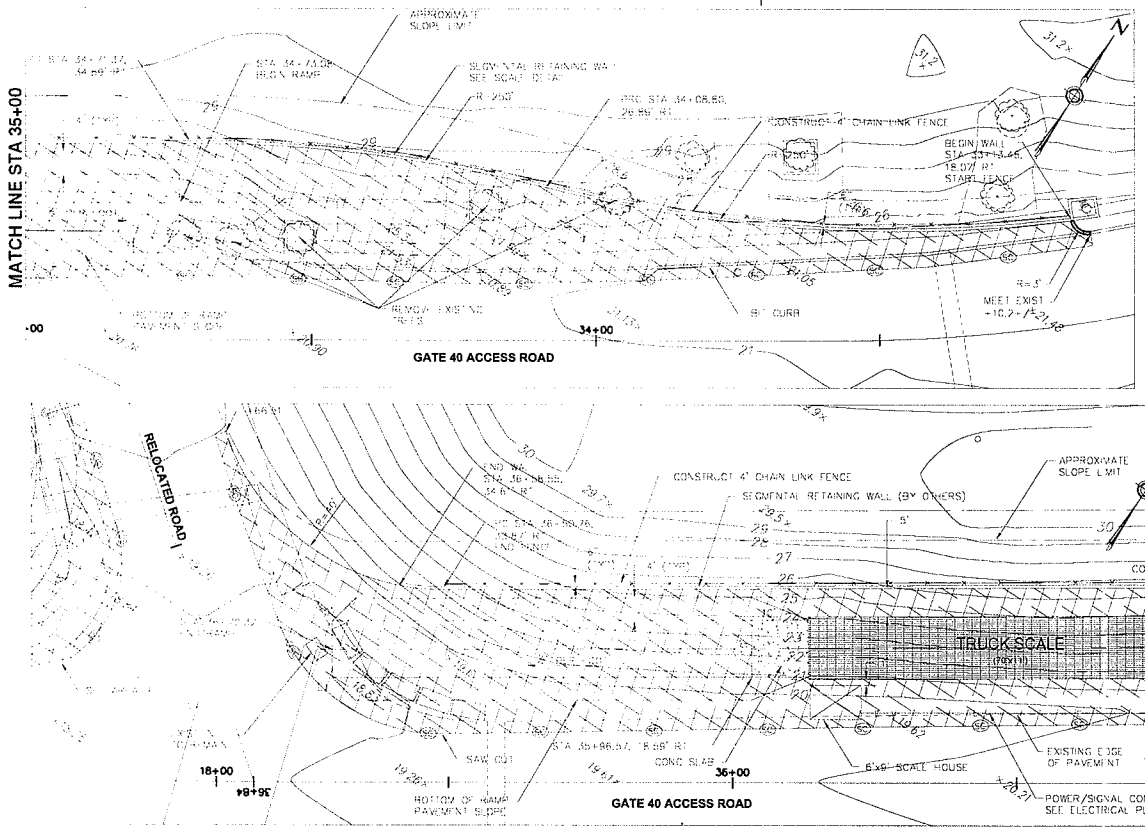
MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

PROJECT NO:	36937668
DRAWN BY:	DS
CHECKED BY:	JS
DATE	05/14/08
CADD FILE:	AS NOTED

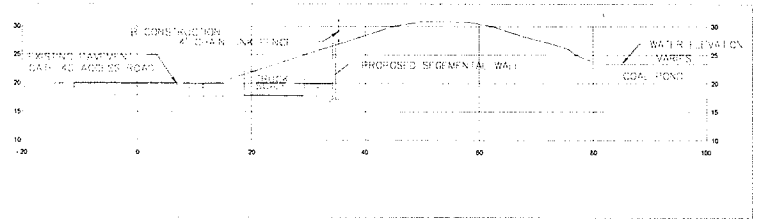
SITE PLANS
AREA & ASH LOADOUT BLDG.

C-5



TRUCK SCALE

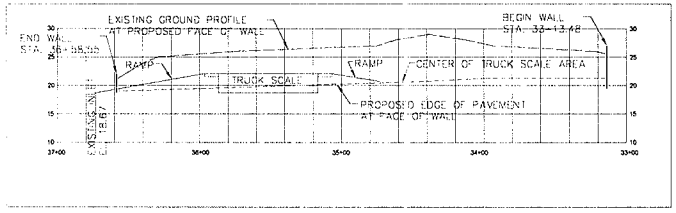
SCALE: 1" = 10'



SECTION THROUGH BERM

AT COAL POND
STA. 35+50.00

SCALE: 1" = 10' HORIZONTAL
1" = 10' VERTICAL



EXISTING GROUND PROFILE

AT FACE OF PROPOSED WALL

SCALE: 1" = 40' HORIZONTAL
1" = 10' VERTICAL

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	ADDED SECTIONS
		WALL

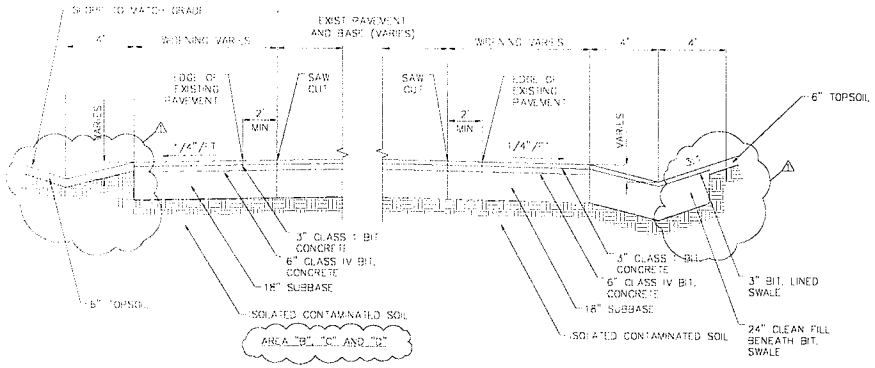
MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

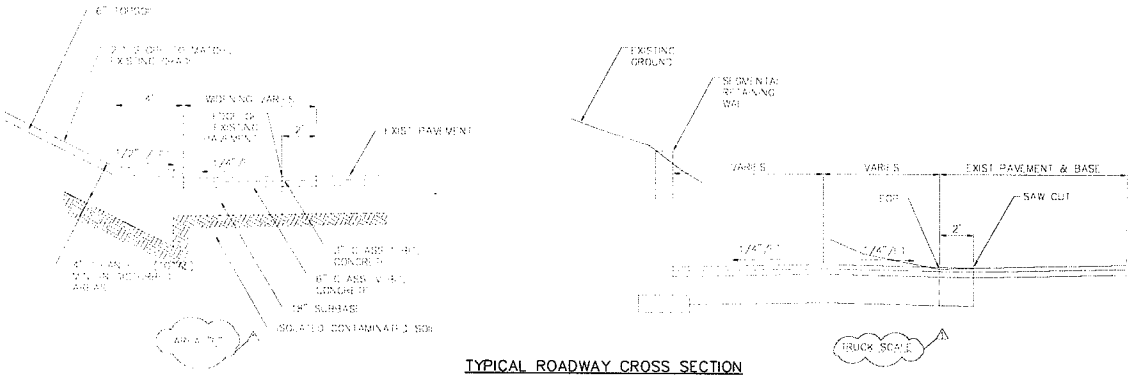
RESERVE ROAD
HARTFORD, CT.

PROJECT NO:	36937668
DRAWN BY:	DS
CHECKED BY:	JS
DATE:	05/14/08
CADD FILE:	AS NOTED

SITE PLAN
TRUCK SCALE

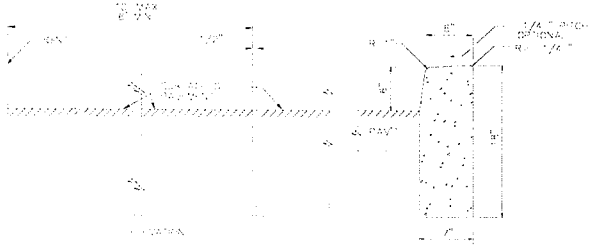
C-6

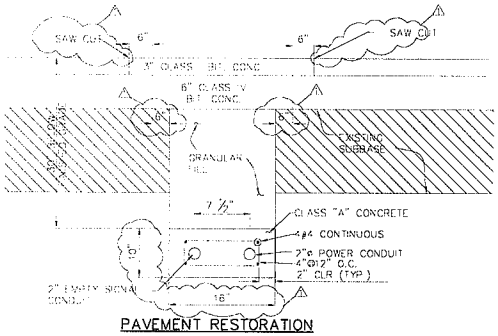




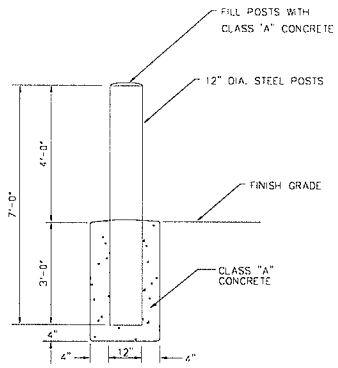
TYPICAL ROADWAY CROSS SECTION

N.T.S.



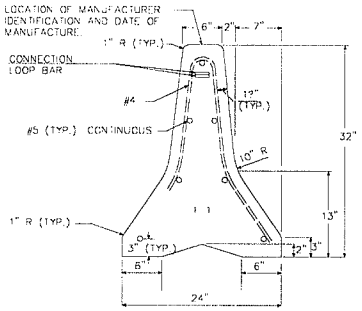


PAVEMENT RESTORATION



STEEL BOLLARD DETAIL

AREA "A"



CONCRETE BARRIER WALL (32" HIGH)

AREA "D"

FOR ADDITIONAL INFORMATION SEE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD DETAIL SHEET No. 822-A

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	DELETED 4" CLEAN FILL
		ADDED WORKAREA
		TITLES, ADDED
		DIMENSIONS, NOTES

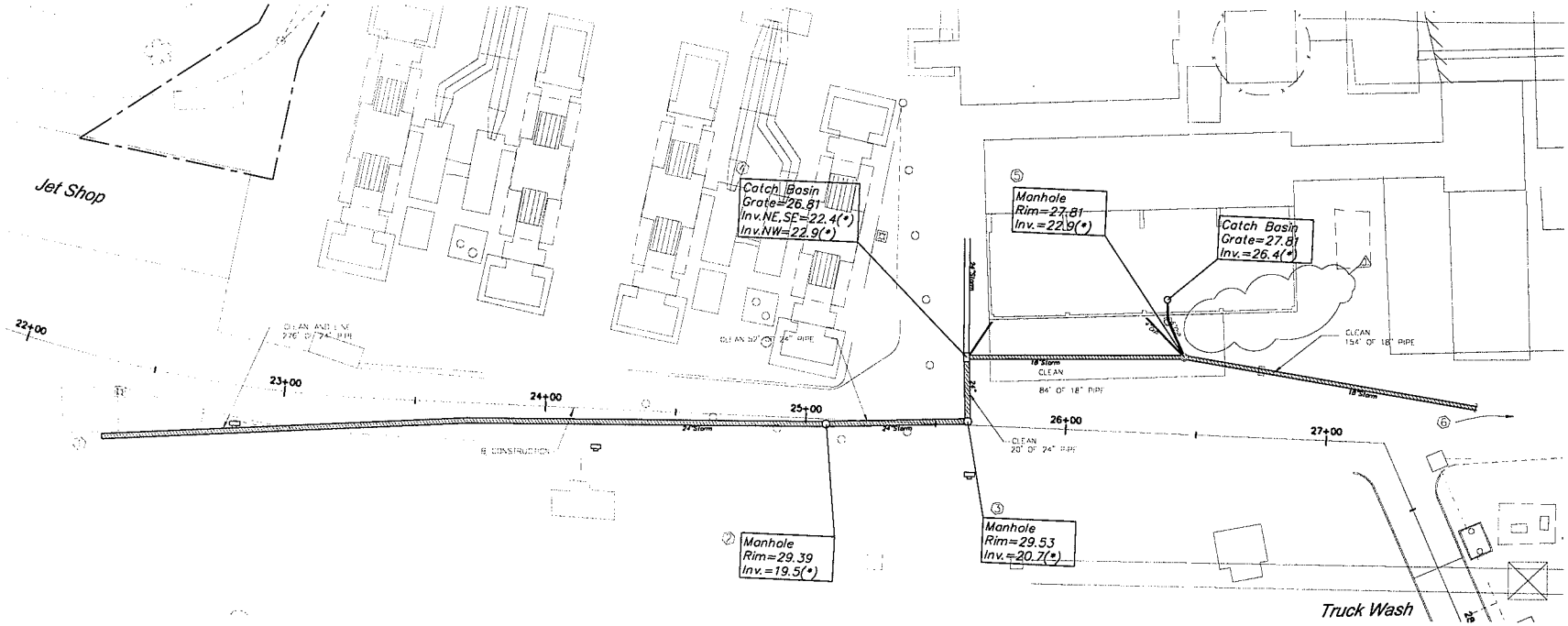
MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

PROJECT NO:	36937668
DRAWN BY:	DS
CHECKED BY:	JS
DATE:	05/14/08
CADD FILE:	AS NOTED

SITE DETAILS

C-10



SCALE: 1" = 20'

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	DELETED CLEANING OF 6" DIP.

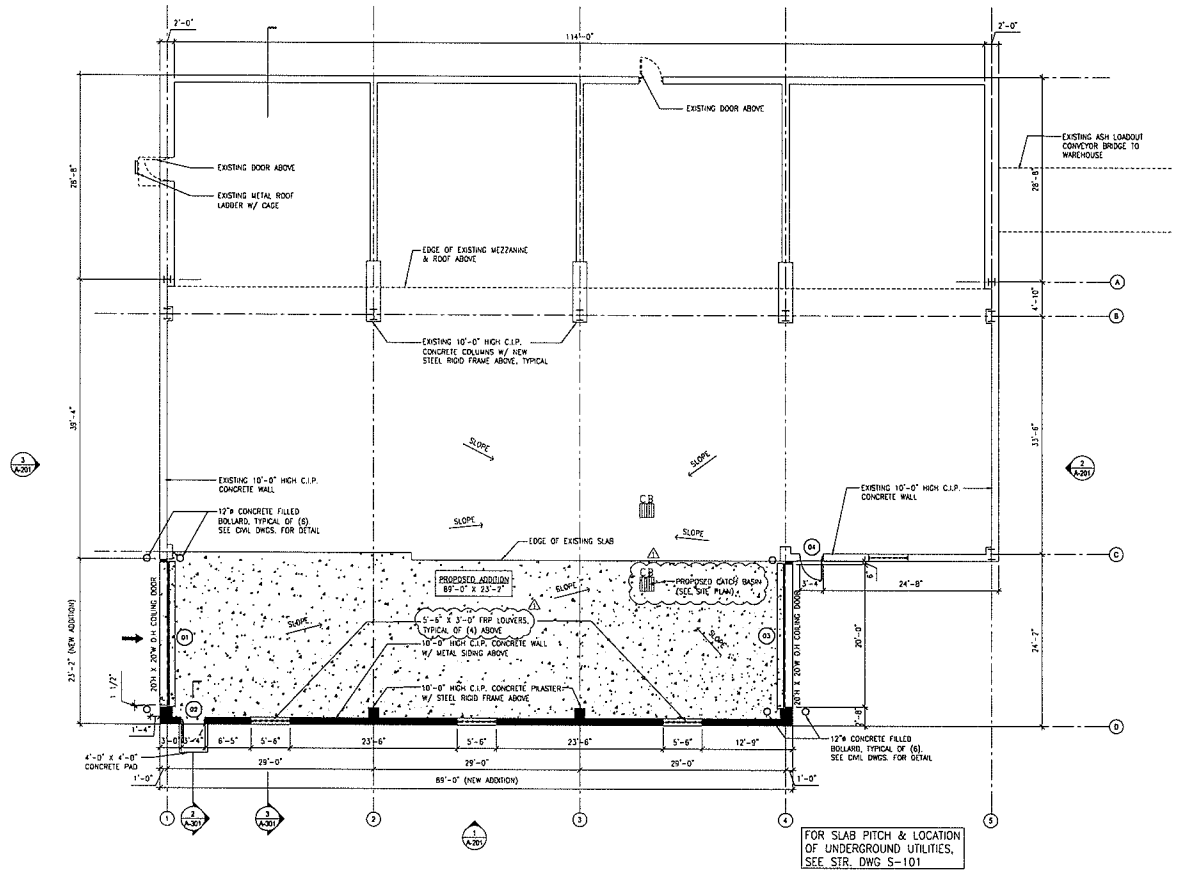
MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

PROJECT NO: 36937668	
DRAWN BY:	DS
CHECKED BY:	JS
DATE:	05/14/08
CADD FILE:	AS NOTED

PIPE CLEANING PLAN

C-11



1 A-101 FLOOR PLAN
SCALE: 1/8" = 1'-0"

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	CHANGED METAL TO FRP
		ADDED A CATCH BASIN

MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

PROJECT NO:	36937668
DRAWN BY:	SM
CHECKED BY:	HSP
DATE:	05/14/08
CADD FILE:	AS NOTED

FLOOR PLAN AND DETAILS

A-101

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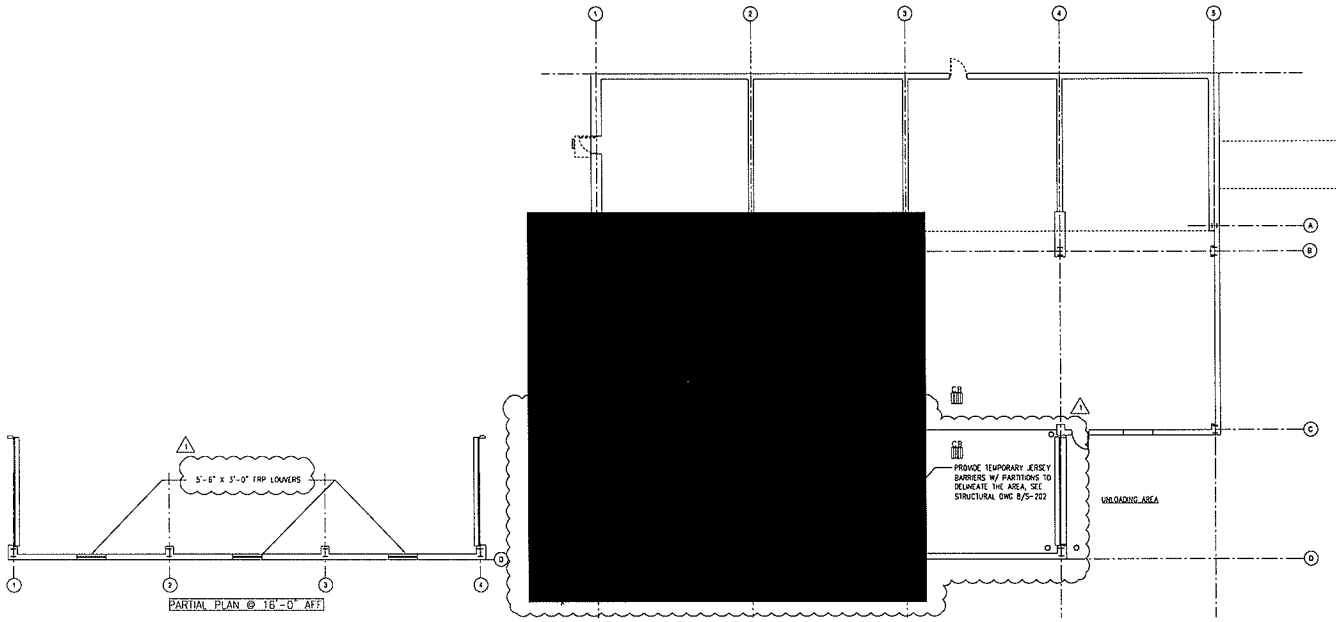
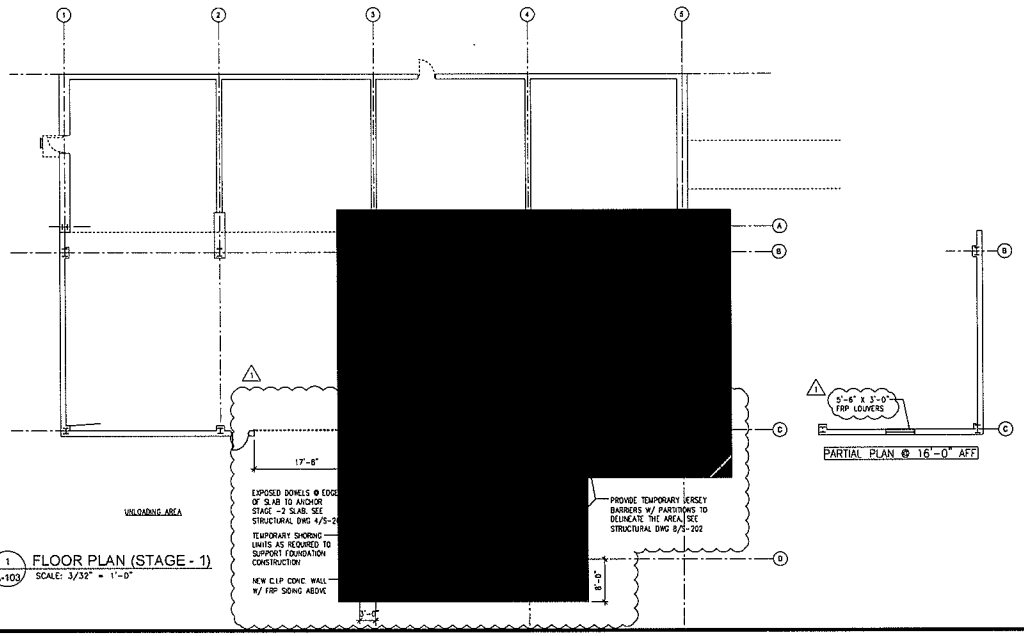


2 A-103 FLOOR PLAN (STAGE - 2)
SCALE: 3/32" = 1'-0"

PARTIAL PLAN @ 16'-0" AFF

SEQUENCE OF CONSTRUCTION NOTES:

1. INSTALL TEMPORARY CONCRETE JERSEY BARRIER AS NOTED IN STAGE I.
2. DEMOLISH PORTIONS OF EXISTING CONCRETE PUSH WALLS WHILE MAINTAINING CONCRETE PIERS AND EXISTING METAL BUILDING ROOF, WALLS AND FRAMING.
3. CONSTRUCT NEW CAST-IN-PLACE CONCRETE PUSH WALLS, PIERS, FOUNDATIONS AND SLAB AS INDICATED IN STAGE I.
4. DEMOLISH EXISTING METAL BUILDING INCLUDING BUT NOT LIMITED TO ROOF, WALLS, FRAMING, EXISTING CONCRETE PIERS, REMAINING EXISTING CONCRETE PUSH WALL IN STAT I. NOTE – DEMOLISH OF EXISTING METAL BUILDING NOT TO BE PERFORMED UNTIL NEW FRAMING STRUCTURE ON SITE.
5. TEMPORARY SHORE, BRACE AND/OR SUPPORT EXISTING ROOF AND WALL AT EXISTING PRE-ENGINEERED BUILDING TO REMAIN FOR STAGE II CONSTRUCTION.
6. INSTALL NEW PRE-ENGINEERED BUILDING AND FRAMES ALONG COLUMN LINES 3, 5 AND BETWEEN COLUMN LINES A & D (STAGE I CONSTRUCTION).
7. REMOVE TEMPORARY CONCRETE JERSEY BARRIERS AND RESET TEMPORARY JERSEY BARRIERS FOR STAGE II.
8. DEMOLISH PORTIONS OF EXISTING CONCRETE PUSH WALL WHILE MAINTAINING EXISTING CONCRETE PIERS AND EXISTING METAL BUILDING, ROOF, WALLS AND FRAMING.
9. CONSTRUCT NEW CAST-IN-PLACE CONCRETE PUSH WALLS, PIERS, FOUNDATIONS AND SLAB AS INDICATED IN STAGE II.
10. DEMOLISH REMAINING EXISTING BUILDING INCLUDING BUT NOT LIMITED TO ROOF, WALLS, FRAMES, EXISTING CONCRETE PIERS AND REMAINING EXISTING CONCRETE PUSH WALLS IN STAGE II. NOTE – DEMOLISH OF EXISTING METAL BUILDING NOT TO BE PERFORMED UNTIL NEW FRAMING STRUCTURE ON SITE.
11. INSTALL NEW PRE-ENGINEERED BUILDING AND FRAMES ALONG COLUMN LINES 1, 2 AND UP TO 3, BETWEEN COLUMN LINES A & D.
12. REMOVE TEMPORARY CONCRETE JERSEY BARRIERS FROM STAGE II CONSTRUCTION AND FROM SITE.
13. SEQUENCE OF CONSTRUCTION MAY BE VARIED WITH PERMISSION OF THE ENGINEER AND/OR OWNER.
14. DEMOLISHING OF EXISTING METAL BUILDING AND FRAMES AS WELL AS INSTALLATION OF NEW FRAMES, PURLINS AND ROOF DECK MUST BE PERFORMED DURING OFF HOURS OF OWNER'S HAULING OPERATIONS.



1 A-103 FLOOR PLAN (STAGE - 1)
SCALE: 3/32" = 1'-0"

PARTIAL PLAN @ 16'-0" AFF

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	PLAN MODIFICATIONS
		SEQ. OF CONST. NOTES

MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

PROJECT NO:	36937668
DRAWN BY:	SM
CHECKED BY:	HSP
DATE:	05/14/08
CADD FILE:	AS NOTED

STAGING PLAN

A-103

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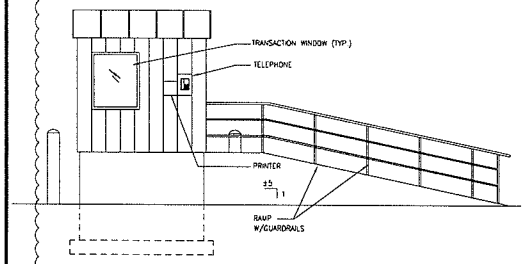
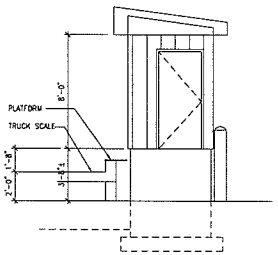
GENERAL NOTES

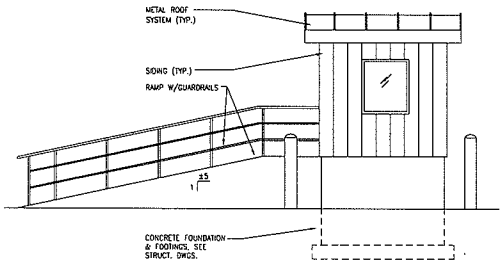
1. ALL COMPONENTS SHOWN FOR PRE-FABRICATED SCALE HOUSE ARE TO BE PROVIDED BY THE SCALE HOUSE MFR.
2. COORDINATE ALL DIMENSIONS, RAMP DESIGN AND COMPONENT LOCATIONS W/ SCALE HOUSE MFR. REQUIREMENTS



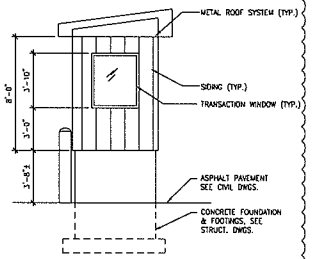
5 A-104 WEST ELEVATION
SCALE: 1/4" = 1'-0"



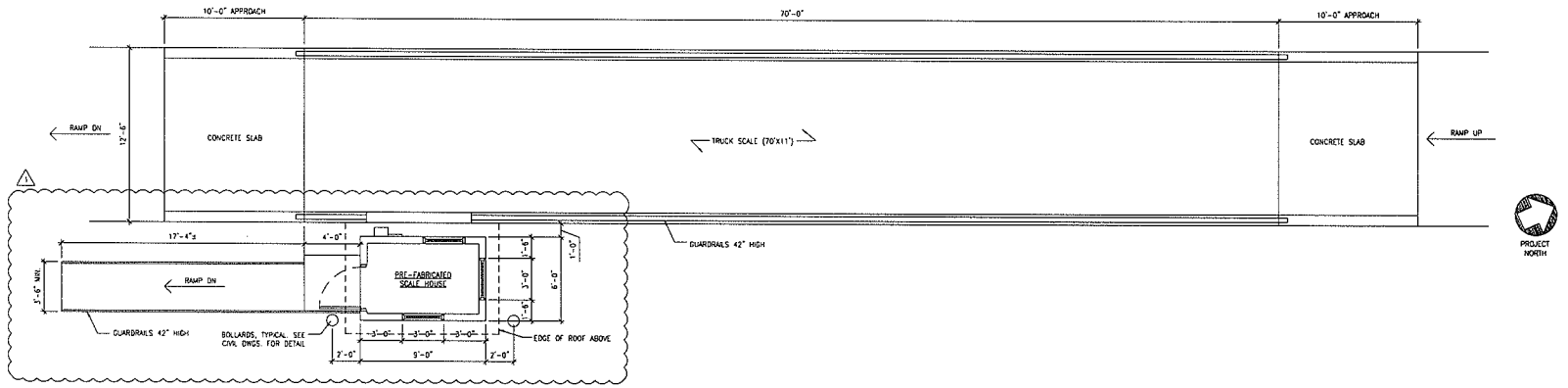
4 A-104 SOUTH ELEVATION
SCALE: 1/4" = 1'-0"



3 A-104 EAST ELEVATION
SCALE: 1/4" = 1'-0"



2 A-104 NORTH ELEVATION
SCALE: 1/4" = 1'-0"



1 A-104 SCALE HOUSE FLOOR PLAN
SCALE: 1/4" = 1'-0"

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	PLAN/ELEV MODIFICATIONS

MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

PROJECT NO:	36937668
DRAWN BY:	SM
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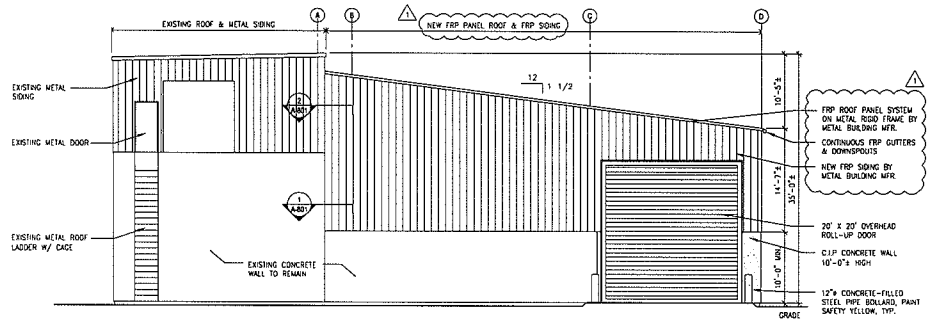
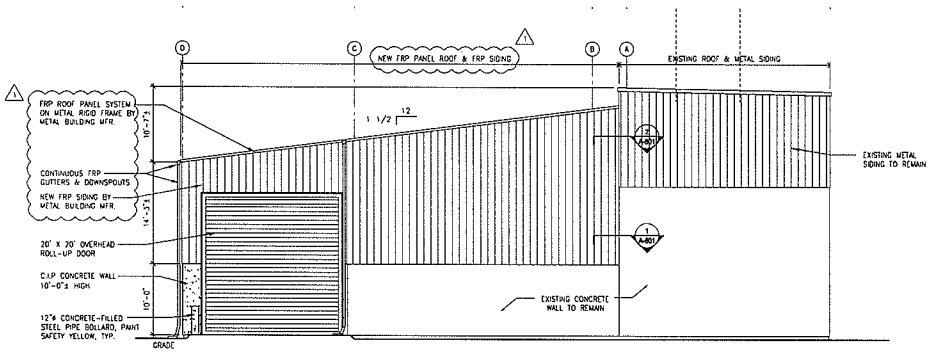
DATE:	05/14/08
CADD FILE:	AS NOTED

SCALE HOUSE FLOOR PLAN & EXTERIOR ELEVATIONS

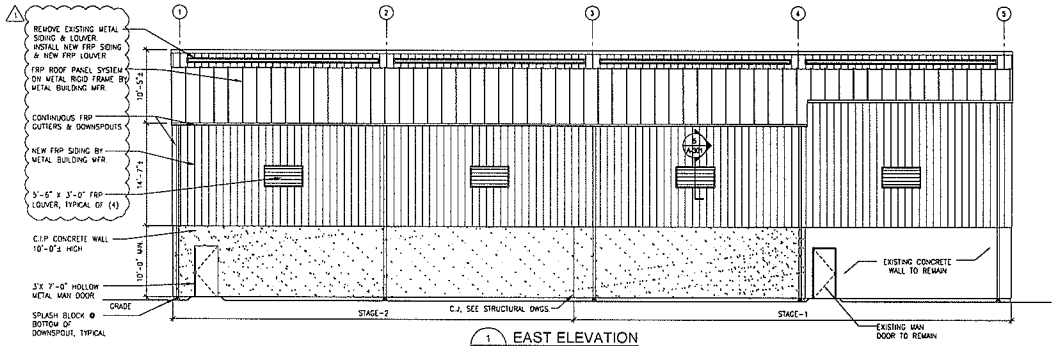
A-104



3 / A-201 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



2 / A-201 NORTH ELEVATION
SCALE: 1/8" = 1'-0"



1 / A-201 EAST ELEVATION
SCALE: 1/8" = 1'-0"

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	CHANGED METAL TO FRP

MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

PROJECT NO:	36937668
DRAWN BY:	SM
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DATE:	05/14/08
CADD FILE:	AS NOTED

BUILDING ELEVATIONS

A-201

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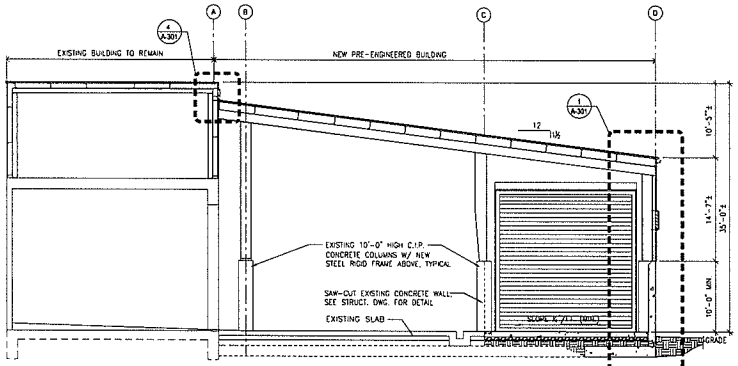
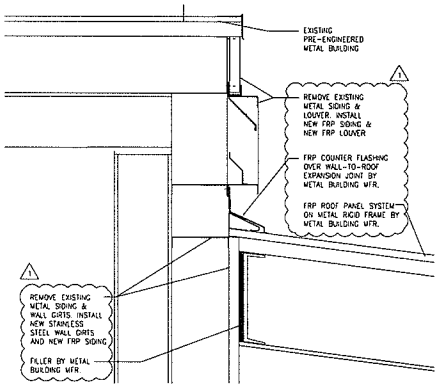
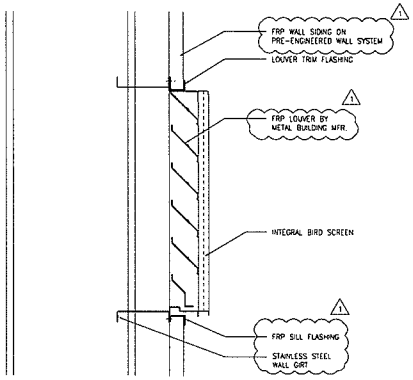


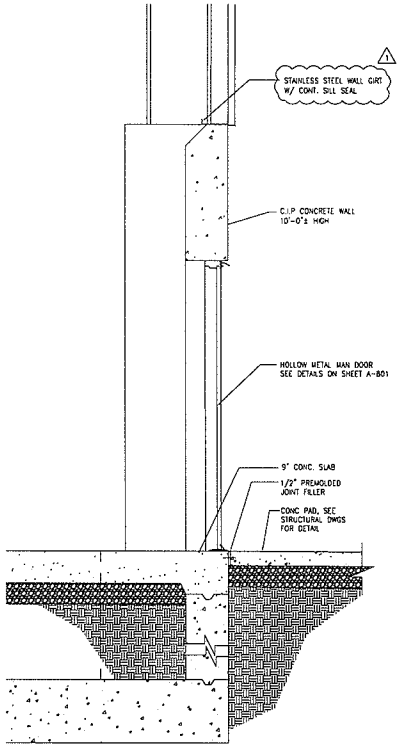
1 A-101 / 3 A-301 BUILDING SECTION
SCALE: 1/8" = 1'-0"



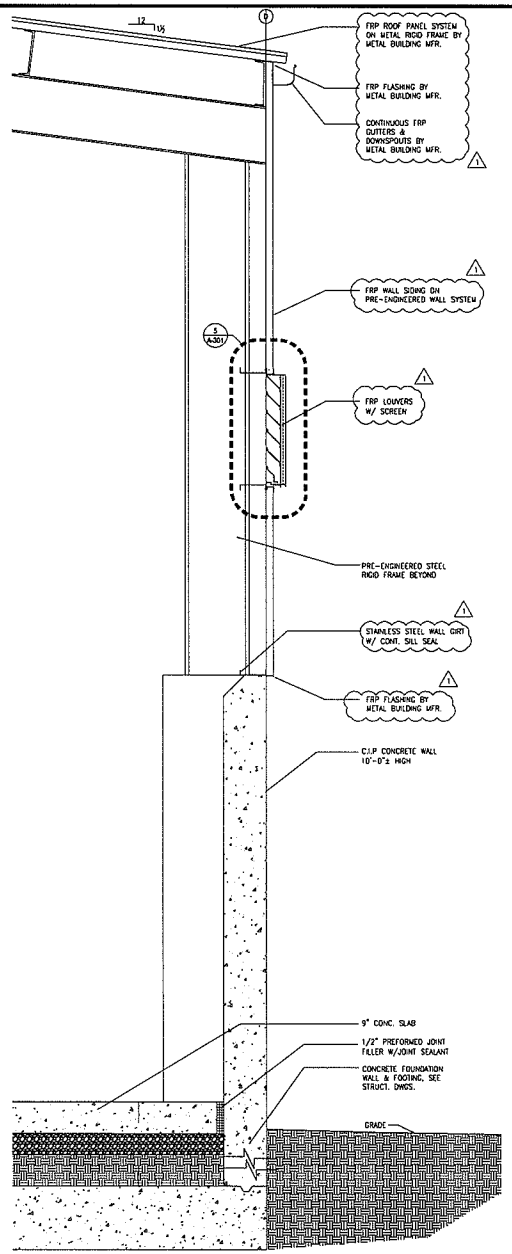
3 A-301 / 4 A-301 DETAIL
SCALE: 1 1/2" = 1'-0"



1 A-301 / 5 A-301 WALL SECTION @ LOUVER
SCALE: 1 1/2" = 1'-0"



1 A-101 / 2 A-301 WALL SECTION @ MAN DOOR
SCALE: 3/4" = 1'-0"



3 A-301 / 1 A-301 WALL SECTION
SCALE: 3/4" = 1'-0"

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	CHANGED METAL TO FRP
		STEEL TO S. STEEL

MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

PROJECT NO:	36937668
DRAWN BY:	SM
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BUILDING SECTIONS & DETAILS

A-301

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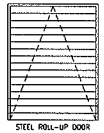
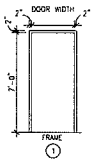
DOOR SCHEDULE

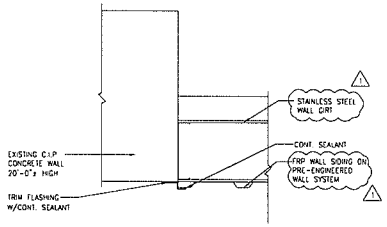
DOOR NUMBER	DOOR TYPE	DOOR: MATERIAL: WOOD-SOLID CORE	HOLLOW METAL	FIBERGLASS	DOUBLE LEAF DOOR	NOMINAL SIZE: WIDTH x HEIGHT EACH LEAF	VISION PANEL	FRAME: MAT'L: FRAME TYPE	HOLLOW METAL	STEEL	DETAIL/SHEET NUMBER: HEAD DETAIL	JAMB DETAIL	THRESHOLD DETAIL	FIRE RATING: 90 MINUTE - B LABEL	45 MINUTE - C LABEL	20 MINUTE - SMOKE TIGHT	HARDWARE SEE SPECIFICATIONS: PANIC RELEASE LATCH	POSITIVE LATCHING	AUTOMATIC CLOSER	E.H. HOLD-OPEN	LEVER LOCKSET	HOLLOW BORE BOLT	PUSH/PULL	AUTOMATIC OPENING	KICK PLATES	TACTILE WARNING	HARDWARE SET NO. (SEE SPECIFICATION)	DOOR SCHEDULE NOTES
01	B	●				20'-0" x 20'-0"				●	H-2	J-2	S-															MOTORIZED ROLL-UP DOOR
02	A	●				3'-0" x 7'-0"		1 ●			H-1	J-1	S-1						●		●							①②
03	B	●				20'-0" x 20'-0"				●	H-2	J-2	S-															MOTORIZED ROLL-UP DOOR
04	○	○				3'-0" x 7'-0"		○			H-2	J-2	S-1						○		○							①②

SYMBOL LEGEND
- ● INDICATES REQUIRED WORK
- ○ INDICATES EXISTING
- ⊕ INDICATES RE-USE RELOCATED EXISTING

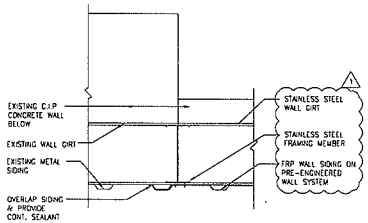
SCHEDULE NOTES:
① EXIT DOOR CAN NOT BE LOCKED FROM INSIDE.
② PROVIDE WEATHER STRIPING & SWEEP FOR ALL EXTERIOR DOORS.



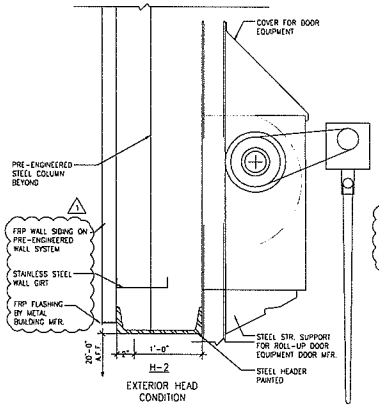


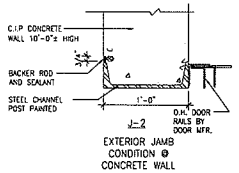


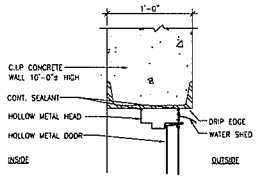
3/A-301 1/A-801 DETAIL @ SIDING & CONC. WALL
SCALE:1 1/2" = 1'-0"

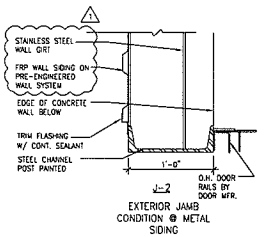


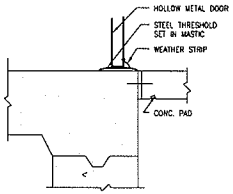
3/A-301 2/A-801 DETAIL @ SIDING
SCALE:1 1/2" = 1'-0"

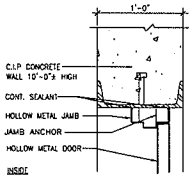












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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	CHANGED METAL TO FRP
		STEEL TO S. STEEL

MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS
RESERVE ROAD
HARTFORD, CT.

PROJECT NO: 36937668
DRAWN BY: SM
CHECKED BY: -
DATE: 05/14/08
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BUILDING SCHEDULES & DETAILS

A-801

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STRUCTURAL GENERAL NOTES

INTERNATIONAL BUILDING CODE 2003 (IBC) WITH STATE OF CONNECTICUT SUPPLEMENTS DATED 2005

DESIGN LOADS

ROOF DEAD LOADS:
AS MATERIALS REQUIRED BY PRE-ENGINEERED BUILDING MANUFACTURER

ROOF LIVE LOAD:

GROUND SNOW	30 PSF
FLAT-ROOF SNOW LOAD	Pf = 30 PSF
DRIFTING	2003 INTERNATIONAL BUILDING CODE
SNOW LOAD IMPORTANCE FACTOR	I = 1.0
SNOW LOAD EXPOSURE FACTOR	Ce = 1.0
SNOW LOAD THERMAL FACTOR	Ct = 1.0
ROOF DESIGN LIVE LOAD	30 PSF

WIND LOAD:

	2003 INTERNATIONAL BUILDING CODE
BASIC WIND SPEED	V = 100 mph
WIND LOAD IMPORTANCE FACTOR	I = 1.0
WIND EXPOSURE	C
WIND DESIGN PRESSURE	P = 12 PSF MWFRS WALLS = 12 PSF COMP. & CLADDING = 19.1 PSF GROSS UPLIFT ON ROOF

EARTHQUAKE LOAD:

	2003 INTERNATIONAL BUILDING CODE AND ASCE 7-02
SITE CLASS	D
MAPPED SPECTRAL REPSONSE ACCELERATIONS	Ss = 0.274 S1 = 0.085
SEISMIC USE GROUP	I
SEISMIC DESIGN CATEGORY	C
BASIC SEISMIC RESISTING SYSTEM	
RESPONSE MODIFICATION FACTOR	AS PER PRE-ENGINEERED BUILDING MANUFACTURER

DESIGN STRESSES:

SOIL PRESSURE: f_p = 1,000 PSF

CONCRETE:

EXTERIOR SLABS	f'c = 4,000 PSI
ALL OTHERS	f'c = 4,000 PSI

REINFORCING STEEL:

#3 BARS AND SMALLER:	fy = 40,000 PSI
#4 BARS AND LARGER:	fy = 60,000 PSI
WELDED WIRE FABRIC:	fy = 65,000 PSI

STRUCTURAL STEEL:

WIDE FLANGE SHAPES	fy = 50,000 PSI
ALL OTHER ROLLED SHAPES	fy = 36,000 PSI
PLATES AND BARS	fy = 36,000 PSI
TUBE SHAPES	fy = 46,000 PSI

GENERAL:

1. USE STRUCTURAL DRAWINGS WITH ARCHITECTURAL, ELECTRICAL AND MECHANICAL DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR INCLUDING ALL REQUIREMENTS INTO SHOP DRAWINGS AND WORK.
2. DO NOT CHANGE SIZE OR DIMENSIONS OF STRUCTURAL MEMBERS WITHOUT APPROVAL OF THE ARCHITECT.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR LIMITING THE AMOUNT OF CONSTRUCTION LOAD IMPOSED UPON STRUCTURAL FRAMING. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN CAPACITY OF STRUCTURAL MEMBERS AT THE TIME THE LOADS ARE IMPOSED.
4. THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION. THE STRUCTURE IS DEPENDENT UPON DIAPHRAGM ACTION OF THE ROOF DECK AND ATTACHMENT TO THE BRACED BAYS FOR STABILITY AND FOR RESISTANCE TO WIND AND SEISMIC FORCES. PROVIDE ALL TEMPORARY BRACING REQUIRED FOR STABILITY AND FOR RESISTANCE TO WIND AND SEISMIC FORCES UNTIL THESE ELEMENTS ARE COMPLETE AND ARE CAPABLE OF PROVIDING THIS SUPPORT.
5. DO NOT SCALE DRAWINGS, USE DIMENSIONS.
6. CONTRACTOR'S CONSTRUCTION AND/OR ERECTION SEQUENCES SHALL RECOGNIZE AND CONSIDER THE EFFECTS OF THERMAL MOVEMENTS OF STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PERIOD.
7. INFORM THE ARCHITECT OF ANY DEVIATION FROM THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL NOT BE RELIEVED OF THE RESPONSIBILITY OF SUCH DEVIATION BY THE ARCHITECT'S REVIEW OF SHOP DRAWINGS, PRODUCT DATA, ETC., UNLESS THE CONTRACTOR HAS SPECIFICALLY INFORMED THE ARCHITECT OF SUCH DEVIATION AT THE TIME OF SUBMISSION, AND THE ARCHITECT HAS GIVEN WRITTEN APPROVAL TO THE SPECIFIC DEVIATION.
8. VERIFY ALL DIMENSIONS AND ELEVATIONS ON STRUCTURAL DRAWINGS WITH ARCHITECTURAL DRAWINGS. REPORT DISCREPANCIES TO ARCHITECT BEFORE PROCEEDING WITH WORK.
9. UNDERGROUND UTILITY LOCATIONS AND MATERIALS OF CONSTRUCTION SHOWN HEREIN AND OTHER LOCATIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO START OF CONSTRUCTION.
10. CONTRACTOR SHALL NOT DISRUPT OPERATION DURING CONSTRUCTION.
11. ALL DISTURBED AREAS TO BE RESTORED TO THE ORIGINAL CONDITIONS.
12. CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND BRACING TO SUPPORT UTILITIES DURING CONSTRUCTION.
13. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL PROVIDE TEST PITS TO VERIFY LOCATION AND ELEVATIONS OF CROSSING SANITARY WATER LINES, STORM SEWER LINES AND ELECTRICAL UTILITIES. THE CONTRACTOR SHALL REQUEST MARK OUT OF UTILITY LOCATION FROM CALL BEFORE YOU DIG (1-800-922-4455) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION OPERATION.

FOUNDATIONS:

1. FOOTING ELEVATIONS SHOWN ON PLAN ARE TO (1) BOTTOM OF FOOTINGS.
2. REFER TO CIVIL DRAWINGS FOR ROUGH GRADE ELEVATIONS.
3. DO NOT PLACE CONCRETE FOR FOOTINGS UNTIL BEARING CAPACITY IS VERIFIED BY OWNER'S GEOTECHNICAL CONSULTANT.
4. OVER EXCAVATION OF SOIL FOR FOOTINGS SHALL BE REPLACED AND COMPACTED IN LAYERS, TO 95% OF MODIFIED PROCTOR.
5. UNSUITABLE BEARING MATERIALS, SUCH AS MISCELLANEOUS FILL AND ORGANIC SOILS MAY EXIST IN AREAS OF NEW FOUNDATIONS. EXISTING UNSUITABLE MATERIALS SHALL BE EXCAVATED AS DIRECTED OR AS INDICATED ON THE DRAWINGS AND SHALL BE FILLED BY PLACEMENT OF COMPACTED GRAVEL FILL AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
6. STEP WALL FOOTINGS 1 VERTICAL TO 2 HORIZONTAL WHERE ELEVATIONS CHANGE UNLESS NOTED OTHERWISE ON DRAWINGS.
7. EDGES OF FOOTINGS SHALL NOT BE PLACED AT A SLOPE GREATER THAN 1 VERTICAL TO 2 HORIZONTAL WITH RESPECT TO ANY ADJACENT FOOTING OR EXCAVATION UNLESS NOTED OTHERWISE ON THE DRAWINGS.
8. DO NOT USE EARTH FORMED TRENCH FOR FOOTINGS OR FOUNDATION WALLS.
9. DO NOT PLACE FOUNDATION CONCRETE ON FROZEN SOIL OR INTO AN EXCAVATION CONTAINING FREE WATER.
10. REFER TO ARCHITECTURAL, PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS FOR ALL LOCATIONS OF TRENCHES, PITS, CONDUITS, ETC., NOT SHOWN ON THE STRUCTURAL DRAWINGS.
11. COORDINATE PLACEMENT OF ANCHOR BOLTS AND SLEEVES WITH FOUNDATION REINFORCEMENT.
12. WALLS MONOLITHICALLY WITH EACH OTHER.

SLAB ON GRADE:

1. SUPPORT WELDED WIRE FABRIC REINFORCEMENT OR REINFORCING STEEL BARS ON CONTINUOUS SLAB BOLSTERS (WITH SAND PLATES) SPACED AS REQUIRED TO ADEQUATELY SUPPORT FABRIC OR REINFORCING STEEL BARS, BUT IN NO CASE GREATER THAN 24" O/C. PLACE WELDED WIRE FABRIC OR REINFORCING STEEL BARS AS SHOWN.
2. PLACE ALL INTERIOR SLABS ON GRADE OVER VAPOR BARRIER. REFER TO SPECIFICATION FOR VAPOR BARRIER REQUIREMENTS.
3. EXTERIOR SLABS ON GRADE CONSTRUCTION AND CONTRACTION JOINTS (INCLUDING SIDEWALKS) SHALL BE TOOLED. REFER TO CIVIL DRAWINGS FOR REQUIRED DEPTH.
4. SLOPE FLOORS TO DRAINS WHERE INDICATED ON DRAWINGS.
5. PLACE ELECTRIC CONDUIT AND OTHER PIPES BELOW CONCRETE FLOOR SLABS.
6. PROVIDE DIAGONAL REINFORCEMENT AT RE-ENTRANT CORNERS IN SLABS AS FOLLOWS: 2-#4 X 4'-0" BAR FOR EACH 4 INCHES OF SLAB THICKNESS.

CONCRETE:

1. HEATING WILL NOT BE PERMITTED FOR BENDING OF REINFORCEMENT STEEL.
2. CONCRETE COVER FOR STEEL REINFORMENT, UNLESS NOTED OTHERWISE:
   UNFORMED SURFACE IN CONTACT WITH THE GROUND, 3 IN.
   FORMED SURFACES EXPOSED TO EARTH OR WEATHER, 2 IN.
3. MINIMUM CONCRETE COVER FOR ANCHOR BOLTS: 3 IN.
4. LAP CONTINUOUS CONCRETE HORIZONTAL REINFORCING BARS 36 DIAMETERS, UNLESS OTHERWISE NOTED. ALL OTHER LAP SPLICES SHALL BE IN ACCORDANCE WITH ACI318-99.
5. PROVIDE CORNER BARS FOR ALL HORIZONTAL REINFORCEMENT.
6. ALL CONCRETE SHALL BE AIR-ENTRAINED.
7. REFER TO CIVIL, ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATION AND DIMENSIONS OF PADS, DEPRESSIONS, OPENINGS, SLEEVES, DRAINS, INSERTS, ANCHORS HANGERS, MISCELLANEOUS IRON, CHASES, CONDUITS, FLOOR FILLS AND FINISHES, CURBS, STONE AND MASONRY DETAILS AND OTHER DETAILS RELATED TO CONCRETE WORK NOT SHOWN ON STRUCTURAL DRAWINGS.
8. PROVIDE DIAGONAL REINFORCEMENT ON EACH SIDE OF OPENINGS, OR RE-ENTRANT CORNERS IN SLABS AS FOLLOWS 2- #4 X 4'-0" BAR FOR EACH 4 INCHES OF SLAB THICKNESS.
9. REFER TO ARCHITECTURAL DRAWINGS AND/OR SPECIFICATIONS FOR CONCRETE FINISHES.
10. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL CONCRETE WORK NOT SHOWN ON STRUCTURAL DRAWINGS.

PRE-ENGINEERED STEEL BUILDING:

1. THE PRE-ENGINEERED BUILDING SHALL BE DESIGNED TO SUPPORT THE MINIMUM DESIGN LOADS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS FOLLOWING THE STATE OF CONNECTICUT BUILDING CODE
2. THE PRE-ENGINEERED BUILDING SHALL BE COATED BOTH AT THE EXTERIOR AND INTERIOR OF THE BUILDING
3. THE MANUFACTURER OF THE PRE-ENGINEERED BUILDING AND THE CONTRACTOR SHALL COORDINATE ALL DIMENSIONS, ANCHOR BOLTS SIZES, ANCHOR BOLT LOCATION AND PLACEMENT AND BASE PLATE SIZES PRIOR TO ANY FAVRICATION OF THE BUILDING OR PLACEMENT OF CONCRETE FOUNDATIONS.
4. THE PRE-ENGINEERED BUILDING MANUFACTURER SHALL SUPPLY CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STAT OF CONNECTICUT WITH THE SHOP DRAWING OF THE PRE-ENGINEERED BUILDING.
5. PROVIDE LATERAL BRACING AS REQUIRED TO RESIST WIND AND SEISMIC LATERAL LOADS (1)
6. PROVIDE LATERAL BRACING TO RESISTH LATERAL LOAD FOR EACH STAGE OF CONSTRUCTION.

STRUCTURAL ABBREVIATIONS:

ADDN'L	ADDITIONAL	LLH	LONG LEG HORIZONTAL
AGGR	AGGREGATE	LLV	LONG LEG VERTICAL
ALT	ALTERNATE	LP	LOW POINT
AB	ANCHOR BOLT	MANU	MANUFACTURER
L	ANGLE	MAS	MASONRY
APPROX	APPROXIMATE	MAX	MAXIMUM
ARCH	ARCHITECTURAL AS ORDERED BY THE ENGINEER	MET	METAL
BPL	BASE PLATE	MIN	MINIMUM
BRG	BEARING	MISC	MISCELLANEOUS
BLKG	BLOCKING	MS	MIDDLE STRIP
BOT	BOTTOM	NS	NEAR SIDE
BE	BOTTOM ELEVATION	NOM	NOMINAL
BRKT	BRACKET	N	NORTH
BLDG	BUILDING	NIC	NOT IN CONTRACT
BL	BUILDING LINE	NTS	NOT TO SCALE
BFE	BOTTOM FOOTING ELEVATION	NO or #	NUMBER
CTR	CENTER	OC	ON CENTER
CL	CENTER LINE	OPG	OPENING
C	CENTER TO CENTER	OPP	OPPOSITE
CLR	CLEAR	OD	OUT TO OUT
COL	COLUMN	OD	OUTSIDE DIAMETER
CONC	CONCRETE	OF	OUTSIDE FACE
CONN	CONNECTION	PVMT	PAVEMENT
CONST	CONSTRUCTION	PERIM	PERIMETER
CONT	CONTINUE, CONTINUOUS	PC	PIECE
CONTR	CONTRACTOR	PCS	PIECES
CJ	CONTROL JOINT	PL	PLATE
CS	COLUMN STRIP	PT	POINT
COV	COVER	PVC	POLYVINYLCHLORIDE
PL	PLATE	LBS or #	POUNDS
DL	DEAD LOAD	PSF	POUNDS PER SQUARE FOOT
DET	DETAIL	PSI	POUNDS PER SQUARE INCH
DIAG	DIAGONAL	PC	PRECAST
DIA	DIAMETER	PREFAB	PREFABRICATED
DIM	DIMENSION	RAD or R	RADIUS
DIST	DISTANCE	REC	RECESS
DWL	DOWEL	RECT	RECTANGLE, RECTANGULAR
DWG	DRAWING	REINF	REINFORCE, REINFORCING
EA	EACH	RC	REINFORCED CONCRETE
EF	EACH FACE	REQ'D	REQUIRED
EW	EACH WAY	RET	RETURN
E	EAST	REV	REVISED, REVISION
EOD	EDGE OF DECK	RD	ROOF DRAIN
EOS	EDGE OF SLAB	RFG	ROOFING
EL	ELEVATION	SCH	SCHEDULE
ELEV	ELEVATOR	SECT	SECTION
ENGR	ENGINEER	SHT	SHEET
EQ	EQUAL	SIM	SIMILAR
EQUIP	EQUIPMENT	S	SOUTH
EQUIV	EQUIVALENT	SP	SPACE
EXIST	EXISTING	SPEC	SPECIFICATIONS
EXP	EXPANSION	SF	SQUARE FEET (FOOT)
EJ	EXPANSION JOINT	SS	STAINLESS STEEL
ES	END STRIP	STD	STANDARD
EXT	EXTERIOR	STL	STEEL
FS	FAR SIDE	STL PL	STEEL PLATE
FT or '	FEET OR FOOT	STR	STRAIGHT
FIN	FINISH, FINISHED	STRUCT	STRUCTURAL
FPRFG	FIREPROOFING	S STL	STRUCTURAL STEEL
FLASH	FLASHING	SUPP	SUPPORT
FLR	FLOOR	SURF	SURFACE
FD	FLOOR DRAIN	SYM	SYMBOL, SYMMETRICAL
FTG	FOOTING	SYS	SYSTEM
FDN	FOUNDATION	THK	THICK, THICKNESS
FURR	FURRED, FURRING	KIP or K	THOUSAND POUNDS
FUT	FUTURE	THD	THREAD, THREADED
GALV	GALVANIZED	THRU	THROUGH
GA	GAUGE	T & B	TOP AND BOTTOM
GC	GENERAL CONTRACTOR	TE	TOP ELEVATION
GR	GRADE	TF	TOP OF FRAME
HGT	HEIGHT	TSE	TOP OF SLAB ELEVATION
HP	HIGH POINT	TOS	TOP OF STEEL
HSB	HIGH STRENGTH BOLT	TYP	TYPICAL
HORIZ	HORIZONTAL, HORIZONTALLY	UON	UNLESS OTHERWISE NOTED
IN or "	INCH OR INCHES	VERT	VERTICAL, VERTICALLY
INCL ID	INCLUDE, INCLUDING INSIDE DIAMETER	VIF	VERIFY IN FIELD
JT	JOINT	WP	WATERPROOF
JST	JOIST	WT	WEIGHT
K	KIP (1,000 LB)	WWF	WELDED WIRE FABRIC
LGTH	LENGTH	W	WEST
LEV	LEVEL	W WO	WITH, WITHOUT
LL	LIVE LOAD	WL	WORKING LINE
LG	LONG	W	WORKING
		PT	POINT
		YS	YIELD STRENGTH

X — SECTION OR DETAIL NUMBER
X-XXX — *SHEET ON WHICH SECTION OR DETAIL IS LOCATED*

SECTION KEY

X — SECTION OR DETAIL NUMBER
X-XXX — *SHEET ON WHICH SECTION OR DETAIL IS LOCATED*

DETAIL KEY

CONNECTICUT RESOURCES RECOVERY AUTHORITY
TEL. NO. (860)-757-7700
FAX. NO. (860)-757-7743

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	MISC NOTE CHANGES

MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

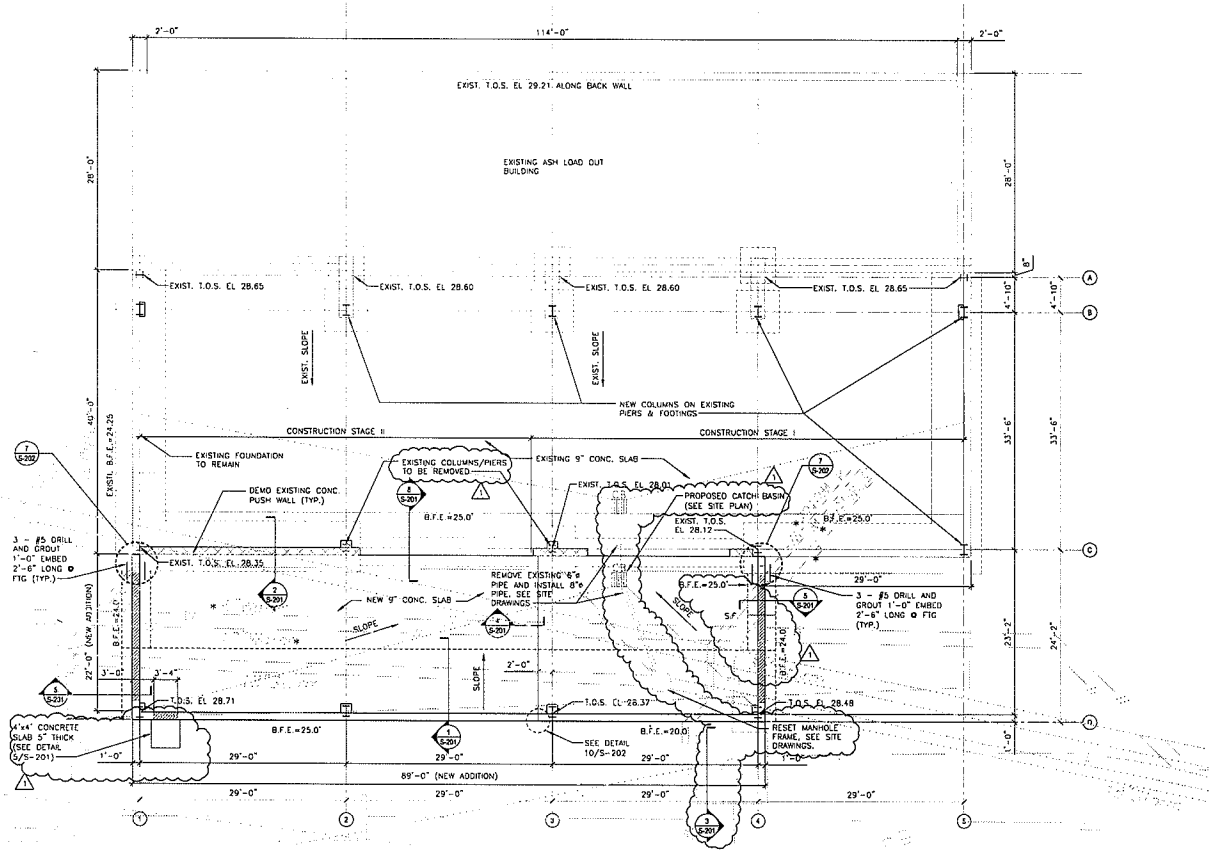
PROJECT NO:	36937668
DRAWN BY:	PD
CHECKED BY:	PJG
DATE:	05/14/08
CADD FILE:	S-001.dwg

STRUCTURAL GENERAL NOTES AND ABBREVIATIONS

S-001

J:\Jobs\36937668\Structural\S-001.dwg May 21, 2008 - 7:07 PM

NOTES:
1. AIR ENTRAIN ALL CONCRETE.
2. FLOOR CONSTRUCTION:
   9" CONCRETE SLAB WITH #5 @ 12" O.C. EACH WAY, EACH FACE ON MINIMUM 9" OF COMPACTED STRUCTURAL FILL.
3. FOR DOOR OPENING LOCATIONS AND ELEVATIONS SEE ARCHITECTURAL DRAWINGS.
4. DROP WALL ELEVATION AT DOOR LOCATION, SEE TYPICAL SECTION.
5. PROVIDE SLEEVE IN FOUNDATION WALL FOR MECHANICAL/ELECTRICAL CONTRACTOR. PIPE SLEEVES SHALL BE SCHEDULE 40 GALVANIZED PIPE.
6. SEE DRAWING S-001 FOR GENERAL NOTES AND ABBREVIATIONS.
7. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING FOUNDATION DIMENSIONS AND ELEVATIONS.
8. (XXX) - INDICATES REMOVAL OF EXISTING 10'± HIGH PUSH WALL.
9. CONTRACTOR SHALL SHORE, BRACE AND/OR SUPPORT ALL UNDERGROUND UTILITIES (TO REMAIN) DURING EXCAVATION AND PLACEMENT OF NEW FOUNDATIONS AND CONCRETE SLAB.



* CONCRETE ENCASE 6" WATER, 12" WATER, 4" WATER, 3" WATERLINE AND ELECTRICAL DUCT LINES. SEE DETAIL 1/S-202

PROJECT NORTH

1 / S-101 FOUNDATION PLAN
SCALE: 1/8" = 1'-0"

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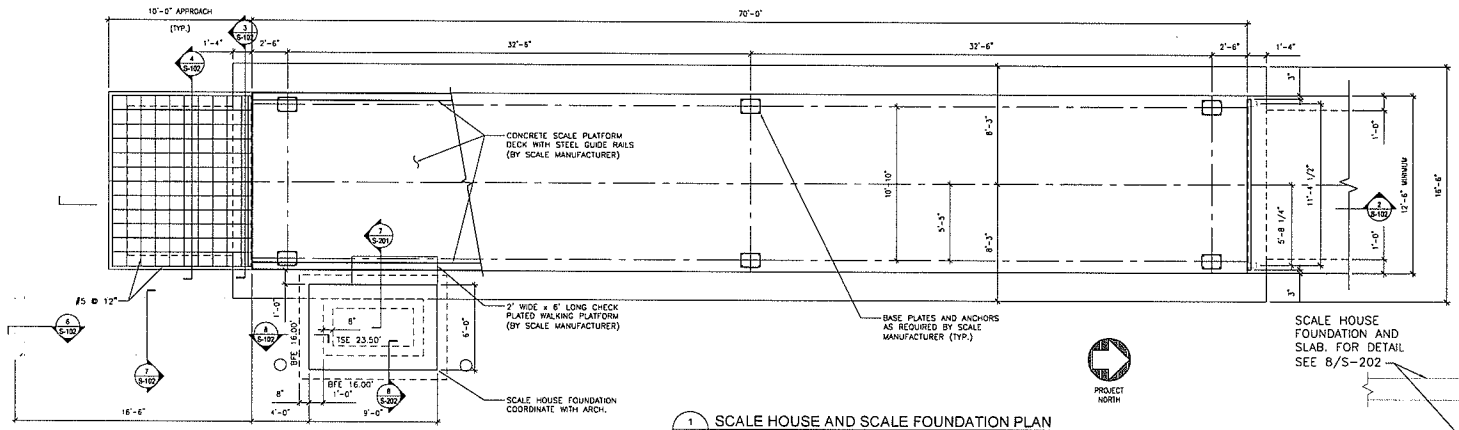
HARTFORD, CT.

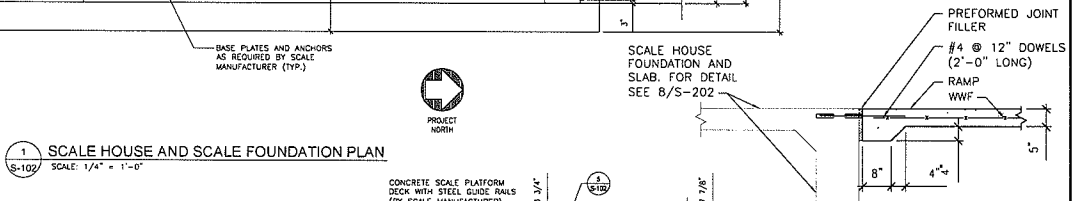
PROJECT NO:	36937668
DRAWN BY:	PD
CHECKED BY:	PJC
DATE:	05/14/08
CADD FILE:	AS NOTED

FOUNDATION PLAN

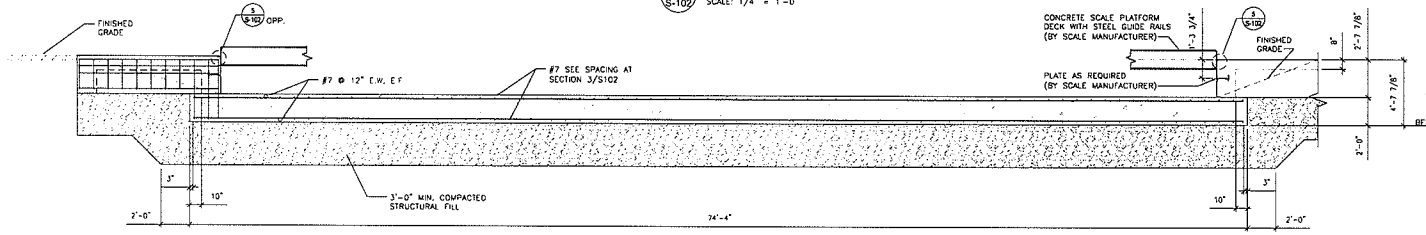
S-101



1 S-102 SCALE HOUSE AND SCALE FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

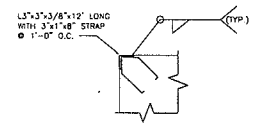


8 S-102 TOP OF RAMP SECTION
SCALE: 3/4" = 1'-0"

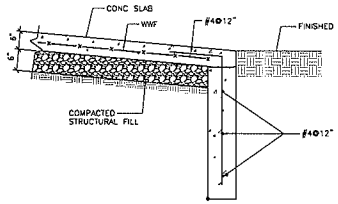


2 S-102 SCALE FOUNDATION SECTION
SCALE: 1/4" = 1'-0"

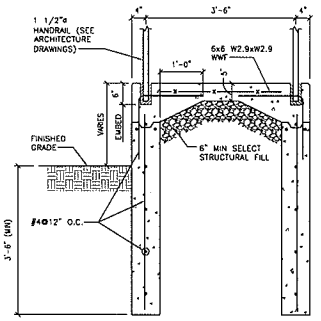
NOTES:
1. COORDINATE AND VERIFY ALL FOUNDATION DIMENSIONS WITH SCALE MANUFACTURER PRIOR TO CONSTRUCTION.
2. IF DIMENSIONS VARY FROM THOSE SHOWN PLEASE INDICATE AND FLAG DIMENSION CHANGES ON SHOP DRAWINGS.
3. COORDINATE SLEEVE LOCATIONS FOR WIRING WITH SCALE MANUFACTURER.
4. COORDINATE LOCATION, SIZES, PIPING AND CONDUITS WITH SITE, ARCHITECTURAL AND ELECTRICAL DRAWINGS.
5. SIGNALIZATION FOR BOTH ACCESS AND EXIT OF SCALE PLATFORM TO BE INCLUDED IN COST OF SCALE (BY SCALE MANUFACTURER).



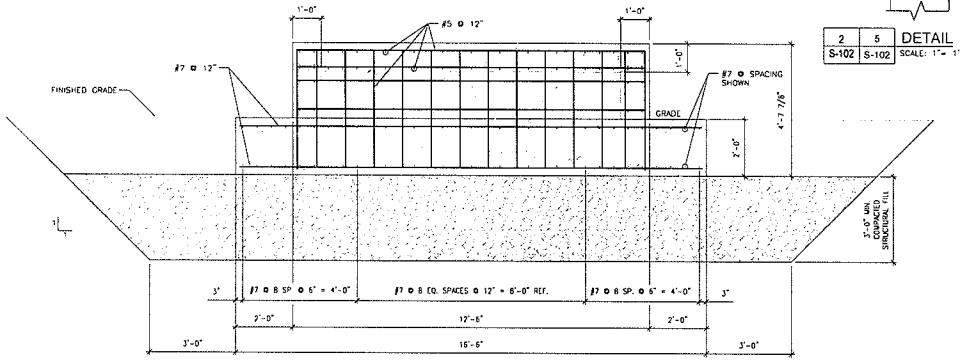
2 S-102 | 5 S-102 DETAIL
SCALE: 1"= 1'-0"



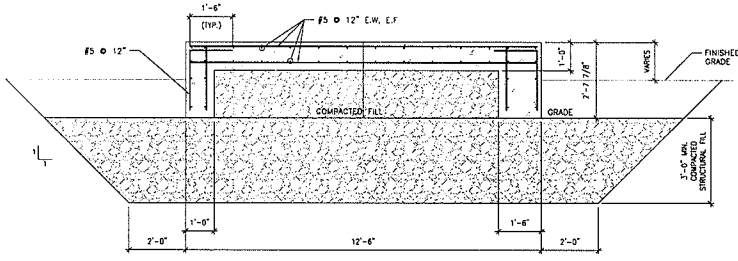
6 S-102 TYPICAL TOE OF RAMP SECTION
SCALE: 3/4" = 1'-0"



7 S-102 TYPICAL RAMP SECTION
SCALE: 3/4" = 1'-0"



3 S-102 SECTION
SCALE: 1/2" = 1'-0"



4 S-102 SECTION
SCALE: 1/2" = 1'-0"

1 FULL SHEET

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	FULL SHEET

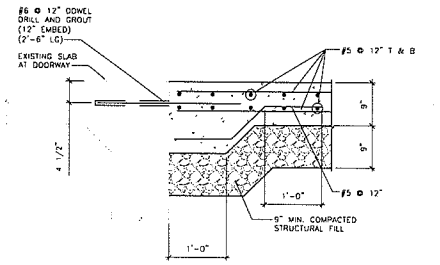
MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

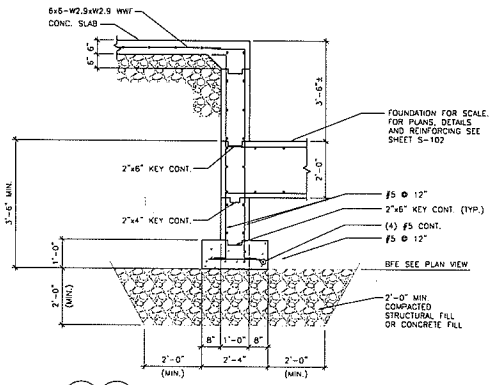
PROJECT NO:	36937668
DRAWN BY:	PD
CHECKED BY:	PJG
DATE:	05/14/08
CADD FILE:	AS NOTED

SCALE AND SCALE HOUSE FOUNDATION PLANS AND DETAILS

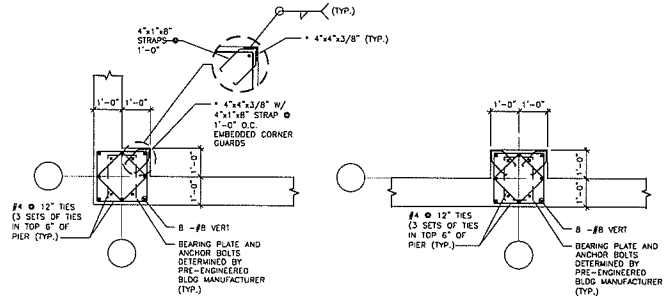
S-102



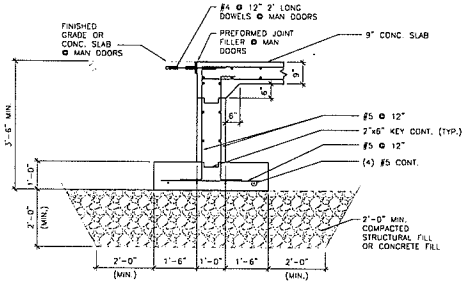
8 | 8 S-101 | S-201 SECTION
SCALE: 1" = 1'-0"



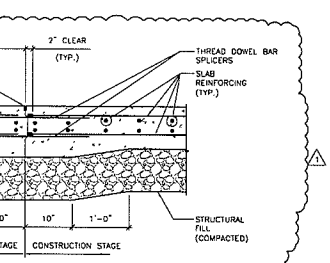
7 | 7 S-102 | S-201 SECTION
SCALE: 1/2" = 1'-0"



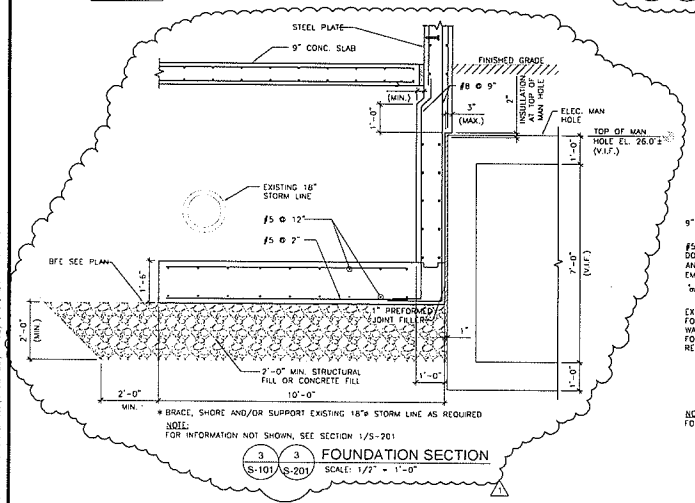
6 | 6 S-101 | S-201 TYPICAL WALL PIER PLAN & DETAILS
SCALE: 1/2" = 1'-0"



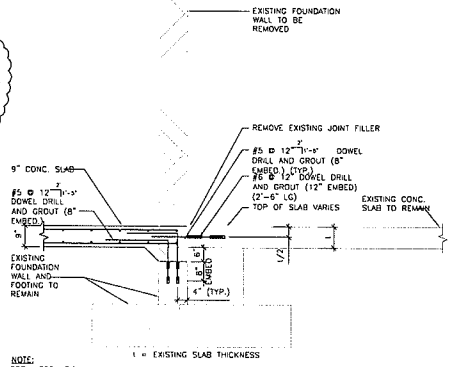
5 | 5 S-101 | S-201 FOUNDATION DETAIL
SCALE: 1/2" = 1'-0"



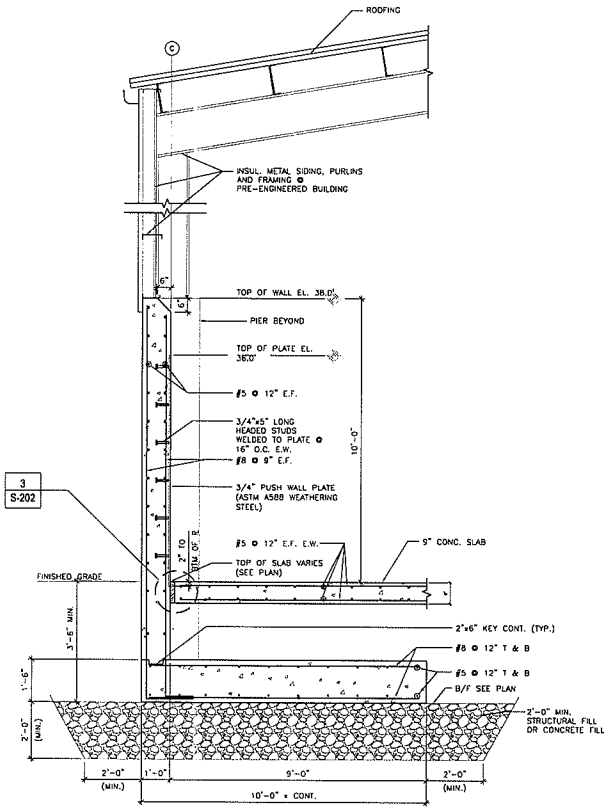
4 | 4 S-101 | S-201 SECTION
SCALE: 1" = 1'-0"



3 | 3 S-101 | S-201 FOUNDATION SECTION
SCALE: 1/2" = 1'-0"



2 | 2 S-101 | S-201 SECTION
SCALE: 1/2" = 1'-0"



1 | 1 S-101 | S-201 CONCRETE PUSH WALL SECTION
SCALE: 1/2" = 1'-0"

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	SECTION MODIFICATIONS

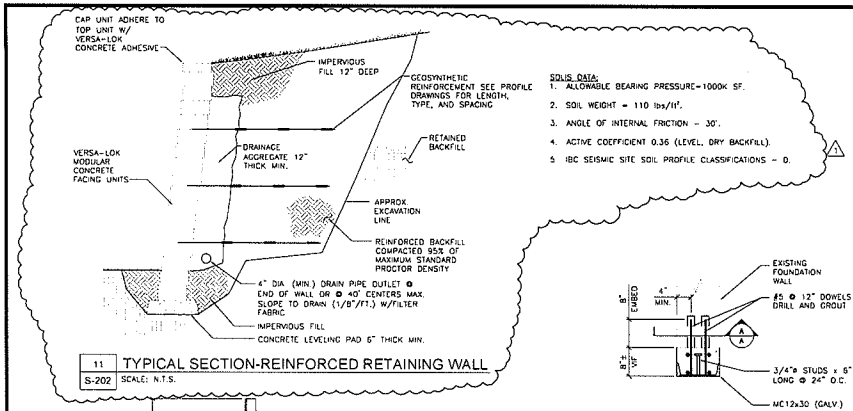
MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

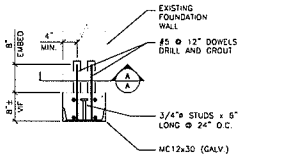
PROJECT NO: 36937668
DRAWN BY: PD
CHECKED BY: PJG
DATE: 05/14/08
CADD FILE: AS NOTED

MISCELLANEOUS DETAILS AND SECTIONS

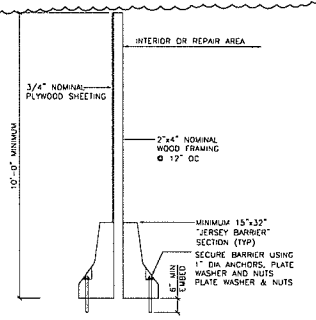
S-201



11 | S-202 TYPICAL SECTION-REINFORCED RETAINING WALL
SCALE: N.T.S.

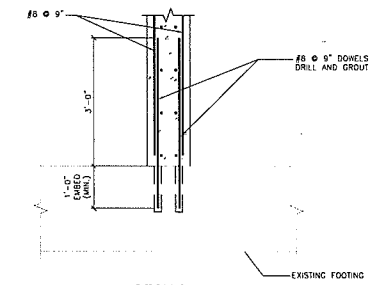


PLAN



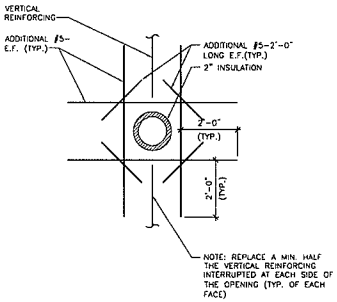
NOTES:
1. THE TEMPORARY CONC JERSEY BARRIER SHOWN SHALL BE CHEMICALLY ANCHORED TO THE EXISTING SLAB. THIS WILL CONSIST OF DRILLING HOLES INTO EXISTING CONCRETE, PLACING ANCHORS INTO HOLE, AND SECURING WITH PRE-APPROVED CHEMICAL ANCHOR MATERIAL.
2. A MINIMUM OF 4 ANCHOR BOLTS FOR EVERY 20 LINEAR FEET OF EACH TEMPORARY CONCRETE JERSEY BARRIER.
3. UPON REMOVAL OF TEMPORARY CONCRETE JERSEY BARRIER, THE ANCHOR BOLTS WILL BE CUT BELOW THE SURFACE OF THE EXISTING CONCRETE SLAB AND FILL THE TOP OF THE HOLE WITH NON-SHRINK GROUT.

9 | S-202 TEMORARY CONSTRUCTION BARRIER DETAIL
SCALE: 1/2" = 1'-0"

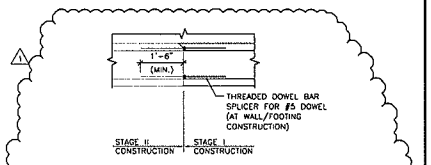


SECTION A-A

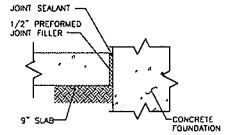
7 | S-101 | 7 | S-202 DETAIL
SCALE: 3/4" = 1'-0"



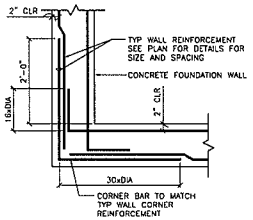
TYPICAL PIPE PENETRATION
5 | S-202 THRU CIP CONC. WALL DETAIL
SCALE: N.T.S.



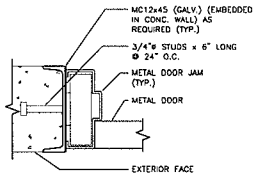
10 | 10 | S-101 | S-202 WALL OR FOOTING CONSTRUCTION DETAIL
SCALE: 1/2" = 1'-0"



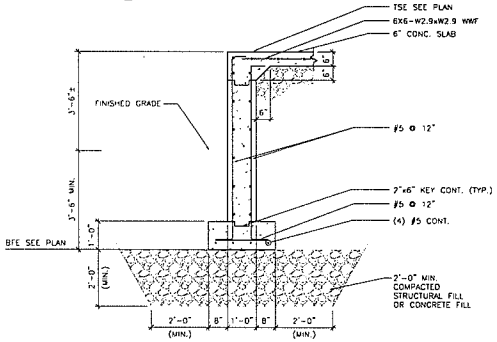
3 | 3 | S-201 | S-202 JOINT DETAIL
SCALE: 3/4" = 1'-0"



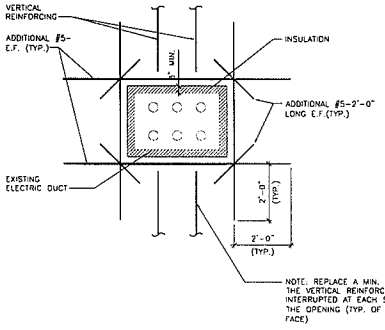
CORNER



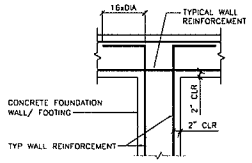
2 | S-202 DOOR FRAME DETAIL
SCALE: 3" = 1'-0"



8 | 8 | S-102 | S-202 SCALE HOUSE FOUNDATION DETAIL
SCALE: 1/2"= 1'-0"

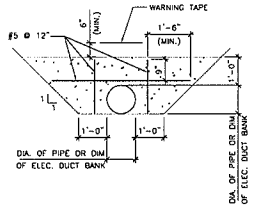


TYPICAL DUCT BANK PENETRATION
6 | S-202 THRU CIP CONC. WALL DETAIL
SCALE: N.T.S.



INTERSECTION

4 | S-202 TYPICAL CORNER REINFORCEMENT DETAILS
SCALE: 3/4" = 1'-0"



1 | 1 | S-101 | S-202 TYPICAL CONCRETE ENCASEMENT DETAIL
SCALE: 1/2" = 1'-0"

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REVISIONS

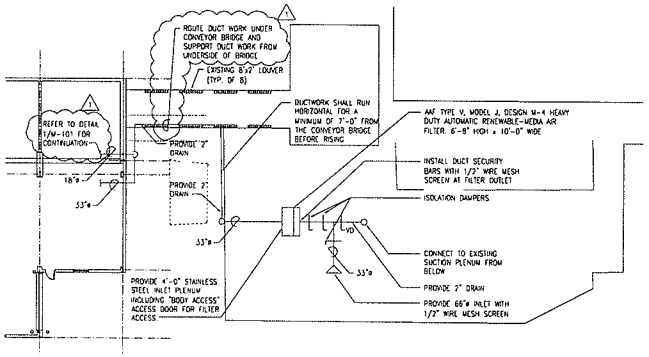
NUMBER	DATE	REMARKS
1	05/23/08	ADDED SECTIONS

MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS
RESERVE ROAD
HARTFORD, CT.

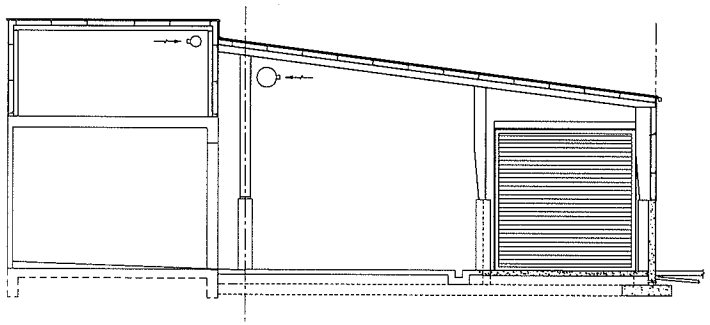
PROJECT NO: 36937668	
DRAWN BY:	PD
CHECKED BY:	PJG
DATE:	05/14/08
CADD FILE:	AS NOTED

MISCELLANEOUS DETAILS AND SECTIONS

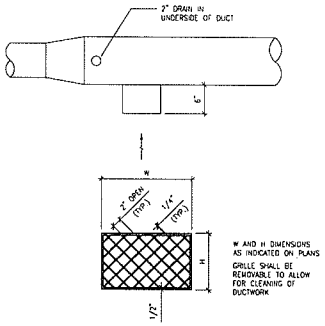
S-202



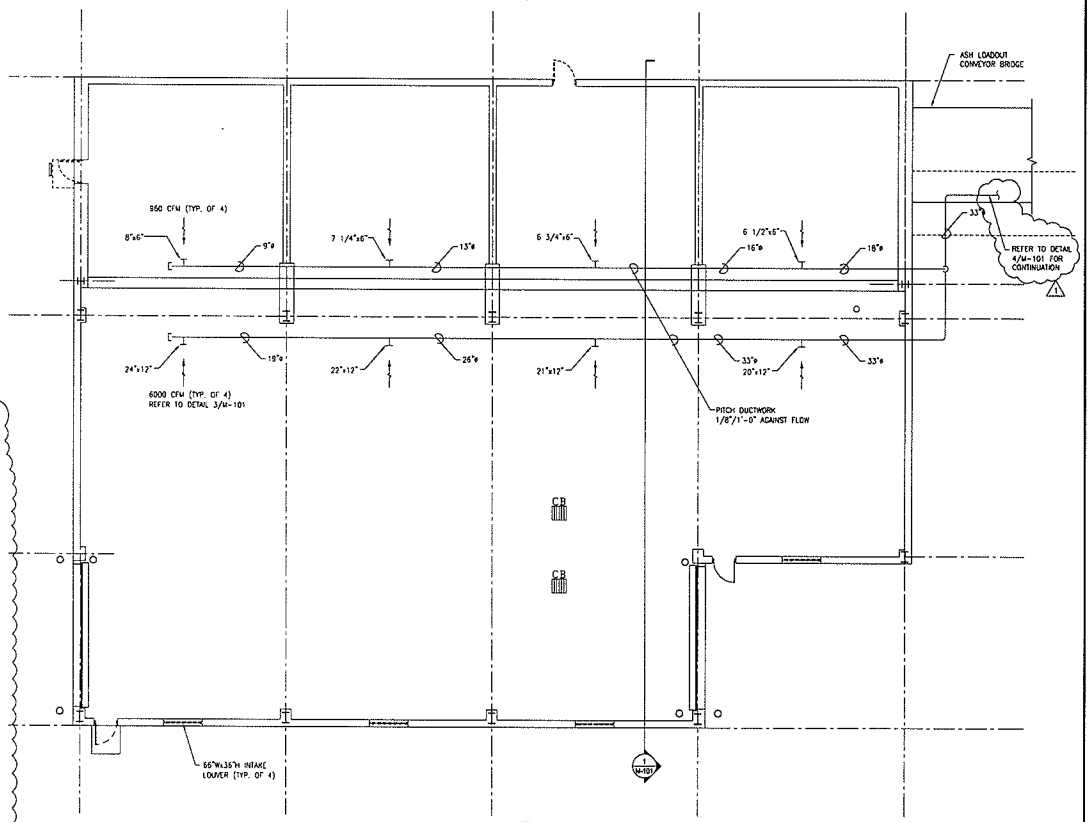
4 M-101 MECHANICAL FLOOR PLAN
SCALE: 1" = 20'-0"



2 M-101 BUILDING SECTION
SCALE: 1/8" = 1'-0"



3 M-101 TYPICAL EXHAUST INLET
SCALE: N.T.S.



1 M-101 MECHANICAL FLOOR PLAN
SCALE: 1/8" = 1'-0"

GENERAL MECHANICAL NOTES:

1. ALL WORK SHALL COMPLY WITH THE LATEST CONNECTICUT STATE CODES AND SUPPLEMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   A. 2003 INTERNATIONAL BUILDING CODE
   B. 2003 INTERNATIONAL PLUMBING CODE
   C. 2003 INTERNATIONAL MECHANICAL CODE
   D. 2003 INTERNATIONAL EXISTING BUILDING CODE
   E. 2005 NATIONAL ELECTRICAL CODE NFIPA 70
   F. IFGC
   G. 2005 CONNECTICUT STATE BUILDING CODE
   H. APPLICABLE ASTM
   I. APPLICABLE ANSI
   J. APPLICABLE UL
2. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS AND ARRANGE FOR ALL REQUIRED INSPECTIONS IN ACCORDANCE WITH ALL STATE AND LOCAL GOVERNING AUTHORITIES.
3. DRAWINGS INDICATE STANDARD REQUIREMENTS. ADDITIONAL REQUIREMENTS BY ORDINANCES, LAWS CODES RULES OR REGULATIONS ARE PART OF THE CONTRACTOR. THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS TO THE BUILDING OWNER OR URS CORPORATION AES.
4. CONTRACTOR IS TO REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. THE CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE CONTRACT DOCUMENT SET WITH ALL OTHER TRADES FOR PROPER INSTALLATION OF WORK. THE CONTRACTOR SHALL PROVIDE A COMPETE SET OF DRAWINGS COORDINATED WITH ARCHITECTURAL, STRUCTURAL, ELECTRICAL AND SITE PROTECTION DRAWINGS FOR LOCATION OF OPENINGS, RECESSES, BUILT-IDN WORK, CLEARANCE REQUIREMENTS, POWER REQUIREMENTS, SUPPORTS, ETC. TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
5. MECHANICAL DRAWINGS, PLANS AND DETAILS ARE DIAGRAMMATIC AND DO NOT SHOW ALL INTERFERENCE'S AND CONDITIONS VISIBLE AND/OR HIDDEN THAT MAY EXIST. THE CONTRACTOR MUST VISIT THE JOB SITE TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND ASSUME RESPONSIBILITY FOR CONDITIONS THEREOF, BEFORE BIDDING AND DURING THE CONDUCT OF WORK.
6. THE LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND SHALL COORDINATE THE WORK OF ALL SUB-CONTRACTORS.
7. ANY AND ALL ERRORS, DISCREPANCIES AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE OWNER AND/OR ARCHITECT DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE B/O. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS WHICH ARE REQUIRED FOR COMPLETION, FUNCTIONALITY AND SERVICEABILITY OF ITEMS SPECIFIED.
8. IN THE EVENT OF ANY AMBIGUITY OR DISCREPANCY BETWEEN THE PLANS AND SPECIFICATIONS, THE SPECIFICATIONS SHALL GOVERN. HOWEVER, PRIOR TO COMMENCEMENT WITH THE WORK IN QUESTION, THE ENGINEER SHALL BE NOTIFIED FOR DETERMINATION.
9. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS AND ANGELS, PRIOR TO THE FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA
10. THE CONTRACTOR SHALL VERIFY ALL MANUFACTURER'S CATALOG NUMBERS WITH MANUFACTURERS FOR CURRENT CONFIGURATIONS AND FUNCTIONS. ALL EQUIPMENT AND MATERIAL SHALL BE LABELED, LISTED AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
11. SUBSTITUTION OF SPECIFIED EQUIPMENT IS SUBJECT TO THE OWNER'S AND ENGINEER'S REVIEW AND ACCEPTANCE. ALL DESIGN, INSTALLATION LABOR, MATERIALS AND WARRANTIES NECESSARY TO ACCOMMODATE SUBSTITUTION REQUIREMENTS MUST BE PROVIDED AT NO EXTRA COST TO THE OWNER.
12. THE TERM "PROVIDE" SHALL MEAN FURNISH, INSTALL, CONNECT AND MAKE OPERABLE.
13. THE TERM "INDICATED" SHALL MEAN AS SHOWN IN CONTRACT DOCUMENTS (DRAWINGS SPECIFICATIONS AND RELATED ATTACHMENTS).
14. BEFORE SELECTING MATERIALS AND/OR EQUIPMENT AND PROCEEDING WITH THE WORK, INSPECT ALL AREAS TO INSURE SUITABILITY, FIT, CLEARANCES AND INTERCONNECTIONS.
15. ALL DUCT DIMENSIONS ARE INSIDE DIMENSIONS. ALLOWANCE SHALL BE MADE FOR OVERALL DIMENSIONS WHEN DETERMINING CLEARANCE REQUIREMENTS.
16. COORDINATE CONNECTION OF DUCT WORK TO SUCTION PLENUM WITH OWNER.

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REVISIONS

NUMBER	DATE	REMARKS
1	05/23/08	ADDED NOTES

MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

PROJECT NO:	36937668
DRAWN BY:	JES
CHECKED BY:	PMA
DATE:	05/14/08
CADD FILE:	AS NOTED

MECHANICAL FLOOR PLANS, BUILDING SECTION AND DETAILS

M-101

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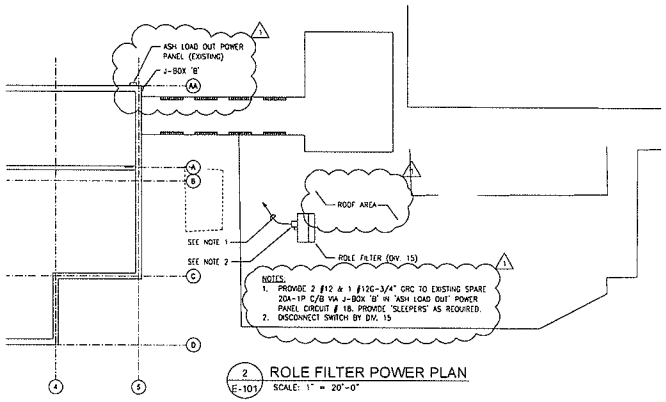
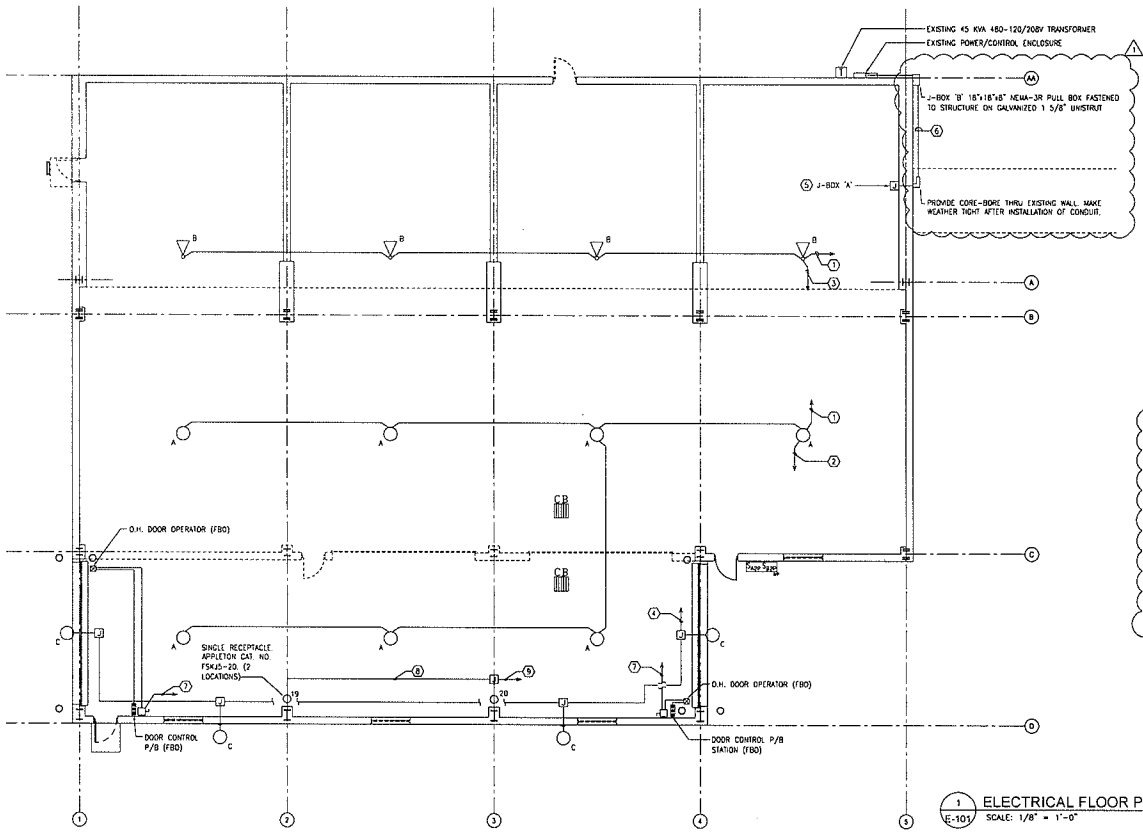


2 E-101 ROLE FILTER POWER PLAN
SCALE: 1" = 20'-0"



1 E-101 ELECTRICAL FLOOR PLAN
SCALE: 1/8" = 1'-0"

PANELBOARD ASH LOAD OUT SCHEDULE (EXISTING)

208/120V-3Ø,4W 225A, 3P, MLO

SURFACE MOUNTED
AIC RATING
PANEL LOCATION
(1-LINE OPTION)

CKT NO.	BREAKER TRIP	POLE	WIRING NO.	SIZE	COND.	LOAD SERVED	LOAD (KW) ØA	ØB	ØC	LOAD SERVED	WIRING NO.	SIZE	COND.	BREAKER TRIP	POLE	CKT NO.
1	20	3			-	SPARE				O.H. DOORS			-	20	3	2
3	-	-			-	- -				- -			-	-	-	4
5	-	-			-	- -				- -			-	-	-	6
7	20	3			-	SPARE				FANS			-	20	3	8 (1)
9	-	-			-	- -				- -			-	-	-	10
11	-	-			-	- -				- -			-	-	-	12
13	20	3			-	SPARE				"A" FIXTURES			-	20	2	14
15	-	-			-	- -				- -			-	-	-	16
17	-	-			-	- -				ROLE FILTER	2 #12 & 1 #12	3/4"	20	1	18
19	20	1			-	GFI RECP				GFI RECP			-	20	1	20
21	-	-			-	GFI RECP				GFI RECP			-	-	-	22
23	20	1			-	SPARE				"B" FIXTURES			-	20	2	24
25	20	1			-	SPARE				- -			-	-	-	26
27	20	2			-	"C" FIXTURES				HEATER			-	20	2	28
29	-	-			-	- -				- -			-	-	-	30
31	-	-			-	SPACE				SPACE			-	-	-	32
33	-	-			-	SPACE				SPACE			-	-	-	34
35	-	-			-	SPACE				SPACE			-	-	-	36
37	100	3			-	SPARE				SPACE			-	-	-	38
39	-	-			-	- -				SPACE			-	-	-	40
41	-	-			-	- -				SPACE			-	-	-	42
						TOTALS	-	-	-							

NOTES:
(1) MARK CIRCUIT AS 'SPARE'

DRAWING NOTES: (X)
1. 2 #12 & 1 #12G - 3/4"C TO J-BOX 'A'. SPLICE INTO CIRCUITING PROVIDED UNDER DEMOLITION STAGE 1.
2. 4 #12-3/4"C TO 3-WAY SWITCH S3pp
3. 4 #12-3/4"C TO 3-WAY SWITCH S3pp
4. 2 #12 & 1 #12G-3/4"C TO EXISTING POWER PANEL VIA J-BOX 'A' AND EXISTING TIME CLOCK.
5. PROVIDE 24"x24"x8" FIBERGLASS J-BOX 'A' WITH GASKETED COVER UNDER STAGE 1.
6. PROVIDE 2" CRC FROM EXISTING 'ASH LOADOUT' POWER PANEL LOCATED INSIDE OF POWER/CONTROL ENCLOSURE FOR BRANCH CIRCUITING. PROVIDE ALL BRANCH WIRING FOR TEMPORARY AND PERMANENT LOADS, CONDUIT & J-BOX 'A' NECESSARY FOR FINAL CIRCUITING DURING THE STAGE 1 DEMOLITION PERIOD AND TAG FOR USE.
7. 3 #12 & 1 #12G-3/4"C TO EXISTING POWER PANEL VIA J-BOX 'A' FOR O.H. DOOR POWER. BOTH DOORS TO BE FED FROM EXISTING 'ASH LOAD OUT' PANEL CKTS 2, 4, 6.
8. 2#12 & 1#12G - 3/4"C TO 'ASH LOADOUT' PANEL VIA J-BOX 'A'.
9. 4#12 & 1#12G - 3/4"C TO 'ASH LOADOUT' PANEL VIA J-BOX 'A'.

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER & MODEL #	LAMP	REMARKS
A	APPLETON #KPCH1407SR 3/4" PENDANT	400W HPS	PENDANT MOUNT AT 22' AFF TO BOTTOM OF FIXTURE
B	APPLETON #CFL400JB-208V 3/4" HUBS	400W HPS	MOUNT AT APPROXIMATELY 22' AFF
C	LITHONIA HI-TEK #WH400S-208V	400W HPS	WALL MOUNT AT 22' AFG TO CENTER OF FIXTURE

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NUMBER	DATE	REMARKS
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MID-CONNECTICUT PROJECT
POWER BLOCK FACILITY
ASH LOADOUT BUILDING & SITE MODIFICATIONS

RESERVE ROAD
HARTFORD, CT.

PROJECT NO: 36937668
DRAWN BY: PD
CHECKED BY: LMM
DATE: 05/14/08
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ELECTRICAL LIGHTING AND POWER PLAN

E-101

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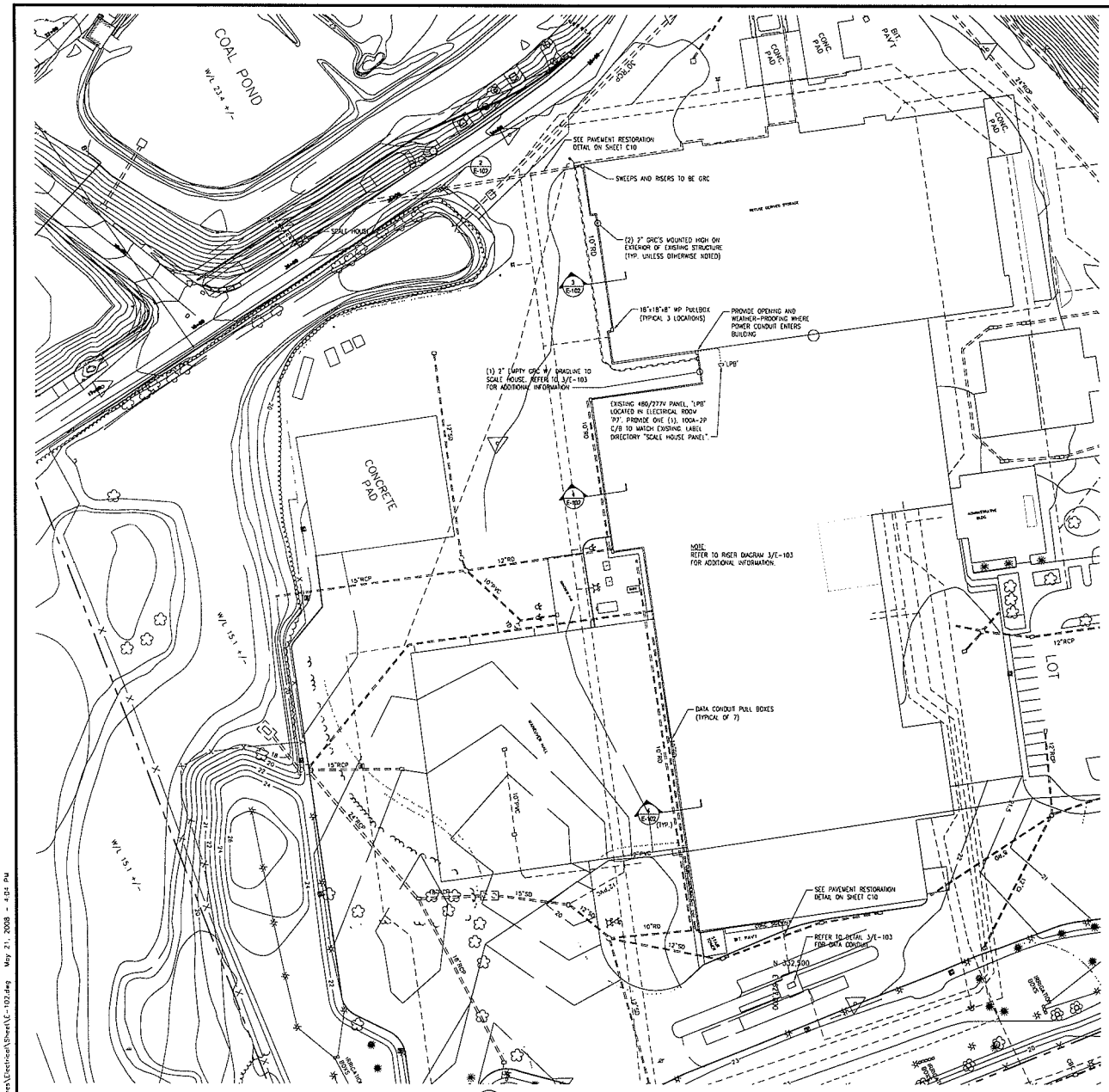
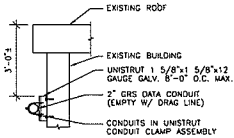


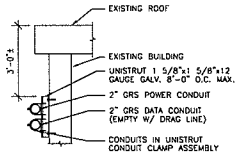
1 E-102 ELECTRICAL FLOOR PLAN
SCALE: 1" = 40'-0"

NOTE:
1. USE STAINLESS STEEL SCREWS TO ATTACH TO STRUCTURE.

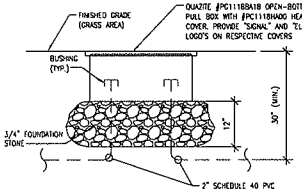


4 E-102 CONDUIT SUPPORT ON BUILDING
SCALE: N.T.S.

NOTE:
1. USE STAINLESS STEEL SCREWS TO ATTACH TO STRUCTURE.



3 E-102 CONDUIT SUPPORT ON BUILDING
SCALE: N.T.S.



2 E-102 HANDHOLE DETAIL
SCALE: N.T.S. TYPICAL OF 2

1 FULL SHEET

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RESERVE ROAD
HARTFORD, CT.

PROJECT NO:	36937668
DRAWN BY:	PD
CHECKED BY:	LMM
DATE:	05/14/08
CADD FILE:	AS NOTED

ELECTRICAL SITE PLAN

E-102

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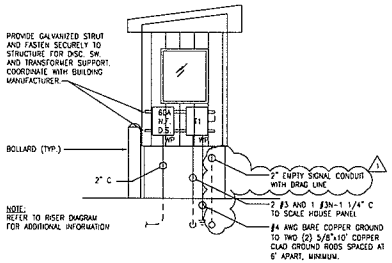
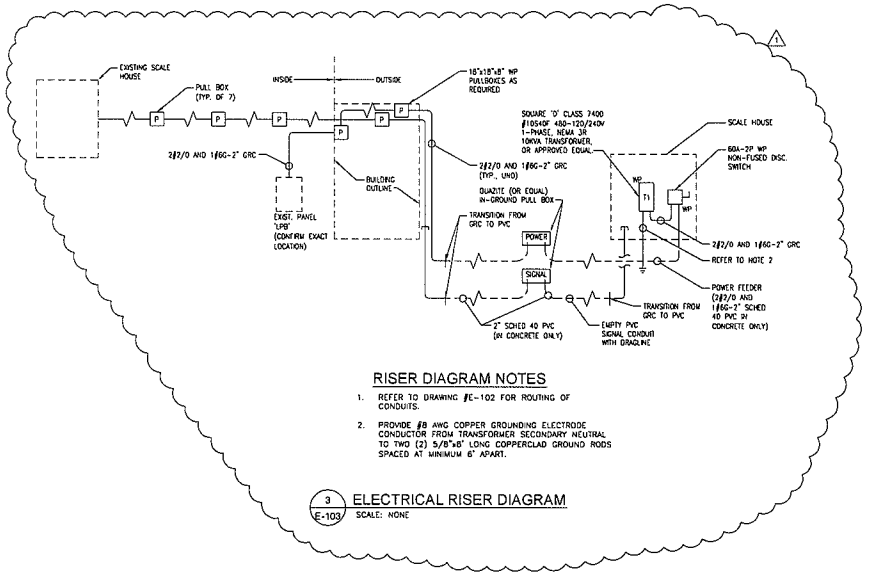


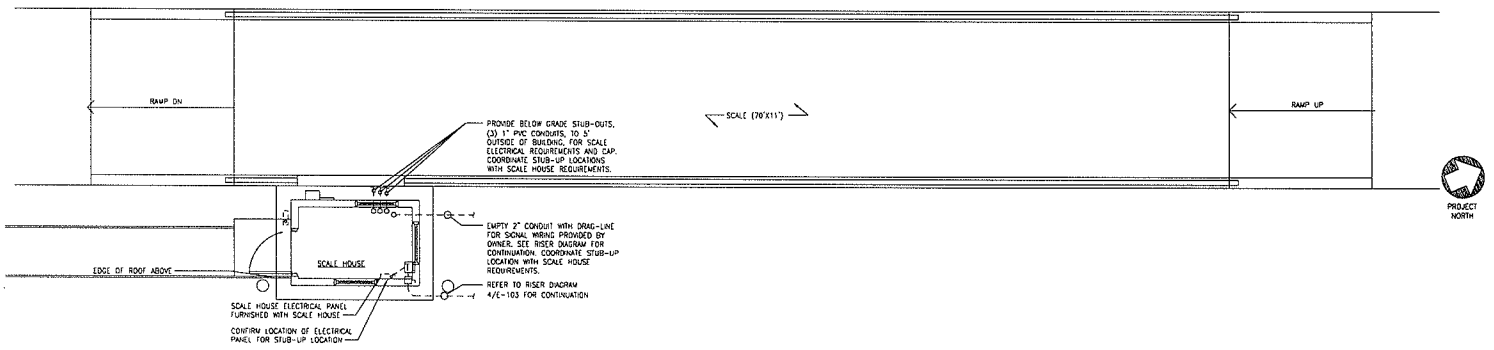
2 / E-103 NORTH ELEVATION
SCALE: 1/4" = 1'-0"



RISER DIAGRAM NOTES

1. REFER TO DRAWING #E-102 FOR ROUTING OF CONDUITS.
2. PROVIDE #8 AWG COPPER GROUNDING ELECTRODE CONDUCTOR FROM TRANSFORMER SECONDARY NEUTRAL TO TWO (2) 5/8"x8' LONG COPPERCLAD GROUND RODS SPACED AT MINIMUM 6' APART.

3 / E-103 ELECTRICAL RISER DIAGRAM
SCALE: NONE



1 / E-103 SCALE HOUSE FLOOR PLAN
SCALE: 1/4" = 1'-0"

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HARTFORD, CT.

PROJECT NO:	36937668
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SCALE HOUSE ELECTRICAL PLAN AND RISER DIAGRAM

E-103

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TECHNICAL SPECIFICATIONS

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Heavy duty 8" concrete deck, 70' x 11' platform with integral steel side rails, above ground truck scale.

1.2 RELATED DOCUMENTS

A. The General provisions of the Contract, including General Conditions and supplementary General Conditions, apply to the specified in this section.

B. Section 03300 - Concrete

1.3 SCOPE OF WORK

A. The work under this section consists of furnishing all labor, materials, equipment, services and transportation required to complete and installation as shown on the drawings, as specified herein or both.

1. Furnish a 8" concrete deck, 70' x 11' certified truck scale platform with integral side rails.

2. Furnished scales shall be M=Emery Winslow Hydro-Static Model H-44pg – 100 70-10 or approve equal.

3. Truck scale furnished shall have the capacity of 100 tons (200,000 lbs.) consisting of one 70' – x 11' platform with heavy duty 8" concrete deck and integral steel side rails.

4. Furnish, install and integrate new digital indicator to the Owners computer system.

5. Furnishing and applying of shop paint and field paint for designated structural steel items.

1.4 SUBMITTALS

A. Product Data: for each type of product indicated.

B. Shop Drawings: Show fabrication, installation and details of the truck scale, hydrostatic load cells, electronic auxiliary devices, scale plateform, 70' x 11' concrete deck, steel side rails, corner, anchorage digital indicator signalization system for

access and existing of scales and special details. Distinguish between factory and field assembly work.

C. Field quality – control reports.

D. Operators and Maintenance manuals.

E. Warranties: Samples of special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: All employers of workers trained and approved by Manufacturer.

B. Pre-installation Conference: Conduct conference at project site.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace scale and/or scale equipment that fall in materials and/or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 Articles where titles below introduce lists, the following requirements apply for the product selection.

1. Manufacturer's: Subject to compliance with requirements provide products by the manufacturer specified.

2. Basis of Design Products: The design of the above ground truck scale is based on Emery Winslow Scale Company.

2.2 TRUCK SCALE

A. The total overall platform will be 70 ft. long by 11 ft wide with heavy duty 8" concrete deck and integral steel side rails.

B. The weigh bridge shall have a maximum capacity of 200,000 lbs.

C. The minimum dual axle capacity shall be 80,000 lbs.

D. The minimum sectional capacity shall be 80,000 lbs.

E. The weigh bridge shall have a minimum cleanout clearance underneath the scale of 12".

F. The weigh bridge shall be free flowing in 360° and shall not require staybar's or be rigidly checked.

G. Load Cells shall be hydrostatic, non-electronic NT&P certified with a minimum capacity of 75,000 lbs. each.

H. The load cells shall be manufactured out of grade 304 stainless steel.

I. Signalization system for egress and access to the truck scale platform.

2.3 LOAD CELL SUMMING NETWORK

A. Summing Network to be located in the scale house.

B. Summing House shall be isolated from electrical surges or lighting that may stroke the weigh bridge.

C. Summing Network to be mounted in a NEMA IV enclosure.

D. Stainless steel hydro-static load cells will be connected to totalizer with copper tubing.

2.4 DIGITAL WEIGHT INDICATOR

A. The digital weigh indicator shall be a Emery Winslow Model 7600 Digital or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrate, areas and conditions with scale manufacturer present for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Prepare written report, endorsed by scale mandufacturer listing conditions detrimental to performance to scale

C. Proceed with scale installation only after unsatisfactory general conditions have been corrected.

3.2 INSTALLATION

A. Install, fastening to in-place construction the load cells, truck platform scale with integral siderails, scales, digital indicator, anchorage, digital indicator including threaded fasteners, anchor bolts, through-bolts and any other connector required.

3.3 ADJUSTING AND CLEANING

A. Sectional adjustments and calibration shall be made as required for scales and to prevent draft.

B. Touch-up Painting: Immediately after erection and installation of scale and scale platform paint abridged areas of shop pain and exposed areas with sand material used for painting of structures. To comply with SSPC-PA1 for touching up painted surfaces.

END OF SECTION 11990

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Structural-steel framing.
2. Fiberglass – Reinforced Plastic (FRP) roof panels.
3. Fiberglass-Reinforced Plastic (FRP) siding panels.
4. Doors and frames.
5. Accessories (Including Louvers, gutters and downspouts.

B. Related Sections:

1. Division 08 Section "Overhead Coiling Doors."
2. Division 08 Section "Sectional Doors."

1.3 DEFINITIONS

A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in referenced standards.

1.4 SUBMITTALS

A. Product Data: For each type of metal building system component. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

1. Structural-steel-framing system.
2. Roof panels - Fiberglass – Reinforced Plastic (FRP).
3. Siding panels - Fiberglass – Reinforced Plastic (FRP).
4. Flashing and trim.
5. Accessories, (including louvers, gutters and downspouts).

B. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other work.

1. Anchor-Bolt Plans: Submit anchor-bolt plans and templates before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location.
2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.

    a. Show provisions for attaching platforms.

3. Fiberglass – Reinforced Plastic Roof and Siding Panel Layout Drawings: Show layouts of FRP panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.

    a. Show roof-mounted items including equipment supports, pipe supports and penetrations and lighting fixtures.
    b. Show wall-mounted items including doors, windows, louvers, and lighting fixtures.

4. Accessory Drawings: Include details of the following items, at a scale of not less than [1-1/2 inches per 12 inches (1:8)] <Insert scale>:

    a. Flashing and trim.
    b. Gutters.
    c. Downspouts.
    d. Louvers.

C. Samples for Initial Selection: For units with factory-applied color finish.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below:

1. FRP Panels: Nominal 12 inches (300 mm) long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
2. Flashing and Trim: Nominal 12 inches (300 mm) long. Include fasteners and other exposed accessories.
3. Accessories: Nominal 12-inch- (300-mm-) long Samples for each type of accessory.

E. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

F. Qualification Data: For qualified erector manufacturer professional engineer.

G. Welding certificates.

H. Metal Building System Certificates: For each type of metal building system, from manufacturer.

1. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:

   a. Name and location of Project.
   b. Order number.
   c. Name of manufacturer.
   d. Name of Contractor.
   e. Building dimensions including width, length, height, and roof slope.
   f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
   g. Governing building code and year of edition.
   h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
   i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
   j. Building-Use Category: Indicate category of building use and its effect on load importance factors.
   k. AISC Certification for Category MB: Include statement that metal building system and components were designed and produced in an AISC-Certified Facility by an AISC-Certified Manufacturer.

I. Erector Certificates: For each product, from manufacturer.

J. Manufacturer Certificates: For each product, from manufacturer.

K. Material Test Reports: For each of the following products:

1. Structural steel including chemical and physical properties.
2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
3. Tension-control, high-strength, bolt-nut-washer assemblies.
4. Shop primers.
5. Nonshrink grout.

L. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency. Include reports for thermal resistance, fire-test-response characteristics, water-vapor transmission, and water absorption.

M. Source quality-control reports.

N. Field quality-control reports.

O. Surveys: Show final elevations and locations of major members. Indicate discrepancies between actual installation and the Contract Documents. Have surveyor who performed surveys certify their accuracy.

P. Maintenance Data: For metal panel finishes to include in maintenance manuals.

Q. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer and member of MBMA.

1. AISC Certification for Category MB: An AISC-Certified Manufacturer that designs and produces metal building systems and components in an AISC-Certified Facility.
2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

B. Land Surveyor Qualifications: A professional land surveyor who practices in jurisdiction where Project is located and who is experienced in providing surveying services of the kind indicated.

C. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

D. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

E. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

F. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3, "Structural Welding Code - Sheet Steel."

G. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.

H. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

I. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. ASTM E 72 Strength of Panels for Building Construction
2. ASTM E 84 Surface Burning Characteristics of Building Materials.
3. FM 4880 Corner Fire Test (if FM approval is required.
4. ASTM D 2583 Indentation Hardness of Plastics
5. ASTM D 696 Coefficient of Linear Thermal Expansion of Plastics
6. ASTM D 1494 Diffused Light Transmission (for translucent materials).
7. Build mockup of typical wall area as shown on Drawings.
8. Build mockups for typical FRP siding panel including accessories.

    a. Size: [48 inches (1200 mm) long by 48 inches (1200 mm)] <Insert dimensions>.

9. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

J. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to FRP building systems including, but not limited to, the following:

    a. Condition of foundations and other preparatory work performed by other trades.
    b. Structural load limitations.
    c. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
    d. Required tests, inspections, and certifications.
    e. Unfavorable weather and forecasted weather conditions.

2. Review methods and procedures related to FRP roof panel assemblies including, but not limited to, the following:

    a. Compliance with requirements for purlin and rafter conditions, including flatness and attachment to structural members.
    b. Structural limitations of purlins and rafters during and after roofing.
    c. Flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect FRP roof panels.
    d. Temporary protection requirements for FRP roof panel assembly during and after installation.
    e. Roof observation and repair after FRP roof panel installation.

3. Review methods and procedures related to FRP siding panel assemblies including, but not limited to, the following:

    a. Compliance with requirements for support conditions, including alignment between and attachment to structural members.
    b. Structural limitations of girts and columns during and after wall panel installation.

c. Flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect FRP siding panels.
d. Temporary protection requirements for FRP siding panel assembly during and after installation.
e. Wall observation and repair after FRP siding panel installation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package FRP panels for protection during transportation and handling.

B. Unload, store, and erect FRP panels in a manner to permit draining of trapped moisture, twisting, and surface damage. Do not use wire slings unless material is fully protected.

C. Stack FRP panels with one end elevated to provide for freely water draining, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store FRP panels in contact with other materials that might cause cuts, scratching, gouges, abrasions, impacts or other surface damage.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when weather conditions permit FRP panels to be installed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements:

1. Established Dimensions for Foundations: Comply with established dimensions on approved anchor-bolt plans, establishing foundation dimensions and proceeding with fabricating structural framing without field measurements. Coordinate anchor-bolt installation to ensure that actual anchorage dimensions correspond to established dimensions.
2. Established Dimensions for FRP Panels: Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and proceed with fabricating FRP panels without field measurements, or allow for field trimming FRP panels. Coordinate construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

1.8 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and

formwork requirements are specified in Division 03 Section "Cast-in-Place Concrete."

B. Coordinate installation of equipment supports and Overhead doorway penetrations, which are specified in Division 08 Section "Overhead Coiling Doors."

C. Coordinate FRP panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

A. Special Warranty on FRP Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace FRP panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Weathertightness Warranty for FRP Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam FRP roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Alliance Steel, Inc.
2. American Buildings Company; Division of Magnatrax Corp.
3. American Steel Building Co., Inc.
4. Bigbee Steel Buildings, Inc.
5. Butler Manufacturing Company; a BlueScope Steel company.
6. CBC Steel Buildings; Division of Magnatrax Corp.
7. Ceco Building Systems; Division of NCI Building Systems, L.P.
8. Elite Structures, Inc.
9. Kirby Building Systems; Division of Magnatrax Corp.
10. Mesco Building Solutions; Division of NCI Building Systems, L.P.
11. Metallic Building Company; Division of NCI Building Systems, L.P.
12. Metco Metal Supply.
13. Nucor Building Systems.
14. Oakland Metal Buildings, Inc.
15. Olympia Steel Building Systems.

16. Package Industries, Inc.
17. Pinnacle Structures, Inc.
18. Star Building Systems; an NCI company.
19. USA, Inc.
20. Vulcan Steel Structures, Inc.

2.2 METAL BUILDING SYSTEMS

A. Description: Provide a complete, integrated set of metal building system manufacturer's standard mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.

1. Provide metal building system of size and with bay spacings, roof slopes, and spans indicated.

B. Primary-Frame Type:

1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.

C. End-Wall Framing: Manufacturer's standard, for buildings not required to be expandable, consisting of primary frame, capable of supporting one-half of a bay design load, and end-wall columns.

D. Wall Framing: Engineer end walls to be expandable. Provide primary frame, capable of supporting full-bay design loads, and end-wall columns.

E. Secondary-Frame Type: Manufacturer's standard purlins and joists and flush-framed.

F. Eave Height: 24 feet.

G. Bay Spacing: 29 feet.

H. Roof Slope: As indicated on plans.

I. Roof System: Manufacturer's standard Rib Panels, Lap-seam FRP roof panels.

J. Exterior Wall System: Manufacturer's standard tapered-rib, exposed-fastener FRP siding panels.

2.3 METAL BUILDING SYSTEM PERFORMANCE

A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."

1. Design Loads: As indicated on Drawings.
2. Deflection Limits: Design metal building system assemblies to withstand design loads with deflections no greater than the following:

    a. Purlins and Rafters: Vertical deflection of 1/240 of the span.
    b. Girts: Horizontal deflection of 1/240 of the span.
    c. FRP Roof Panels: Vertical deflection of 1/240of the span.
    d. FRP Siding Panels: Horizontal deflection of 1/240 of the span.
    e. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.

3. Drift Limits: Engineer building structure to withstand design loads with drift limits no greater than the following:

    a. Lateral Drift: Maximum of 1/400 of the building height.

4. FRP panel assemblies shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ASTM E 72.

C. Seismic Performance: FRP building systems shall withstand the effects of earthquake motions determined according to IBC 2003 and Connecticut State Building Code Supplement (2005).

D. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient;, material surfaces.

E. Water Penetration for FRP Roof Panels: No water penetration when tested according to ASTM E 1646 at test-pressure difference of 2.86 lbf/sq. ft. (137 Pa).

F. Water Penetration for FRP Siding Panels: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 2.86 lbf/sq. ft. (137 Pa).

G. Wind-Uplift Resistance: Provide FRP roof panel assemblies that comply with UL listed as Construction No. NM 523 or NM 524 for Class 90.

2.4 STRUCTURAL-STEEL FRAMING

A. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse sidewall, end-wall, and corner columns; and wind bracing.

1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.

    a. Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.

2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
3. Frame Configuration: One-directional sloped.
4. Exterior Column Type: Tapered.
5. Rafter Type: Tapered.

B. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:

1. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet.
2. End-Wall Rafters: C-shaped, cold-formed, structural-steel sheet; or I-shaped sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.

C. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, to comply with the following:

1. Purlins: C- or Z-shaped sections; fabricated from built-up stainless steel plates, stainless steel sheet, or structural- stainless steel shapes; minimum 2-1/2-inch- (64-mm-) wide flanges.

    a. Depth: As needed to comply with system performance requirements.

2. Purlins: Stainless steel joists of depths indicated.
3. Girts: C- or Z-shaped sections; fabricated from built-up stainless steel plates, stainless steel sheet, or structural-stainless steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum 2-1/2-inch- (64-mm-) wide flanges.

a. Depth: As required to comply with system performance requirements.

4. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up stainless steel plates, stainless steel sheet, or structural-stainless steel shapes; to provide adequate backup for FRP panels.
5. Flange Bracing: Minimum 2-by-2-by-1/8-inch (51-by-51-by-3-mm) structural-steel angles or 1-inch (- (25-mm-) diameter, cold-formed structural tubing to stiffen primary-frame flanges.
6. Sag Bracing: Minimum 1-by-1-by-1/8-inch (25-by-25-by-3-mm) structural-steel angles.
7. Base or Sill Angles: Minimum 3-by-2-inch (76-by-51-mm) stainless steel sheet.
8. Purlin and Girt Clips: Manufacturer's standard clips fabricated from stainless steel sheet.
9. Secondary End-Wall Framing: Manufacturer's standard sections fabricated from stainless steel sheet .
10. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
11. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-stainless steel sheet; built-up stainless steel plates; or stainless steel sheet; designed to withstand required loads.

D. Bracing: Provide adjustable wind bracing as follows:

1. Rods: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 (345); or ASTM A 529/A 529M, Grade 50 (345); minimum 1/2-inch- (13-mm-) diameter steel; threaded full length or threaded a minimum of 6 inches (152 mm) at each end.
2. Cable: ASTM A 475, 1/4-inch- (6-mm-) diameter, extra-high-strength grade, Class B, zinc-coated, seven-strand steel; with threaded end anchors.
3. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.
4. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
5. Fixed-Base Columns: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
6. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels.
7. Bracing: Provide wind bracing using any method specified above, at manufacturer's option.

E. Bolts: stainless steel bolt (ASTM 316) for structural-framing components that are primed or finish painted. Provide stainless steel bolts (ASTM 316) for structural-framing components.

F. Materials:

1. W-Shapes: ASTM A 992/A 992M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
3. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
4. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
5. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B or C, structural tubing.
6. Structural-Steel Sheet: Hot-rolled, ASTM A 660-00, Structural Steel (SS), Grades 30 through 55 (205 through 380), or High-Strength Low-Alloy Steel (HSLAS), Grades 45 through 70 (310 through 480); or cold-rolled, ASTM A 1008/A 1008M, Structural Steel (SS), Grades 25 through 80 (170 through 550), or High-Strength Low-Alloy Steel (HSLAS), Grades 45 through 70 (310 through 480).

    a. Stainless Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grades 33 through 80 (230 through 550), or High-Strength Low-Alloy Steel, Grades 50 through 80 (340 through 550).
7. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), carbon-steel, hex-head bolts; ASTM A 563 (ASTM A 563M) carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.

    a. Finish: stainless steel ASTM F 593-01, F 594-01.

8. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.

    a. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C. , Class C.

9. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers, plain.

    a. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

10. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex-head steel structural bolts with spline ends.

    a. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50, baked-epoxy coated.

11. Unheaded Anchor Rods: ASTM A 572/A 572M, Grade 50 (345).

    a. Configuration: Straight.
    b. Nuts: ASTM A 563 (ASTM A 563M) **heavy-**hex carbon steel.
    c. Plate Washers: ASTM A 36/A 36M carbon steel.
    d. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
    e. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

12. Headed Anchor Rods: ASTM F 1554, Grade 36.

    a. Configuration: Straight.
    b. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
    c. Plate Washers: ASTM A 36/A 36M carbon steel.
    d. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
    e. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

13. Threaded Rods: ASTM A 572/A 572M, Grade 50 (345).

    a. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
    b. Washers: ASTM A 36/A 36M carbon steel.
    c. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

G. Finish for all structural primary and secondary framing members: Factory primed. Apply specified primer immediately after cleaning and pretreating.

    1. Primer: Zinc-rich primer.
    2. Intermediate coat (Factory or Field coat): Epoxy.
    3. Final Coat: (Factory or Field coat): Urethane

2.5 MATERIALS AND FINISHES

A. FRP roofing and siding units shall be Tuff Span as manufactured by Enduro Composites, Fort Worth, Texas or approved equal.

    1. Profile/Series shall approved by arch based on design of building manufacturer.
    2. Glass fiber reinforcements shall be continuous, straight and bi-directional (along the length and width of unit). Glass content shall be 47% minimum by weight (30% for FM approved materials).
    3. Resin type shall be premium grade:

        a. Vinyl Esgter, UV stabilized

    4. Material shall be protected from UV rays by:

        a. UV stabilized resin with neopentyl glycol and acrylic monomer.
        b. UV acrylic polymer coating, factory applied with minimum .4 mil dry film thickness.
        c. Surfacing mat or veil

5. Material shall be:

   a. Class 1 Flame Spread of 25 or less per ASTM E84 UL listed.

6. Finish shall be embossed top, smooth bottom.
7. Color shall be Enduro standard or as selected by Owner.

2.6 STRUCTURAL PARAMETERS

A. Performance Criteria:

1. Cladding panels shall meet the performance criteria listed below for the spans shown on the drawings. Compliance with structural parameters shall be demonstrated by large scale, ASTM Test Method E-72 for positive and negative loads as established by governing building code.

B. Uniform Loads (per Sq. Ft.)

1. Roofing: 19 Positive 19 Negative Wind 40 Live
2. Siding: 19 Positive 19 Negative Wind

C. Deflective Limit

1. Roofing: L/D = L/120
2. Siding: L/D = L/90

Lower allowable deflection, such as L/120 or 90, will strengthen building structure.

D. Factor of Safety:

1. Roofing: Positive = 2.5 Negative Wind = 1.88
2. Siding: Positive = 1.88 Negative Wind = 1.88

2.7 ACCESSORIES

A. General: Provide accessories as standard with metal building system and FRP panel manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.

1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

B. Roof Panel Accessories: Provide components required for a complete FRP roof panel assembly including copings, fasciae, corner units, ridge closures, clips,

sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of FRP roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same material as FRP roof panels.
2. Clips: Manufacturer's standard, formed from stainless-steel sheet, designed to withstand negative-load requirements.
3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from steel stainless-steel sheet.
4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-(25-mm-) thick, flexible closure strips; cut or premolded to match FRP roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
6. Thermal Spacer Blocks: Where FRP panels attach directly to purlins, provide thermal spacer blocks of thickness required to provide 1-inch (25-mm) standoff; fabricated from extruded polystyrene.

C. Siding Panel Accessories: Provide components required for a complete FRPwall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal siding panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same material as FRP wall panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-(25-mm-) thick, flexible closure strips; cut or premolded to match FRP siding panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
4. Closure strips made from synthetic rubber (EDPM) as per specific panel profiles.

D. Flashing and Trim: As per recommendations of FRP panel manufacturers.

1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
2. Opening Trim: Formed from 0.034-inch (0.86-mm) nominal-thickness,per FRP per panel manufacturer metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet pre-painted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings.

E. Gutters: Tuff Span fiberglass Gutter System or approved equal per FRP panel manufacturer finished to match roof fascia and rake trim. Match profile of gable

trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- (2438-mm-) long sections.

1. Gutter Supports: Fabricated from same material and finish as gutters.
2. Strainers: per FRP Gutter System manufacturer.

F. Downspouts: Formed from 0.022-inch (0.56-mm) nominal-thickness, per FRP Gutter System manufacturer; finished to match FRP SIDIGN panels. Fabricate in minimum 10-foot- (3-m-) long sections, complete with formed elbows and offsets.

1. Mounting Straps: Fabricated from same material and finish as gutters.

G. Louvers per louver manufacturer recommendations: Size and design indicated; self-framing and self-flashing. Fabricate; finished to match FRP siding panels. Form blades from 0.040-inch (1.02-mm) nominal-thickness; folded or beaded at edges, set at an angle that excludes driving rains, and secured to frames by riveting or welding. Fabricate louvers with equal blade spacing to produce uniform appearance.

1. Blades: Fixed.
2. Free Area: Not less than 7.5 sq. ft. (0.65 sq. m) louver depth of 6" for 5'-6" -inch- (1220-mm-) wide by 3'-0"- (1220-mm-) high louver.
3. Bird Screening: 1/2-inch- (13-mm-) square fiberglass mesh, 0.041-inch (1.04-mm) wire; with re-wirable frames, removable and secured with clips; fabricated of same kind and form of FRP and with same finish as louvers.

    a. Mounting: Exterior face of louvers.

4. Vertical Mullions: Provide mullions at spacings recommended by manufacturer, or 72 inches (1830 mm) o.c., whichever is less.
5. Point of beginning water penetration: Not less than 100 Fpm.
6. Air Performance: Not more than 0.1 in-wg static pressure drop at 800 Fpm free-area intake velocity.

H. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

I. Materials:

1. Stainless Steel Self-Tapping Screws: Panel to Structure Fastening

    a. Type "A" [point for fastening to wood structure or Tuff Span structural members (add ½" to the given length).
    b. Type "B" point for fastening to steel structures up to 3/8" in thickness.
        1) Note: Type "A" and "B" screws are available in 300 series and 316 stainless steel and Monel. SFS self-drilling screws are available in 304ss only. Washers (min. 0.729" dia.) are required with all fasteners. (See chart above.

2. Stainless Steel Comments: Side Lap and FRP Flashing Fastening.

   a. The SB2 gromment is recommended for side lap and flashing. The SB2 should be tightened until the flexible neoprene grommet sleeve bulges out and tightly grips the FRP material.

      The recommended side lap fastening is 18" on center mini8mum for roof installation with a pitch of 3 on 12 or more. For roofs with lesser slopes, the side laps should be fastened at 12" on center minimum.

3. Closure Strips:

   a. Closure strips made from synthetic rubber (EDPM) are available for use with specific panel profiles.

4. Butyl Tape:

   a. Tape is 3/32" thick x ½" wide non-shrinking, non-hardening used for sealing side and end laps.

2.8 SOURCE QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified testing agency to evaluate product.

B. Special Inspector: Contractor will engage a qualified special inspector to perform the following tests and inspections and to submit reports. Special inspector will verify that manufacturer maintains detailed fabrication and quality-control procedures and will review the completeness and adequacy of those procedures to perform the Work.

   1. Special inspections will not be required if fabrication is performed by manufacturer registered and approved by authorities having jurisdiction to perform such Work without special inspection.

      a. After fabrication, submit copy of certificate of compliance to authorities having jurisdiction, certifying that Work was performed according to Contract requirements.

C. Testing: Test and inspect shop connections for metal buildings according to the following:

   1. Bolted Connections: Shop-bolted connections shall be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
   2. Welded Connections: In addition to visual inspection, shop-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:

a. Liquid Penetrant Inspection: ASTM E 165.
b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
c. Ultrasonic Inspection: ASTM E 164.
d. Radiographic Inspection: ASTM E 94.

D. Product will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

2.9 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.

1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.

1. Make shop connections by welding or by using high-strength bolts.
2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
4. Weld clips to frames for attaching secondary framing.
5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.

1. Make shop connections by welding or by using non-high-strength bolts.

2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

E. FRP Panels: Fabricate and finish FRP panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of FRP panel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Before erection proceeds, survey elevations and locations of concrete-bearing surfaces and locations of anchor rods, bearing plates, and other embedment's to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.

1. Engage land surveyor to perform surveying.

C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.

B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

D. Base and Bearing Plates: Clean concrete-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.

1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for bolt type and joint type specified.

    a. Joint Type: Snug tightened or pretensioned.

G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.

1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
2. Locate and space wall girts to suit openings such as louvers.
3. Provide supplemental framing at entire perimeter of openings, including louvers, ventilators, and other penetrations of roof and walls.

H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.

1. Tighten rod and cable bracing to avoid sag.
2. Locate interior end-bay bracing only where indicated.

I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 FRP PANEL INSTALLATION, GENERAL

A. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.

1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.

B. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Follow Manufacturer's installation instructions and shop drawings.
2. Field cut metal panels as required for openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent FRP panel finishes.
3. Install metal panels perpendicular to structural supports unless otherwise indicated.
4. Flash and seal FRP panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
5. Locate and space fastenings in uniform vertical and horizontal alignment.
6. Locate FRP panel splices over, but not attached to, structural supports with end laps in alignment.
7. Lap FRP flashing over FRP panels to allow moisture to run over and off the material.
8. Pilot holes must be drilled in support for self taping stainless steel screws at drive speeds of 500 RPM or less to prevent thread rolling.
9. End Laps shall be 6 inch minimum for roof panels and 4 inch minimum for siding panels.

C. Lap-Seam FRP Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.

1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of FRP panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by FRP panel manufacturer.

1. Seal FRP panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by FRP panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

3.5 DOOR AND FRAME INSTALLATION

A. General: Install doors and frames plumb, rigid, properly aligned, and securely fastened in place according to manufacturers' written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each door frame with elastomeric sealant used for metal wall panels.

B. Personnel Doors and Frames: Install doors and frames according to SDI A250.8. Fit non-fire-rated doors accurately in their respective frames, with the following clearances:

1. Between Doors and Frames at Jambs and Head: 1/8 inch (3 mm).
2. Between Edges of Pairs of Doors: 1/8 inch (3 mm).
3. At Door Sills with Threshold: 3/8 inch (9.5 mm).
4. At Door Sills without Threshold: 3/4 inch (19.1 mm).
5. At fire-rated openings, install frames according to, and doors with clearances specified in, NFPA 80.

3.6 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
2. Install components for a complete FRP wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with

corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements and manufacturer's written installation instructions. Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

C. Gutters: Join sections with lapped-and-sealed joints per manufacturer's specifications. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches (914 mm) o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

D. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1524 mm) o.c. in between.

1. Provide elbows at base of downspouts to direct water away from building.
2. Provide concrete splash block below base of downspouts.

E. Louvers: Locate and place louver units level, plumb, and at indicated alignment with adjacent work.

1. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
2. Provide perimeter reveals and openings of uniform width for sealants and joint fillers.
3. Protect galvanized- and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of corrosion-resistant paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
4. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required.

Comply with Division 07 Section "Joint Sealants" for sealants applied during louver installation.

F. Pipe Flashing: Form flashing around pipe penetration and FRP roof panels. Fasten and seal to panel as recommended by manufacturer.

3.7 FIELD QUALITY CONTROL

A. Special Inspections: Contractor will engage a qualified special inspector to perform the following special inspections:

1. Inspection of fabricators.
2. Steel construction.

B. Testing Agency: Contractor will engage a qualified testing agency to perform tests and inspections.

C. Tests and Inspections:

1. High-Strength, Field-Bolted Connections: Connections shall be tested and inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
2. Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:

a. Liquid Penetrant Inspection: ASTM E 165.
b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
c. Ultrasonic Inspection: ASTM E 164.
d. Radiographic Inspection: ASTM E 94.

D. Product will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.8 CLEANING AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.

1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."

2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

C. FRP Panels: Remove temporary protective coverings and strippable films, if any, as FRP panels are installed. On completion of FRP panel installation, clean finished surfaces as recommended by FRP panel manufacturer. Maintain in a clean condition during construction.

1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

D. Louvers: Clean exposed surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.

1. Restore louvers damaged during installation and construction period so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

a. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 13123

PART 1 GENERAL

1.1 SUMMARY

A. This specification describes the minimum health, safety, and emergency response requirements for the execution of the soil excavation in conjunction with Ash Load Out Building and Site Modifications Project.

1.2 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926-SUBPART P	Excavations
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Generators of Hazardous Waste
40 CFR 263	Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.
49 CFR 171-179	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials, Tables, and Hazardous Materials Communications Regulations
49 CFR 178	Shipping Container Specification

CONNECTICUT COUNCIL ON SOIL AND WATER CONSERVATION (CCSWC)

CCSWC GSESC	Connecticut Guidelines for Soil Erosion and Sediment Control, May 2002, latest edition

REGULATIONS OF CONNECTICUT STATE AGENCIES (RCSA)

RCSA 22a-449(c)	Connecticut Department of Environmental Protection (CTDEP) Hazardous Waste Management

RCSA 22a-209	Connecticut Department of Environmental Protection (CTDEP) Solid Waste Management
RCSA 22a-430	Connecticut Department of Environmental Protection (CTDEP) Water Pollution Control
RCSA 22a-6k	Connecticut Department of Environmental Protection (CTDEP) Water Pollution Control

STATE OF CONNECTICUT

CTDPH 20-441	Refresher Training

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION (CTDOT)

CTDOT OEMCA	On-Site Environmental Mitigation for Construction Activities, CTDOT Office of Environmental Planning, January 1986, latest edition
FORM 814	State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, Form 814, 1988 and amendments to date.

1.3 DEFINITIONS

The following terms are defined for use under this contract. Additional definitions of terms used in conduct of hazardous waste and hazardous substances operations are as contained in 29 CFR 1910.120.

Area Monitoring

Monitoring shall be performed by TRC where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.
Air monitoring shall be used to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of employee protection needed on site.

Contaminated Waste

A material or substance that contains chemicals or has physical properties that may result in human health effects from short-term or prolonged exposure.

Contract Administrator

Connecticut Resources Recovery Authority (CRRA) 100 Constitution Plaza, Hartford, CT 06103-1722.

CTDEP

The Connecticut Department of Environmental Protection, 79 Elm Street, Hartford, CT 06106

CTDPH

The Connecticut Department of Public Health, 410 Capitol Avenue, Hartford, CT 06106.

Decontamination

The removal of hazardous substances from employees, their equipment, and vehicles to the extent necessary to preclude the spread of the contaminant(s) to undesired locations.

EPA

The U.S. Environmental Protection Agency, 401 M Street SW, Washington, DC 20460.

Hazardous Substance

Any substance that results or may result in adverse effects to the health or safety of employees.

Hazardous Waste

A waste or combination of wastes defined in 40 CFR 261.3, or (2) those substances defined in 49 CFR 171.

Health Hazard

A chemical, biological, or physical agent, or mixture of agents, which may cause acute or chronic health effects in exposed persons.

Immediately Dangerous to Life or Health (IDLH)

An atmospheric condition that would pose an immediate threat to life, would cause irreversible or delayed adverse health effects, or would interfere with an individual's ability to escape from a dangerous atmosphere.

Permissible Exposure Limits (PELs)

PEL means levels published by Occupational Safety and Health Act (OSHA) that establish limits of inhalation exposure. There are three basic PEL classifications: time-weighted average (TWA), short-term exposure limit (STEL), and ceiling limit. The TWA and STEL limits are an "averaged" concentration over two different time periods. The TWA is generally calculated by

averaging measured concentrations of a contaminant over an 8-hour time period; whereas, the STEL is calculated by averaging measured concentrations of a contaminant over a 15-minute time period. The third type of PEL is a ceiling limit, which is an absolute threshold. No averaging occurs with the measured concentration. It is an "instantaneous" limit that is not to be exceeded for any period of time.

Physical Boundary

Area physically roped or partitioned off around an enclosed lead control area to limit unauthorized entry of personnel.

Project Monitor/Inspector

An employee of CRRA or its designated representative who functions as the on-site representative of CRRA overseeing the activities of the contractor.

Uncontrolled Waste Site

An area where an accumulation of hazardous waste or contaminated waste creates a threat to the health and safety of individuals and/or the environment.

1.4 REQUIREMENTS

A. The Contractor shall perform work in compliance with all Federal, State, and local regulations and requirements and be responsible for obtaining and payment of fees for all permits and approvals required to perform the work. Applicable regulations and requirements may include, but are not limited to:

1. Federal Regulations

Environmental Protection Agency (EPA) requirements for the management of hazardous waste including 40 CFR 261, 40 CFR 262, and 40 CFR 263, 40 CFR 268, and 40 CFR 761.

Department of Transportation (DOT) requirements for the transportation of waste including 49 *CFR* 171, 49 *CFR* 172, and 49 CPR 173.

OSHA requirements for Safety and Health Protection including 29 CFR 1910 and 29 CFR 1926.

2. State of Connecticut Regulations

Connecticut Department of Environmental Protection (CTDEP)

a. Waste Management Bureau - requirements for Hazardous, Connecticut-regulated and Solid Waste management, transport and disposal including RCSA 22a-449(c) and RCSA 22a-209.

b. Water Management Bureau - requirements for control of wastewater discharges and use of Best Management Practices (BMPs) to protect surface and ground waters including RCSA 22a-430 and 22a-6k.

c. Air Management Bureau - requirements for control of fugitive dust and visible emissions and permitting of sources exceeding state limits.

Connecticut Department of Transportation (CTDOT)

a. Requirements for environmental mitigation for construction activities (CTDOT OEMCA).

Connecticut Council on Soil and Water Conservation (CCSWC)

a. Requirements for soil erosion and sediment control (CCSWC GSESC).

3. City of Hartford Regulations

a. Health Department - requirements to comply with health standards prior to start of work.

b. Fire Department - requirements for fire protection during work.

1.5 SUBMITTALS

Submit the following a minimum of fifteen (15) days prior to the start of work:

A. Statements

1. Site Safety and Health Plan (SSHP)

Submit an SSHP prepared by Certified Industrial Hygenist for review and approval. Conform to the requirements of Federal, State and local laws, rules, and regulations. Work cannot proceed until the Safety Plan has been approved. The SSHP shall include:

a. Identification and evaluation of the hazards and risks associated with the decontamination activities, including excavation hazards and precautionary measures to be followed by workers for all hazards.

b. Identification of supervisory personnel and alternates responsible for site safety/response operations. Name and title of person responsible for administering plan.

c. Determination of levels of personal protection to be worn for various site operations.

d. List of equipment with adequate nomenclature by item, that will be used at the job site and the date and location where this equipment can be inspected by CRRA.

e. Establishment of work zones (exclusion area, contamination reduction area, and support area).

f. Establishment of decontamination methods and procedures.

h. Establishment of emergency procedures, such as: escape routes, fire protection, signals for withdrawing work parties from site, emergency communications, wind indicators, and procedures for evacuation of injured workers.

i. Identification and arrangements with nearest medical facility for emergency medical care for both routine-type injuries and toxicological problems. Submit name, location, and telephone number of this medical facility.

j. Establishment of air and personnel monitoring procedures.

k. Establishment of procedures for obtaining and handling potentially contaminated materials.

l. Identification of medical monitoring program, including respirator medical qualification examination for each individual at the work site.

m. Certification for each person entering the reduction or exclusion zones that the person is fit for duty at hazardous waste sites, and adequate medical screening tests have been obtained which address the contaminants associated with the specific hazardous waste site.

n. Identification of training plan to be instituted, including contents of 29 CFR 1910.1200 and 29 CFR 1910.134; its training contents; and instructor with appropriate training certification. Training plan shall also include counseling to each employee on exposure hazards.

o. Establishment of a hazard communication program (29 CFR 1910.1200).

p. 29 CFR 1910.

q. 29 CFR 1926.

r. 29 CFR 1926-SUBPART P, excavation measures.

x. Hazardous Noise

Provide a written hearing protection program which will include: hazardous noise signs, as directed, wherever equipment and work procedures produce sound levels greater than 84 dBA or 140 db peak sound level.

4. Certification that all Contractor employees are trained in accordance with Paragraph 3.1, as required.

5. Provide a copy of the Contractor's Heat or Cold Stress Monitoring Program.

6. List of all Contractor and Subcontractor personnel proposed to enter the site.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 EMPLOYEE TRAINING

A. The Contractor shall certify that all employees, including subcontractor employees, engaged in soil excavation activities: 1) are currently monitored under a medical surveillance program for respirator use in compliance with 29 CFR 1910.134; and 2) are fit tested for respirator use as necessary.

B. Employees that may come in contact with hazardous materials as part of this project shall receive an appropriate level of health and safety training in accordance with 29 CFR 1910.120, including classroom instruction, first aid and CPR training, and refresher training.

C. Employees who have not received the required training prior to the start of site operations are not to engage in site operations until such training has been completed.

3.1.1 Program Certification

A. The Contractor shall provide written certification of completed training and/or acquired experience for all employees designated to engage in on-site activities and shall be supplied prior to the start of site operations.

Such certification shall be endorsed by a member of top level management, a corporate officer, or the health and safety program manager.

3.2 PERSONNEL PROTECTION

The Contractor shall assume that initially Level D personal protective equipment (PPE) will be required.

A. The Contractor shall apply engineering and/or work practice controls as a means of protecting personnel in performance of site-specific tasks. Engineering controls shall be implemented to reduce and maintain employee exposure at or below safe levels for those

tasks demonstrating known or suspected hazards. Work practice controls shall be applied when engineering controls are impractical.

1. Personal Protective Equipment and Levels of Protection

   a. The Contractor shall use personal protective equipment (PPE) only when engineering and/or work practice controls have been deemed impractical or insufficient to protect employees during site operations.

   b. The Contractor shall be directed to wear PPE based on an evaluation of performance- characteristics, site specific tasks, and known or suspected hazards. The Contractor shall assemble the PPE into levels of protection (LOP) or ensembles appropriate for the site (Level D and C).

   c. The Contractor shall include a description of their respiratory protection program and the method of respirator fit testing employed.

   d. d. The Contractor shall only make use of NIOSH/MSHA approved respiratory protective equipment.

3.3 MEDICAL SURVEILLANCE

A. Medical, Surveillance Program

1. The Contractor shall establish and implement a medical surveillance program (MSP) for employees engaged in on-site operation in accordance with 29 CFR 1910.

2. The MSP program shall include physical examinations administered by a board certified physician familiar with internal or occupational medicine.

B. Retention of Medical Records

1. The Contractor shall retain all medical records and personnel exposure monitoring data for an appropriate period as described in Subpart C of 29 CFR 1910.20 of the Occupational Safety and Health Administration.

C. Personnel Certification

1. The Contractor shall provide written certification of medical fitness for work of all employees designated to engage in on-site operations prior to the start of those operations.

2. Such certification shall be endorsed by a member of top level management, a corporate officer, or the health and safety program manager.

D. Employee Heat and Cold Stress Monitoring

1. As dictated by seasonal conditions, the Contractor shall implement an employee heat or cold stress monitoring program during site operations and shall provide CRRA with a copy of the program.

2. The program shall include employee awareness of the signs and symptoms of heat or cold stress, preventive measures, and employee parameters to be monitored.

3.4 SITE SAFETY BRIEFINGS

A. Contractor shall conduct safety briefings prior to initiating any new site activity and a safety meeting held prior to each shift to ensure that employees are appraised of the requirements of the safety and health plan and that they are being followed.

3.5 INSPECTION

3.5.1 Inspection of Equipment

3.5.1.1 Respirators

Respirator users shall inspect their respirators in strict accordance with the instructions provided by the manufacturer. Respirators shall be in compliance with the Respiratory Protection Program as required by ANSI Z88.2 and 29 CFR 1910.134. Each respirator filter shall be in compliance with UL 586.

3.5.2 Personnel Inspection

3.5.2.1 Clothing

Personnel for Proper Attire Commensurate with Hazards Involved: Check for:

a. Clean clothing in good condition (wear freshly laundered clothing at the beginning of the job and at the start of each workday thereafter).
b. Boots and gloves of approved type and in good condition.

3.5.2.2 Gum or Tobacco Chewing

Gum or tobacco chewing is prohibited.

3.5.2.3 Physical Defects or Injuries

Ensure that people have no physical defects or injuries which may prevent their wearing respirators or which may cause rescue to be difficult. No beards, sideburns, or large mustaches shall be allowed on people who must wear respirators.

3.5.2.4 Alcoholic Beverages and Drugs

Ensure that people entering the site are not under influence of alcoholic beverages and drugs.

3.5.2.5 Counseling on Reproductive Hazards

Ensure that all employees have been counseled on and fully understand the reproductive hazards related to work in contaminated areas since chemical contaminants may seriously affect them.

3.6 SITE CONTROL

A. The Contractor shall be responsible for conducting operations at the site in a manner as to reduce the possibility of contact with any contaminants present and to prevent the removal of contaminants by personnel or equipment leaving the site.

B. The Contractor shall keep a daily log of site activities, Including: personnel visiting site, affiliation, date, arrival time, departure time and purpose of visit.

C. The Contractor shall provide CRRA with a list of all Contractor and subcontractor personnel proposed to enter the site prior to start of operations, updating the list as necessary.

D. In no case shall visitors (i.e., personnel not regularly assigned to work on the site who have legitimate business at the site) be allowed entrance to Excavation Areas. Contractor shall fence, barricade, and/or mark to prevent unauthorized personnel into Excavation Areas.

E. Transfer of contaminated wastes from the excavation areas to the designated waste storage area shall be performed in a manner to prevent spillage, leakage, contamination to unimpacted areas and shall prevent exposure to facility and other site personnel.

3.7 SANITATION

A. The Contractor shall provide toilet facilities, potable water, and washing facilities. These facilities shall be in near proximity to the Excavation Areas.

3.8 DEFICIENCIES

A. CRRA will stop any operation that the Contractor has been directed to correct and has not corrected. CRRA will stop any Contractor operations that pose an imminent or immediate health or safety hazard to Contractor employees, facility personnel, other on-site personnel, or the environment. If the Contractor does not comply with the stoppage and immediately correct a health or safety deficiency, then CRRA may at its discretion retain the services of another contractor to correct the deficiency. All liability and expenses resulting from such work stoppages and deficiency correction shall be the responsibility of the Contractor.

END OF SECTION 01560

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The work covered by this section includes the furnishing of all labor, materials, equipment and incidentals for construction and installation of a modular concrete retaining wall including drainage materials as shown on the Construction Drawings or as described by the Contract specifications. The work included in this section consists of, but is not limited, to the following:

1. Excavation and foundation soil preparation.
2. Furnishing and placement of the leveling base.
3. Furnishing and placement of the drainage system at the base of the wall.
4. Furnishing and placement of geotextiles.
5. Furnishing and placement of modular unit wall facing units.
6. Furnishing and placement of geosynthetic reinforcement.
7. Furnishing and compaction of infill, drainage and retained soils.

B. The particular wall construction requirements contained herein are based on the use of Pisa II Geogrid Reinforced Modular Retaining Walls as manufactured by Unilock. Use of an alternate wall system may require modifications to the construction sequences, procedures and methodologies.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and supplementary Conditions and Division 1 Specification Sections, apply to this section.

B. Related Sections: The following Sections contain requirements that relate to this Section.

1. Section 02100 – Site Clearing
2. Section 02220 – Excavation, Backfilling and Compaction
3. Section 02222 – Structural Excavation

1.3 QUALITY ASSURANCE

C. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified.

1. ASTM C33 – Specification for Concrete Aggregates
2. ASTM C90 – Standard Specification for Load-Bearing Concrete Masonry Units
3. ASTM C140 – Standard Methods of Sampling and Testing concrete Masonry Units.

4. ASTM C150 – Specification for Portland Cement
5. ASTM C595 – Specification for Blended Hydraulic Cements.
6. ASTM D4751 – Standard Test Method for Apparent Opening Size.
7. ASTM C1262 – Evaluating the Freeze – Thaw Durability of Manufactured Concrete Masonry Units and Related Concrete Units.
8. ASTM D4595 – Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method
9. ASTM D5262 – Test Method for Evaluating the Unconfined Creep Behavior of Geosynthetics.
10. ASTM D698 – Moisture Density Relationship for Soils, Standard Method
11. ASTM D422 – Gradation of Soils
12. ASTM D424 – Atterberg Limits of Soils
13. ASTM G51 – Soil pH.
14. ASTM D3034 – Specification for Polyvinyl Chloride (PVC) Plastic Pipe.
15. ASTM D1248 – Specification for Corrugated Plastic Pipe.
16. ASTM D2729 – Specification for Perforated Polyvinyl Chloride (PVC) Plastic Pipe.
17. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
18. ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
19. GRI GG-1 – Single Rib Geogrid Tensile Strength.
20. GRI GG-5 – Geogrid Pullout.
21. GRI GT-6 – Geotextile Pullout.
22. NCMA Design Manual for Segmental Retaining Walls (Second Edition)
23. NCMA TEK 2-4 – Specifications for Segmental Retaining Wall Units.
24. NCMA SRWU-1 – Determination of Connection Strength between Geosynthetics and Segmental Concrete Units.
25. NCMA SRWU-2 – Determination of Shear Strength between Segmental Concrete Units.

1.4 DELIVERY, MATERIAL HANDLING AND STORAGE

A. The installing Contractor shall check all materials delivered to the site to ensure that the correct materials have been received.

B. The installing Contractor shall take care to store all materials on-site in such a way that no damage occurs to any of the materials. Damaged or contaminated materials shall not be incorporated into any part of the modular retaining wall system. The Contractor shall store and handle all materials in accordance with manufacturer's recommendations and in a manner to prevent deterioration or damage due to moisture, temperature changes, contaminants, breaking, chipping or other causes.

1.5 ENGINEERING, DESIGN AND CERTIFICATION

A. The term Engineer shall refer to the individual or firm who has been retained by the Contractor to provide design and inspection services for the retaining wall. The engineer must be qualified in the area of segmental retaining wall design and construction and must be licensed to practice engineering in the State of Connecticut.

B. The Engineer will perform the following tasks:

1. Supply shop drawings for design and construction of retaining wall. These drawings are to be used in conjunction with these specifications. These drawings shall be signed and sealed by the Engineer.
2. Review the site soil and geometric conditions to ensure the designed retaining wall is compatible with the site prior to construction.
3. Inspect the site conditions, materials incorporated into the retaining wall, and the construction practices used during construction.
4. Provide the Design-Builder with a letter after completion, certifying the design meets the requirements of this specification, the design was compatible with the site and the wall was constructed according to design.

C. The design of the modular retaining wall system indicated on the Construction Drawings is based on the use of Pisa II retaining wall units as manufactured by UNILOCK and Raugrid 3/3 geogrid as manufactured by Luckenhaus North America, Inc. If the Contractor shall submit calculations and shop drawings for the wall system(s). The shop drawings and calculations are to be signed and sealed by a Professional Engineer registered in the State of Connecticut. These shop drawings are to be used in conjunction with these specifications.

1.6 INSTALLER QUALIFICATIONS

A. Contractor must have successfully completed projects similar in scope and size in the last three years. Documentation of the experience shall be furnished to the Design-Builder with bids.

PART 1 - MATERIALS

2.1 DEFINITIONS:

A. Modular concrete retaining wall units are dry-cast solid concrete units that form the external fascia of a modular unit retaining wall system.

B. Coping units are the last course of concrete units used to finish the tope of the wall.

C. Infill soil is specified soil which is placed directly behind the drainage soil and within the reinforced zone, if applicable.

D. Retained soil is an in-situ soil or a specified soil which is placed behind the wall infill soil.

E. Foundation soil is the in-situ soil beneath the wall structure.

F. Drainage soil is a free draining soil with natural soil filtering capability, or a free draining soil encapsulated in a suitable geotextile, or a combination of free draining soil and perforated pipe all wrapped in a geotextile, placed directly behind the modular concrete units.

G. Drainage pipe is a perforated polyethylene pipe used to carry water, collected at the base of a soil retaining wall, to outlets in order to prevent pore water pressures from building up behind the wall facing modules.

H. Non-woven geotextiles are permeable synthetic fabrics formed from a random arrangement of fibers in a planar structure. They allow the passage of water from one soil medium to another while preventing the migration of fine particles that might clog the drainage medium.

I. Geosynthetic reinforcement is a polymer structure having tensile strength and durability properties that are suitable for soil reinforcement applications.

2.2 PRODUCTS

A. Modular Concrete Retaining Wall Units:

1. The concrete wall modules shall be 6 in. high x 8 in. deep with a maximum tolerance of plus or minus 1/8 in. for each dimension.
2. The concrete wall modules shall have a tongue and grove arrangement at to and bottom of module which shall be offset to permit a minimum wall batter of 1 V:8H.
3. The concrete wall modules shall have a minimum 28 day compressive strength of 5000 psi in accordance with ASTM C-90. The concrete shall have a maximum moisture absorption rate of 6 percent for freeze-thaw protection.
4. The retaining wall modules shall be solid units and have a minimum weight of 45 lb per unit.
5. Color to be selected by Architect from manufacturer's standard range.
6. Units shall be furnished with a concrete adhesive compatible with the units for fastening of coping unit and units above grade.

B. Infil Soil: The infil soil shall consist of Structural Backfill as defined in Section 02240.

C. Retained Soil: The retained soil shall be on-site soils unless specified otherwise in the Construction Specifications. If imported fill is required, it shall consist of Satisfactory Backfill Materials as defined in Section 02240.

D. Foundation Soil: The foundation soil shall be on-site soils, subject to review and approval by the special Inspector.

E. Leveling Base Material: The footing material shall be compacted Granular Fill as defined in section 02230 or a concrete leveling base.

F. Drainage Materials:

1. The drainage pipe shall be 6 in. diameter perforated PVC pipe in accordance with ASTM D 2729 wrapped in a non-woven geotextile, or as specified on the Construction Drawings.

2. The non-woven geotextile shall be a 100% continuous filament polyester non-woven needle-punched engineering fabric or as specified on the Construction Drawings. Geotextile filtration shall have an Apparent Opening Size ranging between U.S. Sieve Sizes 70 to 100 and a mi8nimum unit weight of 5.0 oz./square yard. The coefficient of permeability shall be between 0.18 to 0.24 in./second.

G. Drainage Soil: The drainage soil shall be compacted granular fill as defined in Section 02234.

H. Geosynthetic Soil Reinforcement: The geogrid shall be a regular grid structure of high density polyethylene (HDPE) or polyester. Geogrid shall be a horizontal layer of high strength high-modulus grid capable of creating a composite soil/geogrid mass that cts as a monolithic gravity structure.

2.3 APPROVED MANUFACTURERS

A. Modular Concrete Retaining Wall Units.

1. Unilock
2. Keystone Retaining Wall Systems
3. Mesa Retaining Walls
4. Versa-Lok Retaining Wall Systems

B. Geosynthetic Soil Reinforcement

1. Luckenhaus North America, Inc.
2. Mirafi
3. Tensar

PART 1 - EXECUTION

3.1 SITE PREPARATION

A. The foundation soil shall be excavated or filled as required to the grades and dimensions shown on the Site/Civil drawings.

B. The foundation soil shall be proof-rolled and shall be inspected by the Owner's Inspection Agent to ensure that it meets the minimum strength requirements according to the design assumptions. If unacceptable foundation soil is encountered, the Contract shall excavate the affected areas and replace with suitable quality material in accordance with Section 02220.

C. In cut situations, the native soil shall be excavated to the lines and grades shown on the Construction Drawings and moved off site or to a suitable location for reuse as retained soil, if applicable.

3.2 INSTALLING DRAINAGE SYSTEM

A. The approved non-woven geotextile shall be set against the back of the first retaining wall unit and over the prepared foundation extending towards the back of the excavation, up the excavation face and on top of the infill soil back to the retaining wall or as shown in the approved shop drawings.

B. The drainage pipe shall be placed behind the leveling base, or lower course of facing units as shown in the approved shop drawings. The pipe shall be laid at a minimum gradient of 2% to ensure adequate drainage to free outlets.

C. T-Sections and outlet pipes shall be installed on the drainage pipe at 50 feet centers or as shown on the approved shop drawings.

D. The remaining length of geotextile shall be pulled taut and pinned over the face of the retained soil. Geotextile overlaps shall be a minimum of 1 ft. and shall be shingled down the face of the excavation in order to prevent the infiltration of retained soil into the wall infill.

3.3 LEVELING BASE OR SPREAD FOOTING PLACEMENT

A. The leveling base material shall be placed and compacted crushed stone, or vibrated concrete along the grades and dimensions shown on the approved shop drawings. The minimum thickness of the leveling base shall be 6 inches.

B. The wall leveling base is to bear on natural undisturbed soil or compacted structural fill as shown on the Construction Drawings.

C. Wall embedment depth shall be determined based on design requirements but shall not be less than the following minimums based on the slope of the grade at the base of the wall and the height of the wall (H) above the leveling base:

1. Level (0.0 degrees): H/20
2. 3 Horiz.: 1 Vert (18.4 degrees): H/10
3. 2 Horiz.: 1 Vert. (26.5 degrees): H/7

3.4 INSTALLATION OF MODULAR CONCRETE RETAINING WALL UNITS

A. The bottom row of retaining wall modules shall be placed on the prepared leveling base as shown on the approved shop drawings. Care shall be taken to ensure that the wall modules are aligned properly, leveled from side to side and front to back and are in complete contact with the base material.

B. The wall modules above the bottom course shall be placed such that the tongue and grove arrangement provides the design batter (i.e. setback) of the wall face, unless a vertical application is shown.

C. The wall modules shall be swept clean before placing additional levels to ensure that no dirt, concrete or other foreign materials become lodged between successive lifts

of the wall modules.

D. Maximum 4 courses of wall units can be placed prior to backfilling.

E. The installing contractor shall check the level of wall modules with each lift to ensure that no gaps are formed between successive lifts that may affect the pullout resistance of geosynthetic reinforcement.

F. Care shall be taken to ensure that the wall modules are not broken or damaged during handling and placement.

G. The following tolerances are the maximum allowable deviatins:

1. Vertical Control: +/-1.25 inches over a 10 foot distance, +/-3 inches total.
2. Horizontal control: +/-1.25 inches over a 10 foot distance, +/-3 inches total.
3. Rotation: +/-2 degrees from planned wall batter.
4. Bulging: Maximum of 1.0 inch over a 10 foot distance.

3.5 DRAINAGE SOIL

A. The drainage soil w3ill be placed behind the retaining wall modules with a maximum depth of one foot and separated from other soils using the approved non-woven geotextile.

B. Drainage soil shall be placed behind the wall facing in maximum lifts of 6 inches and compacted to a minimum density of 95% Standard Proctor in accordance with ASTM D 1557.

C. No heavy compaction equipment shall be allowed within 3 feet of the back of the wall fascia.

3.6 GEOSYNTHETIC SOIL REINFORCEMENT

A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.

B. Geogrid reinforcement shall be placed at the elevations and to the extents shown on the approved shop drawings.

C. The geogrid shall be placed over the compacted infill soil and the wall facing units with the outside edge extending over the tongue of the bottom unit and to within 1 inch of the front facing unit. The geogrid soil reinforcement shall be laid on top of the units and horizontally on compacted backfill. The next course of units shall be placed so that the geogrid will conform to the backside and under the lip of the top units. Pull grid taut, and anchor geogrid to compacted backfill prior to placing addition backfill.

D. Slack in the geogrid shall be removed in a manner and to such a degree as approved by the Engineer.

E. Geogrid reinforcements shall be continuous throughout their embedment lengths. Spliced connections between shorter pieces of geogrid will not be allowed unless pre-approved by the Engineer.

F. Adjacent sections of geogrid at the same elevation are to butt against one another without any gaps between the two sections. Geogrid sections that step in elevation are to be overlapped 6" at their respective elevation.

G. No tracked construction equipment shall be allowed to operate directly on top of the geogrid until a minimum thickness of 6 inches of fill has been placed. Rubber tired equipment may drive on tope of the geogrid at slow speeds but should exercise care not to stop suddenly or make sharp turns.

3.7 INFILL SOIL FOR GEOSYNTHETIC REINFORCED RETAINING WALLS

A. Retained soils shall be placed and compacted behind the infill soil in maximum lift thickness of 6 inches. The retained soils shall be Satisfactory Backfill Materials compacted to a minimum density of 95% Standard Proctor in accordance with ASTM D 1557.

B. No heavy compaction equipment shall be allowed within 3 feet of the back of the wall modules.

3.8 RETAINED SOIL

A. Retained soils shall be placed and compacted behind the infil soil in maximum lift thickness of 6 inches. The retained soils shall be Satisfactory Backfill Materials compacted to a minimum density of 95% Standard Proctor in accordance with ASTM D 1557.

B. No heavy compaction equipment shall be allowed within 3 feet of the back of the wall modules.

3.9 FINISHING WALL

A. Items 3.4 to 3.8 shall be repeated until the grades indicated on the Construction Drawings are achieved.

B. Coping units shall be secured to the top of the wall with a 3/8 in. bead of concrete adhesive positioned 2" in front and behind the tongue of the last course of retaining wall units.

C. Wall units above grade shall be secured to the top of the wall with a 3/8 in. bead of concrete adhesive positioned 2" in front and behind the tongue of the last course of retaining wall units.

D. Finish grading above the wall to direct surface run off water away from the top of the wall with a soil of low permeability.

3.10 QUALITY CONTROL

A. An Inspection Agent shall be engaged by the Contractor on a full-time basis during the construction of the wall to assure that proper construction practices are followed. A Testing Laboratory with qualified personnel would be an acceptable Inspection Agent.

B. The foundation, drainage and backfill material used in the construction of the wall shall be inspected to verify conformance with the specified requirements and the indicated design parameters.

C. The compaction of each lift of soil shall be inspected to verify that it conforms to the specified requirements; compaction tests should be performed at intervals of approximately every fifty feet along the length of the wall. Compaction tests should be in conformance with ASTM D 1557.

D. Each layer of grid shall be inspected for placement location, orientation, length and anchorage before backfill is placed on top of it; the Inspection Agency should verify the each layer of grid is taut prior to adding backfill above it.

E. The Inspection Agent should issue field reports as construction progresses, in order that the inspection process is documented. The Inspection Agent should issue a letter at the end of the wall construction stating that the wall was constructed within the parameters of the design.

END OF SECTION 02275

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Single-wall round ducts and fittings for use downstream of the air filter.
2. Sheet metal materials.
3. Sealants and gaskets.
4. Hangers and supports.
5. Seismic-restraint devices.

B. Related Sections:

1. Division 15 Section "Nonmetal Ducts" for fibrous-glass ducts, thermoset fiber-reinforced plastic ducts, thermoplastic ducts, PVC ducts, and concrete ducts.
2. Division 15 Section "HVAC Casings" for factory- and field-fabricated casings for mechanical equipment.
3. Division 15 Section "Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.

1. Static-Pressure Classes:
   a Exhaust Ducts (Negative Pressure): 12-inch wg

B. Structural Performance: Duct hangers and supports and seismic restraints shall withstand the effects of gravity and seismic loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards -

Metal and Flexible" and ASCE/SEI 7, supplemented with International Building Code 2003 and Connecticut Supplements dated 2005.

1.4 SUBMITTALS

A. Product Data: For each type of the following products:

1. Liners and adhesives.
2. Sealants and gaskets.
3. Seismic-restraint devices.

B. Shop Drawings:

4. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
5. Factory- and shop-fabricated ducts and fittings.
6. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
7. Elevation of top of ducts.
8. Dimensions of main duct runs from building grid lines.
9. Fittings.
10. Reinforcement and spacing.
11. Seam and joint construction.
12. Equipment installation based on equipment being used on Project.
13. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
14. Hangers and supports, including methods for duct and building attachment, seismic restraints, and vibration isolation.

C. Delegated-Design Submittal:

1. Sheet metal thicknesses.
2. Joint and seam construction and sealing.
3. Reinforcement details and spacing.
4. Materials, fabrication, assembly, and spacing of hangers and supports.
5. Design Calculations: Calculations, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation for selecting hangers and supports and seismic restraints.

D. Field quality-control reports.

PART 2 - PRODUCTS

2.1 SINGLE-WALL ROUND DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a Lindab Inc.
   b McGill AirFlow LLC.
   c SEMCO Incorporated.
   d Sheet Metal Connectors, Inc.
   e Spiral Manufacturing Co., Inc.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Transverse Joints - Round Duct," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Seams - Round Duct and Fittings," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "90 Degree Tees and Laterals," and Figure 3-5, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.2 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G60.
2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or 316, as indicated in the "Duct Schedule" Article; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D, No. 3, or No. 4 as indicated in the "Duct Schedule" Article.

D. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.

E. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 12-inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

C. Solvent-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Base: Synthetic rubber resin.
3. Solvent: Toluene and heptane.
4. Solids Content: Minimum 60 percent.
5. Shore A Hardness: Minimum 60.
6. Water resistant.
7. Mold and mildew resistant.
8. VOC: Maximum 395 g/L.

9. Maximum Static-Pressure Class: 12-inch wg, positive or negative.
10. Service: Indoor or outdoor.
11. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.

E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

F. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 12-inch wg static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.4 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct."

C. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

D. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.

E. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

F. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

G. Trapeze and Riser Supports:

1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

2.4 SEISMIC-RESTRAINT DEVICES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper B-Line, Inc.; a division of Cooper Industries.
2. Ductmate Industries, Inc.
3. Hilti Corp.
4. Kinetics Noise Control.
5. Loos & Co.; Cableware Division.
6. Mason Industries.
7. TOLCO; a brand of NIBCO INC.
8. Unistrut Corporation; Tyco International, Ltd.

B. General Requirements for Restraint Components: Rated strengths, features, and applications shall be as defined in reports by an agency acceptable to authorities having jurisdiction.

1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.

C. Channel Support System: Shop- or field-fabricated support assembly made of slotted steel channels rated in tension, compression, and torsion forces and with accessories for attachment to braced component at one end and to building structure at the other end. Include matching components and corrosion-resistant coating.

D. Restraint Cables: ASTM A 603, galvanized-steel cables with end connections made of cadmium-plated steel assemblies with brackets, swivel, and bolts designed for restraining cable service; and with an automatic-locking and clamping device or double-cable clips.

E. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod.

F. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install round ducts in maximum practical lengths.

D. Install ducts with fewest possible joints.

E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

H. Install ducts with a clearance of 1 inch.

I. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

J. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "Duct Cleanliness for New Construction Guidelines."

3.2 INSTALLATION OF EXPOSED DUCTWORK

A. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.

B. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

C. Repair or replace damaged sections and finished work that does not comply with these requirements.

3.3 DUCT SEALING

A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":

C. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Outdoor, Exhaust Ducts: Seal Class C.

3.4 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."

B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.

C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.

D. Hangers Exposed to View: Threaded rod and angle or channel supports.

E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.

F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.5 SEISMIC-RESTRAINT-DEVICE INSTALLATION

A. Install ducts with hangers and braces designed to support the duct and to restrain against seismic forces required by applicable building codes. Comply with ASCE/SEI 7, supplemented with International Building Code 2003 and Connecticut Supplements dated 2005.

1. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
2. Brace a change of direction longer than 12 feet.

B. Select seismic-restraint devices with capacities adequate to carry present and future static and seismic loads.

C. Install cables so they do not bend across edges of adjacent equipment or building structure.

D. Install cable restraints on ducts that are suspended with vibration isolators.

E. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction.

F. Attachment to Structure: If specific attachment is not indicated, anchor bracing and restraints to structure, to flanges of beams, to upper truss chords of bar joists, or to concrete members.

G. Drilling for and Setting Anchors:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcement or embedded items during drilling. Notify the Architect if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Set anchors to manufacturer's recommended torque, using a torque wrench.

5. Install zinc-coated steel anchors for interior applications and stainless-steel anchors for applications exposed to weather.

3.6 CONNECTIONS

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.7 DUCT CLEANING

A. Clean new duct system(s) before testing, adjusting, and balancing by visually inspecting the interior of the ductwork for significant debris.

3.8 START UP

A. Air Balance: Balance total system flow to match design flow.

3.9 DUCT SCHEDULE

A. Elbow Configuration:

1. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-3, "Round Duct Elbows."
   a Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.
      1) Velocity 1000 or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.
      2) Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.
      3) Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.
   b Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.
   c Round Elbows, 14 Inches and Larger in Diameter: Standing seam.

END OF SECTION 15815

BID PRICE FORM

Bidder will complete the Work as specified in the Contract Documents for the modification of the ash load-out building and site at the Mid-Connecticut Resource Recovery Facility the following lump sum price (please use itemized table below):

Item	Bid Price (Dollars)	Bid Price (Words)
Ash Load-Out Building Modifications	$	Dollars & 0/100 Cents
Ash Load-Out Building/Mechanical Exhaust System	$	Dollars & 0/100 Cents
Site Improvements	$	Dollars & 0/100 Cents
Unattended Scale House with Electrical Power Conduit and Data-Video Cable Conduit	$	Dollars & 0/100 Cents
TOTAL	$	Dollars & 0/100 Cents

Bidder affirms that the above lump sum and unit price costs represent the entire cost to complete the Work in accordance with the Contract Documents, and that no claim will be made on account of any increase in wage scales, material prices, delivery delays, taxes, insurance, cost indexes or any other rates affecting the construction industry or this Project, and that each and every such claim is hereby expressly waived by Bidder.

Name of Bidder (Firm):	
Signature of Bidder Representative:	
Name (Type/Print):	
Title:	
Date:	

MANDATORY PRE-BID CONFERENCE AND SITE TOUR SIGN-IN SHEET
ASH LOAD OUT BUILDING ND SITE MODIFICATIONS
Power Block Facility
Hartford, Connecticut
10:00 a.m., May 15, 2008

(PLEASE PRINT)

Name	Company	*PROVIDE A CRRA REPRESENTATIVE WITH A BUSINESS CARD OR FILL-IN THESE COLUMNS*			
		Address	Email Address	Telephone Number	Fax Number
JOSEPH BURGIO	CRRA	100 CONSTITUTION PLAZA - HARTFORD, CT	Jburgio@ct.gov	860-757-7742	860-757-7742
BILL FLETCHER	CNS	52 SHIRUM RD EPPING NH 03467	BFletcher@CNSNH.com	603 679-3488	603 679-3342
GUS BRENNAN	RICHARDS CORP	72 North Hartford Rd Terryville, CT 06786	Wbrennan@richardscorp.com	860-583-9229	860 582 9202
Todd Mather	Mather Corporation	21 W. Dudley Town Rd. Bloomfield CT 06002	TODDMATHER@MATHERCORP.COM	860-242-0743	860 242-1493
ROBERT SHANAHAN	BOTTICELLO LLC	321 Olcott St Manchester, CT 06040	BOTTICELLO2220@SBCGLOBAL.NET	649-3665	645-3320
Mike Sullivan	Apex Cos, LLC	58 H Connecticut Ave South Windsor CT 06074	MSullivan@apexcos.com	860 282 1700	860-282-1800
Steven McCarty	Coastlands Enterprises	1200 Farmington Ave Berlin CT 06037	Steve@coastlandsenterprises.com	860-828-6890	860-828 0780
CHRIS DICKMAN	CISCO LLC	525 ELM GRASSO BLVD NEW HAVEN, CT 06519	CDICKMAN@CISCO.NET	203-752-2558	203-772-1084

MANDATORY PRE-BID CONFERENCE AND SITE TOUR SIGN-IN SHEET
ASH LOAD OUT BUILDING ND SITE MODIFICATIONS
Power Block Facility
Hartford, Connecticut
10:00 a.m., May 15, 2008

(PLEASE PRINT)

Name	Company	*PROVIDE A CRRA REPRESENTATIVE WITH A BUSINESS CARD OR FILL-IN THESE COLUMNS*			
		Address	Email Address	Telephone Number	Fax Number
GREG FARNELL	MERRITT CONTRACTORS	350 BOSTWICK AVE. BRIDGEPORT CT 06605	MERRITTCON@AOL.COM.	203 367 6220	203 334 7095
MIKE VOLPE	EMPIRE PAVING	Brainard Rd No. Haven	EmpirePaving.com	203 752-0002	203 752-0242
Michael Fitzgerald	Construction Network Services CNS	Epping NH 03840 52A Skirkig Road	cnsnh.com mfitzgerald@	603 679 3488	603 679 3342