

SPECIFICATIONS FOR RECREATION CENTERS FACILITIES

DPR Capital Projects

THIS DOCUMENT OUTLINES MINIMUM DESIGN STANDARDS THAT SHOULD BE TAKEN INTO CONSIDERATION WHILE DESIGNING ANY RECREATION CENTER FACILITY.

Department of Parks and
Recreation - Capital Planning
& Design

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Introduction

Definition of Recreation Centers specifications

Recreation centers facilities provide a range of activities and services that encourage community cohesion, improve public health, foster civic bonds and quality of life. They are considered by the department of parks and recreation as a highly important community resource.

Regarding the facility's anticipated uses, the present document outlines minimum design standards that should be taken into consideration while designing any recreation center facility. It addresses the individual spaces required in the building and the desired characteristics of each space in general terms .

Principal aims and objectives of this document

The review of Recreation centers facilities has been undertaken to guide future planning across DC. Provision of RC facilities has been considered in terms of quality, quantity and accessibility.

The main objectives are:

1. Set up a pre-design definition of a recreation center facility for the 4 types;
2. List the space requirements in the facility;
3. Explain the Functional relationships;
4. Define the building system requirements;
5. Address the desired characteristics of each space including furniture and equipment with their description.

A successful RC Specifications process

Planning and development of all recreation centers facilities is a collaborative process involving the neighborhood citizens, the community leaders and all relevant departments like the local police and fire chiefs who should be asked for input on safety for example . Community consultation with residents in the identification of the RC program is an important principle in the development of the DPR facilities. Meetings have to be held at least 3 times : predesign phase, final design phase and the kick off meeting with the BD firm to start the construction.

DPR conduct the needs assessment each 5 years for determining and addressing needs, or "gaps" between current conditions and desired conditions or "wants" of DC population. It also provides an indication of public opinion and some meaningful statistics. **Add statistics or any relevant data from surveys.**

Recreation centers specifications Content

The following categories are the contents of each indoor and outdoor spaces:

1. Purpose;
2. Users;
3. Activities;
4. Space requirements;

5. Spatial relationships;
6. Finishes;
7. Doors & windows;
8. Building system requirements:
 - a. Mechanical;
 - b. Plumbing;
 - c. Electrical & lightning;
 - d. Technology.
9. Furniture & equipment;
10. Special considerations.

OVERVIEW

DPR vision

To be America’s Gold Standard for Parks and Recreation agencies and to be THE place in the District of Columbia *where the fun happens*.

DPR Mission

To provide equal and open access to Gold Standard recreational programs, services, and facilities – across all 8 Wards.

Recreation Centers facilities

Recreation centers are everywhere in the city. DPR provides essential recreation services to residents, workers, and visitors. The District owns and manages 73 recreation centers throughout the District’s neighborhoods, which gives it one of the highest number of recreation centers per capita nationwide.

Recreation Center facilities include all indoor community halls and areas, regardless of size, and indoor youth and senior centers. Many of the facilities are multi-functional, providing local space for early childhood education; computer labs; classrooms; gymnasiums; fitness rooms and others. Some of the larger facilities also offer sport, recreation opportunities and aquatics facilities.

Classification

DPR plans for the provision of recreation centers facilities according to a classification corresponding to the residential development units outlined in the DC.Census. The hierarchy is based on the neighborhood as the central core and radiates to larger units and special uses. The RC classification consists of **Neighborhood Center-NC, Urban Center-UC, Community Center-CC and District Center-DC**.

Neighborhood Center-NC	7,500 – 15,000 SF	1 Mile from every resident
Purpose	NC is small-scale, focusing on.....	
Function		
Size	Min: Max:	
Capacity		

Urban Center	15,000 – 30,000	1.5 Miles from every resident
Purpose		
Function		
Size	Min:	
	Max:	
Capacity		
Community Center-CC	30,000 – 50,000	2 Mile from every resident
Purpose		
Function		
Size	Min:	
	Max:	
Capacity		
District Center-DC	60,000 – 90,000	3 Mile from every resident
Purpose		
Function		
Size	Min:	
	Max:	
Capacity		

GENERAL SPECIFICATIONS

Principles/laws/guidelines!?

It is important to point out that LEED Certification is a desired outcome. The building design and construction of all DPR facilities are green buildings under LEED v4. and most of the following specifications are including USGBC requirements.

Site selection

Location

DPR develops its projects on appropriate sites in areas with existing infrastructure, avoiding all sensitive lands. DPR's work aims to reduce the environmental impact of new projects.

It is desirable that the site's location is within the boundary of a development certified under LEED for Neighborhood Development (Stage 2 or Stage 3 under the Pilot or 2009 rating systems, Certified Plan or Certified Project under the LEED v4 rating system).

All DPR's projects promote walkability and target 1 Mile of home for every resident which reduces motor vehicle use, thereby reducing greenhouse gas emissions, air pollution, and other environmental and public health harms associated with motor vehicle use. The projects are also located on a site whose surrounding existing density within a ¼-mile radius of the project boundary.

Play fields should not be placed in low lying areas prone to retaining water.

DPR assesses site conditions before design to evaluate sustainable options and inform related decisions about site design.

Size

The site's size must meet the minimum state requirements for size for all the different facilities : **Neighborhood Center-NC, Urban Center-UC, Community Center-CC and District Center-DC.**

External appearance

The recreation center (RC) boundaries are to be configured in such a way as to optimize visual access into the site and to the building.

Structures

Structures should be designed to resist vandalism.

Public Safety and Security

RC users' safety is an important component of recreation centers design and must be considered early in the design process.

Prior to construction, RC designs should be reviewed by the appropriate division to ensure pedestrian linkages are consistent with the neighborhood existing pedestrian infrastructure.

Accessibility

Accessibility for people with disabilities is a priority for the DPR, and all the facilities should strive for an overall environment which is accessible and provides a fulfilling recreational experience for all people.

To ensure comprehensive accessibility, the design and construction of RC amenities should comply with current design standards for accessibility.

Parking is a requirement in the design of RCs and is incorporated based on the program function but in the meanwhile it mustn't exceed the minimum local code requirements for parking capacity.

If the intent is to use on-street parking for users of the RC, it is desirable to provide a sidewalk adjacent to the curb to connect to RC accesses.

DPR installs electrical vehicle supply equipment (EVSE) in 2% of all parking spaces used by the project and clearly identifies and reserves these spaces for the sole use by plug-in electric vehicles.

Environmental Conditions

RC design should recognize and, where possible, take advantage of natural site features including sloping land, existing vegetation, riverbank areas, and water bodies identified in a early stage of the site selection.

Protect key natural and cultural resources that are valuable to the community (Complete from the LEED certification rating system).

Community Use

The recreation centers facilities provide a wide range of services. (**List all the services provided by RC**)

SPECIFIC SPECIFICATIONS

Indoor spaces

Entrance, Lobby and Reception

- All entrance doors should have push button automatic door openers for maximum ADA accessibility.
- Entrance doors to the facility should be double-doors with a removable central post (mullion) for ease of bringing large items in and out of the facility.
- Main entrance door should include a “People Counter” system. BOD – SenSource ClearCount 3DX with AI.
- Reception desk must be ADA accessible and able to accommodate at least two employees as well as infrastructure to support a third computer station for security camera monitoring.
- Lobby should be welcoming include:
 - DPR Signage
 - Wall-mounted 72” televisions
- Reception Desk should include:
 - One desktop computer (per staff member stationed at reception desk)
 - One desktop computer for security camera.
 - Sufficient electrical and data outlets needed to operate the computers, phones, and another other systems housed at reception desk.
 - Telephone (one per employee stationed at reception desk).
 - Task Chairs (KI Furniture, Altus Mesh – ALTMFA – Plastic Base, Hard Floor Casters, Color – Grey Mesh)
 - Actual desk should provide access to accommodate a visitor that might arrive in a wheelchair.
 - www.amazon.com/Desk-Grommet-Plastic-Cable-Cover/dp/B076HJH2WQ

Entrance Floor Grilles

General

1. Work Included
 - a. Provide recessed entrance grilles and frames.
2. Job Conditions
 - a. Coordination: Coordinate concrete slab placement with installation of recessed frame. Field verify location, shape and size of mat.
3. Delivery, Storage, and Handling
 - a. Delivery: Deliver materials in Manufacturer’s original, unopened, undamaged packaging.
 - b. Storage: Store materials at temperature and in humidity conditions recommended by manufacturer and protect from exposure to harmful weather conditions.

Products

1. Manufacturers
 - a. Basis of Design: Drawings and specifications are based on Advanced Track Foot Grille by MATS INC.

- b. Other Manufacturers: Subject to compliance with requirements, products by the
 - c. following are acceptable:
 - i. ARDEN ARCHITECTURAL SPECIALTIES, INC.
 - ii. BALCO, INC.
 - iii. C/S GROUP.
 - iv. J. L. INDUSTRIES, INC.
 - v. KADEE INDUSTRIES, INC.
 - vi. PAWLING CORPORATION; ARCHITECTURAL PRODUCTS DIVISION.
 - vii. REESE ENTERPRISES, INC.
 - d. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1
2. Grill and Frame Description
- a. Grill
 - i. Construction: Bolt-thru design with individual aluminum spacers. Swedge, welded and key lock fastening of rails is not allowed.
 - ii. Material: Aluminum Alloy type 6061-T6.
 - iii. Drying Inserts: Nylon.
 - iv. Dimension: Grille depth to be 1-1/2" , with frame 1-5/8"
 - v. Grille Sizes and Layouts: As indicated.
 - b. Frame: Provide manufacturer's standard frames of size and style for grille type, for permanent recessed installation in subfloor, complete with installation anchorages and accessories. Unless otherwise indicated, fabricate frame of same material and finish as grilles.
 - c. Drain Pan: Provide manufacturer's standard, 0.060-inch- thick, stainless-steel sheet drain pan with NPS 2 drain outlet for each floor-grille unit. Coat bottom of pan with protective coating recommended by manufacturer. ASTM A 666, Type 304.
3. Fabrication
- a. Shop fabricated floor grilles to greatest extent possible in sizes as indicated. Unless otherwise indicated, provide each grille as a single unit; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in grilles are necessary, space symmetrically and away from normal traffic lanes.
 - b. Fabricate frame members in single lengths or, where frame dimensions exceed maximum available lengths, provide minimum number of pieces possible, with hairline joints equally spaced and pieces spliced together.
4. Finishes
- a. Aluminum: Mill finish.
 - b. Stainless Steel: Mill finish.

Execution

1. Examination
 - a. Examine substrates and floor conditions for compliance with requirements for location, size, minimum recess depth, and other conditions affecting installation of floor grilles and frames.
 - b. Examine roughing-in for drainage piping systems to verify actual locations of piping connections before floor grille and frame and drain pan installation.
 - c. Proceed with installation only after unsatisfactory conditions have been corrected.
2. Installation
 - a. Install recessed floor grilles and frames and drain pans to comply with manufacturer's written instructions at locations indicated and with top of floor grilles and frames in relationship to one another and to adjoining finished flooring as recommended by manufacturer. Coordinate top of floor-grille surfaces with doors that swing across grilles to provide clearance under door.
3. Protection
 - a. After completing frame installations, provide temporary filler of plywood or fiberboard in floor-grille recesses and cover frames with plywood protective flooring. Maintain protection until directed by Architect to remove.

Staff Office

- Should house AED machine (LIFEPAK Series 1000 Defibrillator System; Both Infant and Adult Both baby and adult pads are required and a wall cabinet for storage)
- Rectangular Workstations (KI Furniture, 700 Desking System, Base Color – North Sea, Top Color – Kensington Maple)
- Task Chairs (KI Furniture, Altus Mesh – ALTMFA – Plastic Base, Hard Floor Casters, Color – Grey Mesh)
- Couch (KI Furniture, Size TBD, Flex Multiple FO33)
- Filing Cabinets
- PA System

Locker Rooms

- SF determined by code requirements
- Slip-Resistant Epoxy flooring with EBC base
- ACT ceiling
- Tile on walls: running bond throughout
- Sanitary disposal bin; Bobrick (B-277 Surface Mounted)

- Toilet paper dispenser; Bobrick (B-2892)
- Grab bar – transfer shower; Bradley Corp (812 series – safe grip)
- Grab bar – toilet; Bradley Corp (812 series – safe grip)
- Baby changing seat; Koala Care (KB110-SSWM)
- Hand dryer; Bradley Corp (2902-2874 SS)
- Mirrors as recommended
- ADA shower seat; Bradley Corp (Reversible shower seat 9569)
- Changing bench with back ADA; Hollman Inc. (Butcher Block Bench 20”W x 48”L x 18”H w/ stainless steel “T” legs and back supports)
- Changing bench ADA; Hollman Inc. (Butcher Block Bench 20”W x 48”L x 18”H w/ stainless steel “T” legs)
- Standard toilet partition; Bradley Corp (Charcoal Gray S215)
- ADA stall partition; Bradley Corp (Charcoal Gray S215)
- Urinal partition; Bradley Corp (Charcoal Gray S215)
- Lockers – qty TBD by Bradley Corp (Lenox – Deep Blue 12”W x 18”D x 72”H)
- High low water fountain
- Soap dispenser; Bradley Corp (Model 6326, 6326-68 SS Satin Finish). **No soap dispensers should be mounted onto the mirrors.**
- Shower curtain rod; Bradley Corp (9539 – SS Satin Finish)
- Counter sink system
- ADA compliant bench (20”W x 48”L x 18”H; Body – Stainless Steel; Color – Maple)
- **No feminine hygiene dispensers** should be installed in the women’s locker rooms or restrooms.

Phenolic Lockers

General

1. Provide phenolic lockers in arrangements, layouts and quantities indicated. Section also includes:
 - a. Pedestal benches.
2. Provide five (5) percent of lockers as ADA compliant. Coordinate location with Architect. Location to be coordinated with locker design, locking and placement of shelves.

Quality Assurance

1. Provide lockers as complete units, including necessary mounting accessories, fittings and fastenings. Each locker type should be produced by one manufacturer.

Delivery, Storage, and Handling

1. Do not deliver lockers until buildings are permanently enclosed and ready for locker installation.
2. Deliver materials in manufacturer’s original packaging to protect from damage.
3. Store materials in manufacturer’s original packaging in accordance with manufacturer’s instructions. Store Lockers indoors, protected from the elements and construction hazards.
4. Handle materials in a manner that will protect the finished product.

Warranty

1. Provide manufacturer's warranty on lockers and accessories for the following:
 - a. Phenolic components: 20 years.
 - b. Hinges and latching devices: 5 years.

Products

1. Manufacturers
 - a. COLUMBIA LOCKERS (Basis of Design), ACCUTECH, PROSPEC, SUMMIT, ASI and CLUBLINE.
2. Materials
 - a. Material: Solid phenolic with a high pressure melamine matte finish surface made as an integral part of the core material. Laminated surfaces are not acceptable. Surface and edges to be non-porous. Provide material which has been selected for uniform color, surface flatness and smoothness. Exposed surfaces which exhibit discolorations, pitting, seam marks, roller marks, stains, telegraphing of core material, or other imperfections on finished units are not acceptable. Defects such as chipping along edges and corners are unacceptable.
3. Properties
 - a. Graffiti Resistance Requirements: When tested in accordance with ASTM D6578, Locker materials shall prove resistant to all chemicals tested for a period of 1 to 10 minutes and shall leave no mar or blemish on the surface when cleaned. Locker materials shall have guaranteed surface clean ability from permanent markers and shall have Non-Ghosting properties.
 - b. Scratch Resistance Requirements: When tested in accordance with ASTM D2197, Locker materials shall prove to be scratch resistant when the maximum Load Value exceeds 10 kilograms.
 - c. Impact Resistance Requirements: When tested in accordance with ASTM D2794, Locker materials shall withstand an Impact Force Value in excess of 45 inch-lbs.
 - d. Screw Holding Strength: When tested in accordance with ASTM D1037, Direct Screw Withdrawal Test, Locker materials shall withstand a direct pull force that exceeds 2,500 lbs per fastener.
 - e. Tensile Strength: Locker materials shall have a Modulus of Elasticity of 1.55 Million PSI.
 - f. Shear Strength: Locker materials shall have a Shear Strength of 2,000 PSI minimum.
 - g. Compression Strength: Locker materials shall have a Compression Strength of 24,000 PSI minimum.
 - h. Water Absorption Requirements: When tested in accordance with ASTM D570 Locker materials shall have a Water Absorption Rate of less than 0.37%.
4. Flame Spread: When tested in accordance with ASTM E84, materials shall meet all requirements for Class B Flame Spread Rating and Smoke Developed and shall carry a Class B Fire Rating Certification in accordance with the requirements of NFPA and ICC.
 - a. Flame Spread shall not exceed 75.
 - b. Smoke Developed shall not exceed 450.

5. Material Thicknesses:
 - a. Doors, Slope Tops, End Panels, and Toe Kick Plates - Minimum .50" Finished Thickness.
 - b. Tops, Bottoms, and Shelves - Minimum .375" Finished Thickness.
 - c. Sides and Locker Backs - Minimum .3125" Finished Thickness.
 - d. Locker Bench Tops - Minimum .75" Finished Thickness.
6. Locker Doors: Full width of the locker box; frameless, allowing access to the entire width of the locker. Framed Doors are unacceptable. Attach doors to hinge with stainless steel theft proof Torx head fasteners.
7. Locker Body: Box construction incorporating mortise and tenon construction; mechanically fastened together with Stainless Steel fasteners. Mortise locker shelves into side walls. Attach hinges with stainless steel theft proof Torx head fasteners.
8. Slope Tops, End Panels, and Toe Kick Plates: Same color, thickness and material as the Locker Doors.
9. Finish/Colors - All exposed exterior surfaces: As selected by Architect in coordination with DPR.

Hardware

1. Hinges: Continuous Heavy Duty Extruded 6063-T5 Aluminum. Pivot Pin shall be made of Type 304 Stainless Steel. Hinge knuckles shall be separated with two nylon washers. Hinge shall be powder coated to match Locker Door.
2. Latching Device: Positive automatic type locking device of pre-locking type.
 - a. Locking - Padlock: Manufacturer's standard recessed handle type containing hole for padlock attachment.
 - b. ADA Compliant Lockers: Lever handle with opening function occurring with 30o or less rotation. Handle shall return to the locked position when released; turning lever will cause door to pop open and remain ajar. Locate approximately 34" above the floor.
3. Coat Hooks: Coat Hooks shall be fabricated of 11 Gauge Type 304 Stainless Steel with a Satin Finish. All edges shall be polished and smooth. Coat Hooks shall be attached to the Locker Body with Stainless Steel Theft Proof Torx Head fasteners or Through Bolts. Provide three (3) Coat Hooks for Single Tier Lockers and three (3) for Double Tier and "Z" Lockers.
4. Number Plates: Provide a Number Plate for each Door or opening, in the sequence as indicated on the drawings.
5. Slope Top Mounting Channels and Supports: Slope Top Mounting Channels and Supports shall be made of Heavy Duty Extruded 6063-T5 Aluminum and shall have a Satin Anodized finish. Mounting Channels shall be field installed and shall attach to the front top edge of the Locker Body and shall be continuous across the front of the Lockers. Supports shall be universal and shall attach to any standard depth or width Locker via factory pre-drilled holes.

Fabrication

1. General: Provide factory pre-assembled Locker units. Lockers shall be complete with all hardware and accessories listed above. Knock down units are unacceptable. Lockers shall arrive at construction site fully assembled.

2. Slope Tops and End Panels: Provide Slope Tops and End Panels as required to complete the installation of the Lockers.
3. Sizes and arrangements as indicated on the architectural drawings.
4. Construction: Fabricate lockers square, rigid, with tight fitting joints.

Execution

1. Installation
 - a. Install lockers in accordance with manufacturer's instructions. Install units plumb, rigid and level, located as indicated on architectural drawings.
 - b. Adjust doors and locks to operate easily without binding. Verify satisfactory operation of integral locking devices.

Multipurpose Room

- Folding Tables (KI Furniture, Piroette Table, 30" x 60", Collaborative Rectangular Legs w/ Casters, Body Color – Black, Top Color – Kensington Maple)
- Stackable Chairs (KI Furniture, Apply Stack Chair ALNAP, Body Color – Black, Upholstery Color – Kensington Maple)
- Vinyl tile flooring
- White Boards: US Maker Board Model No. PSM152A
- Should include Window Shades
 - Spring-Assist Manual Shade System by Draper
 - Fabric: Greenscreen Evolve
 - Color: Natural
 - Openness Factor: 1%
 - Average Fabric Thickness: 0.027"
 - Average Fabric Weight: 8.41 ounces per square yard

Kitchen (Demonstration)

- Typically larger than warming kitchen
- CT flooring
- Cabinets
- Stainless steel countertops
- Three compartment stainless steel sink (should be ADA accessible)
- Icemaker
- Induction Cooktop; General Electric Model No. PHP9036DJBB
- Microwave; General Electric Model No. PEB9159SF-SS
- Double Oven; General Electric Profile Series PK7500SF-SS
- Double Wall Oven; General Electric Model No. GE Café Series COMB30" CT9800SHSS
- Refrigerator; Maxx Cold Model MCR-23FD Stainless
- Freezer; Continental Model No. 1FE-SS
- Dishwasher; General Electric Model No. GLDT696DSS
- Prep Table; Michigan Maple Block Model F-Style Open Base – Custom Size 49"x28"x34"
- High Stool with Back; KI Furniture 800 Series: 24" Height, Regular w/ Back Frame: Black. Seat: Fabric. E Vinyl Reflection

- White Boards: US Maker Board Model No. PSM152A

Kitchen (Warming)

- Typically 250-300 SF or less
- CT flooring
- Cabinets
- Countertops
- Sink should be ADA accessible
- Induction Cooktop; General Electric Model No. PHP9036DJBB
- Microwave; General Electric Model No. PEB9159SF-SS
- Double Oven; General Electric Profile Series PK7500SF-SS
- Double Wall Oven; General Electric Model No. GE Café Series COMB30" CT9800SHSS
- Refrigerator; Maxx Cold Model MCR-23FD Stainless
- Freezer; Continental Model No. 1FE-SS
- Dishwasher; General Electric Model No. GLDT696DSS
- White Boards: US Maker Board Model No. PSM152A

Computer lab

- Furniture (TBD)
- Harddrive
 - OptiPlex 7040SFF
 - Intel® Core™ i7-6700 Processor (Quad Core, 8MB, 8T, 3.4GHz, 65W)
 - 8GB (2x4G) 2133MHz DDR4 Memory
 - 3.5 inch 500GB 7200rpm Hard Disk Drive
- Monitor
 - Dell 24 Monitor E2417H
 - Manufacturer Part JGD2D
 - Dell Part 210-AIWG
- Adapter
 - Dell Adapter – DisplayPort to DVI Single-Link
 - Manufacturer part 8K5HD
 - Dell part 470-AANH
- White Board: US Maker Board Model No. PSM152A
- Printers/Copiers are not part of Capital FF&E package.

Boxing room

- Typically 1,800 – 2,000 SF
- 20' x 20' Title Competition Boxing Ring
- STRK 80 – Title Titanic Flex-Strike Heavy Bags (80 lbs), Color Black
- STRK 110 – Title Titanic Flex-Strike Heavy Bags (110 lbs), Color Black
- RESSB M RD – Reyes Speed Bag Medium, Size 7 x 10, Color Red
- RESSB M RD – Reyes Speed Bag Medium, Size 6 x 9, Color Red
- Lockers
- Seating
- Drinking Fountain (Halsey Taylor Bi-Level HAC Cooler with Hydroboost Bottle Filler, Model HTHB-HAC8BLWF & HTHB-HACDBLWF)
- Sound System

- Ceiling Fans; “AirVolution” Model 370, size & qty TBD based on room size

Fitness room

- Size dependent on facility
- High impact rubber flooring; 8mm interlocking tiles (Metron Series Blue MF 21)
- Wall mirrors
- Water Fountain (Halsey Taylor Bi-Level HAC Cooler with Hydroboost Bottle Filler, Model HTHB-HAC8BLWF & HTHB-HACDBLWF)
- Day lockers
- Wall-Mounted Purell® 9019-01 White Sanitizing Wipes Wall Dispenser
- Ceiling Fans; “AirVolution” Model 370, size & qty TBD (based on ceiling height and room size)
- Wall-mounted 72” televisions (quantities TBD by spatial constraints)
- 50 SF storage room
- Cybex fitness equipment (quantities TBD by spatial constraints)
- Cybex 770T Treadmill
- Cybex 770AT Total Body Arc Trainer
- Cybex 625 C Upright Cycle
- Cybex 625R Recumbent Cycle
- Cybex Free Weights 50lb, 100lb
- Cybex Adjustable Dumbbell Bench
- Cybex Leg Press
- Cybex Twin Tier Dumbbell Rack w/ Backstop
- Cybex Bravo w/ Progress Stabilization
- Cybex VR1 Dual Multi-Press
- Cybex VR1 Dual Leg Extension/Curl

Fitness Room Flooring

Quality Assurance

1. Installer Qualifications:
 - a. Firm experienced in the flooring field and approved by the flooring manufacturer.
 - b. Must have completed a minimum of three projects of similar magnitude and complexity.

Attic Stock

1. Furnish 2% of the total quantity (but not less than 2 full sealed cartons) of each type, pattern and color. Provide 5% of colors with less than 5000 square feet. Properly package and identify each material.

Job Conditions

1. Proper Surfaces:

- a. Even, sound, thoroughly clean and dry and free of all defects that might adversely affect the flooring work.
 - b. All floors to receive resilient flooring shall be wet cured only. No curing compound permitted.
2. Related Work
 - a. Work which passes through, beneath or behind flooring must be completed prior to starting any flooring work.
3. Temperature Requirements
 - a. Temporary Heat: Provide as required to maintain the minimum temperature during flooring installation and for at least one week after installation.
 - b. Minimum Temperature: 70 degrees F for a minimum two weeks prior to and during application.
 - c. Humidity: Do not apply flooring when relative humidity exceeds 70% or to damp or wet surfaces.
4. Ventilation
 - a. Provide adequate ventilation to prevent accumulation of hazardous fumes during application of solvent-based products in enclosed spaces, and maintain until flooring and finish has cured.

Products – Rubber Flooring Tiles

1. Material: Dual durometer layers composed of 100% synthetic and natural rubber, high quality additives, and colorants to meet the performance requirements of ASTM F1344, Class 1-A and 1-B Standard, Specification for Rubber Floor Tile.
2. Tiles:
 - a. Edge type: Interlocking
 - b. Size: 1 meter x 1 meter
 - c. Thickness: 8mm
 - d. Colors: As directed by DPR
3. Manufacturer
 - a. Basis of Design
 - i. RF-1: RPM SPORTS FLOORING Metro Fleck.
 - ii. RF-2: RPM SPORTS FLOORING Metro
 - b. Other Manufacturers: Subject to requirements, products manufactured by other rubber sports flooring manufacturers are acceptable. Products should be submitted to the Architect during bidding for inclusion by an Addendum. No substitutions permitted after bids are received.
4. Accessories
 - a. Concrete Slab Prime: Non-staining type, compatible with adhesive, as recommended by flooring manufacturer.

- i. Moisture Emissions Sealer: Type specifically formulated for moisture emission control; CHEMREX CX Concrete Floor Primer, SINAK Sealer P-105 or Concrete Moisture Emission Sealer by DRITAC (BASIC ADHESIVES INC.).
- b. Leveling Compound: Non-staining latex modified, Portland cement based type, compatible with flooring, as provided or recommended by the flooring manufacturer.
- c. Adhesives: Waterproof, stabilized type as recommended by the resilient flooring and base manufacturer to suit material and substrate conditions.
 - i. Low-VOC, FS MMM-A-125C, Type II, water- and mold-resistant. Use ASTM D3110, dry-use type for laminated and finger-jointed members, certified in accordance with ASTM C557 and complying with required VOC regulations.
 - ii. VOC Content: The volatile organic compound (VOC) content of adhesives shall not exceed the limits defined in Rule #1168 “Adhesive and Sealant Applications” of the South Coast Air Quality Management District (SCAQMD), of the State of California. All VOC limits are defined in grams per liter, less water and less exempt compounds (determined by U.S. EPA Reference Test Method 24). The VOC limits are as follows:
 - 1. Water-based contact cement: 250 g/L
 - 2. Water-based construction adhesive: 100 g/L

Execution

1. Inspection
 - a. Examine substrates and installation condition. Do not proceed with flooring work until unsatisfactory conditions have been corrected.
 - b. Subfloor surfaces shall be smooth, level, at installed at the required finish elevation.
 - c. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.
2. Substrate Preparation
 - a. Prepare substrates according to floor manufacturer's written instructions to ensure adhesion of flooring products.
 - b. Concrete Substrates:
 - i. Verify that substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
 - ii. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
 - iii. Perform moisture and pH tests recommended by flooring manufacturer. Proceed with installation only after satisfying manufacturer’s recommendations for test results.
3. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

4. When required, lightly grind concrete subfloors with a terrazzo grinder to remove trowel marks, slab curl at saw cut joints or other surface irregularities or high spots which will telegraph to the flooring surface.
5. Do not install flooring until it is the same temperature as the space where it is to be installed.
6. Broom or vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

Installation

1. Install flooring in accordance with manufacturer's instructions and recommendations.

Cleaning and Protection

1. Protect resilient flooring from damage and wear during construction operations. Where temporary cover is required for this purpose, comply with manufacturer' recommendations for protective materials and the method of their application. Remove temporary covering just prior to cleaning for final inspection.
2. Clean flooring just prior to final inspections.

Signage (Interior)

Work Included

1. Work includes:
 - a. Room numbers.
 - b. Room identification.
 - c. Restrooms
 - d. Stairwell identification.
 - e. Emergency escape directories.
 - f. Tactile (ADA) exit signs
 - g. Other signs indicated.
2. All signs which identify permanent facilities/accommodations shall be tactile and braille and limited minimally to room numbers, restrooms, stairways, and room names as deemed appropriate by DPR.

Quality Assurance

1. Signage Standards: Conform to the Americans with Disabilities Act (ADA) Standards where applicable and to the extent as indicated.
2. Acceptable Manufacturers: All units are to be custom fabricated; manufacturer's products meeting the specifications will be acceptable. Manufacturers must be regularly engaged in fabrication and installation of signage units and related identifying devices.

- a. Fabricator shall make at least one visit to the site before production begins to review all sign locations and installation conditions with Architect and DPR representative.
 - b. Fabricator must review all dimensional changes with Architect.
3. Approvals: All identifying devices shall be approved at the fabricator's shop by the Architect prior to shipment and installation.
4. Spelling and Braille Accuracy: Responsibility of sign manufacturer.
5. DPR has the right to renumber the room numbers during construction. Manufacturer must not begin fabrication of room number plates until room numbers have been approved by the DPR, in writing, through the Architect.
6. Room identifications will be provided to the Contractor by the Owner during construction.

Products

1. Materials:
 - a. Plates: High pressure phenolic "ES" plastic; scratch resistant, non-static, thermoset, rated self-extinguishing.
 - i. Colors: As selected by Architect in coordination with DPR.
 - ii. Thickness: 3/32" for ADA plates; 1/16" for non-raised copy (flat) plates.
 - b. Changeable Copy: Provide 3/32" thick plastic back-up plate laminated to back of face plate to create slot for removable nameplates.
 - c. Provide an integral method to create tactile and Braille signs; producing a unitary component. Glued on or laminated letters or Braille cells are not acceptable.
2. Design Guidelines
 - a. Plate Shape: Square cornered; do not bevel edges.
 - b. Letter Style
 - i. ADA Signs: Helvetica medium, all capital letters.
 - ii. All Other Signs: Helvetica medium, mixed upper and lower case.
 - c. Tactile Letters and Braille: Grade II braille; raised 1/32" above background surface. Provide Braille dome topped same color as background. Sign manufacturer shall be responsible for verifying accuracy of spelling, both tactile and Braille.
 - d. Letter Sizes: As indicated in drawing set.
3. Methods of Manufacturing
 - a. Tactile Signs: Relief engraved plates.
 - b. Non-Tactile Signs: Routed engraved.

Execution

1. Installation:
 - a. Mount signs plumb and level.
 - b. Mount all identification devices with 3/4" foam tape on all four edges.

- c. Signs Mounted on Glass: Provide opaque sheet matching sign material and finish onto opposite side of glass to conceal back of sign.
2. Clean Up:
 - a. After completion of work remove all debris and tools from the premises, clean all adhesive spatter and run-over from finished surfaces and wash all plated clean of fingermarks and soil. Polish sign surfaces with a soft cotton rag.

Gymnasium

- Typically 8,000 – 9,000 SF
- 84' x 50' basketball court with at least 8' buffer between any walls or bleachers.
- Cross basketball courts (2): 59' x 42'
- Volleyball court (1): 59' x 29.5'
- Pickleball courts (2): 20' x 44'
- Six (6) rear-folding, rear-braced basketball goal systems
- Volleyball sleeves per manufacturer's recommendations
- 2" thick wall padding x 6' tall
- Scoreboard; Daktronics model BB-2125 (BOD)
- Scoring console; Daktronics All Sport 500 Series controller (BOD)
- Shot clocks on each of the main basketball court goals
- Gym striping listed in order of predominance: 1) Main Basketball 2) Main Volleyball 3) Cross Basketball. Note that all game lines should be 2" wide. Intersecting game lines shall be separated by a natural break
- Gym dividers (reinforced vinyl with fully padded batten, no exposed hardware) with electric motor system; 115-volt actuator.
 - Solid bottom height preference—10ft tall solid vinyl, with mesh above.
- Telescoping bleacher system with end enclosures to keep children from traveling under the bleacher system.
- DPR logo to be painted within center court circle (graphic/stripping layout to be provided by owner)

Basketball System

- Preferred Backboard: Gared LXP4200 Steel Frame Glass Backboard
 - Backboard Thickness: 2 1/8"
 - Material: 1/2" tempered glass with steel frame
 - Finish: Gray powdercoat on brackets and plates
- Preferred Goal: Gared Series 2000 Series Breakaway Goal
 - Finish: Official orange powder coat finish
 - Goal is supplied with anti-whip nylon net and mounting hardware.

Basketball Backstops

General

1. Work Included

- a. Provide basketball backstops, banks, reflex goals and accessories as shown on architectural drawings.
- b. Mounting accessories.

Products

1. Manufacturers

- a. Acceptable Manufacturers: For the purpose of designating type and quality of design, basketball backstop specifications are based on the design of PORTER ATHLETIC EQUIPMENT and are for performance requirements and general design. Other manufacturers acceptable are INSTITUTIONAL PRODUCTS, INC.; AALCO, BPI (BASKETBALL PRODUCTS INTERNATIONAL) and DRAPER/E-Z FOLD.

2. Components

a. Backstop

- i. Type: Center strut, ceiling suspended, forward fold. PORTER 90949.

1. Vertical front drop frame assembly consisting of a center mast structural steel tube with side sway structural pipe braces, front brace assembly with folding knee joint, and all required miscellaneous braces and support hangers.

ii. Operation

1. Motor Operated: Minimum 1/2 horse power motor-winch using 1/4" aircraft cable, cable guides and necessary hardware. LYNRUS QR2000 Electric Winch Model 402-745 or equal.

- a. Motor: Capacitor-start, reversible, 115-volt, 60-cycle AC, single-phase electric motors with automatic overload protection.
- b. Sealed-bearing, self-locking worm-gear type winch with worm and gear completely enclosed and permanently sealed in an oil bath. Spool designed with lip on each end to cause the cable to lay uniformly and prevent "stacking".
- c. Controls: Coordinate with central control system specified herein.

- iii. Height Adjustment: 8' to 10' in 3" increments; adjustable from floor. Provide with positive locking engagement at each height interval. PORTER B503-211 Center Height Adjustment.

- iv. Bank: 42" x 72" rectangular glass bank with 1/2" Herculite tempered glass and aluminum frame. 2" wide fused border and rectangular target area. Provide with safety padding. PORTER 00208-00 and 00227-000.

b. Safety Straps

- i. Safety Straps: Provide on all units. PORTER 10797-100; LYNRUS Aut-O-Loc 402-765.
- ii. Central Controls: Wall-mounted keypad control system with protective cover to prevent damage from stray basketballs, volleyballs, etc. Provide for operating backstops, back board height adjusters, and divider curtains.
 1. Provide a separate system for each gymnasium.
 2. Coordinate with equipment listed. See Section 11485 for divider curtain.
 3. Locate keypads as directed
 4. Provide all relays, wiring and other components for complete operating systems.
 5. Provide 11 x 18” custom diagrammatic graphic with acrylic cover adjacent to control.
 6. Basis of Design Manufacturer: PORTER 02500 Powr-Touch; BPI 402-730.

Execution

1. Installation
 - a. Install in strict accordance with manufacturer's installation instructions and recommendations.
 - b. Provide all miscellaneous mounting members and fasteners as required, and of sufficient strength to bear imposed loads of the equipment. Coordinate location of miscellaneous steel and relationship with building structural framing.
 - c. Install and adjust backstops to be in correct location to the court striping and installed plumb and level.
2. Demonstration
 - a. Installer: Demonstrate to Owner’s designated personnel, procedures relative to operating, trouble shooting, servicing and maintaining the equipment.

Volleyball System

General

1. Work Included
 - a. Provide volleyball systems consisting of posts, nets, floor sockets, winches, miscellaneous items and accessories as specified herein and indicated on architectural drawings.
2. Delivery, Storage, and Handling
 - a. Deliver, store and handle items as recommended by manufacturer. Protect from damage at all times.
 - b. Maintain items in manufacturer's original shipping containers or cartons until ready to install.

- c. Coordinate delivery of floor sockets with placement of concrete floor slab.
- 3. Quality Assurance
 - a. Provide each system as a complete assembly by one manufacturer including necessary fittings, hardware and accessories.

Products

- 1. Manufacturers
 - a. A. Basis of Design: DE11 by SENOH (SPORTS IMPORTS).
 - b. Other Acceptable Manufacturers: Products manufactured by DRAPER, SPAULDING/PORTER, AALCO or SCHELDE are acceptable, providing they meet the requirements specified herein and conform to the layouts indicated on the architectural drawings.
 - c. Volleyball System
 - i. Posts: Electrically welded steel tube. 3" diameter, 3/16" wall thickness.
 - 1. Telescoping type, manual pin lock adjustment system adjusts to 11 net heights from 6'-0" to 8'-2".
 - 2. Provide two winches per post assembly for tightening top and bottom net cables.
 - 3. Provide 14-space side bracket in increments of 1" to ensure straight, taut draw on bottom net cable.
 - ii. Net: Black flexabar coated nylon with top and bottom Herculite bindings sewn to net body with four rows of stitching. Provide complete with dowels, marking tapes and top and bottom cables. SENOH Model VP2032S.
 - iii. Sockets: Solid cast bronze alloy or brass alloy with drop-in caps to fit flush with floor surface. SENOH Model KA25.
 - iv. Finish: Manufacturer's standard baked-on finish. Color as selected by Architect in coordination with DPR.

Execution

- 1. Installation
 - a. Cast floor sockets into concrete slab-on grade. Coordinate delivery and location of sockets with concrete placement and wood floor installation.
 - b. Install volleyball system in strict accordance with manufacturer's recommendations.

Gymnasium Wall Padding

Products and Materials

1. Manufacturer: Subject to compliance with the specifications, products manufactured by PORTER; AMERICAN ATHLETIC INC.; PROMATS or BISON are acceptable.
2. Description: Panels consisting of 7/16" OSB back, bonded to 2" polyurethane foam core and 14 oz. flame retardant vinyl coated nylon facing. Conform to ASTM F2440.
3. Sizes: As indicated on drawings.
4. Color: As selected by Architect in collaboration with DPR.
5. Attachment Clips: "Z" clips mounted on wall and panel for concealed attachment.

Execution

1. Installation
 - a. Install in accordance with manufacturer's instructions. Securely fix wall panels by means of Z-clips attached to wall. Engage panel mounted Z-clips into wall mounted clips.
 - i. No visible fasteners permitted.

Gymnasium Flooring

Quality Assurance

1. Manufacturer Qualifications: Firm with a minimum of 10 years' experience, specializing in the wood athletic flooring field.
2. Installer Qualifications: A firm or individual that has been approved by MFMA as an accredited Installer according to the MFMA Accreditation Program.
 - a. Installer responsibilities include installation and field finishing of wood athletic flooring components and accessories, and application of game lines and markers.
3. Maple Flooring: Comply with MFMA grading rules for species, grade, and cut.
 - a. Certification: Provide flooring that carries MFMA mark on each bundle or piece.

Submittals

1. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for wood athletic flooring.
2. Shop Drawings: For each type of floor assembly and accessory. Include plans, elevations, sections, details, and attachments to other work. Include the following:
 - a. Expansion provisions and trim details.
 - b. Layout, colors, widths, and dimensions of game lines and markers.
 - c. Locations of floor inserts for athletic equipment installed through flooring assembly.
3. Samples: Submit samples of each major component part making up this floor system.
4. Certification: Submit certificates attesting that the materials furnished will meet or exceed the specifications for grade, quality, dryness and treatment, if required.
5. Maintenance Literature: Submit 3 copies of Maple Floor Manufacturers Association (MFMA) Care and Preservation of Your Wood Floors.
6. Special Environmental Requirements:

- a. Submit product data documentation indicating urea formaldehyde free content for each composite wood product/system.
- b. Submit product documentation for adhesives and field applied finishes and game line paint, documentation indicating VOC Content
- c. Submit chain-of-custody certificates certifying that wood products specified to be made from certified wood comply with forest certification requirements. Include evidence that door manufacturer is certified for chain of custody by an FSC-accredited certification body. Include statement indicating costs for each certified wood product.

Delivery, Storage, and Handling

1. Deliver, store and handle flooring materials in their original packages, with their seals unbroken and labels intact.
2. Maintain areas where materials are to be stored at 65 degrees F. and under 50% humidity.
3. Do not deliver, store or install materials until all masonry, gypsum board, painting and tile work are completed; all overhead mechanical and electrical work is completed and all overhead mechanical work, lighting, backstops, scoreboards are installed; room temperature is between 55o F and 80o F and relative humidity is between 35 and 50%.
 - a. Do not store materials at the installation location if the moisture content of the slab vapor transmissions exceeds 4.5 pounds per 1,000 square feet.
4. Adhesives
 - a. Do not store adhesives with materials that have a high capacity to absorb VOC emissions (i.e., materials which are woven, fibrous or porous in nature, such as acoustical ceilings, carpets, textiles, etc.).
 - b. Do not store adhesives in occupied spaces.
5. Job Conditions
 - a. Moisture Content: At time of delivery, average moisture content of wood flooring to be 7 to 10 percent.
 - b. Conditioning: Do not install wood flooring until spaces are enclosed and at approximate humidity condition planned for occupancy.
 - i. Condition wood in accordance with flooring manufacturer's standards or for 5 days before start of installation by placing in spaces to receive flooring and maintaining ambient temperature between 65 and 75 degrees F before, during, and after installation, whichever standard is greater.
 - ii. Open sealed packages of wood flooring to permit natural adjustment of moisture content and allow flooring to acclimate to the room conditions.
 - c. Permanent heat, light and ventilation shall be installed and operating during and after installation. Maintain a temperature range of 55-80oF and relative humidity of 35-50%.
 - d. After floors are completed, keep area free from traffic to allow curing time for the adhesive and other type materials. If after required curing time, General Contractor requires use of this area, protect the flooring with non-fibered Kraft paper or red rosin paper, with joints taped. Maintain protection until Contract Completion.

Floor Systems

1. General: Provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship":
2. Description Type WD-1: DIN 18032 Part 2 rated Maple Floor System – Fixed resilient floor consisting in general of a vapor retarder, resilient pads, steel anchors, wood subflooring, maple flooring, sanding, sealers, finishes, game lines and wall base. Depth of system 2-1/2".
3. Subfloor: Factory assembled subfloor panels shall provide nominal 3/4" X 4" X 8' UL plywood nailers with 3/4" Rezill pads attached. Sleeper anchorage struts shall be nominal 1/2" X 4" UL grade plywood with pre-drilled anchor pockets.
4. Flooring:
 - a. 33/32" X 2-1/4", Second & Better Grade, Northern Hard Maple Flooring, TGEM, MFMA Grade marked; certified as harvested from managed forests
5. Fasteners:
 - a. Flooring Fasteners -1-3/4" barbed cleats or coated staples.
 - b. Subfloor Fasteners - 3/4" staples or equivalent.
 - c. Concrete Fasteners - 16 gauge steel channel.
6. Manufacturer:
 - a. Basis of Design: CONNOR "Alliance"
 - b. Other Manufacturers: Subject to requirements, flooring systems manufactured by ROBBINS or ACTION are acceptable.

Miscellaneous Materials

1. Vapor Barrier: Polyethylene sheet, 6-mil.
2. Adhesives: Types as recommended by the floor manufacturer for the various floor systems and substrate surfaces.
 - a. Low-VOC, FS MMM-A-125C, Type II, water- and mold-resistant. Use ASTM D3110, dry-use type for laminated and finger-jointed members, certified in accordance with ASTM C557 and complying with required VOC regulations.
 - i. VOC Content: The volatile organic compound (VOC) content of adhesives shall not exceed the limits defined in Rule #1168 "Adhesive and Sealant Applications" of the South Coast Air Quality Management District (SCAQMD), of the State of California. All VOC limits are defined in grams per liter, less water and less exempt compounds (determined by U.S. EPA Reference Test Method 24). The VOC limits are as follows:
 1. Water-based contact cement: 250 g/L
 2. Water-based construction adhesive: 100 g/L
3. Sanding Materials
 - a. Sanding Materials: Specifically manufactured for sanding finished flooring; appropriate size and abrasive quality.

4. Finishing Materials
 - a. Gymnasium sealer and finish recommended in writing by flooring manufacturer, and MFMA approved.
 - b. Per MFMA Heavy Duty and Gymnasium Finishes for Maple, Beech, and Birch Floors; approximately 30% solids for sealer and 40% solids for gym finish.
 - c. Sealer and Gym Finish: Non-darkening and slip-resistant.
 - d. Buffing Material: #100 screenback pads or equivalent steelwool pads.
5. Manufacturers:
 - a. BASIC COATINGS
 - b. BONAKEMI USA, INC.
 - c. CRAWFORD LABORATORIES
 - d. HILLYARD INC.
 - e. HUNTINGTON LABORATORIES, INC.
 - f. MINWAX COMPANY
6. Game Line Paint: As recommended by finishing materials manufacturer as compatible with their products.
 - a. VOC Content: Products shall HAVE A VOC content of not more than 150 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - b. Basket Ball Main/Full Court: Black lines.
 - c. Volley Ball Main Court: Yellow lines.
 - d. Other Markings: Colors as directed by Architect.
7. Perimeter Molding: Vented rubber cove type, 1/4" x 3" x 4", black. Provide with pre-molded corners.
 - a. At Wall Openings (doors, corridors, etc.): Provide 1/4" thick x 5" wide aluminum floor plates to span wall/floor expansion space. Mill finish.
8. Miscellaneous Fasteners: Screws, nails and staples for attaching various components.
9. Leveling Compound: Non-staining latex modified, Portland cement based type, compatible with flooring, as provided or recommended by the flooring manufacturer.
10. Blocking: Provide wood blocking at telescoping bleachers for thickness of cushioning pads.
 - a. Under stacked portion of bleachers provide full coverage blocking.
 - b. Under remaining portion of opened bleachers provide blocking under wheels.

Execution

1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of wood athletic flooring.
2. Proceed with installation only after unsatisfactory conditions have been corrected.
3. Concrete Slabs: Verify that slabs are dry according to test methods recommended by flooring manufacturer or, if none, by test method as follows:

- a. Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than two tests in each installation area and with test areas evenly spaced in installation areas.
- b. Test concrete slabs per ASTM F1869, Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- c. Proceed with installation only after substrates have maximum moisture vapor- emission rate acceptable to the floor system manufacturer.
- d. Proceed with installation only after substrates pass testing.

Preparation

1. Broom and vacuum clean substrate immediately before floor system installation. Remove coatings and substances which might interfere with attachment or successful operation of flooring system.
2. Grind high spots and fill low spots on concrete substrates to produce a maximum 1/8-inch deviation in any direction when checked with a 10-foot straight edge.
 - a. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
3. Remove coatings including curing compounds and other substances on substrates that are incompatible with installation adhesives and that contain soap, wax, oil, or silicone; use mechanical methods recommended by manufacturer. Do not use solvents.

Installation

1. Install flooring systems in accordance with wood athletic flooring manufacturer's written instructions, but not less than written recommendations of MFMA applicable to flooring type indicated.
 - a. Installation Tolerances: 1/8 inch in 10 feet of variance from level.
2. Install vapor barrier over concrete slab; cover entire area beneath wood flooring. Lap joints 6" and seal with tape.
3. Perimeter Molding: Install vented rubber cove base anchored to masonry walls as recommended by flooring system manufacturer.

Sanding and Finishing

1. Conform to requirements of MFMA's "Industry Recommendations for Sanding, Sealing, Court Lining, Finishing, and Resurfacing of Maple Gym Floors."
2. Machine sand with coarse, medium, and fine grades of sandpaper to achieve a level, smooth, uniform surface without ridges or cups. Remove sanding dust by tack or vacuum.
3. Finishing:
 - a. Apply one coat of penetrating sealer and three coats of gym finish. With coverages in accordance with manufacturer's instructions.
 - b. Screenback or steel wool and vacuum or tack between each coat after it is dry.
 - c. Floor shall present a uniform high gloss surface without misses or holidays.

4. Game Lines and Graphics:
 - a. Apply game lines and graphics accurately between the first two finish coats after buffing and vacuuming.
 - b. Layout: Layout floor for dual use of basketball and volleyball. Include the following:
 - i. Use sufficient coats of line paint to provide sharp bright lines.
 - ii. Provide lines straight with sharp edges.

Cleanup

1. On completion of the flooring work, remove unused materials and clean-up cut offs, saw and sanding dust and other debris.

Protection

1. Protect wood athletic flooring during remainder of construction period to allow finish to cure and to ensure that flooring and finish are without damage or deterioration at time of Contract Completion.
2. Do not cover flooring after finishing until finish reaches full cure and not before seven days after applying last finish coat.
3. Do not move heavy and sharp objects directly over flooring. Protect fully cured floor finishes and surfaces with plywood or hardboard panels to prevent damage from storing or moving objects over flooring.

Gymnasium Scoreboard and Console

General

1. Work Included
 - a. Provide labor, equipment and accessories necessary to install scoreboard(s) and wireless console(s) as specified herein and indicated on drawings.
2. Quality Assurance
 - a. Submit certification that scoreboard and console was tested and approved in plant prior to shipping.
3. Product Delivery, Storage, and Handling
 - a. Deliver materials in manufacturer's original, unopened and labeled packages.
 - b. Comply with manufacturer's recommendations for handling and protection during installation.

Products

1. Manufacturer
 - a. Basis of Design: LED Model 2780 by NEVCO.

- b. Other Manufacturers: Subject to requirements, scoreboards manufactured by ALL AMERICAN, DAKTRONICS or SPORTABLE SCOREBOARDS are acceptable.
2. Materials
- a. Extruded aluminum cabinet with heliarc welded corners and minimum .040” aluminum sheet face.
 - b. Finish: Acrylic polyurethane paint. Color as selected by Architect.
 - c. Electronics: Low voltage, solid state, 2-wire cable, multiplex system, quartz crystal controlled.
 - d. Provide fiber optic communication interface to reduce threat of damage from electrical storms.
 - e. LED (light emitting diode) units: Seven-bar, segmented digits with protective aluminum cover, rated typical life 100,000 hours, and designed to provide excellent visibility from all angles and sides.
3. Scoreboard Description
- a. Type: Interior, electronic basketball scoreboard with two integral horns and LED displays for time, scores, period, number for player fouling with personal fouls, team fouls, bonus and double bonus indicators and next possession arrows.
 - b. Size - Approximate: 5' high x 10' wide x 8" deep.
 - c. Captions and Electronic Team Names: 8 x 48 pixel "Home", "Guests", 8 x 16 pixel "fls", and 8 x 32 pixel "player". All Captions and Team Names are 2 LED per Pixel, 16mm pixel to pixel centers. Pixel matrices shall be available in Red or Amber. Period caption plate; 5” white lettering on black background. Captions can be altered on a per-sport basis for Volleyball, Wrestling and Basketball automatically.
 - d. LED displays
 - i. Timing: Red 13 inches high digits with lit colon.
 - ii. Team scores: Amber 13 inches high digits.
 - iii. Period: Amber 9 inches high digits.
 - iv. Player number and fouls: Red 9 inches high digits
 - v. Team fouls: Amber 9 inches high digits.
 - vi. Next possession: Amber arrow for each team.
 - vii. Bonus and double bonus in the form of a 4 inch Red LE
 - e. Power Requirements: 120 volts, 60 hertz, 3 amps.
4. Control Center
- a. Type: Wireless, microprocessor based, operator's control center with receiver unit mounted at scoreboard.
 - i. Unit shall comply with Part 15 of FCC Rules regarding interference.
 - ii. Console: High impact, break-resistant plastic.
 - iii. Features
 - 1. Power on-off switch.
 - 2. 40 key keyboards, internal beeper acknowledging each entry, and bookmark capabilities.

3. Keyboard overlays for scoreboard or accessory.
 4. Remote hand-held main time switch with integral horn button.
 5. Provide with LED displays, lithium cell battery backup to maintain scoreboard memory and time of day, self-test mode, power on-off switch, alternate time control, and multiple scoreboard operation.
 6. Timer features: Time of day display, multiple time out timers with warning, interval horn, up-count auto stop with horn, and 1/10th second display during last minute.
 7. Dimmer control for scoreboard.
 - iv. Receiver: Aluminum construction; approximately 6-1/8 x 3 x 1-3/8 inches with 4 inch antenna and mounted at scoreboard.
 - v. Maximum range: 1,000 feet from control center to receiver.
 - vi. Receiver shall require no additional source of power or separate control cable.
 - vii. Power adapters: Provide for each control center and receiver.
 1. Input: 120 volts, 0.4 amps, 50/60 Hz.
 2. Output: 9 volts, 1.67 amps, 15 watts.
 - viii. Provide option of battery supply for control operation if utility power not available.
5. Accessories
- a. Scoreboard Guards: Provide wire cage type scoreboard guards. Size and type as recommended by scoreboard manufacturer. Provide at each scoreboard.

Execution

1. Preparation
 - a. Verify exact scoreboard and control center quantities and junction box locations.
 - b. Coordinate requirements for electrical power, wall blocking, auxiliary framing and supports.
 - c. Coordinate scoreboard electrical requirements to ensure proper power source, conduit, wiring, and boxes are provided. Prior to installation, verify type and location of power supply.
2. Installation
 - a. Install scoreboards and accessories in accordance with manufacturer's instructions and approved installation drawings.
 - b. Before installation, field test scoreboards and accessories for operating functions. Ensure that scoreboards accurately perform all operations. Correct deficiencies.
 - c. Rigidly mount scoreboards and accessories level and plumb with brackets and fasteners.
 - d. Clean exposed surfaces.
 - e. Protect scoreboards and finishes from other construction operations.
3. Demonstration and Training
 - a. Provide demonstration and training session for Owner's representative covering operation and maintenance of electronic scoreboard.

Gymnasium Curtain Divider

General

1. Work Included
 - a. Provide foldup curtain divider with motorized electric hoist. Locate curtains where indicated on drawings.
2. Quality Assurance
 - a. Provide the curtain dividers as complete assemblies by one manufacturer including necessary fittings, hardware and accessories.
 - b. Installer: As approved by the curtain divider manufacturer or an authorized representative of the manufacturer.

Products

1. Curtain Divider
 - a. Curtain: Mesh curtain with 6 inch vinyl top and bottom edges.
 - i. Mesh: White, vinyl coated, polyester mesh, approximately 50% open weave.
 1. Weight: 6 ounce per square yard.
 2. Fire resistant.
 3. Tensile Strength: 100 lbs. per inch.
 - ii. Vinyl: Solid, polyester-reinforced vinyl fabric, hemmed and double stitched to house 1-1/2" (+/-) diameter steel curtain support tube.
 1. Weight: 18 ounce per square yard.
 2. Tensile Strength: 300 pounds per inch.
 3. Tear Strength: 100 pounds per inch.
 4. Fire Retardants: Self-extinguishing in less than 5 seconds.
 5. Color: As selected by Architect in collaboration with DPR.
 - iii. Raising Components
 1. Provide 1/8" - 7x19 aircraft cable, spaced uniformly across curtain width. Anchor each line through bottom tube batten and run vertically through curtain, weaving from side to side every 18" through rolled-edge brass grommets.
 2. Drive Pipe Support Assembly: At top support, cables wind on individual reels spindled to a common tube steel drive shaft running full length of curtain. Drive shaft is powered by electric operator.
 - b. Electric Operator: 120 volt, HP as required to operate curtain 20 feet per minute. Provide key operated flush wall switches.
 - i. Coordinate controls with Central Control unit as specified in architectural drawings.
 - ii. Conduit, wiring and etc. from power to operator and to remote wall switch.

- c. Supports: Provide support system consisting of threaded rods, steel shapes and clamps as required to suspend drive pipe support assembly from overhead roof steel.
- d. Size: Heights and lengths as indicated in architectural drawings.
- e. Manufacturers
 - i. AALCO MANUFACTURING COMPANY
 - ii. AMERICAN ATHLETIC INCORPORATED
 - iii. BPI
 - iv. INSTITUTIONAL PRODUCTS, INC. (IPI)
 - v. PORTER

Execution

- 1. Installation
 - a. Install the curtain divider in strict accordance with manufacturer's installation instructions and approved shop drawings.
 - i. Coordinate installation with Electrical Contractor.
 - ii. Adjust curtain divider and operator assembly to operate smoothly without binding.
 - iii. Clean curtain to original condition upon completion of work.

Gymnasium Telescoping Bleachers

General

- 1. Work Included
 - a. Wall attached telescoping bleachers including manually operated systems of multiple-tiered seating rows comprised of seats, deck components, and understructure that permits closing without dismantling into a nested configuration for storing or for moving purposes.
- 2. System Description
 - a. Bleacher Seat System: Multiple tiered seating rows comprised of seat and deck components, risers, and supportive understructure.
 - b. Operation: Operable on the telescopic principle, stacking vertically.
 - c. Secure sections with mechanical locks as well as the power system, operable upon activating the pendant control.
- 3. Quality Assurance
 - a. NFPA Standard: Comply with requirements of NFPA 102, "Standard for Assembly Seating, Tents and Membrane Structures", and specifically with Chapter 5, "Folding and Telescopic Seating", except where other requirements are indicated or imposed by authorities having jurisdiction.
 - b. Manufacturer: Company specializing in folding seating with a minimum of 10 years' experience in manufacturing gym seats.

- c. Engineer Qualifications: Professional engineer licensed in the State of Ohio and experienced in providing engineering services of the kind indicated that have resulted in the successful installation of telescoping bleachers similar in material, design, and extent to those indicated for this project.
 - d. Installer Qualifications: An experienced installer who has specialized in the installation of telescoping bleachers similar to the type required for this project and is acceptable to, or certified by the bleacher manufacturer.
 - e. Welding Processes: To be performed by certified professional welding operators in accordance with American Welding Society, (AWS), D1.1 "Structural Welding Code-Steel" and D1.3 "Structural Welding Code-Sheet Steel".
4. Submittals
- a. Shop Drawings: Shop Drawings indicating layout of telescoping bleacher units coordinated with field measurements. Include seat heights, row spacing and rise, aisle widths and locations, overall dimensions in closed and open position, connections and relationship to adjoining work, accessories, types of materials, and finishes.
 - b. Samples of material and color finish as follows:
 - i. Seats and Risers: 12" long samples finished with manufacturer's standard coating.
 - ii. Plywood: 12" square samples finished with manufacturer's standard coating.
 - iii. Painted Steel: 6" square sample of sheet steel finished with baked enamel coating.
 - c. Certification: Submit certifications that bleachers comply with design loads, include structural computations, material properties, and other information needed for structural analysis that has been signed and sealed by a professional engineer registered in the District of Columbia.
 - d. Operating/Maintenance Information: Include operation and maintenance information in maintenance manuals to be submitted at time of Contract Closeout.
 - e. Warranty: Manufacturers standard warranty documents.
5. Design Criteria
- a. Design telescopic seating to support, in addition to its own weight, and the weight of added accessories, a uniformly distributed live load of not less than 100 lbs. per sq. ft. of gross horizontal projection.
 - i. Seat boards and Footrest: Designed for a live load of not less than 120 lbs. per linear foot.
 - ii. Sway Force (applied to seats): 24 lbs. per linear ft. parallel to the seats and 10 lbs. per linear ft. perpendicular to the seats. Sway forces shall not be considered simultaneously applied.
 - b. Railings, posts and sockets designed to withstand the following forces applied separately:
 - i. Design and construct handrails for:
 - 1. A concentrated load of 200 lbs. applied at any point and in any direction.

2. A uniform load of 50 lbs. per ft. applied in any direction. The concentrated and uniform loading conditions shall not be required to be applied simultaneously.
- ii. Design and construct guards for:
 1. A concentrated load of 200 lbs. per ft. applied at any point and in any direction along the top railing member.
 2. A uniform load of 50 lbs. per ft. applied horizontally at the required guardrail height and simultaneous uniform load of 100 lbs. per ft. applied vertically downward at the top of the guardrail. The concentrated and uniform loading conditions shall not be required to be applied simultaneously.
 3. American Institute of Steel Construction (AISC), American Iron and Steel Institute (AISI) and Aluminum Association (AA) design criteria shall be the basis for calculation of member sizes and connections.
 4. Design wood members in accordance with National Forest Products Association's, (NFOPA), and National Design Specification for Wood Construction.

6. Warranty

- a. Manufacturer shall warrant all work performed under these specifications to be free of defects for a period of five years from date of contract completion.

Products

1. Manufacturer

- a. Subject to compliance with the specified requirements, telescopic bleacher assemblies manufactured by IRWIN TELESCOPIC SEATING COMPANY, INTERKAL, HUSSEY or KODIAK INDUSTRIES are acceptable.

2. System Design

- a. Dimensions and Number of Rows: As indicated on drawings.

3. Materials

- a. Lumber: ANSI/Voluntary Product 20, B & B Southern Pine
- b. Plywood: ANSI/Voluntary Product PS1, APA A-C Exterior Grade.
- c. Structural Steel Shapes, Plates and Bars: ASTM A 36.
- d. Uncoated Steel Strip (Non-Structural Components): ASTM A569, Commercial Quality, Hot-Rolled Strip.
- e. Uncoated Steel Strip (Structural Components): ASTM A570 Grade 33, 40, 45, or 50, Structural Quality, Hot-Rolled Strip.
- f. Uncoated Steel Strip (Structural Components): ASTM A607 Grade 45 or 50, High-Strength, Low Alloy, Hot-Rolled Strip.
- g. Galvanized Steel Strip: ASTM A653 Grade 40, zinc coated by the hot-dip process, structural quality.
- h. Structural Tubing: ASTM A500 Grade B, cold-formed.

- i. Polyethylene Plastic: ASTM D 1248, Type III, Class B; molded, color-pigmented, textured, impact-resistant, structural formulation; in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.
 - j. Fasteners: Vibration-proof, of size and material standard with manufacturer.
4. Components and Fabrication
- a. Understructure System
 - i. Steel Supports and Rolling Frames: Constructed of formed steel shapes of the size and shape necessary to support the design loads. All support bracing shall begin at Row 2 and be of diagonal or "knee" type for rigidity.
 - ii. Wheels: Minimum 4" diameter x 1" non-marring soft rubber face to protect wood or synthetic floor surfaces. Each operating row shall have a minimum of 8 wheels.
 - iii. Each fully skirted wheel channel shall be continuously in contact with adjacent channels by nylon guides, to eliminate metal to metal contact, and non-binding guide rods to provide alignment when opening and closing. Lubrication is not be required.
 - iv. Vertical Columns: High tensile steel structural tube to meet design criteria.
 - v. Bolt deck stiffeners to both the rear beam and the nose with locking hardware.
 - b. Deck System
 - i. Lower Rear Riser: Continuous formed steel member recessed to provide full heel room and provide a continuous envelope for the deck and longitudinal support of the deck surface.
 - ii. Front Nose Beam: Continuous structural member to support design loads and provide continuous longitudinal support of the deck surface.
 - iii. Laminated Decking: Provide with 0.030 (30 thousandths) high density polyethylene overlay, permanently bonded to structural western fir plywood in strict compliance with U.S. Product Standard PS 195. Finished thickness to be 5/8". Polyethylene finish to be textured grey or beige. Plywood shall be supported along the front and back edge for maximum rigidity. An "H" type aluminum splice beam shall be provided between all decks. Plywood with clear or painted finish is unacceptable.
 - iv. Through bolt decking to steel supports with locking hardware. Decking attached by the use of self-tapping fasteners is unacceptable.
 - c. Seat System
 - i. Seat Modules: 18" long assembled, gas assisted injection-molded, high density, HDPE (high density polyethylene) modules in monochromatic colors providing, dual textured scuff resistant 10" wide seat surface with ½" minimum interlock on seat and face. Unit structural tested to 600 lbs occupant load.
 - ii. Integrally molded end caps at aisle end locations for clean finished appearance.
 - iii. Integrally molded recess pockets to accept seat number and row letters.
 - iv. Integrally molded rear closure panel at back of seat.

- v. Seat Attachment: Each plastic seat module shall be securely anchored by a 12 gauge steel clamp bracket that provides steel-to-steel, through bolted attachment to the front nose beam of the bleacher.
- d. Finish
 - i. Metal Surfaces: Manufacturer's standard epoxy powder coated semigloss black.
 - ii. Laminated Decking: Textured polyethylene grey finish.
 - iii. Wood Seats and Riser Boards: Machine and hand sanded and finished with a moisture repellent sealer coat on all surfaces. Finish to be UV cured, water-based polyurethane with a high gloss clear coat.
- 5. Manual Operation
 - a. Individual sections containing a series of tiered rows shall be manually opened and closed. Provide each tiered row with mechanical locks to keep rows fully extended when in the open position. Design row locks to automatically release upon operation of release lever in the front skirt panel. Hinging of the lower skirt board is not acceptable.
- 6. Accessories
 - a. Flex-Row: Provide first row modular recoverable seating units to be utilized by persons in wheelchairs and able-bodied persons. Each Flex-Row unit shall have an unlock handle for easy deployment if wheelchair or team seating access is needed. Unlock handle shall lock the bleacher seats into position when fully opened.
 - i. Provide a black full-surround steel skirting with no more than $\frac{3}{4}$ " floor clearance for safety and improved aesthetics.
 - ii. Provide a black injection molded end cap for the nose beam for safety and improved aesthetics.
 - iii. Provide a mechanical positive lock when the Flex-Row system is in the open and used position.
 - iv. Flex-Row modular units are designed to achieve multi-use front row seating to accommodate team seating, ADA requirements and facility specific requirements. Flex-Row units are available in modular units from 2 to 7 seats wide as well as full section widths.
 - b. Front Aisle Steps: Provide at each vertical aisle location front aisle step. Front steps shall engage with front row to prevent accidental separation or movement. Steps shall be fitted with four non-skid rubber feet each 1/2" in diameter. Blow molded end caps shall have full radius on all four edges. Quantity and location as indicated.
 - c. Non-Slip Tread: Provide at front edge of each aisle locations an adhesive backed abrasive non-slip tread surface.
 - d. Foot Level Aisles: Provide deck level full width vertical aisles located as indicated. Widths as indicated.
 - e. Intermediate Aisle Steps: Permanently attached, closed design. Front step to be hinged for storage on first row deck without need for removal. Blow molded end caps shall

have full radius on all four edges. Step shall have non-skid on surface. Quantity and location as indicated.

- f. Intermediate Aisle Handrails: Non-removable folding aisle handrails shall be provided. Aisle railings shall be permanently attached to the mounting pocket and allow railings to pivot and fold within the deck without the need for removal. Aisle railing shall be an individual rail design, located on every other row starting at row two (2). Railing to be constructed of 1 1/2" 11 gauge round steel tubing, finished in a textured powder coated epoxy. Aisle rails that require removal, rails made of square tubing or rail systems spanning several rows will not be acceptable. For safety, rail or rail pockets that protrude beyond the face of the bleacher while in the closed position or railings with blunt, non-turned ends will not be allowed.
- g. Self-Storing End Rails: Provide telescoping, steel self-storing 42" high above seat, end rail with tubular supports and intermediate members designed with 4" sphere passage requirements. Finish rails textured epoxy powder-coated black enamel, provide at the open ends of the group. Rails shall meet all national building codes. End rails shall start at row two.
- h. Rear fillers, including supports for closing openings between top row and rear wall of adjoining construction.

Execution

1. Installation
 - a. Install telescoping bleachers in accordance with manufacturer's instructions and approved submittal drawings.
2. Adjustment and Cleaning
 - a. Adjustment: After installation completion, test and adjust telescoping bleacher assemblies to operate in compliance with manufacturer's operations manual.
 - b. Cleaning: Clean installed telescoping bleachers on both exposed and semi-exposed surfaces. Touch-up finishes to restore damage or soiled surfaces.
3. Protection
 - a. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer to ensure telescoping bleachers are without damage or deterioration at time of substantial completion.

Senior Room / Lounge

- Counter Sink
- 72" Wall-Mounted Television
- Lounge Chair (KI Furniture, Jessa Lounge Chair # 5623/NC)
- Lounge Loveseat (KI Furniture, Jessa Lounge Loveseat # 5633/NC)

- Lounge Sofa (KI Furniture, Jessa Lounge Sofa # 5643/NC)
- Counter Sink
- Microwave
- Dishwasher
- Refrigerator
- Storage Room
- Nesting Tables & Nesting Chairs for Activities
- Should include at least one storage room

Teen Room / Lounge

- Storage Room
- Pool Table; Mfr: Olhausen, Model: Grand Champion – 8', Black Laminate
- Table Tennis; JOOLA 3000SC
- Lounge Chairs (KI Furniture, Sway Chair Lounge Chair)
- Ottomans (KI Furniture, Sway Ottaman)
- Bar Stools (KI Furniture, Apply Café Stool 30”H / Café Stool 30”)
- Bar Tables (KI Furniture, Athens Café Table 4 Column AH4R3042P-54B 74P, 42”H, 30” Dia. Powder Coat)
- Multiple Seating (KI Furniture, Logix Seating 12 Degree Curved 30x30x30 w/ back)
- Coffee (End) Table (KI Furniture, Narrow Table 12x30)
- 72” Wall-Mounted Television

Indoor Pool Locker Rooms

- BOD: Suitemate swimsuit water extractor 115V. Provide with direct drain to p-trap.

Children’s Co-op Room

- 750-1,000 SF
- Slip-Resistant Epoxy flooring with EBC base
- ACT ceiling
- Should contain one shared restroom for child users
- Should contain a double-sink and counter space
- Should contain a storage supply closet

Commercial Water Closets

General

1. Summary (Section Includes):
 - a. Water closets.
 - b. Flushometer valves.
 - c. Toilet seats.

Products

1. Wall Mounted Water Closets (Wall mounted, top spud, accessible for ADA installations):
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

- i. American Standard America.
 - ii. Briggs Plumbing Products, Inc.
 - iii. Capizzi.
 - iv. Crane Plumbing, L.L.C.
 - v. Ferguson Enterprises, Inc.; ProFlo Brand.
 - vi. Gerber Plumbing Fixtures LLC.
 - vii. Kohler Co.
 - viii. Mansfield Plumbing Products LLC.
 - ix. Peerless Pottery Sales, Inc.
 - x. TOTO USA, INC.
 - xi. Zurn Industries, LLC; Commercial Brass and Fixtures.
 - b. Bowl
 - i. Standards: ASME A112.19.2/CSA B45.1 and ASME A112.19.5.
 - ii. Material: Vitreous china.
 - iii. Type: Siphon jet.
 - iv. Style: Flushometer valve.
 - v. Height: Standard.
 - vi. Rim Contour: Elongated.
 - vii. Water Consumption: As indicated on construction documents.
 - viii. Spud Size and Location: NPS 1-1/2; top.
 - c. Flushometer Valve: Battery Operated Sensor.
 - d. Toilet Seat: Open front, elongated.
 - e. Support:
 - i. Standard: ASME A112.6.1M.
 - ii. Description: Waste-fitting assembly as required to match drainage piping material and arrangement with faceplates, couplings gaskets, and feet; bolts and hardware matching fixture. Include additional extension coupling, faceplate, and feet for installation in wide pipe space.
 - iii. Water-Closet Mounting Height: Standard and Handicapped/elderly according to ICC/ANSI A117.1.
2. Flushometer Valves (Lever-Handle, Diaphragm Flushometer Valves):
- a. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - i. Coyne & Delany Co.
 - ii. Gerber Plumbing Fixtures LLC.
 - iii. Sloan Valve Company.
 - iv. Zurn Industries, LLC; Commercial Brass and Fixtures.
 - b. Standard: ASSE 1037.
 - c. Minimum Pressure Rating: 125 psig.
 - d. Features: Include integral check stop and backflow-prevention device.
 - e. Material: Brass body with corrosion-resistant components.
 - f. Exposed Flushometer-Valve Finish: Chrome plated.

- g. Panel Finish: Chrome plated or stainless steel.
 - h. Battery operated sensor type.
 - i. Style: Exposed.
 - j. Consumption: As indicated on construction documents.
 - k. Minimum Inlet: NPS 1.
 - l. Minimum Outlet: NPS 1-1/4.
3. Toilet Seats
- a. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - i. American Standard America.
 - ii. Bemis Manufacturing Company.
 - iii. Centoco Manufacturing Corporation.
 - iv. Church Seats.
 - v. Jones Stephens Corp.; Comfort Seat Brand.
 - vi. Kohler Co.
 - vii. Olsonite Seat Co.
 - viii. Sanderson Plumbing Products, Inc.
 - ix. Sperzel of Lexington.
 - x. TOTO USA, INC.
 - xi. Zurn Industries, LLC; Commercial Brass and Fixtures.
 - b. Standard: IAPMO/ANSI Z124.5.
 - c. Material: Plastic.
 - d. Type: Commercial (Standard).
 - e. Shape: Elongated rim, open front.
 - f. Hinge: Check.
 - g. Hinge Material: Non-corroding metal.
 - h. Seat Cover: Not required.
 - i. Color: White.

Execution

- 1. Installation
 - a. Water-Closet Installation:
 - i. Install level and plumb according to roughing-in drawings.
 - ii. Install accessible, wall-mounted water closets at mounting height for handicapped/elderly, according to ICC/ANSI A117.1.
 - b. Support Installation:
 - i. Use carrier supports with waste-fitting assembly and seal.
 - ii. Install wall-mounted, back-outlet water-closet supports with waste-fitting assembly and waste-fitting seals; and affix to building substrate.
 - c. Flushometer-Valve Installation:

- i. Install flushometer-valve, water-supply fitting on each supply to each water closet.
 - ii. Attach supply piping to supports or substrate within pipe spaces behind fixtures.
 - iii. Install actuators in locations that are easy for people with disabilities to reach.
 - d. Install toilet seats on water closets.
 - e. Wall Flange and Escutcheon Installation:
 - i. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations and within cabinets and millwork.
 - ii. Install deep-pattern escutcheons if required to conceal protruding fittings.
 - iii. Comply with escutcheon requirements specified in Escutcheons for Plumbing Piping.
 - f. Joint Sealing:
 - i. Seal joints between water closets and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
 - ii. Match sealant color to water-closet color.
 - iii. Comply with sealant requirements specified in Joint Sealants.
- 2. Connections
 - a. Connect water closets with water supplies and soil, waste, and vent piping. Use size fittings required to match water closets.
 - b. Comply with water piping requirements specified in Domestic Water Piping.
 - c. Comply with soil and waste piping requirements specified in Sanitary Waste and Vent Piping.
- 3. Adjusting
 - a. Operate and adjust water closets and controls. Replace damaged and malfunctioning water closets, fittings, and controls.
 - b. Adjust water pressure at flushometer valves to produce proper flow.
- 4. Cleaning and Protection
 - a. Clean water closets and fittings with manufacturers' recommended cleaning methods and materials.
 - b. Install protective covering for installed water closets and fittings.
 - c. Do not allow use of water closets for temporary facilities unless approved in writing by Owner.

Commercial Urinals

Summary

- 1. Section Includes:
 - a. Urinals.
 - b. Flushometer valves.

Products

- 1. Urinals: Wall hung, back outlet, siphon jet, accessible.

- a. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - i. American Standard America.
 - ii. Briggs Plumbing Products, Inc.
 - iii. Ferguson Enterprises, Inc.; ProFlo Brand.
 - iv. Gerber Plumbing Fixtures LLC.
 - v. Kohler Co.
 - vi. Mansfield Plumbing Products LLC.
 - vii. Peerless Pottery Sales, Inc.
 - b. Fixture:
 - i. Standards: ASME A112.19.2/CSA B45.1 and ASME A112.19.5.
 - ii. Material: Vitreous china.
 - iii. Type: Siphon jet with extended shields.
 - iv. Strainer or Trapway: Manufacturer's standard strainer with integral trap.
 - v. Water Consumption: As indicated on construction documents.
 - vi. Spud Size and Location: NPS 3/4; top.
 - vii. Outlet Size and Location: NPS 2; back.
 - viii. Color: White.
 - c. Flushometer Valve: Battery operated sensor type.
 - d. Waste Fittings:
 - i. Standard: ASME A112.18.2/CSA B125.2 for coupling.
 - ii. Size: NPS 2.
 - e. Support: ASME A112.6.1M, Type I, urinal carrier with fixture support plates and coupling with seal and fixture bolts and hardware matching fixture. Include rectangular, steel uprights.
2. Urinal Flushometer Valves (Battery-Powered, Solenoid-Actuator, Piston Flushometer Valves)
- a. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - i. Coyne & Delany Co.
 - ii. Gerber Plumbing Fixtures LLC.
 - iii. Hydrotek International, Inc.
 - iv. Kohler Co.
 - v. Moen Incorporated.
 - vi. Sloan Valve Company.
 - vii. TOTO USA, INC.
 - viii. Zurn Industries, LLC; Commercial Brass and Fixtures.
 - b. Standard: ASSE 1037.
 - c. Minimum Pressure Rating: 125 psig.
 - d. Features: Include integral check stop and backflow-prevention device.
 - e. Material: Brass body with corrosion-resistant components.
 - f. Exposed Flushometer-Valve Finish: Chrome plated.
 - g. Style: Exposed.

- h. Actuator: Solenoid complying with UL 1951; listed and labeled as defined in NFPA 70, by a qualified testing agency; and marked for intended location and application.
- i. Trip Mechanism: Battery-powered electronic sensor complying with UL 1951; listed and labeled as defined in NFPA 70, by a qualified testing agency; and marked for intended location and application.
- j. Consumption: As indicated on construction documents.
- k. Minimum Inlet: NPS 3/4.
- l. Minimum Outlet: NPS 3/4.

Execution

1. Examination

- a. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before urinal installation.
- b. Examine walls and floors for suitable conditions where urinals will be installed.
- c. Proceed with installation only after unsatisfactory conditions have been corrected.

2. Installation

- a. Urinal Installation:
 - i. Install urinals level and plumb according to roughing-in drawings.
 - ii. Install wall-hung, back-outlet urinals onto waste fitting seals and attached to supports.
 - iii. Install wall-hung, bottom-outlet urinals with tubular waste piping attached to supports.
 - iv. Install accessible, wall-mounted urinals at mounting height for the handicapped/elderly, according to ICC/ANSI A117.1.
- b. Support Installation:
 - i. Install supports, affixed to building substrate, for wall-hung urinals.
 - ii. Use chair-type carrier supports with rectangular steel uprights for accessible urinals.
- c. Flushometer-Valve Installation:
 - i. Install flushometer-valve water-supply fitting on each supply to each urinal.
 - ii. Attach supply piping to supports or substrate within pipe spaces behind fixtures.
 - iii. Install fresh batteries in battery-powered, electronic-sensor mechanisms.
- d. Wall Flange and Escutcheon Installation:
 - i. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations.
 - ii. Install deep-pattern escutcheons if required to conceal protruding fittings.
 - iii. Comply with escutcheon requirements specified in Escutcheons for Plumbing Piping.
- e. Joint Sealing:
 - i. Seal joints between urinals and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.

- ii. Match sealant color to urinal color.
 - iii. Comply with sealant requirements specified in Joint Sealants.
- 3. Connections
 - a. Connect urinals with water supplies and soil, waste, and vent piping. Use size fittings required to match urinals.
 - b. Comply with water piping requirements specified in Domestic Water Piping.
 - c. Comply with soil and waste piping requirements specified in Sanitary Waste and Vent Piping.
 - d. Where installing piping adjacent to urinals, allow space for service and maintenance.
- 4. Adjusting
 - a. Operate and adjust urinals and controls. Replace damaged and malfunctioning urinals, fittings, and controls.
 - b. Adjust water pressure at flushometer valves to produce proper flow.
 - c. Install fresh batteries in battery-powered, electronic-sensor mechanisms.
- 5. Cleaning and Protection
 - a. Clean urinals and fittings with manufacturers' recommended cleaning methods and materials.
 - b. Install protective covering for installed urinals and fittings.
 - c. Do not allow use of urinals for temporary facilities unless approved in writing by Owner.

Commercial Lavatories

Summary

- 1. Section Includes:
 - a. Lavatories.
 - b. Faucets.

Products

- 1. Lavatory: Oval, self-rimming, vitreous china, counter-mounted.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - i. American Standard America.
 - ii. Briggs Plumbing Products, Inc.
 - iii. Capizzi.
 - iv. Crane Plumbing, L.L.C.
 - v. Ferguson Enterprises, Inc.; ProFlo Brand.
 - vi. Gerber Plumbing Fixtures LLC.
 - vii. Kohler Co.
 - viii. Mansfield Plumbing Products LLC.
 - ix. Peerless Pottery Sales, Inc.
 - x. TOTO USA, INC.
 - xi. Zurn Industries, LLC; Commercial Brass and Fixtures.

- b. Fixture:
 - i. Standard: ASME A112.19.2/CSA B45.1.
 - ii. Type: Self-rimming for above-counter mounting.
 - iii. Nominal Size: Oval, 19 by 17 inches.
 - iv. Nominal Size: Round, 19 inches.
 - v. Faucet-Hole Punching: One hole.
 - vi. Faucet-Hole Location: Top.
 - vii. Color: White.
 - viii. Mounting Material: Sealant.
- 2. Solid-Brass, Sensor Operated Faucets
 - a. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components- Health Effects," for faucet materials that will be in contact with potable water.
 - b. Lavatory Faucets: Sensor Operated-type, commercial, solid-brass valve.
 - i. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. American Standard America.
 - 2. Bradley Corporation.
 - 3. Chicago Faucets.
 - 4. Delta Faucet Company.
 - 5. Elkay Manufacturing Co.
 - 6. Grohe America, Inc.
 - 7. Just Manufacturing.
 - 8. Kohler Co.
 - 9. Moen Incorporated.
 - 10. Speakman Company.
 - 11. T & S Brass and Bronze Works, Inc.
 - 12. Zurn Industries, LLC; Commercial Brass and Fixtures.
 - 13. Sloan
 - 14. Zurn
 - ii. Standard: ASME A112.18.1/CSA B125.1.
 - iii. General: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and fixture receptor.
 - iv. Body Type: Centerset.
 - v. Body Material: Commercial, solid brass.
 - vi. Finish: Polished chrome plate.
 - vii. Maximum Flow Rate: As indicated on construction documents.
 - viii. Mounting Type: Deck, exposed.
 - ix. Spout: Rigid type.
 - x. Spout Outlet: Aerator.
 - xi. Drain: Grid Drain.
- 3. Supply Fittings

- a. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for supply-fitting materials that will be in contact with potable water.
 - b. Standard: ASME A112.18.1/CSA B125.1.
 - c. Supply Piping: Chrome-plated-brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated-brass or stainless-steel wall flange.
 - d. Supply Stops: Chrome-plated-brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.
 - e. Operation: Loose key.
 - f. Risers:
 - i. NPS 1/2.
 - ii. Chrome-plated, soft-copper flexible tube ASME A112.18.6, braided- or corrugated-stainless-steel, flexible hose riser.
4. Waste Fittings
- a. Standard: ASME A112.18.2/CSA B125.2.
 - b. Drain: Grid type with NPS 1-1/4 offset and straight tailpiece.
 - c. Trap:
 - i. Size: NPS 1-1/2 by NPS 1-1/4.
 - ii. Material: Stainless-steel, two-piece trap and swivel elbow with 0.012-inch thick stainless-steel tube to wall; and stainless-steel wall flange.

Execution

1. Examination
 - a. A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before lavatory installation.
 - b. Examine counters and walls for suitable conditions where lavatories will be installed.
 - c. Proceed with installation only after unsatisfactory conditions have been corrected.
2. Installation
 - a. Install lavatories level and plumb according to roughing-in drawings.
 - b. Install supports, affixed to building substrate, for wall-mounted lavatories.
 - c. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Escutcheons for Plumbing Piping.
 - d. Seal joints between lavatories, counters, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Joint Sealants.
 - e. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible lavatories. Comply with requirements in Plumbing Piping Insulation.
3. Connections
 - a. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
 - b. Comply with water piping requirements specified in Domestic Water Piping.

- c. Comply with soil and waste piping requirements specified in Sanitary Waste and Vent Piping.
- 4. Adjusting
 - a. Operate and adjust lavatories and controls. Replace damaged and malfunctioning lavatories, fittings, and controls.
 - b. Adjust water pressure at faucets to produce proper flow.
 - c. Install fresh batteries in battery-powered, electronic-sensor mechanisms.
- 5. Cleaning and Protection
 - a. After completing installation of lavatories, inspect and repair damaged finishes.
 - b. Clean lavatories, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
 - c. Provide protective covering for installed lavatories and fittings.
 - d. Do not allow use of lavatories for temporary facilities unless approved in writing by Owner.

Commercial Sinks

Summary

- 1. Section Includes:
 - a. Service basins.
 - b. Handwash sinks.
 - c. Pantry/Kitchen sinks.
 - d. Classroom sinks.
 - e. Sink faucets.
 - f. Supply fittings.
 - g. Waste fittings.

Products

- 1. Service Basins (Terrazzo, floor mounted):
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - i. Acorn Engineering Company.
 - ii. Crane Plumbing, L.L.C.
 - iii. Florestone Products Co., Inc.
 - iv. Stern-Williams Co., Inc.
 - b. Fixture:
 - i. Standard: IAPMO PS 99.
 - ii. Shape: Rectangular.
 - iii. Nominal Size: As indicated.
 - iv. Height: As indicated.
 - v. Tiling Flange: On one side.

- vi. Rim Guard: On all exposed top surfaces.
 - vii. Color: Not applicable
 - viii. Drain: Grid with NPS 3 outlet.
 - c. Mounting: On floor and flush to wall.
 - d. Faucet: As indicated on construction document
- 2. Pantry / Kitchen Sinks (Stainless steel, wall mounted):
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - i. Advance Tabco.
 - ii. AERO Manufacturing Company.
 - iii. Amtekco Industries, Inc.
 - iv. Eagle Group; Foodservice Equipment Division.
 - v. Elkay Manufacturing Co.
 - vi. Griffin Products, Inc.
 - vii. Just Manufacturing.
 - b. Fixture:
 - i. Standards: ASME A112.19.3/CSA B45.4 and NSF/ANSI 2.
 - ii. Type: Basin with radius corners, back for faucet, and support brackets.
 - iii. Nominal Size: As indicated.
 - c. Faucet: As indicated on construction document
 - d. Supply Fittings: Comply with requirements in "Supply Fittings" Article.
 - e. Waste Fittings: Comply with requirements in "Waste Fittings" Article.
 - f. Support: ASME A112.6.1M, Type II, sink carrier.
- 3. Classroom Sinks (Stainless steel, wall mounted):
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - i. Advance Tabco.
 - ii. AERO Manufacturing Company.
 - iii. Amtekco Industries, Inc.
 - iv. Eagle Group; Foodservice Equipment Division.
 - v. Elkay Manufacturing Co.
 - vi. Griffin Products, Inc.
 - vii. Just Manufacturing.
 - b. Fixture:
 - i. Standards: ASME A112.19.3/CSA B45.4 and NSF/ANSI 2.
 - ii. Type: Basin with radius corners, back for faucet, and support brackets.
 - iii. Nominal Size: As indicated.
 - c. Faucet: As indicated on construction document.
 - d. Supply Fittings: Comply with requirements in "Supply Fittings" Article.
 - e. Waste Fittings: Comply with requirements in "Waste Fittings" Article.

- f. Support: ASME A112.6.1M, Type II, sink carrier.
4. Sink Faucets
- a. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for faucet-spout materials that will be in contact with potable water.
 - b. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - i. American Standard America.
 - ii. Bradley Corporation.
 - iii. Chicago Faucets.
 - iv. Delta Faucet Company.
 - v. Elkay Manufacturing Co.
 - vi. GROHE America, Inc.
 - vii. Just Manufacturing.
 - viii. Kohler Co.
 - ix. Moen Incorporated.
 - x. Speakman Company.
 - xi. T & S Brass and Bronze Works, Inc.
 - xii. Zurn Industries: Commercial Brass and Fixtures.
 - c. Standard: ASME A112.18.1/CSA B125.1.
 - d. General: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and sink receptor.
 - e. Body Type: Widespread.
 - f. Body Material: Commercial, solid brass.
 - g. Finish: Polished chrome plate.
 - h. Maximum Flow Rate: As indicated on construction document.
 - i. Handle(s): Lever.
 - j. Mounting Type: Deck, exposed Back/wall, exposed.
 - k. Spout Type: Swivel gooseneck.
 - l. Vacuum Breaker: Required for hose outlet.
 - m. Spout Outlet: Aerator.
5. Supply Fittings
- a. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for supply-fitting materials that will be in contact with potable water.
 - b. Standard: ASME A112.18.1/CSA B125.1.
 - c. Supply Piping: Chrome-plated brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated brass or stainless-steel wall flange.
 - d. Supply Stops: Chrome-plated brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.
 - e. Operation: Wheel handle.
 - f. Risers:
 - i. NPS 1/2

- ii. Chrome-plated, soft-copper flexible tube.
- 6. Waste Fittings
 - a. Standard: ASME A112.18.2/CSA B125.2.
 - b. Drain: Grid type with NPS 1-1/2 offset and straight tailpiece.
 - c. Trap:
 - i. Size: NPS 1-1/2.
 - ii. Material: Chrome-plated, two-piece, cast-brass trap and ground-joint swivel elbow with 0.032-inch-thick brass tube to wall; and chrome-plated brass or steel wall flange.
 - d. Material: Stainless-steel, two-piece trap and swivel elbow with 0.012-inch-thick stainless-steel tube to wall; and stainless-steel wall flange.
- 7. Grout
 - a. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume adjusting, dry, hydraulic-cement grout.
 - b. Characteristics: Non-shrink; recommended for interior and exterior applications.
 - c. Design Mix: 5000-psi, 28-day compressive strength.
 - d. Packaging: Premixed and factory packaged.

Execution

- 1. Examination
 - a. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before sink installation.
 - b. Examine walls, floors, and counters for suitable conditions where sinks will be installed.
 - c. Proceed with installation only after unsatisfactory conditions have been corrected.
- 2. Installation
 - a. Install sinks level and plumb according to roughing-in drawings.
 - b. Install supports, affixed to building substrate, for wall-hung sinks.
 - c. Install accessible wall-mounted sinks at handicapped/elderly mounting height according to ICC/ANSI A117.1.
 - d. Set floor-mounted sinks in leveling bed of cement grout.
 - e. Install water-supply piping with stop on each supply to each sink faucet.
 - i. Exception: Use ball, gate, or globe valves if supply stops are not specified with sink. Comply with valve requirements specified in General-Duty Valves for Plumbing Piping.
 - ii. Install stops in locations where they can be easily reached for operation.
 - f. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Escutcheons for Plumbing Piping.
 - g. Seal joints between sinks and counters, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Joint Sealants.

- h. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks. Comply with requirements in Plumbing Piping Insulation.
- 3. Connections
 - a. Connect sinks with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
 - b. Comply with water piping requirements specified in Domestic Water Piping.
 - c. Comply with soil and waste piping requirements specified in Sanitary Waste and Vent Piping.
- 4. Adjusting
 - a. Operate and adjust sinks and controls. Replace damaged and malfunctioning sinks, fittings, and controls.
 - b. Adjust water pressure at faucets to produce proper flow.
- 5. Cleaning and Protection
 - a. After completing installation of sinks, inspect and repair damaged finishes.
 - b. Clean sinks, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
 - c. Provide protective covering for installed sinks and fittings.
 - d. Do not allow use of sinks for temporary facilities unless approved in writing by Owner.

Commercial Showers, Receptors, and Basins

Summary

- 1. Section Includes:
 - a. Shower faucets.
 - b. Grout.

Products

- 1. Shower Faucets
 - a. NSF Standard: Comply with NSF 61, "Drinking Water System Components – Health Effects," for shower materials that will be in contact with potable water.
 - b. Shower Faucets:
 - i. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. American Standard America.
 - 2. Chicago Faucets.
 - 3. Ferguson Enterprises, Inc.; ProFlo Brand.
 - 4. Kohler Co.
 - 5. Lawler Manufacturing Co., Inc.
 - 6. Leonard Valve Company.
 - 7. Matco-Norca.
 - 8. Moen Incorporated.
 - 9. Powers; a division of Watts Water Technologies, Inc.

- 10. Speakman Company.
- 11. Zurn Industries, LLC; AquaSpec Commercial Faucet Products.
- ii. Description: Single-handle, pressure-balance mixing valve with hot- and cold water indicators; check stops; and shower head.
- iii. Faucet:
 - 1. Standards: ASME A112.18.1/CSA B125.1 and ASSE 1016.
 - 2. Body Material: Solid brass.
 - 3. Finish: Polished chrome plate.
 - 4. Maximum Flow Rate: As indicated on construction documents.
 - 5. Mounting: Concealed.
 - 6. Operation: Single-handle, push-pull or twist or rotate control.
 - 7. Antiscald Device: Integral with mixing valve.
 - 8. Check Stops: Check-valve type, integral with or attached to body on hot and cold water supply connections.
- iv. Supply Connections: NPS 1/2.
- v. Shower Head:
 - 1. Standard: ASME A112.18.1/CSA B125.1.
 - 2. Type: Ball joint with arm and flange.
 - 3. Shower Head Material: Metallic with chrome-plated finish, manual proof.
 - 4. Spray Pattern: Fixed.
 - 5. Integral Volume Control: Required.
 - 6. Shower-Arm, Flow-Control Fitting: As indicated on construction documents.
 - 7. Temperature Indicator: Not required.
- c. Grout:
 - i. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
 - ii. Characteristics: Non-shrink; recommended for interior and exterior applications.
 - iii. Design Mix: 5000-psi, 28-day compressive strength.
 - iv. Packaging: Premixed and factory packaged.

Execution

- 1. Installation
 - a. Assemble shower components according to manufacturers' written instructions.
 - b. Install water-supply piping with stop on each supply to each shower faucet.
 - i. Exception: Use ball, gate, or globe valves if supply stops are not specified with shower. Comply with valve requirements specified in General-Duty Valves for Plumbing Piping.
 - ii. Install stops in locations where they can be easily reached for operation.
 - c. Install shower flow-control fittings with specified maximum flow rates in shower arms.

- d. Set shower receptors in leveling bed of cement grout.
 - e. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheons requirements specified in Escutcheons for Plumbing Piping.
2. Connections
- a. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
 - b. Comply with water piping requirements specified in Domestic Water Piping.
 - c. Comply with traps and soil and waste piping requirements specified in Sanitary Waste and Vent Piping.
3. Adjusting
- a. Operate and adjust showers and controls. Replace damaged and malfunctioning showers, fittings, and controls.
 - b. Adjust water pressure at faucets to produce proper flow.
4. Cleaning and Protection
- a. After completing installation of showers, inspect and repair damaged finishes.
 - b. Clean showers, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
 - c. Provide protective covering for installed fixtures and fittings.
 - d. Do not allow use of showers for temporary facilities unless approved in writing by Owner.

Water Fountains (Indoor Pressure Water Coolers)

1. Products
- a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - i. Elkay Manufacturing Co.
 - ii. Halsey Taylor.
 - iii. Haws Corporation.
 - iv. Larco Inc.
 - v. Tri Palm International, LLC; Oasis Brand.
 - vi. Tri Palm International, LLC; Sunroc Brand.
 - b. Standards
 - i. Comply with NSF 61.
 - ii. Comply with ASHRAE 34, "Designation and Safety Classification of Refrigerants," for water coolers. Provide HFC 134a (tetrafluoroethane) refrigerant unless otherwise indicated.
 - c. Cabinet: All stainless steel.
 - d. Bubbler: One, with adjustable stream regulator, located on deck.

- e. Control: Push button.
- f. Drain: Grid with NPS 1-1/4 tailpiece.
- g. Supply: NPS 3/8 with shutoff valve.
- h. Waste Fitting: ASME A112.18.2/CSA B125.2, NPS 1-1/4 brass P-trap.
- i. Filter: One or more water filters complying with NSF 42 and NSF 53 for cyst and lead reduction to below EPA standards, with capacity sized for unit peak flow rate.
- j. Cooling System: Electric, with precool, hermetically sealed compressor, cooling coil, air-cooled condensing unit, corrosion-resistant tubing, refrigerant, corrosion-resistant-metal storage tank, and adjustable thermostat.
 - i. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- k. Capacities and Characteristics:
 - i. Cooled Water: 8 gph.
 - ii. Electrical Characteristics:
 - 1. Motor Horsepower: 1/6.
 - 2. Volts: 120-V ac.
 - 3. Phase: Single.
 - 4. Hertz: 60.

Execution

1. Examination
 - a. Examine roughing-in for water-supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before fixture installation.
 - b. Examine walls and floors for suitable conditions where fixtures will be installed.
 - c. Proceed with installation only after unsatisfactory conditions have been corrected.
2. Installation
 - a. Install fixtures level and plumb according to roughing-in drawings. For fixtures indicated for children, install at height required by authorities having jurisdiction.
 - b. Install off-the-floor carrier supports, affixed to building substrate, for wall mounted fixtures.
 - c. Install mounting frames, affixed to building construction, and attach recessed, pressure water coolers to mounting frames.
 - d. Install water-supply piping with shutoff valve on supply to each fixture to be connected to domestic-water distribution piping. Use ball, gate, or globe valve. Install valves in locations where they can be easily reached for operation. Valves are specified in General-Duty Valves for Plumbing Piping.
 - e. Install trap and waste piping on drain outlet of each fixture to be connected to sanitary drainage system.

- f. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons where required to conceal protruding fittings. Comply with escutcheon requirements specified in Escutcheons for Plumbing Piping.
 - g. Seal joints between fixtures and walls using sanitary-type, one-part, mildew resistant, silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Joint Sealants.
3. Connections
- a. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
 - b. Comply with water piping requirements specified in Domestic Water Piping.
 - c. Install ball or gate shutoff valve on water supply to each fixture. Install valve upstream from filter for water cooler. Comply with valve requirements specified in General-Duty Valves for Plumbing Piping.
 - d. Comply with soil and waste piping requirements specified in Sanitary Waste and Vent Piping.
4. Adjusting
- a. Adjust fixture flow regulators for proper flow and stream height.
 - b. Adjust pressure water-cooler temperature settings.
5. Cleaning
- a. After installing fixture, inspect unit. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.
 - b. Clean fixtures, on completion of installation, according to manufacturer's written instructions.
 - c. Provide protective covering for installed fixtures.
 - d. Do not allow use of fixtures for temporary facilities unless approved in writing by Owner.

Interior Lighting

Summary

1. Section Includes:
 - a. This Section specifies the interior light fixtures for buildings and structures (in part with lighting fixture drawings, schedules, and basis of design cut sheets).
 - b. Provide all labor, materials, and equipment as necessary to complete all work as indicated on the drawings, and as specified herein.
 - c. The Contractor shall furnish and install all light fixtures, as shown on the drawing. Light fixtures shall conform to the types and manufacturers as specified on the drawings, schedules, basis of design cut sheets, and herein.

- d. The Contractor shall furnish all lamps and necessary hangers, supports, wiring, etc., for installation of light fixtures.
- e. Lighting fixture categories:
 - i. Interior lighting fixtures, lamps, and ballasts
 - ii. Interior solid-state luminaires that use LED technology.
 - iii. Emergency lighting units.
 - iv. Exit signs.
 - v. Lighting fixture supports.

2. Definitions

- a. BF: Ballast factor.
- b. CCT: Correlated color temperature.
- c. CRI: Color-rendering index.
- d. HID: High-intensity discharge.
- e. LER: Luminaire efficacy rating.
- f. Lumen: Measured output of lamp and luminaire, or both.
- g. Luminaire: Complete lighting fixture, including ballast housing if provided.
- h. LED: Light emitting diode
- i. Luminaire efficiency: luminaire delivered lumens divided by initial lamp lumens, expressed in a percentage.
- j. System input wattage: Total draw, expressed in watts, of a luminaire system comprised of the luminaire (see definition) any additional auxiliary electrical equipment that may require additional power to operate.
- k. Approved Equal: Lighting fixture substitution differing from the prime specified catalog number, but in full compliance with lighting fixture drawings and specifications. Approved Equal status shall be determined by the Lighting Designer/Architect/Electrical Engineer.
- l. IP: International protection or Ingress protection rating.

3. Quality Assurance

- a. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.
- b. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- c. Comply with NFPA 70.
- d. FM Global Compliance: Lighting fixtures for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
- e. Contractor shall patch all holes, cracks, and potential light leaks so that sheet rock ceilings have a seamless and smooth transition from ceiling to fixture trim and/or housing.
- f. Contractor shall replace blemished, damaged, or unsatisfactory fixtures as direct by the Owner's representative.

- g. Fixture manufacturer(s) shall coordinate conduit entry locations with installing contractor.
4. Warranty
- a. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.
 - i. Warranty Period for Emergency Lighting Unit Batteries: 10 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining nine years.
 - b. Warranty on LED luminaires and lamps: Manufacturer to provide 5 year minimum warranty, with extended warranty option.

Products

1. General Requirements for Lighting Fixtures and Components
- a. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
 - b. Comply with UL 1598
 - c. Metal Parts: Free of burrs and sharp corners and edges.
 - d. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.
 - e. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit re-lamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during re-lamping and when secured in operating position.
 - f. Diffusers and Globes:
 - i. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - 1. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
 - 2. UV stabilized.
 - ii. Glass: Annealed crystal glass unless otherwise indicated.
 - g. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
 - i. Label shall include the following lamp and ballast characteristics:
 - 1. "USE ONLY" and include specific lamp type.
 - 2. Lamp diameter code (T-4, T-5, T-8, T-12, etc.), tube configuration (twin, quad, triple, etc.), base type, and nominal wattage for fluorescent and compact fluorescent luminaires.
 - 3. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.

4. Start type (preheat, rapid start, instant start, etc.) for fluorescent and compact fluorescent luminaires.
 5. ANSI ballast type (M98, M57, etc.) for HID luminaires.
 6. CCT and CRI for all luminaires.
- h. Air-Handling Fluorescent Fixtures: For use with plenum ceiling for air return and heat extraction and for attaching an air-diffuser-boot assembly specified in other sections for "Diffusers, Registers, and Grilles."
- i. Air-Supply Units: Slots in one or both side trims join with air-diffuser-boot assemblies.
 - ii. Heat-Removal Units: Air path leads through lamp cavity.
 - iii. Combination Heat-Removal and Air-Supply Unit: Heat is removed through lamp cavity at both ends of the fixture door with air supply same as for air supply units.
 - iv. Dampers: Operable from outside fixture for control of return-air volume.
 - v. Static Fixture: Air-supply slots are blanked off, and fixture appearance matches active units.
2. General Requirements for Electronic Ballasts:
- a. Comply with UL 935 and with ANSI C82.11.
 - b. Designed for type and quantity of lamps served.
 - c. Ballasts shall be designed for full light output unless another BF, dimmer, or bi-level control is indicated.
 - d. Sound Rating: Class A.
 - e. Total Harmonic Distortion Rating: Less than 10 percent.
 - f. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
 - g. Operating Frequency: 42 kHz or higher.
 - h. Lamp Current Crest Factor: 1.7 or less.
 - i. BF: 0.88 or higher.
 - j. Power Factor: 0.95 or higher.
 - k. Parallel Lamp Circuits: Multiple lamp ballasts shall comply with ANSI C82.11 and shall be connected to maintain full light output on surviving lamps if one or more lamps fail.
3. Luminaires controlled by occupancy sensors shall have programmed-start ballasts.
- a. Electronic Programmed-Start Ballasts for T8 Lamps: Comply with ANSI C82.11 and the following:
 - i. Lamp end-of-life detection and shutdown circuit for T5 diameter lamps.
 - ii. Automatic lamp starting after lamp replacement.
 - b. Single Ballasts for Multiple Lighting Fixtures: Factory wired with ballast arrangements and bundled extension wiring to suit final installation conditions without modification or rewiring in the field.
 - c. Ballasts for Low-Temperature Environments:
 - i. Temperatures 0 Deg F and Higher: Electronic type rated for 0 degrees F starting and operating temperature with indicated lamp types.

- d. Temperatures Minus 20 Deg F and Higher: Electromagnetic type designed for use with indicated lamp types.
 - e. Ballasts for Dimmer-Controlled Lighting Fixtures: Electronic type.
 - i. Dimming Range: 100 to 5 percent of rated lamp lumens.
 - ii. Ballast Input Watts: Can be reduced to 20 percent of normal.
 - iii. Compatibility: Certified by manufacturer for use with specific dimming control system and lamp type indicated.
 - f. Control: Coordinate wiring from ballast to control device to ensure that the ballast, controller, and connecting wiring are compatible.
 - g. Ballasts for Bi-Level Controlled Lighting Fixtures: Electronic type.
 - i. Operating Modes: Ballast circuit and leads provide for remote control of the light output of the associated lamp between high- and low-level and off.
 - 1. High-Level Operation: 100 percent of rated lamp lumens.
 - 2. Low-Level Operation: 30 percent of rated lamp lumens.
 - ii. Ballast shall provide equal current to each lamp in each operating mode.
 - iii. Compatibility: Certified by manufacturer for use with specific bi-level control system and lamp type indicated.
4. Ballasts for Compact Fluorescent Lamps
- a. Description: Electronic-programmed rapid-start type, complying with UL 935 and with ANSI C 82.11, designed for type and quantity of lamps indicated. Ballast shall be designed for full light output unless dimmer or bi-level control is indicated:
 - i. Lamp end-of-life detection and shutdown circuit.
 - ii. Automatic lamp starting after lamp replacement.
 - iii. Sound Rating: Class A.
 - iv. Total Harmonic Distortion Rating: Less than 20 percent.
 - v. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
 - vi. Operating Frequency: 20 kHz or higher.
 - vii. Lamp Current Crest Factor: 1.7 or less.
 - viii. BF: 0.95 or higher unless otherwise indicated.
 - ix. Power Factor: 0.95 or higher.
 - x. Interference: Comply with 47 CFR 18, Ch. 1, Subpart C, for limitations on electromagnetic and radio-frequency interference for non-consumer equipment.
5. Ballasts for Hid Lamps
- a. Electronic Ballast for Metal-Halide Lamps: Include the following features unless otherwise indicated:
 - i. Minimum Starting Temperature: Minus 20 deg F for single-lamp ballasts.
 - ii. Rated Ambient Operating Temperature: 130 deg F.
 - iii. Lamp end-of-life detection and shutdown circuit.
 - iv. Sound Rating: Class A.
 - v. Total Harmonic Distortion Rating: Less than 20 percent.

- vi. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
 - vii. Lamp Current Crest Factor: 1.5 or less.
 - viii. Power Factor: 0.90 or higher.
 - ix. Interference: Comply with 47 CFR 18, Ch. 1, Subpart C, for limitations on electromagnetic and radio-frequency interference for non-consumer equipment.
 - x. Protection: Class P thermal cutout.
6. Power Supplies (Drivers) for LED Lamps
- a. Electronic power supply/driver for LED luminaires and lamps: Include the following features unless otherwise indicated:
 - i. Driver shall be constant current type.
 - ii. 0-10v dimming
 - iii. UL Class 2 designed for use with any 12v or 24v UL class 2 devices
 - iv. Operating Ambient Temperature -40 to 150 deg F.
 - v. Sound Rating: Class A
 - vi. DC control voltage shall have maximum peak to peak ripple of 10% VDC. Short-term transient voltage of control devices must not exceed 14 volts.
 - b. LED power supply/driver manufacturer shall state compatibility with submitted lighting control system, and areas where intended operation and lifetime may be impacted.
7. Quartz Lamp Light Controller
- a. General Requirements for Controllers: Factory installed by lighting fixture manufacturer. Comply with UL 1598.
 - b. Standby (Quartz Restrike): Automatically switches quartz lamp on when a HID lamp in the fixture is initially energized and during the HID lamp restrike period after brief power outages.
 - c. Connections: Designed for a single branch -circuit connection.
 - d. Switching Off: Automatically switches quartz lamp off when HID lamp reaches approximately 60 percent light output.
8. Exit Signs
- a. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.
 - b. Internally Lighted Signs:
 - i. Lamps for AC Operation: LEDs, 50,000 hours minimum rated lamp life.
9. Emergency Lighting Units
- a. General Requirements for Emergency Lighting Units: Self-contained units complying with UL 924.
 - i. Battery: Sealed, maintenance-free, lead-acid type.
 - ii. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - iii. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When

normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.

- iv. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
- v. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
- vi. Remote Test: Switch in hand-held remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal supply, providing visual confirmation of either proper or failed emergency response.
- vii. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

10. Fluorescent Lamps

- a. T8 rapid-start lamps, rated 32 W maximum, nominal length of 48 inches, 2800 initial lumens (minimum), CRI 75 (minimum), color temperature 3500 K, and average rated life 20,000 hours unless otherwise indicated.
- b. T8 rapid-start lamps, rated 17 W maximum, nominal length of 24 inches, 1300 initial lumens (minimum), CRI 75 (minimum), color temperature 3500 K, and average rated life of 20,000 hours unless otherwise indicated.
- c. T5 rapid-start lamps, rated 28 W maximum, nominal length of 45.2 inches, 2900 initial lumens (minimum), CRI 85 (minimum), color temperature 3500 K, and average rated life of 20,000 hours unless otherwise indicated.
- d. T5HO rapid-start, high-output lamps, rated 54 W maximum, nominal length of 45.2 inches, 5000 initial lumens (minimum), CRI 85 (minimum), color temperature 3500 K, and average rated life of 20,000 hours unless otherwise indicated.
- e. Compact Fluorescent Lamps: 4-Pin, CRI 80 (minimum), color temperature 3500 K, average rated life of 10,000 hours at three hours operation per start, and suitable for use with dimming ballasts unless otherwise indicated:
 - i. 13 W: T4, double or triple tube, rated 900 initial lumens (minimum).
 - ii. 18 W: T4, double or triple tube, rated 1200 initial lumens (minimum).
 - iii. 26 W: T4, double or triple tube, rated 1800 initial lumens (minimum).
 - iv. 32 W: T4, triple tube, rated 2400 initial lumens (minimum).
 - v. 42 W: T4, triple tube, rated 3200 initial lumens (minimum).
 - vi. 57 W: T4, triple tube, rated 4300 initial lumens (minimum).
 - vii. 70 W: T4, triple tube, rated 5200 initial lumens (minimum).

11. Hid Lamps

- a. Metal-Halide Lamps: ANSI C78.43, with minimum CRI 65, and color temperature 4000 K.
- b. Pulse-Start, Metal-Halide Lamps: Minimum CRI 65, & color temperature 400 K.
- c. Low-Pressure Sodium Lamps: ANSI 78.41, CRI 0, & color temperature 1800 K.

12. Lighting Fixture Support Components

- a. Comply with requirements in other sections for channel- and angle-iron supports and nonmetallic channel and angle supports.
- b. B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- c. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.
- d. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gage.
- e. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- f. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

13. LED Lamps

- a. LED modules shall be field serviceable from below in non-accessible ceilings. LED's shall be RoHS compliant, 85 CRI (minimum), with a maximum of 2.5 step McAdam ellipse color consistency. LED data shall be tested in compliance with IESNA LM-70, LM-80 and TM-21 protocol. Lamp life shall be 50,000 hours (minimum) at L70. Intended LED current (mA) and driver shall be fully compatible, as stated so by both manufacturers.

Execution

1. Installation

- a. Lighting Fixtures
 - i. Read all installation instructions provided by lighting fixture manufacturer prior to install.
 - ii. Provide rough-in for pour-in place concrete ceilings and recessed fixtures as needed.
 - iii. Provide ceiling-cut outs in sheetrock, as instructed by fixture manufacturer.
 - iv. Set level, plumb, and square with ceilings and walls unless otherwise indicated. Center continuous run fixtures within cove or ceiling opening.
 - v. Install lamps in each luminaire.
 - vi. Install trim, or any overlap flange pieces to conceal unfinished ceiling surfaces.
 - vii. Patch and paint sheetrock to conceal holes or light leaks between fixture trim/edge and ceiling. Take out lamp and trim finish prior to patching.
- b. Lamps, lenses, louvers, and other optical assemblies shall be wiped clean of dust no more than 14 days prior to opening. Temporary Lighting: If it is necessary, and approved by Architect, to use permanent luminaires for temporary lighting, install and energize the minimum number of luminaires necessary. When construction is sufficiently complete, remove the temporary luminaires, disassemble, clean thoroughly, install new lamps, and reinstall.

- c. Remote Mounting of Ballasts: Distance between the ballast and fixture shall not exceed that recommended by ballast manufacturer. Verify, with ballast manufacturers, maximum distance between ballast and luminaire.
 - d. Lay-in Ceiling Lighting Fixtures Supports: Use grid as a support element.
 - i. Install ceiling support system rods or wires, independent of the ceiling suspension devices, for each fixture. Locate not more than 6 inches from lighting fixture corners.
 - ii. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
 - iii. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.
 - iv. Install at least one independent support rod or wire from structure to a tab on lighting fixture. Wire or rod shall have breaking strength of the weight of fixture at a safety factor of 3.
 - e. Suspended Lighting Fixture Support:
 - i. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
 - ii. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
 - iii. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
 - iv. Do not use grid as support for pendant luminaires. Connect support wires or rods to building structure.
 - v. Prior to order, confirm and coordinate fixture mounting height, and dimensions/length of required support.
 - f. Air-Handling Lighting Fixtures: Install with dampers closed and ready for adjustment.
 - g. Connect wiring according to requirements in other sections.
 - h. Contractor to coordinate all junction boxes, conduit and feeds with lighting fixture locations.
2. Identification
- a. Install labels with panel and circuit numbers on concealed junction and outlet boxes. Comply with requirements for identification specified in other sections.
3. Field Quality Control
- a. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.
 - b. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.
4. Startup Service
- a. Burn-in all lamps that require specific aging period to operate properly, prior to occupancy by Owner. Burn-in fluorescent and compact fluorescent lamps intended to be dimmed, for at least 100 hours at full voltage.
5. Adjusting

- a. Under the direction of the Lighting Designer, adjust, trim, and lock all luminaires having adjustable components during on-site aiming. Provide a minimum of three (3) visits to Project, with the lighting designer, during other-than-normal occupancy hours, and in the absence of daylight for initial aiming.
- b. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting aimable luminaires to suit actual occupied conditions. Provide up to two visits to Project during other-than normal occupancy hours for this purpose. Some of this work may be required after dark.
 - i. Adjust aimable luminaires in the presence of Architect.
- c. All tools, lifts, and necessary equipment to access and adjust luminaires shall be provided by the Installing Contractor during initial aiming and occupancy adjustments.

Restroom (Family)

- 60-75 SF
- Slip-Resistant Epoxy flooring with EBC base
- ACT ceiling
- Tile on walls: running bond throughout
- Same restroom fixtures and accessories as described in Locker Room requirements
- Should contain Baby Changing Station

Restroom (Men's Standard)

- Size dependent on facility
- Slip-Resistant Epoxy flooring with EBC base
- ACT ceiling
- Tile on walls: running bond throughout
- Same restroom fixtures and accessories as described in Locker Room requirements
- Should contain Baby Changing Station

Restroom (Women's Standard)

- Size dependent on facility
- Slip-Resistant Epoxy flooring with EBC base
- ACT ceiling
- Tile on walls: running bond throughout
- Same restroom fixtures and accessories as described in Locker Room requirements
- Should contain Baby Changing Station
- Please DO NOT INCLUDE Sanitary Napkins Dispensers in any locker room or restroom.

Restroom Accessories

Quality Assurance

1. Provide each type of products of one manufacturer. Provide locks with same keying for all accessory units in the project.
2. Stamped names or labels on exposed faces of units not permitted.

Products

1. Manufacturers
 - a. Where a manufacturer's product is specified as a Basis of Design, equal products as manufactured by BOBRICK, BRADLEY, AJW, AMERICAN SPECIALTIES, may be used provided the product meets the requirements of the specifications, unless otherwise indicated.
2. Items
 - a. Toilet Paper Dispenser: Single jumbo roll; stainless steel
 - i. Basis of Design: BOBRICK B-2890
 - b. Combination Towel Dispenser/Waste Receptacle: Recessed, stainless steel; seamless wall flanges, continuous piano hinges, tumbler lock.
 - i. Basis of Design: BOBRICK B-3803 Trim Line
 - c. Soap Dispenser: Surface mounted on wall with concealed mounting, stainless steel housing; welded 18 gage; Stainless steel 304 satin finish.
 - i. Basis of Design: Product: BOBRICK B-26617 Trim Line Series.
 - d. Towel Dispenser: Recessed, stainless steel; seamless wall flanges, continuous piano hinges, tumbler lock.
 - i. Basis of Design: BOBRICK B-35903 Trim Line
 - e. Grab Bars: Stainless steel, nonslip grasping surface finish.
 - i. Standard Duty Grab Bars
 1. Push/Pull Point Load: 250 pound-force minimum.
 2. Dimensions: 1-1/4 inch (32 mm) outside diameter, minimum 0.05 inch wall thickness, concealed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
 3. Length and Configuration: As indicated on drawings.
 4. Products: B-5806 Series as manufactured by BOBRICK.
 5. Style and Length
 - a. As indicated; where not indicated provide 42" long horizontal and 18vertical bars.
 - b. Provide both horizontal and vertical bars.
 - f. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
 - i. Product: Model 4781-15 manufactured by BRADLEY.
 - g. Infant Changing Table
 - i. Description: Surface mount, fold down stainless steel cover. Concave molded polyethylene changing surface with safety strap. Folds up flat against wall when not in use. Provide with integral sanitary liner holder.
 1. Sanitary Liners: Provide 2 cases (approximately 2,800) disposable liners.
 - ii. Manufacturer Koala Bear Kare Horizontal Baby Changing Station by Koala Corporation, Brocar Products or Four D, Inc.

- h. Mop Strip
 - i. Description: Stainless steel, satin finish back plate with three spring activated rubber cam mop holders.
 - ii. Location: Provide at each janitors sink. Coordinate height with Architect.
 - iii. Product: Bradley Model 9953.
 - i. Mirrors - Framed Type: BOBRICK B-290 Series.
 - i. Frame: Stainless steel angle, theft resistant concealed fasteners.
 - ii. Glass: Float 1/4" thick with full silver coating, copper coating and organic coating. Warranted by manufacturer 10 years against silver spoilage. Sizes: As indicated or scheduled on the drawings.
 - j. Towel and Clothes Hooks: Rockwood Model RM828; US32D finish. Equal type by Mockett or Peter Pepper.
 - k. Shower Hooks: BOBRICK Model 204-1; stainless steel.
 - l. Shower Curtain Rod: BOBRICK Series B-6047
 - i. Description: Type 304, 18 gauge stainless steel.
 - ii. Diameter: 1-1/4".
 - iii. Length: Field verify.
 - iv. Provide with mounting flanges and escutcheons.
 - m. Shower/Drying Seat: BOBRICK Model B-5181.
 - i. Description: Folding type; reversible.
 - ii. Frame: Stainless steel tubing, type 304, 1-1/4" diameter; 16 gauge.
 - iii. Seat: Solid phenolic; color as selected by Architect.
3. Schedule of Accessories
- a. Location, quantity and mounting height of accessories as indicated on architectural drawings.
 - b. Keyed Units: Key all similar types of units alike. Provide two keys per unit.

Installation

1. Install in accordance with manufacturer's instructions using fasteners which are appropriate for substrate and recommended by manufacturer of unit. Install units and plumb and level, firmly anchored in positions indicated.
2. Provide concealed fasteners wherever possible of types required for substrate conditions encountered.
 - a. Metal Stud and Gypsum Board: Screws or bolts anchored to 16 gage (minimum) metal plate blocking or wood blocking located within stud space.
 - b. Concrete Masonry Units: Integral fasteners (i.e. expansion anchors, etc.).
 - c. Metal Lath and Plaster and Studs: Toggle bolts.
3. Lead, plastic or fiber plugs are not acceptable.
4. Grab Bars: Coordinate grab bar locations as to right hand or left hand installations with field conditions.
 - a. Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F446.
5. Upon completion of installation, adjust each accessory unit for proper operation and clean exposed surfaces. Turn over keys to designated Owner's personnel.

Storage Room

- Size dependent on facility
- Should contain shelving and storage rack system
- SC flooring with CRB base
- EST ceiling

Doors and windows

- Main entrance should have push button automatic opening for ADA.

Electrical Room

- Typically 60-80 SF
- SC flooring with CRB base
- EST ceiling

Mechanical Room

- Typically 80-100 SF
- SC flooring with CRB base
- EST ceiling

Video Equipment

- Video Projector
 - WUXGA 1920 x 1200 pixel resolution. 5,200 Lumens bright. 10,000:1 contrast ratio
 - Light Source: Laser diodes (laser class 1) 20,000 hours to ½ brightness.
 - Single Chip DLP, imaging technology
 - Provide with manual projector lens coordinated with projection screen and throw distance
 - Provide with HDMI, DVI input options
 - Provide with compatible HD Base T (digital link) connection that is compatible with the specified XTP matrix switch output.
 - Provide appropriate mounting hardware and surge protector
 - Acceptable Product:
 - Panasonic PT-RZ570 with Chief RPMA324 and SurgeX SA-82, or approved equal
- Flat panel display 65" High Definition Display
 - Aspect Ratio 16:9. Contrast Ratio 5,000,000:1.
 - Provide with HDMI connectivity
 - Provide with digital and analog tuner
 - Provide with Wall Mount
 - Provide with surge protector.
 - Acceptable Product:
 - NEC E655, with SurgeX SA-82, and Chief XTM1U, or approved equal
- Motor Operated Projection Screen
 - Type: Motor operated, remote controlled, recessed ceiling mounted.

- Screen: Flame retardant and mildew resistant, mat white with black masking borders. Vertical seams permitted at minimum 6' on center. HDTV 16:9 format.
 - Provide extra drop length of dimension indicated to comply with the following requirements for fabric color and location of drop length:
 - Color: Black
 - Location: At top of screen
 - Provide drop length as required for bottom of screen to be set 3' above floor. Coordinate each screen with ceiling/screen mounting height
- Doors: Independently motorized. Field finished to match ceiling.
- Motor: 3-wire quick reversal type; ball bearing with automatic overload cut-off and integral interlocking gears.
 - Power: 115V, 60 Hz, 3.5 amp.
 - Controls: Key operated 3-position switch ("UP", "OFF", "DOWN").
 - Provide with pre-set but accessible limit switches to automatically stop screen fabric in the up and down position. Provide positive stop action.
- Case: Extruded aluminum back, top and front with stamped steel end caps.
- Mounting Brackets: Provide ceiling mount type brackets of quantity as required by manufacturer.
- Manufacturer: Signature Series V Motorized Screen with M1300 Viewing Surface by DRAPER or equal by DA-LITE SCREEN COMPANY, BRET FORD/KNOX MANUFACTURING

Audio Visual Systems

General

1. All equipment shall be professional grade and rated for continuous duty. Basic guidelines have been prepared with manufacturer names, makes, and model numbers included as minimum performance requirements. These must be satisfied, unless a variance (exemption document) is submitted and approved by the Consultant.
2. System(s) shall be installed and configured for simplicity of operation, with user-friendly controls.
3. Provide product quantity as required for complete and operable system(s). If any quantities are given, the Contractor shall provide at least the given amount. Some of the products listed under this section may not be required to fulfill the work as outlined.
4. Regardless of the length or completeness of the descriptive paragraphs listed herein, each device shall meet published manufacturer's specifications.
5. Remove all manufacturer's nameplates or logos from product, such as found on speaker(s), within the public sight lines or spaces when applicable.
6. Paint all wall and ceiling mounted speaker grilles and enclosures as directed by the Consultant/Architect.
7. The Contractor is responsible for providing a fully operational turnkey audiovisual system. The following equipment list and attached drawings are for final design intent purposes.

8. The Contractor shall program no less than five (5) presets on the DSP based audio console such that the first preset will reset the virtual console to a default “cleared” setup and each of the other presets will be for various levels of user group activities. Additionally, settings that are not needed for everyday use will be locked out and the password will be given to Owner.

Input Sources

1. Audio Player
 - a. Playback media: CD, CD-ROM, CD-R, CD-RW(12cm/8cm)
 - b. Playback format: CD-DA Stereo, 44.1kHz, 16bit, WAV Stereo, 8k / 16k / 32k / 11.025k / 22.05k / 44.1k / 12k / 24k / 48kHz, 8/16bit, MP2 Stereo, 32k / 44.1k / 48kHz, 32kbps - 384kbps, MP3 Stereo, 32k / 44.1k / 48kHz, 32kbps - 320kbps, VBR
 - c. Acceptable Product:
 - i. Tascam CD-200iL, or approved equal
2. Paging Microphones
 - a. 8 programmable zones/buttons,
 - b. All-call button, Buttons have push-to-talk or latch functionality
 - c. Hold, Busy, and Zone LED signals, Standard RJ45 connectors, RS485 protocol over single CAT5 cable connection
 - d. Acceptable Product:
 - i. Bogen PPM8, (Qty:2), or approved equal

Audio Equipment

1. Ceiling Speaker (P)
 - a. Recessed ceiling speaker, enamel over steel grille; with off-white or bright white finish
 - b. Front-mounted detachable volume control knob
 - c. 8" cone speaker
 - d. Self-contained 1W amplifier
 - e. Nominal Coverage Angle: 90
 - f. Directivity Index (DI): 4.6 dB
 - g. Rated Maximum SPL: 92 dB SPL @ four feet on axis 1 W output at 1000 Hz.
 - h. Frequency Range: 100 Hz - 10 kHz
 - i. Acceptable Product:
 - i. Bogen ASWG1/DK, or approved equal
2. Ceiling Speaker (S)
 - a. Nominal Coverage Angle: 110°
 - b. Directivity Index (DI): 4.6 dB
 - c. Rated Maximum SPL: 106 dB SPL @ 1m (3.3 ft)
 - d. Frequency Range: 75 Hz - 20 kHz
 - e. Acceptable Product:
 - i. JBL Control 26CT or approved equal
3. Receiver Four Channel for Wireless Microphones

- a. Four receivers in a 1RU chassis with internal power supply
 - b. Individual gain controls, LED meters, and XLR outputs for each channel
 - c. Digital predictive switching diversity
 - d. Up to 60 dB independently adjustable gain for each channel
 - e. Audio and RF LED meters with peak indicator
 - f. Switchable mic/line output level
 - g. Provide with all necessary antennas and accessories
 - h. Acceptable product:
 - i. Shure ULXD4Q receiver, Shure UA830 amplifier and Shure UA8 antenna located at (RF1), or approved equal.
4. Body Pack Transmitter
- a. Metal construction
 - b. Detachable ¼ wave antenna
 - c. Frequency and power lockout
 - d. >120 dB dynamic range
 - e. AES 256-bit encryption for secure transmission
 - f. 100 meter (300 feet) line-of-sight operating range
 - g. Provide with lavalier and headset style microphones
 - h. Acceptable product:
 - i. Shure ULXD1 (Qty:2), or approved equal.
5. Handheld Transmitter
- a. Metal construction
 - b. Frequency and power lockout
 - c. >120 dB dynamic range
 - d. AES 256-bit encryption for secure transmission
 - e. 100 meter (300 feet) line-of-sight operating range
 - f. Provide with an SM58 Microphone head
 - g. Acceptable product:
 - i. Shure ULXD2/SM58 (Qty:2) , or approved equal
6. Handheld Transmitter
- a. Metal construction
 - b. Frequency and power lockout
 - c. >120 dB dynamic range
 - d. AES 256-bit encryption for secure transmission
 - e. 100 meter (300 feet) line-of-sight operating range
 - f. Provide with an SM58 Microphone head
 - g. Acceptable product:
 - i. Shure ULXD2/SM58 (Qty:2) , or approved equal
7. Wired Microphone
- a. Vocal microphone for performances and announcements
 - b. Type: Dynamic (moving coil)
 - c. Frequency Response 50 to 15.000 Hz

- d. Polar Pattern: Unidirectional (cardioid)
 - e. Acceptable Product:
 - i. Shure SM58 (Qty:2) , or approved equal
8. Wired Gooseneck Microphone
- a. Type: Condenser (Back electret)
 - b. Polar Pattern: Cardioid
 - c. Frequency Response: 50Hz - 18KHz
 - d. Sensitivity: -40dB +/- 3dB at 1 KHz (0dB = 1 V/Pa)
 - e. Impedance: 200 Ohms
 - f. Power Requirements: 9 - 48 volts phantom power
 - g. Termination: 3 Pin Male XLR
 - h. Provide with shock mount
 - i. Intergrade with owner furnished lectern
 - j. Acceptable Product
 - i. Clock Audio C 34E/SR-RF (Qty:1), Clock Audio SM93 (Qty:1) , or approved equal.
9. Microphone Stand
- a. Base Type, Weighted
 - b. Height Type, Standard
 - c. Tube Materials, Steel
 - d. Height, 37" to 66"
 - e. Weight, 14 lbs.
 - f. Acceptable Product:
 - i. Atlas Sound MS20 (Qty:2), or approved equal
10. Microphone Cable
- a. 20' Microphone Cable
 - b. Provide with WI3F and WI3M XLR connectors soldered to premium Canare L4E6S star quad cable
 - c. Four conductors shall be arranged as two pairs in an "X" configuration
 - d. Acceptable Product:
 - i. Whirlwind MKQ20-Black (Qty:4) , or approved equal
11. DSP (DSP Type 1)
- a. Mic / Line input channels
 - b. 8 output channels
 - c. Network-centric architecture
 - d. Compatible for digital audio interface with DSP within video matrix switch.
 - e. Provide Dante audio interface
 - f. Acceptable Product:
 - i. Extron DMP 128 AT, or approved equal
12. DSP (DSP EXT)
- a. 4 Mic / Line input channels
 - b. 4 output channels
 - c. Network-centric architecture

- d. Compatible for digital audio interface with DSP within video matrix switch.
 - e. Provide Dante audio interface
 - f. Acceptable Product:
 - i. Extron AXI 44 AT, or approved equal
13. Amplifier Type 1
- a. Two channels with bridgeable channels
 - b. 100 watts per channel at 70v
 - c. Signal, clip, and protect LED 4. Low Z & 70V/100V
 - d. Screw terminal output connectors
 - e. Nomad Link network ready
 - f. Acceptable Product:
 - i. Extron XPA 1002, or approved equal
14. ADA/Assistive Listening System (ALS1)
- a. Superior audio quality - 80 dB signal-to-noise ratio (SNR)
 - b. 57 selectable channels
 - c. 100% Digital
 - d. Limited Lifetime Warranty
 - e. Balanced/Unbalanced audio Inputs
 - f. Provide with receiver package
 - g. Acceptable Product:
 - i. Listen Technologies LT-803-072-P1, Listen Technologies LP-40-072, or approved equal
15. Paging Processor
- a. Page Control Module – For zone paging applications (8 inputs, 8 outputs)
 - b. Main Frame: 4 slots for input/output cards, 16 TTL/Analog Inputs, 8 TTL Outputs, RS485, RS232 Port, Ethernet Port, Output Card: 4 Channels with individual Overload Indicator, Mute, Meter, Signal Present, Level Control, and adjustable Overload Threshold
 - c. Input Card: 4 Channels with individual Bypass, Mute, Sensitivity Select, Phantom Power, Mute, RTO (route to output), VU Meter, Signal Present, Level Control and adjustable Overload Threshold
 - d. Acceptable Product:
 - i. Bogen Core 8x8, or approved equal

Video Equipment

- 1. Video projector at (VP1)
 - a. WUXGA 1920 x 1200 pixel resolution. 5,200 Lumens bright. 10,000:1 contrast ratio
 - b. Light Source: Laser diodes (laser class 1) 20,000 hours to ½ brightness.
 - c. Single Chip DLP, imaging technology
 - d. Provide with manual projector lens coordinated with projection screen and throw distance
 - e. Provide with HDMI, DVI input options

- f. Provide with compatible HD Base T (digital link) connection that is compatible with the specified XTP matrix switch output.
 - g. Provide appropriate mounting hardware and surge protector
 - h. Acceptable Product:
 - i. Panasonic PT-RZ570 with Chief RPMA324 and SurgeX SA-82, or approved equal
2. Flat panel display 65" at (FP1)
- a. High Definition Display
 - b. Aspect Ratio 16:9
 - c. Contrast Ratio 5,000,000:1
 - d. Provide with HDMI connectivity
 - e. Provide with digital and analog tuner
 - f. Provide with Wall Mount
 - g. Provide with surge protector
 - h. Acceptable Product:
 - i. NEC E655, with SurgeX SA-82, and Chief XTM1U, or approved equal
3. Video Matrix Switcher, with Control processor and DSP
- a. Provide 10 x 8 digital video matrix switch with, AV control processor, and digital sound processor
 - b. Four DTP inputs and six HDMI inputs
 - c. Four HDMI outputs and four independently scaled DTP outputs
 - d. Integrated DTP input and output support transmission of video, control, and analog audio up to 330 feet (100 meters) over a shielded CATx cable
 - e. Provide only manufacturer approved shielded CATx cable
 - f. Supports computer and video resolutions up to 1920x1200, including 1080p/60 and 2K
 - g. Bidirectional RS- 232 and IR pass- through for AV device control
 - h. Remote powering of select DTP transmitters and receivers
 - i. Provide DSP with 10 x 8 stereo switching matrix and 4 x 4 microphone mixing matrix
 - j. Acceptable Product:
 - i. Extron DTP CrossPoint 108 4K, or approved equal
4. Multi-Format Transmitter for HDMI and VGA
- a. Inputs: One HDMI, one VGA on 15- pin HD, two 3.5 mm stereo mini jacks for audio
 - b. Output: One DTP® 230 twisted pair output on RJ- 45
 - c. Auto- switching between inputs
 - d. Supports computer and video resolutions up to 1920x1200, including 1080p/60 and 2K
 - e. Analog stereo audio embedding
 - f. Compatible with CATx shielded twisted pair cable
 - g. Acceptable Product
 - i. Extron DTP T UWP 232 D, or approved equal
5. HDMI Receiver
- a. Input: One DTP® 230 twisted pair input on RJ-45
 - b. Outputs: One HDMI, stereo audio on captive screw
 - c. Supports computer and video resolutions up to 4K

- d. HDCP 2.2 compliant
 - e. Compatible with CATx shielded twisted pair cable
 - f. Bidirectional RS-232 and IR for AV device control
 - g. Decora Wall plate type
 - h. Acceptable Product:
 - i. Extron DTP HDMI 4K 230 Rx, or approved equal
6. Pan Tilt Zoom Camera with Ceiling Mount and Extender at (CM1)
- a. 12X Optical Zoom Lens
 - b. Exmor 1/2.8-Type 2.34 Megapixel (1080p/60 native) high-speed, low noise CMOS image sensor
 - c. HDMI Output
 - d. 73° Wide Horizontal Field of View
 - e. Built-in web server for configuration, control and remote management
 - f. Provide with ceiling mount
 - g. Provide with camera extender
 - h. Acceptable Product:
 - i. Vaddio RoboSHOT 12 HDMI, Vaddio 535-2000-206, Vaddio OneLink HDMI, or approved equal.
7. Streaming Recorder
- a. Record at 480p, 720p, 1080p, 1024x768, or 1280x1024 resolution
 - b. Stream at resolutions from 512x288 to 1080p/30
 - c. Stream and record simultaneously
 - d. Produces MP4 media files
 - e. HDMI, input, HDCP-compliant input and output signal management
 - f. RS 232, Ethernet, and digital I/O control ports
 - g. Acceptable Product:
 - i. Extron SMP 111, or approved equal

Control System

- 1. Button Panel wall mounted
 - a. Unidirectional RS-232 and IR port for universal display control
 - b. Discrete ON and OFF display power controls
 - c. Configurable buttons
 - d. Dual color, backlit buttons can be labeled for easy identification
 - e. Removable button caps
 - f. Acceptable Product:
 - i. Extron MLC 55 RS, or approved equal
- 2. Touch Panel wall mounted
 - a. Button Panel wall mounted at (WC1)
 - b. Unidirectional RS-232 and IR port for universal display control
 - c. Discrete ON and OFF display power controls

- d. Configurable buttons
- e. Dual color, backlit buttons can be labeled for easy identification
- f. Removable button caps
- g. Acceptable Product:
 - i. Extron MLC 55 RS, or approved equal
- 3. IP Link Accessory with Four Relays
 - a. Four relays ports, with both normally open and normally closed connections
 - b. IP link compatible
 - c. Connections to support momentary contact closure for projection screens.
 - d. Provide rack mount / shelf
 - e. Acceptable Product:
 - i. Extron IPA T RLY4, or approved equal
- 4. Network Switch for AV
 - a. Gigabit Speed with non-blocking architecture supporting 100% Gigabit throughput
 - b. Provide an virtual local area network for Dante digital audio VLAN
 - c. Provide an virtual local area network for Audiovisual Control VLAN
 - d. Static routing
 - e. IGMP and MLD snooping, providing advanced multicast filtering
 - f. 24 Gigabit copper Ports
 - g. 2 dedicated SFP ports
 - h. Fan less operation
 - i. Acceptable Product:
 - i. NETGEAR GS724T Switch, or approved equal

Audio Visual Systems – Gymnasium

Digital, Addressable Fire Alarm System

Site Clearing (Landscape)

Earth Moving (Landscape)

Splash Pads

Splash Pad Protective Surfacing

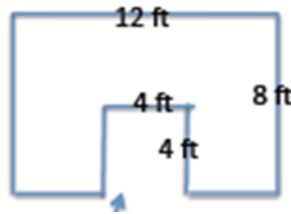
Playground Surfacing

Ornamental Fencing and Gates

Chain Link Fencing and Gates

Community Gardens

1. Site Considerations
 - a. **All garden designs must be submitted to DPR for edits and final approval. Email Joshua.singer@dc.gov with any questions or requests for information, instructions, and material lists.*
 - b. Size
 - i. Minimum 2,500 feet (approximately 1/17 of an acre)
 - c. Site necessities
 - i. Minimum of 6 hours (half day) of sun
 - ii. Site must have access to running water
 - d. Slope
 - i. If the garden is located on a significant slope (determined by DPR) the garden must, to prevent erosion, be terraced or leveled with retaining walls installed
 - e. Plots
 - i. Minimum 10 plots of the same size
2. Garden Beds
 - a. In-ground beds
 - i. Can be any size beds but each garden should have the majority of beds the same size.
 - ii. If soil is contaminated it must be replaced 2 feet deep with a 90/10 organic compost/organic topsoil. There should be no sand, rocks, trash or backfill dirt in the garden bed.
 - iii. If the soil is not contaminated, added 6 inches of compost to top of soil and till at least 1 foot deep. All objects, such as trash and rocks must be removed.
 - iv. All in-ground beds must be located outside of any critical root zones of trees, unless given permission by DPR.
 - b. Raised Beds
 - i. Raised beds should be no wider than 4 feet and if the bed is longer than 8 ft, it is recommended to use additional cross beam support or sturdy materials like concrete to prevent the bed sides from bowing.
 - ii. Raised beds are typically rectangle shape but can be other shapes like a U shape to improve size of plots as long as the width never exceeds 4 ft.



- iii. When possible keep the majority of raised beds in each garden the same size and shape.
- iv. Raised bed wood sides must be a minimum of 2 inches thick. Recommended 4-6 inches thick.
- v. DPR Standard is 6 inches thick (6''x 6'' timbers stacked on top of each other and fastened with timberloks)
- vi. If using pressure treated materials or other materials that can leach, there must be a food grade rubber or poly barrier between the soil and wood.
- vii. Recommended barrier
 - 1. Ultra Scrim FGC Food Grade Compliant:
<http://store.globalplasticsheeting.com/hydroponicandaquaponic>

3. Soils

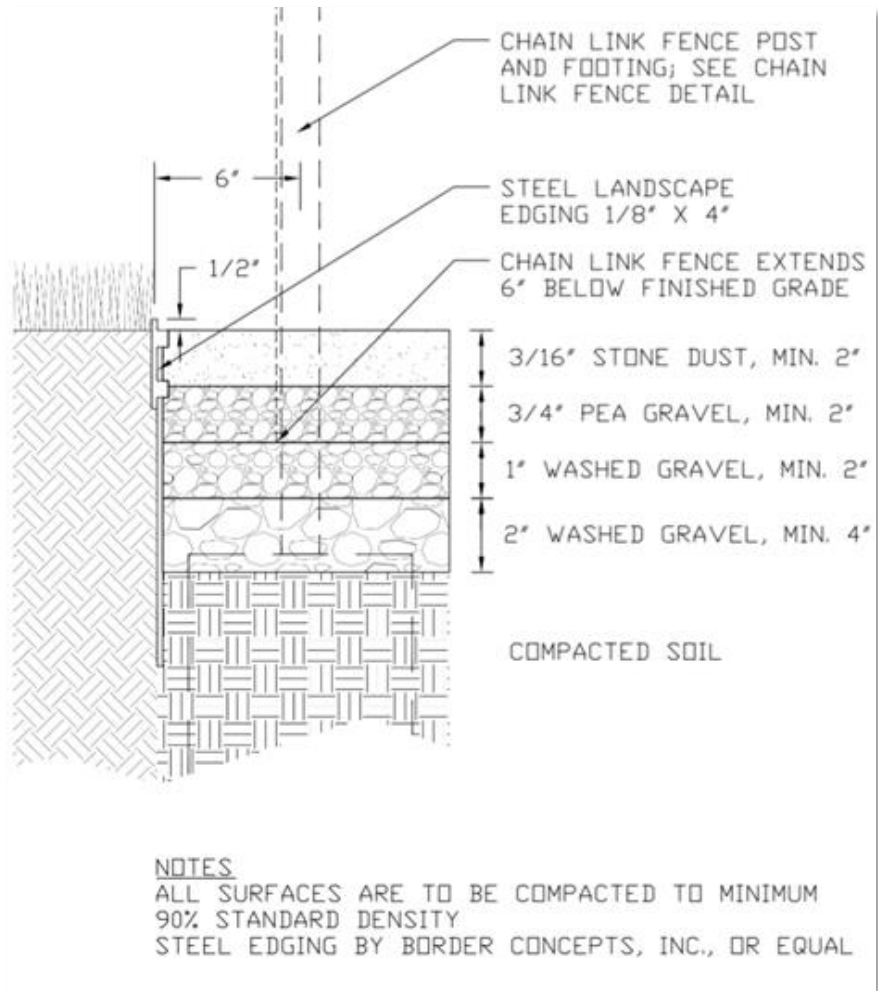
- a. Soil must be a 90/10 organic topsoil/compost mix. There should be no rocks, trash, or backfill dirt in the raised bed.
- b. There must be a soil test for Lead and Arsenic
- c. Lead must be below 300 ppm and Arsenic below 20ppm.
- d. There must be a soil drainage test
- e. Water must drain 1-3" per hour
- f. Any onsite drainage issues that occur before or after the garden construction must be fixed as well.
- g. If soil does not meet these requirements there can either be a DPR approved soil remediation plan (which may include either removal, amending, or biological remediation of the soil) or the construction of raised beds.

4. Fencing

- a. When possible, 10' fencing should be installed to lower vandalism.
- b. Recommend fencing is black vinyl coated chain link fence.
- c. Public/communal plots may be located on the outside of the fence to be more inclusive with the community.

5. Surfacing

- a. Should be comprised of crushed stone "decomposed granite" ADA compliant surface, 6-inch depth and geotextile fabric (directly under decomposed granite surface) over 4" coarse aggregate substrate.
- b. Landscape edging should be used around perimeters to keep surfacing from spilling outside of community garden area.



Surfacing / Fencing Detail

- 6. Water Hydrant
 - a. Frost proof hose bibs (all water installations must be frost proof and must be able to be locked)

- d. All gate entrances must be 4 ft wide and ADA accessible.
- 8. Signage Requirements
 - a. DPR Standard Bulletin board
 - b. DPR Standard Community Garden signage
- 9. Additional Site Amenities
 - a. Non-asphalt roofing shed
 - b. Non-asphalt roofing shade structure (pavilion, shelter, etc.)
 - c. Rain barrels and gutters attached to all roofing spaces
 - d. Education area including tables and benches
 - e. Should be rat-proof and have 3 compartments



- 10. Community Garden Group
 - a. DPR Community gardens are intended to be managed by community garden groups comprised of local community members, who will manage the garden, waiting lists, organize yearly public meetings, and are the direct contacts with DPR.
- 11. Additional Specifications
 - a. 4 x 8 Garden Bed Specs, Directions, and Supplies
 - i. Supplies
 - 1. 6"x6" cedar timbers or pressure treated with a poly barrier in between the wood and soil. Typically sold in 8-ft. lengths. Cedar (or redwood) timbers look good and weather well; you don't have to apply finish to protect the wood. Buy enough for three layers, and check that each timber has straight edges and is mostly clear of knots on at least one side.
 - 2. ½" rebar - Great for securing the foundation timbers to the ground, especially when the bed is on a slight slope or uneven terrain. Rebar is sold in 18" to 24" lengths; 18" pieces are fine for making sure 6x6 timbers stay in place.
 - 3. 8" landscape screws. Use a high-quality screw (such as Timberlok and Timbrex brands) for fastening the sides together.
 - ii. Building Instructions

1. Determine the dimensions. Planting beds should be no more than 4 ft. wide. Each side should be constructed of only one timber per layer, so make the dimensions no more than 8 ft. per side or buy longer timbers.
2. Cut the timbers. When determining how long to make the timbers, remember that they will butt end-to-side. You'll need to subtract 5 . in. (the true width of a 6x6 timber) from the length of each side. Using a circular saw, cut all timbers according to your specific dimensions, four timbers per layer.
3. Outline the bed. Lay out the first layer of timbers at the work site. Butt the end of each timber to the side of the next timber, working clockwise. Use a shovel to cut into the turf and mark the outline on both sides of the timbers.
4. Dig. Remove the timbers and dig out the turf and dirt within the outline to create trench for each board. The trench should be 4 inches deep.
5. Spread gravel. Put 4 inches of gravel in the trench and spread it evenly with a hoe. If the ground is normally porous, you can substitute sand for gravel.
6. Bore holes. Use a drill/driver with spade bit to drill holes through the four foundation timbers about every 2 ft. Rebar will go through these holes and into the ground.
7. Set the first layer. Arrange timbers in the trenches as you did before, with the holes vertical. Use the level, framing square and speed square to ensure that this layer of timbers is level and the bed is square.
8. Secure with rebar. Use a sledgehammer to drive a length of rebar through the holes and at least 1 ft. into the ground. Make sure each piece of rebar is flush with the top of the board. Continue to check for level as you pound the rebar.
9. Build the walls. Arrange the next layer of timbers on the foundation, but this time work counterclockwise. This way the timbers will overlap at the corners in the opposite direction from the first layer, creating a lapped pattern. If you choose to add more layers, continue to alternate directions.
 - a. 2 rows high (12") for non-ADA accessible beds
 - b. 3 rows high (18") for ADA accessible beds
10. Fasten the timbers. Use a drill/driver to drive landscape screws through the top course and into the timber beneath. Put two screws at each corner and two in each side.
11. Drill weep holes. Use a spade bit to drill weep holes, two in each long side of the bed and one in each short side. Drill from the outside so that tear-out doesn't show and angle the bit upward so water will flow out.
12. Line and fill the bed. If there are concerns about existing soil quality or potential contamination issues, line bed with landscaping fabric. Add

organic topsoil and fill to within 2 to 3 in. of the top, tamping lightly as you fill.

13. Optional: Install a cap railing of 2x6's secured to the top layer of timbers with 3-in. decking screws.



iii. Optional Raised Bed Alternatives

1. Concrete blocks (not Cinder blocks) with a tile top attached with mortar.



2. Galvanized Metal sheets with pressure treated wood frame- must have 6'' trim on top for sitting



Turf and Grasses

Concrete Paving

Plants

General

1. Summary

- a. This Section includes the following:
 - i. Trees and shrubs
 - ii. Perennials and ground covers
 - iii. Planting soil mixes/media and soil amendments

2. Definitions

- a. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand silt, and clay particles, friable, pervious and black or darker shade of brown gray or red than the underlying subsoil, reasonably free of subsoil, clay lumps, gravel and other objects more than 50 mm in diameter; and free of subsoil and weeds, roots, toxic materials or other non-soil materials.

- b. Manufactured/Imported Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
 - c. LOD: Limit of Disturbance
 - d. Backfill: The earth used to replace or the act of replacing earth in an excavation.
 - e. Finish grade: Elevation of finished surface of planting soil
 - f. Planting Soil Mix: Imported topsoil that is modified with soil amendments, fertilizers and sometimes existing soil to produce a soil mixture best for plant growth.
 - g. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
 - h. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
 - i. Surface soil: Soil that is present at the top layer of the existing soil profile at the project site. In undisturbed areas the surface soil is typically topsoil, but in disturbed areas such as urban environments the surface soil can be subsoil.
 - j. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1.
 - k. Green roof module: Unit product containing materials to support green roof plant growth plus planting.
3. Submittals
- a. Product Data: For each type of product indicated.
 - b. Submit 1 pint samples of topsoil, imported soils and mulch.
 - c. Product Certificates: For each type of manufactured product, signed by product manufacturer.
 - d. Planting Schedule: Indicate anticipated planting dates for exterior plants.
 - e. Contractor to establish recommended procedures for the Owner for maintenance of exterior plants during a calendar year. Submit before expiration of required maintenance periods.
 - f. Soil Test Reports: For imported/manufactured topsoil and existing soils.
4. Quality Assurance
- a. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of exterior plants. Installer required having an experienced full-time supervisor on Project site when exterior planting is in progress.
 - i. Pesticide Applicator: State licensed, commercial.
 - b. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1-2004, "American Standard for Nursery Stock."
 - c. Soil Analysis: For each soil type, contractors to furnish soil analysis and a written report by a qualified soil-testing laboratory.

- i. The soil-testing laboratory shall oversee soil sampling and report suitability of tested soil for plant growth.
 - ii. Soil Testing Lab Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated.
 - iii. Report suitability of tested soil for plant growth. State recommendations for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
 - iv. Soil tests shall be made of existing soils, imported soils and planting mixes to determine soil texture, pH, total calcium, magnesium, phosphorus, potassium, soluble salts and percent organic matter. Each sample to be submitted for testing shall be extracted from a composite sample representing different areas of the site.
 - v. Each soil test shall examine the following chemical and physical attributes. Any soil that falls within the indicted range of results shall be considered provisionally acceptable. Soil that falls outside to any of the indicated ranges may be amended, retested and resubmitted for approval by the Landscape Architect. Once a soil is considered acceptable its pH level should be examined for suitability with the plants that are to be grown on site. Special attention should be paid to the pH tolerances of plants that require acidic soil for healthy growth.
 - vi. Chart of tolerances:
 - 1. pH range 4.5-7.0
 - 2. Organic matter >1.5%
 - 3. Calcium <175 units or 3,000 lbs./A
 - 4. Magnesium 26-50 units or 71-124 lbs/A
 - 5. Phosphorus 26-50 units or 62-102 lbs/A
 - 6. Potassium 26-50 units or 85-160 lbs/A
 - 7. Electrical conductivity 600 ppm or .4 mmhos/cm (.4 dS)
 - d. Preinstallation Conference: Conduct conference with landscape contractor at Project Site before planting and lawn installation takes place.
5. Coordination
- a. Planting Restrictions: Plant exterior plants during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
 - i. Deciduous trees and shrubs: March 1 to June 30 or September 1 to November 15.
 - ii. Evergreen trees, shrubs and vines: March 1 to June 30 or September 15 to November 15.
 - iii. Perennials, green roof plants and groundcovers: March 15 to November 15.
 - iv. Notify Owner and Architect in writing if planting is to be installed at any other time than the above.

- v. No Oaks or Elms to be dug or transplanted in fall.
 - b. Coordination with Turf: Plant trees and shrubs after finish grades are established and before planting lawns, unless otherwise acceptable to Architect.
 - 6. Delivery, Storage, and Handling
 - a. Deliver bare-root stock plants freshly dug. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.
 - b. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
 - c. Handle planting stock by root ball.
 - d. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.
 - e. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
 - 7. Warranty
 - a. Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period. Warrant the following exterior plants, for the warranty period indicated, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond Contractor's control, and structural failures including plantings falling or blowing over.
 - i. Warranty Period for Trees, Shrubs, Perennials and Groundcovers: Two years from date of Substantial Completion.
 - ii. Remove and replace dead plants immediately unless required to plant in the succeeding planting season.
 - iii. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period as determined by Landscape Architect.
 - iv. A limit of one replacement of each plant will be required, except for losses or replacements due to failure to comply with requirements.

Products

- 1. Trees and Shrubs
 - a. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1-2004, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sunscald, injuries, abrasions, and disfigurement.

- b. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1-2004. Root flare shall be visible before planting.
 - c. Grade: Provide trees and shrubs of sizes and grades complying with ANSI Z60.1. Trees and shrubs of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.
- 2. Shade and Flowering Trees
 - a. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1-2004.
 - i. Provide balled and burlapped trees.
 - ii. Branching Height: One-third to one-half of tree height for shade trees.
 - b. Small Flowering Single Stem and Multistem Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1- 2004; Stem form as follows:
 - i. Stem Form: Single stem or multistem clump, with three or more main stems.
 - ii. Provide balled and burlapped trees.
- 3. Deciduous Shrubs
 - a. Form and Size: Deciduous shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1-2004 for type, shape, and height of shrub.
 - i. Provide balled and burlapped or container-grown shrubs.
- 4. Broadleaf Evergreens
 - a. Form and Size: Normal-quality, well-balanced, broadleaf evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1-2004.
 - i. Provide balled and burlapped or container-grown shrubs.
- 5. Perennials and Groundcovers
 - a. Perennials and Ground Covers: Provide perennials and ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1-2004.
 - i. Provide container grown plants or bare root plants where specified.
- 6. Topsoil
 - a. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 5.08 cm (2 inches) or larger in any dimension and other extraneous materials harmful to plant growth. Topsoil should be free from anaerobic activity.
 - b. Imported topsoil or manufactured topsoil, when obtained from off-site sources; do not obtain from agricultural land, bogs or marshes. Verify suitability of soil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.
 - c. All topsoil shall meet acceptable soil test levels as specified in Section 1.5 C Soil Analysis. A certificate of soil test analysis, soil source location and crops grown in the soil over the

past three years must be submitted to the owner for approval before any soil is delivered to the project.

7. Inorganic Soil Amendments

- a. All planting soil mixes shall have a certified agricultural soil analysis made at the Contractor's expense by a recognized soil testing laboratory to ascertain percentage of nitrogen, phosphorus, potash, soluble salt, organic matter, pH and soil texture.
- b. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent.
- c. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through 3.35-mm (No. 6) sieve and a maximum of 10 percent passing through 0.425-mm (No. 40) sieve.
- d. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- e. Aluminum Sulfate: Commercial grade, unadulterated.
- f. Perlite: Horticultural perlite, soil amendment grade.
- g. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through 0.30-mm (No. 50) sieve.
- h. Sand: Clean, washed, natural or manufactured, and free of toxic materials.
- i. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.
- j. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

8. Organic Soil Amendments

- a. Organic matter used in planting soil mix shall be composted bark, leaf mold, Orgrow or other material approved by the Architect.
- b. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

9. Planting Soil Mix

- a. Provide planting soil mix in all planting areas on grade using the components listed below in the following quantities:
 - i. Approved Topsoil 40%
 - ii. Approved Compost 30%
 - iii. Existing Soil 30%
- b. Provide planting soil mix in rain garden area using the components listed below in the following quantities:
 - i. Approved Topsoil 30%
 - ii. Approved Sand 50%
 - iii. Approved Compost 20%

10. Fertilizer

- a. "Dry Roots" or approved seaweed emulsion based root growth stimulant, applied upon installation.

- b. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water insoluble nitrogen, phosphorus, and potassium.
 - i. Composition: Nitrogen, phosphorus and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
11. Mulch
- a. Mulch shall be double shredded hardwood bark. Material shall be mulching grade, uniform in size and free of foreign materials.
12. Pesticides
- a. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
13. Stakes and Guys
- a. Upright Stakes: Use only where indicated. Rough-sawn, sound, new hardwood, redwood, or pressure-preservative-treated softwood, free of knots, holes, cross grain, and other defects, by length indicated, pointed at one end.
 - b. Tie Wire: ASTM A 641/A 641M, Class 1, galvanized-steel wire, 2-strand, twisted, 0.106 inch) in diameter.
 - c. Hose Chafing Guard: Reinforced rubber or plastic hose at least 1/2 inch in diameter, black, cut to lengths required to protect tree trunks from damage.
 - d. Flags: Standard surveyor's plastic flagging tape, white long.
14. Landscape Edging
- a. Subject to compliance with requirements, provide Basis of Design product:
 - i. Manufacturer: Permaloc Inc. Commercial Grade aluminum Landscape Edging www.permaloc.com
 - b. Model: Cleanline XL
 - c. Size: 3/16" x 5"
 - d. Stake: 12 inch tempered Standard Stake, included with each section
 - e. Finish: Black powder coat
15. Miscellaneous Products
- a. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturers written instructions.
 - b. Trunk-Wrap Tape: Two layers of crinkled paper cemented together with bituminous material, 10.16 cm (4-inch) wide minimum, with stretch factor of 33 percent.
 - c. Washed Gravel: Clean, crushed stone or gravel complying with ASTM C33, size 8 or 9.

Execution

- 1. Examination

- a. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.
2. General Preparation
- a. Protect structures, utilities, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations.
 - b. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
 - c. Prior to amending soils, clear surface of all trash, debris and stones larger than 1” diameter or length and all brush, weeds, grass, wire, grade stakes and other objects that would interfere with soil preparation. Install all utilities prior to beginning soil work.
 - d. Prior to landscape planting installation refer to Division 2 Sections Site Clearing and Earthwork for removal of existing site improvements throughout proposed planting areas.
 - e. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.
 - f. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.
3. Planting Bed Requirements
- a. Prepare planting beds as follows:
 - i. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
 - ii. Apply fertilizer directly to subgrade before loosening.
 - iii. Loosen surface soil to a depth of at least 8 inches. Apply planting soil mix and mix thoroughly into top 8 inches of soil. Till soil to a homogeneous mixture of fine texture. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property. Do not spread if planting soil or subgrade is frozen, muddy or excessively wet.
 - b. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.
 - c. Before planting, obtain Landscape Architect’s acceptance of finish grading; Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.
 - d. Protection of Soil Mixes:
 - i. Contamination and Compaction: Do not deliver or place soils in frozen, wet, or muddy conditions. Material should be at or near optimum compaction moisture

content as determined by AASHTO T 99 (ASTM D 698). Do not place materials in an excessively moist condition.

4. Tree and Shrub Excavation

- a. Pits and Trenches: Excavate circular pits with sides sloped inward at 45 degree angle. Excavations with vertical sides are not acceptable. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.
 - i. Tree pit width shall be a minimum of 12 inches larger than root ball on all sides, unless shown otherwise. Tree pit depth shall be 3' -0" minimum or sufficient to allow 1/8 of root ball to be above finished grade. Backfill as specified.

5. Tree and Shrub Planting

- a. Set balled and burlapped stock plumb and in center of pit or trench with 1/8 of root ball above adjacent finish grades.
- b. Set container grown stock plumb and in center of pit or trench with top of root ball 1" - 2" above adjacent finish grades.
- c. Organic Mulching: Apply 2-3-inch average thickness of organic mulch extending 12 inches beyond edge of planting pit or trench. Do not place mulch within 3 inches of trunks or stems.

6. Tree and Shrub Pruning:

- a. Prune, thin, and shape trees and shrubs as directed by Architect.

7. Guying and Staking

- a. Stake trees of 3-3 1/2" caliper. Use a minimum of 2 stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend at least 72 inches above grade. Set vertical stakes and space to avoid penetrating root balls or root masses. Support trees with two strands of tie wire encased in hose sections at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree. See tree planting details for number of stakes per tree.
- b. Stakes to be removed after One Year.

8. Perennial and Groundcover Planting

- a. Set out and space ground cover and plants as indicated on plans.
- b. Dig holes large enough to allow spreading of roots, and backfill with planting soil.

9. Planting Bed Mulching

- a. Mulch backfilled surfaces of planting beds and other areas indicated.
 - i. Organic Mulch: 2-3 inch average thickness of organic mulch, and finish level with adjacent finish grades. Do not place mulch against plant stems.
 - ii. Apply pre-emergent herbicide to soil surface before mulching as per manufacturer's instructions.

10. Landscape Edging Installation

- a. For edging used between lawn and planting bed or gravel mulch: Set edging into trench with top at 1/2" above compacted finish grade on turf side with side having loops for stakes placed on planting bed side.

11. Watering, Cleanup, and Protection

- a. Water existing, transplanted and new plantings twice a week or more to provide 1” per week of water after substantial completion, until plants become established and for at least the first summer growing season.
- b. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting.
- c. During exterior planting, keep adjacent paving and construction clean and work area in an orderly condition.

12. Disposal

- a. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

Approved Plant Listing

1. Perennials

Latin Name	Common Name
<i>Achillea millefolium</i>	Common Yarrow
<i>Actaea racemosa</i>	Common Black Cohosh, Bugbane
<i>Ageratina altissima</i>	White Snakeroot
<i>Antennaria plantaginifolia</i>	Plantain-leaved Pussytoes
<i>Aquilegia canadensis</i>	Wild or Eastern Red Columbine
<i>Aralia racemosa</i>	Spikenard, American Spikenard
<i>Arisaema triphyllum</i>	Common Jack-in-the-pulpit
<i>Aruncus dioicus</i>	Goatsbeard (Eastern Goat's-beard)
<i>Asarum canadense</i>	Common Wild Ginger
<i>Asclepias incarnata</i>	Swamp Milkweed
<i>Asclepias tuberosa</i>	Butterfly Weed
<i>Baptisia australis</i>	Blue Wild Indigo
<i>Baptisia tinctoria</i>	Yellow Wild-indigo
<i>Caltha palustris</i>	Marsh Marigold, Cowslip
<i>Caulophyllum thalictroides</i>	Blue Cohosh, Common Blue Cohosh
<i>Chamaecrista fasciculata</i>	Common Partridge Pea
<i>Chelone glabra</i>	White Turtlehead
<i>Chrysogonum virginianum</i>	Green and Gold
<i>Chrysopsis mariana</i>	Maryland Golden-aster
<i>Claytonia virginica</i>	Virginia Spring Beauty
<i>Conoclinium coelestinum</i>	Mistflower, Ageratum
<i>Coreopsis verticillata</i>	Whorled or Threadleaf Coreopsis
<i>Dicentra cucullaria</i>	Dutchman's Breeches
<i>Dicentra eximia</i>	Wild Bleeding Heart
<i>Erigeron pulchellus</i>	Robin's Plantain
<i>Eupatorium hyssopifolium</i>	Hyssop-leaved Thoroughwort

<i>Eupatorium perfoliatum</i>	Boneset, Common Boneset
<i>Eurybia divaricata</i>	White Wood Aster
<i>Euthamia graminifolia</i>	Flat-top Goldenrod
<i>Eutrochium fistulosum</i>	Hollow Joe-pye-weed
<i>Fragaria virginiana</i>	Wild Strawberry
<i>Gentiana clausa</i>	Bottle or Closed Gentian
<i>Geranium maculatum</i>	Wild or Spotted Geranium
<i>Helenium autumnale</i>	Common Sneezeweed
<i>Helianthus angustifolius</i>	Narrow-leaved Sunflower
<i>Helianthus divaricatus</i>	Woodland or Spreading Sunflower
<i>Helianthus tuberosus</i>	Jerusalem Artichoke
<i>Heliopsis helianthoides</i>	Oxeye, Smooth Oxeye, Oxeye Sunflower
<i>Hepatica nobilis v. obtusa</i>	Round-lobed Hepatica
<i>Heuchera americana</i>	American Alumroot
<i>Hibiscus moscheutos</i>	Swamp or Eastern Rose-mallow
<i>Houstonia caerulea</i>	Common Bluets, Azure Bluets, Quaker Ladies
<i>Hypericum prolificum</i>	Shrubby St. Johns-wort
<i>Impatiens capensis</i>	Orange or Spotted Jewelweed
<i>Iris cristata</i>	Dwarf Crested Iris
<i>Iris virginica</i>	Virginia or Southern Blueflag
<i>Jeffersonia diphylla</i>	Twinleaf
<i>Liatris pilosa v. pilosa</i>	Grass-leaf Blazing Star or Gayfeather
<i>Liatris scariosa</i>	Large Blazing Star, Eastern Blazing Star
<i>Liatris spicata</i>	Dense Blazing Star, Gayfeather, Blazing Star
<i>Liatris squarrosa</i>	Scaly Blazing Star, Plains Blazing Star
<i>Lilium canadense</i>	Canada Lily
<i>Lilium superbum</i>	Turk's-cap Lily
<i>Lobelia cardinalis</i>	Cardinal Flower
<i>Lobelia siphilitica</i>	Great Blue Lobelia
<i>Maianthemum canadense</i>	Canada Mayflower, False Lily-of-the-valley
<i>Maianthemum racemosum</i>	Eastern Solomon's-plume, False Solomon's-seal
<i>Mertensia virginica</i>	Virginia Bluebell, Virginia Cowslip
<i>Mimulus ringens</i>	Square-stemmed or Allegheny Monkeyflower
<i>Mitchella repens</i>	Partridge-berry
<i>Monarda didyma</i>	Scarlet Beebalm, Oswego Tea
<i>Monarda fistulosa</i>	Wild Bergamot
<i>Monarda punctata</i>	Spotted Beebalm
<i>Oenothera fruticosa</i>	Narrow-leaf Evening Primrose or Sundrops
<i>Opuntia humifusa</i>	Eastern Prickly-pear
<i>Osmorhiza claytonii</i>	Sweet Cicely
<i>Oxalis violacea</i>	Violet Wood-sorrel
<i>Packera aurea</i>	Golden or Heartleaf Ragwort
<i>Peltandra virginica</i>	Arrow Arum, Tuckahoe
<i>Penstemon digitalis</i>	Beardtongue, Tall or White Foxglove
<i>Persicaria virginiana</i>	Virginia Knotweed, Jumpseed

Phlox divaricata	Wild Blue or Woodland Phlox
Phlox maculata	Meadow Phlox, Wild Sweet William
Phlox paniculata	Fall or Garden Phlox
Phlox subulata	Moss Phlox, Moss Pink
Physostegia virginiana	Northern or Fall Obedient-plant
Podophyllum peltatum	Mayapple
Polemonium reptans	Spreading Jacob's Ladder, Greek Valerian
Polygonatum biflorum	Solomon's seal
Pycnanthemum incanum	Hoary Mountain-mint
Pycnanthemum muticum	Clustered Mountain-mint
Pycnanthemum tenuifolium	Narrow-leaf or Slender Mountain-mint
Rhexia virginica	Virginia Meadow Beauty, Deergrass
Rudbeckia fulgida	Orange Coneflower
Rudbeckia hirta	Blackeyed Susan
Rudbeckia laciniata	Cut-leaf, Common or Green-headed Coneflower
Ruellia caroliniensis	Carolina or Common Wild-petunia
Salvia lyrata	Lyre-leaf Sage
Sanguinaria canadensis	Bloodroot
Saururus cernuus	Lizard's-tail, Water-dragon
Scutellaria integrifolia	Rough or Hyssop Skullcap, Helmet Flower
Sedum ternatum	Wild or Woodland Stonecrop
Senna marilandica	Maryland or Southern Wild Senna
Silene caroliniana	Wild or Northern Wild Pink
Sisyrinchium angustifolium	Narrow-leaved Blue-eyed-grass
Solidago altissima	Tall Goldenrod, Late Goldenrod
Solidago caesia	Blue-stemmed or Wreath Goldenrod
Solidago flexicaulis	Zig-zag Goldenrod
Solidago juncea	Early Goldenrod
Solidago nemoralis	Gray, Dwarf, Old Field Goldenrod
Solidago odora	Sweet Goldenrod
Solidago rugosa	Rough-stemmed or Wrinkle-leaf Goldenrod
Spiranthes cernua	Nodding Ladies' Tresses
Stellaria pubera	Star, Giant or Great Chickweed, Common Starwort
Symphyotrichum cordifolium	Heart-leaved aster, Blue Wood Aster
Symphyotrichum laeve	Smooth Blue Aster, Smooth Aster
Symphyotrichum lateriflorum	Calico Aster
Symphyotrichum novae-angliae	New England Aster
Symphyotrichum novi-belgii	New York Aster
Thalictrum dioicum	Early Meadow Rue
Thalictrum pubescens	Common Tall Meadow Rue, King of the Meadow
Thalictrum thalictroides	Rue Anemone (Windflower)
Tiarella cordifolia	Heart-leaved Foamflower, False Miterwort
Tradescantia virginiana	Virginia Spiderwort
Uvularia perfoliata	Perfoliate or Mealy Bellwort
Verbena hastata	Blue, Common or Swamp Verbena

Verbesina alternifolia	Wingstem, Yellow Ironweed
Vernonia noveboracensis	New York Ironweed
Veronicastrum virginicum	Culver's-root
Viola cucullata	Marsh Blue Violet
Viola labradorica (conspersa)	Dog Violet
Viola pedata	Bird's-foot Violet
Viola sagittata	Arrow-leaved Violet
Viola striata	Striped Violet, Cream Violet
Yucca filamentosa	Common Yucca, Adam's Needle
Zizia aurea	Golden-alexanders

2. Ferns

Latin Name	Common Name
Adiantum pedatum	Northern Maidenhair Fern
Asplenium platyneuron	Ebony Spleenwort
Athyrium asplenoides	Southern Lady Fern
Dryopteris intermedia	Spinulose Wood Fern
Dryopteris marginalis	Evergreen or Intermediate Wood Fern
Dryopteris carthusiana	Marginal Wood Fern, Evergreen Shield Fern
Matteuccia struthiopteris	Ostrich Fern
Onoclea sensibilis	Sensitive Fern, Bead Fern
Osmunda claytoniana	Interrupted Fern
Osmunda spectabilis	Royal Fern
Osmundastrum cinnamomeum	Cinnamon Fern
Parathelypteris noveboracensis	New York Fern
Polystichum acrostichoides	Christmas Fern
Pteridium aquilinum	Bracken Fern
Thelypteris palustris	Marsh Fern

3. Grasses, Sedges, and Rushes

Latin Name	Common Name
Andropogon virginicus	Broomsedge, Broomstraw, Sedge Grass
Carex laxiculmis	Creeping Sedge
Carex pensylvanica	Pennsylvania Sedge
Carex plantaginea	Seersucker or Plaintain-leaved Sedge
Carex platyphylla	Broadleaf Sedge
Carex stricta	Tussock Sedge, Upright Sedge
Danthonia spicata	Poverty Oat Grass
Dichanthelium clandestinum	Deer-tongue Grass
Elymus hystrix	Bottlebrush Grass
Elymus virginicus	Virginia Wild Rye
Eragrostis spectabilis	Purple Love Grass
Juncus effusus	Common Rush, Soft Rush

Muhlenbergia capillaris
Panicum virgatum
Saccharum giganteum
Schizachyrium scoparium
Scirpus cyperinus
Sorghastrum nutans
Tridens flavus
Zizania aquatica

Muhly Grass
Switchgrass
Giant Plumegrass, Sugarcane Plumegrass
Little Bluestem
Woolgrass Bulrush
Indian Grass
Purpletop, Tall Redtop
Southern Wild Rice

4. Vines

Latin Name
Bignonia capreolata
Clematis virginiana
Clitoria mariana
Lonicera sempervirens
Passiflora incarnata
Passiflora lutea
Wisteria frutescens

Common Name
Cross-vine
Virgin's Bower
Butterfly Pea, Maryland Butterfly Pea
Trumpet or Coral Honeysuckle
Purple Passionflower, Maypop
Yellow Passionflower
American Wisteria

5. Shrubs

Latin Name
Alnus serrulata
Amorpha fruticosa
Aronia arbutifolia
Aronia melanocarpa
Baccharis halimifolia
Castanea pumila
Ceanothus americanus
Cephalanthus occidentalis
Cornus amomum
Crataegus crus-galli
Eubotrys racemosa
Euonymus americanus
Gaylussacia baccata
Hamamelis virginiana
Hydrangea arborescens
Hypericum prolificum
Ilex decidua
Ilex verticillata
Itea virginica
Kalmia latifolia

Common Name
Smooth or Hazel Alder
False Indigo
Red Chokeberry
Black Chokeberry
High Tide Bush, Groundsel Tree, Mullet Bush
Allegheny Chinquapin
New Jersey Tea, Redroot
Buttonbush
Silky Dogwood
Cockspur Hawthorn
Fetterbush, Swamp Doghobble
Strawberry-bush, Heart's-a-bustin'
Black Huckleberry
Witch Hazel
Wild Hydrangea, Smooth Hydrangea
Shrubby St. John's Wort
Deciduous Holly, Possum-haw
Winterberry, Winterberry Holly
Virginia Sweetspire
Mountain Laurel

Lindera benzoin	Spicebush
P. hysocarpus opulifolius	Ninebark
Rhododendron maximum	Great Rhododendron
Rhododendron periclymenoides	Wild Azalea, Pinxter Azalea
Rhododendron viscosum	Swamp Azalea
Rhus aromatica	Fragrant sumac
Rhus copallinum	Winged, Shining or Flameleaf Sumac
Rhus glabra	Smooth Sumac
Rosa carolina	Carolina Rose, Pasture Rose
Rosa palustris	Swamp Rose
Sambucus canadensis	Common Elderberry
Staphylea trifolia	Bladdernut
Vaccinium corymbosum	Highbush or Northern Highbush Blueberry
Vaccinium pallidum	Early Lowbush or Blue Ridge Blueberry
Viburnum acerifolium	Maple-leaved Viburnum, Dockmackie
Viburnum dentatum	Arrowwood, Southern Arrowwood Viburnum
Viburnum nudum	Poosum-haw Viburnum, Southern Wild Raisin
Viburnum prunifolium	Blackhaw Viburnum, Nannyberry

6. Trees

Latin Name	Common Name
Acer rubrum	Red Maple
Amelanchier arborea	Downy Serviceberry, Juneberry, Shadbush
Amelanchier canadensis	Canada Serviceberry, Juneberry
Aralia spinosa	Devil's Walking-stick, Hercules club
Asimina triloba	Pawpaw, Common Pawpaw
Betula nigra	River Birch
Carpinus caroliniana	American Hornbeam, Ironwood
Carya cordiformis	Bitternut Hickory
Carya glabra	Pignut Hickory
Carya tomentosa	Mockernut Hickory
Celtis occidentalis	Common Hackberry
Cercis canadensis	Eastern Redbud
Chionanthus virginicus	Fringe Tree, Old Man's Beard
Cornus florida	Flowering Dogwood
Diospyros virginiana	Common or American Persimmon
Fagus grandifolia	American Beech
Ilex opaca	American Holly
Juniperus virginiana	Eastern Redcedar
Liquidambar styraciflua	Sweetgum
Liriodendron tulipifera	Tulip-tree, Tulip-poplar, Yellow Poplar
Magnolia virginiana	Sweetbay Magnolia, Swamp Magnolia
Morella cerifera	Wax Myrtle, Southern Bayberry

Nyssa sylvatica	Sour Gum, Black Gum, Tupelo
Pinus echinata	Shortleaf Pine
Pinus rigida	Pitch Pine
Pinus taeda	Loblolly Pine
Pinus virginiana	Virginia Pine, Scrub Pine
Prunus americana	American Wild Plum
Prunus angustifolia	Chickasaw Plum
Quercus alba	White Oak
Quercus bicolor	Swamp White Oak
Quercus coccinea	Scarlet Oak
Quercus falcata	Southern Red Oak, Spanish Oak
Quercus marilandica	Blackjack Oak
Quercus michauxii	Swamp Chestnut Oak, Basket Oak
Quercus montana	Chestnut Oak, Rock Chestnut Oak
Quercus muehlenbergii	Chinquapin, Chinkapin or Yellow Oak
Quercus palustris	Pin Oak
Quercus phellos	Willow Oak
Quercus rubra	Northern Red Oak
Quercus stellata	Post Oak
Quercus velutina	Black Oak
Salix nigra	Black Willow
Sassafras albidum	Sassafras
Taxodium distichum	Baldcypress

Irrigation

PART 1 - GENERAL

1.01 SCOPE

- A. This section specification information is for Rain Bird low volume dripline irrigation products including Control Zone Kits, XFD, XFCV, XFS Dripline, compatible fittings, and Low Volume Emission Devices.
- B. Provide labor, materials, supplies, equipment, tools, and transportation, and perform all operations in connection with and reasonably incidental to the complete installation of the drip irrigation system, and guarantee/warranty as shown on the drawings, the installation details, and as specified herein.

1.02 SUBMITTALS

- A. Deliver four (4) copies of submittals to Owner's Representative within ten (10) working days from date of Notice to Proceed. Furnish information in 3-ring binder with table of contents and index sheet. Index sections for different components and label with specification section number and name of component. Furnish submittals for components on material list. Indicate which items are being supplied on catalog cut sheets when multiple items are shown on one sheet. Owner's Representative. Incomplete submittals will be returned without review.
- B. Materials List: Include dripline and low-volume irrigation components, control zone components, shop drawings and other components shown on drawings and installation details or described herein. Quantities of materials need not be included.
- C. Manufacturers' Data: Submit manufacturers' catalog cuts, specifications, and operating instructions for equipment shown on materials list.
- D. Shop Drawings: Submit shop drawings called for in installation details. Show products required for proper installation, their relative locations, and critical dimensions. Note modifications to installation details as part of shop drawing documentation.

1.03 FLUSHING AND TESTING

- A. Schedule testing with Owner's Representative a minimum of three (3) days in advance of testing.
- B. Provide clean, clear water, pumps, labor, fittings, and equipment necessary to conduct line flushing and testing procedures.
- C. Recommended Dripline and Emitter Lateral Flushing Procedures.
 - 1. Flush the system every two weeks for the first six (6) weeks and check the water that is flushed out for cleanliness. Establish a regular system flushing schedule for the future based on results from the initial six-week flushing schedule.
 - 2. Flush the system completely after any repairs are made and monitor system operation closely under regular system flushing schedule.
 - 3. Check the pressure at the supply and flush headers on a regular basis and compare with the pressure readings taken after installation.
- D. Recommended Dripline and Emitter Lateral Leakage Testing Procedures.
 - 1. Subject installed dripline tubing and emitter lateral piping to water pressure equal to specified operating pressure for ten (10) minutes. Test with control zone components and dripline flush valve components installed.
 - 2. Partially backfill buried pipe and tubing to prevent movement under pressure. Expose couplings, fittings, and valve components.

3. Visually inspect valve assemblies and fittings for leakage and replace defective pipe, fitting, joint, valve, or appurtenance. Repeat test until test segment is free from leaks. Cement or caulking to seal leaks is prohibited.

E. Recommended Dripline and Emitter Lateral Operational Testing Procedures.

1. Activate each dripline and emitter lateral control zone valve in sequence from controller. Provide either one additional person with radio or use handheld remote to activate remote control valves from controller. Manually activating remote control valve using manual bleed mechanism at remote control valve is not an acceptable method of activation. Owner's Representative will visually observe operation, water application patterns, and leakage.
2. Replace or adjust defective valve, fitting, dripline segment, emitter lateral segment, or appurtenance to correct operational and coverage uniformity deficiencies.
3. Repeat test(s) until each dripline or emitter lateral test segment passes testing procedures. Repeat tests, replace components, and correct deficiencies at no additional cost to Owner and/or Owner's Representative.

1.04 CONSTRUCTION REVIEW

- A. The purpose of on-site reviews by Owner's Representative is to periodically observe work in progress, Contractor's interpretation of construction documents, and to address questions with regard to installation.
- B. Schedule reviews for dripline layout and system testing with Owner's Representative as indicated on drawings or as required by these specifications.
- C. Impromptu reviews may occur at any time during project.
- D. A review will occur at completion of irrigation system installation and Project Record Drawing submittal.

1.05 GUARANTEE/WARRANTY AND REPLACEMENT

- A. The purpose of guarantee/warranty is to ensure that Owner receives irrigation materials of prime quality, installed and maintained in thorough and careful manner.
- B. Contractor is responsible for providing guarantee/warranty of irrigation materials, equipment, and workmanship against defects for period of one (1) year from formal written acceptance by Owner's Representative. Fill and repair depressions. Restore landscape, utilities, structures and site features damaged by settlement of irrigation trenches or excavations. Repair damage to premises caused by defective items. Make repairs within seven (7) days of notification from Owner's Representative.
- C. Replace damaged items with new and identical materials, using methods specified in contract documents or applicable codes. Make replacements at no additional cost to contract price.
- D. Guarantee/warranty applies to originally installed materials and equipment, and replacements made during guarantee/warranty period.

PART 2 – MATERIALS

2.01 QUALITY

- A. Provide and install specified equipment and materials, delivered new to the site in unopened containers and confirmed to be without flaws or defects.

2.02 LATERAL PIPE AND FITTINGS

- A. Use rigid, unplasticized polyvinyl chloride (PVC) 1120, 1220 National Sanitation Foundation (NSF) approved pipe, extruded from material meeting requirements of Cell Classification 12454-A or 12454-B, ASTM Standard D1784, with integral belled end suitable for solvent welding.
- B. Use Class 160, SDR-26, rated at 160 PSI (11 bar), conforming to dimensions and tolerances established by ASTM Standard D2241. Use PVC pipe rated at higher pressures than Class 160 in cases where small nominal diameters are not manufactured in Class 160.

(or)

Use Class 200, SDR-21, rated at 200 PSI (13,8 bar), conforming to dimensions and tolerances established by ASTM Standard D2241. Use PVC pipe rated at higher pressures than Class 200 in the cases where small nominal diameters are not manufactured in Class 200.

(or)

Use Schedule 40 conforming to dimensions and tolerances established by ASTM Standard D1785; UV radiation resistant.

- C. Use Schedule 40, Type 1, PVC solvent weld fittings conforming to ASTM Standards D2466 and D1784 for PVC pipe. Use primer approved by pipe manufacturer. Solvent cement to conform to ASTM Standard D2564, of type approved by pipe manufacturer.
- D. Use PVC Schedule 80 nipples and PVC Schedule 40 or 80 threaded fittings for threaded pipe connections as specified on the drawings and details.
- E. Threaded joint sealant: Use non-hardening, nontoxic pipe thread sealant formulated for use on threaded connections and approved by pipe fitting or valve manufacturer.

2.03 DRIP IRRIGATION COMPONENTS

A. Rain Bird Control Zone Kits

1. General Information

- a. Provide control zone kits manufactured by Rain Bird as indicated on construction drawings.
- b. Control zone kit assemblies for dripline irrigation zones must include control valve, filtration, and pressure regulation components sized to meet the hydraulic demands and flow requirements of the zones that they service.

2. Rain Bird Low Flow Control Zone Kit for dripline zones with flows from 0.2 to 5.0 GPM (0.8 to 18.9 lpm), including low flow valve (LFV) and pressure regulating filter (PRF).

a. Available model numbers:

- 1) XCZ-075-PRF [3/4" (19 mm) Low Flow valve and 3/4" (19 mm) PR filter]
- 2) XACZ-075-PRF [3/4" (19 mm) Low Flow Anti-siphon valve and 3/4" (19 mm) PR filter]
- 3) XCZ-LF-100 [1" (25 mm) Low Flow valve 1" with and 3/4" (19 mm) PR filter]
- 4) XCZF-LF-100 [1" (25 mm) Low Flow valve 1" with flow control handle and 3/4" (19 mm) PR filter]

b. Low Flow Valve (LFV) component specifications include:

- 1) Valve body and bonnet constructed of high impact, weather-resistant plastic, stainless steel and other chemical/UV resistant materials
- 2) Diaphragm with a double-knife seal, constructed of durable Buna-N rubber with a clog-resistant metering orifice
- 3) Energy-efficient, low-power encapsulated solenoid with captured plunger and 90 mesh (200 micron) solenoid filter
- 4) External bleed for manual system flushing during start-up, internal bleed for manual zone activation during maintenance operations
- 5) Inlet pressure rating: 20 to 120 PSI (1,4 to 8,3 bar)
- 6) Female threaded inlet and outlet connections
- 7) Anti-siphon valve configuration (XACZ-075-PRF) includes listed features and incorporates atmospheric vacuum breaker with I.A.P.M.O and A.S.S.E. listing approval

c. Pressure Regulating Filter (PRF) combines filtration and pressure regulation in one integrated unit for protection of downstream components of drip irrigation system. PRF component specifications include:

- 1) Compact "Y" filter body and cap configuration constructed of glass-filled, UV-resistant polypropylene, with 120 PSI (8,3 bar) operating pressure rating. Maximum dimensions of filter body; Height: 4 1/2" (11,4 cm), Length: 5 1/2" (14 cm), Width: 2" (5,1 cm)

- 2) Standard 200 mesh (75 micron) filter screen constructed of durable stainless steel attached to a polypropylene frame. Screen is serviceable for cleaning purposes by unscrewing cap from filter body and removing filter element.
- 3) Normally-open pressure regulating device with preset outlet pressure of approximately 30 PSI (2,1 bar). Pressure regulating device allows full flow with minimal pressure loss unless inlet pressure is greater than preset level. As inlet pressure increases above preset level, internal spring compresses to reduce downstream pressure.
- 4) Male threaded 3/4" (19 mm) inlet and outlet connections.

(or)

3. Rain Bird Medium Flow Control Zone Kit for dripline zones with flows from 3.0 to 15.0 GPM (11.4 to 56.8 lpm), including Rain Bird DV or ASVF valve and pressure regulating filter (PRF).
 - a. Available model numbers:
 - 1) XCZ-100-PRF [1" (25 mm) DV valve and 1" (25 mm) PR filter]
 - 2) XCZF-100-PRF [1" (25 mm) DV valve with removable flow control handle and 1" (25 mm) PR filter]
 - 3) XACZ-100-PRF [1" (25 mm) Anti-siphon Valve and 1" (25 mm) PR Filter]
 - b. DV Valve component specifications must include:
 - 1) Valve body and bonnet constructed of high impact, weather-resistant plastic, stainless steel and other chemical/UV resistant materials
 - 2) Energy-efficient, low-power encapsulated solenoid with captured plunger and 90 mesh (200 micron) solenoid filter
 - 3) External bleed for manual system flushing during start-up, internal bleed for manual zone activation during maintenance operations
 - 4) Inlet pressure rating: 20 to 120 PSI (1.4 to 8.3 bar)
 - 5) Female threaded inlet and outlet connections
 - 6) Anti-siphon valve configuration (XACZ-100-PRF) includes listed features and incorporates atmospheric vacuum breaker with I.A.P.M.O and A.S.S.E. listing approval
 - c. Pressure Regulating Filter (PRF) combines filtration and pressure regulation in one integrated unit for protection of downstream components of drip irrigation system. PRF component specifications include:
 - 1) Compact "Y" filter body and cap configuration constructed of glass-filled, UV-resistant polypropylene, with 120 PSI (8,3 bar) operating pressure rating. Maximum dimensions of filter body; Height: 4 1/2" (11,4 cm), Length: 5 1/2" (14 cm), Width: 2" (5,1 cm)
 - 2) Standard 200 mesh (75 micron) filter screen constructed of durable stainless steel attached to a polypropylene frame. Screen is serviceable for cleaning purposes by unscrewing cap from filter body and removing filter element.

- 3) Normally-open pressure regulating device with preset outlet pressure of approximately 40 PSI (2,8 bar). Pressure regulating device allows full flow with minimal pressure loss unless inlet pressure is greater than preset level. As inlet pressure increases above preset level, internal spring compresses to reduce downstream pressure.
- 4) Male threaded 1" (25 mm) inlet and outlet connections.

(or)

4. Rain Bird Medium Flow Commercial Control Zone Kits for dripline zones with flows from 3.0 to 20.0 GPM (11.4 to 75.7 lpm), including, Rain Bird PESB valve with PVC ball valve and pressure regulating quick-check basket filter and Rain Bird PGA valve with pressure regulating basket filter.
 - a. PESB Available model numbers:
 - 1) XCZ-100-PRB-COM [1" (25 mm) PVC ball valve, 1" (25 mm) Rain Bird PESB valve, and 1" (25 mm) PRB-QKCHK-100 quick check pressure regulating basket filter]
 - b. PESB valve assembly component specifications must include:
 - 1) 1" (25 mm) PVC full-port ball valve with female threaded inlet and outlet connections
 - 2) PESB valve body and bonnet constructed of durable glass-filled nylon, stainless steel and other chemical/UV resistant materials
 - 3) Diaphragm constructed of a durable Buna-N rubber material reinforced with nylon
 - 4) One-piece solenoid with captured plunger and 90 mesh (200 micron) solenoid filter
 - 5) External bleed for manual system flushing during start-up, internal bleed for manual zone activation during maintenance operations
 - 6) Inlet pressure rating: 20 to 200 PSI (1,4 to 13,8 bar)
 - 7) Female threaded inlet and outlet connections
 - c. PGA Available model number:
 - 1) XCZ-100-PRB-LC [1" (25 mm) Rain Bird PGA valve, and 1" (25 mm) PRB -100 pressure regulating basket filter]
 - d. PGA valve assembly component specifications must include:
 - 1) PGA valve body and bonnet constructed of durable glass-filled nylon, stainless steel and other chemical/UV resistant materials
 - 2) Diaphragm constructed of a durable Buna-N rubber material reinforced with nylon
 - 3) One-piece solenoid with captured plunger and 90 mesh (200 micron) solenoid filter
 - 4) External bleed for manual system flushing during start-up, internal bleed for manual zone activation during maintenance operations
 - 5) Inlet pressure rating: 15 to 150 PSI (1,4 to 13,8 bar)
 - 6) Female threaded inlet and outlet connections

- e. Pressure Regulating Quick Check Basket Filter combines filtration and pressure regulation in one integrated unit for protection of downstream components of drip irrigation system. Pressure regulating basket filter component specifications must include:
- 1) Basket style body and jar-top cap constructed of heavy-duty glass-filled, UV-resistant polypropylene, with 150 PSI (10,3 bar) operating pressure rating. Maximum dimensions of filter body; Height: 6 1/2" (16,5 cm), Length: 6 1/2" (16,5 cm), Width: 3 1/2" (8,9 cm)
 - 2) Indicator incorporated into filter cap that changes color from green to red during operation when the filter element requires cleaning.
 - 3) Standard 200 mesh (75 micron) filter screen constructed of stainless steel attached to propylene frame. Screen is serviceable for cleaning purposes by unscrewing cap from filter body and removing filter element.
 - 4) Normally-open in-line pressure regulating device, constructed of durable, UV resistant non-corrosive material able to accommodate an inlet pressure rating of not less than 150 PSI (10,3 bar), with preset outlet pressure of approximately 40 PSI (2,8 bar). Pressure regulating device allows full flow with minimal pressure loss unless inlet pressure is greater than preset level. As inlet pressure increases above preset level, internal spring compresses to reduce downstream pressure.
 - 5) Male threaded 1" (25 mm) inlet and outlet connections.

(or)

5. Rain Bird High Flow Commercial Control Zone Kit for dripline zones with flows from 15.0 to 40.0 GPM (56,8 to 151,4 lpm), including Rain Bird PESB valve and two parallel Rain Bird pressure regulating quick-check basket filters.
- a. Available model numbers:
- 1) XCZ-150-PRB-COM [1 1/2" (38 mm) Rain Bird PESB valve, and two 1" (25 mm) PRB-QKCHK-100 pressure regulating check basket filters]
- b. PESB valve assembly component specifications must include:
- 1) PESB valve body and bonnet constructed of durable glass-filled nylon, stainless steel and other chemical/UV resistant materials
 - 2) Diaphragm constructed of a durable Buna-N rubber material reinforced with nylon
 - 3) One-piece solenoid with captured plunger and 90 mesh (200 micron) solenoid filter
 - 4) External bleed for manual system flushing during start-up, internal bleed for manual zone activation during maintenance operations
 - 5) Inlet pressure rating: 20 to 200 PSI (1,4 to 13,8 bar)
 - 6) Female threaded inlet and outlet connections

- c. Pressure Regulating Quick Check Basket Filter combines filtration and pressure regulation in one integrated unit for protection of downstream components of drip irrigation system. Pressure regulating basket filter component specifications must include:
- 1) Basket style body and jar-top cap constructed of heavy-duty glass-filled, UV-resistant polypropylene, with 150 PSI (10,3 bar) operating pressure rating. Maximum dimensions of filter body; Height: 6 1/2" (16,5 cm), Length: 6 1/2" (16,5 cm), Width: 3 1/2" (8,9 cm)
 - 2) Indicator incorporated into filter cap that changes color from green to red during operation when the filter element requires cleaning.
 - 3) Standard 200 mesh (75 micron) filter screen constructed of stainless steel attached to propylene frame. Screen is serviceable for cleaning purposes by unscrewing cap from filter body and removing filter element.
 - 4) Normally-open in-line pressure regulating device, constructed of durable, UV resistant non-corrosive material able to accommodate an inlet pressure rating of not less than 150 PSI (10,3 bar), with preset outlet pressure of approximately 40 PSI (2,8 bar). Pressure regulating device allows full flow with minimal pressure loss unless inlet pressure is greater than preset level. As inlet pressure increases above preset level, internal spring compresses to reduce downstream pressure.
 - 5) Male threaded 1" (25 mm) inlet and outlet connections

B. Rain Bird XF Series Dripline Components

1. General Information

- a. Provide flexible dual-layered pressure-compensating inline XF Series Dripline manufactured by Rain Bird, with emitter spacing and dripline row spacing as indicated on construction drawings.
- b. Provide insert or compression fittings manufactured by Rain Bird that are compatible with inline emitter tubing as indicated on construction drawings.

2. Rain Bird XFD On-Surface Dripline with pressure-compensating inline emitters.

- a. Available Rain Bird XFD On-Surface Dripline model numbers for POTABLE water systems; a dual-layered, brown colored dripline tubing with emitter flow rates and spacing as shown:
 - 1) Rain Bird XFD-06-12; 0.6 GPH (2,3 lph) emitters spaced 12" (30,5 cm) on-center
 - 2) Rain Bird XFD-06-18; 0.6 GPH (2,3 lph) emitters spaced 18" (45,7 cm) on-center
 - 3) Rain Bird XFD-09-12; 0.9 GPH (3,4 lph) emitters spaced 12" (30,5 cm) on-center
 - 4) Rain Bird XFD-09-18; 0.9 GPH (3,4 lph) emitters spaced 18" (45,7 cm) on-center

- b. Available Rain Bird XFDP On-Surface Dripline model numbers for NON-POTABLE water systems; a dual-layered, purple colored dripline tubing with emitter flow rates and spacing as shown:
 - 1) Rain Bird XFDP-06-12; 0.6 GPH (2,3 lph) emitters spaced 12" (30,5 cm) on-center
 - 2) Rain Bird XFDP-06-18; 0.6 GPH (2,3 lph) emitters spaced 18" (45,7 cm) on-center
 - 3) Rain Bird XFDP-09-12; 0.9 GPH (3,4 lph) emitters spaced 12" (30,5 cm) on-center
 - 4) Rain Bird XFDP-09-18; 0.9 GPH (3,4 lph) emitters spaced 18" (45,7 cm) on-center

- c. Required dripline tubing material and performance specifications include:
 - 1) XFD tubing; dual-layered, brown in color, conforming to an outside diameter (O.D.) of 0.634 inches (16 mm) and an inside diameter (I.D.) of 0.536 inches (13,6 mm) and wall thickness of 0.049 inches (1,2 mm)
 - 2) XFDP tubing; dual-layered, purple in color, conforming to an outside diameter (O.D.) of 0.634 inches (16 mm) and an inside diameter (I.D.) of 0.536 inches (13,6 mm) and wall thickness of 0.049 inches (1,2 mm)
 - 3) Factory installed, pressure-compensating, inline emitters welded to the inner circumference of the polyethylene tubing at spacing specified by model number
 - 4) Inline emitters designed to pressure-compensate by lengthening the emitter's turbulent flow path (Rain Bird patent pending)
 - 5) Consistent flow rate from each installed inline emitter when emitter inlet pressure is supplied between recommended operating range of 8.5 to 60 PSI (0,7 to 4,1 bar)
 - 6) Required filtration for XF Series dripline tubing and emitters is 120 mesh (125 micron)

- 3. Rain Bird XFCV Dripline with Heavy-Duty Check Valve and pressure-compensating inline emitters.
 - a. Available Rain Bird XFCV Dripline with Heavy Duty-Check Valve model numbers for POTABLE water systems; brown colored dripline tubing with emitter flow rates and spacing as shown:
 - 1) Rain Bird XFCV-06-12; 0.6 GPH (2,3 lph) emitters spaced 12" (30,5 cm) on-center
 - 2) Rain Bird XFCV-06-18; 0.6 GPH (2,3 lph) emitters spaced 18" (45,7 cm) on-center
 - 3) Rain Bird XFCV-09-12; 0.9 GPH (3,4 lph) emitters spaced 12" (30,5 cm) on-center
 - 4) Rain Bird XFCV-09-18; 0.9 GPH (3,4 lph) emitters spaced 18" (45,7 cm) on-center

 - b. Required dripline tubing material and performance specifications include:

- 1) XFCV tubing; dual-layered, brown in color, conforming to an outside diameter (O.D.) of 0.634 inches (16 mm) and an inside diameter (I.D.) of 0.536 inches (13,6 mm) and wall thickness of 0.049 inches (1,2 mm)
 - 2) Inline emitter that includes a 3.5psi check-valve to facilitate 8ft of holdback
 - 3) Factory installed, pressure-compensating, inline emitters welded to the inner circumference of the polyethylene tubing at spacing specified by model number
 - 4) Inline emitters designed to pressure-compensate by lengthening the emitter's turbulent flow path (Rain Bird patent pending)
 - 5) Consistent flow rate from each installed inline emitter when emitter inlet pressure is supplied between recommended operating range of 8.5 to 60 PSI (0,7 to 4,1 bar)
 - 6) Required filtration for XF Series dripline tubing and emitters is 120 mesh (125 micron)
4. Rain Bird XFS Sub-Surface Copper-Colored Dripline with Copper Shield™ Technology and pressure-compensating inline emitters.
- a. Available Rain Bird XFS Sub-Surface Copper-Colored Dripline model numbers for POTABLE water systems; dual layered, copper colored dripline tubing with emitter flow rates and spacing as shown:
 - 1) Rain Bird XFS-06-12; 0.6 GPH (2,3 lph) emitters spaced 12" (30,5 cm) on-center
 - 2) Rain Bird XFS-06-18; 0.6 GPH (2,3 lph) emitters spaced 18" (45,7 cm) on-center
 - 3) Rain Bird XFS-09-12; 0.9 GPH (3,4 lph) emitters spaced 12" (30,5 cm) on-center
 - 4) Rain Bird XFS-09-18; 0.9 GPH (3,4 lph) emitters spaced 18" (45,7 cm) on-center
 - b. Available Rain Bird XFSP Sub-Surface Copper-Colored Dripline model numbers for NON-POTABLE water systems; dual layered purple colored dripline tubing with emitter flow rates and spacing as shown:
 - 1) Rain Bird XFSP-06-12; 0.6 GPH (2,3 lph) emitters spaced 12" (30,5 cm) on-center
 - 2) Rain Bird XFSP-06-18; 0.6 GPH (2,3 lph) emitters spaced 18" (45,7 cm) on-center
 - 3) Rain Bird XFSP-09-12; 0.9 GPH (3,4 lph) emitters spaced 12" (30,5 cm) on-center
 - 4) Rain Bird XFSP-09-18; 0.9 GPH (3,4 lph) emitters spaced 18" (45,7 cm) on-center
 - c. Dripline tubing material and performance specifications:
 - 1) XFS Copper-colored, dual layered tubing conforming to an outside diameter (O.D.) of 0.634 inches (16 mm) and an inside diameter (I.D.) of 0.536 inches (13,6 mm) and wall thickness of 0.049 inches (1,2 mm)

- 2) XFSP tubing; dual layered, purple in color, conforming to an outside diameter (O.D.) of 0.634 inches (16 mm) and an inside diameter (I.D.) of 0.536 inches (13,6 mm) and wall thickness of 0.049 inches (1,2 mm)
- 3) Factory installed, pressure-compensating, inline emitters welded to the inner circumference of the polyethylene tubing at spacing specified by model number
- 4) Inline XFS Sub-Surface Copper-Colored Dripline emitters include Rain Bird's exclusive Copper Shield™ Technology (patent pending), which protects the emitter from root intrusion with a copper chip and without the use of herbicides made available via supplementary equipment and/or via impregnation into the emitter body. Unlike the use of herbicides which often include EPA-approved handling procedures (as recommended by some manufacturer's of inline emitter products), Rain Bird's Copper Shield™ Technology does not require special handling procedures. Inline emitters are designed to pressure-compensate by lengthening the emitter's turbulent flow path (Rain Bird patent pending)
- 5) Consistent flow rate from each installed inline emitter when emitter inlet pressure is supplied between recommended operating range of 8.5 to 60 PSI (0,7 to 4,1 bar)
- 6) Required filtration for XF Series dripline tubing and emitters is 120 mesh (125 micron)

5. Rain Bird XF Series Blank Dripline Tubing

- a. Available model numbers for POTABLE water systems:
 - 1) Rain Bird XFD blank tubing, dual-layered and brown in color.
- b. Available model numbers for NON-POTABLE water systems:
 - 1) Rain Bird XFDP blank tubing, dual-layered and purple in color.

6. Rain Bird Easy Fit Dripline Tubing Compression Fittings

- a. Available model numbers, designed for compatibility with Rain Bird XF Series Dripline Tubing:
 - 1) Tee: MDCFTEE
 - 2) Coupling: MDCF COUP
 - 3) Elbow: MDCFEL
 - 4) Adapters:
 - a) 1/2" (13 mm) Male pipe thread adapter: MDCF50MPT
 - b) 3/4" (19 mm) Male pipe thread adapter: MDCF75MPT
 - c) 1/2" (13 mm) Female pipe thread adapter: MDCF50FPT
 - d) 3/4" (19 mm) Female pipe thread adapter: MDCF75FPT
 - e) 3/4" (19 mm) Female hose thread adapter: MDCF75FHT
 - 5) Flush Cap end closure for POTABLE system: MDCF CAP
 - 6) Flush Cap end closure for NON-POTABLE system: MDCFPCAP
- b. Easy Fit compression fitting material and performance specifications include:

- 1) Easy Fit directional fittings and flush cap fittings constructed from molded UV-resistant ABS material with Buna-N rubber seal for long-term, leak free connections
- 2) Easy Fit adapters constructed from UV-resistant ABS materials for use exclusively with Easy Fit Compression Fittings
- 3) Easy Fit Compression Fittings are intended for use with polyethylene tubing from .630" to .669" (16 mm-17 mm) OD to provide a leak-free compression fit
- 4) Maximum pressure loss for the Easy Fit adapters estimated to be 0.1 PSI (0,007 bar) per adapter
- 5) Operating pressure range for Easy Fit compression fittings and adapters is 0 to 60 PSI (0 to 4,1 bar)

(or)

7. Rain Bird XF Series Dripline Tubing Insert Fittings

a. Available model numbers, designed for compatibility with Rain Bird XF Series Dripline Tubing:

- 1) Tee: XFF-TEE insert tee (17 x 17 x 17 mm)
- 2) Coupling: XFF-COUP insert coupling (17 x 17 mm)
- 3) Elbow: XFF-ELBOW insert elbow (17 x 17 mm)
- 4) Cross: XFD-CROSS insert cross (17 x 17 x 17 x 17 mm)
- 5) Insert Adapters:
 - a) 1/2" (13 mm) Male pipe thread adapter: XFF-MA-050 [17 mm x 1/2" (13 mm) MPT]
 - b) 3/4" (19 mm) Male pipe thread adapter: XFF-MA-075 [17 mm x 3/4" (19 mm)MPT]
 - c) 3/4" (19 mm) Female pipe thread adapter: XFD-FA-075 [17 mm x 3/4" (19 mm)FPT]
 - d) 1/2" (13 mm) Tee male pipe thread adapter: XFF-TMA-050 [17 mm x 1/2" (13 mm)MPT x 17 mm]
 - e) 3/4" (19mm) Tee female pipe thread adapter: XFD-TFA-075 [17 mm x 3/4" (19 mm)FPT x 17 mm]

b. XF Series insert fitting specifications and features include:

- 1) Constructed from black and/or brown acetyl plastic for long-term, leak free connections
- 2) Intended for use with polyethylene tubing with ID of 0.536" (13,6 mm), including Rain Bird XF Dripline and XF Series Blank Tubing
- 3) Operating pressure range is 0 to 50 PSI (0 to 3,5 bar)

8. Rain Bird Air Relief Valves.

a. Available model numbers, designed for compatibility with Rain Bird XF Series Dripline Tubing:

- 1) ARV050 Air Relief Valve; includes 1/2" (13 mm) air relief valve.

C. Rain Bird Point Source Irrigation Emission Devices

1. General Information

- a. Provide low-volume point-source emission devices, manufactured by Rain Bird, to efficiently deliver irrigation water at the plant root zone as indicated on construction drawings.

2. Rain Bird Single-outlet Xeri-Bug™ Emitters

- a. Available model numbers with self-piercing barb inlet:
 - 1) XB-05PC (Blue); 0.5 GPH (1,89 lph)
 - 2) XB-10PC (Black); 1.0 GPH (3,79 lph)
 - 3) XB-20PC (Red); 2.0 GPH (7,57 lph)
- b. Available model numbers with 10-32 threaded inlet:
 - 1) XB-05PC-1032 (Blue); 0.5 GPH (1,89 lph)
 - 2) XB-10PC-1032 (Black); 1.0 GPH (3,79 lph)
 - 3) XB-20PC-1032 (Red); 2.0 GPH (7,57 lph)
- c. Available model numbers with 1/2" (13 mm) threaded inlet:
 - 1) XBT-10 (Black); 1.0 GPH (3,79 lph)
 - 2) XBT-20 (Red); 2.0 GPH (7,57 lph)
- d. Single-outlet Xeri-Bug Emitter specifications and features include:
 - 1) Available with three inlet options:
 - a) Self-piercing barb inlet; Emitters with self-piercing barb inlet permit one-step insertion into 1/2" (13 mm) or 3/4" (19 mm) drip tubing when installed with Rain Bird Xeriman tool.
 - b) 10-32 threaded inlet; Emitters with 10-32 threaded inlet allow threaded connection into PolyFlex Riser, 1032 Thread Adapter, or 1800 Xeri-Bubbler Adapter
 - c) 1/2" (13 mm) threaded inlet; Emitters with 1/2" (13 mm) threaded inlet allow threaded connection into 1/2" (13 mm) PVC male adapter.
 - 2) External surfaces constructed from UV resistant acetyl materials
 - 3) Self-flushing to minimize clogging
 - 4) Color-coded to identify flow rate;
 - a) Blue emitter indicates a flow rate of 0.5 GPH (1,89 lph)
 - b) Black emitter indicates a flow rate of 1.0 GPH (3,79 lph)
 - c) Red emitter indicates a flow rate of 2.0 GPH (7,57 lph)
 - 5) Pressure-compensating over the pressure range of 15 to 50 PSI (1,0 to 3,5 bar) with consistent flow rate of [0.5 GPH (1,89 lph)] or [1.0 GPH (3,79 lph)] or [2.0 GPH (7,57 lph)] over this pressure range

3. Rain Bird Single-outlet Pressure-Compensating Modules

- a. Available model numbers with self-piercing inlet barb:
 - 1) PC-05: light brown, 5 GPH (18,95 lph)
 - 2) PC-07: violet, 7 GPH (26,53 lph)
 - 3) PC-10: green, 10 GPH (37,90 lph)
 - 4) PC-12: dark brown, 12 GPH (45,48 lph)
 - 5) PC-18: white, 18 GPH (68,22 lph)
 - 6) PC-24: orange, 24 GPH (90,96 lph)

- b. Available model numbers with 10-32 threaded inlet:
 - 1) PC-05 1032: light brown, 5 GPH (18,95 lph)
 - 2) PC-07 1032: violet, 7 GPH (26,53 lph)
 - 3) PC-10 1032: green, 10 GPH (37,90 lph)

- c. Available model numbers with ½" FPT inlet:
 - 1) PCT-05: light brown, 5 GPH (18,95 lph)
 - 2) PCT-07: violet, 7 GPH (26,53 lph)
 - 3) PCT-10: green, 10 GPH (37,90 lph)

- d. Pressure-Compensating Module specifications and features include:
 - 1) Available with three inlet options:
 - a) Self-piercing barb inlet; Emitters with self-piercing barb inlet permit one-step insertion into 1/2" (13 mm) or 3/4" (19 mm) drip tubing when installed with Rain Bird Xeriman tool.
 - b) 10-32 threaded inlet; Emitters with 10-32 threaded inlet allow threaded connection into PolyFlex Riser, 1032 Thread Adapter, or 1800 Xeri-Bubbler Adapter
 - c) ½" FPT Threaded inlet allow threaded connection to ½" PVC riser.
 - 2) External surfaces constructed from UV resistant acetyl materials
 - 3) Color-coded to identify flow rate;
 - a) Tan outlet indicates a flow rate of 5 GPH (18,93 lph)
 - b) Violet outlet indicates a flow rate of 7 GPH (26,50 lph)
 - c) Green outlet indicates a flow rate of 10 GPH (37,85 lph)
 - d) Dark brown outlet indicates a flow rate of 12 GPH (45,42 lph)
 - e) White outlet indicates a flow rate of 18 GPH (68,13 lph)
 - f) Orange outlet indicates a flow rate of 24 GPH (90,84 lph)
 - 4) Pressure-compensating over the pressure range of 10 to 50 PSI (0.7 to 3,5 bar) with consistent flow rate of [5 GPH (18,93 lph)] or [7 GPH 26,50 lph]] or [10 GPH (37,85 lph)] or [12 GPH (45,42 lph)] or [18 GPH (68,13 lph)] or [24 GPH (90,84 lph)] over this pressure range.

- e. Rain Bird PC Diffuser Cap specifications and features include:
 - 1) Available with two color options:
 - a) PC Diffuser (Black); This Diffuser Cap is to be used for Pressure-Compensating Module zones serviced by a potable water source.
 - b) PC DIFF-PPL (Purple); This Diffuser Cap is to be used for Pressure-Compensating Module zones serviced by a non-potable water source.

- 2) Constructed from UV-resistant polyethylene material
- 3) Capable of snapping onto Rain Bird Pressure-Compensating Modules to create a bubbler effect and prevent wash out

4. Rain Bird Multi-outlet Xeri-Bug Emission Devices

- a. Available model numbers with barb inlet:
 - 1) XB-05-6: Blue, 0.5 GPH (1,89 lph/outlet)
 - 2) XB-10-6: Black, 1.0 GPH (3,79 lph/outlet)
 - 3) XB-20-6: Red, 2.0 GPH (7,57 lph/outlet)
- b. Available model numbers with 1/2" (13 mm) female threaded inlet:
 - 1) XBT-05-6: Blue, 0.5 GPH (1,89 lph/outlet)
 - 2) XBT-10-6: Black, 1.0 GPH (3,79 lph/outlet)
 - 3) XBT-20-6: Red, 2.0 GPH (7,57 lph/outlet)
- c. Multi-outlet Xeri-Bug specifications and features include:
 - 1) Available with two inlet options:
 - a) Barb inlet; Emitters with barb inlet permit insertion into 1/2" (13 mm) or 3/4" (19 mm) drip tubing
 - b) 1/2" (13 mm) threaded inlet; Emitters with 1/2" (13 mm) threaded inlet allow threaded connection into 1/2" (13 mm) PVC male adapter.
 - 2) Six outlet ports, barbed to retain 1/4" (6,4mm) distribution tubing
 - 3) External surfaces constructed from UV resistant acetyl materials
 - 4) Self-flushing to minimize clogging
 - 5) Color-coded to identify flow rate;
 - a) Blue emitter indicates a flow rate of 0.5 GPH (1,89 lph) per outlet
 - b) Black emitter indicates a flow rate of 1.0 GPH (3,79 lph) per outlet
 - c) Red emitter indicates a flow rate of 2.0 GPH (7,57 lph) per outlet
 - 6) Pressure-compensating over the pressure range of 15 to 50 PSI (1,0 to 3,5 bar) with consistent flow rate of [0.5 GPH (1,89 lph)] or [1.0 GPH (3,79 lph)] or [2.0 GPH (7,57 lph)] GPH over this pressure range

5. Rain Bird 6-outlet Manifold Emission Device

- a. Available model number:
 - 1) EMT-6XERI
- b. 6-outlet Manifold specifications and features include:
 - 1) 1/2" (13 mm) female threaded inlet
 - 2) Six free-flowing outlet ports, barbed to retain 1/4" (6,4 mm) distribution tubing and sealed by manufacturer with durable plastic caps removable with pliers during installation
 - 3) Recommended operating pressure range between 15 to 50 PSI (1,0 to 3,5 bar)

6. Rain Bird Multi-Outlet Xeri-Bird™ 8 Emission Device

- a. Available model numbers:
 - 1) XBD-80: Xeri-Bird™ 8 unit (includes seven removable port plugs) with filter
 - 2) XBD-81: Xeri-Bird™ 8 unit with eight 1 GPH (3,79 lph) Xeri-Bug (XB-10-PC) emitters factory installed and filter
- b. Xeri-Bird™ 8 specifications and features include:
 - 1) 1/2" (13 mm) threaded device inlet with union base nut to allow removal of the Xeri-Bird 8 body from riser for easy installation and maintenance
 - 2) Eight independent ports, each capable of accepting a Rain Bird Xeri-Bug™ emitter or Rain Bird PC Module for independent flows from 0.5 to 24 GPH (1,89 to 90,96 lph), or a self-piercing barb connector (SPB-025) for unrestricted flow
 - 3) Eight barbed outlet ports mounted on bottom of device capable of securely retaining 1/4" (6,4 mm) distribution tubing
 - 4) 200 mesh (75 micron) filter, easily serviceable from top of unit.
 - 5) Capable of being used with retrofit pressure regulator (PRS-050-30) when pressure regulation is required at unit

D. Rain Bird Low Volume Broadcast Irrigation Emission Devices

1. General Information

- a. Provide low-volume broadcast emission devices, manufactured by Rain Bird, to efficiently deliver irrigation water in a short-radius wetting pattern to planting areas as indicated on construction drawings.

2. Rain Bird Xeri-Bubbler™

- a. Available model numbers with 1/4" (6,4 mm) barb inlet:
 - 1) SXB-180-025; half-circle, 5 streams
 - 2) SXB-360-025; full-circle, 8 streams
 - 3) UXB-360-025; full-circle, umbrella
- b. Available model numbers with 10-32 thread inlet:
 - 1) SXB-180-1032; half-circle, 5 streams
 - 2) SXB-360-1032; full-circle, 8 streams
 - 3) UXB-360-1032; full-circle, umbrella
- c. Available model numbers with 5" (12,7 cm) spike inlet:
 - 1) SXB-180-SPYK; half-circle, 5 streams
 - 2) SXB-360-SPYK; full-circle, 8 streams
 - 3) UXB-360-SPYK; full-circle, umbrella
- d. Xeri-Bubbler™ specifications and features include:
 - 1) Three inlet connection options:
 - a) 10-32 self-tapping thread
 - b) 1/4" (6,4 mm) barb
 - c) 5" (12,7 cm) spike

- 2) Three flow pattern options:
 - a) Half-circle with 5 streams
 - b) Full-circle with 8 streams
 - c) Full-circle umbrella pattern
- 3) Flow and radius adjustment capability by turning outer cap
- 4) SXB series features flow range of 0 to 13 GPH (0 to 49,2 lph)
- 5) UXB series features flow range of 0 to 35 GPH (0 to 132,5 lph)
- 6) Operating pressure range between 15 to 30 PSI (1,0 to 2,1 bar)

3. Rain Bird Xeri-Pop™ Micro-Spray

- a. Available model numbers:
 - 1) XP-400X; 4-inch (101,6 mm) pop-up
 - 2) XP-600X; 6-inch (152,4 mm) pop-up
 - 3) XP-1200X; 12-inch (304,8 mm) pop-up
- b. Xeri-Pop™ Micro-Spray specifications and features include:
 - 1) 1/4" (6,4 mm) barb inlet located in base of unit for connection to 1/4" (6,4 mm) distribution tubing
 - 2) Three pop-up height options:
 - a) 4-inch (10,16 cm) pop-up
 - b) 6-inch (15,24 cm) pop-up
 - c) 12-inch (30,5 cm) pop-up
 - 3) Compatible with the following Rain Bird nozzles:
 - a) Multi-port Series nozzles
 - b) 5-series MPR plastic nozzles
 - c) 5-series plastic bubbler nozzle (use in conjunction with Rain Bird PCS-series pressure compensating screen)
 - d) 8-series MPR plastic nozzles
 - 4) External body construction using UV-resistant ABS material
 - 5) Self-flushing, pressure-activated wiper seal
 - 6) Operating pressure range between 20 to 50 PSI (1,4 to 3,5 bar). Optimum performance achieved with 40 PSI (2,8 bar) pressure regulator.

4. Rain Bird Xeri-Sprays™

- a. Available model numbers:
 - 1) XS-090; Quarter-circle, spray pattern
 - 2) XS-180; Half-circle, spray pattern
 - 3) XS-360; Full-circle, stream spray pattern
 - 4) 360 ADJMST; Full-circle spray
- b. Xeri-Spray™ specifications and features include:
 - 1) 10-32 self-tapping threaded inlet
 - 2) Four flow pattern options:
 - a) Quarter-circle spray pattern
 - b) Half-circle spray pattern
 - c) Full-circle spray pattern

- d) Full-circle mister
- 3) Operating pressure range between 10 to 30 PSI (0,75 to 2,1 bar)
- 4) Adjustable flow and radius with integral ball valve
 - a) Flow adjustability between 0 to 31 GPH (0 to 117,3 lph)
 - b) Radius adjustability for full-circle sprays between 0 to 13.4 feet (0 to 4,1 m)
 - c) Radius adjustability for part-circle sprays between 0 to 10.6 feet (0 to 3,2 m)

E. Rain Bird Drip Irrigation Accessories

1. 1/4" (6,4 mm) Barb Transfer Fittings

- a. Available model numbers:
 - 1) XBF1CONN:1/4" (6,4 mm) Barb Connector
 - 2) XBF2EL: 1/4" (6,4 mm) Barb x Barb Elbow
 - 3) XBFTEE: 1/4" (6,4 mm) Barb x Barb Tee
- b. 1/4" (6,4 mm) Barb Transfer Fittings specifications and features include:
 - 1) Three fitting configurations:
 - a) Connector
 - b) Elbow
 - c) Tee
 - 2) Designed for connections of Rain Bird XQ 1/4" (6,4 mm) distribution tubing with an ID of 0.17" (4,3 mm)
 - 3) Barbed on one end to permit easy insertion into any 1/2" (13 mm) or 3/4" (19 mm) polyethylene tubing using a Rain Bird Xeriman® tool (XM-TOOL)
 - 4) Constructed from UV resistant acetyl.
 - 5) Operating pressure range between 0 to 50 PSI (0 to 3.5 bar)

2. Rain Bird Diffuser Bug Cap

- a. Available model numbers:
 - 1) DBC-025 (Black); for potable water source
 - 2) DBC-025-PPL (Purple); for non-potable water source
- b. Diffuser Bug Cap specifications and features include:
 - 1) Barb inlet designed to fit into 1/4" (6,4 mm) distribution tubing with ID of 0.16" (4 mm)
 - 2) Flanged shield designed to diffuse water to minimize soil erosion at emission point
 - 3) Constructed from polyethylene material
 - 4) Operating pressure range between 0 to 50 PSI (0 to 3,5 bar)

PART 3 – EXECUTION

3.01 INSPECTIONS AND REVIEWS

A. Pre-construction Site Inspection

1. Verify construction site conditions and note irregularities affecting work of this section. Report irregularities in writing to Owner's Representative prior to beginning work. Commencement of work implies acceptance of existing site conditions.

B. Utility Locates ("Call Before You Dig")

1. Arrange and coordinate Utility Locates with local authorities prior to construction.
2. Repair underground utilities that are damaged during construction. Make repairs at no additional cost to contract price.

3.02 DRIPLINE LAYOUT OF WORK

A. Stake out dripline irrigation system. Items staked include manifold/header pipe and tubing, sleeves, control zone assemblies, flush valves, air relief valves, and check valves.

B. Dripline Irrigation System Layout Review: Dripline irrigation system layout review will occur after staking has been completed. Notify Owner's Representative one week in advance of review. Modifications will be identified by Owner's Representative at this review.

3.03 DRIPLINE EXCAVATION, TRENCHING, AND BACKFILL

A. Excavate and install pipes at minimum cover indicated in drawings or specifications. Excavate trenches at appropriate width for connections and fittings.

B. Minimum cover for dripline components (distance from top of pipe to finish grade):

1. Buried PVC manifold and supply header pipe to dripline grid layouts: 12" (30,5 cm) to top of pipe.
2. Buried dripline lateral pipe downstream PVC manifold and supply header pipe: 4" (10 cm) to top of pipe
3. On-grade dripline lateral pipe downstream PVC manifold and supply header pipe: Secure to finish grade with approved tubing stakes. Install and test prior to installation of landscape fabric and mulch.

C. Backfill only after buried lines have been reviewed, tested, and approved.

D. Excavated material is generally satisfactory for backfill. Use backfill free from rubbish, vegetable matter, frozen materials, and stones larger than 2" (50 mm) in maximum diameter. Remove material not suitable for backfill. Use backfill free of sharp objects next to pipe.

- E. Dress backfilled areas to original grade. Incorporate excess backfill into existing site grades. Dispose of excess backfill off site.
- F. Contact Owner's Representative for trench depth adjustments where utilities conflict with irrigation trenching and pipe work.

3.04 ASSEMBLING PIPE AND FITTINGS

A. General:

- 1. Keep pipe free from dirt and debris. Cut pipe ends square, debur and clean as recommended by pipe manufacturer.
- 2. Keep ends of assembled pipe capped. Remove caps only when necessary to continue assembly.

B. PVC Pipe and Fittings:

- 1. Use only strap-type friction wrenches for threaded plastic pipe.
- 2. PVC Solvent Weld Pipe and Fittings:
 - a. Use appropriate primer and solvent cement. Join pipe in manner recommended by pipe and fitting manufacturers and in accordance with accepted industry practices.
 - b. Cure for thirty (30) minutes before handling and twenty-four (24) hours before pressurizing or installing with vibratory plow.
 - c. Snake pipe from side to side within trench.
- 3. PVC Threaded Connections:
 - a. Use only factory-formed threads. Field-cut threads are not permitted.
 - b. Apply thread sealant in manner recommended by component, pipe and sealant manufacturers and in accordance with accepted industry practices.

C. Dripline Tubing and Fittings:

1. Use only Rain Bird XF-Series Insert Fittings or Rain Bird Easy Fit Compression Fittings for Rain Bird XF-Series dripline tubing connections or transitions as recommended by the Manufacturer's representative for the specific site and system conditions.
2. Dripline Insert Fittings:
 - a. Install dripline tubing and fittings in manner recommended by manufacturer and in accordance with accepted industry practices.
3. Dripline Compression Fittings:
 - a. Install dripline tubing and fittings in manner recommended by manufacturer and in accordance with accepted industry practices.

3.05 INSTALLATION OF DRIPLINE IRRIGATION COMPONENTS

A. Control Zone Kit Assembly:

1. Flush mainline pipe before installing Control Zone Kit assembly.
2. Locate where shown on drawings. Connect control wires to remote control valve wires using specified wire connectors and waterproof sealant. Provide connectors and sealant per manufacturer's recommendations.
3. Install a maximum of four (4) Low Flow or Medium Flow Control Zone Kits per standard rectangular valve box. Install a maximum of one (1) Medium Flow Commercial Control Zone Kits per standard rectangular valve box. Install a maximum of one High Flow Commercial Control Zone Kits per jumbo rectangular valve box.
 - a. Locate valve boxes at least 12" (30,5 cm) from, and align with, nearby walls or edges of paved areas.
 - b. Group Control Zone Kit assemblies together where practical. Align grouped valve boxes in uniform patterns. Allow at least 12" (30,5 cm) between valve boxes.
 - c. Brand controller letter and station numbers on valve box lid in 2" (50 mm) high letters.

B. Lateral Piping and Dripline Tubing:

1. Install lateral piping and dripline tubing at locations and in grid patterns as indicated on drawings and installation details, and in strict accordance with manufacturer recommendations.
2. Thoroughly flush PVC lateral piping, supply headers, and dripline tubing immediately upon installation.

C. Air Relief Valve Kit Assembly: Install at all high points in dripline tubing grid as shown and directed on drawings and installation details.

D. Flush Point Assembly: Install in flush header or at ends of each dripline zone segment as shown and directed on drawings and installation details. Install at least 12-inches from and align with adjacent walls or edges of paved areas.

3.06 PROJECT RECORD (AS-BUILT) DRAWINGS

A. Document field changes from original design and construction documents. Maintain on-site and separate from original construction documents, one complete set of documents labeled "Project Field Documents". Keep documents current. Do not permanently cover work until accurate "as-built" information is recorded.

B. Record pipe network alterations on a daily basis. Record work that is installed differently than shown on construction documents. Record accurate reference dimensions, measured from at least two permanent reference points, of each control zone kit assembly, each dripline zone boundary, each air relief valve assembly, each flush point assembly, and other dripline irrigation components enclosed within valve box.

C. Obtain from Owner's Representative one set of reproducible Mylar drawings or CAD files prior to construction completion. Duplicate information contained on "Project Field Documents" maintained on-site using technical drafting pen or AutoCAD. Label each sheet "Record Drawing".

D. Provide "Record Drawings" to Owner's Representative. Completion of Record Drawings is required prior to final construction review at completion of irrigation system installation.

3.07 WINTERIZATION AND SPRING START-UP

A. Winterize irrigation system in fall following completion, or partial completion, of irrigation system construction. Start-up irrigation system in spring following completion, or partial completion, of irrigation system construction. Repair any damage caused in improper winterization at no additional cost to Owner. Coordinate winterization and start-up with landscape maintenance personnel.

3.08 MAINTENANCE

A. Maintain irrigation system for duration of 30 calendar days from formal written acceptance by Owner's Representative. Make periodic examinations and adjustments to irrigation system components in order to achieve the most efficient and uniform application of water.

- B. Following completion of Contractor's maintenance period, Owner will be responsible for maintaining system in working order during remainder of guarantee/warranty period, for performing necessary minor maintenance, for protecting against vandalism, and for preventing damage after landscape maintenance operation.

3.09 CLEANUP

- A. Remove from site machinery, tools, excess materials, and rubbish upon completion of work.

Fire Extinguishers and Cabinets

Quality Assurance

1. Provide fire extinguishers complying with Fire Protection Association (NFPA) Pamphlet No. 10.
2. Provide only new portable fire extinguishers fully loaded, tested and approved by Underwriter's Laboratories (UL), and ready for use.

Products

1. Acceptable Manufacturers
 - a. Portable Fire Extinguishers
 - i. AMEREX CORP.
 - ii. ANSUL INC.
 - iii. BUCKEYE FIRE EQUIPMENT COMPANY
 - iv. WALTER KIDDE, THE FIRE EXTINGUISHER CO.
 - v. J. L. INDUSTRIES
 - vi. LARSEN' S MANUFACTURING COMPANY
 - vii. POTTER-ROEMER
 - viii. WATROUS
 - b. Fire Extinguisher Cabinets
 - i. J.L. INDUSTRIES
 - ii. LARSEN' S MANUFACTURING COMPANY
 - iii. POTTER-ROEMER
 - iv. WATROUS
 - v. THE WILLIAMS BROTHERS CORP.
 - c. Where a specific manufacturer's product is specified herein it is to establish a level of quality. Products by the other manufacturers listed are acceptable providing they meet these specifications.
2. Fire Extinguishers
 - a. Multipurpose Dry-Chemical Type: Fabricate in accordance with NFPA No.10, 10A, and 10L and UL Standards, except hose, gauge face cover, and horn cone parts shall be metal. No plastic or nylon valves, trigger/handle, casing, or gauge will be acceptable.

frames. Fabricate trim in one piece with corners mitered, welded and ground smooth. Open miters are not acceptable.

Installation

1. Install fire extinguishers and fire extinguisher cabinets where indicated or as directed by Architect in accordance with manufacturer's recommendations. Mount at heights indicated, when not indicated as directed by Architect.
2. Securely anchor brackets and cabinets to substrate construction with toggle bolts or expansion anchors. Lead, wood or plastic plugs and fasteners are not acceptable.
3. Fire extinguishers are to be fully charged and ready for use when building is turned over to the Owner. Extinguishers shall be certified as fully charged by an approved fire extinguisher service company and shall be tagged or labeled as such.

Adjusting, Cleaning, and Protection

1. Adjust cabinet doors that do not swing or operate freely.
2. Refinish or replace cabinets and doors damaged during installation.
3. Provide final protection and maintain conditions that ensure that cabinets and doors are without damage or deterioration at the time of Substantial Completion.

Projection Screens

General

1. Work Included:
 - a. Provide motor operated, above ceiling mount front projection screen complete with all controls, mounting brackets and hardware.
2. Product Delivery, Storage, and Handling
 - a. Deliver items in manufacturer's original protective packaging.
 - b. Store items in original packaging to prevent soiling and physical damage.
 - c. Handle so as to prevent damage to finished surface.

Products (Projection Screens)

1. Motor Operated Projection Screen
 - a. Type: Motor operated, remote controlled, recessed ceiling mounted.
 - b. Screen: Flame retardant and mildew resistant, mat white with black masking borders. Vertical seams permitted at minimum 6' on center. HDTV 16:9 format.
 - i. Provide extra drop length of dimension indicated to comply with the following requirements for fabric color and location of drop length:
 1. Color: Black.
 2. Location: At top of screen.

3. Provide drop length as required for bottom of screen to be set 3' above floor. Coordinate each screen with ceiling/screen mounting height
- c. Sizes: As indicated on schedule contained herein.
- d. Doors: Independently motorized. Field finished to match ceiling.
- e. Motor: 3-wire quick reversal type; ball bearing with automatic overload cutoff and integral interlocking gears.
 - i. Power: 115V, 60 Hz, 3.5 amp.
 - ii. Controls: Key operated 3-position switch ("UP", "OFF", "DOWN").
 - iii. Provide with pre-set but accessible limit switches to automatically stop screen fabric in the up and down position. Provide positive stop action.
- f. Case: Extruded aluminum back, top and front with stamped steel end caps.
- g. Mounting Brackets: Provide ceiling mount type brackets of quantity as required by manufacturer.
- h. Manufacturer: Signature Series V Motorized Screen with M1300 Viewing Surface by DRAPER or equal by DA-LITE SCREEN COMPANY, BRETTFORD/KNOX MANUFACTURING.

Execution

1. Installation
 - a. A. Install screens in neat, plumb, true alignment in locations indicated on drawings and as detailed. Comply with written installation instructions of screen manufacturer.
 - b. Coordinate above ceiling mount with ceiling grid layout.

Television Mounting Brackets

General

1. Work Included:
 - a. Provide flat screen television wall mount and ceiling mount type brackets complete with all accessories.
2. Product Delivery, Storage, and Handling
 - a. Deliver items in manufacturer's original protective packaging.
 - b. Store items in original packaging to prevent physical damage.
 - c. Handle so as to prevent damage to finished surface.

Products

1. Manufacturers
 - a. Subject to compliance with the specified requirements, products manufactured by BRETTFORD MANUFACTURING, LUCASEY, OMNI MOUNT, PEERLESS INDUSTRIES, INC. or PREMIER MOUNTS is acceptable.
2. Mounting Brackets

- a. Wall Mount Type: Fixed height, tilting.
 - i. Television Size Range: 37” and larger.
 - ii. Double bracket style with universal mounting arms.
 - iii. Load Capacity: 160 pounds.
 - iv. Tilt mechanism: Steel rectangular tilting frame with 2 steel angles spaced at 16 inches.
 - 1. Equip mechanism with mating bracket to accept plate of monitor bracket.
 - 2. Finish: Matt black, powder coat.
 - 3. Tilt Adjustment Capability: 10 degrees.
- b. Ceiling Mount Type: Unit consists of support column anchored to ceiling and adjustable, tilting, rotating mechanism with display attachment bracket.
 - i. Components
 - 1. Support column: Extruded aluminum tubular section or steel pipe with matt black powder coat finish. Column anchored at ceiling with steel plate.
 - 2. Tilt mechanism: Steel rectangular frame with matt black powder coat finish attached to column and equipped with mating brackets to accept keystone plates of monitor brackets.
 - ii. Television Size Range: 37” and larger.
 - iii. Adjustable ceiling mount with extension range of 37” to 60” . Provide with universal mounting bracket.
 - iv. Tilt: 25 degrees.
 - v. Rotation: 360 degrees.
 - vi. Maximum Load Capacity: 66 pounds.
- c. Provide all hardware for assembly and attachment of the bracket to various substrates indicated.
- d. Coordinate mounting of ceiling units with required overhead mounting steel and brackets.

Execution

- 1. Examination and Preparation
 - a. Examine areas and substrates to receive mounting brackets.
 - b. Do not proceed with installation until substrates have been properly prepared and deviations from the manufacturer's recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 - c. Commencement of installation constitutes acceptance of conditions.
- 2. Installation
 - a. In accordance with manufacturer's instructions.

- b. Verify that wood blocking has been provided in stud/gypsum board walls. Blocking to be located at mounting hardware.
 - c. Coordinate placement of miscellaneous steel above ceiling for connection to building framing members.
 - d. Clean-up: Remove all cartons, debris, scraps, etc. and leave spaces clean and have brackets ready to use.
3. Protection
- a. Protect installed products until completion of project.
 - b. Touch-up, repair or replace damaged products before Contract Completion.

Flagpoles

- Suggested Manufacturers:
 - The Baartol Company, Inc.: www.baartol.com
 - Pole-Tech Company, Inc.: www.poletech.com
- Pole Design: Cone tapered
 - Pole: Stainless Steel; ASTM 3212 TP04 grade
 - Mounting: Wall mounted type, 30 degrees inclusive angle outrigger
 - Outside Butt Diameter: 4 inches
 - Outside Tip Diameter: 1-3/4 inches
 - Nominal Wall Thickness: 0.125 inches
 - Halyard: Interior Type
- Performance Requirements:
 - Flagpole with Flag Flying: Resistant without permanent deformation to 95 miles/hour wind velocity; non-resonant safety design factor of 2.5Cybex Leg Press
- Accessories:
 - Finial Ball: Aluminum, 6 inch diameter
 - Truck Assembly: Stainless steel, revolving, stainless steel ball bearings, non-fouling
- Flags:
 - United States of America and District of Columbia design, 48 x 72 inch size, weather and UV-resistant fabric, brass grommets, hemmed edges
- Operators:
 - Motor: NEMA, MG 1
 - Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.
 - Disconnect Switch: Factory mount disconnect switch in control panel
- Mounting Components:
 - Wall Support Assembly: Stainless steel; round: one-piece assembly, back-plate for through bolting with galvanized steel anchor bolts and cover
 - Lightning Ground Rod: 18 inch long copper rod, 3/4 inch diameter
 - Lighting Ground Cable: Copper No. 6 AWG, soft drawn

IT Server Room

- Typically 100 SF

- Should be 10' x 10' per OCTO
- Storage racks per OCTO requirements
- SC flooring with CRB base
- Should have separate air conditioning to keep room cool

Janitor's Closet

- Typically 65-70 SF
- Epoxy flooring with EBC base
- EST ceiling
- Mop sink

Elevators

- Please use one of the following Elevator Companies: Quality Elevator Company, Delaware Elevator Company, Elevator Control Service, and Minnesota Elevator, Inc. DGS is able to repair and maintain the elevators much more efficiently. We will also be able to keep items in stock and use the parts on various elevators.
- Please do not use the following elevator companies: Otis Elevator, KONE Elevator Company, Schindler Elevator and ThyssenKrupp Elevators as they are proprietary, have given DGS problems and seem to be overly expensive and difficult to maintain.

Keying

- Best System's Cormax by Stanley Security
- Keying should be on H Keyway; Biting Codes provided by DGS Locksmith Melvin Bates.

Lobby & Reception

Purpose	Users	Activities
	-Typically contains at least one staff member and computer	
Space requirements		
Spatial relationships		
Finishes	Building system requirements	Furniture & Equipment
-Carpet mats needed if flooring is exposed concrete	Mechanical: Plumbing:	-Drinking Fountain (Halsey Taylor Bi-Level HAC Cooler with Hydroboost Bottle Filler, Model HTHB-HAC8BLWF & HTHB-HACDBLWF)
Doors & windows	Electrical & lightning:	Special considerations
	Technology:	<ul style="list-style-type: none"> - Should contain signage stating name of facility (previously approved by DPR Communications) -Should contain Dedication Plaque (previously approved by DPR Communications), 18"x 24" Dark Walnut Wood Plaque, Brushed Silver Face, Laser Engraved Black Text. Dedicated plaque should be approved by DPR Communications before being ordered. -Should contain DPR CAPRA Banner - Should contain Framed Fire Evacuation Plan

Staff office

Purpose	Users	Activities
	-Typically contains at least one staff member and computer	
Space requirements		
-Typically 125-150 SF		
Spatial relationships		
Finishes	Building system requirements	Furniture & Equipment
	Mechanical: Plumbing:	
Doors & windows	Electrical & lightning:	Special considerations
-Should have a window facing the main public entrance	Technology:	

Outdoor spaces

DPR creates exterior open space that encourages interaction with the environment, social interaction, passive recreation, and physical activities.

Tennis court

Basketball Court

Playground

Outdoor pool

Skate Park

Spray Park

Outdoor Fitness

Dog Park

Walking path / Track

Include Dropbox Information

Bicycle Storage and Shower Rooms

Bicycle storage must be within 100 feet (30 meters) walking distance of any main entrance.

Exterior Lighting

General

1. Summary
 - a. Section Includes:
 - i. Exterior luminaires with lamps and ballasts.
 - ii. Luminaire-mounted photoelectric relays.
 - iii. Poles and accessories.
 - b. Definitions
 - i. CCT: Correlated color temperature.
 - ii. CRI: Color-rendering index.
 - iii. HID: High-intensity discharge.
 - iv. LER: Luminaire efficacy rating.
 - v. Luminaire: Complete lighting fixture, including ballast housing if provided.
 - vi. Pole: Luminaire support structure, including tower used for large area illumination.
 - vii. Standard: Same definition as "Pole" above.
 - c. Structural Analysis Criteria for Pole Selection

- i. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied as stated in AASHTO LTS-4-M.
- ii. Live Load: Single load of 500 lbf, distributed as stated in AASHTO LTS-4-M.
- iii. Ice Load: Load of 3 lbf/sq. ft., applied as stated in AASHTO LTS-4-M Ice Load Map.
- iv. Wind Load: Pressure of wind on pole and luminaire and banners and banner arms, calculated and applied as stated in AASHTO LTS-4-M.
 - 1. Basic wind speed for calculating wind load for poles exceeding 49.2 feet in height is 100 mph.
 - a. Wind Importance Factor: 1.0.
 - b. Minimum Design Life: 50 years.
 - c. Velocity Conversion Factors: 1.0.
 - 2. Basic wind speed for calculating wind load for poles 50 feet high or less is 90 mph.
 - a. Wind Importance Factor: 1.0.
 - b. Minimum Design Life: 25 years.
 - c. Velocity Conversion Factors: 1.0.
- d. Quality Assurance
 - i. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.
 - ii. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - iii. Comply with IEEE C2, "National Electrical Safety Code."
 - iv. Comply with NFPA 70.
 - v. Contractor shall patch all holes, cracks, and potential light leaks so that sheet rock ceilings have a seamless and smooth transition from ceiling to fixture trim and/or housing.
 - vi. Contractor shall replace blemished, damaged, or unsatisfactory fixtures as directed by the Owner's representative.
 - vii. Fixture manufacturer(s) shall coordinate conduit entry locations with installing contractor.
- e. Delivery, Storage, and Handling
 - i. Package aluminum poles for shipping according to ASTM B 660.
 - ii. Store poles on decay-resistant-treated skids at least 12 inches above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.
 - iii. Retain factory-applied pole wrappings on metal poles until right before pole installation. For poles with nonmetallic finishes, handle with web fabric straps.
- f. Warranty

- i. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.
 - 1. Warranty Period for Luminaires: Five years from date of Substantial Completion.
 - 2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.
 - 3. Warranty Period for Color Retention: Five years from date of Substantial Completion.
 - 4. Warranty Period for Poles: Repair or replace lighting poles and standards that fail in finish, materials, and workmanship within manufacturer's standard warranty period, but not less than three years from date of Substantial Completion.
- ii. Warranty on LED luminaires and lamps: Manufacturer to provide 5 year minimum warranty, with extended warranty option.

Products

- 1. Manufacturers
 - a. Products: Subject to compliance with requirements, provide one of the products indicated on Drawings.
- 2. General Requirements for Luminaires
 - a. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.
 - i. LER Tests Incandescent Fixtures.
 - ii. LER Tests Fluorescent Fixtures.
 - iii. LER Tests HID Fixtures..
 - b. Lateral Light Distribution Patterns: Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.
 - c. Metal Parts: Free of burrs and sharp corners and edges.
 - d. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.
 - e. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.
 - f. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be

removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

- g. Exposed Hardware Material: Stainless steel.
 - h. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - i. Light Shields: Metal baffles, factory installed.
 - j. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
 - i. White Surfaces: 85 percent.
 - ii. Specular Surfaces: 83 percent.
 - iii. Diffusing Specular Surfaces: 75 percent.
 - k. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.
 - l. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - i. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
 - ii. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
 - 1. Color: As selected by Architect from manufacturer's full range.
 - m. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
 - i. Label shall include the following lamp and ballast characteristics:
 - 1. "USES ONLY" and include specific lamp type.
 - 2. Lamp diameter code (T-4, T-5, T-8, T-12), tube configuration (twin, quad, triple), base type, and nominal wattage for fluorescent and compact fluorescent luminaires.
 - 3. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.
 - 4. Start type (preheat, rapid start, instant start) for fluorescent and compact fluorescent luminaires.
 - 5. ANSI ballast type (M98, M57, etc.) for HID luminaires.
 - 6. CCT and CRI for all luminaires.
3. Luminaire-Mounted Photoelectric Relays
- a. Comply with UL 773 or UL 773A.

- b. Contact Relays: Factory mounted, single throw, designed to fail in the on position, and factory set to turn light unit on at 1.5 to 3 fc and off at 4.5 to 10 fc with 15-second minimum time delay Relay shall have directional lens in front of photocell to prevent artificial light sources from causing false turnoff.
 - i. Relay with locking-type receptacle shall comply with ANSI C136.10.
 - ii. Adjustable window slide for adjusting on-off set points.
4. LED Lamps
- a. LED modules shall be field serviceable from below in non-accessible ceilings. LED's shall be RoHS compliant, 85 CRI (minimum), with a maximum of 2.5 step McAdam ellipse color consistency. LED data shall be tested in compliance with IESNA LM-70, LM-80 and TM-21 protocol. Lamp life shall be 50,000 hours (minimum) at L70. Intended LED current (mA) and driver shall be fully compatible, as stated so by both manufacturers.
5. Power Supplies (Drivers) for LED Lamps
- a. Electronic power supply/driver for LED luminaires and lamps: Include the following features unless otherwise indicated:
 - i. Driver shall be constant current type.
 - ii. 0-10v dimming
 - iii. UL Class 2 designed for use with any 12v or 24v UL class 2 devices
 - iv. Operating Ambient Temperature -40 to 150 deg F.
 - v. Sound Rating: Class A
 - vi. DC control voltage shall have maximum peak to peak ripple of 10% VDC. Short-term transient voltage of control devices must not exceed 14 volts.
 - b. LED power supply/driver manufacturer shall state compatibility with submitted lighting control system, and areas where intended operation and lifetime may be impacted.
6. General Requirements for Poles and Support Components
- a. Structural Characteristics: Comply with AASHTO LTS-4-M.
 - b. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts unless otherwise indicated.
 - c. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.
 - i. Materials: Shall not cause galvanic action at contact points.
 - ii. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication unless otherwise indicated.
 - iii. Anchor-Bolt Template: Plywood or steel.
 - d. Handhole: Oval-shaped, with minimum clear opening of 2-1/2 by 5 inches, with cover secured by stainless-steel captive screws.
 - e. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange.
 - f. Power-Installed Screw Foundations: Factory fabricated by pole manufacturer, with structural steel complying with ASTM A 36/A 36M and hot-dip galvanized according to ASTM A 123/A 123M; and with top-plate and mounting bolts to match pole base flange and strength required to support pole, luminaire, and accessories.

- g. Breakaway Supports: Frangible breakaway supports, tested by an independent testing agency acceptable to authorities having jurisdiction, according to AASHTO LTS-4-M.
7. Steel Poles
- a. Poles: Comply with ASTM A 500, Grade B, carbon steel with a minimum yield of 46,000 psig; one-piece construction up to 40 feet in height with access handhole in pole wall.
 - i. Shape: Round, tapered.
 - ii. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.
 - b. Steel Mast Arms: Single-arm type, continuously welded to pole attachment plate. Material and finish same as pole.
 - c. Brackets for Luminaires: Detachable, cantilever, without underbrace.
 - i. Adapter fitting welded to pole, allowing the bracket to be bolted to the pole mounted adapter, then bolted together with stainless-steel bolts.
 - ii. Cross Section: Tapered oval, with straight tubular end section to accommodate luminaire.
 - iii. Match pole material and finish.
 - d. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top.
 - e. Steps: Fixed steel, with nonslip treads, positioned for 15-inch vertical spacing, alternating on opposite sides of pole; first step at elevation 10 feet above finished grade.
 - f. Grounding and Bonding Lugs: Welded 1/2-inch threaded lug, complying with requirements in other sections, listed for attaching grounding and bonding conductors of type and size listed in that Section, and accessible through handhole.
 - g. Cable Support Grip: Wire-mesh type with rotating attachment eye, sized for diameter of cable and rated for a minimum load equal to weight of supported cable times a 5.0 safety factor.
 - h. Platform for Lamp and Ballast Servicing: Factory fabricated of steel with finish matching that of pole.
 - i. Factory-Painted Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - i. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or with SSPC-SP 8, "Pickling."
 - ii. Interior Surfaces of Pole: One coat of bituminous paint, or otherwise treat for equal corrosion protection.
 - iii. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
 - 1. Color: As selected by Architect from manufacturer's full range.

8. Pole Accessories

- a. Duplex Receptacle: 120 V, 20 A in a weatherproof assembly complying with requirements in other sections for ground-fault circuit-interrupter type.
 - i. Recessed, 12 inches above finished grade.
 - ii. Nonmetallic polycarbonate plastic or reinforced fiberglass, weatherproof in use, cover, that when mounted results in NEMA 250, Type 4X enclosure.
 - iii. With cord opening.
 - iv. With lockable hasp and latch that complies with OSHA lockout and tag-out requirements.
- b. Minimum 1800-W transformer, protected by replaceable fuses, mounted behind access cover.
- c. Base Covers: Manufacturers' standard metal units, arranged to cover pole's mounting bolts and nuts. Finish same as pole.
- d. Transformer Type Base: Same material and color as pole. Coordinate dimensions to suit pole's base flange and accept indicated accessories.

Execution

1. Luminaire Installation

- a. Install lamps in each luminaire.
- b. Fasten luminaire to indicated structural supports.
 - i. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.
- c. Adjust luminaires that require field adjustment or aiming Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

2. Pole Installation

- a. Alignment: Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole.
- b. Clearances: Maintain the following minimum horizontal distances of poles from surface and underground features unless otherwise indicated on Drawings:
 - i. Fire Hydrants and Storm Drainage Piping: 60 inches.
 - ii. Water, Gas, Electric, Communication, and Sewer Lines: 10 feet.
 - iii. Trees: 15 feet from tree trunk.
- c. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in other sections.
- d. Raise and set poles using web fabric slings (not chain or cable).

3. Bollard Luminaire Installation

- a. Align units for optimum directional alignment of light distribution.
- b. Install on concrete base with top 4 inches above finished grade or surface at bollard location. Cast conduit into base, and shape base to match shape of bollard base. Finish

by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in other sections.

4. Corrosion Prevention
 - a. Steel Conduits: Comply with Requirements in other sections. In concrete foundations, wrap conduit with 0.010-inch-thick, pipe-wrapping plastic tape applied with a 50 percent overlap.
5. Grounding
 - a. Ground metal poles and support structures according to requirements in other sections.
 - i. Install grounding electrode for each pole unless otherwise indicated.
 - ii. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.
6. Field Quality Control
 - a. Inspect each installed fixture for damage. Replace damaged fixtures and components.
 - b. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.
 - i. Verify operation of photoelectric controls.
 - c. Illumination Tests:
 - i. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IESNA testing guide(s):
 1. IESNA LM-5, "Photometric Measurements of Area and Sports Lighting Installations."
 2. IESNA LM-50, "Photometric Measurements of Roadway Lighting Installations."
 3. IESNA LM-52, "Photometric Measurements of Roadway Sign Installations."
 4. IESNA LM-64, "Photometric Measurements of Parking Areas."
 5. IESNA LM-72, "Directional Positioning of Photometric Data."
 - d. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

Landscaping

DPR creates exterior open space that encourages interaction with the environment, social interaction, passive recreation, and physical activities.

Soils

We used to use a 50/50 or 70/30 topsoil to compost mix but we found that the compost just disappears every year and we have to buy a lot more. Lately we've been ordering 100% sifted topsoil (no backfill and completely free of trash and debris). Some places call it garden soil. And we add a few bags of compost. We're shooting for 90/10 garden top soil to compost. Let me know if you need more detail specs.

Seeding and Sodding

Materials

A. Lawn seed: Fresh, clean, and new crop seed mixture.

1. Submit seed vendor's certification for required grass seed mixture, indicating percentage by weight, and percentages of purity, germination, and weed seed for each grass species.
2. Seed shall be mixed by an approved method.
3. The seeding varieties must conform to the Virginia Crop Improvement Association (VCIA) for 2005-06 turf grass mixtures in the Virginia Sod Certification Program. All seed must be certified and meet minimum quality standards prescribed by the VCIA.
4. Composed of the following varieties, mixed to the specified proportions by weight and tested to minimum percentages of purity and germination. To be free of Poa annua, bent grass, and noxious weed seed free.

Blend: 80% Tall Fescue - Category 1

20% Kentucky Blue grass - Category 1

RATE: Tall Fescue - 220 lbs per acre

Kentucky Bluegrass - 40 lbs per acre

We used to use a 50/50 or 70/30 topsoil to compost mix but we found that the compost just disappears every year and we have to buy a lot more. Lately we've been ordering 100% sifted topsoil (no backfill and completely free of trash and debris). Some places call it garden soil. And we add a few bags of compost. We're shooting for 90/10 garden top soil to compost. Let me know if you need more detail specs.

Security

- Color mini-dome cameras (locations TBD by DGS PSD)
- CCTV Client viewing stations
- Card Reader Doors
- Glass Break Detectors
- 360 Degree Motion Detectors
- Burglar Alarm Sirens
- Rs2 E-Burg License
- DMP XR550 Burglar Alarm Panel
- Camera Power Supply (Altronix ALTV1224C)
- Milestone Husky Network Video Recorder "NVR" M50-Series 16 Channels (to include equipment rack, monitor, rack rails, rack mounted UPS and rack mount KM)
- Control Panel Site (EP-1502 Controller, NCL8-SPW Enclosure, LIN-PS Power Supply)
- All exit doors (besides main entrance) should have panic bars that activate alarm to prevent theft and access in and out of facility other than main entrance.

Signage

- Each room should have occupancy limits (posted on exterior of the room)
- Each room should have signage indicating the name of the room (posted on exterior of room). If a sign is placed on glass, please provide a second sign on the other side of glass to hide glue or other adhesives.
- Signage should be placed on the latch side of door
- Signage should be 1/8" thick, precision cut brushed aluminum, laminated onto black PVC backer with DF tape and silicon to wall.
- Signage lettering should be 1" high, raised; Text should be 5/8"
- Center of door signage should be mounted 4' -6" from FFE and 10" from side of door to center of raised lettering

General

- Each new facility should be "generator ready"
- All windows should have film or shades to reduce glare
- Rooftops should include solar panels OR be "solar ready"

Lighting

- As few different fixtures as possible for ease of maintenance
- LED, Motion-Sensored

Systems

TBD