ADDENDUM #3

FROM : ARCHITECHNICA
555 W. BENJAMIN HOLT DRIVE
SUITE 423
STOCKTON, CA 95207
(209) 952-5850 FAX (209) 952-2442

PROJECT : CODESTACK ACADEMY

LOCATION : 201 North California Street
Stockton CA 95202

REF. # : ARCH PROJ. No. 2023-04

OWNER : San Joaquin County of Education
2707 Transworld Drive
Stockton, CA 95206

DATE : 05 MARCH 2025

NOTICE TO ALL BIDDERS

IT IS THE PURPOSE AND INTENT OF THIS ADDENDUM TO MODIFY AND/OR CLARIFY THE DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT AND THIS ADDENDUM SHALL BECOME A PART OF THE CONTRACT DOCUMENTS. THESE CHANGES AND/OR INTERPRETATIONS SHALL BE INCORPORATED INTO YOUR BID.

REFER TO PROJECT PLANS AND SPECIFICATIONS PREPARED BY ARCHITECHNICA, COVER SHEET DATED 22 January 2025.

GENERAL

ITEM 01 **Changes to Bid Schedule:**

Deadline for RFI Submissions: Friday, March 14, 2025

RFI Responses will be posted no later than: Monday, March 24, 2025, 2:00pm

Deadline for Submitting the Bid/Proposal: Thursday, March 27, 2025 before 2:00pm.

Notice of Award to selected Bidder: Friday, April 4, 2025

Construction Duration does not change. Start date to adjust accordingly.

ITEM 02 QUESTION (02.28.25): Is this project Public or Private?

RESPONSE: This is a Public project but Prime Bidders must be Pre-qualified with the School District before bids are due to be eligible to Bid.

ITEM 03 QUESTION (02.28.25): Does this project require a Laborers Union Job?

RESPONSE: No, this project does not require Laborers Union trades. (see specification section 01 42 00, F.5)

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ITEM 04 QUESTION (02.28.25): Does this project require any bid bond?

RESPONSE: Yes, Bid Bond is required for this project, see Checklist of Mandatory Bid forms page 12 of Notice Inviting Bids.

ITEM 05 QUESTION (02.28.25): Can you please provide the Geotech report?

RESPONSE: The Geotech report can be found on the SJCOE/Construction web link under "Related Documents" links for the project: San Joaquin County Office of Education Campus Construction

PG&E

ITEM 06 QUESTION (02.28.25): Do we include the primary and secondary PG&E scope in our Bid?

RESPONSE: Yes, your bid should include Primary and secondary PG&E scope in your bid.

ITEM 07 QUESTION (02.28.25): Please provide PG&E green book. Sheet W1.3 states to coordinate with them.

RESPONSE: The PG&E Green Book can be found online from the PG&E website: https://www.pge.com/en/account/service-requests/building-and-renovation/greenbook-manual-online.html

INTERIOR PAINT

ITEM 08 QUESTION (02.28.25): DUNN EDWARDS paint is specified in plans but not listed in specification section 09 91 00.

RESPONSE: Specification section 09 91 00 has been updated to include Dunn Edwards equivalents. (attached)

PERMITS AND COSTS

ITEM 09 QUESTION (02.28.25): We have reached out to the County as well as the City of Stockton regarding necessary permits/costs for this project. We have been told that this project will be solely handled by the Office of Education. Can you please confirm what permits and costs, if any, need to be carried by the contractor? Or if the permit costs are unknown an allowance amount can be provided so that all bidders include the same value.

RESPONSE: Refer to section 3.6.1 in the General Conditions.

Permits will be paid by the San Joaquin County Office of Education, through the contractor as needed. Contractor to provide a line item on their Pay Applications to cover these costs as needed. No fix dollar amount is required in the contractor's bid. The covering of these costs shall not include any markup other than administrative costs to process the payment.

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ITEM 10 QUESTION (02.28.25): We will be closing of the sidewalks. Will we need to provide a temp walkway for pedestrians?

RESPONSE: provide signage that sidewalk is closed and pedestrians should use crosswalk to sidewalk on opposite side of street.

ITEM 11 QUESTION (02.28.25): Who will be responsible to the encroachment permit?

RESPONSE: The General Contractor is responsible for obtaining the encroachment permit.

ITEM 12 QUESTION (02.28.25): Who will be responsible for the lane closures when installing pipe across the main street?

RESPONSE: The General Contractor is responsible for lane closures. Permits will need to be obtained from the City of Stockton.

LIME TREATMENT

ITEM 13 QUESTION (02.28.25): The geotechnical report and plans call for 24" of Lime treatment at the pavement areas or removal of 2' and replacement with non-expansive fill. Is it possible to lime treat 18" and replace the top 6" with added Class 2AB. 24" of lime would create multiple mobilizations because they can only treat 18" in place. The site does not allow for flip flopping of material due to location.

RESPONSE: Due to the history of the site, and Geotech report recommendations. Please bid per plans and specifications.

PROJECT MANUAL – new or revised sections (see also ITEM 08 above)

ITEM 14 Document – Section 07 16 00 Below Grade Waterproofing to be replaced with section 07 17 16.04 Bentonite Waterproofing (attached). All reference to Waterproofing Membrane below grade in drawings.

ITEM 15 Document – Section 32 05 19 Geosynthetics for Exterior Improvements, (attached).

ITEM 16 Document – Section 33 41 10 Subdrainage, (attached).

Attachments: *specification section 09 91 00, specification section 07 17 16.04, specification section32 05 19, specification section 33 41 10.*

END OF ADDENDUM #3

ARCHITECHNICA
By

Tim Dearborn, AIA
Architect

SECTION 09 91 00 – PAINTING AND FINISHING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.

B. Painting schedules, including painting of exposed surfaces, interior and exterior, except as otherwise specified or indicated.

1.2 RELATED SECTIONS

A. Section 05 50 00 – Metal Fabrications: Shop Primed Surfaces.

B. Section 06 20 13 – Exterior Finish Carpentry.

C. Section 06 20 23 – Interior Finish Carpentry.

D. Section 07 62 00 – Sheet Metal Flashing and Trim.

E. Section 08 11 13 – Hollow Metal Doors and Frames.

F. Section 08 31 13 – Access Doors and Frames.

G. Section 09 24 00 – Portland Cement Plastering.

H. Section 09 29 00 – Gypsum Board.

I. Divisions 21 – 23 – Mechanical Sections as applicable to the Project.

J. Divisions 25 – 28 – Electrical Sections as applicable to the Project.

1.3 REFERENCES

A. The publications listed below form a part of this Section to the extent referenced. The publications are referred to in the text by the basic designation only. Refer to Section 01 42 00 for definitions, acronyms, and abbreviations.

B. Unless otherwise noted, standards, manuals, and codes refer to the latest edition of such standards, manuals, and codes as of the date of issue of this Project Manual

C. Referenced Standards:

1. ASTM D523 – Standard Test Method for Specular Gloss.
2. The Master Painters Institute, MPI Gloss and Sheen Levels.

1.4 QUALITY ASSURANCE

A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with sufficient documented experience.

B. Applicator: Company specializing in commercial painting and finishing with sufficient documented experience.

C. Gloss Levels: Per Master Painters Institute (MPI) gloss standards “MPI Gloss and Sheen Levels,” measured in accordance with ASTM D523.

GLOSS LEVEL	DESCRIPTION	GLOSS AT 60 DEGREES ASTM D523	SHEEN AT 85 DEGREES ASTM D523
G1	A traditional matte finish – flat.	5 units, maximum	and 10 units, maximum
G2	A high side sheet flat – “a velvet-like finish.”	10 units, maximum	And 10 – 35 units
G4	A “satin-like” finish	10-25 units	and 35 units maximum
G5	A traditional semi-gloss.	35 - 70 units	-
G6	A traditional gloss.	70 - 85 units	-
G7	A high gloss.	More than 85 units	-

1.5 REGULATORY REQUIREMENTS

A. Conform to California Building Code for flame spread and smoke density requirements for finishes.

B. Furnish certification that all paint coatings furnished for the location of the project comply with the EPA clean air act for permissible levels of volatile organic content for architectural coatings applied in California as designated by California Air Resources Board (CARB), 2019 California Green Building Standards Code, and the San Joaquin Valley Air Pollution Control District (SJVAPCD).

C. At the completion of the project, all open containers shall be disposed of by the contractor per State and County Regulations.

1.6 SUBMITTALS

A. Submit product data under provisions of Section 01 33 00.

B. Provide product data on all finishing products.

C. Submit four brush-out samples 8 inches by 10 inches in size illustrating color and gloss level selected for each surface finishing product scheduled.

D. Field Sample: Furnish sample of actual paint colors selected on portion of building item to receive paint as directed by Architect, prior to beginning interior and exterior painting.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site in manufacturer's original unopened, labeled containers; inspect to verify acceptance.

B. Store and protect products from abuse and contamination.

C. Container labeling is to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation and instructions for mixing and reducing.

D. Store paint materials at minimum ambient temperature of 50 degrees F and a maximum of 90 degrees F, in well-ventilated area, unless required otherwise by manufacturer's instructions.

E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 50 degrees F for 24 hours before, during and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.

C. Minimum Application Temperatures for Latex Paints: 50 degrees F for exterior work and interior work, unless required otherwise by manufacturer's instructions.

D. Provide lighting level of 80 foot candles measured mid-height at substrate surface.

1.9 EXTRA STOCK

A. Provide a new and unopened five-gallon container of each type, color and sheen to Owner.

B. Label each container with vendor, paint type, color name, and color code, in addition to the manufacturer's label.

C. Coordinate with the District to transfer the extra stock over to the District.

PART 2 PRODUCTS

2.1 PAINT SYSTEMS, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

2.2 SUSTAINABLE DESIGN REQUIREMENTS

A. VOC Content: Provide materials that comply with VOC limits set by Rule 4601 of the San Joaquin Valley Air Pollution Control District and 2022 California Green Building Standards Code Table 5.504.4.3; these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:

1. Flat Paints and Coatings: VOC content not more than 50 g/L.
2. Primers, Sealers, and Undercoaters: VOC content not more than 100 g/L.
3. Nonflat Paints and Coatings: VOC content not more than 100 g/L.
4. Nonflat-high gloss Paints and Coatings: VOC content not more than 150 g/L.
5. Stains: VOC content not more than 250 g/L.
6. Anti-Corrosive and Anti-Rust Paints and Primers applied directly to Ferrous Metals: VOC content not more than 250 g/L.
7. Zinc-Rich Primer applied to Galvanized and Ferrous Metals: VOC content not more than 340 g/L.

8. Varnish: VOC content not more than 450 g/L.

B. Chemical Components of **Field-Applied Interior Paints and Coatings**: Provide topcoat paints and anti-corrosive and anti-rust paints applied to ferrous metals that comply with the following chemical restrictions; these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:

1. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
2. Restricted Components: Paints and coatings shall not contain any of the following:

a. Acrolein.
b. Acrylonitrile.
c. Antimony.
d. Benzene.
e. Butyl benzyl phthalate.
f. Cadmium.
g. Di (2-ethylhexyl) phthalate.
h. Di-n-butyl phthalate.
i. Di-n-octyl phthalate.
j. 1, 2-dichlorobenzene.
k. Diethyl phthalate.
l. Dimethyl phthalate.
m. Ethylbenzene.
n. Formaldehyde.
o. Hexavalent chromium.
p. Isophorone.
q. Lead.
r. Mercury.
s. Methyl ethyl ketone.
t. Methyl isobutyl ketone.
u. Methylene chloride.
v. Naphthalene.
w. Toluene (methylbenzene).
x. 1,1,1-trichloroethane.
y. Vinyl chloride.

2.3 ACCEPTABLE MANUFACTURERS – PAINT

A. Refer to Table at the end of this Section.

B. Substitutions: Under provisions of Section 01 25 13.

2.4 ACCEPTABLE MANUFACTURERS – PRIMER SEALERS

A. Refer to Table at the end of this Section.

B. Substitutions: Under provisions of Section 01 25 13.

2.5 ACCEPTABLE MANUFACTURERS – STAIN AND CLEAR FINISHES

A. Refer to Table at the end of this Section.

B. Substitutions: Under provisions of Section 01 25 13.

2.6 MATERIALS

A. All paint materials shall be provided from a single manufacturer unless noted otherwise in this Section.

B. Coatings: Ready mixed. Process pigments to a soft paste consistency capable of being readily and uniformly dispersed to a homogeneous coating.

C. Coatings: Good flow and brushing properties; capable of drying or curing free of streaks or sags.

D. Accessory Materials: All other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

E. All Materials specified by brand name or manufacturer shall be delivered unopened at the job in their original containers.

2.7 FINISHES

A. Refer to schedule at end of Section for surface finish schedule.

PART 3 EXECUTION

3.1 GENERAL

A. Storage: All materials used by the painting contractor shall be stored and mixed in a place designated by the Owner or the Architect. The storage place must be kept neat and clean at all times. All cloths, waste or other material that might constitute a fire hazard shall be placed in a suitable metal container or shall be removed from the site or destroyed at the end of each day's work.

3.2 INSPECTION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application to the Architect, Architect's representative or inspector in writing. The Architect will cause such defect to be remedied.

C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Plaster; Gypsum Wallboard: 12 percent.
2. Concrete Masonry Units: 10 percent.
3. Interior Located Wood: 15 percent.
4. Exterior Located Wood: 7 percent.

D. Beginning of application constitutes acceptance of the surfaces.

3.3 PREPARATION

A. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or painting.

B. Correct minor defects and clean surfaces that affect work of this Section.

C. Seal marks that may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Gypsum Board Surfaces: Latex fill minor defects. Spot-prime defects after repair.

F. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer, unless otherwise recommended by finish coating system manufacturer.

G. Shop-Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces as recommended by primer manufacturer. Prime shop-primed steel items with steel primers specified in this Section.

H. Concrete, Stucco and Masonry: All dust and loose mortar shall be removed by sweeping or by brushing with a stiff fiber or wire brush.

1. Concrete and masonry surfaces that show signs of efflorescent shall be treated with a zinc sulfate wash (3lbs. per gallon of water), or by scrubbing affected areas with a solution of muriatic acid. Remove loose crystals and rinse with clear water. Allow to dry thoroughly before painting.

a. All surfaces defects and all cracks more than 1/16 inch wide shall be filled with patching plaster or spackle according to package directions and textured to match adjacent areas.
b. Form oils or separating agents that might impair the adhesion or the appearance of the specified finish shall be removed before any materials are applied.

2. Plaster work that has cured for less than two months and all other plaster areas that show the presence of excessive amounts of free alkali when tested with phenolphthalein or some other suitable means shall be treated with a zinc sulfate wash (3 lbs. per gallon of water) to neutralize the alkali and obtain the optimum of surface carbonation.

a. All surface Cracks greater than 1/32 inch wide, holes and other surface defects shall be repaired as recommended by the finish paint manufacturer’s written instructions.

I. Interior Wood Items Scheduled to Receive Finish: Hand sandpaper and wipe off dust and grit prior to priming. Seal knots, pitch streaks and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.

1. At woodwork with transparent finish, nail holes, cracks or defects shall be filled with wood filler tinted to match color of stain.

3.4 PROTECTION

A. Protect elements surrounding the work of this Section from damage or disfiguration.

B. Repair damage to other surfaces caused by work of this Section.

C. Furnish drop cloths, shields and protective methods to prevent spray or droppings from disfiguring other surfaces.

D. Remove empty paint containers from site.

3.5 WORKMANSHIP

A. All work shall be performed by experienced mechanics in a skillful manner. All materials shall be evenly applied so as to be free from sags, crawls or other defects. Coats shall be of the proper consistency and well brushed out as to show the minimum brush marks, except varnish and enamel which shall be uniformly applied. Brushes shall be clean and in good condition. All areas with a transparent coat will be repainted at contractor's expense.

B. All painting shall be by brush, except plaster and gypsum board which may be by spraying with back rolling. Underside of soffits, covered walks, acoustical panels and screens may be completed by spraying with back rolling.

C. No work shall be completed under conditions that are unsuitable for the production of good results. No painting shall be completed while plaster is curing, or while wood sawing, sanding or cleaning is in process. Coats shall be thoroughly dry before the succeeding coat is applied. Finishes shall be uniform as to sheen, shine, color and texture, except when glazing is required.

D. No exterior painting shall be done in rainy, damp, or frosty weather. No Interior painting or finishing shall be permitted until the building has been thoroughly dried out by artificial heat. A minimum temperature of 50 degrees Fahrenheit shall be maintained in areas where the application or drying of paint is occurring.

E. This contractor shall take into account that not less than the following percentages of total surfaces shall be painted in deep (dark) tones of color selected: (This includes colors requiring ultra-deep bases)

1. Walls: 25%
2. Ceilings: 25%
3. Doors and Door Frames: 100%
4. Sheet Metal: 50%
5. Exposed Steel: 100%

3.6 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

1. Paint mil thicknesses shall not be less than the minimums recommended by the paint manufacturers.
2. No Paint, varnish or stain shall be reduced or applied in any way except as herein specifically called for, or recommended by the manufacturer.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform finish.

D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

E. Sand lightly between coats to achieve required finish.

F. Allow applied coat to dry before next coat is applied.

G. The number of coats called for in the Painting Schedules included in this specification are the minimum number required. Additional coats may be required to achieve the desired finish.

H. The drawings reference the Painting Schedules included in this specification through the use of a note that references the Paragraph Number of the Schedule and the Painting Paragraph Letter Designation, i.e. **3.9A** references **Painting Schedule - Exterior Surface** and that the surface is **Ferrous Metal.**

I. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

J. Prime back surfaces of interior and exterior woodwork with primer paint, type as recommended by manufacturer.

K. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.

3.7 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. See Divisions 21 – 23 and 25 – 28 for other items requiring painting.

B. Paint interior surfaces of air ducts and convector heating cabinets that are visible through grilles and louvers with one) coat of flat black paint, to limit of sight line. Paint dampers exposed behind grilles to match face panels. Paint all new interior and exterior exposed ductwork and ductwork supports. Paint all new conduit, pipes and conduit/pipe supports in exposed interior and exterior locations.

C. Reinstall electrical plates, hardware, light fixture trim, and fittings removed for surface preparation or painting.

D. Do not paint factory-finished mechanical and electrical equipment.

3.8 CLEANING

A. As Work proceeds, promptly remove paint where spilled, splashed or spattered.

B. During progress of Work, maintain premises free of unnecessary accumulation of tools, equipment, surplus materials and debris.

C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove from site daily.

3.9 PAINTING SCHEDULE – EXTERIOR SURFACES:

A. Ferrous Metal
1st coat – Acrylic Low Sheen Primer
2nd and 3rd coats – 100 percent Acrylic Semi-Gloss

B. Ferrous Metal (Industrial)
1st coat – Epoxy Primer
2nd and 3rd coats – Aliphatic Urethane Gloss Enamel
For use at exterior metal architectural features/exposed structure

C. Galvanized Metal (Handrail and Guardrail Assemblies only)
1st coat – Etch Prep
2nd coat – Epoxy Satin Primer
3rd and 4th coats – High Dispersion Pure Acrylic Polymer

D. Galvanized Metal and Aluminum (Except Handrail and Guardrail Assemblies)
1st coat – Etch Prep
2nd coat – Acrylic Low Sheen Primer
3rd and 4th coats – 100 percent Acrylic Semi-Gloss

E. Exposed Concrete and Cement Plaster System with Cementitious Finish Coat
1st coat – Acrylic Flat Primer
2nd and 3rd coats – Elastomeric Flat

F. Cement Plaster System with Acrylic Finish Coat
1st coat – Acrylic Flat Primer
2nd and 3rd coats – Elastomeric Flat

G. Wood
1st coat – Acrylic Flat Primer
2nd and 3rd coats – 100 percent Acrylic Flat

H. Wood
1st coat – Acrylic Flat Primer
2nd and 3rd coats – 100 percent Acrylic Semi-Gloss

I. Pressure Treated Wood
1st coat – Acrylic Flat Primer
2nd and 3rd coats – 100 percent Acrylic Satin

J. Masonry (CMU)
1st coat – Acrylic Block Filler Primer
2nd and 3rd coats – Elastomeric Flat

3.10 PAINTING SCHEDULE – INTERIOR SURFACES:

A. Gypsum Board
1st coat – PVA Primer Sealer
Texture by Section 09 29 00 Contractor
2nd coat – PVA Primer Sealer – Tint towards final color.
3rd and 4th coats – 100 percent Acrylic Eggshell

B. Interior Cement Plaster
1st coat – PVA Primer Sealer
2nd coat and 3rd coats – 100 percent Acrylic Semi-Gloss Enamel

C. Gypsum Board (Whiteboard Finish)
1st coat – PVA Primer Sealer
Texture by Section 09 29 00 Contractor (Level 5)
2nd coat – Acrylic Flat Primer
3rd coat – 2-Part Solvent Based Dry-Erase Coating

D. Wood (Opaque Finish)
1st coat – Acrylic Flat Primer – Tint towards final color.
2nd coat and 3rd coats – 100 percent Acrylic Semi-Gloss

E. Interior Ferrous Metal
1st coat – Acrylic Low Sheen Primer – Tint towards final color.
2nd coat and 3rd coats – 100 percent Acrylic Semi-Gloss Enamel
Typical paint system at all hollow metal doors, pressed metal frames, and exposed steel structure.

F. Concrete
1st coat – Acrylic Flat Primer – Tint towards final color
2nd coat and 3rd coats – 100 percent Acrylic Semi-Gloss

G. Masonry (CMU)
1st coat – Acrylic Block Filler Primer
2nd coat and 3rd coats – 100 percent Acrylic Semi-Gloss

H. Wood (Transparent Finish)
1st coat – Oil-based Interior Wood Stain
2nd coat – Oil-based Interior Sanding Sealer
3rd and 4th coats – Oil-based Interior Wood Varnish – Semi-Gloss

I. Galvanized Metal, Zinc Alloy Metal and Aluminum
1st coat – Etch Prep
2nd coat – Acrylic Low Sheen Primer – Tint towards final color.
2nd coat and 3rd coats – 100 percent Acrylic Semi-Gloss Enamel

PAINTING SCHEDULE

APPLICATION	TYPE	MPI Gloss Level	MANUFACTURER	PRODUCT NUMBER	Dunn Edwards
PRIMERS					
Exterior Ferrous Metal	Acrylic	G2	Vista	8600	ENPR00
Exterior Ferrous Metal (Industrial)	Epoxy	G6	Vista	SET 7900	Rust-Bond
Exterior Galvanized Metal and Aluminum (Except Handrail and Guardrail Assemblies)	Acrylic	G2	Vista	8600	ULGM00
Exterior Galvanized Metal (Handrail and Guardrail Assemblies Only)	Epoxy	G4	Vista	4800	ULGM00
Exterior Wood and Pressure Treated Wood	Acrylic	G1	Vista	4200	EZPR00
Exterior Cement Plaster and Concrete; and Interior Concrete	Acrylic	G1	Vista	4600	ESSL00
Exterior Cement Plaster System with Acrylic Finish Coat	Acrylic	G1	Vista	4000	ESSL00
Exterior and Interior Masonry (Block Filler)	Acrylic	G1	Vista	40 or 018	SBSL00
Interior Gypsum Board& Cement Plaster	PVA	G1	Vista	1100	VNSL00
Interior Wood	Acrylic	G1	Vista	4200	DCPR00
Interior Ferrous Metal	Acrylic	G2	Vista	8600	ENPR00
Interior Aluminum, Ferrous & Galvanized Metal	Acrylic	G2	Vista	8600	ULGM00
Interior Gypsum Board (Dry-Erase)	Acrylic	G1	Vista	Cover Stain	VNSL00
FINISHES					
Exterior Ferrous & Galvanized Metal, Aluminum, Wood and Pressure Treated Wood (Except Handrail and Guardrail Assemblies)	100 percent Acrylic	G5	Vista	7000	SSHL50
Exterior Ferrous Metal (Industrial)	Aliphatic Urethane Enamel	G6	Rust-oleum	3300	3300
Exterior Galvanized Metal (Handrail and Guardrail Assemblies Only)	High Dispersion Pure Acrylic	G5	Vista	574	ENCT50
Exterior Cement Plaster, Concrete, and CMU	Elastomeric	G1	Vista	500	EDLX10
Exterior Wood and Masonry	100 percent Acrylic	G1	Vista	3000	SSHL10
Exterior Pressure Treated Wood	100 percent Acrylic	G4	Vista	1750	SSHL40
Interior Gypsum Board, Wood, Masonry (CMU) and Concrete	100 percent Acrylic	G5	Vista	7000	SWLL50
Interior Gypsum Board (Dry-Erase Finish)	2-Part Solvent		Rust-oleum	WHITE	WHITE
Interior Ferrous & Galvanized Metal and Aluminum	100 percent	G5	Vista	8400	SPMA50

	Acrylic Enamel				
Interior Plaster (existing and new)	100 percent Acrylic Enamel	G5	Vista	8400	SSWL50

MISCELLANEOUS				
Interior Wood Stain	Oil-based	G1	Old Masters	11101
Interior Sanding Sealer	Oil-based	G1	Old Masters	45004
Interior Wood Varnish	Oil-based Polyurethane Semi-Gloss Finish	G5	Old Masters	495
Exterior Heavy-Duty Cleaner	Water Based	-	Jasco	Prep & Prime
Exterior & Interior Galvanized Metal Etch Prep.	Water Based	-	Jasco	Prep & Prime

END OF SECTION

SECTION 07 17 16.04 – BENTONITE WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Bentonite waterproofing
2. Molded sheet drainage panels

1.2 RELATED REQUIREMENTS

1. Section 03 30 00 "Cast-in-Place Concrete" for forms, waterstops, and concrete placement.
2. Section 31 20 00 "Earth Moving" for excavating and backfilling.
3. Section 31 50 00 "Excavation Support and Protection" for permanent below-grade support systems that require blind-side waterproofing.
4. Section 33 41 10 "Subdrainage" for drainage pipe and conduits, drainage panels, and filter fabrics.

1.3 REFERENCES

A. References, General: Versions of the following standards current as of the date of issue of the project apply to the Work of this Section.

B. ASTM International (ASTM): www.astm.org:

1. ASTM C920 - Standard Specification for Elastomeric Joint Sealants
2. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
3. ASTM D1621 - Standard Test Method for Compressive Properties Of Rigid Cellular Plastics
4. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
5. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity
6. ASTM D4716 - Standard Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
7. ASTM D4833 - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
8. ASTM D5385 - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes
9. ASTM E96/E 96M - Standard Test Methods for Water Vapor Transmission of Materials
10. ASTM E154 - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover

C. U. S. Environmental Protection Agency (EPA): www.epa.gov.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Conduct conference at Project Site.

1. Review requirements for waterproofing products and installation, including surface preparation, substrate conditions, project and manufacturer's details, installation procedures, mockups, testing and inspection requirements, protection and repairs, and coordination and sequencing of waterproofing installation with work of other Sections.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of waterproofing product specified, including:

1. Technical data indicating compliance with requirements.

2. Substrate preparation instructions and recommendations.

B. Shop Drawings: Show locations for waterproofing system components. Show details for each type of substrate, joints, corners, and edge conditions, including flashings, counterflashings, penetrations, transitions, and terminations.

1.6 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type of bentonite waterproofing, from manufacturer.

B. Qualification Data: For Installer, manufacturer[, and waterproofing Inspector].

1. Certification of manufacturer's approval of Installer.

C. Product Test Reports: Test data for waterproofing products and waterproofing system, by qualified testing agency, indicating proposed waterproofing meets performance requirements, when requested by Architect.

D. Warranty: Sample of manufacturer and installer special warranties.

E. Field quality control reports.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A manufacturer-approved firm with minimum [three] years' experience in installation of specified products in successful use on similar projects, employing workers trained by manufacturer, including a full-time on-site supervisor with a minimum of [ten] years' experience installing similar work, and able to communicate verbally with Contractor[, Architect,] and employees.

B. Manufacturer Qualifications: A qualified manufacturer [listed in this Section] with minimum thirty years experience in manufacture of waterproofing as one of its principal products.

1. Manufacturer's product submitted has been in satisfactory operation on five similar installations for at least ten years.

2. Approval of Manufacturers and Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

a. Product data, including certified independent test data indicating compliance with requirements.

b. Sample shop drawings from similar project.

c. Project references: Minimum of five installations of similar system not less than five years old, with Owner and Architect contact information.

d. Name and resume of proposed qualified Inspector.

e. Sample warranty.

C. Testing Agency Qualifications: Qualified independent agency experienced in the installation of the specified waterproofing system, and qualified to perform observation and inspection specified in Field Quality Control Article to determine Installer’s compliance with the requirements of this Project, acceptable to Architect, retained by the Contractor.

1.8 DELIVERY, STORAGE AND HANDLING

A. Accept materials on site in manufacturer's unopened original packaging.

B. Store products in weather protected environment, clear of ground and moisture, within temperature ranges recommended by waterproofing manufacturer.

C. Construction Waste: Store and dispose of packaging materials and construction waste in accordance with requirements of Division 01 Section [Construction Waste Management"

1.9 ENVIRONMENTAL REQUIREMENTS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit bentonite waterproofing to be installed according to manufacturers' written instructions and warranty requirements.

1. Do not install waterproofing during rain, mist or heavy fog. If rain or mist is anticipated before the membrane is compacted below-grade, cover any exposed bentonite or seams with min. 6 mil polyethylene sheet.

2. Placing bentonite clay products on damp surfaces is allowed if approved in writing by manufacturer.

1.10 SCHEDULING

A. Schedule work so waterproofing applications may be inspected prior to concealment.

1.11 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which waterproofing manufacturer agrees to furnish waterproofing material to repair or replace those materials installed according to manufacturer's written instructions that exhibit material defects or otherwise fail to perform as specified under normal use within warranty period specified.

1. Access for Repair: Owner shall provide unimpeded access to the Project and the waterproofing system for purposes of testing, leak investigation, and repair, and shall reinstall removed cladding and overburden materials upon completion of repair.

2. Cost Limitation: Manufacturer's obligation for repair or replacement shall be limited to the original installed cost of the materials.

3. Warranty Period: Ten years date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Products: Provide waterproofing products manufactured by **Tremco, Inc., Commercial Sealants and Waterproofing Division,** Beachwood OH; (866) 321-6357; email: techresources@tremcoinc.com; www.tremcosealants.com,.

B. Source Limitations: Provide waterproofing system materials and accessory products from a single-source system manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General: Waterproofing system shall be capable of performing as a continuous watertight installation and as a moisture drainage plane transitioned to adjacent flashings and discharging water to the building exterior. Waterproofing shall accommodate normal substrate movement, construction material transitions, opening transitions, penetrations, and perimeter conditions without resultant moisture deterioration.

B. Compatibility: Provide waterproofing system materials that are compatible with adjacent materials under conditions of service and substrates on which product is applied, as recommended by waterproofing manufacturer based on testing and field experience.

2.3 COMPOSITE HDPE/BENTONITE MEMBRANE

A. **Composite HDPE/Bentonite Membrane**: Composite membrane consisting of a 20-mil- thick, HDPE geomembrane liner bonded to up to 1.0 lb/sq. ft. layer of bentonite clay granules, with a spun polypropylene facing.

1. Basis of Design Product: **Tremco, Inc., Paraseal LG 20 MIL**
2. Puncture Resistance, ASTM E 154: Not less than 155 lbf.
3. Tensile Strength, ASTM D 412: Not less than 4,000 psi.
4. Elongation, ASTM D 412: Not less than 500 percent.
5. Vapor Permeance, ASTM E 96: Not greater than 0.03 perms.
6. Resistance to Hydrostatic Head, ASTM D 5385: 230 feet.
7. Color: Gray/black.

2.4 ACCESSORY MATERIALS

A. Granular Bentonite: Sodium bentonite clay containing a minimum of 90 percent montmorillonite (hydrated aluminum silicate), with a minimum of 90 percent passing a No. 20 sieve.

a. Basis of Design Product–Tr**emco, Inc., Paragranular**

B. Bentonite Mastic: Trowelable consistency, bentonite compound, specifically formulated for application at joints and penetrations.

b. Basis of Design Product – **Tremco, Inc., Paramastic**

C. Termination Bar: Extruded-aluminum or formed-stainless-steel bars with upper flange to receive sealant.

c. Basis of Design Product – **Tremco, Inc., Paraseal Paraterm Bar**

D. Plastic Protection Sheet: Polyethylene sheeting complying with ASTM D 4397; thickness recommended by waterproofing manufacturer to suit application but at least 6 mils thick.

E. Cement Grout Patching Material: Manufacturer's recommended grout mix compatible with substrate being patched.

F. Masonry Fasteners: Case-hardened nails or hardened-steel, powder-actuated fasteners. Depending on manufacturer's written requirements, provide 1/2- or 1-inch- diameter washers under fastener heads.

G. Tapes: Waterproofing manufacturer's recommended tape for joints between sheets, membranes, or panels. Use with recommended adhesive bonding primer.

1. Reinforced Overlap Seam Tape: Reinforced, rubberized-asphaltic waterproofing seam tape 4-inch wide by 60 mils thick for sealing membrane overlaps.

a. Basis of Design Product **– Tremco, Inc., Permanent Seam Tape**

2. Non-Reinforced Overlap Tape: Non-reinforced, adhesive tape of partially cross-linked polymeric elastomers 2 by 1/8 inch for molding form-fit seals around contours and for taping seams within overlaps.

a. Basis of Design Product – **Tremco, Inc., Para JT**

3. Bentonite Laminate Tape: Pressure sensitive, double-sided tape laminate of bentonite sandwiched between a netting and non-woven fabric for wrapping through-concrete imbeds and other detailing.

a. Basis of Design Product – **Tremco, Inc., Parastick 'n' Dry**

H. Waterstops: Flexible, reinforced, bentonite-laminate of bentonite sandwiches between a netting and non-woven fabric for wrapping through-concrete imbeds and other detailing.

a. Basis of Design Product – **Tremco, Inc., Superstop**

I. Joint Sealants: Termination Seals:

1. Single component, high performance, medium-modulus, low-VOC, UV-stable, non-sag polyurethane sealant.

    a. Basis of Design Product: **Tremco Inc.; Dymonic 100**.

2.5 WATERPROOFING PROTECTION AND DRAINAGE

A. Protection Course: Not required.

B. **Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel**: Manufactured composite subsurface drainage panels consisting of a nonwoven, spun-bonded polypropylene facing laminated to one side of a studded, non-biodegradable, polystyrene drainage core[, with polymeric film attached to back of drainage core].

1. Basis of Design: **Tremco, TREMDrain 1000**.
2. Flow Capacity, per unit width, ASTM D 4716: 18 gpm/ft.
3. Flow Rate, ASTM D 4491: 165 gpm/ft2.
4. Apparent Opening Size: No. 70 sieve.
5. Puncture Strength, ASTM D 4833: 65 lb.
6. Core Compressive Strength, ASTM D 1621: 15,000 lb/ft2.
7. Thickness: 0.437 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Surface Condition: Before applying waterproofing materials, examine substrate conditions.

B. Proceed with installation once unsatisfactory conditions have been corrected.

3.2 INTERFACE WITH OTHER WORK

A. Sequencing of Work: Coordinate sequencing of waterproofing installation with work of other sections that form portions of building envelope moisture control to ensure that flashings and transition materials can be properly installed and inspected.

B. Subsequent Work: Coordinate waterproofing installation with work of other sections installed subsequent to waterproofing to ensure complete inspection of installed waterproofing and sealing of waterproofing penetrations necessitated by subsequent work.

3.3 PREPARATION

A. Clean, prepare, and treat substrates. Fill voids with cement grout or Paramastic as recommended by manufacturer.

B. Formed Concrete Surfaces: Remove fins and projections. Fill voids, form-tie holes, and other defects greater than 1/4 inch in depth.

C. Horizontal Concrete Surfaces: Remove standing water, debris, and substances that may impair bonding of patching materials or effectiveness of waterproofing. Fill voids and other defects greater than 1/4 inch in depth.

D. Excavation Support and Protection System: Fill minor gaps and spaces 1 (25 mm) wide or wider with appropriate filling material. Cover or fill large voids and crevices.

3.4 INSTALLATION, GENERAL

A. Install waterproofing and accessories according to manufacturer's written instructions. Protect bentonite material from wetting prior to permanent placement.

1. Install a continuous layer of waterproofing membrane with ends and edges lapped a minimum of 4 inches. Stagger end joints, seal laps and treat fastener penetrations in accordance with manufacturer’s written instructions.
2. Apply Paragranular around penetrations in horizontal surfaces and changes in plane according to manufacturer's details.
3. Apply Paramastic at changes of plane, construction joints in substrate, projections, and penetrations.

B. Protect waterproofing from damage and wetting during construction. Repair punctures, tears, and cuts according to manufacturer's written instructions.

3.5 VERTICAL BLINDSIDE WALL WATERPROOFING

A. Install Paraseal membrane with the gray, bentonite side to be in direct contact with concrete and/or shotcrete and over a continuous layer of a TREMDrain drainage board. TREMDrain drainage board is applied 4 feet above submerged conditions.

B. Verify which penetrations must be accessed after concrete placement for completion of waterproofing detail treatment and ensure that sufficient access to membrane is provided within a wood formed box out; verify which penetrations will not be accessed after concrete placement for completion of waterproofing detail treatment and ensure that final detailing procedures are completed prior; waterproof penetrations in accord with manufacturer’s current procedures; contact manufacturer for procedures at project conditions not provided in installation manuals.

C. Prevent waterproofing products from hydrating before material is coated with liquid-applied membrane. When threat of rain is imminent, installed products not already coated should be covered with polyethylene sheeting to decrease the chance of hydration. After any precipitation, pump standing water off waterproofing as soon as possible and repair damaged membrane.

D. Excavation Support and Protection: Cut, clean, and treat tiebacks and similar projections. Encase tieback rods, nuts, and plates. If water is present, cover shoring and lagging with plastic protection sheets. If water is present, set up a dewatering system to remove water.

3.6 BELOW-SLAB WATERPROOFING

A. Below Structural Slabs-on-Grade: Apply waterproofing membrane with HDPE side down.

1. Install membrane sheets bentonite-side up. Staple seams where subject to displacement during concrete placement.
2. Install under footings, grade beams, and pile caps; or continue waterproofing through key joints between footings and foundation walls, and extend a minimum of 8 inches up or beyond perimeter slab forms. Stagger seams minimum 12 inches.
3. Install under slabs starting at lowest point, install a continuous layer of waterproofing membrane, with ends and edges lapped a minimum of 4 inches.
4. Protect waterproofing from damage caused by reinforcing bar supports with sharp edges.

3.7 DRAINAGE PANEL INSTALLATION

A. Place and secure drainage panels in accordance with manufacturer’s written instructions. Use adhesives that do not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to inspect substrate conditions, surface preparation, waterproofing application, protection, and drainage components, and to furnish reports to Architect.

B. Reporting: Forward written inspection reports to the Architect of the inspection and test being performed.

C. Correction: Correct deficient applications not passing tests and inspections, make necessary repairs, and retest as required to demonstrate compliance with requirements.

3.9 CLEANING AND PROTECTING

A. Protect Paraseal from moisture prior to concrete placement.

END OF SECTION

SECTION 32 05 19 – GEOSYSTHETICS FOR EXTERIOR IMPROVEMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Geotextile for separation.

B. Geotextile for filtration.

C. Geogrid for stabilization.

1.02 RELATED REQUIREMENTS

A. Section 31 10 00 - Site Clearing.

B. Section 31 20 00 – Earth Moving.

1.03 REFERENCE STANDARDS

A. AASHTO M 288 - Standard Specification for Geosynthetic Specification for Highway Applications; 2022.

B. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus; 2021.

C. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2022.

D. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2015 (Reapproved 2023).

E. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a (Reapproved 2023).

F. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2021a.

G. ASTM D4833/D4833M - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products; 2007 (Reapproved 2020).

H. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).

I. ASTM D4886 - Standard Test Method for Abrasion Resistance of Geotextiles (Sandpaper/Sliding Block Method); 2018.

J. ASTM D5199 - Standard Test Method for Measuring the Nominal Thickness of Geosynthetics; 2012 (Reapproved 2019).

K. ASTM D6637/D6637M - Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method; 2015.

L. ASTM D7737/D7737M - Standard Test Method for Individual Geogrid Junction Strength; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene preinstallation meeting one week prior to start of work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer’s data on each product used, including physical properties, seaming materials, and installation instructions.

C. Shop Drawings:

1. Indicate overall layout, dimensions, geotextile sheet, and seam layout.
2. Indicate anchorage, penetration, and seaming details.

D. Samples: Two sheets, 12 by 12 inches minimum in size, indicating physical properties.

E. Certificate: Certify that products of this section meet or exceed specified requirements.

F. Test Reports:

1. Indicate results of field leakage tests.
2. Indicate results of field interface friction tests.

G. Manufacturer's Instructions: Indicate seaming method.

H. Manufacturer's qualification statement.

I. Installer's qualification statement.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least 3 years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least 3 years of documented experience and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Identify, store, and handle geosynthetic rolls and samples in accordance with ASTM D4873/D4873M.

C. Protect materials from sunlight and other ultraviolet light sources during storage.

D. Handle geosynthetics carefully and prevent dragging, dropping, or imbalanced lifting.

1.08 FIELD CONDITIONS

A. Temperature Requirements: Do not place geosynthetic when ambient air or base surface temperature is less than 40 degrees F or above 140 degrees F.

B. Surface Requirements: Do not place geosynthetic when receiving surface is saturated or has ponded water.

C. Follow recommendations of geosynthetic manufacturers.

PART 2 PRODUCTS

2.01 GEOSYNTHETIC

A. Provide geosynthetic in largest size sheets possible to minimize field joining.

B. Uniform thickness in accordance with ASTM D5199.

C. Resistant to mildew and chemicals in soil, stable under freeze-thaw cycles, does not shrink or expand under wet conditions, and does not unravel or become clogged during use.

D. Ultraviolet Stability: 65 percent, minimum, when tested in accordance with ASTM D4355/D4355M.

E. Abrasion Resistance: 80 percent loss for 250 cycles, when tested in accordance with ASTM D4886.

2.02 GEOTEXTILE

A. General:

1. Material: Polyethylene consisting of 5 percent maximum regrind and free of contaminants.
2. Survivability: Class 1, when tested in accordance with AASHTO M 288.

B. Geotextile for Separation: Capable of restricting adjacent material mixing.

1. Type: Woven.
2. Seams: Loose laid.
    a. Overlap: According to manufacturer.
        1) 12 inches, minimum.
    b. Stitch: According to manufacturer; continuous; tied off at ends.
3. Grab Strength: 300 lbf, minimum, when tested in accordance with ASTM D4632/D4632M.
4. Puncture Strength: 450 lbf, minimum, when tested in accordance with ASTM D4833/D4833M.

C. Geotextile for Filtration: Capable of allowing liquid passage while restricting solids.

1. Type: Nonwoven.
2. Seams: Mechanically sewn.
    a. Overlap: 3 inches.
    b. Stitch: Flat; continuous; tied off at ends.
3. Grab Strength: 300 lbf, minimum, when tested in accordance with ASTM D4632/D4632M.
4. Permittivity: 0.5 per second, minimum, in accordance with ASTM D4491/D4491M.
5. Apparent Opening Size: No.40, 0.016 inch, maximum, when tested in accordance with ASTM D4751.
6. Sewn Seam Strength: 275 lbf, minimum, when tested in accordance with ASTM D4632/D4632M.
7. Trapezoid Tear Strength: 100 lbf, minimum, when tested in accordance with ASTM D4533/D4533M.
8. Puncture Strength: 450 lbf, minimum, when tested in accordance with ASTM D4833/D4833M.

D. Geotextile Accessories:

1. Seaming Thread: High strength; polyester thread; contrasting color.
2. Anchoring Pins: As recommended by manufacturer.

2.03 GEOGRID

A. General:

1. Material: Polyethylene consisting of 5 percent maximum regrind and free of contaminants.
2. Tensile Strength at 2 Percent Strain: 400 lbf/ft, minimum, when tested in accordance with ASTM D6637/D6637M.
3. Tensile Strength at 5 Percent Strain: 800 lbf/ft, minimum, when tested in accordance with ASTM D6637/D6637M.
4. Minimum Opening Size: 1/2 inch.

5. Maximum Opening Size: 3 inches.

B. Geogrid for Stabilization: Capable of reducing deformation of unbound granular materials.

1. Seams: Loose laid.

a. Overlap: 12 inches.

2. Ultimate Tensile Strength: 1,300 lbf/ft, minimum, when tested in accordance with ASTM D6637/D6637M.

3. Junction Strength: 25 lbf, minimum, when tested in accordance with ASTM D7737/D7737M.

C. Geogrid Accessories:

1. Anchoring Staples: As recommended by manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify receiving surface is smooth, without ruts or protrusions, and grades are according to design drawings.

B. Verify receiving surface is unsaturated and free of ponded water.

C. Verify geosynthetic is free of defects or flaws that degrade physical performance.

D. Verify each geosynthetic member is uniquely marked, identifying proper placement.

3.02 PREPARATION

A. Remove vegetation, boulders, and rocks larger than 3/4 inch in size and other sharp objects, see Section 31 10 00.

B. Remove unsuitable materials, see Section 31 20 00.

C. Fill in holes, including stake holes, backfill, and fill, see Section 31 20 00.

D. Grade as indicated on drawings, see Section 31 20 00.

E. Compact smooth as indicated on drawings, see Section 31 20 00.

3.03 INSTALLATION

A. General:

1. Notify Architect minimum of 24 hours before geosynthetic installation.

2. Prevent surface drainage from eroding under geosynthetic. Repair undermined areas before backfill.

3. Position geosynthetic smooth and wrinkle-free on prepared surface; unroll or unfold carefully, avoiding stretching.

4. Secure geosynthetic to prevent movement or damage during installation.

5. Perform seaming in adequate lighting. Seam each geosynthetic member immediately after final placement. Clean sheets of dust, dirt, and other foreign matter before seaming.

6. Follow manufacturer's recommended installation procedures.

B. Separation:

1. Install geotextile according to manufacturer's recommendations.

2. Lay sheets in direction of construction.

3. Place adjacent geotextile and loosely fasten until seamed.

4. Repairs: Remove damaged portion of geotextile and seam additional layer to cover affected area.

C. Filtration:

1. Install geotextile according to manufacturer's recommendations.
2. Lay sheets in direction of construction.
3. Place adjacent geotextile and loosely fasten until seamed.
4. Protect geotextile from surface runoff contamination before backfill.
5. Repairs: Remove damaged portion of geotextile and seam additional layer to cover affected area. Replace geotextile where surface runoff contamination has occurred.

D. Stabilization:

1. Install geogrid according to manufacturer's recommendations.
2. Lay sheets in direction of construction.
3. Allow geogrid to lie in relaxed state 1/2 hour, minimum before attachments.
4. Place adjacent geogrid and loosely fasten until seamed.
5. Repairs: Remove damaged portion of geogrid, and seam additional layer to cover affected area.

3.04 BACKFILL

A. Obtain approval for geosynthetic sheet installation from Architect before placing fill.

B. Backfill in manner to prevent damage to geosynthetic. Repair geosynthetic damaged during backfill operations.

C. Cover geosynthetic in installed direction, see Section 31 20 00.

1. Cover geosynthetic within time limits specified by manufacturer.
2. Drive only on earth cover and use only rubber-tired or rubber-tracked vehicles.
3. Lift Thickness: 12 inches.

3.05 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Provide geosynthetic installation schedule to manufacturer's field representative.

C. Inspect completed liner for pinholes, punctures, and tears; inspect seams and joints for unbonded areas. Repair defects or damages found.

3.06 PROTECTION

A. Do not exceed geosynthetic manufacturer's recommended exposure to UV radiation.

B. Prevent surface water runoff from contaminating geosynthetic.

C. Do not use pins or staples where risk of damaging underlying geosynthetic layer is present.

D. Erect barricades preventing traffic over unfilled geosynthetic.

END OF SECTION

SECTION 33 41 10 – SUBDRAINAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building Perimeter Drainage Systems.

B. Filter aggregate and bedding.

1.02 RELATED REQUIREMENTS

A. Section 31 20 00 - Excavation: Excavating for subdrainage system piping and surrounding filter aggregate.

B. Section 32 05 19 – Geosynthetics for Exterior Improvements: Filter Fabric.

1.03 REFERENCE STANDARDS

A. ASTM D2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2021.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on pipe drainage products, pipe accessories, and filter fabric.

C. Shop Drawings: Indicate dimensions, layout of piping, high and low points of pipe inverts, gradient of slope between corners and intersections, and points of connection to site storm drain system.

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

E. Project Record Documents: Record location of pipe runs, connections, cleanouts, and principal invert elevations.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Comply with applicable code for materials and installation of the work of this section.

2.02 PIPE MATERIALS

A. Polyvinyl Chloride Pipe: ASTM D2729; plain end, 4-inch inside diameter; with required fittings.

B. Corrugated Plastic Tubing: Flexible type; 4-inch diameter, with required fittings.

C. Use perforated pipe at subdrainage system; unperforated through sleeved walls.

2.03 AGGREGATE AND BEDDING

A. Filter Aggregate and Bedding Material: Class II Permeable Material, Caltrans Specification Section 68-1.025.

2.04 ACCESSORIES

A. Pipe Couplings: Solid plastic.

B. Filter Fabric: Section 32 05 19 – Geosynthetics for Exterior Improvements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

3.02 PREPARATION

A. Hand trim excavations to required elevations. Correct over-excavation per recommendations of the Geotechnical Engineer.

B. Remove large stones or other hard matter that could damage drainage piping or impede consistent backfilling or compaction.

3.03 INSTALLATION

A. Install and join pipe and pipe fittings in accordance with pipe manufacturer's instructions.

B. Place drainage pipe on clean cut subsoil.

C. Lay pipe to slope gradients noted on drawings; with maximum variation from true slope of 1/8 inch in 10 feet.

D. Loosely butt pipe ends. Place joint cover strip 12 inches wide, around pipe diameter centered over joint.

E. Place pipe with perforations facing down. Mechanically join pipe ends.

F. Install pipe couplings.

G. Install filter aggregate at sides, over joint covers and top of pipe. Provide top cover compacted thickness of 12 inches.

H. Place filter fabric over levelled top surface of aggregate cover prior to subsequent backfilling operations.

I. Place aggregate in maximum 4-inch lifts, consolidating each lift.

J. Refer to Section 31 20 00 for compaction requirements. Do not displace or damage pipe when compacting.

K. Place impervious fill over drainage pipe aggregate cover and compact.

L. Connect to storm sewer system with unperforated pipe, through installed sleeves.

3.04 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspection and testing.

B. Request inspection prior to and immediately after placing aggregate cover over pipe.

3.05 PROTECTION

A. Protect pipe and aggregate cover from damage or displacement until backfilling operation begins.

END OF SECTION