City of Richmond
Department of Planning
& Development Review

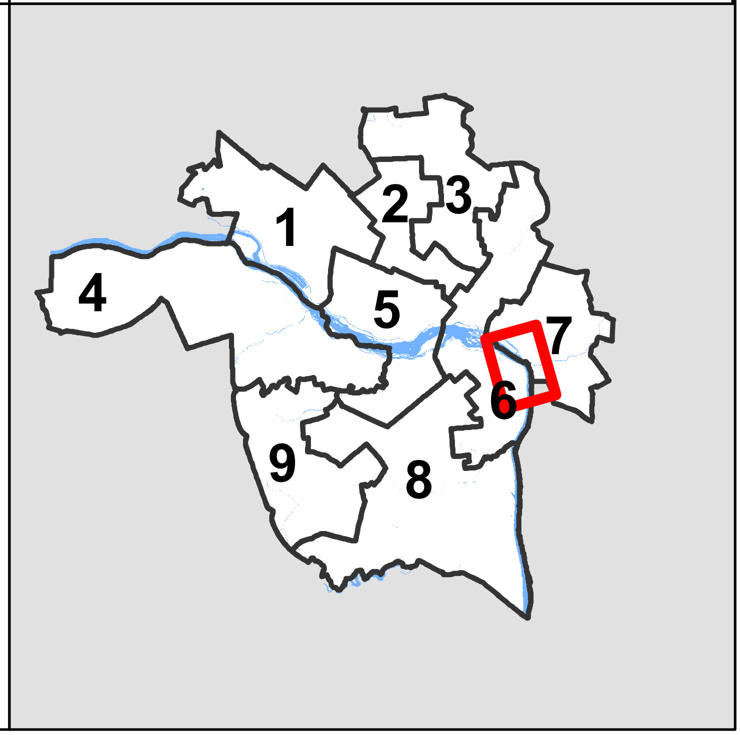
Location, Character, and Extent

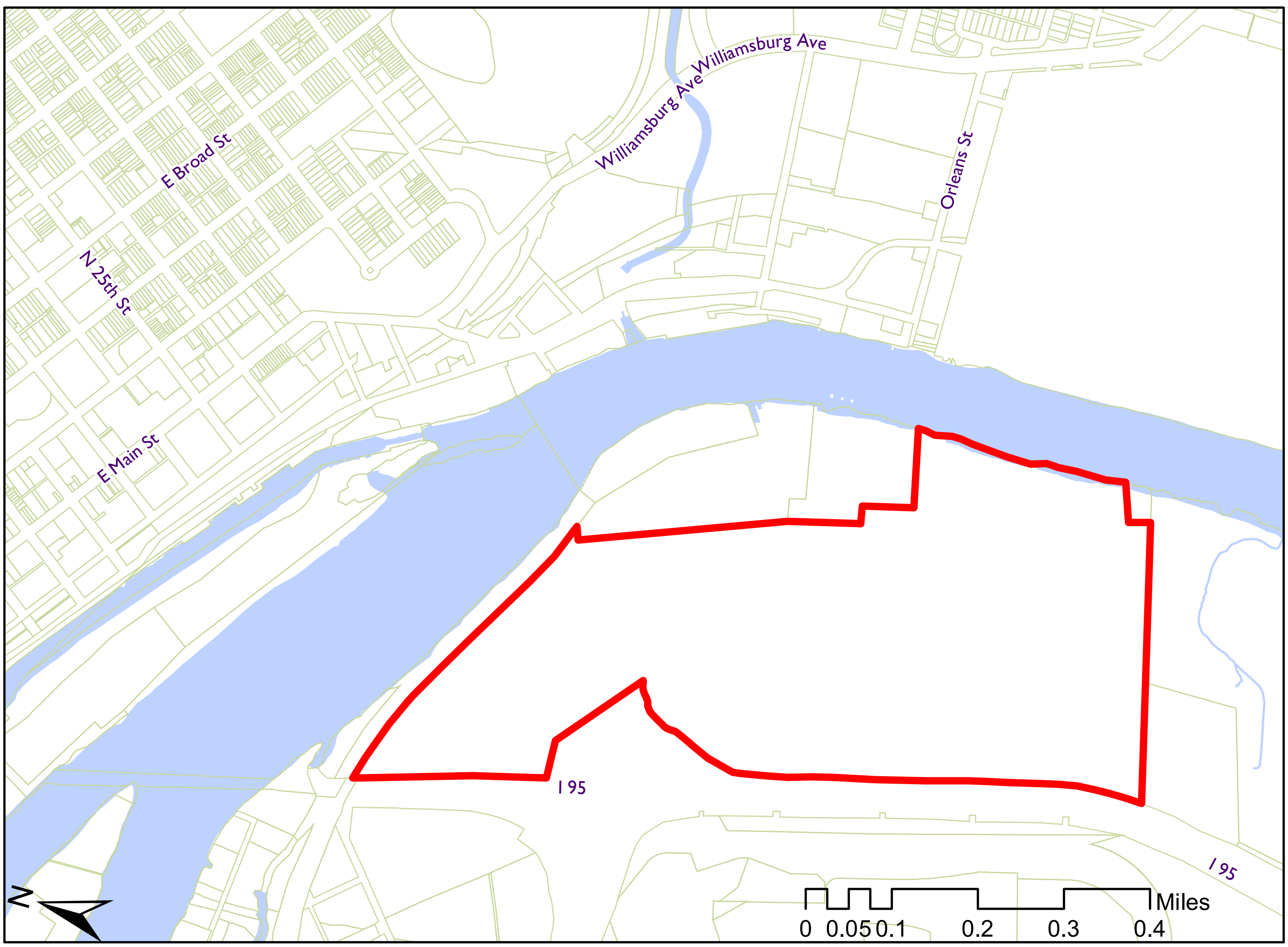
LOCATION: 1400 Brander Street

COUNCIL DISTRICT: 6

PROPOSAL: Final review of sludge thickening and dewatering facility improvements .

For questions, please contact Josh Son
at 646-3741 or joshua.son@richmondgov.com





City of Richmond Capital Improvements Plan

Wastewater Treatment Plant

Division 48

Sludge Thickening and Dewatering Facility Improvements

UDC Final Review Submittal – UDC No. 2019-28

November 14, 2019

For

December 5, 2019 UDC Meeting

Department of Public Utilities

Greeley and Hansen

Environ-Civil Engineering, Ltd.

Application for Urban Design Committee Review

Department of Planning and Development Review
Planning & Preservation Division
900 E. Broad Street, Room 510
Richmond, Virginia 23219 | (804) 646-6335
www.richmondgov.com/CommitteeUrbanDesign

RICHMOND PLANNING & DEVELOPMENT REVIEW
PDR

Application Type (select one)

- [ ] Location, Character, & Extent
- [ ] Section 17.05
- [ ] Other:
- [ ] Encroachment
- [ ] Design Overlay District

Review Type (select one)

- [ ] Conceptual
- [x] Final

Project Information

Submission Date: 11/14/19

Project Name: Thickening and Dewatering Facility Improvements

Project Address: 1400 Brander Street, Richmond VA, 23224-2399

Brief Project Description (this is not a replacement for the required detailed narrative):

This is a wastewater treatment project at the wastewater treatment plant which was included in the City's Capital Improvements Plan. The project scope includes upgrade of equipment that are near the end of their service life at the thickening and dewatering facilities.

Applicant Information (a City representative must be the applicant, with an exception for encroachments)

Name: Ed Alleyne

Email: EDWARD.ALLEYNE@RICHMONDGOV.COM

City Agency: Department of Public Utilities

Phone: 804-646-8514

Main Contact (if different from Applicant): George Guhse

Company: Greeley and Hansen

Phone: 804-513-3338

Email: gguhse@greeley-hansen.com

Submittal Deadlines

All applications and support materials must be filed no later than 21 days prior to the scheduled meeting of the Urban Design Committee (UDC). Please see the schedule on page 3 as actual deadlines are adjusted due to City holidays. **Late or incomplete submissions will be deferred to the next meeting.**

Filing

Applications can be mailed or delivered to the attention of "Urban Design Committee" at the address listed at the top of this page. **It is important that the applicant discuss the proposal with appropriate City agencies, Zoning Administration staff, and area civic associations and residents prior to filing the application with the UDC.**

Submittal Deadlines

The UDC is a ten member committee created by City Council in 1968 whose purpose is to advise the City Planning Commission (CPC) on the design of projects on City property or right-of-way. The UDC provides advice of an aesthetic nature in connection with the performance of the duties of the Commission under Sections 17.05, 17.06, and 17.07 of the City Charter. The UDC also advises the Department of Public Works in regards to private encroachments in the public right-of-way.

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RICHMOND PLANNING & DEVELOPMENT REVIEW
PDR

Submssion Requirements

•An electronic copy (PDF preferred) of all application materials, which can be emailed, or delivered by FTP or USB.
•Three (3) copies of the application cover sheet and all support materials (see below).
•Plan sheets should be 11" x 17", folded to 8 1/2" x 11". If it is not possible to scale plans to these dimensions, please provide one set of larger, scaled plans.
•All applications must include the attached cover sheet and the following support materials, as applicable to the project, based on Review Type:

Conceptual Review:
•A detailed project narrative which includes the following: purpose of the project, project background, project budget and funding sources, description of construction program and estimated construction start date (description should also provide information on the surrounding area to provide context).
•A site plan for the project indicating site characteristics which include: building footprints, parking areas, pedestrian routes, recreation areas, open areas, and areas of future expansion.
•A set of floor plans and elevations, as detailed as possible.
•A landscaping plan which shows the general location and character of plant materials and notes any existing tree to be removed.

Final Review:
•A detailed project narrative which includes the following: purpose of the project, project background, project budget and funding sources, description of construction program, and estimated construction start date (description should also provide information on the surrounding area to provide context).
•A site plan for the project indicating site characteristics which include: building footprints, parking areas, pedestrian routes, recreation areas, open areas, and areas of future expansion.
•A set of floor plans and elevations, as detailed as possible.
•A landscaping plan that includes a complete plant schedule, the precise location of all plant materials, and a landscape maintenance analysis. The plant schedule must show number, size and type of each planting proposed. If existing trees are to be removed, their size, type, and location must be noted on the landscape plan.
•The location of all lighting units should be noted on a site plan, including wall-mounted, site, and parking lot lighting. Other site details such as benches, trash containers, and special paving materials should also be located. Include specification sheets for each item.
•Samples of all proposed exterior building materials, including but not limited to brick, mortar, shingles, siding, glass, paint, and stain colors. When an actual sample cannot be provided, a product information sheet that shows the item or a photo of an existing item may be substituted.

Review and Processing

•Once an application is received, it is reviewed by Staff, who compiles a report that is sent to the UDC.
•A copy of the report and the meeting agenda will be sent to the applicant prior to the meeting.
•At the UDC meeting, the applicant or a representative should be present or the application may be deferred to the next regularly scheduled meeting. It is also strongly suggested that a representative of the City Agency which will have final responsibility for the item be present at the meeting (if the applicant and the representative are not the same).
•Once the UDC recommends action on the application, it is automatically placed on the agenda for the next City Planning Commission (CPC) meeting. Exceptions to this are encroachment applications, recommendations for which are forwarded to the Department of Public Works.
•At the CPC meeting, the applicant or a representative should be present, or the application may be deferred to the next regularly scheduled meeting.

Application for Urban Design Committee Review

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RICHMOND PLANNING & DEVELOPMENT REVIEW
PDR

Regular meetings are scheduled on the Thursday after the first Monday of each month at **10:00 a.m. in the 5th floor conference room of City Hall, 900 E. Broad Street**. Special meetings are scheduled as needed.

Meeting Schedule 2019

Submission Deadline	UDC Meeting	CPC meeting to follow UDC
November 15, 2018	**December 6, 2018**	December 17, 2018
December 13, 2018	**January 10, 2019**	January 22, 2019[1]
January 17, 2019	**February 7, 2019**	February 19, 2019[2]
February 14, 2019	**March 7, 2019**	March 18, 2019
March 14, 2019	**April 4, 2019**	April 15, 2019
April 11, 2019	**May 9, 2019**	May 20, 2019
May 16, 2019	**June 6, 2019**	June 17, 2019
June 13, 2019	**July 3, 2019****	July 15, 2019
July 11, 2019**	**August 8, 2019**	August 19, 2019[3]
August 15, 2019	**September 5, 2019**	September 16, 2019
September 12, 2019	**October 10, 2019**	October 21, 2019
October 17, 2019	**November 7, 2019**	November 18, 2019
November 14, 2019	**December 5, 2019**	December 16, 2019

[1] Monday, January 21, 2019 is a City of Richmond Holiday.
[2] Monday, February 18, 2019 is a City of Richmond Holiday.
[3] This August CPC Meeting may be canceled. If so, the meeting would be Tuesday, September 3, 2019.
** Moved forward to account for Independence Day

The Richmond Urban Design Committee is a ten member advisory committee created by City Council in 1968. Its purpose is to advise the City Planning Commission on the design of City projects. The Urban Design Committee reviews projects for appropriateness in "location, character, and extent" and for consistency with the City's Master Plan and forwards recommendations to the City Planning Commission. The Urban Design Committee also advises the Department of Public Works in regards to private encroachments in the public right-of-way.

For more information, please contact the Planning and Preservation Division staff at (804) 646-6335 or the Secretary to the Urban Design Committee at (804) 646-3741 or at joshua.son@richmondgov.com.

last revised 6/10/2019

CITY OF RICHMOND

GREELEY AND HANSEN

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers

DANIELS & ASSOCIATES, P.C.
Consulting Engineers

Department of Public Utilities Wastewater Treatment Plant Division 48 Project: Sludge Thickening and Dewatering Facility Improvements

Urban Design Committee
December 2019 Meeting

Rosemary Green, City of Richmond
Ed Alleyne, City of Richmond
George Guhse, Greeley and Hansen
Ben Custalow, Greeley and Hansen

Agenda

- Project Narrative
- Sludge Thickening Facility
  - Site Plan
  - Floor Plans and Elevations
  - Landscaping Plan
  - Outside Site Lighting
  - Exterior Building Materials
- Sludge Dewatering Facility
  - Site Plan
  - Floor Plans and Elevations
  - Existing Landscape
  - Outside Site Lighting
  - Exterior Building Materials

CITY OF RICHMOND

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Consulting Engineers

Project Narrative

City of Richmond, Virginia

Department Of Public Utilities

Wastewater Treatment Plant

Project Description for Division 48 Project

Sludge Thickening and Dewatering Facility Improvements

November, 2019

The City of Richmond currently operates a sludge thickening facility and a sludge dewatering facility at its wastewater treatment plant (WWTP) that were installed in the late 1980's. Thickening centrifuges are fed by waste activated sludge (WAS) pumps (0.5% solids) and produce a cake of approximately 6% solids without the use of polymer. Dewatering centrifuges are fed digested sludge from sludge storage tanks (2-4% solids) and produce a cake of approximately 25% solids with the use of polymer. Greeley and Hansen designed both the Thickening and Dewatering facilities. The facilities have been in continuous operation for over 30 years.

The thickening and dewatering centrifuges are near the end of their service life and down time for maintenance has become excessive and costly. The City selected Greeley and Hansen to develop a basis of design report (BODR) for upgrades to both facilities. Greeley and Hansen developed a report with an evaluation of current and future flow conditions, a characterization of existing equipment condition, a detailed review of multiple centrifuge manufacturers, and a recommendation for facility upgrades. Pilot testing was not conducted for budgetary reasons, but sludge samples for both facilities were provided to each centrifuge manufacturer that was considered to determine compatibility with the proposed equipment. Ultimately, four centrifuge manufacturers were shortlisted based upon their performance characteristics, energy consumption, operational features, maintenance facility locations, existing installations, and cost.

The scope of the current project includes the following upgrades in the Thickening facility: Replacement of four thickening centrifuges, new centrifuge control panels elevated on a platform above the 100-yr flood plain, replacement of four progressing cavity sludge pumps, new electrical building and transformers above 100-yr flood elevation adjacent to the existing facility, new outdoor HVAC platform above 100-yr flood elevation adjoining the existing facility. The thickening centrifuges would be replaced with the current facility in operation and would not require a temporary thickening facility.

The scope of the current project includes the following upgrades in the Dewatering Facility: Replacement of five dewatering centrifuges, new centrifuge control panels and centrifuges on platform above the 100-yr flood plain, new dewatering polymer system, new dewatered cake conveyor system composed of screw and belt conveyors, new loading building, new Integrated Power Assembly unit above the 100-yr flood plain elevation. Other supporting systems that need to be upgraded are centrate drains, noise reduction system in the centrifuge room, I&C Systems, and HVAC system. A temporary dewatering system is included to allow the rehabilitation of the dewatering building to be conducted without coordinating a difficult phased construction approach.

The estimated construction cost for the thickening building, new thickening electrical building, and dewatering building is $27.5 million. Program funding for this project is from the City Utility Funding. The Program Schedule for the project is as follows:

Program Schedule – Division 48, Sludge Thickening and Dewatering Facility Improvements	
Design Completion	January 2020
Bid and Award	July 2020
Construction Complete	October 2023

CITY OF RICHMOND

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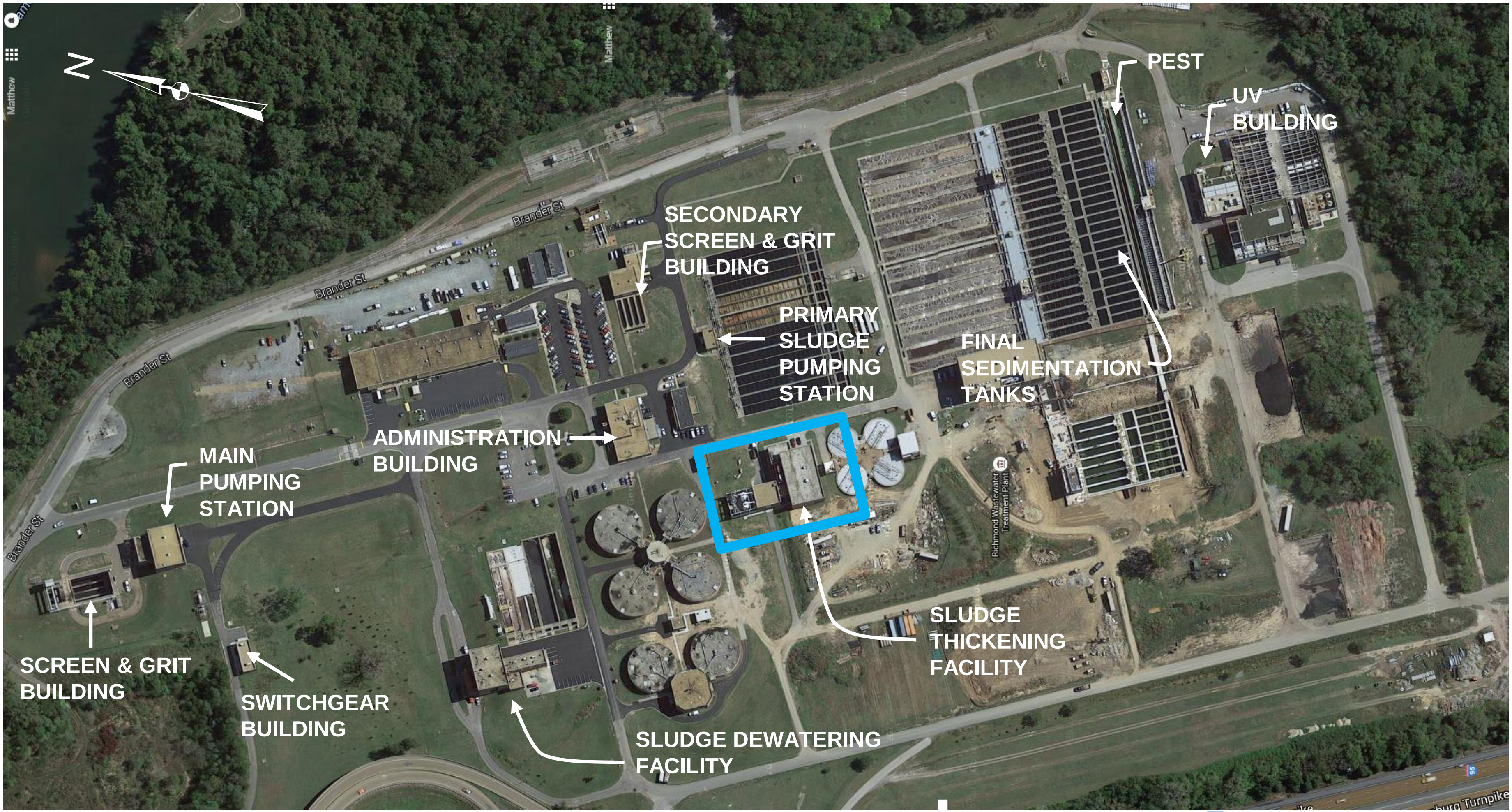
Consulting Engineers

Sludge Thickening Facility Site Plan

Richmond WWTP Overview

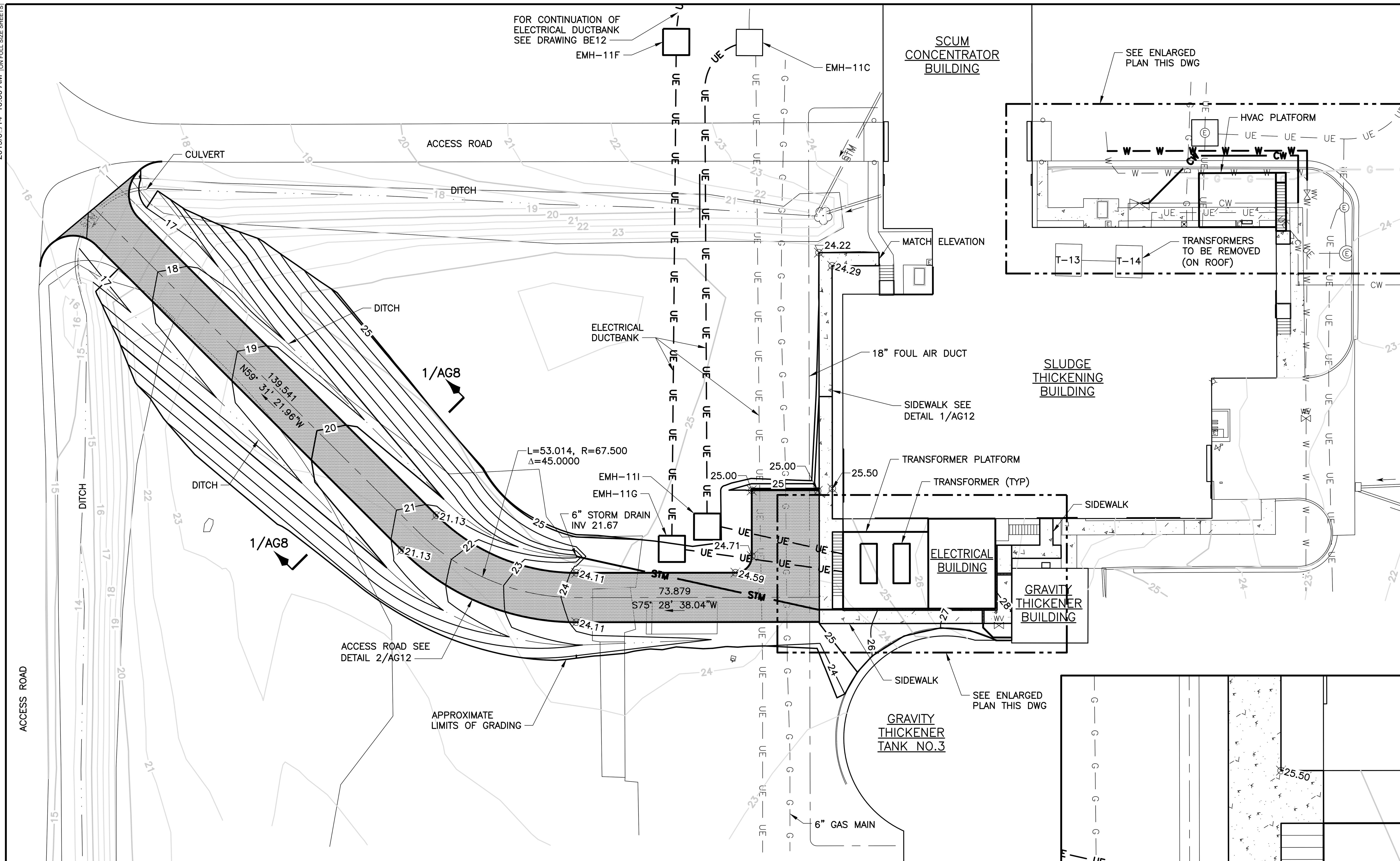


RICHMOND-PETERSBURG TURNPIKE   ROUTE I-95

GREELEY AND HANSEN

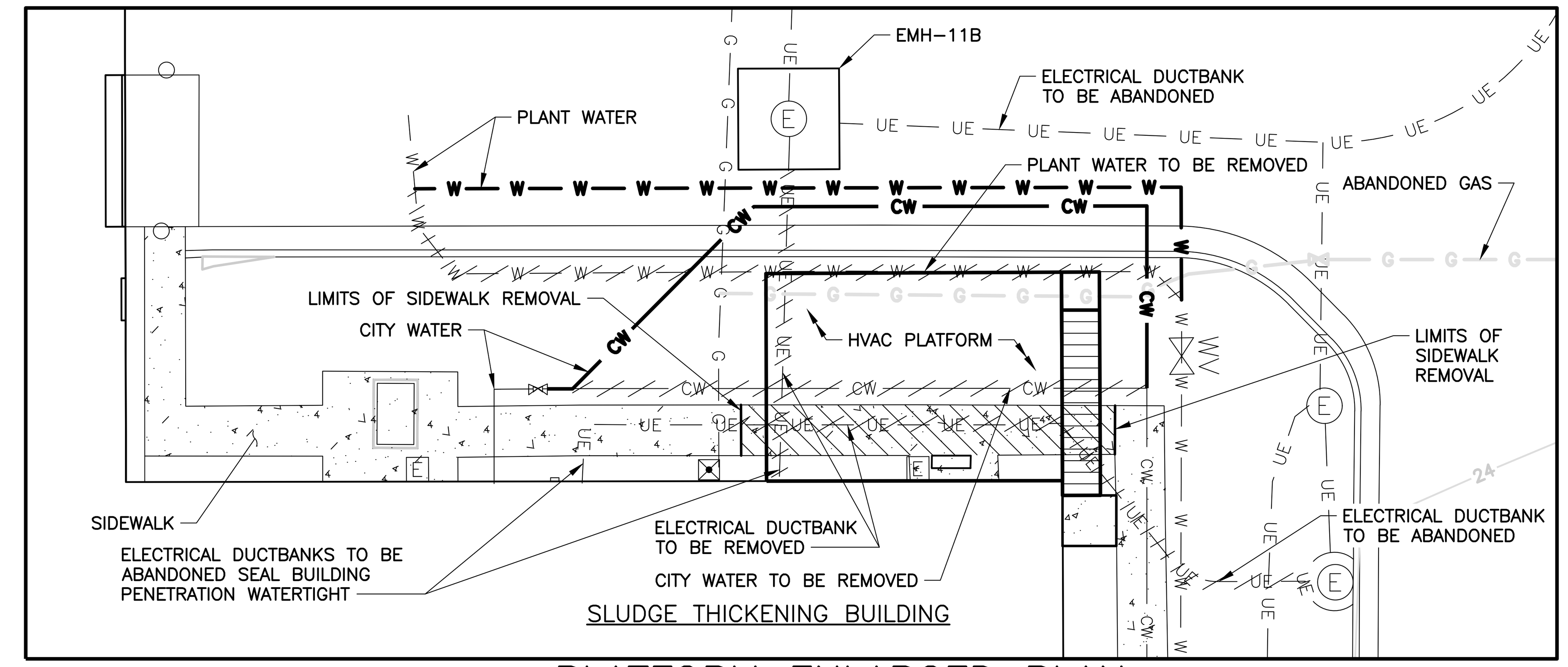
Environ-Civil Engineering, Ltd.

DANIELS & ASSOCIATES, P.C. Consulting Engineers



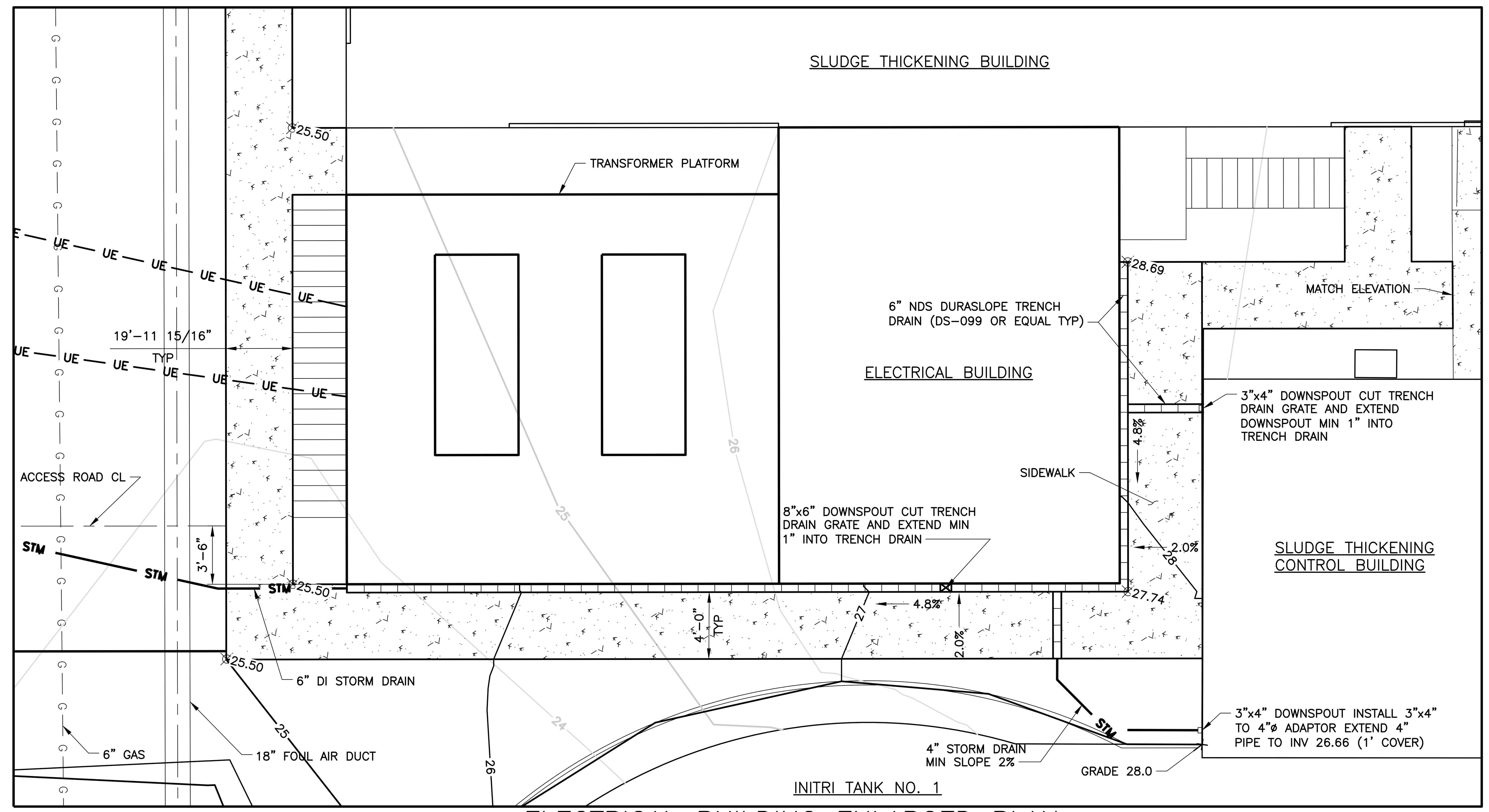
NEW SITE PLAN

SCALE: 1" = 20'



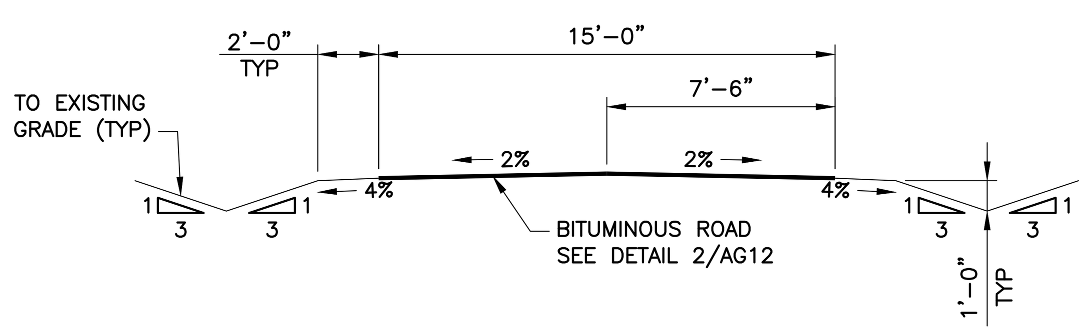
PLATFORM ENLARGED PLAN

SCALE: 1" = 10'



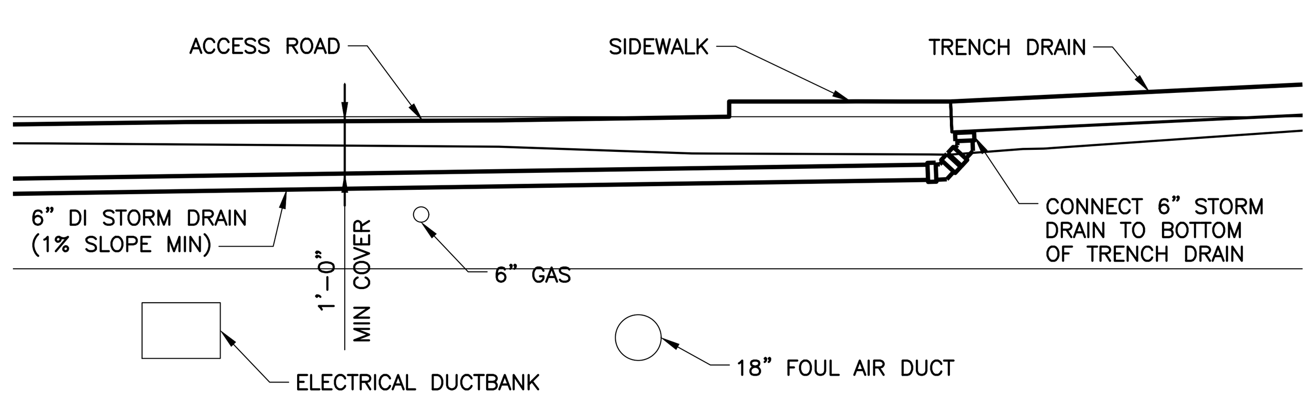
ELECTRICAL BUILDING ENLARGED PLAN

SCALE: 1" = 5'



SECTION 1/AG8

SCALE: NOT TO SCALE



DETAIL 1/AG8

SCALE: 1" = 5'

PRELIMINARY 90%

JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	BED	APPROVED
DRAWN	PMY	
CHECKED	BDC	

NO.	DATE	APPD	DESCRIPTION

SCALE: 1"=5', 1"=10', 1"=20'

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

GENERAL

NEW SITE PLAN – THICKENING

PROJECT NO.	02188-BG039
DWG	AG8
SHEET	9 OF XX
DATE	JULY 2019 REV 0

CITY OF RICHMOND

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Sludge Thickening Facility Floor Plans and Elevations

Sludge Thickening Facility West Elevation

GREELEY AND HANSEN

Environ-Civil Engineering, Ltd.

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DANIELS & ASSOCIATES, P.C.
Consulting Engineers

NEW BASEMENT PLAN AT EL +28.0

SCALE: 3/16" = 1'-0"

NOTES:

1. PROVIDE NEW COUPLINGS WHERE NEW PIPING CONNECTS TO EXISTING PLAIN END PIPING.

PRELIMINARY 90%

JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	THL	APPROVED	
DRAWN	PMY		
CHECKED	BDC		

NO.	DATE	APPD	DESCRIPTION

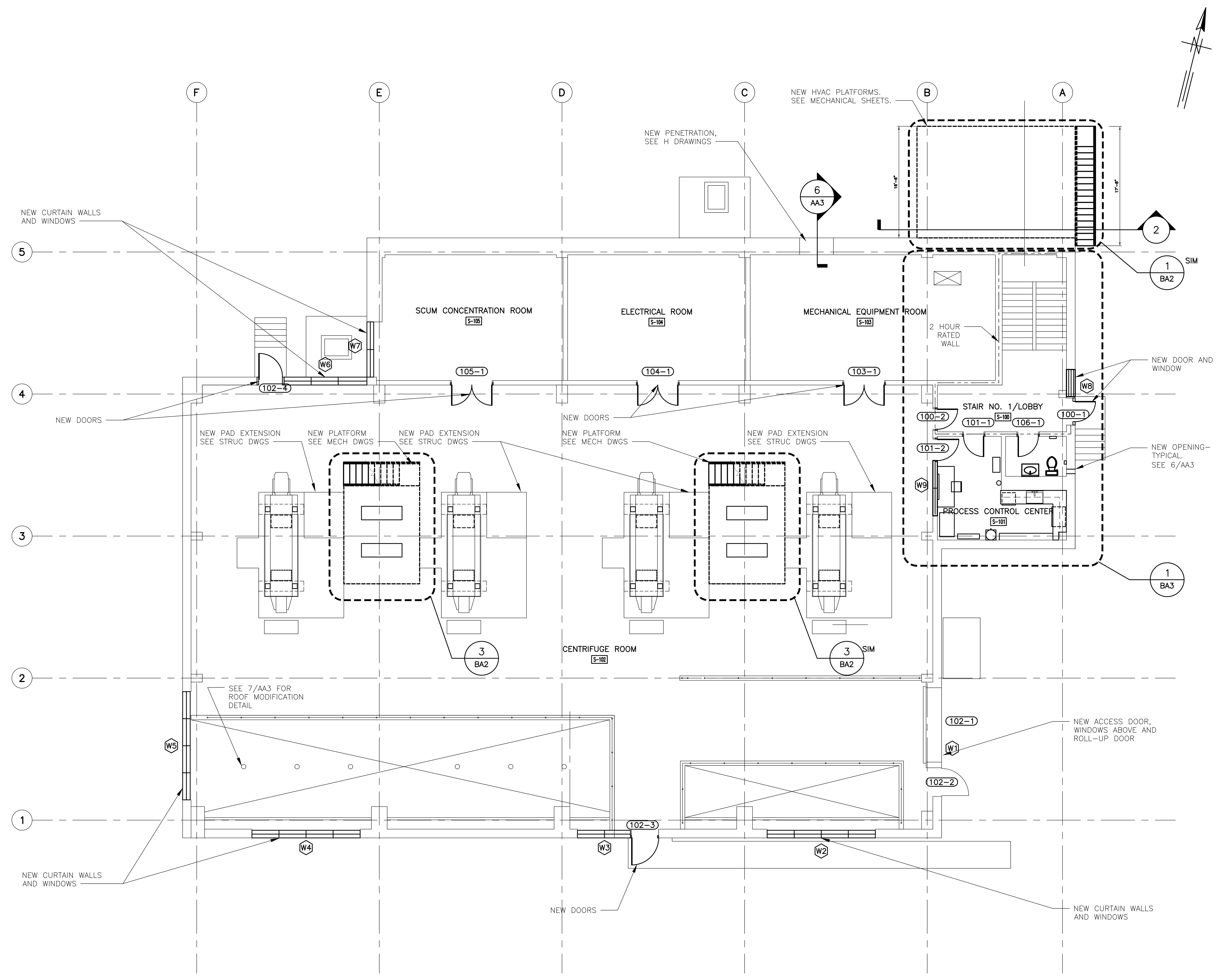
SCALE
4 0 4 8 12 FT
3/16"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

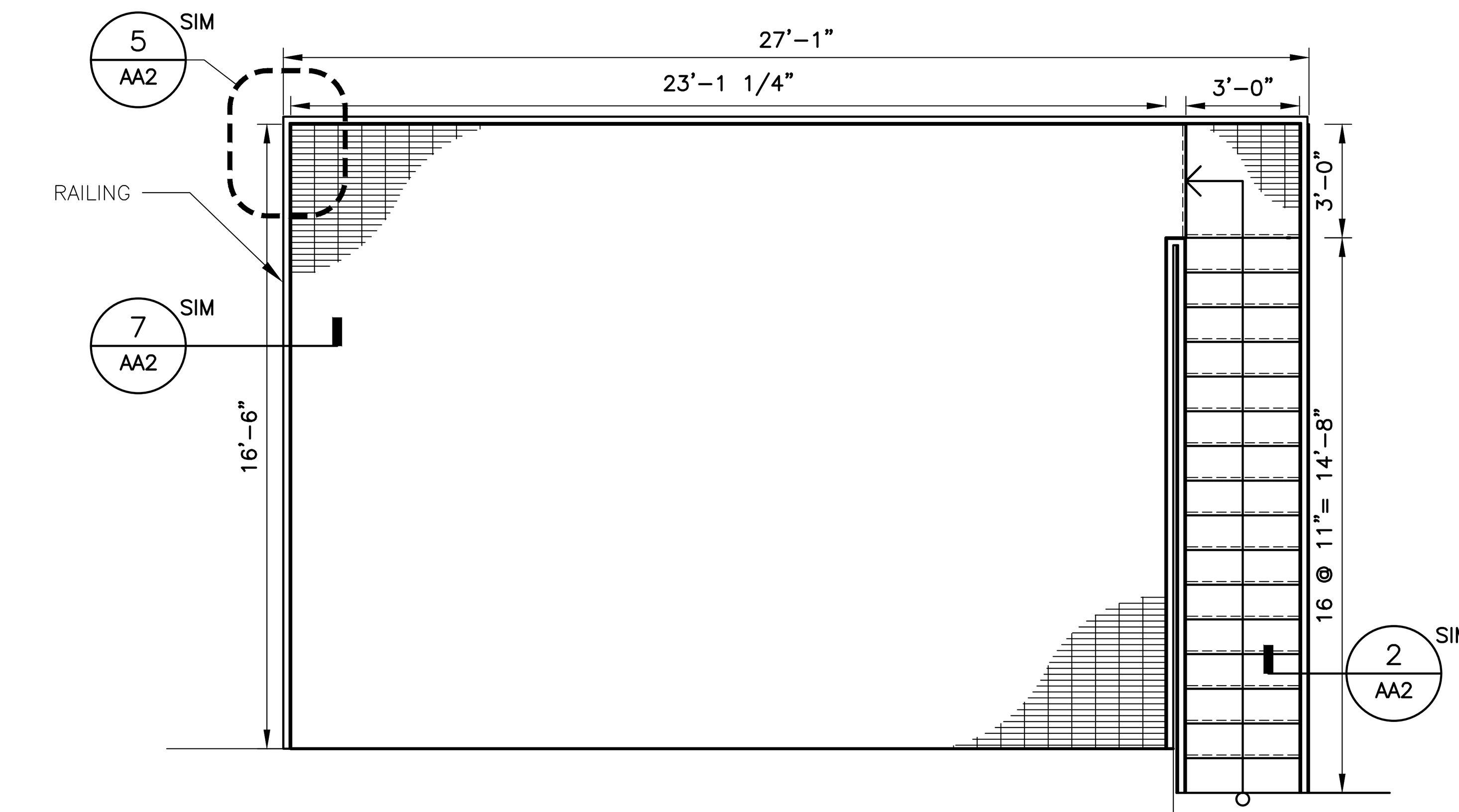
SLUDGE THICKENING BUILDING
MECHANICAL

NEW BASEMENT PLAN

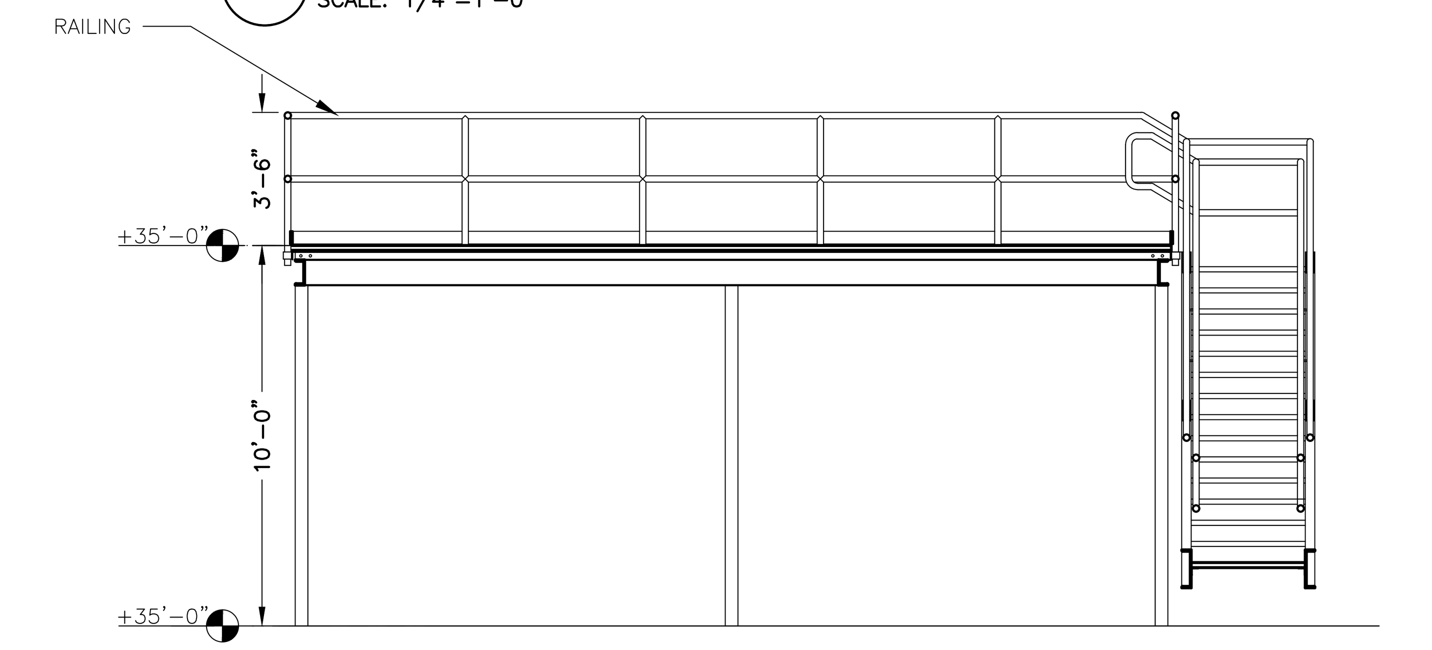
PROJECT NO. 02188-BG039
DWG BM8
SHEET 67 OF XX
DATE JULY 2019 REV 0



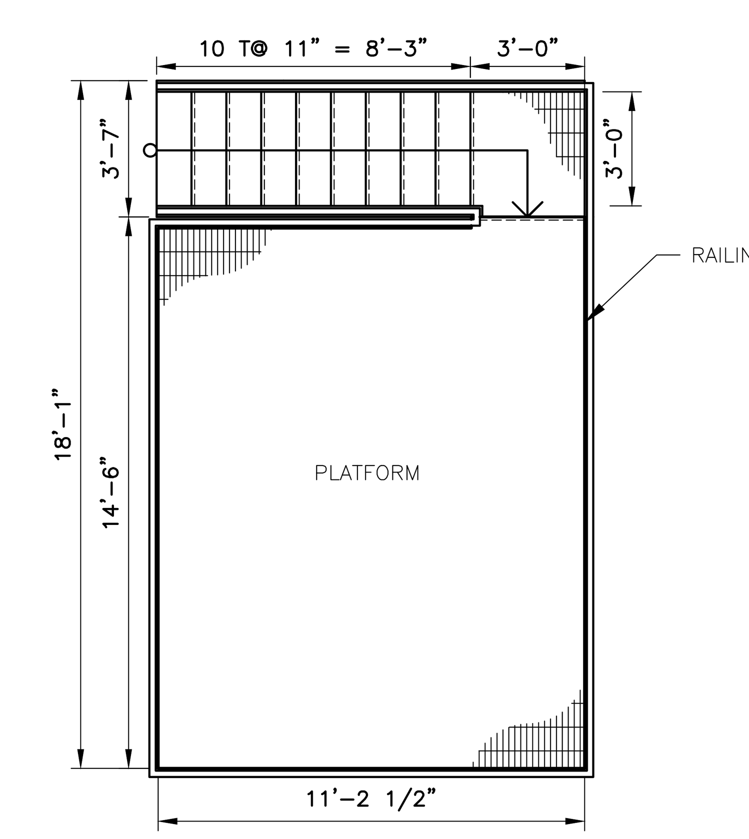
PLAN AT FL EL 29'–0"
SCALE: 1/8"=1'–0"



1 PLAN OF HVAC PLATFORM AT FL. EL. 35'–0"
SCALE: 1/4"=1'–0"



2 SECTION OF HVAC PLATFORM
SCALE: 1/4"=1'–0"



3 PLAN OF TYP. PLATFORM AT FL. EL. 35'–0"
SCALE: 1/4"=1'–0"

PRELIMINARY 90%
JUNE 2019

GREELEY AND HANSEN ARCHITECTS
100 S WACKER DR. SUITE 1400
CHICAGO, IL 60606

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	JL
DRAWN	JXW
CHECKED	TCB

APPROVED

NO.	DATE	APPD	DESCRIPTION

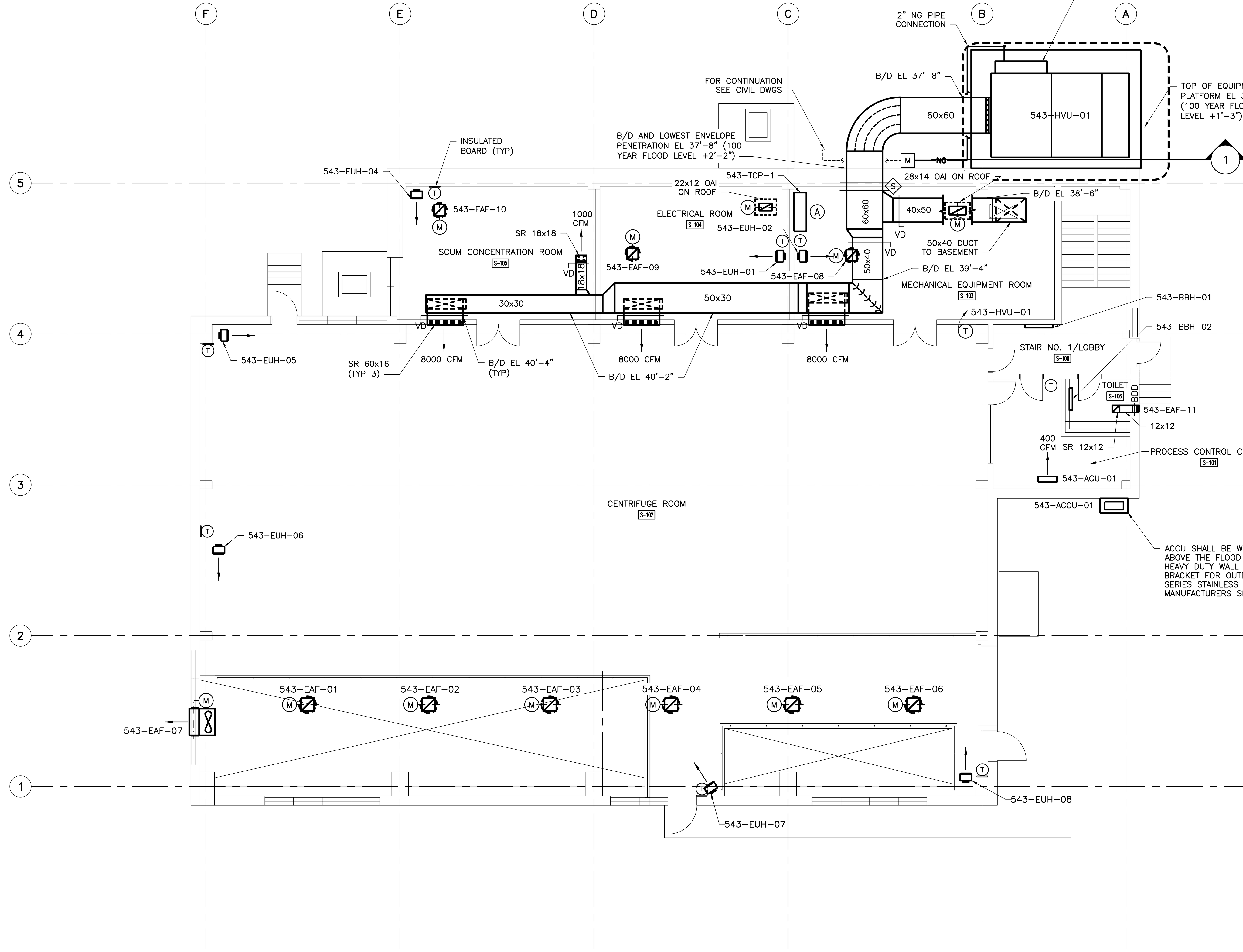
SCALE
8 0 8 16 FT 1/8"=1'–0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

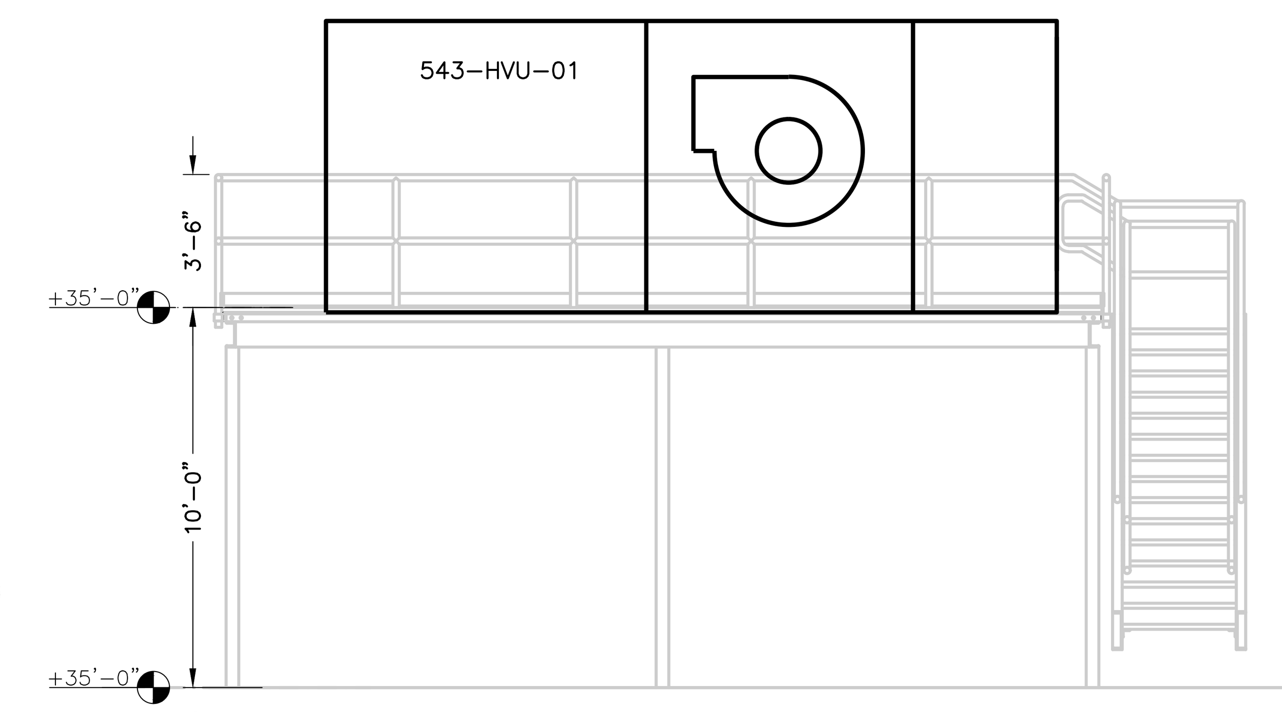
SLUDGE THICKENING BUILDING
ARCHITECTURAL

FLOOR PLAN FL EL 29'–0"

PROJECT NO.	02188-BG039
DWG	BA2
SHEET	48 OF XX
DATE	JULY 2019
REV	0



PLAN AT FL EL 29'-0"
SCALE: 1/8" - 1'-0"



1 SECTION OF HVAC PLATFORM
SCALE: 1/4"=1'-0"

KEY NOTES:

(A) EAF-18 AND OTHER EXISTING EQUIPMENT NOT REPLACED SHALL BE REWIRED TO NEW TEMPERATURE CONTROL PANEL 543-TCP-01

PRELIMINARY 90%
JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

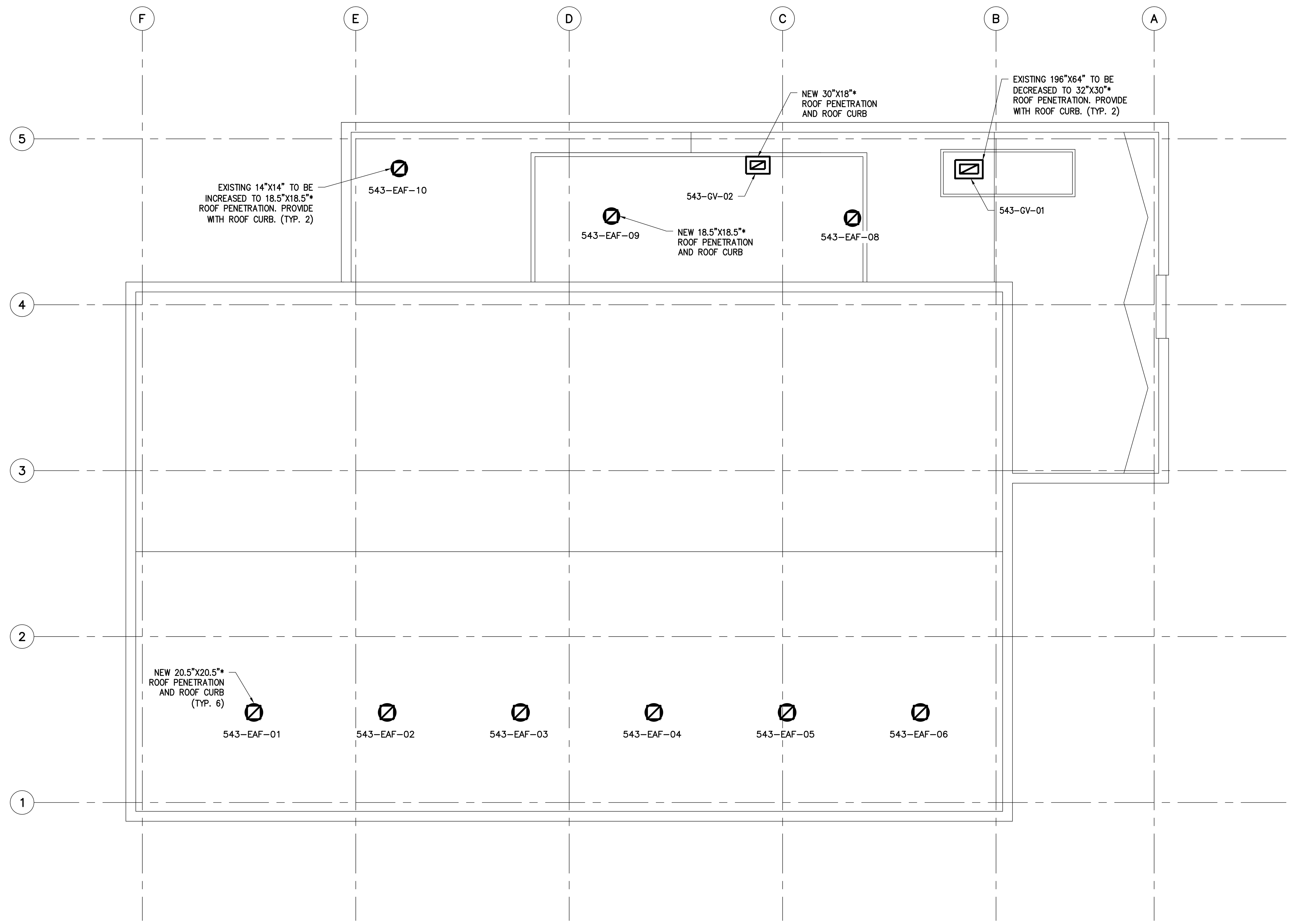
DESIGNED NH	APPROVED	NO.	DATE	APPD	DESCRIPTION	SCALE
DRAWN ML						8 0 8 16 FT 1/8"=1'-0"
CHECKED GJ						

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

SLUDGE THICKENING BUILDING
HVAC

PLAN AT FL EL 29'-0"

PROJECT NO. 02188-BG039
DWG BH7
SHEET 78 OF XX
DATE JULY 2019 REV 0



ROOF PLAN
SCALE: 1/8" – 1'-0"

GENERAL NOTES:

1. ALL EQUIPMENT SERVING CENTRIFUGE ROOM, SCUM CONCENTRATION ROOM, ELECTRICAL ROOM, AND MECHANICAL EQUIPMENT ROOM SHALL BE CLASS 1 DIV. 2 RATED.

PRELIMINARY 90%
JUNE 2019

Environ-Civil Engineering, Ltd.
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501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED NH	APPROVED		
DRAWN ML			
CHECKED GJ			

NO.	DATE	APPD	DESCRIPTION

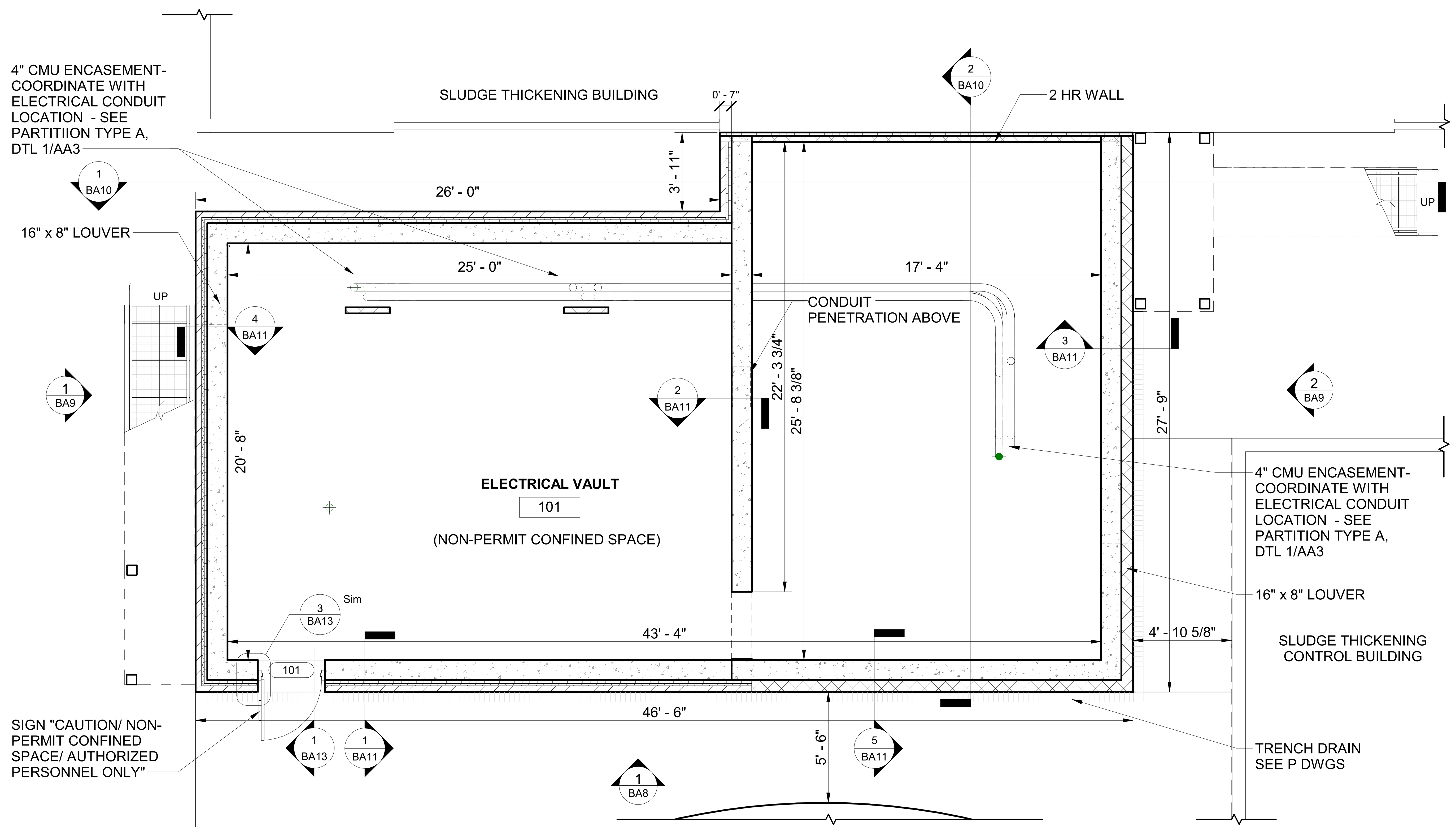
SCALE
8 0 8 16 FT
1/8"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

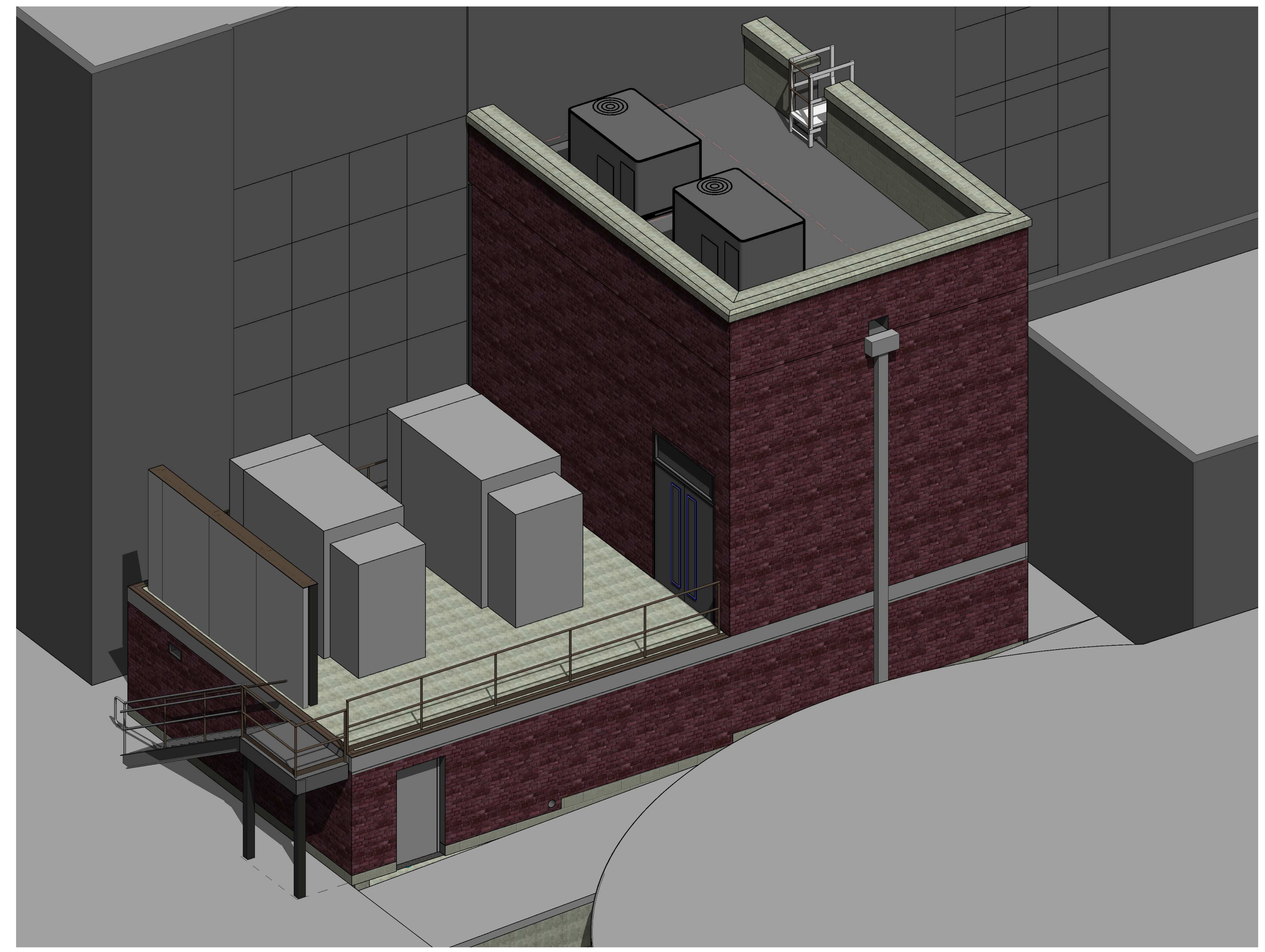
RICHMOND VIRGINIA

SLUDGE THICKENING BUILDING
XXX
ROOF PLAN

PROJECT NO. 02188-BG039
DWG BH8
SHEET 76 OF XX
DATE JULY 2019 REV 0



1 FLOOR PLAN AT EL 23'-0"
SCALE: 1/4" = 1'-0"



2 AXONOMETRIC VIEW OF ELECTRICAL BUILDING FROM SOUTHWEST
SCALE:

PRELIMINARY 90%
JUNE 2019

GREELEY AND HANSEN
ARCHITECTS
100 S WACKER DR. SUITE 1400
CHICAGO, IL 60606

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	JL	APPROVED	
DRAWN	JXW		
CHECKED	JL		

NO.	DATE	APPD	DESCRIPTION

SCALE
4 0 4 8 FT
1/4" =1' - 0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVSION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

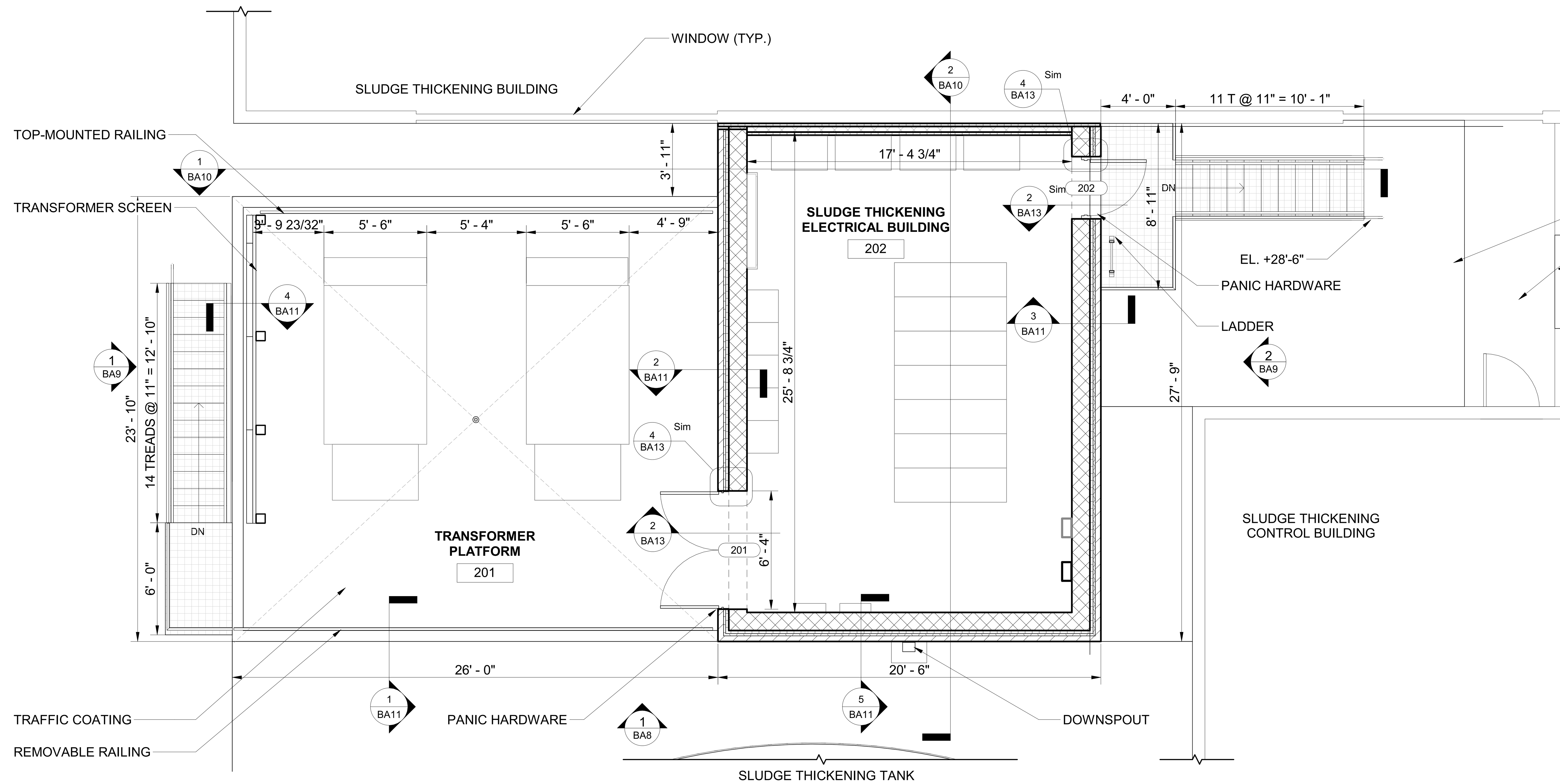
RICHMOND VIRGINIA

SLUDGE THICKENING ELECTRICAL BUILDING
ARCHITECTURAL

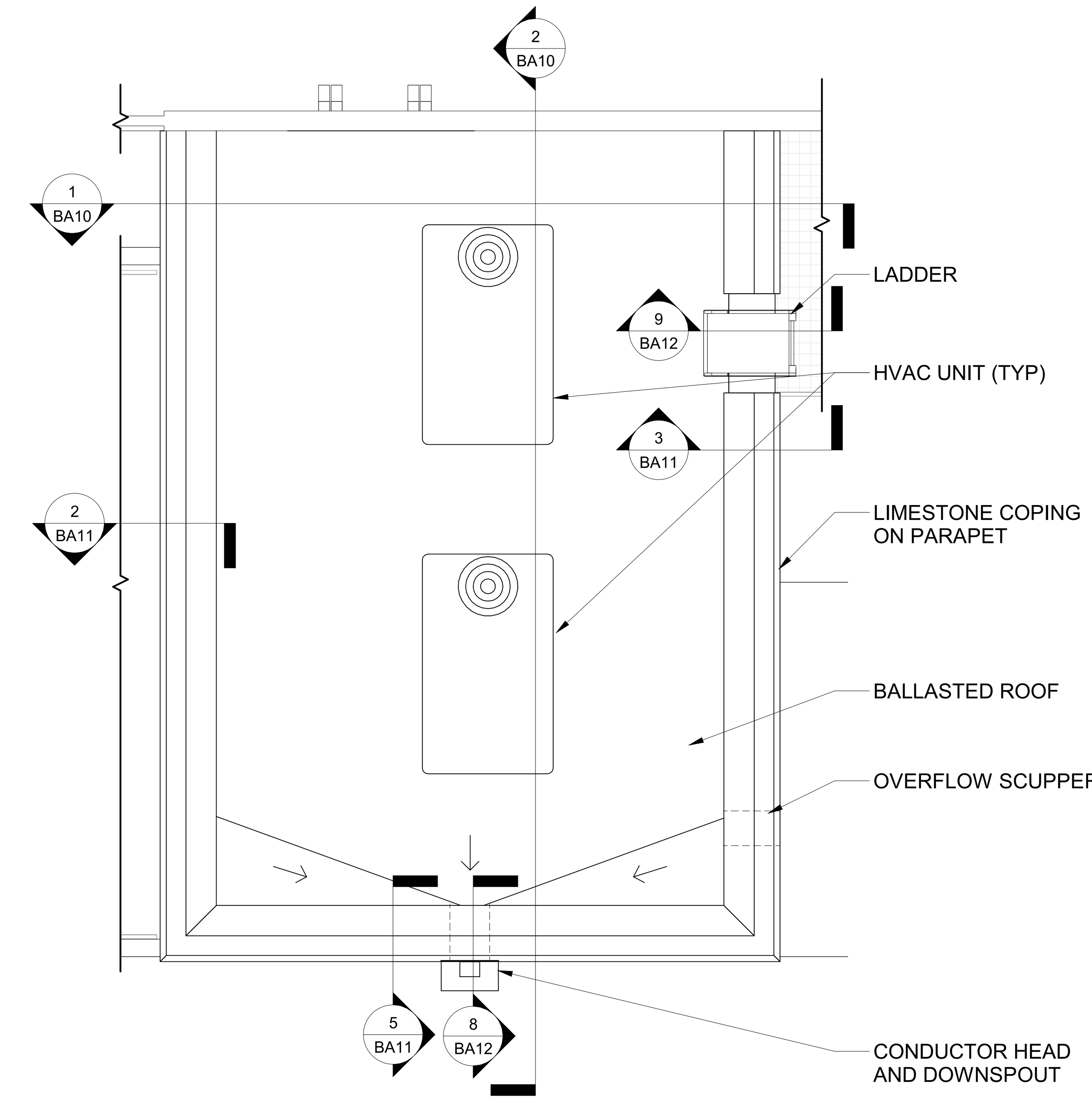
FLOOR PLAN AND AXONOMETRIC

PROJECT NO.:	02188
DWG	BA6
SHEET	OF 234
DATE	JULY 2019
REV	

6/10/2019 10:15:35 AM



1 FLOOR PLAN AT EL 35'-0"
SCALE: 1/4" = 1'-0"



2 ROOF PLAN AT 52'-0"
SCALE: 1/4" = 1'-0"

ROOM FINISH SCHEDULE

NUMBER	ROOM NAME	LEVEL	BASE OFFSET	FLOOR	WALLS	CEILING	CEILING HEIGHT	AREA
101	ELECTRICAL VAULT	FOUNDATION	0' - 0"				7' - 4 1/2"	963 SF
201	TRANSFORMER PLATFORM	T/ FL ELECTRICAL BLDG	0' - 0"					591 SF
202	SLUDGE THICKENING ELECTRICAL BUILDING	T/ FL ELECTRICAL BLDG	0' - 0"				16' - 0"	437 SF

DOOR SCHEDULE

MARK	ROUGH HEIGHT	ROUGH WIDTH	DESCRIPTION	THICKNESS	DOOR MATERIAL	FRAME MATERIAL	HEAD	JAMB	SILL	FIRE RATING	COMMENTS
101	6' - 8"	3' - 4"		0' - 1 3/4"	AL	AL	1/BA13	3/BA13	1/BA13	-	
201	7' - 10 1/2"	6' - 4"	DOUBLE LEAF DOOR W/ TRANSOM	0' - 1 3/4"	AL	AL	2/BA13	4/BA13	1/BA13	-	PANIC HDW
202	8' - 0"	3' - 4"	EXT SNG LEAF DOOR W/ TRANSOM	0' - 1 3/4"	AL	AL	2/BA13	4/BA13	1/BA13	-	PANIC HDW

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GREELEY AND HANSEN ARCHITECTS
100 S WACKER DR. SUITE 1400
CHICAGO, IL 60606

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED JL
DRAWN JXW
CHECKED JL
APPROVED

NO.	DATE	APPD	DESCRIPTION

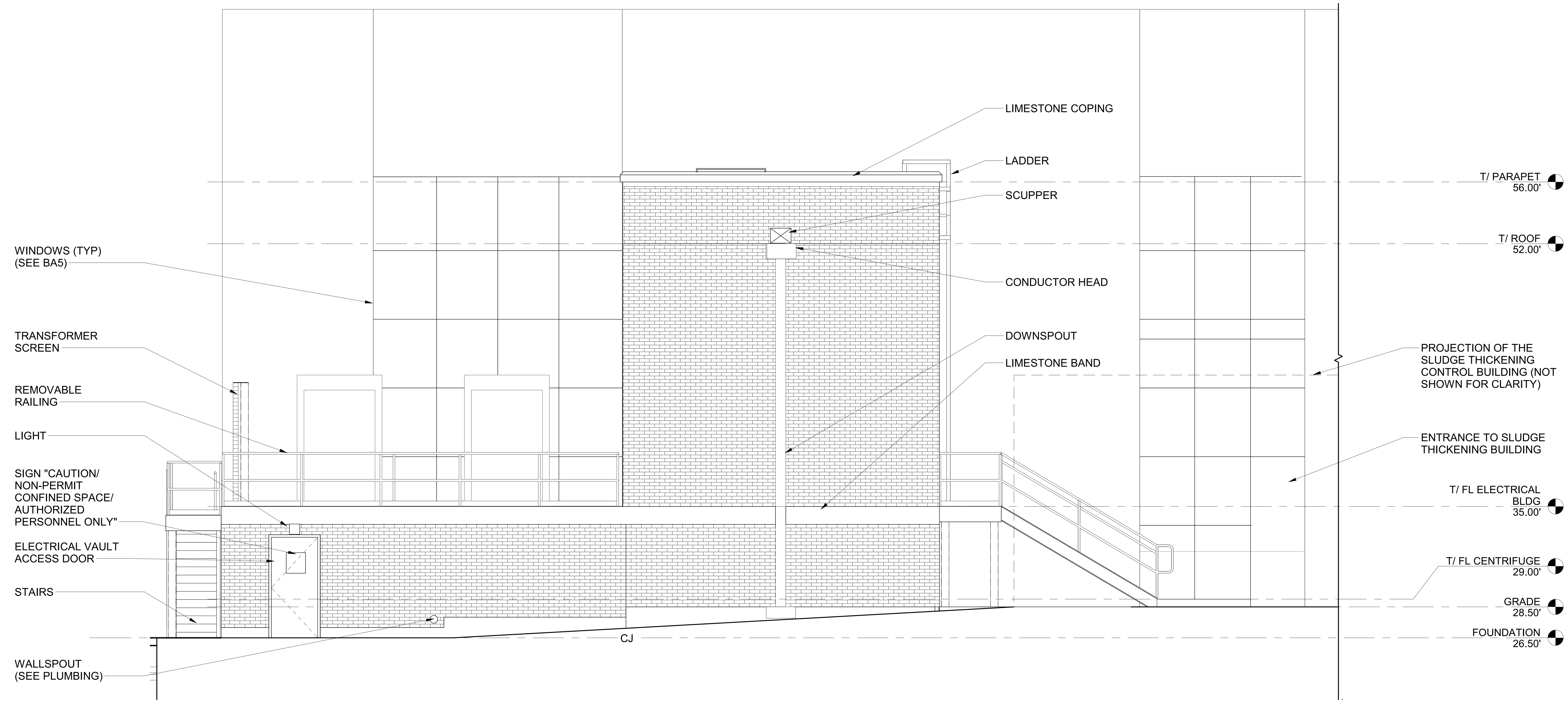
SCALE 4 0 4 8 FT 1/4" =1' - 0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVSION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

SLUDGE THICKENING ELECTRICAL BUILDING
ARCHITECTURAL

FLOOR AND ROOF PLANS

PROJECT NO.: 02188
DWG BA7
SHEET OF 234
DATE JULY 2019
REV



1 BA6 SOUTH ELEVATION
SCALE: 1/4" = 1'-0"

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ARCHITECTS
100 S WACKER DR. SUITE 1400
CHICAGO, IL 60606

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	JL	APPROVED	
DRAWN	JXW		
CHECKED	JL		

NO.	DATE	APPD	DESCRIPTION

SCALE
4 0 4 8 FT
1/4" =1' - 0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVSION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

RICHMOND VIRGINIA

SLUDGE THICKENING ELECTRICAL BUILDING
ARCHITECTURAL

ELEVATION

PROJECT NO.:	02188
DWG	BA8
SHEET	OF 234
DATE	JULY 2019
REV	

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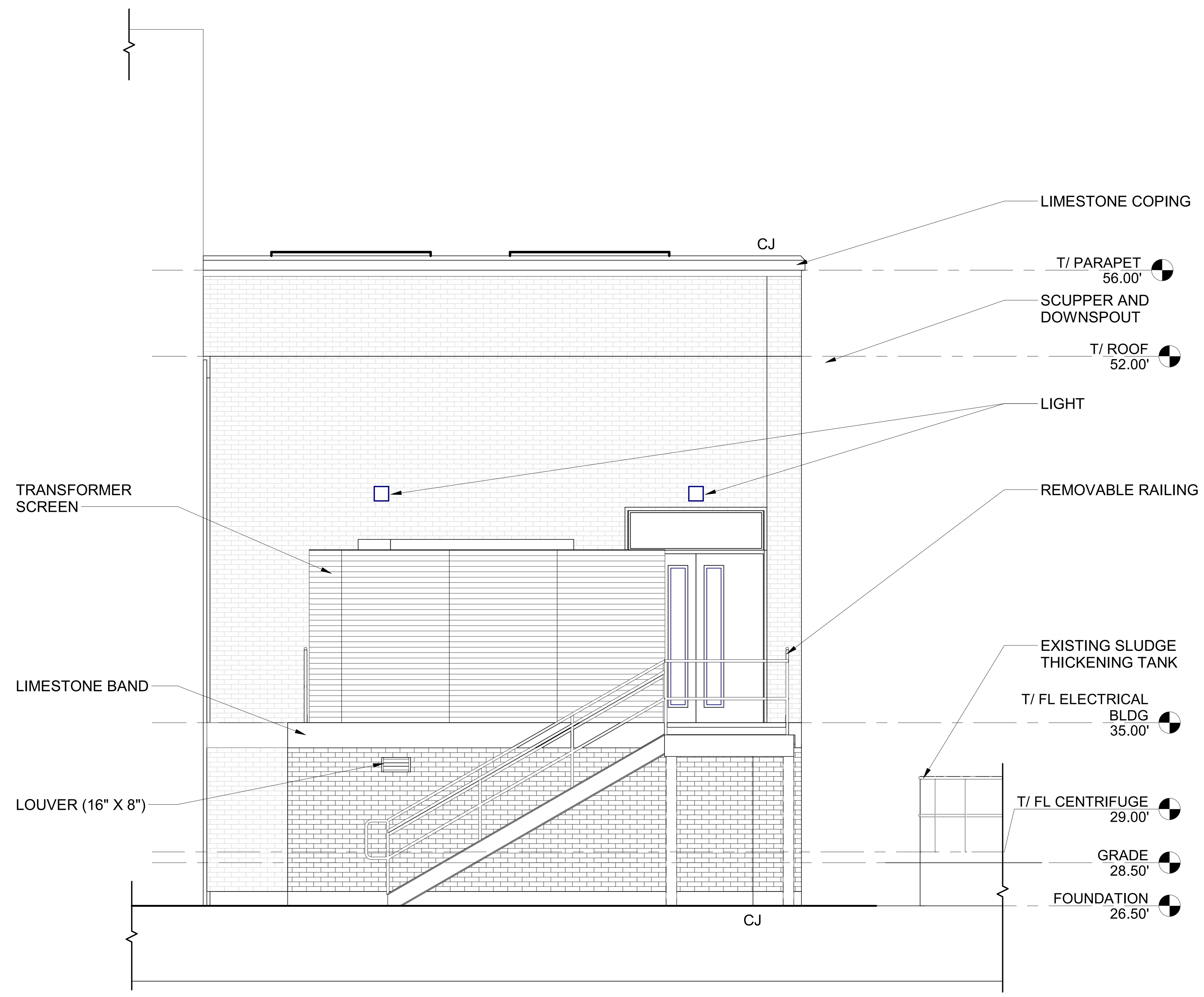
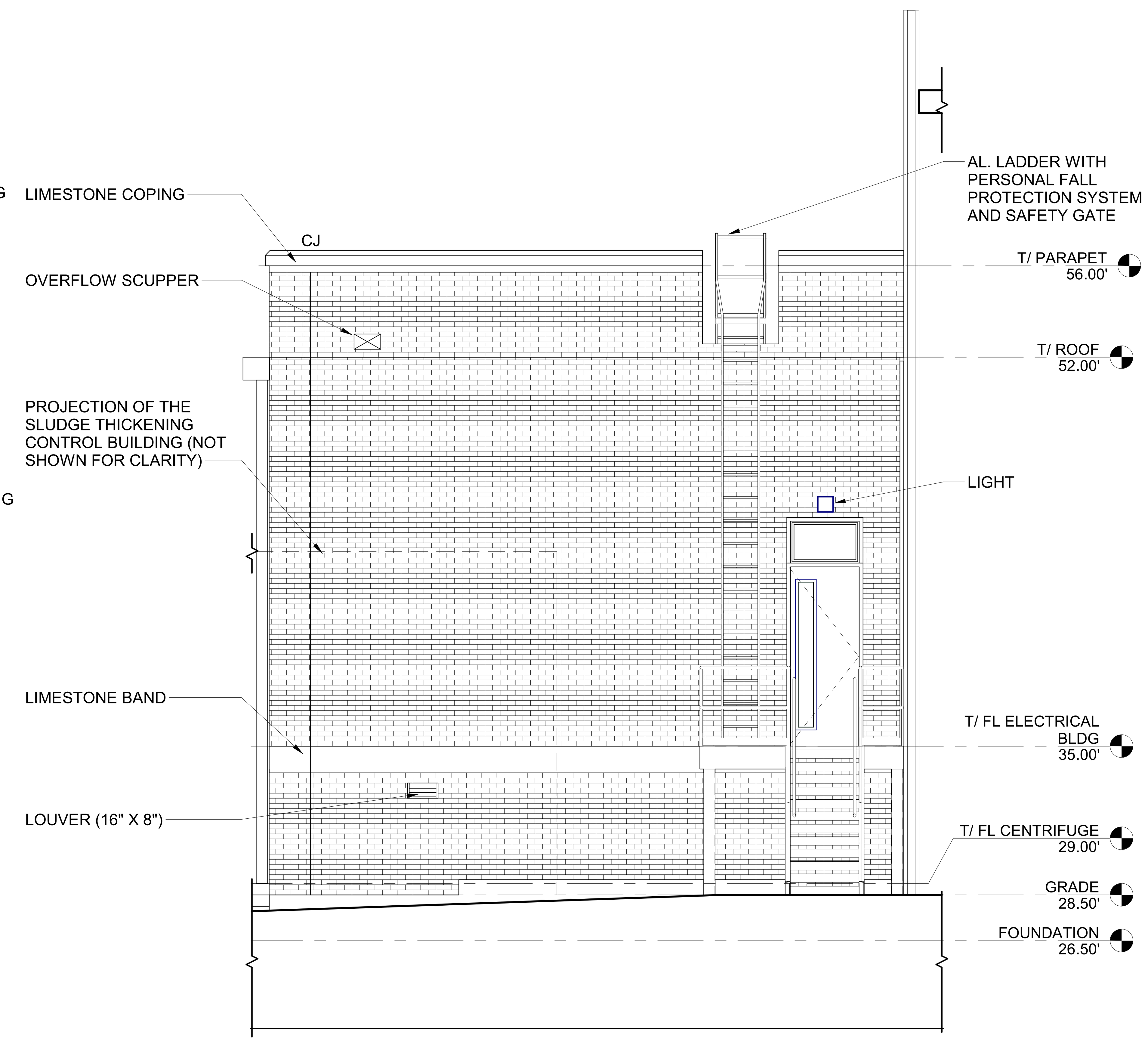
BAR MEASURE 1" ON FULLSIZE SHEETS



1 BA6 WEST ELEVATION
SCALE: 1/4" = 1'-0"



2 BA6 EAST ELEVATION
SCALE: 1/4" = 1'-0"

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CHICAGO, IL 60606

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	JL	APPROVED
DRAWN	JXW	
CHECKED	JL	

NO.	DATE	APPD	DESCRIPTION

SCALE
4 0 4 8 FT
1/4" =1' - 0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVSION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

RICHMOND VIRGINIA

SLUDGE THICKENING ELECTRICAL BUILDING
ARCHITECTURAL

ELEVATIONS

PROJECT NO.:	02188
DWG	BA9
SHEET	OF 234
DATE JULY 2019	REV

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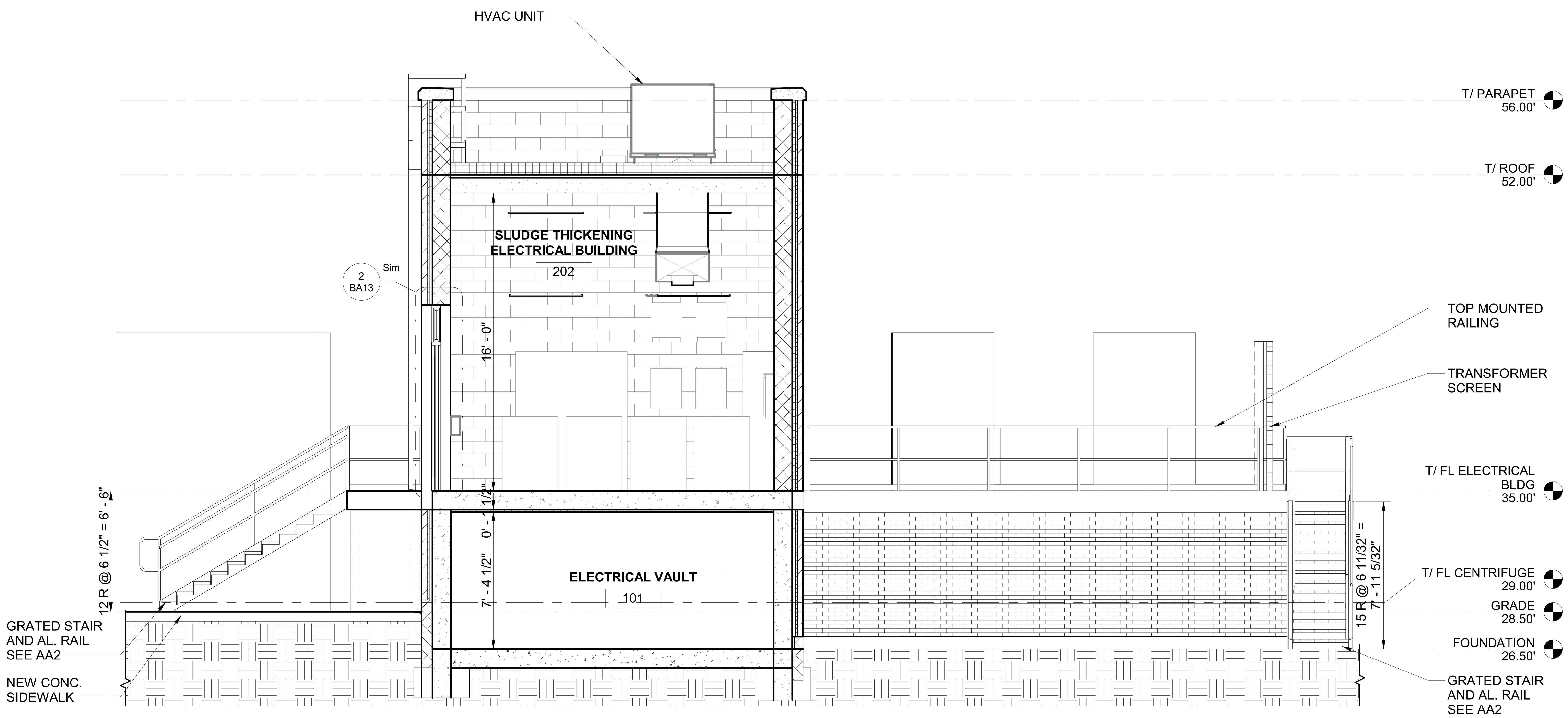
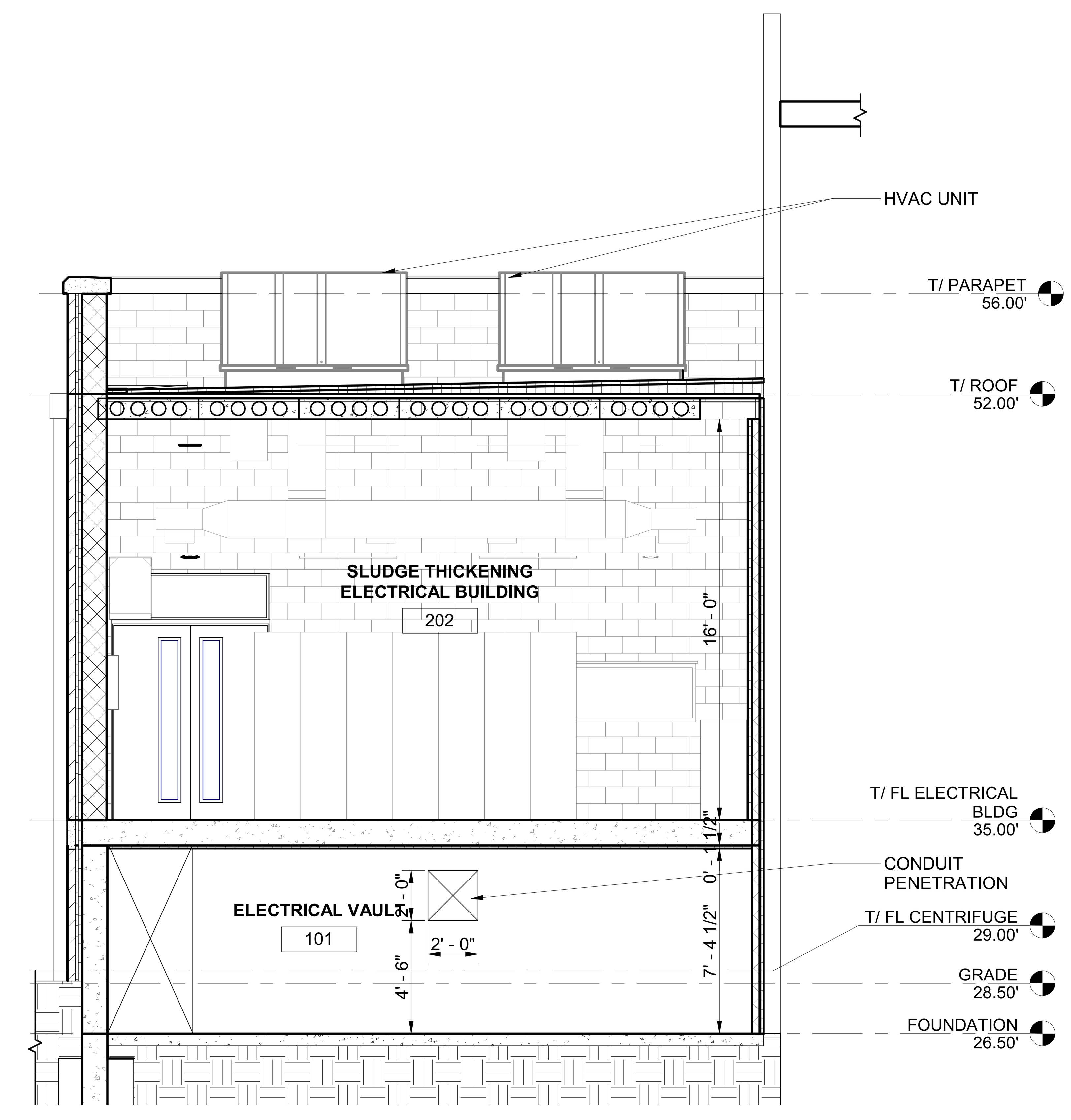
BAR MEASURE 1" ON FULLSIZE SHEETS



1 BA6 SECTION
SCALE: 1/4" = 1'-0"



2 BA6 SECTION 2
SCALE: 1/4" = 1'-0"

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9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	JL	APPROVED
DRAWN	JXW	
CHECKED	JL	

NO.	DATE	APPD	DESCRIPTION

SCALE
4 0 4 8 FT
1/4" =1' - 0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVSION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

RICHMOND VIRGINIA

SLUDGE THICKENING ELECTRICAL BUILDING
ARCHITECTURAL

SECTIONS

PROJECT NO.:	02188
DWG	BA10
SHEET	OF 234
DATE JULY 2019	REV

1 WALL SECTION
SCALE: 1/2" = 1'-0"

2 WALL SECTION
SCALE: 1/2" = 1'-0"

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

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

5 WALL SECTION
SCALE: 1/2" = 1'-0"

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BAR MEASURES 1" ON FULLSIZE SHEETS

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CHICAGO, IL 60606

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JUNE 2019

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9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	JL	APPROVED
DRAWN	JXW	
CHECKED	JL	

NO.	DATE	APPD	DESCRIPTION

SCALE
1 0 1 2 3 4 5 FT
1/2"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVSION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

RICHMOND VIRGINIA

SLUDGE THICKENING ELECTRICAL BUILDING
ARCHITECTURAL

WALL SECTIONS

PROJECT NO.:	02188		
DWG	BA11		
SHEET		OF	234
DATE	JULY 2019	REV	

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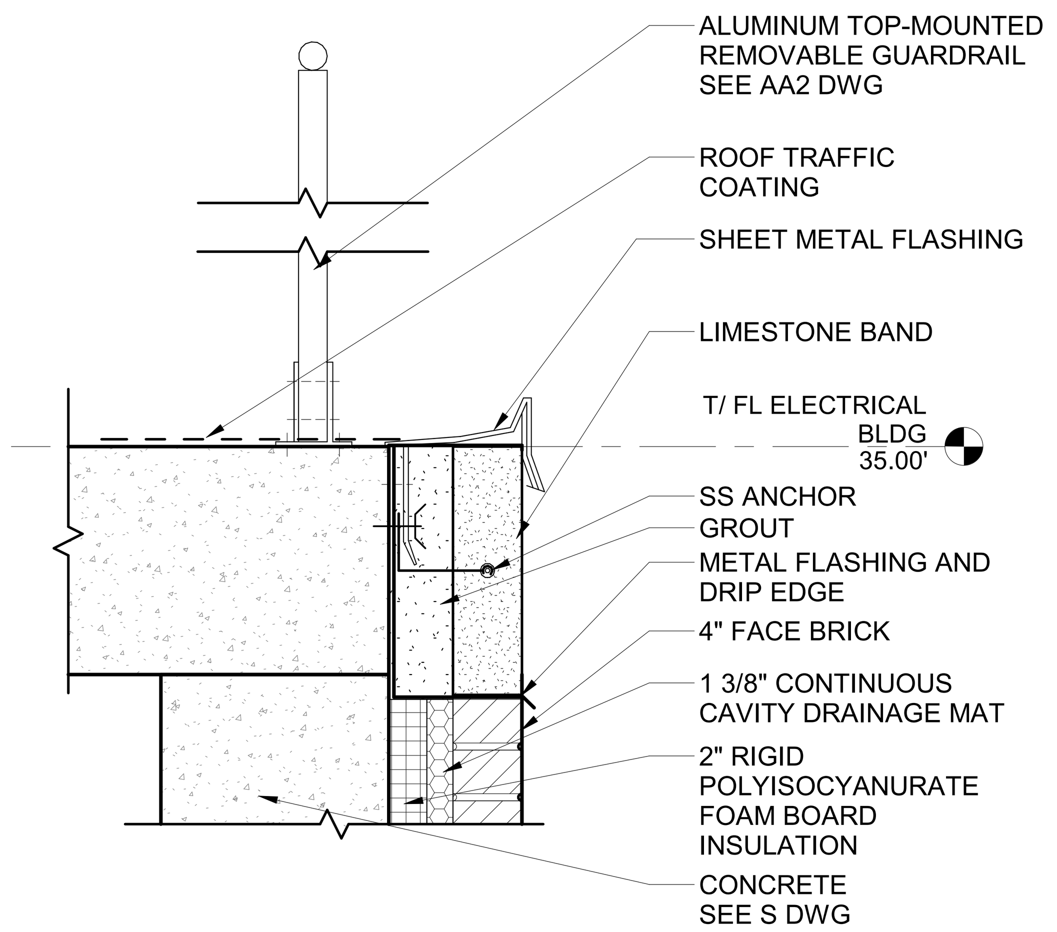
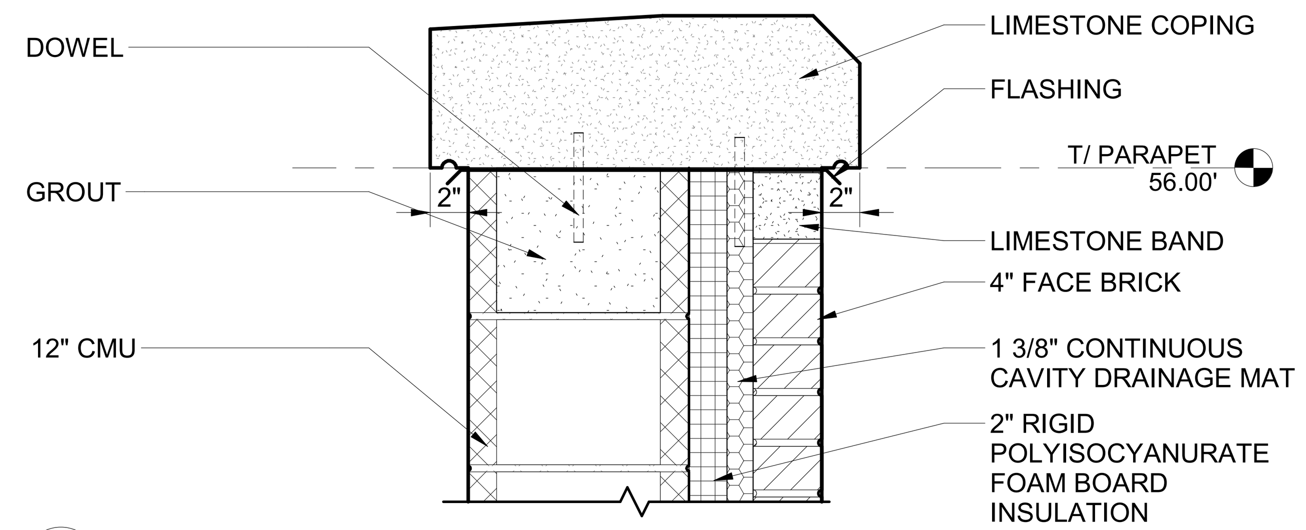
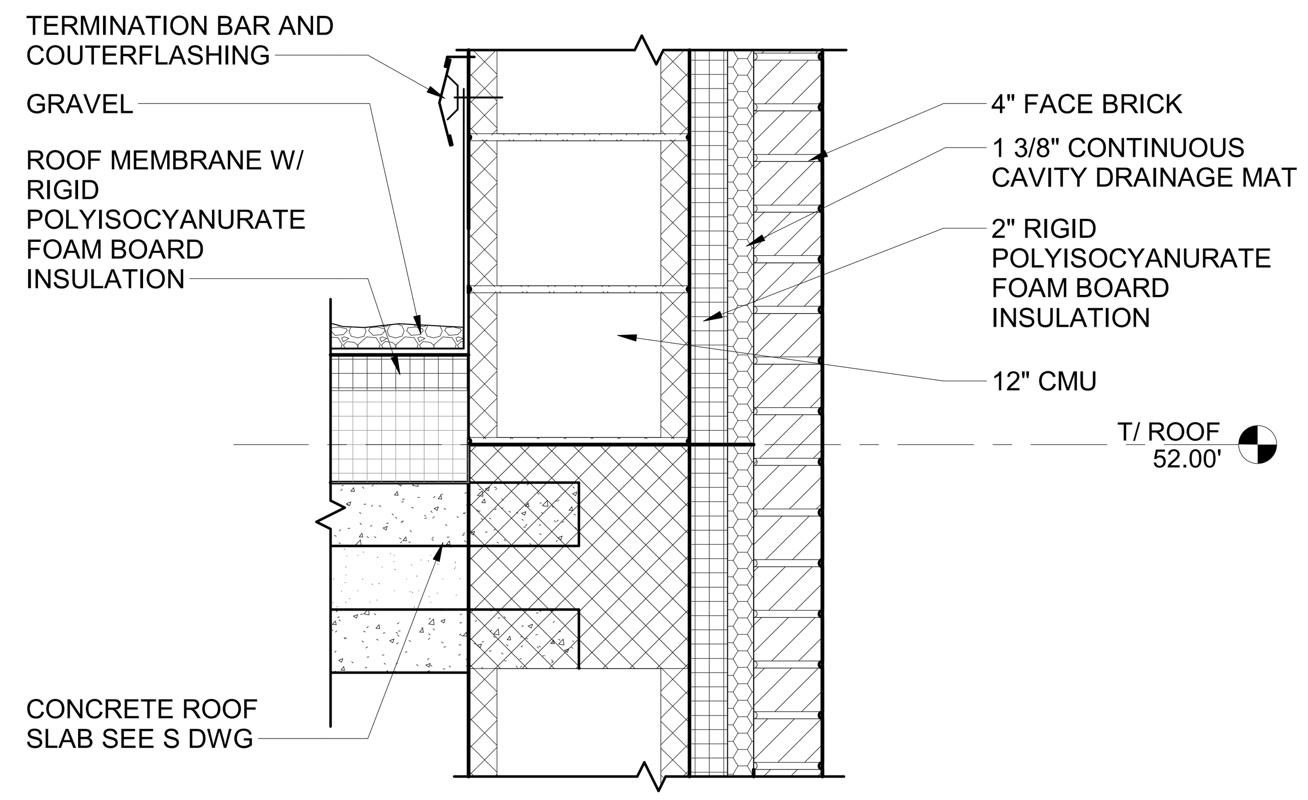
BAR MEASURE 1" ON FULLSIZE SHEETS



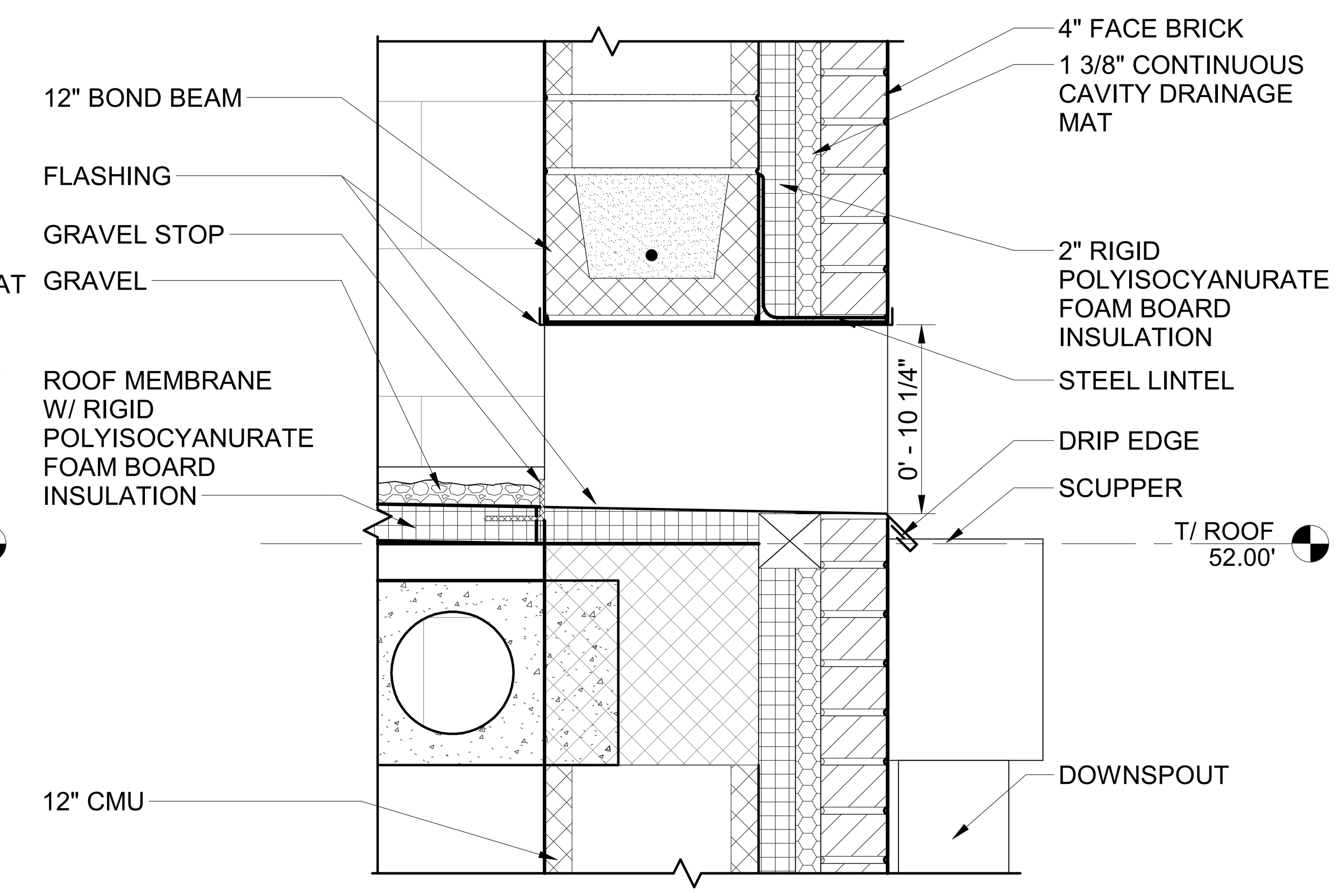
1 BA11 DETAIL - WALL AND ROOFING W/ GUARDRAIL
SCALE: 1 1/2" = 1'-0"



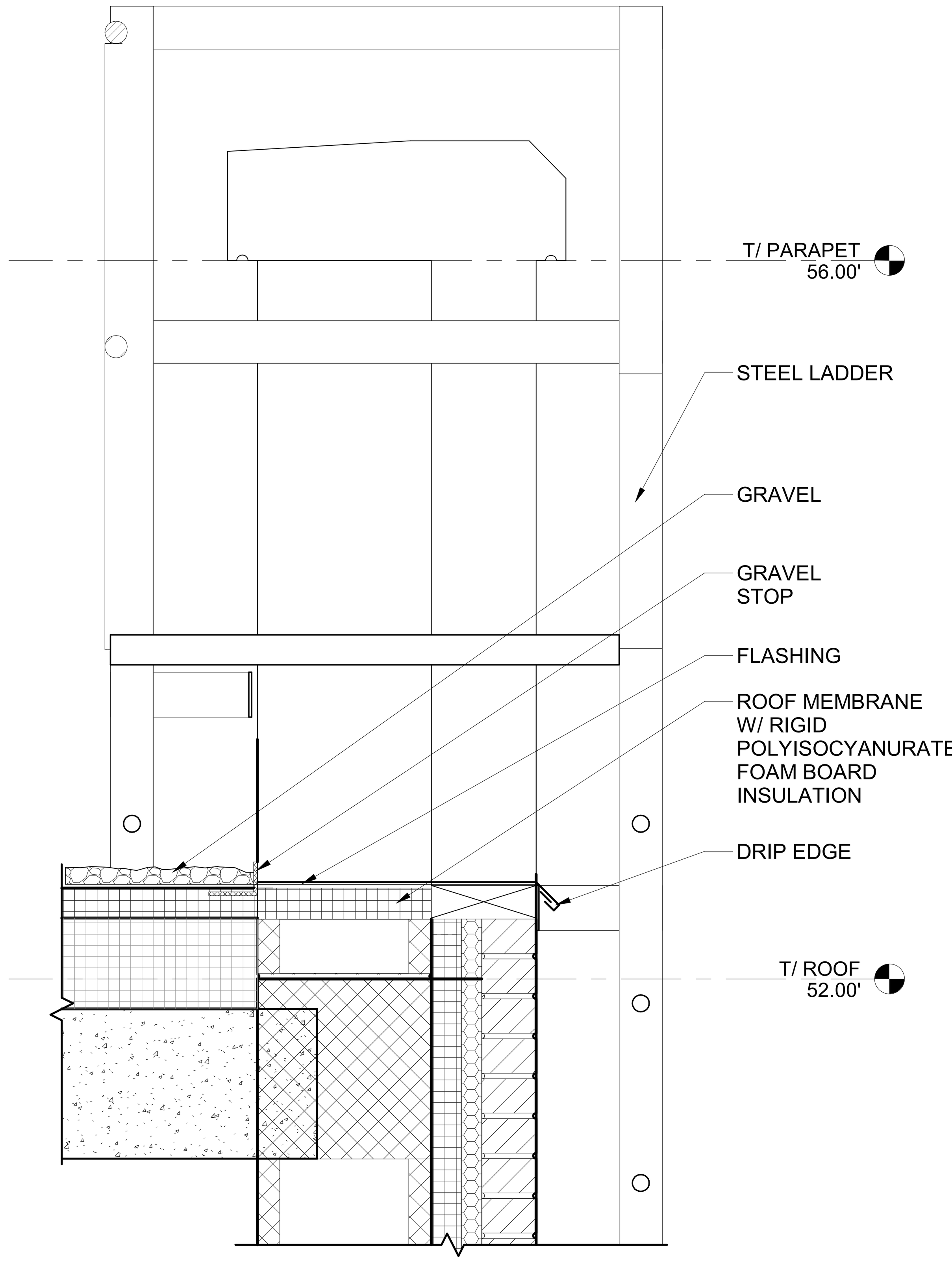
3 BA11 DETAIL - PARAPET WALL
SCALE: 1 1/2" = 1'-0"



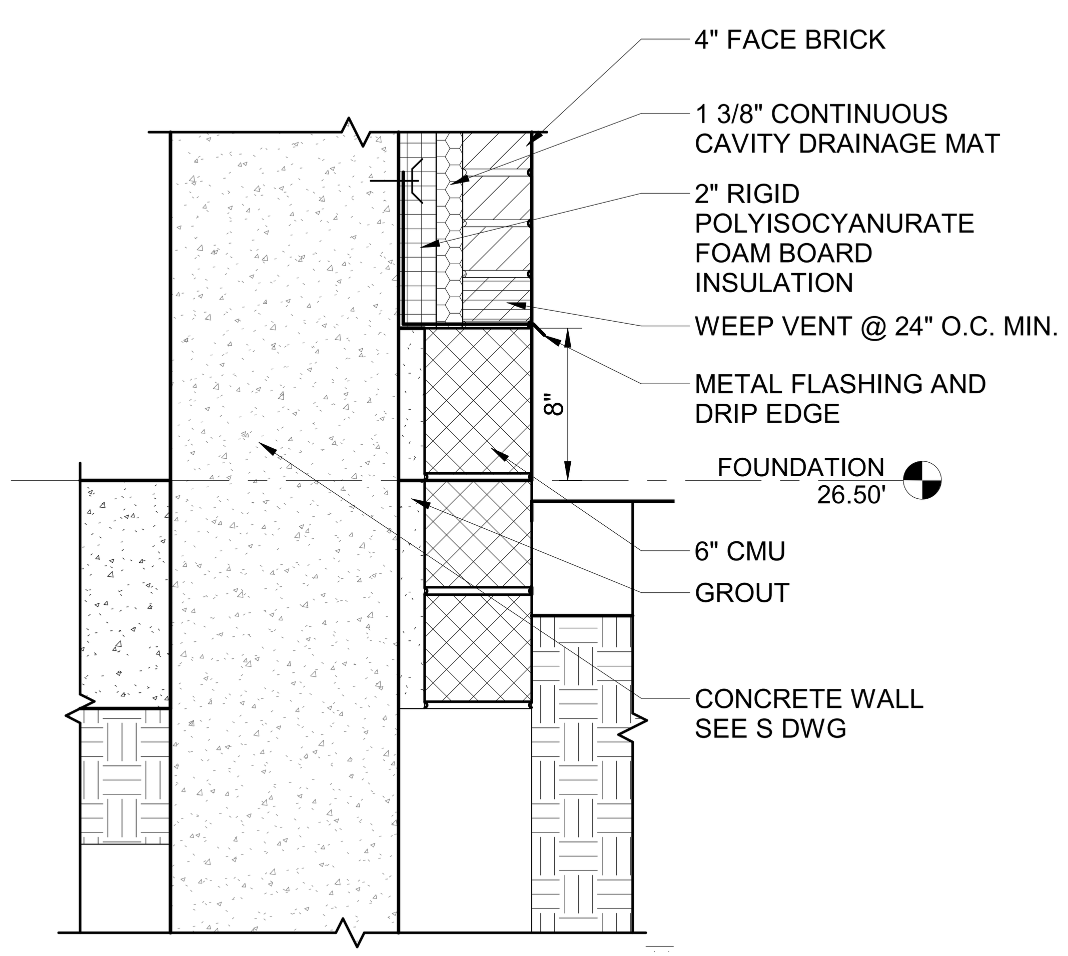
4 BA11 DETAIL - PARAPET WALL AND ROOFING
SCALE: 1 1/2" = 1'-0"



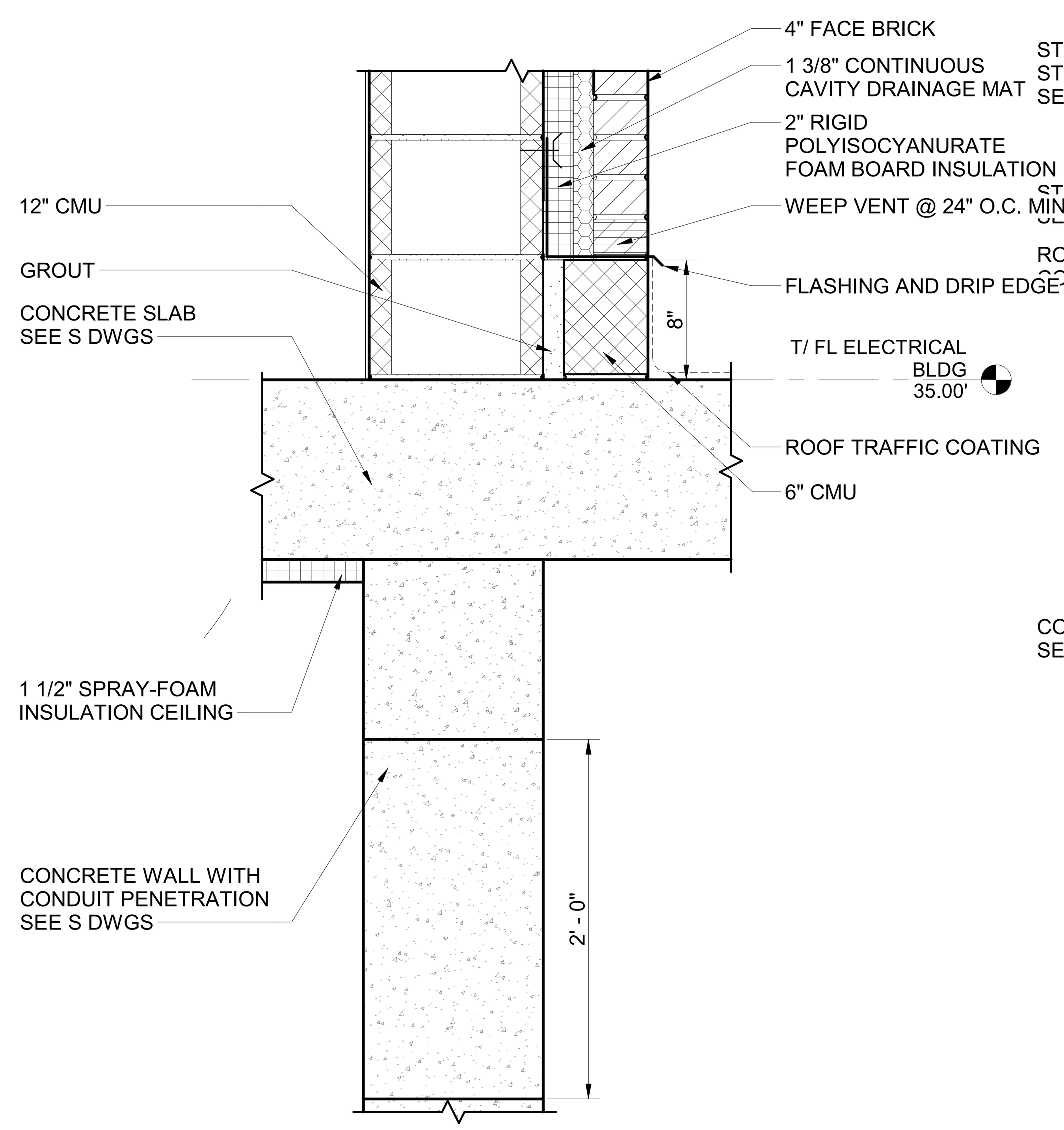
8 BA7 DETAIL - PARAPET WALL AND ROOFING W/ DOWNSPOUT
SCALE: 1 1/2" = 1'-0"



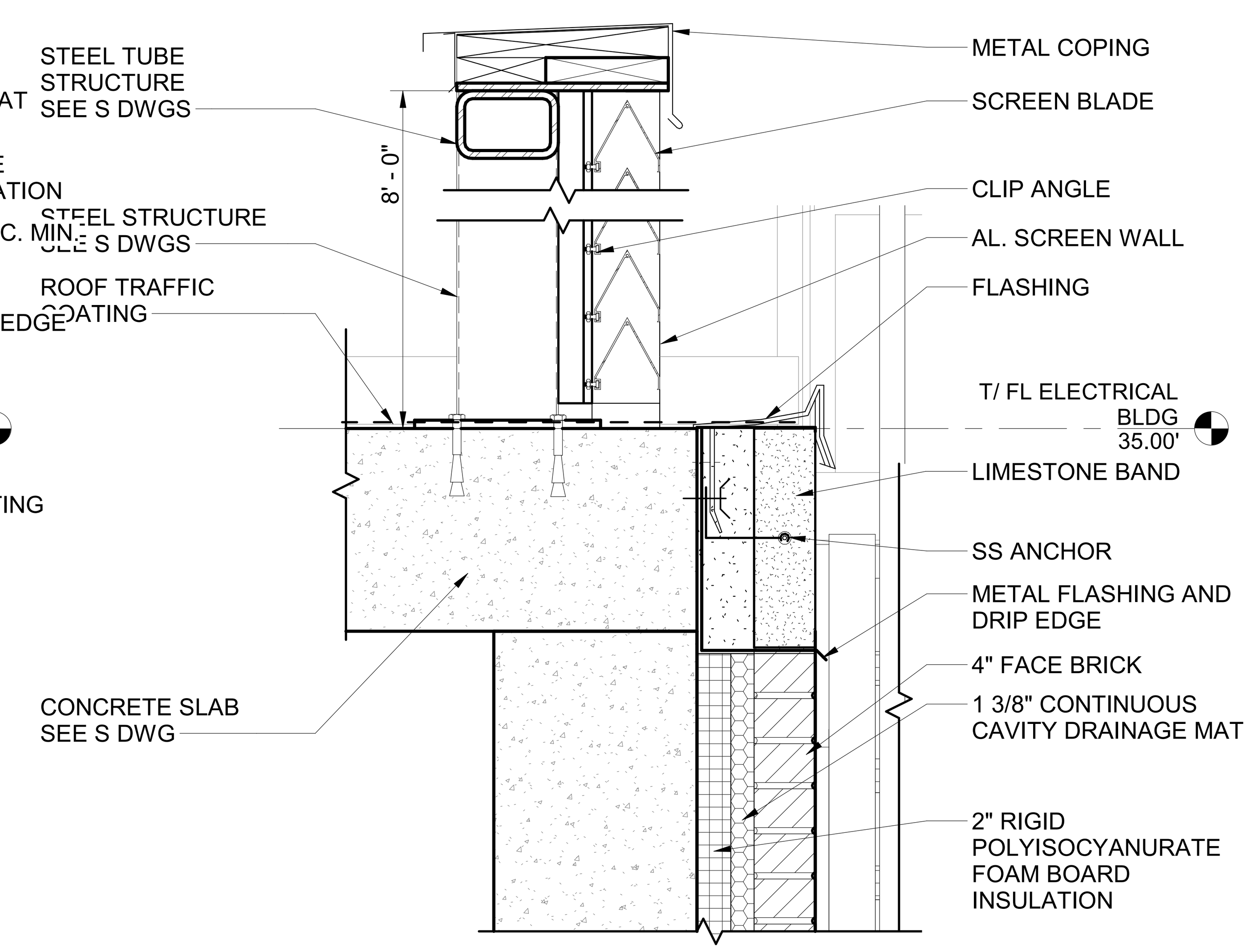
9 BA7 DETAIL - PARAPET WALL AND ROOFING W/ LADDER
SCALE: 1 1/2" = 1'-0"



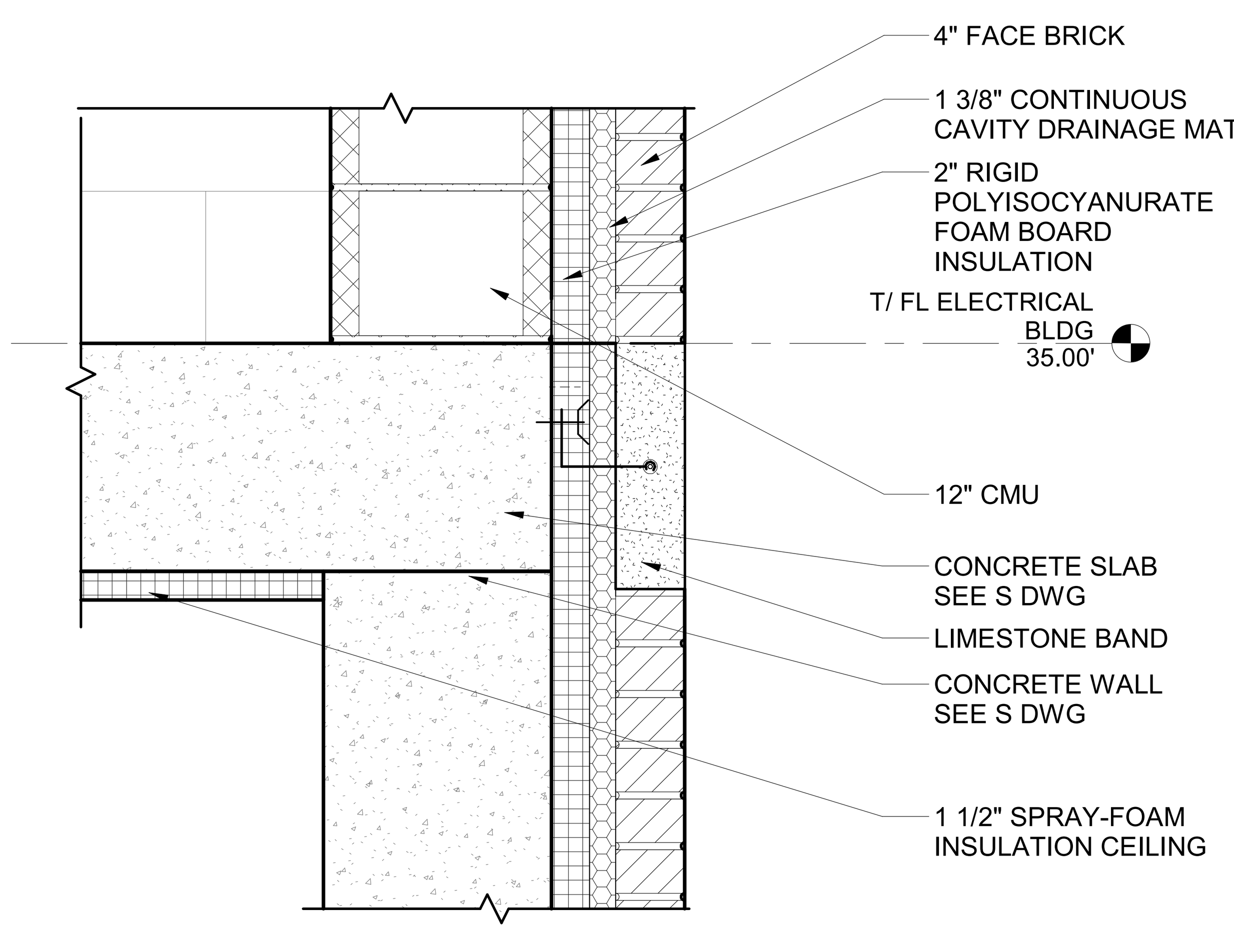
2 BA11 DETAIL - WALL BELOW GRADE
SCALE: 1 1/2" = 1'-0"



5 BA11 DETAIL - PLATFORM WALL AND ROOFING
SCALE: 1 1/2" = 1'-0"



6 BA11 DETAIL - WALL AND ROOFING WITH SCREEN WALL
SCALE: 1 1/2" = 1'-0"



7 BA11 DETAIL - CONCRETE AND CMU WALLS
SCALE: 1 1/2" = 1'-0"

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JUNE 2019

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GREELEY AND HANSEN
ARCHITECTS
100 S WACKER DR. SUITE 1400
CHICAGO, IL 60606

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	JL	APPROVED
DRAWN	JXW	
CHECKED	JL	

NO.	DATE	APPD	DESCRIPTION

SCALE
0 1 FT
1 1/2"=1'-0"

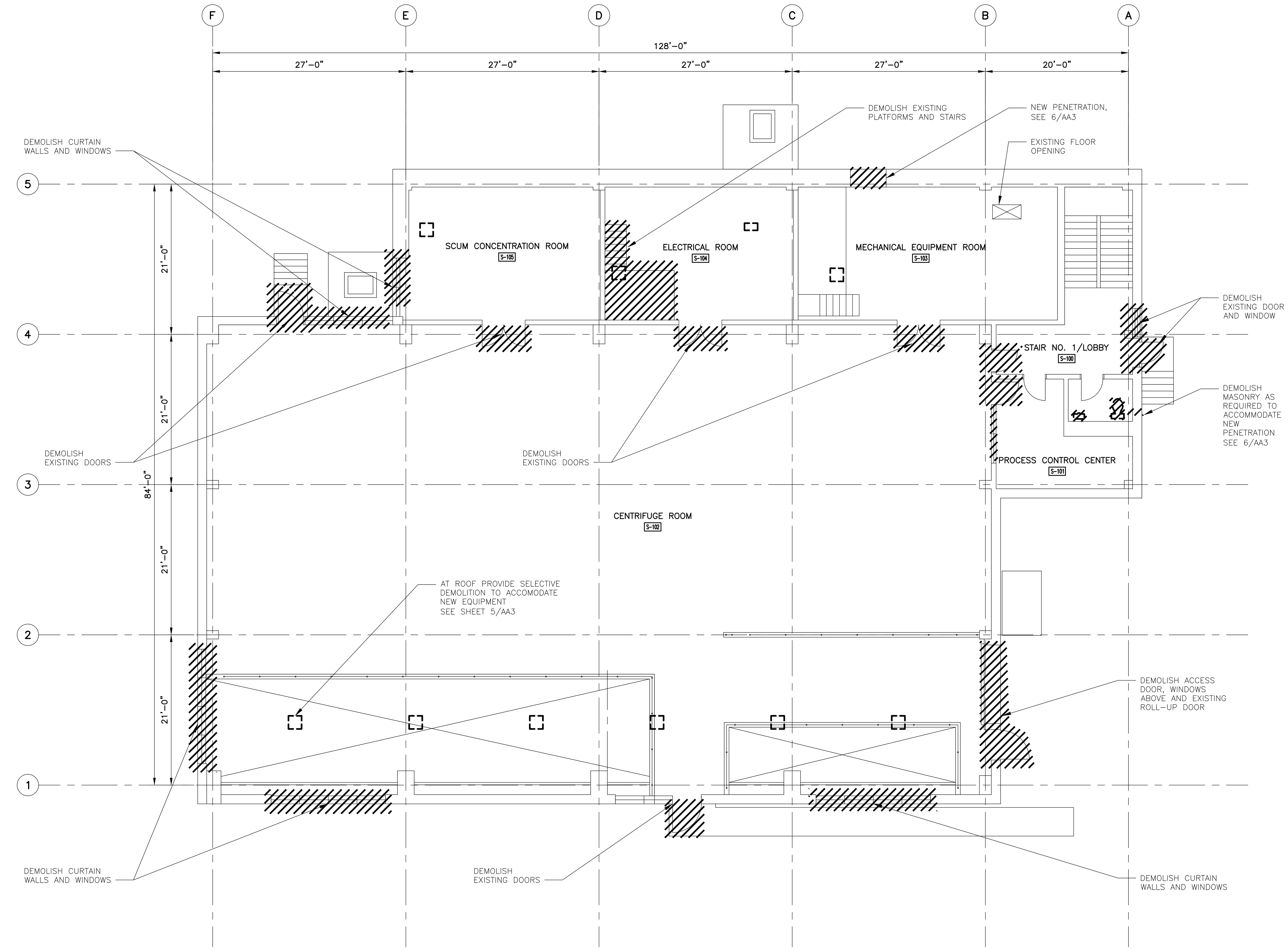
CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVSION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

RICHMOND VIRGINIA

SLUDGE THICKENING ELECTRICAL BUILDING
ARCHITECTURAL

DETAILS - SHEET 1 OF 2

PROJECT NO.:	02188	
DWG	BA12	
SHEET		OF 234
DATE	JULY 2019	REV



PLAN AT FL EL 29'-0"

SCALE: 1/8" - 1'-0"

DEMOLITION NOTES:

1. DEMOLISH INTERIOR FINISHES, FURNISHINGS, AND FIXTURES AT OFFICE LABORATORY AND TOILET (SEE MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS)
2. VERIFY EXTENT OF DEMOLITION SHOWN ON THE DEMOLITION DRAWINGS IS APPROPRIATE TO PERMIT THE NEW WORK TO BE ACCOMPLISHED. ANY DAMAGE WHICH MAY BE CAUSED TO ANY PART OF EXISTING CONSTRUCTION TO REMAIN AS A RESULT OF DEMOLITION WORK MUST BE THE RESPONSIBILITY OF AND BE CORRECTED BY THE CONTRACTOR.
3. TEMPORARILY REMOVE STAIRS AND RAILS, AS NEEDED TO ACCOMMODATE THE REMOVAL OF TANKS FROM BASEMENT, AND STORE SAFELY TO PROTECT FROM DAMAGE. CUT WELDS BETWEEN STRINGERS AND CLIP ANGLES, CUT CLIP ANGLE ANCHORS OR UNBOLT AS APPROPRIATE. REPLACE STAIR STRINGERS AND RAILS ONCE THE TANK DEMOLITION WORK IS COMPLETE. REUSE OR REPLACE CLIP ANGLES AS REQUIRED TO SUPPORT LANDINGS AND STRINGERS. CONNECT STRINGERS AND LANDINGS TO CLIP ANGLES IN THE SAME MANNER AS BEFORE REMOVAL (WELD OR BOLT). TOUCH UP PAINT AS REQUIRED FOR NEAR APPEARANCE. RESET HANDRAILS.
4. PAINT ALL EXISTING WALL SURFACES NEWLY EXPOSED TO VIEW DUE TO REMOVAL OF EXISTING EQUIPMENT OR OTHER DEMOLITION WORK. PAINT TO MATCH ADJACENT SURFACES.

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100 S WACKER DR. SUITE 1400
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9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED JL
DRAWN JXW
CHECKED TCB

APPROVED

NO.	DATE	APPD	DESCRIPTION

SCALE
8 0 8 16 FT 1/8"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

SLUDGE THICKENING BUILDING
ARCHITECTURAL

DEMOLITION PLAN AT FL EL 29'-0"

PROJECT NO. 02188-BG039
DWG BA1
SHEET 43 OF XX
DATE JULY 2019 REV 0

ROOM FINISH SCHEDULE (SLUDGE THICKENING BUILDING)

ROOM NO.	ROOM NAME	FLOOR	BASE BOARD MATL	BASE BOARD HEIGHT	WALLS N	WALLS S	WALLS E	WALLS W	CEILING MATL	CEILING HEIGHT	NOTES
100	STAIR NO. 1 LOBBY	EXISTING	VYNIL		EXISTING				ACT	9'-3 1/2"	
101	PROCESS CONTROL CENTER	RES	VYNIL		PT	PT	PT	PT	ACT	9'-0"	
106	TOILET	RES	VYNIL		CT	CT	CT	CT	CBC	8'-8"	

NOTE: REFER TO PLANS AND ELEVATIONS FOR MORE DETAILED INFORMATION FOR THE ROOM FINISHES LISTED ABOVE.

DOOR SCHEDULE (SLUDGE THICKENING BUILDING)

DOOR NO.	ROUGH OPENING WIDTH	ROUGH OPENING HEIGHT	TYPE	GLAZING	DESCRIPTION	DOOR THICKNESS	DOOR MTL	MTL	FIRE RATING (HR)	NOTES
100-1	3'-10 ¼"	7'-2"	C	G-3		1¾"	AL	AL	--	
100-2	3'-4"	7'-4'	D	G-3		1¾"	SS	SS	B-1½H	
101-1	3'-4"	7'-4"	D	G-3		1¾"	SS	SS	B-1½H	SOUND ATTENUATING GLAZING
101-2	3'-4"	7'-2"	C	G-3		1¾"	AL	AL	--	SOUND ATTENUATING GLAZING
102-1	11-0 ½"	12'-4 ¾"	--	--	OHCD	--	--	--	--	
102-2	4'-3"	7'-2"	C	G-3		1¾"	AL	AL	--	
102-3	3'-10 ¼'	7'-2"	C	G-3		1¾"	AL	AL	--	
102-4	3'-10 ¼'	7'-2"	C	G-3		1¾"	AL	AL	--	
103-1	6'-4"	8'-8"	B	--		1¾"	AL	AL	--	
104-1	6'-4"	8'-8"	B	--		1¾"	AL	AL	--	
105-1	6'-4"	8'-8"	B	--		1¾"	AL	AL	--	
106-1	3'-4"	7'-4"	A	G-3		1¾"	SS	SS	B-1½H	¾" UNDERCUT

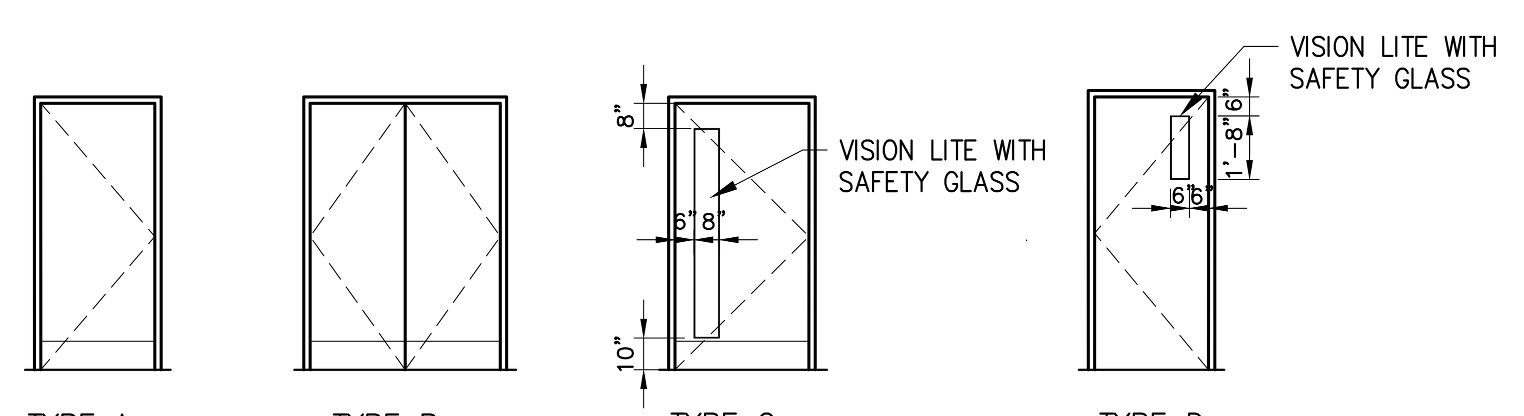
NOTE: DOORS TO FIT INTO EXISTING OPENINGS. DIMENSIONS FOR DOORS MAY VARY FROM VALUES LISTED IN SCHEDULE (V.I.F.)

OPENING SCHEDULE (SLUDGE THICKENING BUILDING)

TYPE MARK	ROUGH OPENING WIDTH	ROUGH OPENING HEIGHT	FRAME MTL	GLAZING TYPE	FIRE RATING (HR)	NOTES
W1	16'-1 ½"	--	AL	VARIES	--	DOOR AND OVERHEAD ROLING DOOR
W2	16'-1 ½"	26'-0"	AL	VARIES	--	–
W3	12'-2"	--	AL	VARIES	--	DOOR
W4	16'-1 ½"	--	AL	VARIES	--	–
W5	16'-1 ½"	--	AL	VARIES	--	–
W6	16'-1 ½"	--	AL	VARIES	--	DOOR
W7	8'-2 ½"	--	AL	VARIES	--	–
W8	8'-2 ½"	17'-4"	AL	VARIES	--	DOOR
W9	11-4"	7'-10"	--	G-4	--	DOOR (HOLLOW METAL)

NOTE: WINDOWS AND LOUVERS TO FIT INTO EXISTING OPENINGS. DIMENSIONS FOR OPENINGS MAY VARY FROM VALUES LISTED IN SCHEDULE.

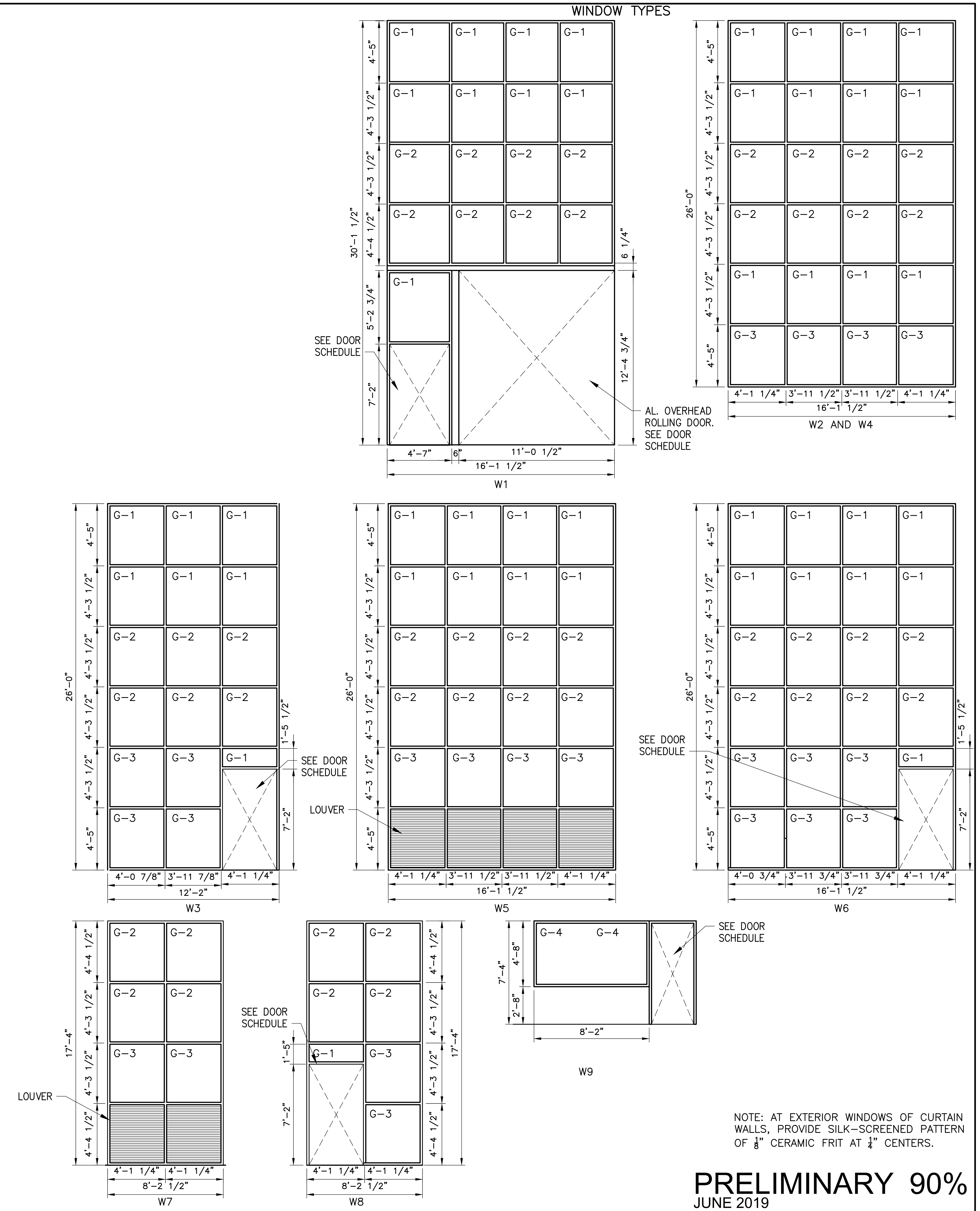
DOOR TYPES



GLAZING TYPES

- G-1 CLEAR GLAZING
- G-2 SPANDREL GLAZING
- G-3 SAFETY GLASS
- G-4 SOUND-ATTENUATING GLASS

WINDOW TYPES



NOTE: AT EXTERIOR WINDOWS OF CURTAIN WALLS, PROVIDE SILK-SCREENED PATTERN OF ⅛" CERAMIC FRIT AT ¼" CENTERS.

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CHICAGO, IL 60606

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED JL
DRAWN JXW
CHECKED TCB
APPROVED

NO.	DATE	APPD	DESCRIPTION

SCALE 1/4"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

SLUDGE THICKENING BUILDING ARCHITECTURAL
SCHEDULES AND DETAILS

PROJECT NO. 02188-BG039
DWG BA5
SHEET 47 OF XX
DATE JULY 2019
REV 0

CITY OF RICHMOND

GREELEY AND HANSEN

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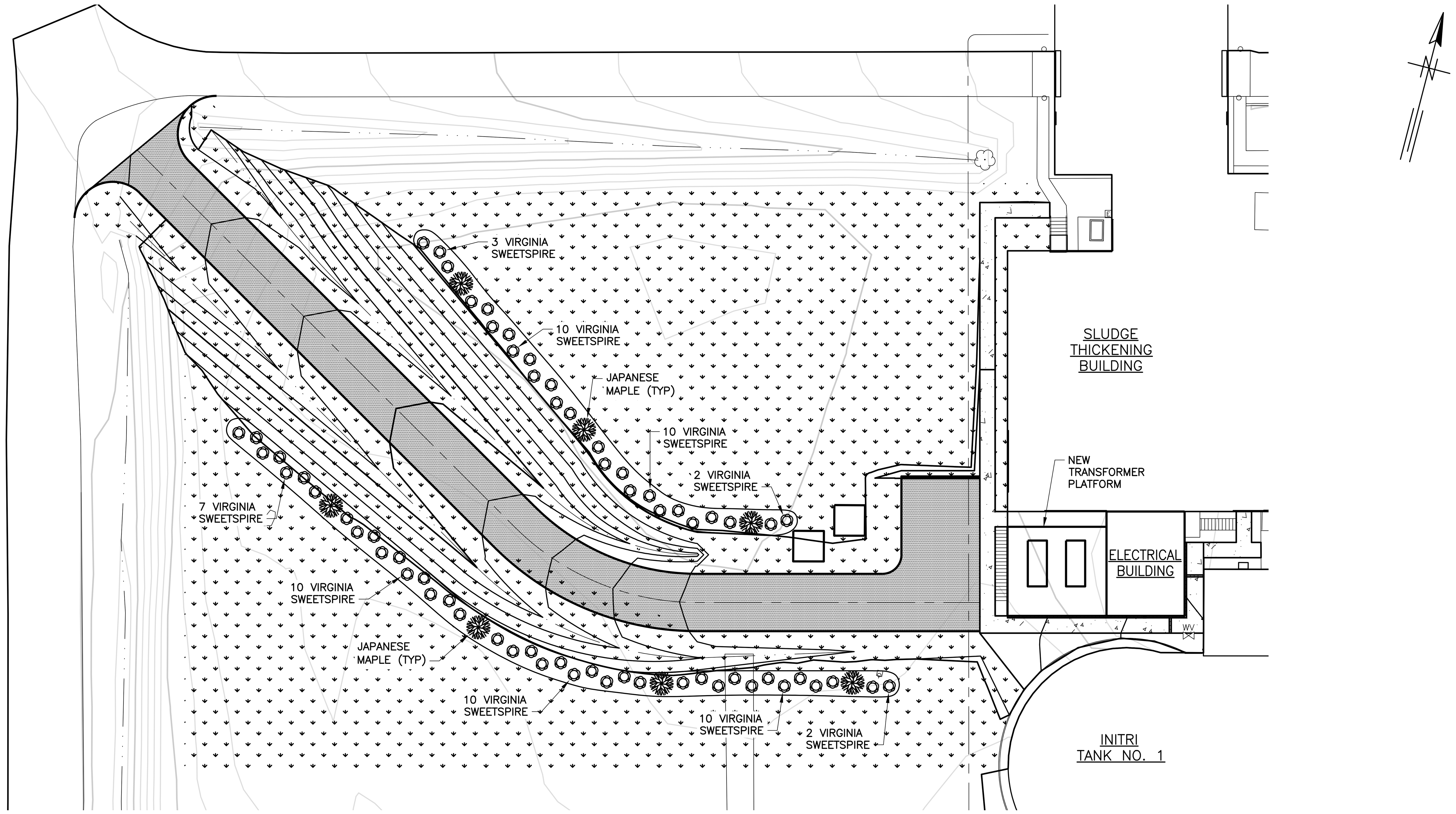
Engineers • Scientists • Construction Managers

DANIELS & ASSOCIATES, P.C.
Consulting Engineers

Sludge Thickening Facility Landscaping Plan



LANDSCAPE PLAN

SCALE: 1" = 20'-0"

LEGEND

- VA SWEET SPIRE
- JAPANESE MAPLE
- MULCH BED
- SEED

NOTES:

1. CONTRACTOR SHALL VERIFY PLANT MATERIAL QUANTITIES SHOWN ON PLAN WITH TOTALS IN PLANTING SCHEDULE. NOTIFY LANDSCAPE ARCHITECT OF ANY DISCREPANCIES PRIOR TO FINAL BIDDING.
2. ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE FULL YEAR TO BE IN HEALTHY GROWING CONDITION. PLANT MATERIALS WHICH DO NOT FULFILL THIS GUARANTEE SHALL BE REPLACED AT NO COST TO THE OWNER. REPLACEMENT SHALL BE GUARANTEED THROUGHOUT THE ORIGINAL GUARANTEE PERIOD. PLANTS THAT DIE WITHIN 60 DAYS OF INSTALLATION SHALL BE REPLACED IMMEDIATELY.
3. CONTRACTOR IS RESPONSIBLE FOR WATERING ALL PLANT MATERIAL DURING INSTALLATION AND UNTIL FINAL INSPECTION AND ACCEPTANCE BY OWNER.
4. CONTRACTOR IS RESPONSIBLE FOR CONTACTING MISS UTILITY PRIOR TO BEGINNING OF CONSTRUCTION FOR LOCATION OF ALL UTILITY LINES. TREES SHALL BE LOCATED A MINIMUM OF 5 FEET FROM SEWER WATER CONNECTIONS. NOTIFY LANDSCAPE ARCHITECT IF ANY CONFLICTS OCCUR.
5. THE LANDSCAPE ARCHITECT IS THE OWNER'S REPRESENTATIVE AND SHALL BE THE APPROVING AUTHORITY FOR INFORMATION PROVIDED IN THESE PLANS AND SPECIFICATIONS.
6. ALL PLANT MATERIALS, TOPSOIL, MULCH, FERTILIZERS, SOIL AMENITIES, PLANTING SUPPLIES AND METHODS SHALL BE SUBJECT TO LANDSCAPE ARCHITECTS APPROVAL. REJECTED MATERIAL SHALL BE REMOVED FROM THE SITE WITHOUT DELAY.
7. ALL PLANT MATERIALS AND PLANTING METHODS SHALL CONFORM TO AAN STANDARDS.
8. CONTRACTOR SHALL LAYOUT AND MARK LOCATION FOR ALL PLANT MATERIAL, PLANTING BEDS AND IMPROVEMENTS SHOWN AND REQUEST IN FIELD APPROVAL FROM LANDSCAPE ARCHITECT.
9. BEDS TO CONTAIN SHRUBS OR GROUND COVER SHALL BE TILLED TO A DEPTH OF 12" AND THE SOIL CONDITIONED BY ADDING CLEAN, WELL-ROTTED MANURE. IF EXISTING SOIL IS CONSIDERED TO BE UNUSABLE BY OWNER, BEDS SHALL BE TREATED TO ELIMINATE WEEDS AND WEED SEEDS.
10. ALL PLANTING BED AREAS SHALL BE COVERED WITH A 2" MINIMUM LAYER OF MEDIUM TEXTURE SHREDDED HARDWOOD MULCH.
11. ALL SUBSTITUTIONS OF PLANT MATERIAL SHALL BE REQUESTED IN WRITING TO THE LANDSCAPE ARCHITECT AND APPROVED IN WRITING BY THE OWNER.
12. ALL PLANTING OPERATIONS SHALL BE UNDER THE SUPERVISION OF AN EXPERIENCED PLANTSMAN.
13. LANDSCAPE ARCHITECT RESERVES THE RIGHT TO SELECT PLANT MATERIALS IN THE NURSERY.
14. UPON COMPLETION OF LANDSCAPE INSTALLATION, THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR WHO WILL VERIFY COMPLETENESS INCLUDING THE REPLACEMENT OF ALL DEAD PLANT MATERIAL AND SCHEDULE A FINAL INSPECTION FOR ACCEPTANCE BY OWNER.
15. THE ONE YEAR GUARANTEE PERIOD SHALL BEGIN UPON THE OWNER'S APPROVAL AND ACCEPTANCE OF THE PLANTING INSTALLATION. THE OWNER SHALL ASSUME RESPONSIBILITY FOR MAINTENANCE INCLUDING WATERING AND WEEDING.
16. FOR TREES BALLED IN WIRE BASKETS, CUT AND REMOVE TOP AND SIDES OF BASKET AFTER INSTALLATION.
17. CONTRACTOR SHALL REMOVE STAKING FROM TREES AT THE END OF THE ONE YEAR WARRANTY PERIOD.
18. LANDSCAPE ARCHITECT RESERVE THE RIGHT TO REJECT ANY PLANTS AND MATERIALS THAT ARE IN AN UNHEALTHY OR UNSIGHTLY CONDITION, AS WELL AS PLANTS AND MATERIALS THAT DO NOT CONFORM TO AAN STANDARDS. SEE AMERICAN STANDARD FOR NURSERY STOCK, ANSI Z60.1– (CURRENT EDITION).

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JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BDC
DRAWN PMY
CHECKED BDC
APPROVED

NO.	DATE	APPD	DESCRIPTION

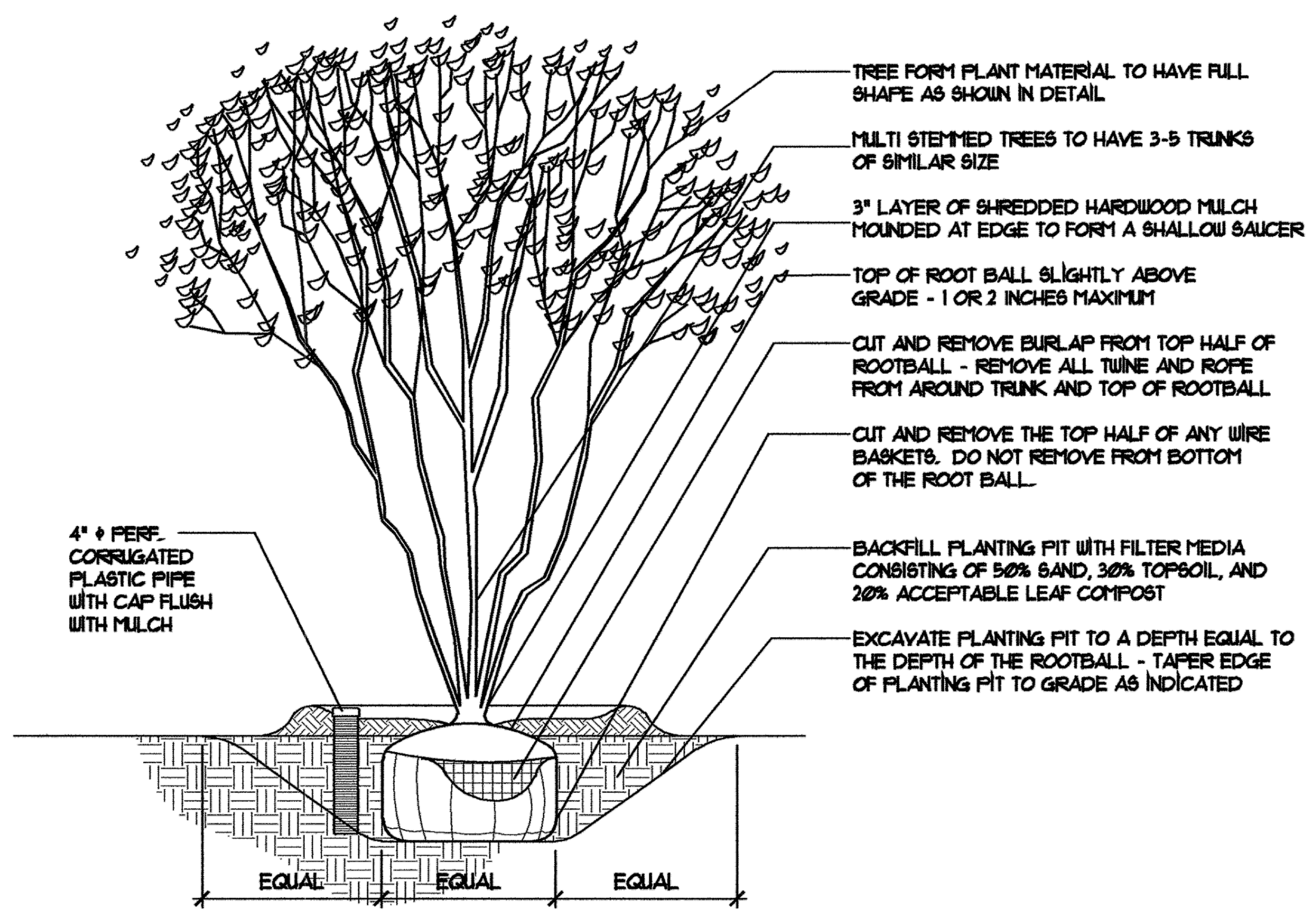
SCALE 20 0 20 40 FT 1"=20'

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

GENERAL

LANDSCAPING PLAN

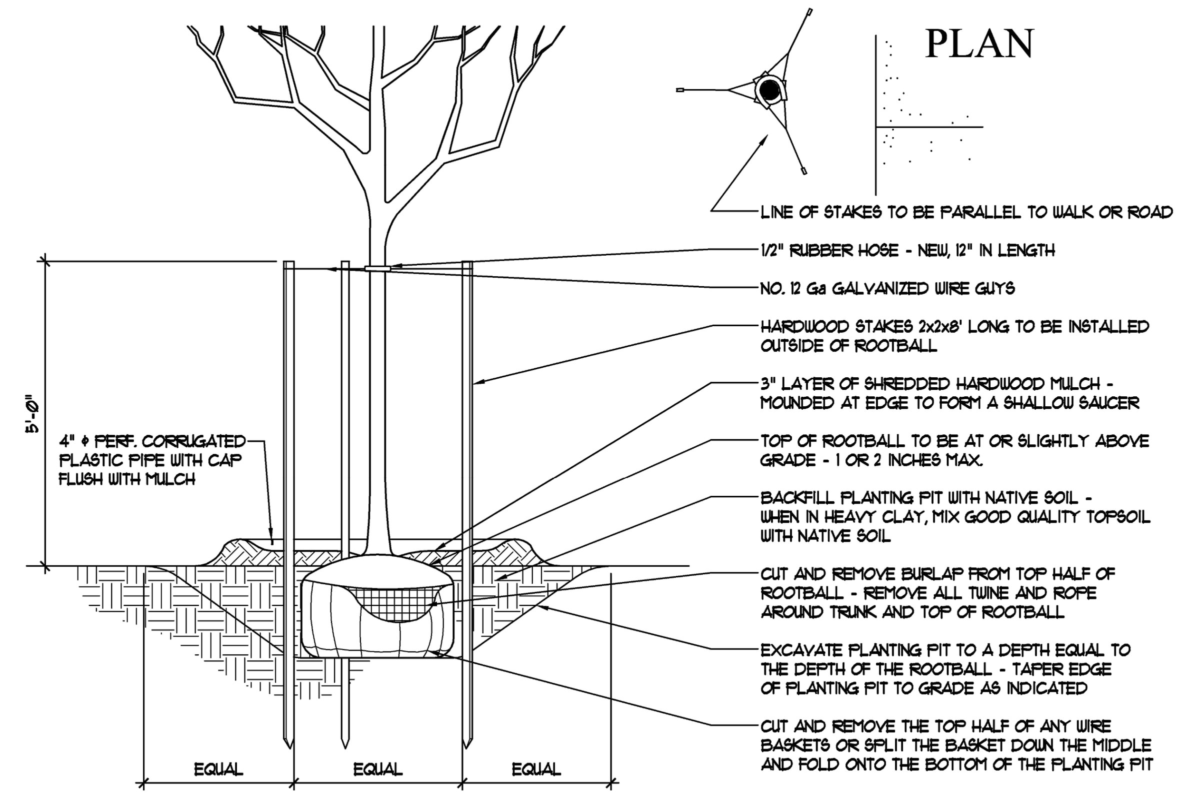
PROJECT NO. 02188-BG039
DWG AG16
SHEET 17 OF XX
DATE JULY 2019 REV 0



DETAIL 1/AG17

MULTI STEM TREE PLANTING

SCALE: NOT TO SCALE

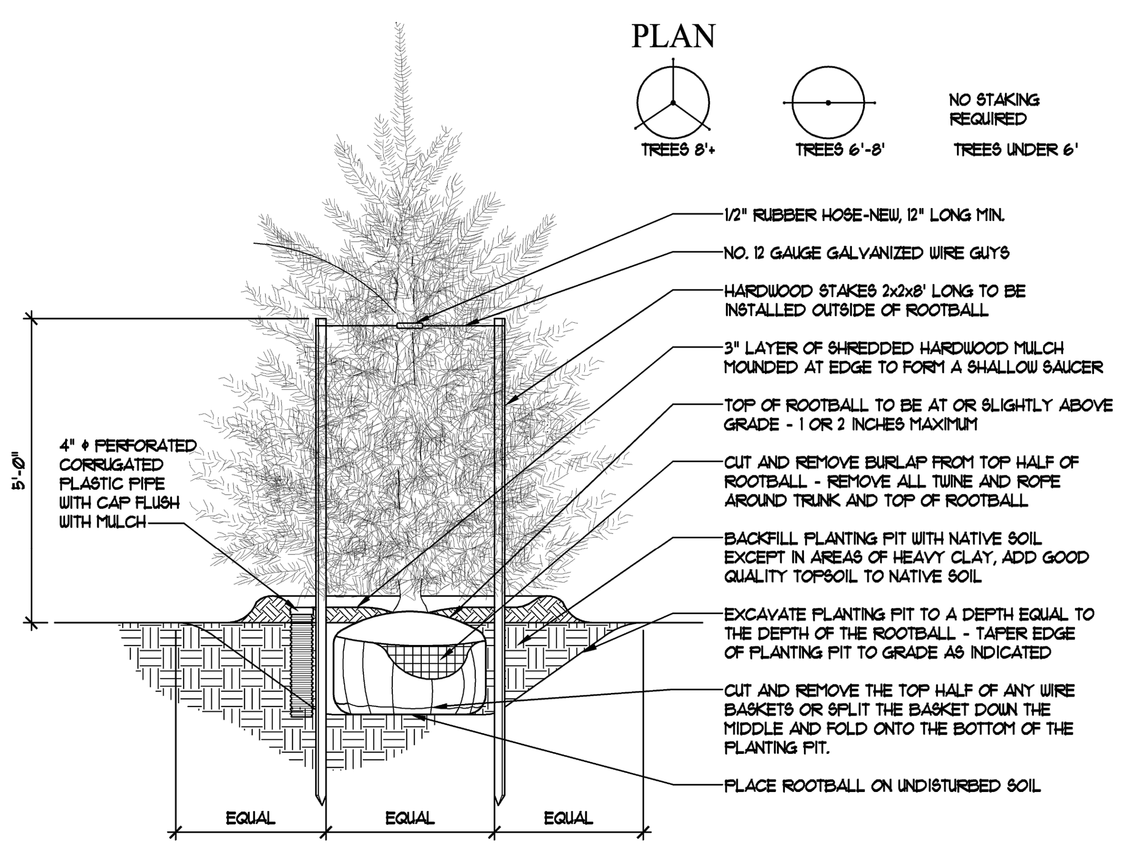


DETAIL 2/AG17

DECIDUOUS TREE STAKING

SCALE: NOT TO SCALE

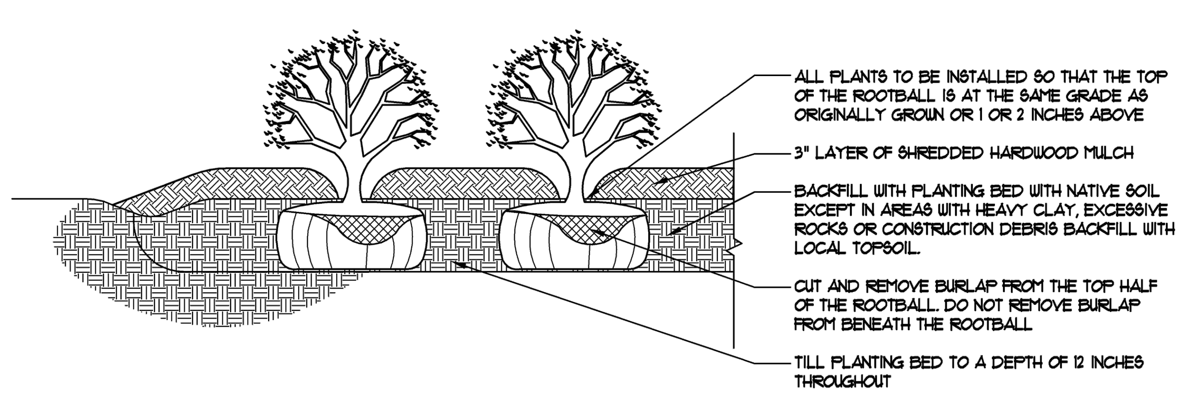
PLANT MATERIAL SCHEDULE								
QUANTITY	BOTONICAL NAME	COMMON NAME	SPACING	CALIPER	HT./SPREAD	ROOT TYPE	DETAIL	REMARKS
TREES								
7	ACER PALMATUM	JAPANESE MAPLE	SHOWN	1 1/2"	8'–10'	B & B	2	SINGLE LEADER
SHRUBS								
64	ITEA VIRGINICA "SPRICH"	VIRGINIA SWEETSPIRE	36" O/C	–	18–24"	CONTAINER	4	MULCH ENTIRE BED, FULL



DETAIL 3/AG17

CONIFER AND EVERGREEN TREE STAKING

SCALE: NOT TO SCALE



DETAIL 4/AG17

SHRUB PLANTING

SCALE: NOT TO SCALE

PRELIMINARY 90%
JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BDC
DRAWN PMY
CHECKED BDC
APPROVED

NO.	DATE	APPD	DESCRIPTION

SCALE

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

GENERAL

LANDSCAPING DETAILS

PROJECT NO. 02188-BG039
DWG AG17
SHEET 18 OF XX
DATE JULY 2019 REV 0

Japanese Maple

Acer palmatum

Japanese Maple in fall
Photo courtesy of NetPS Plant Finder

Japanese Maple
Photo courtesy of NetPS Plant Finder

Height: 20 feet

Spread: 25 feet

Sunlight:

Hardiness Zone: 5b

Description:

The most coveted of all small landscape trees, and with good reason - it has almost the perfect shape, habit, and fall colors; the species can be quite variable, numerous cultivars are available selected for specific attributes

Ornamental Features

Japanese Maple features subtle corymbs of red flowers rising above the foliage in mid spring before the leaves. It has dark green foliage throughout the season. The lobed palmate leaves turn outstanding shades of yellow, red and deep purple in the fall. It produces red samaras from early to mid fall. The rough gray bark and red branches add an interesting dimension to the landscape.

Landscape Attributes

Japanese Maple is a deciduous tree with a more or less rounded form. Its relatively fine texture sets it apart from other landscape plants with less refined foliage.

This is a relatively low maintenance tree, and should only be pruned in summer after the leaves have fully developed, as it may 'bleed' sap if pruned in late winter or early spring. It has no significant negative characteristics.

Japanese Maple is recommended for the following landscape applications;

- Accent
- Shade

Planting & Growing

Japanese Maple will grow to be about 20 feet tall at maturity, with a spread of 25 feet. It has a low canopy with a typical clearance of 5 feet from the ground, and is suitable for planting under power lines. It grows at a slow rate, and under ideal conditions can be expected to live for 80 years or more.

This tree does best in full sun to partial shade. It prefers to grow in average to moist conditions, and shouldn't be allowed to dry out. It is not particular as to soil pH, but grows best in rich soils. It is somewhat tolerant of urban pollution, and will benefit from being planted in a relatively sheltered location. Consider applying a thick mulch around the root zone in winter to protect it in exposed locations or colder microclimates. This species is not originally from North America.

Little Henry® Virginia Sweetspire

Itea virginica 'Sprich'

Height: 3 feet

Spread: 5 feet

Sunlight:

Hardiness Zone: 6a

Description:

A compact spreading version of this native shrub which features extremely long and narrow panicles of white flowers in early summer, consistently reddish-purple fall color; good for the garden or for naturalizing, spreads to form small colonies

Little Henry Virginia Sweetspire in bloom
Photo courtesy of NetPS Plant Finder

Ornamental Features

Little Henry Virginia Sweetspire has racemes of fragrant white flowers at the ends of the branches in early summer. It has green foliage throughout the season. The narrow leaves turn an outstanding burgundy in the fall. The fruit is not ornamentally significant. The purple stems can be quite attractive.

Little Henry Virginia Sweetspire flowers
Photo courtesy of NetPS Plant Finder

Landscape Attributes

Little Henry Virginia Sweetspire is a dense spreading deciduous shrub with a ground-hugging habit of growth. Its average texture blends into the landscape, but can be balanced by one or two finer or coarser trees or shrubs for an effective composition.

This shrub will require occasional maintenance and upkeep, and should only be pruned after flowering to avoid removing any of the current season's flowers. Gardeners should be aware of the following characteristic(s) that may warrant special consideration;

- Suckering

Little Henry Virginia Sweetspire is recommended for the following landscape applications;

- *General Garden Use*
- *Naturalizing And Woodland Gardens*

Planting & Growing

Little Henry Virginia Sweetspire will grow to be about 3 feet tall at maturity, with a spread of 5 feet. It tends to fill out right to the ground and therefore doesn't necessarily require facer plants in front. It grows at a medium rate, and under ideal conditions can be expected to live for 40 years or more.

This shrub performs well in both full sun and full shade. It is an amazingly adaptable plant, tolerating both dry conditions and even some standing water. It is not particular as to soil type or pH. It is somewhat tolerant of urban pollution. This is a selection of a native North American species.

Little Henry Virginia Sweetspire in fall
Photo courtesy of NetPS Plant Finder

Sludge Thickening Facility Outside Site Lighting

LIGHTING FIXTURE SCHEDULE							
LABEL	DESCRIPTION	LAMP TYPE	LUMENS	INPUT WATTAGE	MOUNTING	MANUFACTURER AND CATALOG NUMBER	REMARKS
A1	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING, 3S COLOR TEMP, 80 CRI	LED	3000	23	CEILING	HOLOPHANE: EMS_L48_ 3000LM, IMACD MD MVOLT 35K OR APPROVED EQUAL	
A1E	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING, 3S COLOR TEMP, 80 CRI W/EMERGENCY BATTERY PACK BSL520	LED	3000	23	CEILING	HOLOPHANE: EMS_L48_ 3000LM, IMACD MD MVOLT 35K 80CRI BSL20 OR APPROVED EQUAL	
A2	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING 3S COLOR TEMP, 80 CRI	LED	4000	31	CEILING	HOLOPHANE: EMS_L48_ 4000LM, IMACD MD MVOLT 35K OR APPROVED EQUAL	
A3	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING 3S COLOR TEMP, 80 CRI	LED	6000	45	CEILING	HOLOPHANE: EMS_L48_ 6000LM, IMACD MD MVOLT 35K OR APPROVED EQUAL	
A4	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING 3S COLOR TEMP, 80 CRI	LED	8000	69	CEILING	HOLOPHANE: EMS_L48_ 8000LM, IMACD MD MVOLT 35K OR APPROVED EQUAL	
A5	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING 3S COLOR TEMP, 80 CRI	LED	10000	80	CEILING	HOLOPHANE: EMS_L48_ 10000LM, IMACD MD MVOLT 35K OR APPROVED EQUAL	
B	LED FIXTURE SUITABLE FOR WET LOCATION, COLOR TEMP, 80 CRI WITH INTERGRAL EMERGENCY BATTERY	LED	2800	28	WALL	HOLOPHANE: HLWPC2 P10 40K 12 TFTM BZSDP EM, OR APPROVED EQUAL	
C	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING 30K COLOR TEMP, 80 CRI	LED	10000	74	PENDANT	HOLOPHANE: PXLW2, 10000LM, WD, 30K, 80CRI OR APPROVED EQUAL	
CE	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING WITH EMERGENCY BATTERY PACK	LED	10000	74	PENDANT	HOLOPHANE: PXLW2, 10000LM, WD, 30K, 80CRI, E10WMCP OR APPROVED EQUAL	
D	E2x2 RECESSED LED TROFFER LISTED WET LOCATION 40K COLOR TEMP, 80 CRI	LED	12000	110	PENDANT ABOVE GRID	LITHONIA: 2WRTL, L24, 1200LM, AFL, MVOLT, 40K, 80 CRI OR APPROVED EQUAL	
D1	E2x2 RECESSED LED TROFFER LISTED WET LOCATION 40K COLOR TEMP, 80 CRI	LED	3000	27	GRID/ GYP BD	LITHONIA: 2WRTL, L24, 3000LM, AFL, MVOLT, 40K, 80 CRI OR APPROVED EQUAL	
D1E	E2x2 RECESSED LED TROFFER LISTED WET LOCATION 40K COLOR TEMP, 80 CRI WITH SM SELF DIAGNOSTIC BATTERY PACK	LED	3000	27	GRID	LITHONIA: 2WRTL, L24, 3000LM, AFL, MVOLT, 40K, 80 CRI, E10WLCD OR APPROVED EQUAL	
D2	E2x2 RECESSED LED TROFFER LISTED WET LOCATION 40K COLOR TEMP, 80 CRI	LED	5000	42	GRID	LITHONIA: 2WRTL, L24, 5000LM, AFL, MVOLT, 40K, 80 CRI OR APPROVED EQUAL	
DE	E2x2 RECESSED LED TROFFER LISTED WET LOCATION 40K COLOR TEMP, 80 CRI WITH SM SELF DIAGNOSTIC BATTERY PACK	LED	12000	110	PENDANT ABOVE GRID	LITHONIA: L24, 1200LM, AFL, MVOLT, 40K, 80 CRI, E10WLCP OR APPROVED EQUAL	
EX	EXIT SIGN WITH NI-CAD BATTERY AND SELF DIAGNOSTICS	LED	10000	3	WALL	HOLOPHANE: QM LED, R, HORO SD OR APPROVED EQUAL	
G	HIGH BAY LED FIXTURE WET LOCATION LISTED 35K COLOR TEMP, 80 CRI	LED	24000	170	PENDANT	HOLOPHANE: PHZ 24L, 35K, 80 CRI, AS P W MFR OR APPROVED EQUAL	
GE	HIGH BAY LED FIXTURE WET LOCATION LISTED 35K COLOR TEMP, 80 CRI, WITH EMERGENCY BATTERY PACK	LED	24000	170	PENDANT	HOLOPHANE: PHZ 24L, 35K, 80 CRI, AS P W MFR, E10WCP OR APPROVED EQUAL	
I	LED FIXTURE SUITABLE FOR MOUNTING TO STANCHION	LED	27000	20	STANCHION	LITHONIA: OLWX1 LED 20W 40K 120 PE OR APPROVED EQUAL	
H	STAINLESS STEEL WITH HOT DIPPED GALVANIZED FINISH, NPS 1-1/2" BASED SECTIONS AND INCLINED BRACKETS				STANCHION MOUNTING TO GUARDRAIL	HOLOPHANE SWIVEL POLE TO MOUNT TO GUARDRAIL #53 OR APPROVED EQUAL	

THICKENING AND DEWATERING → B

THICKENING → I

PRELIMINARY 90%
JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED XXX
DRAWN PMY
CHECKED XXX
APPROVED

NO.	DATE	APPD	DESCRIPTION

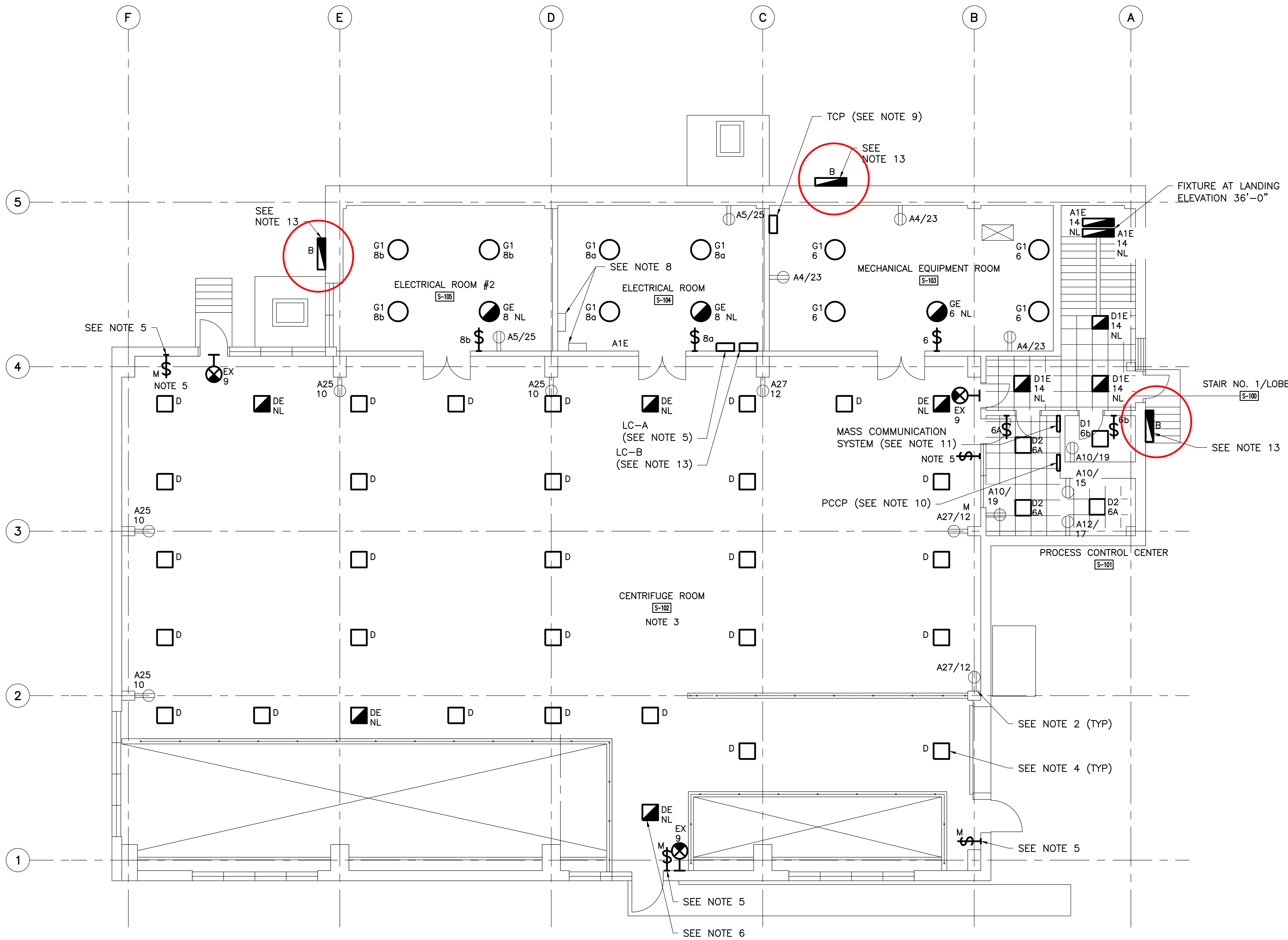
SCALE

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

GENERAL
ELECTRICAL

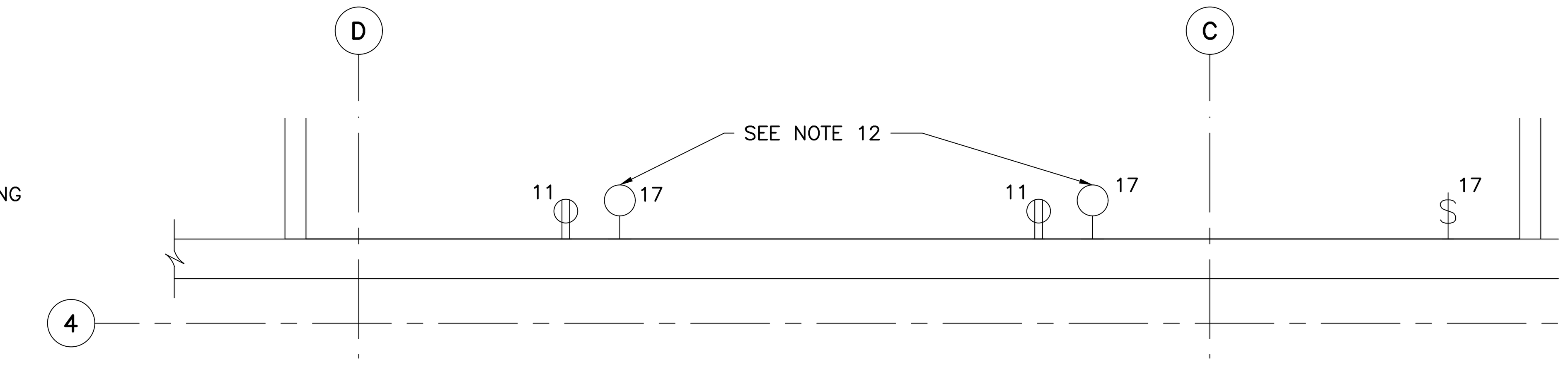
LIGHTING FIXTURE SCHEDULE

PROJECT NO. 02188-BG039
DWG AE2
SHEET 39 OF XX
DATE JULY 2019 REV 0



LIGHTING PLAN – FL EL 29'-0"

SCALE: 1/8" = 1'-0"



PARTIAL LIGHTING PLAN – ROOF

SCALE: NO SCALE

NOTES:

1. LIGHTING IS FED FROM PANEL 543-LP-B U.N.O.
2. INTERCEPT EXISTING RECEPTACLE CIRCUITS ORIGINALLY FED FROM EXISTING PANEL LPB-A IN ROOM S-104 AND EXTEND CONDUIT AND WIRING TO 543-LP-B. A# INDICATES ORIGINAL PANEL AND CIRCUIT /# INDICATES NEW CIRCUIT IN PANEL 543-LP-B. FIELD VERIFY EXISTING PANEL AND CIRCUIT. FIELD VERIFY AND CONFIRM EXISTING RECEPTACLE CIRCUITS PRIOR TO DEMOLITION.
3. EXISTING CONDUIT AND WIRING FEEDING THE CENTRIFUGE ROOM LIGHTING FIXTURES ARE FED FROM REPURPOSED PANEL LP-B CIRCUITS B1, B2, B3, B4, B5, B30. INTERCEPT CIRCUITS AT REPURPOSED PANEL AND EXTEND CONDUIT AND WIRING TO NEW PANEL 543-LPB-B. CIRCUITS 16, 18, 20, 22, 24 AND 26 LOCATED IN THE NEW THICKENING ELECTRICAL BUILDING (CIRCUIT NUMBERS ARE FOR REFERENCE ONLY. FIELD VERIFY EXISTING CENTRIFUGE ROOM LIGHTING CIRCUITS).
4. RECONNECT EXISTING CENTRIFUGE ROOM LIGHTING CIRCUITS TO NEW LIGHTING FIXTURES.
5. REPLACE EXISTING SWITCH WITH NEW MOMENTARY CONTACT SWITCH. EXISTING CONDUIT AND WIRING TO REMAIN. PROVIDE NEW 120V, 4 CIRCUIT CONTACTOR (LC-A) TO CONTROL LIGHTING CIRCUITS 16, 18, 20, 22, AND 24 VIA SWITCH. LOCATE CONTACTOR IN ELECTRICAL ROOM S-104. PROVIDE CONTACTOR CONTROL POWER FROM PANEL 543-LP-B CIRCUIT 27.
6. WIRE ALL FIXTURES INDICATED AS NIGHT LIGHTING AHEAD OF ANY SWITCHING.
7. PULL BOX FROM REPURPOSED PANEL LPB-A, LPB-B REFER TO DRAWING BE9 NOTE 4.
8. PROVIDE CIRCUIT 30 FROM PANEL 543-LP-A TO TCP TO FEED REF-13 LOCATED IN TUNNEL.
9. NEW PCCP FED FROM 543-LP-B, CIRCUIT 26.
10. INTERCEPT EXISTING PLANT MASS NOTIFICATION SYSTEM CONDUITS AT REPURPOSED PANEL LPB-A AND EXTEND CONDUIT AND WIRING TO NEW PANEL 543-LP-B1 CIRCUIT 8, 10.
11. CIRCUIT ROOFTOP RECEPTACLES AND LIGHTING TO PANEL 543-LP-B1.
12. PROVIDE 120V, 2 CIRCUIT CONTACTOR (LC-B) LIGHTING CIRCUITS 5 AND 7 VIA SWITCH. LOCATE CONTACTOR IN ELECTRICAL ROOM S-104. PROVIDE CONTROL POWER FROM PANEL 543-LP-B CIRCUIT 27.
13. DISCONNECT EXISTING LIGHT FIXTURE AND REPLACE WITH NEW FIXTURE.

PRELIMINARY 90%

JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	MSZ	APPROVED	
DRAWN	MV		
CHECKED	JM		

NO.	DATE	APPD	DESCRIPTION

SCALE 1/8"=1'-0" (8 0 8 16 FT)

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

SLUDGE THICKENING BUILDING
ELECTRICAL

LIGHTING PLAN EL 29'-0"

PROJECT NO.	02188-BG039
DWG	BE25
SHEET	118 OF XX
DATE	JULY 2019
REV	0

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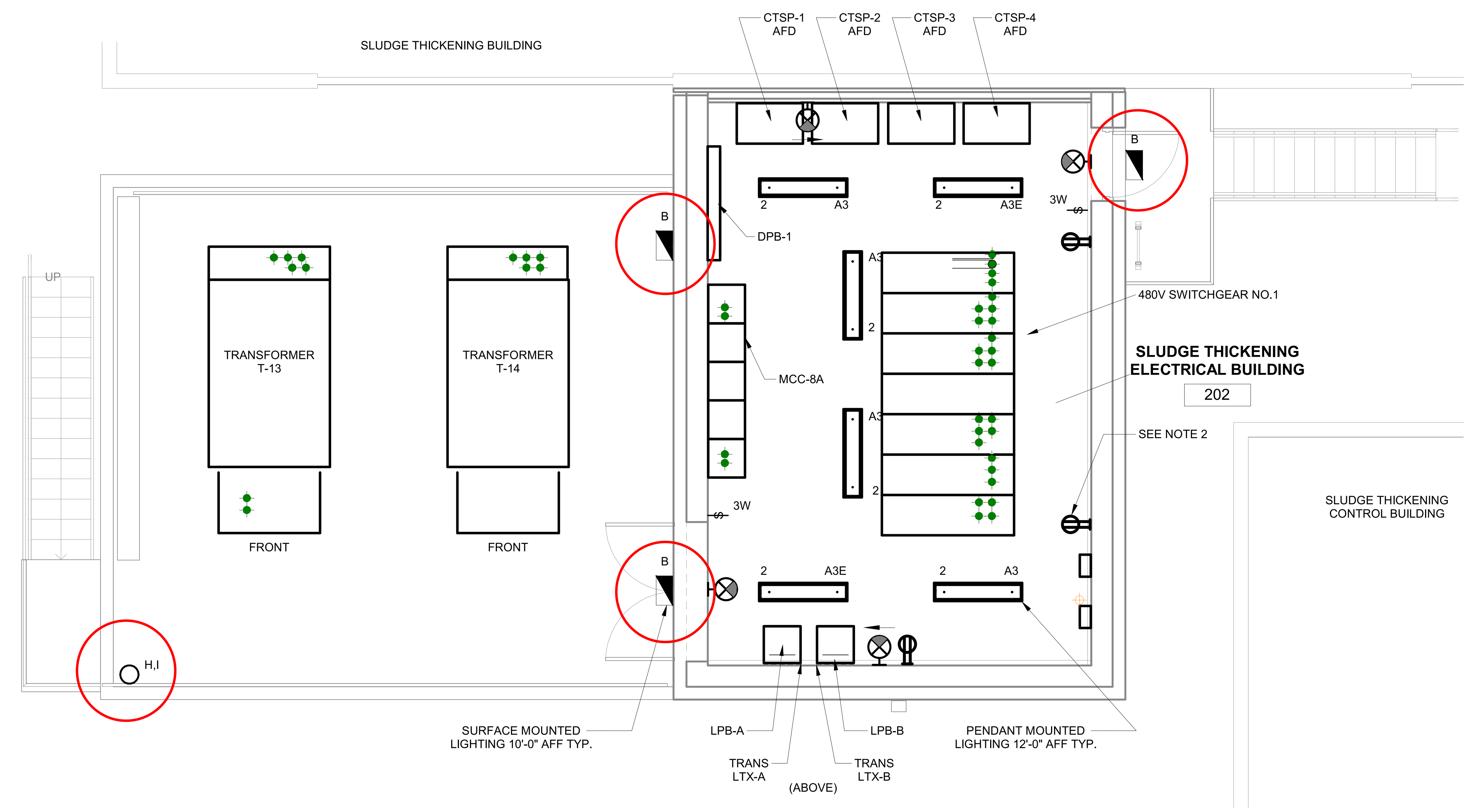
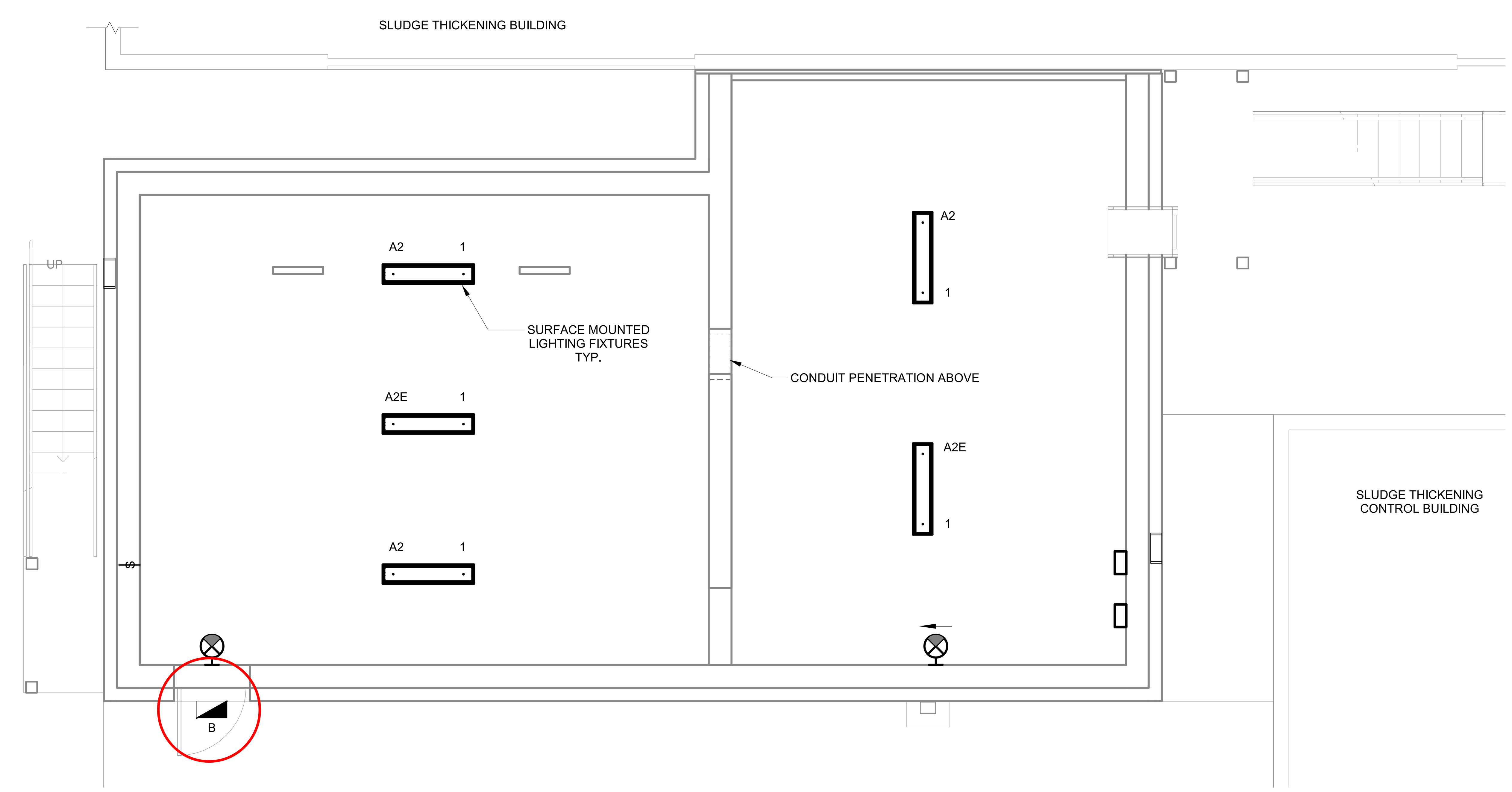
BAR MEASURE 1" ON FULLSIZE SHEETS



LIGHTING PLAN

SCALE: 1/4" = 1'-0"



VAULT LIGHTING PLAN

SCALE: 1/4" = 1'-0"

NOTES:

1. LIGHTING FIXTURES ARE FED FROM PANEL 543-LP-B U.N.O.
2. RECEPTACLES FED FROM 543-LPB-B1.

PRELIMINARY 90%

JUNE 2019

GREELEY AND HANSEN

9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	MSZ	APPROVED
DRAWN	TD	
CHECKED	NV	

NO.	DATE	APPD	DESCRIPTION

SCALE
4 0 4 8 FT
1/4" = 1' - 0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVSION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

RICHMOND VIRGINIA

SLUDGE THICKENING BUILDING
ELECTRICAL

ELECTRICAL BUILDING LIGHTING PLANS

PROJECT NO.:	02188
DWG	BE26
SHEET	OF 234
DATE	JULY 2019
REV	

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HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS

Catalog Number	
Notes	Type

HLWPC2

Wallpack® Full Cutoff LED

Mechanical
- Heavy grade A360 cast aluminum (aluminum with <1% copper)
- Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering
- Mounts to a standard junction box
- Wet location listed
- IP65 rated housing, down light only
- ¾" painted threaded entry(¾" - 14 NPT) on each side and on top, accepts ¾" and ½" condiut
- ¾" threaded plugs are painted on each side
- Vibration testing per ANSI C136.31: 3G rating for surface mount and pendant mount up to 1.5', excludes swivel kit

Electrical
- Certified by UL or CSA
- Rated for -40°C (-40°F) minimum ambient
- A programmable electronic driver with 0-10V control leads
- Available in: 120-277V 50/60 Hz and 347-480V 50/60 Hz,
- Standard: 3000K, 4000K and 5000K CCT (>70 CRI)
- Optional >80 CRI (3000K, 4000K and 5000K CCT), 8 week lead-time
- Optional limited wavelength amber, 8 week lead-time
- Internally mounted emergency battery backup for operation in an ambient temperature ranging from -20°C (-4°F) to 30°C (86°F), available with P10 thru P40 performance packages, non CEC compliant
- All surge protection meets ANSI/IEEE C62.41.2 10kV/10kA
- Standard surge protection is 20kV/10kA per ANSI C136.2
- Optional surge protection is 10kV/5kA per ANSI C136.2

Optical
- Light engine housing is IP66 rated
- Acrylic optical system
  - Type V: E (entry), M (medium), R (rectangle) & W (wide)
  - Asymmetric

Controls
- Field adjustable output (AO)
- Button style photocontrol (PE)
- Motion sensor & ambient photocontrol combination for mounting low (8-15') (MASL) and high (15-30') (MASH) mounting heights

Certification and Standards
- Luminaire is CSA listed, US and Canada
- Suitable for operation in an ambient temperature up to 40°C/104°F per UL or CSA certification
- Design lights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.
- LM-79 compliant
- The projected LED Lumen Maintenance shall be based only on IES LM-80-08 and TM-21

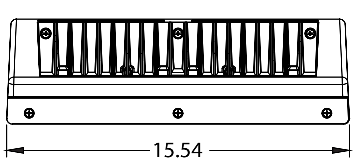
Warranty

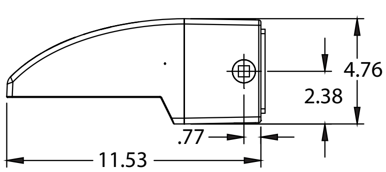
5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_Conditions.aspx.

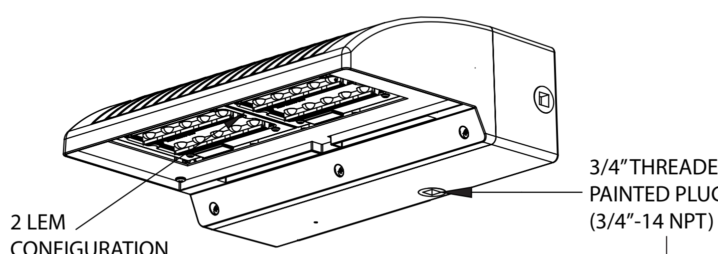
Note: Actual performance may differ as a result of end-user environment and application.

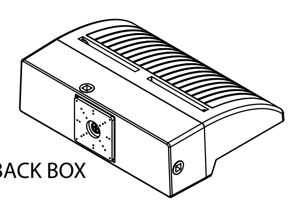
All values are design or typical values, measured under laboratory conditions at 25 °C.

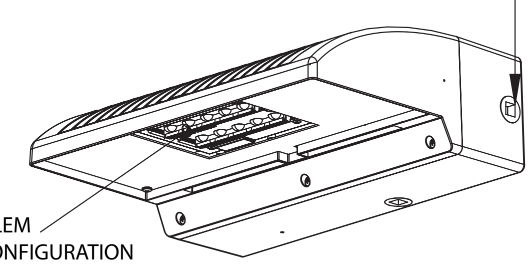
Specifications subject to change without notice.











Note: Maximum weight 22 lbs.

ORDERING INFORMATION

Example: HLWPC2 P20 40K AS T3M BZSDP

Series	Lumen Package	Color Temperature	Voltage	Optics	Color	CRI
HLWPC2 Wallpack Full Cutoff LED	1 LEM Package P10 3,100 lm P20 5,600 lm 2 LEM Package P30 7,800 lm P40 9,900 lm P50 11,700 lm (Nominal Lumens, 4000K)	AMB True Amber 30K 3,000 K CCT 40K 4,000 K CCT 50K 5,000 K CCT	AS Auto-Sensing Voltage (120V-277V) 50/60HZ AH Auto-Sensing Voltage (347V-480V) 50/60HZ 12 120V 20 208V 24 240V 27 277V 34 347V 48 480V	T2S Type 2 Short T2M Type 2 Medium T3S Type 3 Short T3M Type 3 Medium T4M Type 4 Medium TFTM Forward Throw Medium ASYDF Asymmetric Diffuse SYMDF Symmetric Diffuse	BKSDP Black BZSDP Bronze GYSDP Grey WHSDP White	Blank 70 CRI (STD) 80CRI 80 CRI

Options:

Adjustable/Programmable Options

AO	Field Adjustable Output

Circuit Options

2CI	2 Independent Circuits

Control - Motion Sensor Options

MASL	Motion / Ambient Sensor, 8-15' Mounting Height Ambient Sensor Enabled at 1 FC
MASH	Motion / Ambient Sensor, 15-30' Mounting Height Ambient Sensor Enabled at 1 FC

Control - Photocontrol Options

PE	Button Style Photocontrol
P3	N.E.M.A. Twistlock Recepactle Mount -3 PIN
P7	N.E.M.A. Twistlock Recepactle Mount -7 PIN
PCLL	DTL Long Life Twistlock Photocontrol for Solid State
PND	0-10V Part-night Dimming, Includes BLC2 & N.E.M.A. Twistlock Photocontrol Receptacle
PSC	Shorting Cap

Fuse Option

SF	Single Fuse
DF	Double Fuse

Safety Option

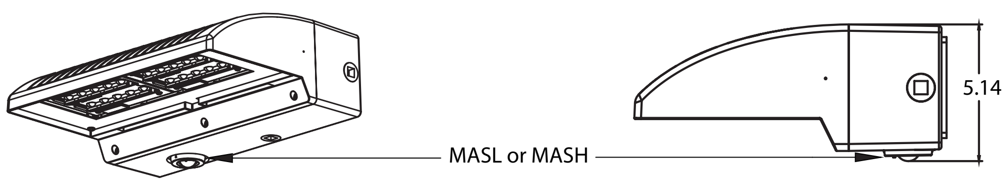
EM	Integral Emergency Battery
TP	Tamper Resistant Hardware

Surge Protection Option - 20kV/10kA is Standard

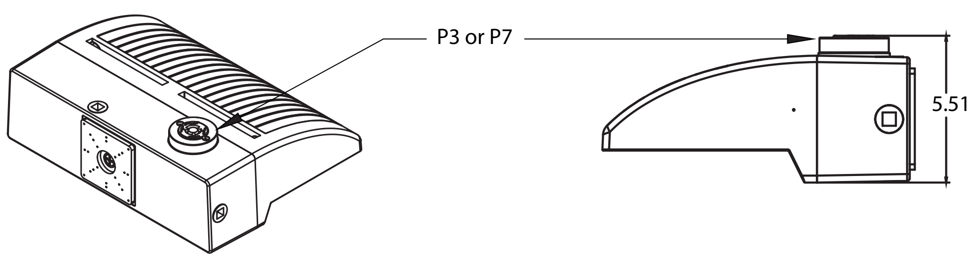
10KV	10kV/5kA Surge Protection, in place of 20kV/10kA

Options Location

Motion/Ambient Sensor mount options for Low (8-15') (MASL) and Height (15-30') (MASH) applications

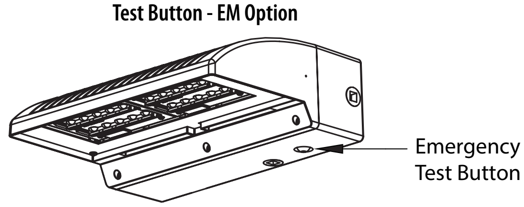


N.E.M.A. Twistlock Receptacle P3 and P7 Options, P7 Shown

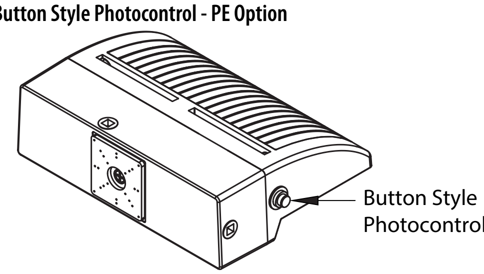


Internal Emergency Battery Test Button - EM Option

Test Button - EM Option



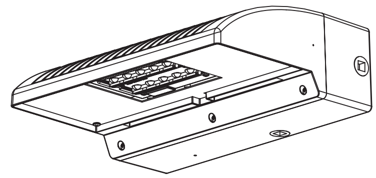
Button Style Photocontrol - PE Option



Driver & LEM Configuration Based on Circuit Options

Number of LEMs & Drivers / Circuit		Sinlge Circuit (std.)		Two Circuit (2CI option)	
		LEMs	Drivers	LEMs	Drivers
Lumen Maintenance Factor	P10	1	1	-	-
	P20	1	1	2	2
	P30	2	1	2	2
	P40	2	1	2	2
	P50	2	1	-	-

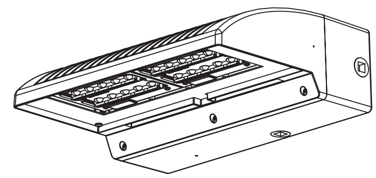
1 LEM Luminaire



SPD Based on Circuit Options

Number of LEMs & Drivers / Circuit		Sinlge Circuit (std.)				Two Circuit (2CI option)			
		LEMs	Drivers	No. of SPDs	SPD	LEMs	Drivers	No. of SPDs	SPD
Lumen Maintenance Factor	P10	1	1	1	20kV/10kA	-	-	-	-
	P20	1	1	1	20kV/10kA	2	2	2	10kV/5kA
	P30	2	1	1	20kV/10kA	2	2	2	10kV/5kA
	P40	2	1	1	20kV/10kA	2	2	2	10kV/5kA
	P50	2	1	1	20kV/10kA	-	-	-	-

2 LEM Luminaire



Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platform noted in a 25°C ambient, based on 6,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

The italicized data is extrapolated beyond the TM-21 standard.

E = (LM) x (CU) x (LAT) x (LLD)
LM and CU are obtained from published photometry.

Operating Hours (Standard)		0	25,000	30,000	36,000	45,000	50,000	60,000	75,000	100,000
Lumen Maintenance Factor	P10	1	0.98	0.97	0.96	0.96	0.95	0.95	0.94	0.92
	P20	1	0.97	0.95	0.94	0.93	0.92	0.90	0.88	0.85
	P30	1	0.98	0.97	0.96	0.96	0.95	0.95	0.94	0.92
	P40	1	0.97	0.95	0.94	0.93	0.92	0.90	0.88	0.85

Operating Hours (2CI Option)		0	25,000	30,000	36,000	45,000	50,000	60,000	75,000	100,000
Lumen Maintenance Factor	P10	1	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
	P20	1	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
	P30	1	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
	P40	1	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Single Circuit Application

Ambient		P10	P20	P30	P40	P50
0°C	32°F	1.02	1.03	1.03	1.04	1.05
10°C	50°F	1.01	1.02	1.02	1.03	1.03
20°C	68°F	1.01	1.01	1.01	1.01	1.01
25°C	77°F	1.00	1.00	1.00	1.00	1.00
30°C	86°F	0.99	0.99	0.99	0.99	0.99
40°C	104°F	0.98	0.97	0.98	0.97	0.97

Optional Two Independent Circuit (2CI) Application

Ambient		P20	P30	P40
0°C	32°F	1.02	1.02	1.02
10°C	50°F	1.01	1.01	1.02
20°C	68°F	1.00	1.01	1.01
25°C	77°F	1.00	1.00	1.00
30°C	86°F	0.99	0.99	0.99
40°C	104°F	0.98	0.98	0.98

Electrical Load

Single Circuit Application

LEDs	Drive Current (mA)	System Watts/ Circuit	Current (A)					
			120	208	240	277	247	480
P10	700	28	0.23	0.13	0.12	0.10	0.08	0.06
P20	1400	47	0.41	0.24	0.20	0.18	0.14	0.10
P30	1050	71	0.63	0.37	0.32	0.29	0.22	0.18
P40	1420	95	0.78	0.45	0.40	0.35	0.27	0.20
P50	1720	115	0.95	0.55	0.48	0.42	0.33	0.24

Optional Two Independent Circuit (2CI) Application

LEDs	Drive Current (mA)	System Watts/ Circuit	Current (A)					
			120	208	240	277	247	480
P10	-	-	-	-	-	-	-	-
P20	700	22	0.10	0.06	0.05	0.04	-	-
P30	1000	32	0.14	0.08	0.07	0.06	-	-
P40	1250	47	0.18	0.10	0.09	0.08	-	-
P50	-	-	-	-	-	-	-	-

Operating Characteristics

LED Package	Distribution	System Watts	30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
P10	T2S	28	2,904	104	1	0	1	3,128	112	1	0	1	3,168	113	1	0	1
	T2M	28	2,887	103	1	0	1	3,110	111	1	0	1	3,149	112	1	0	1
	T3S	28	2,964	106	1	0	1	3,194	114	1	0	1	3,234	116	1	0	1
	T3M	28	2,801	100	1	0	1	3,017	108	1	0	1	3,055	109	1	0	1
	T4M	28	2,858	102	1	0	1	3,079	110	1	0	1	3,118	111	1	0	1
	TFTM	28	2,979	106	1	0	1	3,209	115	1	0	1	3,250	116	1	0	1
	SYMDF	28	2,771	99	1	0	1	2,986	107	1	0	1	3,023	108	1	0	1
	ASYDF	28	2,756	98	1	0	1	2,969	106	1	0	1	3,007	107	1	0	1
P20	T2S	47	5,303	113	1	0	1	5,713	122	1	0	1	5,785	123	1	0	1
	T2M	47	5,272	112	1	0	2	5,680	121	1	0	2	5,751	122	1	0	2
	T3S	47	5,414	115	1	0	2	5,832	124	1	0	2	5,906	126	1	0	2
	T3M	47	5,115	109	1	0	2	5,510	117	1	0	2	5,580	119	1	0	2
	T4M	47	5,220	111	1	0	2	5,623	120	1	0	2	5,694	121	1	0	2
	TFTM	47	5,440	116	1	0	2	5,861	125	1	0	2	5,935	126	1	0	2
	SYMDF	47	5,062	108	2	0	2	5,453	116	2	0	2	5,522	117	2	0	2
	ASYDF	47	5,033	107	1	0	1	5,422	115	2	0	1	5,491	117	2	0	1
P30	T2S	71	7,319	103	2	0	2	7,884	111	2	0	2	7,984	112	2	0	2
	T2M	71	7,276	102	2	0	2	7,838	110	2	0	2	7,937	112	2	0	2
	T3S	71	7,472	105	1	0	2	8,049	113	2	0	2	8,151	115	2	0	2
	T3M	71	7,059	99	2	0	2	7,604	107	2	0	2	7,700	108	2	0	2
	T4M	71	7,203	101	2	0	2	7,760	109	2	0	2	7,858	111	2	0	2
	TFTM	71	7,508	106	1	0	2	8,088	114	2	0	2	8,190	115	2	0	2
	SYMDF	71	6,985	98	2	0	2	7,525	106	3	0	3	7,620	107	3	0	3
	ASYDF	71	6,946	98	2	0	2	7,483	105	2	0	2	7,578	107	2	0	2
P40	T2S	95	9,320	98	2	0	2	10,041	106	2	0	2	10,168	107	2	0	2
	T2M	95	9,266	98	2	0	2	9,982	105	2	0	3	10,108	106	2	0	3
	T3S	95	9,515	100	2	0	2	10,251	108	2	0	2	10,381	109	2	0	2
	T3M	95	8,989	95	2	0	2	9,684	102	2	0	2	9,807	103	2	0	2
	T4M	95	9,174	97	2	0	2	9,883	104	2	0	3	10,008	105	2	0	3
	TFTM	95	9,561	101	2	0	2	10,300	108	2	0	2	10,431	110	2	0	2
	SYMDF	95	8,896	94	3	0	3	9,583	101	3	0	3	9,705	102	3	0	3
	ASYDF	95	8,846	93	2	0	2	9,530	100	2	0	2	9,650	102	2	0	2
P50	T2S	115	10,972	95	2	0	2	11,820	103	2	0	2	11,969	104	2	0	2
	T2M	115	10,908	95	2	0	3	11,751	102	2	0	3	11,900	103	2	0	3
	T3S	115	11,202	97	2	0	2	12,067	105	2	0	2	12,220	106	2	0	2
	T3M	115	10,582	92	2	0	2	11,400	99	2	0	3	11,544	100	2	0	3
	T4M	115	10,799	94	2	0	3	11,634	101	2	0	3	11,781	102	2	0	3
	TFTM	115	11,256	98	2	0	2	12,126	105	2	0	2	12,279	107	2	0	2
	SYMDF	115	10,472	91	3	0	3	11,282	98	3	0	3	11,424	99	3	0	3
	ASYDF	115	10,414	91	2	0	2	11,219	98	3	0	2	11,361	99	3	0	2

Use the following to scale 70CRI to 80CRI.

CCT	Multiplier
3000K	0.909
4000K	0.886
5000K	0.865

All IES files available on product web page

Operating Characteristics (continued)

LED Package	Distribution	System Watts	30K + 2CI Option (3000K, 70 CRI)					40K + 2CI Option (4000K, 70 CRI)					50K + 2CI Option (5000K, 70 CRI)				
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
P20	T2S	49	5,015	102	1	0	1	5,402	110	1	0	1	5,471	112	1	0	1
	T2M	49	4,985	102	1	0	2	5,371	110	1	0	2	5,439	111	1	0	2
	T3S	49	5,120	104	1	0	1	5,515	113	1	0	2	5,585	114	1	0	2
	T3M	49	4,837	99	1	0	2	5,210	106	1	0	2	5,276	108	1	0	2
	T4M	49	4,936	101	1	0	2	5,317	109	1	0	2	5,385	110	1	0	2
	TFTM	49	5,144	105	1	0	2	5,542	113	1	0	2	5,612	115	1	0	2
	SYMDF	49	4,786	98	2	0	2	5,156	105	2	0	2	5,222	107	2	0	2
	ASYDF	49	4,760	97	1	0	1	5,127	105	1	0	1	5,192	106	1	0	1
P30	T2S	70	6,769	97	1	0	1	7,293	104	2	0	2	7,385	106	2	0	2
	T2M	70	6,730	96	2	0	2	7,250	104	2	0	2	7,342	105	2	0	2
	T3S	70	6,911	99	1	0	2	7,445	106	1	0	2	7,539	108	1	0	2
	T3M	70	6,529	93	2	0	2	7,033	100	2	0	2	7,123	102	2	0	2
	T4M	70	6,663	95	2	0	2	7,178	103	2	0	2	7,269	104	2	0	2
	TFTM	70	6,945	99	1	0	2	7,481	107	1	0	2	7,576	108	2	0	2
	SYMDF	70	6,461	92	2	0	2	6,960	99	2	0	2	7,049	101	2	0	2
	ASYDF	70	6,425	92	2	0	2	6,922	99	2	0	2	7,009	100	2	0	2
P40	T2S	89	8,370	94	2	0	2	9,017	101	2	0	2	9,131	103	2	0	2
	T2M	89	8,321	93	2	0	2	8,964	101	2	0	2	9,078	102	2	0	2
	T3S	89	8,545	96	2	0	2	9,205	103	2	0	2	9,322	105	2	0	2
	T3M	89	8,073	91	2	0	2	8,696	98	2	0	2	8,807	99	2	0	2
	T4M	89	8,238	93	2	0	2	8,875	100	2	0	2	8,987	101	2	0	2
	TFTM	89	8,586	96	2	0	2	9,250	104	2	0	2	9,367	105	2	0	2
	SYMDF	89	7,989	90	3	0	3	8,606	97	3	0	3	8,715	98	3	0	3
	ASYDF	89	7,944	89	2	0	2	8,558	96	2	0	2	8,666	97	2	0	2

Use the following to scale 70CRI to 80CRI.

CCT	Multiplier
3000K	0.909
4000K	0.886
5000K	0.865

All IES files available on product web page

LED Package	Distribution	System Watts	AMB (Wavelength)					LED Package	Distribution	System Watts	AMB (Wavelength)				
			Lumens	LPW	B	U	G				Lumens	LPW	B	U	G
P10	T2S	28	1,061	38	0	0	1	P30	T2S	28	1,975	71	0	0	1
	T2M	28	1,054	38	0	0	1		T2M	28	1,964	70	0	0	1
	T3S	28	1,083	39	0	0	1		T3S	28	2,016	72	0	0	1
	T3M	28	1,023	37	0	0	1		T3M	28	1,905	68	0	0	1
	T4M	28	1,044	37	0	0	1		T4M	28	1,944	69	0	0	1
	TFTM	28	1,088	39	0	0	1		TFTM	28	2,026	72	0	0	1
	SYMDF	28	1,012	36	1	0	1		SYMDF	28	1,885	67	1	0	1
	ASYDF	28	1,007	36	0	0	1		ASYDF	28	1,875	67	0	0	1

OLWX1 LED
LED Wall Luminaire

c UL us LISTED • LED • 5 YEAR warranty • WET LOCATION™ • DLC QPL LISTED • NIGHTTIME FRIENDLY™

Catalog Number	
Notes	
Type	

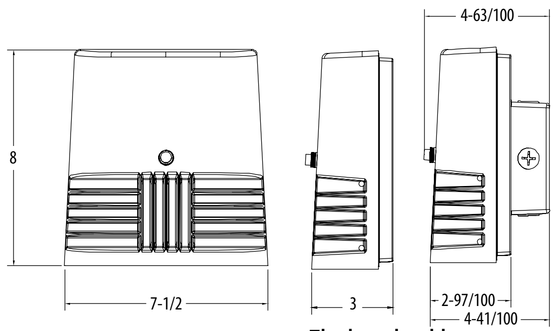
Hit the Tab key or mouse over the page to see all interactive elements.

Introduction

The OLWX1 is versatile and energy efficient. It is designed to replace up to 250W metal halide while saving over 87% in energy costs. Whether you are mounting it to a recessed junction box, conduit/through wiring, as an up light, as a down light, or as a flood light – the OLWX1 has all applications covered.

Specifications

Width:	7-1/2″ *(19 cm)*
Height:	8″ *(20.3 cm)*
Depth:	3″ *(7.62 cm)*
Weight:	5 lbs *(2.27kg)*



Flush or backbox mount

Ordering Information

EXAMPLE: OLWX1 LED 20W 50K

OLWX1 LED					
Series	**Performance Package**	**Color Temperature**	**Voltage**	**Controls**	**Finish**
OLWX1 LED	13W 13 watts [1] 20W 20 watts 40W 40 watts [1]	40K 4000 K 50K 5000 K [1]	(blank) MVOLT [2] 120 120V [3]	(blank) None PE 120V button photocell [2]	(blank) Dark bronze

Accessories
Ordered and shipped separately.

OLWX1TS	Slipfitter for OLWX1
OLWX1YK	Yoke for OLWX1
OLWX1THK	Knuckle for OLWX1

NOTES
1. 13W and 40W are not available with 50K 120 PE option.
2. MVOLT driver operates on any line voltage from 120-277V (50/60Hz).
3. Specify 120V when ordering with photocell (PE option).

FEATURES & SPECIFICATIONS

INTENDED USE
The versatility of the OLWX1 LED combines a sleek, low-profile wall pack design with energy efficient, low maintenance LEDs for replacing up to 250W metal halide fixtures. Mounting accessories are available to convert the OLWX1 LED into an energy efficient flood light.

OLWX1 LED is ideal for outdoor applications such as building perimeters, loading areas, driveways and sign and building flood lighting.

CONSTRUCTION
Cast-aluminum housing with textured dark bronze polyester powder paint for durability. Integral heat sinks optimize thermal management through conductive and convective cooling. LEDs are protected behind a glass lens. Housing is sealed against moisture and environmental contaminants (IP65 rated). See Lighting Facts label and photometry reports for details.

ELECTRICAL
Light engine consists of 1 high-efficiency Chip On Board (COB) LED with integrated circuit board mounted directly to the housing to maximize heat dissipation and promote long life (L73/100,000 hours at 25°C). Electronic drivers have a power factor >90% and THD <20% and a minimum 2.5kV surge rating. Flood light mounting accessories include an additional 6kV surge protection device. LEDs are available in 4000K and 5000K CCTs.

INSTALLATION
Easily mounts to recessed junction boxes with the included wall mount bracket, or for surface mounting and conduit entry - with the included junction box with five 1/2″ threaded conduit entry hubs. Flood light mounting accessories (sold separately) include knuckle, integral slipfitter and yoke mounting options. Each flood mount accessory comes with a top visor and vandal guard. Luminaire may be wall or ground mounted in downward or upward orientation.

LISTINGS
UL Listed to U.S. and Canadian safety standards for wet locations. Rated for -40° C minimum ambient. Tested in accordance with IESNA LM-79 and LM-80 standards. DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY
5-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25°C. Specifications subject to change without notice.

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts.

Fixture Model Number	CCT	System Watts	Lumens	LPW	B	U	G	CRI
OLWX1 LED 13W 40K	4000 K	14 W	1,271	91	1	0	0	>70
OLWX1 LED 13W 50K	5000 K	14 W	1,289	92	1	0	0	>80
OLWX1 LED 20W 40K	4000 K	20 W	2,697	135	1	0	0	>70
OLWX1 LED 20W 50K	5000 K	19 W	2,663	140	1	0	0	>70
OLWX1 LED 40W 40K	4000 K	39 W	4,027	101	2	0	0	>70
OLWX1 LED 40W 50K	5000 K	37 W	4,079	110	2	0	0	>70

Electrical Load

Fixture Model Number	Rated Power (watts)	Input current at given input voltage (amps)				
		120V	208V	240V	277V	347V
OLWX1 LED 13W 40K	14 W	0.12	0.07	0.06	0.06	0.04
OLWX1 LED 13W 50K	14 W	0.12	0.07	0.06	0.06	0.04
OLWX1 LED 20W 40K	20 W	0.20	0.12	0.10	0.09	0.06
OLWX1 LED 20W 50K	19 W	0.20	0.12	0.10	0.09	0.06
OLWX1 LED 40W 40K	39 W	0.37	0.21	0.19	0.16	0.11
OLWX1 LED 40W 50K	37 W	0.37	0.21	0.19	0.16	0.11

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

	0°C	10°C	20°C	25°C	30°C	40°C
13W	1.06	1.03	1.01	1.00	0.99	0.96
20W	1.06	1.04	1.01	1.00	0.99	0.96
40W	1.07	1.04	1.01	1.00	0.99	0.96

Projected LED Lumen Maintenance

Data references the extrapolated performance projections in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
OLWX1 LED 13W	1.00	0.92	0.85	0.73
OLWX1 LED 20W	1.00	0.92	0.85	0.73
OLWX1 LED 40W	1.00	0.94	0.88	0.79

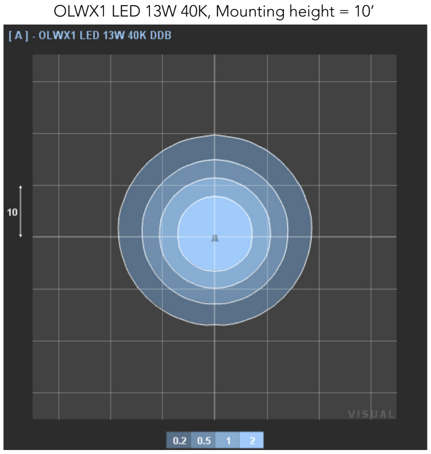
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit the Lithonia Lighting OLWX1 LED homepage. Tested in accordance with IESNA LM-79 and LM-80 standards

LEGEND

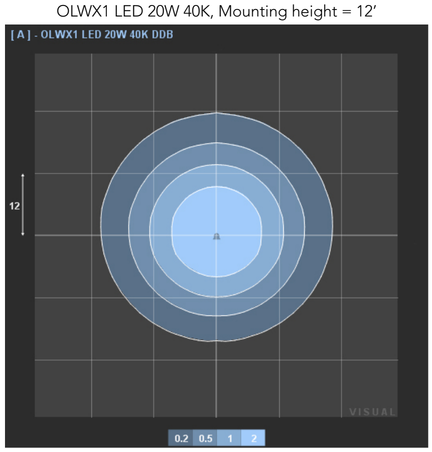
- 0.2 fc
- 0.5 fc
- 1.0 fc
- 2.0 fc

OLWX1 LED 13W 40K, Mounting height = 10'



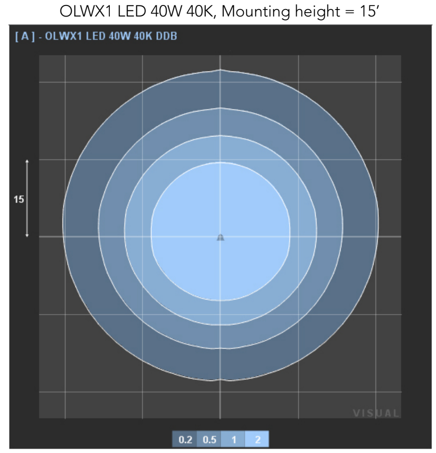
Test No. LTL22697 tested in accordance with IESNA LM-79-08.

OLWX1 LED 20W 40K, Mounting height = 12'



Test No. LTL22696 tested in accordance with IESNA LM-79-08.

OLWX1 LED 40W 40K, Mounting height = 15'



Test No. LTL22695 tested in accordance with IESNA LM-79-08.

Accessories

OLWX1TS
Slipfitter for OLWX1

Standard size tenon is 2 1/8".
The slip fitter has a range of 2" to 2 3/8".

OLWX1YK
Yoke for OLWX1

OLWX1THK
Knuckle for OLWX1

Top Visor and Vandal Guard included with accessories

CITY OF RICHMOND

GREELEY AND HANSEN

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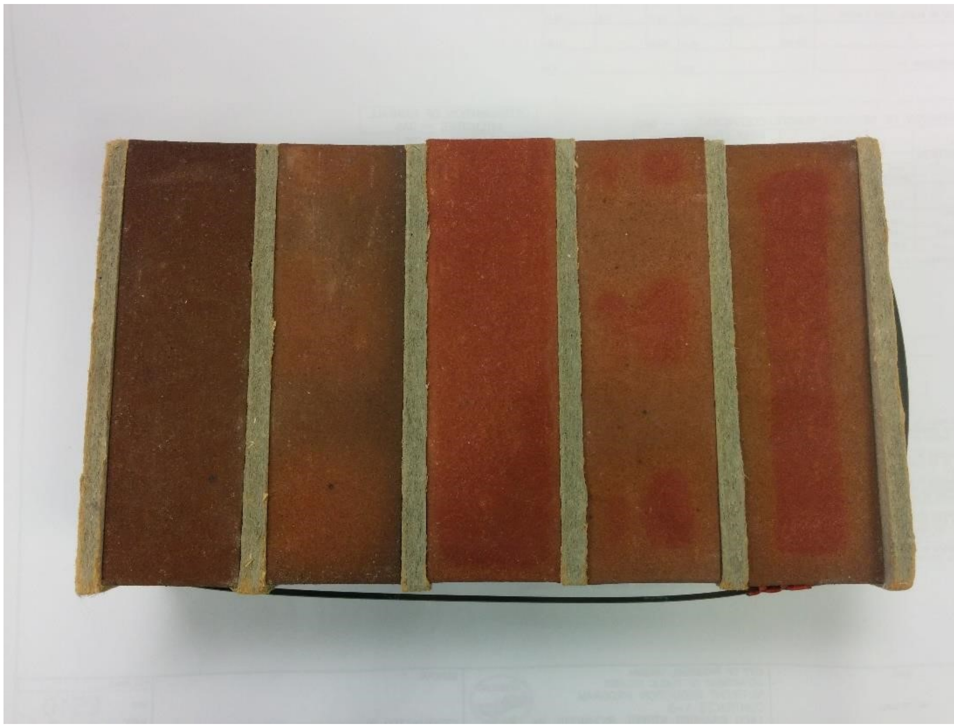
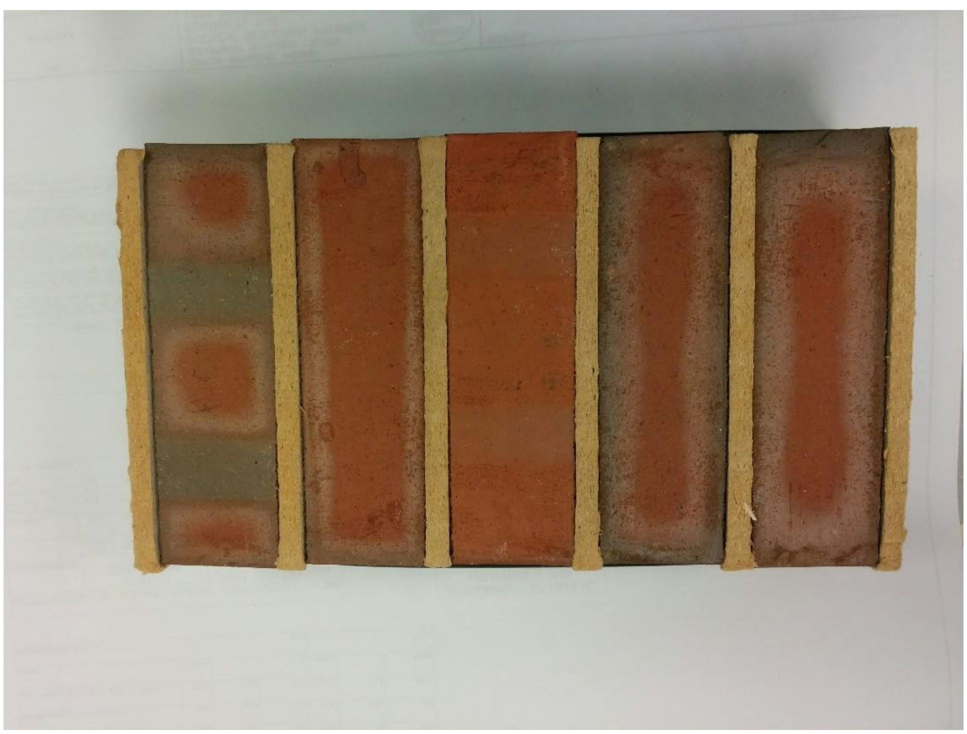
Consulting Engineers

Sludge Thickening Facility Exterior Building Materials

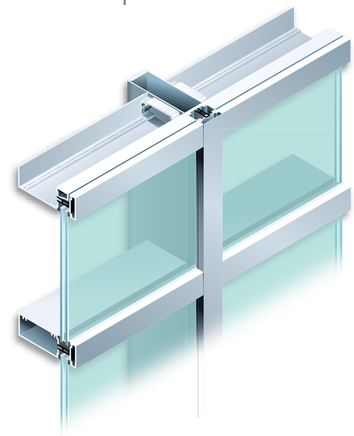
Brick





Reliance™-TC—thermal composite curtain wall system by Oldcastle BuildingEnvelope®

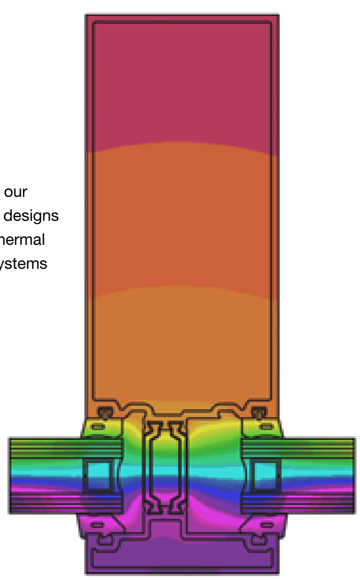
Energy efficiency has become a critical part of the design process in modern construction. In keeping with our commitment to the environment we have further enhanced the Reliance™-TC Composite Curtain Wall System. This product is designed to meet higher levels of thermal performance with a traditional glazed curtain wall system.



Benefits

The Reliance™-TC curtain walls utilize multiple assembly and glazing options to meet a wider range of performance requirements. Reliance™-TC Type I Curtain Wall utilizes a composite vertical and standard Reliance™ horizontals. Reliance™-TC Type II features thermal composite members for all verticals and horizontals with pressure plate assembly. You may also add a FRP pressure plate to horizontals and/or verticals to maximize U-factors and Condensation Resistance Factor (CRF). The product is available in 7-1/4" and 6" depths with an aluminum pressure plate or 7-1/2" or 6-1/4" using the FRP pressure plate. Two-color capability is still available with all vertical and horizontal sections. As with Reliance™ Curtain Wall, Reliance™-TC offers optional depths and profiles, with the ability to adapt entrance doors and operable windows.

We analyze our curtain wall designs using 3-D thermal modeling systems



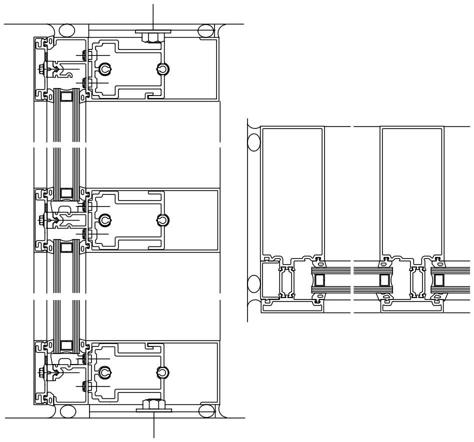
Features

- Overall system dimensions: 2-1/2" x 6", 2-1/2" x 6-1/4", 2-1/2" x 7-1/4" and 2-1/2" x 7-1/2"
- Utilizes standard Reliance™ Curtain Wall profiles and components
- Thermally broken utilizing 27 mm and 30 mm thermal struts and an EPDM isolator
- Optional FRP pressure plate
- Accommodates the standard doors or the AD-375 Thermal Door
- Accommodates ZS-30 projected and casement vents

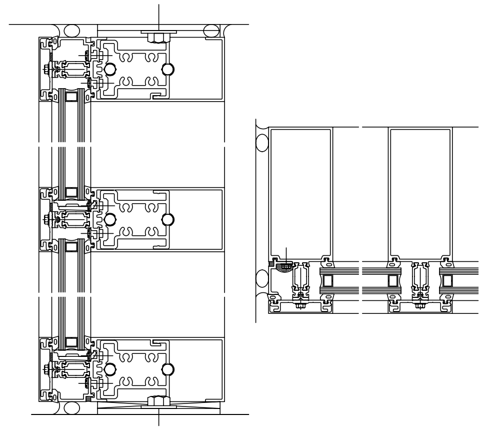
Reliance™-TC thermal composite curtain wall system

Details

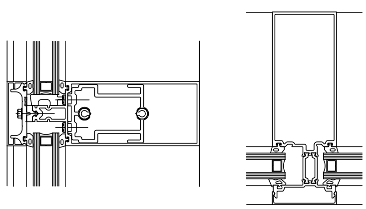
Reliance™-TC Type I



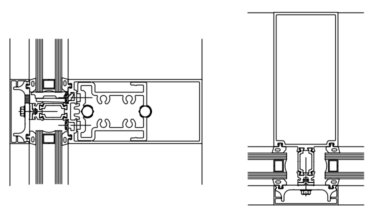
Reliance™-TC Type II



Optional FRP Pressure Plate



Optional FRP Pressure Plate



Performance

- Air Infiltration: <.06 CFM/SQ FT @ 6.24 PSF per ASTM E283
- Static Water: 15 PSF per ATSM E331
- Dynamic Water: 88 MPH per AAMA 501.1-05
- Deflection Load: 40 PSF per ASTM E330
- Structural Load: 60 PSF per ASTM E330
- STC: 28 with standard 1" insulating glass, 34 with double laminated 1" insulating glass
- Thermal Performance per AAMA 1503 for Clear 1" Insulating Glass with FRP Pressure Plate
  - U-Factor = 0.52
  - CRF Frame = 79
- Thermal Performance per AAMA 1503 for 1" Insulating Glass with Sunglass #2 surface, 90% argon and Technoform warm edge spacer utilizing FRP Pressure Plate
  - U-Factor = 0.30
  - CRF Frame = 82
- NFRC Tested and Certified
- Thermal Performance Characteristics per AAMA 507
- NFRC Component Modeling Approach Program certified

Oldcastle BuildingEnvelope®

2425 Olympic Boulevard, Suite 525-East ▪ Santa Monica, CA 90404
1-866-OLDCASTLE (653-2278) ▪ oldcastlebe.com

Flushline™ Entrances

High-Traffic Entrances Designed to Protect What's Inside

Our proven Flushline™ Entrances have been enhanced from the inside out for the performance and protection you need for today's harsh environments, more demanding building codes and commercial applications where durability is needed. This makes Flushline™ Entrances the natural choice for educational building applications – from grade schools to universities – where durability, strong design aesthetics, security and a custom look are important.

For decades, our Flushline™ heavy-duty flush panel door has provided the kind of performance you need in areas with heavy traffic. Now, our impact-tested, blast-tested and expanded hardware provides architects, designers and building owners with the ideal solution to protect our students and educators from unpredictable natural disasters and other threats. Kawneer is proud to continue to serve as a single-source solution for entrances that are proven to protect what's inside.

KAWNEER
AN ARCONIC COMPANY

Performance

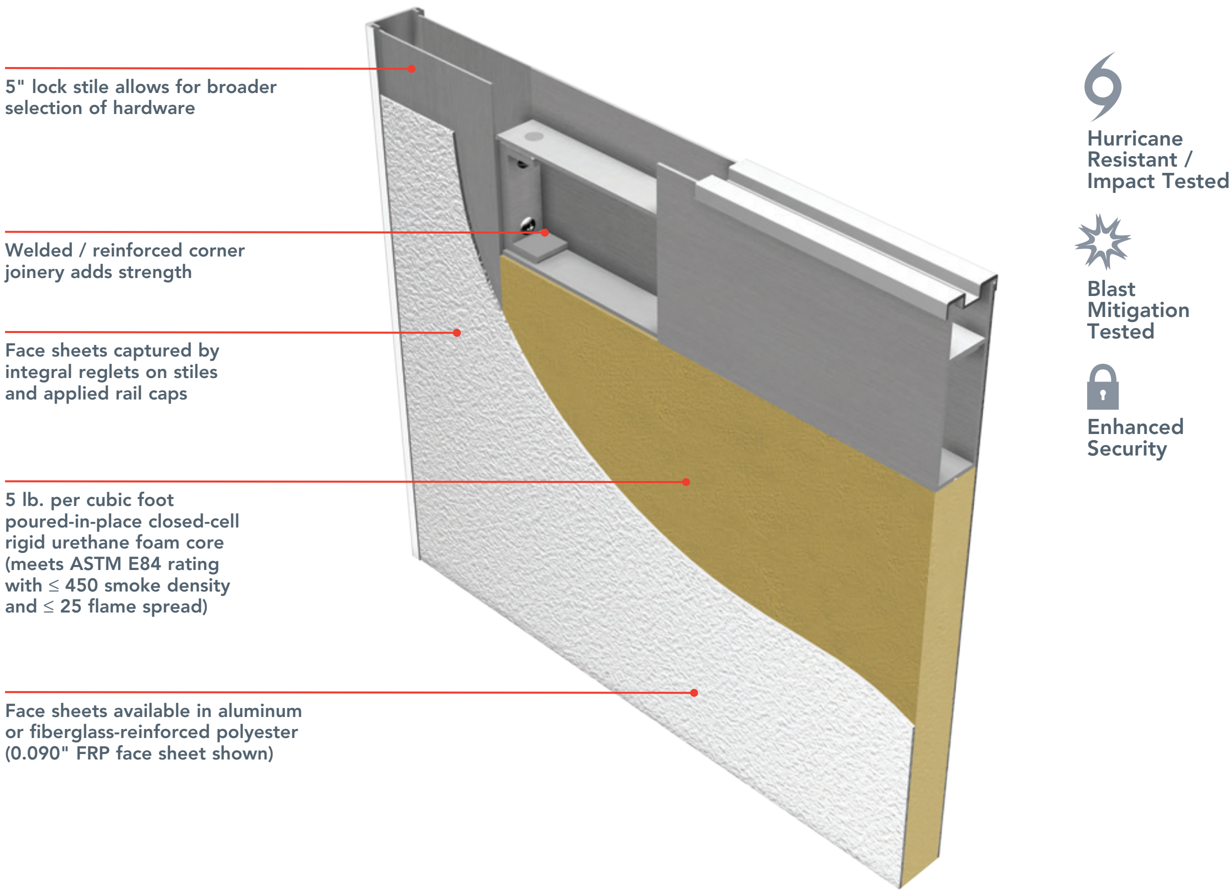
Flushline™ Entrances are engineered to resist many forms of damage associated with educational building applications – from athletic equipment to active students to the high-volume traffic associated with day-to-day use. But more than that, these doors have been designed to meet third-party testing standards for hurricane resistance and blast mitigation. Now tested for both large and small missile impact, Flushline™ Entrances not only withstand windborne debris and hurricane forces, but also provide increased security throughout the year. And, as one of the first aluminum flush doors tested for blast mitigation, Flushline™ Entrances help to protect students and educators from bomb blasts.

These tough exterior doors are constructed with vertical stiles joined to top and bottom rails by SIGMA deep-penetration welds. Mechanical clips and SIGMA fillet welds create the strongest door corners available today – a configuration that withstands abusive conditions while providing lower maintenance costs. Flushline™ Entrances provide both strength and flexibility to withstand years of wear and abuse.

Aesthetics and Versatility

Starting with the exterior, our engineers have designed Flushline™ Entrances with a flush appearance and face sheets that are captured with integral projections on the stiles and applied rail caps. Aluminum face sheets are available in both plain and embossed textures, with anodized or painted finishes. Fiberglass-reinforced polyester (FRP) sheets are also available and are designed to be colorfast and resist fading due to ultraviolet rays. Extremely tough FRP sheets resist the scratching and denting that can occur with metal skins.

Wider 5" lock stiles offer the added benefit of a broader selection of standard hardware options, allowing Flushline™ Entrances to match other entrances in the building for a total building solution. For maximum versatility, Flushline™ Entrances can also accommodate geometric aluminum framed vision lites.



Kawneer Company, Inc.
Technology Park / Atlanta
555 Guthridge Court
Norcross, GA 30092

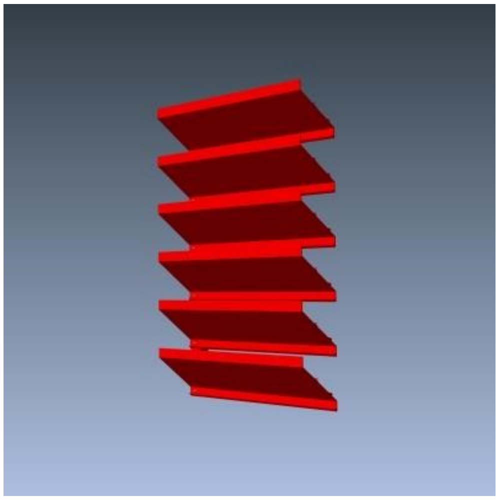
kawneer.com
770 . 449 . 5555

KAWNEER
AN ARCONIC COMPANY

MODEL 450XPI

STANDARD CONSTRUCTION

- Material: Extruded Aluminum 6063-T6
- Vertical Supports: 5” x 2” x .125” Aluminum Support Channels
- Blades 4” (102mm) deep, .081” (2.1mm) nominal wall thickness
- Blade Spacing: 5” (127mm) on center
- Finish: Mill

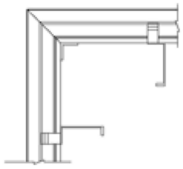


OPTIONAL ACCESSORIES

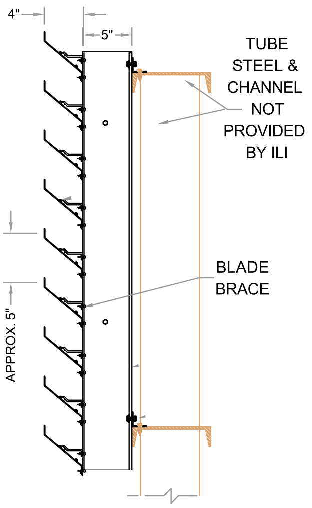
- Cap Flashing
- Hinged Access Panels
- Visible Mullions
- Invisible Mullions for continuous blade appearance

FINISHES

- 2 coat fluropolymer: Kynar® 500 / Hylar® 5000 custom colors available in 70% PVDF (AAMA 2605) or 50% PVDF (AAMA 2604) formulas.
- 3 coat fluropolymer: Kynar 500 / Hylar 5000 custom colors available in 70% PVDF (AAMA 2605) formulas.
- Anodic finishes: Class I and Class II in Clear, Light/Medium/Dark Bronze, Champagne, and Black.
- Prime coat
- Mill



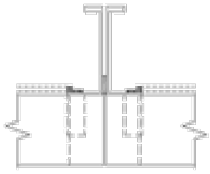
Corner View



Vertical Section

SUGGESTED SPECIFICATIONS

- General: Furnish and install where indicated on drawings 4” (102mm) Extruded Aluminum Inverted Equipment Screen Model 450XPI as manufactured by Industrial Louvers, Inc., Delano, MN.
- Material: Extruded aluminum supports and blades shall be one piece 6063-T6 alloy. Vertical supports shall have a material thickness of .125” (3.2mm). Fixed inverted blades shall have a material thickness of .081” (2.1mm). Supports and blades shall be joined by stainless steel mechanical fastener.
- Support: Structural Steel is designed, engineered and provided by others.



Invisible Vertical Mullion

Qty.	Size: Actual ○ Width	R.O. ● Height	Mullion Type	No. of Sections	Notes
			Invisible		
			Invisible		
			Invisible		
☐	Sill flashing:		Job #:	Project:	
☐	Screen:		Location:		
☐	Finish: Choose from dropdown		Representative:		
	Color:		Approved for fabrication	☐ As is	☐ As noted
☐	Other:		By:		Date:

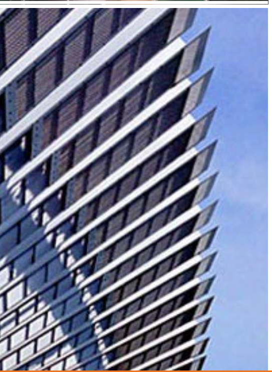
Please sign and return

CATALOG NO. 450XPI Rev: FEB 2015

FINISHES

Industrial Louvers, Inc.



Coatings and anodized finishes make each product unique and are key to durability and long-term value of projects. Beautiful, durable fluoropolymer coatings are resistant to chalking, abrasion and ultraviolet degradation, and keep products looking new for years. ILI offers the advantage of in-house painting for 70% PVDF finishes. Finishing product in-house ensures we can enforce the highest possible quality standards, and significantly reduces the potential for damage from shipping to an outside finisher. It also reduces lead times and provides us with the flexibility to manage our own finishing schedule.

ILI's standard 70% PVDF finish is Fluropon Pure® from Sherwin-Williams line of coatings. With significantly reduced hazardous materials, these coatings are formulated with material transparency and environmental impacts in mind. Fluropon Pure coatings offer opportunities to comply with material disclosure and optimization credits in LEED® V4 and comply with Red List Free requirements for Living Building Challenge projects. ILI is committed to sustainable practices on all of the projects in which we participate, not just on those that require it. All of ILI's standard colors and thousands of custom-matched colors are available in this formulation.

Fluropon Pure Specifications

- Meets or exceeds AAMA 2605
- Appropriate for building components designed for high-rise and monumental structures.
- Appropriate for projects located in areas with intense sunlight, extreme temperatures or high levels of atmospheric pollutants.
- Formulated without the use of PFOA, hexavalent chromium, cadmium, lead and phthalates.

Our wide selection of standard finishes will complement nearly any exterior. We also custom-match colors and offer exotic patterns and marine finishes. Please note that some custom finishes may not be available in the Fluropon Pure formulation.

The colors on this card are as close to actual as reproduction technology allows.

www.IndustrialLouvers.com
ilinfo@IndustrialLouvers.com

+1 763.972.2981 • 1.800.328.3421
511 South 7th Street Delano, MN 55328-9125

Coatings and anodized finishes make each product unique and are key to durability and long-term value of projects. Industrial Louvers, Inc. (ILI) offers a comprehensive range of painted and anodized finishes. Our wide selection of standard finishes will complement nearly any exterior. We also custom-match colors and offer exotic patterns and marine finishes.

Standard Color Selections

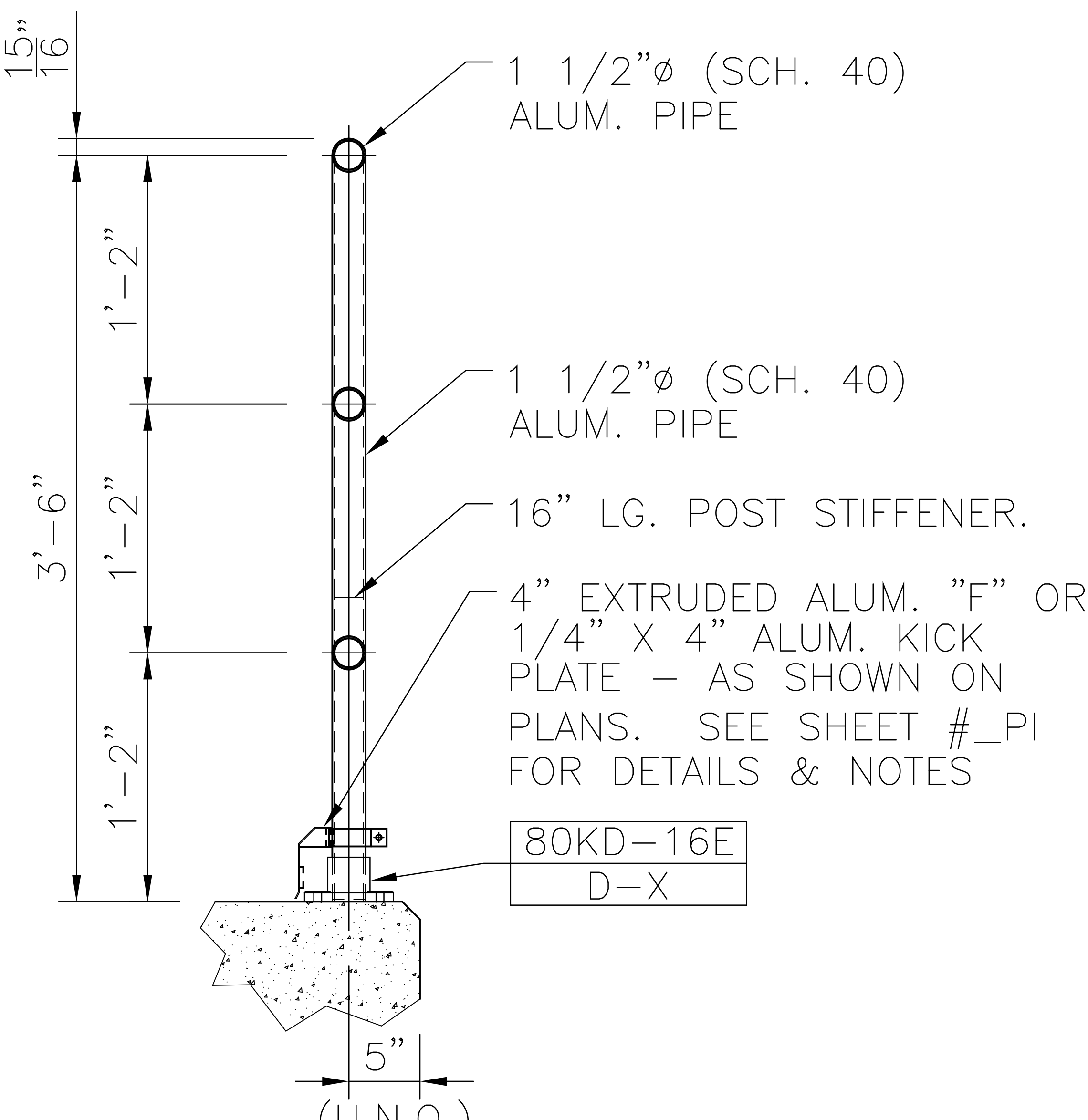
Bone White 391A580FP	Stone White 391A454FP	Seawolf Beige 397F199FP	Classic II Champagne Pearl 399C245FP	Oriental Ivory 393A361FP
Beige 393F061FP	Classic II Silver 399B697FP	Rawhide 397A538FP	Sandstone 393X321FP	Statuary Bronze 397F262FP
Fashion Grey 392A849FP	Brick Red 394F146FP	Sierra Tan 397A537FP	Dark Brown 397A536FP	Charcoal 392A848FP
Black 398F019FP	Military Blue 396A933FP	Interstate Green 395F081FP	Anodic Clear 399C210FP	Dark Bronze 397A606FP

(70% PVDF) Fluropon Pure® Color Codes

Note that colors are representations only and will not match actual finishes. When making a final color selection, please request a hard copy of our finish guide or samples of color chips.

Louvered Screen Example Picture:

ANODIZED ALUMINUM

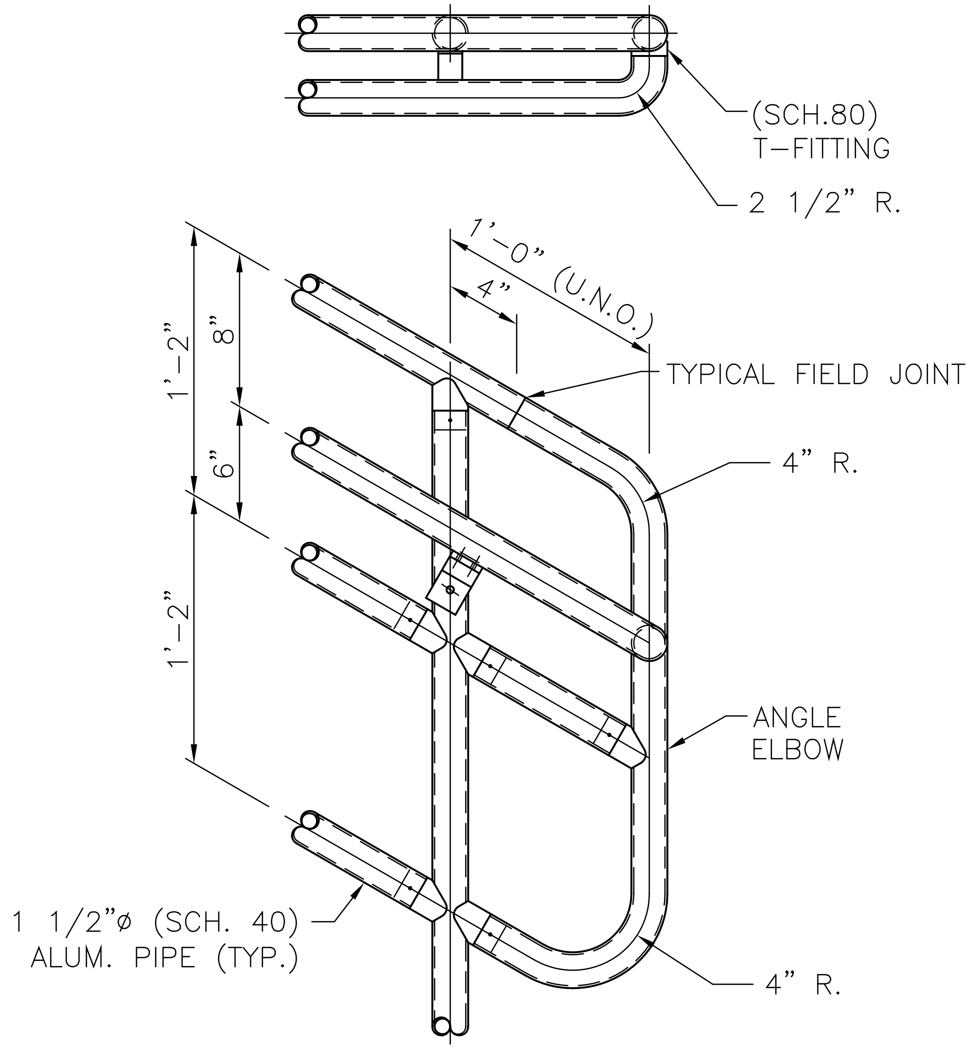


SECTION X / D-1

ROCKY MOUNTAIN RAILINGS

11839 E 51st AVE DENVER, CO 80239 PHONE (303) 432-0003 FAX (303) 432-2038

ANODIZED ALUMINUM



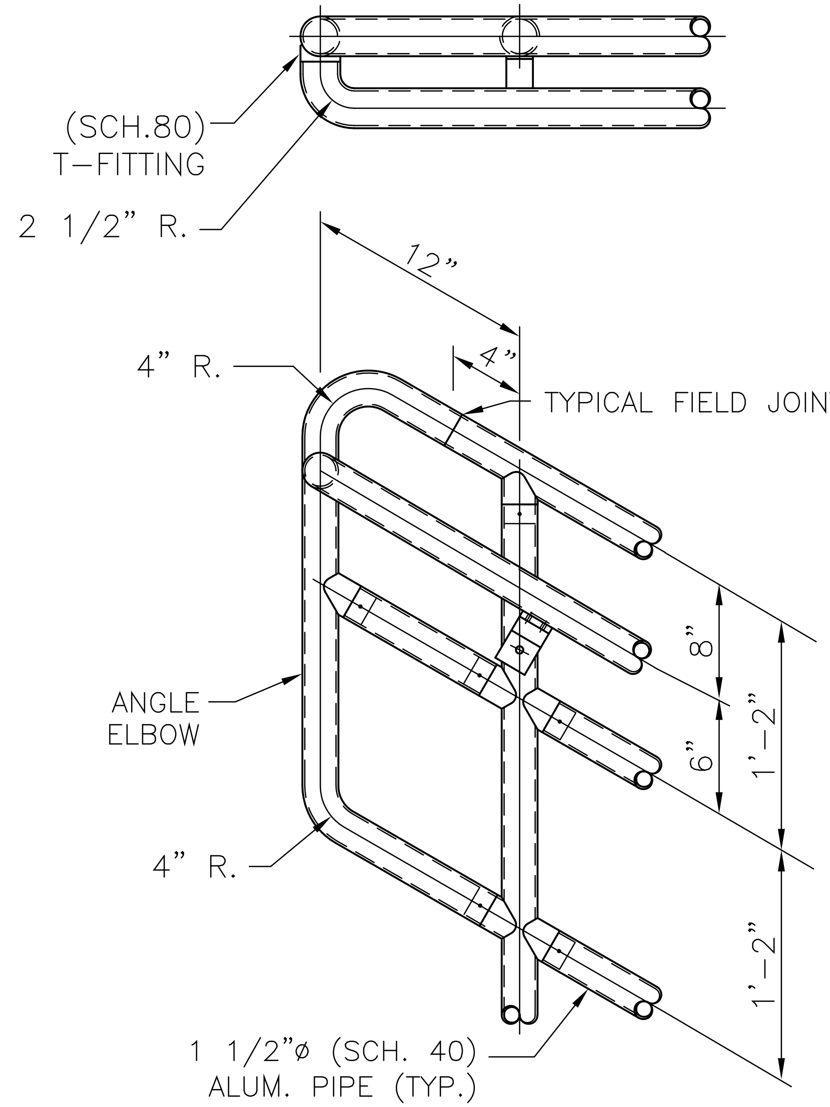
BOTTOM RAKE P—END W/ HANGOFF

25KD—5F

ROCKY MOUNTAIN RAILINGS

11839 E 51st AVE DENVER, CO 80239 PHONE (303) 432—0003 FAX (303) 432—2038

ANODIZED ALUMINUM



TOP RAKE P-END W/ HANGOFF

25KD-6G

ROCKY MOUNTAIN RAILINGS
11839 E 51st AVE DENVER, CO 80239 PHONE (303) 432-0003 FAX (303) 432-2038

CITY OF RICHMOND

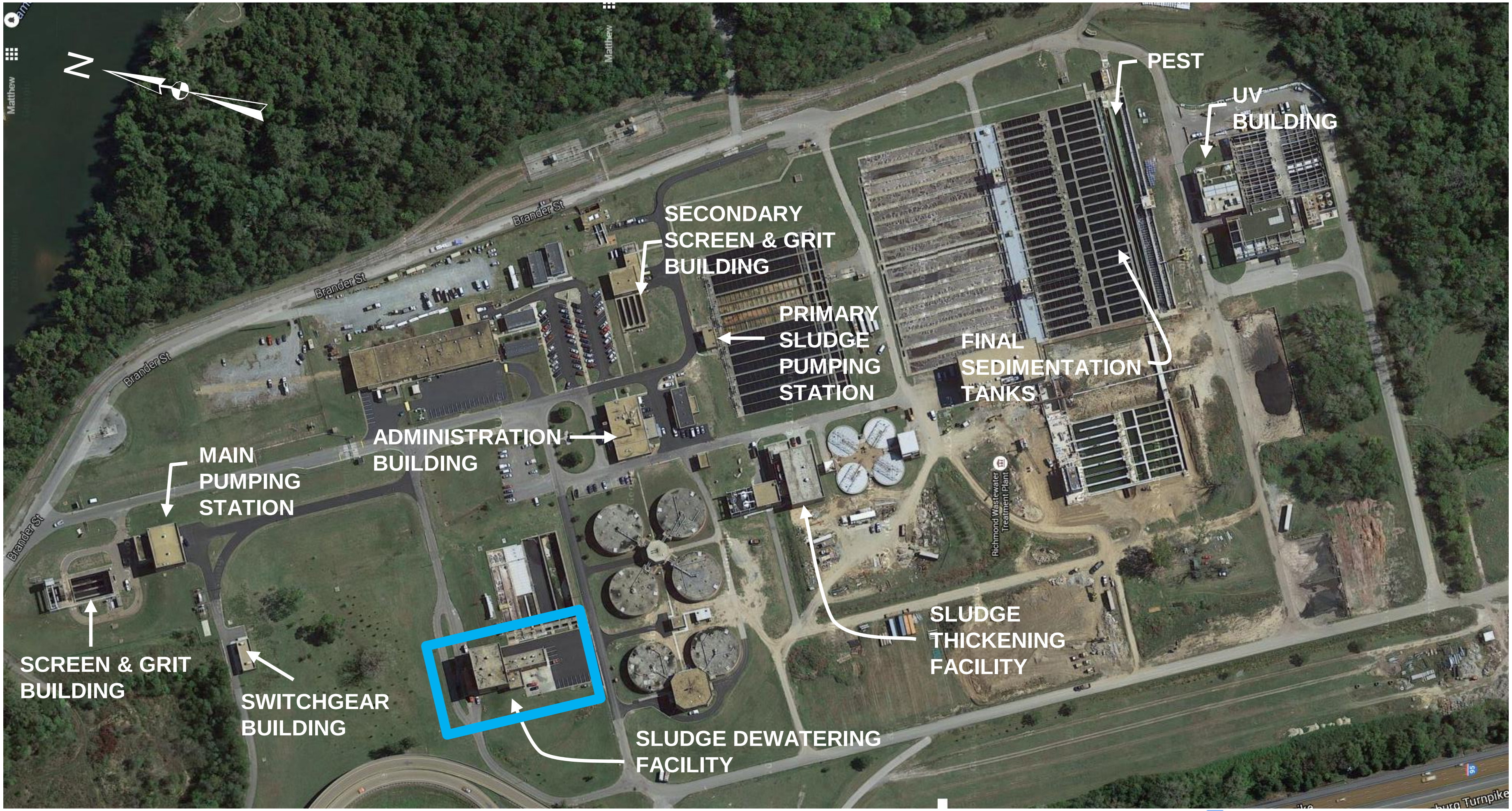
GREELEY AND HANSEN

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers

DANIELS & ASSOCIATES, P.C.
Consulting Engineers

Sludge Dewatering Facility Site Plan

Richmond WWTP Overview

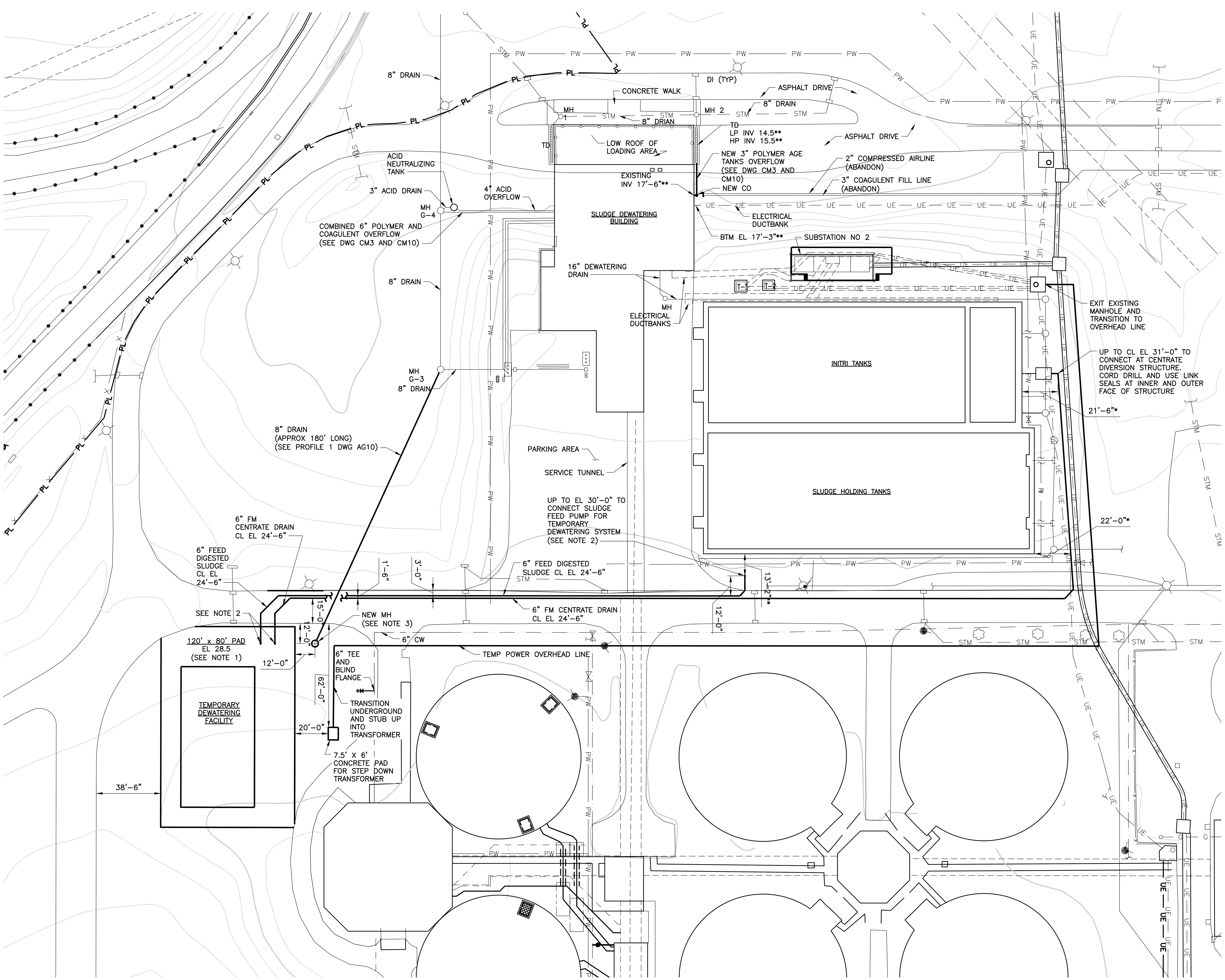


RICHMOND-PETERSBURG TURNPIKE ROUTE I-95

GREELEY AND HANSEN

Environ-Civil Engineering, Ltd.

DANIELS & ASSOCIATES, P.C. Consulting Engineers



NEW SITE PLAN

SCALE: 1" = 30'

NOTES:

1. LEVEL COMPACTED SOIL PAD TO BE RETURNED TO PRE-CONSTRUCTION CONDITIONS AFTER CONSTRUCTION IS COMPLETED.
2. CONTRACTOR TO INSTALL 6" CENTRATE AND 6" SLUDGE FEED TO TEMPORARY DEWATERING PAD. CONNECT PIPES TO TEMPORARY DEWATERING FACILITY AT ONE END AND TEMPORARY DEWATERING FEED PUMPS IN SLUDGE STORAGE TANK BY THE TEMPORARY DEWATERING CONTRACTOR.
3. TEMPORARY DEWATERING FACILITY WASTE SUCH AS WASH-DOWN DRAIN OR ROOF DRAIN, SHALL BE CONNECTED TO NEW MANHOLE.

PRELIMINARY 90%
JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BEC	APPROVED	NO.	DATE	APPD	DESCRIPTION	SCALE: 30 0 30 60 FT 1"=30'
DRAWN PMY						
CHECKED BDC						

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

GENERAL

NEW SITE PLAN – DEWATERING

PROJECT NO. 02188-BG039
DWG AG9
SHEET 10 OF XX
DATE JULY 2019 REV 0

S:\0218_RICHMOND\WW ENG SERVICES 02188\BG-039 DEWATERING CENT DESIGN\21 CADD\21.05 WORKING DWGS\RC839-AG09 YONTS, PHILIP 2019/0 /14 10:50 AM

CITY OF RICHMOND

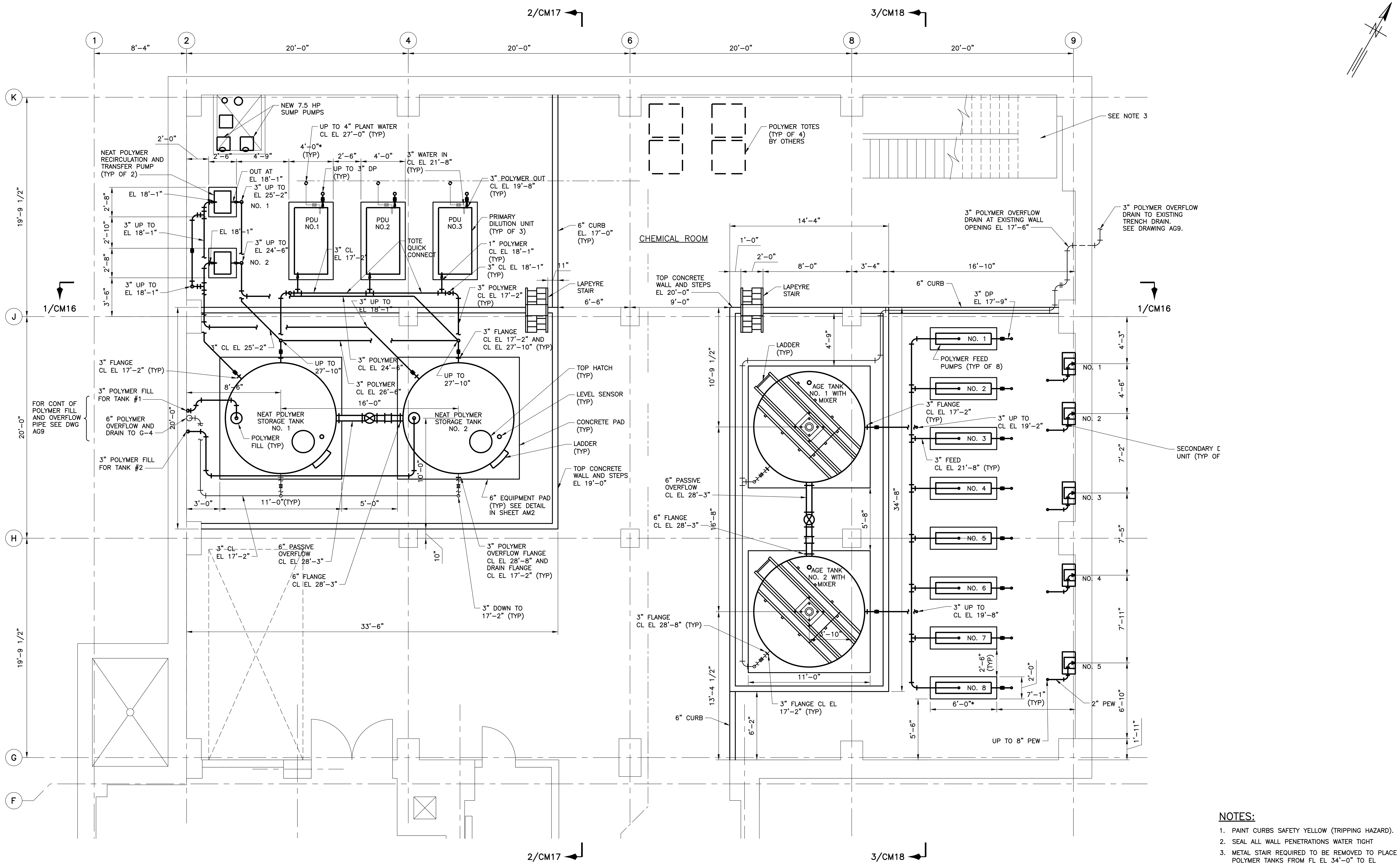
GREELEY AND HANSEN

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers

DANIELS & ASSOCIATES, P.C.
Consulting Engineers

Sludge Dewatering Facility Floor Plans and Elevations

Sludge Dewatering Facility West Elevation



NOTES:

1. PAINT CURBS SAFETY YELLOW (TRIPPING HAZARD).
2. SEAL ALL WALL PENETRATIONS WATER TIGHT
3. METAL STAIR REQUIRED TO BE REMOVED TO PLACE POLYMER TANKS FROM FL EL 34'-0" TO EL 16'-6". REINSTALL STAIRS AFTER TANK PLACEMENT.

NEW BASEMENT PLAN AT FL EL 16'-6"

SCALE: 1/4" = 1'-0"

PRELIMINARY 90%

JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BVB	APPROVED	NO.	DATE	APPD
DRAWN PMY				
CHECKED GLG				

DESCRIPTION

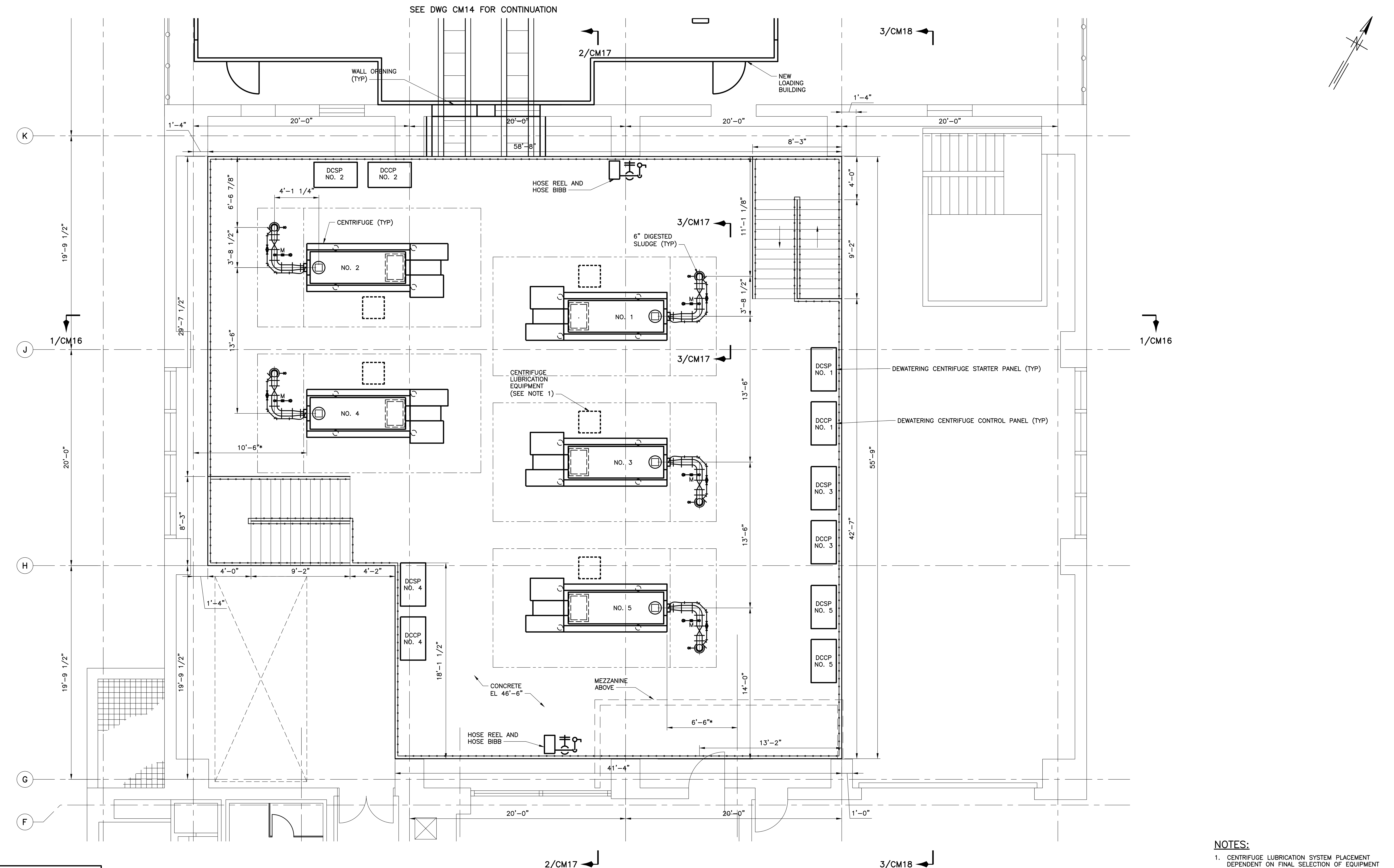
SCALE 4 0 4 8 FT 1/4"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

SLUDGE DEWATERING BUILDING MECHANICAL

NEW BASEMENT PLAN AT FL EL 16-6

PROJECT NO. 02188-BG039
DWG CM10
SHEET 145 OF XX
DATE JULY 2019 REV 0



NOTES:

1. CENTRIFUGE LUBRICATION SYSTEM PLACEMENT DEPENDENT ON FINAL SELECTION OF EQUIPMENT

NEW CENTRIFUGE PLATFORM PLAN AT EL 46'-6"

SCALE: 1/4" = 1'-0"

PRELIMINARY 90%

JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BVB
DRAWN SK
CHECKED GLG
APPROVED

NO.	DATE	APPD	DESCRIPTION

SCALE
4 0 4 8 FT 1/4"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

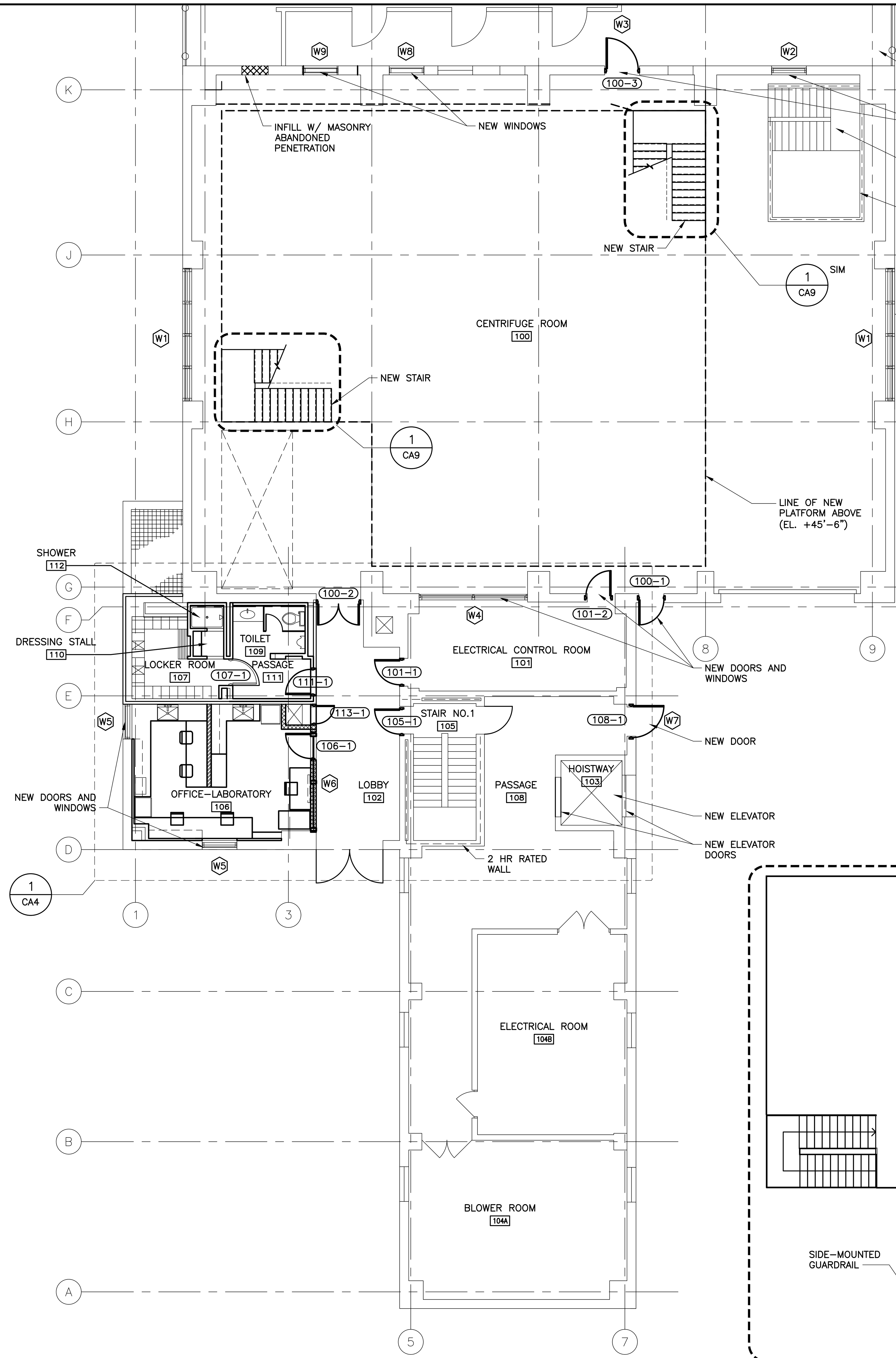
RICHMOND VIRGINIA

SLUDGE DEWATERING BUILDING
MECHANICAL

NEW PLATFORM PLAN AT EL 46'-6"

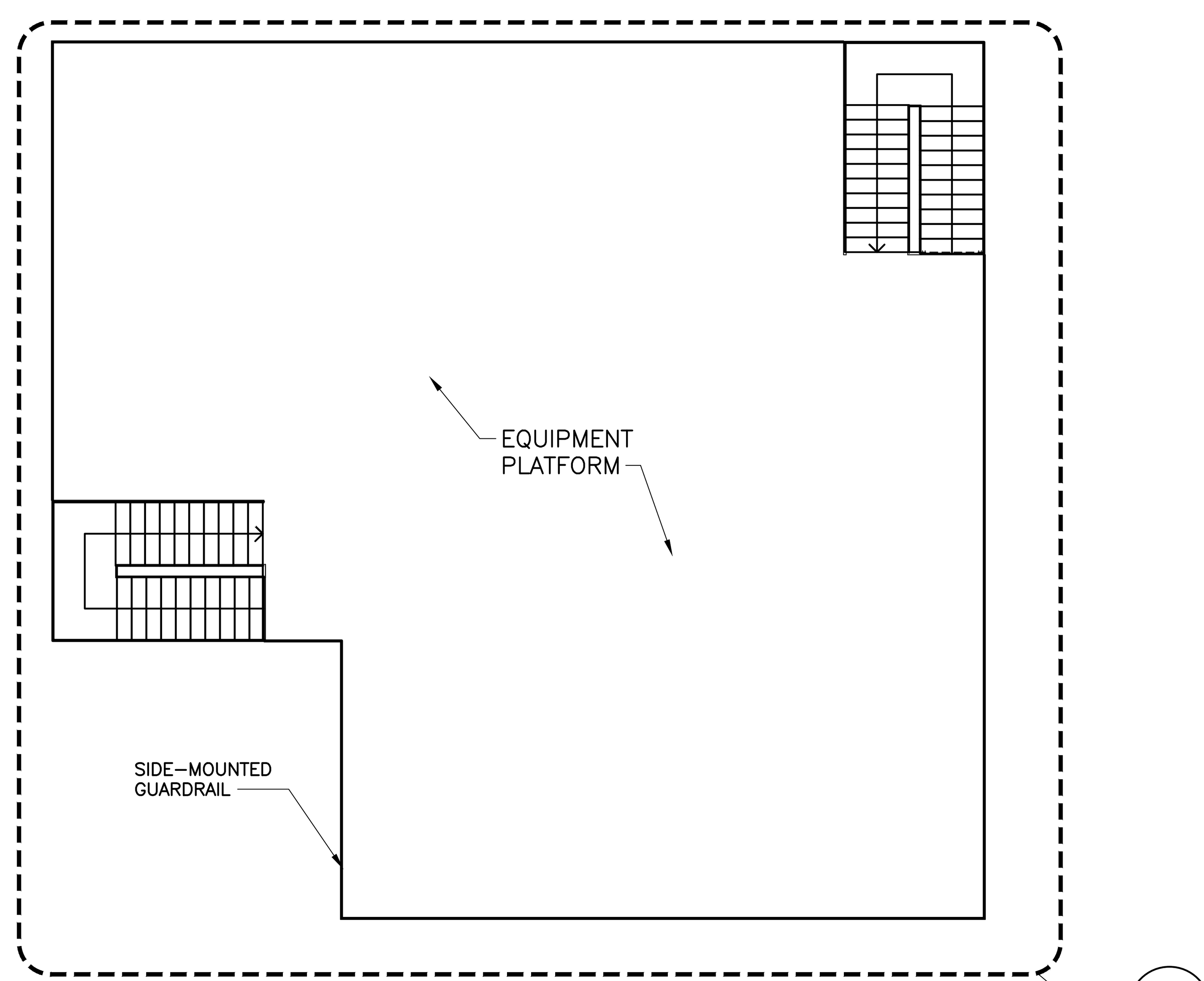
PROJECT NO. 02188-BG039
DWG CM15
SHEET 150 OF XX
DATE JULY 2019 REV 0

S:\0218_RICHMOND\WW ENG SERVICES 02188\BG-039 DEWATERING CENT DESIGN\21 CADD\21.05 WORKING DWGS\RC839-CM15 YONTS, PHILIP



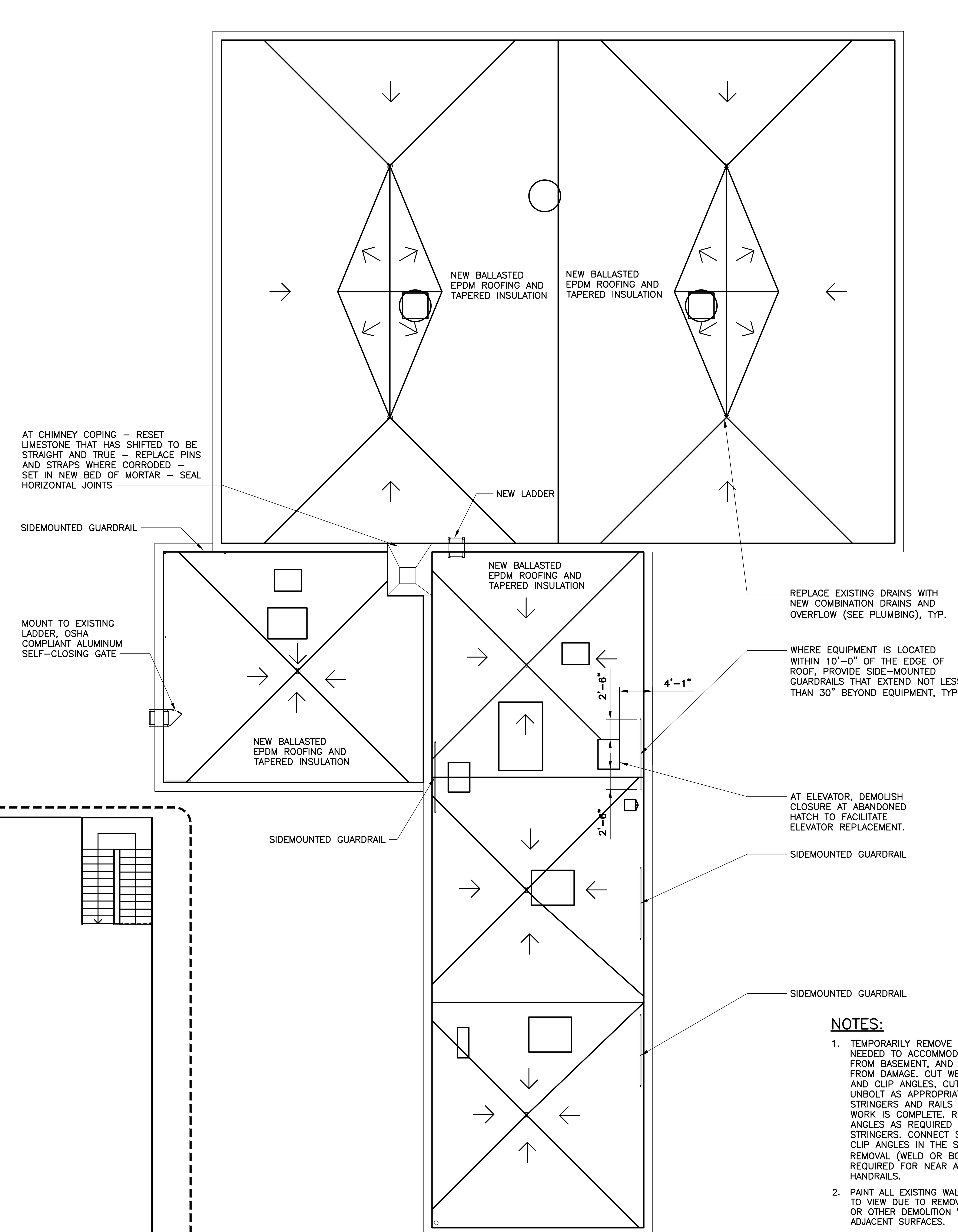
PLAN AT EL 34'–0"

SCALE: 1/8" = 1'–0"



PLAN AT EL 46'–6"

SCALE: 1/8" = 1'–0"



ROOF PLAN

SCALE: 1/8" = 1'–0"

NOTES:

1. TEMPORARILY REMOVE STAIRS AND RAILS, AS NEEDED TO ACCOMMODATE THE REMOVAL OF TANKS FROM BASEMENT, AND STORE SAFELY TO PROTECT FROM DAMAGE. CUT WELDS BETWEEN STRINGERS AND CLIP ANGLES, CUT CLIP ANGLE ANCHORS OR UNBOLT AS APPROPRIATE. REPLACE STAIR STRINGERS AND RAILS ONCE THE TANK DEMOLITION WORK IS COMPLETE. REUSE OR REPLACE CLIP ANGLES AS REQUIRED TO SUPPORT LANDINGS AND STRINGERS. CONNECT STRINGERS AND LANDINGS TO CLIP ANGLES IN THE SAME MANNER AS BEFORE REMOVAL (WELD OR BOLT). TOUCH UP PAINT AS REQUIRED FOR NEAR APPEARANCE. RESET HANDRAILS.
2. PAINT ALL EXISTING WALL SURFACES NEWLY EXPOSED TO VIEW DUE TO REMOVAL OF EXISTING EQUIPMENT OR OTHER DEMOLITION WORK. PAINT TO MATCH ADJACENT SURFACES.
3. SEE CA9 FOR ROOF DETAILS.
4. ELECTRICAL CONTROL ROOM (F1 OCCUPANCY) IS ANCILLARY TO MAIN OCCUPANCY (F2) AND <10% OF FLOOR AREA – NO SEPARATION REQUIRED.

PRELIMINARY 90%

JUNE 2019

GREELEY AND HANSEN
ARCHITECTS
100 S WACKER DR. SUITE 1400
CHICAGO, IL 60606

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED JL	APPROVED
DRAWN JXW	
CHECKED TCB	

NO.	DATE	APPD	DESCRIPTION

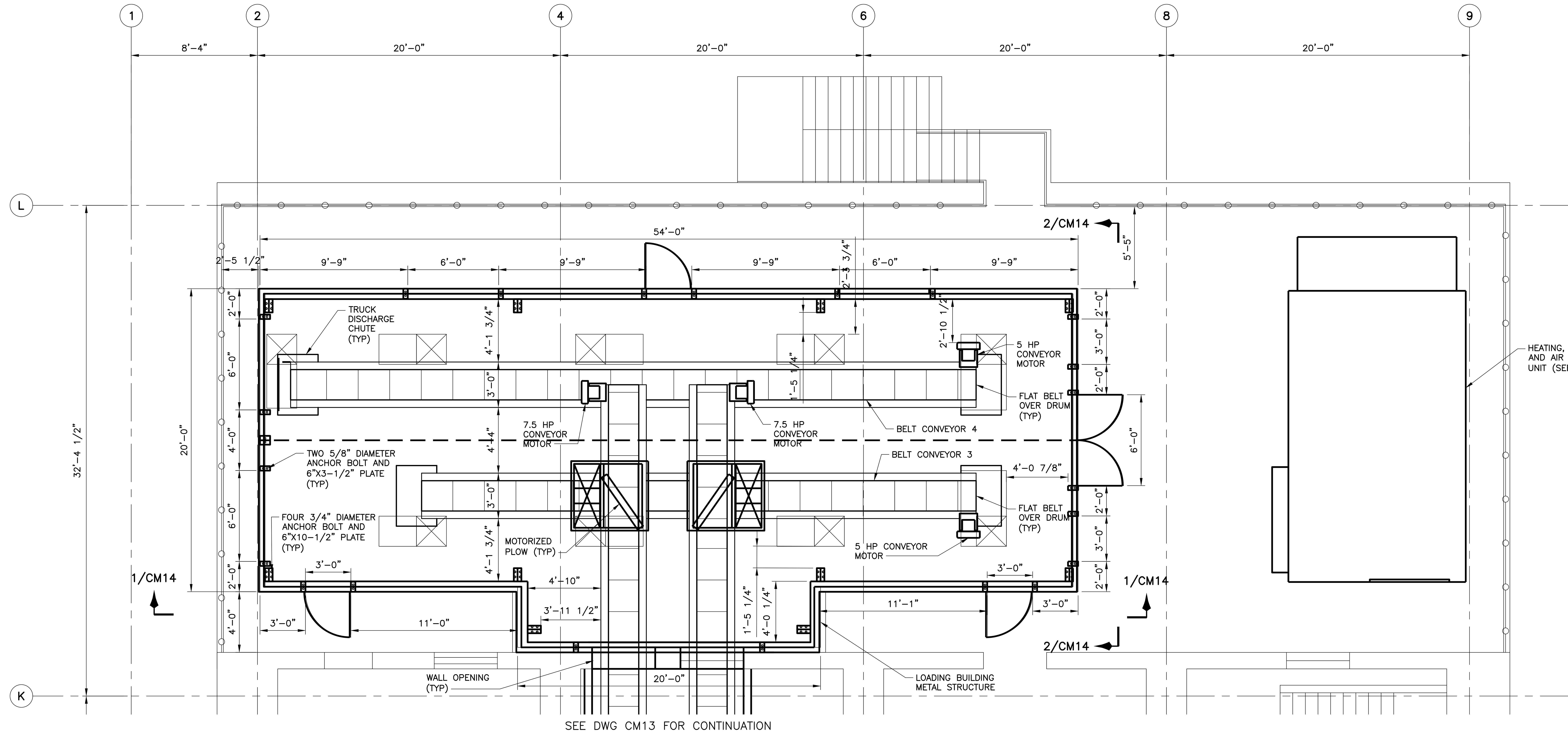
SCALE 1/8"=1'–0" (8 0 8 16 FT)

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

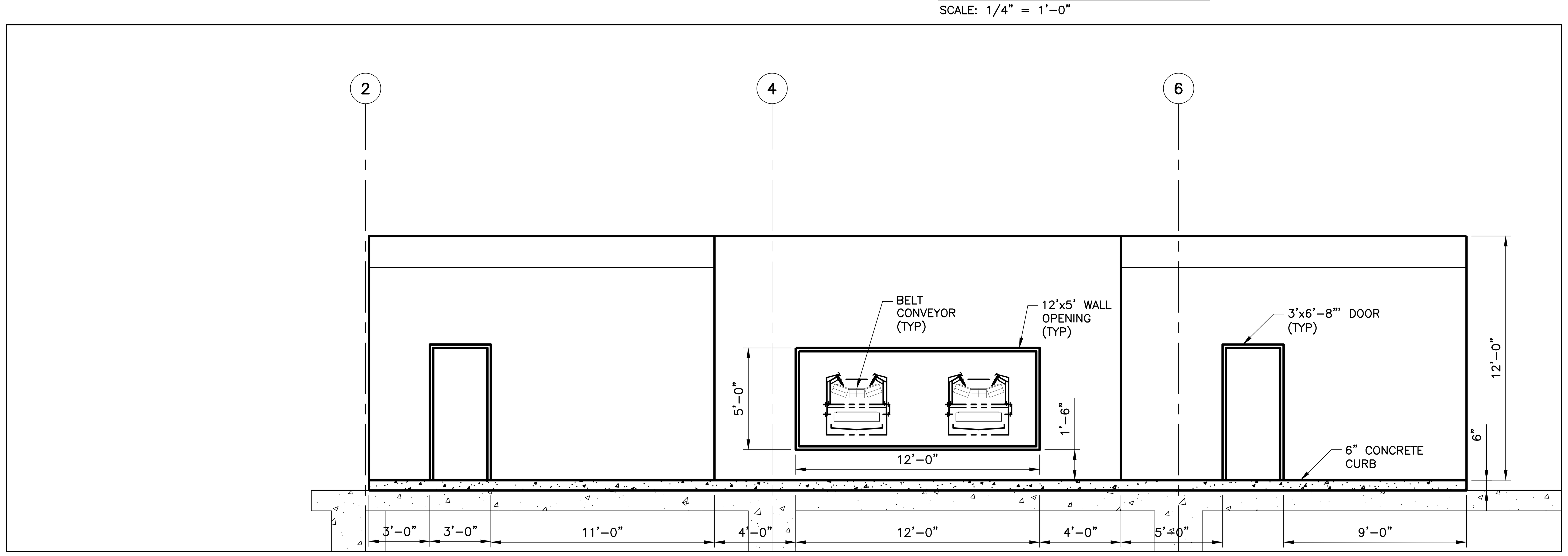
SLUDGE DEWATERING BUILDING
ARCHITECTURAL

PLAN AT EL 34'–0" AND ROOF PLAN

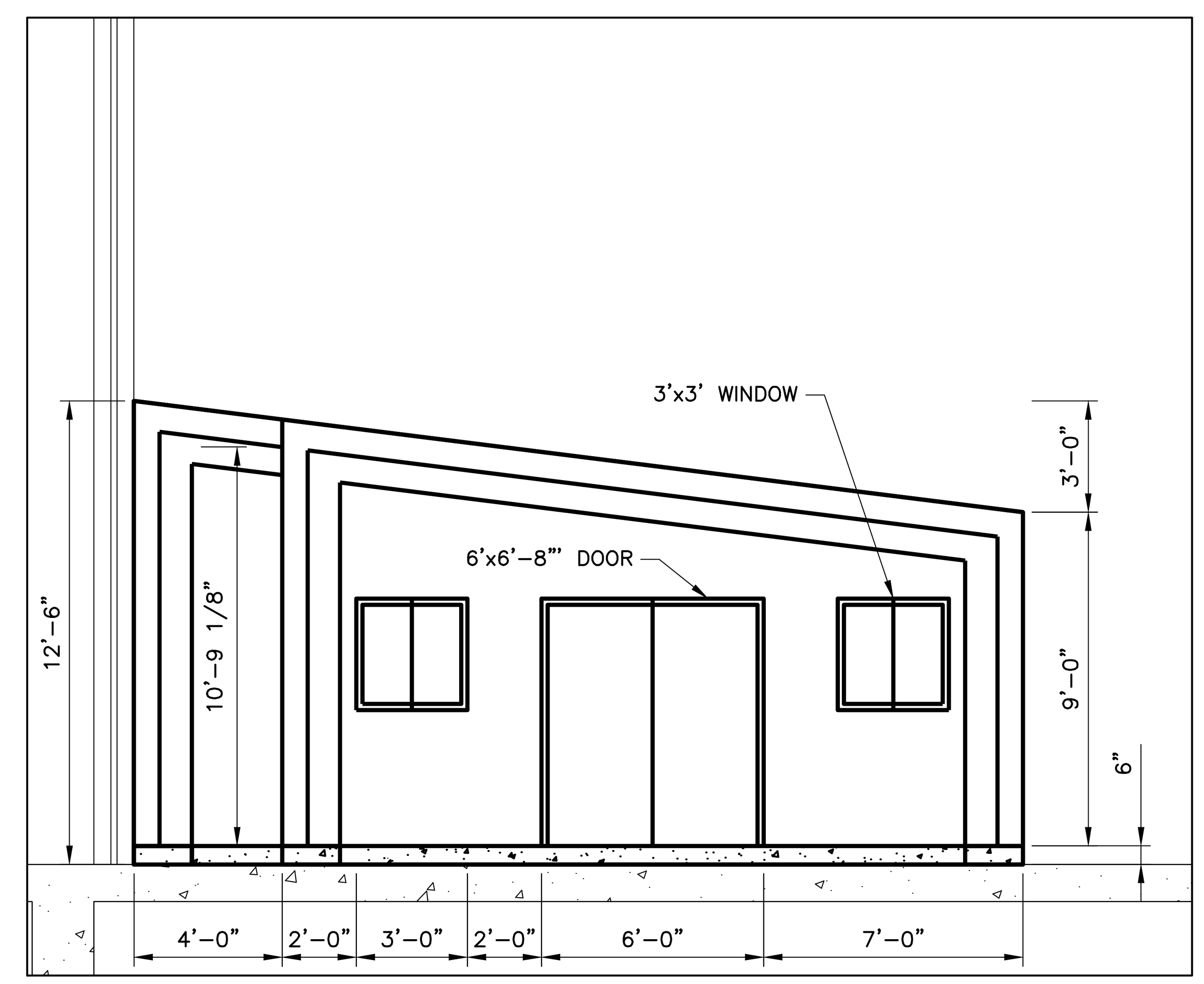
PROJECT NO.	02188-BG039
DWG	CA3
SHEET	96 OF XX
DATE	JULY 2019
REV	0



PLAN AT EL 34'-0"
SCALE: 1/4" = 1'-0"



SECTION 1/CM14
SCALE: 1/4" = 1'-0"



SECTION 2/CM14
SCALE: 1/4" = 1'-0"

PRELIMINARY 90%
JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	BVB	APPROVED
DRAWN	SK	
CHECKED	GLG	

NO.	DATE	APPD	DESCRIPTION

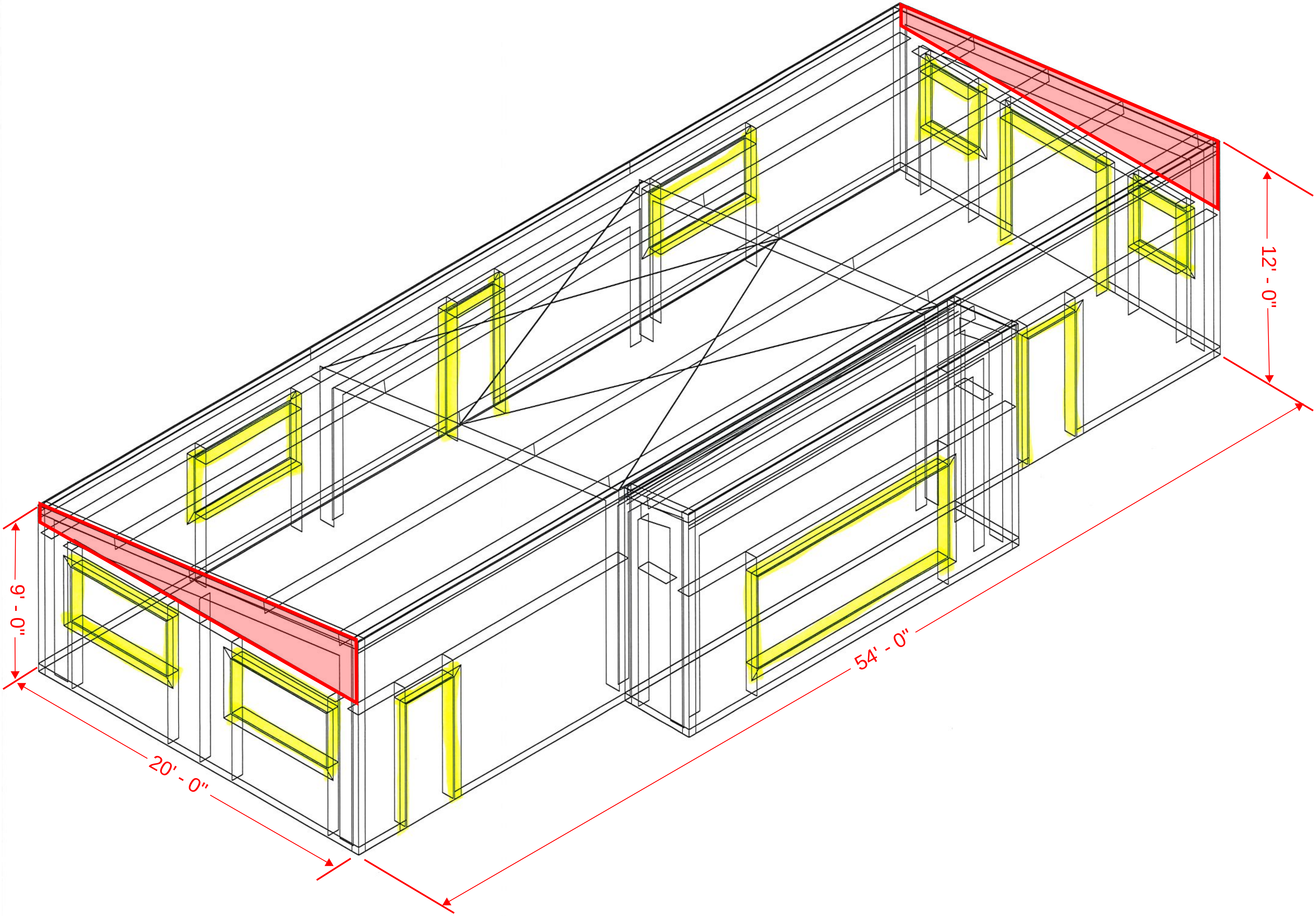
SCALE
4 0 4 8 FT
1/4"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

SLUDGE DEWATERING BUILDING
MECHANICAL

NEW LOADING BUILDING AND CONVEYORS PLAN AT FL EL 34'-0"

PROJECT NO.	02188-BG039	
DWG	CM14	
SHEET	142	OF XX
DATE	JULY 2019	REV 0

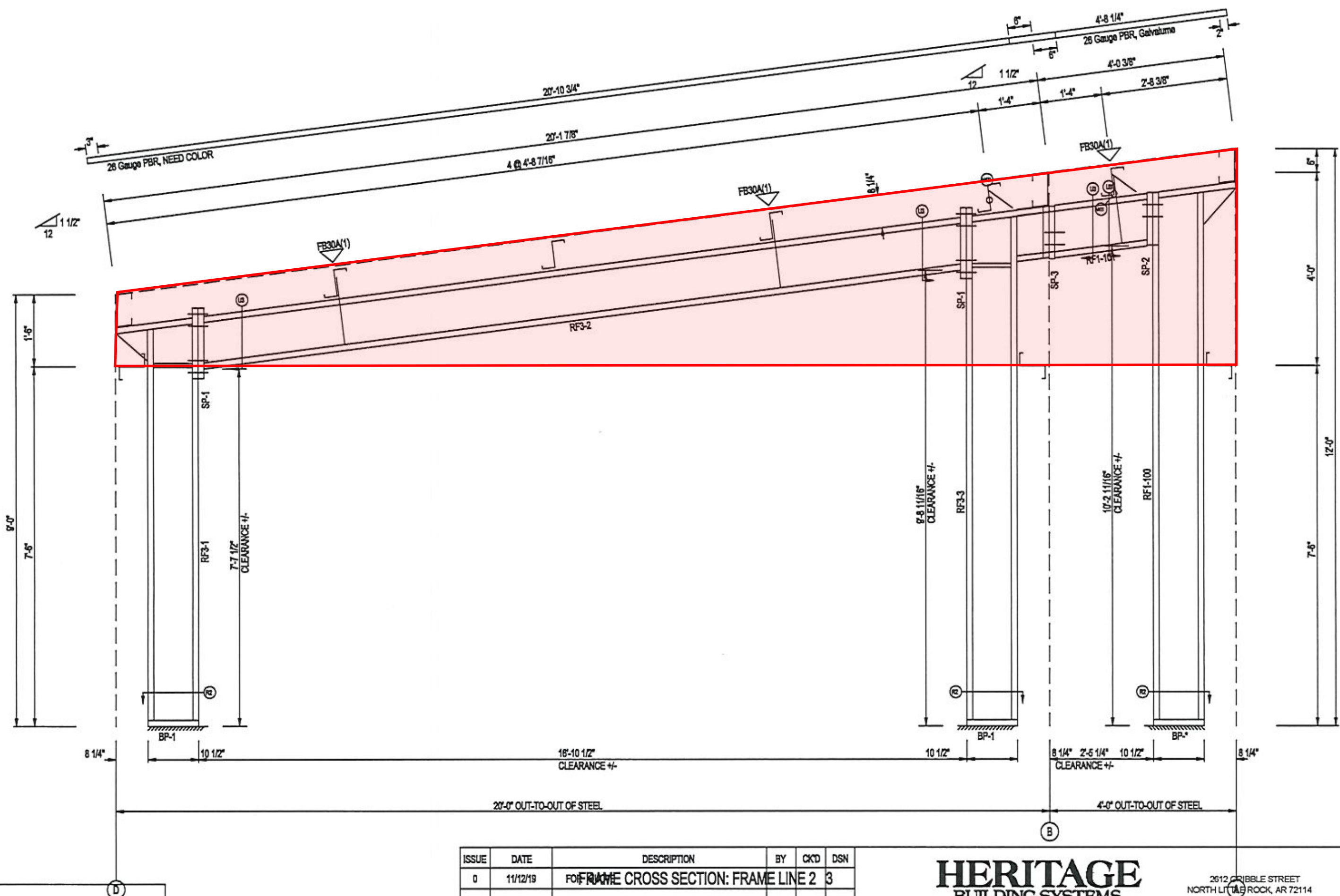


9' - 0"
20' - 0"
54' - 0"
12' - 0"

SPLICE PLATE & BOLT TABLE									
Mark	Qty Top	Bot	Int	Type	Dia	Length	Width	Thick	Length
SP-1	4	4	0	A325	3/4"	1 3/4"	6"	3/8"	1'-4 7/8"
SP-2	4	0	0	A325	3/4"	1 3/4"	6"	3/8"	1'-0 3/4"
SP-3	4	0	0	A325	3/4"	1 3/4"	6"	3/8"	11 1/8"

BASE PLATE TABLE			
Col Mark	Plate Size Width	Thick	Length
BP-*	6"	3/8"	10 1/2"

FLANGE BRACES: BOTH SIDES(UNLESS NOTED)
FBxxA(1): xx=length(in)
A - L2X2X14G



GENERAL NOTES:

1. ALL BOLTED JOINTS WITH A325M-09 TYPE 1 BOLTS ARE SPECIFIED AS SNUG TIGHTED JOINTS IN ACCORDANCE WITH THE "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS, JUNE 30, 2004". PRETENSIONING METHODS, INCLUDING TURN-OF-NUT, CALIBRATED WRENCH, TWIST OFF TYPE TENSION BOLTS OR DIRECT TENSION INDICATOR ARE NOT REQUIRED. INSTALLATION INSPECTION REQUIREMENTS FOR SNUG TIGHT BOLTS (SPECIFICATION FOR STRUCTURAL JOINTS SECTION 9.1) IS SUGGESTED.
2. ALL FIELD WELDED CONNECTIONS OF SECONDARY FRAMING SHALL BE BOLTED WITH A325 MACHINE BOLTS
3. INSTALL ALL FLANGE BRACES ON COLUMN AND RAFTER AS SHOWN

ISSUE	DATE	DESCRIPTION	BY	CK'D	DSN
0	11/12/19	FRAME CROSS SECTION: FRAME LINE 2	3		

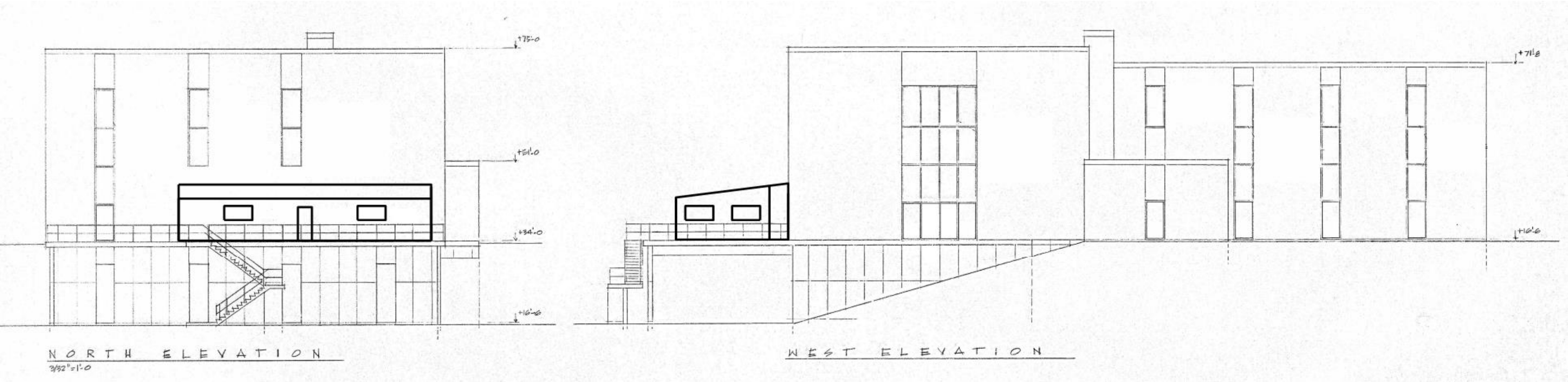
HERITAGE BUILDING SYSTEMS
Established 1979

2612 GRIBBLE STREET
NORTH LITTLE ROCK, AR 72114
1-800-643-5555

PROJECT: Bernardo Vazquez-Bravo
CUSTOMER: Vazquez-Bravo, Bernardo | OWNER:
LOCATION: Richmond, VA, 23235

CAD	DATE	SCALE	PHASE	BUILDING ID	JOB NUMBER	SHEET NUMBER	ISSUE
	11/12/19	N.T.S.	1	A	2344155	E1	0

New Loading Building Elevations



New Loading Building

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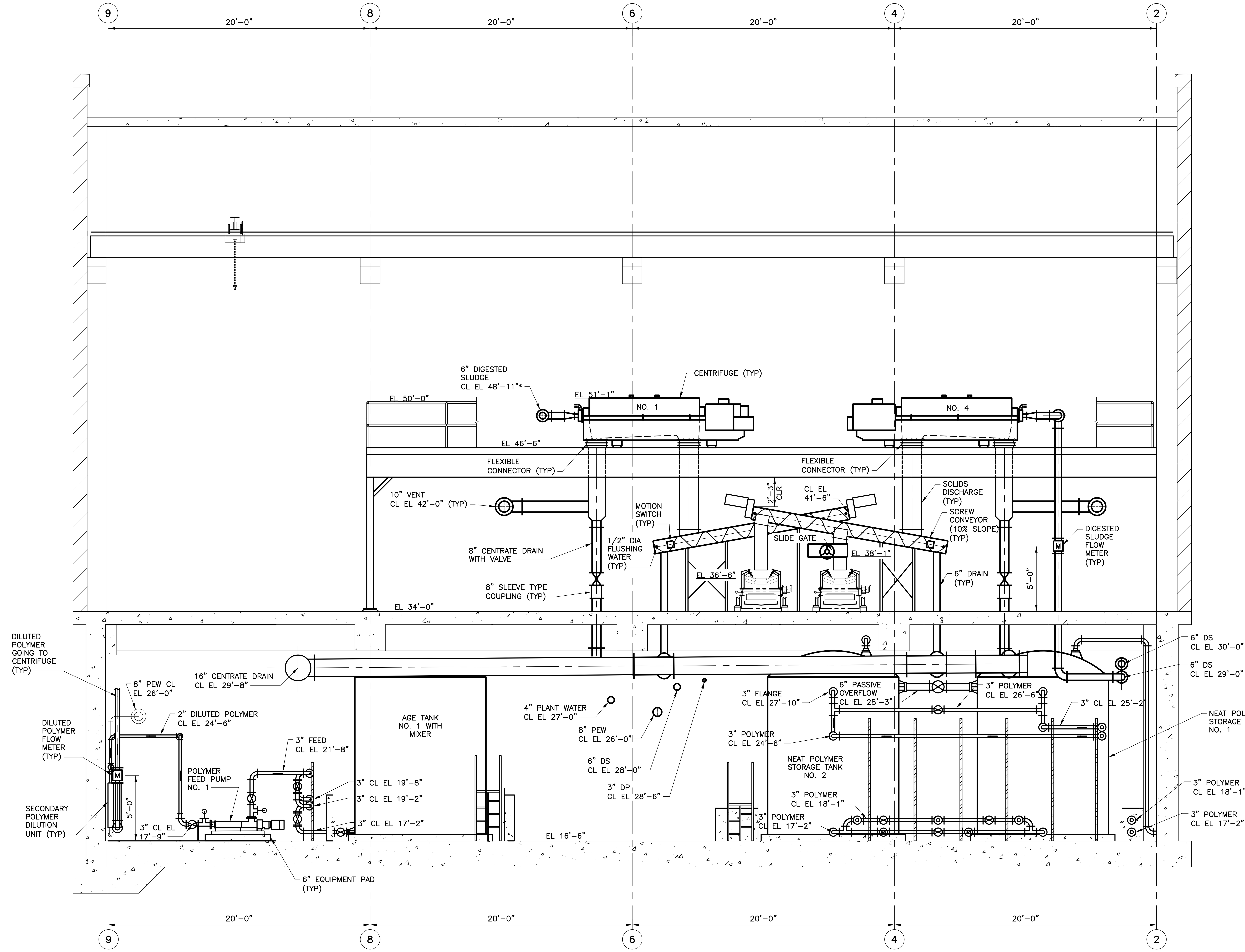
DANIELS & ASSOCIATES, P.C.
Consulting Engineers



SECTION 1/CM10, CM11, CM13, CM15
SCALE: 1/4" 1'-0"

PRELIMINARY 90%
JUNE 2019

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GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BVB
DRAWN PMY
CHECKED GLG

APPROVED

NO.	DATE	APPD	DESCRIPTION

SCALE
4 0 4 8 FT
1/4"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

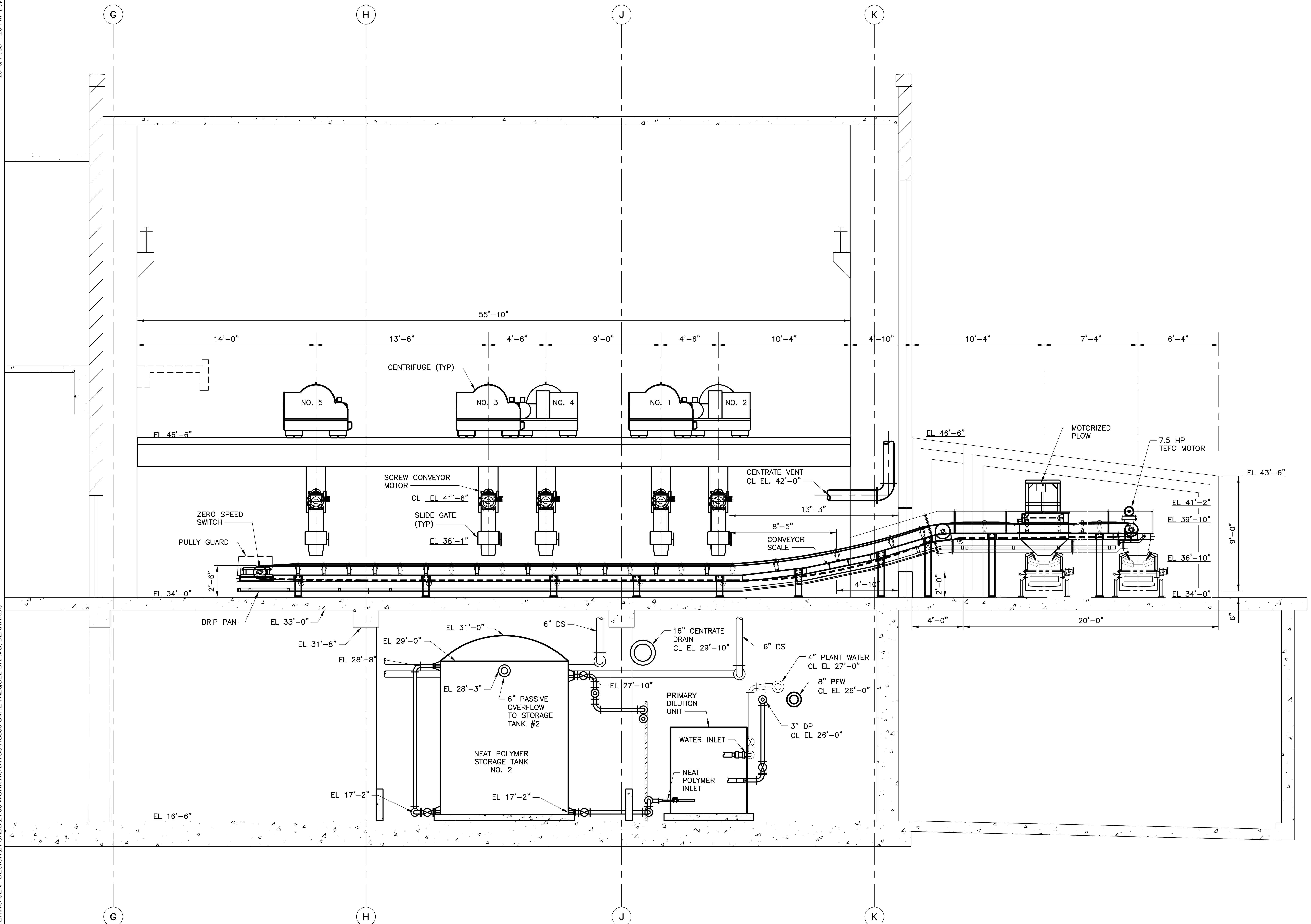
RICHMOND VIRGINIA

SLUDGE DEWATERING BUILDING
MECHANICAL

NEW SECTION

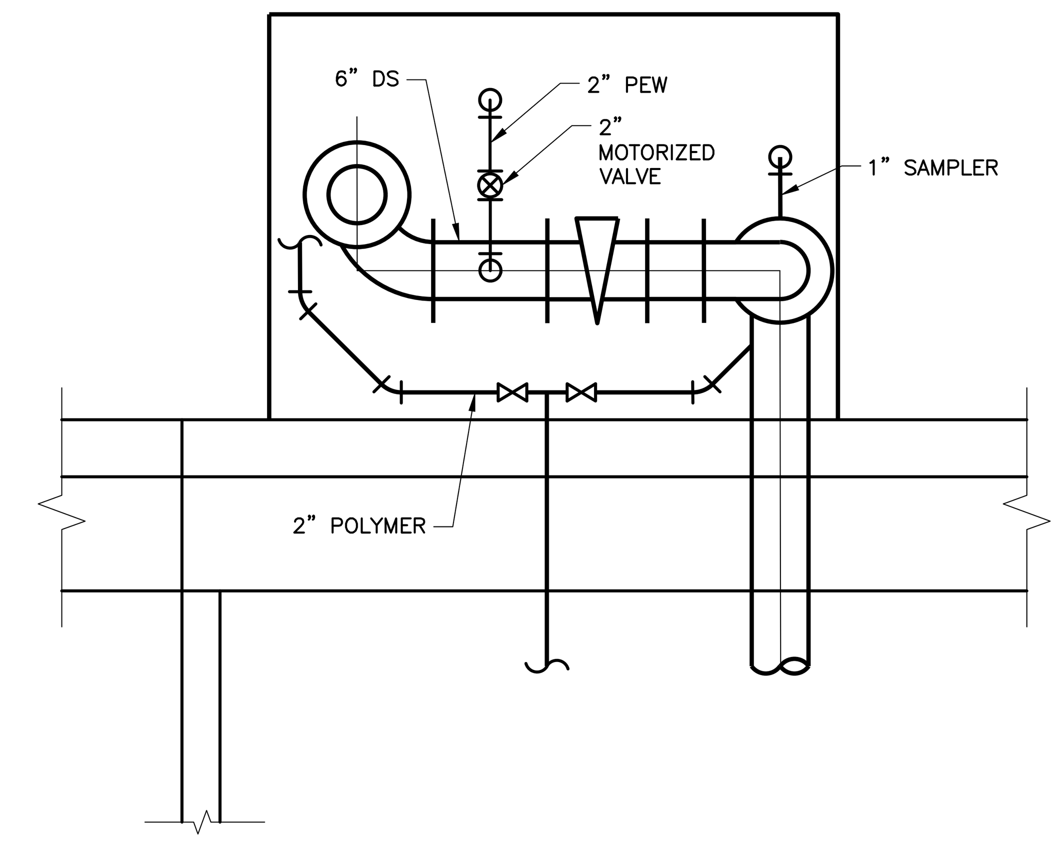
PROJECT NO. 02188-BG039
DWG CM16
SHEET 151 OF XX
DATE JULY 2019 REV 0

S:\0218_RICHMOND\WW ENG SERVICES 02188\BG-039 DEWATERING CENT DESIGN\21 CADD\21.05 WORKING DWGS\RC839-CM1 YONTS, PHILIP
2019/0 /14 12:0 PM
BAR MEASURE 1" ON FULL SIZE SHEETS



SECTION 2/CM10, CM11, CM13, CM15

SCALE: 1/4" = 1'-0"



SECTION 3/CM15

SCALE: 3/4" = 1'-0"

PRELIMINARY 90%

JUNE 2019

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9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BVB	APPROVED	NO.	DATE	APPD	DESCRIPTION
DRAWN PMY					
CHECKED GLG					

SCALE
4 0 4 8 FT
1/4"=1'-0"

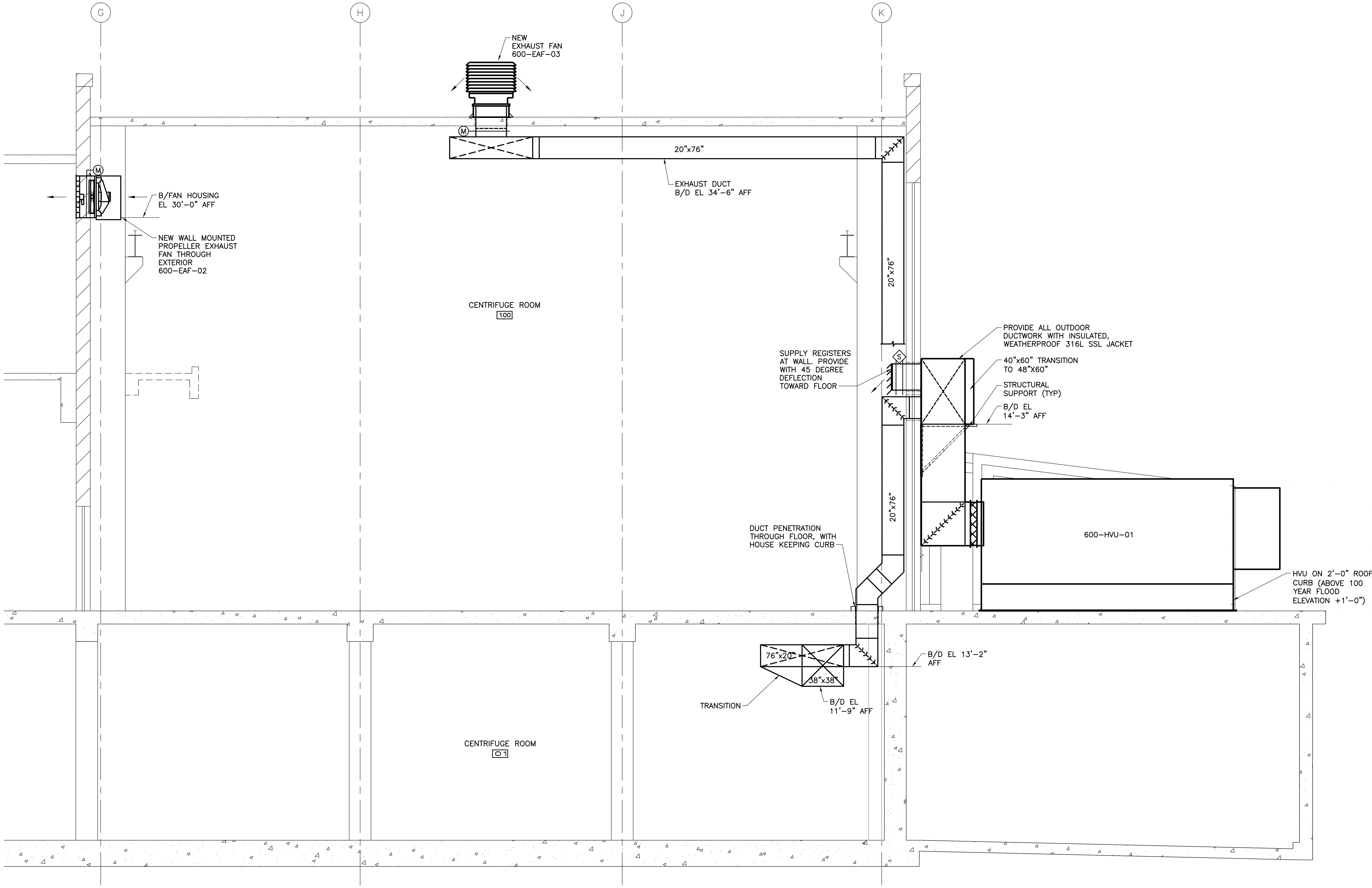
CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

RICHMOND VIRGINIA

SLUDGE DEWATERING BUILDING
MECHANICAL

NEW SECTION

PROJECT NO. 02188-BG039
DWG CM17
SHEET 156 OF XX
DATE JULY 2019 REV 0



SECTION 1/CH06, CH07, CH08, CH09

SCALE: 1/4" 1'-0"

PRELIMINARY 90%
JUNE 2019

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GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED NH
DRAWN SLS
CHECKED GJ
APPROVED

NO.	DATE	APPD	DESCRIPTION

SCALE 4 0 4 8 FT 1/4"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

SLUDGE DEWATERING BUILDING
MECHANICAL

SECTION

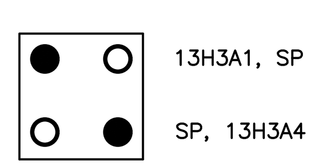
PROJECT NO. 02188-BG039
DWG CH10
SHEET 167 OF XX
DATE JULY 2019 REV 0

2019/11/12 1:11 PM

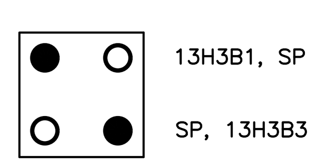
S:\0218_RICHMOND\WW ENG SERVICES 02188\BG-039 DEWATERING CENT DESIGN\21 CADD\21.05 WORKING DWGS\RC839-CH10 VAZQUEZ-BRAVO, BERNARDO

NEW POWER PLAN AT FL EL 34'-0"

SCALE: 1/8" = 1'-0"



SECTION 1
SCALE: NOT TO SCALE



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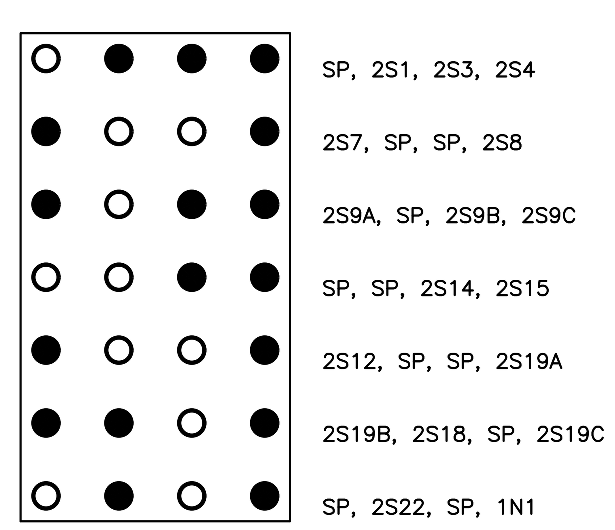
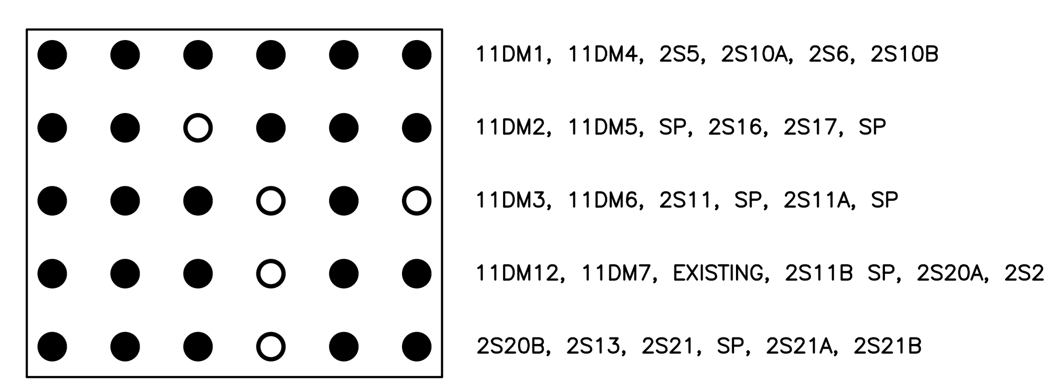
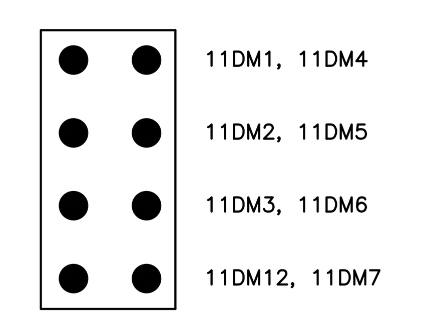
SCALE: NOT TO SCALE



SECTION 3
SCALE: NOT TO SCALE



SECTION 4
SCALE: NOT TO SCALE



SECTION 5
SCALE: NOT TO SCALE

NOTES:

1. DEMOLISH EXISTING DUCTBANK AND INSTALL NEW DUCTBANK WITH NEW CABLES AND CONDUITS AS SHOWN.
2. SPLICE THE NEW CABLES AT EXISTING PULL BOX AND TRANSITION TO EXISTING CONDUITS FEEDING LOADS OUTSIDE OF DEWATERING BUILDING. REFER TO DRAWING CE20 (480V SWITCHGEAR NO.2 ONE LINE DIAGRAM)
3. EXTEND EXISTING CONDUITS TO SPLICE BOX AS REQUIRED.
4. LOADS OUTSIDE OF DEWATERING BUILDING FED FROM EXISTING DISTRIBUTION SWITCHBOARD (LOCATED AT EL 16'-6" IN DEWATERING BUILDING) TO BE TRANSFERRED TO NEW SWITCHGEAR NO.2 AND CONDUITS EXTENDED TO EXISTING PULL BOX AS REQUIRED.
5. DOUBLE LUG LINE SIDE OF MV PRIMARY SWITCHES FOR TAP TO FEED TRANSFORMERS T-13 & T-14 IN THICKENING FACILITY.
6. FIELD COORDINATE AND RETAIN EXISTING CONDUITS FEEDING LAODS FROM CC-11D.
7. TRANSITION TO EXISTING CONDUITS FEEDING DCCP-1 THROUGH DCCP-5 AT THE HANDHOLE.

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JUNE 2019

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GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED NY
DRAWN MV
CHECKED JM
APPROVED

NO.	DATE	APPD	DESCRIPTION

SCALE 4 0 4 8 FT 1/4"=1'-0"

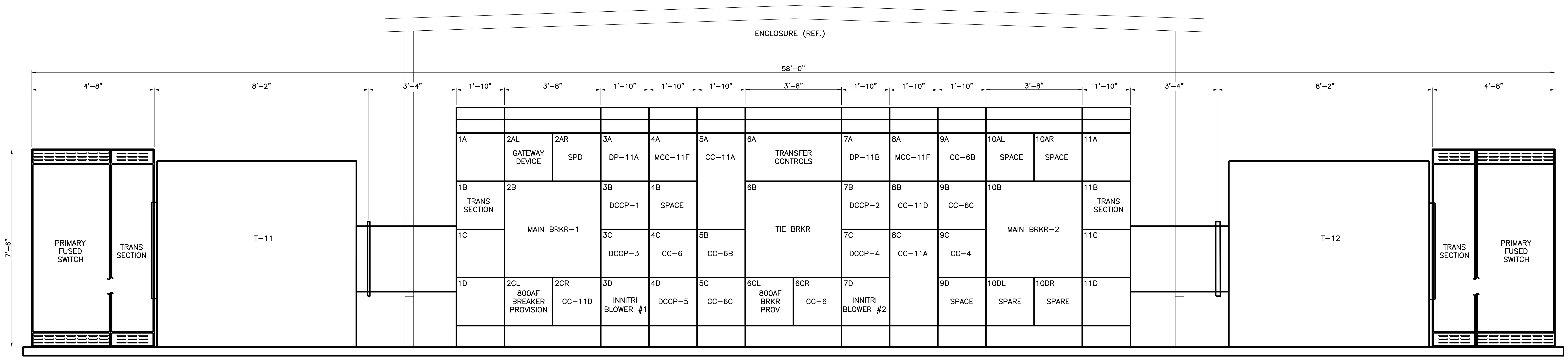
CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

RICHMOND VIRGINIA

SLUDGE DEWATERING BUILDING
ELECTRICAL

SITE PLAN

PROJECT NO. 02188-BG039
DWG CE21
SHEET 202 OF XX
DATE JULY 2019 REV 0



480V OUTDOOR SWITCHGEAR NO.2 ELEVATION

SCALE: NOT TO SCALE

PRELIMINARY 90%
JUNE 2019

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Engineers • Scientists • Construction Managers
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GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED NY
DRAWN PY
CHECKED NV

APPROVED

NO.	DATE	APPD	DESCRIPTION

SCALE

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

SLUDGE DEWATERING BUILDING
ELECTRICAL

480V SWITCHGEAR NO.2 ELEVATION

PROJECT NO. 02188-BG039
DWG CE24
SHEET 205 OF XX
DATE JULY 2019 REV 0

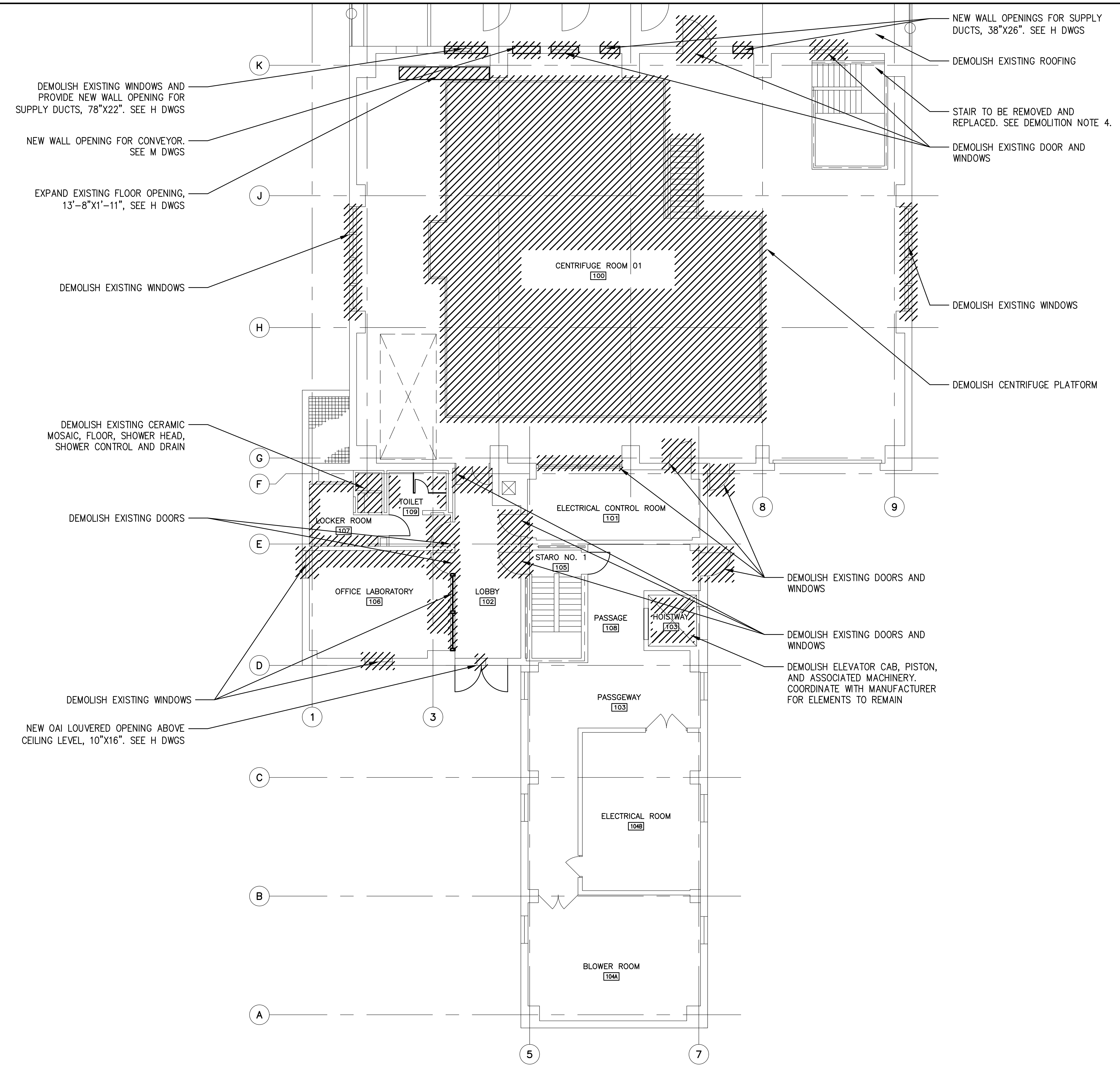
S:\0218_RICHMOND\WW ENG SERVICES 02188\BG-039 DEWATERING CENT DESIGN\21 CADD\21.05 WORKING DWGS\RC839-CE24 YONTS, PHILIP
2019/0 /1 1:59 PM BAR MEASURE 1" ON FULL SIZE SHEETS

Integrated Power Assembly Example

- **Integrated Power Assembly which replaces existing Unit Substation and Distribution Switch Board**

Integrated Power Assembly

Prefabricated unit to be placed on a higher/larger concrete slab outside dewatering building



PLAN AT EL 34'-0"

SCALE: 1/8" = 1'-0"

DEMOLITION NOTES:

1. DEMOLISH INTERIOR FINISHES, FURNISHINGS, AND FIXTURES AT OFFICE LABORATORY, TOILET AND LOCKER ROOM (SEE MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS)
2. DEMOLISH EXISTING ELEVATOR, INCLUDING HYDRAULIC JACK. DRILL EXISTING WORK HOLE AS REQUIRED
3. VERIFY EXTENT OF DEMOLITION SHOWN ON THE DEMOLITION DRAWINGS IS APPROPRIATE TO PERMIT THE NEW WORK TO BE ACCOMPLISHED. ANY DAMAGE WHICH MAY BE CAUSED TO ANY PART OF EXISTING CONSTRUCTION TO REMAIN AS A RESULT OF DEMOLITION WORK MUST BE THE RESPONSIBILITY OF AND BE CORRECTED BY THE CONTRACTOR.
4. TEMPORARILY REMOVE STAIRS AND RAILS, AS NEEDED TO ACCOMMODATE THE REMOVAL OF TANKS FROM BASEMENT, AND STORE SAFELY TO PROTECT FROM DAMAGE. CUT WELDS BETWEEN STRINGERS AND CLIP ANGLES, CUT CLIP ANGLE ANCHORS OR UNBOLT AS APPROPRIATE. REPLACE STAIR STRINGERS AND RAILS ONCE THE TANK DEMOLITION WORK IS COMPLETE. REUSE OR REPLACE CLIP ANGLES AS REQUIRED TO SUPPORT LANDINGS AND STRINGERS. CONNECT STRINGERS AND LANDINGS TO CLIP ANGLES IN THE SAME MANNER AS BEFORE REMOVAL (WELD OR BOLT). TOUCH UP PAINT AS REQUIRED FOR NEAR APPEARANCE. RESET HANDRAILS.
5. PAINT ALL EXISTING WALL SURFACES NEWLY EXPOSED TO VIEW DUE TO REMOVAL OF EXISTING EQUIPMENT OR OTHER DEMOLITION WORK. PAINT TO MATCH ADJACENT SURFACES.

PRELIMINARY 90%

JUNE 2019

GREELEY AND HANSEN
ARCHITECTS
100 S WACKER DR. SUITE 1400
CHICAGO, IL 60606

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED JL	APPROVED	NO.	DATE	APPD	DESCRIPTION	
DRAWN JXW						
CHECKED TCB						

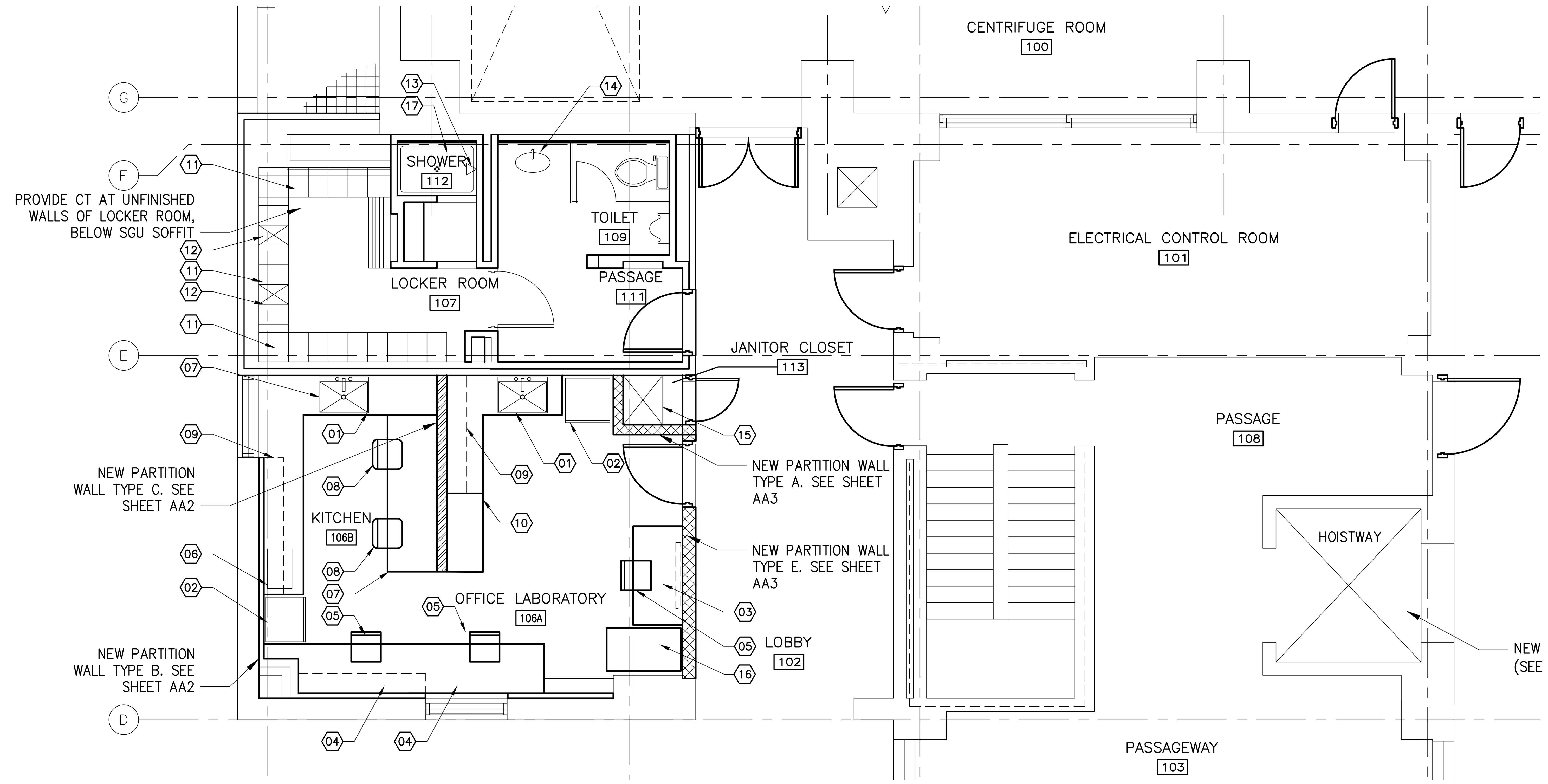
SCALE 8 0 8 16 FT 1/8"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

SLUDGE DEWATERING BUILDING
ARCHITECTURAL

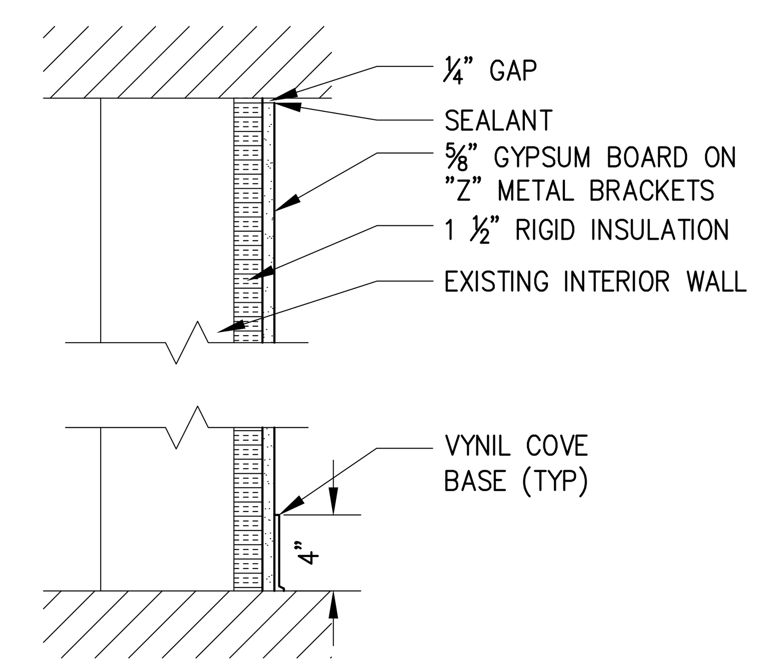
DEMOLITION PLAN AT EL 34'-0"

PROJECT NO. 02188-BG039
DWG CA1
SHEET 119 OF XX
DATE JULY 2019 REV 0



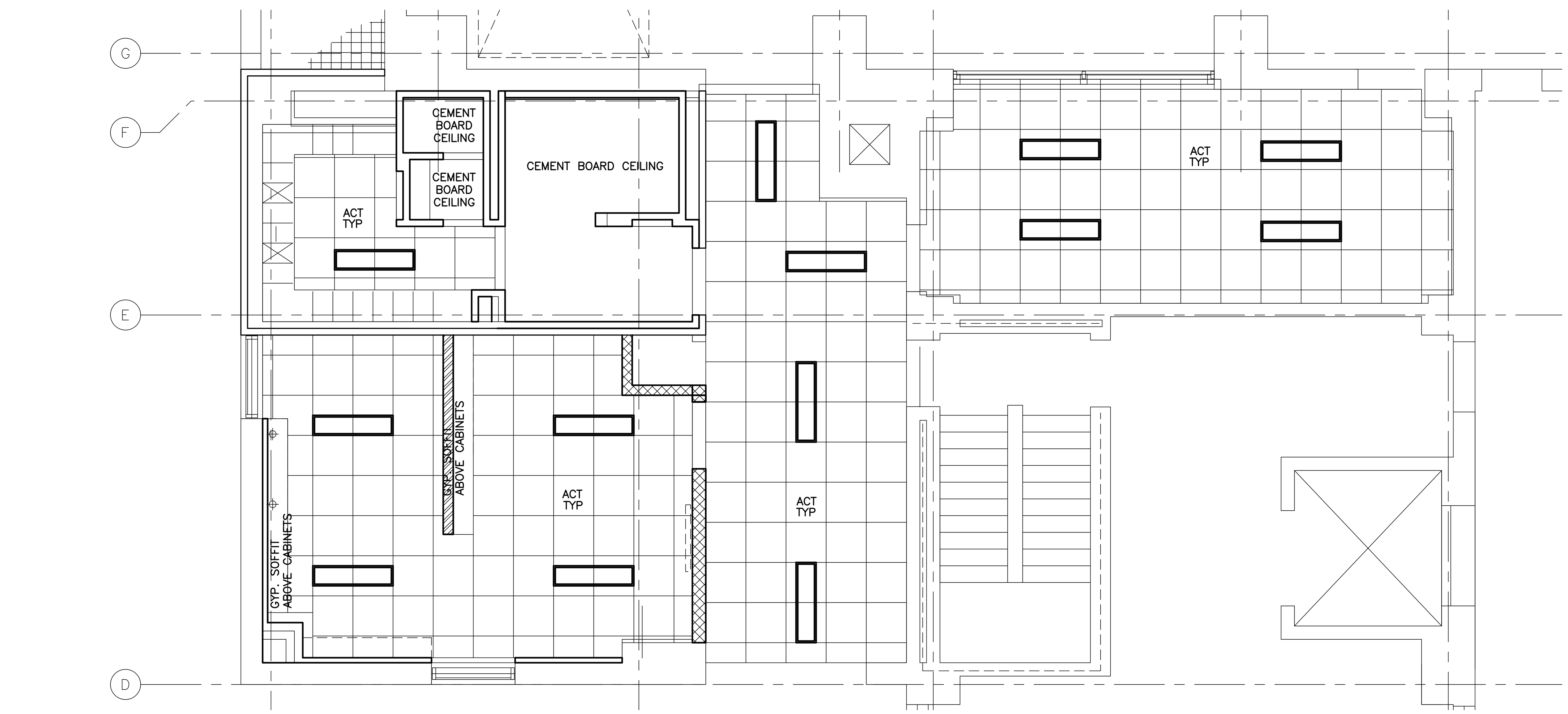
PLAN AT EL 34'-0"

SCALE: 1/4" = 1'-0"



DETAIL NON-RATED GYPSUM DRYWALL

SCALE: 1 1/2" = 1'-0"



RCP AT EL 34'-0"

SCALE: 1/4" = 1'-0"

NEW FURNISHINGS AND ACCESSORIES

01 SINK, KITCHEN
02 REFRIGERATOR
03 OPERATOR CONSOLE AND SCREEN
04 WORK STATION
05 DESK CHAIR
06 MICROWAVE, UNDER COUNTER
07 HIGH TABLE
08 HIGH STOOL
09 OVERHEAD CABINET
10 CABINET
11 LOCKERS
12 ACCESSIBLE LOCKERS
13 SHOWER HEAD
14 SINK, VANITY
15 MOP BASIN
16 UPS CART
17 TERRAZZO FLOOR AND DRAIN

CERAMIC TILE:

LOCKER ROOM
FLOOR: 200 SF
WALLS: 50LF X 8F= 400SF
TOTAL: 600 SF

NOTES:

1. REPLACE SGU THAT ARE CRACKED, HAVE HOLES, OR DAMAGES WITH NEW TO MATCH EXISTING
2. PAINT ALL EXISTING WALL SURFACES NEWLY EXPOSED TO VIEW DUE TO REMOVAL OF EXISTING EQUIPMENT OR OTHER DEMOLITION WORK. PAINT TO MATCH ADJACENT SURFACES.

PRELIMINARY 90%
JUNE 2019

GREELEY AND HANSEN
ARCHITECTS
100 S WACKER DR. SUITE 1400
CHICAGO, IL 60606

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED JL	APPROVED	NO.	DATE	APPD	DESCRIPTION	SCALE
DRAWN JXW						0 4 8 FT 1/4"=1'-0"
CHECKED TCB						1 0 1 FT 1 1/2"=1'-0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

RICHMOND VIRGINIA

SLUDGE DEWATERING BUILDING
ARCHITECTURAL

CONTROL ROOM AND BATHROOM FLOOR PLANS AND RCP

PROJECT NO. 02188-BG039
DWG CA4
SHEET 122 OF XX
DATE JULY 2019 REV 0

2019/06/10 8:50 AM

\\GH-MA03\PROJECTS\0218_RICHMOND\WW ENG SERVICES 02188\BG-039 DEWATERING CENT DESIGN\21 CADD\21.05 WORKING DWGS\RC839-CA4 WANDERLEY, JULIA

ROOM FINISH SCHEDULE (DEWATERING BUILDING)											
ROOM NO.	ROOM NAME	FLOOR	BASE BOARD		WALLS				CEILING		NOTES
			MATL	HEIGHT	N	S	E	W	MATL	HEIGHT	
101	ELECTRICAL CONTROL ROOM	EXISTING			EXISTING BRICK				ACT		
102	LOBBY	RES	VYNIL		EXISTING BRICK				ACT		
106	OFFICE–LABORATORY	RES	VYNIL		–	PT–GYP	SGU	PT–GYP	ACT		DIVIDER WALL TO BE PT–GYP
107	LOCKER ROOM	RES	VYNIL		EXISTING SGU				ACT		PROVIDE NEW CT BEHIND LOCKERS
109	TOILET	RES	VYNIL		EXISTING SGU				CBC		REPLACE DAMAGED SGU
110	DRESSING STALL	RES	VYNIL		EXISTING SGU				CBC		REPLACE DAMAGED SGU
111	PASSAGE	RES	VYNIL		MATCH EXISTING				CBC		
112	SHOWER	BASE			EXISTING SGU				CBC		TERRAZZO BASE

NOTES:
1. REFER TO PLANS AND ELEVATIONS FOR MORE DETAILED INFORMATION FOR THE ROOM FINISHES LISTED ABOVE.
2. REPLACE SGU THAT ARE CRACKED, HAVE HOLES, OR DAMAGES WITH NEW TO MATCH EXISTING.
3. PAINT ALL EXISTING WALL SURFACES NEWLY EXPOSED TO VIEW DUE TO REMOVAL OF EXISTING EQUIPMENT OR OTHER DEMOLITION WORK. PAINT TO MATCH ADJACENT SURFACES.

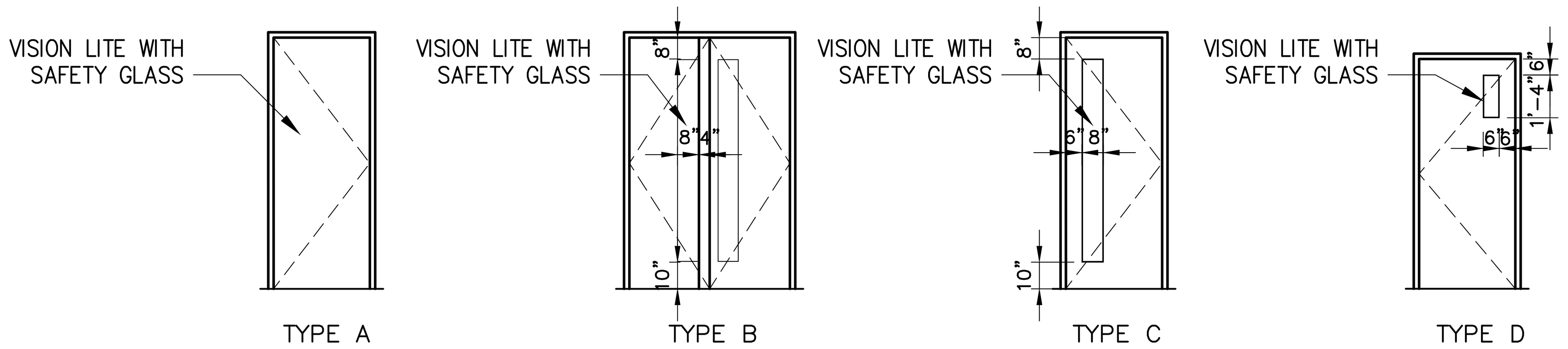
DOOR SCHEDULE (DEWATERING BUILDING)										
DOOR NO.	ROUGH OPENING		TYPE	GLAZING	DESCRIPTION	DOOR		FRAME	FIRE RATING (HR)	NOTES
	WIDTH	HEIGHT				THICKNESS	MTL	MTL		
100–1	3'–4"	8'–0"	C	G–3		1¾"	AL	AL	––	
100–2	5'–4"	8'–0"	B	G–3		1¾"	AL	AL	––	
100–3	4'–2"	8'–3 ½"	C	G–3		1¾"	AL	AL	––	
101–1	3'–4"	8'–0"	C	G–3		1¾"	AL	AL	––	PANIC HARDWARE
101–2	3'–4"	8'–0"	C	G–3		1¾"	AL	AL	––	PANIC HARDWARE
105–1	3'–4"	8'–0"	D	G–3		1¾"	SS	SS	B	
106–1	3'–4" *	8'–0" *	C	G–3		1¾"	AL	AL	––	OPENING IN NEW WALL
107–1	3'–2"	7'–4"	A	––		1¾"	AL	AL	––	
108–1	4'–2"	8'–3 ½"	C	G–3		1¾"	AL	AL	––	
111–1	3'–4"	8'–0"	A	––		1¾"	AL	AL	––	
113–1	2'–6"	8'–0"	A	––		1¾"	AL	AL	––	

NOTE: DOORS TO FIT INTO EXISTING OPENINGS. DIMENSIONS FOR DOORS MAY VARY FROM VALUES LISTED IN SCHEDULE.

OPENING SCHEDULE (DEWATERING BUILDING)										
TYPE MARK	QUANTITY	ROUGH OPENING		FRAME MTL	GLAZING TYPE	DETAILS			FIRE RATING (HR)	NOTES
		WIDTH	HEIGHT			HEAD	JAMB	SILL		
W1	2	15'–10"	32'–8"	AL	VARIES	––	––	––	––	–
W2	1	4'–2"	32'–8"	AL	VARIES	––	––	––	––	–
W3	1	4'–2"	24'–4 ½"	AL	VARIES	––	––	––	––	PROVIDE DOOR TYPE C
W4	1	13'–0"	7'–4'	AL	G–3	––	––	––	––	–
W5	2	4'–2'	4'–10"	AL	G–1	––	––	––	––	–
W6	1	12'–0"	2'–0"	AL	G–4	––	––	––	––	PROVIDE DOOR TYPE C
W7	1	4'–2"	24'–4 ½"	AL	G–2	––	––	––	––	PROVIDE DOOR TYPE C
W8	1	4'–2"	32'–8"	AL	VARIES	––	––	––	––	PROVIDE CONVEYOR OPENING (SEE M DWG)
W9	1	4'–2"	32'–8"	AL	VARIES	––	––	––	––	PROVIDE DUCT OPENINGS (SEE H DWGS)

NOTE: WINDOWS AND LOUVERS TO FIT INTO EXISTING OPENINGS. DIMENSIONS FOR OPENINGS MAY VARY FROM VALUES LISTED IN SCHEDULE.

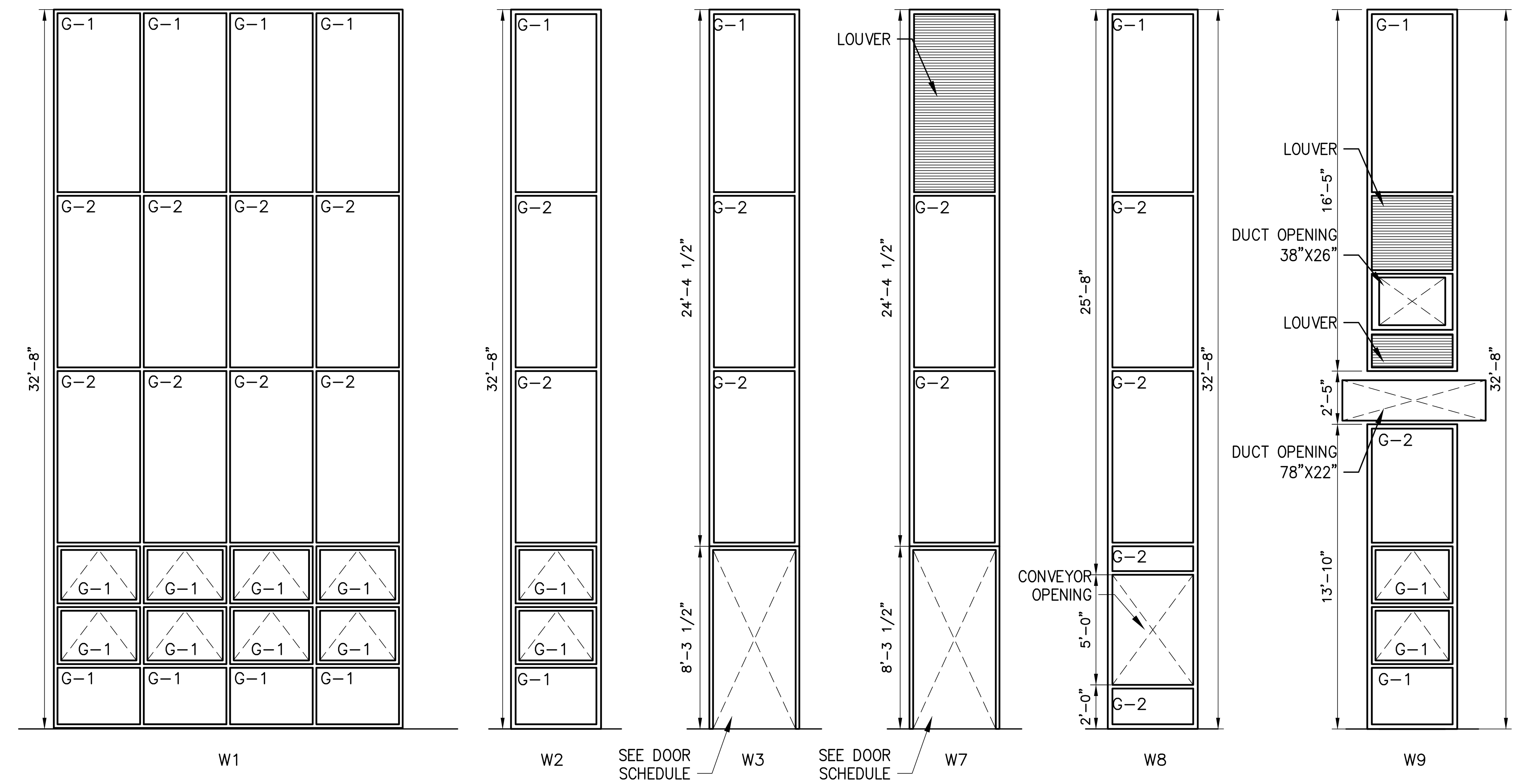
DOOR TYPE

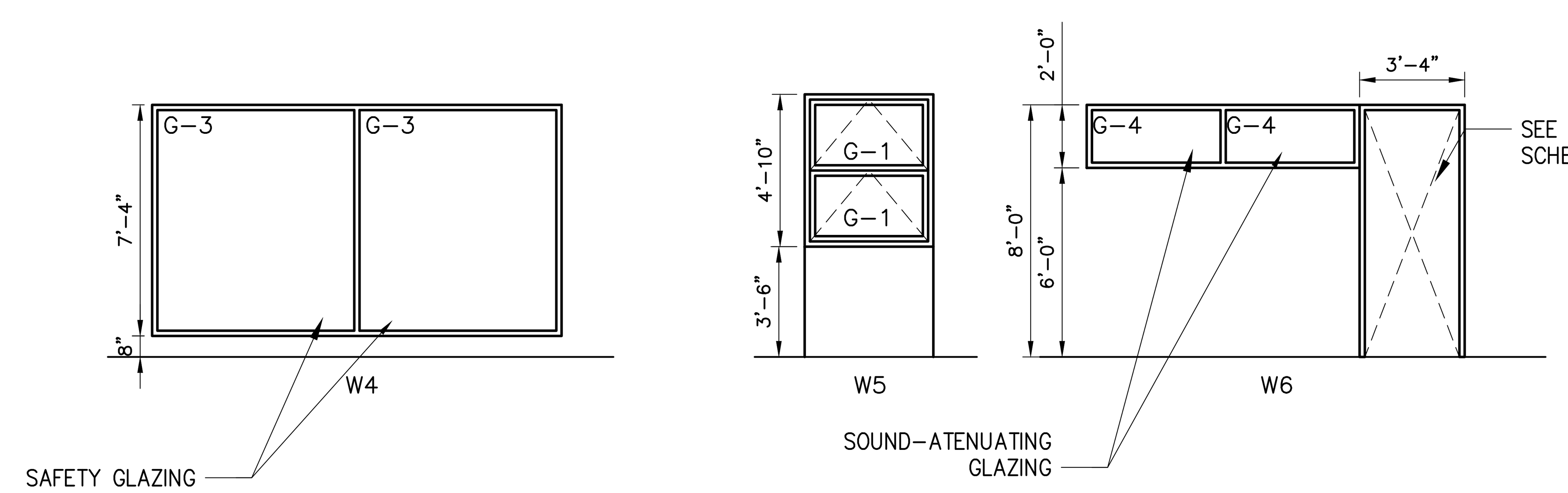


GLAZING TYPES

G–1 CLEAR GLAZING
G–2 SPANDREL GLAZING
G–3 SAFETY GLASS
G–4 SOUND–ATTENUATING GLASS

WINDOW TYPE





NOTE: AT EXTERIOR WINDOWS OF CURTAIN WALLS, PROVIDE SILK–SCREENED PATTERN OF ⅛" CERAMIC FRIT AT ¼" CENTERS.

PRELIMINARY 90%
JUNE 2019

GREELEY AND HANSEN ARCHITECTS
100 S WACKER DR. SUITE 1400
CHICAGO, IL 60606

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED JL
DRAWN JXW
CHECKED TCB
APPROVED

NO.	DATE	APPD	DESCRIPTION

SCALE 1/4"=1'–0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

SLUDGE DEWATERING BUILDING
ARCHITECTURAL

DOORS AND WINDOWS

PROJECT NO. 02188-BG039
DWG CA7
SHEET 125 OF XX
DATE JULY 2019 REV 0

CITY OF RICHMOND

GREELEY AND HANSEN

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers

DANIELS & ASSOCIATES, P.C.
Consulting Engineers

Sludge Dewatering Facility Existing Landscape

Existing Landscape
North of Dewatering Facility

GREELEY AND HANSEN

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Consulting Engineers

Existing Landscape
East and West of Dewatering Facility

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Consulting Engineers

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Consulting Engineers

Sludge Dewatering Facility Outside Site Lighting

THICKENING
AND
DEWATERING

LIGHTING FIXTURE SCHEDULE

LABEL	DESCRIPTION	LAMP TYPE	LUMENS	INPUT WATTAGE	MOUNTING	MANUFACTURER AND CATALOG NUMBER	REMARKS
A1	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING, 3S COLOR TEMP, 80 CRI	LED	3000	23	CEILING	HOLOPHANE: EMS_L48_ 3000LM, IMACD MD MVOLT 35K OR APPROVED EQUAL	
A1E	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING, 3S COLOR TEMP, 80 CRI W/EMERGENCY BATTERY PACK BSL520	LED	3000	23	CEILING	HOLOPHANE: EMS_L48_ 3000LM, IMACD MD MVOLT 35K 80CRI BSL20 OR APPROVED EQUAL	
A2	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING 3S COLOR TEMP, 80 CRI	LED	4000	31	CEILING	HOLOPHANE: EMS_L48_ 4000LM, IMACD MD MVOLT 35K OR APPROVED EQUAL	
A3	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING 3S COLOR TEMP, 80 CRI	LED	6000	45	CEILING	HOLOPHANE: EMS_L48_ 6000LM, IMACD MD MVOLT 35K OR APPROVED EQUAL	
A4	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING 3S COLOR TEMP, 80 CRI	LED	8000	69	CEILING	HOLOPHANE: EMS_L48_ 8000LM, IMACD MD MVOLT 35K OR APPROVED EQUAL	
A5	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING 3S COLOR TEMP, 80 CRI	LED	10000	80	CEILING	HOLOPHANE: EMS_L48_ 10000LM, IMACD MD MVOLT 35K OR APPROVED EQUAL	
B	LED FIXTURE SUITABLE FOR WET LOCATION, COLOR TEMP, 80 CRI WITH INTERGRAL EMERGENCY BATTERY	LED	2800	28	WALL	HOLOPHANE: HLWPC2 P10 40K 12 TFTM BZSDP EM, OR APPROVED EQUAL	
C	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING 30K COLOR TEMP, 80 CRI	LED	10000	74	PENDANT	HOLOPHANE: PXLW2, 10000LM, WD, 30K, 80CRI OR APPROVED EQUAL	
CE	LED FIXTURE SUITABLE FOR WET, DAMP, COLD LOCATION, NEMA 4X GASKET, VAPOR TIGHT FIBERGLASS HOUSING WITH EMERGENCY BATTERY PACK	LED	10000	74	PENDANT	HOLOPHANE: PXLW2, 10000LM, WD, 30K, 80CRI, E10WMCP OR APPROVED EQUAL	
D	E2x2 RECESSED LED TROFFER LISTED WET LOCATION 40K COLOR TEMP, 80 CRI	LED	12000	110	PENDANT ABOVE GRID	LITHONIA: 2WRTL, L24, 1200LM, AFL, MVOLT, 40K, 80 CRI OR APPROVED EQUAL	
D1	E2x2 RECESSED LED TROFFER LISTED WET LOCATION 40K COLOR TEMP, 80 CRI	LED	3000	27	GRID/ GYP BD	LITHONIA: 2WRTL, L24, 3000LM, AFL, MVOLT, 40K, 80 CRI OR APPROVED EQUAL	
D1E	E2x2 RECESSED LED TROFFER LISTED WET LOCATION 40K COLOR TEMP, 80 CRI WITH SM SELF DIAGNOSTIC BATTERY PACK	LED	3000	27	GRID	LITHONIA: 2WRTL, L24, 3000LM, AFL, MVOLT, 40K, 80 CRI, E10WLCD OR APPROVED EQUAL	
D2	E2x2 RECESSED LED TROFFER LISTED WET LOCATION 40K COLOR TEMP, 80 CRI	LED	5000	42	GRID	LITHONIA: 2WRTL, L24, 5000LM, AFL, MVOLT, 40K, 80 CRI OR APPROVED EQUAL	
DE	E2x2 RECESSED LED TROFFER LISTED WET LOCATION 40K COLOR TEMP, 80 CRI WITH SM SELF DIAGNOSTIC BATTERY PACK	LED	12000	110	PENDANT ABOVE GRID	LITHONIA: L24, 1200LM, AFL, MVOLT, 40K, 80 CRI, E10WLCP OR APPROVED EQUAL	
EX	EXIT SIGN WITH NI-CAD BATTERY AND SELF DIAGNOSTICS	LED	10000	3	WALL	HOLOPHANE: QM LED, R, HORO SD OR APPROVED EQUAL	
G	HIGH BAY LED FIXTURE WET LOCATION LISTED 35K COLOR TEMP, 80 CRI	LED	24000	170	PENDANT	HOLOPHANE: PHZ 24L, 35K, 80 CRI, AS P W MFR OR APPROVED EQUAL	
GE	HIGH BAY LED FIXTURE WET LOCATION LISTED 35K COLOR TEMP, 80 CRI, WITH EMERGENCY BATTERY PACK	LED	24000	170	PENDANT	HOLOPHANE: PHZ 24L, 35K, 80 CRI, AS P W MFR, E10WCP OR APPROVED EQUAL	
I	LED FIXTURE SUITABLE FOR MOUNTING TO STANCHION	LED	27000	20	STANCHION	LITHONIA: OLWX1 LED 20W 40K 120 PE OR APPROVED EQUAL	
H	STAINLESS STEEL WITH HOT DIPPED GALVANIZED FINISH, NPS 1-1/2" BASED SECTIONS AND INCLINED BRACKETS				STANCHION MOUNTING TO GUARDRAIL	HOLOPHANE SWIVEL POLE TO MOUNT TO GUARDRAIL #53 OR APPROVED EQUAL	

PRELIMINARY 90%
JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED XXX
DRAWN PMY
CHECKED XXX
APPROVED

NO.	DATE	APPD	DESCRIPTION

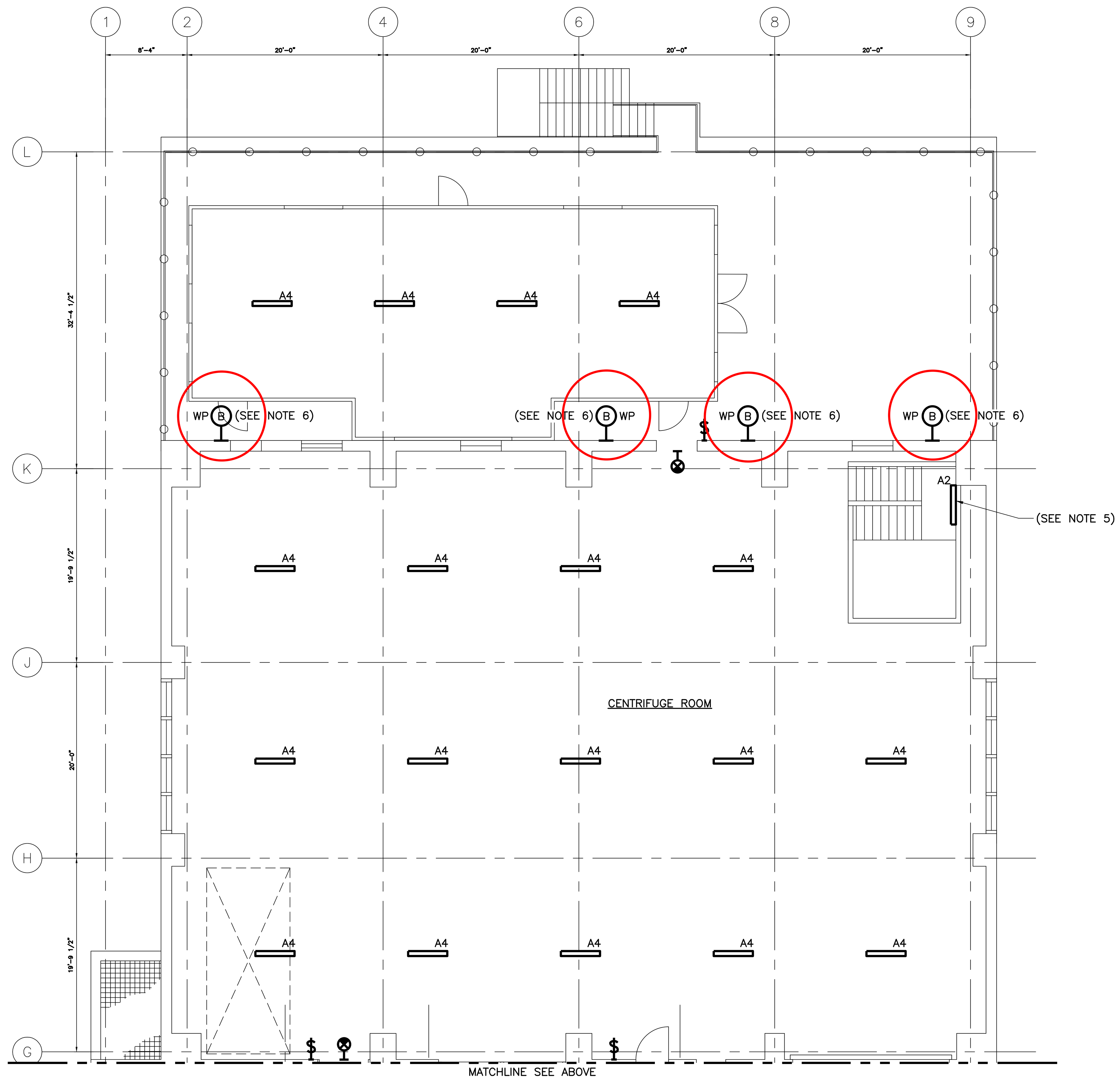
SCALE

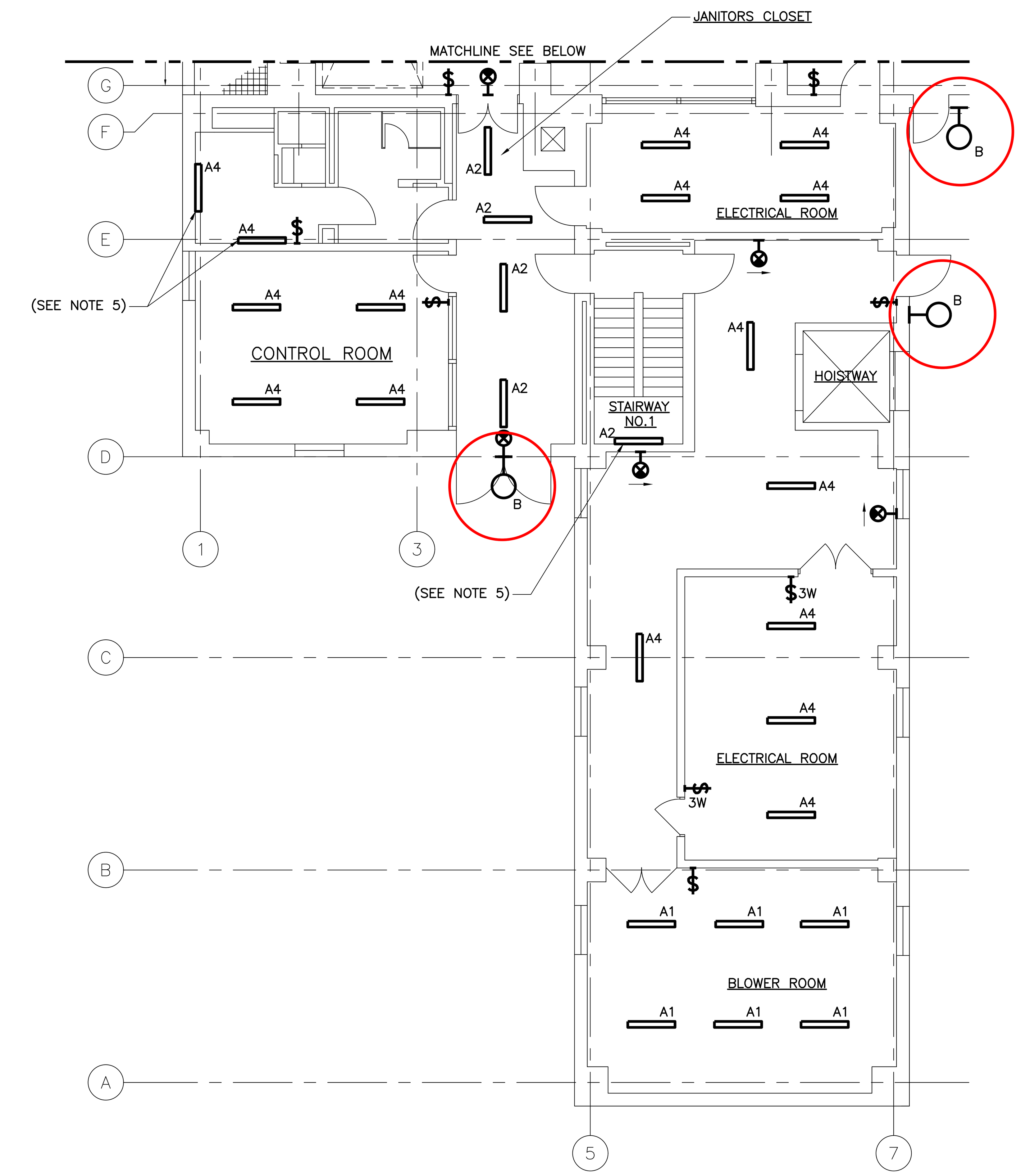
CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND
DEWATERING FACILITY IMPROVEMENTS

GENERAL
ELECTRICAL

LIGHTING FIXTURE SCHEDULE

PROJECT NO. 02188-BG039
DWG AE2
SHEET 39 OF XX
DATE JULY 2019 REV 0





LIGHTING PLAN AT EL (ABOVE PLATFORM) 34'–0"

SCALE: 1/8" = 1'–0"

NOTES:

1. DEMOLISH EXISTING LIGHTING AND REPLACE WITH LIGHTING SHOWN. RETAIN EXISTING WIRING TO FEED NEW LIGHTS.
2. RETAIN EXISTING EMERGENCY BATTERY PACK UNITS.
3. RE–USE EXISTING LIGHTING CIRCUITS FROM LPB–11 THAT FEED EXISTING LIGHTS TO FEED NEW LIGHTING SHOWN.
4. FIELD COORDINATE LOCATION OF EXISTING BRIDGE CRANE AND MAINTAIN ADEQUATE CLEARANCE.
5. WALL MOUNT THE FIXTURE.
6. WALL MOUNT WEATHERPROOF LIGHTING. MAINTAIN ADEQUATE CLEARANCE FROM ANY DUCTWORK OR OBSTRUCTION WHILE MAINTAINING FOOT CANDLE REQUIREMENTS.

PRELIMINARY 90%
JUNE 2019

Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers
501 East Franklin Street, Suite 527 Richmond, VA 23219

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED	NY	APPROVED
DRAWN	PY	
CHECKED	NV	

NO.	DATE	APPD	DESCRIPTION

SCALE 1/8"=1'–0"

CITY OF RICHMOND, VIRGINIA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER TREATMENT PLANT
DIVISION 48 SLUDGE THICKENING AND DEWATERING FACILITY IMPROVEMENTS

SLUDGE DEWATERING BUILDING
ELECTRICAL

LIGHTING PLAN AT EL 34'–0"

PROJECT NO. 02188-BG039
DWG CE42
SHEET 223 OF XX
DATE JULY 2019
REV 0

HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS

Catalog Number	
Notes	Type

HLWPC2

Wallpack® Full Cutoff LED

Mechanical

- Heavy grade A360 cast aluminum (aluminum with <1% copper)
- Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering
- Mounts to a standard junction box
- Wet location listed
- IP65 rated housing, down light only
- ¾" painted threaded entry(¾" - 14 NPT) on each side and on top, accepts ¾" and ½" condiut
- ¾" threaded plugs are painted on each side
- Vibration testing per ANSI C136.31: 3G rating for surface mount and pendant mount up to 1.5', excludes swivel kit

Electrical

- Certified by UL or CSA
- Rated for -40°C (-40°F) minimum ambient
- A programmable electronic driver with 0-10V control leads
- Available in: 120-277V 50/60 Hz and 347-480V 50/60 Hz,
- Standard: 3000K, 4000K and 5000K CCT (>70 CRI)
- Optional >80 CRI (3000K, 4000K and 5000K CCT), 8 week lead-time
- Optional limited wavelength amber, 8 week lead-time
- Internally mounted emergency battery backup for operation in an ambient temperature ranging from -20°C (-4°F) to 30°C (86°F), available with P10 thru P40 performance packages, non CEC compliant
- All surge protection meets ANSI/IEEE C62.41.2 10kV/10kA
- Standard surge protection is 20kV/10kA per ANSI C136.2
- Optional surge protection is 10kV/5kA per ANSI C136.2

Optical

- Light engine housing is IP66 rated
- Acrylic optical system
  - Type V: E (entry), M (medium), R (rectangle) & W (wide)
  - Asymmetric

Controls

- Field adjustable output (AO)
- Button style photocontrol (PE)
- Motion sensor & ambient photocontrol combination for mounting low (8-15') (MASL) and high (15-30') (MASH) mounting heights

Certification and Standards

- Luminaire is CSA listed, US and Canada
- Suitable for operation in an ambient temperature up to 40°C/104°F per UL or CSA certification
- Design lights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.
- LM-79 compliant
- The projected LED Lumen Maintenance shall be based only on IES LM-80-08 and TM-21

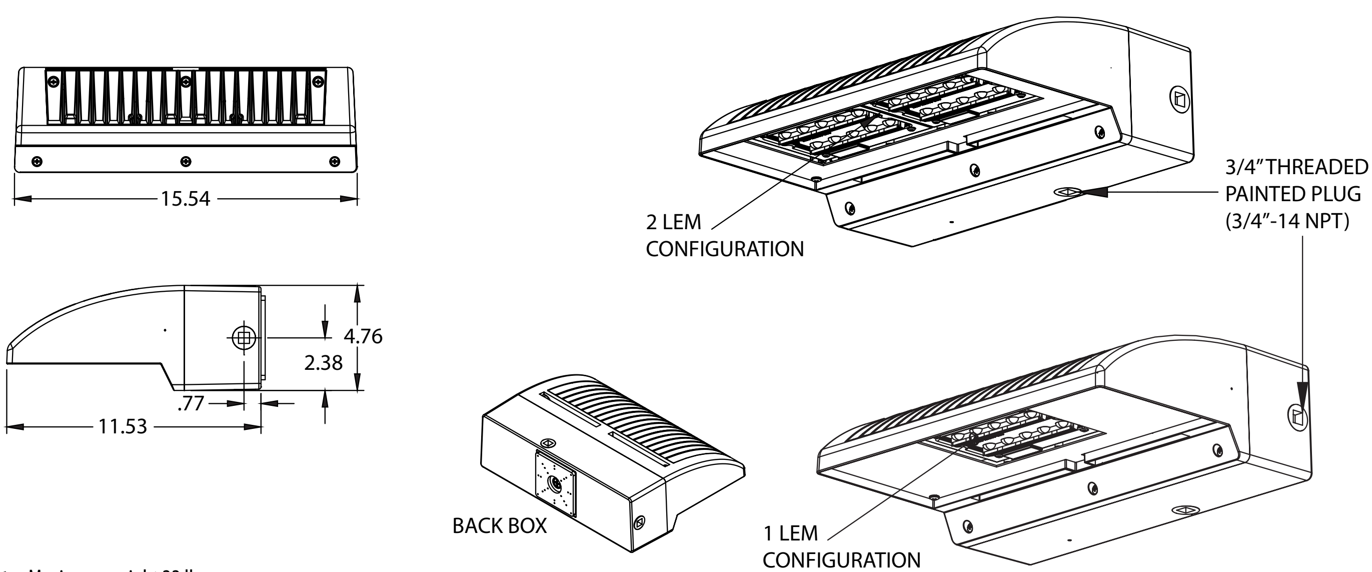
Warranty

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_Conditions.aspx.

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.



Note: Maximum weight 22 lbs.

HLWPC2

Wallpack® Full Cutoff LED

ORDERING INFORMATION

Example: HLWPC2 P20 40K AS T3M BZSDP

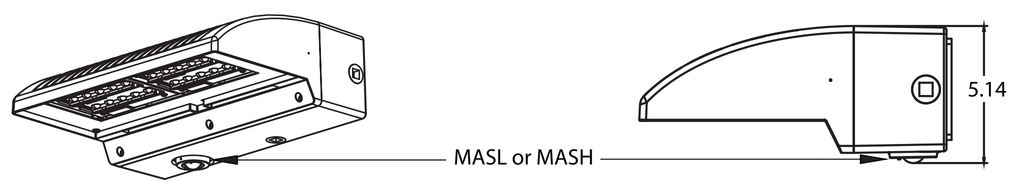
Series		Lumen Package		Color Temperature		Voltage		Optics		Color		CRI	
HLWPC2	Wallpack Full Cutoff LED	1 LEM Package		AMB	True Amber	AS	Auto-Sensing Voltage (120V-277V) 50/60HZ	T2S	Type 2 Short	BKSDP	Black	Blank	70 CRI (STD)
		P10	3,100 lm	30K	3,000 K CCT	AH	Auto-Sensing Voltage (347V-480V) 50/60HZ	T2M	Type 2 Medium	BZSDP	Bronze	80CRI	80 CRI
		P20	5,600 lm	40K	4,000 K CCT	12	120V	T3S	Type 3 Short	GYSDP	Grey		
				50K	5,000 K CCT	20	208V	T3M	Type 3 Medium	WHSDP	White		
		2 LEM Package				24	240V	T4M	Type 4 Medium				
		P30	7,800 lm			27	277V	TFTM	Forward Throw Medium				
		P40	9,900 lm			34	347V	ASYDF	Asymmetric Diffuse				
		P50	11,700 lm			48	480V	SYMDF	Symmetric Diffuse				
		(Nominal Lumens, 4000K)											

Options:

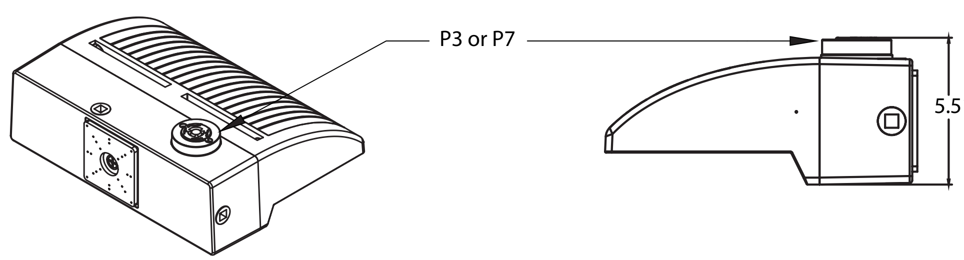
Adjustable/Programmable Options		Control - Photocontrol Options		Fuse Option	
AO	Field Adjustable Output	PE	Button Style Photocontrol	SF	Single Fuse
		P3	N.E.M.A. Twistlock Recepactle Mount -3 PIN	DF	Double Fuse
Circuit Options		P7	N.E.M.A. Twistlock Recepactle Mount -7 PIN		
2CI	2 Independent Circuits	PCLL	DTL Long Life Twistlock Photocontrol for Solid State	**Safety Option**	
		PND	0-10V Part-night Dimming, Includes BLC2 & N.E.M.A. Twistlock Photocontrol Receptacle	EM	Integral Emergency Battery
Control - Motion Sensor Options		PSC	Shorting Cap	TP	Tamper Resistant Hardware
MASL	Motion / Ambient Sensor, 8-15' Mounting Height Ambient Sensor Enabled at 1 FC			**Surge Protection Option - 20kV/10kA is Standard**	
MASH	Motion / Ambient Sensor, 15-30' Mounting Height Ambient Sensor Enabled at 1 FC			10KV	10kV/5kA Surge Protection, in place of 20kV/10kA

Options Location

Motion/Ambient Sensor mount options for Low (8-15') (MASL) and Height (15-30') (MASH) applications

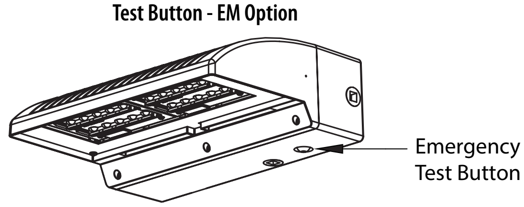


N.E.M.A. Twistlock Receptacle P3 and P7 Options, P7 Shown

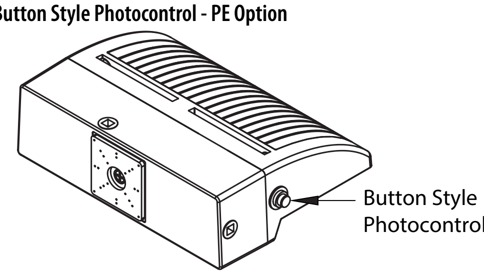


Internal Emergency Battery Test Button - EM Option

Test Button - EM Option



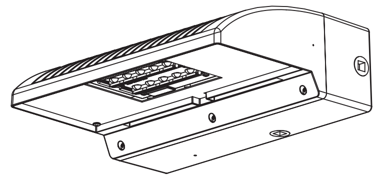
Button Style Photocontrol - PE Option



Driver & LEM Configuration Based on Circuit Options

Number of LEMs & Drivers / Circuit		Sinlge Circuit (std.)		Two Circuit (2CI option)	
		LEMs	Drivers	LEMs	Drivers
Lumen Maintenance Factor	P10	1	1	-	-
	P20	1	1	2	2
	P30	2	1	2	2
	P40	2	1	2	2
	P50	2	1	-	-

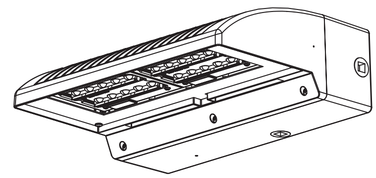
1 LEM Luminaire



SPD Based on Circuit Options

Number of LEMs & Drivers / Circuit		Sinlge Circuit (std.)				Two Circuit (2CI option)			
		LEMs	Drivers	No. of SPDs	SPD	LEMs	Drivers	No. of SPDs	SPD
Lumen Maintenance Factor	P10	1	1	1	20kV/10kA	-	-	-	-
	P20	1	1	1	20kV/10kA	2	2	2	10kV/5kA
	P30	2	1	1	20kV/10kA	2	2	2	10kV/5kA
	P40	2	1	1	20kV/10kA	2	2	2	10kV/5kA
	P50	2	1	1	20kV/10kA	-	-	-	-

2 LEM Luminaire



Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platform noted in a 25°C ambient, based on 6,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

The italicized data is extrapolated beyond the TM-21 standard.

E = (LM) x (CU) x (LAT) x (LLD)
LM and CU are obtained from published photometry.

Operating Hours (Standard)		0	25,000	30,000	36,000	45,000	50,000	60,000	75,000	100,000
Lumen Maintenance Factor	P10	1	0.98	0.97	0.96	0.96	0.95	0.95	0.94	0.92
	P20	1	0.97	0.95	0.94	0.93	0.92	0.90	0.88	0.85
	P30	1	0.98	0.97	0.96	0.96	0.95	0.95	0.94	0.92
	P40	1	0.97	0.95	0.94	0.93	0.92	0.90	0.88	0.85

Operating Hours (2CI Option)		0	25,000	30,000	36,000	45,000	50,000	60,000	75,000	100,000
Lumen Maintenance Factor	P10	1	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
	P20	1	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
	P30	1	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
	P40	1	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Single Circuit Application

Ambient		P10	P20	P30	P40	P50
0ºC	32ºF	1.02	1.03	1.03	1.04	1.05
10ºC	50ºF	1.01	1.02	1.02	1.03	1.03
20ºC	68ºF	1.01	1.01	1.01	1.01	1.01
25ºC	77ºF	1.00	1.00	1.00	1.00	1.00
30ºC	86ºF	0.99	0.99	0.99	0.99	0.99
40ºC	104ºF	0.98	0.97	0.98	0.97	0.97

Optional Two Independent Circuit (2CI) Application

Ambient		P20	P30	P40
0ºC	32ºF	1.02	1.02	1.02
10ºC	50ºF	1.01	1.01	1.02
20ºC	68ºF	1.00	1.01	1.01
25ºC	77ºF	1.00	1.00	1.00
30ºC	86ºF	0.99	0.99	0.99
40ºC	104ºF	0.98	0.98	0.98

Electrical Load

Single Circuit Application

LEDs	Drive Current (mA)	System Watts/ Circuit	Current (A)					
			120	208	240	277	247	480
P10	700	28	0.23	0.13	0.12	0.10	0.08	0.06
P20	1400	47	0.41	0.24	0.20	0.18	0.14	0.10
P30	1050	71	0.63	0.37	0.32	0.29	0.22	0.18
P40	1420	95	0.78	0.45	0.40	0.35	0.27	0.20
P50	1720	115	0.95	0.55	0.48	0.42	0.33	0.24

Optional Two Independent Circuit (2CI) Application

LEDs	Drive Current (mA)	System Watts/ Circuit	Current (A)					
			120	208	240	277	247	480
P10	-	-	-	-	-	-	-	-
P20	700	22	0.10	0.06	0.05	0.04	-	-
P30	1000	32	0.14	0.08	0.07	0.06	-	-
P40	1250	47	0.18	0.10	0.09	0.08	-	-
P50	-	-	-	-	-	-	-	-

Operating Characteristics

LED Package	Distribution	System Watts	30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
P10	T2S	28	2,904	104	1	0	1	3,128	112	1	0	1	3,168	113	1	0	1
	T2M	28	2,887	103	1	0	1	3,110	111	1	0	1	3,149	112	1	0	1
	T3S	28	2,964	106	1	0	1	3,194	114	1	0	1	3,234	116	1	0	1
	T3M	28	2,801	100	1	0	1	3,017	108	1	0	1	3,055	109	1	0	1
	T4M	28	2,858	102	1	0	1	3,079	110	1	0	1	3,118	111	1	0	1
	TFTM	28	2,979	106	1	0	1	3,209	115	1	0	1	3,250	116	1	0	1
	SYMDF	28	2,771	99	1	0	1	2,986	107	1	0	1	3,023	108	1	0	1
	ASYDF	28	2,756	98	1	0	1	2,969	106	1	0	1	3,007	107	1	0	1
P20	T2S	47	5,303	113	1	0	1	5,713	122	1	0	1	5,785	123	1	0	1
	T2M	47	5,272	112	1	0	2	5,680	121	1	0	2	5,751	122	1	0	2
	T3S	47	5,414	115	1	0	2	5,832	124	1	0	2	5,906	126	1	0	2
	T3M	47	5,115	109	1	0	2	5,510	117	1	0	2	5,580	119	1	0	2
	T4M	47	5,220	111	1	0	2	5,623	120	1	0	2	5,694	121	1	0	2
	TFTM	47	5,440	116	1	0	2	5,861	125	1	0	2	5,935	126	1	0	2
	SYMDF	47	5,062	108	2	0	2	5,453	116	2	0	2	5,522	117	2	0	2
	ASYDF	47	5,033	107	1	0	1	5,422	115	2	0	1	5,491	117	2	0	1
P30	T2S	71	7,319	103	2	0	2	7,884	111	2	0	2	7,984	112	2	0	2
	T2M	71	7,276	102	2	0	2	7,838	110	2	0	2	7,937	112	2	0	2
	T3S	71	7,472	105	1	0	2	8,049	113	2	0	2	8,151	115	2	0	2
	T3M	71	7,059	99	2	0	2	7,604	107	2	0	2	7,700	108	2	0	2
	T4M	71	7,203	101	2	0	2	7,760	109	2	0	2	7,858	111	2	0	2
	TFTM	71	7,508	106	1	0	2	8,088	114	2	0	2	8,190	115	2	0	2
	SYMDF	71	6,985	98	2	0	2	7,525	106	3	0	3	7,620	107	3	0	3
	ASYDF	71	6,946	98	2	0	2	7,483	105	2	0	2	7,578	107	2	0	2
P40	T2S	95	9,320	98	2	0	2	10,041	106	2	0	2	10,168	107	2	0	2
	T2M	95	9,266	98	2	0	2	9,982	105	2	0	3	10,108	106	2	0	3
	T3S	95	9,515	100	2	0	2	10,251	108	2	0	2	10,381	109	2	0	2
	T3M	95	8,989	95	2	0	2	9,684	102	2	0	2	9,807	103	2	0	2
	T4M	95	9,174	97	2	0	2	9,883	104	2	0	3	10,008	105	2	0	3
	TFTM	95	9,561	101	2	0	2	10,300	108	2	0	2	10,431	110	2	0	2
	SYMDF	95	8,896	94	3	0	3	9,583	101	3	0	3	9,705	102	3	0	3
	ASYDF	95	8,846	93	2	0	2	9,530	100	2	0	2	9,650	102	2	0	2
P50	T2S	115	10,972	95	2	0	2	11,820	103	2	0	2	11,969	104	2	0	2
	T2M	115	10,908	95	2	0	3	11,751	102	2	0	3	11,900	103	2	0	3
	T3S	115	11,202	97	2	0	2	12,067	105	2	0	2	12,220	106	2	0	2
	T3M	115	10,582	92	2	0	2	11,400	99	2	0	3	11,544	100	2	0	3
	T4M	115	10,799	94	2	0	3	11,634	101	2	0	3	11,781	102	2	0	3
	TFTM	115	11,256	98	2	0	2	12,126	105	2	0	2	12,279	107	2	0	2
	SYMDF	115	10,472	91	3	0	3	11,282	98	3	0	3	11,424	99	3	0	3
	ASYDF	115	10,414	91	2	0	2	11,219	98	3	0	2	11,361	99	3	0	2

Use the following to scale 70CRI to 80CRI.

CCT	Multiplier
3000K	0.909
4000K	0.886
5000K	0.865

All IES files available on product web page

Operating Characteristics (continued)

LED Package	Distribution	System Watts	30K + 2CI Option (3000K, 70 CRI)					40K + 2CI Option (4000K, 70 CRI)					50K + 2CI Option (5000K, 70 CRI)				
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
P20	T2S	49	5,015	102	1	0	1	5,402	110	1	0	1	5,471	112	1	0	1
	T2M	49	4,985	102	1	0	2	5,371	110	1	0	2	5,439	111	1	0	2
	T3S	49	5,120	104	1	0	1	5,515	113	1	0	2	5,585	114	1	0	2
	T3M	49	4,837	99	1	0	2	5,210	106	1	0	2	5,276	108	1	0	2
	T4M	49	4,936	101	1	0	2	5,317	109	1	0	2	5,385	110	1	0	2
	TFTM	49	5,144	105	1	0	2	5,542	113	1	0	2	5,612	115	1	0	2
	SYMDF	49	4,786	98	2	0	2	5,156	105	2	0	2	5,222	107	2	0	2
	ASYDF	49	4,760	97	1	0	1	5,127	105	1	0	1	5,192	106	1	0	1
P30	T2S	70	6,769	97	1	0	1	7,293	104	2	0	2	7,385	106	2	0	2
	T2M	70	6,730	96	2	0	2	7,250	104	2	0	2	7,342	105	2	0	2
	T3S	70	6,911	99	1	0	2	7,445	106	1	0	2	7,539	108	1	0	2
	T3M	70	6,529	93	2	0	2	7,033	100	2	0	2	7,123	102	2	0	2
	T4M	70	6,663	95	2	0	2	7,178	103	2	0	2	7,269	104	2	0	2
	TFTM	70	6,945	99	1	0	2	7,481	107	1	0	2	7,576	108	2	0	2
	SYMDF	70	6,461	92	2	0	2	6,960	99	2	0	2	7,049	101	2	0	2
	ASYDF	70	6,425	92	2	0	2	6,922	99	2	0	2	7,009	100	2	0	2
P40	T2S	89	8,370	94	2	0	2	9,017	101	2	0	2	9,131	103	2	0	2
	T2M	89	8,321	93	2	0	2	8,964	101	2	0	2	9,078	102	2	0	2
	T3S	89	8,545	96	2	0	2	9,205	103	2	0	2	9,322	105	2	0	2
	T3M	89	8,073	91	2	0	2	8,696	98	2	0	2	8,807	99	2	0	2
	T4M	89	8,238	93	2	0	2	8,875	100	2	0	2	8,987	101	2	0	2
	TFTM	89	8,586	96	2	0	2	9,250	104	2	0	2	9,367	105	2	0	2
	SYMDF	89	7,989	90	3	0	3	8,606	97	3	0	3	8,715	98	3	0	3
	ASYDF	89	7,944	89	2	0	2	8,558	96	2	0	2	8,666	97	2	0	2

Use the following to scale 70CRI to 80CRI.

CCT	Multiplier
3000K	0.909
4000K	0.886
5000K	0.865

All IES files available on product web page

LED Package	Distribution	System Watts	AMB (Wavelength)					LED Package	Distribution	System Watts	AMB (Wavelength)				
			Lumens	LPW	B	U	G				Lumens	LPW	B	U	G
P10	T2S	28	1,061	38	0	0	1	P30	T2S	28	1,975	71	0	0	1
	T2M	28	1,054	38	0	0	1		T2M	28	1,964	70	0	0	1
	T3S	28	1,083	39	0	0	1		T3S	28	2,016	72	0	0	1
	T3M	28	1,023	37	0	0	1		T3M	28	1,905	68	0	0	1
	T4M	28	1,044	37	0	0	1		T4M	28	1,944	69	0	0	1
	TFTM	28	1,088	39	0	0	1		TFTM	28	2,026	72	0	0	1
	SYMDF	28	1,012	36	1	0	1		SYMDF	28	1,885	67	1	0	1
	ASYDF	28	1,007	36	0	0	1		ASYDF	28	1,875	67	0	0	1

CITY OF RICHMOND

GREELEY AND HANSEN

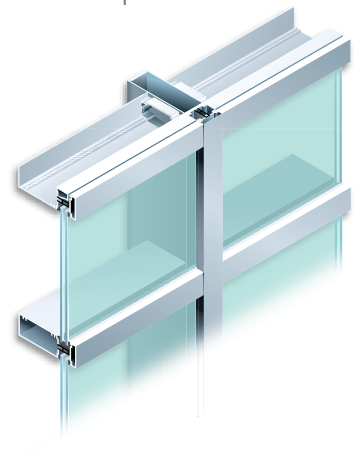
Environ-Civil Engineering, Ltd.
Engineers • Scientists • Construction Managers

DANIELS & ASSOCIATES, P.C.
Consulting Engineers

Sludge Dewatering Facility Exterior Building Materials

Reliance™-TC—thermal composite curtain wall system by Oldcastle BuildingEnvelope®

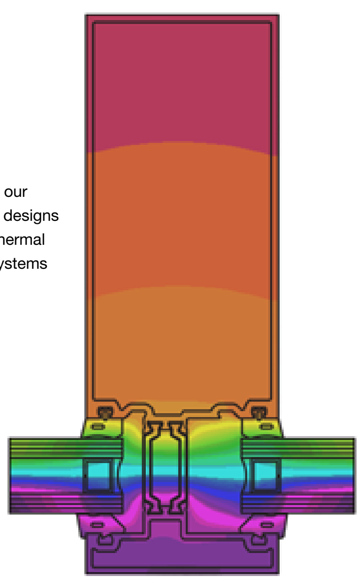
Energy efficiency has become a critical part of the design process in modern construction. In keeping with our commitment to the environment we have further enhanced the Reliance™-TC Composite Curtain Wall System. This product is designed to meet higher levels of thermal performance with a traditional glazed curtain wall system.



Benefits

The Reliance™-TC curtain walls utilize multiple assembly and glazing options to meet a wider range of performance requirements. Reliance™-TC Type I Curtain Wall utilizes a composite vertical and standard Reliance™ horizontals. Reliance™-TC Type II features thermal composite members for all verticals and horizontals with pressure plate assembly. You may also add a FRP pressure plate to horizontals and/or verticals to maximize U-factors and Condensation Resistance Factor (CRF). The product is available in 7-1/4" and 6" depths with an aluminum pressure plate or 7-1/2" or 6-1/4" using the FRP pressure plate. Two-color capability is still available with all vertical and horizontal sections. As with Reliance™ Curtain Wall, Reliance™-TC offers optional depths and profiles, with the ability to adapt entrance doors and operable windows.

We analyze our curtain wall designs using 3-D thermal modeling systems



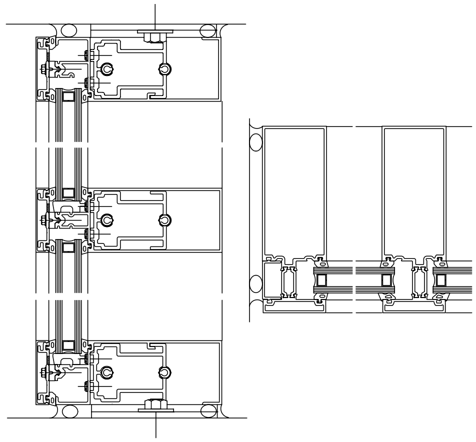
Features

- Overall system dimensions: 2-1/2" x 6", 2-1/2" x 6-1/4", 2-1/2" x 7-1/4" and 2-1/2" x 7-1/2"
- Utilizes standard Reliance™ Curtain Wall profiles and components
- Thermally broken utilizing 27 mm and 30 mm thermal struts and an EPDM isolator
- Optional FRP pressure plate
- Accommodates the standard doors or the AD-375 Thermal Door
- Accommodates ZS-30 projected and casement vents

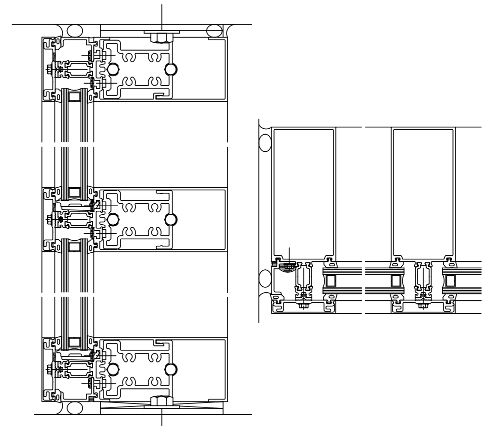
Reliance™-TC thermal composite curtain wall system

Details

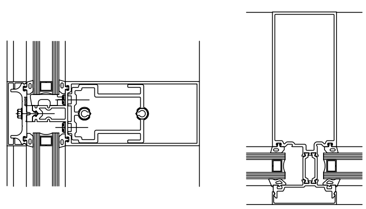
Reliance™-TC Type I



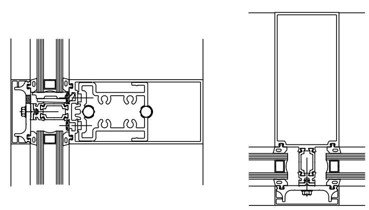
Reliance™-TC Type II



Optional FRP Pressure Plate



Optional FRP Pressure Plate



Performance

- Air Infiltration: <.06 CFM/SQ FT @ 6.24 PSF per ASTM E283
- Static Water: 15 PSF per ATSM E331
- Dynamic Water: 88 MPH per AAMA 501.1-05
- Deflection Load: 40 PSF per ASTM E330
- Structural Load: 60 PSF per ASTM E330
- STC: 28 with standard 1" insulating glass, 34 with double laminated 1" insulating glass
- Thermal Performance per AAMA 1503 for Clear 1" Insulating Glass with FRP Pressure Plate
  - U-Factor = 0.52
  - CRF Frame = 79
- Thermal Performance per AAMA 1503 for 1" Insulating Glass with Sunglass #2 surface, 90% argon and Technoform warm edge spacer utilizing FRP Pressure Plate
  - U-Factor = 0.30
  - CRF Frame = 82
- NFRC Tested and Certified
- Thermal Performance Characteristics per AAMA 507
- NFRC Component Modeling Approach Program certified

Oldcastle BuildingEnvelope®
2425 Olympic Boulevard, Suite 525-East ▪ Santa Monica, CA 90404
1-866-OLDCASTLE (653-2278) ▪ oldcastlebe.com

Flushline™ Entrances

High-Traffic Entrances Designed to Protect What's Inside

Our proven Flushline™ Entrances have been enhanced from the inside out for the performance and protection you need for today's harsh environments, more demanding building codes and commercial applications where durability is needed. This makes Flushline™ Entrances the natural choice for educational building applications – from grade schools to universities – where durability, strong design aesthetics, security and a custom look are important.

For decades, our Flushline™ heavy-duty flush panel door has provided the kind of performance you need in areas with heavy traffic. Now, our impact-tested, blast-tested and expanded hardware provides architects, designers and building owners with the ideal solution to protect our students and educators from unpredictable natural disasters and other threats. Kawneer is proud to continue to serve as a single-source solution for entrances that are proven to protect what's inside.

KAWNEER
AN ARCONIC COMPANY

Performance

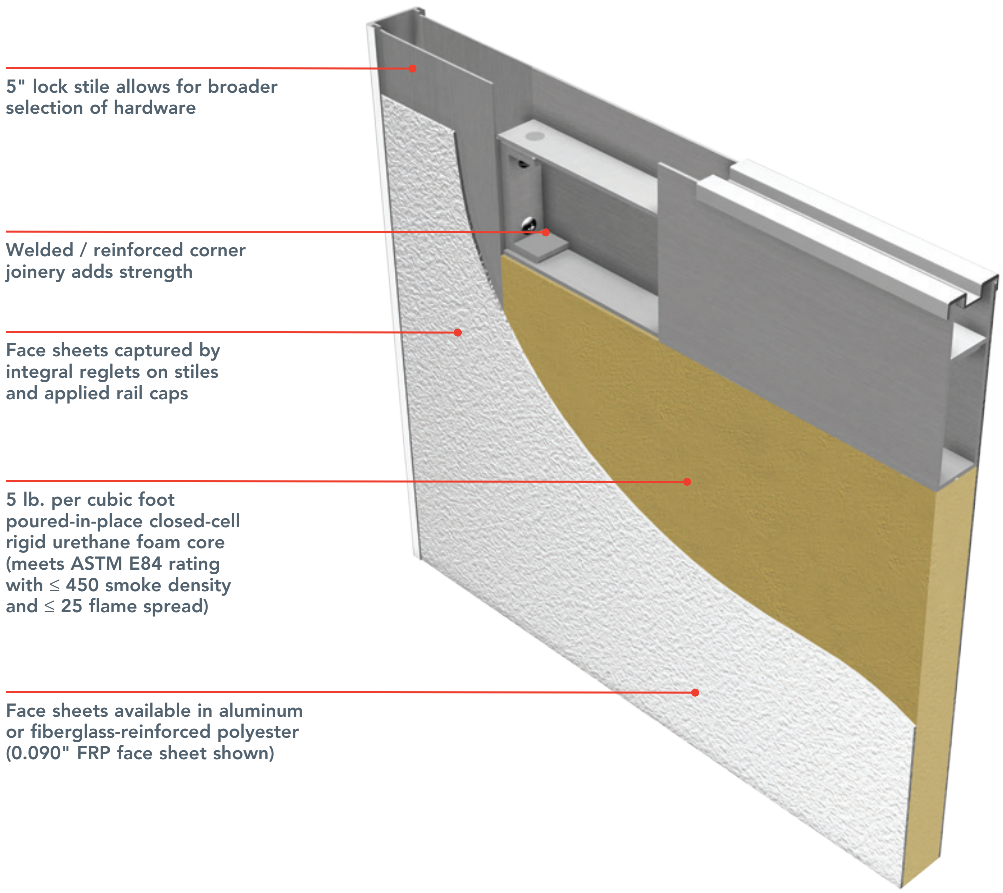
Flushline™ Entrances are engineered to resist many forms of damage associated with educational building applications – from athletic equipment to active students to the high-volume traffic associated with day-to-day use. But more than that, these doors have been designed to meet third-party testing standards for hurricane resistance and blast mitigation. Now tested for both large and small missile impact, Flushline™ Entrances not only withstand windborne debris and hurricane forces, but also provide increased security throughout the year. And, as one of the first aluminum flush doors tested for blast mitigation, Flushline™ Entrances help to protect students and educators from bomb blasts.

These tough exterior doors are constructed with vertical stiles joined to top and bottom rails by SIGMA deep-penetration welds. Mechanical clips and SIGMA fillet welds create the strongest door corners available today – a configuration that withstands abusive conditions while providing lower maintenance costs. Flushline™ Entrances provide both strength and flexibility to withstand years of wear and abuse.

Aesthetics and Versatility

Starting with the exterior, our engineers have designed Flushline™ Entrances with a flush appearance and face sheets that are captured with integral projections on the stiles and applied rail caps. Aluminum face sheets are available in both plain and embossed textures, with anodized or painted finishes. Fiberglass-reinforced polyester (FRP) sheets are also available and are designed to be colorfast and resist fading due to ultraviolet rays. Extremely tough FRP sheets resist the scratching and denting that can occur with metal skins.

Wider 5" lock stiles offer the added benefit of a broader selection of standard hardware options, allowing Flushline™ Entrances to match other entrances in the building for a total building solution. For maximum versatility, Flushline™ Entrances can also accommodate geometric aluminum framed vision lites.



Hurricane Resistant / Impact Tested

Blast Mitigation Tested

Enhanced Security

Kawneer Company, Inc.
Technology Park / Atlanta
555 Guthridge Court
Norcross, GA 30092

kawneer.com
770 . 449 . 5555

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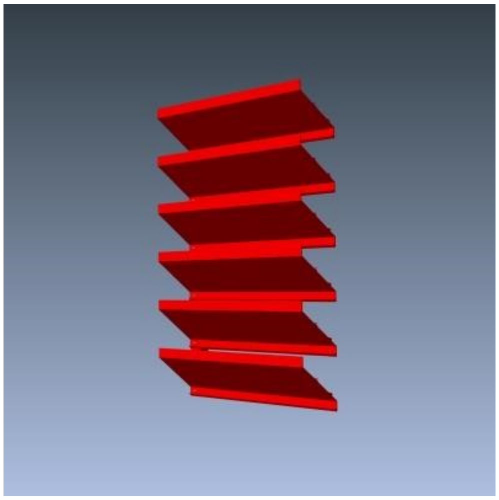
MODEL 450XPI



STANDARD CONSTRUCTION

- Material: Extruded Aluminum 6063-T6
- Vertical Supports: 5" x 2" x .125" Aluminum Support Channels
- Blades 4" (102mm) deep, .081" (2.1mm) nominal wall thickness
- Blade Spacing: 5" (127mm) on center
- Finish: Mill

OPTIONAL ACCESSORIES

- Cap Flashing
- Hinged Access Panels
- Visible Mullions
- Invisible Mullions for continuous blade appearance

FINISHES

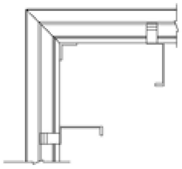
- 2 coat fluropolymer: Kynar® 500 / Hylar® 5000 custom colors available in 70% PVDF (AAMA 2605) or 50% PVDF (AAMA 2604) formulas.
- 3 coat fluropolymer: Kynar 500 / Hylar 5000 custom colors available in 70% PVDF (AAMA 2605) formulas.
- Anodic finishes: Class I and Class II in Clear, Light/Medium/Dark Bronze, Champagne, and Black.
- Prime coat
- Mill

SUGGESTED SPECIFICATIONS

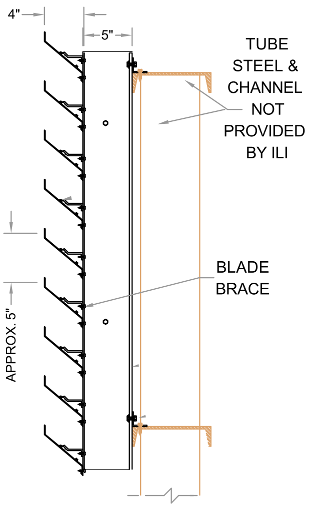
- General: Furnish and install where indicated on drawings 4" (102mm) Extruded Aluminum Inverted Equipment Screen Model 450XPI as manufactured by Industrial Louvers, Inc., Delano, MN.

- Material: Extruded aluminum supports and blades shall be one piece 6063-T6 alloy. Vertical supports shall have a material thickness of .125" (3.2mm). Fixed inverted blades shall have a material thickness of .081" (2.1mm). Supports and blades shall be joined by stainless steel mechanical fastener.

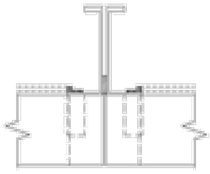
- Support: Structural Steel is designed, engineered and provided by others.



Corner View



Vertical Section



Invisible Vertical Mullion

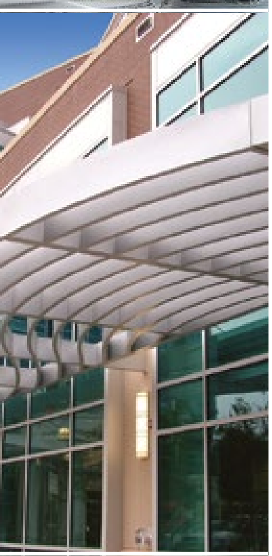
Qty.	Size: Actual ○ R.O. ● Width	Height	Mullion Type	No. of Sections	Notes
			Invisible		
			Invisible		
			Invisible		
☐	Sill flashing:		Job #: Project:		
☐	Screen:		Location:		
☐	Finish: Choose from dropdown		Representative:		
	Color:		Approved for fabrication ☐ As is ☐ As noted		
☐	Other:		By: Date:		

Please sign and return

CATALOG NO. 450XPI Rev: FEB 2015

FINISHES

Industrial Louvers, Inc.



Coatings and anodized finishes make each product unique and are key to durability and long-term value of projects. Beautiful, durable fluoropolymer coatings are resistant to chalking, abrasion and ultraviolet degradation, and keep products looking new for years. ILI offers the advantage of in-house painting for 70% PVDF finishes. Finishing product in-house ensures we can enforce the highest possible quality standards, and significantly reduces the potential for damage from shipping to an outside finisher. It also reduces lead times and provides us with the flexibility to manage our own finishing schedule.

ILI's standard 70% PVDF finish is Fluropon Pure® from Sherwin-Williams line of coatings. With significantly reduced hazardous materials, these coatings are formulated with material transparency and environmental impacts in mind. Fluropon Pure coatings offer opportunities to comply with material disclosure and optimization credits in LEED® V4 and comply with Red List Free requirements for Living Building Challenge projects. ILI is committed to sustainable practices on all of the projects in which we participate, not just on those that require it. All of ILI's standard colors and thousands of custom-matched colors are available in this formulation.

Fluropon Pure Specifications

- Meets or exceeds AAMA 2605
- Appropriate for building components designed for high-rise and monumental structures.
- Appropriate for projects located in areas with intense sunlight, extreme temperatures or high levels of atmospheric pollutants.
- Formulated without the use of PFOA, hexavalent chromium, cadmium, lead and phthalates.

Our wide selection of standard finishes will complement nearly any exterior. We also custom-match colors and offer exotic patterns and marine finishes. Please note that some custom finishes may not be available in the Fluropon Pure formulation.

The colors on this card are as close to actual as reproduction technology allows.

www.IndustrialLouvers.com
ilinfo@IndustrialLouvers.com

+1 763.972.2981 • 1.800.328.3421
511 South 7th Street Delano, MN 55328-9125

Industrial Louvers, Inc.

Coatings and anodized finishes make each product unique and are key to durability and long-term value of projects. Industrial Louvers, Inc. (ILI) offers a comprehensive range of painted and anodized finishes. Our wide selection of standard finishes will complement nearly any exterior. We also custom-match colors and offer exotic patterns and marine finishes.

Standard Color Selections

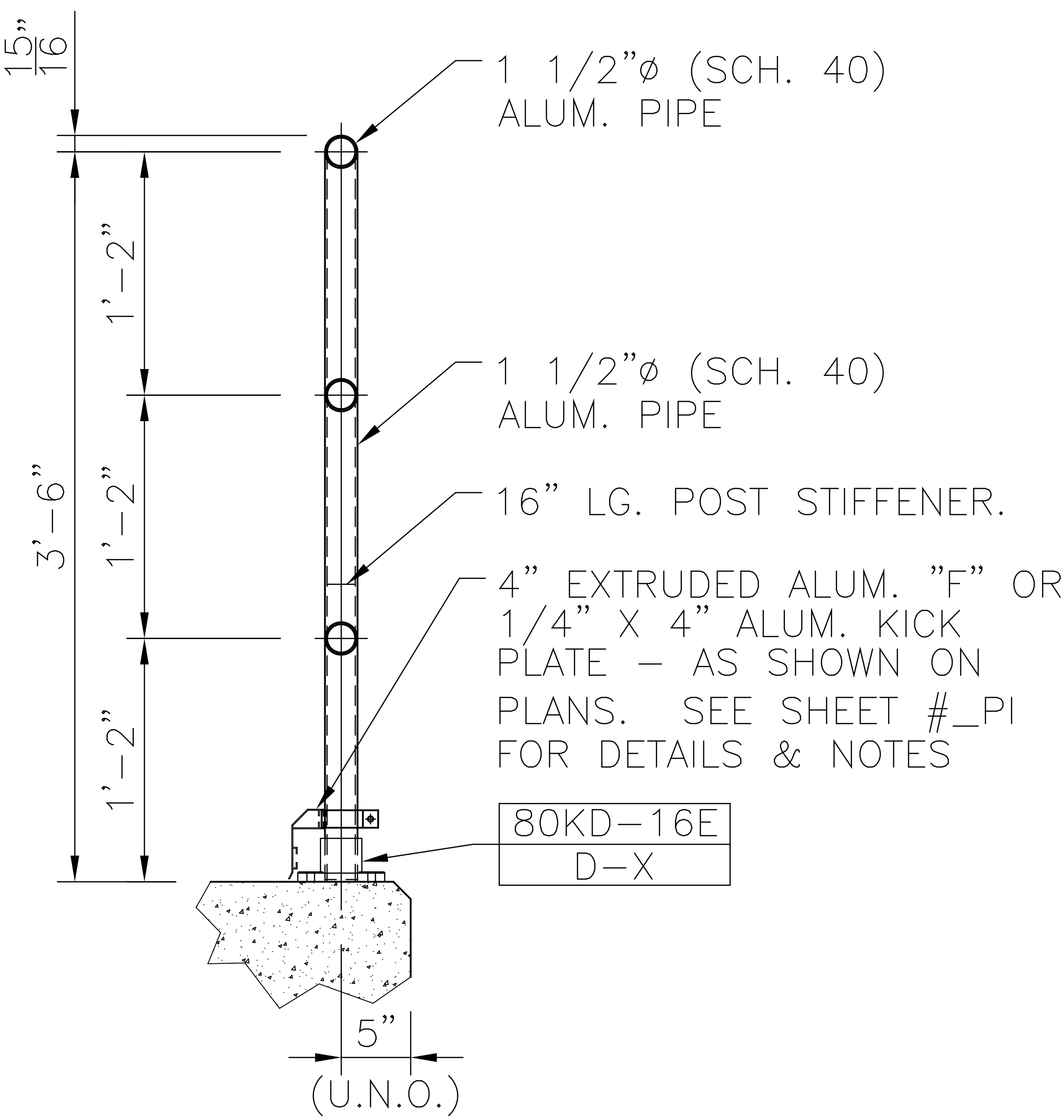
Bone White 391A580FP	Stone White 391A454FP	Seawolf Beige 397F199FP	Classic II Champagne Pearl 399C245FP	Oriental Ivory 393A361FP
Beige 393F061FP	Classic II Silver 399B697FP	Rawhide 397A538FP	Sandstone 393X321FP	Statuary Bronze 397F262FP
Fashion Grey 392A849FP	Brick Red 394F146FP	Sierra Tan 397A537FP	Dark Brown 397A536FP	Charcoal 392A848FP
Black 398F019FP	Military Blue 396A933FP	Interstate Green 395F081FP	Anodic Clear 399C210FP	Dark Bronze 397A606FP

(70% PVDF) Fluropon Pure® Color Codes

Note that colors are representations only and will not match actual finishes. When making a final color selection, please request a hard copy of our finish guide or samples of color chips.

Louvered Screen Example Picture:

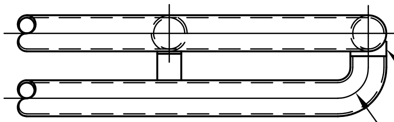
ANODIZED ALUMINUM

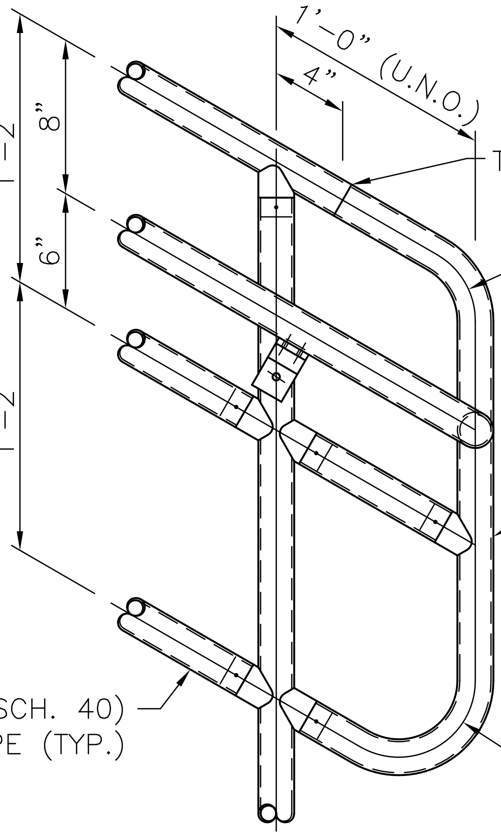


SECTION X/D-1

ROCKY MOUNTAIN RAILINGS
11839 E 51st AVE DENVER, CO 80239 PHONE (303) 432-0003 FAX (303) 432-2038

ANODIZED ALUMINUM



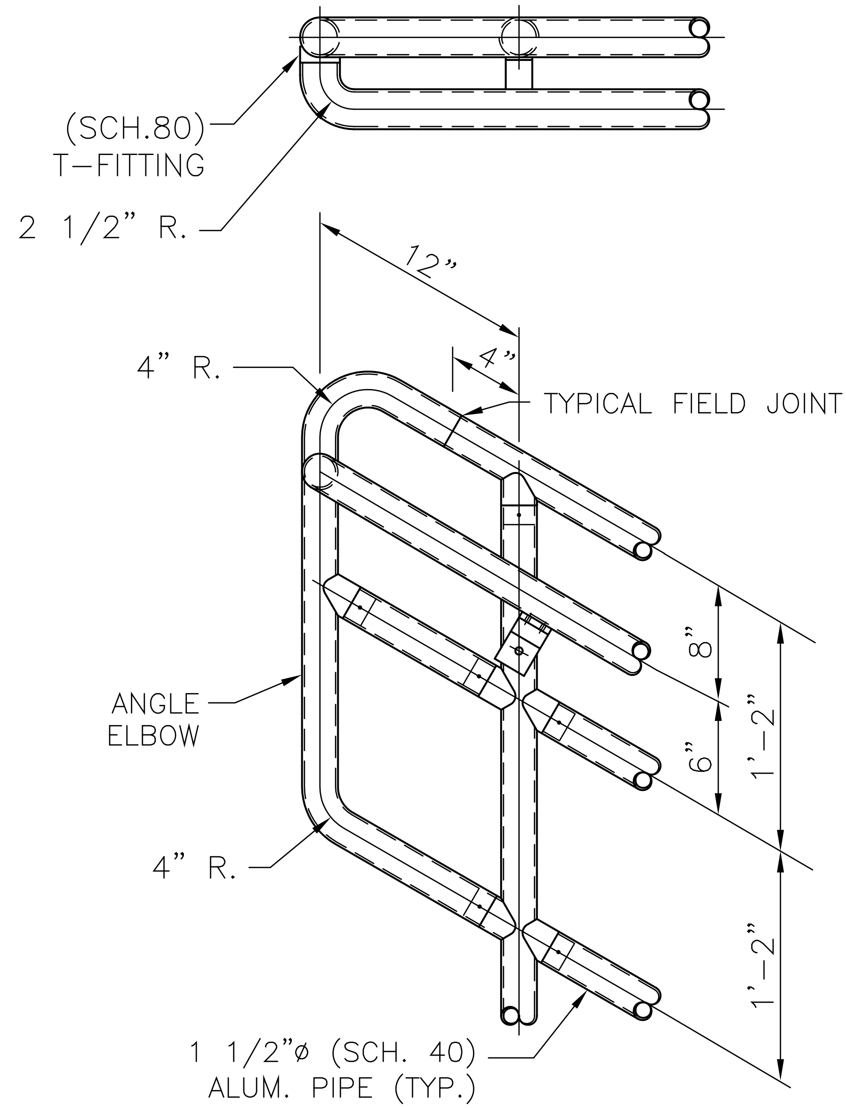


BOTTOM RAKE P-END W/ HANGOFF

25KD-5F

ROCKY MOUNTAIN RAILINGS
11839 E 51st AVE DENVER, CO 80239 PHONE (303) 432-0003 FAX (303) 432-2038

ANODIZED ALUMINUM



TOP RAKE P-END W/ HANGOFF

25KD-6G

ROCKY MOUNTAIN RAILINGS
11839 E 51st AVE DENVER, CO 80239 PHONE (303) 432-0003 FAX (303) 432-2038

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SIGNATURE® 200 COLORS

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HAWAIIAN BLUE	CRIMSON RED	FERN GREEN	CHARCOAL GRAY	ASH GRAY
SADDLE TAN	KOKO BROWN	RUSTIC RED	LIGHT STONE	BURNISHED SLATE
DESERT SAND	COBALT BLUE	POLAR WHITE	SOLAR WHITE	COAL BLACK

- Final color selection should be made from actual color chips.
- Trim available in all colors.
- Please speak to a representative for the most current warranty information.
- All colors are available in 26-gauge material. Please consult a representative with requests for other gauges.

Call 800.643.5555 with questions.

BBB ACCREDITED BUSINESS A+ rated

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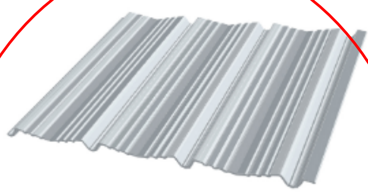
WALL PANEL TYPES

MULTIPLE OPTIONS FOR A PERFECT SOLUTION

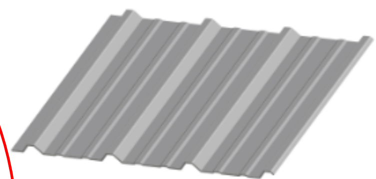
Not only does our array of steel buildings wall panel types offer superior performance, but you can also look forward to aesthetically pleasing profile options and color choices. Below is a brief description of our wall panel offerings.



AVP WALL PANEL

Featuring Pencil Ribs for Improved Aesthetics

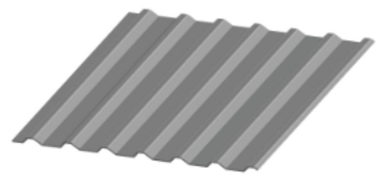
AVP WALL PANEL



PBR PANELS

Superior Performance, Aesthetically Pleasing Profiles

PBR PANELS



PBU WALL PANELS

Architecturally Versatile, Exposed Fastener

PBU WALL PANELS

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Department of Public Utilities Wastewater Treatment Plant Division 48 Project: Sludge Thickening and Dewatering Facility Improvements

Questions?

Urban Design Committee
December 2019 Meeting