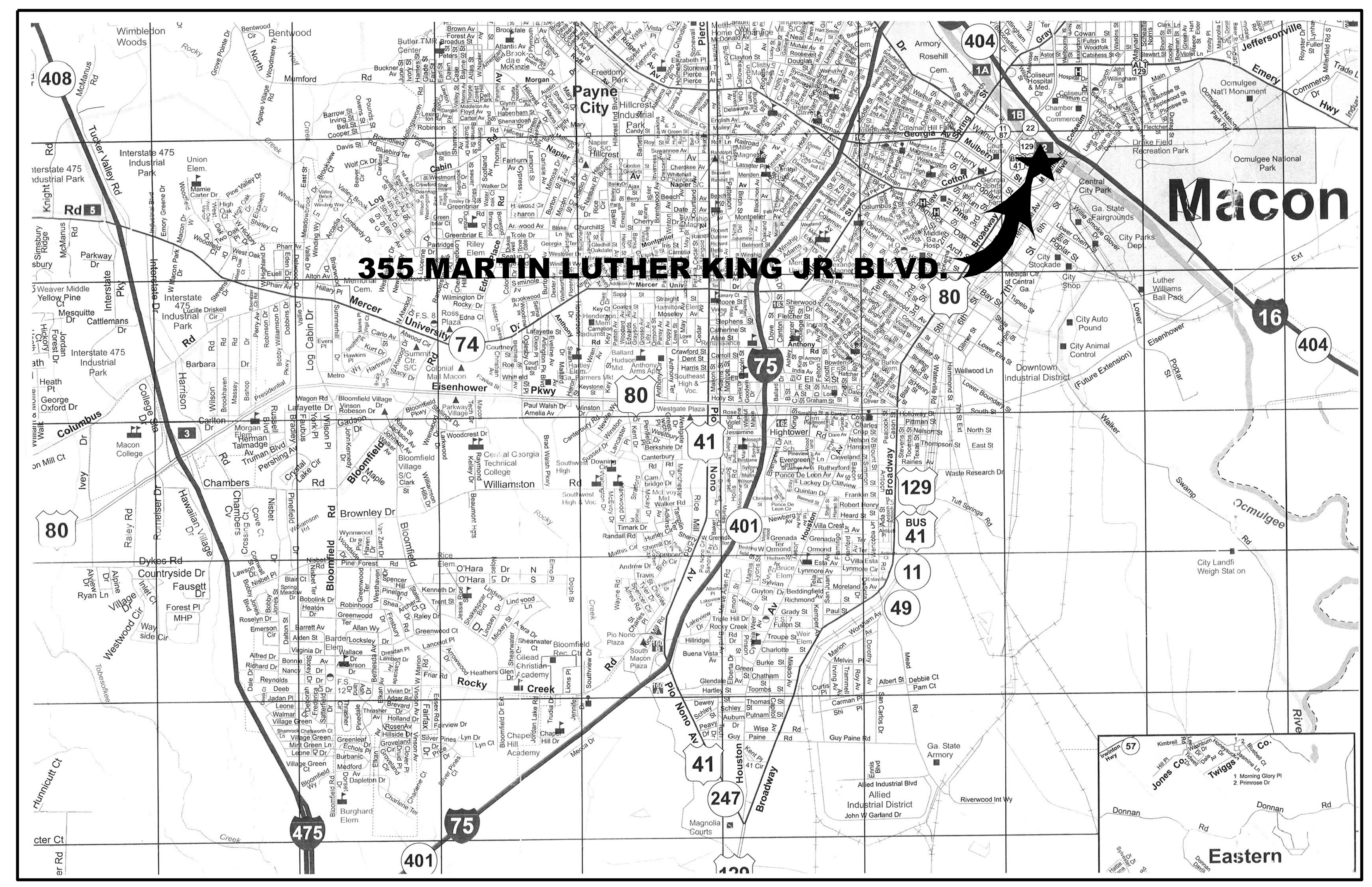
RESTROOM RENOVATIONS FOR:

DOUGLASS THEATRE

355 MARTIN LUTHER KING JR. BLVD., MACON, GA

TOTAL NUMBER OF SHEETS = 14



SITE LOCATION MAP
NO SCALE

CONSULTING ENGINEERS

MECHANICAL / PLUMBING
DULOHERY WEEKS
MACON, GEORGIA

ELECTRICAL
DULOHERY WEEKS
MACON, GEORGIA

GEORGIA REGISTERED No. 36592 PROFESSIONAL ENGINEER THOMAS A. BEAL

GEORGIA REGISTERED NO. 032283 PROFESSIONAL ENGINEER WESLEY O. WOMMACK

ARCHITECTS | PLANNERS
609 Cherry Street
Macon, GA 31201
478.742.1208
www.btbbinc.com

RESTROOM RENOVATIONS FOR:
DOUGLASS THEATRE
355 MARTIN LUTHER KING JR. BLVD., MACON, GA

STATE OF GEORGIA ROBERT W. BROWN CERTIFICATE NO. 7129 REGISTERED ARCHITECT

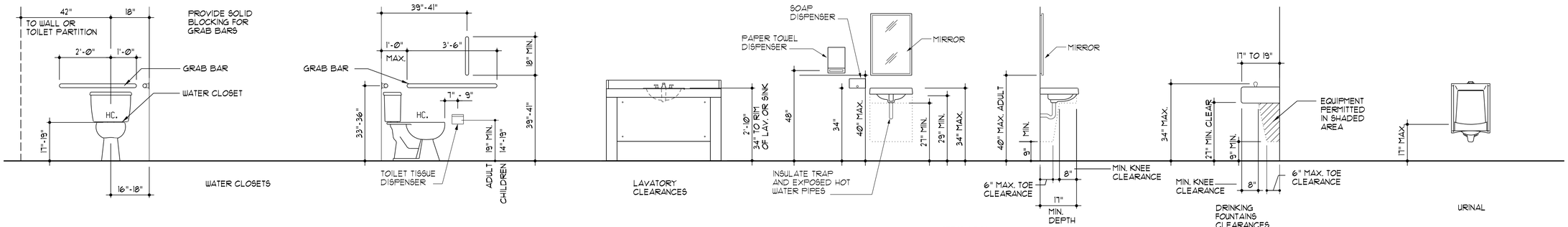
ISSUANCES	
12/19/17	BID DOCUMENTS

17-031

TITLE SHEET

G1.1

F:\PROJECTS\17-031Douglass Theatre Restroom Renovation\Working Drawings\17-031G1.1 Title Sheet.dgn
12/20/2017



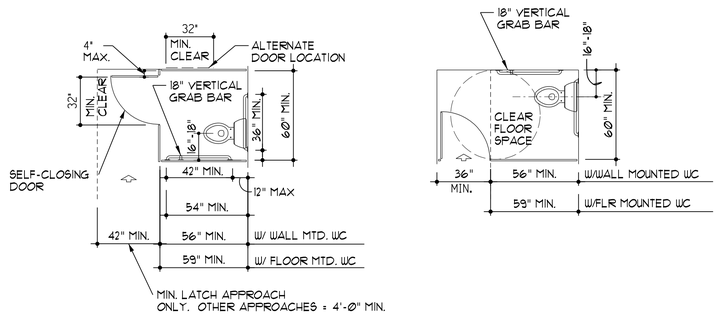
TYPICAL ADA WHEELCHAIR REACH RANGES

STAIR HANDRAIL EXTENSIONS

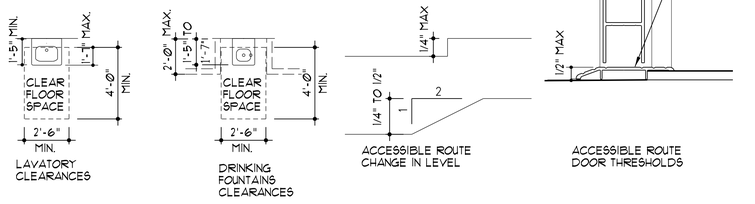
NOTE: X IS THE 1'-Ø" MIN. HANDRAIL EXTENSION REQUIRED AT EACH TOP RISER.

Y IS THE MIN. HANDRAIL EXTENSION OF 1'-Ø" PLUS THE WIDTH OF ONE TREAD THAT IS REQUIRED AT EACH BOTTOM RISER.

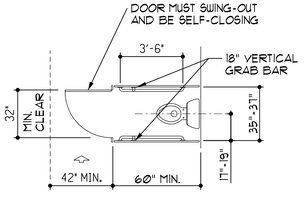
STANDARD WHEELCHAIR ACCESSIBLE STALLS



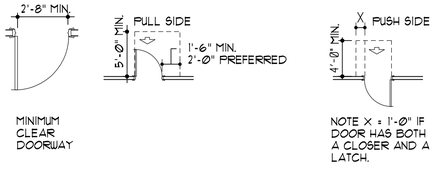
STANDARD ADA CLEARANCES



STANDARD AMBULATORY ACCESSIBLE TOILET COMPARTMENT



STANDARD ADA MANEUVERING CLEARANCES AT DOORS



ADA NOTES :

1. ALL HANDICAPPED ACCESSORIES AND FIXTURES SHALL CONFORM TO THE "AMERICANS WITH DISABILITIES ACT".
2. THE FOLLOWING NOTES FROM THE ADA GUIDELINS SHALL BE USED

4.13.9 DOOR HARDWARE. HANDLES, PULLS, LATCHES, LOCKS AND OTHER OPERATING DEVICES ON ACCESSIBLE DOORS SHALL HAVE A SHAPE THAT IS EASY TO GRASP WITH ONE HAND AND DOES NOT REQUIRE TIGHT GRASPING OR TWISTING OF THE WRIST TO OPERATE. LEVER - OPERATED MECHANISMS, PUSH-TYPE MECHANISMS, AND U-SHAPED HANDLES ARE ACCEPTABLE DESIGNS. WHEN SLIDING DOORS ARE FULLY OPEN, OPERATING HARDWARE SHALL BE EXPOSED AND USABLE FROM BOTH SIDES. HARDWARE REQUIRED FOR ACCESSIBLE DOOR PASSAGE SHALL BE MOUNTED NO HIGHER THAT 4'-0" ABOVE FINISHED FLOOR.

4.13.10 DOOR CLOSER. IF A DOOR HAS A CLOSER, THEN THE SWEEP PERIOD OF THE CLOSER SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 70 DEGREES, THE DOOR WILL TAKE AT LEAST 3 SECONDS TO MOVE TO A POINT 3 IN FROM THE LATCH, MEASURED TO THE LEADING EDGE OF THE DOOR.

4.13.11 DOOR OPENING FORCE. THE MAXIMUM FORCE FOR PUSHING AND PULLING OPEN A DOOR SHALL BE AS FOLLOW:

(1) FIRE DOORS SHALL HAVE THE MINIMUM OPENING FORCE ALLOWABLE BY THE APPROPRIATE ADMINISTRATIVE AUTHORITY.

(2) OTHER DOORS.
(A) EXTERIOR HINGED DOOR: (RESERVED).

(B) INTERIOR HINGED DOORS: 5 LBF.

(C) SLIDING OR FOLDING DOORS: 5 LBF.

THESE FORCES DO NOT APPLY TO THE FORCE REQUIRED TO RETRACT LATCH BOLTS OR DISENGAGE OTHER DEVICES THAT MAY HOLD THE DOOR IN A CLOSED POSITION.

4.15.3 SPOUT LOCATION. THE SPOUTS OF DRINKING FOUNTAINS AND WATER COOLERS SHALL BE AT THE FRONT OF THE UNIT AND SHALL DIRECT THE WATER FLOW IN A TRAJECTORY THAT IS PARALLEL OR NEARLY PARLLEL TO THE FRONT OF THE UNIT. THE SPOUT SHALL PROVIDE A FLOW OF WATER AT LEAST 4" HIGH SO AS TO ALLOW THE INSERTION OF A CUP OR GLASS UNDER THE FLOW OF WATER. ON AN ACCESSIBLE DRINKING FOUNTAIN WITH A ROUND OR OVAL BOWL, THE SPOUT MUST BE POSITIONED SO THE FLOW OF WATER IS WITHIN 3" OF THE FRONT EDGE OF THE FOUNTAIN.

4.16.6 DISPENSERS. TOILET PAPER DISPENSERS SHALL BE INSTALLED WITHIN REACH, AS SHOWN ON WATER CLOSET DRAWING THIS SHEET. DISPENSERS THAT CONTROL DELIVERY, OR THAT DO NOT PERMIT CONTINUOUS PAPER FLOW SHALL NOT BE USED.

4.17.5 DOORS. TOILET STALL DOORS, INCLUDING DOOR HARDWARE, SHALL COMPLY WITH 4.13. IF TOILET STALL APPROACH IS FROM THE LATCH SIDE OF THE STALL DOOR, CLEARANCE BETWEEN THE DOOR SIDE OF THE STALL AND ANY OBSTRUCTION MAY BE REDUCED TO A MINIMUM OF 3'-6"

4.18.3 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE 2'-6" BY 4'-0" SHALL BE PROVIDED IN FRONT OF URINALS TO ALLOW FORWARD APPROACH. THIS CLEAR SPACE SHALL JOIN OR OVERLAP AN ACCESSIBLE ROUTE SHIELDS THAT DO NOT EXTEND BEYOND THE FRONT EDGE OF THE URINAL RIM MAY BE PROVIDED WITH 2'-6" CLEARANCE BETWEEN THEM.

4.19.4 EXPOSED PIPES AND SURFACES. HOT WATER AND DRAIN PIPES UNDER LAVATORIES SHALL BE INSULATED OR OTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER LAVATORIES.

4.27.4 OPERATION. CONTROLS AND OPERATING MECHANISMS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL BE NO GREATER THAN 5 LBF.

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RESTROOM RENOVATIONS FOR: DOUGLASS THEATRE

355 MARTIN LUTHER KING JR. BLVD., MACON, GA

STATE OF GEORGIA — ROBERT W. BROWN — REGISTERED ARCHITECT — CERTIFICATE NO. 7429

ISSUANCES

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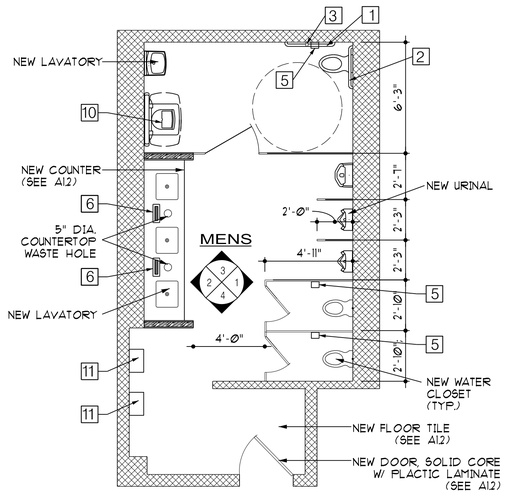
17-031

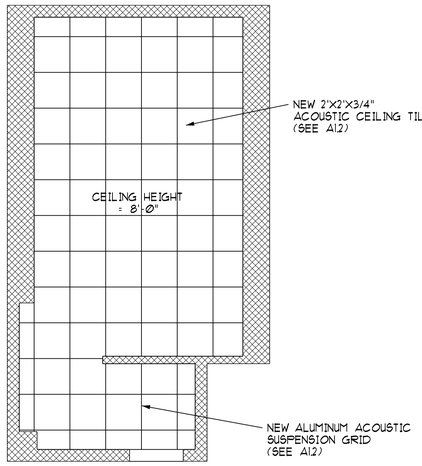
GENERAL INFORMATION

G1.2



NEW FIRST FLOOR MENS PUBLIC RESTROOM

1/4"=1'-0"



NEW FIRST FLOOR (RCP) MENS PUBLIC RESTROOM

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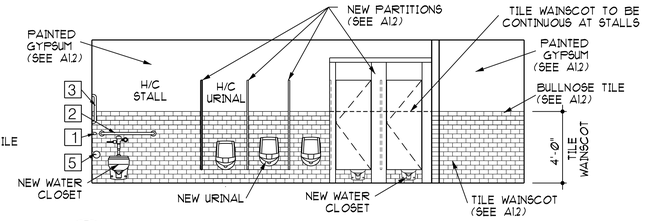
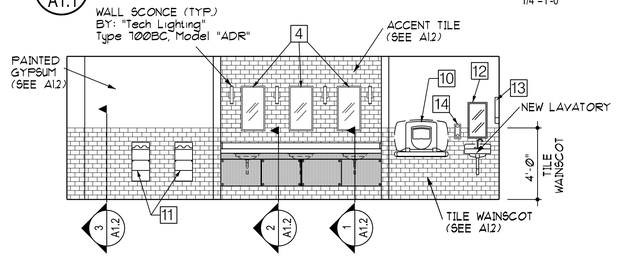


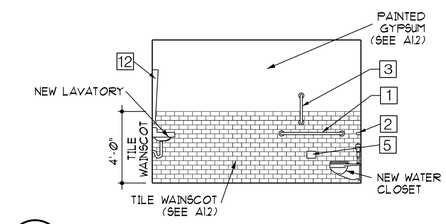
1 A1.1 MENS PUBLIC RESTROOM ELEVATION

1/4"=1'-0"



2 A1.1 MENS PUBLIC RESTROOM ELEVATION

1/4"=1'-0"



3 A1.1 MENS PUBLIC RESTROOM ELEVATION

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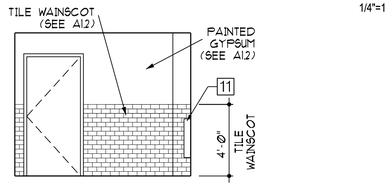

4 A1.1 MENS PUBLIC RESTROOM ELEVATION

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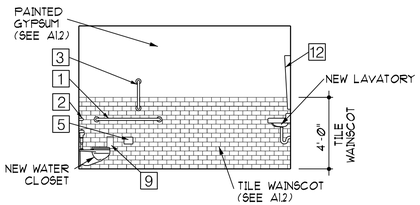
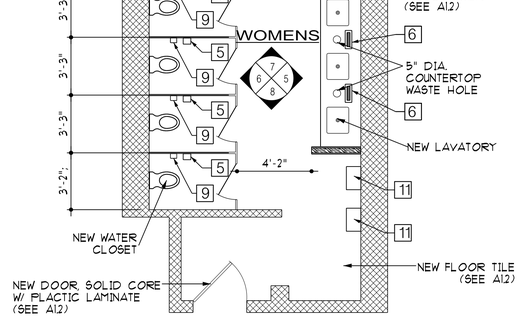


7 A1.1 WOMENS PUBLIC RESTROOM ELEVATION

1/4"=1'-0"

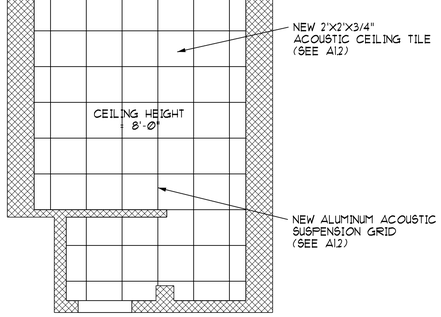
NOTE:

REFER TO G1.2 FOR ALL ADA REQUIREMENTS FOR HEIGHTS AND DISTANCES



NEW FIRST FLOOR WOMENS PUBLIC RESTROOM

1/4"=1'-0"



NEW FIRST FLOOR (RCP) WOMENS PUBLIC RESTROOM

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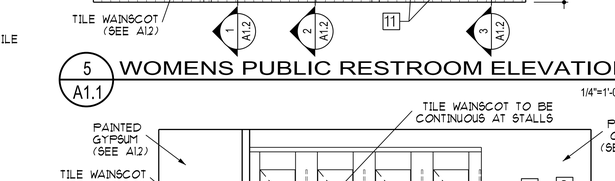

5 A1.1 WOMENS PUBLIC RESTROOM ELEVATION

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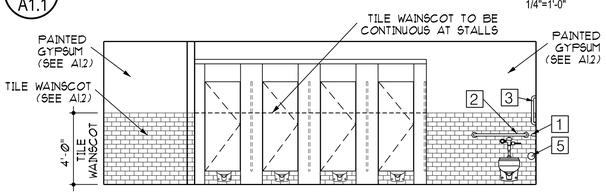

6 A1.1 WOMENS PUBLIC RESTROOM ELEVATION

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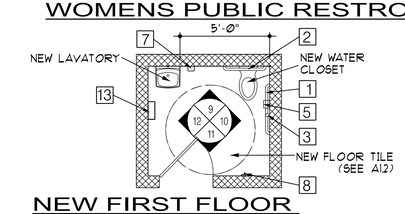
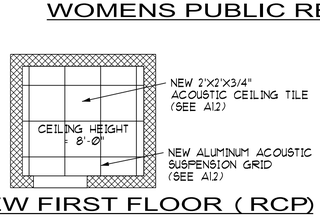


NEW FIRST FLOOR MENS SINGLE RESTROOM

1/4"=1'-0"



NEW FIRST FLOOR (RCP) MENS SINGLE RESTROOM

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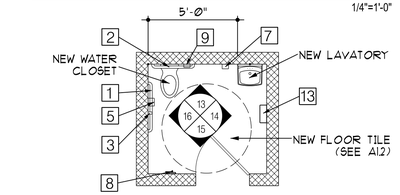
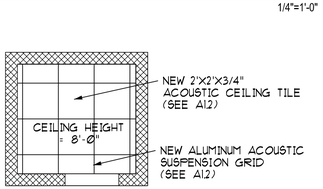


NEW FIRST FLOOR WOMENS SINGLE RESTROOM

1/4"=1'-0"



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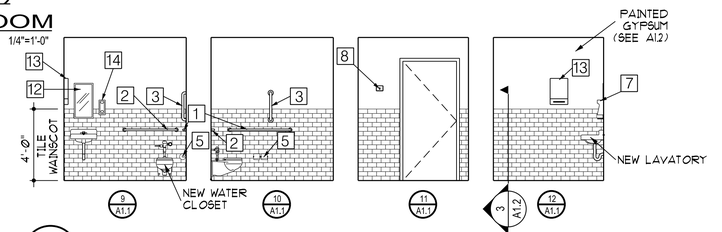

9-12 A1.1 MENS SINGLE RESTROOM ELEVATIONS

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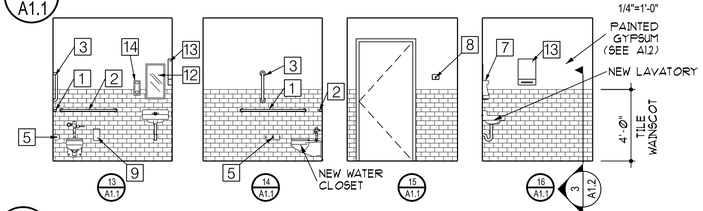
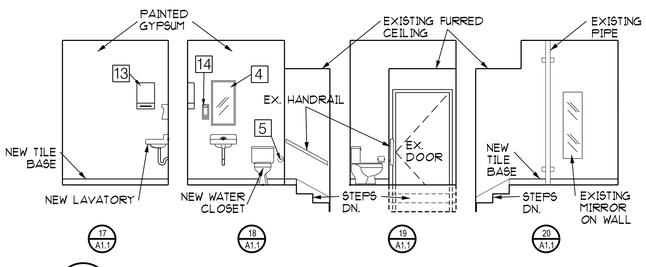


13-16 A1.1 WOMENS SINGLE RESTROOM ELEVATIONS

1/4"=1'-0"

NEW SECOND FLOOR PRIVATE RESTROOM FLOOR PLAN AND (RCP)

1/4"=1'-0"



17-20 A1.1 PRIVATE RESTROOM ELEVATIONS

1/4"=1'-0"

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RESTROOM RENOVATIONS FOR:
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355 MARTIN LUTHER KING JR. BLVD., MACON, GA

STATE OF GEORGIA
ROBERT W. BROWN
CERTIFICATE NO. 7005
REGISTERED ARCHITECT

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17-031

RESTROOM FLOOR PLANS, REFLECTED CEILING PLANS & INTERIOR ELEVATIONS

A1.1

F:\PROJECTS\17-03\Douglass Theatre Restroom Renovation\Working Drawings\17-03 ALL Restroom Floor Plans, RCP's & Interior Elevations.dgn
12/20/2017

FINISH SCHEDULE

LOCATION	FLOORS	WALLS (TILE)			WALLS (PAINT)	DOORS		CEILING		VANITY		TOILET STALLS
	INTERCERAMIC, CONTESSA GLAZED PORCELAIN 12"x24", COLOR: "PEARL" GROUT: ProSpec "ANTIQUE WHITE #03"	WALL TILE WAINSCOT INTERCERAMIC, GLAZED CERAMIC, 3"x6", COLOR: "WHITE" FINISH: BRITE GROUT: ProSpec "ICE WHITE #35"	BULLNOSE TOP WAINSCOT INTERCERAMIC, GLAZED CERAMIC, 3"x6", COLOR: "ABSOLUTE BLACK" FINISH: BRITE GROUT: ProSpec "ONYX BLACK #49"	ACCENT TILE @ VANITY INTERCERAMIC, GLAZED CERAMIC, 3"x6", COLOR: "ARROW WOOD" FINISH: BRITE GROUT: ProSpec "SUMMER WHEAT #63"	WALL ABOVE WAINSCOT BENJAMIN MOORE #1529 COLOR: "STINGRAY"	SOLID CORE WITH PLASTIC LAMINATE COLOR: "HAMPTON WALNUT" BY: WILSONART	HOLLOW METAL FRAMES BENJAMIN MOORE #1528 COLOR: "EARLY MORNING MIST"	2'x2'X5/8" ACOUSTIC PANELS EQUAL TO "MARS" BY USG W/"FINELINE BEVEL(FLB) EDGE & SCRUBBABLE FACTORY APPLIED VINYL FINISH. COLOR: "WHITE"	9/16" ALUMINUM GRID, EQUAL TO USG "CENTRICITEE" ACOUSTIC SUSPENSION SYSTEM W/ ALUM. CAPING FOR ENVIROMENTALLY SEVERE CONDITIONS. COLOR: "WHITE"	VANITY COUNTERTOP SILESTONE QUARTZ, 3" THICK COLOR: "WHITE NORTH"	VANITY APRON WILSONART PLACTIC LAMINATE, #7959K-78 COLOR: "HAMPTON WALNUT" BY: "WILSONART"	WILSONART PLASTIC LAMINATE #4966-60 COLOR: "SHADOW"
PUBLIC MEN TOILET	X	X	X	X	X	X	FN-2	X	X	X	X	X
PUBLIC WOMEN TOILET	X	X	X	X	X	X	FN-2	X	X	X	X	X
MEN TOILET	X	X	X	X	X			X	X			X
WOMEN TOILET	X	X	X	X	X			X	X			X
PRIVATE TOILET	FN-3	FN-1			X							

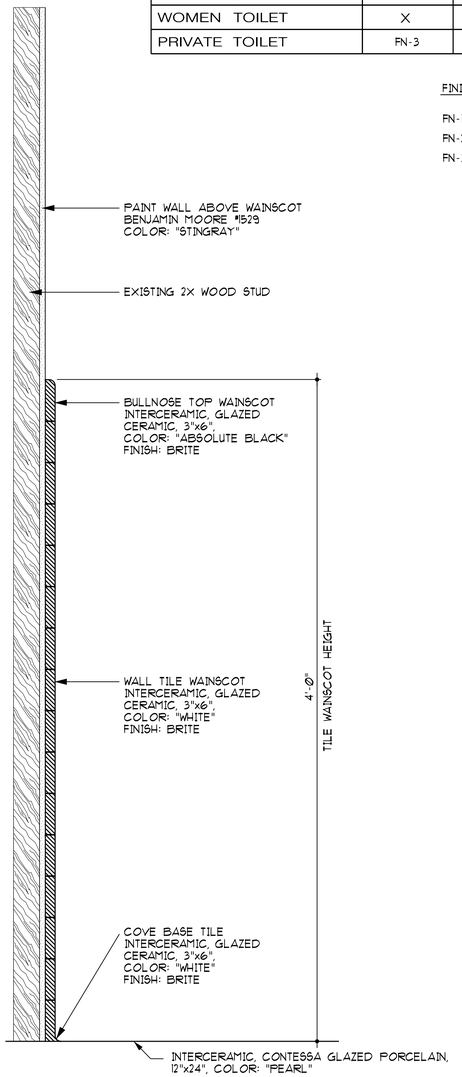
NOTE: FINAL FINISHES TBD DURING CONSTRUCTION

FINISH NOTES

FN-1. PRIVATE TOILET SHALL HAVE ONLY COVE BASE TILE

FN-2. PAINT FULL HOLLOW METAL DOOR FRAME INSIDE THE RESTROOM AND AT CORRIDOR

FN-3. PROVIDE FINISHED EDGE ON STAIRS



3 / A1.2 WALL TILE SECTION DETAIL

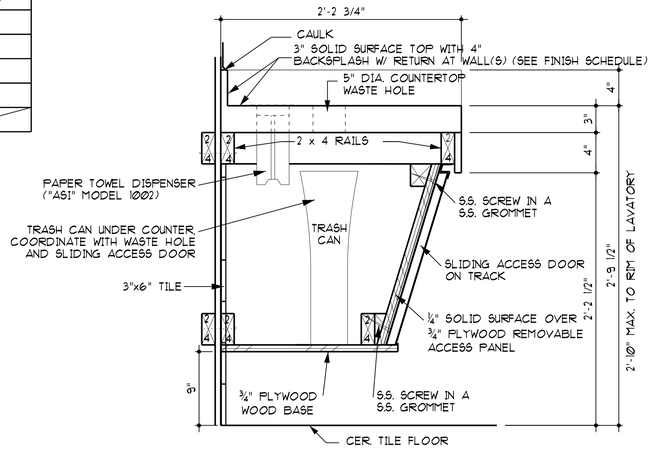
SCHEDULE OF TOILET ACCESSORIES

ITEMS NO.	DESCRIPTION	MANUFACTURE INFORMATION
1	42" GRAB BAR	"ASI" 3800 SERIES
2	36" GRAB BAR	"ASI" 3800 SERIES
3	18" VERTICAL GRAB BAR	"ASI" 3800 SERIES
4	FRAMED MIRROR	"ASI" 0600-1630
5	ROLL PAPER HOLDER (WALL)	"ASI" 0263-1
6	TOWEL DISPENSER (COUNTERTOP)	"ASI" 1002
7	SOAP DISPENSER (COUNTERTOP)	"ASI" 0390-1AC
8	COAT HOOK	"ASI" 7301
9	NAPKIN DISPOSAL (WALL)	"ASI" 0852
10	CHANGING STATION	"ASI" 9012
11	ELEC. HAND DRYER	"DYSON" AB14
12	FRAMED TILT MIRROR	"ASI" 0535
13	TOWEL DISPENSER (WALL)	"ASI" 0210
14	SOAP DISPENSER (WALL)	"ASI" 0346

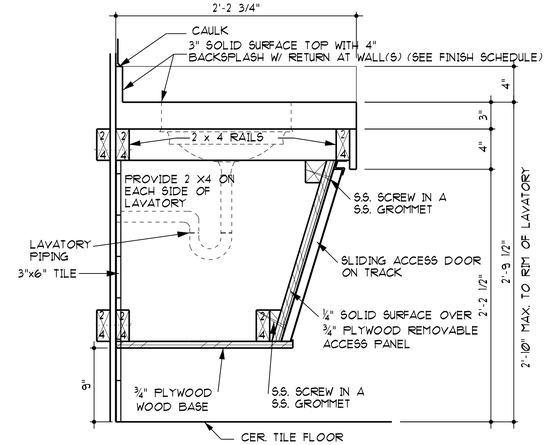
ROOM NAME	QUANTITY													NOTES
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
PUBLIC MEN TOILET	1	1	1	3	3	2	3	*	/	1	2	1	1	1	
PUBLIC WOMEN TOILET	1	1	1	3	5	2	3	*	5	1	2	1	1	1	
MEN TOILET	1	1	1	/	1	/	/	1	/	/	/	1	1	1	
WOMEN TOILET	1	1	1	/	1	/	/	1	1	/	/	1	1	1	
PRIVATE TOILET	/	/	/	1	1	/	/	/	/	/	/	/	1	1	

NOTES

1. ANY ACCESSORIES NOT SHOWN SHALL BE LOCATED AS DIRECTED BY ARCHITECT.
2. PROVIDE A ROLL PAPER HOLDER AT EACH WATER CLOSET. AS NOTED IN SCHEDULE ABOVE
3. PROVIDE A SANITARY NAPKIN DISPOSAL AT EACH WATER CLOSET IN WOMEN'S RESTROOM. AS NOTED IN SCHEDULE ABOVE
* 4. COAT HOOKS SHALL BE FURNISHED WITH TOILET PARTITION DOORS. TOILETS W/O PARTITIONS WILL REQUIRE A DOOR MOUNTED COAT HOOK NOTED IN SCHEDULE ABOVE.



2 / A1.2 TOILET COUNTER DETAIL
SECTION @ PAPER TOWEL DISPENSER & TRASH CAN



1 / A1.2 TOILET COUNTER DETAIL
SECTION @ SINK AND TRAP

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17-031

TOILET ACCESSORIES & DETAILS

A1.2

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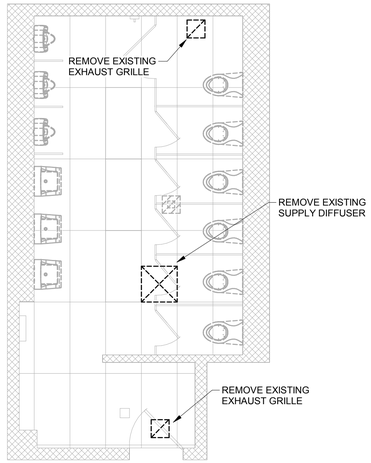
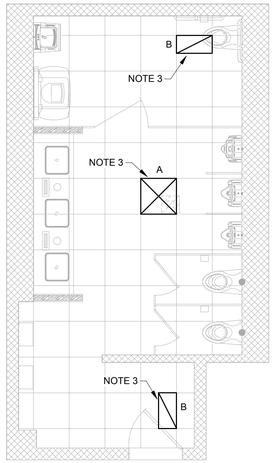
12/19/2017



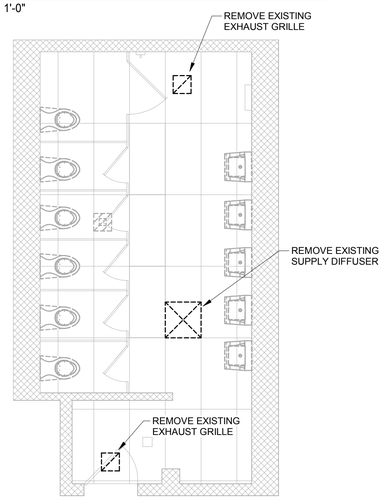
EXISTING FIRST FLOOR MENS PUBLIC RESTROOM

1/4" = 1'-0"



NEW FIRST FLOOR MENS PUBLIC RESTROOM

1/4" = 1'-0"



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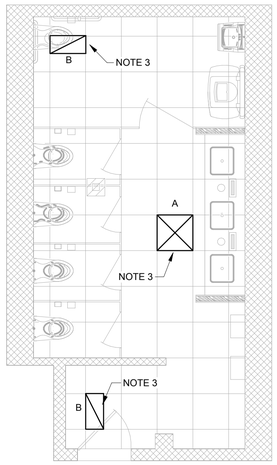
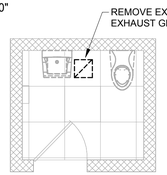
1/4" = 1'-0"



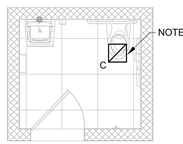
NEW FIRST FLOOR WOMENS PUBLIC RESTROOM

1/4" = 1'-0"



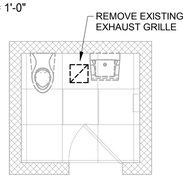
EXISTING FIRST FLOOR MENS SINGLE RESTROOM

1/4" = 1'-0"



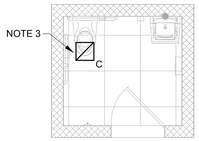
NEW FIRST FLOOR MENS SINGLE RESTROOM

1/4" = 1'-0"



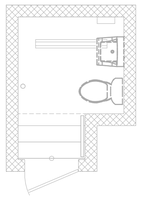
EXISTING FIRST FLOOR WOMENS SINGLE RESTROOM

1/4" = 1'-0"



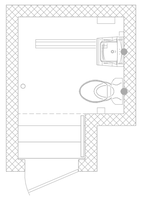
NEW FIRST FLOOR WOMENS SINGLE RESTROOM

1/4" = 1'-0"



EXISTING SECOND FLOOR PRIVATE RESTROOM

1/4" = 1'-0"



NEW SECOND FLOOR PRIVATE RESTROOM

1/4" = 1'-0"

AIR DISTRIBUTION SCHEDULE

DESIGNATION	DESCRIPTION
A	6" ROUND NECK SQUARE CEILING DIFFUSER, LAY-IN
B	1'x2' PERFORATED EXHAUST GRILLE, LAY-IN PANEL
C	1'x1' PERFORATED EXHAUST GRILLE, LAY-IN PANEL

GENERAL MECHANICAL NOTES

1. THE DRAWINGS SHOW THE GENERAL ARRANGEMENT AND LOCATIONS OF THE MECHANICAL WORK. THE CONTRACTOR SHALL FIELD VERIFY LOCATIONS AND SIZES OF DUCTWORK AND AIR DISTRIBUTION NECK SIZES, ETC.) DUE TO LIMITED FIELD OBSERVATION AND LACK OF EXISTING DRAWINGS. COORDINATE THE MECHANICAL INSTALLATION WITH THE STRUCTURE AND ALL OTHER TRADES. PERFORM ALL WORK IN ACCORDANCE WITH 2012 INTERNATIONAL MECHANICAL CODE (IMC).
2. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF THE CEILING MOUNTED DEVICES.
3. CONTRACTOR TO REMOVE EXISTING AIR DISTRIBUTION DEVICES AND PROVIDE NEW AIR DISTRIBUTION DEVICES IN LOCATIONS AS INDICATED ON THE NEW WORK PLANS. EXTEND EXISTING DUCTWORK TO NEW LOCATIONS AS NECESSARY. WHERE CONFLICTS ARISE, REFER TO THE ENGINEER.
4. ALL NEW SUPPLY AIR DUCTWORK SHALL HAVE ONE LAYER OF TYPE 'A' DUCT WRAP. FINAL SUPPLY AIR DIFFUSER CONNECTION TO BE MADE USING MINIMUM R-8.0 FLEXIBLE DUCTWORK. FLEXIBLE DUCTWORK SHALL NOT EXCEED 5 FEET IN LENGTH. EXHAUST AIR DUCTWORK SHALL NOT BE INSULATED.
5. DEVICES REQUIRED TO BE ACCESSIBLE SHALL NOT BE INSTALLED ABOVE DRYWALL CEILINGS. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR LOCATIONS OF HARD CEILINGS.

MECHANICAL LEGEND

⊠ ———		SUPPLY AIR DUCT
⊘ - - - -		RETURN AIR DUCT OR EXHAUST DUCT
——→		DUCT TRANSITION
XY / Z		X=DIFFUSER TYPE / Y=THROW Z=AIRFLOW, CFM
	MD	MANUAL DAMPER
	FD	FIRE DAMPER
	SD	SMOKE DAMPER
		TURNING VANES
		FLEXIBLE DUCT CONNECTION
Ⓣ		THERMOSTAT/TEMPERATURE SENSOR
Ⓗ		HUMIDISTAT/HUMIDITY SENSOR
Ⓢ		DUCT SMOKE DETECTOR
	CO_2	CARBON DIOXIDE DETECTOR
	HP	SPLIT SYSTEM HEAT PUMP
	AH	SPLIT SYSTEM AIR HANDLER
	DHP	DUCTLESS HEAT PUMP
	DAH	DUCTLESS AIR HANDLER
	EF	EXHAUST FAN
	AD	ACCESS DOOR
	TD	TRANSFER DUCT
Ø	DIA	DIAMETER
	OA	OUTSIDE AIR
	UG	UNDERGROUND
	W/	WITH
	AFF	ABOVE FINISH FLOOR
——— D ———		HVAC DRAIN PIPING
——— R ———		REFRIGERANT PIPING

DULOHERY WEEKS ENGINEERS

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ARCHITECTS|PLANNERS
609 Cherry Street
Macon, GA 31201
478.742.1208
www.btbbinc.com

RESTROOM RENOVATIONS FOR:
DOUGLAS THEATRE
355 MARTIN LUTHER KING JR. BLVD., MACON, GA

GEORGIA REGISTERED No. 36692 PROFESSIONAL ENGINEER THOMAS A. BEAL
Thomas A. Beal

ISSUANCES

12-19-2017	BID DOCUMENTS

17-031

RESTROOM MECHANICAL PLANS

M1.1

SECTION 23 0110 – MECHANICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

B. It is recognized that separate sub-contracts may be instituted by THIS CONTRACT'S GENERAL CONTRACTOR with others. It is the responsibility of THIS CONTRACT'S GENERAL CONTRACTOR to completely inform, coordinate and advise those sub-contractors as to all of the requirements, conditions and information associated with providing and installing their portion of the total job.

1.02 IMPOSED REGULATIONS:

A. Applicable provisions of the State and Local Codes and of the following codes and standards in addition to those listed elsewhere in the specifications are hereby imposed on a general basis for mechanical work. In each case, the prevailing edition shall be the current adopted edition of the state where the project is located.

1. *International Mechanical Code.*
2. *International Energy Conservation Code.*
3. *International Fire Code.*

1.03 SCOPE OF WORK:

A. Provide all labor, materials, equipment and supervision to construct complete and operable mechanical systems as indicated on the drawings and specified herein. All materials and equipment used shall be new, undamaged and free from any defects.

1.04 EXISTING SERVICES AND FACILITIES:

A. Damage to Existing Services: Existing services and facilities damaged by the Contractor through negligence or through use of faulty materials or workmanship shall be promptly repaired, replaced, or otherwise restored to previous conditions by the Contractor without additional cost to the Owner.

B. Interruption of Services: Interruptions of services necessary for connection to or modification of existing systems or facilities shall occur only at prearranged times approved by the Owner. Interruptions shall only occur after the provision of all temporary work and the availability of adequate labor and materials will assure that the duration of the interruption will not exceed the time agreed upon.

C. Removed Materials: Existing materials made unnecessary by the new installation shall be removed, shall remain the property of the Owner and shall be stored at a location and in a manner as directed, or, if classified by the Owner's authorized representative as unsuitable for further use, shall become the property of the Contractor and shall be removed from the site.

1.05 PRODUCT WARRANTIES:

A. Provide manufacturer's standard printed commitment in reference to a specific product and normal application, stating that certain acts of restitution will be performed for the Purchaser or Owner by the manufacturer, when and if the product fails within certain operational conditions and time limits. Where the warranty requirements of a specific specification section exceed the manufacturer's standard warranty, the more stringent requirements will apply and modified manufacturer's warranty shall be provided. In no case shall the manufacturer's warranty be less than one (1) year.

1.06 PRODUCT SUBSTITUTIONS:

A. General: Materials specified by manufacturer's name shall be used unless prior approval of an alternate is given by addenda. Requests for substitutions must be received in the office of the Architect at least 10 days prior to opening of bids.

PART 2 - PRODUCTS

2.01 GENERAL MECHANICAL PRODUCT REQUIREMENTS:

A. Standard Products: Provide not less (quality) than manufacturer's standard products, as specified by their published product data. In addition to the indication that a particular product/model number is acceptable, comply with the specified requirements. Do not assume that the available off-the-shelf condition of a product complies with the requirements; as an example, a specific finish or color may be required.

B. Uniformity: Where multiple units of a general product are required for the mechanical work, provide identical products by the same manufacturer, without variations except for sizes and similar variations as indicated.

C. Product Compatibility, Options: Where more than one product selection is specified, either generically or proprietarily, selection is Purchaser's or Installer's option. Provide mechanical adaptations as needed for interfacing of selected products in the work.

D. Equipment Nameplates: Provide a permanent operational data nameplate on each item of power operated mechanical equipment, indicating the manufacturer, product name, model number, serial number, speed, capacity, power characteristics, labels of tested compliance, and similar essential operating data.

E. Locate nameplates in easy-to-read locations. When product is visually exposed in an occupied area of the building, locate nameplate in a concealed position (where possible) which is accessible for reading by service personnel.

PART 3 - EXECUTION

3.01 PRODUCT INSTALLATION, GENERAL:

A. Except where more stringent requirements are indicated, comply with the product manufacturer's installation instructions and recommendations, including handling, anchorage, assembly, connections, cleaning and testing, charging, lubrication, startup, test operation and shut-down of operating equipment. Consult with manufacturer's technical experts, for specific instructions on unique product conditions and unforeseen problems.

B. Protection and Identification: Deliver products to project properly identified with names, models numbers, types, grades, compliance labels and similar information needed for distinct identifications; adequately packaged or protected to prevent deterioration during shipment, storage and handling. Store in a dry, well ventilated, indoor space, except where prepared and protected by the manufacturer specifically for exterior storage.

C. Permits and Tests: Provide labor, material and equipment to perform all tests required by the governing agencies and submit a record of all tests to the Owner or his representative. Notify the Architect five days in advance of any testing.

END OF SECTION 23 0110

SECTION 23 0120 - MECHANICAL STANDARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 QUALITY ASSURANCE:

A. Industry Standards: It is a general requirement that mechanical work comply with applicable requirements and recommendations of standards published by listed agencies and trade associations, except to the extent more detailed and stringent requirements are indicated or required by governing regulations.

B. Listing of Associations, Standards, and Abbreviations:

1. AGA — *American Gas Association*, 1515 Wilson Blvd., Arlington, VA 22209
2. AMCA — *Air Movement & Control Association*, 30 W. University Dr., Arlington Heights, IL 60004, 302/394-0150
3. ARI — *Air-Conditioning and Refrigeration Institute*, 4301 North Fairfax Drive, Suite 425, Arlington, VA 22203, 703/524-8800
4. ASHRAE — *American Society of Heating, Refrigerating & Air Conditioning Engineers, Inc.*, 1791 Tullie Circle, NE, Atlanta, GA. 30329, 404/636-8400
5. AWS — *American Welding Society, Inc.*, 2501 NW 7th St., Miami, FL 33125, 305/642-7090
6. CISPI — *Cast Iron Soil Pipe Institute*, 2020 K. St., NW, Washington, DC, 202/233-4536
7. NEBB — *National Environmental Balancing Bureau*, 1611 North Kent St., Arlington, VA 22209
8. NEC — *National Electrical Code* by NFPA
9. NEMA — *National Electrical Manufacturers Association*, 1300 N 17th Street, Suite 1847, Rosslyn, VA 22209, 703/841-3200
10. NFPA — *National Fire Protection Association*, 407 Atlantic Ave., Boston, MA 02210, 617/482-8755
11. SMACNA — *Sheet Metal & Air Conditioning Contractors National Association, Inc.*, 8224 Old Courthouse Rd., Tysons Corner, Vienna, VA 22180, 703/790-9890
12. TIMA — *Thermal Insulation Manufacturers Association*, 7 Kirby Plaza, Mt. Kisco, NY 10549, 912/241-2284
13. UL — *Underwriters' Laboratories, Inc.*, 207 East Ohio St., Chicago, IL 60611, 312/642-6969

PARTS 2 AND 3 - PRODUCTS AND EXECUTION

A. Not applicable,

END OF SECTION 23 0120

SECTION 23 0210 - MECHANICAL COORDINATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 QUALITY ASSURANCE:

A. Mechanical Coordination Drawings: Prepare a set of coordination drawings showing the coordination of the major elements, components and systems of the mechanical work, and showing the coordination of mechanical work with other work. Prepare drawings at accurate scale and sufficiently large to show locations of every item, including clearances for installing, maintaining, insulating, breaking down equipment, replacing motors and similar requirements. Prepare drawings to include plans, elevations, sections and details as needed to conclusively show successful coordination and integration of the work. Submit drawings for review by the Architect/Engineer.

B. Coordinate the actual location of all mechanical work visible in finished spaces with the Architect/Engineer. This includes air distribution devices, exposed ductwork, thermostats, humidistats, switches, sensors, etc.

PART 2 - PRODUCTS

2.01 MECHANICAL PRODUCT COORDINATION:

A. Power Characteristics: Refer to the electrical sections of the specifications and the electrical drawings for the power characteristics available for the operation of each power driven item of equipment. The electrical design was based on the typical power requirements of the equipment manufacturers scheduled or specified. Any modifications to the electrical system which are required due to the use of an approved equivalent manufacturer shall be made at no additional cost to the owner. All changes must be clearly documented and submitted for review by the Architect/Engineer prior to purchasing equipment. Coordinate purchases to ensure uniform interface with electrical work. The mechanical contractor shall furnish a detailed list of equipment electrical characteristics to the electrical contractor for the purpose of preparing the coordination affidavit required by Division 26.

B. Coordination of Options and Substitutions: Where the contract documents permit the selection from several product options, and where it becomes necessary to authorize a substitution, do not proceed with purchasing until coordination of interface of equipment has been checked and satisfactorily established.

C. Firestopping: Refer to architectural drawings for the locations of all fire rated ceilings, floors and walls. The contractor shall furnish detailed shop drawings of all firestopping details to be used for both piping and ductwork. All firestopping details shall be U.L. listed and subject to approval by the Authority having jurisdiction.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION:

A. Substrate Examination: The Installer of each element of the mechanical work must examine the condition of the substrate to receive the work, and the conditions under which the work will be performed, and must notify the Contractor in writing of conditions detrimental to the proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

B. Do not proceed with the installation of sleeves, anchors, hangers, roof penetrations and similar work until mechanical coordination drawings have been processed and released for construction. Where work must be installed prior to that time in order to avoid a project delay, review proposed installation in a project coordination meeting including all parties involved with the interfacing of the work.

3.02 CUTTING AND PATCHING:

A. Structural Limitations: Do not cut structural framing, walls, floors, decks and other members intended to withstand stress, except with the Architect's or Engineer's written authorization.

B. Where authorized, cut opening through concrete (for pipe penetrations and similar services) by core drilling or sawing. Do not cut by hammer-driven chisel or drill.

C. Other work: Do not endanger or damage other work through the procedures and processes of cutting to accommodate mechanical work. Review the proposed cutting with the Installer of the work to be cut, and comply with his recommendations to minimize damage. Where necessary, engage the original Installer or other specialists to execute the cutting in the recommended manner.

D. Where patching is required to restore other work, because of either cutting or other damage inflicted during the installation of mechanical work, execute the patching in the manner recommended by the original Installer. Restore the other work in every respect, including the elimination of visual defects in exposed finishes, as judged by the Architect. Engage the original Installer to complete patching of the following categories of work:

1. Exposed concrete finishes and exposed masonry.
2. Waterproofing and vapor barriers.
3. Interior exposed finishes and casework, where judged by the Architect to be difficult to achieve an acceptable match by other means.

3.03 COORDINATION OF MECHANICAL INSTALLATION:

A. General: Sequence, coordinate and integrate the various elements of mechanical work so that the mechanical plant will perform as indicated and be in harmony with the other work of the building. The Architect/Engineer will not supervise the coordination, which is the exclusive responsibility of the Contractor. Comply with the following requirements:

1. Install piping, ductwork and similar services straight and true, aligned with other work and with overhead structures and allowing for insulation. Conceal where possible.
2. Arrange work to facilitate maintenance and repair or replacement of equipment. Locate services requiring maintenance on valves and similar units in front of services requiring less maintenance. Connect equipment for ease of disconnecting, with minimum of interference with other work.
3. Equipment located above ceilings shall be installed in a position and elevation which allows complete and adequate maintenance access through the ceiling grid or access panel while standing safely on a ladder. If this is not possible, a suitable maintenance platform must be provided per IMC.
4. Give the right-of way to piping systems required to slope for drainage (over other service lines). Piping shall be located to avoid interference with ductwork and light fixtures.
5. Store materials off the ground and protected from standing water and weather.

B. Drawings: Conform with the arrangement indicated by the contract documents to the greatest extent possible, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, comply with the Architect's decision on resolution of the conflict.

C. Electrical Work: Coordinate the mechanical work with electrical work, and properly interface with the electrical service. In general, and except as otherwise indicated, install mechanical equipment ready for electrical connection. Refer to electrical sections of the specifications for electrical connection of mechanical equipment.

D. Duct Smoke Detectors: All HVAC duct smoke detectors, including smoke detectors for smoke dampers, shall be furnished by Division 26 and installed by Division 23. In buildings equipped with a fire alarm system, all duct smoke detectors must be compatible with the fire alarm system and must be connected to the fire alarm system for notification. All fire alarm wiring and associated devices shall be furnished and installed by the fire alarm system installer. In buildings not equipped with a fire alarm system, each duct smoke detector must have a remote device where actuation of the duct smoke detector shall activate a visible and an audible signal in an approved location. Duct smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as "Air Duct Detector Trouble." Each smoke detector shall be wired into the respective fan control circuit to automatically shut down the fan upon sensing products of combustion.

3.04 COORDINATION OF MECHANICAL START-UP:

A. Painting and Air Distribution: Coordinate the initial cleaning and start-up of the air distribution system, to occur prior to preparatory cleaning and general interior painting and decorating on the project. The HVAC system should not be operated until drywall work is completed. Drywall dust must not be allowed to contaminate the interior of air handing units and ductwork. Use high efficiency temporary filters until project closeout.

END OF SECTION 23 0210

SECTION 23 0220 - MECHANICAL SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUBMITTAL FORMS AND PROCEDURES:

A. The purpose of submittals is to demonstrate to the Architect/Engineer that the Contractor understands the design concept. The Architect/Engineer's review of such drawings, schedules, or cuts shall not relieve the Contractor from responsibility for deviation from drawings or specifications unless he has, in writing, called the Architect/Engineer's attention to such deviations at the time of submission, and has received from the Architect/Engineer, in writing, permission for such deviations. All submittals must be completely checked by the Contractor prior to submission for review.

B. Hard Copy Submittals: Submittal data shall be placed in one or more hard-back 3-ring binders, arranged and labeled according to specification section. Each binder shall contain a title page and table of contents. Provide separator tabs, and label by specification section. Make note in the table of contents, any drawings that accompany the submittal. Title page shall contain Project Name, Contractor's Name, Division 23 Superintendent's name, Suppliers and point of contact for each, and date. Except as otherwise indicated in other sections, submit 5 complete copies. Quantity indicated does not include copies required for regulatory agencies.

C. Electronic Submittals: If the Architect agrees to allow electronic submittals via an on- line information management product such as "Submittal Exchange," etc., all electronic submittal files shall be organized to match the bid documents for specification section and name. Each submittal file shall be complete for each specification section. Multiple partial submittals per specification section will be rejected. Make note in the table of contents, any drawings that accompany the submittal. Title page shall contain Project Name, Contractor's Name, Division 23 Superintendent's name, Suppliers and point of contact for each, and date.

D. Submittals shall be made for all items contained in the following specification sections:

1. Mechanical Coordination
2. Mechanical Identification
3. Ductwork and Accessories
4. Air Distribution

E. Response to Submittals: A Submittal Review Report shall be issued by the Architect/Engineer with the following classifications for each item:

1. **"No Exceptions Taken"**: No corrections, no marks. Contractor shall submit copies for distribution.
2. **"Make Corrections Noted"**: A few minor corrections. Items may be ordered as marked up without further resubmission. Submit copies for distribution.
3. **"Revise and Resubmit"**: Minor corrections. Item may be ordered at the Contractor's option. Contractor shall resubmit drawings with corrections noted.
4. **"Rejected"**: Major corrections or not in accordance with the contract documents. No items shall be ordered. Contractor shall correct and resubmit drawings.

PART 2 - PRODUCTS

2.01 SUBMITTAL REQUIREMENTS:

A. General: Each specification section shall list the required submittal items. All submittal items shall conform to the requirements listed below. For each major section of submittal data, include a summary page which lists items and model numbers for each piece of equipment.

B. Shop Drawings: Prepare mechanical shop drawings to accurate scale except where diagrammatic representations are specifically indicated. Show clearance dimensions of critical locations, and show dimensions of spaces required for operation and maintenance of equipment. Show piping connections and other service connections, and show interface with other work including structural support. Indicate by note, the portions of mechanical work shown on the shop drawings which deviated from the indication of work in the contract documents, and explain the reasons for the deviations. Show how such deviations coordinate with interfacing deviations on shop drawings for other portions of the work, currently or previously submitted.

C. Manufacturer's Data: Where pre-printed data is submitted for more than one distinct product, size, type, material, trim, accessory group or other variation, mark submitted copy with black pen to indicate which of the variations is to be provided. Delete or mark-out significant portions of preprinted data which are not applicable. Where operating ranges are shown, mark data to show portion of range required for project application. Expansion or elaboration of standard data to describe a non-standard product must be processed as a shop drawing submittal. For each product include the manufacturer's production specifications, installation or fabrication instructions, nearest source of supply (including telephone number), sizes, weights, speeds, operating capacities, piping and service line connection sizes and locations, statements of compliance with required standards and governing regulation (include manufacturer's signed statements if not covered in printed data), performance data (where applicable) and similar information needed to confirm compliance with the requirements.

D. Certifications: Where specifically indicated, submit with notarized execution.

E. Test Reports: Submit test reports which have been signed and dated by the firm performing the test and prepared in the manner specified in the standard or regulation governing the test procedures as indicated.

F. Manufacturer's Product Warranties: Where pre-printed and published warranty includes substantial deviation from required warranty (as judged by the Architect or Engineer), product is automatically disqualified from use on the project, except where manufacturer prepares and issues a specific product warranty on the product, stating that it is in lieu of the published warranty, and is executed by an authorized officer, and complies with the requirements. Warranties shall comply with the requirements of individual specification section where those requirements exceed the manufacturer's standard warranty.

PART 3 - EXECUTION

3.01 CLOSEOUT REQUIREMENTS:

A. Operating Instructions: Submit manufacturer's operating instructions for each item of mechanical equipment and supplement with additional project application instructions where necessary. Prepare and submit specific operating instructions for charging, start-up, control or sequencing of operation, phase or seasonal variations, shut-down, safety and similar operational instructions. Prepare in typewritten form in completely explained and easily understood English language.

B. Maintenance Manuals: Organize each copy of the required system maintenance manuals to include an index followed by thumb-tab marked sections for each of the following:

1. System operating instructions.
2. Emergency instructions including addresses and telephone numbers of service sources.
3. Regular system maintenance procedures including lubrication.
4. Spare parts listing and stocking recommendations.
5. Inspection, adjusting, rebalancing, cleaning, parts replacement, and similar maintenance instructions and recommendations, including the proper use of tools and accessories.
6. Valve schedule and control diagram for each system.
7. Manufacturer's data for each operating item in each system.
8. Manufacturer's product warranties and guarantees relating to the system and equipment items in the system.
9. Corrected or approved issues of submittal items relating to the system.
10. Bind each maintenance manual in one or more vinyl-covered, 2", 3-ring binder, plus pocket-folder type binders for folded drawings, and mark the back spine of each binder with system identification and volume number.

C. Maintenance Materials: Deliver to Owner's representative at the location as directed, in containers or packages suitable for storage and fully identified.

D. Guarantees: Where indicated as "Certified", provide guarantee which, in addition to execution by an authorized officer of each guarantor, is attested to by the Secretary of each guarantor and bears the corporate seal.

END OF SECTION 23 0220

SECTION 23 0240 - MECHANICAL WORK CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 DOCUMENTATION PROCEDURES:

A. Signed Commitments: Do not proceed with transfer of mechanical plant to the Owner for operation until warranties, performance certifications and similar commitments to be signed by Contractor and other entities have been executed and transmitted to Architect (for Owner's records).

1.03 RECORD DRAWINGS:

A. Explanation: Except where otherwise indicated, mechanical drawings (contract drawings) prepared by Architect/Engineer, contract/drawings, are diagrammatic in nature and may not show locations accurately for various components of mechanical systems. Shop drawings, including coordination drawings, prepared by Contractor shall show certain portions of work more accurately to scale and location, and in greater detail.

B. General Recording Procedure: Maintain a white-print set, blue-line or black-line, of mechanical contract drawings and shop drawings in clean, undamaged condition, for mark-up of actual installations which vary substantially from the work as shown. Mark-up whatever drawings are most capable of showing the installed conditions accurately; however, where shop drawings are marked, record a reference note on appropriate contract drawing. Mark with erasable pencil and use multiple colors to aid in the distinction between work of separate mechanical systems. In general, record every substantive installation of mechanical work which previously is either not shown or shown inaccurately, but in any case record the following:

1. *"Mechanical Project Record"* shall be maintained as part of the *"Project Record"* specified in Division 1.

PART 2 – PRODUCTS

2.01 NOT APPLICABLE:

PART 3 - EXECUTION

3.01 CLOSEOUT PROCEDURES:

A. General Coordination: Sequence closeout procedures properly, so that work will not be endangered or damaged, and so that every required performance will be fully tested and demonstrated.

B. System Performance Test Run: At the time of mechanical work closeout, check each item in each system to determine that it is set for proper operation. With Owner's representative and Architect/Engineer present, operate each system ina test run of appropriate duration to demonstrate compliance with performance requirements. During or following test runs, make final corrections or adjustments of system to refine and improve performances wherever possible, including noise and vibration reductions, elimination of hazards, better response of controls, signals and alarms, and similar system performance improvements. Provide testing or inspection devices as may be requested for Architect's/Engineer's observation of actual system performances. Demonstrate that controls and items requiring service or maintenance are accessible. Test run shall be scheduled to coincide with Engineer's final inspection of the mechanical work.

C. Cleaning and Lubrication: After final performance test run of each mechanical system, clean system both externally and internally. Clean dirt and debris from air handling systems and install new filters. Flush piping system by operating drains and similar means, and clean strainers and traps. Lubricate both power and hand operated equipment and remove excess lubrication. Touch-up minor damage to factory painted finishes and other painting specified as mechanical work; refinish work where damage is extensive.

D. General Operating Instructions: In addition to specified training of Owner's operating personnel specified in individual mechanical sections, and in addition to preparation of written operating instructions and compiled maintenance manuals specified, provide general operating instructions for the total mechanical plant. Conduct a walk-through explanation and demonstration for orientation and education of Owner's personnel to be involved in continued operation of building and its mechanical plant.

1. Describe each basic mechanical system and how its control system functions, including flow adjustments, temperature control and similar operations.
2. Explain and point out identification system, displayed diagrams, signals, alarms and similar provisions of the work.
3. Describe basic sequencing requirements and interlock provisions for system start-up, phasing, coast-down, shut-down and seasonal operations.
4. Emphasize emergency procedures and safety provisions for protection of equipment and safety of occupants during equipment malfunction, disasters, power failures and similar unusual circumstances, and describe system limitations and precautions including weather adjustments.
5. Outline basic maintenance procedures.

E. Demonstrate what adjustments have been made and can continue to be made to reduce noise and vibration, improve system output, decrease energy consumption and similar performance improvements.

F. Point out operational security provisions, safety, unavoidable hazards and similar operator limitations. Display and conduct a "thumb-through" explanation of maintenance manuals, record drawings, meter readings and similar service items.

G. Construction Equipment: After completion of performance testing and Owner's operating instructions and demonstrations, remove installers tools, test facilities, construction equipment and similar devices and materials used in execution of the work but not incorporated in the work.

3.02 CONTINUED SYSTEM OPERATIONS:

A. Final Acceptance: At time of substantial completion of mechanical work, Owner's operating personnel will take over operation of mechanical systems. However, until time of final acceptance, respond promptly with consultation and services on whatever operation or maintenance problems may remain or arise in continued operation of mechanical plant.

END OF SECTION 23 0240

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RESTROOM RENOVATIONS FOR:
DOUGLAS THEATRE
355 MARTIN LUTHER KING JR. BLVD., MACON, GA

GEORGIA REGISTERED No. 36692 PROFESSIONAL ENGINEER THOMAS A. BEALL

ISSUANCES

12-19-2017	BID DOCUMENTS

17-031

MECHANICAL SPECIFICATIONS

M1.2

DULOHERY WEEKS ENGINEERS

SECTION 23 2110 - DUCTWORK AND ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 QUALITY ASSURANCE:

A. Industry Standards:

1. Comply with SMACNA *(Sheet Metal and Air Conditioning Contractor's National Association)* recommendations for fabrication, construction and details and installation procedures, except as otherwise indicated.
2. Comply with ASHRAE *(American Society of Heating, Refrigerating and Air Conditioning Engineers)* recommendations, except as otherwise indicated.
3. Provide composite ductwork insulation (insulation, coverings, sealers, mastics and adhesives) with flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as tested by ASTM E84 (NFPA 255) method.
4. Provide duct connectors which comply with applicable portion of UL 181 and bear label of *Underwriter's Laboratories*.

1.03 SUBMITTALS:

A. Provide manufacturer's data, test reports, and product warranties as applicable for all items.

PART 2 - PRODUCTS

2.01 ABOVE GROUND DUCTWORK:

A. General: Galvanized steel ductwork shall be used for all supply and exhaust ducts except as indicated otherwise by the contract documents. Preinsulated flexible duct shall be used to make final concealed connections to diffusers, registers, and grilles. Length of flexible duct shall not exceed five feet.

B. Galvanized Steel Ductwork: Ducts shall be fabricated from G90 galvanized sheet steel complying with ASTM A653, lockforming quality. Concealed round ducts shall be the spiral seam type or snap-lock type with matching fittings.

C. Flexible Ducts: Flexible ducts shall be U.L. Listed as Class 1 Flexible Air Duct Material and shall comply with NFPA Standards 90A and 90B. Duct shall be a factory fabricated assembly composed of a polymeric liner duct bonded permanently to a coated spring steel wire helix and supporting a fiberglass insulating blanket with a minimum R-value of 8.0. Low permeability outer vapor barrier of fiberglass reinforced film laminate shall complete the assembly. Duct shall be suitable for low and medium pressure systems and shall carry a full 5-year warranty. For all flexible duct connections to diffusers, registers and grilles,provide rigid elbow brace accessory with one duct diameter centerline radius. Acceptable manufacturers are *Atco*, *Flexmaster*, *Genflex* and *Thermaflex*.

2.02 DUCTWORK ACCESSORIES:

A. General: Except as otherwise indicated for each ductwork accessory, provide metal type, gauge, weight, construction and reinforcing as required by size limitations, and applicable SMACNA standards, including fittings, supports and appurtenances.

B. Balancing Dampers: Provide single blade dampers for round ducts and rectangular ducts less than 12" as indicated on the drawings. Dampers shall be constructed of galvanized steel. Damper shall be installed complete with locking quadrants. For rectangular ducts 12" and wider, provide opposed-blade type dampers constructed of galvanized steel mounted in a galvanized steel channel frame. Blade spacing shall not exceed 6" and the top and bottom edges of the blades shall be crimped to stiffen the blades. Damper blades shall be interconnected by rods and linkages to provide simultaneous operation of all blades. Damper shall be provided with an extended rod to permit installation of a damper regulator. Dampers shall be as manufactured by *Air Balance*, *Arrow*, *Dowco*, *Jer-Air*, *National Controlled Air*, *Ruskin*, *Phillips-Aire*, *Safe-Air* and *United*.

D. Round Take-Offs: Round take-offs shall be made using collars constructed of galvanized steel equipped gasket flange and manual balancing damper with 2 inch handle standoff. Do not furnish extractors or air scoops. Take-offs from low pressure rectangular trunk ducts shall have 45 degree entry. Takeoffs shall be by *Celcon*, *Crown*, *Flexmaster*, *Jer-Air, Metalcraft*, *Sheet Metal Connectors*, *Thermaflex* and *United*.

E. Rectangular Take-Offs: Rectangular take-offs shall be made using collars constructed of galvanized steel equipped with gasket flange and manual balancing damper with 2 inch handle standoff. Do not furnish extractors or air scoops. All takeoffs shall have 45 degree entry. Takeoffs shall be by *Celcon*, *Crown*, *Flexmaster*, *Jer-Air*, *Metalcraft*, *Sheet Metal Connectors*, *Thermaflex* and *United*.

2.03 DUCTWORK INSULATION:

A. General: Refer to the mechanical plans for duct insulation types and locations. Insulation shall be as manufactured by *Certainteed*, *Knauf*, *Manville* and *Owens Corning*.

B. Duct Wrap: Type "A" Duct wrap shall be 2" thick, 1.5 pcf density, blanket type fiberglass insulation with vapor barrier and minimum R-Value of 8.0.

C. Ductwork Insulation Accessories: Provide mechanical fasteners as recommended by the insulation manufacturer.

D. Ductwork Insulation Compounds: Provide cement, adhesives, coatings, sealers, protective finishes, and similar compounds as recommended by the insulation manufacturer for the applications indicated.

2.04 MISCELLANEOUS MATERIALS:

A. General: Provide miscellaneous materials and products of the types and sizes indicated and where not otherwise indicated, provide type and size required to comply with ductwork system requirements including proper connection of ductwork and equipment.

B. Duct Sealant: Duct Sealant for above ground ductwork shall be a mastic suitable for the pressure classification in accordance with SMACNA *HVAC Duct Construction Standard*". All joints and seams shall be sealed.

C. Ductwork Support Materials: Provide hot-dipped galvanized steel rods, fasteners, anchors, straps, angles and trim for support of ductwork. Wires shall not be acceptable.

2.05 DUCT FABRICATION:

A. Shop fabricate ductwork in 4, 8, 10, or 12 foot lengths, unless otherwise indicated or required to complete runs. Pre-assemble in the shop to the greatest extent possible, so as to minimize field assembly of systems. Disassemble systems only to the extent necessary for shipping and handling. Match-mark sections for re-assembly and coordinated installation.

B. Fabricate ductwork with joints, seams and reinforcements as required in the latest edition of SMACNA *HVAC Duct Construction Standards, 2"* static pressure rating.

C. Fabricate duct fittings to match adjoining ducts and to comply with duct requirements as applicable to fittings. Elbows shall be either the curved radius type or the square type with turning vanes. Curved radius elbows shall have a centerline radius equal to 1.5 times the duct width. Curved radius elbows with square throats shall not be acceptable.

D. Fabricate ductwork with accessories installed during fabrication to the greatest extent possible. Where ducts are specified to lined, make allowances for the thickness of the liner. Duct sizes shown on the drawings are clear, inside dimensions.

PART 3 - EXECUTION

3.01 INSTALLATION OF DUCTWORK:

A. General: Assemble and install ductwork in accordance with the latest edition of SMACNA *HVAC Duct Construction Standards* and with recognized industry practices which will achieve air tight noiseless systems, capable of performing each indicated service. Install each run with a minimum of joints. Align ductwork accurately at connections, and with internal and external surface smooth. Support ducts rigidly with suitable ties, braces, hangers and anchors of the type which will hold ducts true-to-shape and prevent buckling. Hanger locations shall be coordinated with the building structure and finish conditions.

B. Complete fabrication of work at the project as necessary to match shop fabricated work and accommodate installation requirements.

C. Locate ductwork runs, except as otherwise indicated, vertically and horizontally and avoid diagonal runs wherever possible. Locate runs as indicated by plans, diagrams, details and notations or, if not otherwise indicated, run ductwork in the shortest route which does not obstruct usable space or block access for servicing the building and its equipment. Coordinate the layout with piping, lighting layouts and similar finished work and plumbing risers. Duct layouts shown are diagrammatic and actual location of duct shall be field verified and coordinated by the duct fabricator prior to beginning fabrication of duct systems.

D. Duct collars shall be provided where ducts pass through walls and partitions which extend full height to the underside of the roof structure. Collars shall be fabricated from 22 gauge galvanized steel sheet. Duct collars shall be provided on both sides of walls and partitions, except collar shall be omitted on that side of the wall where registers and grilles are installed. Flanges shall be installed tight against the wall. The space between the duct and the wall shall be packed with mineral wool.

E. Coordinate duct installations with installation of accessories, dampers, equipment, controls and other associated work of the ductwork system.

3.02 INSTALLATION OF INSULATION:

A. Duct Wrap: Wrap shall be wrapped around duct work with all circumferential joints butted and longitudinal joints overlapped a minimum of 2". Adhere insulation to duct with 4" strips of fire resistant adhesive at 8" on centers. On circumferential joints, the 2" flange on the facing shall be taped with minimum of 3" wide foil reinforced *Kraft* tape. On longitudinal joints the overlap shall be taped with a minimum 3" wide foil reinforced Kraft tape. On ends of insulation use 3" wide foil reinforced *Kraft* tape to fasten insulation ends to duct. For duct widths 24" and greater, provide additional mechanical fasteners on 18" centers on the bottom of the duct to prevent sagging. Insulate that part of the supply diffusers above the ceiling so that there is no uncovered metal surface subject to condensation. Provide taped-on 12"x12" squares of insulation over damper regulators located above ceilings. All duct wrap shall also be wrapped with wire.

3.03 CLEANING AND PROTECTION:

A. Clean ductwork internally, unit-by-unit as it is installed, of dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of the metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration.

B. Temporary Closure: At ends of ducts which are not connected to equipment or air distribution devices at the time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent the entrance of dust and debris.

END OF SECTION 23 2110

SECTION 23 2210 - AIR DISTRIBUTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 QUALITY ASSURANCE:

A. *Titus* is the Basis of Design manufacturer for grilles, registers and diffusers. Equivalent equipment by *Carnes*, *Krueger*, *Metalaire*, *Nailor* and *Price* that meets performance, capacity, space and other requirements of the design documents shall be acceptable.

B. Industry Standards: Comply with *National Fire Protection Association* Standard No. 90A, as applicable to construction and installation of required devices.

1.03 SUBMITTALS:

A. Provide manufacturer's data, test reports, and product warranties for all items as applicable.

PART 2 - PRODUCTS

2.01 GRILLES, REGISTERS, AND DIFFUSERS:

A. Ceiling Diffusers: Square ceiling diffusers shall be the full 2x2 face type with round neck, three or four cones, and one-way, two-way, three-way, or four-way throw as indicated. Diffusers shall be of stamped aluminum construction with white finish. Provide T-bar lay-in frame for grid ceilings. Do not furnish dampers. Provide with molded insulated blanket (R-6 minimum).

B. Ceiling Exhaust Grilles: Perforated face exhaust grilles shall be all aluminum construction with white finish. All 1'x1', 1'x2', and 2'x2' grilles in lay-in ceilings shall be the lay-in type. All other sizes shall have a flanged frame.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. General: Install devices as detailed on the drawings and in accordance with manufacturer's written instructions and in accordance with recognized industry practices.

B. Coordinate with other work, including ductwork and ductwork accessories and ceiling system as necessary to interface installation of grilles and diffusers properly with other work.

C. Ceiling mounted devices to be installed in lay-in tile ceilings shall be compatible with 24"x24" or 24"x48" T-bar grid as applicable. Refer to Architectural Reflected Ceiling Plans for exact locations of grilles, registers and diffusers. For flush mounted devices in T-bar ceilings, special care shall be taken to install devices in the center of ceiling tiles. Sagging will not be permitted. Provide rear sheet metal angle bracing.

END OF SECTION 23 2210

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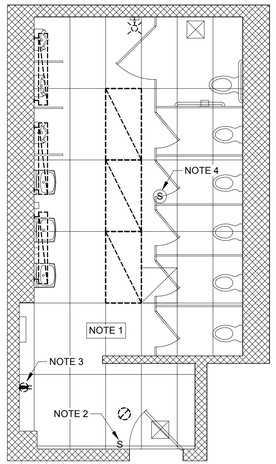
THE DELIVERY OF THIS DRAWING SHOULD NOT BE CONSTRUED TO PROVIDE ANY EXPRESS WARRANTY OR GUARANTEE TO ANYONE THAT ALL DIMENSIONS, DETAILS, ETC. ARE EXACT OR TO INDICATE THAT THE USE OF THIS DRAWING IMPLIES ANY REVIEW AND APPROVAL OF THE DESIGN PROFESSIONAL FOR ANY FUTURE USE. ANY USE OF THE INFORMATION ON THIS DRAWING IS AT THE SOLE RISK AND LIABILITY OF THE USER.

17-031

MECHANICAL SPECIFICATIONS

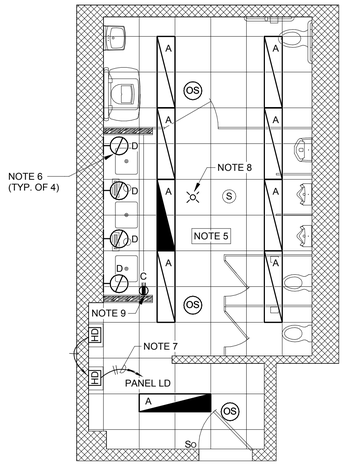
M1.3

DULOHERY WEEKS ENGINEERS



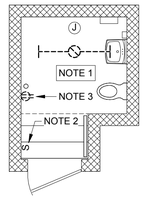
EXISTING FIRST FLOOR MENS PUBLIC RESTROOM

1/4" = 1'-0"



NEW FIRST FLOOR MENS PUBLIC RESTROOM

1/4" = 1'-0"



EXISTING SECOND FLOOR PRIVATE RESTROOM

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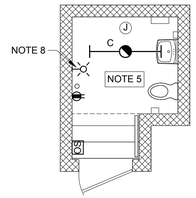
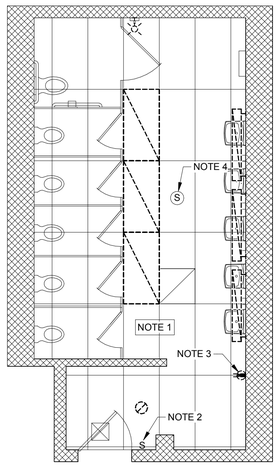


NEW SECOND FLOOR PRIVATE RESTROOM

1/4" = 1'-0"



EXISTING FIRST FLOOR WOMENS PUBLIC RESTROOM

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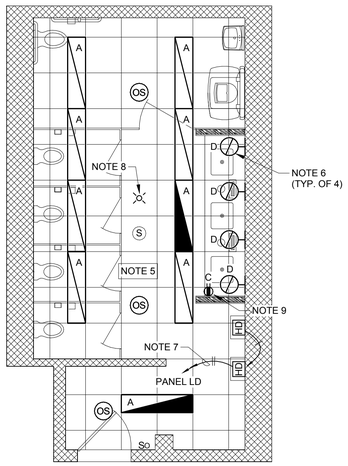

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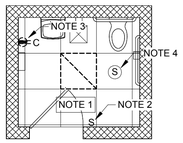
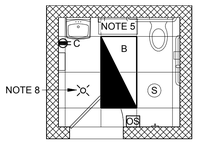
1/4" = 1'-0"



EXISTING FIRST FLOOR MENS SINGLE RESTROOM

1/4" = 1'-0"



NEW FIRST FLOOR MENS SINGLE RESTROOM

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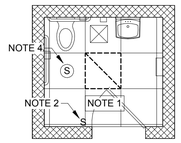
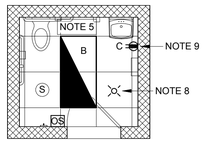


EXISTING FIRST FLOOR WOMENS SINGLE RESTROOM

1/4" = 1'-0"



NEW FIRST FLOOR WOMENS SINGLE RESTROOM

1/4" = 1'-0"

DEMOLITION NOTES:

A. THIS PLAN HAS BEEN PROVIDED AS A GENERAL SCOPE OF DEMOLITION REQUIRED. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS AND REMOVE ITEMS INDICATED IN THESE DEMOLITION NOTES ON THIS SHEET WHETHER THE SPECIFIC ITEM IS SHOWN ON THE DEMOLITION PLAN OR NOT.

B. THERE IS NO ELECTRICAL DEMOLITION EXCEPT AS SPECIFICALLY NOTED OR SHOWN.

C. ENSURE ANY EXISTING LOW VOLTAGE CABLING TO REMAIN IS SECURED TO STRUCTURE WITH J-HOOKS AND PROTECTED FROM DAMAGE DURING DEMOLITION AND NEW CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR KEEPING THESE SYSTEMS IN WORKING ORDER. PROVIDE 4" J-HOOK AS REQUIRED.

D. EXISTING CEILINGS, WALLS, AND FLOORS DISTURBED OR DISFIGURED BY THE ELECTRICAL RENOVATION SHALL BE PATCHED, MENDED OR REPLACED BY TRADES ACTIVELY PARTICIPATING IN THIS TYPE OF WORK. RESPONSIBILITY FOR REPAIRS SHALL BE COORDINATED BETWEEN GENERAL CONTRACTOR AND ELECTRICAL SUBCONTRACTOR.

E. ALL EXISTING EQUIPMENT REMOVED FROM SERVICE AND NOT INTENDED FOR REUSE SHALL REMAIN THE PROPERTY OF OWNER AND SHALL BE DISPOSED OF OR STORED AS DIRECTED BY THE OWNER, OR AS INDICATED ON PLANS.

F. MAINTAIN SERVICE TO ALL EXISTING CIRCUITS THAT ARE NOT SCHEDULED FOR REMOVAL.

G. REMOVE ANY ABANDONED SURFACE RACEWAY TO ABOVE CEILING.

H. WHERE ONLY A PORTION OF A CIRCUIT'S LOAD IS SCHEDULED TO BE REMOVED, REMOVE ONLY THAT PORTION ASSOCIATED WITH THE DEMOLISHED DEVICE TO A POINT WHERE THE REMAINING LOAD IS ACTIVE AND MAINTAIN IN A GOOD OPERATING CONDITION.

I. EXISTING EQUIPMENT NOT SCHEDULED FOR DEMOLITION ON ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS SHALL HAVE SERVICE MAINTAINED OR RECONNECTED TO EXISTING OR NEW PANELBOARD AS NECESSARY.

J. TO MAINTAIN SERVICE OR EXTEND OR RECONNECT CIRCUITS WHERE CONDUIT CAN NOT BE CONCEALED, SURFACE METAL RACEWAY (WIREMOLD 2000 SERIES) SHALL BE USED IN FINISHED AREAS, EMT CONDUIT OTHERWISE - VERIFY WITH ARCHITECT BEFORE INSTALLING.

K. COORDINATE ELECTRICAL DEMOLITION WITH ARCHITECTURAL DETAILS, FLOOR PLANS, ELEVATIONS, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. PROVIDE FITTINGS, JUNCTION BOXES AND ACCESSORIES TO MEET CONDITIONS. COORDINATE ROUTING OF ALL NEW FEEDERS WITH EXISTING SITE ELEMENTS. ALL FEEDERS SHALL BE CONCEALED WHERE POSSIBLE.

L. FIELD VERIFY EXACT LOCATIONS OF ALL EXISTING DEVICES AND EQUIPMENT NOTED OR SHOWN.

M. WHERE WALL BOXES FOR SWITCHES AND OUTLETS ARE REMOVED AND NOT RE-USED IN COMPLETE WORK, CONTRACTOR SHALL PROVIDE BLANK PAINTABLE STEEL COVERPLATES OVER JUNCTION BOXES.

N. WHERE CEILINGS ARE BEING REMOVED, TEMPORARILY SUPPORT ALL CEILING MOUNTED ELECTRICAL DEVICES TO REMAIN (SPEAKERS, ETC.) AND REINSTALL IN THE SAME LOCATION IN THE NEW CEILING. SEE ARCHITECTURAL FOR CEILINGS BEING REPLACED.

O. WHERE RECEPTACLES AND DEVICES ARE BEING REMOVED FROM EXISTING CIRCUITS FEEDING RECEPTACLES TO REMAIN, SPLICE AND EXTEND CIRCUITS (PER N.E.C. REQUIREMENTS) AS REQUIRED TO MAINTAIN FULL OPERATION. PROVIDE ADDITIONAL CONDUIT AND WIRING AS REQUIRED.

NOTES:

1. REMOVE ALL EXISTING LIGHT FIXTURES AND ASSOCIATED BRANCH CIRCUITRY IN THIS SPACE. HOMERUN SHALL REMAIN TO SERVE NEW LIGHT FIXTURES.
2. REMOVE EXISTING LIGHT SWITCH AND ASSOCIATED BRANCH CIRCUITRY. BOX AND CONDUIT SHALL REMAIN TO SERVE NEW SWITCH.
3. REMOVE EXISTING RECEPTACLE. SPLICE AND EXTEND CIRCUITRY AS REQUIRED TO SERVE NEW RECEPTACLE.
4. EXISTING SPEAKER TO REMAIN. TEMPORARILY SUPPORT DEVICE DURING DEMOLITION AND INSTALLATION OF NEW CEILING. RE-INSTALL SPEAKER IN NEW CEILING AND EXTEND CABLING AS REQUIRED.
5. CONNECT NEW LIGHT FIXTURES TO EXISTING LIGHTING CIRCUIT SERVING THIS SPACE. PROVIDE NEW BRANCH CIRCUITRY USING 3#12, 1/2"C.
6. ALIGN TOP OF FIXTURE WITH TOP OF MIRROR. CENTER FIXTURE BETWEEN MIRRORS. COORDINATE MOUNTING EXACT HEIGHT WITH ARCHITECTURAL ELEVATIONS.
7. PROVIDE 5#12, 1/2"C. HOMERUN TO (2) SPARE 20A/1P CIRCUIT BREAKERS IN EXISTING PANEL "LD" TO SERVE NEW HAND DRYERS. FIELD VERIFY EXACT LOCATION OF PANELBOARD PRIOR TO BID.
8. NEW FIRE ALARM DEVICE SHALL MATCH EXISTING FIRE ALARM SYSTEM MANUFACTURER. EXTEND NOTIFICATION CIRCUIT AS REQUIRED TO SERVE NEW DEVICE.
9. POWER NEW RECEPTACLE FROM LIGHTING CIRCUIT SERVING THIS SPACE.

LEGEND:

LIGHTING FIXTURES:

UPPERCASE LETTER ADJACENT TO FIXTURE DENOTES DESIGNATION PER THE LIGHTING FIXTURE SCHEDULE. NUMERAL DENOTES BRANCH CIRCUIT CONNECTION.

REFER TO THE FIXTURE SCHEDULE FOR THE SPECIFIC FIXTURE INFORMATION.

EMERGENCY FIXTURES SHALL HAVE FACTORY INSTALLED INTERNAL BATTERIES, PER SPECIFICATIONS.

NON-EMERGENCY	EMERGENCY/ BATTERY BACKUP	
		LIGHTING FIXTURE: LINEAR
		LIGHTING FIXTURE: LINEAR
		LIGHTING FIXTURE: SURFACE MTD.
		LIGHTING FIXTURE: WALL MTD.
		DOWNLIGHT/SCONCE FIXTURE

SWITCHES:

MOUNTING HEIGHT OF SWITCHES SHALL BE 48" NOMINAL.

S	SWITCH: SINGLE-POLE
S_O	SWITCH: OVERRIDE
O_S	OCCUPANCY SENSOR, CEILING MOUNTED
OS	OCCUPANCY SENSOR, WALL MOUNTED

FIRE ALARM:

	FIRE ALARM STROBE LIGHT, 80" AFF TO THE BOTTOM OF THE LENS.
	FIRE ALARM STROBE LIGHT, CEILING MOUNTED.

RECEPTACLES:

NOMINAL MOUNTING HEIGHT OF RECEPTACLES SHALL BE 18" TO CENTER, UNO.

	RECEPTACLE: DUPLEX
	RECEPTACLE: GROUND-FAULT-INTERRUPTING TYPE
HD	HAND DRYER POWER CONNECTION: COORDINATE MOUNTING HEIGHT W/ ARCHITECTURAL ELEVATIONS SEE HAND DRYER INSTALLATION DETAIL ON E1.2.

MISCELLANEOUS COMPONENTS:

J	JUNCTION BOX: MTD. ABOVE CEILING
S	SPEAKER: CEILING MTD.

DEVICE IDENTIFIER TAGS:

NUMERAL ADJACENT TO DEVICE DENOTES BRANCH CIRCUIT CONNECTION. IDENTIFIER TAGS ADJACENT TO DEVICES INDICATE:

C	MOUNT ABOVE COUNTERTOP OR BACKSPLASH, 9" ABOVE WORK SURFACE TO CENTER
XX"	MOUNT DEVICE AT HEIGHT INDICATED

BRANCH CIRCUITS:

CONDUCTOR COUNTS ARE SHOWN ON THE HOMERUNS ONLY. CONTRACTOR SHALL DETERMINE COUNTS FOR INTERMEDIATE RUNS BASED ON THE MANNER IN WHICH THE CIRCUIT ELEMENTS ARE CONNECTED. REFER TO THE SPECIFICATION SECTION 262010 FOR SPECIAL REQUIREMENTS.

LA-1,3,5 — 'HOMERUN' TO PANEL: NUMBER OF HASH MARKS INDICATES QUANTITY OF No. 12 AWG UNGROUNDED CONDUCTORS IN 3/4" RACEWAY. GROUNDED CONDUCTORS (NEUTRALS) ARE NOT SHOWN - ONE DEDICATED NEUTRAL IS REQUIRED FOR EACH UNGROUNDED CONDUCTOR INSTALLED, SEE SPECIFICATIONS. EACH CONDUCTOR SHALL BE MIN. No. 12 AWG UNLESS NOTED OTHERWISE.

GENERAL NOTES:

1. THE ELECTRICAL DRAWINGS ARE ONLY PART OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS FOR THEIR INTERRELATIONSHIP AND REQUIRED COORDINATION BETWEEN DISCIPLINES.
2. WHERE COMPLETE BRANCH CIRCUIT WIRING IS NOT SHOWN, PROVIDE ACCORDING TO HOMERUNS SHOWN AND CORRESPONDING CIRCUIT NUMBERS ADJACENT TO THE DEVICE OR FIXTURE. REFER TO THE SPECIFICATIONS FOR THE WIRING METHODS. BRANCH CIRCUIT RATINGS SHALL BE BASED ON OVERCURRENT DEVICE RATINGS SHOWN IN THE PANEL SCHEDULES.

DULOHERY WEEKS ENGINEERS

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RESTROOM RENOVATIONS FOR:
DOUGLAS THEATRE
355 MARTIN LUTHER KING JR. BLVD., MACON, GA

GEORGIA REGISTERED PROFESSIONAL ENGINEER WESLEY O. WOMMACK

ISSUANCES

12-19-2017	BID DOCUMENTS

17-031

RESTROOM ELECTRICAL PLANS

E1.1

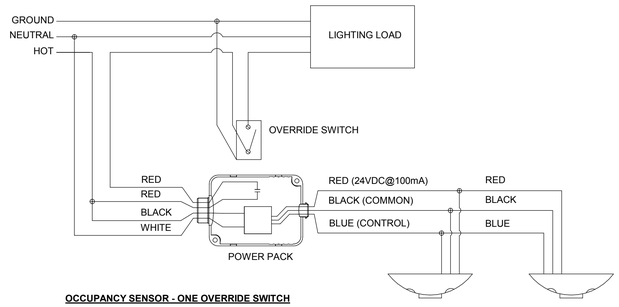
NOTES: (SENSOR WIRING)

A NOT ALL MANUFACTURERS' WIRING CONFIGURATIONS ARE THE SAME. REFER TO MANUFACTURER SPECIFIC WIRING DETAILS PRIOR TO INSTALLATION.

B THESE PLANS INDICATE AREAS TO BE CONTROLLED BY OCCUPANCY OR VACANCY SENSORS. SINCE COVERAGES AND DEVICES VARY BETWEEN MANUFACTURERS, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE PROPER DEVICE LOCATION, ORIENTATION, AND QUANTITIES WITH THE MANUFACTURER OF THE SYSTEM BEING INSTALLED TO MEET THE SPECIFIED CRITERIA.

C THERE ARE NO POWER PACKS SHOWN ON THESE PLANS. PROVIDE POWER PACKS AS REQUIRED WITH SENSORS. POWER PACKS ARE TO BE RATED AT 20A. PROVIDE ONE POWER PACK PER 20A LIGHTING CIRCUIT OR PER INDIVIDUAL AREA BEING CONTROLLED.

D CEILING SENSORS ARE TO BE MOUNTED AWAY FROM ANY STRONG AIRFLOW. COORDINATE LOCATION OF SENSORS WITH MECHANICAL AND LIGHTING PLANS.

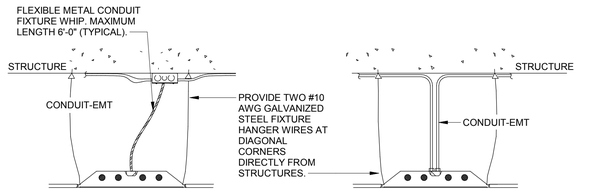


OCCUPANCY SENSOR - ONE OVERRIDE SWITCH

SENSOR WIRING
NOT TO SCALE

LIGHT FIXTURE SCHEDULE

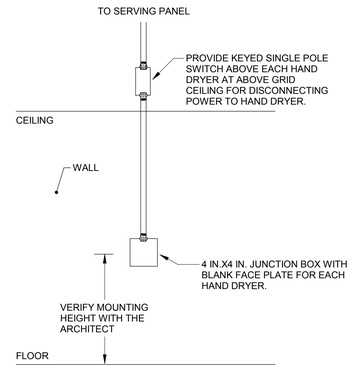
TYPE	DESCRIPTION	LAMPS	MANUFACTURER / SERIES	FINISH	MOUNTING
A	1'X4' FLAT PANEL TROFFER	LED: 2000 LUMEN 3000K	ELITE "FPL1" SERIES", LITHONIA, METALUX, H.E. WILLIAMS	WHITE	RECESSED
B	2'X4' FLAT PANEL TROFFER	LED: 4000 LUMEN 3000K	ELITE "FPL1" SERIES", LITHONIA, METALUX, H.E. WILLIAMS	WHITE	RECESSED
C	1'X4' SURFACE FIXTURE WITH ACRYLIC DIFFUSER.	LED: 4600 LUMEN 3500K	LITHONIA "LBLED" SERIES, METALUX, COLUMBIA, H.E. WILLIAMS	WHITE	SURFACE
D	CYLINDRICAL WALL SCONCE	LED: 400 LUMEN 2700K	TECH LIGHTING "ADERA 13" SERIES	CHROME	SURFACE



FIXTURE MOUNTING FOR LAY IN GRID CEILING

FIXTURE MOUNTING FOR GYPBOARD OR NON-ACCESSIBLE CEILING

LIGHT FIXTURE MOUNTING
NOT TO SCALE



NOTE:
VERIFY EXACT LOCATIONS AND MOUNTING HEIGHT WITH ARCHITECT PRIOR TO ROUGH-IN

HAND DRYER INSTALLATION
NOT TO SCALE

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LIGHT FIXTURE SCHEDULE & DETAILS

E1.2

DULOHERY WEEKS ENGINEERS

SECTION 26 0100 - GENERAL PROVISIONS - ELECTRICAL

A. APPLICABLE PROVISIONS OF THE STATE AND LOCAL CODES AND OF THE FOLLOWING CODES AND STANDARDS ARE HEREBY IMPOSED ON A GENERAL BASIS FOR ELECTRICAL WORK:
1. NEC, NATIONAL ELECTRICAL CODE (NFPA NO. 70), WITH GEORGIA AMENDMENTS.
2. THE LIFE SAFETY CODE (NFPA NO. 101), WITH GEORGIA AMENDMENTS.
3. STATE OF GEORGIA ADA ACCESSIBILITY GUIDELINES FOR BUILDING AND FACILITIES.
4. THE STANDARD BUILDING CODE, WITH GEORGIA AMENDMENTS.
5. THE NATIONAL ELECTRICAL SAFETY CODE (ANSI C2.)
6. U.L. FIRE RESISTANCE DIRECTORY.
7. U.L. ELECTRICAL CONSTRUCTION MATERIALS DIRECTORY.
8. U.L. ELECTRICAL APPLIANCE AND UTILIZATION EQUIPMENT DIRECTORY.

B. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND SUPERVISION TO CONSTRUCT COMPLETE AND OPERABLE ELECTRICAL SYSTEMS AS INDICATED ON THE DRAWINGS AND SPECIFIED HEREIN. ALL MATERIALS AND EQUIPMENT USED SHALL BE NEW, UNDAMAGED AND FREE FROM ANY DEFECTS.

C. TRADITIONAL ELECTRICAL SYSTEMS WORK SHALL BE FURNISHED AND INSTALLED BY ORGANIZATIONS WHO HAVE SUCCESSFULLY COMPLETED WORK OF SIMILAR SIZE AND SCOPE, AND WHO HAVE BEEN IN BUSINESS FOR AT LEAST 3 YEARS. THE SUPERINTENDENT SHALL HAVE A STATE OF GEORGIA UNRESTRICTED ELECTRICAL CONTRACTOR'S LICENSE.

D. ALL PERMITS AND FEES SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR.

E. ALL WORK PERFORMED SHALL BE WARRANTED FOR A PERIOD OF ONE YEAR FROM THE FINAL COMPLETION DATE EXCEPT FOR FUSES AND LAMPS IN LIGHT FIXTURES.

F. DO NOT SCALE THE ELECTRICAL DRAWINGS. OBTAIN ALL DIMENSIONS FROM THE ARCHITECT'S DIMENSIONED DRAWINGS, FIELD MEASUREMENTS AND SHOP DRAWINGS.

G. ALL EQUIPMENT SHALL BE SUITABLE FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED. SUCH CONSIDERATIONS SHALL INCLUDE, BUT NOT BE LIMITED TO CHARACTERISTICS OF THIS SPECIFIC PROJECT SUCH AS WET/DAMP/DRY LOCATIONS, AMBIENT TEMPERATURE / HUMIDITY, SPACES USED AS AIR PLENUMS AND HAZARDOUS LOCATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW THE CONTRACT DOCUMENTS AND ORDER EQUIPMENT BASED ON INTENDED USE.

H. ALL MATERIALS AND EQUIPMENT USED SHALL BE NEW, UNDAMAGED AND FREE FROM ANY DEFECTS. PROVIDE MATERIALS AND EQUIPMENT THAT ARE U.L. LISTED, UNLESS LISTING IS UNAVAILABLE. WHERE PRODUCT IS SPECIFIED BY CATALOG NUMBER, SUCH SPECIFICATION IS INTENDED ONLY TO CONVEY GENERAL CHARACTERISTICS. ACTUAL PRODUCT SELECTION SHALL BE BASED ON CATALOG NUMBER, OTHER REFERENCES ON THE DRAWINGS / SPECIFICATIONS AND INTENDED USE. PRODUCTS NOT LISTED IN THESE SPECIFICATIONS OR SHOWN ON DRAWINGS SHALL NOT BE USED.

I. REQUESTS FOR PRIOR APPROVAL (I.E. BEFORE THE BID OPENING) MUST CONTAIN ALL INFORMATION LISTED FOR THE SPECIFIC ITEM IN SECTION 260120, INCLUDING ANY APPLICABLE DIMENSIONED LAYOUT DRAWINGS. REQUESTS MUST BE SENT BY MAIL OR EMAIL SUCH THAT THEY ARE RECEIVED IN THE ARCHITECT'S OFFICE NO LATER THAN TEN WORKING DAYS PRIOR TO THE OPENING OF BIDS.

J. PROTECT THE WORK DURING THE COURSE OF CONSTRUCTION. DO NOT INSTALL ANY EQUIPMENT OR MATERIALS UNTIL THE PROPER ENVIRONMENTAL CONDITIONS HAVE BEEN ESTABLISHED. PRIOR TO THE BUILDING BEING "DRIED-IN", PROTECT INCOMPLETE CONDUIT RUNS, OUTLET BOXES, EQUIPMENT ENCLOSURES, ETC. FROM THE ENTRY OF WATER OR CONSTRUCTION DEBRIS, BY INSTALLING AND MAINTAINING TEMPORARY PROTECTIVE COVERS. ALL EQUIPMENT AND MATERIALS THAT BECOME DAMAGED WILL BE REMOVED AND REPLACED WITH NEW, AT NO ADDITIONAL COST TO THE OWNER.

K. DO NOT CUT STRUCTURAL FRAMING, WALLS, FLOORS, DECKS, AND OTHER MEMBERS INTENDED TO WITHSTAND STRESS, EXCEPT WITH THE ARCHITECT'S WRITTEN AUTHORIZATION. AUTHORIZATION WILL BE GRANTED ONLY WHEN THERE IS NO OTHER REASONABLE METHOD FOR COMPLETING THE ELECTRICAL WORK, AND WHERE THE PROPOSED CUTTING CLEARLY DOES NOT MATERIALLY WEAKEN THE STRUCTURE. WHERE AUTHORIZED, CUT OPENINGS THROUGH CONCRETE (FOR CONDUIT PENETRATIONS AND SIMILAR SERVICES) BY CORE DRILLING OR SAWING. DO NOT CUT BY HAMMER-DRIVEN CHISEL OR DRILL. WHERE PATCHING IS REQUIRED TO RESTORE OTHER WORK, BECAUSE OF CUTTING OR OTHER DAMAGE INFLICTED DURING THE INSTALLATION OF ELECTRICAL WORK, EXECUTE THE PATCHING IN THE MANNER RECOMMENDED BY THE ORIGINAL INSTALLER. RESTORE THE OTHER WORK IN EVERY RESPECT, INCLUDING THE ELIMINATION OF VISUAL DEFECTS IN EXPOSED FINISHED, AS JUDGED BY THE ARCHITECT. ENGAGE THE ORIGINAL INSTALLER TO COMPLETE PATCHING OF VARIOUS CATEGORIES OF WORK INCLUDING: CONCRETE AND MASONRY FINISHING, WATERPROOFING AND ROOFING, EXPOSED WALL FINISHES, ETC.

L. WHERE ELECTRICAL WORK MUST CONNECT TO OR BE INCORPORATED INTO WORK INSTALLED BY OTHER TRADES, ENGAGE THE SERVICES OF THE OTHER TRADE TO INTERFACE THE WORK. UNDER NO CIRCUMSTANCES SHALL THE INSTALLER PERFORMING WORK UNDER THIS DIVISION OF THE SPECIFICATIONS MODIFY OR ALTER WORK INSTALLED BY OTHERS. SUCH WORK INCLUDES, BUT IS NOT LIMITED TO: ROOF PENETRATIONS, ANY ATTACHMENTS TO ROOFING SYSTEM, PENETRATIONS IN VAPOR BARRIERS, EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS).

SECTION 26 0120 - ELECTRICAL SUBMITTALS

A. SUBMIT FOR REVIEW BY THE ARCHITECT A SCHEDULE WITH ENGINEERING DATA OF MATERIALS AND EQUIPMENT TO BE INCORPORATED IN THE WORK. SUBMITTALS SHALL BE SUPPORTED BY DESCRIPTIVE MATERIALS, I.E., CATALOG SHEETS, PRODUCT DATA SHEETS, DIAGRAMS, PERFORMANCE CURVES AND CHARTS PUBLISHED BY THE MANUFACTURER, TO SHOW CONFORMANCE TO SPECIFICATIONS AND PLAN REQUIREMENTS; MODEL NUMBERS ALONE SHALL NOT BE ACCEPTABLE.

B. DATA SUBMITTED FOR REVIEW SHALL CONTAIN ALL INFORMATION TO INDICATE COMPLIANCE WITH CONTRACT DOCUMENTS. COMPLETE ELECTRICAL CHARACTERISTICS SHALL BE PROVIDED FOR ALL EQUIPMENT.

C. THE CONTRACTOR SHALL REVIEW ALL SUBMITTALS PRIOR TO SUBMITTING TO ENSURE COMPLIANCE WITH THE CONTRACT DOCUMENTS. COMMENTS MADE BY THE DESIGN PROFESSIONAL DO NOT RELIEVE THE CONTRACTOR FROM COMPLYING WITH THE CONTRACT DOCUMENTS (DRAWINGS, SPECIFICATIONS, AND ADDENDA). THE DESIGN PROFESSIONAL DOES NOT APPROVE ANY SUBMITTALS. THE DESIGN PROFESSIONAL ONLY REVIEWS AND MAKES OBSERVATIONS REGARDING THE SUBMITTALS.

D. THE PURPOSE OF THE SUBMITTALS IS TO DEMONSTRATE TO THE DESIGN PROFESSIONAL THAT THE CONTRACTOR UNDERSTANDS THE DESIGN CONCEPT AND THAT HE DEMONSTRATES HIS UNDERSTANDING BY INDICATING WHICH EQUIPMENT AND MATERIALS HE INTENDS TO FURNISH AND INSTALL. ANY DEVIATION FROM THE CONTRACT DOCUMENTS SHALL BE CLEARLY STATED ON THE SUBMITTAL DATA. IF NOT CLEARLY STATED, THE SUBMITTAL SHALL BE MARKED "REVISE AND RESUBMIT". FAILURE OF THE CONTRACTOR TO PROVIDE SUBMITTALS DURING THE SUBMITTAL PROCESS SHALL MAKE THE CONTRACTOR TOTALLY RESPONSIBLE FOR ANY AND ALL CHANGES TO ACHIEVE COMPLIANCE WITH THE CONTRACT DOCUMENTS.

E. SHOP DRAWINGS SHALL BE EVALUATED BY THE ARCHITECT IN ACCORDANCE WITH THE FOLLOWING CLASSIFICATIONS:

1. **"NO EXCEPTIONS TAKEN"**: NO CORRECTIONS, NO MARKS. ITEMS MAY BE ORDERED.
2. **"MAKE CORRECTIONS NOTED"**: A FEW MINOR CORRECTIONS. ITEMS MAY BE ORDERED AS MARKED UP WITHOUT FURTHER RESUBMISSION.
3. **"REVISE AND RESUBMIT"**: MINOR CORRECTION. ITEM MAY BE ORDERED AT THE CONTRACTOR'S OPTION. CONTRACTOR SHALL RESUBMIT DRAWINGS WITH CORRECTIONS NOTED.
4. **"REJECTED"**: MAJOR CORRECTIONS OR NOT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. NO ITEMS SHALL BE ORDERED. CONTRACTOR SHALL CORRECT AND RESUBMIT DRAWINGS.

SECTION 26 1010 - RACEWAY SYSTEMS AND SUPPORTS

A. METAL CLAD CABLE SHALL ONLY BE UTILIZED FOR INTERIOR LIGHTING AND POWER CIRCUITS 20 AMPS OR LESS. HOMERUN CONDUCTORS SHALL BE ROUTED IN ELECTRIC METALLIC TUBING (EMT).

B. ELECTRIC METALLIC TUBING (EMT) SHALL BE USED IN EXPOSED CEILING AREAS. EMT IS PERMITTED CONCEALED IN WALLS OR CEILINGS AND CONCEALED IN SLABS ABOVE GRADE.

C. INTERMEDIATE METAL CONDUIT (IMC) OR RIGID GALVANIZED STEEL CONDUIT (RGS) SHALL BE PERMITTED INDOORS CONCEALED OR EXPOSED, IN REFRIGERATED SPACES, AND VERTICAL DROPS SERVING EQUIPMENT. PROVIDE IMC OR RGS TRANSITIONS FROM BELOW GRADE NONMETALLIC RACEWAY SYSTEM TO ABOVE GRADE METALLIC RACEWAY SYSTEM. PROVIDE CORROSION PROTECTION FOR CONDUITS PASSING THROUGH CONCRETE SLABS SHALL BE BY ONE OF THE FOLLOWING MEANS:

1. FIELD-WRAP CONDUITS WITH TAPE, USING WITH A 50 PERCENT OVERLAY. TAPE SHALL BE PREMIUM 7-MIL, FLAME RETARDANT, WEATHER RESISTANT TAPE. RESISTS TEMPERATURE AND MOISTURE FOR SPLICING. MEETS REQUIREMENTS OF UL 510, HHI-595, AND CSA 22.2.
2. CONDUITS SHALL HAVE A FACTORY-APPLIED POLYVINYL CHLORIDE, PLASTIC RESIN, OR EPOXY COATING.

D. RIGID NON-METALLIC CONDUIT (SCHEDULE 40 PVC) SHALL BE PERMITTED FOR BELOW GRADE INSTALLATIONS AND GROUNDING ELECTRODE CONDUCTOR RACEWAY.

E. FLEXIBLE METAL CONDUIT SHALL BE PERMITTED FOR FINAL CONNECTION TO LIGHTING FIXTURES AND FINAL CONNECTION TO OTHER THAN DIVISION 23 EQUIPMENT LOCATED IN INDOOR, DRY LOCATIONS.

F. LIQUID-TIGHT FLEXIBLE METAL CONDUIT SHALL BE PERMITTED AS FINAL CONNECTION TO EQUIPMENT IN INDOOR OR OUTDOOR LOCATIONS.

G. CONNECTORS/COUPLINGS FOR USE WITH EMT CONDUIT SHALL BE STEEL COMPRESSION TYPE, EXCEPT THAT STEEL, SET SCREW TYPE WILL BE ACCEPTABLE FOR EMT CONDUITS SIZES 2-1/2" AND LARGER. CONNECTORS/COUPLINGS FOR USE WITH IMC AND RGS CONDUIT SHALL BE THREADED TYPE. ALL CONNECTORS SHALL BE INSULATED THROAT TYPE. LOCKNUTS SHALL BE OF THE SAME MATERIAL AS CONNECTORS. ALL FITTINGS SHALL BE RAINTIGHT. FITTINGS ENCASED IN CONCRETE SHALL BE CONCRETE-TIGHT.

H. CONDUIT BODIES: PROVIDE GALVANIZED STEEL OR CAST METAL CONDUIT BODIES CONSTRUCTED WITH THREADED CONDUIT ENDS, REMOVABLE COVER, AND CORROSION RESISTANT SCREWS.

I. CEILING OUTLET BOXES: PROVIDE 4" OCTAGON, GALVANIZED STEEL INTERIOR OUTLET BOXES CONSTRUCTED WITH STAMPED KNOCKOUTS IN BACK AND SIDES AND WITH THREADED HOLES WITH SCREWS FOR SECURING BOX COVERS OR WIRING DEVICES.

J. WALL OUTLET BOXES: RECESSED BOXES SHALL BE GALVANIZED STEEL CONSTRUCTED WITH STAMPED KNOCKOUTS IN BACK AND SIDES AND WITH THREADED HOLES WITH SCREWS FOR SECURING BOX COVERS OR WIRING DEVICES. MINIMUM BOX SIZE SHALL BE 4" SQUARE BY 1-1/2" DEEP. BOXES SHALL HAVE SQUARE EDGE TILE TYPE COVERS. WHERE DEVICES ARE GANGED, USE GANG-TYPE BOXES WITH GANG BOX COVERS. THE USE OF GANGABLE TYPE OUTLET OR SWITCHBOXES IS NOT ACCEPTABLE UNLESS REQUIRED BY SPECIFIC DEVICE MANUFACTURER. USE MASONRY TYPE BOXES OF EQUAL OR GREATER VOLUME TO THOSE SPECIFIED ABOVE, IN MASONRY WALLS.

K. SURFACE OUTLET BOXES: USE CAST ALUMINUM BOX WITH THREADED HUBS IN CONJUNCTION WITH METALLIC CONDUIT SYSTEMS.

L. SUPPORTING DEVICES SHALL BE THE PRODUCTS OF MANUFACTURERS' SPECIFICALLY INTENDED FOR SUPPORTING ELECTRICAL RACEWAYS, DEVICES AND EQUIPMENT. MAKESHIFT SUPPORTS ARE NOT ACCEPTABLE. WHERE CHANNEL TYPE SUPPORTS ARE USED, SELECT COMPLETE ASSEMBLIES BASED ON THE WEIGHT OF THE RACEWAY(S) OR EQUIPMENT BEING SUPPORTED. THE USE OF TIE WIRE OR TIE WRAPS AS A MEANS OF SUPPORT FOR ELECTRICAL RACEWAYS, DEVICES AND EQUIPMENT IS NOT PERMITTED.

M. PLYWOOD BACKBOARDS SHOWN IN COMMUNICATIONS ROOMS OR OTHERWISE FOR THE SUPPORT OF LOW-VOLTAGE CABLING SYSTEMS AND/OR MOUNTING OF EQUIPMENT SHALL BE FIRE RESISTANT, TYPE AC RATED. THE PLYWOOD SHALL BE PAINTED WITH GRAY, FIRE RESISTANT COATING. ENSURE THAT THE PLYWOOD RATING SEAL IS LEFT EXPOSED AFTER PAINTING.

N. A THROUGH-PENETRATION FIRESTOP SYSTEM SHALL BE USED TO SEAL PENETRATIONS OF ELECTRICAL CONDUITS AND CABLES THROUGH FIRE-RATED PARTITIONS PER NEC 300-21 AND NEC 800-3. THE FIRESTOP SYSTEM SHALL BE QUALIFIED BY FORMAL PERFORMANCE TESTING IN ACCORDANCE WITH ASTM E-814, OR UL 1479. THE FIRESTOP SYSTEM SHALL CONSIST OF A FIRE-RATED CAULK TYPE SUBSTANCE AND A HIGH TEMPERATURE FIBER INSULATION. IT SHALL BE PERMANENTLY FLEXIBLE, WATER-PROOF, NON-TOXIC, SMOKE AND GAS TIGHT AND HAVE A HIGH ADHESION TO ALL SOLIDS SO DAMMING IS NOT REQUIRED. ONLY METAL CONDUIT SHALL BE USED IN CONJUNCTION WITH THIS SYSTEM TO PENETRATE FIRE RATED PARTITIONS. INSTALL IN STRICT COMPLIANCE WITH MANUFACTURER'S RECOMMENDATIONS. 3M, METACAULK OR NELSON.

O. RACEWAY INSTALLATION - GENERAL: ALL ABOVE GRADE CONDUITS SHALL BE ROUTED PARALLEL OR PERPENDICULAR TO THE BUILDING STRUCTURE. RACEWAYS SHALL NOT BE INSTALLED EXPOSED IN FINISHED SPACES OR ON THE EXTERIOR OF THE BUILDING. ALL EXPOSED RACEWAY SYSTEMS SHALL BE PAINTED TO MATCH THE SURFACE TO WHICH IT IS ATTACHED. PROVIDE 200 LB. NYLON PULL CORD IN ALL CONDUITS INSTALLED FOR CABLE SYSTEMS SPECIFIED UNDER DIVISION 23 AND DIVISION 27; AND WHERE CONDUITS WILL BE LEFT EMPTY FOR FUTURE USE. CAP OPEN ENDS AND MARK LOCATION OF OPPOSITE END WITH BLACK INDELIBLE MARKER PEN. SEAL THE INSIDE OF ALL CONDUITS ENTERING THE BUILDING FROM OUTSIDE, WHETHER THEY CONNECT TO ENCLOSURES OR NOT. DO NOT RUN RACEWAYS ATOP THE ROOF DECK, THROUGH STAIRWELLS OR ELEVATOR SHAFTS.

P. BELOW SLAB AND IN-SLAB INSTALLATIONS: (WITHIN THE BUILDING FOOTPRINT) DO NOT INSTALL CONDUITS IN SLABS ON-GRADE. RACEWAYS SHALL BE ROUTED UNDER THE FIRST FLOOR BUILDING SLAB. CONDUITS SHALL BE ROUTED SUCH THAT THE TOP OF THE CONDUIT IS A MINIMUM OF SIX INCHES BELOW THE SLAB. ALL 90 DEGREE ELBOWS AND ALL STUB-UPS THROUGH THE FLOOR SLAB FOR ALL SIZE CONDUITS SHALL BE CORROSION PROTECTED RGS OR CORROSION PROTECTED IMC. RACEWAYS IN SLABS ABOVE GRADE SHALL BE TOTALLY EMBEDDED IN THE SLAB. THEY SHALL BE PLACED ABOVE THE LOWER REINFORCING AND BELOW THE UPPER REINFORCING. THE OUTER EDGE IN NO CASE SHALL BE LESS THAN 1" FROM THE SURFACE OF THE SLAB. THE CORNERS OF RACEWAYS AT TURNUPS INTO WALLS SHALL NOT BE EXPOSED AT THE WALL/FLOOR JUNCTION.

Q. BELOW GRADE INSTALLATIONS: (OUTSIDE THE BUILDING FOOTPRINT) PERFORM ALL EXCAVATING, TRENCHING AND BACKFILLING TO INSTALL WORK OF THIS PROJECT IN ACCORDANCE WITH APPLICABLE SECTIONS OF DIVISION 2 OF THE SPECIFICATIONS AND ANSI C2. BOTTOM OF TRENCHES SHALL BE SMOOTH AND LEVEL TO PROVIDE UNIFORM BEARING FOR CONDUITS. SECURE CONDUITS IN TRENCH TO ELIMINATE UNNECESSARY CURVATURE AND TO PREVENT MOVEMENT OF CONDUITS WHILE BACKFILLING. MAINTAIN 6" VERTICAL SEPARATION BETWEEN CONDUITS INSTALLED ONE ABOVE THE OTHER. BACKFILL AND COMPACT EACH LAYER SEPARATELY. THE MINIMUM COVER REQUIREMENTS SPECIFIED HEREIN SHALL BE REFERENCED TO THE UPPERMOST LAYER OF CONDUITS. MAINTAIN MINIMUM 12" HORIZONTAL AND 6" VERTICAL SEPARATION BETWEEN CONDUITS OF DIFFERENT SYSTEMS AND BETWEEN OTHER UNDERGROUND UTILITIES.

R. MOISTURE PROTECTION: CONDUITS AND BOXES INSTALLED IN EXTERIOR WALLS SHALL NOT PENETRATE THE VAPOR BARRIER. BOXES INSTALLED ON THE BUILDING EXTERIOR SHALL HAVE GASKETED COVERS. ALL CONDUITS ENTERING BOX SHALL BE SEALED WITH INSULATING ELECTRICAL PUTTY.

S. WALL OUTLET LAYOUT: THE LOCATION OF DEVICES SHOWN ON THE DRAWINGS IS SCHEMATIC. PRIOR TO ROUGHING-IN, REVIEW THE ARCHITECTURAL INTERIOR ELEVATIONS AND MILLWORK SHOP DRAWINGS, TO ENSURE THAT OUTLETS WILL NOT BE INSTALLED BEHIND CABINETS OR OTHERWISE INACCESSIBLE. ENSURE THAT THERE IS SUFFICIENT SPACE FROM DOOR JAMB, CABINETS, ETC. TO INSTALL WITHOUT TRIMMING DEVICE COVER.

T. ROUGH-IN FOR DIVISION 27 SYSTEMS AND USING AGENCY PROVIDED TELECOM-MUNICATIONS SYSTEMS: PROVIDE ALL OUTLET AND JUNCTION BOXES, SLEEVES AND RACEWAYS TO FORM AN ACCESSIBLE PATHWAY FROM EACH WALL OR FLOOR MOUNTED DEVICE, AND CEILING MOUNTED DEVICES TO THE IDF OR MDF OR HEADEND EQUIPMENT LOCATION IN WHICH THE CABLE TERMINATES, AS SPECIFIED HEREIN AND AS INDICATED ON THE DRAWINGS. CONDUIT SIZES SHALL CONFORM TO THE FOLLOWING:

1. FIRE ALARM OUTLET: 3/4"
2. OTHER: 3/4"

U. ROUGH-IN FOR DIVISION 23 CONTROL WIRING: PROVIDE OUTLET BOX AND ¾" CONDUIT STUBBED UP TO ABOVE ACCESSIBLE CEILING FROM EACH WALL MOUNTED DEVICE. ROUGH-IN DETAILS SHALL BE SIMILAR TO THAT SHOWN FOR DIVISION 27 DEVICES. CABLING SUPPORT SYSTEM ABOVE ACCESSIBLE CEILINGS FOR DIVISION 23 CONTROL WIRING SHALL BE SUPPLIED AND INSTALLED BY DIVISION 23 CONTRACTOR. IN AREAS WITH EXPOSED CEILINGS, SUCH AS MECHANICAL ROOMS, PROVIDE COMPLETE CONDUIT PATHWAY TO THE ASSOCIATED CONTROL EQUIPMENT.

SECTION 26 2010 - WIRES AND CABLES, 600V AND BELOW

A. COLOR CODING: COLOR SHALL BE **GREEN** FOR GROUNDING CONDUCTORS. THE COLOR OF THE CIRCUIT CONDUCTORS SHALL BE AS FOLLOWS: 120/208 VOLT, 3-PHASE: PHASE A – BLACK, PHASE B –RED, PHASE C – BLUE, NEUTRALS – WHITE (WITH STRIPES AS SPECIFIED BELOW). 277/480V, 3-PHASE: PHASE A - BROWN, PHASE B - ORANGE, PHASE C - YELLOW, NEUTRALS - GRAY (WITH STRIPES AS SPECIFIED).

B. ALL CONDUCTORS SHALL BE 600V COPPER, WITH 75 DEGREES C, THWN/THHN INSULATION. MINIMUM SIZE SHALL BE NO. 12 AWG. CONDUCTORS WITHIN THREE INCHES OF FIXTURE BALLASTS SHALL BE RATED 90 DEGREES C. SIZES UP TO NO. 10 AWG MAY BE STRANDED; SIZES NO. 8 AWG AND LARGER SHALL BE CONCENTRIC-LAY-STRANDED. ALL CONTROL CONDUCTORS SHALL BE CONCENTRIC-LAY-STRANDED.

C. CONDUCTORS USED IN FLEXIBLE METAL CONDUIT AND LIQUID-TIGHT FLEXIBLE METAL CONDUIT USED FOR FINAL CONNECTION TO EQUIPMENT SHALL BE STRANDED.

D. METAL CLAD (MC) CABLE SHALL BE U.L. LISTED MANUFACTURED CABLE ASSEMBLY CONSISTING OF INSULATED COPPER CONDUCTORS WITH A METALLIC OUTER COVER AND AN INTERIOR GROUND WIRE. THE CABLE SHALL BE UTILIZED FOR INTERIOR LIGHTING AND POWER CIRCUITS 20 AMPS OR LESS. HOMERUN CONDUCTORS SHALL BE ROUTED IN E.M.T. MC CABLE CONNECTORS SHALL BE MALLEABLE IRON OR STEEL SET SCREW TYPE.

E. NO MORE THAN THREE PHASE CONDUCTORS, EACH OF OPPOSITE PHASES FOR A THREE PHASE WYE SYSTEM, SHALL BE COMBINED IN A SINGLE RACEWAY WITHOUT WRITTEN PERMISSION FROM THE ARCHITECT.

F. FOR EACH UNGROUNDED CONDUCTOR, PROVIDE A DEDICATED NEUTRAL CONDUCTOR, WITH STRIPE COLOR TO MATCH UNGROUNDED CONDUCTOR INSULATION COLOR.

G. SPLICING OF FEEDER CONDUCTORS SHALL NOT BE ACCEPTABLE, UNLESS SPECIFICALLY INDICATED ON THE DRAWING. WHERE SPLICING OF FEEDER CONDUCTORS IS INDICATED, SPLICES SHALL BE MADE USING RAYCHEM RVS SPLICE KIT AND COMPRESSION TYPE BUTT SPLICE

H. ALL CONDUCTORS SHALL BE INSTALLED IN RACEWAYS.

I. MAKE CONNECTIONS TO WIRING DEVICES USING "PIGTAILS" WITHIN OUTLET BOXES. DIRECT CONNECTION (LOOP) TO DEVICES IS NOT ACCEPTABLE.

J. DISTANCE LIMITATIONS: ALL 120 VOLT, 20 AMP BRANCH CIRCUITS EXCEEDING 90 FEET IN LENGTH SHALL CONSIST OF NO. 10 AWG CIRCUIT CONDUCTORS. INCREASE CONDUIT SIZE ACCORDINGLY. ALL 277 VOLT, 20 AMP BRANCH CIRCUITS EXCEEDING 150 FEET IN LENGTH SHALL CONSIST OF NO. 10 AWG CIRCUIT CONDUCTORS. INCREASE CONDUIT SIZE ACCORDINGLY.

SECTION 26 2020 - WIRING DEVICES

A. DEVICE COLORS SHALL BE SELECTED BY THE ARCHITECT ON AN AREA-BY-AREA BASIS.

B. GENERAL USE RECEPTACLES:

1. STANDARD (HEAVY DUTY SPECIFICATION GRADE): HUBBELL 5362, ARROW HART 5362, OR PASS & SEYMOUR 5362
2. TAMPER RESISTANT (HEAVY DUTY SPECIFICATION GRADE): HUBBELL 5362TR, ARROW HART TR5362, OR PASS & SEYMOUR TR5362.
2. GROUND-FAULT RECEPTACLES (HEAVY DUTY AUTO GROUNDING): HUBBELL GF20LA, ARROW HART SGF20, OR PASS & SEYMOUR 2095S.
3. RECEPTACLES SHALL BE 2-POLE, 3-WIRE, GROUNDING TYPE, RATED 20A/125V.
4. PROVIDE WEATHER RESISTANT RECEPTACLES IN ALL OUTDOOR LOCATIONS.

C. ALL RECEPTACLES INSTALLED IN THE FOLLOWING LOCATIONS SHALL BE TAMPER-RESISTANT TYPE:
1. DWELLING UNITS, DORMITORIES, GUEST ROOMS AND GUEST SUITES OF HOTELS AND MOTELS.
2. CHILD CARE FACILITIES.
3. PRESCHOOLS AND ELEMENTARY EDUCATION FACILITIES.
4. BUSINESS OFFICES, CORRIDORS, WAITING ROOMS AND THE LIKE IN CLINICS, MEDICAL AND DENTAL OFFICES AND OUTPATIENT FACILITIES.
5. SUBSETS OF ASSEMBLY OCCUPANCIES DESCRIBED IN NEC 518.2 TO INCLUDE PLACES OF WAITING TRANSPORTATION, GYMNASIUMS, SKATING RINGKS, AND AUTITORIUMS.

D. SPECIAL PURPOSE RECEPTACLES: PROVIDE HEAVY-DUTY TYPE OF THE NEMA CONFIGURATION INDICATED ON THE DRAWINGS, AS MANUFACTURED BY HUBBELL, ARROW HART, OR PASS & SEYMOUR.

E. TOGGLE SWITCHES (INDUSTRIAL EXTRA HEAVY DUTY SPECIFICATION GRADE): HUBBELL HBL1221, ARROW HART AH1221, OR PASS & SEYMOUR PS20AC1. PROVIDE SINGLE-POLE, THREE-WAY AND FOUR-WAY SWITCHES AS INDICATED. CATALOG NUMBERS LISTED HEREIN ARE FOR SINGLE POLE UNITS. OTHER CONFIGURATIONS SHALL BE FROM THE SAME PRODUCT FAMILY.

F. MAKE CONNECTIONS TO SIDE TERMINALS OF WIRING DEVICES ONLY. WRAP SIDE OF DEVICE WITH TWO COMPLETE TURNS OF 600V ELECTRICAL TAPE, TO COVER THE EXPOSED TERMINALS.

G. WALL PLATES: PROVIDE ONE PIECE WALL PLATES FOR WIRING DEVICES, WITH GANGING AND CUTOUTS AS INDICATED. PROVIDE BLANK PLATES FOR ALL UNUSED OUTLET BOXES. PROVIDE WITH METAL SCREWS FOR SECURING PLATES TO DEVICES, SCREW HEADS COLORED TO MATCH FINISH OF PLATE, AND WALL PLATES POSSESSING THE FOLLOWING ADDITIONAL CONSTRUCTION FEATURES:

1. MATERIAL AND FINISH: COORDINATE TYPE AND COLOR WITH ARCHITECT PRIOR TO BID.
2. WALL PLATES FOR SURFACE RACEWAY BOXES SHALL BE OF THE SAME WIDTH AS THE SURFACE RACEWAY BOXES.
3. ALL PLATES SHALL BE MID-SIZE SIZE.

H. WEATHERPROOF COVERS: ALL DEVICES INSTALLED OUTDOORS SHALL BE PROVIDED WITH WEATHER PROOF COVERS. COVERS SHALL BE INTERMATIC DIE-CAST WP SERIES (OR EQUIVALENT), SINGLE OR TWO GANG TYPE. THE ASSEMBLY SHALL BE U.L. LISTED FOR WET LOCATIONS, WHEN IN USE.

I. OCCUPANCY/VACANCY SENSOR CATALOG NUMBERS AND LOCATIONS SHOWN ON PLANS AND SPECIFICATIONS ARE FOR REPRESENTATION PURPOSES ONLY. EXACT MODELS AND MOUNTING LOCATIONS SHALL BE PROVIDED BY SENSOR MANUFACTURER. SYSTEM DRAWINGS INCLUDING DEVICE LAYOUT, DEVICE TYPE, AND WIRING DETAILS SHALL BE SUBMITTED FOR REVIEW IN SHOP DRAWING PHASE PRIOR TO ORDERING. ALL SENSORS SHALL BE DUAL TECHNOLOGY.

J. OCCUPANCY/VACANCY SENSORS:

1. CORNER MOUNTED: DUAL TECHNOLOGY (ULTRASONIC & INFRARED), CEILING OR WALL BRACKET MOUNTED. SELECT BASED ON SIZE OF SPACE. PROVIDE POWER PACK AND MOUNTING HARDWARE; SUITABLE FOR SWITCHING 120 AND/OR 277 VOLT LOADS. WATT-STOPPER DT-200 SERIES, HUBBELL LODT SERIES, OR EQUIVALENT BY COOPER OR SENSOR SWITCH.

2. CEILING MOUNTED: DUAL TECHNOLOGY (ULTRASONIC & INFRARED), CEILING MOUNTED. SELECT BASED ON SIZE OF SPACE. PROVIDE POWER PACK AND MOUNTING HARDWARE; SUITABLE FOR SWITCHING 120 AND/OR 277 VOLT LOADS. WATT-STOPPER DT-300 SERIES, HUBBELL OMNIDT SERIES, OR EQUIVALENT BY COOPER OR SENSOR SWITCH.

3. WALL MOUNTED: DUAL TECHNOLOGY (ULTRASONIC & INFRARED), WALL BRACKET MOUNTED. SELECT BASED ON SIZE OF SPACE. SUITABLE FOR SWITCHING 120 AND/OR 277 VOLT LOADS. WATT-STOPPER DW-100 SERIES, HUBBELL LHMTS1 SERIES, OR EQUIVALENT BY COOPER OR SENSOR SWITCH.

4. THE TRIGGERING OF ONLY ONE TECHNOLOGY SHALL KEEP THE FIXTURES ON.

5. POWER PACKS FOR SENSORS SHALL BE RATED FOR CONTROL OF FRACTIONAL HORSEPOWER MOTOR LOADS IN CONJUNCTION WITH THE RESPECTIVE LIGHTING LOAD. LOW-VOLTAGE MULTI-CONDUCTOR CABLE BETWEEN SENSORS AND POWER PACKS SHALL BE PLENUM RATED, 22 AWG.

6. PROVIDE LOW VOLTAGE MOMENTARY PUSHBUTTON SWITCH(ES) FOR MANUAL CONTROL IN CONFIGURATION SHOWN ON PLANS. MULTIPLE SWITCHING ZONES SHALL BE GROUPED IN THE LEAST NUMBER OF MULTI-PUSHBUTTON SWITCHES POSSIBLE.

7. PROVIDE AUXILIARY CONTACTS IN SENSORS WHERE SHOWN ON SHOWN ON THE PROJECT DRAWINGS, OR AS OTHERWISE REQUIRED FOR THE FUNCTIONALITY SPECIFIED IN THE PARTICULAR BUILDING SPACE.

K. OCCUPANCY/VACANCY SENSOR INSTALLATION:

1. CORNER MOUNTED SENSORS SHALL BE CEILING BRACKET MOUNTED WHERE CEILING IS PRESENT AND NO HIGHER THAN 12' AFF. WHERE SPACE HAS NO CEILING OR CEILING IS HIGHER THAN 12' AFF, THE CORNER MOUNTED SENSOR SHALL BE MOUNTED 10' AFF ON A MANUFACTURER-SUPPLIED WALL BRACKET.

2. SENSORS SHALL BE INSTALLED IN LOCATIONS SHOWN ON MANUFACTURER SUBMITTED SHOP DRAWINGS.

3. CONNECT LOW VOLTAGE MOMENTARY SWITCH(ES) TO SENSOR POWER-PACK TO ACHIEVE MANUAL-ON/AUTOMATIC-OFF OPERATION IN THE CONFIGURATION SHOWN ON PLANS. SWITCH(ES) SHALL ALLOW MANUAL-OFF OPERATION AS WELL.

4. WALL MOUNTED SENSORS SHALL ALSO BE CONFIGURED TO OPERATE MANUAL-ON/AUTOMATIC-OFF, IN CONFIGURATION SHOWN ON PLANS.

5. MANUAL SWITCHES ARE NOT REQUIRED IN CORRIDORS, STAIRWELLS, OR MULTIPLE OCCUPANT RESTROOMS. SENSORS SHALL BE AUTOMATIC-ON/AUTOMATIC-OFF IN THESE SPACES.

6. LOW-VOLTAGE SENSOR CABLE SHALL BE SUPPORTED BY J-HOOKS ATTACHED TO STRUCTURAL MEMBERS, AND SHALL BE RUN AT RIGHT ANGLES WITH RESPECT TO BUILDING STRUCTURE.

7. ADJUST TIME-OFF DELAY TO A MINIMUM OF FIFTEEN MINUTES.

SECTION 26 2030 - LIGHTING FIXTURES

A. TYPES AND SPECIFIC REQUIREMENTS ARE PROVIDED ON THE LIGHTING FIXTURE SCHEDULE ON THE PLANS. ALL LIGHT FIXTURES SHALL BE PROVIDED WITH LAMPS AND BALLASTS AND SHALL BE FULLY FUNCTIONING AT COMPLETION OF PROJECT.

B. PROVIDE LIGHTING FIXTURE ASSEMBLIES COMPLETE WITH ALL HARDWARE AND ACCESSORIES NEEDED TO INSTALL AND CONNECT, AS INDICATED ON THE DRAWINGS AND THIS SECTION OF THE SPECIFICATIONS.

C. THE CONTRACTOR SHALL SELECT THE VOLTAGE, FRAME TYPE, BALLAST TEMPERATURE RATING AND NUMBER OF BALLASTS, BASED ON THE USE SHOWN, ON AN AREA-BY-AREA BASIS. THESE MODIFIERS ARE NOT INCLUDED IN CATALOG NUMBERS. (I.E. A GIVEN FIXTURE MAY BE REQUIRED FOR USE ON MORE THAN ONE VOLTAGE. DETERMINE VOLTAGE BY CIRCUIT TO WHICH FIXTURE IS CONNECTED.)

D. ANY FIXTURES THAT ARE DEFECTIVE OR DAMAGED SHALL BE REPLACED WITH NEW. THIS INCLUDES, BUT IS NOT LIMITED TO SCRATCHES, DENTS, INCONSISTENT FINISHES, ETC. THE ARCHITECT'S OPINION SHALL BE FINAL IN MAKING THE DETERMINATION.

E. BALLASTS AND LED DRIVERS SHALL HAVE A 5-YEAR WARRANTY OR LONGER AND SHALL INCLUDE REPLACEMENT BALLAST OR DRIVER ASSEMBLY AND REASONABLE REPLACEMENT LABOR COSTS.

F. LED FIXTURES SHALL HAVE A L70 RATED LIFE OF 50,000 HOURS OR LONGER.

G. EMERGENCY BALLASTS OR LED EMERGENCY DRIVERS SHALL BE IOTA ILB-CP10 OR EQUAL BY BODINE. LED EMERGENCY DRIVER SHALL PROVIDE A MINIMUM OF 10W OF POWER THROUGH CONSTANT POWER TECHNOLOGY FOR 90 MINUTES. DRIVER SHALL HAVE A 5-YEAR WARRANTY.

H. LAY-IN FIXTURES SHALL BE SUPPORTED INDEPENDENTLY OF THE SUSPENDED CEILING FRAMING MEMBERS BY AT LEAST TWO TIE WIRES LOCATED ON OPPOSITE CORNERS OF EACH FIXTURE. FIXTURES OTHER THAN LAY-IN TYPE SHALL BE SECURELY FASTENED IN ACCORDANCE WITH NEC ARTICLE NO. 410-36 (B). FIXTURES INSTALLED IN RATED CEILINGS SHALL COMPLY WITH THE U.L. FIRE RESISTANCE DIRECTORY FOR THE CEILING DESIGN ENCOUNTERED.

DULOHERY WEEKS ENGINEERS

ARCHITECTS|PLANNERS
609 Cherry Street
Macon, GA 31201
478.742.1208
www.btbbinc.com

RESTROOM RENOVATIONS FOR:
DOUGLAS THEATRE
355 MARTIN LUTHER KING JR. BLVD., MACON, GA

GEORGIA REGISTERED No. 32283 PROFESSIONAL ENGINEER WESLEY O. WOMMACK

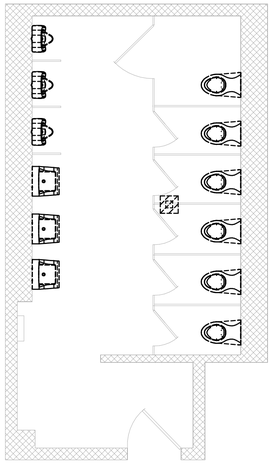
ISSUANCES

12-19-2017	BID DOCUMENTS

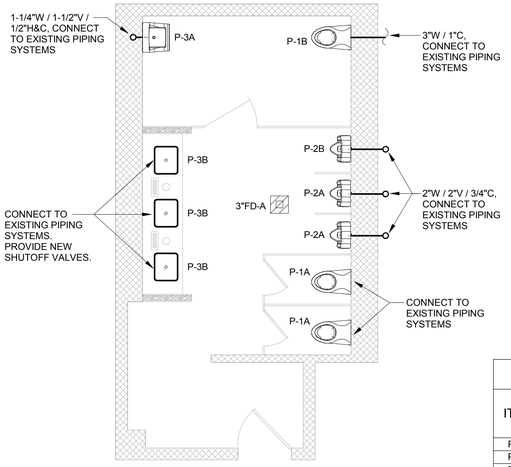
17-031

ELECTRICAL SPECIFICATIONS

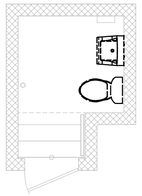
E1.3



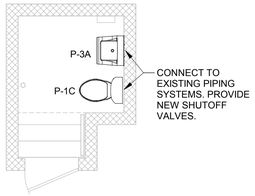
EXISTING FIRST FLOOR
MENS PUBLIC RESTROOM
1/4" = 1'-0"



NEW FIRST FLOOR MENS
PUBLIC RESTROOM
1/4" = 1'-0"



EXISTING SECOND FLOOR
PRIVATE RESTROOM
1/4" = 1'-0"



NEW SECOND FLOOR
PRIVATE RESTROOM
1/4" = 1'-0"

PLUMBING FIXTURE SCHEDULE

ITEM	DESCRIPTION	MINIMUM CONNECTION SIZE (INCHES)				MOUNTING HEIGHT REMARKS (ABOVE FLOOR)
		HOT WATER	COLD WATER	WASTE	VENT	
P-1A	WATER CLOSET	---	1"	3"	1-1/2"	15" RIM HT.
P-1B	WATER CLOSET - H.C.	---	1"	3"	1-1/2"	17" RIM HT.
P-1C	WATER CLOSET - H.C.	---	1/2"	3"	1-1/2"	17" RIM HT.
P-2A	URINAL	---	3/4"	2"	1-1/2"	24" RIM HT.
P-2B	URINAL - H.C.	---	3/4"	2"	1-1/2"	17" RIM HT.
P-3A	LAVATORY - H.C.	1/2"	1/2"	1-1/4"	1-1/2"	34" RIM HT.
P-3B	LAVATORY	1/2"	1/2"	1-1/4"	1-1/2"	COUNTERTOP

DEMOLITION NOTES:

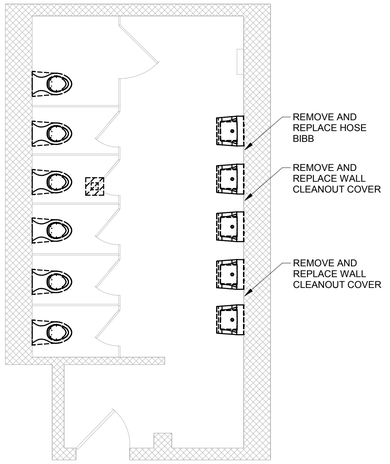
1. THE DRAWINGS SHOW THE GENERAL ARRANGEMENT AND LOCATIONS OF EXISTING PLUMBING RELATED WORK. THE CONTRACTOR SHALL FIELD VERIFY ACTUAL PIPING CONFIGURATION (WASTE, VENT AND WATER) AFTER DEMOLITION OF WALLS, FLOORS, ETC. DUE TO LIMITED FIELD OBSERVATION AND LACK OF EXISTING DRAWINGS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ENCOUNTERED THAT WOULD INTERFERE WITH THE PROPER INSTALLATION OF THE NEW FIXTURES.
2. DEMO ALL PLUMBING FIXTURES, FLOOR DRAINS, CLEANOUT COVERS, HOSE BIBBS, ETC. IN THE AREAS SHOWN. CAP PIPING ABOVE CEILING OR BELOW FLOOR AS REQUIRED.

GENERAL PLUMBING NOTES:

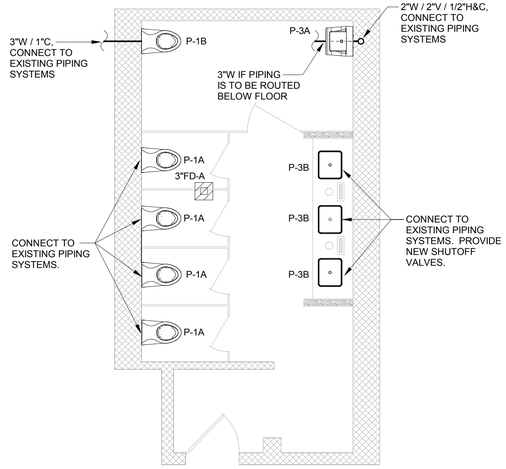
1. ALL SUSPENDED PIPING SHALL BE SUPPORTED FROM FLOOR AND/OR ROOF STRUCTURAL MEMBERS. IN NO CASE SHALL PIPING BE SUSPENDED FROM FLOOR OR ROOF DECK LESS THAN 4" THICK CONCRETE.
2. FIRE STOP ALL PENETRATIONS OF FIRE RATED ASSEMBLIES. REFER TO ARCHITECTURAL DRAWINGS FOR ASSEMBLY RATINGS.
3. PIPING INSTALLED IN PLENUM SPACES SHALL MEET ASTM E-84, ASTM E-136 AND UL 723 STANDARDS FOR FLAME SPREAD AND SMOKE GENERATION. COORDINATE PLENUM LOCATIONS WITH MECHANICAL CONTRACTOR.
4. COORDINATE ALL WORK WITH OTHER TRADES.
5. PROVIDE INLINE TRAP SEAL DEVICES ON ALL NEW FLOOR DRAINS NOT PROVIDED WITH TRAP PRIMERS.
6. ALL WATER AND VENT PIPING SHALL BE INSTALLED ABOVE THE CEILING UNLESS NOTED OTHERWISE.
7. ALL WASTE PIPING SHALL BE INSTALLED BELOW THE FLOOR UNLESS NOTED OTHERWISE.
8. PROVIDE CLEANOUTS AT THE BASE OF ALL SOIL AND WASTE PIPING OVER ONE STORY IN HEIGHT.
9. HOSE BIBBS SHALL BE MOUNTED 1' - 6" ABOVE FINISHED FLOOR.

PLUMBING LEGEND

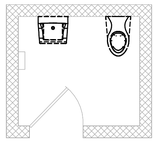
ABBREVIATION	SYMBOL	DESCRIPTION
HWR		HOT WATER RETURN PIPING
H		HOT WATER PIPING
T		TEMPERED HOT WATER PIPING
C		COLD WATER PIPING
G	G	NATURAL GAS PIPING
ST	ST	STORM DRAIN PIPING (ABOVE GROUND)
ST	ST	STORM DRAIN PIPING (BELOW GROUND)
OF	OF	OVERFLOW DRAIN PIPING
CA	CA	COMPRESSED AIR PIPING
S,W		SOIL AND WASTE PIPING
V		VENT PIPING
		SOLENOID VALVE
		SHUT-OFF VALVE
		SWING CHECK VALVE
		FLOW CONTROL
		CONNECT TO EXISTING
HB/E		HOSE BIBB (WALL BOX) FREEZE PROOF
HB/B		HOSE BIBB (WALL BOX) NON-FREEZE PROOF
HB/R		ROOF HYDRANT NON-FREEZE PROOF
HB/I		HOSE BIBB (INTERIOR)
WCO		WALL CLEAN OUT
RD		ROOF DRAIN
FCO		FLOOR CLEAN OUT
GCO		GRADE CLEAN OUT
FD - ''		FLOOR DRAIN - TYPE
HA - ''		WATER HAMMER ARRESTOR - SIZE
DSN		DOWNSPOUT NOZZLE
VTR		VENT THRU ROOF
VTS		VENT THRU SIDEWALL
AFF		ABOVE FINISH FLOOR
AFG		ABOVE FINISH GRADE
A/C		ABOVE CEILING
B/F		BELOW FLOOR
GPM		GALLONS PER MINUTE
PSI		POUNDS PER SQUARE INCH
U/G		UNDER GROUND
TYP.		TYPICAL
T-P		TRAP PRIMER
H.C.		HANDICAP ACCESSIBLE
GPH		GALLONS PER HOUR
CONN.		CONNECTION
ARCH.		ARCHITECTURAL
PRESS.		PRESSURE
W.C.		WATER COLUMN
DWGS.		DRAWINGS



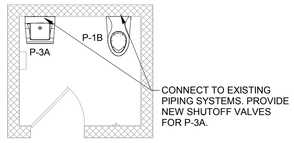
EXISTING FIRST FLOOR
WOMENS PUBLIC RESTROOM
1/4" = 1'-0"



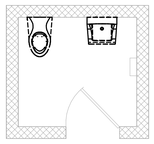
NEW FIRST FLOOR WOMENS
PUBLIC RESTROOM
1/4" = 1'-0"



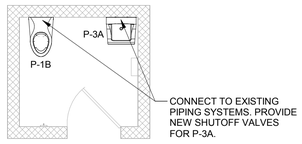
EXISTING FIRST FLOOR
MENS SINGLE RESTROOM
1/4" = 1'-0"



NEW FIRST FLOOR MENS
SINGLE RESTROOM
1/4" = 1'-0"



EXISTING FIRST FLOOR
WOMENS SINGLE RESTROOM
1/4" = 1'-0"



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GEORGIA REGISTERED No. 36692 PROFESSIONAL ENGINEER THOMAS A. BEAL

ISSUANCES

12-19-2017	BID DOCUMENTS

17-031

RESTROOM
PLUMBING PLANS

P1.1

DULOHERY WEEKS ENGINEERS

SECTION 22 0110 – PLUMBING GENERAL PROVISIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

B. It is recognized that separate sub-contracts may be instituted by THIS CONTRACT'S GENERAL CONTRACTOR with others. It is the responsibility of THIS CONTRACT'S GENERAL CONTRACTOR to completely inform, coordinate and advise those sub-contractors as to all of the requirements, conditions and information associated with providing and installing their portion of the total job.

1.02 IMPOSED REGULATIONS:

A. Applicable provisions of the State and Local Codes and of the following codes and standards in addition to those listed elsewhere in the specifications are hereby imposed on a general basis for plumbing work. In each case, the prevailing edition shall be the current adopted edition of the state where the project is located.

1. International Plumbing Code.
2. International Energy Conservation Code.
3. International Fire Code.

1.03 SCOPE OF WORK:

A. Provide all labor, materials, equipment and supervision to construct complete and operable plumbing systems as indicated on the drawings and specified herein. All materials and equipment used shall be new, undamaged and free from any defects.

1.04 EXISTING SERVICES AND FACILITIES:

A. Damage to Existing Services: Existing services and facilities damaged by the Contractor through negligence or through use of faulty materials or workmanship shall be promptly repaired, replaced, or otherwise restored to previous conditions by the Contractor without additional cost to the Owner.

B. Interruption of Services: Interruptions of services necessary for connection to or modification of existing systems or facilities shall occur only at prearranged times approved by the Owner. Interruptions shall only occur after the provision of all temporary work and the availability of adequate labor and materials will assure that the duration of the interruption will not exceed the time agreed upon.

C. Removed Materials: Existing materials made unnecessary by the new installation shall be removed, shall remain the property of the Owner and shall be stored at a location and in a manner as directed, or, if classified by the Owner's authorized representative as unsuitable for further use, shall become the property of the Contractor and shall be removed from the site.

1.05 PRODUCT WARRANTIES:

A. Provide manufacturer's standard printed commitment in reference to a specific product and normal application, stating that certain acts of restitution will be performed for the Purchaser or Owner by the manufacturer, when and if the product fails within certain operational conditions and time limits. Where the warranty requirements of a specific specification section exceed the manufacturer's standard warranty, the more stringent requirements will apply and modified manufacturer's warranty shall be provided. In no case shall the manufacturer's warranty be less than one (1) year.

1.06 PRODUCT SUBSTITUTIONS:

A. General: Materials specified by manufacturer's name shall be used unless prior approval of an alternate is given by addenda. Requests for substitutions must be received in the office of the Architect at least 10 days prior to opening of bids.

PART 2 - PRODUCTS

2.01 GENERAL PRODUCT REQUIREMENTS:

A. Standard Products: Provide not less (quality) than manufacturer's standard products, as specified by their published product data. In addition to the indication that a particular product/model number is acceptable, comply with the specified requirements. Do not assume that the available off-the-shelf condition of a product complies with the requirements; as an example, a specific finish or color may be required.

B. Uniformity: Where multiple units of a general product are required for the work, provide identical products by the same manufacturer, without variations except for sizes and similar variations as indicated.

C. Product Compatibility, Options: Where more than one product selection is specified, either generically or proprietarily, selection is Purchaser's or Installer's option. Provide adaptations as needed for interfacing of selected products in the work.

D. Equipment Nameplates: Provide a permanent operational data nameplate on each item of power operated equipment, indicating the manufacturer, product name, model number, serial number, speed, capacity, power characteristics, labels of tested compliance, and similar essential operating data.

E. Locate nameplates in easy-to-read locations. When product is visually exposed in an occupied area of the building, locate nameplate in a concealed position (where possible) which is accessible for reading by service personnel.

PART 3 - EXECUTION

3.01 PRODUCT INSTALLATION, GENERAL:

A. Except where more stringent requirements are indicated, comply with the product manufacturer's installation instructions and recommendations, including handling, anchorage, assembly, connections, cleaning and testing, charging, lubrication, startup, test operation and shut-down of operating equipment. Consult with manufacturer's technical experts, for specific instructions on unique product conditions and unforeseen problems.

B. Protection and Identification: Deliver products to project properly identified with names, models numbers, types, grades, compliance labels and similar information needed for distinct identifications; adequately packaged or protected to prevent deterioration during shipment, storage and handling. Store in a dry, well ventilated, indoor space, except where prepared and protected by the manufacturer specifically for exterior storage.

C. Permits and Tests: Provide labor, material and equipment to perform all tests required by the governing agencies and submit a record of all tests to the Owner or his representative. Notify the Architect five days in advance of any testing.

END OF SECTION 22 0110

SECTION 22 0120 - PLUMBING STANDARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 QUALITY ASSURANCE:

A. Industry Standards: It is a general requirement that plumbing work comply with applicable requirements and recommendations of standards published by listed agencies and trade associations, except to the extent more detailed and stringent requirements are indicated or required by governing regulations. Listing of Associations, Standards, and Abbreviations:

1. AGA American Gas Association
   1515 Wilson Blvd.
   Arlington, VA 22209

2. ASHRAE American Society of Heating, Refrigerating &
   Air Conditioning Engineers, Inc.
   1791 Tullie Circle, NE, Atlanta, GA. 30329
   404/636-8400

3. AWS American Welding Society, Inc.
   2501 NW 7th St., Miami, FL 33125
   305/642-7090

4. CISPI Cast Iron Soil Pipe Institute
   2020 K. St., NW, Washington, DC
   202/233-4536

5. NEC National Electrical Code by NFPA

6.

7. NEMA National Electrical Manufacturers Association
   1300 N 17th Street, Suite 1847
   Rosslyn, VA 22209
   703/841-3200

8. NFPA National Fire Protection Association
   407 Atlantic Ave.,
   Boston, MA 02210
   617/482-8755

9. UL Underwriters' Laboratories, Inc.
   207 East Ohio St.,
   Chicago, IL 60611
   312/642-6969

PARTS 2 AND 3 - PRODUCTS AND EXECUTION (Not applicable)

END OF SECTION 22 0120

SECTION 22 0210 - PLUMBING COORDINATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 QUALITY ASSURANCE:

A. Plumbing Coordination Drawings: Prepare a set of coordination drawings showing the coordination of the major elements, components and systems of the plumbing work, and showing the coordination of plumbing work with other work. Prepare drawings at accurate scale and sufficiently large to show locations of every item, including clearances for installing, maintaining, insulating, breaking down equipment, replacing motors and similar requirements. Prepare drawings to include plans, elevations, sections and details as needed to conclusively show successful coordination and integration of the work. Submit drawings for review by the Architect/Engineer.

B. Coordinate the actual location of all plumbing work visible in finished spaces with the Architect/Engineer.

PART 2 - PRODUCTS

2.01 PRODUCT COORDINATION:

A. Power Characteristics: Refer to the electrical sections of the specifications and the electrical drawings for the power characteristics available for the operation of each power driven item of equipment. The electrical design was based on the typical power requirements of the equipment manufacturers scheduled or specified. Any modifications to the electrical system which are required due to the use of an approved equivalent manufacturer shall be made at no additional cost to the owner. All changes must be clearly documented and submitted for review by the Architect/Engineer prior to purchasing equipment. Coordinate purchases to ensure uniform interface with electrical work. The plumbing contractor shall furnish a detailed list of equipment electrical characteristics to the electrical contractor for the purpose of preparing the coordination affidavit required by Division 26.

B. Coordination of Options and Substitutions: Where the contract documents permit the selection from several product options, and where it becomes necessary to authorize a substitution, do not proceed with purchasing until coordination of interface of equipment has been checked and satisfactorily established.

C. Firestopping: Refer to architectural drawings for the locations of all fire rated ceilings, floors and walls. The contractor shall furnish detailed shop drawings of all firestopping details to be used for both piping and ductwork. All firestopping details shall be U.L. listed and subject to approval by the Authority having jurisdiction.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION:

A. Substrate Examination: The Installer of each element of the work must examine the condition of the substrate to receive the work, and the conditions under which the work will be performed, and must notify the Contractor in writing of conditions detrimental to the proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

B. Do not proceed with the installation of sleeves, anchors, hangers, roof penetrations and similar work until coordination drawings have been processed and released for construction. Where work must be installed prior to that time in order to avoid a project delay, review proposed installation in a project coordination meeting including all parties involved with the interfacing of the work.

3.02 CUTTING AND PATCHING:

A. Structural Limitations: Do not cut structural framing, walls, floors, decks and other members intended to withstand stress, except with the Architect's or Engineer's written authorization. Authorization will be granted only where there is not other reasonable method for completing the work, and where the proposed cutting clearly does not materially weaken the structure.

B. Where authorized, cut opening through concrete (for pipe penetrations and similar services) by core drilling or sawing. Do not cut by hammer-driven chisel or drill.

C. Other work: Do not endanger or damage other work through the procedures and processes of cutting to accommodate mechanical work. Review the proposed cutting with the Installer of the work to be cut, and comply with his recommendations to minimize damage. Where necessary, engage the original Installer or other specialists to execute the cutting in the recommended manner.

D. Where patching is required to restore other work, because of either cutting or other damage inflicted during the installation of plumbing work, execute the patching in the manner recommended by the original Installer. Restore the other work in every respect, including the elimination of visual defects in exposed finishes, as judged by the Architect. Engage the original Installer to complete patching of the following categories of work:

1. Exposed concrete finishes.
2. Exposed masonry.
3. Waterproofing and vapor barriers.
4. Roofing, flashing and accessories.
5. Interior exposed finishes and casework, where judged by the Architect to be difficult to achieve an acceptable match by other means.

3.03 COORDINATION OF PLUMBING INSTALLATION:

A. General: Sequence, coordinate and integrate the various elements of plumbing work so that building systems will perform as indicated and be in harmony with other work of the building. The Architect/Engineer will not supervise the coordination, which is the exclusive responsibility of the Contractor. Comply with the following requirements:

1. Install piping and similar services straight and true, aligned with other work and with overhead structures and allowing for insulation where applicable. Conceal where possible.
2. Arrange work to facilitate maintenance and repair or replacement of equipment. Locate services requiring maintenance on valves and similar units in front of services requiring less maintenance. Connect equipment for ease of disconnecting, with minimum of interference with other work.
3. Give the right-of way to piping systems required to slope for drainage (over other service lines). Piping shall be located to avoid interference with ductwork and light fixtures.
4. Store materials off the ground and protected from standing water and weather.

B. Drawings: Conform with the arrangement indicated by the contract documents to the greatest extent possible, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, comply with the Architect's decision on resolution of the conflict.

C. Electrical Work: Coordinate the plumbing work with electrical work, and properly interface with the electrical service. In general, and except as otherwise indicated, install plumbing equipment ready for electrical connection. Refer to electrical sections of the specifications for electrical connection of plumbing equipment.

D. Utility Connections: Coordinate the connection of plumbing systems with exterior underground utilities and services. Comply with the requirements of governing regulations, franchised service companies and controlling agencies. Provide a single connection for each service except where multiple connections are indicated.

END OF SECTION 22 0210

SECTION 22 0220 - PLUMBING SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUBMITTAL FORMS AND PROCEDURES:

A. The purpose of submittals is to demonstrate to the Architect/Engineer that the Contractor understands the design concept. The Architect/Engineer's review of such drawings, schedules, or cuts shall not relieve the Contractor from responsibility for deviation from drawings or specifications unless he has, in writing, called the Architect/Engineer's attention to such deviations at the time of submission, and has received from the Architect/Engineer, in writing, permission for such deviations. All submittals must be completely checked by the Contractor prior to submission for review.

B. Hard Copy Submittals: Submittal data shall be placed in one or more hard-back 3-ring binders, arranged and labeled according to specification section. Each binder shall contain a title page and table of contents. Provide separator tabs, and label by specification section. Make note in the table of contents, any drawings that accompany the submittal. Title page shall contain Project Name, Contractor's Name, Division 22 Superintendent's name, Suppliers and point of contact for each, and date. Except as otherwise indicated in other sections, submit 5 complete copies. Quantity indicated does not include copies required for regulatory agencies.

C. Electronic Submittals: If the Architect agrees to allow electronic submittals via an on-line information management product such as "Submittal Exchange, etc., all electronic submittal files shall be organized to match the bid documents for specification section and name. Each submittal file shall be complete for each specification section. Multiple partial submittals per specification section will be rejected. Make note in the table of contents, any drawings that accompany the submittal. Title page shall contain Project Name, Contractor's Name, Division 22 Superintendent's name, Suppliers and point of contact for each, and date.

D. Submittals shall be made for all items contained in the following specification sections:

1. Plumbing Coordination
2. Plumbing Identification
3. Plumbing Pipe, Tube, and Fittings
4. Plumbing Hangers and Supports
5. Plumbing Piping Systems Insulation
6. Domestic Water Piping System
7. Soil, Waste and Vent Piping System
8. Plumbing Fixtures

E. Response to Submittals: A Submittal Review Report shall be issued by the Architect/Engineer with the following classifications for each item:

1. **"No Exceptions Taken"**: No corrections, no marks. Contractor shall submit copies for distribution.
2. **"Make Corrections Noted"**: A few minor corrections. Items may be ordered as marked up without further resubmission. Submit copies for distribution.
3. **"Revise and Resubmit"**: Minor corrections. Item may be ordered at the Contractor's option. Contractor shall resubmit drawings with corrections noted.
4. **"Rejected"**: Major corrections or not in accordance with the contract documents. No items shall be ordered. Contractor shall correct and resubmit drawings.

PART 2 - PRODUCTS

2.01 SUBMITTAL REQUIREMENTS:

A. General: Each specification section shall list the required submittal items. All submittal items shall conform to the requirements listed below. For each major section of submittal data, include a summary page which lists items and model numbers for each piece of equipment.

B. Shop Drawings: Prepare shop drawings to accurate scale except where diagrammatic representations are specifically indicated. Show clearance dimensions of critical locations, and show dimensions of spaces required for operation and maintenance of equipment. Show piping connections and other service connections, and show interface with other work including structural support. Indicate by note, the portions of plumbing work shown on the shop drawings which deviated from the indication of work in the contract documents, and explain the reasons for the deviations. Show how such deviations coordinate with interfacing deviations on shop drawings for other portions of the work, currently or previously submitted.

C. Manufacturer's Data: Where pre-printed data is submitted for more than one distinct product, size, type, material, trim, accessory group or other variation, mark submitted copy with black pen to indicate which of the variations is to be provided. Delete or mark-out significant portions of preprinted data which are not applicable. Where operating ranges are shown, mark data to show portion of range required for project application. Expansion or elaboration of standard data to describe a non-standard product must be processed as a shop drawing submittal. For each product include the manufacturer's production specifications, installation or fabrication instructions, nearest source of supply (including telephone number), sizes, weights, speeds, operating capacities, piping and service line connection sizes and locations, statements of compliance with required standards and governing regulation (include manufacturer's signed statements if not covered in printed data), performance data (where applicable) and similar information needed to confirm compliance with the requirements.

D. Certifications: Where specifically indicated, submit with notarized execution.

E. Test Reports: Submit test reports which have been signed and dated by the firm performing the test and prepared in the manner specified in the standard or regulation governing the test procedures as indicated.

F. Manufacturer's Product Warranties: Where pre-printed and published warranty includes substantial deviation from required warranty (as judged by the Architect or Engineer), product is automatically disqualified from use on the project, except where manufacturer prepares and issues a specific product warranty on the product, stating that it is in lieu of the published warranty, and is executed by an authorized officer, and complies with the requirements. Warranties shall comply with the requirements of individual specification section where those requirements exceed the manufacturer's standard warranty.

PART 3 - EXECUTION

3.01 CLOSEOUT REQUIREMENTS:

A. Operating Instructions: Submit manufacturer's operating instructions for each item of plumbing equipment and supplement with additional project application instructions where necessary. Prepare and submit specific operating instructions for charging, start-up, control or sequencing of operation, phase or seasonal variations, shut-down, safety and similar operational instructions. Prepare in typewritten form in completely explained and easily understood English language.

B. Maintenance Manuals: Organize each copy of the required system maintenance manuals to include an index followed by thumb-tab marked sections for each of the following:

1. System operating instructions.
2. Emergency instructions including addresses and telephone numbers of service sources.
3. Regular system maintenance procedures including lubrication.
4. Spare parts listing and stocking recommendations.
5. Inspection, adjusting, rebalancing, cleaning, parts replacement, and similar maintenance instructions and recommendations, including the proper use of tools and accessories.
6. Valve schedule and control diagram for each system.
7. Manufacturer's data for each operating item in each system.
8. Manufacturer's product warranties and guarantees relating to the system and equipment items in the system.
9. Corrected or approved issues of submittal items relating to the system.
10. Bind each maintenance manual in one or more vinyl-covered, 2", 3-ring binder, plus pocket-folder type binders for folded drawings, and mark the back spine of each binder with system identification and volume number.

C. Maintenance Materials: Deliver to Owner's representative at the location as directed, in containers or packages suitable for storage and fully identified.

D. Guarantees: Where indicated as "Certified", provide guarantee which, in addition to execution by an authorized officer of each guarantor, is attested to by the Secretary of each guarantor and bears the corporate seal.

END OF SECTION 22 0220

SECTION 22 0230 - PLUMBING IDENTIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 QUALITY ASSURANCE:

A. Manufacturers: Firms regularly engaged in the manufacture of identification systems required for this product.

B. Submittals: Submit manufacturer's data on materials and submit a sample of each type required.

PART 2 - PRODUCTS

2.01 PLUMBING IDENTIFICATION MATERIALS:

A. Plastic Pipe Markers:

1. General: Product manufacturer's standard pre-printed, flexible or semi-rigid, permanent, color-coded, plastic-sheet pipe markers, complying with ANSI A13.1.
2. Small Pipe: For external diameters less than 6 inches (including insulation, if any), provide full band pipe markers, extending 360 degrees around pipe at each location, fastened by one of the following methods:
   a. Snap-on application of pre-tensioned semi-rigid plastic pipe marker.
   b. Adhesive lap joint in pipe marker overlap.
   c. Laminated or bonded application of pipe marker to pipe (or insulation).
   d. Taped to pipe (or insulation) with color-coded plastic adhesive tape, not less than 3/4 inch wide; full circle at both ends of pipe marker, tape lapped 1-1/2 inch.
3. Large Pipes: For external diameters of 6 inches and larger (including insulation, if any), provide either full-band or strip-type pipe markers, but not narrower than 3 x letter height (and of required length), fastened by one of the following methods:
   a. Laminated or bonded application of pipe marker to pipe (insulation).
   b. Taped to pipe (or insulation) with color-coded plastic adhesive tape, not less than 1-1/2 inches wide: full circle at both ends of pipe marker, tape lapped 3 inches.
4. Lettering: Comply with piping system names as specified, scheduled or shown, and abbreviate only as necessary for each application length.
5. Arrows: Print each pipe marker with arrow indicating direction of flow, either integrally with piping system service lettering or as separate unit of plastic (to accommodate both directions).
6. Install pipe markers on piping of the following piping systems:

   Domestic Cold Water
   Domestic Hot Water

B. Plastic Tape: Manufacturer's standard color-coded pressure-sensitive (self-adhesive) vinyl tape, not less than 3 mils thick:

1. Width: Provide 1-1/2 inches wide tape markers on pipes with outside diameters including insulation of less than 6 inches, 2-1/2 inches wide tape on larger pipes.
2. Color: Comply with ANSI A13.1.

C. Engraved Plastic-Laminate Signs:

1. General: Provide engraving stock melamine plastic laminated, complying with FS L-P-387, in the sizes and thicknesses indicated, engraved with engraver's standard letter style of the sizes and wording indicated, black with white core, letter color, except as otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.
2. Thickness: 1/16 inch, except as otherwise indicated.
3. Fasteners: Self-tapping stainless steel screws, except contact type permanent adhesive where screws cannot or should not penetrate the substrate.

D. Valve Tags:

1. Valve tags shall be 18 gauge (minimum) brass with 1-1/4" (minimum) height and width. Identification letters and numbers shall be stamped in tag and shall be filled with black paint
2. Valve tags shall be attached to valve using cable ties. Cable ties shall be self-locking nylon ties.
3. Valve tags shall be installed on any new shut-off and drain valves. Valve tag shape and designations shall be as follows:

Identification System	Shape	Numbers
Domestic Cold Water	Hexagonal	CW-1, 2, 3, ...
Domestic Hot Water	Hexagonal	HW-1, 2, 3, ...

2.02 LETTERING AND GRAPHICS:

A. General: Coordinate names, abbreviations and other designations used in the identification work, with the corresponding designations shown, specified or scheduled. Provide numbers, lettering recommended by manufacturers or as required for proper identifications and operation/maintenance of the systems and equipment.

B. Multiple Systems: Where multiple systems of the same generic name are shown and specified, provide identification which indicates the individual system number as well as the service.

PART 3 - EXECUTION

3.01 APPLICATION AND INSTALLATION:

A. Coordination: Where identification is to be applied to surfaces which require insulation, painting and other covering or finish, including valve tags in finished spaces, install identification after completion of covering or painting.

B. All equipment, valves, etc. located above ceiling grids shall be located with an engraved marker permanently attached to the ceiling grid. The marker shall describe the item located above the ceiling.

C. Piping System Identification:

1. General: Install pipe markers on each system indicated to receive identification, and include arrows to show normal direction of flow.

D. Locate pipe markers as follows wherever piping is exposed to view in mechanical rooms, accessible maintenance spaces (including accessible areas above ceilings) and exterior non-concealed locations:

1. Near each valve and control device.
2. Near each branch, excluding short take-offs for fixtures. Mark each pipe at branch, where there could be a question of flow pattern.
3. Near locations where pipes pass through walls or ceilings, or enter non-accessible enclosures.
4. Near major equipment items and other points of origination and termination.
5. Spaced intermediately at maximum spacing of 50 feet along each piping run, except reduce spacing to 25 feet in congested areas of piping and equipment.

E. Do not mark piping exposed in finished occupied spaces.

F. Plumbing Equipment Identification: Install an engraved plastic laminate sign on or near each major item of plumbing equipment and each operational device, as specified herein if not otherwise specified for each item or device. Provide signs for all major items of plumbing equipment.

G. Valve tags shall be attached to the valve handwheel with cable ties.

END OF SECTION 22 0230

SECTION 22 0240 - PLUMBING WORK CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 DOCUMENTATION PROCEDURES:

A. Signed Commitments: Do not proceed with transfer of plumbing systems to the Owner for operation until warranties, performance certifications and similar commitments to be signed by Contractor and other entities have been executed and transmitted to Architect (for Owner's records).

1.03 RECORD DRAWINGS:

A. Explanation: Except where otherwise indicated, plumbing drawings (contract drawings) prepared by Architect/Engineer, contract/drawings, are diagrammatic in nature and may not show locations accurately for various components of plumbing systems. Shop drawings, including coordination drawings, prepared by Contractor shall show certain portions of work more accurately to scale and location, and in greater detail.

B. General Recording Procedure: Maintain a white-print set, blue-line or black-line, of plumbing contract drawings and shop drawings in clean, undamaged condition, for mark-up of actual installations which vary substantially from the work as shown. Mark-up whatever drawings are most capable of showing the installed conditions accurately; however, where shop drawings are marked, record a reference note on appropriate contract drawing. Mark with erasable pencil and use multiple colors to aid in the distinction between work of separate systems. In general, record every substantive installation of plumbing work which previously is either not shown or shown inaccurately, but in any case record the following:

1. Underground and aboveground piping, both exterior and interior, drawn to scale and fully dimensioned.
2. Plumbing "Project Record" shall be maintained as part of the "Project Record" specified in Division 1.

PART 2 - PRODUCTS

2.01 NOT APPLICABLE:

PART 3 - EXECUTION

3.01 CLOSEOUT PROCEDURES:

A. General Coordination: Sequence closeout procedures properly, so that work will not be endangered or damaged, and so that every required performance will be fully tested and demonstrated.

B. System Performance Test Run: At the time of plumbing work closeout, check each item in each system to determine that it is set for proper operation. With Owner's representative and Architect/Engineer present, operate each system in a test run of appropriate duration to demonstrate compliance with performance requirements. During or following test runs, make final corrections or adjustments of system to refine and improve performances wherever possible, including noise and vibration reductions, elimination of hazards, better response of controls, signals and alarms, and similar system performance improvements. Provide testing or inspection devices as may be requested for Architect's/Engineer's observation of actual system performances. Demonstrate that controls and items requiring service or maintenance are accessible. Test run shall be scheduled to coincide with Engineer's final inspection of the plumbing work.

C. Cleaning and Lubrication: After final performance test run of each plumbing system, clean system both externally and internally. Flush piping system by operating drains and similar means, and clean strainers and traps. Lubricate both power and hand operated equipment and remove excess lubrication. Touch-up minor damage to factory painted finishes and other painting specified as plumbing work; refinish work where damage is extensive.

D. General Operating Instructions: In addition to specified training of Owner's operating personnel specified in individual plumbing sections, and in addition to preparation of written operating instructions and compiled maintenance manuals specified, provide general operating instructions for the plumbing systems. Conduct a walk-through explanation and demonstration for orientation and education of Owner's personnel to be involved in continued operation of building.

1. Describe each basic system and how its control system functions, including flow adjustments, temperature control and similar operations.
2. Explain and point out identification system, displayed diagrams, signals, alarms and similar provisions of the work.
3. Describe basic sequencing requirements and interlock provisions for system start-up, phasing and shut-down.
4. Emphasize emergency procedures and safety provisions for protection of equipment and safety of occupants during equipment malfunction, disasters, power failures and similar unusual circumstances.
5. Outline basic maintenance procedures.

E. Demonstrate what adjustments have been made and can continue to be made to reduce noise and vibration, improve system output, decrease energy consumption and similar performance improvements.

F. Point out operational security provisions, safety, unavoidable hazards and similar operator limitations. Display and conduct a "thumb-through" explanation of maintenance manuals, record drawings, meter readings and similar service items.

G. Construction Equipment: After completion of performance testing and Owner's operating instructions and demonstrations, remove installers tools, test facilities, construction equipment and similar devices and materials used in execution of the work but not incorporated in the work.

3.02 CONTINUED SYSTEM OPERATIONS:

A. Final Acceptance: At time of substantial completion of plumbing work, Owner's operating personnel will take over operation of plumbing systems. However, until time of final acceptance, respond promptly with consultation and services on whatever operation or maintenance problems may remain or arise.

END OF SECTION 22 0240

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ISSUANCES

12-19-2017	BID DOCUMENTS

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17-031

PLUMBING SPECIFICATIONS

DULOHERY WEEKS ENGINEERS

P1.2

SECTION 22 0310 – PLUMBING PIPE, TUBE AND FITTINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 QUALITY ASSURANCE:

A. Industry Standards:

1. Qualify welding procedures, welders and operators in accordance with ASME B31.1 for shop and project site welding of piping work.
2. Certify welding of piping work using the Standard Procedure Specifications by, and welders tested under supervision of, the National Certified Pipe Welding Bureau.
3. Where plastic piping is indicated to transport potable water, provide pipe and fittings bearing approval label by the National Sanitation Foundation (NSF).

B. SUBMITTALS:

1. Submit manufacturer's data, welding certifications, test reports, and product warranties as applicable for all piping materials.
2. Grooved joint couplings and fittings shall be shown on drawings and product submittals, and be specifically identified with the applicable style number.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS:

A. General: Provide pipe and tube of the type, joint type, grade, size and weight (wall thickness or Class) indicated for each service. Where type, grade or class is not indicated, provide proper selection as determined by Installer for installation requirements and comply with governing regulations and industry standards.

B. Black Steel Pipe: ASTM A 53, Schedule 40.

C. Galvanized Steel Pipe: ASTM A 53, Schedule 40.

D. Copper Tube: ASTM B88-89 Type (wall thickness) as indicated for each service; hard-drawn temper, except as otherwise indicated. Solder for use on domestic water piping shall be lead free type.

E. Plastic Pipe:

1. PVC-DWV: ASTM D2665-88
2. CPVC-WATER: ASTM D2846, ASTM F441 and ASTM F442 with socket type solvent cement or threaded fittings and joints complying with ASTM F 437, ASTM F438 and ASTM F439.

2.02 PIPE/TUBE FITTINGS:

A. General: Provide factory-fabricated fittings of the type, materials, grade, class and pressure rating indicated for each service and pipe size. Provide sizes and types matching pipe, tube valve or equipment connections in each case. Where not otherwise indicated, comply with governing regulations and industry standards for selections, and with pipe manufacturer's recommendations where applicable.

B. Soldering Materials: Except as otherwise indicated, provide soldering materials as determined by the Installer to comply with installation requirements.

1. Tin-Antimony Solder: ASTM B 32, Grade 95TA.

C. Solvent Cement for PVC Joints: D2564-88.

D. Pipe Sleeves:

1. Iron Pipe Sleeves: Fabricate from Schedule 40 galvanized steel pipe; remove burrs.
2. Sheet Metal Pipe Sleeves: Fabricate from galvanized sheet metal closed with lock-seam joints. For following pipe sizes provide gauge indicated: 3 inch pipe and smaller, 20 gauge; 4 to 6 inch pipe, 16 gauge; over 6 inch pipe, 14 gauge.
3. Pipe Sleeve Caulking: 3M Fire Barrier Caulk, CP25N/S, except where another caulking system or material is specified or approved by Jaco or Flamestopper.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. General: Install pipe, tube and fittings in accordance with recognized industry practices which will achieve permanently-leakproof piping systems, capable of performing each indicated service without piping failure. Install each run with a minimum of joints and couplings, but with adequate and accessible unions for disassembly and maintenance/ replacement of valves and equipment. Reduce sizes (where indicated) by use of reducing fittings. Align piping accurately at connections, within 1/16" misalignment tolerance.

1. Comply with ASME B31.1 Code for Pressure Piping.

B. Locate piping runs as indicated on the drawings. Route vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown, or described by diagrams, details and notations or, if not otherwise indicated, run piping in the shortest route which does not obstruct usable space or block access for servicing the building and its equipment. Where possible, locate insulated piping for 1.0" clearance outside insulation. Changes in direction shall be made with fittings.

C. Piping System Joints: Provide joints of the type indicated in each piping system.

D. Soldered Joints: Solder copper tube and fitting joints where required, in accordance with recognized industry practice. Cut tube ends squarely, ream to full inside diameter, and clean outside of tube ends and inside of fittings with steel wool. Apply solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting and solder in manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens. Use a non-corrosive paste flux and wire solder composed of 95 percent tin and 5 percent antimony.

E. Plastic Pipe/Tube Joints: Comply with manufacturer's instructions and recommendations and with applicable industry standards. Install all storm, soil, waste and vent plastic pipe underground in compliance with ASTM D 2321.

F. Insulating (Dielectric) Nipples: Comply with manufacturer's instructions for installing nipples in a manner which will prevent galvanic action and stop corrosion where the joining of ferrous and non-ferrous piping occurs.

G. Pipe Sleeves: Install pipe sleeves of the types specified wherever piping passes through the walls, floors or structural members of the work. Provide sleeves of adequate size, accurately centered in pipe runs. Size sleeves so that piping and insulation will have free movement in the sleeve, including allowance for thermal expansion. Where insulation includes a vapor barrier covering provide sleeve with sufficient clearance for installation of vapor barrier. Install length of sleeve equal to thickness of construction penetrated, except extend floor sleeves 0.25 inches above floor finish. Provide temporary support of sleeves during placement of concrete and other work around sleeves and provide temporary closure to prevent concrete and other materials from entering pipe sleeves.

1. Sleeve Type: At interior partitions and ceilings, install sheet metal sleeves.
2. Sleeve Type: At exterior penetrations both above and below grade, install iron pipe sleeves.
3. Sleeve Type: Except as otherwise specified, install steel pipe sleeves.
4. Caulk pipe sleeves at exterior penetrations and at other locations where indicated. Provide sufficient quantities of oakum and lead to make permanent weather-tight closure between sleeve and piping, slightly recessed at exposed surface.

3.02 CLEANING, FLUSHING AND INSPECTING:

A. General: Clean exterior surfaces of installed piping systems of superfluous materials and prepare for application of specified coatings.

B. Flush out piping system with clean water before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.

3.03 PIPING TESTS:

A. General: Provide temporary equipment for testing, including pump and gages. Test piping systems before insulation is installed wherever feasible, and remove control devices before testing. Test each natural section of each piping system independently, but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating.

1. Required test period is 2 hours.

B. Unless otherwise specified for specific systems, hydraulically test each pressurized piping system at 150% of operating pressure indicated, but not less than 100 psig test pressure.

C. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 5% of test pressure.

D. Repair piping systems sections which fail the required piping test, by disassembly and re-installation, using new materials to the extent required to overcome leakage. Do not use chemicals, stop-leak compound, mastics, or other temporary repair methods. Drain test water from piping systems after repair work and retesting has been completed.

END OF SECTION 22 0310

SECTION 22 0320 – PLUMBING HANGERS AND SUPPORTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUBMITTALS:

A. Provide manufacturer's data, test reports, and product warranties on all items.

PART 2 - PRODUCTS

2.01 HANGERS AND SUPPORTS:

A. General: Except as otherwise indicated, provide factory-fabricated piping hangers and supports of the type specified complete with bolts and washers. Comply with the manufacturer's published product information. Size hangers and supports properly for piping and weight of the medium being transported. Provide insulation shields for all insulated piping.

B. Hangers for domestic hot and cold water piping shall be copper plated band type with adjusting nut; Grinnell, Fig. CT-69, B-Line Fig. B 3172CT, or equivalent by Michigan Hanger, PHD Manufacturing or Hubbard Enterprises/Holdrite.

C. Hangers for plastic drain and vent piping shall be Clevis type, B-Line Fig. B 3100, or equivalent by Grinnell, Michigan Hanger, PHD Manufacturing or Hubbard Enterprises/Holdrite.

PART 3 - EXECUTION

3.01 HORIZONTAL PIPING SUPPORT:

A. Maximum spacing of hangers and supports for above-ground horizontal pipe and tubing shall be as follows:

1. Cast-iron pipe (all sizes) shall be supported at not more than five foot intervals and near each hub or hubless pipe joint and at multiple fittings as required.

B. Copper Tubing:

Tubing Size (inches)	Support Spacing (feet)
3/4 & smaller	5
1 to 2-1/2	6
3	10
4 and larger	12

C. Plastic Pipe:

Nominal Pipe Size (inches)	Support Spacing (feet)
3/4	3.0
3/4 to 1	3.5
1-1/4 to 1-1/2	4.0
2 to 2-1/2	4.5
3 and larger	5.5

D. Prevent electrolysis in the support of copper tubing by the use of hangers and supports which are copper plated, or by other recognized industry methods.

E. Branch piping located in walls, partitions or pipe chases shall be rigidly supported inside the wall or chase.

3.02 VERTICAL PIPING SUPPORT:

A. Plastic Piping: Support at 8 feet maximum intervals and near each joint.

B. Copper Tubing: Support at riser tops and 5 feet maximum on center for pipe 1-1/2" and larger and 4 feet on center for pipe 1-1/4" and smaller. Use copper plated pipe clamps.

C. Fixture Supports: See Fixture Schedule. Provide concealed supports and carriers recommended by the manufacturer of the fixtures and equipment to suit the structural and finish conditions.

3.03 ADJUSTMENT OF HANGERS AND SUPPORTS:

A. Adjust hangers and supports to bring piping to proper level, elevations and slopes.

END OF SECTION 22 0320

SECTION 22 1110 - DOMESTIC WATER PIPING SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 QUALITY ASSURANCE:

A. Code Compliance: Comply with governing regulations which require the products used for domestic water piping work to be selected from lists in certain published standards or codes as indicated therein.

1.03 SUBMITTALS:

A. Provide manufacturer's data, test reports, and product warranties as applicable for all items.

B. Provide certified copy of contractor's sterilization test.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS:

A. General: Comply with section 220310 for product requirements of piping materials. For each service, provide the piping materials indicated including, pipe, fitting, hangers supports, anchors, valves and accessories. Where more than one type is indicated, selection is Installer's option. Where type is not otherwise indicated, provide materials complying with governing regulations.

B. Water Distribution Piping:

1. Pipe Sizes 4" and Smaller: Copper tube of the size indicated.
2. Wall Thickness: Type K (belowground). Type L (above ground).
3. Fittings: Wrought copper-solder joint (with lead free solder).

2.02 ACCESSORIES:

A. General: Provide factory-fabricated piping products of the size, type, rating and capacity indicated. Where not indicated, provide proper selection as determined by the Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections.

B. Watts is an approved manufacturer for water supply products.

C. Water Hammer Arrestors: Bellows type; precharged compressor chamber; stainless steel casing and bellows. Provide sizes complying with PDI Standard WH-201. Josam 75000 Series, Jay R. Smith Fig 5000, or Zurn 1700 Series

D. Interior Hose Bibbs HB/I: Hose bibbs shall be ½ inch in size, polished chrome plated bronze body with integral vacuum breaker and loose key operated. Interior Hose Bibbs shall be Woodford Model 26, Chicago No. 387 or Acorn 8135.

E. Ball Valves: Ball valves shall have two-piece bronze or brass body, meeting MSS-SP110, full or standard port, blowout-proof stem and adjustable packing nut independent of handle. Valves shall be rated for 150 SWP, 600 WOG or 300 CWP. Valves shall be by Apollo, Milwaukee, Nibco, Victaulic, Watts or Red-White.

F. Escutcheon Plates: Metal split-ring type units, with nickel or chrome plated finish. Provide units sized to fit closely outside of pipe insulation or bare pipe where no covering is required.

G. Sheet-Metal Pipe Sleeves: Fabricate from galvanized sheet metal closed with lock-seam joints. For following pipe sizes provide gauge indicated: 3 inch pipe and smaller, 20 gauge; 4 inch to 6 inch pipe, 16 gauge; over 6 inch pipe, 14 gauge.

H. Pipe Sleeve Caulking: 3M Fire Barrier Caulk, CP25N/S, except where another caulking system or material is specified, or equivalent by Hilti or Tremco.

PART 3 - EXECUTION

3.01 INSTALLATION OF PIPING:

A. General: Comply with the requirements of section 220310 for installation of basic piping materials.

B. Expansion Compensation: Except as otherwise indicated, install piping, including mains, branches and runouts with offsets to allow for free expansion and contraction sufficient to prevent leaks and over-stressing of the piping system.

C. Sterilization: The entire water distribution system shall be thoroughly sterilized with a solution containing not less than 50 parts per million of available chlorine. The chlorinating material shall be liquid chlorine conforming to Federal Specification BB-C-120. The sterilization solution shall be allowed to remain in the system for a period of 24 hours, during which time all valves and faucets shall be opened and closed several times. After sterilization, the solution shall be flushed from the system with clean water until the residual chlorine content is not greater than 0.2 parts per million. After completion of sterilization water samples shall be sent to the Local Health Department (LDH) for testing. Approval must be received from LDH before the system is put into service.

3.02 INSTALLATION OF ACCESSORIES:

A. Install premanufactured accessories in accordance with the manufacturer's instructions and recommendations.

B. Access Panel: Install access panels as shown on drawings. Paint access panels to match walls or ceilings.

C. Escutcheon Plates: Install escutcheon plates at pipe sleeves where piping is exposed to view in occupied spaces of the building, on the exterior and elsewhere as indicated.

D. Water Hammer Arrestors: Install units at the top of each riser or as otherwise indicated to comply with PDI Standard WH-201.

E. Air Vents: Install manual air vents at high points in the system and as shown on the drawings.

END OF SECTION 22 1110

SECTION 22 1210 - SOIL, WASTE, AND VENT PIPING SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUBMITTALS:

A. Provide manufacturer's data, test reports, and product warranties as applicable for all items.

1.03 QUALITY ASSURANCE:

A. Industry Standards: Comply with local regulations, the International Plumbing Code and standards established by the Plumbing and Drainage Institute (PDI) pertaining to floor drains.

B. General: Provide factory-fabricated drainage piping products of the size and type indicated. Where not indicated, provide proper selection as determined by the Installer to comply with the installation requirements and governing regulations. Contractor shall coordinate drainage products selected with finish conditions encountered.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS:

A. General: Comply with section 22 0310 for product requirements of piping materials. For each service, provide the piping materials indicated, including pipe, fittings, joints, hangers, supports, anchors and accessories. Where type is not otherwise indicated, provide materials complying with governing regulations.

B. Watts, Mifab and Wade are approved manufacturers for drainage products.

C. Soil, Waste and Vent Piping (Belowground):

1. Schedule 40 ABS-DWV or PVC-DWV pipe and fittings. Joints shall be solvent cement socket type.
2. Service weight cast iron hub and spigot pipe and fittings, ASTM A74. Joints in underground cast iron piping shall be made using an ASTM-C564 neoprene elastomeric compression gasket conforming to the requirements of ASTM C 1563.

D. Soil, Waste Drain and Vent Piping (Above Ground):

1. Schedule 40 plastic ABS-DWV or PVC-DWV pipe and fittings. Joints shall be solvent cement socket type above ground. If ABS or DWV pipe and fittings are used aboveground all penetrations of rated walls, floors, and assemblies shall be protected in an approved manner, including penetrations of one side of an assembly.
2. Hub less cast iron pipe and fittings conforming to CISPI 301 or ASTM A888. Joints in above ground cast iron shall be made using heavy-duty ASTM C 1540 and ASTM C 564 stainless steel no-hub couplings or cast iron no-hub couplings.

2.02 FLOOR DRAINS:

A. Drains installed in waterproofed floors [and roofs] shall be provided with flashing clamps.

B. Floor Drain FD-A: shall have a coated cast iron body with integral pipe stops, flashing collar, seepage flange, vandal-proof screws and 6"x6" square Nikaloy strainer.
Drains shall be:

1. J.R. Smith 2010 Series
2. Josam 30000 Series
3. Zurn ZN-415 Series

2.03 CLEANOUTS:

A. Cleanout plugs shall be cast bronze or brass countersunk type with taper threads complying with ANSI B2.

B. Cleanouts on underground drainage shall have piping extended to the floor and finished with cleanout plug and removable floor plate.

C. Cleanouts shall be the same size as the pipe on which installed, except cleanouts on underground piping shall be a maximum of 4".

D. Cleanouts in waterproofed floors shall have flashing clamp.

E. Wall Cleanouts: shall consist of a threaded recessed tapped cleanout tee with tapered thread bronze plug, securing screw, and round stainless steel wall plate. Cleanout shall be:

1. J.R. Smith 4532S
2. Josam 58600-COT
3. Zurn ZN-1446

2.04 DRAINAGE ACCESSORIES:

A. Escutcheon Plates: Metal split-ring type units, with nickel or chrome plated finish. Provide units sized to fit closely outside of pipe insulation or bare pipe where no covering is required.

B. Inline Floor Drain Trap Sealer: Provide trap sealer with ASB plastic body, keeper pin neoprene rubber diaphragm and sealing gasket. Trap sealer unit shall comply with the requirements of ASSE 1072. Basis of design is Sure Seal model SS.

PART 3 - EXECUTION

3.01 INSTALLATION OF PIPING:

A. General: Comply with the requirements of section 220310 for installation of basic materials.

B. Testing: The piping of the soil, waste and vent system shall be tested with water before installing fixtures. Water test shall be applied to the soil, waste and venting system either in its entirety or in sections. If the test is applied to the entire system, all openings in the piping shall be closed except the highest opening, and the system shall be filled with water to the point of overflow. If the system is tested in sections, each opening of the section under test shall be plugged and each section shall be filled with water and tested with at least a 10 foot head of water. In testing successive sections, at least the upper 10 feet of the next preceding section shall be tested so that each joint or pipe in the building except the upper most 10 feet of the system has been submitted to a test of at least 10 foot head of water. The water shall be kept in the system, or in the portion under test, for at least 30 minutes before the inspection starts; the system shall be tight at all joints. Joints that fail the test shall be remade and retested.

C. Protection: The installer of drains shall advise the Contractor of required protection for the drains during the remainder of the construction periods, to avoid clogging with construction materials and debris to prevent damage from traffic and construction work.

D. During construction all pipe openings shall be capped or plugged, when not being worked on, to prevent foreign objects and construction debris from entering system.

E. Horizontal drainage piping 2-1/2" and smaller shall be graded at a minimum of 1/4 inch per foot, unless noted otherwise. Horizontal drainage piping 3" and larger shall be graded at a minimum of 1/8 inch per foot, unless noted otherwise.

F. All underground plastic soil, waste and vent piping shall be installed in compliance with ASTM D 2321.

3.02 INSTALLATION OF ACCESSORIES:

A. Install escutcheon plates at pipe sleeves where piping is exposed to view in occupied spaces of the building, on the exterior and elsewhere as indicated.

B. Cleanouts in vertical piping shall be roughed-in with the centerline 18" above the finished floor.

C. Install drains in accordance with manufacturer's written instructions and in locations indicated.

D. Coordinate with soil and waste piping as necessary to interface drains with drainage piping system.

E. Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes, where penetrated.

F. Install drains at low points of the surface areas to be drained. Set tops of drains flush with finished floor or deck.

G. The installer shall advise the General Contractor of required protection for drains and cleanouts during the remainder of the construction period, to prevent damage from traffic and construction work.

H. After installation, cover the tops of drains with duct tape or some other strong material during the remainder of the construction process, to avoid clogging with construction materials and debris.

END OF SECTION 22 1210

SECTION 22 1610 – PLUMBING PIPING SYSTEM INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SCOPE:

A. Plumbing piping systems to be insulated include:

1. Domestic Hot and Cold Water Piping, Above Ground

1.03 QUALITY ASSURANCE:

A. Manufacturers: Provide insulation products produced by one of the following for each type and temperature range of insulation.

1. Certainteed
2. Knauf
3. Manville
4. Owens-Corning
5. Pittsburgh Corning

B. Flame/Smoke Ratings: Provide composite piping insulation (insulation, jackets, covering, sealers, mastics and adhesives) with flame-spread rating not exceeding 25 and smoke developed rating not exceeding 50, as tested by ASTM E 84 (NFPA 255) method and UL 723.

1.04 SUBMITTALS:

A. Provide manufacturer's data, test reports, and product warranties for all items.

PART 2 - PRODUCTS

2.01 PIPE INSULATION:

A. Fiberglass Insulation: Insulation shall be preformed, two-piece, heavy density fiberglass with self sealing ASJ jacket conforming to FS HH-I-558 Form D, Type III, and Class 12. Valves and fittings shall be insulated with fiberglass insulation of the same material thickness as insulation on adjacent pipe and having a molded PVC jacket. Jackets shall be Certainteed Snap-Form, Knauf Proto PVC or Zeston PVC. Insulation thickness shall be as follows:

1. Domestic Hot & Cold Water Piping: 1 inch thick for all sizes.

PART 3 - EXECUTION

3.01 APPLICATION REQUIREMENTS:

A. General: Insulate all new above ground domestic hot and cold water piping except do not insulate supplies to fixtures unless specifically required.

3.02 INSTALLATION OF PIPING INSULATION:

A. General: Install insulation products in accordance with the manufacturer's written instructions, and in accordance with recognized industry practices to ensure that the insulation serves its intended purpose. Do not use cut pieces or scraps abutting each other.

B. Insulation shall be applied on clean dry surfaces. All insulation shall be continuous through wall and ceiling openings and sleeves. Insulation on all cold surfaces, where vapor barrier jackets are used, will be applied with continuous unbroken vapor seal. Seal off ends of insulation on cold piping systems with white vapor barrier coating at valves, flanges, supports and exposed ends. Supports that are secured to cold surfaces shall be insulated and vapor sealed to prevent condensation.

C. Pipe covering protection shields shall be provided around exterior of pipe insulation at pipe hangers which fit around pipe insulation. Shields shall be 12 inches long by 180 degrees and shall be 18 gauges galvanized steel sheet. High density isolationinserts shall be provided at pipe saddles.

D. Unions shall not be insulated.

E. Cover valves, flanges, fittings and similar items in each piping system.

F. Extreme care shall be taken to insure a neat, uniform exterior surface on insulation applied to exposed pipes. Insulation in finished areas shall be painted in accordance with the paint specifications.

3.03 PROTECTION AND REPLACEMENT:

A. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

B. Protection: The Installer of the insulation shall advise the Contractor of required protection for the insulation work during the remainder of the construction period, to avoid damage and deterioration.

END OF SECTION 22 1610

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17-031

PLUMBING SPECIFICATIONS

P1.3

SECTION 22 3110 - PLUMBING FIXTURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 QUALITY ASSURANCE:

A. Industry Standards: Comply with ANSI Standards pertaining to plumbing fixtures and systems.

B. Comply with ANSI A117.1 standard pertaining to plumbing fixtures for handicapped.

C. Comply with standards established by Plumbing and Drainage institute (PDI) pertaining to plumbing fixture supports.

D. Comply with applicable Federal Standard FS WW-P-541/Series sections pertaining to plumbing fixtures.

PART 2 - PRODUCTS

2.01 PLUMBING FIXTURES:

A. General: Provide factory-fabricated fixtures of the type, style and material indicated. For each type of fixture, unless otherwise specified, provide fixture manufacturer's standard trim, carrier seats and valves as indicated by their published product information, either as designed and constructed, or as recommended by the manufacturer, and as required for a complete installation. Where more than one type or manufacturer is indicated, selection is Installer's option.

2.02 MATERIALS:

A. General: Unless otherwise specified, comply with applicable Federal Specification WW-P-541/series sections pertaining to plumbing fixtures, fittings, trim, metals and finishes. Comply with requirements of WW-P-541/specification relative to quality of ware, glazing, enamel, composition and finish of metals, air gaps and vacuum breakers, even though some plumbing fixtures specified in this section are not described in WW-P-541.

B. Unless otherwise specified, faucets shall comply with National Sanitation Foundation International NSF Standard 61, and where applicable NSF Standard 61, Section 9. Faucets shall be NSF certified, and bear the NSF mark.

C. Provide materials which have been selected for their surface flatness and smoothness. Exposed surface which exhibit pitting, seam marks, roller marks, foundry sand holes, stains, discoloration or other surface imperfections on finished units are not acceptable.

D. Where fittings, trim and accessories are exposed or semi-exposed, provide bright chrome-plated or polished stainless steel units.

E. Vitreous China: High quality, free from fire cracks, spots, blisters, pinholes and speck; glaze exposed surfaces and test for crazing resistance in accordance with ASTM C 554.

F. Vitreous China and Enamel Iron Fixtures shall be white unless specified otherwise.

G. Comply with additional fixture requirements contained in the fixture schedule.

H. In addition to the manufacturers list below, the following manufacturers are approved for all vitreous china and cast iron plumbing fixtures Zurn One, Eljer and Sloan.

I. Flush valves shall be the size, roughing height, and flow rate specified hereinafter for each fixture. Flush valve shall be a diaphragm actuated type with chrome plated exterior, angle stop with cover, vacuum breaker, adjustable tailpiece, and cast escutcheon with setscrew. Where shown on the drawings provide a trap primer connection in the valve tailpiece. All flush valves specified to be 24" roughing shall be provided with wall brace.

J. All low voltage wiring, sensors, and transformers shall be provided under this section with the hardwired flush valves and/or faucets.

K. Toilet seats shall be same color as fixture. Seats shall be open front without cover, and solid molded plastic with self-sustaining check hinge. Seats shall be for elongated bowl unless specified otherwise.

L. Carriers shall be commercial grade and selected to match the fixtures for which they are used. Carriers shall be floor mounted and designed to transfer any fixture loading to the floor and not the wall unless specified otherwise. Carriers provided for wall hung urinals shall be two plate type. Carriers for wall hung water closets and urinals shall be provided with chrome plated mounting hardware.

M. Fixture stops shall be provided for all fixtures and shall be chrome plated with cast escutcheons with set screws. Stops for flush valves shall be by the flush valve manufacturer. Stops for shower valves shall be either angle or straight type and shall be concealed behind the shower cover plate. Stops for lavatories and sinks shall be loose key or wheel handle type as specified for each fixture.

N. Fixture drains shall be by the same manufacturer as the lavatory and sink faucets, with a matching finish. Lavatory and sink drains shall be pop-up, grid, or crumb cup type as specified for each fixture. Drains shall be chrome plated brass or stainless steel unless noted otherwise. Drain tailpieces shall be minimum 17 gauge chrome plated cast brass.

O. All p-traps, continuous wastes and fixture drain piping shall be 17 gauge chrome plated cast brass and of the size indicated in the fixture schedule on the plumbing drawings.

P. Insulation kits shall be provided for all handicap lavatories and sinks with exposed supply and waste piping. Insulation kits shall include covers for fixture drains, p-traps and supplies.

2.03 PLUMBING FIXTURE SCHEDULE:

A. Water Closet P-1A: shall be a wall mounted, wall outlet, vitreous china, siphon jet water closet with elongated bowl (designed for 1.28 gallon flush), 1-1/2" top spud, four bolt holes, chrome plate bolts, and outlet gasket. The water closet shall be fitted with a white seat and 1-1/2" (11-1/2" roughing) flush valve. Flush valve shall be a battery powered infrared operated diaphragm actuated type with manual override button and chrome plated exterior. Water closet and trim shall be:

	AMERICAN STD.	KOHLER	CRANE
	Afwall	Kingston	Eco Placidus
Water Closet:	2257.001	K-4325	3446NS
Flush Valve:	SLOAN	DELANY	ZURN
Seat:	PLUMBTECH	BEMIS	CENTOCO
Carrier:	J.R. SMITH	JOSAM	ZUREN

B. Water Closet P-1B: shall be the same as water closet P-1A except mounting height. Refer to Plumbing Fixture Schedule on the drawings for the mounting height. The flush valve shall be 11-1/2" roughing. Flush valve shall be a battery powered infrared operated diaphragm actuated type with manual override button and chrome plated exterior. Flush valve shall be:

Flush Valve:	SLOAN	DELANY	ZURN

C. Water Closet P-1C: shall be an ADA compliant floor mounted, floor outlet, vitreous china, siphon jet water closet with elongated bowl (designed for 1.28 gallon flush), flush tank, floor bolts, bolt caps, and outlet gasket. The water closet shall be fitted with a white seat, flush mechanism and a wheel handle angle supply. Water closet shall be:

	KOHLER		
Water Closet:	Cimarron K-3609		
Seat:	PLUMBTECH	BEMIS	CENTOCO
Supply:	McGUIRE	ZURN	WATTS

D. Urinal P-2A: shall be a wall hung, vitreous china, washout urinal (designed for 0.125 gallon flush), 2" outlet, 3/4" top spud and wall hangers. The urinal shall be fitted with a 3/4" (11-1/2" roughing) flush valve and back plate. Flush valve shall be a battery powered infrared operated diaphragm actuated type with manual override and chrome plated exterior. Urinal shall be:

	AMERICAN STD.	KOHLER	ZURN
	Washbrook	Bardon	
Urinal:	6590.525	K-4904-ET-0	Z5798
Flush Valve:	SLOAN 8186-0.13	K-10949	Included

E. Urinal P-2B: shall be the same as urinal P-2A except for mounting height. Refer to the Plumbing Fixture Schedule on the drawings for mounting height.

F. Lavatory P-3A: shall be a wall hung, 20" x 18" vitreous china lavatory with back splash and punched for one hole centerset. The lavatory shall be fitted with a chrome plated ADA compliant center-set faucet with battery powered infrared sensor for "touch free" operation and low flow aerator (0.5 gpm), off-set perforated grid drain, 1-1/4" p-trap, loose key angle supplies, chair carrier with concealed arm supports . Lavatory and trim shall be:

	AMERICAN STD.	KOHLER	CRANE
Lavatory:	Lucerne 0355.012	Greenwich K-2032	Harwich 14121H
Faucet:	MOEN 8553		
Drain:	McGUIRE	ZURN	WATTS
P-trap:	McGUIRE	ZURN	WATTS
Supplies:	McGUIRE	ZURN	WATTS
Insulation Kit:	McGUIRE	TRUEBRO	SKAL-GUARD
Carrier:	J.R. SMITH	JOSAM	ZURN

G. Lavatory P-3B: shall be a nominal 19" x 16" enameled cast iron undermount lavatory bowl with overflow. The lavatory shall be fitted with a chrome plated ADA compliant center-set faucet with battery powered infrared sensor for "touch free" operation and low flow aerator (0.5 gpm), off-set perforated grid drain, 1-1/4" p-trap, loose key angle supplies and insulation kit. Lavatory and trim shall be:

	KOHLER		
Lavatory:	K-5400-0		
Faucet:	MOEN 8553		
Drain:	McGUIRE	ZURN	WATTS
P-trap:	McGUIRE	ZURN	WATTS
Supplies:	McGUIRE	ZURN	WATTS
Insulation Kit:	McGUIRE	TRUEBRO	SKAL-GUARD

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Install plumbing fixtures of types indicated where shown and at indicated heights or where not shown in accordance with manufacturer's written instruction, roughing-in drawings and with recognized industry practices.

B. Fasten plumbing fixtures securely to indicated supports or building structure, and ensure that fixtures are level and plumb and tight against mounting surface.

C. Seal the outer perimeter of wall mounted lavatories and urinals and water closets to the wall and floor mounted water closets to the floor with a smooth bead of white silicone compound.

D. All fixtures provided under another division of the specifications shall be roughed-in and connected under this section. Provide individual shut-off valves or supply stops to all fixtures with a water or gas supply. Provide p-traps and extensions to waste stack in wall or to drain, as shown on the drawings, if not provided by the fixture supplier. Supply stops and p-traps shall be McGUIRE, EBC, or BRASS-CRAFT.

E. Provide and install undercounter mixing valves for all sinks and lavatories.

3.02 FIELD QUALITY CONTROL:

A. Upon completion of installation of plumbing fixtures and after units are water pressurized, test and adjust fixtures for proper operation.

END OF SECTION 22 3110

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17-031

PLUMBING SPECIFICATIONS

P1.4

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