TECHNICAL SPECIFICATIONS
FOR
MOORPARK COLLEGE ADMINISTRATION BUILDING RENOVATION

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

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DIVISION 1 – GENERAL REQUIREMENTS

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SECTION 07 7100

ROOF SPECIALTIES

1

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Roof hatches.
2. Acoustical smoke vents.
3. Gravity ventilators.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 05 5000 – Metal Fabrications.
3. Section 07 5113 – Cold Applied Bitunious Roofing.
4. Section 07 6000 - Flashing and Sheet Metal.

1.02 SUBMITTALS

A. Shop Drawings: Submit for fabricated sheet metal indicating details, methods of joining, anchoring and fastening, thicknesses and gauges of metals, concealed reinforcement, sections, and profiles.

B. Samples: Submit Samples for materials or assemblies as requested. Provide finish Samples of exposed items.

C. Product Data: Submit brochures of manufactured items.

D. Installation Instructions: Provide manufacturer's recommended installation methods and instructions for each item. Instructions shall be prepared to indicate exact conditions of roofing, structure and adjoining construction.

1.03 QUALITY ASSURANCE

A. Drawings and requirements specified govern. Provide the Work in accordance with the Architectural Sheet Metal Manual published by SMACNA for conditions not indicated or specified and for general fabrication of sheet metal items.

B. Qualifications of Installer: Minimum 5 years experience in successfully installing the same or similar sheet metal specialties on roofing systems similar to the roofing systems specified.

C. Coordinate opening sizes and installation with roofing and related Work to ensure fit and installation.

D. Pre-installation Meetings: Refer to Division 07 roofing sections as appropriate. Attend the pre-installation and inspection meetings for roofing Work.

1.04 DELIVERY, STORAGE AND HANDLING

A. Protect roof specialties and accessories by storing above grade on required skids or supports. Protect from physical damage and do not install bent or damaged materials.

PART 2 - PRODUCTS

2.01 ROOF HATCHES

A. Manufacturers:

1. Nystrom / Babcock Davis.

2. Bilco Company.

3. Lane-aire Model CRH.

4. Milcor Inc.

5. Equal.

B. Provide roof hatches of indicated sizes. Hatches shall be fabricated of galvanized steel, 14 gage curb and cover, 22 gage cover liner, and 1 inch thick insulation in cover and curb. Cover shall operate by a compression spring enclosed in a telescopic case or enclosed torsion spring, with automatic hold-open arm. Provide padlock hasp on inside of unit. Include the following accessories:

1. Fixed hatch railing system, providing a permanent means of fall protection for roof hatch openings. Rail system shall meet OSHA Standard 29 CFR 1910.23(a)(3).

2. Ladder extensions. Bilco Model 1, "LadderUP Safety Post," Maxam Metal Products, "Spring Balance Safety Post", or equal, on fixed ladders below roof hatches. Device shall be manufactured of high strength steel with telescoping tubular section that locks automatically when fully extended. Upward and downward movement shall be controlled by a stainless steel spring balancing mechanism. Finish shall be hot dip galvanized. Unit shall be completely assembled with fasteners for securing to the ladder rungs in accordance with the manufacturer's instructions.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrate to receive roofing accessories and associated Work and conditions under which accessories will be installed. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install roof accessories in accordance with SMACNA and manufacturer's recommendations as required.

3.03 FIELD QUALITY CONTROL

A. Upon request of the Project Inspector, perform field water testing to demonstrate that installation is watertight. Continue testing with a continuous hose stream applied at base of installation for at least 30 minutes. If leaking is observed, discontinue test and repair installation, then test until satisfactory results are obtained.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.05 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 09 6518 1

RUBBER FLOOR COVERING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Rubber sheet flooring.

B. Related Requirements:

1. Division 01 - General Requirements.

2. Section 09 6513 - Rubber Base.

1.02 DEFINITIONS

A. Pop-up: A pop-up is defined as any surface deviation or looseness of substrate that is equal to or greater than 1/64 (0.015625) inch above the concrete floor level, regardless of the size.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer’s published technical data describing materials, construction, and recommended installation procedures Submit technical data and installation instructions for each adhesive material. Submit list and Product Data of recommended finish materials.

B. Maintenance Instructions: Submit manufacturer’s recommendations for maintenance, care, cleaning of rubber tile.

C. Samples: Submit Samples of rubber sheet flooring in each available color and pattern. Following color selections, submit full size Samples of each selected color and pattern. Submit pint cans of each type of adhesive.

D. Maintenance Materials: Before Substantial Completion, deliver one unopened container of each color and pattern of rubber sheet flooring in each color and pattern installed. Label each container indicating locations installed. Include unopened cans of adhesives adequate to install the maintenance materials.

E. Installer’s Experience Qualifications: Submit list of not less than five projects, extending over period of not less than five years, indicating installer’s experience record. Submit letter from manufacturer indicating manufacturer's approval for installer of the products.

1.04 QUALITY ASSURANCE

A. Qualifications of Installer: Minimum five years experience in successfully installing the same or similar flooring materials.

B. Comply with the following as a minimum requirement:

C. ASTM E84: Class A Flame Spread Rating of 25 or less.

D. Comply with current CHPS Collaborative for High Performance Schools California requirements, www.chps.net.

E. Chemically based products such as sealers, primers, fillers, adhesives, etcetera must be compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health's current standard for the Testing and Evaluation.

F. Moisture Testing: ASTM F1869.

1.05 DELIVERY, STORAGE AND HANDLING

A. Materials shall be delivered to the Project site in original unopened manufacturer's packaging clearly labeled with manufacturer's name. Materials shall be stored at not less than 70 degrees F for not less than 48 hours before installation.

1.06 PROJECT CONDITIONS

A. Ventilation and Temperature: Verify areas that are to receive new flooring are ventilated to remove fumes from installation materials, and areas are within temperature range recommended by the various material manufactures for Project site installation conditions.

1.07 WARRANTY

A. The manufacturer shall provide a fifteen-year limited wear warranty.

B. The installer shall provide a two-year fabrication and installation warranty.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Nora by Interface. Basis-of-Design: nora systems, Inc., 9 Northeastern Blvd., Salem, NH 03079; telephone 800-332-NORA or 603-894-1021; fax 603-894-6615.

B. Johnsonite.

C. Flexco Corporation.

D. Roppe Corporation.

E. Equal.

2.02 MATERIALS

A. Nora environcare 2.0mm, Article 1462, ASTM F1859 Standard specification for Rubber Sheet Flooring Covering without Backing, Type 1.

B. Material, nora vulcanized rubber compound 913 with environmentally compatible color pigments that are free of toxic heavy metals like lead, cadmium, or mercury.

C. Composition, homogeneous rubber compound with a random scatter design. The back of sheet is double-sanded smooth.

D. Material dimension (ASTM 1859) is 49.21 feet by 48 inches (15m by 1.22m), greater or equal to amount specified.

E. Flammability (E648/NFPA 253): NBSIR 75 950, 0.97.

F. Smoke Density (ASTM E662/NFPA 258) NBS, 196 (flaming) and 207 (non-flaming).

G. Burn Resistance, resistant to cigarette and solder burns.

H. Slip Resistance (ASTM D2047), static coefficient of friction, Neolite dry 0.93, Neolite we 0.90. Conforming to CBC Chapter 11B and ADAAG requirements for non-slip materials.

I. Bacteria Resistance (ASTM E2180/ASTM G21), resistant to bacteria, fungi, and micro-organism activity.

J. Indoor Air Quality, Greenguard Gold Certified for low VOC emission in compliance with CDPH 01350.

K. Crack Filler and Leveling Compound: Cementitious type, Durabond's Webcrete # 95, Ardex SD-F, Armstrong S-194 or equal, as recommended by flooring manufacturer.

L. Adhesive: Water based, low odor type formulated specially for use with rubber flooring and manufactured or recommended by manufacturer of rubber sheet flooring.

M. Reducer Strips: Tapered rubber not less than one inch wide, and thickness to match tile.

N. Underlayment: One of the following, grade stamped on panels as indicated.

1. Halex (9 mm) flooring underlayment.

2. Matrix (9 mm) by Traxx Corporation.

3. Equal.

O. Floor Finish: Polymer type recommended by manufacturer for rubber flooring, UL rated non-slip.

PART 3 - EXECUTION

3.01 COORDINATION

A. Coordinate with related Work to assure level, smooth, and clean finish surfaces to receive rubber floor tile and stair covering.

3.02 EXAMINATION

A. Field verify dimensions and other conditions affecting the Work of this section.

B. Before Work is commenced, examine surfaces that are to receive rubber flooring. Repair and/or replace defective Work before starting Work of this section.

3.03 PREPARATION

A. Concrete floors:

1. Install preparation according to manufacturer's instructions.

2. Sweep floors.

3.04 INSTALLATION OF FLOORING

A. Color and pattern: Install flooring in a rectangular pattern, in one color without border in rooms or spaces, unless otherwise indicated.

B. Install rubber floor tile when ambient temperature is 70 degrees F. or higher.

C. Install the flooring adhesive in a thin film evenly with a notched trowel. Trowel notches shall be as recommended by flooring manufacturer.

1. Mix adhesive in accordance with manufacturer's instructions. Provide safety precautions during mixing.

2. Install adhesive only in the area that can be covered by flooring material within the adhesive manufacture's recommended working time.

3. Remove any adhesive that has dried or filmed over.

4. Adhesive application rate shall be required to avoid telegraphing trowel lines to the surface after maintenance coatings are applied. Adjust tile runoff during installation if necessary.

D. Provide reducer where floor covering edges are exposed, such as at center of the door or where floor coverings terminate.

E. Install rubber flooring in accordance with manufacturer's recommendations. Tiles shall fit snugly at wall. Closely trim to pipes, jambs, outlets, and similar conditions.

F. Mechanically cut flooring material to provide square true edges.

G. As floor tile is installed, the floor shall be rolled with a clean, 150-pound roller in both directions.

3.05 CLEANING, WAXING, AND COMPLETION

A. Maintain flooring surfaces clean as installation progresses.

B. Clean flooring when sufficiently seated and remove foreign substances.

C. Before Substantial Completion, install at least two coats of floor finish on rubber tile flooring, in accordance with manufacturer's instructions. Do not buff polymeric floor finish unless specifically recommended by finish manufacturer.

D. Clean adjacent surfaces of adhesive or other deleterious conditions.

3.07 CLEAN UP

A. Remove rubbish, debris and waste material and legally dispose of off the Project site.

3.08 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.09 INSTRUCTION

A. After Work of this section is complete, flooring manufacturer’s technical representative shall provide a one hour instruction period to Owner staff in maintenance of flooring.

END OF SECTION

SECTION 09 6813 1

TILE CARPETING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Tile carpeting.

B. Related Requirements:

1. Division 01 - General Requirements.

2. Section 09 6513 - Rubber Base.

1.02 SUBMITTALS

A. Shop Drawings: Submit dimensioned layout of carpet tile and details for binder bars.

B. Samples:

1. Submit minimum three labeled carpet tile actual size with proper backing. Carpet style and color as selected by the Owner.

2. Trim and accessories: Submit 12-inch long Samples of each type trim proposed for the Work.

C. Product Data: Submit the following:

1. Carpet tile manufacturer's published technical data fully describing carpet materials, construction, and recommended installation directions.

2. Technical data and installation instructions for each adhesive and sealer material.

3. Carpet tile manufacturer's published instructions for maintenance, care, cleaning and repair of carpet.

4. MSDS on Manufacturers recommended adhesives and primers.

D. Certificate:

1. Submit a certificate from carpet tile manufacturer that materials supplied comply with fire hazard resistance standards specified.

2. Submit a manufacturer certification that the installer is approved by the manufacture to install the specified product.

E. Installer's Experience Qualifications: Submit list of not less than five projects with similar scope of work, extending over period of not less than five years, indicating installer's experience record.

1.03 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:

1. Manufacturer's installation instructions

2. Materials shall comply with CBC Chapter 11B and ADAAG requirements.

3. Comply with current CHPS requirements for low emitting materials, www.chps.net.

4. Chemically based products such as sealers, primers, fillers, adhesives, etc. must be approved by owner's office of the Environmental Health and Safety (OEHS).

5. Carpet tile must be free of Anti-Microbial Protection.

6. Comply with ASTM F1869 for moisture testing.

B. Requirements of Regulatory Agencies: Carpet tile shall meet requirements of federal, state and local regulatory agencies for flammability, static control, or other properties as specified with testing documentation from the manufacturer by a third party laboratory.

C. Carpet Tile Installation: Comply with CRI 104 - Standard for Installation of Textile Floor Covering Materials.

D. Each color of carpet tile shall be of the same dye lot.

E. Qualifications of Installer: Minimum five years experience in successfully installing the same or similar flooring materials.

F. Pre-Installation and Progress meetings: Prior to start of work of this section and after approval of submittals, schedule an onsite Pre-Installation and progress meetings between Contractor, Supervising Installer, OWNER and Project Inspector to review construction, drawings and installation procedures in accordance with the requirements of this specification.

1.04 DELIVERY, STORAGE AND HANDLING

A. Full cartons of carpet tile shall be packaged and identified by the flooring manufacturer. Distributor, dealer, or vendor cutting, re-packaging, and re-labeling is not permitted.

B. Store material at least 48 hours at room temperature prior to installation and in accordance with manufacturer's instructions.

C. Deliver fire-rated materials with testing agency labels and required fire classification numbers attached and legible.

1.05 JOB CONDITIONS

A. Ventilation and Temperature: Verify areas to be carpeted are ventilated to remove any off gassing from installation materials, and areas are within temperature range recommended by the various material manufacturers for Project site installation conditions. The temperature of a concrete slab must be stabilized above 65 degrees both 12 hours prior to and after the installation. The following environmental conditions inside the building are critical for proper installation. Temperature must be between 65 degrees F and 95 degrees F and the humidity between 10 percent and 65 percent for at least 72 hours before and 72 hours after installation. In addition, any adhesives and primers should be stored under these conditions for a minimum of 24 hours prior to installation.

B. Protection: Prohibit traffic on carpet for at least 12 hours after installation. Cover carpet with heavy non-staining Kraft paper in areas where the Work of other trades is to be performed and traffic and passage areas. Protect carpet from damage or soiling. Maintain protection in place until Substantial Completion.

1.06 WARRANTY

A. Contractor shall provide a two-year installation warranty.

B. Manufacturer shall provide a 15-year material warranty as described below:

1. Delamination Warranty: Carpet tile will not delaminate for a minimum of 30 years from the date of installation.

2. Zippering Warranty: Carpet tile will not zipper or develop continuous pile yarn runners in the body of the carpet for a minimum of 30 years from the date of Substantial Completion.

3. Edge Ravel: Carpet tile will not have continuous pile yarn coming out at seams for a minimum of 30 years from the date of Substantial Completion.

4. Cup, Dish or Dome Warranty: The manufacturer warrants that the carpet tile will not cup, dish or dome for 30 years from the date of Substantial Completion.

5. Dimensional Stability Warranty: The manufacturer warrants that the carpet tile will not lose its dimensional stability (namely: growth or shrinkage with glue-down installations) for 30 years due to normal variations in atmosphere, temperature, or humidity

6. Wear Warranty: The manufacturer warrants that the carpet tile will lose no more than 10 percent by weight of the pile fiber during the life of the carpet from the date of Substantial Completion.

C. Manufacturer shall provide a 10-year material warranty for colorfastness and texture retention.

1. Stain and Soil Protection: 10-year stain removal written guaranty.

2. Texture Retention Warranty: The manufacturer warrants that the carpet tile will substantially maintain its physical surface texture against crushing, matting and walking out for 10 years from the date of Substantial Completion.

3. Colorfastness to light: Carpet tile will not fade for 10 years due to exposure to sunlight.

4. Colorfastness to atmospheric contaminants: Carpet tile will not fade for 10 years due to atmospheric contaminants.

1.07 MAINTENANCE

A. Extra Materials: Provide minimum three cartons of extra materials for each color, pattern, and dye lot of carpet.

PART 2 - PRODUCTS

2.01 MANUFACTURERS AND PRODUCTS

A. Manufacture Interface, Open Ended 9.845 in x 39.38 in, GlasBac Backing, product number 131400AK00.

B. Adhesives and Primers: As recommended by tile carpeting manufacturer.

2.02 MATERIALS

A. Carpet tile shall meet the following minimum standards:

1. Pile: 0.17-inch maximum height level, 0.10 in thickness, 9.00/in stiches.

2. Dye Method: 100 percent Solution Dyed Method, content 100% recycled Nylon Content Nylon.

3. Construction: 9.845 in x 39.38 in

4. Pile / Yarn weight: 22 oz/yd squared.

5. Minimum Density: Not less than 7,615 oz/yd to the third.

6. Moisture Impervious: Carpet tile shall be unaffected by water and moisture.

7. Static Protection: The manufacturer warrants that the carpet tile will not static discharge in excess of 3.0 KV or under when tested under the AATCC Test Method 134 for the life of the carpet.

8. Carpet dimensional stability AACHEN Din 54318 less than 0.10%.

9. Fluorochemical Treatment: Minimum of 500 parts per million: per CRI-102; after two hot extractions (AATCC171), minimum 400 Parts per Million per CRI TM-102.

10. Traffic Classification: Severe. Class III – Extra Heavy Commercial Traffic (more than 1000-foot traffic per day).

11. Lightfastness: (AATCC 16-E) greater than 4.0 at 60 AFU's.

12. Flammability:

    a. Flooring Radiant Panel: Class I- per ASTM E648

    b. NBS Smoke Density: Less than 450 per test ASTM E662; NFPA-258

    c. Flame Resistant: Shall pass Methenamine pill test ASTM E662.

    d. Materials shall meet the requirements of California Proposition 65. In case of fire, no material shall be used that emit gas and is prohibited by California Proposition 65.

13. Run Resistant Strength: Not less than 25 pounds, in accordance with the Loop Pile Run Resistance test (TP 155-86), wet or dry for a minimum of 30 years.

14. Indoor Air Quality: Carpet tile and adhesion systems shall meet or exceed CRI and EPA guidelines (Green Label Plus certified and labeled) and may not contain any VOC's such as: 4PCH (4 phenulcyclohexeneor, SBR latex (Styrene Butadiene Rubber).

15. Recycling Program: Carpet tile shall be eligible for a recycling program (the carpet tile will be recycled and no part of the reclaimed carpet enters a landfill) either through the carpet tile manufacturer or fiber manufacturer. If project scope included removal and disposal of existing carpet or carpet tile, contractor is responsible for delivery to a certified recycling center. A recycling certificate must be submitted to Architect, with its name and address of location of recycling center, date and weight of carpet recycled. Contractor is responsible for costs associated with recycling.

B. Carpet tile shall be from one dye lot.

C. Full cartons of carpet tile shall be cut, packaged, and identified by the factory. Distributors, dealers and vendor cutting, re-packaging, and re-labeling are not permitted.

D. Not used.

E. Adhesive: Water-resistant latex-based adhesive recommended by carpet tile manufacturer for re-leasable adhesive carpet tile installation. Where primers or sealers are furnished, verify their compatibility with adhesive.

F. Crack Filler and Leveling Compound: 100 percent cementitious binder type (as defined by ASTM C150), The following manufacturers are currently listed as approved:

1. Webcrete #95 as manufactured by Durabond

2. Ardex SD-F as manufactured by Ardex

3. Or as recommended by the flooring manufacturer.

4. Leveling Compound shall meet or exceed 200 pounds when tested in accordance with ASTM 1583.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Before installation is started, examine surfaces to receive carpet tile. Deficiencies shall be corrected before starting Work of this section.

B. Field verify dimensions and other conditions affecting this Work before commencing carpet tile installation.

3.02 PREPARATION

A. Provide concrete moisture vapor emission and pH testing to concrete specified to be covered with carpet tile. Includes concrete placed below, on and above grade. For replacement projects, concrete slabs not in direct contact with ground may be excluded from this requirement. Comply with requirements of ASTM F1869.

B. Testing shall take place after allowing concrete to dry for a minimum of 90 days. Testing to be scheduled no less than one or more than three weeks prior to scheduled flooring installation.

C. Quantification of Concrete Moisture Vapor Emissions

1. The test site should be maintained at the same temperature and humidity conditions as those anticipated during normal occupancy. These temperature and humidity levels should be maintained for 48 hours prior and during test period. If meeting this criterion is not possible, then minimum conditions should be 75 plus or minus 10 degrees F and 50 plus or minus 10 percent relative humidity. When a building is not under HVAC control, a recording

hygrometer or data logger shall be in place recording conditions during the test period. A transcript of this information must be included with the test report.

2. The number of vapor emission test sites is determined by the square footage of the facility. The minimum number of tests to be placed is equal to three in the first 1,000 square feet and one per each additional 1,000 square feet.

3. Tests sites are to be cleaned of adhesive residue, curing compounds, paints, sealers, floor coverings, etcetera 24 hours prior to the placement of test kits.

4. Weigh test dish on site prior to start of test. Scale must report weight to 0.1 grams. Record weight and start time.

5. Expose Calcium Chloride and set dish on concrete surface.

6. Install test containment dome and allow test to proceed for 72 hours.

7. Retrieve test dish by carefully cutting through containment dome. Close and reseal test dish.

8. Weigh test dish on site recording weight and stop time.

9. Calculate and report results as “pounds of emission per 1,000 square feet per 24 hours”.

10. Follow manufacturer’s corrective measures accordingly. Moisture vapor emission must meet manufacture’s recommendation prior to installation.

D. Quantification of pH Level

1. At each vapor emission test site, after removal of test containment dome, perform pH test.

   a. Place several drops of water onto the concrete surface to form a puddle approximately 1 inch in diameter.

   b. Allow the water to set for approximately 60 seconds

   c. Dip the pH paper into the water and remove immediately, compare color to chart provided by paper supplier to determine pH reading

   d. Acceptable range is pH5 to pH9. Excessive alkalinity shall be neutralized prior to installation of the carpet tile.

   e. Record and report results.

   f. Follow manufacturer’s corrective measures accordingly.

E. Preparation of Subfloors: Any leveling compound used over a vapor or moisture barrier will be warranted to be installed in a wet or moist environment without moisture limitations.

1. Delay application of flooring until sub-floors are sufficiently dry according to flooring manufacturer's recommendations, or perform remedial measures as recommended by flooring materials manufacturer.

F. Cleaning and Drying: Clean concrete floor slabs of oil, grease, waxes, curing compounds, dust, dirt, debris, paint, and other deleterious substances. Failure to remove or seal old adhesives or other floor coatings may result in installation failure. Provide a commercial vacuum cleaner to remove dust and dirt. Do not furnish oiled or chemical treated sawdust or any similar product for dust removal.

G. Leveling: Verify floor slabs true to level and plane within a tolerance of 3/16 inch in 10-feet. Test floor areas both ways with a 10-foot straightedge and repair high and low areas exceeding allowable tolerance. Pop ups shall be hammered out and floor filled with an approved cementitious leveling compound. Remove high areas by power sanding, stone rubbing or grinding, chipping off and filling with an approved cementitious leveling compound, or equivalent method. Fill low areas with an approved cementitious leveling compound. Repair and level the surfaces having abrupt changes in plane, such as trowel marks or ridges, whether or not within the allowable tolerance. Again clean areas where repairs are performed and prime floor using recommended primer by manufacture. Do not sand, stone rub grind or power chip floor adhesives that contain asbestos.

H. Not used.

I. Conditioning of Materials: Carpet tile and adhesives shall be conditioned at the Project site at not less than 65 degrees F and relative humidity between 10 percent and 65 percent for 48 hours prior to installation and in accordance to manufacturer's instructions.

J. Floors should be level and sound. Any trowel marks from old adhesives must be sanded smooth, creating a level surface prior to the application of adhesives and primers.

3.03 CARPET TILE INSTALLATION

A. General: Install carpet tile in accordance with requirements of CRI 104, except where more stringent requirements are specified herein or recommended by carpet materials manufacturers.

B. Install carpet tiles in each dye lot in the number sequence as furnished by manufacturer. Measure the area to find the best starting point that will utilize a maximum size perimeter tile. After selecting the starting point, snap a chalk line that bisects this point by at right angles. To achieve a perfect angle form a triangle by measuring 6-inch up from the center point. Then measure 8-inch out from the center point. Then, find a 10-inch angle between these two points. (See manufacturers written instructions for complete details).

C. Color Control: Install dye lot in the number sequence at locations indicated to prevent shading variations. Install only one dye lot for each area of building unless otherwise reviewed. If more than one dye lot is required, obtain prior review of color match between dye lots by Owner and its representative's written approval.

D. Carpet Tile Fit: Refer to the layout Shop Drawings. The corners of the carpet tiles should be flat to assure a proper fit. Install the carpet tiles snuggly. Be careful to not to over tighten the installation.

E. Laying and Seaming: Cut carpet tiles for seams between rows and prevent damage to loops, prevent edge ravels, and preserve uniform row alignment and spacing on both sides and across seams. Install carpet tiles with loop rows in straight lines both ways, free of offsets, waviness, distortion, or misalignment. Cut seam edges straight and square with backing. Trim carpet tiles at walls, columns, and penetrations for a compressed fit.

F. Doorways: Extend carpet tiles into doorways without piecing in and seam to the carpet on other side of door under door centerline except where metal thresholds occur; no small filler pieces of carpet tiles will be permitted at doorways.

G. Adhesive Installation: Provide proper equipment as required by manufacturer. Evenly spread adhesive free of excess or thin areas. Place and lay carpet tile within open time of adhesive.

H. Binder Bars: Provide bars at edges of carpet tiles not abutting walls or other construction, securely fastened in place by using aluminum drive nails. Precisely align splices and tightly miter angles.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion. Limit rolling traffic on carpet tiles for at least 12 hours after installation. Cover carpet tiles with heavy non-staining Kraft paper in areas where the Work of other trades is to be performed and/or traffic and passage areas. Protect carpet from damage or soiling. Maintain protection in place until Substantial Completion.

3.05 CLEANING

A. As each carpeted area is completed, clean up dirt and debris, remove spots and soiling with proper cleaner, trim off loose threads with sharp scissors, and vacuum entire area clean.

3.06 CLEAN-UP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.07 INSTRUCTION

A. Before Substantial Completion of the Work, should the district request and at the districts discretion, provide a four hour Owner instruction period for proper maintenance of carpeting. Instructions shall be provided by technical representative of manufacturer.

END OF SECTION

SECTION 11 5213 1

PROJECTION SCREENS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Manually operated projection screens.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 09 2216 - Non-Structural Metal Framing.
3. Section 09 2900 - Gypsum Board.
4. Section 09 5113 – Acoustical Panel Ceilings.
5. Electrical: Division 26.

1.02 SUBMITTALS

A. Shop Drawings: Submit details for installation, attachment, and electrical requirements.

B. Product Data: Submit manufacturer data indicating model and size of units.

C. Installation Instructions: Submit manufacturer's installation instructions.

D. Certification: Submit GREENGUARD certification for conformance to UL 2818.

1.03 QUALITY ASSURANCE

A. Coordinate installation of ceiling mounted recessed screens with ceiling installation.

B. Conduct a pre-installation meeting on Project site to review procedures, details and interfacing with adjacent materials and finishes.

C. Screen fabric shall be GREENGUARD certified for Chemical Emissions for Building Materials, Finishes and Furnishings in conformance to UL 2818.

D. References:

1. UL 2818 - Standard for Chemical Emissions for Building Materials, Finishes and Furnishings.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver projection screens to project site in manufacturer's original unopened undamaged packaging with identification labels intact.

B. Store protected from exposure to harmful weather and in dry, ventilated conditions at temperature less than 80 degrees F.

C. Handle projection screens with care in order to prevent damage.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Da-Lite Screen Co., specified as basis of design.

B. Draper Inc.

C. Elite Screens Inc.

D. Stewart Filmscreen Corp.

E. Equal.

2.02 MANUALLY OPERATED PROJECTION SCREENS

A. Heavy duty, manually operated retractable projection screen mounted on ball bearing rigid steel spring roller.

B. Screen Case: Steel or aluminum case sized to suit projection screen and furnished with end caps concealing roller ends. Steel case shall be powder coated painted, white or black, as selected by ARCHITECT.

C. Screen:

1. Nominal Diagonal / Aspect Ratio: 109 inches, 16:10.

2. Approximate Viewing Area Dimensions: 57-1/2 inches high by 92 inches wide.

3. Surface: Matte white, flame retardant, mildew resistant, washable fiberglass fabric with black borders.

D. Accessories:

1. Installation Hardware:

a. Surface Mounted: Manufacturer’s mounting brackets and fasteners for attachment to framing through wall or ceiling.

b. Recessed: Manufacturer’s hanger rods, angles, brackets and fasteners for attachment to underside of structure.

2. Recessed Projection Screens Trim Kit: Integral trim or manufacturer’s ceiling trim flange surrounding the perimeter of the screen case.

3. Pull Rod: One manufacturer’s standard pull rod for each projection screen.

E. Products:

1. Ceiling or Wall Mounted: Da-Lite Screen Co., Model C, or equal.

2. Recessed: Da-Lite Screen Co., Advantage manual with CSR with integral ceiling trim.

A. Accessories:

1. Installation Hardware: Manufacturer’s mounting brackets and fasteners for attachment to wall or ceiling.

a. Surface Mounted: Manufacturer’s mounting brackets and fasteners for attachment to framing through wall or ceiling.

b. Recessed: Manufacturer’s hanger rods, angles, brackets and fasteners for attachment to underside of structure.

2. Recessed Projection Screens Trim: Manufacturer’s integral trim or manufacturer’s ceiling trim flange surrounding the perimeter of the screen case.

B. Products:

1. Ceiling or Wall Mounted: Da-Lite Screen Co., Cosmopolitan, or equal.

2. Recessed: Da-Lite Screen Co., Cosmopolitan with recess kit, or Equal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install screens according to manufacturer's installation instructions and Shop Drawings.

B. The finished installation shall be free from damage, blemishes or other defects impacting appearance or operation, with operating panels in alignment with adjacent ceiling, and be uniform in plane and appearance.

3.02 CLEANUP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 26 4745

NETWORKING & DATA COMMUNICATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. SCOPE

1. This section outlines the requirements for the Local Area Networks system switches, system hubs, networking modules (transceivers) and connectivity at the MC/MDF and at the various IC/IDF's throughout the owner's facility.

2. Administrative Network

a. The Administrative Network distribution components will be located in telecom room MDF and in various communications rooms throughout the facility. The system is connected via CAT 6A cabling to various server and workstation locations throughout the building.

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b. Administrative Network nodes are located throughout the building.

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c. These are fed by fiber optic cabling to the MDF and distributed locally via UTP CAT 6A (as noted on the plans) cabling infrastructure. The Administrative Network will be a Fast- EtherNet design providing switched 100Mbit speed to various workgroups in the facility.

d. The contractor will be responsible to install, program, test and document the system as installed, verifying throughput rates.

e. The contractor will be required to work in close coordination with the owner's information systems director and staff.

1.02 WORK INCLUDED

A. Furnish and install all required system switches, system hubs, system 100/1000BASE-T modules, transceivers, patch cables and accessories for a complete system.

B. The installation shall include interconnect/patching equipment (fiber and copper), jumpers (optical fiber and twisted-pair copper), hub & switch equipment, optical

fiber transceivers, routers, asynchronous controllers, optical fiber transceivers, and any other equipment enumerated within. In addition to material and equipment, contractor shall provide labor and any incidental material required for installation. All active equipment shall be installed and connected to the cable system.

C. Configuration, programming and testing of the local area networks.

D. New local area network locations are listed on the drawings.

1.03 RELATED DOCUMENTS

A. SECTION 260000 - GENERAL ELECTRICAL CONDITIONS;

B. SECTION 264750 - CABLING & DISTRIBUTION SYSTEMS

1.04 FUNCTIONAL REQUIREMENTS

A. Transmission Media. The example LAN will use both twisted-pair and fiber optic cable plant to provide connectivity between user workstations located in offices and network resources located in the facility computer room(s).

B. Host/Server Access. The network will allow users to access all host/server resources, including future application servers, such as additional database servers. There should be full compatibility with existing initiatives (e.g., a new financial system, security system, and telephone and employee services database repository).

C. Outside Communications. The network will need to support future access to external networks through routers. These communications will use the Transport Control Protocol/Internet Protocol (TCP/IP) protocol.

D. Environment/Facility Considerations. The network architecture design must take into account existing space, power, and heat constraints.

E. Flexible Architecture. The design must have sufficient flexibility to permit grouping users into distinct "workgroups" for office automation services. Physical features, such as a layered distribution scheme, redundant patching, and real-time configuration and topology modifications, will be included in the design. The overall transition strategy should minimize downtime and denial of service.

F. Office Automation Services. The network will support a broad range of office automation services for DOS, Windows, and Macintosh workstations. The following services will be provided:

1. File storage and retrieval;

2. Network printing;

3. Support of commercial off-the-shelf (COTS) desktop applications (in the DOS, Windows and Macintosh environments), including electronic mail and calendaring; and fax services.

1.05 OPERATIONAL REQUIREMENTS

A. Network Management. The design will contain methods and tools for the efficient management and control of the network. The capability to monitor and manage both network traffic and physical components of the network will be provided.

B. Fault Recovery. The design will include contingency or back-up plans should any element of the network fail.

1.06 PERFORMANCE REQUIREMENTS

A. Network Response. The servers and other components of the network must be sized to avoid unacceptable start-up delays when workstations are first activated, long login times, and slow response during normal network utilization (e.g., application startup and exit, file retrieval and save operations). Response times for network desktop applications should not be significantly greater than stand- alone usage.

B. Network Availability. The users must be able to access the network 24 hours a day, seven days a week unless specifically made unavailable at organization discretion(e.g., for administrative or maintenance activities).

1.07 NETWORK CAPACITY: Individual components of the network will be sized as indicated below:

A. The cable plant -- The cable plant will provide for approximately 150 cable drops distributed throughout the offices and facility.

B. User workstations -- Initially, service will be provided for approximately 50 local users. However, when fully operational, the network will be capable of supporting approximately 150+ local users (150+ Windows-based PCs and servers).

C. Intelligent hub equipment -- All hub equipment will be sized to support all ports plus 25% spare ports for growth.

1.08 REFERENCES AND STANDARDS INCORPORATED

A. Published specifications, standards, tests or recommended methods of trade, industry or government organizations apply to work of this section where cited by abbreviation noted below:

1. EIA Electrical Industries Association
2. IEEE Institution of Electrical and Electronics Engineers
3. ISO International Standards Organization
4. ITU International Telecommunications Union
5. CCITT Consultative Committee of International Telegraph and Telephone
6. ANSI American National Standards Institute
7. TIA Telecommunications Industry Association
8. ASTM American Society for Testing and Materials
9. NEC National Electric Code
10. FCC Federal Communications Commission
11. CEA Insulated Cable Engineers Association, Inc.
12. IEC International Electrotechnical Commission
13. NEMANational Electrical Manufacturers Association
14. UL Underwriters' Laboratories, Inc.
15. IPC The Institute for Interconnecting and Packaging Electronic Circuits
16. NFPA National Fire Protection Association
17. BICSI Building Industry Consulting Service International

B. Nothing in the drawings, details, or specifications shall be construed to permit work not conforming to applicable laws, ordinances, rules, or regulations and standard industry IEEE 802 Ethernet standards.

C. It is not the intent of the drawings, details, or specifications to repeat requirements of codes except where necessary for completeness or clarity.

1.09 SUBMITTALS

A. Submit manufacturer's data literature for each item used describing each product, including specification, installation instructions and general recommendations.

B. Submit manufacture's data literature on system hubs, switches, 100/1000BASE-T modules, 100/1000BASE-FB modules, 100/1000Base2 modules, power supplies and accessories.

C. As per section 260000 - General drawings, submittals and shop drawings.

D. In addition to the requirements of Division 1, submit all materials for approval, arranged in same order as specifications, individually referenced to specification paragraph and drawing number. Submit number required in Division 1 plus three (3) copies of 8 1/2” x 11" material and 2 prints and one reproducible of drawings in 24” X 26” size, minimum. Submit 8 1/2” x 11” items bound in volumes and 24” X 36” drawings in edgebound sets.

E. Progress Schedule: Include duration and milestones for the following:

1. All submittals specified.

2. Completion of equipment buyout.

3. Completion of equipment receipt at fabrication shop.

4. Shop fabrication.

5. Shop testing.

6. Shipment to site.

7. Installation.

8. Field testing.

9. Training.

10. First use date.

F. Manufacturer's Product Data:

1. List of Materials: For each item include:

a. Manufacturer.

b. Model number.

c. Listing: UL, City Lab or none.

d. Quantity.

2. Manufacturer's Product Data: In sequence of list of materials, data sheet for each item, including all accessories, marked for proposed product.

G. Field and Shop Drawings:

1. Resubmit: for coordination reference complete with corrections from previous submittal:

a. List of Materials.

b. Manufacturer's Product Data.

2. Field (installation) Drawings: collate in sequence:

a. Drawing index/symbol sheet.

b. Floor plans. At scale of contract documents. Show:

(1) Devices with circuit number.

(2) Rough-in.

(3) Mounting height.

(4) Conduit size.

(5) Wire type.

(6) Wire fill.

c. Sections/Elevations. At scale of contract documents.

(1) Mounting Location Reference

d. Enlarged Plans. At scale of contract documents or larger as required for trade coordination. Show:

(1) Refer to floor plans.

(2) Architectural features.

(3) Rack cabinets.

(4) System furniture.

(5) Clearances.

e. System conduit riser drawing, show:

(1) Terminal cabinets.

(2) Coordination with floor plans.

(3) Wire runs not shown on floor plans.

(4) Wire type.

(5) Wire fill.

f. Mounting details

(1) Stamped and signed by engineer licensed in jurisdiction for work of this type.

(2) Show loads, strength of connections, etc.

(3) Show calculations - on drawings or in bound volume forreview by authorities having jurisdiction.

(4) Provide details for:

(a) Racks.

(5) Installation details as required.

(6) Terminal cabinets: terminations.

g. Wire run sheets (if used) show:

(1) Wire number.

(2) Source.

(3) Designation.

(4) Signal type.

(5) Wire type.

(6) Operating level or voltage (if applies).

h. Shop and Field Test Reports

3. Schedule: Submit test reports in timely manner relative to project schedule such that owner may conduct verification of submitted test data at owner's option, without delay of progress.

a. Shop test report: Submit prior to shipping completed system to project site.

b. Field test report: Submit following system completion and prior to and as condition precedent to owner's acceptance of the work of this section.

4. Test Reports: Include:

a. Time and date of test.

b. Personnel conducting test.

c. Test object.

d. Procedure used.

e. Test equipment, including serial and date of calibration.

f. Results of test - numerical or graphical presentation.

5. Verification of submitted test data: Owner may elect to verify some or all test data submitted. Retest in presence of designated observer(s) at reasonable convenience of owner. Provide technician familiar with work of this section. Provide all test equipment.

H. Reference Data for Operation, Maintenance and Repair

1. In addition to the requirements of Division 1, submit 3 sets. Submit in three post binders (not ring binder) with tabs.

a. Index.

b. Systems operating instructions.

c. Reduced set of system record drawings.

d. Key schedule.

e. Maintenance and spare pans schedules.

f. Shop and Field Test Reports.

g. Equipment manuals. Collate alphabetically by manufacturer. Provide manufacturer's original operation, instruction and service manuals for each equipment item. For each set, provide

manufacturer's original printed copies only. Photocopies not acceptable.

I. Record Drawings in AutoCAD (current release) format delta 1: 3-13-25

1. Quantity:

a. Review sets: as for shop and field drawings.

b. Record set:

(1) Three (3) bluelines.

(2) One CD with applicable .DWG files as full scale

c. Content: All drawings required under “Field and Shop Drawings”. Show as installed condition.

PART 2 - PRODUCTS

2.01 GENERAL

A. Quality of Products: Material and equipment specified herein have been selected as the basis of acceptable and desired quality of performance and have been coordinated to function as components of the specified system. Where a particular material, device, piece of equipment of system is specified directly, the current manufacturer's specification for the same shall be considered to be part of these specifications, as if completely contained herein in every detail. Each material, device, or piece of equipment provided hereunder shall comply with all of the manufacturer's published specifications for that item.

B. Quantity: Provide quantity as shown on contract drawings, the schedule or as otherwise defined herein.

C. Preference: Owner desires system to be furnished and installed as specified herein.

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D. Substitutions: Comply with SECTION 26 0000 -GENERAL CONDITIONS.

E. Provide complete: Provide all auxiliary and incidental materials and equipment necessary for the operation and protection of the work of this section at, if specified in full herein.

F. Provide new: All materials provided under the work of this section shall be new, shall be the manufacturer's latest design/model, and shall be permanently labeled with the manufacturer's name, model number and serial number.

G. Similar: Similar devices shall be of the same manufacturer, unless specifically noted otherwise in these specifications.

H. Continuous Use: All active circuitry shall be solid state and shall be rated for continuous use. All circuit components shall be operated in full compliance with the manufacturer's recommendations and shall contain sufficient permanent identification to facilitate replacement.

2.02 MANUFACTURERS A.

NETWORKING HARDWARE

1. System design is based on products as manufactured b Belden
Substitutions must be pre-approved according to Section 26 00 00 and general conditions.

B. SYSTEM SPECIFICATIONS

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1. LOCAL AREA NETWORK

a. The Local Area Network shall be based on and support IEEE802.3 functional standards for EtherNet Local Area Networking. This shall include IEEE 802.3 100/1000BASE-T and 100/1000BASE-T for station microcomputers, and IEEE 802.3 100/1000BASE-F or 100/1000BASE-F (FIORL) synchronous technology for fiber optic repeater interconnection.

b. The main distribution frame (MDF) and all intermediate distribution frames (IDF's) shall support one EtherNet segment per network.

c. System shall be sufficient to support use at full capacity without user-perceptible delays in network response time.

d. System shall be sufficient to support any combination of system features at full capacity. System shall allow reconfiguration of backbone to allow Customer maximum flexibility and implementation of options in case of need when future services are identified and added.

C. LAN CONFIGURATION

1. System hubs are required in DESIGNATED zones so that every data drop on site can be serviced by a hub.

2. Each system hub shall allow for growth, without the need to add an additional hubs to 125% of the current data drop count for the area of the campus that it serves even though all those drops will not be connected at initial installation.

3. Each designated location shall utilize a system hub as per the specification.

4. Each hub location shall utilize fiber optic transceiver module for connection to the fiber optic backbone or horizontal distribution (where fiber is utilized as the backbone or horizontal media).

5. Each hub location shall utilize 100/1000BASE-T(RJ45), 100/1000BASE-T (RJ45), unshielded twisted pair ports for connection to the UTP CAT 6 LAN cable plant or 100/1000BASE-2 ports for connection to the ThinLAN cable plant. The quantity of initially installed 100/1000BASE-T/100/1000BASE-2 ports shall be per the needs indicated and requirements of this specification and contract drawings.

6. The initially active 100/1000BASE-T, 100/1000BASE-T locations shall be connected to the system Hubs via CAT 6 UTP patch cords and patch panels. If Telco style 100/1000BASE-T modules are utilized in the system Hub then CAT 6, Telco-to RJ45 patch panels shall be installed with the appropriate cable to the hub for full connectivity.

2.03 MATERIALS AND EQUIPMENT

A. SYSTEM HUBS

1. The Local Area Network shall be created from a family of intelligent, or "smart," switches, hubs and related products. The product family shall consist of various hubs; numerous plug-in EtherNet, FDDI, and internetworking modules for these hubs, and network management software. These products shall enable the customer to create a large-scale facility network that is flexible, reliable, and manageable.

2. The System shall have port switching technology that shall offer remote network configuration and management capabilities.

3. The System's network management shall support network analysis, identify specific network problems, and correct or self-heal problems dynamically. The system's network management shall not be a passive traffic monitoring tool.

4. System hubs shall have the following parameters and features:

a. Modular Multi-Media Chassis.

b. Supports SNMP Based Network Management System.

c. Supports Inband and Out of Band Network Management.

5. Specific EtherNet features required:

a. Supports Shielded/Unshielded Twisted Pair, Coax, AUI & Synchronous Fiber.

b. Supports Internal EtherNet Terminal Servers for TCP/IP.

c. Supports Fiber Links Up to 2.0 Kilometers.

6. System hub shall be provided in 12, 24, or 48 port versions. The system hub shall be able to be mounted in a rack and installed from the front.

7. Transceiver slots for connection of twisted pair 100/1000Base-T, Thin LAN or fiber optic FIORL.

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~~8. The unit shall include and Intel I960 RISC-based processor, 1 Mbytes of RAM and 256Kbytes of flash EEPROM.~~

9. Complete workgroup security including: intruder prevention, auto port disabling, network management alarm, leaves drop prevention, authorized managers list and password protection.

10. Provisions for added SNMP management module.

11. Intelligent error monitoring, intelligent segmentation recovery, auto-segmentation, fault isolation and integrity.

12. Support for SNMP/IP and IPX multi-vendor management with SNMP browsers.

13. The unit shall be UL rated and meet FCC Part 15 Class A emissionsstandards.

14. The unit shall be provided with a lifetime limited, 5 year on site warranty.

15. The system hub must be capable of implementation to include all of the following features:

a. A single-port FOIRL module shall be available to provide FOIRL-based EtherNet connections through the system hub. The module shall comply with the IEEE FOIRL and 100/1000BASE-FL and

100/1000BASE-FL standards which ensures interoperability with other vendors' FOIRL-compliant devices. In addition, users in a FOIRL environment shall be able to take advantage of the system hub benefits such as multi-channel architecture, port redundancy, and fault tolerance.

b. The FOIRL module shall achieve point-to-point connections longer than the 1 kilometer specified by the IEEE FOIRL specification by use of high power optics.

c. A FOIRL transceiver shall be available to link a network station to EtherNet 100/1000BASE-FL LANs using fiber-optic cable. The FOIRL transceiver shall attach directly to the AUI port on the network station eliminating the need for an AUI cable.

(1) The FOIRL transceiver shall comply with the IEEE 802.3 100/1000BASE-FL draft standard and offers low-light level detection for error-free transmission.

16. An EtherNet transceiver module shall be available to provide AUI connectivity to the system hubs.

17. An EtherNet BNC module shall be available to provide a single connection to thin-wire EtherNet segments up to 185 meters in length.

a. The BNC module shall be fully compliant with the IEEE 100/1000BASE-2 standard. All thin wire segments shall be able to be terminated either internally or externally.

~~B. Approved Suppliers~~

~~1. The following vendors have been pre-approved to supply product under this contract:~~

~~a. Cisco~~

~~b. 3Com~~

~~c. Bay Networks~~

~~d. Others submit in accordance with substitution requirements.~~

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PART 3 - EXECUTION

3.01 GENERAL

A. Provide installation logs supporting building infrastructure.

B. Configure and cross connect all ports as required for complete end to end system.

3.02 DRAWING DETAILS (Shop Drawings)

A. Show wall elevation and wire details on shop drawings. Show equipment function, make and model and wire routing and terminations within rack or cabinet.

B. Show as-built location of all devices on shop drawings.

C. Provide 3 sets of bound operation and maintenance manuals, including submittal materials, and record of field changes. Provide complete as-built wiring diagrams in AutoCAD~~2000~~ format. Provide CD files and original tracings (E size) in format of construction drawings. Input all cabling information into ACS system and provide a detailed printed report with as-builts.

3.03 QUALITY CONTROL

A. Evidence of Experience and Qualifications

1. Show that the contractor who will perform the work has a minimum of 5 years experience successfully installing system of the same type and design as specified herein. Include the names, locations, and points of contact of at least two similar installations of the same type and design as specified herein where the installer has installed such systems. Indicate the type of each system and certify that each system has performed satisfactorily in the manner intended for a period of not less than 12 months.

2. Show that the instructor, who will train staff, operating and maintenance personnel, has received a minimum of a CNE/MCE training from a factory training center, and 2 years experience in the installation of systems of the type specified. Submit training certification in equipment submittals, title section training and certifications.

3.04 TESTING

A. GENERAL

1. Testing shall be performed in the presence of the owner.

a. Testing shall include verification of:

(1) Server operation and configuration

(2) NOS installation, configuration and operation

(3) HUB insulation and operation

(4) Cable Plant

2. All test equipment shall bear current calibration stickers or dated certificates.

3. Printed test results along with as-built drawings shall be assembled into a 3 ring project binder and delivered to the consultant for verification and final acceptance prior to start of warranty, and signed by an RCDD

3.05 COMMISSIONING

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A. General

1. The contractor shall guarantee all equipment and wiring free from inherent mechanical and electrical defects for one year from the date of final acceptance by owner.

2. Acceptance shall consist of the following:

a. Burn-in period.

(1) The system shall be accepted for start of warranty upon successful completion and testing of the system.

(2) Burn-in period shall be a 30 day time frame to allow the system to operate free of defects, grounds, programming faults, etcetera.

(3) The 30-day burn-in shall begin the day of acceptance by owner.

(4) The burn-in period shall be 30 days of continuous use without system trouble, false alarm, open, short or ground condition present.

(5) Should the system fail for any reason during the burn-in period, the contractor shall respond immediately upon notification by owner's personnel and correct said deficiencies.

(6) Upon correction and restoration, the burn-in period shall be re-set to "0" and the 30 day count shall begin again.

(7) Warranty shall commence upon day 31 of successful burn-in period.

b. Final Test

(1) Before the installation shall be considered completed and acceptable by the awarding authority, a test on the system shall be performed as follows:

(a) The contractor's job foreman, in the presence of a representative of the manufacturer, and a representative of the owner shall operate every network device to ensure proper operation and correct configuration at the file server location.

(b) When the testing has been completed to the satisfaction of both the contractor's job foreman and the representatives of the manufacturer and owner, a notarized letter co-signed by each attesting to the satisfactory completion of said testing shall be forwarded to the owner.

(c) The contractor shall leave the data network system in proper working order, and, without additional expense to the owner, shall replace any defective materials or equipment provided by him under this contract within one year (365 days) from the date of final acceptance by the consultant.

B. As Built Drawings, Testing, and Maintenance Instructions

1. A complete set of reproducible as-built drawings in AutoCAD ~~R2000~~ format (CDs and sheets) showing installed wiring, color coding, and wire tag notations for exact locations of all installed equipment, specific interconnections between all equipment, and internal wiring of the equipment shall be delivered to the owner upon completion of system acceptance.

2. Operating and Instruction Manuals

a. Operating and instruction manuals shall be submitted prior to testing of the system. Four (4) complete sets of operating and instruction manuals shall be delivered to the owner upon completion.

b. Provide necessary training and/or schooling to designated owner personnel at no additional cost to owner. Training shall be on site.

C. Testing Frequency Instructions

1. Complete, accurate, step-by-step testing instructions giving recommended and required testing frequency of all equipment, methods for testing each individual piece of equipment, and a complete trouble-shooting manual explaining how to test the primary internal parts of each piece of equipment shall be delivered to the owner upon completion of the system.

2. Maintenance instructions shall be complete, easy to read, understandable, and shall provide the following information:

    a. Instructions on replacing any components of the system, including internal parts.

    b. Instructions on periodic cleaning and adjustment of equipment with a schedule of these functions

    c. A complete list of all equipment and components with information as to the address and phone number of both the manufacturer and local supplier of each item.

    d. User operating instructions shall be provided, prominently displayed on a separate sheet located next to the control.

END OF SECTION

SECTION 33 10 00

WATER UTILITIES 1

PART 1 – GENERAL

1.01 SUMMARY

A. Pipe and fittings for site water lines.

B. Pipe and fittings for site irrigation lines.

C. Pipe and fittings for site water utility vault.

D. Valves.

E. Conduit, Pull boxes, sleeves.

1.02 RELATED SECTIONS

A. Section 31 2000 Earthwork.

1.03 REFERENCES

A. American Water Works Association Standards (AWWA).

B. Ventura County Water Works Districts - Design Standards.

C. Standard Specifications for Public Works Construction (Green Book), latest edition.

1.04 SUBMITTALS

A. Submit the following:

1. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories.

2. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

3. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations. Turn over to the project manager one set of drawings with all deviations from the plans shown in neat, clean and readable red ink.

4. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

5. Disinfection Report:

a. Type and form of disinfectant used.
b. Date and time of disinfectant injection start and time of completion.
c. Test locations.
d. Name of person collecting samples.
e. Initial and 24-hour disinfectant residuals in treated water in ppm for each outlet tested.
f. Date and time of flushing start and completion.
g. Disinfectant residual after flushing in ppm for each outlet tested.

6. Bacteriological Report:
   a. Date issued, project name, and testing laboratory name, address, and telephone number.
   b. Time and date of water sample collection.
   c. Name of person collecting samples.
   d. Test locations.
   e. Initial and 24-hour disinfectant residuals in ppm for each outlet tested.
   f. Coliform bacteria test results for each outlet tested.
   g. Certify water conforms, or fails to conform, to bacterial standards of AWWA C651 Section 7.1 Standard Conditions

7. Water Quality Certificate: Certify water conforms to quality standards of City of Moorpark, suitable for human consumption.

1.05 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of piping mains, valves, connections, and invert elevations.

B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with County of Ventura Standards, AWWA, and Standard Specifications for Public Works Construction.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

1.07 QUALIFICATIONS

A. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this section with minimum three years experience.

B. Testing Firm: Company specializing in testing potable water systems, certified by State of California.

C. Submit bacteriologist's signature and authority associated with testing.

1.08 DELIVERY AND STORAGE

A. Deliver and store valves in shipping containers with labeling in place.

PART 2 – PRODUCTS

2.01 GENERAL

A. All water lines shall be designed for a minimum working pressure of 350 psi. All fittings appurtenant piping materials shall be designed for a minimum working pressure of 350 psi unless otherwise indicated.

2.02 PIPE

A. Pipe: Pipe material shall be Ductile Iron (CL 350) conforming to Standard Specifications for Public Work Construction Section 209-1.

B. Joints: Mechanical joints shall be used for the waterline construction unless otherwise shown on plans and standard details. Gaskets for mechanical joints shall be rubber conforming to ANSI A21.11 and AWWA C111. PVC joints shall conform to ASTM D3139.

B. Fittings: Fittings shall be ductile iron rated for 350 psi working pressure. Mechanical joint fittings shall conform to ANSI A21.10 or AWWA C110 (short short body style, not approved). Lining for fittings shall be Plastic Engineering P.E.I. 100 epoxy to a minimum thickness of 10 mils. Fittings shall be wrapped with 6 mil. polyethylene sheet. Grease all underground nuts and bolts before wrapped with the polyethylene sheet.

2.03 VALVES

A. Gate Valves conform to AWWA C-509-01.

B. Gate valves shall be iron body, NRS valves with O-ring seals, and shall open when the stem is rotated counterclockwise. The valves shall be designed for a minimum working pressure of 250 psig, have a bronze stem, and have a cast iron wedge with styrene butadiene rubber permanently bonded to the wedge. The valves shall have full port openings for unobstructed flow, be designed for underground service, and be in full compliance with the latest revision of AWWA C509. The valve linings and coatings shall be in accordance with AWWA C210-84. Linings and coatings shall be factory applied. Valves shall be furnished with 2-inch square operating nut. Valve shall be wrapped with 6 mil. polyethylene sheet. Grease all underground nuts and bolts before wrapping with the polyethylene sheet.

C. Ball Valves

2.04 WATER METER

A. Not Applicable.

2.05 ACCESSORIES

A. Concrete for Thrust Blocks: Contractor shall construct concrete thrust block per County of Ventura Standards.

B. Thrust blocks shall be constructed to bear against undisturbed earth and shall not bear against adjacent pipe, fittings, or valves. Where concrete must be poured around adjacent pipe, a block out or a short pipe length shall be used such that a flexible joint exists within 12 inches of each side of thrust block, unless indicated otherwise on the plans. Concrete shall not be allowed to set in contact with pipe surfaces or to enter or come in contact with any joint.

C. Valve Appurtenances: The Contractor shall furnish and install all valve appurtenances. Provide two galvanized T-handled operating wrenches, 4 feet total length or as required to easily access valve from grade.

D. Valve box body shall be unreinforced concrete 8 ¾" inside diameter traffic box with cast iron ring. The valve box cover shall be cast iron. Both valve body and cover shall be Christy G3 or equal. The cover shall be marked "water." The cover of each valve box shall be provided with a 2" diameter bronze disc and the Contractor shall stamp the valve number on the disc per the Architect's instructions. The disc shall be mounted to the valve box cover or higher using stainless steel screws. The extension piece shall be 8" in diameter, Class 150 P.V.C. water line conforming to the requirements of AWWA C-900.

E. Appropriate warning detector tape shall be placed over all utilities.

1. Underground detectable warning tape shall be placed over all non-metallic underground utilities.

2. 12-gauge copper continuous location wire shall be placed on all water mains.

F. Corrosion-Protection Encasement for Piping

1. Encasement for Underground Metal Piping and Fittings: AWWA C105, Polyethylene film, 10 mil minimum thickness, tube or sheet. Plastic wrap shall be clear or black. Purple wrap shall not be used.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Maintenance records in accordance with NFPA 25.

B. Verify the existing water main sizes, class of pipes, and locations as indicated.

C. Verify piping system has been cleaned, inspected, and pressure tested.

D. Perform scheduling and disinfecting activity with start-up, water pressure testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.02 PREPARATION

A. Remove scale and dirt, on inside and outside, before assembly.

B. Prepare pipe connections to equipment with flanges or unions.

3.03 BEDDING

A. Excavate pipe trench in accordance with Specification Section 31 23 33 for work of this section. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches compacted depth, compact to a minimum of 95 percent relative compaction.

C. The compaction of the backfill material along the sides and one foot above the pipe shall be done with hand tampers to protect the pipe. Jetting is not permitted to obtain required compaction.

D. Maintain optimum moisture content of bedding material to attain required compaction density.

3.04 INSTALLATION - PIPE

A. Route pipe in straight line.

B. Install pipe to allow for expansion and contraction without stressing pipe or joints.

C. Install access fittings to permit disinfection of water system.

D. Form and place concrete for thrust blocks at each elbow or change of direction of pipe main in accordance with County of Ventura Standard Plans & Specifications.

E. Protect metal restrained joint components against corrosion by applying a bituminous coating by coating with non-oxide corrosion resistant greased 10 mil plastic wrap.

F. Establish elevations of buried piping to ensure cover conforming to District Standards. The minimum cover from the finish grade to the top of pipe is 36 inches for potable and fire waterline, any shallower cover to clear with the existing utility crossings shall be reviewed and approved by the District's Representative.

G. Install 12 gauge copper continuous location wire over top of pipe.

H. Backfill trench in accordance with Specification Section 31 23 33.

I. Maintain separation of water main from sewer piping in accordance with the State Department of Health Services, Criteria for the Separation of Water Mains and Sanitary Sewers (Section 64630, Title 22 California Administrative Code), and State Regional Water Quality Control Board.

J. All pipe laid in trench which is to be left for further extension (i.e., end of work day) shall have its open end covered to protect from possible rodent intrusion.

3.05 INSTALLATION - VALVES

A. Set valves on solid bearing per County of Ventura Standard Plans & Specifications.

B. Center and plumb valve box over valve. Set box cover flush with finished grade.

C. Install brass valve 1 ½" diameter tags and imprint valve number per District.

3.06 SERVICE CONNECTIONS

A. Install service connections in accordance with County of Ventura Standard Plans & Specifications.

3.07 PRESSURE TEST OF WATER PIPING SYSTEM

A. Water piping system shall be pressure tested for 2 hours at 200 psi, with no allowable drop in water pressure.

B. All leakage tests shall be completed and approved prior to placing of permanent resurfacing.

C. Pressure test shall be witnessed by District's inspector.

3.08 DISINFECTION AND BACTERIA TESTING OF WATER PIPING SYSTEM

A. Water piping system shall be disinfected and flushed per AAWA Section C651.

B. Upon completion of retention period required for disinfection, flush pipeline until chlorine concentration in water leaving pipeline is no higher than that generally prevailing in existing system or is acceptable for domestic use.

C. Legally dispose of chlorinated water. When chlorinated discharge may cause damage to environment, apply neutralizing chemical to chlorinated water to neutralize chlorine residual remaining in water.

D. After final flushing and before pipeline is connected to existing system, or placed in service, employ an approved independent testing laboratory to sample, test and certify water quality suitable for human consumption.

3.09 TEST RECORDS

A. Records shall be in accordance with NFPA 13 & 24. Records shall be made of each piping system installation during the test. These records shall include:

1. Date of test.

2. Description and identification of piping tested.

3. Test fluid.

4. Test pressure.

5. Remarks to include such items as:

a. Leaks (type, location).
b. Repairs made on leaks.

6. Certification by Contractor and signed acknowledgment by the District's Representative.

3.10 FIELD QUALITY CONTROL

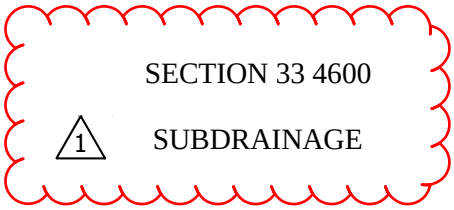
A. Inspection and testing shall be performed by District’s Representative.

B. Perform pressure test on potable water distribution system in accordance with County of Ventura Standard Plans & Specifications except that there is no allowable leakage for the duration of the test.

1. Slowly bring piping to test pressure and allow system to stabilize prior to conducting leakage test. Do not open or close valves at differential pressures above rated pressure.

2. Examine exposed piping, fittings, valves, hydrants, and joints carefully during hydrostatic pressure test. Repair or replace damage or defective pipe, fittings, valves, hydrants, or joints discovered, following pressure test.

END OF SECTION



PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Perforated-wall pipe and fittings.
2. Geotextile filter fabrics.

B. Related Requirements:

1. Section 03 3000 – Cast-In-Place Concrete
2. Section 07 1326 Self-Adhering Sheet Waterproofing
3. Section 07 2100 Thermal Insulation

1.2 ACTION SUBMITTALS

A. Product Data: For geotextile filter fabrics and composite drainage panel

PART 2 - PRODUCTS

2.1 PERFORATED-WALL PIPES AND FITTINGS

A. Perforated PE Pipe and Fittings: ASTM F 405 or AASHTO M 252, Type CP; corrugated, for coupled joints.

2.2 SOIL MATERIALS

A. Soil materials are specified in Section 31 2000 Earthwork.

2.3 WATERPROOFING MEMBRANE

A. Material: Comply with specification section 07 1326

2.4 GEOTEXTILE FILTER FABRICS

A. Description: Fabric of PP or polyester fibers or combination of both, with flow rate range from 110 to 330 gpm/sq. ft. when tested according to ASTM D 4491.

B. Structure Type: Nonwoven, needle-punched continuous filament.

1. Survivability: AASHTO M 288 Class 2
2. Styles: Flat and sock.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 31 2200 Grading.

3.2 FOUNDATION DRAINAGE INSTALLATION

A. Place impervious fill material on subgrade adjacent to bottom of footing after concrete footing forms have been removed. Place and compact impervious fill to dimensions indicated, but not less than 6 inches deep and 12 inches wide.

B. Lay flat-style geotextile filter fabric in trench and overlap trench sides.

C. Place supporting layer of drainage course over compacted subgrade and geotextile filter fabric, to compacted depth of not less than 4 inches.

D. Encase pipe with sock-style geotextile filter fabric before installing pipe. Connect sock sections with adhesive or tape.

E. Install drainage piping as indicated in Part 3.4 "Piping Installation" for foundation subdrainage.

F. Add drainage course to width of at least 6 inches on side away from wall and to top of pipe to perform tests.

G. After satisfactory testing, cover drainage piping to width of at least 6 inches on side away from footing and above top of pipe to within 12 inches of finish grade.

H. Install drainage course and wrap top of drainage course with flat-style geotextile filter fabric.

I. Place layer of flat-style geotextile filter fabric over top of drainage course, overlapping edges at least 4 inches.

J. Place backfill material over compacted drainage course. Place material in loose-depth layers not exceeding 6 inches. Thoroughly compact each layer. Final backfill to finish elevations and slope away from building.

3.3 UNDERSLAB DRAINAGE INSTALLATION

A. Excavate for underslab drainage system after subgrade material has been compacted but before drainage course has been placed. Include horizontal distance of at least 6 inches between drainage pipe and trench walls. Grade bottom of trench excavations to required slope, and compact to firm, solid bed for drainage system.

B. Lay flat-style geotextile filter fabric in trench and overlap trench sides.

C. Place supporting layer of drainage course over compacted subgrade and geotextile filter fabric, to compacted depth of not less than 4 inches.

D. Encase pipe with sock-style geotextile filter fabric before installing pipe. Connect sock sections with adhesive or tape.

E. Install drainage piping as indicated in Part 3 "Piping Installation" Article for underslab subdrainage.

F. Add drainage course to width of at least 6 inches on side away from wall and to top of pipe to perform tests.

G. After satisfactory testing, cover drainage piping with drainage course to elevation of bottom of slab, and compact and wrap top of drainage course with flat-style geotextile filter fabric.

3.4 PIPING INSTALLATION

A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.
   1. Retaining-Wall Subdrainage: When water discharges at end of wall into stormwater piping system, install piping level and with a minimum cover of 36 inches unless otherwise indicated. When water discharges to daylight, slope pipe as required for positive drainage flow.
   2. Lay perforated pipe with perforations down.
   3. Excavate recesses in trench bottom for bell ends of pipe. Lay pipe with bells facing upslope and with spigot end entered fully into adjacent bell.

B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.

C. Install thermoplastic piping according to ASTM D 2321.

3.5 PIPE JOINT CONSTRUCTION

A. Join perforated PE pipe and fittings with couplings according to ASTM D 3212 with loose banded, coupled, or push-on joints.

B. Special Pipe Couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and fit materials and dimensions of both pipes.

3.6 CLEANOUT INSTALLATION

A. Cleanouts for Retaining-Wall Subdrainage:

1. Install cleanouts from piping to grade. Locate cleanouts at beginning of piping run and at changes in direction. Install fittings so cleanouts open in direction of flow in piping.
2. In vehicular-traffic areas, use NPS 4 cast-iron soil pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, 18 by 18 by 12 inches deep. Set top of cleanout 1" above grade.
3. In nonvehicular-traffic areas, use NPS 4 PVC pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, 12 by 12 by 4 inches deep. Set top of cleanout flush with grade.
4. Comply with requirements for concrete specified in Section 033000 Cast-in-Place Concrete.

3.7 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling.
2. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

B. Drain piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.8 CLEANING

A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 334600