ARCH. & STRUC. BIDDING/PERMIT – ADDENDUM 1

Project Name: Highland Township – Highland Township Fire Station No. 1 **Addendum No: One (1)**

Project Number: 18-122A Issue Date: April 20, 2020
Project Location: 1600 W. Highland Rd. Highland, MI 48357

This Addendum forms a part of the above described Architectural & Structure Bidding/Permit documents and supersedes, supplements or clarifies parts thereof to the extent defined by the terms set forth in this Addendum.

This Addendum consists of (5) typed page(s) and the following attachments :

Drawings: Overall Topographic Survey (TS-1), Site Topographic Survey (TS-1A), Site Layout Plan (SP-1), Site Demolition Plan (TD-1), Site Soil Erosion & Sedimentation Control Plan (SE-1), Site Grading & Paving Plan (C-1), Site Stormwater Management Plan & Detail (C-2), Site Utilities Plan (C-3), Site Utilities Profiles (C-4), Site Septic System Details (C-5), Site Engineering Details (C-6), M.D.O.T. Standard Details (C-7), Cover Sheet (A0-00), Room Finish Schedule & Wall Types (A0-03), Door Schedule & Frame Types (A0-04), Architectural Site Plan Details (A2-01), Main Level Floor Plan (A3-01), Masonry Dimension Plan (A3-02), Main Level Dimension Plans (A3-03), Enlarged Floor Plans (A3-10), Plan Details (A3-21), Plan Details (A3-22), Roof Plan (A3-30), Roof Details (A3-31), Reflected Ceiling Plans (A4-01), Ceiling Details (A4-02), Exterior Elevations (A5-01), Exterior Elevations (A5-02), Wall Sections (A6-01), Wall Sections (A6-02), Wall Sections (A6-03), Wall Sections (A6-04), Section Details (A6-10), Sections Details (A6-11), Interior Elevations (A8-01), Interior Elevations (A8-02), Mechanical Site Plan (M1-00), Floor Plans – Sanitary & Vent (M1-01), Floor Plans – Domestic Water and Gas (M1-02), Floor Plans – HVAC (M2-01), Electrical Site Plan (E1-00), Floor Plans – Power (E3-00)

Specifications: 000200 Material Finish Color Schedule, 073113 Asphalt Shingles, 077100 Roof Specialties, 123216 Manufactured Casework, 224000 Plumbing Fixtures, 329200 Turf and Grasses

CIVIL DRAWINGS:

ITEM C1 TS-1 OVERALL TOPOGRAPHIC SURVEY
A. Added notes for iron, found capped iron rod, and found nail.

ITEM C2 TS-1A SITE TOPOGRAPHIC SURVEY
A. Added notes for iron, found capped iron rod, and found nail.

ITEM C3 SP-1 SITE LAYOUT PLAN
A. Added notes for light poles.
B. Added note for flag poles.
C. Added note for light poles.
D. Added note for alternate monument sign.

ITEM C4 TD-1 SITE DEMOLITION PLAN
A. Revised

ITEM C5 SE-1 SITE SOIL EROSION & SEDIMENTATION CONTROL PLAN
A. Added notes for iron, found capped iron rod, and found nail.
B. Added note for downspouts.
C. Added note for light poles.

ITEM C6 C-1 SITE GRADING & PAVING PLAN
A. Added notes for iron, found capped iron rod, and found nail.
B. Added note for downspouts.
C. Added note for light poles.

ITEM C7 C-2 SITE STORMWATER MANAGEMENT PLAN & DETAIL
A. Added notes for iron, found capped iron rod, and found nail.
B. Added note for downspouts.
C. Added note for light poles.
D. Added note for C.B.

ITEM C8 C-3 SITE UTILITIES PLAN
A. Added note for P.V.C. SDR.
B. Added notes for iron, found capped iron rod, and found nail.
C. Added note for light poles.
D. Added note for downspouts.
E. Add note for floor drain lead.
F. Add note for fire line.

ITEM C9 C-4 SITE UTILITIES PROFILES
A. Added note for electrical and phone service.

ITEM C10 C-5 SITE SEPTIC SYSTEM DETAILS
A. Added notes for iron, found capped iron rod, and found nail.
B. Added note for downspouts.
C. Added note for light poles.

ITEM C11 C-5 SITE SEPTIC SYSTEM DETAILS
A. Added notes for iron, found capped iron rod, and found nail.
B. Added notes for downspouts.

ITEM C12 C-6 SITE ENGINEERING DETAILS
A. Added note for light pole.

ITEM C13 C-7 M.D.O.T. STANDARD DETAILS
A. Revised

ARCHITECTURAL DRAWINGS:

ITEM A1 A0-00 COVER SHEET
A. Updated the 'List of Drawings' to include Addendum 1.

ITEM A2 A0-03 ROOM FINISH SCHEDULE & WALL TYPES
A. Added keynote 9-10 for wall mounted signage.

B. Updated keynotes on room finish schedule for signage.
C. Revised room names for rooms 103-104.
D. Added details numbers 2-3 for sign types 'A' and 'B'.

ITEM A3 A0-04 DOOR SCHEDULE & FRAME TYPES
A. Added "IG-10 (at rated opening)" glazing tag to Door Types N and G.
B. Added Door Type FF.
C. Revised Door/Opening Schedule as indicated for door 120A from a F-type to a G-type.
D. Revised Room Finish Schedule for Bath 116, 124, 128, & 203.

ITEM A4 A2-01 ARCHITECTURAL SITE PLAN DETAILS
A. New Sheet.

ITEM A5 A3-01 MAIN LEVEL FLOOR PLAN
A. Updated keynote 14 on plan for floor deck.
B. Updated keynote 33 on plan for stair system.
C. Updated keynote 39 on plan for entrance slab.
D. Revised interior elevation number for apparatus bay.
E. Revised restroom 103 and 104 name tags to 'women's restroom' and 'men's restroom.'

ITEM A6 A3-02 MASONRY DIMENSION PLANS
A. Added elevation indicators to masonry openings on plan.

ITEM A7 A3-03 MAIN LEVEL DIMENSION PLANS
A. Revised restroom 103 and 104 name tags to 'women's restroom' and 'men's restroom.'
B. Added dimension strings.

ITEM A8 A3-10 ENLARGED FLOOR PLAN
A. Updated keynote 14 on plan for floor deck.
B. Updated keynote 33 on plan for stair system.
C. Added keynote 40 on plan for hose bid.

ITEM A9 A3-21, A3-22 PLAN DETAILS
A. Added note for millwork/casework.
B. Added note for concrete collard.

ITEM A10 A3-30 ROOF PLAN
A. Added keynote 20 for guard rail system.
B. Added roof access hatch on flat roof.

ITEM A11 A3-31 ROOF DETAILS
A. Added note for masonry pan flashing.
B. Added note for grout masonry pan flashing.

ITEM A12 A4-01 REFLECTED CEILING PLAN
A. Revised keynote 22 on plan for exterior fiber cement siding.
B. Revised keynote 26 on plan for exterior metal soffit.

ITEM A13 A4-02 CEILING DETAILS
A. Added note for millwork/casework.

B. Revised note for smoke tight lid.

ITEM A14 A5-01, A5-02 EXTERIOR ELEVATIONS
A. Updated keynote 8 for pipe guardrail.
B. Updated keynote 26 for wood decking.
C. Updated keynote 31 for backlit metal channel letters.
D. Added keynote 34 for guard rail on flat roof.
E. Added keynote 35 for louver vent.
F. Revised Elevation titles

ITEM A15 A6-01, A6-02, A6-03, A6-04 WALL SECTIONS
A. Revised to a step foundation at masonry walls.
B. Revised roof insulation to rigid nailbase.
C. Added soffit depth dimensions.
D. Revised notes.
E. Added pan flashing in masonry walls.

ITEM A16 A6-10, A6-11 SECTION DETAILS
A. Revised roof insulation to rigid nailbase.
B. Added steel angle sizes.
C. Revised starter course CMU.
D. Revised foundation.
E. Added fascia board and trim sizes.
F. Revised notes.

ITEM A17 A8-01 INTERIOR ELEVATIONS
A. Revised note from 'steel rack' to 'adjustable wall mounted wire shelving system.'

ITEM A18 A8-02 INTERIOR ELEVATIONS
B. Revised drawing 14 on sheet.

STRUCTURAL DRAWINGS:

ITEM S1 S3-01 FOUNDATION PLAN
A. Slab Thickness updated in PPE Laundry
B. Trench Drain Shown in PPE Laundry

ITEM S2 S3-02 MEZZANINIE FRAMING PLAN
A. Section 5 Added to Drawings

ITEM S3 S3-03 ROOF FRAMING PLAN
A. Truss Configuration and attachment clarified

MECHANICAL DRAWINGS:

ITEM M1 M1-00 MECHANICAL SITE PLAN
A. Underground Pipping relocated into Mechanical Room

ITEM M2 M1-01 FLOOR PLANS – SANITARY & VENT

A. Added note for trench drain in PPE Laundry (135).
B. Moved 6" Oil Sanitary Line.

ITEM M3 M1-02 FLOOR PLANS – DOMESTIC WATER AND GAS
A. Added note on plan for emergency eye wash.
B. Added note on plan for extractor, washer, and dryer.
C. Removed gas line on plan.
D. Revised pipe locations on plan.
E. Added note on plan for vertical piping in apparatus bay.
F. Revised gas line and meter surrounding emergency generator.

ITEM M4 M2-01 FLOOR PLANS - HVAC
A. Added keynote 12 on plan for transfer duct.
B. Revised size of transfer grille from '36x6' to '24x10.'
C. Revised CFM locations on plan.
D. Revised intake air louver on plan.
E. Added smoke detector to mezzanine level.

ELECTRICAL DRAWINGS:

ITEM E1 E1-00 ELECTRICAL SITE PLAN
A. Revised Electrical service lines
B. Revised Site Lighting layout and schedule

ITEM E2 E3-00 FLOOR PLANS - POWER
A. Revised Generator and Transformer

SPECIFICAITONS:

ITEM SP1 SPECIFICATION SECTION 000200 – MATERIAL FINISH / COLOR SCHEDULE
A. Reissue for modifications to Cast in Place Concrete CONC-1
B. Reissue for modifications to Soffit Panels MS-1

ITEM SP2 SPECIFICATION SECTION 073113 – ASPHALT SHINGLES
A. Edits to Ridge Vent at Vertical Walls

ITEM SP3 SPECIFICATION SECTION 077100 – ROOF SPECIALITIES
B. Roof Hatch and Roof Curb spec added

ITEM SP4 SPECIFICATION SECTION 123216 – MANUFACTURED CASEWORK
A. Note regarding locks updated

ITEM SP5 SPECIFICATION SECTION 224000 – PLUMBING FIXTURES
A. Product Selections updated & coordinated with the plan

ITEM SP6 SPECIFICATION SECTION 329200 – TURF AND GRASSES
A. New specification section issued this addendum.

****END OF ADDENDUM****

MATERIAL FINISH / COLOR SCHEDULE

Spec Section	Item	Description	Product Specified	Finish / Color	Location *(refer to drawings for exact locations)*
033000	**CAST IN PLACE CONCRETE**				
	CONC-1	NOT USED			
	SC-1	Concrete Finish	Sealed Concrete	Finish: Clear	Interior
042000	**UNIT MASONRY**				
	GFMU-1	Ground Face Masonry Unit	Brampton Brick	Finish / Color: Charcoal Suave	At all exposed exterior block
		Mortar	SGS Solomon	Color: Plain Masonry	
047200	**CAST STONE**				
	CS-1	Cast Stone	Royal Stone	Color: 45 Gray	Exterior - Sill & Watertable
		Mortar	SGS Solomon	Color: Plain Masonry	
044313.13	**ANCHORED MASONRY STONE VENEER**				
	STN-1	Natural Stone	Fond du Lac Stone Inc.	Finish / Color: Mosaic, Graphite	Exterior
	STN-2	Thin Natural Stone	To Match STN-1	To Match STN-1	Exterior
		Mortar	SGS Solomon	Color: Plain Masonry	
055213	**PIPE AND TUBE RAILINGS**				
Alt.		Aluminum Railing	Timber Tech - Impression Rail	Finish / Color: Black	Exterior Balcony
062023	**INTERIOR FINISH CARPENTRY**				
	ST-2	Wood Stain	White Maple, plain sliced	Custom Stain to Match WC-1	

MATERIAL FINISH / COLOR SCHEDULE

Spec Section	Item	Description	Product Specified	Finish / Color	Location *(refer to drawings for exact locations)*
067300	**COMPOSITE DECKING**				
	CL-1	PVC Decking	Trex Enhance Basics, Facia Profiles 1" x 8" (.56" x 7.25" Actual)	Color: Beach Dune	Exterior - Above Windows
	CL-2	PVC Decking	Trex Enhance Basics, Facia Profiles 1" x 12" (.56" x 11.375" Actual)	Color: Beach Dune	Exterior - Above Apparatus Bay OH Doors
073113	**ASPHALT SHINGLES**				
	ARS-1	Architectural Roof Shingles	Landmark PRO	Color: Max Def Pewterwood	Roof
074293	**SOFFIT PANELS**				
	MS-1	Metal Soffit	Manufactuer: Quality Edge Product Line: Porch Ceiling Collection	Color: Light Cherry (947)	Exterior - Soffit
074646	**FIBER-CEMENT SIDING**				
	SD-1	Fiber-Cement Siding - Boards	HardiePanel	Finish: Select Cedarmill Color: PNT-5	Exterior - Board
	SD-2	Fiber-Cement Siding - Battens	HardieTrim Batten Boards	Finish: Rustic Grain. Color: PNT-5	Exterior - Batten
	SD-3	Fiber-Cement Trim Board	HardieTrim - 5/4 Roughsawn	Finish: Roughsawn Color: PNT-4	Exterior - Trim Board
	SD-4	Fiber-Cement Soffit	HardieSoffit	Non-Vented Select Cedarmill Color: PNT-4	Exterior - Soffit
077100	**ROOF SPECIALTIES**				
	MRS-1	Roof Edge Fascia and Break Metal Fascia Cladding	Pac-Clad	Cityscape	
	MRS-2	Pre-Finished Aluminum Gutters/Downspouts	Pac-Clad	Cityscape	

MATERIAL FINISH / COLOR SCHEDULE

Spec Section	Item	Description	Product Specified	Finish / Color	Location *(refer to drawings for exact locations)*
079200	**JOINT SEALANTS**				
		Sealant at Masonry Block		Custom Match to *each* Masonry Block type	Exterior
081113	**HOLLOW METAL DOORS AND FRAMES**				
	HM, KD	Flush Hollow Metal Frame		Refer to door schedule	Interior & exterior openings
081416	**FLUSH WOOD DOORS**				
	ST-1	Pre-finished Wood Door	Masonite Architectural - Aspiro Series	Finish / Color: White Maple, Stout	Interior Doors refer to opening schedule
083613	**SECTIONAL DOOR**				
		Overhead Sectional Door	C.H.I. Overhead Doors - 3297 Full-View Aluminum Insulated	Finish / Color: Powder Coating to Match PNT-3	Exterior
084113	**ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS**				
	ANOD-1	Storefront System	As Specified	Color: Dark Bronze	Exterior Doors
084115	**FIBERGLASS REINFORCED POLYSTER (FRP) DOOR**				
	FRP-1	FRP Door with Aluminum Frame	Special-Lite, SL-17 Sandstone Texture FRP/Aluminum Hybrid Door	Color: Light Grey #5597	Exterior Doors
088000	**GLAZING**				
	IG-10	Non-Tempered Insulating Glass	Trulite Glass & Aluminum Solutions, LLC		Exterior Glazing
		Transaction Counter Glazing			Interior - Transaction Counters

MATERIAL FINISH / COLOR SCHEDULE

Spec Section	Item	Description	Product Specified	Finish / Color	Location *(refer to drawings for exact locations)*
089000	**LOUVERS AND VENTS**				
		Louvers	Ruskin Stationary Louver	Custom Colors to Match Masonry at each location	
093000	**TILING**				
	PT-1	Porcelain Tile	American Olean - Theoretical, 2" x 2" Mosaic	Color / Finish: Creative Gray (TH96)	Interior - Floor Tile
	PT-2	Porcelain Tile	American Olean - Theoretical 12" x 24" Field Tile 3" x 12" Bullnose	Color / Finish: Logical Gray (TH95)	Interior - Wall Tile
	PT-3	Porcelain Tile	American Olean - Theoretical 12" x 24" Field Tile	Color / Finish: Abstract Black TH99	Interior - Accent Tile
	STN-2	Thresholds	Daltile - Double Hollywood Bevel 4"W x 36" L X 5/8"H (ADA Compliant)	Finish: Carrara White M701 - Polished	Interior - Restrooms & Baths
	MT-1	Metal Wall Edge Protection	Schluter Systems - QUADEC, 5/16" (Q 45 AE)	Finish: Satin Anodized Aluminum	Interior
		Grout	TEC 1/8" Grout Joint Thickness	Color: 934 Delorean Gray	Interior - Floor Tile
		Grout	TEC 1/8" Grout Joint Thickness	Color: 949 Silverado	Interior - Wall Tile

MATERIAL FINISH / COLOR SCHEDULE

Spec Section	Item	Description	Product Specified	Finish / Color	Location *(refer to drawings for exact locations)*
095123	**ACOUSTICAL TILE CEILINGS**				
	ACT-1	2' x 4' Acoustical Tile with 15/16" grid	Tile USG - Radar CinemaPLUS Performance (SLT Edge) Grid: USG Donn DX/DXL	Color: Flat Black 205	Interior - Refer to Room Finish Schedule
	ACT-2	2' x 2' Acoustical Tile with 15/16" grid	Tile USG - Radar CinemaPLUS Performance (SLT Edge) Grid: USG Donn DX/DXL	Color: Flat Black 205	Interior - Refer to Room Finish Schedule
096513	**RESILIENT BASE AND ACCESSORIES**				
	RB-1	Coved Resilient Wall Base	Roppe Wall Base - 4"	Color: 177 Steel Blue	Interior - Refer to Room Finish Schedule
096519	**RESILIENT TILE FLOORING**				
	LVT-1	Luxury Vinyl Tile	Shaw Contract - Surface 18" x 36"	Color: Natural (15155)	Interior
	LVT-2	Luxury Vinyl Tile	Shaw Contract - Cove (1027V) 9" x 48"	Color: Gesso (27520)	Interior
096566	**RESILIENT ATHLETIC FLOORING**				
	AF-1	Resilient Athletic Flooring	Matsinc. - Decathlon Standard 9 mm Thickness	Finish: Red	Interior
096723	**RESINOUS FLOORING**				
	EP-1	Epoxy Flooring	Florock - FloroShop	Color: Standard Grey 4805	Interior
096813	**TILE CARPETING**				
	CPT-1	Tile Carpet	Shaw Contact - Mindful Play, Think Tile (5T186) 24"x 24"	Color: Transform 86585 Install: Quarter Turn	Interior
	WO-1	Walk-Off Carpet	Shaw Contract - All Access 24" x 24" Path 5T034	Finish: Ebony 34500	Interior

MATERIAL FINISH / COLOR SCHEDULE

Spec Section	Item	Description	Product Specified	Finish / Color	Location *(refer to drawings for exact locations)*
097200	**WALL COVERINGS**				
	WC-1	Wood Veneer Wallcovering	Koroseal - Arbor Wood Veneer Wallcovering	Color: Cherry, American Flat Cut (AA2511)	Interior
	WC-2	NOT USED			
	WC-3	Vinyl Wallcovering	Koroseal - Timberline Wall Covering	Finish/Color: Cashmere T122-51	Interior
	WC-4	Vinyl Wallcovering	Koroseal - Timberline Wall Covering	Finish/Color: Rosewood T122-50	Interior
	WC-5	Projectable / Writable Wallcovering	Koroseal - Walltalkers - Project Rite	Finish/Color: White	Interior
098433	**SOUND-ABSORBING WALL UNITS**				
	FWAP-1	Fabric Wrapped Acoustical Panels	Koroseal -		Interior
099113	**EXTERIOR PAINTING**				
	PNT-4	Paint	Sherwin Williams	Color: SW 7660 Earl Gray	Exterior - Siding (Trim, Soffit)
	PNT-5	Paint	Sherwin Williams	Color: SW 7075 Web Gray	Exterior - Siding (Board, Batten)
099123	**INTERIOR PAINTING**				
	PNT-1	Paint	Sherwin Williams	Color: SW 6253 Olympus White	Interior - Field
	PNT-2	Paint	Sherwin Williams	Color: SW 6257 Gibralter	Interior
	PNT-3	Paint	Sherwin Williams	Color: SW 7588 Show Stopper	Interior - Accent Red
	PNT-6	Paint	Sherwin Williams	Color: SW 6255 Morning Fog	Interior
	PNT-7	Paint	Sherwin Williams	Color: SW 6990 Caviar	Interior
	EP PNT-1	Paint	Sherwin Williams	Color: SW 6253 Olympus White	Interior - Refer to Room Finish Schedule

MATERIAL FINISH / COLOR SCHEDULE

Spec Section	Item	Description	Product Specified	Finish / Color	Location *(refer to drawings for exact locations)*
101419	**SIGNAGE AND DIMENSIONAL LETTERS**				
	LED Letters	New Generation Signs	Back-Lit Metal Channel Letters	Color: Black	Exterior
102600	**WALL AND DOOR PROTECTION**				
	WP-1	Wall Protection	Korogard BW80 Wood Chair Rail	Backing Finish: Charcoal (77) Bumper Finish: Riga Birch WC	Interior
	WP-2	Rigid Wallcovering	Koroguard - Protective Wall Covering	Finish/Color: Black 01	Interior
		Corner Guards	Korogard G800 Series Vinyl Corner Guard	Finish: Fog	Interior - PNT-1 corners
		Corner Guards	Construction Specialties, Inc - Acrovyn Corner Guards, SSM-20N	Finish: 318 Berry Red	Interior - PNT-3 corners
		Corner Guards	Korogard G800 Series Vinyl Corner Guard	Finish: Riga Birch WC	Interior - WC-3 corners
		Corner Guards	Construction Specialties, Inc - Acrovyn Corner Guards, ACO-8	Finish: Chocolate Pear WK	Interior - WC-4 corners
105113	**METAL LOCKERS**				
		Wall Mounted Metal Lockers	GearGrid - Standard Fire Station Wall Mounted Lockers	Per Manufacturer's Standard Colors	Interior
123216	**MANUFACTURED CASEWORK**				
	PL-1	Plastic Laminate	Pionite	Finish / Color: ME011-G Pyrenees Marble	Interior
	PL-2	Plastic Laminate	Pionite	Finish / Color: Slate Element AV791	Interior
	PL-3	Plastic Laminate	Pionite	Finish / Color: WM221 Amber Curly Maple	Interior
	PL-4	Plastic Laminate	Wilsonart	Finish / Color: D12K-18 Regimental Red (Linearity Finish)	Interior

MATERIAL FINISH / COLOR SCHEDULE

Spec Section	Item	Description	Product Specified	Finish / Color	Location *(refer to drawings for exact locations)*
123661.16	**SOLID SURFACING COUNTERTOPS**				
	SS-1	Countertop	Corian	Finish / Color: Cosmos Prima	Interior

SECTION 073113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Asphalt shingles.
2. Underlayment.
3. Ridge vents.
4. Metal flashing and trim.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

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

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Evaluation reports.

C. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.7 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.

1. Material Warranty Period: 30 years from date of Substantial Completion, prorated, with first ten years nonprorated.
2. Algae-Resistance Warranty Period: Asphalt shingles will not discolor for 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. Laminated-Strip Asphalt Shingles: ASTM D 3462/D 3462M, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.

1. Shingle to be: Landmark PRO

2. Nominal Size: Manufacturer’s standard.
3. Algae Resistance: Granules resist algae discoloration.
4. Impact Resistance: UL 2218, Class 4.
5. Color and Blends: Refer to Section 000200 “Material Finish / Color Schedule”

B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

2.2 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226/D 226M, asphalt-saturated organic felts, nonperforated.

1. Type: Type I.

B. Self-Adhering Sheet Underlayment, Granular Surfaced: ASTM D 1970/D 1970M, minimum of 55-mil- (1.4-mm-) thick sheet; glass-fiber-mat-reinforced, SBS-modified asphalt; mineral-granule surfaced; with release backing; cold applied.

1. Basis of Design Product: Subject to compliance with requirements, provide Atlas Roofing Corporation :Weather Master Granular SE” water barrier underlayment or comparable product from one of the following:
   a. Carlisle
   b. CertainTeed Corporation
   c. Henry Company
   d. IKO
   e. Polyguard Products, Inc.
   f. Tamko Building Products

2.3 RIDGE VENTS

A. Rigid Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic ridge vent for use under ridge shingles at dual slope roofing areas.

1. Basis of Design Product: Subject to compliance with requirements, provide Owens Corning "VentSure Ridge Vent" or comparable product from one of the following:
   a. Air Vent, Inc.
   b. Cor-A-Vent, Inc.
   c. Lomanco, Inc.
2. Minimum Net Free Area: 20 sq. in. per lineal foot.
3. Width: 15 inches.
4. Thickness: 1 inch.
5. Features:

B. Rigid Ridge Vent – Single Slope: Manufacturer's standard, rigid section prefinished metal ridge vent for use over ridge shingles at single slope roofing area / vertical wall.

1. Basis of Design Product: Subject to compliance with requirements, provide Pac-Clad "SS Ridge Vent – Slope to High Wall" or comparable product.
2. Minimum Net Free Area: 20 sq. in. per lineal foot.
3. Width: 15 inches.
4. Thickness: 0.040" Aluminum.
5. Lengths: manufacturer's standard 12 ft sections
6. Features:
   a. Expanded metal support screen.
   b. continuous cleat at vertical wall
   c. Continuous 20 ga. "Z" bracket.
   d. Concealed splice joints

C. Intake Vent: Manufacturer's filtered edge vent with internal baffles
1. Basis of Design Product: Subject to compliance with requirements, provide CertainTeed "Intake Vent" or comparable products
2. Minimum Net Free Area: 9 sq. in. per lineal foot.
3. Thickness: 0.75" low profile
4. Lengths: manufacturer's standard 48" sections
5. Features:
   a. Drainage system.
   b. Drip edge
   c. Internal weather filter
   d. Integrated end to seal end of unit

2.4 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch- (3-mm-) diameter, sharp-pointed, with a minimum 3/8-inch- (9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch (19 mm) into solid wood decking or extend at least 1/8 inch (3 mm) through OSB or plywood sheathing.

1. Shank: Smooth.
2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

C. Felt-Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch (25-mm) minimum diameter.

2.5 METAL FLASHING AND TRIM

A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.

B. Single-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Lap sides a minimum of 2 inches (50 mm) over underlying course. Lap ends a minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with felt-underlayment nails.

1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches (75 mm) in direction that sheds water. Lap ends of felt not less than 6 inches (150 mm) over self-adhering sheet underlayment.
2. Install fasteners at no more than 36 inches (914 mm) o.c.

C. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install lapped in direction that sheds water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover underlayment within seven days.

1. Install over entire roof area. Refer to drawings.

3.2 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."

3.3 ASPHALT-SHINGLE INSTALLATION

A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."

B. Install starter strip along lowest roof edge, consisting of an asphalt-shingle strip with tabs removed with self-sealing strip face up at roof edge.

1. Extend asphalt shingles 1/2 inch (13 mm) over fasciae at eaves and rakes.
2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.

F. Fasten asphalt-shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions.
1. When ambient temperature during installation is below 50 deg F (10 deg C), seal asphalt shingles with asphalt roofing cement spots.

G. Closed-Cut Valleys: Extend asphalt-shingle strips from one side of valley 12 inches (300 mm) beyond center of valley. Use one-piece shingle strips without joints in valley. Fasten with extra nail in upper end of shingle. Install asphalt-shingle courses from other side of valley and cut back to a straight line 2 inches (50 mm) short of valley centerline. Trim upper concealed corners of cut-back shingle strips.

1. Do not nail asphalt shingles within 6 inches (150 mm) of valley center.
2. Set trimmed, concealed-corner asphalt shingles in a 3-inch- (75-mm-) wide bed of asphalt roofing cement.

H. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.

I. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

1. Fasten ridge cap asphalt shingles to cover polypropylene ridge vent without obstructing airflow.

END OF SECTION 073113

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof-edge specialties.
2. Roof-edge drainage systems.
3. Roof hatch and curb assembly

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For roof specialties.

1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.

C. Samples: For each type of roof specialty and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For tests performed by a qualified testing agency.

B. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.5 WARRANTY

A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section 075323 – Ethylene Propylene Diene Monomer (EPDM) Roofing.

B. Finish Warranty Period: 10 years from date of Substantial Completion

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. FM Approvals' Listing: Manufacture and install roof-edge specialties that are listed in FM Approvals' "RoofNav" and approved for the appropriate windstorm classification, in accordance with the wind uplift pressures as indicated on the drawings. Identify materials with FM Approvals' markings.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient

2.2 ROOF-EDGE SPECIALTIES

A. Two Piece Roof-Edge Gutter and Fascia: Manufactured, two-piece, low roof slope edge fascia consisting of metal fascia cover in section lengths not exceeding 12 feet. Basis of design: Metal Era Seal-Tite Industrial Gutter with roof flange in color to match gutter. Provide 20 yr. warranty.

1. Manufacturers:
   a. Architectural Products Company
   b. ATAS International, Inc.
   c. Castle Metal Products
   d. Metal-Era, Inc.
   e. OMG Roofing Products
   f. Peterson Aluminum Corporation
   g. Southern Aluminum Finishing Company, Inc.

2. Formed Aluminum Sheet: Pre-Finished Aluminum sheet, 0.050 inch (1.02 mm) thick

   a. Surface: Smooth, flat finish.
   b. Color: Section 000200 - Refer to material finish / color schedule.

3. Corners: Factory mitered and mechanically clinched and sealed watertight.
4. Splice Plates: Concealed of same material, finish, and shape as fascia cover.

2.3 ROOF-EDGE DRAINAGE SYSTEMS

A. Sheet metal formed to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.

1. Gutter Size: As indicated on drawings. If not indicated then provide a 6”x
2. Gutter Profile: ‘Wind Resistant Chamfer’ (Box) equal to OMG Roofing system.
   a. Cap Material: Pre-finished aluminum in 22 gauge thickness.

b. Color: As selected from manuf. standard colors.
3. Provide mesh or perforated metal leaf guard
4. Downspout Size: 4” x 4”
5. Downspout Profile: Rectangular
6. Downspout Spacing: Refer to exterior elevations
7. Provide concrete splash block at each downspout outlet
8. Color as selected by architect from supplier’s full range of options.

2.4 MATERIALS

A. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.

2.5 MISCELLANEOUS MATERIALS

A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

1. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.

2.6 ROOF HATCHES

A. Roof Hatches: Fabricate roof hatches with insulated double-wall lids and insulated double-wall curb adapter frame with integral mounting flange clamps and lid frame counterflashing. Fabricate with welded or mechanically fastened and sealed corner joints. Provide continuous weather tight perimeter gasketing and equip with corrosion-resistant or hot-dip galvanized hardware.
1. Basis-of-Design Product: The Bilco Company “Versa Mount” Replace hatch , or a comparable product by one of the following:

2. Manufacturers:

a. Babcock-Davis; a Cierra Products Inc. Company.
b. Bristolite Skylights.
c. Custom Curb, Inc.
d. Dur-Red Products.
e. Hi Pro International, Inc.
f. J. L. Industries, Inc.
g. Metallic Products Corporation.
h. Milcor Inc.; a Gibraltar Company.
i. Nystrom, Inc.
j. O'Keeffe's Inc.
k. Precision Ladders, LLC.
l. Roof Products & Systems Corporation.
m. ThyCurb; Div of Thybar Corporation.
n. Wasco Products, Inc.
o. Western Canwell.

3. Loads: Fabricate roof hatches to withstand 40-lbf/sq. ft. (1.9-kPa) external and 20-lbf/sq. ft. (0.95-kPa) internal loads.
4. Type and Size: Single-leaf lid, to match existing roof hatch curb. Verify dimensions in field.
5. Curb and Lid Material: Galvanized steel sheet, 0.079 inch (2.0 mm) thick.

    a. Finish: High-performance organic coating.

6. Insulation: Cellulosic-fiber board.
7. Interior Lid Liner: Manufacturer's standard metal liner of same material and finish as outer metal lid.
8. Exterior Curb Liner: Manufacturer's standard metal liner of same material and finish as metal curb.
9. Fabricate units to minimum height of 12 inches (300 mm), unless otherwise indicated.
10. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate hatch curbs with height constant.
11. Hardware: Galvanized steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.
12. Ladder Safety Post: Manufacturer's standard ladder safety post. Post to lock in place on full extension. Provide release mechanism to return post to closed position.

2.7 ROOF CURBS

A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints, and integrally formed deck-mounting flange at perimeter bottom.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. AES Industries, Inc.
    b. Curbs Plus, Inc.
    c. Custom Solution Roof and Metal Products.
    d. Greenheck Fan Corporation.
    e. LM Curbs.
    f. Metallic Products Corp.
    g. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
    h. Pate Company (The).
    i. Roof Products, Inc.
    j. Safe Air of Illinois.
    k. Thybar Corporation.
    l. Vent Products Co., Inc.

B. Material: Zinc-coated (galvanized) steel sheet, 0.079 inch thick.

1. Finish: Two-coat fluoropolymer.
2. Color: As selected by Architect from manufacturer’s full range.

C. Construction:

1. Insulation: Factory insulated with 1-1/2-inch-thick cellulosic-fiber board insulation.
2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
3. Factory-installed wood nailer at top of curb, continuous around curb perimeter.

4. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
5. Fabricate curbs to minimum height of 16 inches unless otherwise indicated.
6. Top Surface: Level around perimeter with roof slope accommodated by sloping the deck-mounting flange.
7. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.
8. Verify the size of the existing roof top unit and the location of the supply and return, coordinate with the curb fabrication.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
4. Torch cutting of roof specialties is not permitted.
5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

1. Space movement joints at a maximum of 12 feet (3.6 m) with no joints within 18 inches (450 mm) of corners or intersections unless otherwise indicated on Drawings.
2. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.

E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F (4 deg C).

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.2 ROOF-EDGE SPECIALITIES INSTALLATION

A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.3 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as roof specialties are installed.

END OF SECTION 077100

SECTION 123216 – MANUFACTURED CASEWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Manufactured casework and accessories.

1.2 RELATED SECTIONS

A. Division 6 - Carpentry: Framing and blocking in walls, floors and ceiling to support equipment.

B. Division 9 - Resilient Flooring: base for casework including floor cabinets and table legs.

C. Division 22: Sinks, faucets, fittings, traps, stops, tail pieces, vacuum breakers, and other fixtures, electrical and mechanical runs and connections.

D. Division 26: Connections for electrical service lines, wire and conduit to service fixtures.

1.3 REFERENCES

A. ADA (ATBCB ADAAG): Americans with Disabilities Act Accessibility Guidelines.

B. ANSI 208.1: Standards for Particleboard.

C. Architectural Woodwork Institute (AWI): Quality Standards.

D. NEMA LD 3: High Pressure Decorative Laminates.

1.4 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Test reports certifying that the casework finish complies with manufacturer's standards for chemical and physical resistance performance requirements.
2. Performance test reports from an independent testing lab on each specified top material.
3. Preparation instructions and recommendations.
4. Storage and handling requirements and recommendations.
5. Installation methods.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
1. Indicate locations of blocking and reinforcements required for installing casework.
2. Include indicators of exposed conduits, if required, for service fittings.
3. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other equipment.
4. Include coordinated dimensions for equipment specified in other Sections or provided by Owner.

C. Certifications:
1. Submit certified product test data in accordance with ANSI A161.1, NEMA LD3, and general

static load testing as specified, performed and certified by an independent testing agency.

2. Submit certification stating that all casework will comply with AWI's "Architectural Woodwork Quality Standards".

3. Material Samples: For each finish selected.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Not less than 5 years experience in the actual production of specified products. Submit documentation of plant facilities and capacity to provide casework for this Project.

B. Installer Qualifications: Firm with 5 years experience in installation or application of systems similar in complexity to those required for this Project, plus the following.
   1. Authorized distributor of manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Casework shall be protected in transit.

B. Store products under cover in a ventilated building not exposed to extreme temperature and humidity changes prior to installation. Do not store or install casework in building until concrete, masonry, and drywall/plaster work is dry.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction if applicable.

1.7 PROJECT CONDITIONS

A. For delivery and installation of casework and equipment, building conditions shall comply with AWI Standard 1700-G-3 and 1700-G-4 and be as follows:
   1. Flooring required to be placed under casework and equipment installed.
   2. Wood or metal blocking (wall grounds) installed within partitions to allow for immediate installation upon delivery.
   3. Heating and air conditioning systems providing consistent temperature and humidity conditions to comply with by AWI Standard 1700-G-4 and 1700-G-5.
      a. Relative humidity not less than 40 percent, nor more than 60 percent.
      b. Temperatures not less than 65 degrees F (18 degrees C) and not greater than 80 degrees F (27 degrees C) in areas of casework and equipment installation.
   4. Overhead mechanical, electrical and plumbing rough-in work is complete.
   5. Wet operations complete prior to delivery.
   6. Ceiling grids (with or without ceiling tiles), overhead soffits, ductwork and lighting installed.
   7. Painting complete.

1.8 WARRANTY

A. Casework Manufacturer Warranty: 5 years from date of delivery. Warranty is for the conditions indicated below, and when notified in writing from Owner, manufacturer shall promptly investigate and address said deficiencies.
   1. Defects in materials and workmanship.
   2. Deterioration of material and surface performance below minimum standards as certified by independent third party testing laboratory.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design: Subject to compliance with requirements, provide custom casework designed based on Case Systems, Inc. or other approved equal product including but not limited to the following:

1. Mica-Tec
2. Stevens Advantage
3. Or approved equal.

2.2 DESIGN

A. Flush Overlay Door Design:
1. Drawer fronts and hinged doors shall overlay the cabinet body. Maintain a maximum 1/8 inch (3.2 mm) reveal between pairs of doors, between door and drawer front, or between multiple drawer fronts within the cabinet

B. Interior woodwork grade: AWI, custom grade

C. ADAAG, Americans with Disabilities Act Requirements: The following requirements shall be met.
1. Countertop height: With or without cabinet below, not to exceed a height of 34 inches (864 mm) A.F.F., (Above Finished Floor), at a surface depth of 24 inches (610 mm).
2. Knee space clearance: Shall be minimum 29 inches (737 mm) A.F.F. at apron, and 30 inches (762 mm) clear span width.
3. 12 inches (305 mm) deep shelving, adjustable or fixed: Not to exceed a range from 9 inches (229 mm) A.F.F. to 54 inches (1372 mm) A.F.F.
4. Wardrobe cabinets: Shall be furnished with rod/shelf adjustable to 48 inches (1219 mm) A.F.F. at a maximum 21 inches (533 mm) shelf depth.
5. Sink cabinet clearances: In addition to above, upper knee space frontal depth shall be no less than 8 inches (203 mm), and lower toe frontal depth shall be no less than 11 inches (279mm), at a point 9 inches (229 mm) A.F.F., and as further described in Volume 56, Section 4.19.

2.3 PERFORMANCE

A. Casework shall conform to the following minimum performance requirements for static load performance:
1. Base cabinet construction/racking test: 800 lbs. (363 kg).
2. Cabinet front joint loading test: 425 lb (193 kg).
3. Wall cabinet static load test: 2,000 lb (907 kg).
4. Drawer front joint loading test: 600 lb (272 kg).
5. Drawer construction/static load test: 750 lb (340 kg).
6. Cabinet adjustable shelf support device/static load test: 300 lb (136 kg).

2.4 MATERIALS AND COMPONENTS

A. Laminated Plastics/Finishes:
1. High-pressure plastic laminate, .030 inch (.76 mm) in thickness, for exterior surfaces shall meet NEMA LD3-2000 VGL standards including thickness.

a. Exterior Color:
1) Refer to 'Material Finish / Color Schedule Section 000200' for color selections
2) Where wood grain laminates are used, direction of wood grain shall be vertical on door, end panels, fascia panels, and exposed backs; horizontal on drawer faces, aprons, and top rails.

2. Plastic Laminate Balancing Sheet: White high-pressure cabinet-liner, .020 inch (.051 mm) in thickness shall meet NEMA LD3-2000 CLS standards. Provide for balancing exterior surface laminates.
3. Countertop High-Pressure Plastic Laminate:
a. High-pressure plastic laminate, textured finish .050 inch (1.27 mm) thickness.
b. Countertop Colors:
1) As indicated in Material Finish / Color Schedule.
c. Heavy gauge neutral colored backing sheet for balanced construction.
4. Pressure Fused Laminate (for concealed surfaces):
a. Melamine resin impregnated, 120 gram PSM minimum, thermofused to core under pressure.
b. Comply with NEMA LD3-2000 VGL standards and NEMA LD3-2000 CLS standards.
c. White pressure fused laminate for cabinet interiors behind door and drawers and interiors of all closed cabinets.
d. Balanced at all concealed surfaces with same thermofused melamine. Unsurfaced coreboard or simple backers not allowed.

B. Core Materials: Particleboard, minimum 47 lb. (21.3 kg) density, of balanced 3-ply construction with moisture content not to exceed 8 percent. Particleboard shall conform to ANSI A208.1, Grade M-3.

C. Edging Types: Provide one or more of the following in accordance with "Edging Locations":
1. 3 mm thick PVC: Solid, high-impact, purified, color-thru, acid resistant, pre-lamination primed edging, machine-applied with hot melt adhesives, automatically trimmed, inside/outside length-radiused for uniform appearance, buffed and corner-radiused for consistent design.

D. Edging Locations. Provide the above specified edging types at the following locations, of the following colors:
1. Door/Drawer-Front edging shall be 3mm PVC.
a. Color selected by Architect to match adjacent laminates.
2. Forward edge of cabinet end panel, top, bottom, door/drawer front spacer rail, interior dividers, and shelf shall be 3mm PVC.
a. Color selected by Architect to match adjacent laminates.

E. Hardware
1. Hinges:
a. 2 ¾ inch, 5-knuckle steel butt hinges made from 0.095 inch thick metal with hospital tip.
2. Pulls: Comply with ADA requirements.
a. Wire design, 4 inches (101.6 mm):
1) Stainless Steel.
3. Drawer Slides:
a. Standard Drawers: Self-closing design, epoxy powder coated White, with positive in-stop, out-stop, and out-keeper to maintain drawer in 80 percent open position. Captive nylon rollers, front and rear. Minimum dynamic (operational) load rating of 100 pounds (45 kg) at 50,000 cycles.
b. File Drawers: Full extension, 3-part progressive opening slide, minimum 100 lb (45 kg),

zinc plated or epoxy coated at manufacturer's option.

1) Provide body mounted molded rails for hanging file system for legal or letter size as indicated. Cutting or machining of drawer body/face not allowed.

c. Paper Storage Drawers: Full extension, 3-part progressive opening slide, minimum 100 lb (45 kg), zinc plated or epoxy coated at manufacturer's option.

4. Catches: Catch shall provide opening resistance in compliance with the Americans with Disabilities Act.
   a. Provide top-mounted magnetic catch for base and wall cabinet door. Provide two at each tall cabinet door. Catch housing shall be molded in White. LH-340ADA.
   b. LH-345 Roller catch for mobile cabinets.
5. Adjustable Shelf Supports: Design shall include keel to retard shelf slide-off, and slot for ability to mechanically attach shelf to clip. Load rating shall be minimum 300 lb (136 kg) each support without failure. Cabinet interior sides shall be flush, without shelf system permanent projection.
6. Wardrobe Rod: Shall be 1-1/16 inches (27 mm) rod, supported by LH-363 flanges.
7. Coat Hooks:
   a. Double coat hooks, wall mount.
8. Locks: Shall be 5 disc tumbler lock keyed alike and master keyed. Dull chrome finish. Lock core shall be removable. Where noted on drawings.

2.5 CABINET CONSTRUCTION

A. Workmanship:
1. Exposed exterior cabinet surfaces shall be .030 inch (.76 mm) high-pressure laminate. Laminate surface/balancing liner to core under controlled conditions by approved and regulated laminating methods to assure a premium lamination. Natural-setting hybrid P.V.A. Type III water resistant adhesives that cure through chemical reaction, containing no health or environmentally hazardous ingredients, shall be used.
   a. Methods requiring heat are not allowed.
   b. "Contact" methods of laminating are not allowed.
2. Cabinet parts shall be accurately machined and bored for premium grade quality joinery construction utilizing automatic machinery to insure consistent sizing of modular components. End panels shall be doweled to receive bottom and top.
3. Back panel shall be fully bound (dadoed) into, and recessed 7/8 inch (22.2 mm) from the back of cabinet sides, top, and bottom to insure rigidity and a fully closed cabinet. Cabinet back shall be mechanically fastened from rear of body for tight interior fit and sealed with full-perimeter high-strength hot-melt adhesive.
4. Drawer bottom shall be fully bound (dadoed)and glued into and recessed 1/2 inch (12.7 mm) up from the bottom of sides, back, and sub-front. Sides of drawer shall be doweled to receive drawer back and sub-front.
5. 3/4 inch (19.1 mm) thick hang rails shall be mechanically fastened to end panels of all wall, base, and tall cabinets for extra rigidity and to facilitate installation.
6. All cases shall be square, plumb, and true.
7. Provide removable back panels and closure panels for plumbing access at sink cabinets, and where required.

B. Detailed Requirements For Cabinet Construction:
1. Sub-Base:
   a. Cabinet sub-base shall be separate and continuous water resistant exterior grade plywood with concealed fastening to cabinet bottom. Ladder-type jobsite construction of individual front, back, and intermediates, to form a secure and level platform to which

cabinets attach. No cabinet sides-to-floor will be allowed.

b. Sub-base at exposed cabinet end panels shall be recessed 1/4 inch (6.4 mm) from face of finished end, for flush installation of finished base material by other trades.

2. Structural Cabinet Body:
   a. Cabinet parts shall be accurately machined and bored for premium grade quality joinery construction utilizing automatic machinery to ensure consistent sizing of modular components. Dowel end panels to receive bottom and top.
   b. Cabinets over 36 inches (914 mm) wide shall be furnished with a mechanically fastened, yet removable, vertical divider to reduce horizontal member/shelf deflection. Wall cabinets shall have a clear inside nominal depth of 12 inches (305 mm) unless detailed otherwise.
3. Cabinet Top and Bottom:
   a. Solid sub-top shall be furnished for all base and tall cabinets.
   b. At cabinets over 36 inches (914 mm), bottoms and tops shall be mechanically joined by a fixed divider.
   c. Exterior exposed wall cabinet bottoms shall be Pressure Fused white laminate both sides. Assembly devices shall be concealed on bottom side of wall cabinets.
4. Cabinet Ends:
   a. Holes drilled for adjustable shelves 1-1/4 inches (32 mm) on center.
   b. Exposed exterior cabinet ends shall be laminated with high-pressure plastic laminate, balanced with high-pressure cabinet-liner interior surface.
5. Fixed And Adjustable Shelves:
   a. Thickness shall be 1 inch.
   b. Shelves shall meet the loading/deflection standards of the National Particleboard Association.
6. Cabinet Backs:
   a. Cabinet backs shall be minimum 1/2 inch (12.7 mm) thick, inset from rear of body, and fully bound (dadoed) four sides. Rear, unexposed, side of back perimeter shall be toe-nailed with mechanical fasteners for tight interior fit and direct connection of back panel to body, and sealed with full-perimeter high-strength hot-melt adhesive.
   b. Provide 3/4 inch (19 mm) thick hang rails fastened to back/body as specified in this Section. Hang rails shall be located at rear of cabinet back and fastened to cabinet sides. Provide minimum of 2 at base, 2 at wall, and 3 at tall cabinets.
   c. Exposed exterior backs shall be high-pressure plastic laminate balanced with high-pressure cabinet-liner.
7. Door And Drawer Fronts:
   a. Overlay Design: Laminated door and drawer fronts shall be 13/16 inch (20.6 mm) thick for all hinged and sliding doors. Drawer fronts and hinged doors shall overlay the cabinet body. Maintain a maximum 1/8 inch (3.2 mm) reveal between pairs of doors, between door and drawer front, or between multiple drawer fronts within the cabinet. Laminated door and drawer fronts shall be 13/16 inch (20.6 mm) thick for all hinged and sliding doors.
   b. Front Rail: Provide minimum 3/4 inch (19.1 mm) by 6 inches (152 mm) by full width cabinet body rails immediately behind all door/drawer and multiple drawer horizontal joints to maintain exact body dimensions, close off reveal, and be locator for lock strikes.
8. Drawers:
   a. Drawer fronts shall be applied to separate drawer body component sub-front.
   b. Drawer sides shall be doweled and glued to receive front and back, machine squared and held under pressure to set.
   c. Typical 1/2 inch (12.7 mm) drawer bottom, recessed, shall be fully bound (dadoed) into front, sides, and back. Routing, in drawer body for bottom, shall receive continuous

glue.

d. Reinforce drawer bottoms with 1/2 inch (12.7 mm) by 4 inches (101.6 mm) front-to-back intermediate underbody stiffeners, mechanically fastened. One at 24 inches (610 mm), two at 36 inches (914 mm), and over.

e. Paper storage drawers shall be fitted with full width hood at back.

9. Vertical and Horizontal Dividers:

a. Natural hardboard 1/4 inch (6.4 mm) thick, smooth both faces. Secured in cabinet with molded plastic clips.

2.6 COUNTERTOP CONSTRUCTION

A. Refer to Section 123623.13 – Plastic Laminate Clad Countertops.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not store or install casework in facility until concrete, masonry, drywall and plaster work is dry within limits acceptable to the casework manufacturer.

B. Do not begin installation until substrates have been properly prepared.

1. Walls and openings are plumb, straight and square.
2. Concrete floors level within 1/8 inch (3 mm) level per 10 foot (3000 mm) run, non-accumulative, when tested with a straight edge in any one direction.

3.2 COORDINATION

A. Verify site dimensions of cabinet locations in building prior to fabrication.

B. Coordination with Mechanical, Plumbing and Electrical Contractors: Coordinate work of this Section with work of other Sections including but not limited to:

1. Water, piping, electrical devices, and wiring.
2. Installation of fittings according to Shop Drawings and manufacturer's written instructions.
3. Setting bases and flanges of sink and countertop-mounted fittings in sealant recommended by manufacturer of sink or countertop material.
4. Anchorage of fittings and piping, unless otherwise indicated.

3.3 INSTALLATION

A. Install casework in accordance with manufacturer's instructions.

1. Installation of casework shall be plumb, level, true and straight, with no distortions.
2. Use concealed shims as required.
3. Where casework or equipment butts against other finished work, scribe and cut for an accurate fit.
4. Lubricate operating hardware as recommended by the manufacturer.

B. Install countertop and edge surfaces in one plane with flush hairline. Locate joints only where shown

on Shop Drawings.

1. Provide required holes and cutouts for service fittings.
2. Seal unfinished edges and cutouts in plastic-laminate countertops with heavy coat of polyurethane varnish.
3. Provide scribe moldings for closures at junctures of countertop, curb, and splash, with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
4. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.4 PROTECTION

A. Inspect casework for damaged or soiled areas; remove, refinish, and touch-up as required.

B. Protect installed products until completion of project.

C. Touch-up, repair or replace damaged products before Substantial Completion.

D. Remove cartons, debris, sawdust, scraps and similar items and leave spaces clean, and casework ready for Owner's use.

E. Provide the services of a qualified manufacturer's representative to demonstrate operation and maintenance procedures of the installed casework and equipment to the Owners personnel.

END OF SECTION 123216

SECTION 224000 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to General Conditions, Supplementary Conditions and General Requirements which are hereby made a part of this Section.

1.2 DESCRIPTION:

A. General: Provide basic materials for mechanical work and install in accordance with the Contract Documents.

1.3 PRODUCT HANDLING:

A. Deliver materials to the job site in original containers and packages, bearing the manufacturer's labels indicting name, type and brand.

1.4 CONTENTS:

A. Major items of work and equipment included under this Section of the Specifications are plumbing fixtures, materials and finish applications for a complete installation.

B. Described herein are the following:
Plumbing Fixtures and Accessories
Plumbing Fixture Connections
Plumbing Fixture Schedule
Equipment

1.5 SUBMITTALS:

A. Product Data:

1. Water closets, including carriers, seats and flush valves.
2. Lavatories, including carriers, faucets, stops, supplies, and drains and traps.
3. Lavatory hot water tempering supply fixture.
4. Electric water coolers, including carriers.
5. Service sinks, including supply fitting and drain.
6. Stainless steel sinks, including faucets, stops, supplies, drains and traps.
7. Showers, including mixing valves and showerheads.
8. Fixture sealant.

1.6 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for plumbing fixtures for people with disabilities.

C. Regulatory Requirements: Comply with requirements in Public Law 102-486, "Energy Policy Act," about water flow and consumption rates for plumbing fixtures.

D. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.

E. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.

F. Comply with the following applicable standards and other requirements specified for plumbing fixtures:

1. Enameled, Cast-Iron Fixtures: ASME A112.19.1M.
2. Plastic Laundry Trays: ANSI Z124.6.
3. Plastic Shower Enclosures: ANSI Z124.2.
4. Plastic Sinks: ANSI Z124.6.
5. Porcelain-Enameled, Formed-Steel Fixtures: ASME A112.19.4M.
6. Slip-Resistant Bathing Surfaces: ASTM F 462.
7. Solid-Surface-Material Lavatories and Sinks: ANSI/ICPA SS-1.
8. Stainless-Steel Residential Sinks: ASME A112.19.3.
9. Vitreous-China Fixtures: ASME A112.19.2M.
10. Water-Closet, Flush Valve, Tank Trim: ASME A112.19.5.
11. Water-Closet, Flushometer Tank Trim: ASSE 1037.
12. Backflow Protection Devices for Faucets with Side Spray: ASME A112.18.3M.
13. Backflow Protection Devices for Faucets with Hose-Thread Outlet: ASME A112.18.3M.
14. Diverter Valves for Faucets with Hose Spray: ASSE 1025.
15. Faucets: ASME A112.18.1.
16. Hose-Connection Vacuum Breakers: ASSE 1011.
17. Hose-Coupling Threads: ASME B1.20.7.
18. Integral, Atmospheric Vacuum Breakers: ASSE 1001.
19. NSF Potable-Water Materials: NSF 61.
20. Pipe Threads: ASME B1.20.1.
21. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
22. Supply Fittings: ASME A112.18.1.
23. Brass Waste Fittings: ASME A112.18.2.

G. Comply with the following applicable standards and other requirements specified for shower faucets:

1. Backflow Protection Devices for Hand-Held Showers: ASME A112.18.3M.
2. Combination, Pressure-Equalizing and Thermostatic-Control Antiscald Faucets: ASSE 1016.
3. Faucets: ASME A112.18.1.
4. Hand-Held Showers: ASSE 1014.
5. High-Temperature-Limit Controls for Thermal-Shock-Preventing Devices: ASTM F 445.

6. Hose-Coupling Threads: ASME B1.20.7.
7. Manual-Control Antiscald Faucets: ASTM F 444.
8. Pipe Threads: ASME B1.20.1.
9. Pressure-Equalizing-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.
10. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
11. Thermostatic-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.

H. Comply with the following applicable standards and other requirements specified for miscellaneous fittings:

1. Atmospheric Vacuum Breakers: ASSE 1001.
2. Brass and Copper Supplies: ASME A112.18.1.
3. Dishwasher Air-Gap Fittings: ASSE 1021.
4. Manual-Operation Flushometers: ASSE 1037.
5. Plastic Tubular Fittings: ASTM F 409.
6. Brass Waste Fittings: ASME A112.18.2.
7. Sensor-Operation Flushometers: ASSE 1037 and UL 1951.

I. Comply with the following applicable standards and other requirements specified for miscellaneous components:

1. Disposers: ASSE 1008 and UL 430.
2. Dishwasher Air-Gap Fittings: ASSE 1021.
3. Flexible Water Connectors: ASME A112.18.6.
4. Grab Bars: ASTM F 446.
5. Hose-Coupling Threads: ASME B1.20.7.
6. Hot-Water Dispensers: ASSE 1023 and UL 499.
7. Off-Floor Fixture Supports: ASME A112.6.1M.
8. Pipe Threads: ASME B1.20.1.
9. Plastic Toilet Seats: ANSI Z124.5.
10. Supply and Drain Protective Shielding Guards: ICC A117.1.

PART 2 - MATERIALS AND INSTALLATION

2.1 PLUMBING FIXTURES AND ACCESSORIES:

A. Provide and connect all fixtures shown on the Drawings or herein called for. All fixtures shall be equal in all respects to the figure numbers hereinafter listed. Figure numbers are used for establishing a standard. All fixture trim shall be by one manufacturer only. No mixing of trim or fixtures will be permitted unless otherwise specified.

B. Unless otherwise specified, all exposed fixture trimmings shall be first quality, chromium plated brass, including pipe nipples from points of rough-in in walls to fixture stops. All faucets shall have renewable seats and discs.

C. Lavatories shall be supported as specified on chair carriers or on concealed hangers attached to walls with through bolts. Where fixtures are opposite each other, the bolts shall pass through both hangers.

D. Fixtures and equipment shall be supported and fastened in a satisfactory manner. Where secured to concrete or brick walls, hangers shall be fastened with brass bolts or machine screws in lead-sleeve type anchorage units or with brass expansion bolts or machine screws in lead-sleeve type anchorage units. Wall hung water closets shall be supported on chair carriers.

E. This Contractor shall be responsible for protection against injury from building materials, acids, tools and equipment, all plumbing fixtures included in this Section of the Specifications. The cost of replacing and repairing plumbing fixtures made necessary by failure of this Contractor to provide suitable protection shall be paid for by this Contractor. After fixtures have been set, clean all fixtures.

F. Fixture connections shall be chrome plated flexible brass pipe. All water supply connections shall be provided with wheel handle stops or valves having NPT female inlets.

1. Approved Fixture Stop Manufacturers:
American Standard
Kohler
Chicago Faucet
T & S Brass & Bronze Works, Inc.

G. Physically handicapped fixtures shall be installed in strict accordance with the Department of Labor Construction Code Commission General Rules for the Physically Handicapped and A.D.A.

H. All chrome plated brushed satin finish shall conform to U.S. Bureau of Standards No. US 26D.

I. Install plumbing fixtures of types indicated where shown and at indicated heights in accordance with fixture manufacturer's written instructions roughing-in drawings and with recognized industry practices. Ensure that plumbing fixtures comply with requirements of local codes, the Michigan Plumbing Code and the National Standard Plumbing Code pertaining to installation of plumbing fixtures.

J. Joints between fixtures and wells or floors shall be filled with single-component silicone sealant complying with ASTM C920. Dow Corning, 786; GE Silicones Sanitary SCS 1700; Pecora, 898; or as approved. No Plaster of Paris shall be used.

2.2 PLUMBING FIXTURE CONNECTIONS:

A. Fixture connections shall be in accordance with the following table:

Fixture	Soil or Waste	Vent	Trap	Hot Water	Cold Water
Water Closets (Flush VA.)	4"	2"			1-1/4"
Lavatory	1-1/2"	1-1/2"	1-1/4"	1/2"	1/2"
Electric Water Coolers	1-1/2"	1-1/4"		1/2"	
Service Sinks	3"	1-1/2"	3"	3/4"	3/4"
Sinks	1-1/2"	1-1/2"	1-1/2"	1/2"	1/2"
Wall Hydrants					3/4"
Hose Bibbs					1/2"

Others as indicated in the Contract Documents.

B. Fixtures shall be American Standard, Kohler or Crane. American Standard model numbers are used to establish a standard.

C. Fixture supports shall be Zurn. J.R. Smith, Josam or Wade.

D. Flush valve shall be Sloan or Zurn.

E. Toilet seats shall be open front Olsonite, Church, Centoco or Beneke.

F. Faucets shall be Symmons, Delta, Chicago or Speakman.

2.3 PLUMBING FIXTURE SCHEDULE:

WC-1 Floor Type Water Closet (Flush Valve): American Standard Madera 16.5" Height" 2854.016, 1.6 G.P.F., white vitreous china siphon jet, elongated bowl, 1-1/2" top spud and bolt caps. Kohler or Zurn.

a. Flush Valve: Sloan "Royal" No. 110-3 quiet action flush valve with vacuum breaker, 1" screwdriver bak-chek angle stop and cap flush connection and coupling for 1-1/2" top spud, wall and spud flanges and adjustable tailpiece. Kohler, Zurn or American Standard.
b. Seats: Heavy Duty, white molded seamless open front with concealed self-sustaining check hinge.

WC-2 Floor Mounted Water Closet (Physically Handicapped): Same as WC-1 except mounting height shall meet the requirements of A.D.A and Michigan Department of Labor Construction Code "Barrier Free" requirements. Mounting of flush valve to be with the lever on the wide side of the compartments.

LAV-1 Undermount Lavatories (Physically Handicapped): American Standard "Ovalyn" 9482, 19" x 16" size oval white vitreous china, and front overflow. Unit shall be drilled to receive the specified trim. Kohler or Zurn

a. Supplies: 1/2" x 3/8", angle supplies with wheel stops, flexible risers and CP escutcheon plates.
b. Trap: CP 1-1/2" bent tube, adjustable "P" trap with cleanout, CP tubing to wall and CP escutcheon plate.
c. Trim: Deck mounted, vandal resistant, American Standard Monterrey 6114, Kohler K15199 or Delta Model 500, single lever, washerless, 4" centerset with 3/8" OD copper inlets, aerator, 1.5 GPM maximum flow restrictor, grid drain and 1-1/4" CP tailpiece. All exposed surfaces heavily chrome plated.

NOTE: Physically handicapped lavatories shall be provided with ASSE 1070 mixing valve. See detail on drawings. Also, provide Trubro Lag Guard 2 insulating kits for all exposed traps and supplies. Verify location of physically handicapped lavatories with Architectural Trades.

LAV-2 Wall Hung Lavatories American Standard Lucern 0356 with 4" drillings, wall hung, 20" x 18" size, vitreous china, lavatory wall mounted, front overflow, 4" high backsplash. Unit shall be drilled to receive the specified trim. Kohler or Zurn

a. Supports: Concealed arms and chair carrier.
b. Supplies: 1/2" x 3/8" angle supplies with wheel stops, flexible risers and CP escutcheon plates.
c. Trap: CP 1-1/4" cast brass adjustable "P" trap with cleanout and tubing outlet to wall complete with CP cast brass escutcheon with lock nut.
d. Trim: Deck mounted, vandal resistant, American Standard Monterrey 6114, Kohler K15199 or Delta Model 500, single lever, washerless, 4" centerset with 3/8" OD copper inlets, aerator, 1.5 GPM maximum flow restrictor, grid drain and 1-1/4" CP tailpiece. All exposed surfaces heavily chrome plated. (Physically Handicapped):

SK-1 Sink: Elkay Barrier Free Double Compartment "Lustertone" Model LR-3321-55, 33" x 21-1/2" overall size, each compartment 13-1/2" x 16" x 5-1/2" deep sink, sound deadened Type 302, 18-8 stainless steel, ledge back, Grip-Rim self-rimming feature. Unit punched to receive specified trim (3 holes).

a. Supplies: 1/2" x 3/8" angle supplies with wheel stops, flexible risers and CP escutcheon plates.
b. Kohler K15172-F Coralais, single control with side spray or Elkay Model LK-2442 with two lever handles mixing faucet with swing spout and aerator. Exposed surfaces to be chrome plated.
c. Drain (right sink): LK-99 stainless steel.
d. Drain (left sink): Provide drain to accept garbage disposer and disposer. . Disposer shall be similar to GE Model GFC 525F continuous feed type with manual test overload, 1/2 HP, 120V motor, plug and cord.
e. Trap: 1-1/2" CP cast brass with adjustable "P" trap with cleanout and tubing outlet to wall with CP cast brass escutcheon.
. All sink dimensions shall be confirmed with Architectural Base Cabinet Drawings to insure that top and sink compartments mate the companion base cabinet.
g. Approved Sink Manufacturers:
Elkay
Just

SK-2 Sink: Elkay Single Compartment Undermount "Crosstown" Model EFRU131610T, 16" x 18" x 10" overall size, , sound deadened Type 304, 16 gauge stainless steel.

a. Supplies: 1/2" x 3/8" angle supplies with wheel stops, flexible risers and CP escutcheon plates.
b. Faucet: Elkay LR1500CR single handle, 1.5 GPM, solid brass w/ CR finish.
c. Stainer: Stainless steel grid.
d. Trap: 1-1/2" CP cast brass with adjustable "P" trap with cleanout and tubing outlet to wall with CP cast brass escutcheon.
e. All sink dimensions shall be confirmed with Architectural Base Cabinet Drawings to ensure that top and sink compartments mate the companion base cabinet.
f. Approved Sink Manufacturers:
Elkay
Just

SK-3 Sink by Elkay Model #14-3C18X24L24X, 16 gauge type 300 series stainless steel free standing 3-compartment sink top with 24" left drainboard. Overall 84.5"L x 29.8"W x 43.8"H, 9"backsplash center punched, support on stainless steel. Galvanized legs and adjustable feet. Provide with three 18" x 24" x 14" deep bowls, 3.5"basket stariner with all fittings and trim.

SS-1 Service Sinks: Powers-Fiat Model No. TSBC 1611 32" x 32", one-piece, corner chamfered, molded stone or terrazzo unit having 10" high walls and 6" drop front, with not less than 1" wide shoulders. Color shall be #231 white drift. Drain body shall be factory installed stainless steel #302 with combination dome strainer and lint basket. The drain body shall provide for a caulked joint to a 3" IPS silicone sealant shall be Plate #833-AA.

a. Supply Fitting: Vandal resistant Chicago Faucet No. 897, combination service sink fitting with vacuum breaker, 3/4" hose thread rigid spout, No. 369 lever handles, wall brace pail hook and No. "R" 1/2" flanged female adjustable arms with integral stops. All exposed surfaces shall be heavily chrome plated.
b. Rim Guard: Vinyl bumper guards equal to Plate #E-77-AA shall be provided on all sides not adjacent to wall.
c. Wall Guard: Stainless steel Model MSG2424.
d. Hose Bracket: Plate #832-AA, 18 gauge, No. 302 stainless steel hose bracket with rubber grip complete with 30" long flexible, cloth reinforced, 5/8" heavy duty rubber hose with 3/4" chrome coupling at hose end.
e. Approved Manufacturers:
Powers-Fiat
Stern-Williams
Mustee

EWC-1 Electric Water Cooler: Elkay LZSTL8WSSP, two level barrier-free unit with bottle filling station. Unit shall include self-closing extra side and front push bars, stream projector with protective hood, stainless steel receptor, all stainless steel body hermetically sealed compressor with built-in overload protector and lubricated for life, copper tube and storage tank. Capacity shall be 8.0 GPM at 90 degrees F. room temperature, 80 degrees F. inlet water temperature and 50 degrees F., 4.6 F.L.A. delivered water temperature. Provide five year warranty on refrigeration system. Oasis or Halsey Taylor.

EWC-2 Elkay ezH2O in-wall bottle filling station, filtered 8 GPH stainless. Chilling capacity of 8.0 GPH (gallons per hour) of 50° F drinking water, based on 80° F inlet water and 90° F ambient. Features shall include hands free, visual filter monitor, filtered, green ticker, laminar flow, antimicrobial, real drain. Electronic bottle filler sensor activation. Product shall be Wall Mount (Inwall Frame/Plate). 120v/1. Compressor: Hermetically-sealed, reciprocating type, single phase. Sealed-in lifetime lubrication. Condenser: Fan cooled, copper tube with aluminum fins. Fan motor is permanently lubricated. Cooling Unit: Combination tube-tank type. Continuous copper tubing with is fully insulated with EPS foam that meets UL requirements for self-extinguishing material. • Refrigerant Control: Refrigerant R-134a is controlled by accurately calibrated capillary tube. • Temperature Control: Easily accessible enclosed adjustable thermostat is factory preset. Requires no adjustment other than for altitude requirements.

a. Supply: 1/2" x 3/8" angle supply with wheel stop, flexible supply and CP escutcheon.

b. Trap: 1-1/4" OD, CP brass, with adjustable "P" trap, outlet tube to wall and CP escutcheon.

c. Approved Manufacturers:
Oasis
Elkay
Halsey Taylor
Sunroc
Haws

SH-1 Commercial Grade Shower valve and head: ASSE 1016P. Symmons C-96-1-X with Symmons Mixing Valve 46-2X- Body with integral stops and checks. Provide 2.5 GPM Symmons #4-137 shower head with spray adjustment, mounting arm and flange, all chrome plated metal. Powers or Leonard or Delta-Tec.

SH-2 Commercial Grade Shower valve and handheld shower system: ASSE 1016P, Symmons C-96-300-B30-V-X with Mixing Valve 46-2X- Body with integral stops and checks. Provide 60" metal flexible hose, 48" metal slide bar, 2.5 GPM Symmons hand held shower head with spray adjustment, mounting hardware for slide bar, all chrome plated metal. Powers, Leonard or Delta-Tec. Provide CP vacuum breaker mounted at 72" AFF. Provide floor drain FD-1.

EEW-1 Emergency eye wash, Bradley "S19224 series" wall-mount halo: standard eye/face wash units save space and fit easily into any work environment. halo eyewash or eye/face wash, operated by an ergonomic, highly visible push handle, provides effective wash down coverage and spray pattern. Integral strainer reduces debris in the water and also prevents clogging. includes antimicrobial protection. Bowl is constructed of yellow impact-resistant plastic, type 304 corrosion-resistant stainless steel or type 316 corrosion-resistant stainless steel. Dust cover is constructed of transparent yellow impact-resistant plastic, type 304 corrosion-resistant stainless steel or type 316 corrosion resistant stainless steel. Activation: type 304 stainless steel push handle. drench hose: perforated sprayhead with protective sprayhead cover is abs plastic and provides soft spray for cleansing eye and face. Chrome-plated brass valve with extended handle stays open once handle is squeezed. Series n9 dula-check backflow preventer has a chrome-nickel plated brass body and includes atmospheric vent for continuous pressure applications.
Wall bracket: heavy gauge sand cast aluminum. 1 1/4" drain fitting and tailpiece furnished.
Provide an emergency eyewash mixing valve. the valve shall control outlet temperature over a wide range of flow and shall be suitable for single shower/ eyewash application. the valve shall include a thermometer to measure the temperature of the stream. temperature adjustment shall be vandal resistant. the control mechanism shall employ a liquid filled thermostatic motor to drive the valve without additional power requirements. the control mechanism shall employ a stainless steel sliding piston control device with reverse seat closure and both fixed and variable cold water bypass. in the event of interruption of the cold water supply, the control mechanism closes off the hot water port, stopping all flow. in the event of interruption of the hot water supply, the control mechanism shall allow cold flow through both the fixed and variable bypass. in the event that the liquid motor fails, the control mechanism closes off the hot water port with the reverse seat and fully opens the internal variable bypass to allow cold water flow.

2.4 EQUIPMENT FURNISHED BY OWNER OR EQUIPMENT FURNISHED UNDER OTHER DIVISIONS OF THESE SPECIFICATIONS AND RELOCATED EQUIPMENT:

A. The Plumbing Contractor shall be responsible for roughing in all plumbing fixtures, equipment or devices requiring plumbing utilities. For new equipment, the Trade furnishing the equipment shall also furnish the Plumbing Contractor to complete his work. For existing equipment, roughing-in requirements shall be determined from actual field observations and measurements.

B. The Plumbing Contractor shall make all final plumbing connections to all new and existing equipment, fixtures or devices requiring plumbing utilities. Provide all necessary adapters, piping, shut-off valves, fixture stops, tailpieces, traps, backflow preventers and specialties for a complete and operable system conforming to state, local and applicable codes.

PART 3 - EXECUTION

3.1 GENERAL:

A. Rough-in and make final supply and waste tie-ins for plumbing fixtures.

B. Provide plumbing fixtures with shut-off stops as specified.

C. All exposed piping to plumbing fixtures: chromium-plated.

3.2 TRAPS AND CLEANOUTS:

A. Provide fixture traps of the water-seal, self cleaning “P” trap type. Trap water seal depth: not less than two inches and not more than four inches. Provide each trap with an accessible brass cleanout of ample size, protected by the water seal.

B. Provide nominal size of each fixture trap to be the same size as the fixture drain to which it is connected.

C. Provide running traps at locations indicated. Extend cleanouts for running traps, installed under the floor and not in trap pit, to finished floor.

3.3 SEALING:

A. Seal the space between plumbing fixtures (except slab top lavatories) and floors and walls.

B. Install sealant in accordance with manufacturer's recommendations, giving a neat, clean, stain-free finished job.

C. Seal self-rimming countertop sinks to countertops with sealant supplied with fixture.

3.4 FIXTURE PROTECTION:

A. Cover and protect the rims, fronts and exposed parts of lavatories, urinals, service sinks, water closets, drinking fountains and other plumbing fixtures with suitable guards and building paper, and maintain the protection until completion of work.

B. Install the above protection immediately at the time of setting the plumbing fixtures and remove only when directed by the Architect. Make any damage to fixtures good without additional cost to the Owner.

3.5 FIELD QUALITY CONTROL:

A. Verify that installed fixtures are categories and types specified for the locations installed.

B. Check that fixtures are complete with trim, faucets, fittings, and other specified components.

C. Inspect installed fixtures for damage. Replace damaged fixtures and components.

D. Test installed fixtures for proper operation after water systems are pressurized. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

3.6 ADJUSTING:

A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings and controls.

B. Operate and adjust [garbage disposals] [point-of-use water heaters] [and] [controls]. Replace damaged and malfunctioning units [and controls].

C. Adjust water pressure at faucets, shower valves and flush valves to produce proper flow and stream.

D. Replace washers and seals of leaking and dripping faucets and stops.

3.7 CLEANING:

A. Install and maintain pipe and equipment clean and free from rust, dirt and scale. Provide temporary covers at pipe and equipment openings.

B. Immediately before turning fixtures over to the Owner and as directed, remove temporary protection and provide final cleaning.

C. Remove faucet spouts, strainers and aerators, remove sediment and debris, and reinstall.

D. Remove sediment from drains and traps.

END OF SECTION 22400

SECTION 329200 - TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Seeding, mulching and establishment of lawns.

B. Related Sections:

1. Division 31 Section "Site Clearing" for topsoil stripping and stockpiling.
2. Division 31 Section "Earth Moving" for excavation, filling and backfilling, and rough grading.

1.3 DEFINITIONS

A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

B. Finish Grade: Elevation of finished surface of planting soil.

C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or 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.

1.4 SUBMITTALS

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

1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.

C. Qualification Data: For qualified landscape Installer.

D. Product Certificates: For soil amendments and fertilizers, from manufacturer.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.

1. Experience: Three years' experience in turf installation in addition to requirements in Division 01 Section "Quality Requirements."
2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
3. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
4. Pesticide Applicator: State licensed, commercial.

B. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.7 PROJECT CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion Insert starting time.

1. Spring Planting: April 15 through May 15.
2. Fall Planting: August 15 through September 15.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.8 MAINTENANCE SERVICE

A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:

1. Seeded Turf (General Lawn Areas): Minimum 60 days from date of Substantial Completion.

a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 90 percent pure seed, and not more than 0.5 percent weed seed:

General Lawn Areas	
*Kentucky bluegrass	30%
*Perennial Rye	30%
*Turf Type Tall Fescue	40%

* minimum of three cultivars

2.3 FERTILIZER

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the composition recommended in the topsoil test reports included with the Project Manual.

2.2 PLANTING SOILS

A. Planting Soil: Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process and stockpiled on-site. Verify suitability of native surface topsoil to produce viable planting soil. For athletic field area, mechanically screen topsoil to eliminate roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

2.3 MULCHES

A. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

B. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

2.4 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.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.

3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

3.3 TURF AREA PREPARATION

A. Limit turf subgrade preparation to areas to be planted.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches (150 mm). Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Spread planting soil, apply fertilizer on surface, and thoroughly blend planting soil.

    a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.

2. Spread planting soil to a maximum depth of 6 inches (150 mm) to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet. Final planting soil compaction must not exceed 85 percent.

    a. Spread approximately 1/2 the thickness of planting soil over loosened subgrade. Mix thoroughly into top 2 inches (50 mm) of subgrade. Spread remainder of planting soil.
    b. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
2. Loosen surface soil to a depth of at least 8 inches (200 mm). Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches (100 mm) of soil. Till soil to a homogeneous mixture of fine texture.

    a. Apply fertilizer directly to surface soil before loosening.

3. Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, trash, and other extraneous matter.
4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future. Final planting soil compaction must not exceed 85 percent.

E. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

F. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 SEEDING

A. Sow seed with a “Brillion” or equivalent drill seeding machine. Do not broadcast or drop seed. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

1. Do not use wet seed or seed that is moldy or otherwise damaged.
2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow lawn seed at a total rate of 5 to 6 lb/1000 sq. ft. See Plans for seeding rates and other requirements for storm water management areas.

3.5 HYDROMULCHING

A. Hydromulch: Mix specified fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre (15.6-kg/92.9 sq. m) dry weight.

3.6 TURF RENOVATION

A. Renovate existing turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
2. Install new planting soil as required.

B. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

C. Remove topsoil containing foreign materials such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

D. Mow, dethatch, core aerate, and rake existing turf.

E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches (150 mm).

H. Apply soil amendments and initial fertilizers required for establishing new turf and mix thoroughly into top 4 inches (100 mm) of existing soil. Install new planting soil to fill low spots and meet finish grades.

I. Apply seed and hydromulch as required for new turf.

J. Water newly planted areas and keep moist until new turf is established.

3.7 TURF MAINTENANCE

A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (100 mm).

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.

C. Mow turf as soon as top growth is tall enough to cut and continue at a frequency of twice per week. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow Kentucky bluegrass to a height of 2 inches (50 mm).

D. Turf Postfertilization: Apply fertilizer after initial mowing and when grass is dry. The contractor shall include a minimum of two (2) fertilizer applications not including the initial seeding fertilization.

3.8 SATISFACTORY TURF - GENERAL LAWN AREAS

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 2 by 2 inches.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.9 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.10 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION 329200