PART 1: GENERAL

1.01. DESCRIPTION AND SCOPE

A. Requirements contained within Division I (General Requirements) are applicable to the work required of this section. Provide labor, materials, equipment and supervision necessary to complete the exterior wall and finish systems including:

1. ICF substrate inspection and preparation
2. Application of PVC or zinc surface mounted v-joint and related trim accessories including vented starter track over moisture barriers
3. Attachment of reinforcing metal to the substrate
4. Mixing Total Wall Total One Coat and addition of optional Total Wall Liquid Acrylic Additive
5. Application of Total Wall Total One Coat mix
6. Application of backer rod, sealant primer and caulk sealant
7. Application of optional prime coat ahead of finish coating
8. Application of Total Wall synthetic finish or elastomeric coating

B. Related Sections

1.	Section 01010	Summary of Work
2.	Section 01040	Coordination of Work
3.	Section 01300	Submittals
4.	Section 01613	Materials Delivery, Storage and Handling
5.	Section 03300	Poured-In-Place Concrete
6.	Section 03470	Precast Concrete
7.	Section 04200	Unit Masonry
8.	Section 05400	Metal Framing
9.	Section 06160	Wood Sheathing
10.	Section 07240	Exterior Insulated and Finish Systems
11.	Section 07460	Siding
12.	Section 07620	Flashing and Sheet Metal
13.	Section 07901	Joint Sealants
14.	Section 09220	Portland Cement Plaster
15.	Section 09260	Gypsum Sheathing
16.	Section 09820	Cementitious Coatings
17.	Section 09830	Elastomeric Coatings

C. Referenced Documents

1. Standards

(1)	ASTM A526	Specification for Sheet Steel, Zinc Coated (Galvanized) by Hot-Dip Process, Commercial Quality
(2)	ASTM B69	Specification for Rolled Zinc
(3)	ASTM C91	Masonry Cement
(4)	ASTM C150	Specification for Portland Cement
(5)	ASTM C144	Aggregate for Masonry Mortar
(6)	ASTM C109	Compressive Strength

(7)	ASTM C307	Tensile Strength
(8)	ASTM C580	Flexural Strength
(9)	ASTM D1784	Specification for rigid PVC
(10)	ASTM C926	Application of Portland Cement Plaster
(11)	ASTM C920	Joint Sealants
(12)	ASTM C1193	Use of Joint Sealants
(13)	ASTM C897	Aggregate for job-mixed Portland Cement Plaster
(14)	ASTM C778	Specification for Standard Sand
(15)	ASTM C206	Finishing Hydrated Lime
(16)	ASTM C207	Hydrated Lime for Masonry Mortar
(17)	ASTM C219	Standard Terminology Relating to Hydraulic Cements
(18)	ASTM C476	Specification for Grout for Masonry
(19)	ASTM C595	Blended Hydraulic Cement
(20)	ASTM C387	Specification for Dry Combined Materials (cements)
(21)	ASTM C887	Dry Packaged Surface Bonding Cements
(22)	ASTM C932	Surface Applied Bonding Agents
(23)	ASTM C1116	Fiber Reinforced Concrete
(24)	ASTM C1063	Installation of Lathing and Furring
(25)	ASTM C1328	Specification for Plastic (stucco) Cements
(26)	ASTM C933	Specification for Welded Wire Lath
(27)	ASTM C1032	Specification for Woven Wire Plaster Base
(28)	ASTM C847	Specification for Metal Lath
(29)	ASTM C1002	Steel Screws for Attachment to Steel Studs
(30)	ASTM C129	Specification for Non-Bearing CMU
(31)	ASTM C90	Specification for Load Bearing CMU
(32)	ASTM C55	Specification for Concrete Brick

D. Terms and Definitions

1. **Fiber Reinforced Hard Coat Stucco**
   A Class of plastering where a fiber reinforced Portland Cement-based stucco is applied to a substrate surface. The ICF substrate receives metal reinforcement. The stucco is then applied over the lath. In all instances, accessories, such as control joint or stop bead, are installed prior to plastering in accordance with lath and plastering guidelines. The base accessories are vented to permit drainage of moisture. An optional prime coat may be applied over the plaster base. A textured synthetic finish or an elastomeric coating is applied as the finish coat.
2. **Rigid Reinforcement**
   A minimum weight of 2.5 pound per square yard galvanized self-furring diamond reinforcement lath is recommended.
3. **Fiber Reinforced Stucco Plaster** (Total Wall Total One Coat**)**
   A dry material that is mixed with water and optional acrylic modifier at the job site. It is trowel applied to the lathed substrate in multiple passes or lifts in a thickness from 3/8” to a maximum of 7/8”. This material is also available in a concentrate, which requires the addition of sand during mixing at the job site.
4. **Acrylic Modifier** (Total Wall Liquid Acrylic Additive)
   A liquid additive that replaces part of the mix water for a Portland cement plaster. The additive improves cure properties, increases strength and reduces shrinkage which also reduces cracking. This product is also used as a surface applied bonding agent when such a material is required over masonry to improve bond of the stucco.
5. **Prime Coat** (Total Prime)
   A roller applied optional prime coat to be used over the plaster base ahead of the finish coat.

6. Synthetic Grade Textured Finish or Elastomeric Coating

The Textured Finish is a premixed material that functions to provide a decorative color and additional weather resistance. The finish may be a trowel applied textured synthetic finish or a roller applied elastomeric coating.

7. Accessories

Items such as weep bases, corner beads, casing beads and control joints that are utilized in the assembly of the system. These materials may be either solid zinc, G90 galvanized metal or PVC. Coastal applications exposed to salt water must use solid zinc or PVC accessories. The lower termination must be a vented drainage accessory.

8. Sealant

A permanently flexible self-sticking compound that is used to seal seams in the system.

1.02. DESIGN LIMITATIONS AND DETAILING

A. All details must conform to Total Wall recommendations and must be consistent with the project requirements.

1. General
   - (1) The length and slope of inclined surfaces must follow the guidelines listed below:
     - (a) Minimum slope: 6” (152.4 mm) of rise in 12” (304.8 mm) of horizontal projection
     - (b) Inclined surfaces must not be used for areas defined as roofs by building codes.
     - (c) Uses not meeting the above criteria must be approved in writing by Total Wall prior to installation.
     - (d) Raw aluminum metal such as aluminum flashing must not be used adjacent to Portland cement based stucco.
2. Substrate System
   - (1) Must be engineered to withstand all applicable loads. Including live, dead, positive and suction wind; seismic activity; etc. Bond strength, fastener strength, and connection strength must be analyzed and engineered. Appropriate factors of safety must be used.
3. Substrates
   - (1) Application of the *TOTAL ONE ICF* system must be to one of the following substrates:
     - (a) An approved manufacturer ICF block substrate.
   - (2) The substrate must not have any planar irregularities greater than 1/4” (6.35 mm) in 10 lineal feet (3.04 M)
4. Expansion Joints and Control Joints
   - (1) Continuous expansion joints and control joints must be installed at the following locations:
     - (a) Where expansion joints occur in the substrate
     - (b) Where building expansion joints occur
     - (c) Where the system abuts other materials
     - (d) Where the substrate changes
   - (2) Expansion and contraction of the system and adjacent materials must be taken into account in the design of expansion joints, with proper consideration given to sealant properties, installation conditions, temperature range, coefficient of expansion of materials, joint width-to-depth ratios, etc. Expansion joints must be constructed using back to back casing bead with a minimum separation of 3/4" separation to receive backer rod and sealant.
   - (3) Continuous control joints must be constructed of back to back casing bead with a minimum 3/8” separation to receive backer rod and sealant, or may be constructed from a single component accessory. Control joints must be installed at the following locations:
     - (a) Where significant structural movements occur, i.e.:
       1. Changes in roofline
       2. To limit panel sizes to 144 sq ft

3. To limit panel shapes to length to width ratio 2.5:1
4. At stress points such as door and window corners
5. At floor lines in wood frame construction unless engineered lumber is employed
6. Changes in building shape and structural system

(4) Isolation joints are required around all wall penetrations, including doors and windows.

5. Details
   (1) Total Wall's latest published information must be followed for standard detail treatments.
   (2) Non-standard detail treatments must follow the recommendations of Total Wall.

B. The use of dark colors must be considered in relation to estimated wall surface temperatures as a function of local climate conditions.

1.03. QUALITY ASSURANCES

A. Contractor
The contractor must have a minimum of two years experience in the wall construction trades, be licensed by Total Wall for application of Total Wall systems, demonstrate the ability to install the system based on projects of similar size and complexity, and meet the approval of the architect. The contractor must provide a list of completed projects. The contractor must provide equipment, manpower and supervision necessary to install the system in compliance with the project plans and specifications.

1.04. SUBMITTALS

A. Total Wall's literature, including application instructions, specifications and details.
B. The optional synthetic finish topcoat or elastomeric topcoat documentation and specifications.
C. Sealant and related components documentation and specifications.

1.05. PRODUCT DELIVERY AND STORAGE

A. Delivery
Deliver all materials supplied by Total Wall in original, unopened containers with legible manufacturer's identification intact.

B. Storage
1. Store all products off the ground, under cover and protected from dampness and sunlight.
2. All liquid products must be stored at 40° F (4.4° C) or above and protected from freezing. Protect from exposure to direct sunlight during storage.

1.06. JOB CONDITIONS

A. Install all materials in strict accordance with all safety and weather conditions required by the product literature, and in accordance with ASTM C926, paragraph 7, and as modified by the applicable standards of authorities having jurisdiction.
B. Apply all coatings when the ambient temperature is 40° F (4.4° C) and rising. A minimum temperature of 40° F (4.4° C) must be maintained 24 hours after completion of work. Supplementary heat must be provided if stated temperature conditions do not exist. Do not apply coatings to a frozen surface.
C. Avoid application in high wind and avoid application in direct sunlight. High substrate surface temperatures, warm moving air, and direct sunlight are conditions that can cause rapid dehydration of stucco which can reduce strength and increase the risk of cracking.
D. Protect surrounding areas and surfaces during application of the wall system.
E. Protect system from precipitation during application and for at least 24 hours after application.

1.07. COORDINATION AND SCHEDULING

A. Closely coordinate work with related sections and trades.

B. Protect the tops of walls to prevent water from entering behind the system. Any required cap flashing, overhangs or drip edges must be installed as soon as possible after the finish coat has been applied.

C. Install all sealants in a timely fashion. Protect open joints from water intrusion with backer rod or other means until the sealant has been installed.

1.08. SYSTEM WARRANTY

A. A Total Wall warranty application form must be completed prior to the commencement of the installation.

B. Upon completion of the installation in accordance with specifications, and payment of all monies due to Total Wall Inc., a system warranty will be issued.

PART 2: PRODUCTS

2.01. MANUFACTURERS

A. All materials related to the stucco system, including the optional acrylic admixture, the Portland cement stucco, the optional bonding agent, the optional synthetic finish coat and any optional trim panels must be obtained from:
Total Wall, Inc.
PO Box 366
Rio, WI 53960
(888) 702-9915

2.02. PORTLAND CEMENT PLASTER SYSTEM COMPONENTS

A. The recommended rigid reinforcement is minimum 2.5 pound galvanized, self-furring diamond lath.

B. The fasteners must be exterior grade climate protected metal screws or pins of proper length and design for the substrate. The fastening system must be field tested on the substrate to determine the proper fastener length and to confirm suitability of the fastening system. The washers must be 7/16” minimum diameter exterior grade metal or plastic plates.

C. The trim accessories must be solid zinc metal, galvanized metal or UV resistance PVC as manufactured by Vinyl Corporation, Plastic Components or other approved source. Galvanized metal accessories must not be used where there is exposure to salt water. The trim accessories may consist of the following:
1. Starter track with weeps, weep base or drainage track
2. Casing bead or stop bead with proper thickness ground
3. Drip casing bead
4. Control joint (v-joint) with proper thickness ground
5. Corner bead

D. Fibered Reinforced Stucco must be Total Wall Total One Coat or Total Wall Total One Coat Concentrate or Total Wall Premium Fibered Stucco. This product is a dry stucco product, available in 80 pound bags (Premium Fibered Stucco is available in 50 lb bags) and designed to be mixed in the field with water and optional acrylic admixture. Please note that the concentrate product also required the addiction of sand during mixing.

E. The Acrylic Admixture must be Total Wall Liquid Acrylic Additive. The acrylic admixture replaces a portion of the mix water for Total Wall Total One Coat. Total Wall Liquid Acrylic Additive increases strength, water tightness and reduces cracking.

F. Sand must be good quality silica, clean and free of debris and contaminants, such as iron. The sand must meet ASTM C897 or ASTM C144 guidelines as applicable. Recommended sand size is 45 – 75 mesh.

G. Water must be clear, potable and free of foreign matter.

H. Sealant Systems

1. Must be one of the following:
   (1) Tremco, Inc.
      (a) Sealant: “Dymeric”
      (b) Prime: use manufacturer’s recommended primer
      (c) Backer rod: Dow “Ethafoam”
      (d) Bond breaker: 3M #226, 480, 481, 710
   (2) Pecora Corporation
      (a) Sealant: 890 Silicone
      (b) Prime: use manufacturer’s recommended primer
      (c) Backer rod: Dow “Ethafoam”
      Bond breaker: 3M 480 or Valley Industrial Products #90
   (3) Dow Corporation
      (a) Sealant: Dow 790 series sealants (790, 791, 795)
      (b) Prime: use manufacturer’s recommended primer
      (c) Backer rod: Dow “Ethafoam”
   (4) Sonneborn Corporation
      (a) Sealant: Sonnelastic 150 and 150LM sealants
      (b) Prime: use manufacturer’s recommended primer
      (c) Backer rod: Dow “Ethafoam”
   (5) Sika Corporation
      (a) Sealant: Sika LM 15
      (b) Prime: use manufacturer’s recommended primer
      (c) Backer rod: Dow “Ethafoam”
2. Sealant must be bonded to trim accessories and not to the stucco unless a fillet bead is constructed as isolation joint.
3. System materials must be dried prior to sealant installation.
4. Color must be selected by the architect.
5. Backer rod is not required when filling v-joint
6. Sealant is supplied and warranted by others. Other sealants may be eligible as approved in writing by Total Wall.

I. Primer and finish coat

1. The stucco is finished with the following:
   (1) Total Wall Primer (optional). The Total Prime Coating is roller applied.
   (2) Total Wall Textured Synthetic. This premixed and pre-textured material is available in any color and six different textures and may be trowel applied or spray applied. This elastomeric grade option is recommended for best performance and appearance.
   (3) Elastomeric Coating. This premixed roller applied coating is available from Total Wall and may be used in lieu of the textured finish.

2.03. MIXING AND PREPARATION

A. Total Wall Liquid Acrylic Additive
   1. No mixing is required for this product

B. Total Wall Total One Coat (pre-sanded mix)
   1. Use a clean mortar mixer
   2. Charge materials to the mixer in the following ration
      (1) Water - 1.75 gallons per 80 lbs of dry powder
      (2) Total Wall Liquid Acrylic Additive (optional) – replace 1-2 quarts of mix water per 80 lbs of dry mix
      (3) Total Wall Total One Coat – charge to mixer
   3. Mix for 3 minutes or until homogeneous
   4. Let stand for 5 – 10 minutes
   5. Mix again for 3 minutes, making sure to scrape any caked or unmixed material into the main mix. Add up to 2 additional quarts of water per 80 lbs of dry mix. If mix is too wet, add dry Total One Coat dry powder to decrease slump.
   6. Begin using product immediately.

C. Total Wall Total One Coat Concentrate
   1. Use a clean mortar mixer
   2. Charge the materials in the following ratio:
      (1) Water – 6.75 gallons
      (2) Total Wall Liquid Acrylic Additive (optional) – replace 1 gallon of mix water
      (3) Sand – 220 pounds dry weight
      (4) Total Wall Total One Coat Concentrate – 80 lb bag
   3. Mix for 3 minutes or until homogeneous
   4. Let stand 5 – 10 minutes
   5. Mix again for 3 minutes, making sure to scrape any caked or unmixed material into the main mix. Add up to 2 additional quarts of water to adjust consistency. If mix is too wet, add dry components in the proper rations to decrease slump.
   6. Begin using product immediately.

D. Sealant
   1. Follow manufacturer instructions

E. Primer and textured finish coat
   1. Primer – open a new pail of Total Prime and add up to one quart of water and slow speed mix for one minute or until homogenous.
   2. Textured finish – Open a new pail of Total Wall textured finish and add up to 12 ounces of water per 5 gallon pail and slow speed mix for one minute.
   3. Elastomeric smooth coating – (used in lieu of the textured finish) open a new 5 gallon pail of Total Lastic 300% smooth or textured and add up to 12 oz of water per 5 gallon pail and slow speed mix for 1 minute.

PART 3: EXECUTION

3.01. INSTALLATION

A. The installation must be performed strictly in accordance with Total Wall's current literature and current job specifications.
B. Lathing must be installed in accordance with job specifications, Total Wall literature and ASTM C1063
C. Plastering must be conducted in accordance with job specifications, Total Wall instructions and ASTM C926

3.02. NEW CONSTRUCTION OR LARGE AREA RENOVATION

A. ICF substrate preparation
   1. Generally, the ICF surface does not need to be rasped or cleaned. Small voids, pocks and nicks in the EPS surface are acceptable.
   2. Planar deflection greater than 1/4" in 10 lineal feet must be corrected by rasping or laminating of additional EPS foam.
   3. Install water proofing tape or liquid applied flashing ICF/window and door intersections.
B. The substrate must receive metal reinforcement and system accessories as follows:
   1. Install proper ground casing bead, stop bead and corner bead trim accessories by mechanically fastening with the proper corrosion resistant fastener and plate or ribbed PVC fastener designed for EPS.
   2. Mechanically fasten the diamond lath reinforcement to the substrate using the proper length corrosion resistant fastener and plate. The target fastener density is an average 1 fastener per sq ft. Screws and plates must be corrosion resistant and must penetrate not less than 5/8" into the ICF plastic or metal ties. The screw head and plate must engage not less than 3 strands of lath and have a minimum diameter of 7/16".
   3. Where metal laps lath away from a stud over non-screwable sheathing, use galvanized annealed wire tires to secure lath.
C. Joint construction must be performed in accordance with Sections 1.02 and 3.03.D and related sections of this specification and job documents.

3.03. PRODUCT PREPARATION AND INSTALLATION

A. Mixing - all materials requiring preparation must be labeled accordingly; the contractor must follow all instructions.
B. Weep base drainage track
   1. Must be installed at the lower termination below any framing and onto the masonry foundation by at least 1".
   2. The lower system termination must be kept above raw earth by at least 4".
C. System terminations
   1. At appropriate locations, the system must be terminated or interrupted with the proper PVC (or metal) accessory including control joint.
   2. Control joints must be constructed using a single prefabricated accessory or from two casing beads installed back to back with a separation of not less than 3/8".
      (1) Where vertical and horizontal joints intersect, the vertical joint must be continuous and the intersection must be sealed.

3. Expansion joints
   (1) Expansion joints must be constructed from 2 casing beads installed back to back with a separation of not less than 3/4" or with a single piece slip joint accessory.
   (2) Expansion joints must be placed where there is a change in substrate construction and where expansion joints already exist in the wall base assembly.
4. Isolation joints
   (1) Isolation joints must be constructed with casing bead around the penetration.
5. Control joints
   (1) Must be installed in walls to limit panel sizes to 144 sq ft.
   (2) The maximum panel length or height must not exceed 18'.
   (3) Panel dimensions must be limited to a 2.5" to 1 length to height dimension ration.
   (4) Control joints must be installed at floor lines in wood frame construction areas.

D. Installation of rigid reinforcement (if specified)
1. Attach the metal lath using proper length and type of corrosion resistant fasteners and plates for the substrate.
2. Overlap the lath with the trim accessory flanges a minimum of 2".
3. Lap metal lath edges a minimum of 2".
4. Keep the lath tight and even with an approximate average fastener density of 1 fastener and plate per sq ft.
5. Do not coincide lath joints with sheathing joints or with the corners of openings either horizontally or vertically.

E. Application of Total Wall Total One Coat Mix –
1. Using a trowel, apply the stucco mix to the wall surface. Use multiple passes or lifts to achieve the desired thickness.
2. Apply stucco mix in accordance with ASTM C956 in either a 2 coat process or a 3 coat process.
3. Remember to gauge thickness to allow for a final pass and texturing of the synthetic finish.
4. Keep a wet edge and work to natural stops such as corners or joints. A darby, slicker or rod can be used to assist in leveling the applied stucco.
5. The scratch coat or initial pass of stucco application must be allowed to stiffen before the second pass or brown coat is applied. The time elapsed between passes or coats are variable and are influenced by weather conditions and manpower constraints.
6. The stucco base must be moist cured for 48 hours and allowed to dry an additional 24 hours before proceeding.

F. Application of Total Wall Prime Coat (optional) and Textured Finish
1. May commerce once the combination of the scratch and brown coat base is cured and dry.
2. Final stucco thickness must meet job specifications.

G. The optional prime coat must be allowed to fully dry before the finish is applied.

H. Textured Synthetic Finish Coat
1. Apply Total Wall Synthetic Finish Coat in full accordance with manufacturer's specifications.
2. The stucco and optional prime coat must be dry and cured before application of the textured finish coat.

I. Sealant
1. Ensure sealant is installed at all required locations in accordance with manufacturer specifications.
2. The sealant must be bonded to the stucco base and not to the finish or prime coat.

3.04. JOB SITE CLEANUP

A. All excess Total Wall system materials must be removed from the job site by the applicator

B. All surrounding areas where Total Wall materials have been applied must be left free of debris and foreign substances.

3.05. INSPECTION

A. The Total Wall applicator, a representative of the property owner's team and a Total Wall representative must inspect the installation and prepare an inspection summary with a copy to Total Wall. It is recommended to visit the job and inspect the application a minimum of 2 times. The first visit will be prior to or during the surface preparation / trim accessory and lath installation phase. The second visit will be during the stucco mixing and plastering phase or at job completion.

B. If an independent inspector is used, a copy of the final report must be submitted to Total Wall.

END OF SPECIFICATION