

DIVISION 1 – GENERAL REQUIREMENTS

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SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased Construction.
4. Work under separate contracts.
5. Access to site.
6. Coordination with occupants.
7. Work restrictions.

B. Related Requirements:

1. Section 01 50 00.00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. See Division 0.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. See Division 0.

B. As a special note to the project: All existing surfaces, and in particular, existing marble, tile and terrazzo surfaces, are required to be protected throughout the life of the construction. Chips, scratches or any other type of minor damage is not acceptable. All damaged areas, even minor damage, is required to be repaired and restored to original condition as determined and defined by the Owner.

C. As a special note to the project: This project is not going for LEED certification, but the Owner does wish to incorporate LEED and sustainable principles in the design and construction of this project.

D. Type of Contract.

1. Project will be constructed under a single prime contract.

1.4 PHASED CONSTRUCTION

- A. The completion of this project will require phased construction.
- B. Proposed Written Phasing Plan and Colorized Illustrations

General Information:

The project phasing information provided in this document and in the information illustrated in the attached drawings is general in nature. The drawings illustrate the location of the various Departments and Divisions as they currently exist and also at each phase through the completion of the project. Each drawing for each phase illustrates the project at the completion of said phase. Minor, and possibly significant, changes in the phasing of construction may occur as the detailed construction schedule is developed by the Contractor and reviewed by the Owner, Construction Manager and Architect. Dates required for substantial completion must meet those identified in Division 0.

Existing Conditions: **March 3, 2017 to May 15, 2017**

The attached sheets PH001, PH002, PH003 and PH004 illustrate the current locations of the various Departments and Divisions. Please note that some Owner directed utility work necessary to complete the Project will begin prior to the start of the Project.

Phase One: **May 15, 2017 to June 30, 2017**

The attached sheets PH101, PH102, PH103 and PH104 illustrate the project at completion of Phase One. Phase One includes, but will not be limited to, obtaining required construction related permits, mobilization, temporary fencing and directional signage, the demolition of the planters along the north and east side of the existing HHS North building, the demolition/dismantling of the north walls of the existing HHS North building; the construction of insulated weather-tight walls to replace the demolished exterior walls of the north side of the HHS North building, a Level 2 Alteration of a minor portion of the basement level of the HHS North building, the construction of the two-story Pedestrian Walkway that eventually links the Justice Center to the New Addition, a Level 2 Alteration to the second floor of the Justice Center, and substantial site and utility work. Alterations, temporary or permanent, and new construction of mechanical, electrical and plumbing systems within the HSS South building and the Justice Center may occur during this phase. Permission to Occupy the Pedestrian Walkway will need to be obtained prior to the start of Phase Two. This phase will require coordination with the City of Appleton, the Owner and possibly with others under separate contract to the Owner. Temporary relocation of employees and existing fixtures, furniture and equipment by the Owner will occur to accommodate construction of this phase.

Phase Two: **June 30, 2017 to June 30, 2018**

The attached sheets PH201, PH202, PH203 and PH204 illustrate the project at completion of Phase Two. Phase Two includes, but will not be limited to, the construction and completion, including occupancy of, the new 3-story building addition along with substantial site and utility

work; this work will include removal of construction-related materials and other obstructions and will allow for full use of the Main/West parking lot for customers and employees. Alterations, temporary or permanent, and new construction of mechanical, electrical and plumbing systems within the HSS South building and the Justice Center may occur during this phase. This phase will require coordination with the City of Appleton, the Owner and with others under separate contract to the Owner, installation of new systems and other general furniture and extensive relocation of employees and existing fixtures, furniture and equipment by the Owner. Permission to Occupy will need to be obtained to complete this phase.

Phase Three: June 30, 2018 to February 28, 2019

The attached sheets PH301, PH302, PH303 and PH304 illustrate the project at completion of Phase Three. Phase Three includes, but will not be limited to, a Level 3 Alteration to all four floors of the existing HHS North Building, a Level 2 Alteration to the basement and also to the third floor of the County Administration Building, and if accepted, all work relating to Alternate Bid A1. Alterations, temporary or permanent, and new construction of mechanical, electrical and plumbing systems within the HSS South building and the Justice Center may occur during this phase. This phase will require coordination with the City of Appleton, the Owner and with others under separate contract to the Owner, installation of new systems and other general furniture and extensive relocation of employees and existing fixtures, furniture and equipment by the Owner. Permission to Occupy will need to be obtained to complete this phase.

Phase Four: February 28, 2019 to May 30, 2019

The attached sheets PH401, PH402, PH403 and PH404 illustrate the project at completion of Phase Four. Phase Four includes, but will not be limited to, a Level 2 Alteration to the basement of the Justice Center, a Level 2 Alteration to the first floor of the Justice Center and a Level 2 Alteration to the basement of the County Administration Building. This phase will require coordination with the City of Appleton, the Owner and with others under separate contract to the Owner, installation of new systems and other general furniture and relocation of employees and existing fixtures, furniture and equipment by the Owner. Permission to Occupy will need to be obtained to complete this phase.

1.5 WORK UNDER SEPARATE CONTRACTS

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.
- B. Proceeding, Concurrent, and/or Subsequent Work: Owner may award separate contract(s) for the following operations at Project site. Those operations shall be coordinated with and integrated into the construction schedule.
 - 1. Moving and relocation of required fixtures, furniture and equipment to temporary spaces on project site.

2. Contract for the removal and disposal of hazardous open materials.
3. Contract for providing and installing new fixture, furniture, and equipment.
4. Moving and relocation of required fixtures, furniture and equipment from temporary spaces on site to final locations on-site.

1.6 ACCESS TO SITE

- A. General: Contractor shall have full use of Project building project area for construction operations during construction period. Contractor's use of Project area is limited by Owner's right to perform work or to retain other contractors on portions of Project.
- B. General: Contractor shall have limited use of Project exterior site for construction operations as indicated on Drawings and as indicated by requirements of this Section.
- C. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 1. Limits: Limit site disturbance, including, but not limited to, earthwork and clearing of vegetation, surface walkways, surface parking, and utilities to greatest extent possible.
 2. Driveways, Walkways and Entrances: Keep driveways loading areas and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- D. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.7 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: The Owner will occupy the site and existing, adjacent building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 2. Notify Owner not less than 5 working days in advance of activities that will affect Owner's operations.
- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with

completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.8 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
2. Trailer parking, vehicular parking, and areas for staging will be severely limited. The Contractor will be allowed to have one trailer on site which shall be located on the grounds in front of the existing County Administration Building. This area, secured by the Contractor, will also be the location for portable toilet facilities. An area roughly 120 feet wide by 200 feet long will be available for staging laydown. This area will be located central to and abutting the area construction zone of the new addition. No Contractor parking will be allowed onsite. All parking, staging, loading, etc. must be approved by the Owner.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, extended hours are allowed as authorized by the Owner and allowed by City Ordinances.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner not less than 5 working days in advance of proposed utility interruptions.
2. Obtain Owner's written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner. Tasks that cause excessive noise or vibrations shall be carried out during non-operating hours. Although this applies to all occupied areas, special consideration shall be given to Courtroom areas. (Typical court schedules run from 8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 5:00 p.m., however, these schedules are sometimes extended into the evening to accommodate special trials.) These types of tasks can include items such as hammer drilling, hammering or banging on concrete elements and using other types of tools that cause sound vibrations through the building or other actions that will in some other way impede normal working operations.










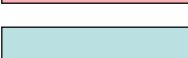










1. Notify Owner not less than 5 working days in advance of proposed disruptive operations.
 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building or on the site other than in designated exterior areas approved by Owner.

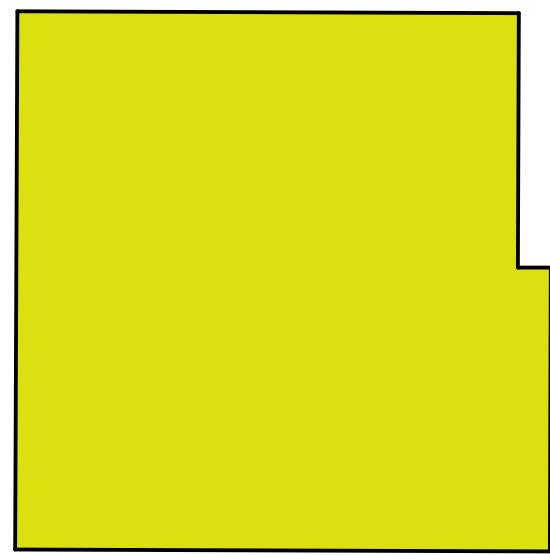
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PART 3 - EXECUTION (Not Used)

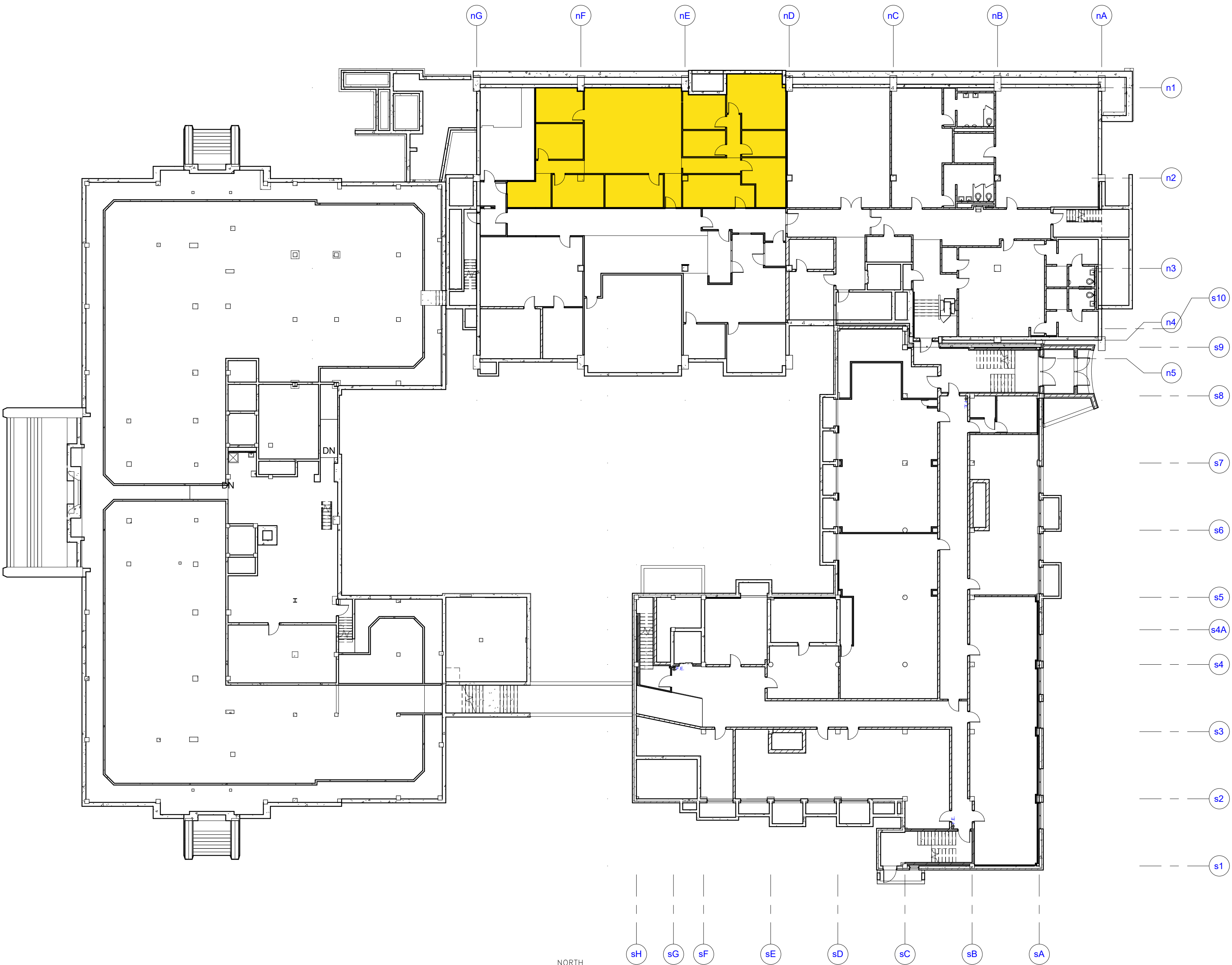
END OF SECTION

EXISTING DEPARTMENT KEY:

PANTONE YELLOW		MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE		VETERAN'S SERVICES
PANTONE RHODAMINE RED		HHS - ADMINISTRATION
PANTONE PURPLE		HHS - ASLT / ADRC
PANTONE VIOLET		HHS - CHILD SUPPORT
PANTONE PROCESS BLUE		HHS - CHILD, YOUTH & FAMILIES
PANTONE 100		HHS - ECONOMIC SUPPORT
PANTONE 1365		HHS - FISCAL
PANTONE 178		HHS - MENTAL HEALTH / AODA
PANTONE 1767		HHS - PUBLIC HEALTH / WIC
PANTONE 2975		JC - CIRCUIT COURT #3
PANTONE GREEN		JC - ASSISTANT COURT COMMISSIONER
PANTONE 361		JC - DISTRICT ATTORNEY
PANTONE 366		JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1		JC - FAMILY COURT COMMISSIONER
PANTONE 5535		JC - FAMILY COURT SERVICES
PANTONE 186		JC - REGISTER IN PROBATE
PANTONE 696		JC - SHERIFF ON-SITE
PANTONE 809		JC - CRIMINAL JUSTICE TREATMENT CENTER
RGB 128-128-128		SHERIFF



227 BUILDING



1
PH001
LEVEL 780.00 COMPOSITE PLAN
1" = 20'-0"



EXISTING





















ALTERATION / ADDITION
OUTAGAMIE COUNTY ADMINISTRATION CENTER
S. WALNUT & W. 8TH, APPLETON WI 54911
LEVEL 780.00 EXISTING COMPOSITE PLAN

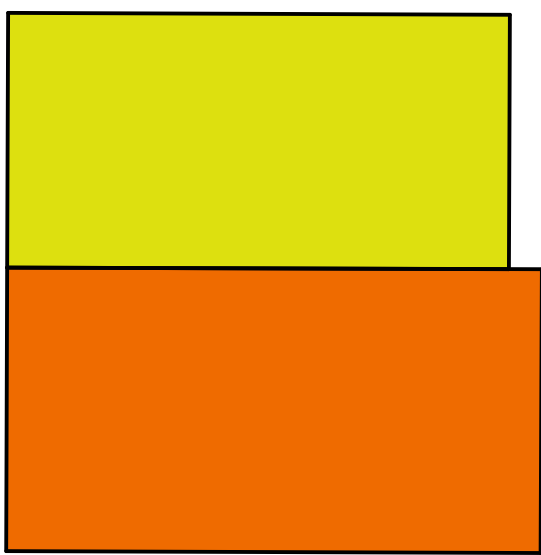
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PROJECT NO. 00002-61600160	
DATE MARCH 3, 2017	
SHEET NO.	

PH001

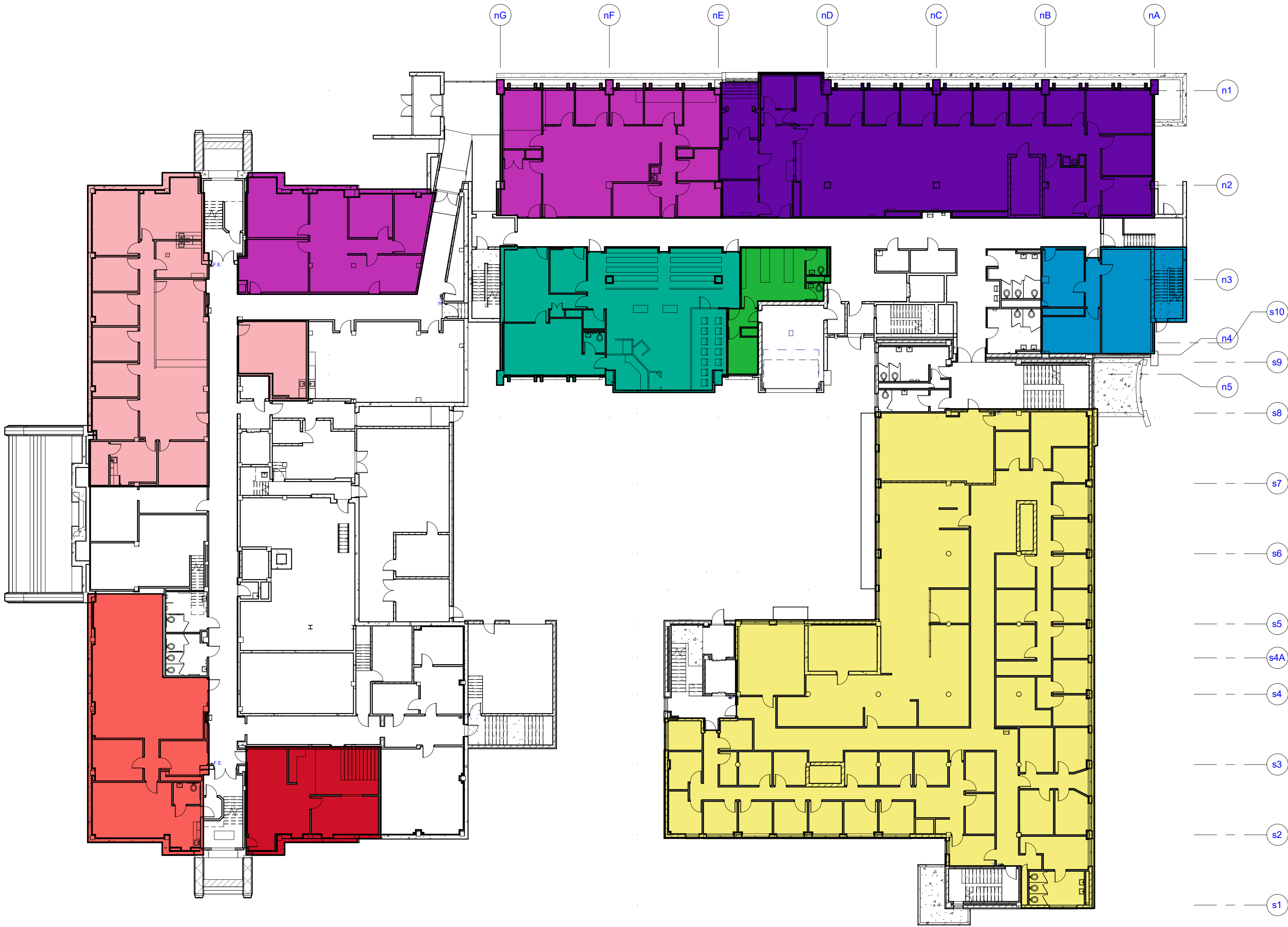
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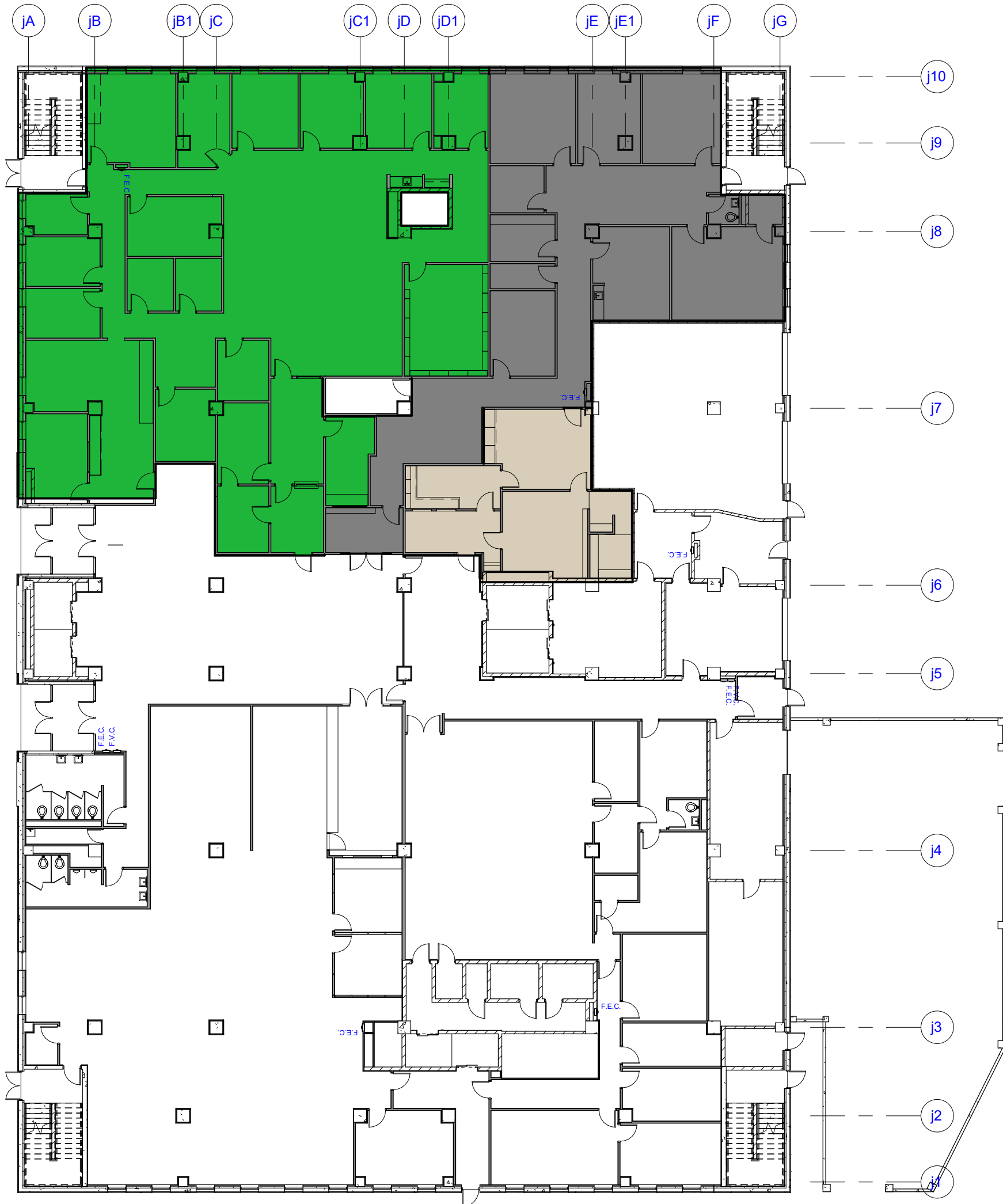
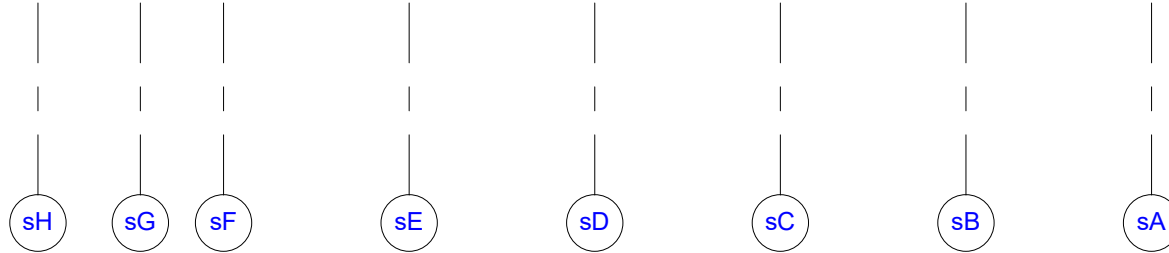
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RGB 128-128-128		SHERIFF



227 BUILDING



1 LEVEL 790.00 COMPOSITE PLAN
PH002 1" = 20'-0"



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S. WALNUT & W. 8TH, APPLETON WI 54911
LEVEL 790.00 EXISTING COMPOSITE PLAN

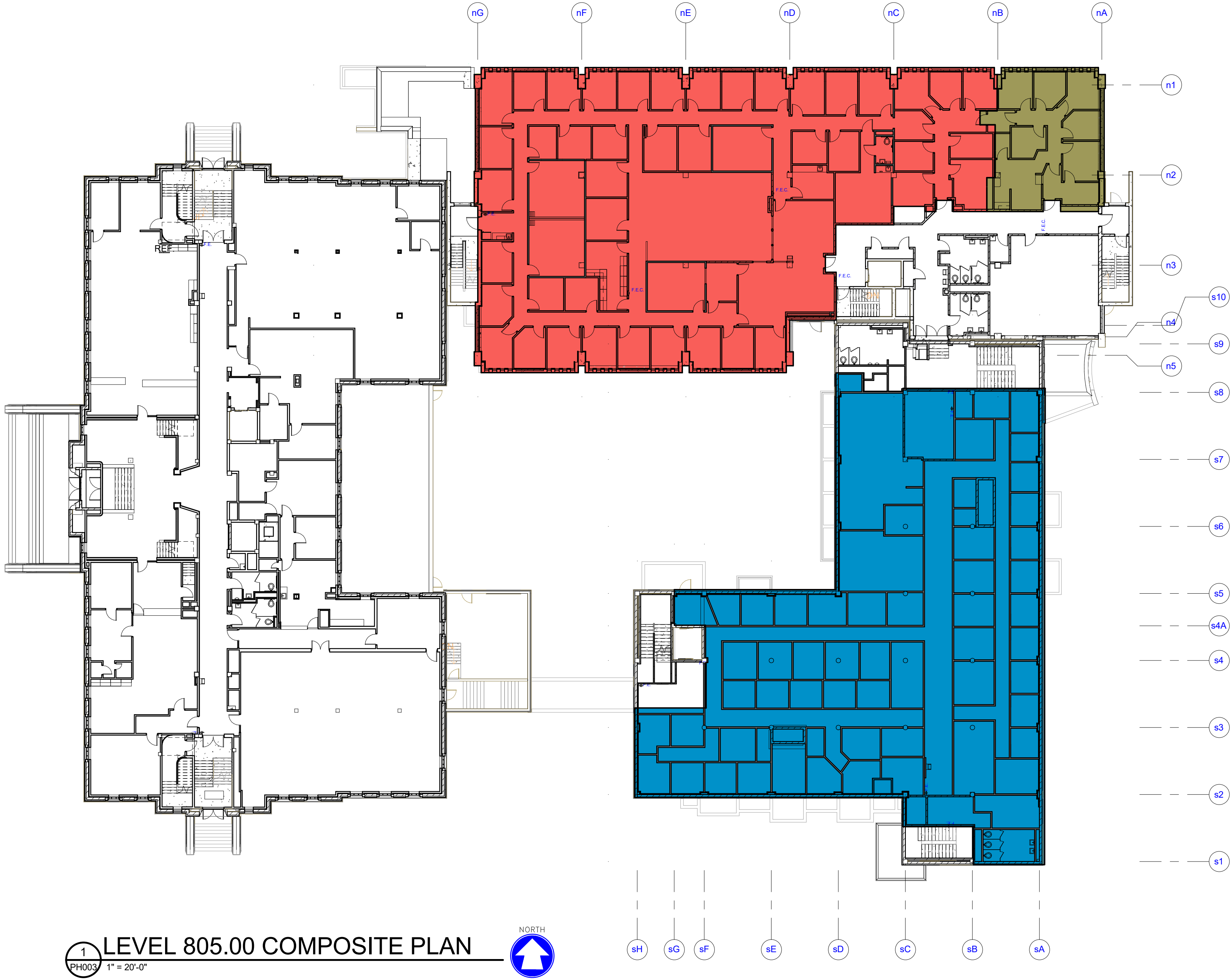
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PH002

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EXISTING DEPARTMENT KEY:		
PANTONE YELLOW	<div></div>	MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE	<div></div>	VETERAN'S SERVICES
PANTONE RHODAMINE RED	<div></div>	HHS - ADMINISTRATION
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1 LEVEL 805.00 COMPOSITE PLAN
PH003 1" = 20'-0"



EXISTING





















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LEVEL 805.00 EXISTING COMPOSITE PLAN

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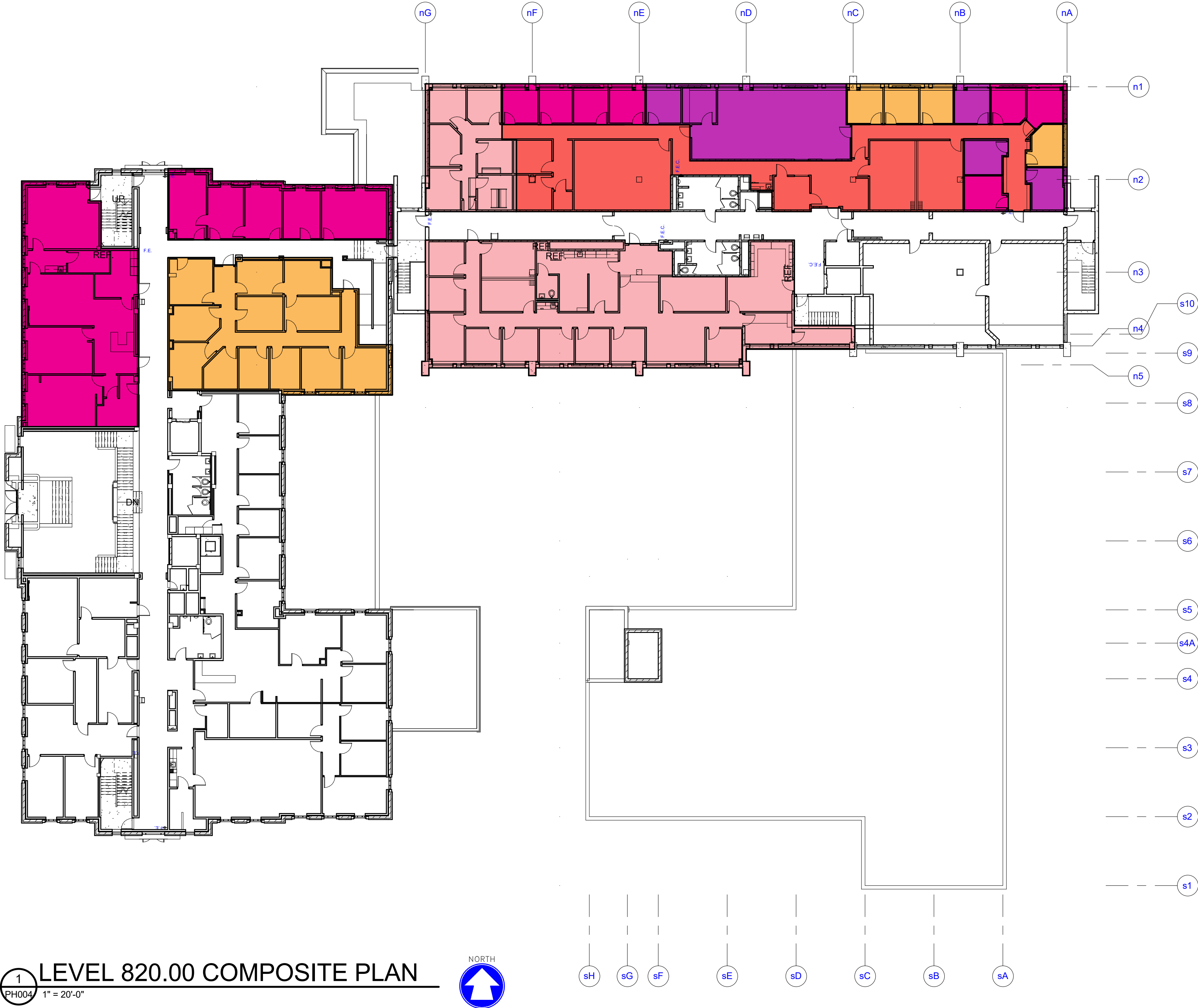
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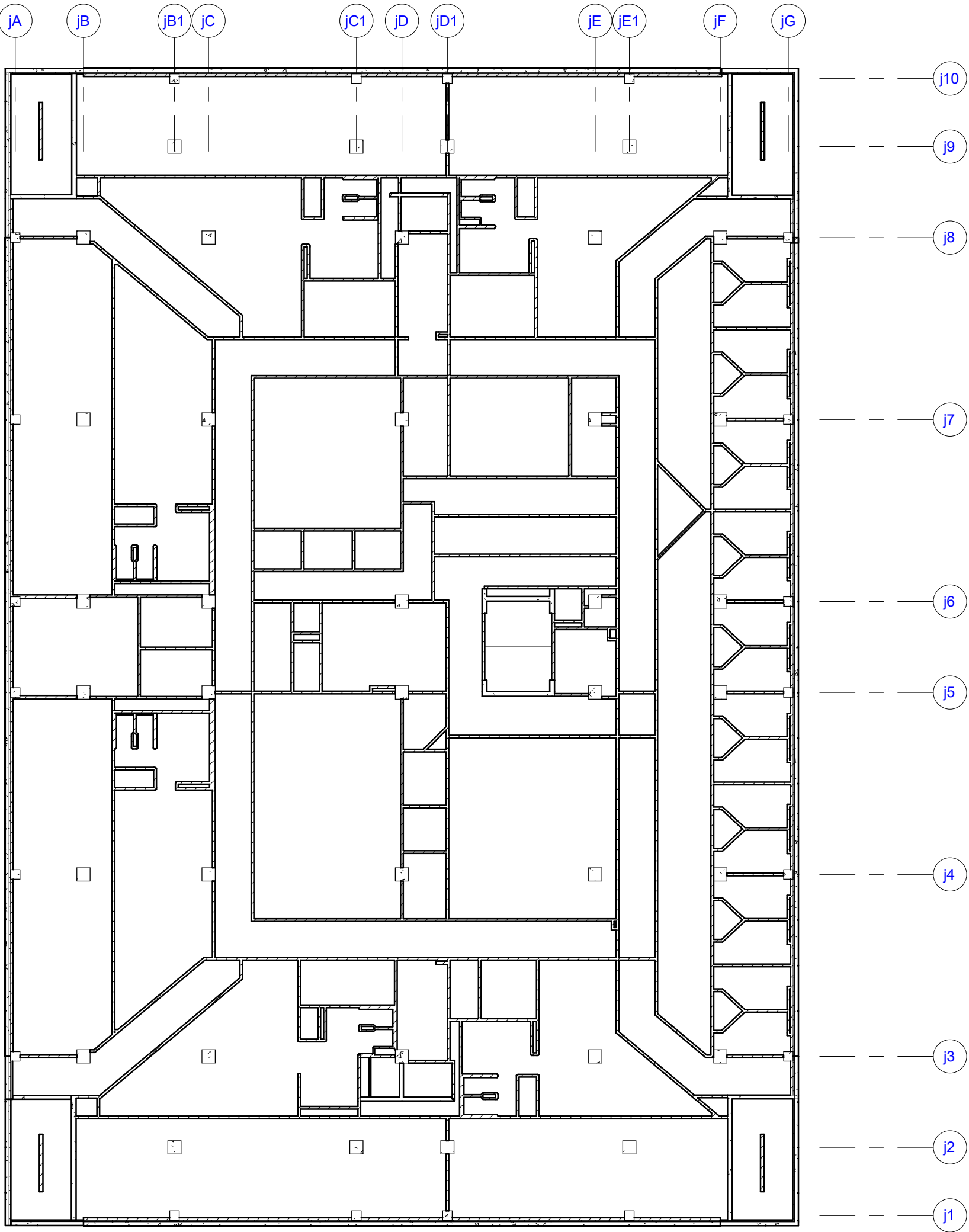
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EXISTING DEPARTMENT KEY:



1 PH004 LEVEL 820.00 COMPOSITE PLAN 1" = 20'-0"









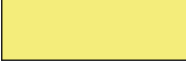













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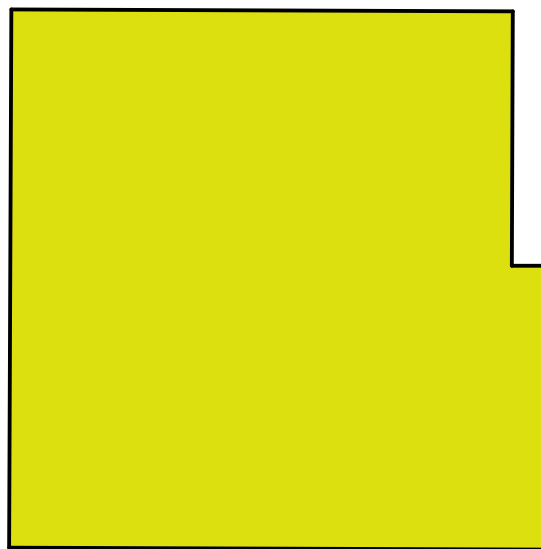
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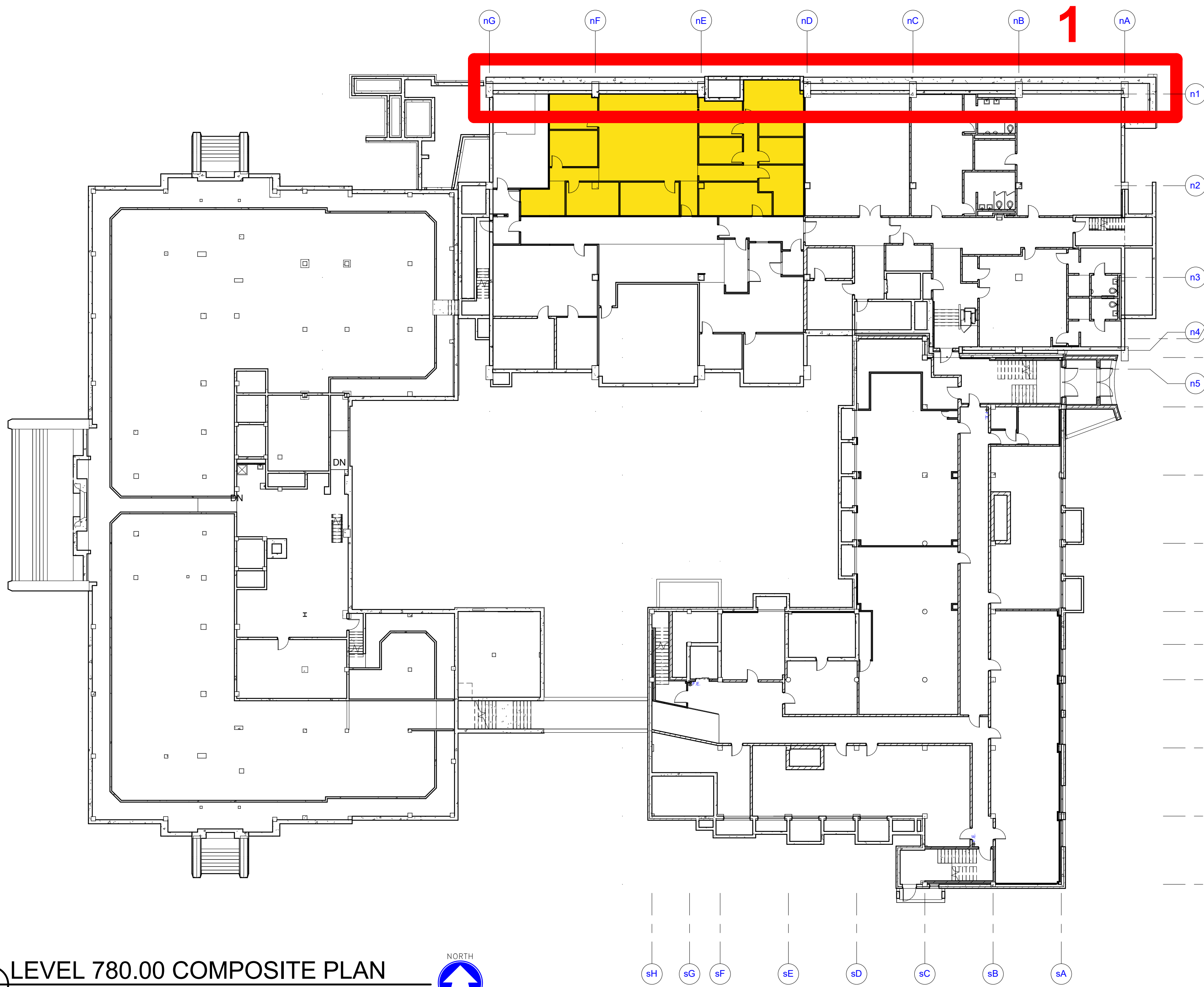
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RGB 128-128-128		SHERIFF



227 BUILDING

LEVEL 780.00 COMPOSITE PLAN























CONCEPTUAL PHASE 1 COMPLETE

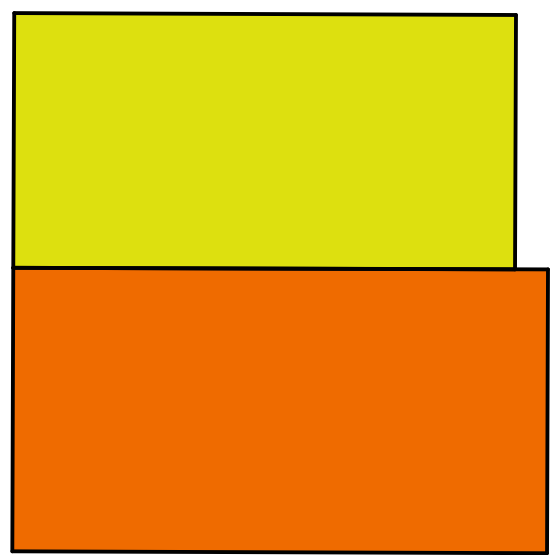
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LEVEL 780.00 PHASE 1 COMPOSITE PLAN

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DATE	
MARCH 3, 2017	
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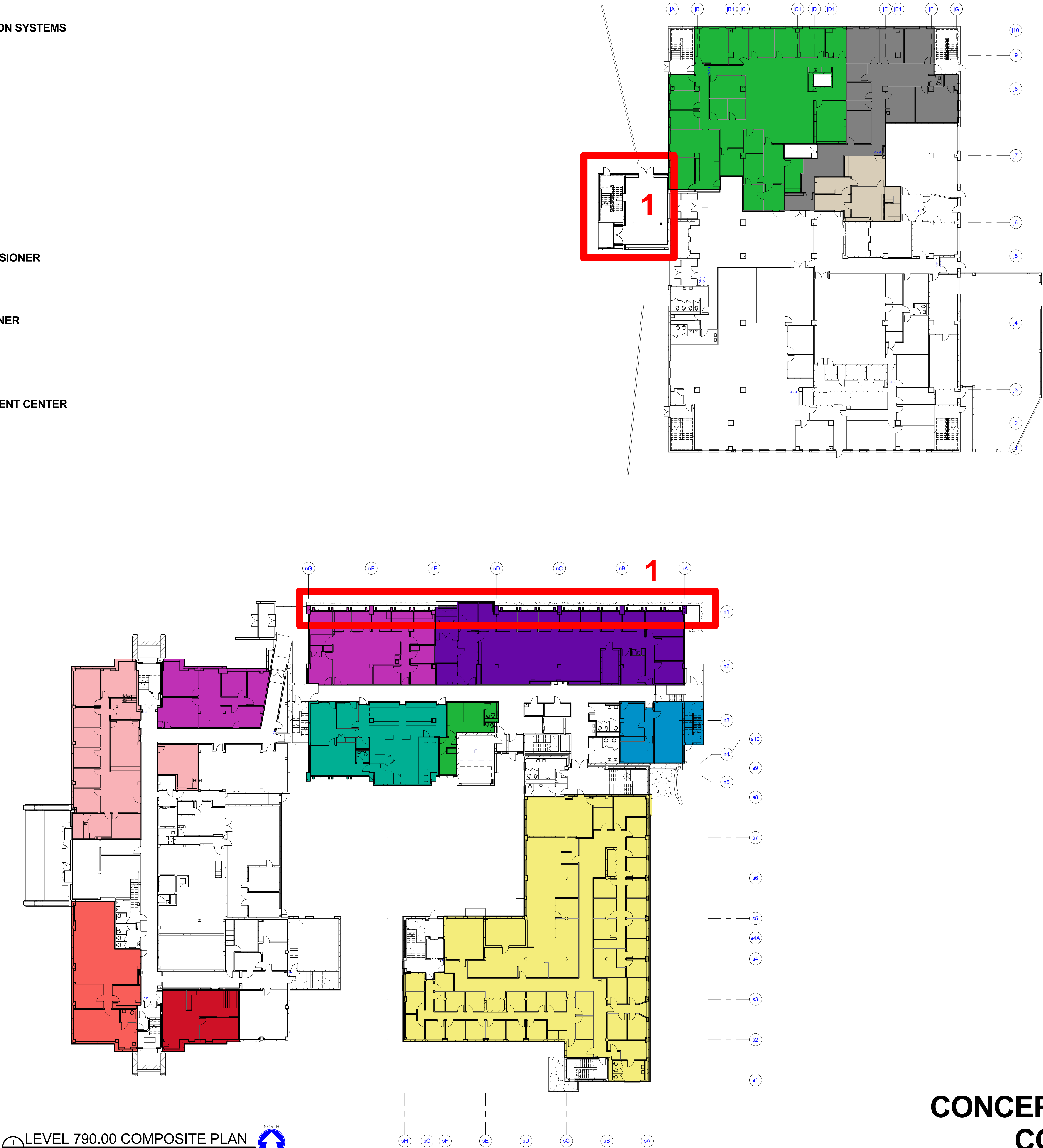
PH101

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RGB 128-128-128		SHERIFF



227 BUILDING

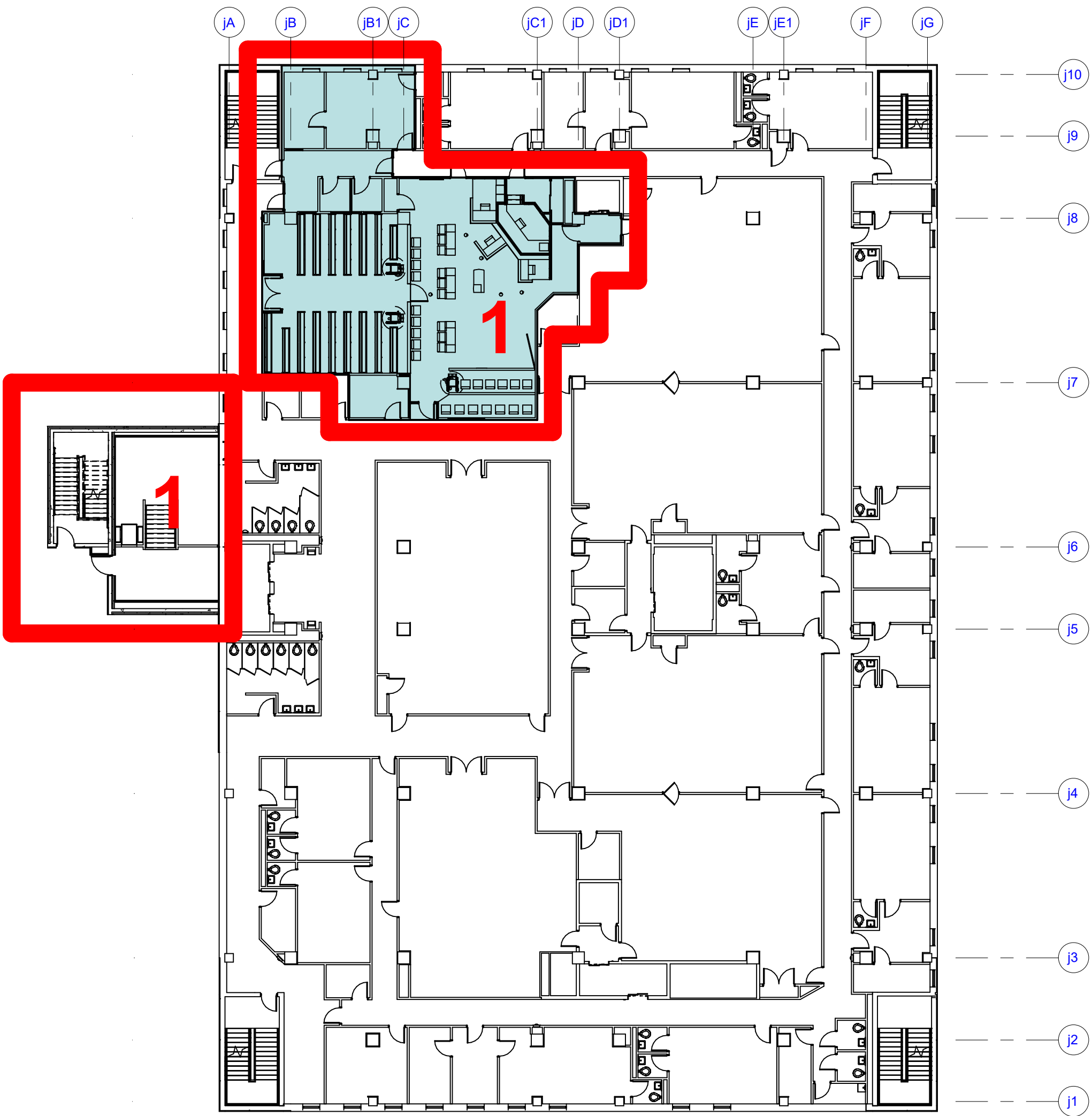
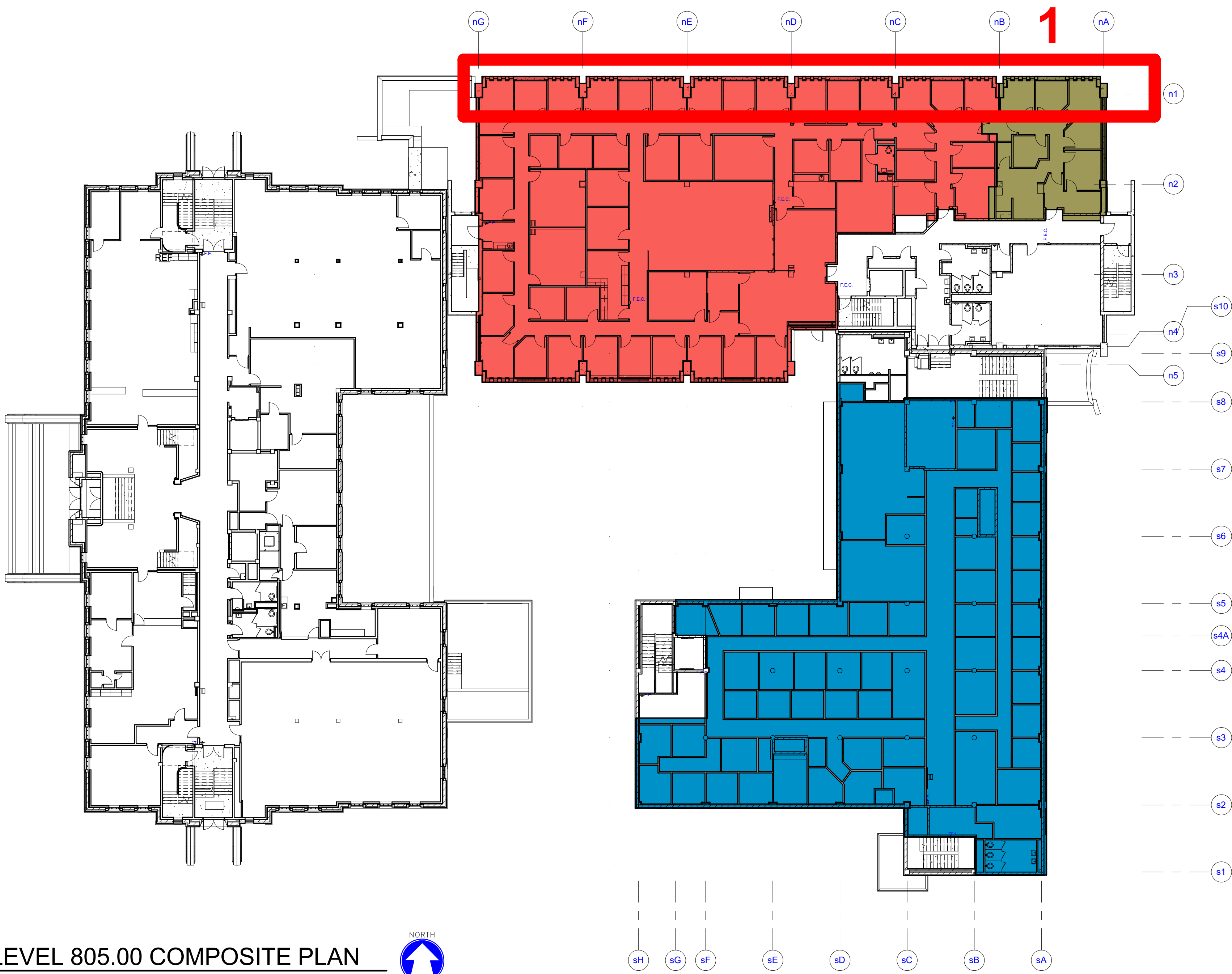


EXISTING DEPARTMENT KEY:

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PANTONE RHODAMINE RED		HHS - ADMINISTRATION
PANTONE PURPLE		HHS - ASLT / ADRC
PANTONE VIOLET		HHS - CHILD SUPPORT
PANTONE PROCESS BLUE		HHS - CHILD, YOUTH & FAMILIES
PANTONE 100		HHS - ECONOMIC SUPPORT
PANTONE 1365		HHS - FISCAL
PANTONE 178		HHS - MENTAL HEALTH / AODA
PANTONE 1767		HHS - PUBLIC HEALTH / WIC
PANTONE 2975		JC - CIRCUIT COURT #3
PANTONE GREEN		JC - ASSISTANT COURT COMMISSIONER
PANTONE 361		JC - DISTRICT ATTORNEY
PANTONE 366		JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1		JC - FAMILY COURT COMMISSIONER
PANTONE 5835		JC - FAMILY COURT SERVICES
PANTONE 196		JC - REGISTER IN PROBATE
PANTONE 696		JC - SHERIFF ON-SITE
PANTONE 809		JC - CRIMINAL JUSTICE TREATMENT CENTER
RGB 128-128-128		SHERIFF

1 LEVEL 805.00 COMPOSITE PLAN

PH103 1" = 20'-0"



CONCEPTUAL PHASE 1
COMPLETE














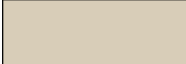






ALTERATION / ADDITION
OUTAGAMIE COUNTY ADMINISTRATION CENTER
S. WALNUT & W. 8TH, APPLETON WI 54911
LEVEL 805.00 PHASE 1 COMPOSITE PLAN

DESIGNED	DRAWN
ASF	BLG
PROJECT NO.	
00002-61600160	
DATE	
MARCH 3, 2017	
SHEET NO.	

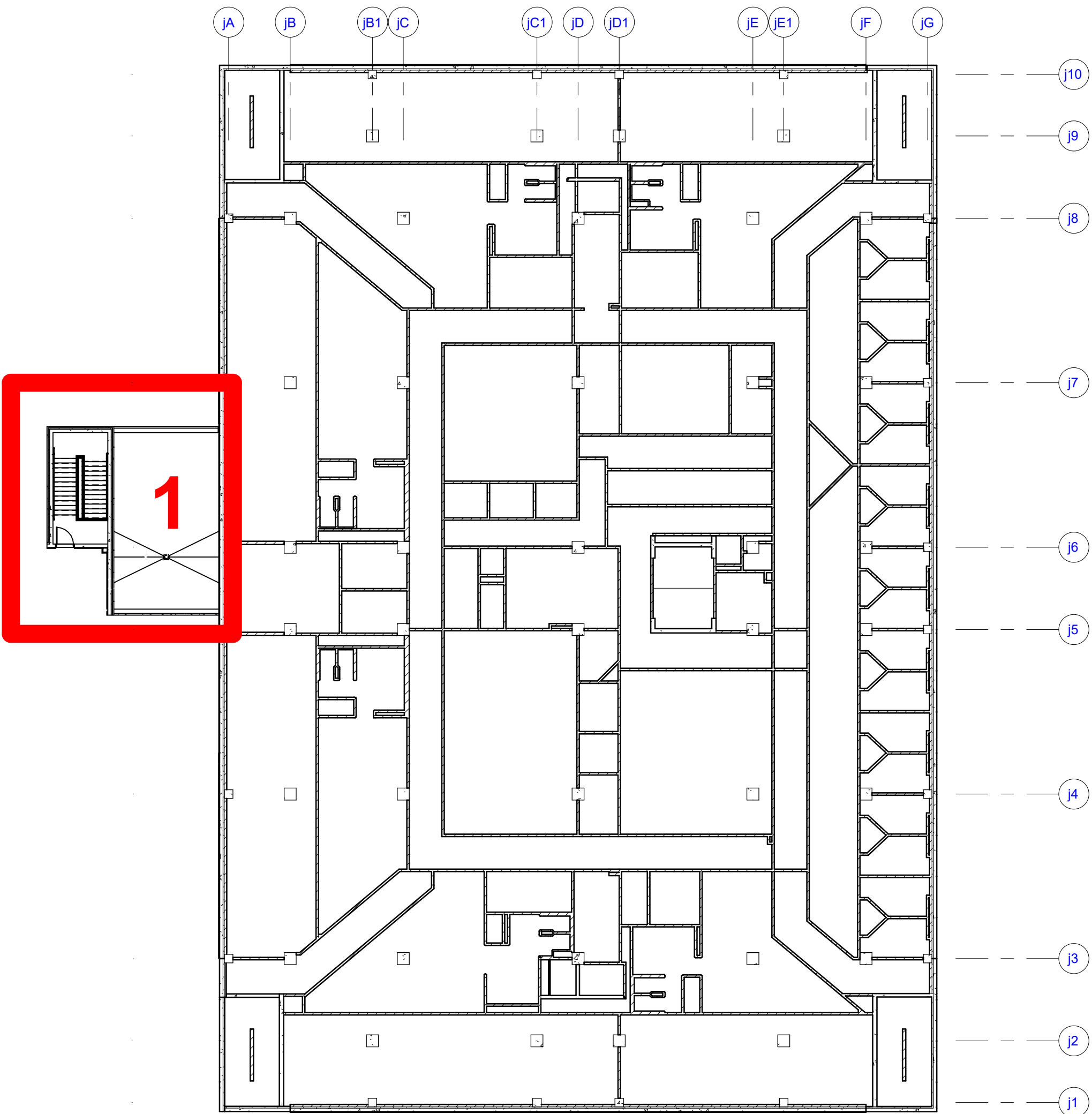
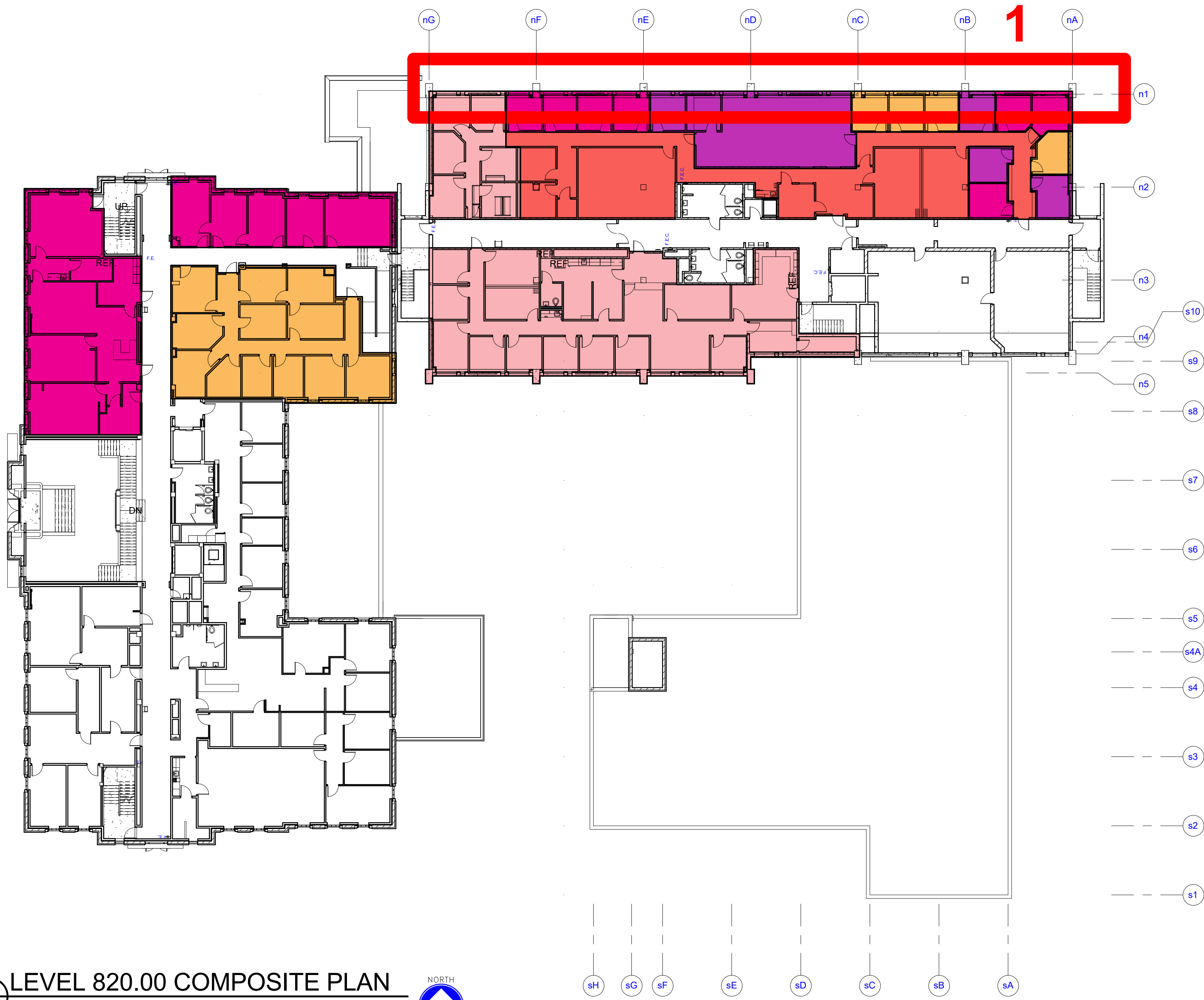
PH103

McMahon
ENGINEERS ARCHITECTS
1000 N. KENNA RD. SUITE 200
MILWAUKEE, WI 53212
Tel: (414) 751-4200 Fax: (414) 751-4284
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1000 N. KENNA RD. SUITE 200
MILWAUKEE, WI 53212
Tel: (414) 751-4200 Fax: (414) 751-4284
www.mcmgip.com

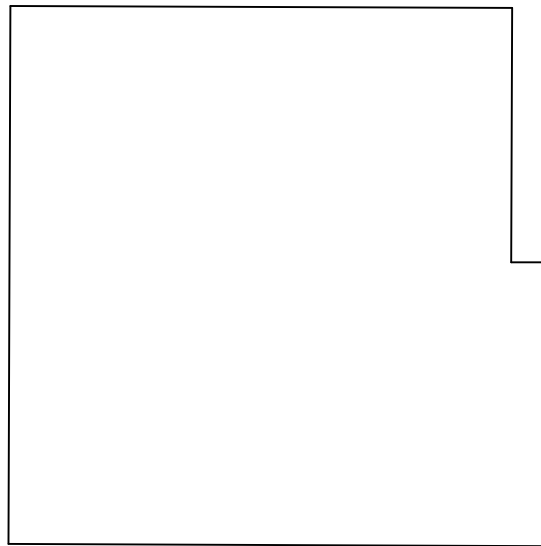
PANTONE YELLOW		MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE		VETERAN'S SERVICES
PANTONE RHODAMINE RED		HHS - ADMINISTRATION
PANTONE PURPLE		HHS - ASLT / ADRC
PANTONE VIOLET		HHS - CHILD SUPPORT
PANTONE PROCESS BLUE		HHS - CHILD, YOUTH & FAMILIES
PANTONE 100		HHS - ECONOMIC SUPPORT
PANTONE 1365		HHS - FISCAL
PANTONE 178		HHS - MENTAL HEALTH / AODA
PANTONE 1767		HHS - PUBLIC HEALTH / WIC
PANTONE 2975		JC - CIRCUIT COURT #3
PANTONE GREEN		JC - ASSISTANT COURT COMMISSIONER
PANTONE 361		JC - DISTRICT ATTORNEY
PANTONE 366		JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1		JC - FAMILY COURT COMMISSIONER
PANTONE 5835		JC - FAMILY COURT SERVICES
PANTONE 186		JC - REGISTER IN PROBATE
PANTONE 696		JC - SHERIFF ON-SITE
PANTONE 809		JC - CRIMINAL JUSTICE TREATMENT CENTER
RGB 128-128-128		SHERIFF

EXISTING DEPARTMENT KEY:



CONCEPTUAL PHASE 1
COMPLETE

PANTONE YELLOW		MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE		VETERAN'S SERVICES
PANTONE RHODAMINE RED		HHS - ADMINISTRATION
PANTONE PURPLE		HHS - ASLT / ADRC
PANTONE VIOLET		HHS - CHILD SUPPORT
PANTONE PROCESS BLUE		HHS - CHILD, YOUTH & FAMILIES
PANTONE 100		HHS - ECONOMIC SUPPORT
PANTONE 1365		HHS - FISCAL
PANTONE 178		HHS - MENTAL HEALTH / AODA
PANTONE 1767		HHS - PUBLIC HEALTH / WIC
PANTONE 2975		JC - CIRCUIT COURT #3
PANTONE GREEN		JC - ASSISTANT COURT COMMISSIONER
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PANTONE 366		JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1		JC - FAMILY COURT COMMISSIONER
PANTONE 5835		JC - FAMILY COURT SERVICES
PANTONE 186		JC - REGISTER IN PROBATE
PANTONE 696		JC - SHERIFF ON-SITE
PANTONE 809		JC - CRIMINAL JUSTICE TREATMENT CENTER
RGB 128-128-128		SHERIFF



227 BUILDING

1 LEVEL 780.00 COMPOSITE PLAN

PH201 1" = 20'-0"



CONCEPTUAL PHASE 2 COMPLETE









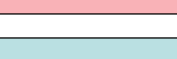



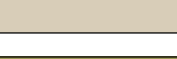







ALTERATION / ADDITION
OUTAGAMIE COUNTY ADMINISTRATION CENTER
S. WALNUT & W. 8TH, APPLETON WI 54911
LEVEL 780.00 PHASE 2 COMPOSITE PLAN

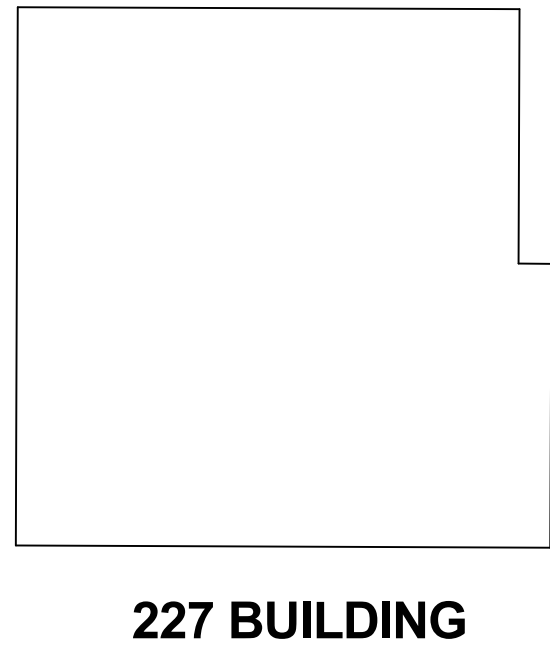
DESIGNED	DRAWN
ASF	BLG
PROJECT NO.	
00002-61600160	
DATE	
MARCH 3, 2017	
SHEET NO.	

PH201

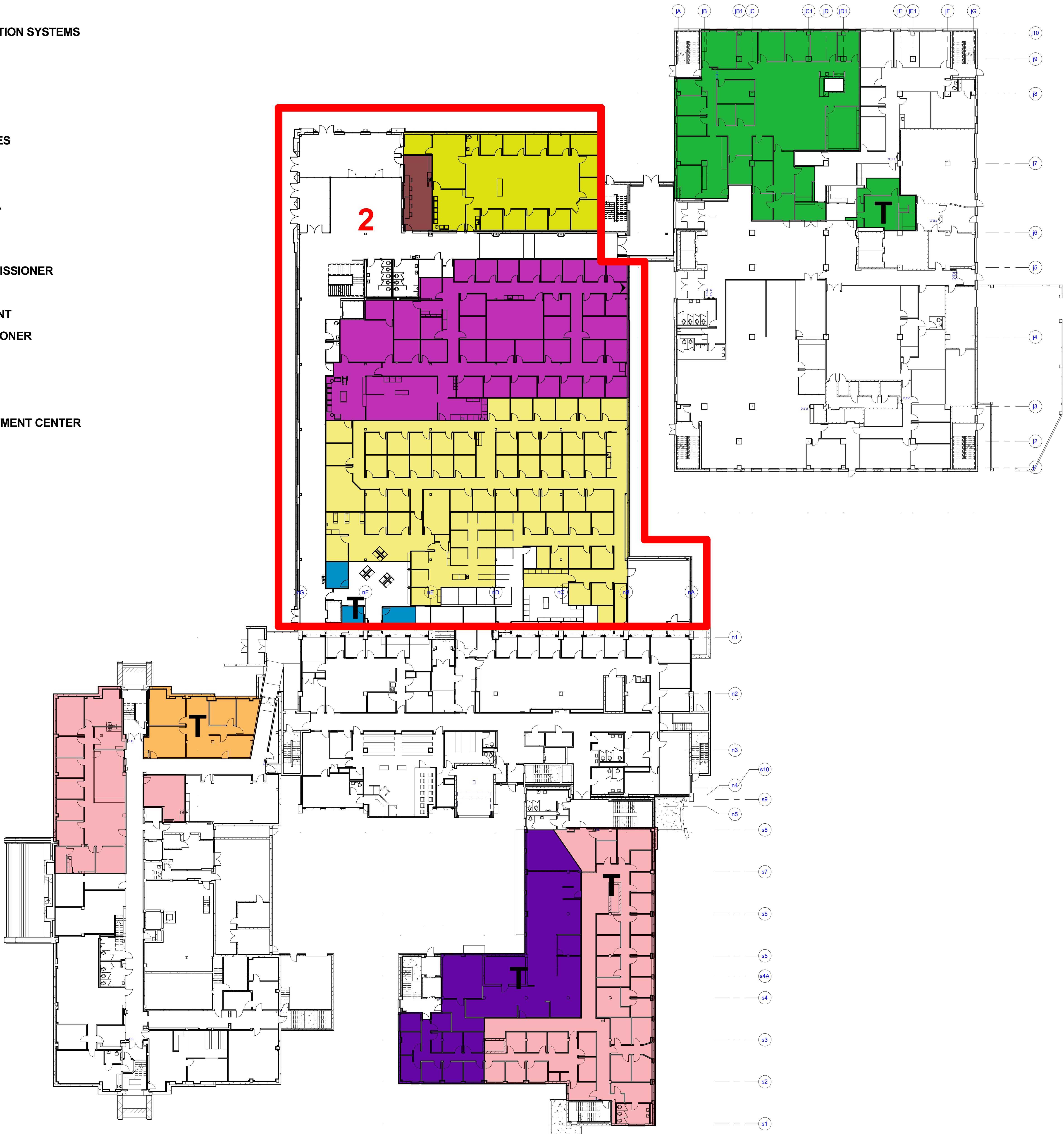
McMAHON
ENGINEERS ARCHITECTS
1000 N. KENNAWAY AVE., SUITE 200
APPLETON, WI 54911
TEL: (920) 751-4200 FAX: (920) 751-4284
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1000 N. KENNAWAY AVE., SUITE 200
APPLETON, WI 54911
TEL: (920) 751-4200 FAX: (920) 751-4284
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PANTONE YELLOW		MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE		VETERAN'S SERVICES
PANTONE RHODAMINE RED		HHS - ADMINISTRATION
PANTONE PURPLE		HHS - ASLT / ADRC
PANTONE VIOLET		HHS - CHILD SUPPORT
PANTONE PROCESS BLUE		HHS - CHILD, YOUTH & FAMILIES
PANTONE 100		HHS - ECONOMIC SUPPORT
PANTONE 1365		HHS - FISCAL
PANTONE 178		HHS - MENTAL HEALTH / AODA
PANTONE 1767		HHS - PUBLIC HEALTH / WIC
PANTONE 2975		JC - CIRCUIT COURT #3
PANTONE GREEN		JC - ASSISTANT COURT COMMISSIONER
PANTONE 361		JC - DISTRICT ATTORNEY
PANTONE 366		JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1		JC - FAMILY COURT COMMISSIONER
PANTONE 5835		JC - FAMILY COURT SERVICES
PANTONE 186		JC - REGISTER IN PROBATE
PANTONE 696		JC - SHERIFF ON-SITE
PANTONE 809		JC - CRIMINAL JUSTICE TREATMENT CENTER
RGB 128-128-128		SHERIFF



227 BUILDING











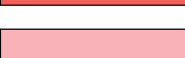











1 PH202 LEVEL 790.00 COMPOSITE PLAN 1" = 20'-0"



CONCEPTUAL PHASE 2 COMPLETE

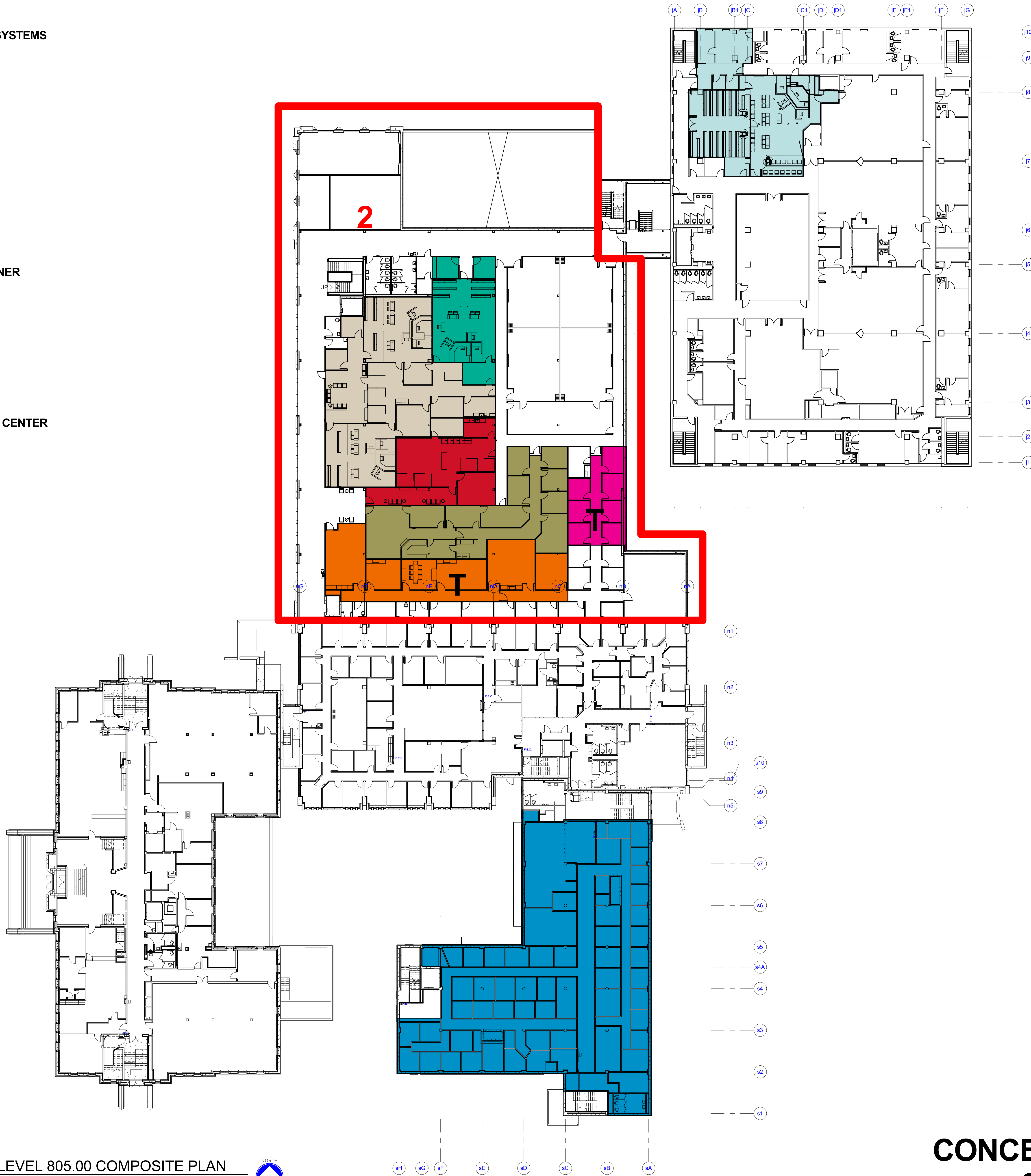
NO.	DATE	REVISION

DESIGNED ASF	DRAWN BLG
PROJECT NO. 00002-61600160	DATE MARCH 3, 2017
SHEET NO.	

PANTONE YELLOW		MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE		VETERAN'S SERVICES
PANTONE RHODAMINE RED		HHS - ADMINISTRATION
PANTONE PURPLE		HHS - ASLT / ADRC
PANTONE VIOLET		HHS - CHILD SUPPORT
PANTONE PROCESS BLUE		HHS - CHILD, YOUTH & FAMILIES
PANTONE 100		HHS - ECONOMIC SUPPORT
PANTONE 1365		HHS - FISCAL
PANTONE 178		HHS - MENTAL HEALTH / AODA
PANTONE 1767		HHS - PUBLIC HEALTH / WIC
PANTONE 2975		JC - CIRCUIT COURT #3
PANTONE GREEN		JC - ASSISTANT COURT COMMISSIONER
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PANTONE 366		JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1		JC - FAMILY COURT COMMISSIONER
PANTONE 5835		JC - FAMILY COURT SERVICES
PANTONE 186		JC - REGISTER IN PROBATE
PANTONE 696		JC - SHERIFF ON-SITE
PANTONE 809		JC - CRIMINAL JUSTICE TREATMENT CENTER
RGB 128-128-128		SHERIFF

EXISTING DEPARTMENT KEY:

1 LEVEL 805.00 COMPOSITE PLAN



CONCEPTUAL PHASE 2
COMPLETE

ALTERATION / ADDITION
OUTAGAMIE COUNTY ADMINISTRATION CENTER
S. WALNUT & W. 8TH, APPLETON WI 54911
LEVEL 805.00 PHASE 2 COMPOSITE PLAN

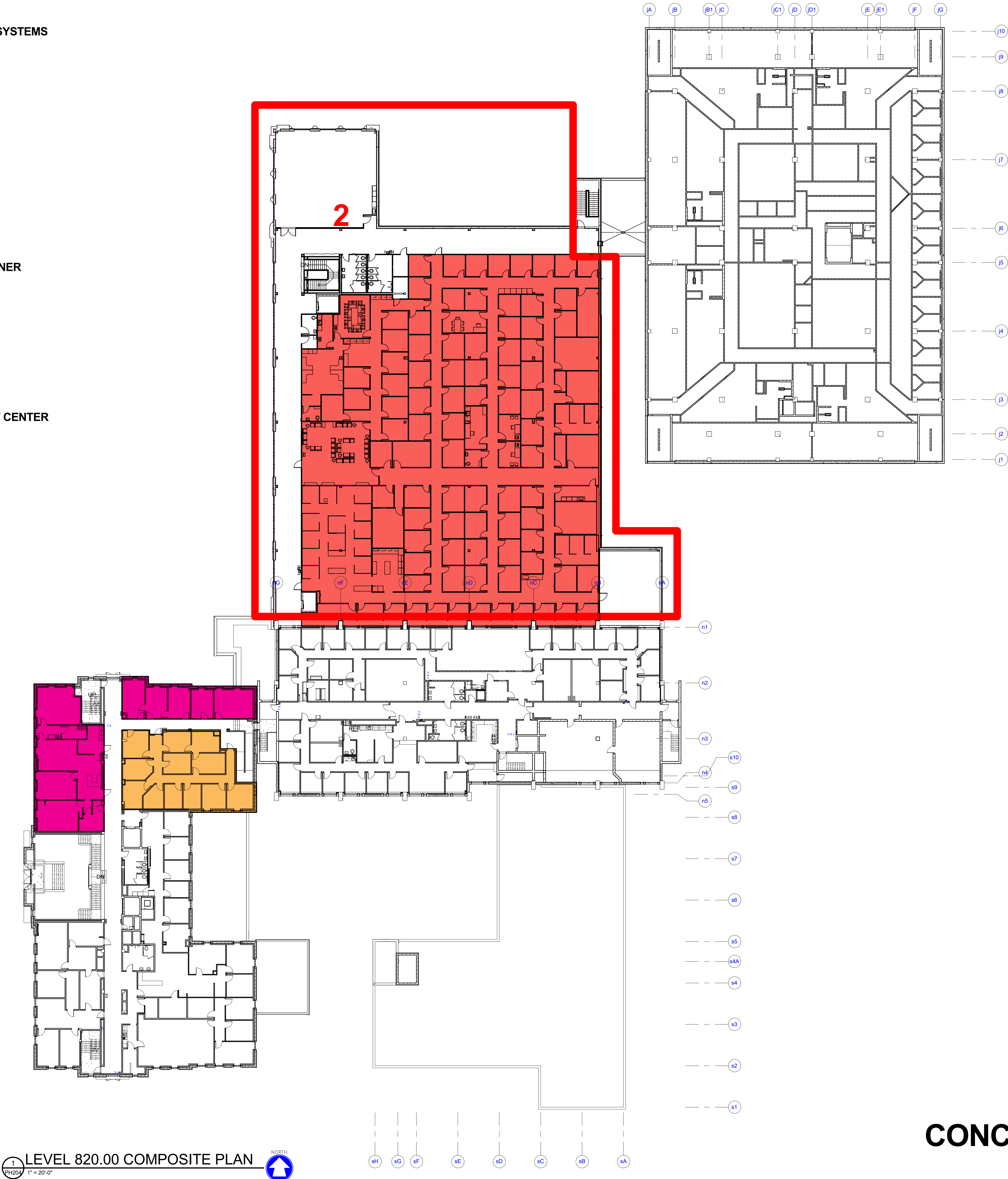
DESIGNED	DRAWN
ASF	BLG
PROJECT NO.	
00002-61600160	
DATE	
MARCH 3, 2017	
SHEET NO.	

PH203

McMAHON
ENGINEERS ARCHITECTS
1005 N. KENNAWAY AVE.
MILWAUKEE, WI 53233
Tel: (414) 754-4200 Fax: (414) 754-4284
www.mcmahon.com

EXISTING DEPARTMENT KEY:

PANTONE YELLOW	<div></div>	MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE	<div></div>	VETERAN'S SERVICES
PANTONE RHODAMINE RED	<div></div>	HHS - ADMINISTRATION
PANTONE PURPLE	<div></div>	HHS - ASLT / ADRC
PANTONE VIOLET	<div></div>	HHS - CHILD SUPPORT
PANTONE PROCESS BLUE	<div></div>	HHS - CHILD, YOUTH & FAMILIES
PANTONE 100	<div></div>	HHS - ECONOMIC SUPPORT
PANTONE 1365	<div></div>	HHS - FISCAL
PANTONE 178	<div></div>	HHS - MENTAL HEALTH / AODA
PANTONE 1767	<div></div>	HHS - PUBLIC HEALTH / WIC
PANTONE 2975	<div></div>	JC - CIRCUIT COURT #3
PANTONE GREEN	<div></div>	JC - ASSISTANT COURT COMMISSIONER
PANTONE 361	<div></div>	JC - DISTRICT ATTORNEY
PANTONE 366	<div></div>	JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1	<div></div>	JC - FAMILY COURT COMMISSIONER
PANTONE 5835	<div></div>	JC - FAMILY COURT SERVICES
PANTONE 186	<div></div>	JC - REGISTER IN PROBATE
PANTONE 696	<div></div>	JC - SHERIFF ON-SITE
PANTONE 809	<div></div>	JC - CRIMINAL JUSTICE TREATMENT CENTER
RGB 128-128-128	<div></div>	SHERIFF



1 LEVEL 820.00 COMPOSITE PLAN
1" = 20'-0"



CONCEPTUAL PHASE 2
COMPLETE

REVISION

DATE

NO.

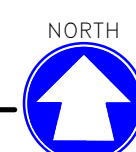
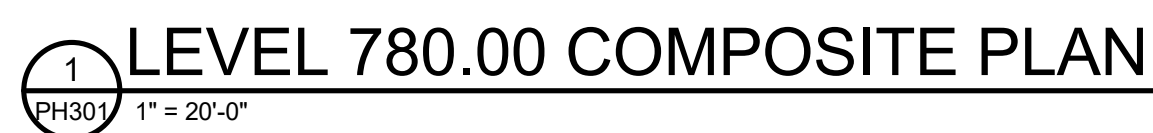
ALTERATION / ADDITION

OUTAGAMIE COUNTY ADMINISTRATION CENTER
S. WALNUT & W. 8TH, APPLETON WI 54911

LEVEL 820.00 PHASE 2 COMPOSITE PLAN

DESIGNED	DRAWN
ASF	BLG
PROJECT NO. 00002-61600160	
DATE MARCH 3, 2017	
SHEET NO.	

EXISTING DEPARTMENT KEY:










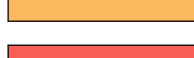

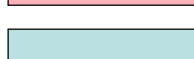










CONCEPTUAL PHASE 3 COMPLETE

DESIGNED ASF	DRAWN BLG
PROJECT NO. O0002-61600160	
DATE MARCH 3, 2017	
SHEET NO.	

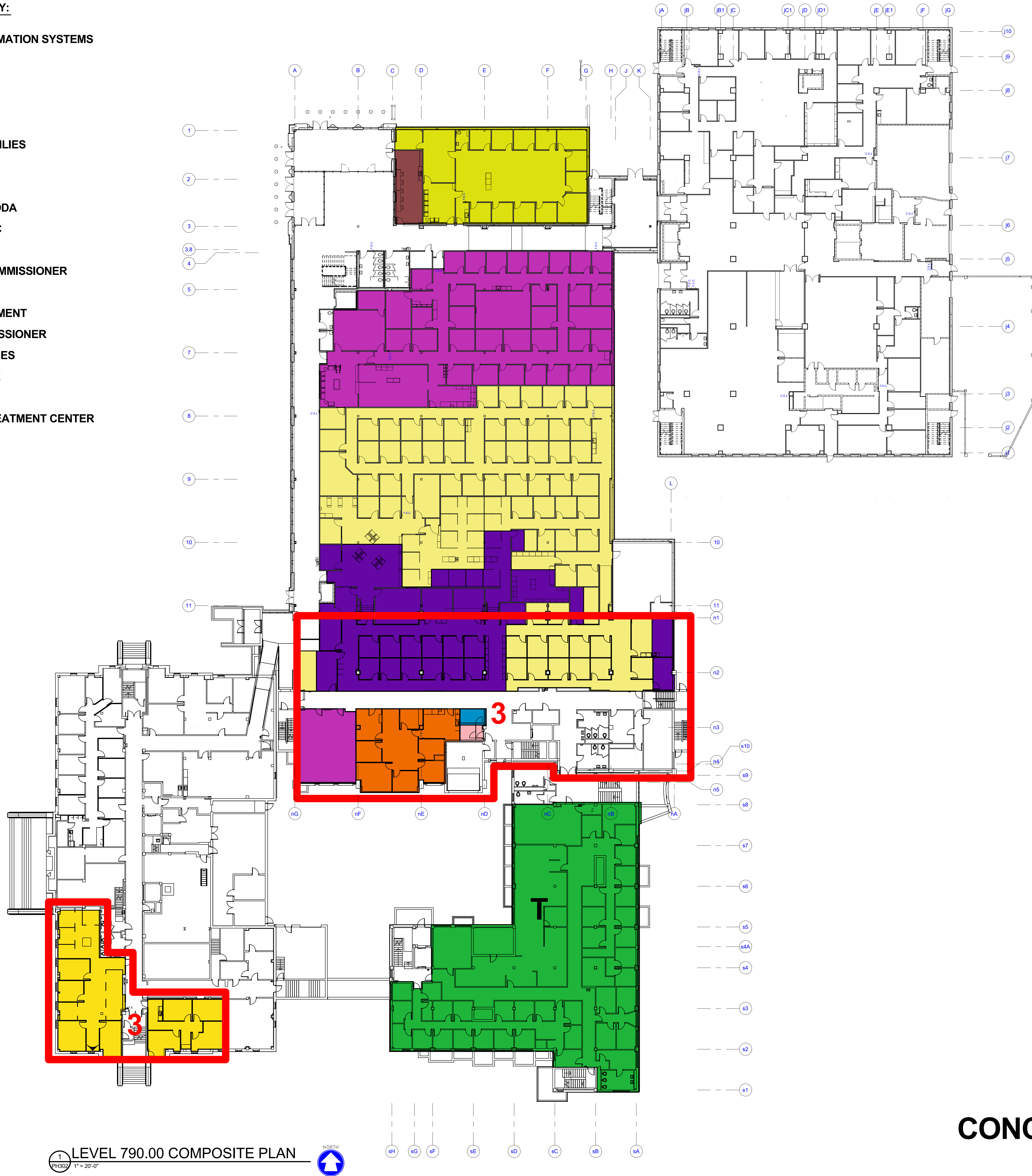
OUTAGAMIE COUNTY ADMINISTRATION CENTER
S. WALNUT & W. 8TH, APPLETON WI 54911
LEVEL 780.00 PHASE 3 COMPOSITE PLAN

PH301

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PANTONE YELLOW		MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE		VETERAN'S SERVICES
PANTONE RHODAMINE RED		HHS - ADMINISTRATION
PANTONE PURPLE		HHS - ASLT / ADRC
PANTONE VIOLET		HHS - CHILD SUPPORT
PANTONE PROCESS BLUE		HHS - CHILD, YOUTH & FAMILIES
PANTONE 100		HHS - ECONOMIC SUPPORT
PANTONE 1365		HHS - FISCAL
PANTONE 178		HHS - MENTAL HEALTH / AODA
PANTONE 1767		HHS - PUBLIC HEALTH / WIC
PANTONE 2975		JC - CIRCUIT COURT #3
PANTONE GREEN		JC - ASSISTANT COURT COMMISSIONER
PANTONE 361		JC - DISTRICT ATTORNEY
PANTONE 366		JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1		JC - FAMILY COURT COMMISSIONER
PANTONE 5835		JC - FAMILY COURT SERVICES
PANTONE 186		JC - REGISTER IN PROBATE
PANTONE 696		JC - SHERIFF ON-SITE
PANTONE 809		JC - CRIMINAL JUSTICE TREATMENT CENTER
RGB 128-128-128		SHERIFF

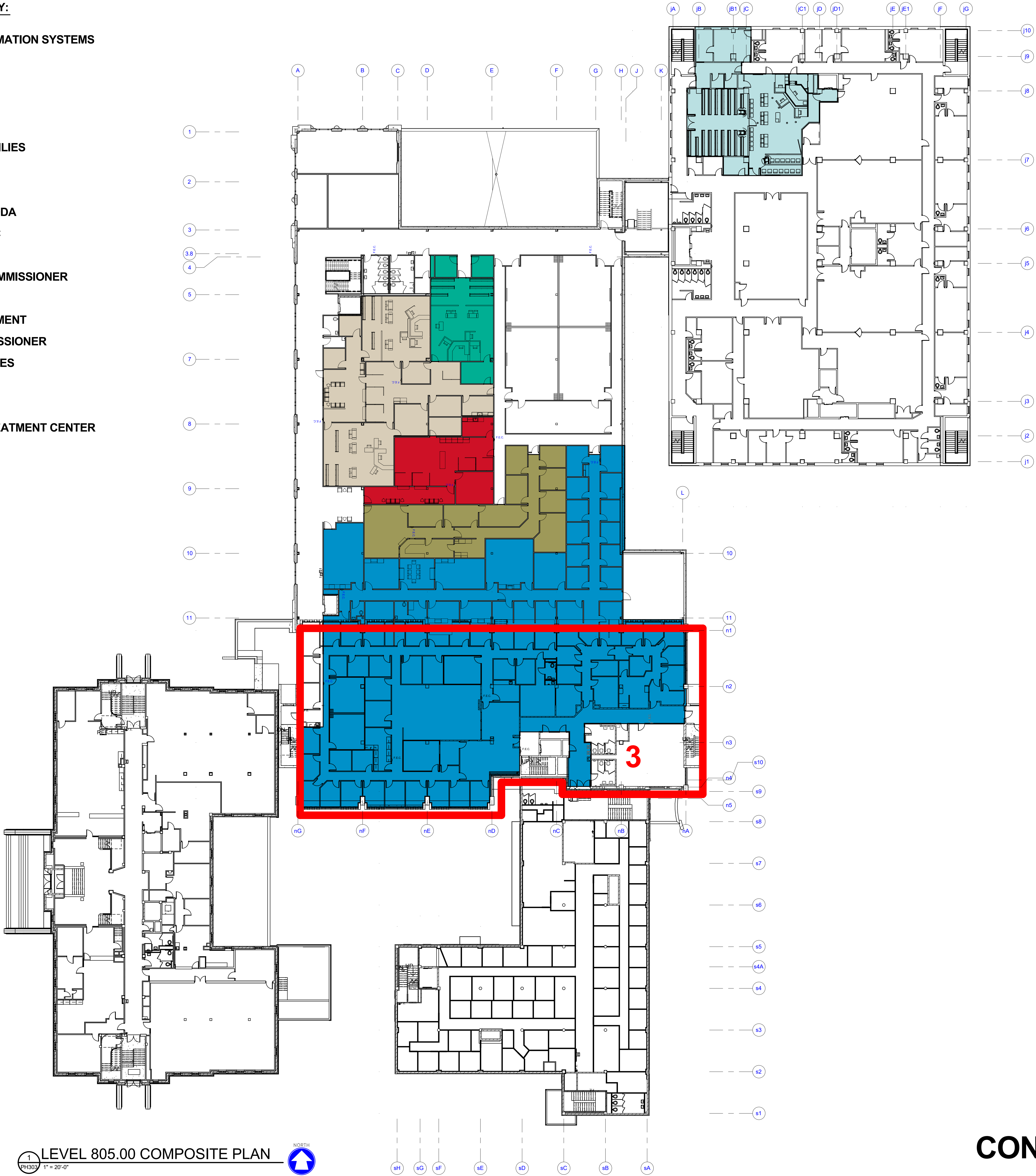
EXISTING DEPARTMENT KEY:



CONCEPTUAL PHASE 3
COMPLETE

EXISTING DEPARTMENT KEY:

PANTONE YELLOW		MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE		VETERAN'S SERVICES
PANTONE RHODAMINE RED		HHS - ADMINISTRATION
PANTONE PURPLE		HHS - ASLT / ADRC
PANTONE VIOLET		HHS - CHILD SUPPORT
PANTONE PROCESS BLUE		HHS - CHILD, YOUTH & FAMILIES
PANTONE 100		HHS - ECONOMIC SUPPORT
PANTONE 1365		HHS - FISCAL
PANTONE 178		HHS - MENTAL HEALTH / AODA
PANTONE 1767		HHS - PUBLIC HEALTH / WIC
PANTONE 2975		JC - CIRCUIT COURT #3
PANTONE GREEN		JC - ASSISTANT COURT COMMISSIONER
PANTONE 361		JC - DISTRICT ATTORNEY
PANTONE 366		JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1		JC - FAMILY COURT COMMISSIONER
PANTONE 5835		JC - FAMILY COURT SERVICES
PANTONE 186		JC - REGISTER IN PROBATE
PANTONE 696		JC - SHERIFF ON-SITE
PANTONE 809		JC - CRIMINAL JUSTICE TREATMENT CENTER
RGB 128-128-128		SHERIFF



1 LEVEL 805.00 COMPOSITE PLAN
PH303 1" = 20'-0"

CONCEPTUAL PHASE 3
COMPLETE

NO.	DATE	REVISION

DESIGNED ASF/MAG	DRAWN BLG
PROJECT NO. 00002-61600160	DATE MARCH 3, 2017
SHEET NO.	

MIS - MANAGEMENT INFORMATION SYSTEMS

VETERAN'S SERVICES

HHS - ADMINISTRATION

HHS - ASLT / ADRC

HHS - CHILD SUPPORT

HHS - CHILD, YOUTH & FAMILIES

HHS - ECONOMIC SUPPORT

HHS - FISCAL

HHS - MENTAL HEALTH / AODA

HHS - PUBLIC HEALTH / WIC

JC - CIRCUIT COURT #3

JC - ASSISTANT COURT COMMISSIONER

JC - DISTRICT ATTORNEY

JC - EMERGENCY MANAGEMENT

JC - FAMILY COURT COMMISSIONER

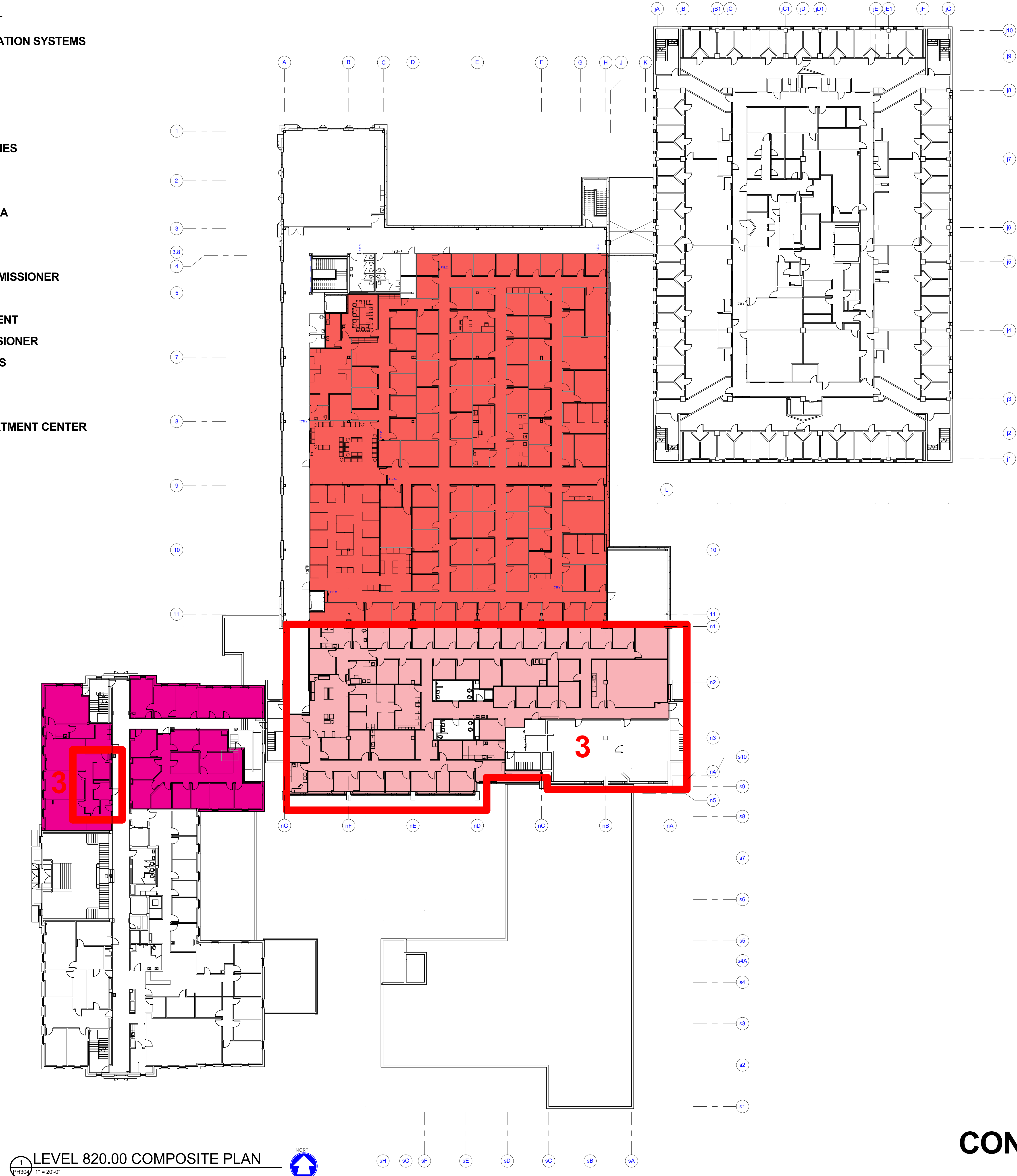
JC - FAMILY COURT SERVICES

JC - REGISTER IN PROBATE

JC - SHERIFF ON-SITE

JC - CRIMINAL JUSTICE TREATMENT CENTER

SHERIFF



CONCEPTUAL PHASE 3 COMPLETE

OUTAGAMIE COUNTY ADMINISTRATION CENTER
S. WALNUT & W. 8TH, APPLETON WI 54911
LEVEL 820.00 PHASE 3 COMPOSITE PLAN

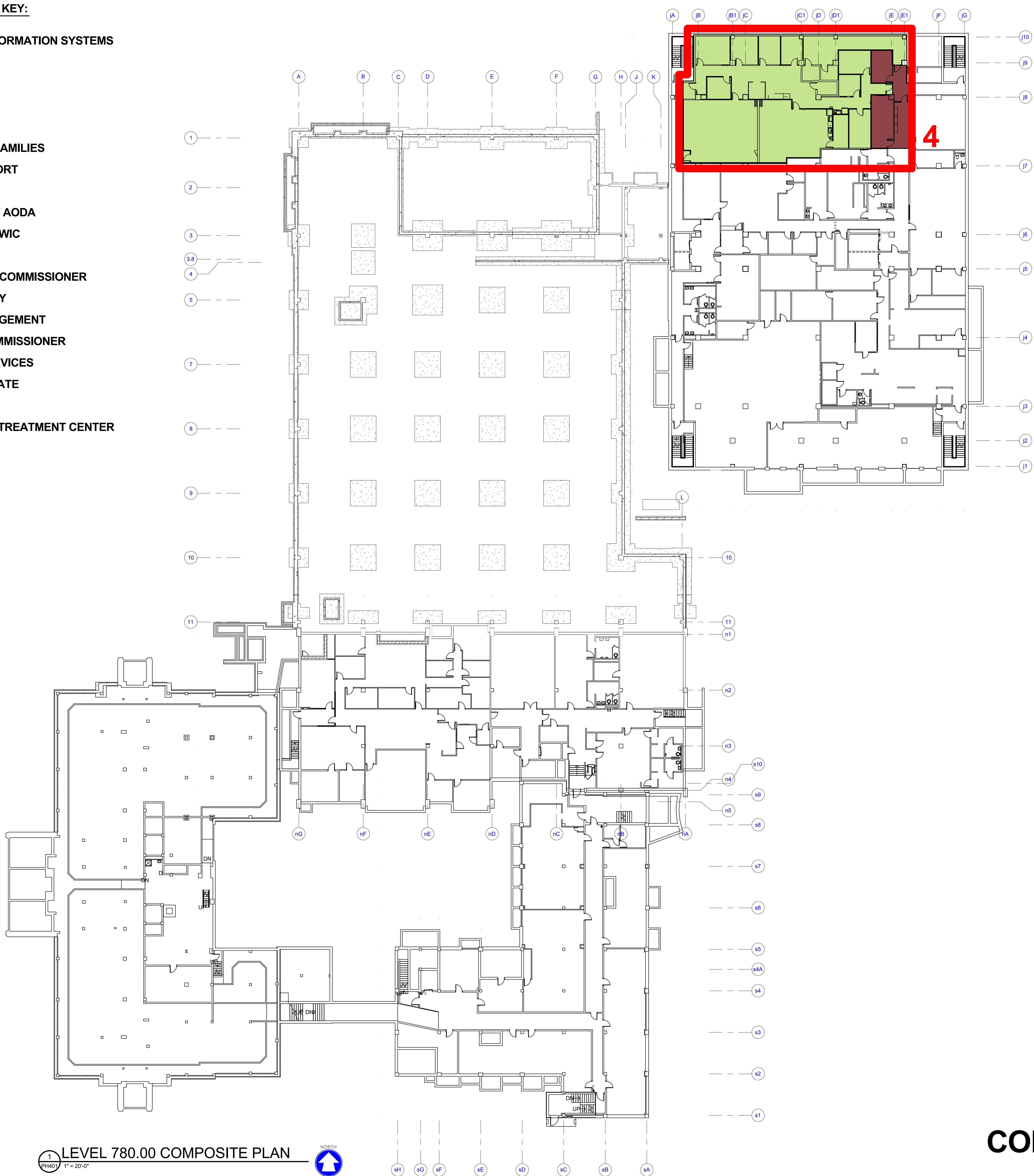
DESIGNED	DRAWN
ASF	BLG
PROJECT NO.	
O0002-61600160	
DATE	
MARCH 3, 2017	
SHEET NO.	

PH304

McMAHON
ENGINEERS ARCHITECTS
1445 McMAHON DRIVE NEENAH, WI 54956
Mailing: P.O.BOX 1025 NEENAH, WI 54957-1025
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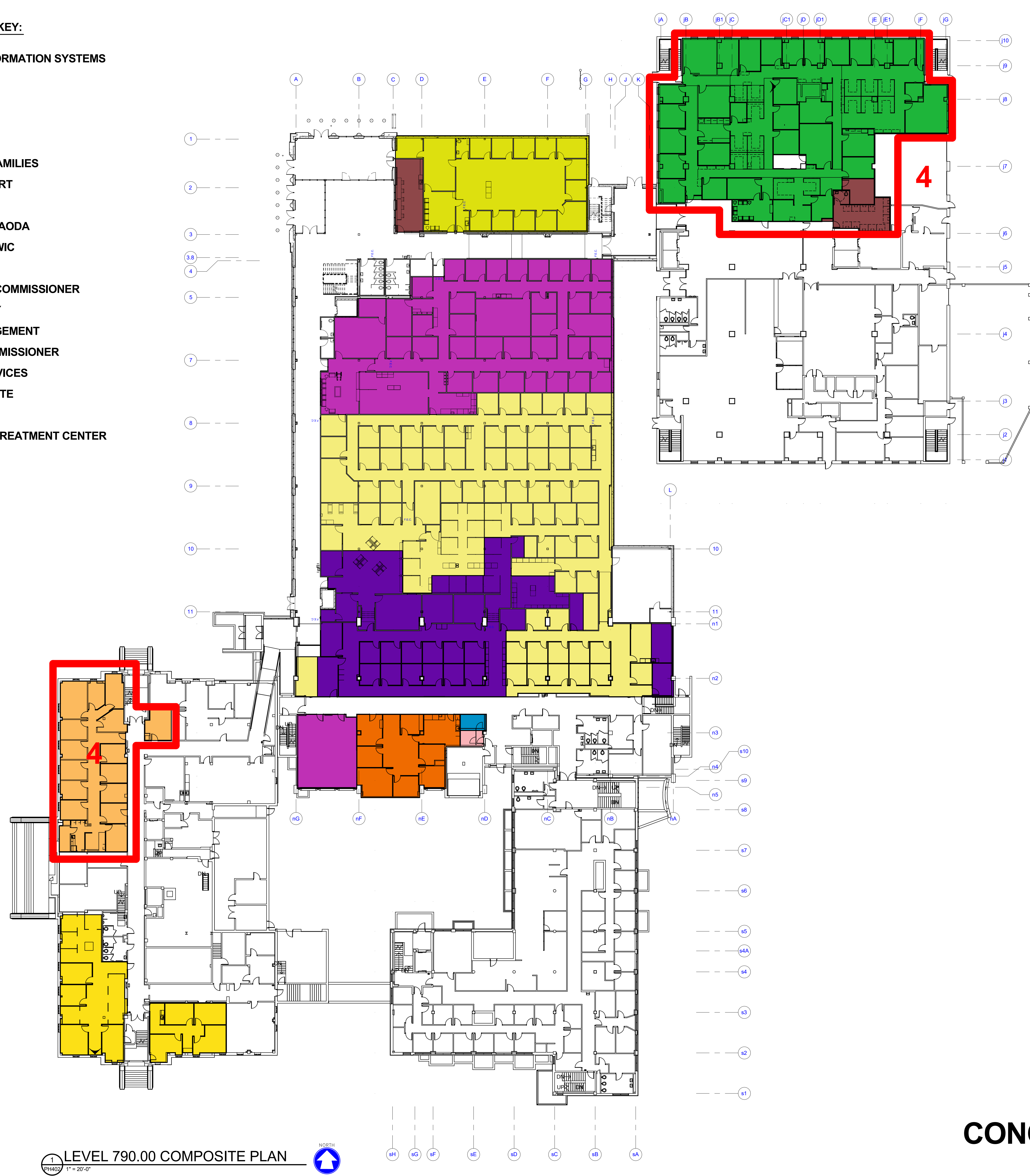
EXISTING DEPARTMENT KEY:		
PANTONE YELLOW	<div></div>	MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE	<div></div>	VETERAN'S SERVICES
PANTONE RHODAMINE RED	<div></div>	HHS - ADMINISTRATION
PANTONE PURPLE	<div></div>	HHS - ASLT / ADRC
PANTONE VIOLET	<div></div>	HHS - CHILD SUPPORT
PANTONE PROCESS BLUE	<div></div>	HHS - CHILD, YOUTH & FAMILIES
PANTONE 100	<div></div>	HHS - ECONOMIC SUPPORT
PANTONE 1365	<div></div>	HHS - FISCAL
PANTONE 178	<div></div>	HHS - MENTAL HEALTH / AODA
PANTONE 1787	<div></div>	HHS - PUBLIC HEALTH / WIC
PANTONE 2975	<div></div>	JC - CIRCUIT COURT #3
PANTONE GREEN	<div></div>	JC - ASSISTANT COURT COMMISSIONER
PANTONE 361	<div></div>	JC - DISTRICT ATTORNEY
PANTONE 366	<div></div>	JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1	<div></div>	JC - FAMILY COURT COMMISSIONER
PANTONE 5835	<div></div>	JC - FAMILY COURT SERVICES
PANTONE 186	<div></div>	JC - REGISTER IN PROBATE
PANTONE 696	<div></div>	JC - SHERIFF ON-SITE
PANTONE 809	<div></div>	JC - CRIMINAL JUSTICE TREATMENT CENTER
RGB 128-128-128	<div></div>	SHERIFF



CONCEPTUAL PHASE 4 COMPLETE

EXISTING DEPARTMENT KEY:

PANTONE YELLOW		MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE		VETERAN'S SERVICES
PANTONE RHODAMINE RED		HHS - ADMINISTRATION
PANTONE PURPLE		HHS - ASLT / ADRC
PANTONE VIOLET		HHS - CHILD SUPPORT
PANTONE PROCESS BLUE		HHS - CHILD, YOUTH & FAMILIES
PANTONE 100		HHS - ECONOMIC SUPPORT
PANTONE 1365		HHS - FISCAL
PANTONE 178		HHS - MENTAL HEALTH / AODA
PANTONE 1767		HHS - PUBLIC HEALTH / WIC
PANTONE 2975		JC - CIRCUIT COURT #3
PANTONE GREEN		JC - ASSISTANT COURT COMMISSIONER
PANTONE 361		JC - DISTRICT ATTORNEY
PANTONE 366		JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1		JC - FAMILY COURT COMMISSIONER
PANTONE 5635		JC - FAMILY COURT SERVICES
PANTONE 186		JC - REGISTER IN PROBATE
PANTONE 696		JC - SHERIFF ON-SITE
PANTONE 809		JC - CRIMINAL JUSTICE TREATMENT CENTER
ROB 128-128-128		SHERIFF



1 LEVEL 790.00 COMPOSITE PLAN
PH402 1" = 20'-0"



CONCEPTUAL PHASE 4
COMPLETE

McMAHON
ENGINEERS ARCHITECTS
1000 N. W. 10th Ave., Suite 1000
Fort Lauderdale, FL 33304
Tel: (954) 575-4200 Fax: (954) 575-4284
www.mcmahon.com

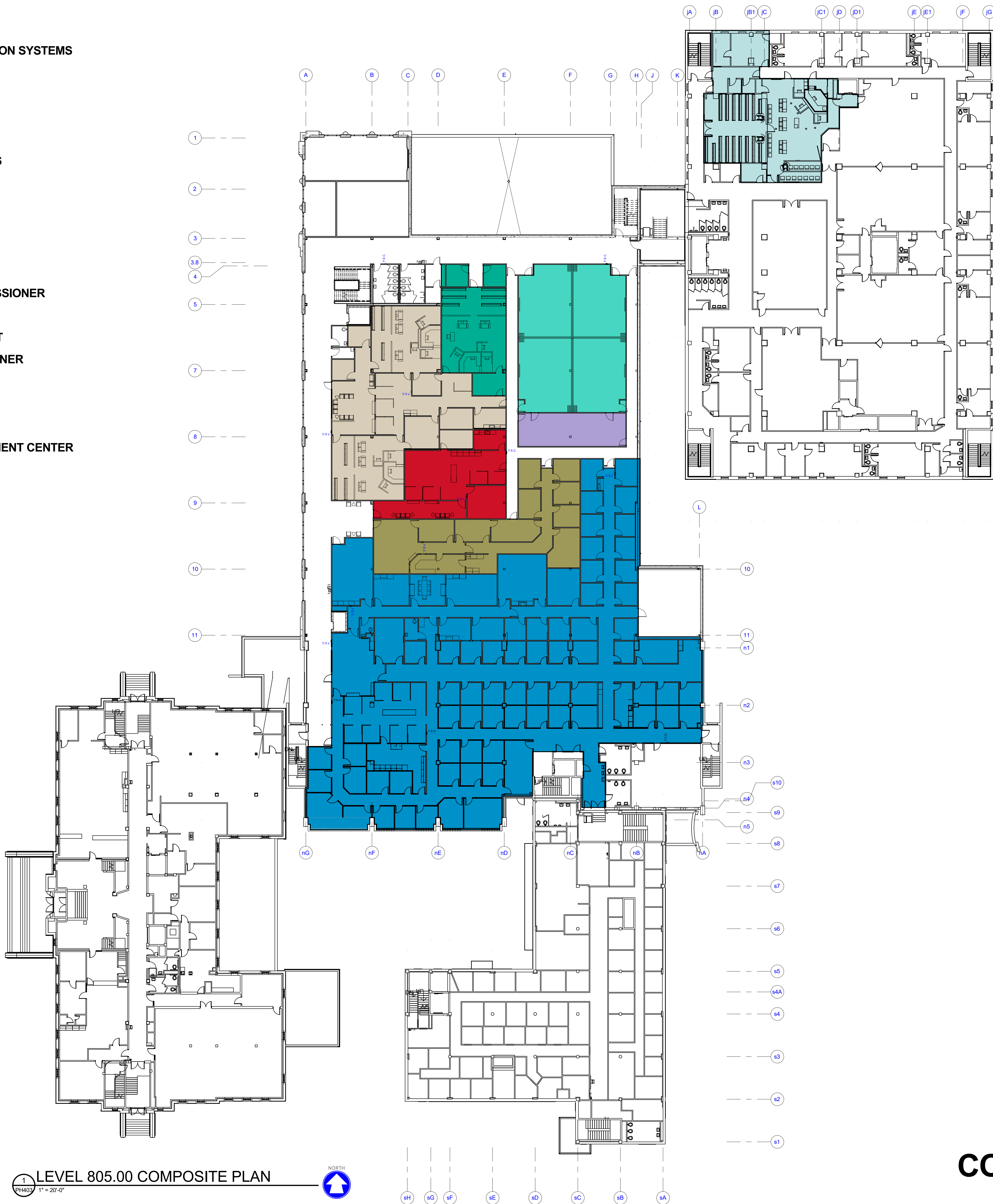
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NO.	DATE	REVISION

ALTERATION / ADDITION
OUTAGAMIE COUNTY ADMINISTRATION CENTER
S. WALNUT & W. 8TH, APPLETON WI 54911
LEVEL 790.00 PHASE 4 COMPOSITE PLAN

DESIGNED ASF	DRAWN BLG
PROJECT NO. 00002-61600160	
DATE MARCH 3, 2017	
SHEET NO. PH402	

PANTONE YELLOW		MIS - MANAGEMENT INFORMATION SYSTEMS
PANTONE ORANGE		VETERAN'S SERVICES
PANTONE RHODAMINE RED		HHS - ADMINISTRATION
PANTONE PURPLE		HHS - ASLT / ADRC
PANTONE VIOLET		HHS - CHILD SUPPORT
PANTONE PROCESS BLUE		HHS - CHILD, YOUTH & FAMILIES
PANTONE 100		HHS - ECONOMIC SUPPORT
PANTONE 1365		HHS - FISCAL
PANTONE 178		HHS - MENTAL HEALTH / AODA
PANTONE 1767		HHS - PUBLIC HEALTH / WIC
PANTONE 2975		JC - CIRCUIT COURT #3
PANTONE GREEN		JC - ASSISTANT COURT COMMISSIONER
PANTONE 361		JC - DISTRICT ATTORNEY
PANTONE 366		JC - EMERGENCY MANAGEMENT
PANTONE COOL GRAY 1		JC - FAMILY COURT COMMISSIONER
PANTONE 5635		JC - FAMILY COURT SERVICES
PANTONE 196		JC - REGISTER IN PROBATE
PANTONE 696		JC - SHERIFF ON-SITE
PANTONE 809		JC - CRIMINAL JUSTICE TREATMENT CENTER
RGB 128-128-128		SHERIFF



CONCEPTUAL PHASE 4 COMPLETE

PANTONE YELLOW

PANTONE ORANGE

PANTONE RHODAMINE RED

PANTONE PURPLE

PANTONE VIOLET

PANTONE PROCESS BLUE

PANTONE 100

PANTONE 1365

PANTONE 178

PANTONE 1767

PANTONE 2975

PANTONE GREEN

PANTONE 361

PANTONE 366

PANTONE COOL GRAY 1

PANTONE 5635

PANTONE 186

PANTONE 696

PANTONE 809

RGB 128-128-128

MIS - MANAGEMENT INFORMATION SYSTEMS

VETERAN'S SERVICES

HHS - ADMINISTRATION

HHS - ASLT / ADRC

HHS - CHILD SUPPORT

HHS - CHILD, YOUTH & FAMILIES

HHS - ECONOMIC SUPPORT

HHS - FISCAL

HHS - MENTAL HEALTH / AODA

HHS - PUBLIC HEALTH / WIC

JC - CIRCUIT COURT #3

JC - ASSISTANT COURT COMMISSIONER

JC - DISTRICT ATTORNEY

JC - EMERGENCY MANAGEMENT

JC - FAMILY COURT COMMISSIONER

JC - FAMILY COURT SERVICES

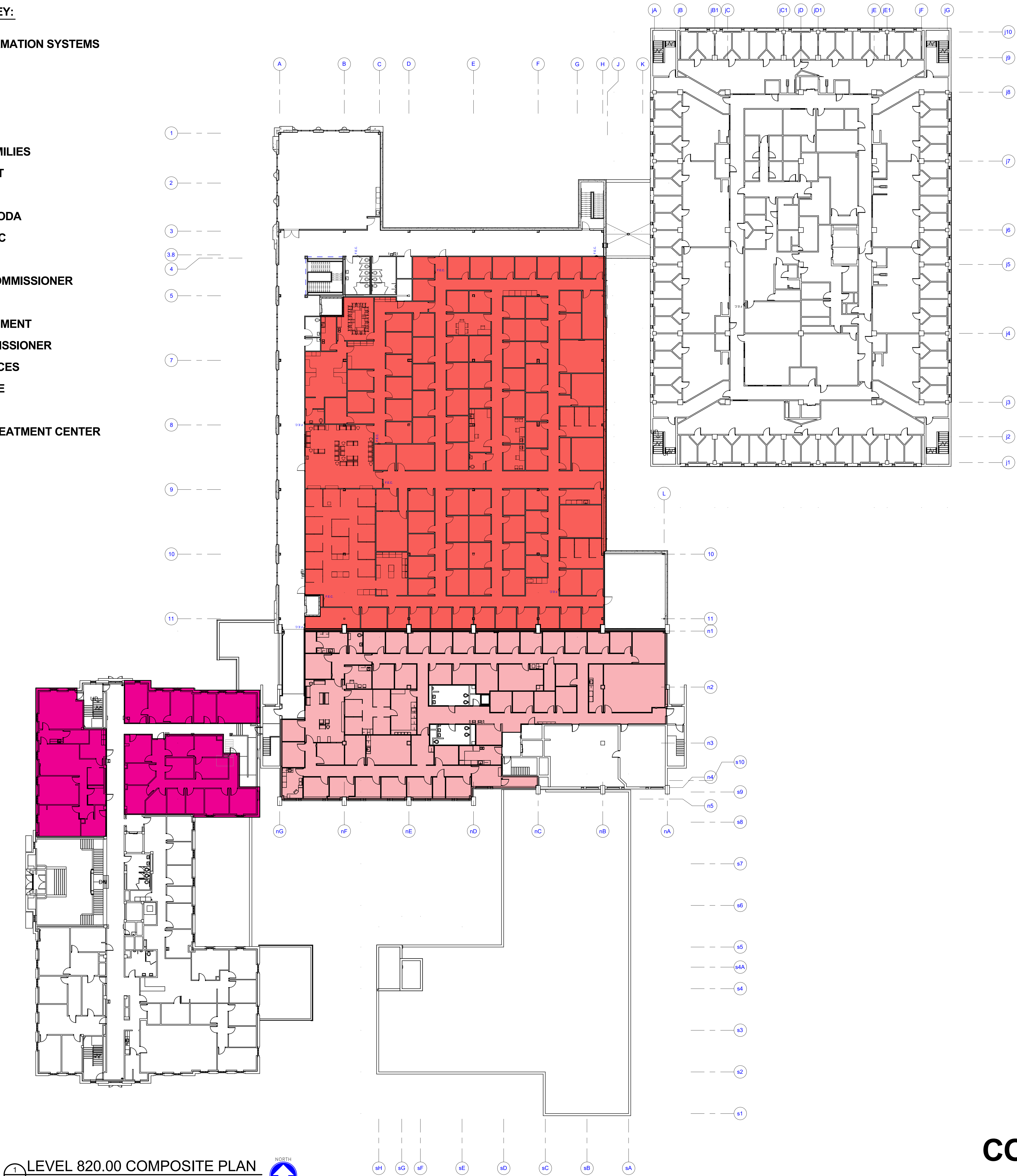
JC - REGISTER IN PROBATE

JC - SHERIFF ON-SITE

JC - CRIMINAL JUSTICE TREATMENT CENTER

SHERIFF

EXISTING DEPARTMENT KEY:



1 LEVEL 820.00 COMPOSITE PLAN
PH404 1" = 20'-0"



CONCEPTUAL PHASE 4
COMPLETE

SECTION 01 22 00.00

UNIT PRICES

Refer to Attachment B, Unit Prices in Appendix of Division 0.

SECTION 01 23 00.00

ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

- 3.1 SCHEDULE OF ALTERNATES – Refer to Attachment C, Alternates in Appendix A of Division 0-Procurement and Contracting Requirements.

END OF SECTION

SECTION 01 35 16.00

ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes special procedures for alteration work.

1.2 DEFINITIONS

- A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.
- B. Consolidate: To strengthen loose or deteriorated materials in place.
- C. Design Reference Sample: A sample that represents the Architect's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.
- D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.
- F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.
- J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.
- K. Retain: To keep existing items that are not to be removed or dismantled.
- L. Strip: To remove existing finish down to base material unless otherwise indicated.

1.3 PROJECT MEETINGS FOR ALTERATION WORK

- A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site.
 - 1. Attendees: In addition to representatives of Owner, Construction Manager, Architect, Contractor, and others deemed necessary, shall be represented at the meeting.
 - 2. Agenda: Discuss items of significance that could affect progress of alteration work.
 - 3. Reporting: Record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.
- B. Coordination Meetings: Conduct coordination meetings at regular intervals.

1.4 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain Owner's property.

1.5 STORAGE AND HANDLING OF SALVAGED MATERIALS

- A. Salvaged Materials:
 - 1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
 - 2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- B. Salvaged Materials for Reinstallation:
 - 1. Repair and clean items for reuse as indicated.
 - 2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.
- C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.
- D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.

1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
2. Secure stored materials to protect from theft.
3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F (3 deg C) or more above the dew point.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.
 1. Use only proven protection methods, appropriate to each area and surface being protected.
 2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
 3. Erect temporary barriers to form and maintain fire-egress routes.
 4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
 5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
 6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
 7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
 8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.
- B. Temporary Protection of Materials to Remain:
 1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
 2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.
- C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
- D. Utility and Communications Services:
 1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
 2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.

3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.
- E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.
1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
 2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.
- F. Existing Roofing: Prior to the start of work in an area, install roofing protection.

3.2 PROTECTION FROM FIRE

- A. General: Follow fire-prevention plan and the following:
1. Comply with NFPA 241 requirements unless otherwise indicated.
 2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
 - a. If combustible material cannot be removed, provide fire blankets to cover such materials.
- B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:
1. Obtain Owner's approval for operations involving use of open-flame or welding or other high-heat equipment. Notify Owner at least 72 hours before each occurrence, indicating location of such work.
 2. As far as practicable, restrict heat-generating equipment to outside the building.
 3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
 4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
 5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
 6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
 - a. Train each fire watch in the proper operation of fire-control equipment and alarms.

- b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
 - c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
 - d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
 - e. Maintain fire-watch personnel at each area of Project site until 60 minutes after conclusion of daily work.
- C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.
- D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.
 - 1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

- A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.
- B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.
- C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.
- D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.
- E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.4 GENERAL ALTERATION WORK

- A. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

END OF SECTION

SECTION 01 40 00.00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Construction Manager, Owner or authorities having jurisdiction are not limited by provisions of this Section.
 - 3. Specific test and inspection requirements are not specified in this Section.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

- A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.

- B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.5 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect through Construction Manager with copy to Contractor. Interpret tests and inspections and state in each report

whether tested and inspected work complies with or deviates from the Contract Documents.

- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect or Construction Manager.
 2. Notify Architect and Construction Manager seven days in advance of dates and times when mockups will be constructed.
 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 4. Obtain Architect and Construction Manager's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 6. Demolish and remove mockups when directed unless otherwise indicated.

1.7 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect and Construction Manager's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 50 00.00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 01 10 00.00 "Summary" for work restrictions and limitations.

1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas. On-site parking for construction personnel not provided.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire prevention program.

1.4 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails.

2.2 TEMPORARY FACILITIES

- A. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 01 77 00.00 "Closeout Procedures."

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where directed by Owner.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- E. Heating: Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- G. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- B. Parking: On site parking will not be provided for construction personnel.
- C. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- D. Project Signs: Provide Project signs only as reviewed and approved by Owner. Unauthorized signs are not permitted.
- E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.
- F. Existing Elevator Use: Do not use existing elevators without written approval by the Owner.
- G. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- H. Existing Stair Usage: Upon review and approval by Owner, existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to state and local requirements.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

- E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.
- G. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- I. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- J. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight and insulated enclosure for building exterior.
- K. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
 - 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
 - 2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 - 3. Provide walk-off mats at each entrance through temporary partition.
- L. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 3. Indicate methods to be used to avoid trapping water in finished work.
- B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard and replace stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.
- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00.00 "Closeout Procedures."

END OF SECTION

SECTION 01 60 00.00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor through Construction Manager of approval or rejection of proposed comparable product request within 5 days of receipt of request, or 5 days of receipt of additional information or documentation, whichever is later.

- a. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. Refer to other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 01 77 00.00 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered for review and approval.
 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered for review and approval.
 3. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers.

Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, provide alternative product for review.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
 - 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 - 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 73 00.00

EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 01 10 00.00 "Summary" for limits on use of Project site.
 - 2. Section 01 77 00.00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.

1.2 INFORMATIONAL SUBMITTALS

- A. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- C. Certified Surveys: Submit two copies signed by land surveyor.
- D. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.3 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services; and other utilities.

2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 01 31 00.00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.

2. Establish limits on use of Project site.
 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 4. Inform installers of lines and levels to which they must comply.
 5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to

confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Remove and replace damaged, defective, or non-conforming Work.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, review with Owner. Also, review with utilities where appropriate.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or

adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. Cutting will typically be performed by the subcontractor responsible for his portion of the work.
 2. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 3. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 4. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 5. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 6. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 7. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Patching is the responsibility of the General Contractor.
 2. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 3. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 4. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 5. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 6. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00.00 "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

SECTION 01 79 00.00

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.
 - 2. Demonstration and training documentation.

1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Documentation: Submit two copies within seven days of end of each training module.
 - 1. At completion of training, submit complete training manual(s) for Owner's use in PDF file format.

1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, experienced in operation and maintenance procedures and training.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.6 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Systems and equipment operation manuals.
 - c. Systems and equipment maintenance manuals.
 - d. Product maintenance manuals.
 - e. Project Record Documents.
 - f. Identification systems.
 - g. Warranties and bonds.
 - h. Maintenance service agreements and similar continuing commitments.
 - 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.

- d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
- a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
- a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
- a. Diagnostic instructions.
 - b. Test and inspection procedures.
7. Maintenance: Include the following:
- a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
8. Repairs: Include the following:
- a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

1.7 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23.00 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

1.8 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
- C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Construction Manager, with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

1.9 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD mode with vibration reduction technology.
 - 1. Submit video recordings by uploading to web-based Project software site.
- B. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
- C. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
- D. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION

DIVISION 2 – EXISTING CONDITIONS

SECTION 02 41 16.00	STRUCTURE DEMOLITION
SECTION 02 41 19.00	SELECTIVE DEMOLITION

SECTION 02 41 16.00
STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of buildings and site improvements.
2. Abandoning in-place below-grade construction.
3. Disconnecting, capping or sealing, and abandoning in-place site utilities.
4. Salvaging items for reuse by Owner.

1.2 MATERIALS OWNERSHIP

- A. Contractor to coordinate with Owner prior to demolition.**

1.3 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.**

1.4 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property. Indicate proposed locations and construction of barriers.**
- B. Schedule of building demolition activities with starting and ending dates for each activity.**
- C. Predemolition photographs or video.**
- D. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.**

1.5 CLOSEOUT SUBMITTALS

- A. Inventory of items that have been removed and salvaged.**

1.6 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.**

1.7 FIELD CONDITIONS

- A. Buildings to be demolished will be vacated and their use discontinued before start of the Work.
- B. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
 - 1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
 - 2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
 - a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. On-site storage or sale of removed items or materials is not permitted.
- F. Arrange demolition schedule so as not to interfere with operations of adjacent occupied buildings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

2.2 SOIL MATERIALS

- A. Satisfactory Soils: Comply with requirements in Section 31 20 00.00 "Earth Moving."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.
- C. Inventory and record the condition of items to be removed and salvaged.

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.
 - 1. Arrange to shut off utilities with utility companies.
 - 2. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
 - 3. Cut off pipe or conduit a minimum of 24 inches (610 mm) below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
 - 4. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.4 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
- C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
- D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 01 50 00.00 "Temporary Facilities and Controls."

1. Protect adjacent buildings and facilities from damage due to demolition activities.
 2. Protect existing site improvements, appurtenances, and landscaping to remain.
 3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
 4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
- E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.5 DEMOLITION

- A. General: Demolish indicated buildings and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
 2. Maintain fire watch during and for at least 2 hours after flame-cutting operations.
 3. Maintain adequate ventilation when using cutting torches.
 4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
- C. Explosives: Use of explosives is not permitted.
- D. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- E. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- F. Abandon foundation walls and other below-grade construction.
1. Remove below-grade construction, including basements, foundation walls, and footings, to at least 24 inches below grade.

- G. Existing Utilities: Abandon existing utilities and below-grade utility structures.
- H. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials.
- I. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.
- J. Promptly repair damage to adjacent buildings caused by demolition operations.

3.6 CLEANING

- A. Remove demolition waste materials from Project site and recycle or dispose of.
- B. Do not burn demolished materials.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

END OF SECTION

SECTION 02 41 19.00
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Predemolition Photographs or Video: Submit before Work begins.
- C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.4 CLOSEOUT SUBMITTALS

- A. Inventory of items removed and salvaged.
- B. Inventory of items removed and reinstalled.

1.5 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.6 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. Before selective demolition, Owner will remove the following items:
 - a. Some, but not all, of the existing fixtures, furniture and equipment. The Contractor shall at his own cost and risk move remaining fixtures, furniture, and equipment as necessary to complete required work. The Contractor shall protect all remaining fixture, furniture and equipment during the life of the project and place all moved items back to their original locations.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.7 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- D. Survey of Existing Conditions: Record existing conditions that differ from the construction documents.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, electrical materials and components indicated to be removed.
 - a. Contractor shall maximize recycling.
 - b. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - c. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.

- d. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - e. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - f. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - g. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - h. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.
- C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Comply with requirements for access and protection specified in Section 01 50 00.00” Temporary Facilities and Controls.”
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 5. Dispose of demolished items and materials promptly.
- B. Reuse of Building Elements: Project has been designed to maximize end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.
1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

DIVISION 3 – CONCRETE

SECTION 03 01 30.00	MAINTENANCE OF CAST-IN-PLACE CONCRETE
SECTION 03 05 01.00	CONCRETE BONDING AGENT (EPOXY RESIN SYSTEM)
SECTION 03 30 00.00	CAST-IN-PLACE CONCRETE
SECTION 03 41 23.00	PRECAST CONCRETE STAIRS
SECTION 03 45 00.00	PRECAST ARCHITECTURAL CONCRETE

SECTION 03 01 30.00

MAINTENANCE OF CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Floor joint repair.
2. Polymer sealers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Material certificates.
- B. Product test reports.
- C. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer to apply packaged patching-mortar materials.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain each color, grade, finish, type, and variety of product from single source with resources to provide products of consistent quality in appearance and physical properties.
- B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

2.2 PATCHING MORTAR

A. Patching Mortar, General:

1. Only use patching mortars that are recommended by manufacturer for each applicable horizontal, vertical, or overhead use orientation.
2. Color and Aggregate Texture: Provide patching mortar and aggregates of colors and sizes necessary to produce patching mortar where indicated that matches existing, adjacent, exposed concrete.
3. Coarse Aggregate for Patching Mortar: ASTM C 33, washed aggregate, Size No. 8, Class 5S. Add to patching-mortar mix only as permitted by patching-mortar manufacturer.

B. Cementitious Patching Mortar: Packaged, dry mix for repair of concrete.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Construction Chemicals - Building Systems.
 - b. W. R. Meadows, Inc.
2. Compressive Strength: Not less than 8000 psi (55 MPa) at 28 days when tested according to ASTM C 109/C 109M.

2.3 MIXES

A. General: Mix products, in clean containers, according to manufacturer's written instructions.

B. Dry-Pack Mortar: Mix patching-mortar dry ingredients with just enough liquid to form damp cohesive mixture that can be squeezed by hand into a ball but is not plastic.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Notify Architect seven days in advance of dates when areas of deteriorated or delaminated concrete and deteriorated reinforcing bars will be located.
- B. Locate areas of deteriorated or delaminated concrete using hammer or chain-drag sounding and mark boundaries. Mark areas for removal by simplifying and squaring off boundaries. At columns and walls make boundaries level and plumb unless otherwise indicated.
- C. Pachometer Testing: Locate at least three reinforcing bars using a pachometer, and drill test holes to determine depth of cover. Calibrate pachometer using depth of cover measurements, and verify depth of cover in removal areas using pachometer.
- D. Perform surveys as the Work progresses to detect hazards resulting from concrete-maintenance work.

3.2 PREPARATION

- A. Ensure that supervisory personnel are on-site and on duty when concrete maintenance work begins and during its progress.
- B. Preparation for Removal of Deteriorated Concrete: Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed in the course of repair.
 - 1. Verify that affected utilities have been disconnected and capped.
 - 2. Provide and maintain shoring, bracing, and temporary structural supports as required to preserve stability and prevent unexpected or uncontrolled movement, settlement, or collapse of construction being demolished and construction and finishes to remain.
- C. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from concrete maintenance work.
 - 1. Comply with each product manufacturer's written instructions for protections and precautions.
 - 2. Contain dust and debris generated by concrete maintenance work and prevent it from reaching the public or adjacent surfaces.
 - 3. Protect floors and other surfaces along haul routes from damage, wear, and staining.
 - 4. Provide supplemental sound-control treatment to isolate removal and dismantling work from other areas of the building.
 - 5. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
- D. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is in working order.
 - 1. Prevent solids such as aggregate or mortar residue from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from concrete maintenance work.
 - 2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.3 APPLICATION

- A. General: Comply with manufacturer's written instructions and recommendations for application of products, including surface preparation.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Packaged, Cementitious Patching Mortar: Three randomly selected sets of samples for each type of mortar required, tested according to ASTM C 928.
- B. Product will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION

SECTION 03 05 01.00

CONCRETE BONDING AGENT (EPOXY RESIN SYSTEM)

PART 1 - GENERAL

1.1 GENERAL

- A. The bonding agent shall be used for bonding rigid materials and fresh concrete to existing or hardened concrete.

1.2 REFERENCES

- A. ASTM C-881, Type I.
- B. ASTM D-648.
- C. ASTM D-695.
- D. ASTM C-293.

1.3 SUBMITTALS

- A. Shop drawings shall be submitted in accordance with the General Conditions and Division 1.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Use Concrete Liquid (LPL) by Master Builders or equivalent.

2.2 STRENGTH REQUIREMENTS

- A. Epoxy resin system shall be capable of developing minimum compressive strength of 8,500 psi, pressure bond strength of 550 psi and tensile strength of 4,000 psi in 7-days per the requirements of the reference.

PART 3 - EXECUTION

3.1 EXECUTION

- A. Mix and apply this system in strict conformance to the manufacturer's recommendations.
- B. Surface preparation shall be carefully completed in the manner presented by the manufacturer.

END OF SECTION

SECTION 03 30 00.00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 REFERENCES

- A. ACI 211.1 - Standard Practice For Selecting Proportions For Normal, Heavyweight & Mass Concrete.
- B. ACI 301 - Specifications For Structural Concrete For Buildings.
- C. ACI 302.1R - Guide For Concrete Floor & Slab.
- D. ACI 305R - Hot Weather Concreting.
- E. ACI 306R - Cold Weather Concreting.
- F. ACI 308 - Standard Practice For Curing Concrete.
- G. ACI 318/318R - Building Code Requirements For Structural Concrete & Commentary.
- H. ACI 347R - Guide To Form Work For Concrete.
- I. ACI SP-15 - Field Reference Manual.
- J. ACI SP-66 - ACI Detailing Manual.
- K. ASTM A-185 - Standard Specification For Steel Welded Fabric, Plain, For Concrete Reinforcement.
- L. ASTM A-615 - Standard Specification For De-Formed & Plain Billet-Steel Bars For Concrete Reinforcement.
- M. ASTM C-31 - Standard Practice For Making & Curing Concrete Test Specimens In The Field.
- N. ASTM C-33 - Standard Specification For Concrete Aggregates.
- O. ASTM C-39 - Standard Test Method For Compressive Strength Of Cylindrical Concrete Specimens.
- P. ASTM C-94 - Standard Specification For Ready-Mixed Concrete.
- Q. ASTM C-150 - Standard Specification For Portland Cement.
- R. ASTM C-260 - Standard Specification For Air-Entraining Admixtures For Concrete.

- S. ASTM C-309 - Standard Specification For Liquid Membrane-Forming Compounds For Curing Concrete.
- T. ASTM C-494 - Standard Specification For Chemical Admixtures For Concrete.
- U. ASTM C-618 - Standard Specification For Coal Fly Ash & Raw Or Calcined Natural Pozzolan For Use As A Mineral Admixture In Portland Cement Concrete.
- V. ASTM C-1107 - Standard Specification For Packaged, Dry, Hydraulic-Cement Grout (non-shrink).
- W. AWS D1.4 - Structural Welding Code - Reinforcing Steel.
- X. CRSI MSP-1 - Manual Of Standard Practice.

1.2 SUBMITTALS

- A. General: Submittals required in this specification shall be submitted for review and acceptance.
- B. Product Data: Submit manufacturer's product data for all concrete and concrete accessories.
- C. Aggregates: Submit test reports showing compliance with specified quality and gradation. If ARCHITECT so desires, samples of the aggregates must be submitted to the ARCHITECT at least 2-weeks before delivery of material to the site. Material must not be delivered until the ARCHITECT has reviewed the samples furnished.
- D. Shop Drawings: Submit shop drawings for fabrication and placement of the following:
 - 1. Reinforcement: Comply with ACI SP-66. Include bar schedules, diagrams of bent bars, arrangement of concrete reinforcement and splices.
- E. Quality Control Submittals: Submit the following information related to quality assurance requirements specified:
 - 1. Design Data: Submit proposed mix designs and test data before concrete operations begin. Identify, for each mix submitted, the method by which proportions have been selected.
 - 2. Test & Inspection Reports: Testing agencies shall report results of concrete and concrete material tests and inspections performed during the course of the work to the OWNER, ARCHITECT and CONTRACTOR. Final reports shall be provided within 7-days of test completion.
 - 3. Certifications: Submit affidavits from an independent testing agency certifying that all materials furnished under this section conform to the specifications.
- F. Placement Schedule: Submit concrete placement schedule at least thirty (30) calendar days prior to start of actual concrete placement operations. Include location of all joints indicated on the drawings, plus anticipated construction joints.

- G. Delivery Tickets: Submit copies of delivery tickets complying with ASTM C-94 for each load of concrete delivered to site.
- H. Cold Weather Concreting: Submit description of planned protective measures.
- I. Hot Weather Concreting: Submit description of planned protective measures.

1.3 QUALITY ASSURANCE

- A. Codes & Standards: Comply with the following documents, except where requirements of the contract documents or of governing codes and governing authorities are more stringent:
 - 1. ACI-301.
 - 2. ACI-318.
 - 3. CRSI Manual Of Standard Practice.
- B. Testing Agency Services: Employ, at CONTRACTOR's expense, an independent testing agency acceptable to the ARCHITECT to perform specified tests and other services required for quality assurance.
 - 1. Testing services on concrete materials shall meet the requirements of ASTM C-1007.
 - 2. Testing services on reinforcing steel shall meet ASTM E-329 requirements.
- C. Source Of Material: Obtain materials of each type from same source for the entire project, unless new source is approved by the ARCHITECT.
- D. The concrete supplier shall conform to the requirements of the NRMCA Certification Plan in relation to material storage, batching, central mixer, delivery units, ticketing systems, etc. Proof of compliance shall be submitted to the ARCHITECT.

1.4 DELIVERY, STORAGE & HANDLING

- A. Deliver reinforcement to project site, bundled and tagged, with metal tags indicating bar size, lengths and other data corresponding to information shown on placement drawings.
- B. Store cementitious materials in dry, weather-tight location. Maintain accurate records of shipment and use.
- C. Store aggregates to permit free drainage and to avoid contamination with deleterious matter or other aggregates. When stockpiled on ground, discard bottom 6-inches of pile.
- D. Handle aggregates to avoid segregation.

1.5 PROJECT CONDITIONS

- A. Cold Weather Concreting: Comply fully with the recommendations of ACI 306.
- B. Hot Weather Concreting: Comply fully with the recommendations of ACI 305R.

PART 2 – PRODUCTS

2.1 FORM WORK

- A. Facing Materials:
 - 1. Exposed Finish Concrete: Materials that will produce smooth, stain-free, final appearance and minimize number of joints.
 - 2. Unexposed finish concrete: Any standard form materials that produce structurally sound concrete.
 - 3. Provide materials with sufficient strength to resist hydrostatic head without bow or deflection in excess of allowable tolerances.
- B. Form Work Accessories:
 - 1. Form Coating: Form release agent that will not adversely affect concrete surfaces or prevent subsequent application of concrete coatings.
 - 2. Metal Ties: Commercially manufactured types; cone snap ties, tapered removable bolt, or other type which will leave no metal closer than 1½-inches from surface of concrete when forms are removed, leaving not more than a 1-inch-diameter hole in concrete surface.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A-615, 60 ksi yield grade billet steel deformed bars; un-coated finish.
- B. Welded Wire Fabric: ASTM A-185, cold-drawn steel, plain; un-coated finish.
- C. Reinforcing Accessories:
 - 1. Tie wire: Black annealed type, 16½-gauge or heavier.
 - 2. Supports: Bar supports conforming to specifications of CRSI “Manual of Standard Practice.”

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C-150, and as follows:

1. Type I, normal, gray color, except where other type is specifically permitted or required.
 2. Type III, gray color shall be used where high early strength concrete is specified. Type III may replace Type I for concrete placed during cold weather.
 3. Other types of cement may be used for specific purpose upon review by the ARCHITECT.
- B. Fly Ash: ASTM C-618, Type C. Type F fly ash shall not be used.
- C. Water: Potable.
- D. Aggregates: Normal weight concrete: ASTM C-33.
- E. Admixtures – General: Admixtures, which contain calcium chloride, shall not be used. Other admixtures not listed below may be used for specific purposes upon the review of the ARCHITECT.
- F. Air-Entraining Admixture: ASTM C-260 and certified by manufacturer for compatibility with other mix components.
- G. Water-Reducing Admixture: ASTM C-494, Type A.
- H. Water-Reducing, Retarding Admixture: ASTM C-494, Type D.
- I. Water-Reducer & Accelerating Admixtures: ASTM C-494, Type E.

2.4 MISCELLANEOUS MATERIALS & ACCESSORIES

- A. Vapor Retarder: Membrane for installation beneath slabs on grade, resistant to decay when tested in accordance with ASTM E-154, and as follows:
1. ASTM D-2103, 10 mil thick, clear polyethylene film.
- B. Non-Shrink Grout (non-metallic): ASTM C-1107.
1. Type: Grout shall be a pre-packaged, natural aggregate grout. Grout shall comply with ASTM C-1107 and shall be certified that the post-hardening and non-shrink property is not based on gas expansion.
 2. Strength: 3,500 psi at 1-day; 4,500 psi at 3-days; 6,500 psi at 7-days; and 7,500 psi at 28-days, when cured at 72°F, as well as meet the 3-day, 7-day and 28-day strengths when tested and cured at the 45° and 95°F limits.
- C. Curing Materials: Curing Compound: ASTM C-309. Membrane curing compounds shall exceed the minimum moisture loss requirements of ASTM C-309 when applied at 350 square feet/gallon.
- D. Epoxy Bonding Systems: ASTM C-881; Type, grade and class as required for project conditions.

- E. Expansion Joint Filler: Refer to “Part 3 – Execution”.
- F. Concrete Sealer: Concrete sealer shall be used only when called for on the drawings.
Membrane Forming Compound: ASTM C1315 Type I, Class A.

2.5 CONCRETE MIX DESIGN

- A. General: Concrete shall be composed of cement, fine aggregate, coarse aggregate, water and admixtures as specified. Proportions of ingredients shall produce concrete that will work readily into corners and angles of forms, bond to reinforcement, without segregation or excessive bleed water forming on the surface of the concrete. Do not begin concrete operations until proposed mixes have been reviewed by the ARCHITECT.
- B. Proportioning Of Normal Weight Concrete: Comply with recommendations of ACI 211.1.
- C. Required Average Strength: For each type and strength of concrete, establish the required average strength f_{cr} of the design mix on the basis of either field experience or trial mixtures, as specified in ACI 301, and proportion mixes accordingly. If trial mixtures method is used, employ an independent testing agency acceptable to the ARCHITECT for preparing and reporting proposed mix designs.
- D. Fly Ash: The CONTRACTOR may elect to replace a portion of the Portland cement with fly ash, except concrete for finished floors up to a maximum percentage by weight of cement plus fly ash of 20%.
- E. Admixtures:
 - 1. Air-Entraining Admixture: Add a rate to achieve specified air content.
 - a. Do not use at interior slab-on-grade in heated areas.
 - b. Maximum air content on interior trowel finished slabs shall not exceed 3% entrapped air.
 - 2. Water-Reducing Admixture: Add, as required, for placement and workability. Add at uniform dosages to provide uniform strength, as analyzed by ACI 214.
 - 3. Water Reducing & Retarding Admixture: Add, as required, in concrete mixes to be placed at ambient temperatures above 90°F. Add at uniform dosages to provide uniform strength, as analyzed by ACI 214.
 - 4. Water Reducing & Accelerating Admixture: Add, as required, in concrete mixes to be placed at ambient temperatures below 50°F.
 - 5. Do not use admixtures not specified or approved.
- F. Classes Of Concrete
 - 1. Class A - All concrete for this project, except uses indicated in Class B and C.
 - 2. Class B - Concrete for foundations greater than 12-inches thick.
 - 3. Class C - Concrete for interior slabs-on-grade and elevated slabs in heated areas.

Class	Compressive Strength (28-Day)	Minimum Cementitious Material (lbs./C.Y.)	Maximum Aggregate Size	Maximum Slump	Water/Cement Ratio	Total Air Content
A	4,000 psi	530	¾	3-inch	.45	6% +/- 1½%
B	4,000 psi	530	1 ½	3-inch	.45	5% +/- 1½%
C	4,000 psi	530	¾	3-inch	.52	-----

2.6 CONTROL OF MIX IN THE FIELD

- A. Slump: A tolerance of up to 1-inch above that specified will be permitted for one (1) batch in five (5) consecutive batches tested. Concrete of lower slump than that specified may be used, provided proper placing and consolidation is obtained.
- B. Total Air Content: A tolerance of +/-1½ % of that specified will be allowed for field measurements.
- C. Do not use batches that exceed tolerances.

2.7 CONCRETE MIXING

- A. Transit Mixers: Mix concrete materials in transit mixers, complying with requirements of ASTM C-94.

2.8 SYNTHETIC FIBER REINFORCING (SFR)

- A. Acceptable Manufacturer / Model
 - 1. Fibermesh Company.
 - 2. FORTA Corporation.
 - 3. Or equal.
- B. When called for on Drawings, the Synthetic Fiber Reinforcing (SFR) used shall be a collated fibrillated polypropylene fibrous material.
- C. The SFR shall be ¾-inch long, unless specifically noted otherwise.
- D. The SFR shall be added at Manufacturer's recommended rate, but not less than 1.5 lbs. per cubic yard.
- E. The SFR shall be in strict accordance with Manufacturer's specifications and recommendations as to type and amount of reinforcing material, measure consistency and workability, or fiber reinforced concrete in accordance with the following:

1. ASTM C-995 - Test Method For Time Of Flow Of Fiber-Reinforced Concrete Through Inverted Slump Cone.
2. ASTM C-1018 - Test Method For Flexure Toughness Of Fiber-Reinforced Concrete.
3. ASTM C1116 - Standard Specification For Fiber-Reinforced Concrete & Shotcrete.
4. ACI Committee 544 recommendation of fiber-reinforced concrete.

PART 3 - EXECUTION

3.1 CONCRETE FORM PREPARATION

- A. General: Comply with requirements of ACI-301 for form work, and as herein specified. The CONTRACTOR is responsible for design, engineering, and construction of form work, and for its timely removal.
- B. Earth Forms: Earth forms are not permitted.

3.2 CONNECTION TO EXISTING CONCRETE

- A. Preparation: At locations where new concrete is to join existing concrete, prepare existing surface by cleaning with wire brush and applying bonding compound in accordance with manufacturer's instructions.
- B. Doweled Connections: Unless noted otherwise, at locations where new concrete is doweled to existing work, drill holes in existing concrete and epoxy anchor the steel dowels.

3.3 VAPOR BARRIER INSTALLATION

- A. General: Place vapor retarder sheet over prepared base material, aligning longer dimension parallel to direction of pour and lapped 6 inches. Seal joints with appropriate tape.

3.4 PLACING REINFORCEMENT

- A. General: Comply with requirements of ACI-301 and as herein specified.
- B. Preparation: Clean reinforcement of loose rust and mill scale, soil, and other materials, which adversely affect bond with concrete.
- C. Placement:
 1. Place reinforcement to achieve not less than minimum concrete coverages, as follows:

- a. Un-Formed Concrete In Contact With Earth = 3-inches.
 - b. Formed Concrete In Contact With Earth Or Water = 2-inches.
 - c. Other Concrete = 1½-inches.
2. Accurately position, support and secure reinforcement against displacement.
3. Lap splices shall be the following bar diameters unless noted otherwise on drawings. Locate splices at point of minimum stress.
- a. Horizontal reinforcement so placed that more than 12-inches of concrete is cast below the reinforcement. (i.e. horizontal wall reinforcement and top beam reinforcement).

Reinforcement	Lap Length In Bar Diameters
#3 through #6	50
#7 through #11	62

- b. All other reinforcement.

Reinforcement	Lap Length In Bar Diameters
#3 through #6	38
#7 through #11	48

- 4. Do not field-bend partially embedded bars unless otherwise indicated or approved.
 - 5. Use approved bar supports and tie wire, as required. Set wire ties to avoid contact with or penetration of exposed concrete surfaces. Tack welding of reinforcing is not permitted.
 - 6. Wire Fabric: Install in maximum lengths possible, lapping adjoining pieces not less than one (1) full mesh. Offset end laps to prevent continuous laps in either direction and splice laps with tie wire.
- D. Welding: Welding of reinforcement is not permitted.
- E. Re-Entrant Corners: At all re-entrant corners in slabs, walls and topping, the CONTRACTOR shall install two (2) #3 x 3'-0" long, each face, @ 3-inch o.c.

3.5 JOINT CONSTRUCTION

- A. Construction Joints: Locate and install construction joints as indicated on drawings. If construction joints are not indicated, locate in manner that will not impair strength and will have least impact on appearance, as acceptable to the ARCHITECT.
- 1. Reinforcement: Continue reinforcement across and perpendicular to construction joints, unless details specifically indicate otherwise.

2. Walls: Distance between construction joints shall not exceed 60-feet in any horizontal direction.
- B. Saw-Cut Joints: Construct saw-cut joints in slabs poured on grade to form panels of sizes indicated on drawings, but not more than 15 feet apart in either direction.
1. Saw cuts: Form joints by means of saw cuts one-fourth slab depth or clear distance to rebar minus ½-inch. Do not cut slab reinforcement.

3.6 CONCRETE PLACEMENT

A. Preparation:

1. Provide materials necessary to ensure adequate protection of concrete during inclement weather before beginning installation of concrete.
2. Sub-grades shall be sprinkled sufficiently to eliminate water loss from the concrete. Concrete shall not be placed on frozen ground or in forms with a frost coating.
3. Before placing the concrete, the CONTRACTOR shall notify all other trades that may have some involvement in the area to be poured.

B. Inspection:

1. Before beginning concrete placement, inspect form work, reinforcing steel and items to be embedded; verifying all such work has been completed.
 - a. Wood Forms: Moisten immediately before placing concrete in locations where form coatings are not used.

C. Placement – General: Comply with requirement of ACI 304 and as follows:

1. Schedule continuous placement of concrete to prevent the formation of cold joints.
2. Provide construction joints if concrete for a particular element or component cannot be placed in a continuous operation. When work is resumed, the surface of the construction joint shall be roughened, thoroughly cleaned of foreign matter and coated with approximately 15 to 20 mils thickness of “Concresive LPL” liquid or paste. Fresh concrete shall be placed within 90-minutes of applying “Concresive LPL”.
3. Deposit concrete as close as possible to its final location, to avoid segregation. Concrete shall not be allowed to free fall over 2’-0”.
4. Concrete shall be conveyed from the mixer to the place of final deposit by methods that will prevent the separation or loss of the materials.
5. Concrete shall not be deposited during rain, unless adequately protected, and, in any case, shall be protected from rain until it has hardened sufficiently so that it will not be damaged.

D. Placement In Forms: Limit horizontal layers to depths that can be properly consolidated, but in no event greater than 24-inches.

1. Consolidate concrete by means of mechanical vibrators, inserted vertically in freshly placed concrete in a systematic pattern at close intervals in accordance with ACI 309R. Penetrate previously placed concrete to ensure that separate concrete layers are knitted together.
 2. Vibrate concrete sufficiently to achieve consistent consolidation without segregation of coarse aggregates.
 3. Do not use vibrators to move concrete laterally.
- E. Slab Placement: Schedule continuous placement and consolidation of concrete within planned construction joints.
1. Thoroughly consolidate concrete without displacing reinforcement or embedded items, using internal vibrators, vibrating screeds, roller pipe screeds or other means acceptable to ARCHITECT.
 2. Strike off and level concrete slab surfaces, using highway straightedges, darbies or bull floats before bleed water can collect on surface. Do not work concrete further until finishing operations are commenced.
- F. Cold Weather Placement: Comply with recommendations of ACI 306 when air temperatures are expected to drop below 40°F either during concrete placement operations or before concrete has cured.
- G. Hot Weather Placement: Comply with recommendations of ACI 305R when ambient temperatures before, during or after concrete placement is expected to exceed 90°F or when combinations of high air temperature, low relative humidity and wind speed are such that the rate of evaporation from freshly poured concrete would otherwise exceed 0.2 pounds per square foot per hour.

3.7 FINISHING FORMED SURFACES

- A. Repairs, General: Repair surface defects, including tie holes, immediately after removing form work.
- B. Unexposed Form Finish: Repair tie holes and patch defective areas. Rub down or chip off fins or other raised areas exceeding 1/4-inch height.
- C. Exposed Form Finish: Repair and patch defective areas, with fins or other projections completely removed or smoothed.

3.8 FINISHING SLABS

- A. Finishing Operations – General:
1. Do not directly apply water to slab surface or dust with cement.
 2. Use hand or powered equipment only as recommended in ACI 302.1R.
 3. Screeding: Strike-off to required grade and within surface tolerances indicated. Verify conformance to surface tolerances. Correct deficiencies while concrete is still plastic.

4. Bull Floating: Immediately following screeding, bull float or darby before bleed water appears to eliminate ridges, fill in voids, and embed coarse aggregate. Recheck and correct surface tolerances.
 5. Final Floating: Float to embed coarse aggregate, to eliminate ridges, to compact concrete, to consolidate mortar at surface, and to achieve uniform, sandy texture. Recheck and correct surface tolerances.
 6. Troweling: Trowel immediately following final floating. Apply first troweling with power trowel except in confined areas, and apply subsequent trowelings with hand trowels. Wait between trowelings to allow concrete to harden. Do not over-trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over it. Consolidate concrete surface by final troweling operation. Completed surface shall be free of trowel marks, uniform in texture and appearance, and within surface tolerance specified.
 - a. Grind smooth surface defects, which would telegraph through final floor covering system.
- B. Coordinate appearance and texture of required final finishes with the ARCHITECT before application.
- C. Broomed Float Finish: After floating and when water sheen has practically disappeared, apply uniform transverse corrugations approximately 1/16-inch deep, without tearing surface.
- D. Trowel Finish: As specified above.
- E. Slab Surface Tolerances:
1. Achieve flat, level planes except where grades are indicated. Slope uniformly to drains.
 2. Floated finishes: Depressions between high spots shall not exceed 5/16-inch under a 10-foot straightedge.
 3. Troweled finishes: Achieve level surface plane so that depressions between high spots do not exceed the following dimension, using a 10-foot straightedge:
 - a. 1/8-inch.
- F. Slab Finish Schedule: Apply finishes in the following typical locations and as otherwise shown on the drawings:
1. Broomed float:
 - a. Sidewalks.
 - b. Exterior slabs not otherwise scheduled.
 2. Trowel finish:
 - a. Exposed interior floors not otherwise scheduled.
 - b. Surfaces to receive resilient tile.
 - c. Surfaces to receive carpet.

3.9 CONCRETE CURING & PROTECTION

A. General:

1. Prevent premature drying of freshly placed concrete, and protect from excessively cold or hot temperatures until concrete has cured.
2. Provide curing of concrete by one of the methods listed and as appropriate to service conditions and type of applied finish in each case.

B. Curing Period:

1. Not less than 7-days for standard cements and mixes.

C. Formed Surfaces: Cure formed concrete surfaces by moist curing with forms in place for full curing period or until forms are removed.

D. Surfaces Not in Contact with Forms:

1. Start curing as soon as free water has disappeared, but before surface is dry. Acceptable curing methods:
 - a. Water ponding.
 - b. Water-saturated sand.
 - c. Water-fog spray.
 - d. Saturated burlap: Provide 4-inch minimum overlap at joints.
 - e. Curing compounds.

E. Avoid rapid drying at end of curing period.

3.10 REMOVAL OF FORMS & SUPPORTS

- A. Non-Load-Bearing Form Work: Provided that concrete has hardened sufficiently that it will not be damaged, forms not actually supporting weight of concrete or weight of soffit forms may be removed after concrete has cured at not less than 50°F for 24-hours. Maintain curing and protection operations after form removal.
- B. Load-Bearing Form Work: Do not remove shoring and forms supporting weight of concrete such as beam soffits, joists, slabs and other structural elements, until concrete has attained at least the specified compressive strength f'_c and until the CONTRACTOR has determined that the actual compressive strength attained is adequate to support the weight of the concrete and superimposed loads.
- C. Test field-cured specimens to determine potential compressive strength of concrete for specific locations.

3.11 MISCELLANEOUS CONCRETE ITEMS

- A. Beam Bearing Plates, Column Base Plates: Provide, as indicated on drawings. Set anchor bolts at correct elevations, complying with diagrams or templates of equipment manufacturer.
 - 1. Grout under base plates and foundations, as indicated, with non-shrink grout.
 - 2. Use non-metallic grout for exposed conditions, unless otherwise indicated.

3.12 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. General:
 - 1. Testing and analysis of concrete will be performed under provisions of Division 1.
 - 2. Materials and operations shall be tested and inspected as work progresses. Failure to detect defective work shall not prevent rejection when defect is discovered, nor shall it obligate the ARCHITECT for final acceptance.
- B. Composite Sampling, Making & Curing Of Specimens: ASTM C-172 and ASTM C-31.
- C. Slump: ASTM C-143. One (1) test per batch.
 - 1. Modify sampling to comply with ASTM C-94.
- D. Air Content Of Normal Weight Concrete: ASTM C-173 or ASTM C-231. One (1) test per strength test performed on air-entrained concrete.
- E. Concrete Temperature:
 - 1. Test hourly when air temperature is 40°F or below.
 - 2. Test hourly when air temperature is 90°F or above.
 - 3. Test each time a set of strength test specimens is made.
- F. Compressive Strength Tests: ASTM C-39.
 - 1. Compressive Test Specimens: Mold and cure one (1) set of four (4) standard cylinders for each compressive strength test required.
 - 2. Testing for acceptance of potential strength of as-delivered concrete:
 - a. Obtain samples on statistically sound, random basis.
 - b. Minimum frequency:
 - 1) One (1) set per 50 cubic yards or fraction thereof for each day's pour of each concrete class.
 - 2) Each class of concrete change.
 - 3) Each change in source of supply.
 - 4) If, within 48-hours of concrete placement, the temperature is expected to fall below 45°F, two (2) additional cylinders shall be

made and field cured under the same conditions as that concrete used in the structure.

- c. Test one (1) specimen per set at 7-days for information, unless an earlier age is required.
- d. Test two (2) specimens per set for acceptance of strength potential; test at 28-days, unless other age is specified. The test result shall be the average of the two specimens. If one (1) specimen shows evidence of improper sampling, molding or testing, the test result shall be the result of the remaining specimen. If both show such evidence, discard the test result and inform the ARCHITECT.
- e. Retain one (1) specimen from each set for later testing, if required.
- f. Strength potential of as-delivered concrete will be considered acceptable if all of the following criteria are met:
 - 1) No individual test result falls below specified compressive strength by more than 500 psi.
 - 2) Not more than 5% of individual test results fall below specified compressive strength $f'(c)$.
 - 3) Average of any three (3) consecutive strength test results equals or exceeds specified compressive strength $f'(c)$.

G. Test Results: Testing agency shall report test results in writing to ARCHITECT and CONTRACTOR within 24-hours of test.

- 1. Test reports shall contain the following data:
 - a. Project name, number and other identification.
 - b. Name of concrete testing agency.
 - c. Date and time of sampling.
 - d. Concrete type, class and any admixtures.
 - e. Location of concrete batch in the completed work.
 - f. All information required by respective ASTM test methods.
- 2. Non-destructive testing devices, such as impact hammer or sonoscope, may be used at ARCHITECT's option for assistance in determining probable concrete strength at various locations or for selecting areas to be cored, but such tests shall not be the sole basis for acceptance or rejection.
- 3. The testing agency shall make additional tests of in-place concrete, as directed by the ARCHITECT, when test results indicate that specified strength and other concrete characteristics have not been attained.
 - a. Testing agency may conduct tests of cored cylinders with ASTM C-42, or other tests, as directed.
 - b. Cost of additional testing shall be borne by the CONTRACTOR when unacceptable concrete has been verified.

END OF SECTION

SECTION 03 41 23.00

PRECAST CONCRETE STAIRS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: These specifications cover manufacture, transportation and erection of precast concrete stairs and landings.
- B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Precast Prestressed Concrete Institute (PCI) Plant Certification Program and shall be certified in category C1.
- B. Erector Qualifications: Precast Prestressed Concrete Institute Qualified Erector and regularly engaged for at least 5 years in the erection of precast structural concrete similar to the requirements of this project. Retain a registered structural engineer to certify that erection is in accordance with design requirements.
- C. Welder Qualifications: In accordance with AWS D1.1.
- D. Codes and Standards: Comply with provision of following codes, specifications and standards, except as otherwise indicated.
 - 1. ACI 301 "Specifications for Structural Concrete."
 - 2. ACI 318 "Building Code Requirements for Structural Concrete."
 - 3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice."
 - 4. Precast Prestressed Concrete Institute MNL 116, Manual for Quality Control for Plants and Production of Precast Concrete Products".
 - 5. Precast Prestressed Concrete Institute MNL 135, "Tolerance Manual for Precast and Pre-stressed Concrete Construction".
 - 6. Precast Prestressed Concrete Institute MNL 120, "PCI Design Handbook".
 - 7. American Welding Society, AWS D1.1 "Structural Welding Code-Steel", D1.4 "Structural Welding Code – Reinforcing Steel", D1.6 "Structural Welding Code - Stainless Steel", C5.4, "Recommended Practices for Stud Welding."
- E. Fabricator Qualifications: Fabricator must be certified producer member of the Precast/Prestressed Concrete Institute (PCI) and participate in its Plant Certification Program with a C1 classification.
- F. Performance Requirements:

1. Delegated Design: Design precast concrete stairs, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
2. Structural Performance: Provide precast structural concrete units and connections capable of withstanding the following design loads within limits and under conditions indicated:
 - a. Stairs shall be designed to support the full dead load plus 100 psf live load.
 - b. Short term and long term deflection shall be no greater than Table 9.5 (b) of ACI-318.

1.3 SUBMITTALS AND DESIGN

A. Shop Drawings:

1. Erection drawings shall show dimensions for proper fabrication; reinforcing steel sizes, grades and locations; inserts accessories and handling methods; calculations for reinforcing; details, sections, jointing, anchoring, and all other necessary information.

B. Tests and Reports:

1. Perform all concrete testing in accordance with PCI MNL-116 requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portland cement:

1. ASTM C 150, Type I or III

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

C. Plain-Steel Welded Wire Reinforcement: ASTM A 185 or A497 fabricated from plain steel wire into flat sheets having a minimum yield strength of 70,000psi.

D. Plates and Angles: Cast-in loose plates and angles shall conform to ASTM 36.

E. Water: Potable, clean and free from oils, acids, salts or other injurious substances.

F. Admixtures:

1. Air entrainment agents shall conform to ASTM C 260.
2. Precast elements exposed to weather or vulnerable to deicers shall have 6% \pm 1.5% of air entrainment.
3. Water reducing agent shall conform to ASTM C 494, Type A.

- 4. High range water reducing agent shall conform to ASTM C494 Type A.
- G. Normal-Weight Aggregates:
 - 1. Fine Aggregates: ASTM C 33, washed natural sand
 - 2. Course Aggregates: Crushed stone conforming to ASTM C 33. Aggregate shall be graded crushed stone with a resulting weight of concrete up to 155 lbs./cu. ft.
- H. Grout:
 - 1. Cement shall be gray Portland cement, free from soluble salts and complying with ASTM C 150, Type I or Type III High Early Strength, one brand throughout work. Strength shall be 4,000 psi in 28 days.

2.2 CONCRETE MIXES

- A. 28-day compressive strength: Minimum of 5,000 psi
- B. Use of calcium chloride or admixtures containing chlorides is not permitted.

2.3 FABRICATION

- A. Casting shall be done in rigidly constructed forms designed to produce dimensionally correct members with uniform surfaces per shop drawings.
- B. At time of casting, manufacturer shall incorporate all accessories, reinforcing steel and handling devices required for proper installation and handling of units.
- C. Provide finished units, which are straight, true to size and shape, and within specified casting tolerances.
- D. Make exposed edges sharp, straight, and square. Make flat surfaces into a true plane.
- E. Place and secure in the forms all anchors, clips, stud bolts, inserts, lifting devices, shear ties, and other devices required for handling and installing the precast units and for attachment of subsequent items indicated and specified.
- F. Curing:
 - 1. Form curing by moisture retention without supplemental heat until concrete reaches adequate strength for removal of product from forms, a minimum of 2,500 psi.
 - 2. Precast units shall be cured to the required 28 day strength prior to shipment.
- G. Casting tolerances: Maintain casting, bowing, warping and dimension tolerances within PCI MNL-116 and PCI MNL-135.

2.4 PRODUCT DELIVERY, STORAGE, & HANDLING

A. Delivery and Handling:

1. Carefully transport and handle precast concrete stairs so as to prevent soiling or damage. Store clear of ground in manner to prevent cracking, distortion, warping and to protect from damage and dirt. Soiling or staining of precast units may be cause for rejection of units. Lift and support units only at designated lifting or supporting points as shown on approved shop drawings.

B. Delegated-Design Submittal:

1. For precast concrete stairs indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Examination:

1. Examine supporting structural frame or foundation and conditions for compliance with requirements for installation tolerances, true and level bearing surfaces, and other conditions affecting performance of the Work.
2. Proceed with installation only after unsatisfactory conditions have been corrected.
3. Do not install precast concrete units until supporting, building structural framing has attained minimum allowable design compressive strength or until supporting steel or other structure is complete.

PART 3 – EXECUTION

3.1 ERECTION

- #### A. Work to be performed by a PCI Qualified Erector. Install in accordance with shop drawings and manufacturer's recommended installation procedures.

B. Handling and Erection:

1. Temporarily stabilize all precast work until permanent connections and/or adjoining cast-in-place concrete work or masonry has been completed and the framework is stable.

3.2 GROUTING

A. Grouting:

1. After precast units have been placed and secured, grout open spaces at connections and joints between platforms and stairs, and between platforms and floor plank,

2. Place grout in a manner to finish smooth, plumb, and level with adjacent concrete surfaces.

3.3 WELDING

- A. Welding shall be continuous with Low-Hydrogen rods per AWS A5.1 or A5.5.

3.4 PATCHING

- A. Patch precast units if strength and appearance has not been impaired. Manufacturer of precast units shall point up all chopped areas. Pointed up areas shall have minimum variation in texture and color. Amount of variation shall be acceptable to the Architect.

3.5 CLEANING

- A. Remove rubbish and debris resulting from precast concrete stair work from premises upon completion.

END OF SECTION

SECTION 03 45 00.00

PRECAST ARCHITECTURAL CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes architectural insulated precast concrete cladding units.

1.2 DEFINITIONS

- A. Design Reference Sample: Sample of approved architectural precast concrete color, finish and texture, preapproved by Architect.

1.3 ACTION SUBMITTALS

- A. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests.
- B. Shop Drawings:
 - 1. Detail fabrication and installation of architectural precast concrete units.
 - 2. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit.
 - 3. Indicate joints, reveals, drips, chamfers, and extent and location of each surface finish.
 - 4. Indicate details at building corners.
- C. Samples: Design reference samples for initial verification of design intent, for each type of finish indicated on exposed surfaces of architectural precast concrete units, in sets of three, representative of finish, color, and texture variations expected; approximately 12 by 12 by 2 inches (300 by 300 by 50 mm).
- D. Delegated-Design Submittal: For architectural precast concrete indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Material certificates.
- C. Material Test Reports: For aggregates.
- D. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm that assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
 - 1. Fabricator is located within 500 miles (800 km) of Project site.
- B. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 117, "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products."
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D.1.1M, "Structural Welding Code - Steel"; and AWS D1.4/D1.4M, "Structural Welding Code - Reinforcing Steel."
- D. Sample Panels: After sample approval and before fabricating architectural precast concrete units, produce a minimum one sample panels approximately 16 sq. ft. (1.5 sq. m) in area for review by Architect at site of construction. Incorporate full-scale details of architectural features, finishes, textures, and transitions in sample panels.

1.6 COORDINATION

- A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design architectural precast concrete units.
- B. Design Standards: Comply with ACI 318 (ACI 318M) and design recommendations of PCI MNL 120, "PCI Design Handbook - Precast and Prestressed Concrete," applicable to types of architectural precast concrete units indicated.
- C. Structural Performance: Provide architectural precast concrete units and connections capable of withstanding design loads indicated within limits and under conditions indicated.

2.2 REINFORCING MATERIALS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

- B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- C. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- D. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from manufacturer's standard steel wire into flat sheets.
- E. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.
- F. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 117.

2.3 PRESTRESSING TENDONS

- A. Prestressing Strand: ASTM A 416/A 416M, Grade 270 (Grade 1860), uncoated, seven-wire, low-relaxation strand.
 - 1. Coat unbonded post-tensioning strand with post-tensioning coating complying with ACI 423.7 and sheath with polypropylene tendon sheathing complying with ACI 423.7. Include anchorage devices and coupler assemblies.

2.4 CONCRETE MATERIALS

- A. Regional Materials: Precast architectural concrete shall be manufactured from aggregates and cement that have been extracted or recovered, as well as manufactured, within 500 miles (800 km) of Project site.
- B. Portland Cement: ASTM C 150/C 150M, Type I or Type III, gray, unless otherwise indicated.
 - 1. For surfaces exposed to view in finished structure, use gray or white cement, of same type, brand, and mill source.
- C. Supplementary Cementitious Materials:
 - 1. Fly Ash: ASTM C 618, Class C or F, with maximum loss on ignition of 3 percent.
 - 2. Metakaolin: ASTM C 618, Class N.
 - 3. Silica Fume: ASTM C 1240, with optional chemical and physical requirement.
 - 4. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
 - 5. Blended Hydraulic Cement: ASTM C 595.
- D. Normal-Weight Aggregates: Except as modified by PCI MNL 117, ASTM C 33/C 33M, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.
 - 1. Face-Mixture-Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining; to match selected finish sample.
 - a. Gradation: To match design reference sample.

2. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand compatible with coarse aggregate; to match approved finish sample.
- E. Coloring Admixture: ASTM C 979/C 979M, synthetic or natural mineral-oxide pigments or colored water-reducing admixtures, temperature stable, and nonfading.
 - F. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 117.
 - G. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
 - H. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.

2.5 STEEL CONNECTION MATERIALS

- A. Carbon-Steel Shapes and Plates: ASTM A 36/A 36M.
- B. Carbon-Steel-Headed Studs: ASTM A 108, AISI 1018 through AISI 1020, cold finished, AWS D1.1/D1.1M, Type A or Type B, with arc shields and with minimum mechanical properties of PCI MNL 117, Table 3.2.3.
- C. Carbon-Steel Plate: ASTM A 283/A 283M, Grade C.
- D. Malleable Iron Castings: ASTM A 47/A 47M, Grade 32510 or Grade 35028.
- E. Carbon-Steel Castings: ASTM A 27/A 27M, Grade 60-30 (Grade 415-205).
- F. High-Strength, Low-Alloy Structural Steel: ASTM A 572/A 572M.
- G. Carbon-Steel Structural Tubing: ASTM A 500/A 500M, Grade B or Grade C.
- H. Wrought Carbon-Steel Bars: ASTM A 675/A 675M, Grade 65 (Grade 450).
- I. Deformed-Steel Wire or Bar Anchors: ASTM A 496/A 496M or ASTM A 706/A 706M.
- J. Carbon-Steel Bolts and Studs: ASTM A 307, Grade A or ASTM F 1554, Grade 36 (ASTM F 568M, Property Class 4.6); carbon-steel, hex-head bolts and studs; carbon-steel nuts, ASTM A 563 (ASTM A 563M); and flat, unhardened steel washers, ASTM F 844.
- K. High-Strength Bolts and Nuts: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; heavy hex carbon-steel nuts, ASTM A 563 (ASTM A 563M); and hardened carbon-steel washers, ASTM F 436 (ASTM F 436M).
- L. Zinc-Coated Finish: For exterior steel items, steel in exterior walls, and items indicated for galvanizing, apply zinc coating by hot-dip process according to ASTM A 123/A 123M or ASTM A 153/A 153M.

1. Galvanizing Repair Paint: High-zinc-dust-content paint with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035B or SSPC-Paint 20.
- M. Shop-Primed Finish: Prepare surfaces of nongalvanized steel items, except those surfaces to be embedded in concrete, according to requirements in SSPC-SP 3 and shop-apply lead- and chromate-free, rust-inhibitive primer, complying with performance requirements in MPI 79 according to SSPC-PA 1.

2.6 GROUT MATERIALS

- A. Sand-Cement Grout: Portland cement, ASTM C 150/C 150M, Type I, and clean, natural sand, ASTM C 144 or ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 to 3 parts sand, by volume, with minimum water required for placement and hydration. Water-soluble chloride ion content less than 0.06 percent by weight of cement when tested according to ASTM C 1218/C 1218M.
- B. Nonmetallic, Nonshrink Grout: Packaged, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107/C 1107M, Grade A for drypack and Grades B and C for flowable grout and of consistency suitable for application within a 30-minute working time. Water-soluble chloride ion content less than 0.06 percent by weight of cement when tested according to ASTM C 1218/C 1218M.
- C. Epoxy-Resin Grout: Two-component, mineral-filled epoxy resin; ASTM C 881/C 881M, of type, grade, and class to suit requirements.

2.7 INSULATED PANEL ACCESSORIES

- A. Polyisocyanurate Board Insulation: ASTM C 591.

2.8 CONCRETE MIXTURES

- A. Prepare design mixtures for each type of precast concrete required.
- B. Limit use of fly ash and ground granulated blast-furnace slag to 20 percent of portland cement by weight; limit metakaolin and silica fume to 10 percent of portland cement by weight.
- C. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at architectural precast concrete fabricator's option.
- D. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 (ACI 318M) or PCI MNL 117 when tested according to ASTM C 1218/C 1218M.
- E. Normal-Weight Concrete Mixtures: Proportion mixtures by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:
 1. Compressive Strength (28 Days): 5000 psi (34.5 MPa) minimum.

- F. Water Absorption: 6 percent by weight or 14 percent by volume, tested according to ASTM C 642, except for boiling requirement.
- G. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content complying with PCI MNL 117.
- H. When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions.

2.9 FABRICATION

- A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.
 - 1. Weld-headed studs and deformed bar anchors used for anchorage according to AWS D1.1/D1.1M and AWS C5.4, "Recommended Practices for Stud Welding."
- B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing architectural precast concrete units to supporting and adjacent construction.
- C. Cast-in reglets, slots, holes, and other accessories in architectural precast concrete units as indicated on the Contract Drawings.
- D. Reinforcement: Comply with recommendations in PCI MNL 117 for fabricating, placing, and supporting reinforcement.
- E. Reinforce architectural precast concrete units to resist handling, transportation, and erection stresses and specified in-place loads.
- F. Prestress tendons for architectural precast concrete units by either pretensioning or post-tensioning methods. Comply with PCI MNL 117.
- G. Comply with requirements in PCI MNL 117 and requirements in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.
- H. Place face mixture to a minimum thickness after consolidation of the greater of 1 inch (25 mm) or 1.5 times the maximum aggregate size, but not less than the minimum reinforcing cover specified.
- I. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming in precast concrete units.
 - 1. Place backup concrete mixture to ensure bond with face-mixture concrete.

- J. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air voids on surfaces. Use equipment and procedures complying with PCI MNL 117.
 - 1. Place self-consolidating concrete without vibration according to PCI TR-6, "Interim Guidelines for the Use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants." Ensure adequate bond between face and backup concrete, if used.
- K. Comply with PCI MNL 117 for hot- and cold-weather concrete placement.
- L. Identify pickup points of architectural precast concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each architectural precast concrete unit on a surface that does not show in finished structure.
- M. Cure concrete, according to requirements in PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.
- N. Discard and replace architectural precast concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 117 and Architect's approval.

2.10 INSULATED PANEL CASTING

- A. Cast, screed, and consolidate bottom concrete wythe supported by mold.
- B. Place insulation boards abutting edges and ends of adjacent boards. Insert wythe connectors through insulation holes, and consolidate concrete around connectors according to connector manufacturer's written instructions.
- C. Ensure bottom wythe and insulation layer are not disturbed after bottom wythe reaches initial set.
- D. Cast, screed, and consolidate top wythe to meet required finish.
- E. Maintain temperature below 150 deg F (65 deg C) in bottom concrete wythe.

2.11 FABRICATION TOLERANCES

- A. Fabricate architectural precast concrete units to shapes, lines, and dimensions indicated so each finished unit complies with PCI MNL 117 product tolerances as well as position tolerances for cast-in items.

2.12 FINISHES

- A. Exposed faces shall be free of joint marks, grain, and other obvious defects. Corners, including false joints shall be uniform, straight, and sharp. Finish exposed-face surfaces of architectural precast concrete units to match approved sample panels and as follows:
1. PCI's "Architectural Precast Concrete - Color and Texture Selection Guide," of plate numbers indicated.
 2. Acid-Etched Finish: Use acid and hot-water solution, equipment, application techniques, and cleaning procedures to expose aggregate and surrounding matrix surfaces. Protect hardware, connections, and insulation from acid attack.
 3. Match existing surface texture, color, and general appearance of the precast panels installed in the 2012 court yard addition at the Outagamie County Administration Building. As a point of reference, the concrete mix was:
 - 50/50 blend of white and grey cement
 - Fine and coarse aggregates
 - Combination of yellow and earth tone red pigments
- B. Finish exposed top surfaces of architectural precast concrete units to match face-surface finish.
- C. Finish exposed back surfaces of architectural precast concrete units with smooth steel-towel finish where indicated on Drawings.
- D. Finish unexposed surfaces of architectural precast concrete units with as cast finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install clips, hangers, bearing pads, and other accessories required for connecting architectural precast concrete units to supporting members and backup materials.
- B. Erect architectural precast concrete level, plumb, and square within specified allowable tolerances. Provide temporary supports and bracing as required to maintain position, stability, and alignment of units until permanent connections are completed.
1. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
 2. Unless otherwise indicated, maintain uniform joint widths of 3/4 inch (19 mm).
- C. Connect architectural precast concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.
- D. Welding: Comply with applicable requirements in AWS D1.1/D1.1M and AWS D1.4/D1.4M for welding, welding electrodes, appearance, quality of welds, and methods used in correcting welding work.

- E. At bolted connections, use lock washers, tack welding, or other approved means to prevent loosening of nuts after final adjustment.
- F. Grouting or Dry-Packing Connections and Joints: Grout connections where required or indicated. Retain flowable grout in place until hard enough to support itself. Alternatively, pack spaces with stiff dry-pack grout material, tamping until voids are completely filled. Place grout and finish smooth, level, and plumb with adjacent concrete surfaces. Promptly remove grout material from exposed surfaces before it affects finishes or hardens. Keep grouted joints damp for not less than 24 hours after initial set.

3.2 ERECTION TOLERANCES

- A. Erect architectural precast concrete units level, plumb, square, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 117, Appendix I.

3.3 REPAIRS

- A. Repair architectural precast concrete units if permitted by Architect. Architect reserves the right to reject repaired units that do not comply with requirements.
- B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from a distance of 20 feet (6 m).
- C. Prepare and repair damaged galvanized coatings with galvanizing repair paint according to ASTM A 780/A 780M.
- D. Wire brush, clean, and paint damaged prime-painted components with same type of shop primer.
- E. Remove and replace damaged architectural precast concrete units when repairs do not comply with requirements.

3.4 CLEANING

- A. Clean surfaces of precast concrete units exposed to view.
- B. Clean mortar, plaster, fireproofing, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.
- C. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.
 - 1. Perform cleaning procedures, if necessary, according to precast concrete fabricator's recommendations. Protect other work from staining or damage due to cleaning operations.
 - 2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION

DIVISION 4 – MASONRY

SECTION 04 22 00.00

CONCRETE UNIT MASONRY

SECTION 04 22 00.00
CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units (CMU's).
2. Steel reinforcing bars.

1.2 ACTION SUBMITTALS

- A. Product Data:** For each type of product indicated.
- B. Shop Drawings:** For reinforcing steel. Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."

1.3 INFORMATIONAL SUBMITTALS

- A. Material Certificates:** For each type and size of product indicated. For masonry units include data on material properties and material test reports.
- B. Mix Designs:** For each type of mortar and grout. Include description of type and proportions of ingredients.
1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

1.4 QUALITY ASSURANCE

- A. Masonry Standard:** Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

1.5 PROJECT CONDITIONS

- A. Cold-Weather Requirements:** Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost

or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

- B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.
- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. CMUs: ASTM C 90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi (19.3 MPa).
 - 2. Density Classification: Normal weight.

2.3 CONCRETE AND MASONRY LINTELS

- A. General: Provide one of the following:
- B. Concrete Lintels: ASTM C 1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength not less than CMUs.
- C. Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Section 03 30 00.00 "Cast-in-Place Concrete," and with reinforcing bars indicated.
- D. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs with reinforcing bars placed as indicated and filled with coarse grout.

2.4 MORTAR AND GROUT MATERIALS

- A. Regional Materials: Aggregate for mortar and grout shall be extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

- B. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- E. Masonry Cement: ASTM C 91.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Lehigh Cement Company; Lehigh White Masonry Cement.
- F. Mortar Cement: ASTM C 1329.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Lafarge North America Inc.; Lafarge Mortar Cement.
- G. Aggregate for Mortar: ASTM C 144.
 - 1. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
 - 2. White-Mortar Aggregates: Natural white sand or crushed white stone.
 - 3. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- H. Aggregate for Grout: ASTM C 404.
- I. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Euclid Chemical Company (The); Accelguard 80.
 - b. Grace Construction Products, W. R. Grace & Co. - Conn.; Morset.
 - c. Sonneborn Products, BASF Aktiengesellschaft; Trimix-NCA.
- J. Water: Potable.

2.5 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).

B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.

1. Interior Walls: Hot-dip galvanized, carbon steel.
2. Wire Size for Side Rods: 0.148-inch (3.77-mm) diameter.
3. Wire Size for Cross Rods: 0.148-inch (3.77-mm) diameter.
4. Wire Size for Veneer Ties: 0.187-inch (4.76-mm) diameter.
5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches (407 mm) o.c.
6. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.

2.6 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.

1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.
2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- (6.35-mm-) diameter, hot-dip galvanized steel wire.
2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch (25 mm) of masonry face, made from 0.25-inch- (6.35-mm-) diameter, hot-dip galvanized steel wire.

C. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch (25 mm) of masonry face, made from 0.187-inch- (4.76-mm-) diameter, hot-dip galvanized steel wire.

D. Partition Top anchors: 0.105-inch- (2.66-mm-) thick metal plate with 3/8-inch- (9.5-mm-) diameter metal rod 6 inches (152 mm) long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

2.7 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; formulated from neoprene or PVC.

B. Preformed Control-Joint Gaskets: Made from PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

- C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

2.8 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. For reinforced masonry, use portland cement-lime mortar.
 - 3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270. Provide the following types of mortar for applications stated unless another type is indicated.
 - 1. For masonry below grade or in contact with earth, use Type M.
 - 2. For reinforced masonry, use Type N.
 - 3. For mortar parge coats, use Type N.
 - 4. For interior non-load-bearing partitions, Type O may be used instead of Type N.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
 - 2. Proportion grout in accordance with ASTM C 476, paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).
 - 3. Provide grout with a slump of 8 to 11 inches (203 to 279 mm) as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 TOLERANCES

- A. Dimensions and Locations of Elements:
 - 1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
 - 2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
 - 3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
3. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm).

3.2 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- C. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.
- G. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.3 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
 - 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
 - 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.4 MASONRY JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
 - 1. Space reinforcement not more than 16 inches (406 mm) o.c.
 - 2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
 - 3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings or as indicated on the drawings.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.

3.5 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:
 - 1. Provide an open space not less than 1/2 inch (13 mm) wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

3.6 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 - 2. Limit height of vertical grout pours to not more than 60 inches (1520 mm).

3.7 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.
- B. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.
- C. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.8 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
 - 2. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.9 MASONRY WASTE DISPOSAL

- A. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 - 1. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade or near footings and foundations.
- B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION

DIVISION 5 – METALS

SECTION 05 12 00.00	STRUCTURAL STEEL
SECTION 05 12 13.00	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL FRAMING
SECTION 05 21 00.00	STEEL JOISTS
SECTION 05 31 13.00	STEEL FORM DECK
SECTION 05 31 23.00	STEEL DECK
SECTION 05 50 00.00	METAL FABRICATIONS
SECTION 05 51 13.00	METAL PAN STAIRS
SECTION 05 52 13.00	PIPE AND TUBE RAILINGS
SECTION 05 73 00.00	DECORATIVE METAL RAILINGS

SECTION 05 12 00.00

STRUCTURAL STEEL

PART 1 - GENERAL

1.1 REFERENCES

- A. ASTM A-36 - Standard Specification For Carbon Structural Steel.
- B. ASTM A-53 - Standard Specification For Pipe, Steel, Black & Hot-Dipped, Zinc-Coated, Welded & Seamless.
- C. ASTM A-123 - Standard Specification For Zinc (Hot Dip Galvanized) Coatings On Iron & Steel Products.
- D. ASTM A-153 - Standard Specification For Zinc Coating (Hot Dip) on Iron & Steel Hardware.
- E. ASTM A-307 - Standard Specification For Carbon Steel Bolts & Studs, 60,000 psi Tensile Strength.
- F. ASTM A-325 - Standard Specification For Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- G. ASTM A-500 - Standard Specification For Cold-Formed Welded & Seamless Carbon Steel Structural Tubing In Round & Shapes.
- H. ASTM A-563 - Standard Specification For Carbon & Alloy Steel Nuts.
- I. ASTM A-992 - Standard Specification For Structural Steel Shapes.
- J. ASTM F-436 - Standard Specification For Hardened Steel Washers.
- K. ASTM F-1554 - Standard Specifications For Anchor Bolts, Steel, 36, 55 & 105 ksi Yield Strength.
- L. AWS A-2.0 - Standard Welding Symbols.
- M. AWS D-1.1 - Structural Welding Code.
- N. AISC 303 - Code Of Standard Practice For Steel Buildings & Bridges.
- O. AISC 360 - Specification For Structural Steel Buildings.
- P. RCSC - Specification For Structural Joints Using ASTM A-325 or A-490 Bolts.

1.2 SUBMITTALS

- A. Submit under provision of Division 1.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing and locations of structural members, openings, attachments and fasteners.
 - 2. Connections and connections not detailed.
 - 3. Indicate welded connections with AWS A-2.0 welding symbols. Indicate net weld lengths.
- C. Manufacturer's Mill Certificate: Submit under provisions of Division 1, certifying that products meet or exceed specified requirements.
- D. Welder's Certificates: Submit under provision of Division 1, certifying welders employed on the work, verifying AWS qualifications within the previous 12-months.

1.3 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC Standards.
- B. Maintain one (1) copy of document on site.

1.4 QUALIFICATIONS

- A. Fabricator: Company specializing in performing the work of this section with minimum 5-years documented experience.
- B. Erector: Company specializing in performing the work of this section with minimum 5-years documented experience.

1.5 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on Drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. W-Shape Structural Steel Members: ASTM A-992.
- B. Channels, Angles, S-Shapes, M-Shapes: ASTM A-36.
- C. Bars, Plates & Rounds: ASTM A-36.

- D. Structural Tubes: ASTM A-500, Grade B.
- E. Pipe: ASTM A-53, Grade B.
- F. Bolts, Nuts & Washers: ASTM A-325 (galvanized to ASTM A-153 for galvanized members), ASTM A-563 and ASTM F-436.
- G. Anchor Bolts: ASTM F-1554, Grade 36.
- H. Shear Connectors: ASTM A-108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- I. Welding Materials: AWS D-1.1; type required for materials being welded.
- J. Grout: ASTM C-1107, non-shrink type, pre-mixed compound, consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 28-days.

2.2 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303 and AISC 360.
- B. Loose Plates: Fabricate flat; size and thickness, as indicated.
 - 1. Drill holes for anchor bolts where required.
 - 2. Weld headed studs to plates, as required.
- C. Loose Lintels: As indicated.
 - 1. Weld double lintels together, where indicated.
 - 2. Where bearing dimension is not indicated, provide minimum of 8-inches bearing on each side of opening.
- D. Miscellaneous Framing: As indicated, with welded-on anchors.
 - 1. In Concrete & Masonry: Set framing prior to placement of structure or provide appropriate inserts in structure for attachment of anchors.
 - 2. Prepare to receive attached members and components.
- E. Shear Connectors: Prepare steel surfaces, as recommended by Manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and Manufacturer's written instructions.

2.3 FINISH

- A. Prepare structural component surfaces in accordance with Division 9.

- B. Shop prime structural steel members. Provide a high solids epoxy coating, 8 DMT minimum for surfaces in contact with masonry or concrete. Do not prime the following:
 - 1. Galvanized steel members.
 - 2. Steel members embedded in concrete or mortar.
 - 3. Steel members to receive sprayed-on fire-proofing.
 - 4. Steel members for which an entirely field-applied coating is required.
- C. Where construction documents call for galvanizing, galvanize structural steel members to ASTM A-123, provide minimum 1.25 ounce/square foot galvanized coating.
- D. Provide finishes as per Division 9.

2.4 SOURCE QUALITY CONTROL & TESTS

- A. Testing and analysis of components will be performed under provisions of Division 1.

PART 3- EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Beginning of installation means erector accepts existing conditions.

3.2 ERECTION

- A. Allow for erection loads and for sufficient temporary bracing to maintain structure safe, plumb and in true alignment until completion of erection and installation of permanent bracing.
- B. Field weld components indicated on Drawings and Shop Drawings.
- C. Do not field cut or alter structural members without review of ENGINEER / ARCHITECT.
- D. After erection, prime welds, abrasions and surfaces not shop primed or galvanized, including surfaces to be in contact with concrete.
- E. Grout under baseplates and bearing plates in accordance with Manufacturer's recommendations.
- F. Erect structural steel in accordance with AISC Specifications.

3.3 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: ¼-inch per story, non-cumulative.

B. Maximum Offset From True Alignment: $\frac{1}{4}$ -inch.

3.4 INSTALLATION – LOOSE PLATES

A. Loose Plates Set On Concrete Or Masonry:

1. Clean setting surfaces and roughen surfaces to improve bond.
2. Set plates at proper elevations and level, with firm bearing on substrate.
 - a. After members bearing on plates have been installed, tighten anchor bolts.

3.5 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Division 1.

END OF SECTION

SECTION 05 12 13.00

ARCHITECTURALLY EXPOSED STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes architecturally exposed structural-steel (AESS) at entire assembly of open stair (10.1.S1, 10.2.S1, & 10.3.S1), all exposed columns, all handrails, and all guardrails.
 - 1. Requirements in Section 05 12 00.00 "Structural Steel Framing" also apply to AESS.

1.2 DEFINITIONS

- A. AESS: Structural steel designated as "architecturally exposed structural steel" or "AESS" in the Contract Documents.

1.3 ACTION SUBMITTALS

- A. Shop Drawings: Show fabrication of AESS components.
 - 1. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain. Indicate grinding, finish, and profile of welds.
 - 2. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections. Indicate orientation of bolt heads.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD, or is accredited by the IAS Fabricator Inspection Program for Structural Steel (AC 172).
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Use special care in handling to prevent twisting, warping, nicking, and other damage. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.6 FIELD CONDITIONS

- A. Field Measurements: Where AECS is indicated to fit against other construction, verify actual dimensions by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 BOLTS, CONNECTORS, AND ANCHORS

- A. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, round-head assemblies, consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.

2.2 PRIMER

- A. Primer must be coordinated with the finish coat system to ensure coating compatibility.

2.3 FABRICATION

- A. In addition to special care used to handle and fabricate AECS, comply with the following:
 1. Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, and roughness.
 2. Grind sheared, punched, and flame-cut edges of AECS to provide smooth surfaces and edges.
 3. Fabricate AECS with exposed surfaces free of mill marks.
 4. Fabricate AECS with exposed surfaces free of seams to maximum extent possible.
 5. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating, and shop priming.
 6. Fabricate with piece marks fully hidden in the completed structure or made with media that permits full removal after erection.
 7. Fabricate AECS to the tolerances specified in AISC 303 for steel that is designated AECS.
 8. Seal-weld open ends of hollow structural sections with 3/8-inch (9.5-mm) closure plates.
- B. Coping, Blocking, and Joint Gaps: Maintain uniform gaps of 1/8 inch (3.2 mm) with a tolerance of 1/32 inch (0.8 mm).
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.4 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work, and comply with the following:
 1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding specified tolerances.
 2. Use weld sizes, fabrication sequence, and equipment for AESS that limit distortions to allowable tolerances.
 3. Provide continuous welds of uniform size and profile where AESS is welded.
 4. Grind butt and groove welds flush to adjacent surfaces within tolerance of plus 1/16 inch, minus zero inch (plus 1.5 mm, minus zero mm).
 5. Make butt and groove welds flush to adjacent surfaces within tolerance of plus 1/16 inch, minus zero inch (plus 1.5 mm, minus zero mm). Do not grind unless required for clearances or for fitting other components, or unless directed to correct unacceptable work.
 6. Remove backing bars or runoff tabs; back-gouge and grind steel smooth.
 7. At locations where welding on the far side of an exposed connection of AESS occurs, grind distortions and marking of the steel to a smooth profile aligned with adjacent material.
 8. Make fillet welds oversize and grind to uniform profile with smooth face and transition.
 9. Make fillet welds of uniform size and profile with exposed face smooth and slightly concave. Do not grind unless directed to correct unacceptable work.

2.5 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
 2. Surfaces to be field welded.
 3. Surfaces to be high-strength bolted with slip-critical connections.
 4. Galvanized surfaces.
- B. Surface Preparation for Nongalvanized Steel:
 1. SSPC-SP 10/NACE No. 2, "Near-White Blast Cleaning."

- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep AECS secure, plumb, and in alignment.
 - 1. If possible, locate welded tabs for attaching temporary bracing and safety cabling where they will be concealed from view in the completed Work.

3.3 ERECTION

- A. Set AECS accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Do not use thermal cutting during erection unless approved by Structural Engineer.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
- B. Weld Connections: Comply with requirements in "Weld Connections" Paragraph in "Shop Connections" Article.
 - 1. Remove backing bars or runoff tabs; back-gouge and grind steel smooth.
 - 2. Remove erection bolts, fill holes, and grind smooth.
 - 3. Fill weld access holes and grind smooth.

3.5 FIELD QUALITY CONTROL

- A. Architect will observe AECS in place to determine acceptability relating to aesthetic effect.

3.6 REPAIRS AND PROTECTION

- A. Remove welded tabs that were used for attaching temporary bracing and safety cabling and that are exposed to view in the completed Work. Grind steel smooth.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION

SECTION 05 21 00.00

STEEL JOISTS

PART 1 - GENERAL

1.1 REFERENCE STANDARDS

(Use Latest Edition of Each Reference Standard Listed)

A. Steel Joist Institute (SJI)/American Institute Of Steel Construction (AISC)

1. Standard specifications for Open Web Steel Joists, K Series.
2. Standard specifications for Open Web Steel Joists, LH Series.
3. Recommended Code of Standard Practice for Steel Joists.

B. American Welding Society (AWS)

1. D1.1. Structural Welding Code – Steel.
2. C1.1. Recommended Practices For Resistive Welding.
3. A2.0. Standard Welding Symbols.

C. American Society Of Testing Of Materials (ASTM)

1. Specific ASTM numbers included in later text.

D. Wisconsin Administrative Code

1. Chapter ILHR 53, Part V – Metals, 53.50, 53.51, 53.52, 53.53.

1.2 QUALIFICATIONS

A. Quality welding processes, welders and welding operators in accordance with AWS D1.1. Structural Welding Code - Steel, and applicable State and local codes.

B. Manufacturer's Mill Certificate: Certify products meet or exceed specified requirements.

1.3 SUBMITTALS

A. Submit shop drawings for fabrication and erection of steel joists. Include dimensioned plans, elevations, details of sections and connections, and list of materials. Show all openings. When bridging is not shown on drawings, detail and furnish in accordance with SJI specifications. Fabricate after review.

B. Provide open web steel joists complying with requirements of Standard Specifications for Open Web Joists, K Series, LH Series, SJI/AISC.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. K Series joists shall comply with requirements of Standard Specifications for Open Web Steel Joists, K Series, SJI/AISC.
- B. LH Series joists shall comply with requirements of Standard Specifications for Open Web Steel Joists LH Series, SJI/AISC.
- C. Accessories
 - 1. Bridging and bridging clip shall be ASTM A-36.
 - 2. Welding shall conform to AWS D1.1.: Type required for materials being welding.
 - 3. Bolts shall be ASTM A-307.

PART 3 - EXECUTION

3.1 FABRICATION

- A. Provide diagonal type and horizontal type bridging and end anchorages complying with SJI specifications.
- B. Provide extended ends for top chords of joists where required. Refer to drawings for size, locations.
- C. Provide ceiling extensions or extend lower chord of steel joists for ceiling finish or where required for providing lateral bracing.
- D. Joists shall be straight and free of twist, and uniformly level.
- E. Spacers Between Chord Members: Neat, evenly spaced and shall not extend beyond face of chords. Splicing of joists will not be permitted.
- F. Adjacent joists shall have panel points aligned.
- G. Provide beveled ends or sloped shoes where joist slope exceeds ¼-inch in 12-inches. Install joists so that their webs are in a vertical plane.
- H. Fabricate in accordance with SJI and AISC standards.
- I. See plans for special loading consideration.

3.2 SHOP COAT OF PAINT

- A. Steel joists shall be furnished shop primed with joists manufacturer's standard Red Oxide primer. Furthermore, the standard shop paint shall conform to the following:
 - 1. Steel Structures Painting Council Specification 15-68T, Type I (Red Oxide).

3.3 HANDLING & STORAGE

- A. Handling joists with care to avoid bending, twisting or other damage.
- B. Unload under supervision of CONTRACTOR.
- C. Place on blocking to keep joists off ground.
- D. Store joists to allow drainage of water from all parts and additionally protect in manner recommended by manufacturer.

3.4 ERECTION

- A. Field verify that measurements are as shown on drawings and that field conditions are acceptable and ready to receive work. Beginning of work means erector accepts existing conditions.
- B. Set joists accurately to line and level, securely braced in position until deck has been placed and all construction operations, which could load structure, are complete.
- C. Where joists bear on steel beams, weld or bolt all bearing points in accordance with SJI specifications.
- D. Install bridging in proper alignment securely welded to chords of joists and splices, and secured at ends of runs. Weld to parallel steel beams. Bridging to be installed before placement of metal roof deck.
- E. Modify all requirements for anchorage, bridging and similar items, as required by applicable local and state codes, including uplift requirements.
- F. Erection of steel joists shall be in accordance with SJI and AISC standards.
- G. Allow for erection loads and for sufficient temporary bracing to maintain structure safe, plumb and in true alignment until complete erection and installation of permanent bracing.
- H. Field welding components indicated on drawings and shop drawings.
- I. Do not field cut or alter structural members without approval of OWNER.
- J. After erection, prime welds, abrasions and surfaces not shop primed.

END OF SECTION

SECTION 05 31 13.00

STEEL FORM DECK

PART 1 - GENERAL

1.1 SYSTEM DESCRIPTION

- A. Performance Requirements: Design form decking in accordance with Steel Deck Institute Design Manual and as follows:
 - 1. Type: Composite VLI.
 - 2. Calculate to structural working stress design and maximum wet load deflection of 1/240.
 - 3. Material: Galvanized steel.
 - 4. See Plans for required deck profile height and gauge.

1.2 QUALITY ASSURANCE

- A. Codes & Standards: Comply with requirements of the following, except where exceeded by the contract documents or requirements of governing authorities:
 - 1. AISI "Specification for the Design of Cold-Formed Steel Structural Members."
 - 2. AWS D1.3 "Structural Welding Code-Sheet Steel."
 - 3. "Steel Deck Institute Design Manual for Composite Decks, Form Decks, Roof Decks, and Cellular Metal Floor Deck with Electrical Distribution."

1.3 STORAGE & HANDLING

- A. Storage: Separate sheets and store units on dry wood sleepers, sloped to promote drainage. Cover with waterproof material ventilated to avoid condensation.
- B. Marking: Unless deck units are all of the same gage and yield strength for the project, mark each unit clearly to identify differences.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - 1. United Steel Deck, Inc.
 - 2. Vulcraft Division/Nucor Corporation.

3. Wheeling Corrugating Company Division/Wheeling-Pittsburgh Steel Corporation.

2.2 MATERIALS

- A. Steel for Galvanized Metal Deck Units: ASTM A-446.
- B. Galvanizing: ASTM A-525, G60 coating where indicated.
- C. Galvanizing Repair Paint: Comply with requirements of Military Specification MIL P-21035B, Type I or II.
- D. Fasteners: Galvanized hardened steel, self-tapping.

2.3 FABRICATION

- A. Steel Form Deck – General: Provide units complying with SDI specifications for deck type indicated.
- B. Fabricate deck so that all joints fall over steel beams.
- C. Deck shall be continuous over a minimum of three (3) continuous spalls.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine field conditions and substrates to receive metal decking, and verify that existing conditions are acceptable before commencing installation.

3.2 INSTALLATION

- A. General: Install deck units and accessories in compliance with Steel Deck Institute specifications and requirements of this specification section. Fasten deck units to supports promptly after placement and alignment. Do not leave placed sheets unattached at end of working day.
 1. Bearing: Allow minimum bearing of 4-inches at non-steel supports; align and level deck units.
 2. Placement: Place deck units flat and square, without excessive warp or deflection.
 3. End laps: Lap ends of deck units over supports and make laps not less than 2-inches.
 4. Precautions: Coordinate location of decking bundles to prevent overloading of structure.

B. Fastening:

1. Fasten form deck units to non-steel supporting members as follows:
 - a. Use mechanical fasteners spaced at 12-inches on center average, but not more than 18-inches apart and not fewer than two (2) fasteners at any support.
2. Side laps: At CONTRACTOR's option, fasten side laps of adjacent deck units using one of the following methods:
 - a. Weld laps.
 - b. Mechanically clinch, or button-punch.
 - c. Mechanically fasten, using self-tapping machine screws of No. 8 size or larger.
 - d. Spacing: Not to exceed 24-inches on center.

C. Openings:

1. Cut deck units and accessories to fit snugly around other work penetrating decks.
2. At openings up to 18-inches in either dimension, provide reinforcement and closure strips as shown or as required for strength and rigidity.

D. Touch-Up Painting: After installation of deck units and accessories, wire-brush burned and abraded areas and rust spots and apply touch-up paint.

1. Apply galvanizing repair paint to galvanized surfaces, complying with manufacturer's instructions.

3.3 DECK EDGES

- A. Where required deck supplier shall provide pour stops, column closeouts, and closure cover plates to create an adequate enclosure form for the concrete deck.

3.4 CLEANING

- A. Clear debris from deck before concrete is placed.
- B. Upon completion of work, remove all rubbish, debris, and excess materials from project site.

END OF SECTION

SECTION 05 31 23.00

STEEL DECK

PART 1 - GENERAL

1.1 REFERENCE STANDARDS

(Use Latest Edition of Each Reference Standard Listed)

- A. Steel Deck Institute (SDI).
- B. American Society for Testing of Materials (ASTM).
 - 1. See specific ASTM numbers included in later text.

1.2 SUBMITTALS

- A. Shop drawings shall consist of dimensioned plans and details, showing location of all members, length of members, splice locations, special details, hole locations, attachment locations, roof drainage locations and protective coating. Fabricate after review.
- B. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.

PART 2 – PRODUCTS

2.1 DESIGN

- A. The basic steel type for the metal roof deck shall conform to the requirements of ASTM A-611, Grade C, having a minimum yield strength of 33,000 psi.
- B. Design shall be in accordance with specifications of the Steel Deck Institute.

PART 3 – EXECUTION

3.1 FABRICATION

- A. Fabricate deck in accordance with standard methods, dimensions, shapes and fittings specified by the Steel Deck Institute.
- B. Fabricate deck so that all joints fall over joists or purlins.
- C. Deck shall be continuous over a minimum of three (3) continuous spans.

3.2 SHOP FINISH

- A. All metal deck shall be thoroughly cleaned and shop painted on both sides with manufacturer's standard paint system.

3.3 ACCESSORIES

- A. Where required, ridge and valley plates, closures and roof sump recesses shall be furnished by deck supplier and shall be attached directly to the deck to provide a suitable surface for the application of insulation and roofing.

3.4 INSTALLATION

- A. Field verify measurements are as shown on drawings, and field conditions are acceptable and ready to receive work.
- B. Roof deck shall be attached to every steel support at spacings, as noted on the plans.
- C. End laps of sheets should be a minimum of 2-inches and shall occur over supporting members.
- D. Side lap attachment between adjacent deck panels can be made with screws. See plans for spacing.
- E. Field cut all openings for ducts, vents, etc.
- F. Install deck in accordance with SDI standards.

3.5 FIELD TOUCH-UP

- A. After erection, remove all mud and other foreign materials.
- B. Wire brush scarred areas on top side of deck, including welds and rust spots, and touch-up with compatible touch-up paint system.
- C. Touch-up to be done immediately after deck erection to prevent further rusting.

END OF SECTION

SECTION 05 50 00.00

METAL FABRICATIONS

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous steel framing and supports.
2. Metal ladders.
3. Loose bearing and leveling plates.

B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Paint products.
2. Grout.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

PART 2 - PRODUCTS

2.1 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

D. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

E. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.

1. Size of Channels: 1-5/8 by 1-5/8 inches (41 by 41 mm).

2. Material: Cold-rolled steel, ASTM A 1008/A 1008M, commercial steel, Type B 0.0677-inch (1.7-mm) minimum thickness; coated with rust-inhibitive, baked-on, acrylic enamel.
- F. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.
- G. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.

2.2 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
1. Provide stainless-steel fasteners for fastening aluminum.
 2. Provide stainless-steel fasteners for fastening stainless steel.
 3. Provide stainless-steel fasteners for fastening nickel silver.
- B. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.
- C. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
- D. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches (41 by 22 mm) by length indicated with anchor straps or studs not less than 3 inches (75 mm) long at not more than 8 inches (200 mm) o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B 633, Class Fe/Zn 5, as needed for fastening to inserts.

2.3 MISCELLANEOUS MATERIALS

- A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- C. Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.

- D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- G. Concrete: Comply with requirements in Section 03 30 00.00 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa).

2.4 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- C. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.
- E. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- F. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
- C. Fabricate steel girders for wood frame construction from continuous steel shapes of sizes indicated.

1. Where wood nailers are attached to girders with bolts or lag screws, drill or punch holes at 24 inches (600 mm) o.c.

2.6 METAL LADDERS

A. General:

1. Comply with ANSI A14.3, except for elevator pit ladders.
2. For elevator pit ladders, comply with ASME A17.1/CSA B44.

B. Steel Ladders:

1. Space siderails 18 inches (457 mm) apart unless otherwise indicated.
2. Siderails: Continuous, 1/2-by-2-1/2-inch (12.7-by-64-mm) steel flat bars, with eased edges.
3. Rungs: 3/4-inch- (19-mm-) diameter.
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide nonslip surfaces on top of each rung.
6. Galvanize ladders, including brackets.

2.7 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
- C. Galvanize exterior miscellaneous steel trim.
- D. Prime interior miscellaneous steel trim with water based primer.

2.8 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

2.9 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.
- B. Galvanize loose steel lintels located in exterior walls.

2.10 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.11 FINISHES, GENERAL

- A. Finish metal fabrications after assembly.

2.12 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
- B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with universal shop primer.
- C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Fill bollards solidly with concrete, mounding top surface to shed water.

3.2 INSTALLING BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION

SECTION 05 51 13.00

METAL PAN STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preassembled steel stairs with concrete-filled treads.
2. Steel tube railings attached to metal stairs.
3. Steel tube handrails attached to walls adjacent to metal stairs.

B. Refer to Section 05 73 00.00 "Decorative Metal Railings" for stairs shown with decorative metal railings.

1.2 ACTION SUBMITTALS

A. Product Data: For metal pan stairs.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00.00 "Quality Requirements," to design stairs and railings.

B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Uniform Load: 100 lbf/sq. ft. (4.79 kN/sq. m).
2. Concentrated Load: 300 lbf (1.33 kN) applied on an area of 4 sq. in. (2580 sq. mm).
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.

C. Structural Performance of Railings: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

- a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
- b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.

- c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

- a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
- b. Infill load and other loads need not be assumed to act concurrently.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Steel Tubing: ASTM A 500 (cold formed).
- D. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008/A 110BN either commercial steel Type 3 or structural steel, Grade 25 (Grade 170), unless another grade is required by design loads; exposed.

2.3 FASTENERS

- A. Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.

2.4 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Section 09 91 23.00 "Interior Painting,"
- B. Concrete Materials and Properties: Comply with requirements in Section 03 30 00.00 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa) unless otherwise indicated.
- C. Welded Wire Reinforcement: ASTM A 185/A 185M, 6 by 6 inches (152 by 152 mm), W1.4 by W1.4, unless otherwise indicated.

2.5 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
 - 1. Join components by welding unless otherwise indicated.
 - 2. Use connections that maintain structural value of joined pieces.

- B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Weld connections to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Weld exposed corners and seams continuously unless otherwise indicated.
 - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 3 welds: partially dressed weld with spatter removed.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.

2.6 STEEL-FRAMED STAIRS

- A. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," Commercial Class, unless more stringent requirements are indicated.
- B. Stair Framing:
 - 1. Fabricate stringers of steel tubes.
 - a. Provide closures for exposed ends of channel stringers.
 - 2. Construct platforms of steel channel headers and miscellaneous framing members as needed to comply with performance requirements.
 - 3. Weld stringers to headers; weld framing members to stringers and headers.
 - 4. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.
- C. Metal Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch (1.7 mm).

2.7 STAIR RAILINGS

- A. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.
- B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint as shown in NAAMM AMP 521.
- C. Form changes in direction of railings by bending.
- D. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- E. Close exposed ends of railing members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails.
- G. Connect posts to stair framing by direct welding.
- H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.
- I. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses.

2.8 FINISHES

- A. Finish metal stairs after assembly.
- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."
- C. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLING METAL PAN STAIRS

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- B. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
- C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints.
- D. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.
- E. Place and finish concrete fill for treads and platforms to comply with Section 03 30 00.00 "Cast-in-Place Concrete."

3.2 INSTALLING RAILINGS

- A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:
 - 1. Anchor posts to steel by welding to steel supporting members.
 - 2. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with postinstalled anchors and bolts.
- B. Attach handrails to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads. Secure wall brackets to building construction as required to comply with performance requirements.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

END OF SECTION

SECTION 05 52 13.00
PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel pipe railings.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design:** Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance:** Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails:

- a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
- b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
- c. Uniform and concentrated loads need not be assumed to act concurrently.

- C. Control of Corrosion:** Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

- B. Shop Drawings:** Include plans, elevations, sections, details, and attachments to other work.

- C. Samples:** For each type of exposed finish required.

- D. Delegated-Design Submittal:** For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

- A. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.2 STEEL AND IRON

- A. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
 - 1. Provide galvanized finish for exterior installation and where indicated.
- B. Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

2.3 MISCELLANEOUS MATERIALS

- A. Fasteners: Provide the following:
 - 1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5 for zinc coating.
 - 2. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
- B. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
- C. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- D. Etching Cleaner for Galvanized Metal: Complying with MPI#25.
- E. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- F. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

- G. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- H. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.4 FABRICATION

- A. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- B. Form work true to line and level with accurate angles and surfaces.
- C. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- D. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
- E. Form changes in direction by bending or by inserting prefabricated elbow fittings.
- F. Bend members in jigs to produce uniform curvature without buckling or otherwise deforming exposed surfaces.
- G. Close exposed ends of railing members with prefabricated end fittings.
- H. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
- I. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
 - 1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers to transfer loads through wall finishes.

2.5 STEEL AND IRON FINISHES

- A. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- B. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Do not apply primer to galvanized surfaces.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).
- B. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- C. Attach railings to wall with wall brackets, except where end flanges are used. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
- D. Secure wall brackets and railing end flanges to building construction as follows:
 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 2. For hollow masonry anchorage, use toggle bolts.

3.2 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

SECTION 05 73 00.00

DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stainless steel guard and handrails with stainless steel wire-rope guard infill.

B. Refer to Section 09 30 00.00 "Tiling" for precast epoxy terrazzo treads and risers.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of railings assembled from standard components.
2. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, and attachment details. Also indicate materials, sizes, styles, fabrication, installation details and lengths for stainless steel wire-rope assemblies.

C. Samples: For each type of exposed finish required.

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

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer and testing agency.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Instructions.

1. Manufacturers' instruction for periodic cleaning.
2. Manufacturer's recommendation for periodic checking and adjusting of cables to maintain proper tension.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer Qualifications: Minimum five years' experience in producing stainless steel cables and fittings.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockups for each form and finish of railing consisting of two posts, top rail, infill area, and anchorage system components at location selected by ARCHITECT.
2. Obtain ARCHITECT's approval prior to installing additional cable systems.
3. Approved sample may remain as part of completed work.

1.6 WARRANTY

A. Special Warranty: Wire-cable and connectors, 2 years limited warranty against defects in materials and workmanship under normal use, installation and maintenance.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

- a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
- b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
- c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

- a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
- b. Infill load and other loads need not be assumed to act concurrently.

2.2 METALS, GENERAL

A. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

2.3 STAINLESS STEEL

A. Pipe ASTM A312 / A312M, Grade 316.

B. Wire Rope and Fittings:

1. Basis of Design Product: Subject to compliance with requirements, provide products Inox Railing by Indital USA or an approved comparable product by others:
 - a. Feeney, Inc. (Sta-Lok).
2. Wire Rope: 1/4" diameter wire rope made from wire complying with ASTM A 492, Type 316.
3. Wire-Rope Fittings: Connectors of types indicated, fabricated from stainless steel, and with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.

2.4 STEEL AND IRON

A. Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.5 FASTENERS

A. Fastener Materials: Unless otherwise indicated, provide the following:

1. Stainless-Steel Components: Type 316 stainless-steel fasteners.
2. Uncoated Steel Components: Plated-steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating where concealed; Type 304 stainless-steel fasteners where exposed.

2.6 MISCELLANEOUS MATERIALS

A. Shop Primers: Provide primers that comply with Section 09 91 23.00 "Interior Painting."

2.7 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Connections: Fabricate railings with welded connections unless otherwise indicated.
- C. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 1. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds; no evidence of a welded joint.

- D. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
- E. Form changes in direction by bending.
- F. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- G. Close exposed ends of hollow railing members with prefabricated end fittings.
- H. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
- I. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

2.8 STAINLESS-STEEL FINISHES

- A. Dull Satin Finish: No. 6. (Wire-cable fittings)
- B. Directional Satin Finish No. 4 (guard and handrail).

2.9 STEEL AND IRON FINISHES

- A. Preparing Nongalvanized Items for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- B. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
- C. High-Performance Coating: Apply epoxy intermediate and polyurethane topcoats to prime-coated surfaces. Comply with coating manufacturer's written instructions and with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Apply at spreading rates recommended by coating manufacturer.
 - 1. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
 2. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).
- C. Attach handrails to walls with wall brackets.
1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
 2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- D. Secure wall brackets to building construction as follows:
1. Secure brackets to substrate per manufacturer's instructions and to meet applicable code requirements.
- E. Touchup Painting: Immediately after erection, clean field welds, bolted connections and abraded areas of shop paint, and paint exposed areas with the same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

END OF SECTION

DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES

SECTION 06 10 53.00	MISCELLANEOUS ROUGH CARPENTRY
SECTION 06 20 23.00	INTERIOR FINISH CARPENTRY
SECTION 06 41 13.00	WOOD-VENEER-FACED ARCHITECTURAL CABINETS
SECTION 06 41 16.00	PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

SECTION 06 10 53.00

MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood blocking and nailers.
2. Plywood backing panels.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

- D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawl spaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
 1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 3. Design Value Adjustment Factors: Treated lumber shall be tested according ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
- C. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
- D. Application: Treat items indicated on Drawings, and the following:
 1. Plywood backing panels.
 2. Concealed blocking

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 1. Blocking.
 2. Nailers.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.
- C. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
 1. Mixed southern pine, No. 2 grade; SPIB.

2. Eastern softwoods, No. 2 Common grade; NELMA.
3. Northern species, No. 2 Common grade; NLGA.
4. Western woods, Construction or No. 2 Common grade; WCLIB or WWP.

2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: DOC PS 1, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Power-Driven Fasteners: NES NER-272.
- C. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.

2.7 MISCELLANEOUS MATERIALS

- A. Flexible Flashing: Self-adhesive rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit.
- B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.

- E. Comply with AWP M4 for applying field treatment to cut surfaces of preservative-treated lumber.

3.2 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 06 20 23.00
INTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior trim.
2. Interior paneling.

1.2 ACTION SUBMITTALS

- A. Product Data:** For each type of process and factory-fabricated product.
- B. Samples:** For each type of paneling.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20.

1. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.

B. Hardboard: AHA A135.4.

2.2 INTERIOR TRIM

A. Hardwood Lumber Trim:

1. To match adjacent wood door finish; see Section 08 14 16.00.
2. Maximum Moisture Content: 10 percent.

B. Hardwood Moldings for Transparent Finish (Stain or Clear Finish): WMMPA HWM 2, N-grade wood moldings made to patterns included in WMMPA HWM 1.

1. Species: To match adjacent wood door finish; see Section 08 14 16.00.
2. Maximum Moisture Content: 9 percent.

2.3 PANELING

A. Hardwood Veneer Paneling:

1. Match species and cut of existing surrounding wood panels or match existing wood door finish floor level. See Section 08 14 16.00.
2. Thickness to match existing surrounding wood panels or thickness necessary to provide a finished appearance equal to and similar to the existing.

2.4 MISCELLANEOUS MATERIALS

- A. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.
- B. Paneling Adhesive: Comply with paneling manufacturer's written recommendations for adhesives.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

3.2 INSTALLATION, GENERAL

- A. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 2. Countersink fasteners, fill surface flush, and sand unless otherwise indicated.
 3. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining interior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.

3.3 STANDING AND RUNNING TRIM INSTALLATION

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Cope at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.

3.4 PANELING INSTALLATION

- A. Plywood Paneling: Select and arrange panels on each wall to minimize noticeable variations in grain character and color between adjacent panels. Install with uniform tight joints between panels.

END OF SECTION

SECTION 06 41 13.00

WOOD-VENEER-FACED ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood-veneer-faced architectural cabinets.
2. Wood furring, blocking, shims, and hanging strips for installing architectural cabinets that are not concealed within other construction.
3. Shop finishing of architectural cabinets.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings: For architectural cabinets.

1. Include plans, elevations, sections, and attachment details.

C. Samples: For each exposed product and for each color and finish specified.

1.3 INFORMATIONAL SUBMITTALS

A. Quality Standard Compliance Certificates: AWI Quality Certification Program.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

1. Shop Certification: AWI's Quality Certification Program accredited participant.

B. Installer Qualifications: Fabricator of products.

PART 2 - PRODUCTS

2.1 CABINETS, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural cabinets indicated for construction, finishes, installation, and other requirements.
 - 1. Provide inspections of fabrication and installation together with labels and certificates from AWI certification program indicating that woodwork complies with requirements of grades specified.

2.2 WOOD CABINETS FOR TRANSPARENT FINISH

- A. Grade: Custom.
- B. Type of Construction: Frameless.
- C. Door and Drawer-Front Style: Flush overlay.
- D. Wood for Exposed Surfaces: To match wood door finish. See Section 08 14 16.00.
- E. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
 - 1. Join subfronts, backs, and sides with glued dovetail joints.

2.3 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
 - 1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.
 - 2. Wood Moisture Content: 5 to 10 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
- C. Composite Wood Products:
 - 1. MDF: ANSI A208.2, Grade 130.
 - 2. Softwood Plywood: DOC PS 1, medium-density overlay.
 - 3. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.
 - 4. Thermoset Decorative Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.4 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 08 71 00.00 "Door Hardware."
- B. Butt Hinges: 2-3/4-inch (70-mm), five-knuckle steel hinges made from 0.095-inch- (2.4-mm-) thick metal, and as follows:
 - 1. Semiconcealed Hinges for Flush Doors: BHMA A156.9, B01361.
 - 2. Semiconcealed Hinges for Overlay Doors: BHMA A156.9, B01521.
- C. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening, self-closing.
- D. Back-Mounted Pulls: BHMA A156.9, B02011.
- E. Wire Pulls: Back mounted, solid metal, 5 inches (127 mm) long, 2-1/2 inches (63.5 mm) deep, and 5/16 inch (8 mm) in diameter.
- F. Shelf Rests: BHMA A156.9, B04013; metal, two-pin type with shelf hold-down clip.
- G. Drawer Slides: BHMA A156.9.
 - 1. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-extension type; zinc-plated-steel, ball-bearing slides.
- H. Door Locks: BHMA A156.11, E07121.
- I. Drawer Locks: BHMA A156.11, E07041.
- J. Door and Drawer Silencers: BHMA A156.16, L03011.
- K. Grommets for Cable Passage: 2-inch (51-mm) OD, molded-plastic grommets and matching plastic caps with slot for wire passage.
 - 1. Color: Brown.
- L. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. Satin Chromium Plated: BHMA 626.
- M. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.5 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber kiln-dried to less than 15 percent moisture content.

- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.6 FABRICATION

- A. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- B. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

2.7 SHOP FINISHING

- A. General: Finish architectural cabinets at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- B. General: Drawings indicate items that are required to be shop finished. Finish these items at fabrication shop as specified in this Section.
- C. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural cabinets, as applicable to each unit of work.
- D. Transparent Finish:
 - 1. Grade: Custom.
 - 2. Finish: System – To match finish of wood doors. See Section 08 14 16.00
 - 3. Staining: Match approved sample for color.
 - 4. Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.
 - 5. Sheen: Satin, 31-45 gloss units measured on 60-degree gloss meter per ASTM D 523.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.
- B. Grade: Install cabinets to comply with quality standard grade of item to be installed.
- C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with cabinet surface.

1. For shop-finished items, use filler matching finish of items being installed.
- D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) using concealed shims.
1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
 2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 3. Maintain veneer sequence matching of cabinets with transparent finish.
 4. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into wood framing, blocking, or hanging strips.
- E. Shop Finishes: Touch up finishing after installation of architectural cabinets. Fill nail holes with matching filler.

END OF SECTION

SECTION 06 41 16.00

PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plastic-laminate-faced architectural cabinets.
2. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets unless concealed within other construction before cabinet installation.

B. Related Requirements:

1. Section 12 36 23.13 "Plastic-Laminate-Clad Countertops."

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product, including panel products, high-pressure decorative laminate, adhesive for bonding plastic laminate and cabinet hardware and accessories.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

C. Samples:

1. Plastic laminates, for each color, pattern, and surface finish.

1.3 INFORMATIONAL SUBMITTALS

A. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Certified participant in AWI's Quality Certification Program.

B. Installer Qualifications: Fabricator of products.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.
 - 1. Provide labels and certificates from certification program indicating that woodwork, including installation, complies with requirements of grades specified.
- B. Grade: Custom.
- C. Type of Construction: Frameless.
- D. Cabinet, Door, and Drawer Front Interface Style: Flush overlay.
- E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Formica Corporation.
 - b. Wilsonart International; Div. of Premark International, Inc.
 - c. Nevamar.
 - d. Pionite.
- F. Laminate Cladding for Exposed Surfaces:
 - 1. Horizontal Surfaces: Grade HGS.
 - 2. Postformed Surfaces: Grade HGP.
 - 3. Vertical Surfaces: Grade VGS.
 - 4. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels.
- G. Materials for Semiexposed Surfaces:
 - 1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade CLS.
 - 2. Drawer Sides and Backs: Thermoset decorative panels with PVC or polyester edge banding.
 - 3. Drawer Bottoms: Thermoset decorative panels.

- H. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. As selected by Architect from laminate manufacturer's full range.

2.2 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Wood Moisture Content: 5 to 10 percent.

- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Medium-Density Fiberboard: ANSI A208.2, Grade 130, made with binder containing no urea formaldehyde.
2. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.
3. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.3 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 08 71 11.00 "Door Hardware (Descriptive Specification)."

- B. Butt Hinges: 2-3/4-inch (70-mm), five-knuckle steel hinges made from 0.095-inch- (2.4-mm-) thick metal, and as follows:

1. Semiconcealed Hinges for Flush Doors: BHMA A156.9, B01361.
2. Semiconcealed Hinges for Overlay Doors: BHMA A156.9, B01521.

- C. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening, self-closing.

- D. Back-Mounted Pulls: BHMA A156.9, B02011.

- E. Wire Pulls: Back mounted, solid metal.

- F. Shelf Rests: BHMA A156.9, B04013; metal, two-pin type with shelf hold-down clip.

- G. Drawer Slides: BHMA A156.9.

1. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-extension type; zinc-plated-steel ball-bearing slides.

- H. Door Locks: BHMA A156.11, E07121.
- I. Drawer Locks: BHMA A156.11, E07041.
- J. Door and Drawer Silencers: BHMA A156.16, L03011.
- K. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. Satin Chromium Plated: BHMA 626.

2.4 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.5 FABRICATION

- A. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- B. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.

3.2 INSTALLATION

- A. Grade: Install cabinets to comply with same grade as item to be installed.
- B. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

- C. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- D. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing.
- E. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into wood framing, blocking, or hanging strips.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean cabinets on exposed and semiexposed surfaces.

END OF SECTION

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

SECTION 07 11 13.00	BITUMINOUS DAMPPROOFING
SECTION 07 21 00.00	THERMAL INSULATION
SECTION 07 54 23.00	THERMOPLASTIC POLYOLEFIN (TPO) ROOFING
SECTION 07 62 00.00	SHEET METAL FLASHING AND TRIM
SECTION 07 84 13.00	PENETRATION FIRESTOPPING
SECTION 07 92 00.00	JOINT SEALANTS

SECTION 07 11 13.00

BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes cold-applied, cut-back-emulsified-asphalt dampproofing.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. BASF Construction Chemicals - Building Systems; Sonneborn Brand Products.
 - 2. Meadows, W. R., Inc.
- B. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.

2.2 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.
- B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.

PART 3 - EXECUTION

3.1 APPLICATION, GENERAL

- A. Comply with manufacturer's written instructions for substrate preparation, dampproofing application, cure time between coats, and drying time before backfilling unless more stringent requirements are indicated.
 - 1. Apply dampproofing to provide continuous plane of protection.

2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.
- B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches (150 mm) over outside face of footing.
1. Extend dampproofing 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
 2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where shown as "reinforced," by embedding an 8-inch- (200-mm-) wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.

3.2 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Concrete Foundations: Apply two brush or spray coats at not less than 1.5 gal./100 sq. ft. (0.6 L/sq. m) for first coat and 1 gal./100 sq. ft. (0.4 L/sq. m) for second coat, one fibered brush or spray coat at not less than 3 gal./100 sq. ft. (1.2 L/sq. m), or one trowel coat at not less than 4 gal./100 sq. ft. (1.6 L/sq. m).

END OF SECTION

SECTION 07 21 00.00
THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Foam-plastic board insulation.
2. Glass-fiber blanket insulation.
3. Mineral-wool blanket insulation.
4. Vapor retarder.

1.2 ACTION SUBMITTALS

- A. Product Data:** For each type of product indicated.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.**
- B. Research/evaluation reports.**

PART 2 - PRODUCTS

2.1 FOAM-PLASTIC BOARD INSULATION

- A. Extruded-Polystyrene Board Insulation:** ASTM C 578, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. DiversiFoam Products.
 - b. Dow Chemical Company (The).
 - c. Owens Corning.
 - d. Pactiv Building Products.
 2. Type IV, 25 psi (173 kPa).

2.2 GLASS-FIBER BLANKET INSULATION

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. CertainTeed Corporation.
 - 2. Guardian Building Products, Inc.
 - 3. Johns Manville.
 - 4. Knauf Insulation.
 - 5. Owens Corning.
- B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
- C. Polypropylene-Scrim-Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).

2.3 MINERAL-WOOL SOUND INSULATION

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Thermafiber. SAFB
- B. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

2.4 SOUND ATTENUATION BATTS – FIBERGLASS INSULATION BATTS

- A. Manufacturers: Subject to compliance with requirements, provide products by Owens Corning or an approved equal.
- B. Unfaced, Glass-Fiber Batt Insulation: ASTM E90-1990 in accordance with ASTM E413.

2.5 VAPOR RETARDERS

- A. Polyethylene Vapor Retarders: ASTM D 4397, 6 mils (0.15 mm) thick, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).
- B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.2 INSTALLATION OF BELOW-GRADE INSULATION

- A. On vertical surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.
 - 1. If not otherwise indicated, extend insulation a minimum of 36 inches (915 mm) below exterior grade line.
- B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
 - 1. If not otherwise indicated, extend insulation a minimum of 24 inches (610 mm) in from exterior walls.

3.3 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Glass-Fiber or Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

4. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
- C. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
1. Loose-Fill Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.4 INSTALLATION OF VAPOR RETARDERS

- A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.
1. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches (406 mm) o.c.
 2. Before installing vapor retarders, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
 3. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.
- C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

END OF SECTION

SECTION 07 54 23.00

THERMOPLASTIC-POLYOLEFIN (TPO) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered thermoplastic polyolefin (TPO) roofing system.
2. Roof insulation.
3. Walkways.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For insulation and roof system component fasteners.

B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:

1. Layout and thickness of insulation.
2. Base flashings and membrane termination details.
3. Flashing details at penetrations.
4. Tapered insulation layout, thickness, and slopes.

C. Samples: For the following products:

1. Roof membrane and flashings, of color required.
2. Walkway pads or rolls, of color required.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For roof membrane and insulation, for tests performed by a qualified testing agency, indicating compliance with specified requirements.

B. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
- B. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D 3746, ASTM D 4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- C. Wind Uplift Resistance: Design roofing system to resist the following wind uplift pressures when tested according to FM Approvals 4474, UL 580, or UL 1897 as indicated on the Structural Drawings.
- D. Energy Performance: Roofing system shall have an initial solar reflectance of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.
- E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.2 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING

- A. TPO Sheet: ASTM D 6878/D 6878M, internally fabric- or scrim-reinforced, TPO sheet.
 - 1. Carlisle Sure-Weld Reinforced TPO Membrane or equal.
 - 2. Thickness: 60 mils (1.5 mm), nominal.
 - 3. Exposed Face Color: Gray.

2.3 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.
 - 1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.

- B. Sheet Flashing: Manufacturer's standard unreinforced TPO sheet flashing, 55 mils (1.4 mm) thick, minimum, of same color as TPO sheet.
- C. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- D. Bonding Adhesive: Manufacturer's standard, water based.
- E. Slip Sheet: ASTM D 2178/D 2178M, Type IV; glass fiber; asphalt-impregnated felt.
- F. Slip Sheet: Manufacturer's standard, of thickness required for application.
- G. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
- H. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate, and acceptable to roofing system manufacturer.
- I. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.4 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C 1289 Type II, Class 1, Grade 2 glass-fiber mat facer on both major surfaces.
 - 1. Thickness: See Drawings.
- B. Tapered Insulation: Provide factory-tapered insulation boards.
 - 1. Material: Match roof insulation.
 - 2. Minimum Thickness: 1/4 inch (6.35 mm).
 - 3. Slope:
 - a. Roof Field: 1/4 inch per foot (1:48) unless otherwise indicated on Drawings.
 - b. Saddles and Crickets: 1/2 inch per foot (1:24) unless otherwise indicated on Drawings, for sloping to drains.

2.5 INSULATION ACCESSORIES

- A. Fasteners: Factory-coated steel fasteners with metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer.

2.6 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16 inch (5 mm) thick and acceptable to roofing system manufacturer.
 - 1. Size: Minimum 30-inches wide.
 - 2. Color: Contrasting with roof membrane.

PART 3 - EXECUTION

3.1 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning Work on adjoining roofing.
- C. Install roof membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition and to not void warranty for existing roofing system.

3.2 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.
- B. Comply with roofing system and roof insulation manufacturer's written instructions for installing roof insulation.
- C. Install insulation according to manufacturer's written instructions.

3.3 ADHERED ROOFING INSTALLATION

- A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roof membrane and allow to relax before installing.
- C. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.

3.4 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.

- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate as detailed on Drawings.

3.5 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products according to manufacturer's instructions.
 - 1. Install flexible walkways at the following locations:
 - a. Locations indicated on Drawings.

3.6 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 07 62 00.00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formed roof-drainage sheet metal fabrications.
2. Formed low-slope roof sheet metal fabrications.

1.2 SUBMITTALS

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

B. Shop Drawings: Show installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.

1. Include details for forming, joining, supporting, and securing sheet metal flashing and trim, including pattern of seams, termination points, fixed points, expansion joints, expansion-joint covers, edge conditions, special conditions, and connections to adjoining work.

C. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

1.4 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within 20-years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.
 - 1. As-Milled Finish: One-side bright mill finish.
 - 2. Exposed Coil-Coated Finishes:
 - a. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat.
 - 3. Color: To match fascia and gravel stop of existing building.

2.2 UNDERLAYMENT MATERIALS

- A. Polyethylene Sheet: 6-mil- (0.15-mm-) thick polyethylene sheet complying with ASTM D 4397.
- B. Slip Sheet: Building paper, 3-lb/100 sq. ft. (0.16-kg/sq. m) minimum, rosin sized.

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
 - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
- C. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- D. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry,

metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

1. Obtain field measurements for accurate fit before shop fabrication.
 2. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Seams: Fabricate nonmoving seams with flat-lock seams.
- G. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- H. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.

2.5 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof-Edge Flashing (Gravel Stop) and Fascia Cap: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 10-foot- (3-m-) long, sections. Furnish with 6-inch- (150-mm-) wide, joint cover plates. Fabricate from the following materials:
1. Aluminum: 0.050 inch (1.27 mm) thick.
- B. Base Flashing: Fabricate from the following materials:
1. Aluminum: 0.040 inch (1.02 mm) thick.
- C. Roof-Penetration Flashing: Fabricate from the following materials:
1. Stainless Steel: 0.019 inch (0.48 mm) thick.

D. Roof-Drain Flashing: Fabricate from the following materials:

1. Stainless Steel: 0.016 inch (0.40 mm) thick.

2.6 WALL SHEET METAL FABRICATIONS

A. Wall Expansion-Joint Cover: Fabricate from the following materials:

1. Aluminum: 0.040 inch (1.02 mm) thick.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement so that completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
5. Install sealant tape where indicated.
6. Torch cutting of sheet metal flashing and trim is not permitted.

B. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.

C. Fastener Sizes: Use fasteners of sizes that will penetrate [wood sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws] [metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance] <Insert size requirement>.

D. Seal joints as shown and as required for watertight construction.

E. Rivets: Rivet joints in uncoated aluminum where indicated and where necessary for strength.

3.2 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches (100 mm) in direction of water flow.

3.3 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
- C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with sealant.
- E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.4 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION

SECTION 07 84 13.00

PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Penetrations in fire-resistance-rated walls.
2. Penetrations in horizontal assemblies.
3. Penetrations in smoke barriers.

1.2 ACTION SUBMITTALS

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

B. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.

1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.3 INFORMATIONAL SUBMITTALS

A. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.

B. Product test reports.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:

1. Penetration firestopping tests are performed by UL or a qualified testing agency acceptable to authorities having jurisdiction.
2. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems bearing marking of qualified testing and inspection agency.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. 3M Fire Protection Products.
 2. Tremco, Inc.; Tremco Fire Protection Systems Group.
 3. USG Corporation.

2.2 PENETRATION FIRESTOPPING

- A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls: Ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
1. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
 2. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at 0.30-inch wg (74.7 Pa) at both ambient and elevated temperatures.
- E. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- C. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.
- D. Install fill materials for firestopping by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.2 IDENTIFICATION

- A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - 1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."

END OF SECTION

SECTION 07 92 00.00

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Urethane joint sealants.
 - 3. Latex joint sealants.
 - 4. Acoustical joint sealants.

1.2 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples: For each kind and color of joint sealant required.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.3 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.4 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 5-years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 5-years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- B. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

2.2 SILICONE JOINT SEALANTS

- A. Mildew-Resistant, Acid-Curing Silicone Joint Sealant SS1: ASTM C 920.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dow Corning Corporation.
 - b. GE Advanced Materials - Silicones.
 - c. Tremco Incorporated.

2.3 URETHANE JOINT SEALANTS

- A. Urethane Joint Sealant US1: ASTM C 920.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Building Systems.
 - b. Tremco Incorporated.

2.4 LATEX JOINT SEALANTS

- A. Latex Joint Sealant LS1: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Building Systems.
 - b. Tremco Incorporated.

2.5 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Joint Sealant AS1: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Corporation.
 - b. USG Corporation.

2.6 JOINT SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form

smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- F. Acoustical Sealant Installation: Comply with ASTM C 919 and with manufacturer's written recommendations.
- G. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces US1.
1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Other joints as indicated.
 2. Joint Sealant: Urethane.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces US1.
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Joints between plant-precast architectural concrete units.
 - c. Joints between metal panels.
 - d. Joints between different materials listed above.
 - e. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - f. Control and expansion joints in ceilings and other overhead surfaces.
 - g. Other joints as indicated.
 2. Joint Sealant: Urethane.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces US1.
1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Control and expansion joints in tile flooring.

- c. Other joints as indicated.
- 2. Joint Sealant: Urethane.
- 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces LSI.
 - 1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Tile control and expansion joints.
 - d. Vertical joints on exposed surfaces of interior unit masonry, concrete, walls, and partitions.
 - e. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
 - f. Other joints as indicated.
 - 2. Joint Sealant: Latex.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces SS1.
 - 1. Joint Sealant Location:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Other joints as indicated.
 - 2. Joint Sealant: Silicone.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- F. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces AS1.
 - 1. Joint Location:
 - a. Acoustical joints.
 - b. Other joints as indicated.
 - 2. Joint Sealant: Acoustical.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

END OF SECTION

DIVISION 8 – OPENINGS

SECTION 08 11 13.00	HOLLOW METAL DOORS AND FRAMES
SECTION 08 14 16.00	FLUSH WOOD DOORS
SECTION 08 33 23.00	OVERHEAD COILING DOORS
SECTION 08 41 13.00	ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
SECTION 08 42 29.23	SLIDING AUTOMATIC ENTRANCES
SECTION 08 71 00.00	DOOR HARDWARE
SECTION 08 80 00.00	GLAZING

SECTION 08 11 13.00

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes hollow-metal work.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.
- C. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Amweld International, LLC.
 - 2. Mesker Door Inc.
 - 3. Steelcraft; an Ingersoll-Rand company.

2.2 REGULATORY REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
 - 1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities

having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

2.3 INTERIOR DOORS AND FRAMES

A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.

1. Physical Performance: Level B according to SDI A250.4.
2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).
 - c. Face: Metallic-coated,] cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
 - d. Edge Construction: Model 1, Full Flush.
 - e. Core: Manufacturer's standard.
3. Frames:
 - a. Materials: Metallic-coated, steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - b. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.
 - c. Construction: Face welded unless indicated otherwise.
4. Exposed Finish: Prime.

2.4 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.

1. Physical Performance: Level B according to SDI A250.4.
2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).
 - c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm), with minimum A40 (ZF120) coating.
 - d. Edge Construction: Model 1, Full Flush.
 - e. Core: Manufacturer's standard insulation material.
3. Thermal-Rated Doors: Provide doors fabricated with thermal-resistive value (R-value) of not less than 2.1 deg F xhx sq. ft/BTU when tested according to ASTM C1363.
4. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
 - b. Construction: Face welded unless indicated otherwise.
5. Exposed Finish: Prime.

2.5 BORROWED LITES

- A. Fabricate of metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm).
- B. Construction: Face welded.
- C. Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as metal as frames.
- D. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2.6 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
 - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
 - 3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
 - 4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-(9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.7 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Power-Actuated Fasteners in Concrete: From corrosion-resistant materials.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).
- I. Glazing: Section 08 80 00.00 "Glazing."
- J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat.

2.8 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
 2. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding.
 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
 4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 5. Jamb Anchors: Provide number and spacing of anchors as follows:

- a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:
 - 1) Two anchors per jamb up to 60 inches (1524 mm) high.
 - 2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
 - 4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
 - b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
 - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
 - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
 - c. Compression Type: Not less than two anchors in each frame.
 - d. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
- a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 4. Provide loose stops and moldings on inside of hollow-metal work.
 5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.9 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

- 1. Shop Primer: SDI A250.10.

2.10 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 - 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
 - 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
 - 5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.

6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 7. In-Place Metal: Secure slip-on drywall frames in place according to manufacturer's written instructions.
 8. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
 - b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
 - c. At Bottom of Door: 5/8 inch (15.8 mm) plus or minus 1/32 inch (0.8 mm).
 - d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
 3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
- C. Glazing: Comply with installation requirements in Section 08 80 00.00 "Glazing" and with hollow-metal manufacturer's written instructions.

3.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

- E. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION

SECTION 08 14 16.00

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Factory finishing flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of door. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Dimensions and locations of cutouts.
4. Undercuts.
5. Requirements for veneer matching.
6. Doors to be factory finished and finish requirements.
7. Fire-protection ratings for fire-rated doors.

C. Samples: For factory-finished doors.

1.3 INFORMATIONAL SUBMITTALS

A. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Eggers Industries.

2.2 FLUSH WOOD DOORS, GENERAL

A. WDMA I.S.1-A Performance Grade:

1. Heavy Duty unless otherwise indicated.

B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
3. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.

C. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.

D. Particleboard-Core Doors:

1. Particleboard: ANSI A208.1, made with binder containing no urea-formaldehyde.
2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
3. Provide doors with glued-wood-stave or structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:

1. Grade: Premium, with Grade A faces.
2. Species:
 - a. For Justice Center remodel, match species of existing wood doors.
 - b. For addition, HHS-North remodel and CAB remodel, match species in the existing CAB building 2012 remodel.
3. Cut: Plain sliced.
4. Match between Veneer Leaves: Book match.
5. Assembly of Veneer Leaves on Door Faces: Center-balance match.
6. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
7. Core: Particleboard.
8. Construction: Five or seven plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.

2.4 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated or field fit if/where required by site conditions. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 - 1. Comply with NFPA 80 requirements for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied.
- C. Openings: Factory cut and trim openings through doors.
 - 1. Light Openings: Trim openings with moldings of material and profile to match existing.
 - 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 08 80 00.00 "Glazing."
 - 3. Louvers: Factory install louvers in prepared openings.

2.5 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors that are indicated to receive transparent finish.
- C. Transparent Finish:
 - 1. Grade: Premium.
 - 2. Staining: As selected by Architect from manufacturer's full range to match existing doors.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hardware: For installation, see Section 08 71 00.00 "Door Hardware".
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
 - 1. Install fire-rated doors according to NFPA 80.
 - 2. Install smoke- and draft-control doors according to NFPA 105.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-

rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.

1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.

- a. Comply with NFPA 80 for fire-rated doors.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION

SECTION 08 33 23.00
OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire-rated service doors.

B. Related Requirements:

1. Section 05 50 00.00 "Metal Fabrications" for miscellaneous steel supports.

1.2 ACTION SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in Manufacturer's product data.

1. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
2. Show locations of controls, locking devices, detectors or replaceable fusible links, and other accessories.
3. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by Manufacturer for both installation and maintenance of units required for this Project.

B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.

1. Temperature-Rise Limit: Where indicated, provide doors that have a maximum transmitted temperature end point of not more than 450°F (250°C) above ambient after 30-minutes of standard fire-test exposure.
2. Smoke Control: Where indicated, provide doors that are listed and labeled with the letter "S" on the fire-rating label by a qualified testing agency for smoke- and draft-control based on testing according to UL 1784; with maximum air-leakage rate of 3.0 cfm/sq. ft. (0.01524 cu. m/s x sq. m) of door opening at 0.10-inch wg (24.9 Pa) for both ambient and elevated temperature tests.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Overhead coiling doors shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.2 FIRE-RATED DOOR ASSEMBLY

- A. Fire-Rated Service Door: Overhead fire-rated coiling door formed with curtain of interlocking metal slats.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ACME Rolling Doors.
 - b. Alpine Overhead Doors, Inc.
 - c. Amarr Garage Doors.
 - d. ASTA Door Corporation.
 - e. C.H.I. Overhead Doors, Inc.
 - f. City-Gates.
 - g. Clopay Building Products.
 - h. Cookson Company.
 - i. Cornell Iron Works, Inc.
 - j. Janus International Corporation.
 - k. Lawrence Roll-Up Doors, Inc.
 - l. McKeon Rolling Steel Door Company, Inc.
 - m. Overhead Door Corporation.
 - n. Raynor.
 - o. Southwestern Rolling Steel Door Co.
 - p. Wayne-Dalton Corp.
- B. Operation Cycles: Door components and operators capable of operating for not less than 10,000.
- C. Fire Rating: 1-hour and 1½-hours with temperature-rise limit and with smoke control (See Drawings).
- D. Door Curtain Material: Galvanized steel.

- E. Door Curtain Slats: Flat profile slats of 2-5/8-inch (67-mm) center-to-center height.
- F. Curtain Jamb Guides: Stainless steel with exposed finish matching curtain slats.
- G. Hood: Match curtain material and finish.
 - 1. Mounting: Face of wall.
- H. Locking Devices: Equip door with slide bolt for padlock.
- I. Electric Door Operator:
 - 1. Usage Classification: Heavy duty, 25 or more cycles per hour and over 90 cycles per day.
 - 2. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use.
 - 3. Motor Exposure: Interior.
 - 4. Emergency Manual Operation: Crank type.
 - 5. Obstruction Detection Device: Automatic photoelectric sensor, electric sensor edge on bottom bar.
 - 6. Control Station(s): Interior mounted.
 - 7. Other Equipment: Portable radio-control system.
- J. Curtain Accessories: Equip door with smoke seals, automatic closing device.
- K. Door Finish: Factory finish per manufacturer.

2.3 DOOR CURTAIN MATERIALS & CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by Door Manufacturer for performance, size, and type of door indicated, and as follows:
 - 1. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face, with minimum steel thickness of 0.010-inch (0.25 mm).
- B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent over travel of curtain.

2.4 HOODS

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

1. Include automatic drop baffle on fire-rated doors to guard against passage of smoke or flame.

2.5 LOCKING DEVICES

- A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

2.6 CURTAIN ACCESSORIES

- A. Smoke Seals: Equip each fire-rated door with replaceable smoke-seal perimeter gaskets or brushes for smoke and draft control as required for door listing and labeling by a qualified testing agency.
- B. Astragal For Interior Doors: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.
- C. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.
- D. Pull-Down Strap: Provide pull-down straps for doors more than 84-inches (2130 mm) high.
- E. Automatic-Closing Device for Fire-Rated Doors: Equip each fire-rated door with an automatic-closing device or holder-release mechanism and governor unit complying with NFPA 80 and an easily tested and reset release mechanism. Automatic-closing device shall be designed for activation by the following:
 1. Replaceable fusible links with temperature rise and melting point as required by Code, interconnected and mounted on both sides of door opening.
 2. Manufacturer's standard UL-labeled smoke detector and door-holder-release devices.
 3. Manufacturer's standard UL-labeled heat detector and door-holder-release devices.
 4. Building fire-detection, smoke-detection, and alarm systems.

2.7 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.8 ELECTRIC DOOR OPERATORS

- A. General: Electric door operator assembly of size and capacity recommended and provided by Door Manufacturer for door and operation-cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch,

control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Chamberlain Group, Inc. (The).
 2. Comply with NFPA 70.
 3. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.
- B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.
- C. Motors: Reversible-type motor with controller (disconnect switch) for motor exposure indicated.
1. Electrical Characteristics:
 - a. Phase: Single-phase.
 - b. Volts: 208V.
 - c. Hertz: 60.
 2. Motor Size: Minimum size as indicated. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. (203 mm/s) and not more than 12 in./sec. (305 mm/s), without exceeding nameplate ratings or service factor.
 3. Operating Controls, Controllers, Disconnect Switches, Wiring Devices & Wiring: Manufacturer's standard unless otherwise indicated.
- D. Obstruction Detection Devices: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening. For fire-rated doors, activation delays closing.
1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.
 - a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, door closes only with sustained or constant pressure on close button.
 2. Electric Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using Manufacturer's standard take-up reel or self-coiling cable.
 - a. Self-Monitoring Type: Four-wire configured device designed to interface with door operator control circuit to detect damage to or disconnection of sensor edge.

- E. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled 'Open' and 'Stop' and sustained or constant-pressure push-button control labeled 'Close'.
 - 1. Interior-Mounted Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
- F. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf (111 N).
- G. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
- H. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.
- I. Portable Radio-Control System: Consisting of two (2) of the following per door operator:
 - 1. Three-channel universal coaxial receiver to open, close, and stop door.
 - 2. Portable control device to open and stop door may be momentary-contact type; control to close door shall be sustained- or constant-pressure type.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to Manufacturer's written instructions and as specified.
- B. Fire-Rated Doors: Install according to NFPA 80.
- C. Smoke-Control Doors: Install according to NFPA 80 and NFPA 105.
- D. Power-Operated Doors: Install automatic garage doors openers according to UL 325.
- E. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion. Lubricate bearings and sliding parts as recommended by Manufacturer. Adjust seals to provide tight fit around entire perimeter.

3.2 DEMONSTRATION

- A. Engage a factory-authorized service representative to train OWNER's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION

SECTION 08 41 13.00

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior and interior storefront framing.
2. Storefront framing for window walls.
3. Exterior and interior manual-swing entrance doors and door-frame units.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, elevations, sections, full-size details, and attachments to other work.

1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
2. Include details of provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.

C. Samples: For each exposed finish required.

D. Entrance Door Hardware Schedule: Prepared by Door Hardware Supplier under Section 08 71 00.00 "Door Hardware." Assist supplier by detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.

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

1.3 INFORMATIONAL SUBMITTALS

A. Energy Performance Certificates: NFRC-certified energy performance values from manufacturer.

B. Product test reports.

C. Field quality-control reports.

D. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.
- D. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation barriers Compliance Boards ADA-ABA Accessibility Guidelines and ANSI A117.1.
- E. Source Limitations for Aluminum-Framed Systems: Obtain from single source from single manufacturer.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design aluminum-framed systems, including comprehensive engineering analysis by a qualified professional engineer; using performance requirements and design criteria indicated.

- B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 2. Failure also includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferring to building structure.
 - c. Glass breakage.
 - d. Noise or vibration created by wind and thermal and structural movements.
 - e. Loosening or weakening of fasteners, attachments, and other components.
 - f. Failure of operating units.
- C. Structural Loads:
1. Wind Loads.
- D. Deflection of Framing Members.
1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19.1 mm), whichever is less.
 2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch (3.2 mm).
 3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:
 - a. Perpendicular to Plane of Wall: No greater than 1/240 of clear span plus 1/4 inch (6.35 mm) for spans greater than 11 feet 8-1/4 inches (3.6 m) or 1/175 times span, for spans less than 11 feet 8-1/4 inches (3.6 m).
- E. Structural: Test according to ASTM E 330 as follows:
1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
 2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
 3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- F. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:
1. Fixed Framing and Glass Area:

- a. Maximum air leakage of 0.06 cfm/sq. ft. (0.30 L/s per sq. m) at a static-air-pressure differential of 6.24 lbf/sq. ft. (300 Pa).
2. Entrance Doors:
 - a. Pair of Doors: Maximum air leakage of 1.0 cfm/sq. ft. (5.08 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).
 - b. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. (2.54 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).
- G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:
 1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
- H. Energy Performance: Certify and label energy performance according to NFRC as follows:
 1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.45 Btu/sq. ft. x h x deg F (2.55 W/sq. m x K) as determined according to NFRC 100.
 2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.40 as determined according to NFRC 200.
 3. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 25 as determined according to NFRC 500.
- I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. EFCO Corporation.
 2. Kawneer North America; an Alcoa company.
 3. Tubelite Inc.
 4. Vistawall.
 5. Oldcastle.

2.3 FRAMING

- A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 1. Construction: Thermally broken.
 2. Glazing System: Retained mechanically with gaskets on four sides.

3. Glazing Plane: Center.
 4. Finish: Dark Bronze. See elevations for bright aluminum accent trim.
 5. Fabrication Method: Field-fabricated stick system.
- B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Materials:
1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - a. Sheet and Plate: ASTM B 209 (ASTM B 209M).
 - b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
 - c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
 - d. Structural Profiles: ASTM B 308/B 308M.
 2. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.
 - a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 - c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.4 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
1. Door Construction: 1-3/4-inch (44.5-mm) overall thickness, with minimum 0.125-inch (3.2-mm-) thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
 - a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.
 2. Door Design: Medium stile; 3-1/2-inch (88.9-mm) nominal width.
 3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.
 - a. Provide nonremovable glazing stops on outside of door.

2.5 ENTRANCE DOOR HARDWARE

- A. Entrance Door Hardware: Hardware not specified in this Section. As specified in Section 08 71 00.00 "Door Hardware."

2.6 GLAZING

- A. Glazing: Comply with Section 08 80 00.00 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.

2.7 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Physical and thermal isolation of glazing from framing members.
 - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 5. Provisions for field replacement of glazing from exterior.
 - 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
 - 7. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
- F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
- G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. Color: Dark Bronze. See elevations for bright aluminum accent trim.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

- B. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

- C. Set continuous sill members and flashing in full sealant bed as specified in Section 07 92 00.00 "Joint Sealants" to produce weathertight installation.

- D. Install components plumb and true in alignment with established lines and grades.

- E. Install glazing as specified in Section 08 80 00.00 "Glazing."

- F. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

END OF SECTION

SECTION 08 42 29.23

SLIDING AUTOMATIC ENTRANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes interior, sliding, power-operated automatic entrances.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For sliding automatic entrances.
 - 1. Include plans, elevations, sections, hardware mounting heights, and attachment details.
 - 2. Include diagrams for power, signal, and control wiring.
 - 3. Indicate locations of activation and safety devices.
 - 4. Include hardware schedule and indicate hardware types, functions, quantities, and locations.
- C. Samples: For each type of exposed finish required.
- D. Delegated-Design Submittal: For automatic entrances.

1.3 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Product test reports.
- C. Field quality-control reports.
- D. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of automatic entrances that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer agrees to repair or replace components on which finishes fail in materials or workmanship within specified warranty period.
 - 1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 AUTOMATIC ENTRANCE ASSEMBLIES

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Power-Operated Door Standard: BHMA A156.10.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00.00 "Quality Requirements," to design automatic entrances.
- B. Structural Performance: Automatic entrances shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
 - 1. Wind Loads: Per code for this region.

2.3 SLIDING AUTOMATIC ENTRANCES

- A. General: Provide manufacturer's standard automatic entrances, including doors, sidelites, framing, headers, carrier assemblies, roller tracks, door operators, controls, and accessories required for a complete installation.
- B. Sliding Automatic Entrance:
 - 1. Single-Sliding Units:

- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Besam Entrance Solutions; ASSA ABLOY.
 - 2) DORMA USA, Inc.
 - 3) Gildor, Inc.
 - 4) Horton Automatics; a division of Overhead Door Corporation.
 - 5) NABCO Entrances, Inc.
 - 6) Stanley Access Technologies.
2. Configuration: Single-sliding door with one sliding leaf and pocketed sidelites.
 - a. Traffic Pattern: Two way.
 - b. Emergency Breakaway Capability.
3. Operator Features:
 - a. Power opening and closing.
 - b. Drive System: Chain or belt.
 - c. Adjustable opening and closing speeds.
 - d. Adjustable hold-open time between zero and 30 seconds.
 - e. Obstruction recycle.
 - f. On-off/hold-open switch to control electric power to operator, key operated.
4. Sliding-Door Carrier Assemblies and Overhead Roller Tracks: Carrier assembly that allows vertical adjustment; consisting of nylon- or delrin-covered, ball-bearing-center steel wheels operating on a continuous roller track, or ball-bearing-center steel wheels operating on a nylon- or delrin-covered, continuous roller track. Support doors from carrier assembly by cantilever and pivot assembly.
 - a. Rollers: Minimum of two ball-bearing roller wheels and two antirise rollers for each active leaf.
5. Sliding-Door Threshold: Threshold members and bottom-guide-track system with stainless-steel, ball-bearing-center roller wheels.
 - a. Configuration: No threshold across door opening and recessed guide-track system at sidelites.
6. Controls: Activation and safety devices according to BHMA standards.
 - a. Activation Device: Motion sensor mounted on each side of door header to detect pedestrians in activating zone and to open door.
 - b. Safety Device: Presence sensor mounted to underside of door header and two photoelectric beams mounted in sidelite jambs on one side of the door to detect pedestrians in presence zone and to prevent door from closing.
7. Finish: Finish framing, door(s), and header with Class I, Dark Bronze.

2.4 ENTRANCE COMPONENTS

- A. Framing Members: Extruded aluminum, minimum 0.125 inch (3.2 mm) thick and reinforced as required to support imposed loads.
 - 1. Nominal Size: 1-3/4 by 4-1/2 inches (45 by 115 mm).
 - 2. Extruded Glazing Stops and Applied Trim: Minimum 0.062-inch (1.6-mm) wall thickness.
- B. Stile and Rail Doors: 1-3/4-inch- (45-mm-) thick, glazed doors with minimum 0.125-inch- (3.2-mm-) thick, extruded-aluminum tubular stile and rail members. Mechanically fasten corners with reinforcing brackets that are welded, or incorporate concealed tie-rods that span full length of top and bottom rails.
 - 1. Glazing Stops and Gaskets: Snap-on, extruded-aluminum stops and preformed gaskets.
 - 2. Stile Design: As indicated on Drawings.
 - 3. Rail Design: As indicated on Drawings.
 - 4. Muntin Bars: Horizontal tubular rail member for each door; match stile design and finish.
- C. Sidelite(s): 1-3/4-inch- (45-mm-) deep sidelite(s) with minimum 0.125-inch- (3.2-mm-) thick, extruded-aluminum tubular stile and rail members matching door design.
 - 1. Glazing Stops and Gaskets: Same materials and design as for stile and rail door.
 - 2. Glazing Stops and Gaskets: Snap-on, extruded-aluminum stops and preformed gaskets.
 - 3. Muntin Bars: Horizontal tubular rail members for each sidelite; match stile design.
- D. Headers: Fabricated from minimum 0.125-inch- (3.2-mm-) thick extruded aluminum and extending full width of automatic entrance units to conceal door operators and controls. Provide hinged or removable access panels for service and adjustment of door operators and controls. Secure panels to prevent unauthorized access.
 - 1. Mounting: Concealed, with one side of header flush with framing.
- E. Signage: As required by cited BHMA standard.
 - 1. Application Process: Door manufacturer's standard process.

2.5 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
- B. Steel Reinforcement: Reinforcement with corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Use surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
- C. Glazing: As specified in Section 08 80 00.00 "Glazing."
- D. Sealants and Joint Fillers: As specified in Section 07 92 00.00 "Joint Sealants."

- E. Fasteners and Accessories: Corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

2.6 DOOR OPERATORS AND CONTROLS

- A. General: Provide operators and controls, which include activation and safety devices, according to BHMA standards, for condition of exposure, and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated.
- B. Door Operators: Provide door operators of size recommended by manufacturer for door size, weight, and movement.
 - 1. Door Operator Performance: Door operators shall open and close doors and maintain them in fully closed position when subjected to Project's design wind loads.
 - 2. Electromechanical Operators: Concealed, self-contained, overhead units powered by fractional-horsepower, permanent-magnet dc motor; with closing speed controlled mechanically by gear train and dynamically by braking action of electric motor; with solid-state microprocessor controller; complying with UL 325; and with manual operation with power off.
 - 3. Doors shall be capable of being locked open if required.
- C. Motion Sensors: Self-contained, K-band-frequency, microwave-scanner units; fully enclosed by their plastic housings; adjustable to provide detection-field sizes and functions required by BHMA A156.10.
 - 1. Provide capability for switching between bi- and unidirectional detection.
 - 2. For one-way traffic, sensor on egress side shall not be active when doors are fully closed.
- D. Presence Sensors: Self-contained, active-infrared scanner units; adjustable to provide detection-field sizes and functions required by BHMA A156.10. Sensors shall remain active at all times.
- E. Photoelectric Beams: Pulsed infrared, sender-receiver assembly for recessed mounting. Beams shall not be active when doors are fully closed.
- F. Electrical Interlocks: Unless units are equipped with self-protecting devices or circuits, provide electrical interlocks to prevent activation of operator when door is locked, latched, or bolted.

2.7 HARDWARE

- A. General: Provide units in sizes and types recommended by automatic entrance and hardware manufacturers for entrances and uses indicated. Finish exposed parts to match door finish.
- B. Breakaway Device for Power-Operated Doors: Device that allows door to swing out in direction of egress to full 90 degrees from any operating position. Interrupt powered operation of door operator while in breakaway mode.
- C. Deadlocks: Deadbolt operated by exterior cylinder and interior thumb turn, with minimum 1-inch- (25-mm-) long throw bolt; BHMA A156.5, Grade 1.
 - 1. Cylinders: As specified in Section 08 71 00.00 "Door Hardware."

2. Deadbolts: Steel, mortise type, BHMA A156.5, Grade 1.
 3. Two-Point Locking for Stile and Rail Sliding Doors: Mechanism in stile of active door leaf that automatically extends second lockbolt into threshold.
- D. Automatic Locking: Electrically controlled device mounted in header that automatically locks sliding door in closed position, preventing door panels from sliding manually. Provide fail-secure operation if power fails.
1. Power Interruption: Lock shall be engaged, preventing doors from sliding manually.
 2. Means of Egress: Standard breakaway feature.
- E. Uninterrupted Power Supply: UL 1778, fully integrated unit mounted within header.
- F. Dustproof Strikes for All-Glass Sliding Doors: Recessed, floor type, BHMA A156.16, Grade 1, to receive deadbolt.

2.8 FABRICATION

- A. General: Factory fabricate automatic entrance components to designs, sizes, and thicknesses indicated and to comply with indicated standards.
- B. Framing: Provide automatic entrances as prefabricated assemblies. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site.
1. Provide components with concealed fasteners and anchor and connection devices.
 2. Fabricate components with accurately fitted joints, with ends coped or mitered to produce hairline joints free of burrs and distortion.
 3. Provide anchorage and alignment brackets for concealed support of assembly from building structure.
 4. Allow for thermal expansion.
- C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.
- D. Door Operators: Factory fabricated and installed in headers, including adjusting and testing.
- E. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated, according to GANA's "Glazing Manual."
- F. Hardware: Factory install hardware to greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site. Cut, drill, and tap for factory-installed hardware before applying finishes.
- G. Controls:
1. General: Factory install activation and safety devices in doors and headers as required by BHMA A156.10 for type of door and direction of travel.

2.9 ALUMINUM FINISHES

- A. Dark Bronze Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install automatic entrances according to manufacturer's written instructions and cited BHMA A156.10 for direction of pedestrian travel, including signage, controls, wiring, and connection to the building's power supply.
 - 1. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.
 - 2. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
 - 3. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous coating.
- B. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
 - 1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
 - 2. Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.
 - 3. Level recesses for recessed thresholds using nonshrink grout.
- C. Door Operators: Connect door operators to electrical power distribution system.
- D. Controls: Install and adjust activation and safety devices according to manufacturer's written instructions and cited BHMA standard for direction of pedestrian travel. Connect control wiring according to Section 26 05 19.00 "Low-Voltage Electrical Power Conductors and Cables."
- E. Guide Rails: Install rails according to BHMA A156.10, including Appendix A, and manufacturer's written instructions unless otherwise indicated.
- F. Glazing: Install glazing as specified in Section 08 80 00.00 "Glazing."
- G. Sealants: Comply with requirements specified in Section 07 92 00.00 "Joint Sealants" to provide weathertight installation.
 - 1. Set thresholds framing members and flashings in full sealant bed.
 - 2. Seal perimeter of framing members with sealant.
- H. Signage: Apply signage on both sides of each door and breakaway sidelite, as required by cited BHMA standard for direction of pedestrian travel.

3.2 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Test and inspect each automatic entrance, using AAADM inspection forms, to determine compliance of installed systems with applicable BHMA standards.
- B. Prepare test and inspection reports.

3.3 ADJUSTING

- A. Adjust hardware, moving parts, door operators, and controls to function smoothly, and lubricate as recommended by manufacturer; comply with requirements of applicable BHMA standards.
- B. Readjust door operators and controls after repeated operation of completed installation equivalent to three days' use by normal traffic (100 to 300 cycles).

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain automatic entrances.

END OF SECTION

SECTION 08 71 00.00

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Mechanical door hardware for the following:
 - a. Swinging doors.
2. Hardware specified in other Sections.
3. Electrified door hardware.

1.2 ACTION SUBMITTALS

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

B. Shop Drawings: Details of electrified door hardware.

C. Samples: For each exposed product and for each color and texture specified.

D. Other Action Submittals:

1. Vertical Door Hardware Schedule: Prepared by or under the supervision of Supplier, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - a. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
 - b. Content: Include the following information:
 - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
 - 2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
 - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
 - 4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.
2. Schedules shall be kept current with all changes to the project. If changes occur, project hardware schedules shall be maintained to reflect the changes as they are approved. Omitted items shall be deleted from openings, added and replaced items shall be

included. Installation submittals shall be kept current as changes occur. Upon request, a complete updated hardware schedule shall be provided to the contractor. Supplemental submittals that include only the changed openings will not be acceptable.

3. Prior to final payment, provide a record copy of hardware schedules, including all revisions and updates. All openings shall be listed to reflect final installed configuration only.
4. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks.

1.3 QUALITY ASSURANCE

- A. Supplier Qualifications: The hardware supplier shall be a corporate member in good standing of The Door and Hardware Institute (DHI), employing at least one Architectural Hardware Consultant (AHC) who is currently participating in DHI's continuing education program (CEP).
- B. Source Limitations: Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.
- C. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated. Provide positive latching and self closing, regardless if specified in sets.
- D. Items of hardware not definitely specified herein but necessary for completion of the work shall be provided. Such items shall be of type and quality suitable to the service required and comparable to the adjacent hardware. Where size and shape of members is such as to prevent the use of types specified, hardware shall be furnished of suitable types having as nearly as practicable the same operation and quality as the type specified. Sizes shall be adequate for the service required.
- E. Include such nuances as strike type, strike lip length, raised barrel hinges, mounting brackets, blade stop spacers, special templates, fasteners, shims, and coordination between conflicting products. All doors shall be provided with a stop.
- F. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
 1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at the tested pressure differential of 0.3-inch wg (75 Pa) of water.
- G. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- H. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

- I. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22.2 N).
 - 2. Comply with the following maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - b. Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
 - c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - 3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
 - 4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
- J. Keying Conference: Conduct conference at Project site.
- K. At the time of completion, the hardware supplier shall provide a certified Fire Door Assembly Inspector (FDAI) to perform a walk-thru inspection of every fire-rated opening on the project. The FDAI shall provide a detailed, opening-by-opening, written document for the owner that ensures all of the specified component parts of the fire-rated assembly have been properly installed and are functioning as designed, in accordance with the criteria of a fire door assembly as per NFPA 80 2007 edition.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver keys to Owner by registered mail or overnight package service.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Manufacturers' standard warranty.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.
 - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated.

2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.
 2. References to BHMA Designations: Provide products complying with these designations and requirements for description, quality, and function.
- C. Hinges: Hager, McKinney, Ives.
1. Interior Door Hinges: Steel, 0.134 inch minimum thickness except as noted. Provide heavyweight 0.180 inch minimum thickness on doors wider than 3'0".
 2. Exterior Door Hinges: Stainless steel, provide heavyweight 0.180 inch minimum thickness unless noted otherwise.
 3. Hinge Size: 4-1/2" x 4-1/2" unless noted otherwise.
 4. Hinge Options:
 - a. Nonremovable Pins: Provide set screw in hinge barrel that when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for outswinging exterior doors, outswinging lockable corridor doors and doors with access control components.
 - b. Corners: Square.
 5. Provide quantity as follows unless otherwise indicated.
 - a. For doors up to 60 inches in height, provide 1 pair hinges; for doors 60 inches to 90 inches in height, provide 1-1/2 pairs of hinges; for doors over 90 inches and up to 120 inches in height, provide 1 additional hinge for each 30 inches of height.
- D. Continuous Hinges: Hager, Select, Ives.
- E. Locks: Schlage ND x TLR x 626, Acceptable: Sargent 10-Line.
- F. Closers: LCN 4040XP Series, Acceptable: Sargent 281.
- G. Automatic Operators: Stanley, Motion Access.
- H. Overhead Stops: Glynn-Johnson, Rixson, ABH.
- I. Exit Devices: Von Duprin 99, Acceptable: Sargent 88.
- J. Cylinders: Sargent CN and Arrow as specified.
- K. Power Transfer: Von Duprin EPT-10, Acceptable: Sargent SEPT-10.
- L. Electric Strikes: Von Duprin, HES, Folger Adams, Securitron.

- M. Flatgoods and Pulls: Rockwood, Ives, Hager.
- N. Thresholds and Weatherstripping: NGP, Zero, Pemko, Hager.
- O. Hardwired Exit Alarms: SDC.
- P. Battery Powered Exit Alarms: Detex.
- Q. Power Supplies: Schlage, Securitron.
- R. Keyswitches: Schlage, SDC, Securitron.
- S. Bollards: Pedestal CEO.

2.2 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
 - 1. Existing System:
 - a. Master key or grand master key locks to Owner's existing system.
- B. Keys: Brass.
 - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
 - a. Notation: Information to be furnished by Owner.

2.3 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
- B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."

- C. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 2. Custom Steel Doors and Frames: HMMA 831.
 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- D. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.
1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- E. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- F. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Owner.
1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.
- G. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 07 92 00.00 "Joint Sealants."
- H. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- I. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- J. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- K. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- L. Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.2 DOOR HARDWARE SCHEDULE

- A. See Schedule attached hereto and made part of the contract documents.

HARDWARE SET 1

EA	HINGES	AS SPECIFIED	652	HAG
1 EA	OFFICE	ND53LD TLR	626	SCH
1 EA	CYLINDER	AS REQUIRED	626	SAR
1 EA	WALL STOP	409	630	ROC

HARDWARE SET 2

EA	HINGES	AS SPECIFIED	652	HAG
1 EA	ELECTRIC STRIKE	6211	630	VON✎
1 EA	STOREROOM	ND80LD TLR	626	SCH
1 EA	CYLINDER	AS REQUIRED	626	SAR
1 EA	CLOSER	4040XP	689	LCN
1 EA	KICK PLATE	10" X 2" LDW	630	ROC
1 EA	WALL STOP	409	630	ROC
1 EA	CARD READER	BY SECURITY CONTRACTOR		
1 EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
1 EA	REQUEST TO EXIT	BY SECURITY CONTRACTOR		
1 EA	ENTRY BUTTON	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 3

EA	HINGES	AS SPECIFIED	652	HAG
1 EA	CLASSROOM	ND70LD TLR	626	SCH
1 EA	CYLINDER	AS REQUIRED	626	SAR
1 EA	OVERHEAD STOP	450S	630	GLY

HARDWARE SET 4

EA	HINGES	AS SPECIFIED	652	HAG
1 EA	ELECTRIC STRIKE	6211	630	VON✎
1 EA	STOREROOM	ND80LD TLR	626	SCH
1 EA	CYLINDER	AS REQUIRED	626	SAR
1 EA	CLOSER	4040XP SCUSH	689	LCN
1 EA	KICK PLATE	10" X 2" LDW	630	ROC
1 EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
1 EA	REQUEST TO EXIT	BY SECURITY CONTRACTOR		
1 EA	ENTRY BUTTON	BY SECURITY CONTRACTOR		
1 EA	CARD READER	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential or entry button allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 5

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211 FS	630 VON✓
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	EA	REX SENSOR	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	CARD READER	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and unlocks upon loss of power or signal from fire alarm system. Free egress at all times.

HARDWARE SET 6

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON✓
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	EA	CARD READER	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	REQUEST TO EXIT	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 7

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	PUSH PLATE	70F 6" X 16"	630 ROC
1	EA	PULL PLATE	107 X 70C 4" X 16"	630 ROC
1	EA	CLOSER	4040XP H	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC

HARDWARE SET 8

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	WALL STOP	409	630 ROC

HARDWARE SET 9

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON✓
1	EA	CLASSROOM	ND70LD TLR	626 SCH
2	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	AUTOMATIC OPERATOR	MAC-MxxC-R	628 MOT✓
2	EA	ACTUATOR	10PBS1	630 BEA✓
2	EA	MOUNTING BOX	10BOX475SQSM	BEA
1	EA	KICK PLATE	10" X 2"LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	EA	KEYSWITCH	653-1414-L2	626 SCH✓

NOTE: Keyswitch disables the corridor side actuator.

HARDWARE SET 10

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	CLASSROOM	ND70LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	WALL STOP	409	630 ROC

HARDWARE SET 11

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	PASSAGE	ND10S TLR	626 SCH
1	EA	OVERHEAD STOP	450S	630 GLY

HARDWARE SET 12

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON✓
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	OVERHEAD STOP	450S	630 GLY
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	CARD READER	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	REQUEST TO EXIT	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 13

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	OVERHEAD STOP	450S	630 GLY
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC

HARDWARE SET 14

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	VON ✓
1	EA	CLASSROOM	ND70LD TLR	SCH
2	EA	CYLINDER	AS REQUIRED	ARR
1	EA	OVERHEAD STOP	450S	GLY
1	EA	AUTOMATIC OPERATOR	MAC-MxxC-R	MOT ✓
1	EA	KICK PLATE	10" X 2" LDW	ROC
2	EA	ACTUATOR	10PBS1	BEA ✓
2	EA	MOUNTING BOX	10BOX475SQFM	BEA
1	EA	KEYSWITCH	653-1414-L2	SCH ✓

NOTE: Keyswitch disables the corridor side actuator.

HARDWARE SET 15

EA	HINGES	AS REQUIRED	652	HAG
1	EA	PRIVACY	ND40S TLR	SCH
1	EA	WALL STOP	409	ROC

HARDWARE SET 16

EA	HINGES	AS REQUIRED	652	HAG
1	EA	PASSAGE	ND10S TLR	SCH
1	EA	WALL STOP	409	ROC

HARDWARE SET 17

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	EXIT DEVICE	99L-BE	VON
1	EA	CLOSER	4040XP SCUSH	LCN
1	EA	KICK PLATE	10" X 2" LDW	ROC

HARDWARE SET 18 (JUSTICE OFFICES)

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	OFFICE	ND53LD TLR	SCH
1	EA	CYLINDER	AS REQUIRED	ARR
1	EA	WALL STOP	409	ROC

HARDWARE SET 19

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	EXIT DEVICE	99L	VON
1	EA	CYLINDER	AS REQUIRED	ARR
1	EA	CLOSER	4040XP	LCN
1	EA	KICK PLATE	10" X 2" LDW	ROC
1	EA	WALL STOP	409	ROC

HARDWARE SET 20

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	STOREROOM	ND80LD TLR	SCH
1	EA	CYLINDER	AS REQUIRED	ARR
1	EA	WALL STOP	409	ROC

HARDWARE SET 21

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	OVERHEAD STOP	450S	630 GLY

HARDWARE SET 22

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON✎
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	CLOSER	4040XP SCUSH	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	REX SENSOR	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	CARD READER	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 23

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON✎
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	EA	REX SENSOR	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	CARD READER	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 24

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	OFFICE	ND53LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	OVERHEAD STOP	450S	630 GLY

HARDWARE SET 25

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	CLASSROOM	ND70LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	OVERHEAD STOP	450S	630 GLY

HARDWARE SET 26

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	REMOVABLE MULLION	5654	628 VON
1	EA	EXIT DEVICE	CD99EO	626 VON
1	EA	EXIT DEVICE	CD99NL-OP	626 VON
3	EA	CYLINDER	AS REQUIRED	626 ARR
2	EA	PULL	BF157	630 ROC
1	EA	AUTOMATIC OPERATOR	MAC-MP1C-R	628 MOT✎
2	EA	ACTUATOR	10PBS1	630 BEA✎
2	EA	MOUNTING BOX	10BOX475SQFM	BEA
2	EA	KICK PLATE	10" X 2" LDW	630 ROC
2	EA	WALL STOP	409	630 ROC

HARDWARE SET 27

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	CLASSROOM	ND70LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC

HARDWARE SET 28

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	9600 FS	630 HES✎
1	EA	EXIT DEVICE	99L-NL	626 VON
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	EA	CARD READER	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and unlocks upon loss of power or signal from fire alarm system. Free egress at all times.

HARDWARE SET 29

1	EA	BYPASS HARDWARE	9885	628 HAG
2	EA	FLUSH PULL	BF97L	630 ROC

HARDWARE SET 30

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON✓
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	OVERHEAD STOP	450S	630 GLY
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	REX SENSOR	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	CARD READER	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 31

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	CLASSROOM	ND70LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	OVERHEAD STOP	450S	630 GLY
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2"LDW	630 ROC

HARDWARE SET 32

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	PUSH PLATE	70F 6" X 16"	630 ROC
1	EA	PULL PLATE	107 X 70C 4" X 16"	630 ROC
1	EA	AUTOMATIC OPERATOR	MAC-MxxC-R	628 MOT✓
1	EA	KICK PLATE	10" X 2"LDW	630 ROC
2	EA	ACTUATOR	10PBS1	630 BEA✓
2	EA	MOUNTING BOX	10BOX475SQFM	BEA
1	EA	WALL STOP	409	630 ROC

HARDWARE SET 33

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON✓
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	AUTOMATIC OPERATOR	MAC-MxxC-R	628 MOT✓
2	EA	ACTUATOR	10PBS1	630 BEA✓
2	EA	MOUNTING BOX	10BOX475SQFM	BEA
1	EA	KICK PLATE	10" X 2"LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	EA	REX SENSOR	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	CARD READER	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: During business hours door is normally closed, unlocked and corridor actuator is active for use. After business hours door is normally closed, locked and corridor actuator is inactive. Valid credential allows entry and use of corridor actuator. Waiting room actuator always active. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 34

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON✓
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	AUTOMATIC OPERATOR	MAC-MxxC-R	628 MOT✓
2	EA	ACTUATOR	10PBS1	630 BEA✓
2	EA	MOUNTING BOX	10BOX475SQFM	BEA
1	EA	KICK PLATE	10" X 2"LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	EA	REX SENSOR	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	ENTRY BUTTON	BY SECURITY CONTRACTOR	
1	EA	CARD READER	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: During business hours door is normally closed, unlocked and waiting room actuator is active for use. After business hours door is normally closed, locked and waiting room actuator is inactive. Valid credential allows entry and use of waiting room actuator. corridor actuator always active. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 35

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	EXIT DEVICE	99L-BE-F	626 VON
1	EA	OVERHEAD STOP	450S	630 GLY
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC

HARDWARE SET 36

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	9600	630 HES✓
1	EA	EXIT DEVICE	99L-NL	626 VON
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	EA	REX SENSOR	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	CARD READER	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 37

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC HINGE	ETW-8	652	HAG✔
1	EA	EXIT DEVICE	9947WDC-EO LBR	626	VON✔
1	EA	EXIT DEVICE EL TRIM	9947WDC-L LBR X E996L FSE	626	VON✔
1	EA	CYLINDER	AS REQUIRED	626	SAR
2	EA	CLOSER	4040XP SCUSH	689	LCN
2	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	EA	REX SENSOR	BY SECURITY CONTRACTOR		
2	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
1	EA	CARD READER	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 38

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	STOREROOM	ND80LD TLR	626	SCH
1	EA	CYLINDER	AS REQUIRED	626	SAR
1	EA	CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	EA	WALL STOP	409	630	ROC

HARDWARE SET 39

	EA	HINGES	AS REQUIRED	652	HAG
1	EA	PRIVACY	ND40S TLR	626	SCH
1	EA	OVERHEAD STOP	450S	630	GLY

HARDWARE SET 40

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	9600	630	HES✓
1	EA	EXIT DEVICE	99L-NL	626	VON
1	EA	CYLINDER	AS REQUIRED	626	ARR
1	EA	CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	EA	WALL STOP	409	630	ROC
1	EA	REX SENSOR	BY SECURITY CONTRACTOR		
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
1	EA	CARD READER	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 41

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	CLASSROOM	ND70LD TLR	626	SCH
1	EA	CYLINDER	AS REQUIRED	626	ARR
1	EA	WALL STOP	409	630	ROC

HARDWARE SET 42

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON✎
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	SET	SEALS	5050	BLK NGP
1	EA	AUTO DOOR BOTTOM	423NA	628 NGP
1	EA	CARD READER	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	REQUEST TO EXIT	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 43

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON✎
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	EA	CARD READER	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	REQUEST TO EXIT	BY SECURITY CONTRACTOR	
1	EA	ENTRY BUTTON	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 44

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC HINGE	ETW-8	652	HAG✔
1	EA	DELAYED EGRESS DEVICE	CX9975L-BE	626	VON✔
1	EA	CYLINDER	AS REQUIRED	626	SAR
1	EA	OVERHEAD STOP	450S	630	GLY
1	EA	CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	EA	POWER SUPPLY	PS902-FA	600	SCH✔
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
1	EA	CARD READER	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential on push side shunts delayed egress alarm. Operating push pad initiates an irreversible process which will release the lock in not more than 15 seconds. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door lock has been released by the application of force to the releasing device, relocking shall be by manual means only. A sign shall be provided on the door located above and within 12 inches of the release device reading: "Push until alarm sounds. Door can be opened in 15 seconds." Doors must close and unlock from push side upon signal from fire alarm system or fire command center and in the event of power loss.

HARDWARE SET 45

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	PASSAGE	ND10S TLR	626	SCH
1	EA	WALL STOP	409	630	ROC
1	SET	SEALS	5050	BLK	NGP
1	EA	AUTO DOOR BOTTOM	423NA	628	NGP

HARDWARE SET 46

	EA	HINGES	AS SPECIFIED	652	HAG
2	EA	EXIT DEVICE	9947WDC-L-BE-F LBR	626	VON
2	EA	CLOSER	4040XP	689	LCN
2	EA	KICK PLATE	10" X 2" LDW	630	ROC
2	EA	MAG HOLD OPEN	SEM7850	689	LCN✓

HARDWARE SET 47

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630	VON✓
1	EA	STOREROOM	ND80LD TLR	626	SCH
1	EA	CYLINDER	AS REQUIRED	626	ARR
1	EA	OVERHEAD STOP	450S	630	GLY
1	EA	CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	EA	REX SENSOR	BY SECURITY CONTRACTOR		
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
1	EA	ENTRY BUTTON	BY SECURITY CONTRACTOR		
1	EA	CARD READER	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 48

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	CLOSER	4040XP SCUSH	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC

HARDWARE SET 49

EA	HINGES	AS REQUIRED	652	HAG
1	EA	PRIVACY W/INDICATOR	L9040 03A X L283-722	626 SCH
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC

HARDWARE SET 50

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	EXIT DEVICE	99L-BE-F	626 VON
1	EA	CLOSER	4040XP	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	MAG HOLD OPEN	SEM7850	689 LCN✓

HARDWARE SET 51

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	EXIT DEVICE	99L	626 VON
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	CLOSER	4040XP H	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	SET	SEALS	5050	BLK NGP
1	EA	AUTO DOOR BOTTOM	423NA	628 NGP

HARDWARE SET 52

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	EXIT DEVICE	99L-BE	626 VON
1	EA	CLOSER	4040XP H	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	WALL STOP	409	630 ROC
1	SET	SEALS	5050	BLK NGP
1	EA	AUTO DOOR BOTTOM	423NA	628 NGP

HARDWARE SET 53

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	OVERHEAD STOP	450S	630 GLY

HARDWARE SET 54

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON ✓
1	EA	CLASSROOM	ND70LD TLR	626 SCH
2	EA	CYLINDER	AS REQUIRED	626 ARR
1	EA	AUTOMATIC OPERATOR	MAC-MxxC-R	628 MOT ✓
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
2	EA	ACTUATOR	10PBS1	630 BEA ✓
2	EA	MOUNTING BOX	10BOX475SQFM	BEA
1	EA	WALL STOP	409	630 ROC
1	EA	KEYSWITCH	653-1414-L2	626 SCH ✓

NOTE: Keyswitch disables the corridor side actuator.

HARDWARE SET 55

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON ✓
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	CLOSER	4040XP SCUSH	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	SET	SEALS	5050	BLK NGP
1	EA	AUTO DOOR BOTTOM	423NA	628 NGP
1	EA	CARD READER	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	REQUEST TO EXIT	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 56

EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630 VON ✓
1	EA	STOREROOM	ND80LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR
1	EA	CLOSER	4040XP SCUSH	689 LCN
1	EA	KICK PLATE	10" X 2" LDW	630 ROC
1	EA	CARD READER	BY SECURITY CONTRACTOR	
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR	
1	EA	REQUEST TO EXIT	BY SECURITY CONTRACTOR	

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 57

1	EA	OFFICE	ND53LD TLR	626 SCH
1	EA	CYLINDER	AS REQUIRED	626 SAR

HARDWARE SET 58

1 EA ELECTRIC STRIKE	6211	630	VON ✓
1 EA STOREROOM	ND80LD TLR	626	SCH
1 EA CYLINDER	AS REQUIRED	626	ARR
1 EA CARD READER	BY SECURITY CONTRACTOR		
1 EA DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
1 EA REQUEST TO EXIT	BY SECURITY CONTRACTOR		
1 EA DOOR BELL	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 59

1 EA ELECTRIC STRIKE	6211WF	630	VON ✓
1 EA STOREROOM	ND80LD TLR	626	SCH
1 EA CYLINDER	AS REQUIRED	626	SAR
1 EA CARD READER	BY SECURITY CONTRACTOR		
1 EA DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
1 EA REQUEST TO EXIT	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 60

1 EA CONTINUOUS HINGE	780-224HD X EPT	628	HAG
1 EA POWER TRANSFER	EPT-10	689	VON ✓
1 EA EXIT DEVICE	99EO ALK 24VDC SS TRIM	626	VON ✓
1 EA CYLINDER	AS REQUIRED	626	SAR
1 EA CLOSER	4040XP SCUSH	689	LCN
1 EA KICK PLATE	10" X 2" LDW	630	ROC
1 EA THRESHOLD	8425	719	NGP
1 EA SWEEP	200NA	628	NGP
1 SET WEATHERSTRIPPING	9700A	628	NGP
1 EA DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		

HARDWARE SET 61

1 EA PASSAGE	ND10S TLR	626	SCH
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HARDWARE SET 62

1 EA WRAP AROUND PLATE	4-CW	630	DON
1 EA STOREROOM	ND80LD TLR	626	SCH
1 EA CYLINDER	AS REQUIRED	626	SAR

HARDWARE SET 63

1 EA STOREROOM	ND80LD TLR	626	SCH
1 EA CYLINDER	AS REQUIRED	626	SAR

HARDWARE SET 64

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	PASSAGE	ND10S TLR	626	SCH
1	EA	CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	EA	WALL STOP	409	630	ROC

HARDWARE SET 65

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	PASSAGE	ND10S TLR	626	SCH

HARDWARE SET 66

1	EA	OFFICE	ND53LD TLR	626	SCH
1	EA	CYLINDER	AS REQUIRED	626	ARR

HARDWARE SET 67

1	EA	STOREROOM	ND80LD TLR	626	SCH
1	EA	CYLINDER	AS REQUIRED	626	ARR

HARDWARE SET 68

1	EA	ELECTRIC STRIKE	310-4 FAIL SAFE	630	FOL ✓
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HARDWARE SET 69

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	PASSAGE	ND10S TLR	626	SCH
1	EA	CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	EA	MAG HOLD OPEN	REUSE EXISTING		

HARDWARE SET 70

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC HINGE	ETW-8	652	HAG✔
1	EA	EXIT DEVICE	99L-F X E996 FS	626	VON✔
1	EA	CYLINDER	AS REQUIRED	626	SAR
1	EA	CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	EA	WALL STOP	409	630	ROC
1	EA	CARD READER	BY SECURITY CONTRACTOR		
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
1	EA	REQUEST TO EXIT	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and unlocks upon loss of power or signal from fire alarm system. Free egress at all times.

HARDWARE SET 71

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC HINGE	ETW-8	652	HAG✓
1	EA	EXIT DEVICE	9947WDC-EO-F LBR	626	VON
1	EA	EXIT DEVICE	QEL-9947WDC-L-NL-F LBR	626	VON✓
1	EA	CYLINDER	AS REQUIRED	626	VON
2	EA	CLOSER	4040XP	689	LCN
2	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	SET	SEALS	5050	BLK	NGP
1	SET	ASTRAGAL	115NA	628	NGP
2	EA	MAG HOLD OPEN	SEM7850	689	VON✓
1	EA	POWER SUPPLY	PS902-2RS	600	SCH✓
1	EA	CARD READER	BY SECURITY CONTRACTOR		
2	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
1	EA	REQUEST TO EXIT	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally held open and locked. Valid credential allows entry when door is closed. Door closes and remains locked upon loss of power or signal from fire alarm system. Free egress at all times.

HARDWARE SET 72

1	EA	DOOR PROP ALARM	EA-SN	628	SDC✓
1	EA	SIGNAGE	TBD		
1	EA	CARD READER	BY SECURITY CONTRACTOR		
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential at exterior allows entry. Valid credential at interior allows unalarmed egress. Egress without valid credential will sound alarm locally and at remote location. Alarm can be reset locally or at remote location. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 73

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC STRIKE	6211	630	VON✓
1	EA	INSTITUTION	ND82LD TLR	626	SCH
2	EA	CYLINDER	AS REQUIRED	626	SAR
1	EA	CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	EA	WALL STOP	409	630	ROC
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
2	EA	CARD READER	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked from both sides. Valid credential allows entry. Door remains closed and locked upon loss of power.

HARDWARE SET 74

1	EA	ELECTRIC STRIKE	UNL	630	SEC✓
1	EA	STOREROOM	ND80LD TLR	626	SCH
1	EA	CYLINDER	AS REQUIRED	626	SAR
1	EA	POWER SUPPLY	PS902-FA	600	SCH✓
1	EA	CARD READER	BY SECURITY CONTRACTOR		
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		
1	EA	REQUEST TO EXIT	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential allows entry. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 75

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	ELECTRIC HINGE	ETW-8	652	HAG✓
1	EA	EXIT DEVICE	99L-BE ALK 24VDC SS TRIM	626	VON✓
1	EA	CYLINDER	AS REQUIRED	626	SAR
1	EA	CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	EA	WALL STOP	409	630	ROC
1	EA	CARD READER	BY SECURITY CONTRACTOR		
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and unlocked from corridor. Valid credential at courtrooms allows unalarmed egress. Egress without valid credential will sound alarm locally and at remote location. Alarm can be reset locally or at remote location. Door remains closed and unlocked upon loss of power. Free egress at all times.

HARDWARE SET 76

2	EA	CONTINUOUS HINGE	780-224HD X EPT	628	HAG
2	EA	POWER TRANSFER	EPT-10	689	VON✓
1	EA	EXIT DEVICE	99EO ALK SS TRIM	626	VON✓
1	EA	EXIT DEVICE	99L X E996L ALK SS TRIM	626	VON✓
3	EA	CYLINDER	AS REQUIRED	626	SAR
2	EA	CLOSER	4040XP SCUSH	689	LCN
2	EA	KICK PLATE	10" X 2" LDW	630	ROC
2	EA	THRESHOLD	8425	719	NGP
2	EA	SWEEP	200NA	628	NGP
2	SET	WEATHERSTRIPPING	9700A	628	NGP
2	EA	CARD READER	BY SECURITY CONTRACTOR		
2	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential at exterior allows entry. Valid credential at interior allows unalarmed egress. Egress without valid credential will sound alarm locally and at remote location. Alarm can be reset locally or at remote location. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 77

	EA	HINGES	AS SPECIFIED	652	HAG
1	EA	STOREROOM	ND80LD TLR	626	SCH
1	EA	CYLINDER	AS REQUIRED	626	SAR
1	EA	CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	10" X 2" LDW	630	ROC
1	EA	WALL STOP	409	630	ROC

HARDWARE SET 78

ALL HARDWARE BY DOOR MANUFACTURER

HARDWARE SET 79

1	EA	ELECTRIC HINGE	ETW-8	652	HAG ✓
1	EA	CLOSER	4040XP	689	LCN
1	EA	CARD READER	BY SECURITY CONTRACTOR		
1	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential on push side allows unalarmed egress. Egress without valid credential will sound alarm locally and at remote location. Alarm can be reset locally or at remote location. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET 80

1	EA	EXIT TRIM	713-8	626	SAR
1	EA	CYLINDER	REUSE EXISTING		

HARDWARE SET AL1

2	EA	CONTINUOUS HINGE	780-112HD EMN X EPT	DKB	HAG ✓
2	EA	POWER TRANSFER	EPT-10	695	VON ✓
1	EA	EXIT DEVICE	RX-QEL33A-EO	710	VON ✓
1	EA	EXIT DEVICE	RX-QEL33A-NL-OP	710	VON ✓
1	EA	CYLINDER	AS REQUIRED	613	SAR
2	EA	PULL	BF157	613	ROC
2	EA	OVERHEAD STOP	100S	613	GLY
1	EA	AUTOMATIC OPERATOR	MAC-LP1D-R	DKB	MOT ✓
1	EA	MODULE	10BR3		BEA ✓
2	EA	ACTUATOR	10PBS1	630	BEA ✓
1	EA	MOUNTING BOX	10BOX475SQSM	BLK	BEA
1	EA	WEATHER RING	10WRSQ475		BEA
1	EA	BOLLARD	ADA-STAINLESS-TOWER	630	PED
2	EA	THRESHOLD	8425	719	NGP
2	EA	SWEEP	200NDKB	DKB	NGP
1	SET	WEATHERSTIPPING	BY DOOR AND FRAME MANUFACTURER		
1	EA	POWER SUPPLY	PS902-2RS	600	SCH ✓
1	EA	CARD READER	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: During business hours doors are normally closed and unlocked. Exterior actuator is active for use. After hours doors are normally closed, locked and exterior actuator is deactivated. Valid credential allows entry and use of exterior actuator. Interior actuator always active for use. Doors remain closed and locked upon loss of power. Free egress at all times.

HARDWARE SET AL2

2	EA	CONTINUOUS HINGE	780-112HD EMN X EPT	DKB	HAG	✓
2	EA	POWER TRANSFER	EPT-10	695	VON	✓
1	EA	EXIT DEVICE	RX-QEL33A-EO	710	VON	✓
1	EA	EXIT DEVICE	RX-QEL33A-NL-OP	710	VON	✓
1	EA	CYLINDER	AS REQUIRED	613	SAR	
2	EA	PULL	BF157	613	ROC	
2	EA	OVERHEAD STOP	100S	613	GLY	
1	EA	AUTOMATIC OPERATOR	MAC-LP1D-R	DKB	MOT	✓
1	EA	MODULE	10BR3		BEA	✓
2	EA	ACTUATOR	10PBS1	630	BEA	✓
1	EA	MOUNTING BOX	10BOX475SQSM	BLK	BEA	
1	EA	WEATHER RING	10WRSQ475		BEA	
1	EA	BOLLARD	ADA-STAINLESS-TOWER	630	PED	
2	EA	THRESHOLD	8425	719	NGP	
2	EA	SWEEP	200NDKB	DKB	NGP	
1	SET	WEATHERSTIPPING	BY DOOR AND FRAME MANUFACTURER			
1	EA	POWER SUPPLY	PS902-2RS	600	SCH	✓

OPERATIONAL DESCRIPTION: During business hours doors are normally closed and unlocked. Exterior actuator is active for use. After hours doors are normally closed, locked and exterior actuator is deactivated. Interior actuator always active for use. Doors remain closed and locked upon loss of power. Free egress at all times.

HARDWARE SET AL3

2	EA	CONTINUOUS HINGE	780-112HD EMN X EPT	DKB	HAG	✓
2	EA	POWER TRANSFER	EPT-10	695	VON	✓
2	EA	EXIT DEVICE	RX-QEL33A-EO	710	VON	✓
2	EA	OVERHEAD STOP	100S	613	GLY	
1	EA	AUTOMATIC OPERATOR	MAC-LP1D-R	DKB	MOT	✓
1	EA	MODULE	10BR3		BEA	✓
1	EA	ACTUATOR	10PBS1	630	BEA	✓
1	EA	MOUNTING BOX	10BOX475SQSM	BLK	BEA	
2	EA	THRESHOLD	8425	719	NGP	
2	EA	SWEEP	200NDKB	DKB	NGP	
1	SET	WEATHERSTIPPING	BY DOOR AND FRAME MANUFACTURER			
1	EA	POWER SUPPLY	PS902-2RS	600	SCH	✓

OPERATIONAL DESCRIPTION: Doors always closed and locked from exterior. No outside access. Interior actuator always active for use. Doors remain closed and locked upon loss of power. Free egress at all times.

HARDWARE SET AL4

2 EA CONTINUOUS HINGE	780-112HD EMN X EPT	DKB	HAG✓
2 EA POWER TRANSFER	EPT-10	695	VON✓
2 EA EXIT DEVICE	RX-33A-EO	710	VON✓
2 EA OVERHEAD STOP	100S	613	GLY
2 EA DROP PLATE	4040XP-18G	695	LCN
2 EA CLOSER	4040XP TOP JAMB	695	LCN
2 EA THRESHOLD	8425	719	NGP
2 EA SWEEP	200NDKB	DKB	NGP
1 SET WEATHERSTIPPING	BY DOOR AND FRAME MANUFACTURER		

HARDWARE SET AL5

2 EA CONTINUOUS HINGE	780-112HD EMN X EPT	DKB	HAG✓
2 EA POWER TRANSFER	EPT-10	695	VON✓
2 EA EXIT DEVICE	RX-QEL33A-EO	710	VON✓
2 EA OVERHEAD STOP	100S	613	GLY
1 EA AUTOMATIC OPERATOR	MAC-MP1D-R	DKB	MOT✓
1 EA MODULE	10BR3		BEA✓
1 EA ACTUATOR	10PBS1	630	BEA✓
1 EA MOUNTING BOX	10BOX475SQSM	BLK	BEA
2 EA SWEEP	200NDKB	DKB	NGP
1 SET WEATHERSTIPPING	BY DOOR AND FRAME MANUFACTURER		
1 EA POWER SUPPLY	PS902-2RS	600	SCH✓

OPERATIONAL DESCRIPTION: Doors always closed and locked from exterior. No outside access. Interior actuator always active for use. Doors remain closed and locked upon loss of power. Free egress at all times.

HARDWARE SET AL6

1 EA DOOR CORD	TSB-C	630	SEC✓
1 EA QEL CONVERSION KIT	958003-00		VON✓
1 EA DOOR PROP ALARM	EA-SN	628	SDC✓
1 EA MODULE	10BR3		BES✓
2 EA SIGNAGE	TBD		
1 EA CARD READER	BY SECURITY CONTRACTOR		
1 EA DOOR POSITION SWITCH	BY SECURITY CONTRACTOR		

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential at exterior allows entry and use of outside automatic operator actuator. Valid credential at interior allows unalarmed egress and use of inside automatic operator actuator. Egress without valid credential will sound alarm locally and at remote location. Alarm can be reset locally or at remote location. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET AL7

1	EA	DOOR PROP ALARM	EA-SN	628	SDC	✓
1	EA	SIGNAGE	TBD			
1	EA	CARD READER	BY SECURITY CONTRACTOR			

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential at exterior allows entry. Valid credential at interior allows unalarmed egress. Egress without valid credential will sound alarm locally and at remote location. Alarm can be reset locally or at remote location. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET AL8

2	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR			
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HARDWARE SET AL9

1	EA	DOOR PROP ALARM	EA-708	628	SDC	✓
1	EA	CYLINDER	AS REQUIRED	626	ARR	
2	EA	SIGNAGE	TBD			
2	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR			

OPERATIONAL DESCRIPTION: Door normally closed and locked. Egress will sound alarm locally and at remote location. Alarm can be reset locally or at remote location. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET AL10

1	EA	DOOR CORD	TSB-C	630	SEC	✓
1	EA	QEL CONVERSION KIT	958003-00		VON	✓
1	EA	DOOR PROP ALARM	EA-SN	628	SDC	✓
1	EA	POWER SUPPLY	PS902-2RS	600	SCH	✓
2	EA	SIGNAGE	TBD			
2	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR			
2	EA	CARD READER	BY SECURITY CONTRACTOR			

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential at exterior allows entry. Valid credential at interior allows unalarmed egress. Egress without valid credential will sound alarm locally and at remote location. Alarm can be reset locally or at remote location. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET AL11

1	EA	DOOR PROP ALARM	EA-SN	628	SDC	✓
2	EA	SIGNAGE	TBD			
2	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR			
1	EA	CARD READER	BY SECURITY CONTRACTOR			

OPERATIONAL DESCRIPTION: Door normally closed and locked. Egress will sound alarm locally and at remote location. Valid credential at interior allows unalarmed egress. Alarm can be reset locally or at remote location. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET AL12

1	EA	DOOR PROP ALARM	EAX-500	GRY	DET	✓
1	EA	CYLINDER	AS REQUIRED	626	SAR	
2	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR			

HARDWARE SET AL13

1	EA	DOOR PROP ALARM	EA-SN	628	SDC	✓
2	EA	SIGNAGE	TBD			
1	EA	CARD READER	BY SECURITY CONTRACTOR			

OPERATIONAL DESCRIPTION: Door normally closed and locked. Valid credential at exterior allows entry. Valid credential at interior allows unalarmed egress. Egress without valid credential will sound alarm locally and at remote location. Alarm can be reset locally or at remote location. Door remains closed and locked upon loss of power. Free egress at all times.

HARDWARE SET AL14

2	EA	CONTINUOUS HINGE	780-112HD X EPT	DKB	HAG	
2	EA	POWER TRANSFER	EPT-10	695	VON	✓
2	EA	EXIT DEVICE	33A-EO ALK SS TRIM	710	VON	✓
2	EA	CYLINDER	AS REQUIRED	613	SAR	
2	EA	OVERHEAD STOP	100S	613	GLY	
2	EA	DROP PLATE	4040XP-18G	695	LCN	
2	EA	CLOSER	4040XP TOP JAMB	695	LCN	
2	EA	THRESHOLD	8425	719	NGP	
2	EA	SWEEP	200NDKB	DKB	NGP	
1	SET	WEATHERSTRIPPING	BY DOOR AND FRAME MANUFACTURER			
2	EA	DOOR POSITION SWITCH	BY SECURITY CONTRACTOR			

OPERATIONAL DESCRIPTION: Door normally closed and locked. Egress will sound alarm locally and at remote location. Alarm can be reset locally or at remote location. Door remains closed and locked upon loss of power. Free egress at all times.

END OF SECTION

<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>	<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>
01.1.001A, 01.1.001B	AL6	03.1.152	16
01.1.001C, 01.1.001D	EX	03.1.153	16
01.1.004	EX	03.1.155	16
01.1.005	59	03.1.156	11
01.1.007	16	03.1.157	16
01.1.008	57	03.1.158	11
01.1.009	16	03.1.159	16
01.1.010	57	03.1.161	16
01.1.011	61	03.1.163	16
01.1.012	57	03.1.165	16
01.1.013	16	03.1.167	16
01.1.014	61	03.1.169	16
01.1.015	16	03.1.170A	42
01.1.016	61	03.1.170B	11
01.1.017	16	03.1.173	16
01.1.018	61	03.1.174	16
01.1.019A	16	03.1.175	16
01.1.019B	EX	03.1.176	16
01.1.021	16	03.1.177	16
01.1.023	EX	03.1.178	16
01.1.024	1	03.1.180	16
01.1.025	16	03.1.181	16
01.1.027	1	03.1.182	16
01.1.029	16	03.1.183	16
01.1.031	59	03.1.184	16
01.1.033	16	03.1.186	7
01.1.034	16	03.1.187	16
01.1.035	16	03.1.188	10
01.1.037	16	03.1.189	6
01.1.038	EX	03.1.191A	53
01.1.103	61	03.1.191B	53
01.3.001	4	03.1.192A	9
01.3.003A	1	03.1.192B	6
01.3.005	EX	03.1.194	16
03.0.001	68	03.1.195	16
03.0.001B	61	03.1.196	1
03.0.004	16	03.1.197	16
03.0.031	10	03.1.198	16
03.0.054	3	03.1.199	16
03.0.54	64	03.1.200	11
03.1.146	1	03.1.201	12
03.1.147	16	03.1.202	13
03.1.148	16	03.1.203	EX
03.1.149	16	03.1.204	EX
03.1.150	16	03.1.205B	AL7
03.1.151	16	03.1.206A	69

<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>	<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>
03.1.207	EX	03.2.115	16
03.1.208	EX	03.2.116	16
03.1.209	EX	03.2.117	16
03.1.210	EX	03.2.118	16
03.1.211	EX	03.2.119	16
3.1.212	62	03.2.120	16
03.1.213A	EX	03.2.121	16
03.1.213B	EX	03.2.122	16
03.1.214	EX	03.2.123	16
03.1.215	EX	03.2.124A	16
03.1.216	-	03.2.124B	16
03.1.S1	EX	03.2.125	16
03.1.S2	63	03.2.127	16
03.1.S3	70	03.2.128	16
03.1.S4A	35	03.2.129	16
03.1.S4B	AL7	03.2.130	16
03.2.053A	2	03.2.131	1
03.2.053B	4	03.2.132	16
03.2.053C	2	03.2.134A	10
03.2.087	16	03.2.134B	10
03.2.088	7	03.2.136	16
03.2.089	16	03.2.137	16
03.2.090	16	03.2.138	16
03.2.091	16	03.2.139	16
03.2.093A	7	03.2.140	16
03.2.093B	7	03.2.141	16
03.2.094	16	03.2.142	16
03.2.095	16	03.2.144	16
03.2.096	16	03.2.145A	EX
03.2.097	16	03.2.145B	EX
03.2.098	16	03.2.146	16
03.2.099	16	03.2.147	EX
03.2.100	16	03.2.148	16
03.2.101	16	03.2.149A	EX
03.2.102	16	03.2.149B	EX
03.2.103	16	03.2.151	EX
03.2.104	16	03.2.152	EX
03.2.105	16	03.2.153	EX
03.2.106	16	03.2.154	16
03.2.107	16	03.2.155	EX
03.2.108	6	03.2.156	16
03.2.109	15	03.2.157	EX
03.2.110	16	03.2.158	16
03.2.112A	16	03.2.S1	80
03.2.112B	6	03.2.S2	65
03.2.113	11	03.2.S3	EX

<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>	<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>
03.3.137A	9	03.3.185	EX
03.3.137B	4	03.3.186A	3
03.3.137C	2	03.3.186B	10
03.3.138	2	03.3.187	16
03.3.139	16	03.3.188	16
03.3.140	16	03.3.189	16
03.3.141	10	03.3.190	EX
03.3.142	16	03.3.191	16
03.3.143	53	03.3.193	10
03.3.144	16	03.3.194	16
03.3.145	15	03.3.195	16
03.3.146	16	03.3.196	16
03.3.147	16	03.3.197	16
03.3.149	16	03.3.198	16
03.3.150	16	03.3.199	16
03.3.151	16	03.3.200	16
03.3.152	16	03.3.201	16
03.3.153	16	03.3.202	16
03.3.154	16	03.3.203	16
03.3.155	16	03.3.205	16
03.3.156	3	03.3.S1A	EX
03.3.157	16	03.3.S1B	EX
03.3.158	10	03.3.S2	65
03.3.159	16	03.3.S3	EX
03.3.160	16	04.0.001A	58
03.3.161	16	04.0.001B	EX
03.3.163	16	04.0.003	16
03.3.165	16	04.0.004	18
03.3.166	7	04.0.006	18
03.3.167	16	04.0.007A	23
03.3.168	16	04.0.007B	16
03.3.169	16	04.0.007C	16
03.3.170	1	04.0.007D	-
03.3.171	EX	04.0.008	18
03.3.172	EX	04.0.010	24
03.3.174A	EX	04.0.011	41
03.3.174B	EX	04.0.012	16
03.3.175	16	04.0.013	25
03.3.176	EX	04.0.014	16
03.3.177	16	04.0.016	18
03.3.179	16	04.0.018	40
03.3.180	10	04.0.018B	5
03.3.181	16	04.0.019	20
03.3.182	16	04.1.001A	EX
03.3.183	EX	04.1.001B	43
03.3.184	EX	04.1.003A	11

<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>	<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>
04.1.003B	16	04.1.050	72
04.1.005A	41	04.2.001A	26
04.1.005B	41	04.2.001B	77
04.1.006	16	04.2.001C	19
04.1.009	16	04.2.001D	78
04.1.010	18	04.2.002	75
04.1.011	18	04.2.003	29
04.1.012	18	04.2.004	EX
04.1.013	16	04.2.005	28
04.1.014	16	04.2.008	45
04.1.015	16	04.2.009	45
04.1.016	16	10.1.001A & B	AL1
04.1.017A	11	10.1.001C & D	AL2
04.1.017B	11	10.1.002A & B	AL3
04.1.018	16	10.1.002C & D	AL4
04.1.019	18	10.1.002E & F	AL5
04.1.020	16	10.1.003A & B	-
04.1.021	74	10.1.004A	23
04.1.022	66	10.1.004B	23
04.1.023	18	10.1.005A	23
04.1.024	18	10.1.005B	23
04.1.026	16	10.1.006	46
04.1.027	16	10.1.007	31
04.1.028	16	10.1.008A	16
04.1.029	16	10.1.008B	22
04.1.030	16	10.1.009	15
04.1.031	16	10.1.010	16
04.1.032	16	10.1.011	16
04.1.033	25	10.1.012	16
04.1.034	16	10.1.013	16
04.1.035	25	10.1.014	16
04.1.036	EX	10.1.015	16
04.1.038	18	10.1.016	16
04.1.039	16	10.1.017	18
04.1.040	67	10.1.018	16
04.1.041	11	10.1.019	16
04.1.042	16	10.1.020	16
04.1.043	16	10.1.021	16
04.1.044	15	10.1.022	47
04.1.045A	64	10.1.023	30
04.1.046	71	10.1.024	76
04.1.047A & B	AL8	10.1.025	48
04.1.047C & D	AL9	10.1.026	32
04.1.048	22	10.1.027	32
04.1.049A	79	10.1.028A & B	AL14
04.1.049B	79		

<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>	<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>
10.1.029	49	10.1.078C	2
10.1.030	8	10.1.078D	2
10.1.031A	33	10.1.079	10
10.1.031B	34	10.1.080	10
10.1.032	16	10.1.082	10
10.1.033A	16	10.1.083	10
10.1.033B	6	10.1.084	10
10.1.034	8	10.1.087	16
10.1.036	73	10.1.088	16
10.1.039	16	10.1.089	16
10.1.040	16	10.1.090	16
10.1.041	16	10.1.091	16
10.1.042	16	10.1.092	16
10.1.043	16	10.1.093	16
10.1.044	16	10.1.094	16
10.1.045	16	10.1.095	16
10.1.046	16	10.1.096	16
10.1.047	16	10.1.097	16
10.1.048	16	10.1.099	16
10.1.049	16	10.1.100	16
10.1.050	16	10.1.101	16
10.1.051	16	10.1.102	16
10.1.052	16	10.1.103	16
10.1.053	16	10.1.104	16
10.1.054	6	10.1.106	16
10.1.055	16	10.1.107	16
10.1.056	16	10.1.108	16
10.1.058	16	10.1.109	16
10.1.059	16	10.1.112	16
10.1.062	1	10.1.113	16
10.1.063	16	10.1.114	16
10.1.064	16	10.1.115	16
10.1.065	16	10.1.116	16
10.1.066	16	10.1.117	16
10.1.067	16	10.1.118	16
10.1.068	16	10.1.119	16
10.1.069	16	10.1.120	16
10.1.070	16	10.1.121	16
10.1.071	16	10.1.122	16
10.1.072	16	10.1.123	16
10.1.073	1	10.1.124	16
10.1.074	11	10.1.125	16
10.1.076	1	10.1.126	16
10.1.077	1	10.1.128	16
10.1.078A	33	10.1.131	16
10.1.078B	2	10.1.132	16

<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>	<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>
10.1.133	16	10.2.018A	14
10.1.134	16	10.2.018B	22
10.1.135	10	10.2.019	16
10.1.136	16	10.2.020	16
10.1.137	16	10.2.021	54
10.1.138	16	10.2.022	23
10.1.140	8	10.2.023A	54
10.1.141	16	10.2.023B	22
10.1.143	16	10.2.024A	18
10.1.144	16	10.2.024B	23
10.1.145A	13	10.2.026A	23
10.1.145B	17	10.2.026B	18
10.1.160	10	10.2.028	41
10.1.164	10	10.2.029	23
10.1.166	10	10.2.030	7
10.1.S2A	35	10.2.031A	9
10.1.S2B	60	10.2.031B	6
10.2.001	50	10.2.033A	54
10.2.002	56	10.2.033B	23
10.2.003	36	10.2.034	30
10.2.004A	51	10.2.035	18
10.2.004B	51	10.2.036	7
10.2.004D	52	10.2.037	41
10.2.004E	52	10.2.038	54
10.2.004F	-	10.2.040A	41
10.2.004G	-	10.2.040B	41
10.2.004H	-	10.2.041A	21
10.2.004I	-	10.2.041B	25
10.2.005A	38	10.2.042A	41
10.2.005B	38	10.2.042B	23
10.2.005C	53	10.2.044A	41
10.2.005D	53	10.2.044B	23
10.2.007A	36	10.2.045	23
10.2.007B	27	10.2.046	23
10.2.008	16	10.2.047	16
10.2.009	16	10.2.048	16
10.2.010A	54	10.2.049	16
10.2.010B	23	10.2.050	16
10.2.010C	22	10.2.051	16
10.2.011	18	10.2.052	18
10.2.012	38	10.2.054	39
10.2.013	53	10.2.057A	11
10.2.014	32	10.2.057B	55
10.2.015	32	10.2.058	16
10.2.016	49	10.2.059	16
10.2.017	8	10.2.060	16

<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>	<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>
10.2.061	16	10.3.021	16
10.2.062	16	10.3.023	16
10.2.063	16	10.3.024	15
10.2.064A	11	10.3.025	16
10.2.064B	56	10.3.026A	16
10.2.065	16	10.3.026B	16
10.2.066	10	10.3.027	44
10.2.067	16	10.3.028	7
10.2.068	44	10.3.029	6
10.2.069	16	10.3.030	16
10.2.071	6	10.3.031	16
10.2.072	16	10.3.032	16
10.2.073	3	10.3.033A	16
10.2.074	16	10.3.033B	16
10.2.075	16	10.3.034	16
10.2.076	16	10.3.035	16
10.2.077	16	10.3.036	16
10.2.078	16	10.3.037	16
10.2.079	16	10.3.038	16
10.2.080	16	10.3.039	16
10.2.081	16	10.3.040	16
10.2.082	16	10.3.041	16
10.2.083	16	10.3.042	16
10.2.084	13	10.3.043	16
10.2.085	16	10.3.044	16
10.2.S2	35	10.3.046	16
10.3.002A	37	10.3.048	39
10.3.002B	36	10.3.049	6
10.3.003	38		
10.3.004	38	10.3.050	6
10.3.005	32	10.3.051	6
10.3.006	32	10.3.052	10
10.3.007	49	10.3.053	16
10.3.008	8	10.3.054	16
10.3.010A	33	10.3.055	16
10.3.010B	2	10.3.056	16
10.3.010C	2	10.3.057	16
10.3.013	16	10.3.058	16
10.3.014	16	10.3.059	16
10.3.015	16	10.3.061	16
10.3.016	16	10.3.063	16
10.3.017	16	10.3.064	16
10.3.019	16	10.3.065	16
10.3.020	11	10.3.066	16

<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>	<u>DOOR NUMBER</u>	<u>HARDWARE SET</u>
10.3.067	16	10.3.117	16
10.3.068	16	10.3.118	16
10.3.069	16	10.3.119	16
10.3.071	10	10.3.121	16
10.3.072	16	10.3.123	13
10.3.073	16	10.3.124	16
10.3.074	16	10.3.125	16
10.3.075	16	10.3.126	16
10.3.076	16	10.3.127	16
10.3.077	16	10.3.128	16
10.3.078	16	10.3.129	16
10.3.079	10	10.3.130	16
10.3.080	16	10.3.131	16
10.3.081	16	10.3.132	16
10.3.082	16	10.3.133	16
10.3.083	16	10.3.134	16
10.3.084	16	10.3.135	16
10.3.085	10	10.3.136	6
10.3.087	16	10.3.S1A	-
10.3.089	16	10.3.S1B	-
10.3.090	16	10.3.S2	35
10.3.091	16		
10.3.092	16	ALT.001, ALT.002	AL10
10.3.094	16	ALT.003	AL11
10.3.095	16	ALT.004	AL9
10.3.096	16	ALT.005A	AL12
10.3.097	16	ALT.005B	EX
10.3.098	16	ALT.006	AL13
10.3.099	16	ALT.007	AL13
10.3.101	16	ALT.008	AL7
10.3.102	16		
10.3.103	16		
10.3.104	16		
10.3.105	16		
10.3.106	16		
10.3.107	16		
10.3.108	16		
10.3.109	16		
10.3.112	16		
10.3.113A	7		
10.3.113B	7		
10.3.114	16		
10.3.115	16		
10.3.116	16		

SECTION 08 80 00.00

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Glass for windows, doors, interior borrowed lites, and storefront framing.
2. Glazing sealants and accessories.
3. Applied graphic film.

1.2 COORDINATION

- ###### A.
- Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.3 ACTION SUBMITTALS

- ###### A.
- Product Data: For each type of product.
- ###### B.
- Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.
- ###### C.
- Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- ###### D.
- Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 WARRANTY

- ###### A.
- Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
1. Warranty Period: 10 years from date of Substantial Completion.
- ###### B.
- Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written

instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

1. Manufacturer used in this section shall refer to a firm that produces primary glass or fabricated glass as defined in the basis of design standard:
 - a. Oldcastle Building Envelope.
 - b. Guardian Industries Corp.; SunGuard.
 - c. Pilkington North America.
 - d. Cardinal Glass Industry, Inc.
 - e. PPG Industries.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer.
- B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the International Building Code and ASTM E 1300.
 1. Design Wind Pressures.
 2. Design Snow Loads: 30 lbs./sq.ft.
 3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
 2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
- C. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

2.5 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
 - 1. Sealing System: Dual seals.
 - 2. Spacer: Manufacturer's standard spacer material and construction.

2.6 GLAZING SEALANTS

- A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

2.7 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
1. AAMA 804.3 tape, where indicated.
 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.9 APPLIED GRAPHIC FILM

- A. Basis of Design Products: Subject to compliance provide the following or comparable products.
 - 1. Ultra-Cool: SX-SC320 Silver Static Cling; 36-inches wide at all observation and visitation rooms.
 - 2. Self-adhesive perforated vinyl one way vision film. 80 microns thick, white front / black back. Full color, 720-1440 DPI, eco solvent printing. Verify design with Owner. At CJU Room 10.1.005.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Adjust glazing channel dimensions as required by project conditions during installation to provide necessary bite on glass, minimum edge and face clearance and adequate sealant thicknesses, with reasonable tolerances.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Apply heel bead of elastomeric sealant.
- F. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.4 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

- C. Remove and replace glass that is damaged during construction period.

3.5 MONOLITHIC GLASS

- A. Clear fully tempered float glass.
 - 1. Minimum Thickness: ¼-inch.
 - 2. Provide safety glazing labeling.
- B. Clear fully tempered float glass.
 - 1. Minimum Thickness: ½-inch.
 - 2. Provide safety glazing labeling.
- C. (2) layers clear fully tempered ¼-inch float glass with between the glass blinds.
 - 1. Provide microblinds and accessories.
 - 2. Integrate with tempered glass, sealants and controls.
 - 3. Direct drive, single side controls.
 - 4. Control knob design and blind slat color to be selected by Architect.

3.6 INSULATING GLASS

- A. Low-E-coated insulating glass.
 - 1. Basis-of-Design: Subject to compliance with requirements, provide Oldcastle Building Envelope fabrication as follows:
 - a. Exterior Lite: ¼-inch PPG Solargray®.
 - b. Interior Lite: ¼-inch PPG Solarban® 60 on Clear Low-E #3.
 - c. ½-inch Cavity: ½-inch (90% Argon Fill).
 - d. Performance Characteristics:

<u>Thermal</u>		<u>Optical</u>	
Winter U-factor/U-value:	0.24	Visible Light Transmittance:	35%
Summer U-factor/U-value	0.22	Visible Light Reflectance (outside):	7%
Solar Heat Gain Coefficient:	0.28	Visible Light Reflectance (inside):	9%
Shading Coefficient:	0.32	Total Solar Transmittance:	18%
Relative Heat Gain (Btu/hr-ft ²):	68	Total Solar Reflectance (outside):	13%
Light to Solar Gain:	1.25	Ultraviolet Transmittance:	8%

- B. Insulating Spandrel glass.
 - 1. Provide Spandrel glass units from same manufacturer ad insulating glass. Spandrel glass to match visual effect of insulating vision glass units.

END OF SECTION

DIVISION 9 – FINISHES

SECTION 09 22 16.00	NON-STRUCTURAL METAL FRAMING
SECTION 09 26 13.00	GYPSUM VENEER PLASTERING
SECTION 09 29 00.00	GYPSUM BOARD
SECTION 09 30 00.00	TILING
SECTION 09 51 13.00	ACOUSTICAL PANEL CEILINGS
SECTION 09 65 13.00	RESILIENT BASE AND ACCESSORIES
SECTION 09 65 19.00	RESILIENT TILE FLOORING
SECTION 09 66 00.00	STRIPPING AND CLEANING DIRTY OR DISCOLORED TERRAZZO FLOORS
SECTION 09 68 13.00	TILE CARPETING
SECTION 09 91 13.00	EXTERIOR PAINTING
SECTION 09 91 23.00	INTERIOR PAINTING
SECTION 09 93 00.00	STAINING AND TRANSPARENT FINISHING

SECTION 09 22 16.00

NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior gypsum board assemblies.
2. Suspension systems for interior gypsum ceilings and soffits.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Provide materials and construction identical to those tested according to ASTM E 119.
- B. STC-Rated Assemblies: Provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413.

2.2 FRAMING SYSTEMS

- A. Steel Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners of equivalent minimum base-metal thickness.
 1. Minimum Base-Metal Thickness: 0.027 inch (0.68 mm).
 2. Depth: As indicated on Drawings.
- B. Slip-Type Head Joints: Where indicated, provide one of the following:
 1. Single Long-Leg Track System: ASTM C 645 top track with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top track and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.
 2. Double-Track System: ASTM C 645 top outer tracks, inside track with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.

3. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- C. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Metal Thickness: 0.027 inch (0.68 mm).
- D. Cold-Rolled Channel Bridging: Steel, 0.053-inch (1.34-mm) minimum base-metal thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Depth: 1-1/2 inches (38 mm).
 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.068-inch- (1.72-mm-) thick, galvanized steel.
- E. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm).
 2. Depth: 7/8 inch (22.2 mm).
- F. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.
- G. Cold-Rolled Furring Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Depth: 3/4 inch (19 mm).
 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch (0.8 mm).
 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.
- B. Hanger Attachments to Concrete:
1. Powder-Actuated Fasteners: Capable of sustaining, a load equal to 10 times that imposed as determined by ASTM E 1190.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch (4.12 mm) in diameter.
- D. Flat Hangers: Steel sheet, 1 by 3/16 inch (25 by 5 mm) by length indicated.
- E. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch (1.34 mm) and minimum 1/2-inch- (13-mm-) wide flanges.

1. Depth: 1-1/2 inches (38 mm).

F. Furring Channels (Furring Members):

1. Cold-Rolled Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges, 3/4 inch (19 mm) deep.
2. Steel Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners of equivalent minimum base-metal thickness.
 - a. Minimum Base-Metal Thickness: 0.027 inch (0.68 mm).
 - b. Depth: 1-5/8 inches (41 mm).
3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22 mm) deep.
 - a. Minimum Base-Metal Thickness: 0.027 inch.

2.4 AUXILIARY MATERIALS

- A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide asphalt saturated organic felt or foam gasket.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 1. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C 844 that apply to framing installation.
 2. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.2 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 - 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Direct Furring:
 - 1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.

3.3 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

- a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - 3. Do not attach hangers to steel roof deck.
 - 4. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 - 5. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 - 6. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION

SECTION 09 26 13.00
GYPSUM VENEER PLASTERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gypsum veneer plaster and gypsum base for veneer plaster.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain gypsum veneer plaster products, including gypsum base for veneer plaster, joint reinforcing tape, and embedding material, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.3 GYPSUM VENEER PLASTER

- A. One-Component Gypsum Veneer Plaster: ASTM C 587, ready-mixed, smooth, finish-coat veneer plaster formulated for application directly over substrate without use of separate base-coat material.
 1. Products: Subject to compliance with requirements, may be incorporated into the Work include, but are not limited to, the following:

- a. National Gypsum Company; Uni-Kal Plaster.

2.4 PANEL PRODUCTS

- A. Gypsum Base for Veneer Plaster: ASTM C 1396/C 1396M.

- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- a. National Gypsum Company; Kal-Core Regular.

- 2. Thickness: 1/2 inch (12.7 mm) unless indicated otherwise.

- B. Gypsum Base for Veneer Plaster, Type X: ASTM C 1396/C 1396M.

- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- a. National Gypsum Company; Kal-Core Fire-Shield, Type X.

- 2. Thickness: 5/8 inch (15.9 mm).

2.5 TRIM ACCESSORIES

- A. Standard Trim: ASTM C 1047, provided or approved by manufacturer for use in gypsum veneer plaster applications indicated.

2.6 JOINT REINFORCING MATERIALS

- A. General: Comply with joint strength requirements in ASTM C 587 and with gypsum veneer plaster manufacturer's written recommendations for each application indicated.

- B. Joint Tape: As recommended by gypsum veneer plaster manufacturer for applications indicated.

- C. Embedding Material for Joint Tape: As recommended by gypsum veneer plaster manufacturer for use with joint-tape material and gypsum veneer plaster applications indicated.

2.7 AUXILIARY MATERIALS

- A. Bonding Agent: ASTM C 631, polyvinyl acetate.

- B. Laminating Adhesive: Adhesive or joint compound recommended by manufacturer for directly adhering gypsum-base, face-layer panels to backing-layer panels in multilayer construction.

- C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
- D. Acoustical Joint Sealant: As specified in Section 07 92 00.00 "Joint Sealants."
- E. Patching Mortar: Dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

PART 3 - EXECUTION

3.1 INSTALLING PANELS

- A. Gypsum Base for Veneer Plaster: Apply according to ASTM C 844 unless manufacturer's written recommendations are more stringent.
1. Erection Tolerance: No more than 1/16-inch (1.6-mm) offsets between planes of gypsum base panels, and 1/8 inch in 8 feet (3 mm in 2.4 m) noncumulative, for level, plumb, warp, and bow.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.
- C. Install trim with back flanges intended for fasteners, and attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- D. Control Joints: Install according to ASTM C 844 and in specific locations approved by Architect.
- E. Gypsum Base: Reinforce interior angles and flat joints with joint tape and embedding material to comply with ASTM C 843 and with gypsum veneer plaster manufacturer's written recommendations.
- F. Abuse-Resistant Base: Reinforce joints between abuse-resistant panels with joint tape and embedding material according to panel manufacturer's written recommendations.
- G. Glass-Mat Interior Gypsum Board: Reinforce joints between moisture- and mold-resistant panels with joint tape and embedding material according to panel manufacturer's written recommendations.

3.2 GYPSUM VENEER PLASTERING

- A. Bonding Agent: Apply bonding agent where required and according to gypsum veneer plaster manufacturer's written recommendations.
- B. Gypsum Veneer Plaster Mixing: Mechanically mix gypsum veneer plaster materials to comply with ASTM C 843 and with gypsum veneer plaster manufacturer's written recommendations.

- C. Gypsum Veneer Plaster Application: Comply with ASTM C 843 and with veneer plaster manufacturer's written recommendations.
1. One-Component Gypsum Veneer Plaster: Trowel apply base coat over substrate to uniform thickness. Fill all voids and imperfections. Immediately double back with same mixer batch of plaster to a uniform total thickness of 1/16 to 3/32 inch (1.6 to 2.4 mm).
 2. Two-Component Gypsum Veneer Plaster:
 - a. Base Coat: Hand trowel or machine apply base coat over substrate to a uniform thickness of 1/16 to 3/32 inch (1.6 to 2.4 mm). Fill all voids and imperfections.
 - b. Finish Coat: Trowel apply finish-coat plaster over base-coat plaster to a uniform thickness of 1/16 to 3/32 inch (1.6 to 2.4 mm).
 3. Where gypsum veneer plaster abuts only metal door frames, windows, and other units, groove finish coat to eliminate spalling.
 4. Do not apply veneer plaster to gypsum base if paper facing has degraded from exposure to sunlight. Before applying veneer plaster, use remedial methods to restore bonding capability to degraded paper facing according to manufacturer's written recommendations.
- D. Concealed Surfaces: Do not omit gypsum veneer plaster behind cabinets, furniture, furnishings, and similar removable items.
- E. Gypsum Veneer Plaster Finish: To match surrounding existing surfaces.

END OF SECTION

SECTION 09 29 00.00

GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Tile backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 INTERIOR GYPSUM BOARD

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

1. American Gypsum.
2. CertainTeed Corp.
3. Georgia-Pacific Gypsum LLC.
4. Lafarge North America Inc.
5. National Gypsum Company.
6. PABCO Gypsum.
7. Temple-Inland.
8. USG Corporation.

B. Gypsum Wallboard: ASTM C 1396/C 1396M.

1. Thickness: 5/8 inch.
 2. Long Edges: Tapered.
- C. Gypsum Board, Type X: ASTM C 1396/C 1396M.
1. Thickness: 5/8 inch.
 2. Long Edges: Tapered.
- D. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
1. Thickness: 5/8 inch.
 2. Long Edges: Tapered.
 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
 4. At all toilet room walls.

2.3 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed Corp.; GlasRoc Tile Backer.
 - b. Georgia-Pacific Gypsum LLC; DensShield Tile Backer.
 2. Thickness: 5/8 inch.
 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
 4. At all ceramic tile walls.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
- B. Aluminum Trim: ASTM B 221 (ASTM B 221M), Alloy 6063-T5.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
1. Interior Gypsum Board: Paper.
 2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 3. Tile Backing Panels: As recommended by panel manufacturer.

- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

2.6 AUXILIARY MATERIALS

- A. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
- C. Acoustical Joint Sealant: As specified in Section 07 92 00.00 "Joint Sealants."

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

- A. Comply with ASTM C 840.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- D. Install trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
 - 1. Aluminum Trim: Install in locations indicated on Drawings.
 - 2. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- E. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 09 91 23.00 "Interior Painting."

- H. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture (light orange peel) matching ARCHITECT's sample, free of starved spots or other evidence of thin application or of application patterns.
- I. Protect adjacent surfaces from drywall compound and texture finishes and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- J. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION

SECTION 09 30 00.00

TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ceramic tile.
2. Terrazzo tile.
3. Precast epoxy terrazzo self-supporting stair tread and riser.

1.2 ACTION SUBMITTALS

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

B. Samples:

1. Each type and composition of tile and for each color and finish required.
2. Assembled samples, with grouted joints, for each type and composition of tile and for each color and finish required.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering and identified with labels describing contents.

1. **Tile and Trim Units:** Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

1.4 WARRANTY

A. Manufacturer / installer shall warrant installed system for a period of one year from date of Substantial Completion against failure of workmanship and materials.

PART 2 - PRODUCTS

2.1 TILE PRODUCTS

A. ANSI Ceramic Tile Standard: Provide Standard grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

B. Terrazzo Tile Standards:

1. Setting and Grouting Materials: Provide materials obtained from one source for each type and color of grout and setting materials.
2. NTMA Standards: Comply with specified provisions and recommendations of NTMA.
3. TCNA Standards: Comply with specifications under the current Handbook for Tile Installation.
4. Manufacturer to supply written Terrazzo Tile Protocol, upon request.

C. Precast Epoxy Terrazzo Self-Supporting Stair Tread & Riser Standards:

1. NTMA Standards: Comply with specified provisions and recommendations of the National Terrazzo & Mosaic Association, Inc. (NTMA).
2. Manufacturer's Instructions: In addition to specified requirements, comply with precast terrazzo manufacturer's instructions and recommendations for substrate preparation, materials storage, mixing and application, finishing and curing.
3. Qualifications: Precast Terrazzo Manufacturer and Trade Contractor must have a minimum of 5 years of successful experience on projects of similar magnitude and complexity to that indicated project. Manufacturer and Contractor to be prequalified by Architect prior to bidding. Failure to prequalify will void bid.
4. Manufacturer to supply a written Quality Assurance Program and Procedure manual.

D. Ceramic Wall Tile: Glazed ceramic tile; colors to match or be similar to those in Room 1.2.0.05.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Olean; Division of Dal-Tile International Inc.
 - b. Crossville, Inc.
 - c. Daltile; Division of Dal-Tile International Inc.
2. Composition: Porcelain.
3. Module Size: 4 by 4 inch.
4. Thickness: 1/4 inch or 5/16 inch.
5. Tile Color and Pattern: See existing toilet room colors and drawings.
6. Grout Color: As selected by Architect from manufacturer's full range.
7. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
 - a. Base Cove: Cove, module size 4 by 4 inch.
 - b. Wainscot Cap: 4 by 4 inch.

E. Ceramic Floor Tile: Factory mounted glazed ceramic tile; colors to match or be similar to those in Room 1.2.0.05.

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

- a. American Olean; Division of Dal-Tile International Inc.
 - b. Crossville, Inc.
 - c. Daltile; Division of Dal-Tile International Inc.
 - 2. Composition: Porcelain.
 - 3. Module Size: 2 by 2 inch.
 - 4. Thickness: 1/4 inch or 5/16 inch.
 - 5. Surface: Slip resistant.
 - 6. Tile Color and Pattern: See existing toilet room colors and drawings.
 - 7. Grout Color: As selected by Architect from manufacturer's full range.
- F. Terrazzo Floor Tile:
- 1. Basis of Design Product: Subject to compliance with requirements, provide "Tectura Design" by Wausau Tile, Inc. or an approved equal product.
 - 2. Composition: Pressed cement terrazzo tile.
 - 3. Module Size: 18 by 18 inches.
 - 4. Thickness: 5/8 inch.
 - 5. Tile Color and Pattern: See drawings.
 - 6. Grout Color: As selected by Architect from manufacturer's full range.
 - 7. Finish: Honed.
- G. Precast Epoxy Terrazzo Self-Supporting Stair Tread and Riser:
- 1. Basis of Design Product: Subject to compliance with requirements, provide "ESS31. Stair Tread" by Wausau Tile, Inc. or an approved equal product.
 - 2. Composition: Epoxy resin.
 - 3. Module Style: ESS31.
 - 4. Thickness: 2-1/2 inches.
 - 5. Tread and Riser Color and Pattern: See Drawings.

2.2 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated.
- B. Chlorinated-Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric; 0.030-inch (0.76-mm) nominal thickness.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Noble Company (The); Nobleseal CIS.

2.3 SETTING MATERIALS

- A. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Bostik, Inc.
 - b. Custom Building Products.
 - c. Summitville Tiles, Inc.
 - d. Mapei Corporation.
2. Prepackaged, dry-mortar mix to which only water must be added.
3. Prepackaged, dry-mortar mix combined with liquid-latex additive.
4. For wall applications, provide nonsagging mortar.

B. Epoxy Mortar (Terrazzo Tile Locations): ANSI A118.3, ISO 13007 R2/RG.

1. Basis of Design Product: Kerapoxy CQ, or equal.

2.4 GROUT MATERIALS

A. Polymer-Modified Tile Grout: ANSI A118.7.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Bostik, Inc.
 - b. Custom Building Products.
 - c. Summitville Tiles, Inc.
 - d. Mapei Corporation.
2. Polymer Type: Dry, redispersible form, prepackaged with other dry ingredients.

B. Epoxy Mortar (Terrazzo Tile Locations): ANSI A118.3, ISO 13007 R2/RG.

2. Basis of Design Product: Kerapoxy CQ, or equal.

2.5 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Metal Edge Strips: Angle or L-shape, stainless steel, ASTM A 666, 300 Series exposed-edge material.
- C. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- a. Custom Building Products; Grout Sealer.
 - b. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
 - c. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
- D. Seal all precast epoxy terrazzo with sealer approved by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.

3.3 INSTALLATION

- A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
1. For the following installations, follow procedures in the ANSI A108 Series of tile installation standards for providing 95 percent mortar coverage:
- a. Tile floor in wet areas.
 - b. Tile floors composed of tiles 8 by 8 inches (200 by 200 mm) or larger.
 - c. Tile floors composed of rib-backed tiles.
- B. Comply with the appropriate Installation Method as depicted in the current edition of the Tile Council of North America Handbook for Ceramic, Glass, and Stone Tile Installation for Terrazzo Tile. All specifications must also conform to local codes, ordinances, trade practices, and climatic conditions.

- C. For terrazzo tile, comply with the appropriate ANSI 118 and/or ISO 13007 standards and specifications. Setting materials manufacturer's printed installation instructions are to be followed in every instance. Materials NOT recommended are A-118.1 Dry-Set Mortars and A-136.1 Organic Adhesives. Only ANSI A-118.4 and ISO C2S1 mortars or better are recommended.
1. A minimum of 95 percent thin-set coverage is recommended on the back of the terrazzo tile. The corners of the tile must have good mortar support to prevent cracking. Back buttering is recommended to reach these requirements.
- D. For terrazzo tile, follow appropriate ANSI A-108 installation specifications that correspond with the selected TCNA Installation Method. This includes Substrate and Surfaces inspections, Location and Frequency of EJ171 Movement Joint Guidelines, Placement Techniques, and Grouting Procedures.
1. Minimum recommended grout joint width is 1/8-inch.
- E. For terrazzo tile, applied initial protectant – 3M Scotchgard™ Stone Floor Protector:
1. Contact your selected grouting materials manufacturer for installation questions.
 2. It is not required that the terrazzo tile be resealed prior to or after grouting.
 - a. When using a heavy pigmented grout, we suggest a grout release be applied prior to grouting. We suggest doing a test area to ensure the grout release was adequately applied.
 3. If a slight grout haze occurs, it can be effectively removed from the tile by using a 3M™ Eraser Pad 3600 Pink Pad with water and /or 3M™ Neutral Cleaner.
 - a. A floor buffer might be recommended to assist in cleaning.
 4. If a more difficult stain occurs, use a Scotch-Brite™ Doodlebug™ Easy Erasing Pad 4610 along with water and/or 3M™ Neutral Cleaner.
 5. For additional protectant information and long term care guidelines, please contact 3M™ via 1-800-852-9722 or www.3m.com/facility.
- F. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- G. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- H. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- I. Jointing Pattern: Lay tile in grid pattern and as indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the

use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

- J. Lay out tile wainscots to dimensions indicated.
- K. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00.00 "Joint Sealants."
- L. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.
- M. Grout Sealer: Apply grout sealer to grout joints in tile floors and walks according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- N. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.
- O. For welded attachment, contact manufacturer for recommended welding guidelines. Do not run a continuous weld when attaching terrazzo to avoid overheating and cracking of the terrazzo.

3.4 CARE AND MAINTENANCE OF TERRAZZO TILE

- A. Cleaning
 - 1. Dust mop or vacuum to remove sand, dust, and other contaminants off the surface.
 - 2. Damp mop lightly soiled floor with a Neutral Cleaner per the manufacturer's recommendations.
 - 3. For more aggressive cleaning, use a mechanical buffer or auto scrubber along with a 3M™ Red Buffer Pad 5100 and Neutral Cleaner per the manufacturer's recommendations.
 - a. For cleaning combined with light polishing, the Scotch-Brite™ Purple Diamond Pad Plus may be used on an auto scrubber.
 - 4. Clean up all spills immediately.
 - a. If a stain occurs, see Wausau Tile's technical bulletin titled Repair of Etch or Stained Terrazzo Tiles to assist with the repair.
 - 5. DO NOT use acidic cleaners, cleaners that contain citrus (d-limonene), 2-butoxyethanol (butly cellusolve), amine based cleaners, isopropyl alcohol, solvent based cleaners, degreasers, or non-neutral cleaners.
 - 6. DO NOT use spray buff products or chemical dust mop treatments.

B. Extended Care and Maintenance

1. Terrazzo tile may be periodically burnished using Scotch-Brite™ Purple Diamond Pad Plus to maintain gloss. No additional Scotchgard™ Stone Floor Protector needs to be applied to restore gloss.
 - a. When the terrazzo tile no longer returns to gloss by burnishing, an additional application of Scotchgard™ Stone Floor Protector should be applied.
2. Scotchgard™ Stone Floor Protector will wear down over time due to floor traffic. On average, high traffic areas should be recoated at least once every 6 months. Light to moderated traffic areas should be recoated at least once a year.
 - a. Please contact 3M via 1-800-852-9722 or www.3m.com/facility and follow their procedures for reapplication of Scotchgard™ Stone Floor Protector.

END OF SECTION

SECTION 09 51 13.00
ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for ceilings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

2.2 ACOUSTICAL PANEL CEILINGS, GENERAL

- A. Glass-Fiber-Based Panels.
- B. Acoustical Panel Standard: Comply with ASTM E 1264.
- C. Metal Suspension System Standard: Comply with ASTM C 635.
- D. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

2.3 ACOUSTICAL PANELS ACT-1

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. CertainTeed Corp. HHF-157.
- B. Color: White.
- C. LR: .83.
- D. NRC: .55.
- E. CAC: 33.
- F. Edge/Joint Detail: Trim.
- G. Thickness: 5/8 inch (15 mm).
- H. Modular Size: 24 by 24 inches (610 by 610 mm).

2.4 GYPSUM PANELS ACT-2

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to:
 - 1. CertainTeed Corp. 1112-OVT-1.
- B. Color: White.
- C. CAC: 40.
- D. LR: .90.
- E. Edge Detail: Trim.
- F. Thickness: ½”.
- G. Modular Size: 24” x 24”.

2.5 FULLY ACCESSIBLE WOOD PANELS ACT-3

- A. Manufacturer: Subject to compliance with requirements, available manufacturer's offering products that may be incorporated into the work include, but are not limited to:
 - 1. Armstrong Woodworks Vector:
 - a. 15/16-inch vector – ¼ reveal.
 - b. Woodworks 4-inch trim.
 - c. W3-Rd 6006 perforations.

- d. Veneer to be chosen by Architect from manufacturer's full range.
- e. Size: 24-inch by 24-inch by ¾-inch.
- f. Class A Fire Rating.
- g. NRR: 40.

2.6 METAL SUSPENSION SYSTEM ACT-1 & ACT-2

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Chicago Metallic Corporation.
- B. Narrow-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation; with prefinished 15/16-inch-wide metal caps on flanges.
 - 1. Structural Classification: Intermediate-duty system.
 - 2. End Condition of Cross Runners: Override (stepped) or butt-edge type.
 - 3. Face Design: Flat, flush.
 - 4. Cap Material: Steel or aluminum cold-rolled sheet.
 - 5. Cap Finish: White.
- C. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

2.7 METAL SUSPENSION SYSTEM AND TRIM ACT-3

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Armstrong Prelude.
 - 2. Woodworks Veneer Trim: 4-inch.
 - a. Finish to match Woodworks vector panels.
 - 3. Include all accessories for a complete installation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

- B. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.
 - 1. Arrange directionally patterned acoustical panels as indicated on reflected ceiling plans.

END OF SECTION

SECTION 09 65 13.00

RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient base.
2. Vinyl molding accessories.
3. Rubber stair accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches (300 mm) long.

PART 2 - PRODUCTS

2.1 VINYL BASE

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

1. Armstrong World Industries, Inc.
2. Johnsonite; A Tarkett Company.
3. VPI, LLC, Floor Products Division.

B. Product Standard: ASTM F 1861, Type TV (vinyl, thermoplastic).

1. Group: I (solid, homogeneous) or II (layered).
2. Style: Coved.

C. Minimum Thickness: 0.125 inch (3.2 mm).

D. Height: 4 inches (102 mm).

E. Lengths: Coils in manufacturer's standard length.

F. Outside Corners: Preformed.

G. Inside Corners: Job formed or preformed.

- H. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 RUBBER STAIR ACCESSORIES (One-Piece Nosing Tread and Riser)

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. Basis-of-Design Product: Norament Grano Stairtreads, or comparable product by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Johnsonite; a Tarkett company.
 - 3. Nora Systems, Inc.
 - 4. Roppe Corporation, USA.
- C. Stair Treads: ASTM F 2169.
 - 1. Type: TS (rubber, vulcanized thermoset).
 - 2. Class: 2.
 - 3. Group: 1 (embedded abrasive strips).
 - 4. Nosing Height: ~1.77 inches.
 - 5. Thickness: ~.2 inches.
 - 6. Size: Lengths and depths to fit each stair tread in one piece.
 - 7. Integral Risers: Smooth, flat; in height that fully covers substrate.
- D. Colors and Patterns: As chosen by Architect from manufacturer's 12 standard colors.

2.3 VINYL MOLDING ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Burke Mercer Flooring Products, Division of Burke Industries, Inc.
 - 3. Flexco.
 - 4. Johnsonite; A Tarkett Company.
 - 5. Roppe Corporation, USA.
- B. Description: Vinyl reducers and/or wheeled traffic transitions.
- C. Profile and Dimensions: Use appropriate profile for conditions.
- D. Colors and Patterns: As selected by Architect from full range of industry colors.

2.4 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until they are the same temperature as the space where they are to be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.2 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.

3.3 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Stair Accessories:
 - 1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
 - 2. Tightly adhere to substrates throughout length of each piece.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

END OF SECTION

SECTION 09 65 19.00
RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vinyl composition floor tile.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 1. Show details of special patterns.
- C. Samples: Full-size units of each color and pattern of floor tile required.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 VINYL COMPOSITION FLOOR TILE

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Armstrong World Industries, Inc.
- B. Tile Standard: ASTM F 1066, Class 2, through-pattern tile.

- C. Wearing Surface: Smooth
- D. Thickness: 0.125 inch (3.2 mm).
- E. Size: 12 by 12 inches (305 by 305 mm).
- F. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
- C. Floor Polish: Match Owner's floor polish product.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
 - 4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- C. Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.

- D. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- E. Do not install floor tiles until they are the same temperature as the space where they are to be installed.
- F. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.2 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles square with room axis.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles with grain running in one direction.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.3 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.

1. Apply two coat(s).
- C. Cover floor tile until Substantial Completion.

END OF SECTION

SECTION 09 66 00.00

STRIPPING & CLEANING DIRTY OR DISCOLORED TERRAZZO FLOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. This procedure includes guidance on stripping and cleaning existing terrazzo which is dirty or has minor damage.
- B. Discoloration of terrazzo may be caused by was build-up, soap scum, overuse of disinfectant, epoxies and coatings that have yellowed, or by dirt tracked into an unsealed floor.
- C. Injurious acids, caustic soda or any ingredient independently or in combination in any compound fluid or solution which will damage the terrazzo shall NOT be used.
- D. Project/Site Conditions:
 - 1. Check manufacturer's literature for precautions and effects of products and procedures on adjacent building materials and components.
- E. General Protection (Surface and Surrounding):
 - 1. Do not change sources or brands of materials during the course of the work.
 - 2. All necessary precautions shall be taken to protect all parts of the building not being cleaned or repaired from effects of the work, including excessive amounts of water that should not be allowed to pond in any area.
 - 3. Provide protection against the spread of dust, debris and water at or beyond the work area by suitable enclosures of sheeting and tarpaulins.
 - 4. Provide masking or covering on adjacent surfaces and permanent equipment. Secure coverings without the use of adhesive type tape or nails. Impervious sheeting which produces condensation should not be used.
 - 5. Provide protection from water damage to building, structure, or building contents as required.
 - 6. Provide a method to prevent solids such as stone or mortar residue from entering the drains or drain lines. Contractor shall be responsible for cleaning out drains and drain liens that become blocked or filled by sand or any other solids because of work performed under this Contract.
 - 7. Scaffolding, ladders and working platforms, required for the execution of this work should be provided. These items should not be attached to the building.

1.2 REFERENCES

- A. NTMA Standards: Comply with specified provisions and recommendations of National Terrazzo and Mosaic Association, Inc. (NTMA), 3166 Des Plaines Avenue, Ste. 132, Des Plaines, IL 60018. 800/323-9736 or 708/635-7744, FAX (708) 635-9127.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements:

1. The objectives for terrazzo cleaning are to remove dirt, grime and coatings from the surfaces without damaging the underlying material and to give all the terrazzo a clean uniform appearance without blotches.

1.4 QUALITY ASSURANCE

- A. Where current codes cannot be complied with, and/or construction limitations (including deterioration of existing substrate) are such that the intended finish cannot be achieved, notify the Architect for clarification and/or decision prior to proceeding with the work.
- B. Field Verification: Field verify and identify all types and quantities of terrazzo that are part of the project.
- C. Mock-ups: Strip and clean 20 square feet of each terrazzo type for review by Architect and Owner before stripping and cleaning all the terrazzo.
- D. Contractor: The work shall be performed by a firm possessing a minimum of five (5) years of specializing experience in the restoration and cleaning of architectural terrazzo, similar to that which is required in this project.
 1. Note: The quality of the work is highly dependent on the competence of the contractor because it is not possible to anticipate every variation encountered in the surfaces, job conditions and methods used.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. ProSoCo, Inc., 755 Minnesota Avenue, P.O. Box 1578, Kansas City, KS 66117 (800/255-4255) or (913/281-2700).
- B. BASF-Wyandotte Corporation, Chemical Specialties Division, 1609 Biddle, Wyandotte, MI 48192 (313/246-6100).

2.2 MATERIALS

- A. Cleaner: Liquid, neutral chemical cleaner, with pH factor between 7 and 10 of formulation recommended by sealer manufacturer for type of terrazzo used, and complying with NTMA requirements, such as Sure Klean 859 (ProSoCo, Inc.), or approved equal.
- B. Interior Terrazzo Floor Sealer: Colorless, slip and stain resistant penetrating sealer with Ph factor between 7 and 10 that does not affect color or physical properties of terrazzo surface. Owner will provide sealer to be applied by Contractor.

- C. Compound Cleaner: A mildly abrasive phosphate free cleaning compound containing no caustic or harsh fillers, manufactured specifically for restorative type cleaning of terrazzo surfaces, such as “Wyandotte Detergent” (BASF-Wyandotte Corporation) or approved equal. – OR- Sure Klean Grout and Tile Cleaner (ProSoCo, Inc.) or approved equal.
- D. Clean, potable water, non-staining and free of oils, acids, alkalis and organic matter.

2.3 EQUIPMENT

- A. Wet vac.
- B. Paint roller.
- C. Low pressure tank sprayer.
- D. Power scrubber with scrub brush attachment.
- E. Stiff bristle brushes (natural or nylon bristle) – Do not use metal brushes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Perform a thorough examination of the existing conditions. Perform any necessary tests on an inconspicuous surface to determine the current conditions and appropriate steps and materials necessary for stripping terrazzo surfaces.

3.2 PREPARATION

- A. Protection:
 - 1. Take all necessary precautions and measures to protect all surrounding materials from damage that might be incurred during the terrazzo restoration work described in this outline specification. Any damage caused by the Contractor to other materials is unacceptable and shall be repaired or replaced by the Contractor to the satisfaction of the Owner, at no cost to the Owner.
 - 2. Improper use of chemicals may constitute a health hazard. Refer to manufacturer’s Material Safety Data Sheets for hazard data, special protection, for use and precautions to be taken in handling and storage. Comply with manufacturer’s recommendations for proper use of chemicals.

3.3 ERECTION, INSTALLATION AND APPLICATION

NOTE: The following procedure calls for stripping the floor down to the original surface, cleaning if necessary, and then sealing with a long-lasting sealer.

- A. Strip existing sealers and coatings from floor:

1. Apply chemical floor cleaner with paint roller and let stand for five to ten minutes. Work in areas no more than four feet wide to insure that the applicator is always standing on a dry floor.
2. Using a low pressure tank sprayer, apply a mist of water over the cleaner already on the floor. The water will emulsify the old sealer and dilute the thixotropic cleaner.
3. Pick up all remaining residues with a wet vac.
4. Using a power scrubber with a scrub brush attachment, scrub the floor until all coating material has been removed.
5. Pick up all liquid residues with a wet vac.
6. Thoroughly rinse the surface with clean, clear water.
7. Pick up all remaining liquid residues with a wet vac or allow to dry.

OR

If dirt and scratches have become so severe that normal stripping and cleaning no longer restore the floor to its original luster, the surface may be stripped using fine grit stones and resurfacing screens. Contact Architect and Owner prior to proceeding to get Owner approval.

CAUTION: This method of removing sealers and coatings involves grinding off a thin layer of the terrazzo. It should only be used as an extreme measure and a specialist must be consulted.

- B. If the floor is still dirty, clean using Sure Klean Grout and Tile Cleaner (ProSoCo, Inc.) or approved equal.
1. Dilute three to four parts water to one part Grout and Tile Cleaner.
 2. Pre-wet area to be cleaned.
 3. Apply cleaning solution with floor scrub brushes.
 4. Let stand two to three minutes while lightly agitating with the stiff, natural bristle brush, broom, or nylon brush.
 5. Thoroughly rinse the surface with clean, clear water.
 6. Pick up all remaining liquid residues with a wet vac and allow to dry.
- C. Seal the terrazzo surface with high strength sealer according to manufacturer's instructions.

END OF SECTION

SECTION 09 68 13.00

TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes modular, tufted textured loop carpet tile.
- B. The project includes re-use of existing carpet tile. See Demolition and Enlarged Finish Plans.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.
- B. Fire-Test-Response Ratings: Where indicated, provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104.

1.7 FIELD CONDITIONS

- A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

1.8 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.
 - 3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Products: Subject to compliance with requirements, provide the following:
 - 1. Interface: Grillwork 13812.
 - a. CPT-1, Color: Construction 5994.
 - b. CPT-2, Color: To be chosen by Architect from manufacturer's full range.
- B. Yarn System: Type 6 nylon.
- C. Pile Characteristic: Tufted textured loop.
- D. Yarn Weight: 18 oz.
- E. Pile Thickness: .12 inches for finished carpet tile.
- F. Backing System: GlasBac Tile.
- G. Size: 19.69 by 19.69 inches.
- H. Applied Soil-Resistance Treatment: Manufacturer's standard.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Preparation: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- E. Installation: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- F. Installation Method: As recommended in writing by carpet tile manufacturer.
- G. Maintain dye lot integrity. Do not mix dye lots in same area.
- H. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- I. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- J. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- K. Install pattern parallel to walls and borders.
- L. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- M. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."

END OF SECTION

SECTION 09 91 13.00

EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on exterior substrates. the following exterior substrates:
 - 1. Steel.
 - 2. Galvanized metal.

1.2 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples: For each type of paint system and each color and gloss of topcoat.
- C. Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Benjamin Moore & Co.
 2. Glidden Professional.
 3. Hallman/Lindsay Paints.
 4. PPG Architectural Finishes, Inc.
 5. Pratt & Lambert.
 6. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. Colors: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Concrete: 12 percent.
 2. Masonry (Clay and CMU): 12 percent.
 3. Portland Cement Plaster: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Steel Substrates:

1. Alkyd System:

- a. Prime Coat: Primer, alkyd, anticorrosive for metal, MPI #79.
- b. Prime Coat: Shop primer specified in Section where substrate is specified.
- c. Intermediate Coat: Exterior alkyd enamel matching topcoat.
- d. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5), MPI #94.

B. Galvanized-Metal Substrates:

1. Alkyd System:

- a. Prime Coat: Primer, galvanized metal, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated.
- b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
- c. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5), MPI #94.

END OF SECTION

SECTION 09 91 23.00

INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Concrete.
 - 2. Concrete masonry units (CMU).
 - 3. Steel.
 - 4. Gypsum board.

1.2 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide products / paint systems from the following:
 - 1. Pittsburgh Paint; speedhide.
 - 2. Diamond Vogel (Following Products: Universal Interior/Exterior Primer; Health Kote Interior Zero VOC Eggshell Latex; Fil-Kote Acrylic Block Filler; Health Kote Interior Zero VOC Flat Latex; Finium DTM-AT Acrylic Semi-Gloss; Pro Max Interior Primer/Sealer).

2.2 PAINT, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. Colors:
 - 1. PPG Speedhide "White Rock" (511-2), P-1.
 - 2. P-2 & P-3 to be chosen by Architect.
 - 3. Bright Yellow at top and sides of housekeeping pads.
 - 4. Verify other colors with Architect.

2.3 BLOCK FILLERS

- A. Block Filler, Latex, Interior/Exterior: MPI #4.

2.4 PRIMERS/SEALERS

- A. Primer Sealer, Latex, Interior: MPI #50.

2.5 METAL PRIMERS

- A. Primer, Rust-Inhibitive, Water Based: MPI #107.

2.6 WATER-BASED PAINTS

- A. Latex, Interior, Institutional Low Odor/VOC, Egg Shell: MPI #143.

2.7 DRY FOG/FALL COATINGS

- A. Dry Fall, Latex, Flat: MPI #118.

2.8 ALUMINUM PAINT

- A. Aluminum Paint: MPI #1.

2.9 FLOOR COATINGS

- A. Sealer, Water Based, for Concrete Floors: MPI #99.
- B. Floor Paint, Latex, Low Gloss (Maximum Gloss Level 2): MPI #60.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry (Clay and CMU): 12 percent.
 - 3. Wood: 15 percent.
 - 4. Gypsum Board: 12 percent.
 - 5. Plaster: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

- A. Concrete Substrates:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #99.
 - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
 - c. Topcoat: Latex, interior, institutional low odor/VOC, (Gloss Level 3), MPI #60.
- B. CMU Substrates:
 - 1. Institutional Low-Odor/VOC Latex System:

- a. Block Filler: Block filler, latex, interior/exterior.
- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, flat, MPI #143.
- d. Topcoat: Latex, interior, institutional low odor/VOC, MPI #143.

C. Steel Substrates:

1. Institutional Low-Odor/VOC Latex System:

- a. Prime Coat: Primer, rust-inhibitive, water based MPI #107.
- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, MPI #143.

D. Gypsum Board and Plaster Substrates:

1. Institutional Low-Odor/VOC Latex System:

- a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #50.
- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, (Gloss Level 3), MPI #143.

END OF SECTION

SECTION 09 93 00.00

STAINING AND TRANSPARENT FINISHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and application of wood finishes on the following substrates:
 - 1. Interior Substrates:
 - a. Dressed lumber (finish carpentry).
 - b. Exposed wood panel products.

1.2 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- D. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- E. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include preparation requirements and application instructions.
- B. Samples: For each type of finish system and in each color and gloss of finish indicated.
- C. Product List: For each product indicated, include printout of current "MPI Approved Products List" for each product category specified in Part 2, with the product proposed for use highlighted.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Stains and Transparent Finishes: 1 quart of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each finish system indicated and each color selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Architect will select one surface to represent surfaces and conditions for application of each type of finish system and substrate.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
 2. Final approval of stain color selections will be based on mockups.
 - a. If preliminary stain color selections are not approved, apply additional mockups of additional stain colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in other Part 2 articles for the category indicated.

2.2 MATERIALS, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
 1. Provide materials for use within each finish system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.
- C. Stain Colors: To match wood door finish in part of building where work occurs.

2.3 PRIMERS AND SEALERS

- A. Alkyd, Sanding Sealer, Clear.
 1. Sherwin Williams Wood Classics FastDry Sanding Sealer.

2. Diamond Vogel Old Master's Sanding Sealer.

2.4 STAINS

- A. Stain, Semi-Transparent, for Interior Wood.
 1. Sherwin Williams Wood Classics 250 VOC Stain.
 2. Diamond Vogel Old Master's Hi-Solids Penetrating Stain.

2.5 POLYURETHANE VARNISHES

- A. Varnish, Interior, Polyurethane, Satin (Gloss Level 4):
 1. Sherwin Williams Wood Classics Polyurethane Varnish.
 2. Diamond Vogel Old Master's Polyurethane.
- B. Varnish, Interior, Polyurethane, Gloss (Gloss Level 7).
 1. Sherwin Williams Wood Classics Polyurethane Varnish.
 2. Diamond Vogel Old Master's Polyurethane.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Exterior Wood Substrates: 15 percent, when measured with an electronic moisture meter.
- C. Maximum Moisture Content of Interior Wood Substrates: 10 percent, when measured with an electronic moisture meter.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with finish application only after unsatisfactory conditions have been corrected.
 1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

- B. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
 - 1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
 - 2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.

3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions and recommendations in "MPI Manual."
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

END OF SECTION

DIVISION 10 – SPECIALTIES

SECTION 10 21 13.19	PLASTIC TOILET COMPARTMENTS
SECTION 10 22 39.00	FOLDING PANEL PARTITIONS
SECTION 10 26 00.00	WALL AND DOOR PROTECTION
SECTION 10 28 00.00	TOILET, BATH, AND LAUNDRY ACCESSORIES
SECTION 10 44 13.00	FIRE PROTECTION CABINETS
SECTION 10 44 16.00	FIRE EXTINGUISHERS

SECTION 10 21 13.19
PLASTIC TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes solid-plastic toilet compartments configured as toilet enclosures and urinal screens.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For toilet compartments. Include plans, elevations, sections, details, and attachment details.
- C. Samples for each type of toilet compartment material indicated.

1.3 INFORMATIONAL SUBMITTALS

- A. Product certificates.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for toilet compartments designated as accessible.

2.2 SOLID-PLASTIC TOILET COMPARTMENTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Accurate Partitions Corp.; ASI Group.
 - 2. All American Metal Corp.
 - 3. American Sanitary Partition Corporation.
 - 4. Ampco Products, LLC.
 - 5. Bradley Corporation.
 - 6. General Partitions Mfg. Corp.
 - 7. Global Partitions; ASI Group.
 - 8. Hadrian Manufacturing Inc.
 - 9. Scranton Products.
- B. Toilet-Enclosure Style: Floor anchored, overhead braced. No sight configuration.
- C. Urinal-Screen Style: Wall braced.
- D. Door, Panel, and Pilaster Construction: Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch (25 mm) thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.
 - 1. Integral Hinges: Configure doors and pilasters to receive integral hinges.
 - 2. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum or stainless-steel strip fastened to exposed bottom edges of solid-plastic components to hinder malicious combustion.
 - 3. Color and Pattern: as selected by Architect from manufacturer's full range.
 - 4. Height: 55 inches, mounted 14 inches above finished floor.
- E. Pilaster Shoes and Sleeves (Caps): Stainless steel.
- F. Brackets (Fittings):
 - 1. Full-Height (Continuous) Type: Heavy duty stainless steel wall brackets. Stainless steel vandal resistant screws.

2.3 HARDWARE AND ACCESSORIES

- A. Hardware and Accessories: Manufacturer's heavy-duty stainless-steel operating hardware and accessories.
 - 1. No sight hardware.
 - 2. Hinges: Integral hinge that swings to a closed or partially open position.
 - 3. Latch and Keeper: Manufacturer's standard latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
 - 4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
 - 5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.

6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.
- B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.
- C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless-steel, hot-dip galvanized-steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.4 FABRICATION

- A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.
- B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
- C. Door Size and Swings: Unless otherwise indicated, provide 24-inch- (610-mm-) wide, in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, out-swinging doors with a minimum 32-inch- (813-mm-) wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
 1. Maximum Clearances:
 - a. Pilasters and Panels: 1/2 inch (13 mm).
 - b. Panels and Walls: 1 inch (25 mm).

3.2 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION

SECTION 10 22 39.00

FOLDING PANEL PARTITIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manually operated, acoustical panel partitions.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For operable panel partitions.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Indicate stacking and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.
3. Include diagrams for power, signal, and control wiring.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale and coordinated with each other, using input from installers of the items involved.

B. Setting Drawings: For embedded items and cutouts required in other work, including support-beam, mounting-hole template.

C. Product certificates.

D. Product test reports.

E. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

- B. Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.
- C. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:
 - 1. Sound-Transmission Requirements: Operable panel partition assembly tested for laboratory sound-transmission loss performance according to ASTM E 90, determined by ASTM E 413, and rated for not less than the STC indicated.
 - 2. Noise-Reduction Requirements: Operable panel partition assembly, identical to partition tested for STC, tested for sound-absorption performance according to ASTM C 423, and rated for not less than the NRC indicated.
- B. Fire-Test-Response Characteristics: Provide panels with finishes complying with one of the following as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Surface-Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 - 2. Fire Growth Contribution: Complying with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265 Method B Protocol or NFPA 286.

2.2 OPERABLE ACOUSTICAL PANELS

- A. Operable Acoustical Panels: Partition system, including panels, seals, finish facing, suspension system, operators, and accessories.
 - 1. Kwik-Wall 3030 hinged pair panels, or equal.

- B. Panel Operation: Manually operated, paired panels.
- C. Panel Construction: As required to support panel from suspension components and with reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.
- D. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.
- E. STC: Not less than 52.
- F. Panel Materials:
 - 1. Steel Frame: Steel sheet, manufacturer's standard thickness.
 - 2. Steel Face/Liner Sheets: Tension-leveled steel sheet, manufacturer's standard thickness.
- G. Panel Closure: Manufacturer's standard.
- H. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.

2.3 SEALS

- A. General: Provide seals that produce operable panel partitions complying with performance requirements and the following:
 - 1. Seals made from materials and in profiles that minimize sound leakage.
 - 2. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.
- B. Horizontal Bottom Seals: Automatic bottom seals. Self-activated seals providing 1 ½ inch of nominal travel.

2.4 PANEL FINISH FACINGS

- A. General: Provide finish facings for panels that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.
 - 1. Color/Pattern: As selected by Architect from manufacturer's full range. Type II, reinforced vinyl weighing 20 oz./lin.yd.
- B. Vinyl-Coated Fabric Wall Covering: Manufacturer's standard, mildew-resistant, washable, vinyl-coated fabric wall covering; complying with CCC-W-408A-D and CFFA-W-101-B.

- C. Cap-Trimmed Edges: Protective perimeter-edge trim with tight hairline joints concealing edges of panel and finish facing. Satin.

2.5 SUSPENSION SYSTEMS

- A. Tracks: Steel or aluminum designed for operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch (2.54 mm) between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.
- B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.
- C. Track Intersections, Switches, and Accessories: As required for operation, storage, track configuration, and layout indicated for operable panel partitions, and compatible with partition assembly specified. Fabricate track intersections and switches from steel or aluminum.

2.6 ACCESSORIES

- A. Work Surfaces: Quantities, placement, and size indicated.
 - 1. Surface: Self-healing, tackable, vinyl-coated fabric wall covering, complying with CFFA-W-101-D, Type II, and indicated fire-test-response characteristics; laminated to natural cork tackboard. Two of each per side.
 - 2. Surface Color: As selected by Architect from manufacturer's full range.
- B. Pass door and exit sign. See Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with ASTM E 557 except as otherwise required by operable panel partition manufacturer's written installation instructions.
- B. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed in area of partition installation.
- C. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.
- D. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.
- E. Light-Leakage Test: Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids. Adjust partitions for alignment and full closure of vertical joints and full closure along top and bottom seals.

3.2 ADJUSTING

- A. Adjust to operate smoothly and easily, without binding or warping.
- B. Verify that safety devices are properly functioning.

3.3 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

END OF SECTION

SECTION 10 26 00.00
WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. High impact wall covering.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of wall and door protection showing locations and extent.
 - 1. Include plans, elevations, sections, and attachment details.

1.3 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Material certificates.
- C. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of wall- and door-protection units that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1.

2.2 HIGH IMPACT WALL COVERS

- A. Wall Covering: 0.040 thick PVC-free thermoplastic impact-resistant sheet, complying with ASTM D1784. Secured to wall surface with water-based adhesive.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Construction Specialties, Inc.: Acrovyn 3000.
 - 2. IPC Door and Wall Protection Systems; Division of InPro.
- C. Materials Thickness: 0.060 inches.
- D. Accessories: Wainscot Trim, 3/8-inch high applied to top of panel.
- E. Splicing: Splicing of sheet material should be avoided. Install in single sheets, full width of wall.
- F. Color and Texture: As selected by Architect from manufacturers full range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation Quality: Install wall protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.
- B. Mounting Heights: Install wall protection in locations indicated on Drawings.
- C. Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.
 - 1. Provide anchoring devices and suitable locations to withstand imposed loads.

2. Where splices occur in horizontal runs of more than 20 feet (6.1 m), splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches (305 mm) apart.
 3. Adjust end and top caps as required to ensure tight seams.
- D. Immediately after completion of installation, clean plastic covers and accessories using a standard, ammonia-based, household cleaning agent.
- E. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION

SECTION 10 28 00.00

TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Toilet room and other accessories.

B. Refer to Drawings for Toilet Room Accessory Schedule.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 10 44 13.00
FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes fire-protection cabinets for portable fire extinguishers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For fire-protection cabinets.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.4 COORDINATION

- A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.
- B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

2.2 FIRE-PROTECTION CABINET

- A. Cabinet Type: Suitable for fire extinguisher.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - b. Larsens Manufacturing Company.

c. Modern Metal Products, Division of Technico Inc.

- B. Cabinet Construction: Nonrated.
- C. Cabinet Material: Cold-rolled steel sheet.
- D. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
 - 1. Rolled-Edge Trim: 4-inch (102-mm backbend depth).
- E. Cabinet Trim Material: Steel sheet.
- F. Door Material: Steel sheet.
- G. Door Style: Vertical duo panel with frame.
- H. Door Glazing: Tempered float glass (clear).
- I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
- J. Accessories:
 - 1. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Architect.
 - a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
 - 1) Location: Applied to cabinet door.
 - 2) Application Process: Pressure-sensitive vinyl letters.
 - 3) Lettering Color: Black.
 - 4) Orientation: Vertical.
- K. Materials:
 - 1. Cold-Rolled Steel: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
 - a. Finish: Baked enamel or powder coat.
 - b. Color: As selected by Architect from full range of industry colors and color densities.
 - 2. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.3 FABRICATION

- A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.
- B. Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.
- C. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
- D. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

END OF SECTION

SECTION 10 44 16.00
FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.5 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Six years from date of Substantial Completion.
 - 2. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10.
 - b. Faulty operation of valves or release levers.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet mounting bracket indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ansul Incorporated; Tyco International.
 - b. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - c. Kidde Residential and Commercial Division.
 - d. Larsens Manufacturing Company.
 - 2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.
- B. Multipurpose Dry-Chemical Type: UL-rated 10-lb nominal capacity, with monoammonium phosphate-based dry chemical in manufacturer's standard enameled container.

2.3 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ansul Incorporated; Tyco International.
 - b. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - c. Larsens Manufacturing Company.
- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
 - 1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

- a. Orientation: Vertical.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
 - 1. Mounting Brackets: 54 inches (1372 mm) above finished floor to top of fire extinguisher.
- C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION

DIVISION 12 – FURNISHINGS

SECTION 12 36 23.13	PLASTIC-LAMINATE –CLAD COUNTERTOPS
SECTION 12 36 61.16	SOLID SURFACING COUNTERTOPS (WINDOW SILLS)
SECTION 12 93 00.00	SITE FURNISHINGS

SECTION 12 36 23.13

PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes plastic-laminate countertops.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product, including high-pressure decorative laminate.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
- C. Samples:
 - 1. Plastic laminates, for each color, pattern, and surface finish.

1.3 INFORMATIONAL SUBMITTALS

- A. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.4 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE COUNTERTOPS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades indicated for construction, installation, and other requirements.
- B. Grade: Custom.
- C. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGS.
 - 1. Manufacturers:

- a. Formica.
 - b. Wilsonart.
 - c. Nevamar
 - d. Pionite.
- D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. To be chosen by Architect from manufacturer's full range.
- E. Edge Treatment: 3mm thick PVC. Architect to choose color from manufacturer's full range.
- F. Core Material at Sinks: Particleboard made with exterior glue or exterior-grade plywood.
- G. Core Thickness: Solid 1 1/8-inch core with backer sheet (approximately 1 1/4-inch thick finished).

2.2 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.
 - 1. Wood Moisture Content: 4 to 9 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Medium-Density Fiberboard: ANSI A208.2, Grade 130.
 - 2. Particleboard: ANSI A208.1, Grade M-2.
 - 3. Softwood Plywood: DOC PS 1.

2.3 ACCESSORIES

- A. Grommets for Cable Passage through Countertops: 2-inch (51-mm) OD, molded-plastic grommets and matching plastic caps with slot for wire passage.

2.4 FABRICATION

- A. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch (25 mm) over base cabinets. Ease edges to radius indicated for the following:
 - 1. Solid-Wood (Lumber) Members: 1/16 inch (1.5 mm) unless otherwise indicated.
- B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

- C. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of varnish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.

3.2 INSTALLATION

- A. Grade: Install countertops to comply with same grade as item to be installed.
- B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
 - 1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items.
 - 2. Seal edges of cutouts by saturating with varnish.
- C. Field Jointing: Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required.
 - 1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.
- D. Install countertops level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- E. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c..
 - 3. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

END OF SECTION

SECTION 12 36 61.16

SOLID SURFACING COUNTERTOPS (WINDOW SILLS)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid surface material windowsills.

1.2 ACTION SUBMITTALS

- A. Product Data: For windowsill materials.
- B. Shop Drawings: For windowsills.
- C. Samples: For each type of material exposed to view.

PART 2 - PRODUCTS

2.1 SOLID SURFACE WINDOWSILLS

A. Solid Surface Material: Homogeneous-filled plastic resin complying with [ICPA SS-1](#).

1. Manufacturers: Subject to compliance with requirements, provide products by [one \(1\)](#) of the following:
 - a. Avonite Surfaces.
 - b. Corian, Du Pont.
 - c. Formica Corporation.
 - d. Hi-Macs, LG Hansys America, Inc.
 - e. Wilsonart LLC.
2. Type: Provide Standard type, unless Special Purpose type is indicated.
3. Colors & Patterns: As chosen by Architect from manufacturer's full range.

B. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.2 INSTALLATION MATERIALS

A. Adhesive: Product recommended by Solid Surface Material Manufacturer.

- B. Sealant for Windowsills: Comply with applicable requirements in Section 07 92 00.00 "Joint Sealants."

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Secure windowsills to sub-tops with adhesive according to Solid Surface Material Manufacturer's written instructions.
- B. Bond joints with adhesive and draw tight as windowsillss are set. Mask areas adjacent to joints to prevent adhesive smears.
- C. Apply sealant to gaps at walls; comply Section 07 92 00.00 "Joint Sealants."

END OF SECTION

SECTION 12 93 00.00

SITE FURNISHINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes seating, bicycle racks, and bollards.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 SEATING

- A. Exterior Bench Basis of Design: Subject to compliance with requirements, provide a cast concrete bench, TF5035 Bay Bench 84 by Wausau Tile, or an approved comparable product by others.
- B. Interior Bench Basis of Design: Subject to compliance with requirements, provide reinforced cast stone bench, TWIG by Landscape Forms, Inc., or an approved comparable product by others.
- C. Colors to be chosen by Architect from manufacturer's full range.
- D. Anchor per manufacturer's instructions.

2.2 BICYCLE RACKS

- A. Basis of Design: Subject to compliance with requirements, provide a TF 7191 bicycle rack by Wausau Tile or an approved comparable product by others.
 - 1. Posts: Reinforced concrete.
 - 2. Piping: 2-inch stainless steel, No. 4.
 - 3. Color to be chosen by Architect from manufacturer's full range.

4. Anchor per manufacturer's instructions.

2.3 LIGHTED BOLLARDS

- A. Basis of Design Product: Subject to compliance with requirements provide TF 6051 Bollard with light fixture ((1) 6-inch LED light, 23w, 120v) by Wausau Tile or an approved comparable product by others.
- B. Reinforced concrete.
- C. Anchor Style A.
- D. Color to be chosen by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
- B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.
- C. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.

END OF SECTION

DIVISION 13 – SPECIAL CONSTRUCTION

SECTION 13 07 00.00

BULLET RESISTANT COMPOSITE (FIBERGLASS)

SECTION 13 07 00.00

BULLET RESISTANT COMPOSITE (FIBERGLASS)

PART 1 - GENERAL

1.1 REFERENCE

- A. Underwriters Laboratory UL 752-Standard for Bullet Resisting Equipment & ASTM E119-98-Standard Test Methods for Fire Tests of Building Construction and Materials, NIJ Standard 0108.01-(National Institute of Justice) Standard for Ballistic Resistant Protective Materials, MIL-P-46593A-Numerical simulation of ballistic impact on composite laminates, MIL-STD-622F- V50 Ballistic Test for Armor.

1.2 SUBMITTALS

- A. The following shall be submitted by the manufacturer:
 - 1. Submit for approval prior to fabrication: samples, test reports, shop drawings (dimensioned profiles including anchorage and finishes), product specifications, test reports (current UL Listing Verification & UL 752 Test Results as provided by Underwriters Laboratories), and printed data in sufficient detail to indicate compliance with the contract documents. Manufacturer's Instructions for installation of TSS Bullet Resistant Fiberglass Panels. All required submittals shall be approved prior to installation.

1.3 DESIGN

- A. Through the design, manufacturing techniques and material application the Bullet Resistant Fiberglass shall be of the "non-ricochet" type. This design is intended to permit the encapture and retention of an attacking projectile lessening the potential of a random injury or lateral penetration.

1.4 QUALITY ASSURANCE

- A. Manufacturer shall be a Company that specializes in manufacturing products of the specified type with a minimum of three years' experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery of the materials to the project with the manufacturer's labels intact and legible. Handle the materials with care to prevent damage. Store materials inside and under cover, stack flat and off floor. Project conditions (temperature, humidity, and ventilation) shall be within the maximum limit recommendations set by manufacturer. Do not install products that are under conditions outside these limits.

1.6 WARRANTY

- A. All materials shall be warranted against defects for a period of one year for the date of receipt at the project site. All workmanship, shall be installed by a certified installer, shall be guaranteed against defects for a period of one year form the date of installation. Certificates of warranty shall be provided at project completion.

PART 2 - PRODUCTS

2.1 BULLET RESISTANT COMPOSITE (FIBERGLASS) MATERIAL

- A. Composite Panel Product: The panels shall be made of multiple layers of woven roving ballistic grade fiberglass cloth impregnated with a thermoset polyester resin and compressed into flat rigid sheets.
- B. Fabrication: The technique and materials used shall provide the controlled internal delamination to permit the encapture of the penetrating projectile. Fasteners shall be non-corrosive.

2.2 SECURITY LEVEL

- A. The Bullet Resistant Fiberglass will be rated and tested for UL752 Level 3.

PART 3 - EXECUTION

3.1 SUPPORTING MEMBERS

- A. Prior to installing the bullet resistive material, the Contractor shall verify that all supports have been installed as required by the contract documents and the architectural drawings.

3.2 JOINTS

- A. All joints shall be reinforced by a back-up layer of bullet resistive material. The bullet resistance of the joint, as reinforced, shall be at least equal to that of the panel. Minimum width of reinforcing layer at joint shall be 4-inches (2-inches on each panel or a 2-inch minimum overlap).

3.3 APPLICATION

- A. Armor shall be installed in accordance with the manufacturer's printed recommendations. Armor panels shall be adhered using an industrial adhesive, mastic, screws or bolts. Method of application shall maintain the bullet resistive rating at junctures with the concrete floor slab, the concrete roof slab, the bullet resistive door frames, the bullet resistive window frames, and all required penetrations.

END OF SECTION

DIVISION 14 – CONVEYING EQUIPMENT

SECTION 14 21 00.00	ELECTRIC TRACTION ELEVATORS
SECTION 14 24 00.00	HYDRAULIC ELEVATORS
SECTION 14 42 00.00	WHEELCHAIR LIFTS

SECTION 14 21 00.00

ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies electric traction elevators.
- B. Related work not specified herein: The following sections contain requirements that relate to this section and are performed by trades other than the elevator manufacturer/installer.
 - 1. Section 01 50 00.00 "Construction Facilities and Temporary Controls": Protection of floor openings and personnel barriers; temporary power and lighting.
 - 2. Section 02 20 00.00 "Earthwork": Excavation for elevator pit.
 - 3. Section 03 30 00.00 "Cast-In-Place Concrete:" Elevator pit, and elevator machine foundation.
 - 4. Section 04 20 00.00 "Unit Masonry:" Masonry hoistway enclosure, building-in and grouting hoistway doorframes, and grouting of sills.
 - 5. Section 05 50 00.00 "Metal Fabrications:" Pit ladder, divider beams, and supports for entrances, rails and hoisting beam at top of elevator hoistway.
 - 6. Section 07 1 450.00 "Cementitious Waterproofing:" Waterproofing of elevator pit.
 - 7. Section 15 50 00.00 "Heating, Ventilating, and Air Conditioning:" Ventilation and temperature control of elevator equipment areas.
 - 8. Section 16 10 00.00 "Electrical:" Main disconnects for each elevator.
 - a. Electrical power for elevator installation and testing.
 - b. Disconnecting device to elevator equipment prior to activation of sprinkler system.
 - c. The installation of dedicated GFCI receptacles in the pit and overhead.
 - d. Lighting in controller area, machine area and pit.
 - e. Wiring for telephone service to controller.
 - 9. Section 16 61 00.00 "Emergency (Standby) Power Supply Systems:" Emergency generator for elevator operation.
 - 10. Section 16 72 00.00 "Fire Alarm Systems:" The installation of fire and smoke detectors at required locations and interconnecting devices; fire alarm signal lines to contacts in the machine area.
 - 11. Section 16 74 00.00 "Telephone Systems:" ADAAG-required emergency communications equipment.
- C. Applicable Codes: Comply with applicable building and elevator codes at the project site, including but not limited to the following:
 - 1. ANSI A117.1, Buildings and Facilities, Providing Accessibility and Usability for Physically Handicapped People.

2. ADAAG, Americans with Disabilities Act Accessibility Guidelines.
3. ANSI/NFPA 70, National Electrical Code.
4. ANSI/NFPA 80, Fire Doors and Windows.
5. ASME/ANSI A17.7, Safety Code for Elevators and Escalators.
6. ANSI/UL 10B, Fire Tests of Door Assemblies.
7. CAN/CSA C22.1, Canadian Electrical Code.
8. CAN/CSA-B44, Safety Code for Elevators and Escalators.
9. EN 12016 (May 1998): "EMC Product Family Standards for lifts, escalators, and passenger conveyors Part 2 – immunity."
10. Local Building Codes.
11. All other local applicable codes.

1.2 SYSTEM DESCRIPTION

A. New Elevator 10.E1

1. Equipment Description: Gen2® gearless traction elevator with Machine-Roomless application.
2. Equipment Control: Elevonic® Control System.
3. Drive: Regenerative.
4. Quantity of Elevators: 1.
5. Elevator Stop Designations: Front Only At 1, 2, 3.
6. Stops: 3.
7. Openings: Front Only.
8. Travel: 30 ft 5 3/4 in.
9. Rated Capacity: 4500 lbs Service.
10. Rated Speed: 150 fpm.
11. Platform Size: 5' 6-3/4" wide x 8' 8" deep.
12. Clear Inside Dimensions: 5 ft 6 in 3/4 wide x 7 ft 11 in 1/2 deep.
13. Cab Height: 93".
 - a. Clear Cab Height: 7' 9".
14. Entrance Type and Width: Two Speed Center-Open 48" doors.
15. Entrance Height: 84".
16. Main Power Supply: 480 Volts + or - 5% of normal, three-Phase, with a separate equipment grounding conductor.
17. Car Lighting Power Supply: 120 Volts, Single-phase, 15 Amp, 60 Hz.
18. Signal Fixtures: Manufacturer's standard with metal button targets (exc. CA).
19. Controller Location: Machine-Roomless Controller(s) shall be located at the front opening of the top terminal landing in the entrance frame.
20. Performance:
 - a. Car Speed: ± 3 % of contract speed under any loading condition or direction of travel.
 - b. Car Capacity: Safely lower, stop and hold up to 120% of rated load. (code required).

21. Ride Quality:
 - a. Vertical Vibration (maximum): 20 milli-g.
 - b. Horizontal Vibration (maximum): 12 milli-g.
 - c. Vertical Jerk (maximum): $4.59 \pm 1.0 \text{ ft./ sec}^3$ ($1.4 \pm 0.3 \text{ m/ sec}^3$).
 - d. Acceleration/Deceleration (maximum): 2.62 ft./ sec^2 (0.8 m/ sec^2).
 - e. In Car Noise: 55 – 60 dB(A).
 - f. Stopping Accuracy: $\pm 0.375 \text{ in.}$ ($\pm 10 \text{ mm}$) max, $\pm 0.25 \text{ in.}$ ($\pm 6 \text{ mm}$) Typical.
 - g. Re-leveling Distance: $\pm 0.5 \text{ in.}$ ($\pm 12 \text{ mm}$).
22. Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.
23. Operating Features:
 - a. Full Collective Operation .
 - b. Anti-nuisance.
 - c. Fan and Light Protection.
 - d. Load Weighing Bypass.
 - e. Full Collective Operation.
 - f. Firefighters' Service Phase I and Phase II.
 - g. Top of Car Inspection.
24. Door Control Features:
 - a. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.
 - b. Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.
Door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening.
 - c. Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.
25. Provide equipment according to: Seismic Zone 0.

B. New Elevator 10.E2

1. Equipment Description: Gen2® gearless traction elevator with Machine-Roomless application.
2. Equipment Control: Elevonic® Control System.
3. Drive: Regenerative.
4. Quantity of Elevators: 2.
5. Elevator Stop Designations: Front Only At 1, 2, 3.
6. Stops: 3.
7. Openings: Front Only.
8. Travel: 30 ft 4 in 0.
9. Rated Capacity: 3500 lbs Passenger.
10. Rated Speed: 200 fpm.
11. Platform Size: 6' 6-3/4" wide x 6' 1-1/8" deep.

12. Clear Inside Dimensions: 6 ft 6 in 3/4 wide x 5 ft 6 in 1/8 deep.
13. Cab Height: 93".
14. Clear Cab Height: 7' 9".
15. Entrance Type and Width: One Speed Side Slide 42" doors.
16. Entrance Height: 84".
17. Main Power Supply: 480 Volts + or - 5% of normal, three-Phase, with a separate equipment grounding conductor.
18. Car Lighting Power Supply: 120 Volts, Single-phase, 15 Amp, 60 Hz.
19. Signal Fixtures: Manufacturer's standard with metal button targets (exc. CA).
20. Controller Location: Machine-Roomless Controller(s) shall be located at the front opening of the top terminal landing in the entrance frame.
21. Performance:
 - a. Car Speed: $\pm 3\%$ of contract speed under any loading condition or direction of travel.
 - b. Car Capacity: Safely lower, stop and hold up to 120% of rated load. (code required).
22. Ride Quality:
 - a. Vertical Vibration (maximum): 20 milli-g.
 - b. Horizontal Vibration (maximum): 12 milli-g.
 - c. Vertical Jerk (maximum): $4.59 \pm 1.0 \text{ ft./sec}^3$ ($1.4 \pm 0.3 \text{ m/sec}^3$).
 - d. Acceleration/Deceleration (maximum): 2.62 ft./sec^2 (0.8 m/sec^2).
 - e. In Car Noise: 55 – 60 dB(A).
 - f. Stopping Accuracy: $\pm 0.375 \text{ in.}$ ($\pm 10 \text{ mm}$) max, $\pm 0.25 \text{ in.}$ ($\pm 6 \text{ mm}$) Typical.
 - g. Re-leveling Distance: $\pm 0.5 \text{ in.}$ ($\pm 12 \text{ mm}$).
23. Duplex Collective Operation:
 - a. Using a microprocessor-based controller, the operation shall be automatic by means of the car and hall buttons. In the absence of system activity, one car can be made to park at the pre-selected main landing. The other (free) car shall remain at the last landing served. Only one car shall respond to a hall call. If either car is removed from service, the other car shall immediately answer all hall calls, as well as its own car calls.
24. Operating Features
 - a. Full Collective Operation.
 - b. Anti-nuisance.
 - c. Fan and Light Protection.
 - d. Load Weighing Bypass.
 - e. Full Collective Operation.
 - f. Firefighters' Service Phase I and Phase II:
 - g. Top of Car Inspection.
 - h. Zoned Car Parking.
 - i. Relative System Response Dispatching.
25. Door Control Features:

- a. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.
- b. Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person. Door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening.
- c. Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.

26. Provide equipment according to: Seismic Zone 0

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data for each system proposed for use. Include the following:

- 1. Signal and operating fixtures, operating panels and indicators.
- 2. Cab design, dimensions and layout.
- 3. Hoistway-door and frame details.
- 4. Electrical characteristics and connection requirements.
- 5. Expected heat dissipation of elevator equipment in control room space and machine space (BTU).
- 6. Color selection chart for Cab and Entrances.

B. Shop Drawings: Submit approval layout drawings. Include the following:

- 1. Car, guide rails, buffers and other components in hoistway.
- 2. Maximum rail bracket spacing.
- 3. Maximum loads imposed on guide rails requiring load transfer to building structure.
- 4. Clearances and travel of car.
- 5. Clear inside hoistway and pit dimensions.
- 6. Location and sizes of access doors, hoistway entrances and frames.

C. Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual.

1.4 QUALITY ASSURANCE

A. Manufacturer: Elevator manufacturer shall be ISO 9001 certified.

B. Permits, Inspections and Certificates: The Elevator Contractor shall obtain and pay for necessary Municipal or State Inspection and permit as required by the elevator inspection authority, and make such tests as are called for by the regulations or such authorities. These tests shall be made in the presence of such authorities or their authorized representatives.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Should the building or the site not be prepared to receive the elevator equipment at the agreed upon date, the General Contractor will be responsible to provide a proper and suitable storage area on or off the premises.
 - 1. Should the storage area be off-site and the equipment not yet delivered, then the elevator contractor, upon notification from the General Contractor, will divert the elevator equipment to the storage area. If the equipment has already been delivered to the site, then the General Contractor shall transport the elevator equipment to the storage area. The cost of elevator equipment taken to storage by either party, storage, and redeliver to the job site shall not be at the expense of the elevator contractor.

1.6 WARRANTY

- A. The elevator contractor's acceptance is conditional on the understanding that their warranty covers defective material and workmanship. The guarantee period shall not extend longer than one (1) year from the date of completion or acceptance thereof by beneficial use, whichever is earlier, of each elevator. The guarantee excludes: ordinary wear and tear, improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.

1.7 MAINTENANCE and SERVICE

- A. Maintenance service consisting of regular examinations and adjustments of the elevator equipment shall be provided by the elevator contractor for a period of 12 months after the elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days and shall include emergency 24-hour callback service. This service shall not cover adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.
- B. The periodic lubrication of elevator components shall not be required, including: Sheaves, Rails, Belts, Ropes, Car and CWT guides, etc.
- C. The elevator control system must:
 - 1. Provide in the controller the necessary devices to run the elevator in inspection operation.
 - 2. Provide on top of the car the necessary devices to run the elevator in inspection operation.
 - 3. Provide in the controller an emergency stop switch. This emergency stop switch when opened disconnects power from the brake and prevents the motor from running.

4. Provide in the event of a power outage, means from the controller to electrically lift and control the elevator brake to safely bring the elevator to the nearest available landing.
 5. Provide the means from the controller to reset the governor over speed switch and also trip the governor.
 6. Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.
- D. Provide system capabilities to enable a remote expert to create a live, interactive connection with the elevator system to enable the following functions:
1. Remotely diagnose elevator issues with a remote team of experts.
 2. Remotely return an elevator to service.
 3. Provide real-time status updates via email.
 4. Remotely make changes to selected elevator functions including:
 - a. Control building traffic: Restrict floor access, remove car from group operation, shut down elevator, select up peak/down peak mode, activate independent service.
 - b. Conserve energy: Activate cab light energy save mode, activate fan energy save mode, shut down car(s).
 - c. Improve passenger experience: Extend door open times, change parking floor, activate auto car full, activate anti-nuisance, advance door opening, door nudging, extend specific floor extended opening time, release trapped passengers.

PART 2 – PRODUCTS

2.1 DESIGN AND SPECIFICATIONS

- A. Provide Machine-Roomless Gen2™ traction passenger elevators from Otis Elevator Company. The control system and car design based on materials and systems manufactured by Otis Elevator Company. Specifically, the system shall consist of the following components:
1. Controller located entirely inside the hoistway. No extra machine room or control closet space required.
 2. An AC gearless machine using embedded permanent magnets mounted at the top of the hoistway.
 3. Polyurethane Coated-Steel Belts for elevator hoisting purposes.
 4. Regenerative drive that captures normally wasted energy and feeds clean power back into the building's power grid.
 5. LED lighting standard in ceiling lights and elevator fixtures.
 6. Sleep mode operation for LED ceiling lights and car fan.
- B. Approved Installer: Otis Elevator Company

2.2 EQUIPMENT: CONTROLLER COMPONENTS

- A. Controller: A microcomputer based control system shall be provided to perform all of the functions of safe elevator operation. The system shall also perform car and group operational control.
1. All high voltage (110V or above) contact points inside the controller shall be protected from accidental contact when the controller doors are open.
 2. Controller shall be separated into two distinct halves; Motor Drive side and Control side. High voltage motor power conductors shall be routed so as to be physically segregated from the rest of the controller.
 3. Field conductor terminations points shall be segregated; high voltage (>30 volts DC and 110 VAC,) and low voltage (< 30 volts DC.
 4. Controllers shall be designed and tested for Electromagnetic Interference (EMI) immunity according to the EN 12016 (May 1998): "EMC Product Family Standards for lifts, escalators, and passenger conveyors Part 2 – immunity."
 5. Controller shall be located inside the wall next to the top landing entrance frame. Emergency access shall be provided through an access panel in the entrance frame secured by a key lock.
 6. A separate control room or cabinet should not be required.
- B. Drive: A Variable Voltage Variable Frequency AC drive system shall be provided. The drive shall be set up for regeneration of AC power back to the building grid.

2.3 EQUIPMENT: MACHINE AND GOVERNOR

- A. Machine: AC gearless machine, with a synchronous permanent-magnet motor, dual solenoid service and emergency disc brakes, mounted at the top of the hoistway.
- B. Governor: The governor shall be a tension type car-mounted governor.
- C. Buffers, Car and Counterweight: Polyurethane type buffers shall be used.
- D. Hoistway Operating Devices:
1. Emergency stop switch in the pit.
 2. Terminal stopping switches.
- E. Positioning System: Consists of an encoder, reader box, and door zone vanes.
- F. Guide Rails and Attachments: Guide rails shall be Tee-section steel rails with brackets and fasteners. Side counterweight arrangements shall have a dual-purpose bracket that combines both counterweight guide rails, and one of the car guide rails to building fastening.

- G. Coated-Steel Belts: Polyurethane coated belts with high-tensile-grade, zinc-plated steel cords and a flat profile on the running surface and the backside of the belt. All driving sheaves and deflector sheaves should have a crowned profile to ensure center tracking of the belts. A continuous 24/7 monitoring system using resistance based technology has to be installed to continuously monitor the integrity of the coated steel belts and provide advanced notice of belt wear.
- H. Governor Rope: Governor rope shall be steel and shall consist of at least eight strands wound about a sisal core center.
- I. Fascia: Galvanized sheet steel shall be provided at the front, and rear, of the hoistway.
- J. Hoistway Entrances:
 - 1. Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of UL fire rated steel.
 - 2. Sills shall be extruded aluminum.
 - 3. Doors: Entrance doors shall be of metal construction with vertical channel reinforcements.
 - 4. Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour (for M1, M2, M3, D1, and D2 Entrance Arrangements or 1 hour for D3 Entrance Arrangement.
 - 5. Entrance Finish: Stainless Steel at Front 1, 2, 3.
 - 6. Frame Finish: Stainless Steel at Front 1, 2, 3.
 - 7. Entrance marking plates: Entrance jambs shall be marked with 4" x 4" (102 mm x 102 mm) plates having raised floor markings with Braille located adjacent to the floor marking. Marking plates shall be provided on both sides of the entrance.
 - 8. Sight Guards: Black sight guards will be furnished with all doors.

2.4 EQUIPMENT: CAR COMPONENTS

- A. Carframe and Safety: A carframe fabricated from formed or structural steel members shall be provided with adequate bracing to support the platform and car enclosures. The car safety shall be integral to the carframe and shall be Type "B", flexible guide clamp type.
- B. Cab Options:
 - 1. Stainless steel, vertical panels.
 - 2. Paints and laminate to be selected from manufacturer's catalog of choices.
 - 3. Brushed Stainless Steel finished base plate located at top and bottom.
- C. Car Front Finish: Satin Stainless Steel.
- D. Car Door Finish: Satin Stainless Steel.
- E. Ceiling Type: Brushed Steel Finish (BSF) Flush Metal Ceiling with 4 LED lights.

- F. Emergency Car Lighting: An emergency power unit employing a 6-volt sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car in the event of building power failure.
- G. Fan: A one-speed 120 VAC fan will be mounted to the structural ceiling to facilitate in-car air circulation, meeting A17.1 code requirements. The fan shall be rubber mounted to prevent the transmission of structural vibration and will include a baffle to diffuse audible noise. A switch shall be provided in the car-operating panel to control the fan.
- H. Handrails: Handrails shall be provided on the Side walls of the car enclosure. Handrails shall be 3/8"x 2" flat tubular handrail with a Brushed Steel Finish .
- I. Threshold: Extruded Aluminum.
- J. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.
- K. Guides: The car shall have 3" diameter roller guides at top and bottom and the counterweight shall have slide type guides at the top and the bottom.
- L. Platform: The car platform shall be constructed of metal. Load weighing device shall be mounted on the belts at the top of the hoistway.

2.5 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

- A. Car Operating Panel: A car operating panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. The car operating panel shall have a satin stainless steel finish.
 - 1. A car operating panel shall be furnished. It shall contain a bank of round stainless steel, mechanical LED illuminated buttons. Flush mounted to the panel and marked to correspond to the landings served. All buttons to have raised numerals and Braille markings with these options:
 - a. Flat Flush Mounted satin stainless steel button with blue or white LED illuminating halo.
 - b. Option- 1/8" satin stainless steel projecting button with blue illuminating halo.
 - c. Vandal-Resistant, Flush satin stainless steel button with blue LED illuminating center jewel.
 - d. Plastic 1/8" fully illuminated button with white LED.
 - 2. The car operating panel shall be equipped with the following features:
 - a. Raised markings and Braille to the left hand side of each push-button.
 - b. Car Position Indicator at the top of and integral to the car operating panel.
 - c. Door open and door close buttons.

- d. Inspection key-switch.
 - e. Elevator Data Plate marked with elevator capacity and car number.
 - f. Help Button: The help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
 - g. Landing Passing Signal: A chime bell shall sound in the car to signal that the car is either stopping at or passing a floor served by the elevator.
 - h. In car keyed stop switch.
 - i. Firefighter's hat.
 - j. Firefighter's Phase II Key-switch.
 - k. Call Cancel Button.
 - l. Firefighter's Phase II Emergency In-Car Operating Instructions: worded according to A17.1 2000, Article 2.27.7.2.
- B. Car Position Indicator: A digital, LED car position indicator shall be integral to the car operating panel.
- 1. Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Hall fixtures shall feature:
 - 2. Integral Hall fixtures shall feature:
 - a. Round stainless steel, mechanical buttons marked to correspond to the landings.
 - b. Hall fixtures to be located in the entrance frame face. Therefore, separate wiring and installation of electrical boxes inside the wall for the hall buttons are not required.
 - c. Buttons shall be in vertically mounted fixture. Fixture shall be satin stainless steel finish.
 - 3. Button Options:
 - a. Flat Flush Mounted satin stainless steel button with blue or white LED illuminating halo).
 - b. Optional- 1/8" satin stainless steel projecting button with blue illuminating halo.
 - c. Vandal-Resistant, Flush satin stainless steel button with blue LED illuminating center jewel.
 - d. Plastic 1/8" fully illuminated button with white LED.
- C. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound.
- D. Access key-switch at top floor in entrance jamb.
- E. Access key-switch at bottom floor in entrance jamb.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Installation of all elevator components except as specifically provided for elsewhere by others.

3.3 DEMONSTRATION

- A. The elevator contractor shall make a final check of each elevator operation with the Owner or Owner's representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

END OF SECTION

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HYDRAULIC ELEVATORS

PART 1 – GENERAL

1.1 SUMMARY

- A. The elevator contractor shall furnish labor and material to provide a hydraulic microprocessor-based control system for existing elevator State #504538. This elevator is labeled 03.E1 on the Construction Documents. It is specifically designed to meet the particular needs of modernizing hydraulic elevators. The system is integrated by communications over serial links and discrete wiring. The "Relative System Response Plus" software dispatches elevators based upon real-time response to actual demands on the elevator.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each system proposed for use.
- B. Shop Drawings: Submit approval layout drawings.
- C. Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Elevator manufacturer shall be ISO 9001 certified.
- B. Permits, Inspections and Certificates: The Elevator Contractor shall obtain and pay for necessary Municipal or State Inspection and permit as required by the elevator inspection authority, and make such tests as are called for by the regulations or such authorities. These tests shall be made in the presence of such authorities or their authorized representatives.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Should the building or the site not be prepared to receive the elevator equipment at the agreed upon date, the General Contractor will be responsible to provide a proper and suitable storage area on or off the premises.
 - 1. Should the storage area be off-site and the equipment not yet delivered, then the elevator contractor, upon notification from the General Contractor, will divert the elevator equipment to the storage area. If the equipment has already been delivered to the site, then the General Contractor shall transport the elevator equipment to the storage area. The cost of elevator equipment taken to storage by either party, storage, and redeliver to the job site shall not be at the expense of the elevator contractor.

1.5 WARRANTY

- A. The elevator contractor's acceptance is conditional on the understanding that their warranty covers defective material and workmanship. The guarantee period shall not extend longer than one (1) year from the date of completion or acceptance thereof by beneficial use, whichever is earlier, of each elevator. The guarantee excludes: ordinary wear and tear, improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.

1.6 MAINTENANCE AND SERVICE

- A. Maintenance service consisting of regular examinations and adjustments of the elevator equipment shall be provided by the elevator contractor for a period of 12 months after the elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days and shall include emergency 24-hour callback service. This service shall not cover adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.
- B. The periodic lubrication of elevator components shall not be required, including: Sheaves, Rails, Belts, Ropes, Car and CWT guides, etc.
- C. The elevator control system must:
 - 1. Provide in the controller the necessary devices to run the elevator in inspection operation.
 - 2. Provide on top of the car the necessary devices to run the elevator in inspection operation.
 - 3. Provide in the controller an emergency stop switch. This emergency stop switch when opened disconnects power from the brake and prevents the motor from running.
 - 4. Provide in the event of a power outage, means from the controller to electrically lift and control the elevator brake to safely bring the elevator to the nearest available landing.
 - 5. Provide the means from the controller to reset the governor over speed switch and also trip the governor.
 - 6. Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.

PART 2 – PRODUCTS

2.1 DUTY

- A. The present capacity of 4000 lbs. and speed of 120 feet per minute will be retained for this elevator.

2.2 TRAVEL

- A. The present travel will be retained.

2.3 STOPS AND OPENINGS

- A. The present stops and openings will be retained.

2.4 POWER SUPPLY – IF NEEDED, UPDATED BY ELECTRICIAN

- A. The present power supply of 480 volts, 3 phase will be retained and the new equipment will be arranged for this power supply. In the event that equipment or product changes to require a power supply update, it would be considered Work by Others.

2.5 OPERATION – ONE CAR

- A. Operation shall be automatic by means of the car and landing buttons. Stops registered by momentary actuation of the car or landing buttons shall be made in the order in which the landings are reached in each direction of travel after the buttons have been actuated. All stops shall be subject to the respective car or landing button being actuated sufficiently in advance of the arrival of the car at that landing to enable the stop to be made. The direction of travel for an idle car shall be established by the first car or landing button actuated.
- B. “UP” landing calls shall be answered while the car is traveling in the up direction and “DOWN” landing calls shall be answered while the car is traveling down. The car shall reverse after the uppermost or lowermost car or landing call has been answered, and then proceed to answer car calls and landing calls registered in the opposite direction of travel.
- C. If the car without registered call arrives at a floor where both up and down hall calls are registered, it shall initially respond to the hall call in the direction that the car was traveling. If no car call or hall call is registered for further travel in that direction, the car shall close its doors and immediately reopen them in response to the hall call in the opposite directions. Direction lanterns, if furnished, shall indicate the change of direction when the doors reopen.
- D. An independent service switch shall be provided in the car operating panel which, when actuated, shall cancel previously registered car calls, disconnect the elevator from the hall buttons and allow operation from the car buttons only.

2.6 POWER UNIT – NEW

- A. The existing power unit will be replaced with a new power unit. The new power unit consists of a positive displacement pump, motor, integral 4-coil control valve, oil tank and muffler. The pump and motor are submerged and are mounted to the tank with rubber isolators to reduce vibration and noise. A muffler is provided to dissipate pulsations and noise from the flow of hydraulic fluid. The valve consists of up, up leveling, down and down leveling controls along with manual lowering and a pressure relief valve.

2.7 SOFT STARTER – NEW

- A. A new solid-state starter will be provided. It will be of the same power requirement and starting configuration as presently exists.

2.8 CONTROLLER – NEW

- A. A microprocessor-based control system shall be provided to perform all the functions of safe elevator motion and elevator door control. This shall include all the hardware required to connect, transfer, and interrupt power, and protect the motor against overloading. The system shall also perform group operational control.
- B. Each controller cabinet containing memory equipment shall be properly shielded from line pollution. The microcomputer system shall be designed to accept reprogramming with minimum system downtime.

1. Door Operator – New, Interfaces with New Controller.

- a. A closed loop door operator shall be furnished. This closed loop microprocessor based door system will facilitate smooth operation under varying environmental influences such as, temperature, wind, friction, and component variation. The processor will monitor the door's actual position and velocity compared to its desired position and velocity. If variations are detected in the profile, the command will be automatically corrected. The closed loop door operator control system shall not require machine room door control equipment.
- b. Door operation shall be automatic at each landing with door opening being initiated as the car arrives at the landing and closing taking place after expiration of an adjustable time interval. An electric car door contact shall prevent the elevator from operating unless the car door is in the closed position.
- c. Door close shall be arranged to start after a minimum time, consistent with Handicap Requirements.
- d. Door shall be arranged to remain open for an adjustable time period sufficient to meet ADA requirements.
- e. The time interval for which the elevator doors remain open when a car stops at a landing shall be independently adjustable for response to car calls and response to hall calls.

2. Special Emergency Service – Part of New Controller Operation.

- a. Special Emergency Service operation shall be provided in compliance with the latest revision of the ASME/ANSI A17.1 Code.
 - b. Special Emergency Service Phase I to return the elevator (s) non-stop to a designated floor shall be initiated by an elevator smoke detector system or a keyswitch provided in a lobby fixture.
 - c. If required, the smoke detector system is to be furnished by others. The elevator contractor shall provide input connections on the elevator controller to receive signals from the smoke detector system.
 - d. A keyswitch in the car shall be provided for in-car control of each elevator when on Phase II of Special Emergency Service.
 - e. If an elevator is on independent service when the elevators are recalled on Phase I operation, a buzzer shall sound in the car and a jewel shall be illuminated, subject to applicable codes.
3. Hoistway Access Switch – Part of New Controller Operation.
 - a. An enabling keyswitch shall be provided in the car operating panel to render all car and hall buttons inoperative and to permit operation of the elevator by means of an access keyswitch adjacent to the hoistway entrance at the access landing. The movement of the car away from access landing, other than the lower terminal, by means of the access keyswitch at the landing shall be limited in travel and direction to that as specified for the upper landing in the latest revisions of the ASME/ANSI A17.1 Code.
4. Automatic Self-Leveling – Part of New Controller Operation
 - a. The elevator shall be provided with automatic self-leveling that shall bring the elevator car level with the floor landings, no more than +/- 1/2" regardless of load or direction of travel. The automatic self-leveling shall correct for overtravel or undertravel.
5. Applied Car Operating Panel – Interfaces with New Controller and Incorporates the Following Items:
 - a. An applied car operating panel shall be furnished. The panel shall contain a bank of illuminated buttons marked to correspond with the landings served, an emergency call button, emergency stop button or switch, door open and door close buttons, and a light switch. The emergency call button shall be connected to a bell that serves as an emergency signal. A fan switch, if optional fan is provided, shall also be located in the car operating panel. All car operating panel lamps shall be the low-voltage long life lamps.
6. ADA Handsoff Phone – Part of a New Car Operating Panel and Required by Code
 - a. The elevator contractor shall furnish and install an ADA phone. This phone enables communication between persons in the elevator and a 24-hour answering service.
 - b. The ADA compliant phone will be a part of the car operating panel. It will automatically dial a preprogrammed number and will inform the answering service of the elevator location via prerecorded digital voice communication. After disclosing the elevator location, the phone will allow two-way voice communication. The

phone contains two light-emitting diodes -- one that indicates the call is in progress and another that indicates the call has been acknowledged. After receiving acknowledgment of the call from the answering service, a deaf/mute person can signal the answering service by reactivating the call button. The phone can be easily programmed and allows incoming calls to be received. The telephone will be furnished and installed in accordance with the ASME A17.1 Safety Code for Elevators and Escalators, and is registered with the FCC.

7. Audible Signal when Passing or Stopping at a Landing – Part of New Car Operating Panel and Required by Current Code with Controller Upgrade
 - a. An audible signal shall sound in the car to tell passengers that the car is either stopping or passing a landing served by the elevator.
8. Emergency Car Lighting – Part of New Car Operating Panel and Required by Code
 - a. An emergency power unit employing a 12-volt sealed rechargeable battery and a totally static circuit shall be provided. The power unit shall illuminate the elevator car and provide current to the alarm bell in the event of normal power failure. The equipment shall comply with the requirements of the latest revision of the ASME/ANSI A17.1 Code.
9. Secure Access
 - a. The elevator controller is to be set up for card reader access. The card reader shall be provided by and installed by the low voltage contractor. Wiring shall be run to the elevator equipment room by the low voltage contractor. Coordinate with elevator contractor at time of construction. Verify location of card access device and programming with Owner prior to installation.
10. Inspection Operation – Part of New Car Operating Panel Required by Code with New Controller
 - a. For inspection purposes, an enabling keyswitch shall be provided in the car operating panel to permit operation of the elevator from on top of the car and to make car and hall buttons inoperative.
 - b. On top of the car, an operating fixture shall be provided containing continuous pressure “UP” and “DOWN” buttons, an emergency stop button, and an inspection-initiating switch. This switch makes the fixture operable and, at the same time, makes the door operator and car and hall buttons inoperable.
11. Hall Buttons – New, Interfaces with New Controller
 - a. New hall buttons shall be installed at each landing, an up and a down button at each intermediate landing and a single button at each terminal landing. Up to one keyswitch per hall station will be added as necessary for security purposes with the residents.
 - b. When a call is registered by momentary pressure on a landing button, that button shall become illuminated and remain illuminated until the call is answered. Hall button lamps shall be low-voltage, long life lamps.

2.9 OPTIGUARD ENTRANCE-PROTECTION DEVICE

- A. A solid-state, infrared passenger protection device shall be installed on the car door. This device provides beams that create an invisible “net” across the elevator entrance. This system uses 154 infrared emitters and detectors to create an invisible safety net across the elevator entrance.
- B. The OPTIGUARD system continuously scans for interrupted beams. If any beam in the curtain is interrupted, the OPTIGUARD system will reopen the elevator door instantly.
- C. OPTIGUARD offers maximum protection for passenger safety minimizing potential injury to passengers as they enter and exit the elevator.
- D. The OPTIGUARD systems infrared beams will also detect approaching objects which reduces potential for damage to elevator doors caused by mail carts, stretchers or other moving equipment. If these beams strike an object in the middle of the entryway, light reflects off the object into special photo-diode receivers mounted on the opposite side of the entrance, which scan into the entryway. If the receivers detect enough light, a reversal signal is generated to open the doors.
- E. If any curtain beam is interrupted, a door-reversal signal will cause the elevator doors to reopen instantly without touching the passenger. After a car stop is made, the door shall remain open for a predetermined interval before closing. If, while the door is closing, the matrix of invisible light beams is interrupted by a passenger entering or leaving the car, the door shall stop and reopen, after which the door shall again start closing.

2.10 CAB INTERIOR – WALLS AND CEILING

- A. Elevator contractor will renovate the elevator as follows. All material provided shall be manufactured and installed in accordance with the ASME A17.1 Safety Code for Elevators and Escalators.
 - 1. New SnapCab interior panels: Replace existing 8-inch (field verify) high horizontal wall panel running around the perimeter of the existing cab just below the ceiling. Match existing panel finish from Classic II Interiors Package.
 - 2. Ceiling: Furnish and install new aluminum frame ceiling with translucent diffuser panels and new LED lighting.
 - 3. Prep and paint existing interior painted front panel, interior painted door, exterior painted door, and all painted head/jamb trim.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Installation of all elevator components except as specifically provided for elsewhere by others.

3.3 DEMONSTRATION

- A. The elevator contractor shall make a final check of each elevator operation with the Owner or Owner's representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

PART 4 – SPECIAL PROVISIONS

4.1 SUPERSEDED MATERIAL

- A. All material, removed or unused, not required in the modification will become the property of the elevator contractor.

4.2 PERMITS AND INSPECTIONS

- A. The elevator contractor shall furnish all licenses and permits and shall arrange for and make all required inspections and tests.

4.3 WIRING

- A. All new wiring and electrical interconnections shall comply with governing codes. Insulated wiring shall have flame-retardant and moisture-proof outer covering and shall be run in conduit, flexible tubing or electrical wireways. Traveling cables shall be flexible and suitably suspended to relieve strain on individual conductors.

4.4 ENGINEERING DESIGN

- A. All new material furnished will be specifically designed to operate with original elevator equipment being retained, thus assuring maximum performance and eliminating any divided responsibility.

4.5 CODE

- A. The elevator equipment shall be furnished and installed in accordance with the latest additions of the ASM/ANSI A17.1 Safety Code for Elevators and Escalators, An American National Standard, including the latest Supplement, and the Americans with Disabilities Act. The elevator equipment shall also comply with all applicable local codes.

4.6 SEALING OF PENETRATIONS

- A. The elevator contractor shall seal any openings that are created by removing or adding items that penetrate through the rated shaft during this project.

4.7 WORK BY OTHERS

- A. The following items may be considered, or may require, necessary work by additional contractors which is not included in our proposed pricing and is the responsibility of the Owner:
 - 1. Provide suitable ventilation and cooling equipment, if required, to maintain the machine room temperature between 60F and 90F. The relative humidity should not exceed 85 percent non-condensing.
 - 2. Provide electrical power for light, tools, hoists, etc. during installation as well as electric current for starting, testing and adjusting the elevator.
 - 3. Wiring necessary to connect these elevators to the emergency power source is not included. The elevator is to be connected to the emergency generator. The elevator contractor will need adequate wiring run from the new generator to the elevator machine room. An automatic power transfer switch for each power feeder to monitor both normal and emergency (standby) power conditions and to perform the transfer from one to the other is needed. Switch to have two sets of normally closed dry contacts, one to be open when the switch is in the emergency (standby) power position; the other to open upon initiation of power transfer and to close when transfer is complete. Switch shall have a phase monitor feature, which prohibits the transfer of power between "live" sources unless the sources are in phase with each other. If a shunt trip device is provided, an additionally normally closed contact with all the associated wiring and conduit to the controller is required from the emergency (standby) power source.
 - 4. One smoke detector is required in each elevator lobby and elevator machine room (and hoistway if sprinklered). Wiring from the detectors is to run to the elevator machine room to the elevator controller. Smoke detectors shall not be self-resetting. Primary and alternate zones for smoke detectors are required to provide the code required elevator alternate landing feature. NOTE: Contacts to be normally closed that open on alarm. Smoke alarms must be addressable.
 - 5. Any cutting, including cutouts to accommodate hall signal fixtures, patching and painting of walls, floors, or partitions.
 - 6. Only elevator equipment is allowed in an elevator machine room.
 - 7. Moisture proof type pit light and switch with duplex convenience outlet; switch shall be adjacent to the pit ladder 18" and 36" above the access floor. The pit convenience outlet shall have Ground Fault Protection (GFI). Minimum illumination at the pit floor is 19 foot candles at the pit ladder, floor level (coordinate final location with elevator contractor field personnel).
 - 8. Fused mainline disconnect switch (with correct size fuses installed per the Power Confirmation Letter), lockable in the "off" position, in the machine room with feeder wires to the transformer, all piped in accordance with N.E.C. and grounded. Disconnect switch must be in sight of elevator machine and be adjacent to machine room door and shall be the type that cannot be engaged with the door open. Power supply has to be a 4 wire system with a separate ground. If a sprinkler head is located in the machine room when hoistways and/or machine room sprinklers are provided, then an automatic disconnect for elevator power (shunt trip) must be provided.
 - 9. Hoistway patching.

10. Provide one (1) 120 volt AC, 15 amp, single-phase power supply with fused SPST disconnect switch, lockable in the "off" position, in the machine room with feeder wiring to the controller for car light supply.
11. Provide a safe and dry on-site storage area for elevator material.
12. Any necessary modification or installation of lights and/or electrical outlets in the machine room and/or pit.
13. Machine room lighting must be guarded with illumination of 19 foot candles at all area of the floor.
14. Elevator car top lighting must be guarded with illumination of 10 foot candles at all areas of the car top.
15. Elevator hoistway shall be fire-rated. Machine room shall be fire rated.
16. Pipes or ducts conveying gas, vapors, liquids, or any electrical wiring which are not used in connection with the operation of the elevators, are not permitted in hoistways or machine rooms.
17. A type ABC fire extinguisher, minimum 10 lbs. is required.
18. Patch any holes in the elevator hoistway wall - necessary to maintain fire rating.
19. Machine room door shall be fire rated and needs "ELEVATOR EQUIPMENT ROOM" sign with 1" high minimum letters posted on the outside. Door handle to machine room must be self-locking and the door must be self-closing.
20. Provide one (1) outside telephone line to the elevator machine room for the elevator phone to allow data calls to and from a toll-free number at a dispatching center. The telephone line must be dedicated to the elevator. Separate phone lines are not needed for the phone and the data calls on a given elevator. In other words a total of one (1) phone line, not two (2), are required in the machine for this project (if not already present).
21. If Owner receives an exception from the State on any code requirements, Owner will provide elevator contractor with copy of letter granting the exception.

END OF SECTION

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WHEELCHAIR LIFTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vertical platform lifts.

1.2 REFERENCES

- A. The lift shall be designed and tested in accordance with 1 CC/A117.1, NEC and ASME A/B.1

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each lift.
 - 1. Include plans, elevations, sections, attachment details, and required clearances.
 - 2. Indicate dimensions, weights, loads, and points of load to building structure.
 - 3. Include diagrams for power, signal, and control wiring.
- C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Research reports.
- C. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.
- B. Inspection and acceptance certificates and operating permits.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of lifts that fail in materials or workmanship within specified warranty period.

- 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.
- B. Regulatory Requirements: Comply with ASME A18.1, "Safety Standard for Platform Lifts and Stairway Chairlifts."

2.2 VERTICAL PLATFORM LIFT

- A. Vertical Platform Lift, General: Preengineered lift system.
 - 1. Basis of Design Product: Subject to compliance with requirement, provide SES Vertical Platform Lift Model VPC-EL72 by Symmetry Elevator (Bella Elevator) or a pre-approved product by others.
- B. Drive System: Acme Accelerated Screw
- C. Rated Load: 750-pound capacity.
- D. Travel Speed: 17-20 fpm.
- E. Self-contained enclosure system: Model VPC EL with Steel Enclosure and Infill Panels.
- F. Lifting Height: up to 72 inches.
- G. Ramped application.
- H. Emergency Battery Backup.
- I. Standard Color: Ivory.
- J. Platform size: 36 inches by 54 inches, straight-through exit (2) Power Gate Operators – upper gate, lower door.

2.3 MATERIALS

- A. Platform shall be constructed of 12-gauge minimum hot rolled steel. If unit is not installed in a 3-inch pit, a stationary ramp shall be provided that extends to meet lower landing.
- B. Platform side panels must be 42 inches high. Side panel framework shall be a minimum of 1-inch by 1 ½-inch steel. Solid infill panels shall be a minimum of 18-gauge steel.
- C. The Mainframe (Main Tower) support shall be a combination 7-gauge C Channel, 12-gauge interface plates, and 16-gauge exterior skin.
- D. Carriage platform supports shall be a minimum of ½-inch steel plate and carriage uprights shall be a minimum of 3/8-inch thick laser cut steel plate.
- E. Elevator style (nylon) rollers shall be used for axial carriage guidance and wear pads shall be used for horizontal stability.
- F. Loaded fasteners shall be grade eight or higher. Locking fasteners shall be used in all critical locations.
- G. The drive mechanism shall be a stationary nut on a rotating 1-inch diameter Acme screw with a secondary safety nut.
- H. The motor shall be 1 HP, 115 volt, 1 phase.
- I. The operating control circuit shall be a regulated N.R.T.L. listed class 2 power limited circuit operating at 24vdc.
- J. On board diagnostics with LED indicators.
- K. Unit can be fitted with optional remote mounted controller (see accessories).
- L. Finish shall be electro statically applied powder coating, oven backed to cure.
- M. An upper final limit switch shall be provided.
- N. Color shall be selected from manufacturer's standard color.
- O. A constant pressure up/down control switch shall be installed on the platform.
- P. A constant pressure, elevator style, hall call control switch shall be provided at each landing.
- Q. When not installed with a runway enclosure, the platform shall be equipped with an obstruction panel that will stop only the downward travel if an obstruction is encountered.
- R. An illuminated emergency stop switch / audible alarm switch shall be provided on the car as a means of signaling for assistance in the event of an emergency.
- S. A grab rail shall be provided on the platform.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Minimum Headroom Clearance: Verify that installed lift will have a minimum headroom of 80 inches (2032 mm) above any point on platform floor at any point of travel.

3.2 INSTALLATION

- A. Unit shall be installed and operated in accordance with the ICC/A117.1, NEC and ASME A18.1 Guidelines.
- B. A lockable service disconnect switch rated at 110v 30A shall be supplied by the electrical contractor at job site.
- C. A dedicated electrical supply provided to the disconnect shall be capable of supplying 30A, at 115v at disconnecting means.
- D. General Contractor to coordinate "work by others" with lift contractor.
- E. The installation of the vertical platform lift shall be made in accordance with approved plans and specifications and the manufacturer's installation instructions.

3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of lift installation and before permitting use of lifts, perform acceptance tests as required and recommended by ASME A18.1 and authorities having jurisdiction.
- B. Operating Test: In addition to acceptance testing, load lifts to rated capacity and operate continuously for 30 minutes between lowest and highest landings served. Readjust stops, signal equipment, and other devices for accurate stopping and operation of system.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lifts. Include a review of emergency systems and emergency procedures to be followed at time of operational failure and other building emergencies.
- B. Check operation of lifts with Owner's personnel present and before date of Substantial Completion. Determine that operating systems and devices are functioning properly.
- C. Check operation of lifts with Owner's personnel present not more than one month before end of warranty period. Determine that operating systems and devices are functioning properly.

END OF SECTION