SECTION 09 77 53 - VEGETATED WALL SYSTEMS (LIVING WALL)

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DRAFT, FOR ELEVATION REVIEW. Product data filled from Elevation SpecSheet (Dec 15, 2025), Introduction guide, and David Bishop confirmations (Oct 18, 2026). Not for issue until remaining table items are confirmed.

[EDITOR'S NOTE: This guide specification is for the architect, landscape architect, or specifier. Delete all editor's notes, and fill in or delete all bracketed options, before issuing. Coordinate article numbering and section cross-references with the project manual.]

[EDITOR'S NOTE, SECTION NUMBER: MasterFormat lists building-applied living walls under 09 77 53 Vegetated Wall Systems, a Level 4 section under 09 77 00 Special Wall Surfacing. It applies to interior walls and to exterior walls attached to a building substrate. For a free-standing exterior or site-mounted green wall, or when the section sits in a landscape manual, MasterFormat 32 95 00 Exterior Planting Support Structures (which lists "green wall" among its inclusions) is an acceptable alternate. If you use it, retitle this section "SECTION 32 95 00 - EXTERIOR PLANTING SUPPORT STRUCTURES (LIVING WALL)" and keep the content. Do not use 32 93 00 Plants for the system as a whole. That section covers the plant material itself and is listed under Related Requirements.]

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes design-assist, fabrication, furnishing, installation, planting, irrigation startup, establishment, and maintenance of a vegetated wall system (living wall). The scope includes:

1. Support frame and attachment to the prepared substrate.
2. Living wall panels or modules.
3. Growing media.
4. Plant material.
5. Irrigation distribution within the wall, from the point of connection downstream. This includes the controller, filtration, pressure regulation, and [fertigation] [monitoring] equipment.
6. Drainage as required for the system: tray integrated pooling and drainage channels; catch basin at the base of interior walls; French drain or similar at the base of exterior walls (David Bishop, Oct 18, 2026).
7. [Horticultural lighting for interior walls.] [Feature lighting.]
8. [Architectural framing or trim surround: [wood] [metal] [composite] [powder-coated steel] [millwork].]
9. Establishment period and maintenance service.

B. Living wall locations: [Interior] [Exterior] [Interior and exterior], as indicated on Drawings.

[EDITOR'S NOTE: Elevation designs, builds, installs, and maintains living walls as a design-build specialty contractor. The scope above reflects that model. Edit to match the project's division of responsibility. Elevation's published guidance is to name who provides backing, power, water, drainage, waterproofing, and finish interfaces before drawings go out for pricing.]

1.2 RELATED REQUIREMENTS

A. Division 01, Section 01 25 00 "Substitution Procedures."

B. Division 03, Section 03 30 00 "Cast-in-Place Concrete": concrete substrate.

C. Division 04, Section 04 20 00 "Unit Masonry": masonry substrate.

D. Division 05, Section 05 40 00 "Cold-Formed Metal Framing", and Division 06, Section 06 10 00 "Rough Carpentry": structural backing, blocking, and framing for attachment of the living wall support frame.

E. Division 07, Section 07 10 00 "Dampproofing and Waterproofing" [07 14 00 "Fluid-Applied Waterproofing"] [07 13 00 "Sheet Waterproofing"]: continuous moisture barrier behind the living wall. **[ELEVATION TO CONFIRM: waterproofing scope, Elevation vs. others]**

F. Division 07, Section 07 62 00 "Sheet Metal Flashing and Trim", and Section 07 92 00 "Joint Sealants": flashing and sealant at wall perimeters and penetrations.

G. Division 22, Section 22 11 16 "Domestic Water Piping", and Section 22 11 19 "Domestic Water Piping Specialties": dedicated water supply, isolation valve, and backflow prevention to the point of connection.

H. Division 22, Section 22 13 16 "Sanitary Waste and Vent Piping" [or storm drainage section]: drain connection where a floor drain, planter drain, or building drain receives any excess irrigation water from the interior catch basin or the exterior French drain (or similar), where connected.

I. Division 23: HVAC design for interior humidity and air movement at interior living walls.

J. Division 26, Section 26 05 00 "Common Work Results for Electrical", and Section 26 27 26 "Wiring Devices": dedicated circuits and receptacles for the controller, pumps, and lighting.

K. Division 26, Section 26 51 19 "LED Interior Lighting" [26 56 00 "Exterior Lighting"]: horticultural and feature lighting where provided by others.

L. Division 32, Section 32 84 00 "Planting Irrigation": site irrigation supply for exterior walls.

M. Division 32, Section 32 93 00 "Plants": plant material at grade adjacent to the living wall.

N. Division 32, Section 32 32 00 "Retaining Walls": plantable retaining wall systems, where applicable.

1.3 REFERENCES

A. General: Use the edition of each standard adopted by the authority having jurisdiction. Where none is adopted, use the edition current at the date of the Contract Documents.

B. American Society of Civil Engineers (ASCE):

1. ASCE/SEI 7, Minimum Design Loads and Associated Criteria for Buildings and Other Structures (Chapter 13, Seismic Design Requirements for Nonstructural Components).

C. AmericanHort:

1. ANSI Z60.1, American Standard for Nursery Stock.

D. ASTM International:

1. ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
2. ASTM A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
3. ASTM B209/B209M, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate. [Retain if aluminum is confirmed.]

4. ASTM B221/B221M, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes. [Retain if aluminum is confirmed.]
5. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
6. ASTM F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

E. American Society of Sanitary Engineering (ASSE):
1. ASSE 1013, Reduced Pressure Principle Backflow Preventers. [or ASSE 1015, Double Check Backflow Prevention Assemblies, as required by the water purveyor]

F. California Building Standards Code (California Code of Regulations, Title 24):
1. Part 2, California Building Code (CBC), including Chapter 16, Structural Design.
2. Part 3, California Electrical Code (CEC).
3. Part 5, California Plumbing Code (CPC).
4. Part 11, California Green Building Standards Code (CALGreen).

G. California Code of Regulations, Title 23, Division 2, Chapter 2.7, Model Water Efficient Landscape Ordinance (MWELO), or the local agency's equivalent ordinance, where applicable to exterior installations.

H. ICC/ASABE 802, Landscape Irrigation Sprinkler and Emitter Standard.

[EDITOR'S NOTE: Delete references not cited in the edited section. Retain the aluminum and stainless references only once Elevation confirms frame and fastener materials.]

1.4 DEFINITIONS

A. Living Wall (Vegetated Wall System): A vertical assembly of living plants rooted in growing media held in panels or modules, supported by a frame attached to a substrate, with integrated irrigation and drainage.

B. Saturated Operating Weight: The in-service weight of the living wall assembly per unit area, including steel panels, trays, soil modules, growing media at full water-holding capacity, mature plants, retained water, irrigation lines on the wall, and mounting hardware.

C. Planting Face: The exposed vertical plane of plant foliage. Light levels are measured here for performance purposes.

D. Root Volume: The volume of growing media available to each plant within its pocket, cell, or module.

E. Fertigation: Delivery of soluble plant nutrients through the irrigation system.

F. Establishment Period: The period after planting during which the Installer maintains the wall and adjusts irrigation, and plants establish root systems, before Final Acceptance.

G. Point of Connection (POC): The location, designated on Drawings, where work of other sections (water, drain, power) ends and work of this Section begins.

H. Basis of Design: The specific manufacturer and system named in Part 2 that sets the standard of quality, performance, and appearance.

1.5 COORDINATION

A. Pre-installation meeting: Before installation, convene a meeting at the Project site with the Architect, Contractor, Installer, and installers of substrate, backing, waterproofing, plumbing, and electrical work. At the meeting:
1. Review substrate and backing, attachment, waterproofing interface, points of connection, access for installation and future maintenance, sequencing, and protection.

2. Confirm responsibility for each interface: backing, power, water, drainage, waterproofing, and finish interfaces.

B. Coordinate the locations of water supply, drain, electrical, and controller equipment so they are accessible for service without disturbing finished architecture.

C. Structural coordination: Provide the saturated operating weight and attachment reactions to the Project structural engineer before framing or backing is detailed. **[ELEVATION TO CONFIRM: whether Elevation provides delegated-design structural calculations]**

D. Coordinate maintenance access: lift, ladder, or platform requirements and clear floor area in front of the wall.

1.6 ACTION SUBMITTALS

A. Product Data: For each component, including channel strut, steel panels, trays, soil modules, growing media, drip line and emitters, controller, filtration, backflow preventer (if in scope), fertigation equipment, and lighting fixtures.

B. Shop Drawings: Include:

1. Elevations showing panel/module layout, overall dimensions, and plant zones.
2. Sections and details showing substrate, moisture barrier, air gap / stand-off, channel strut, steel panel, tray, soil module, flashing, and framing or trim surround.
3. Attachment layout with anchor types and spacing, and structural reactions.
4. Irrigation design: schematic and layout showing POC, isolation valve, backflow preventer, filter, pressure regulator, controller, [fertigation injector,] zones, drip lines, flush points, and [recirculation tank and pump]. Include design flow and pressure.
5. Drainage: catch basin at the base of interior walls; French drain or similar at the base of exterior walls (David Bishop, Oct 18, 2026); show the catch basin or French drain, any drain outlet, overflow path, and connection to building drain where used.
6. Electrical: power requirements and locations for controller, pumps, and lighting.
7. [Lighting layout for interior walls: fixture locations, aiming, and calculated light levels at the planting face.]

C. Plant List and Planting Plan: Botanical and common name, quantity, container size at installation, planting density, and zone layout. Indicate light and exposure suitability for each species.

D. Samples: Per Elevation SpecSheet (Dec 15, 2025):

1. One tray sample.
2. Proposed plant palette (digital or live samples as requested).
3. [Growing media sample, sealed container, when requested.]

E. Delegated-Design Submittal: Where structural design of the support frame and attachment is delegated, structural calculations signed and sealed by a civil or structural engineer licensed in California. Include saturated operating weight, wind and seismic forces, and anchor capacities.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Light Readings: For interior walls, measured light levels at the planting face, taken at a grid of points before plant selection is finalized.

C. Water Quality and Pressure: Static pressure at the POC, verified by Contractor.

D. Sample Warranty and Sample Maintenance Agreement.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: A firm that specializes in design, installation, and maintenance of living wall systems, and that provides the maintenance service in this Section. Per Elevation SpecSheet (Dec 15, 2025):

1. Certified Plant Hackers Network™ Installer, or an approved Elevation-trained contractor, with not less than one completed comparable living wall project.
2. California: The Installer shall hold a California contractor's license appropriate to the work. Elevation Living Walls holds CA Contractor License #1064586.
3. Single-source responsibility: One firm shall be responsible for system design coordination, installation, planting, irrigation startup, establishment, and maintenance.

B. Mockup: [Retain for large or high-visibility walls.] Build a mockup not less than 2 ft by 2 ft showing channel strut, steel panel, trays, planting, and irrigation, per Elevation SpecSheet. Approved mockup may become part of the Work.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver panels/modules, frame, and irrigation components in the manufacturer's packaging, labeled.

B. Plant Material:

1. Deliver plants in a healthy, vigorous condition, protected from wind, sun, cold, and physical damage in transit.
2. Schedule plant delivery to coincide with planting. Store plants on site only in a shaded, protected area. Water plants and keep media moist until planted.
3. Do not deliver plants until the support frame, irrigation, and drainage are installed and tested.

C. Store growing media covered and protected from contamination and saturation.

D. Store components off the ground, under cover, and protected from construction damage.

1.10 FIELD CONDITIONS

A. Interior installations: Install plant material only after the space is enclosed, permanent or approved temporary HVAC is operating, and permanent or approved temporary lighting is operating at the required levels at the planting face.

B. Exterior installations: Do not plant during extreme heat, freezing conditions, or high wind. Account for orientation, seasonal sun, reflected heat, wind exposure, and coastal conditions.

C. Plant pre-growing: Optional bench-grow per SpecSheet. **[ELEVATION TO CONFIRM: standard pre-grow period and lead time when used]** Coordinate the plant growing schedule with the construction schedule.

1.11 SEQUENCING

A. Sequence work so that the substrate, backing, waterproofing, flashing, water supply with backflow prevention, drain, and power are complete, tested, and accepted before installation of the support frame.

B. Install plant material after dust-generating trades in the vicinity are complete, or protect plants per Part 3.

1.12 WARRANTY

A. Special Warranty: Installer agrees to repair or replace components of the living wall system that fail in materials or workmanship within the warranty period.

B. System Components: Per Elevation SpecSheet (Dec 15, 2025), manufacturer warranty of 5 years on trays and structural components (steel panels, channel strut, trays) from date of Substantial Completion.

1. Irrigation equipment (controller, valves, filters, drip line, and [pumps]): **[ELEVATION TO CONFIRM: irrigation equipment warranty length, if separate from the 5-year structural warranty]**.

C. Plant Material: Per Elevation SpecSheet (Dec 15, 2025), 90 days after installation, subject to compliance with Owner maintenance protocols or an Elevation service plan.

1. The plant warranty is valid only while the Owner keeps a maintenance agreement in force with the Installer, and only under the operating conditions in the submitted maintenance manual.
2. Exclusions: Damage from vandalism, physical abuse, Owner-caused interruption of water or power, changes to lighting or HVAC conditions, acts of nature beyond design criteria, and unauthorized modification or maintenance by others.

[EDITOR'S NOTE: Plant warranty of 90 days is from the Elevation SpecSheet. Elevation's published guidance also ties longer plant performance to ongoing care. Confirm whether irrigation hardware is covered under the 5-year structural warranty or separately.]

1.13 MAINTENANCE SERVICE

A. Initial Maintenance Service: Provide maintenance by the Installer beginning at planting and continuing through the establishment period and for **[ELEVATION TO CONFIRM: initial maintenance term included]** after Final Acceptance.

B. Scope of each visit: Irrigation review and adjustment, controller programming and seasonal adjustment, filter and emitter inspection, drainage path inspection (no trough), pruning and grooming, nutrition/fertigation management, pest and disease monitoring, and replacement of dead or declining plants.

C. Visit Frequency: Twice per month for interior and exterior walls (typical; frequency varies by project), to confirm there are no major issues such as water stoppage or insects (David Bishop, Oct 18, 2026).

D. Service Response: Respond to irrigation failure, leak, or alarm notifications within **[ELEVATION TO CONFIRM: response time]**.

E. Continuing Maintenance Proposal: Provide the Owner with a proposal for continued maintenance service, starting at the end of the initial maintenance term, as an informational submittal.

PART 2 - PRODUCTS

2.1 MANUFACTURER / INSTALLER

A. Basis-of-Design: Subject to compliance with requirements, provide the Elevation Living Wall System by Varden™ as furnished and installed by Elevation Living Walls, or an approved equal per Section 01 25 00 "Substitution Procedures." **[ELEVATION TO CONFIRM: whether Varden™ / Verdtech naming is used in open architect specs]**

B. Elevation Living Walls (Elevation Vertical Gardens & Living Walls, Inc.), Orange County, California. Website: elevationlivingwalls.com. Phone 949.627.0580. CA Contractor License #1064586. Contact: David Bishop, Founder / President. **[ELEVATION TO CONFIRM: spec contact email]**

1. System: Elevation Living Wall System by Varden™. Trays manufactured in the USA by Verdtech, Inc. (per Elevation SpecSheet, Dec 15, 2025).

C. Substitutions: A proposed equal must match the basis of design in system type, saturated operating weight, root volume per plant, irrigation and drainage performance, plant density, warranty, and maintenance service. It must also meet the Installer qualifications in Part 1. Submit comparative data for each item.

[EDITOR'S NOTE: This is an "or approved equal" (open) version. For a proprietary (sole-source) specification, delete "or an approved equal" and Paragraph C, and state "No substitutions." Use a proprietary specification only where the Owner's procurement rules allow it.]

2.2 SYSTEM DESCRIPTION

A. System Type: Modular hanging-tray living wall system. Injection-molded polypropylene trays hang on galvanized steel mesh panels that are mounted to channel strut offset from the substrate, with a continuous moisture barrier behind the planted face where required. Plants are rooted in 5-inch-diameter mesh soil modules seated in the trays. (Source: Elevation SpecSheet Dec 15, 2025; David Bishop Oct 18, 2026.)

B. Design Intent: The system is designed around plant health. That means adequate root volume, consistent irrigation, positive drainage, and maintenance access, so the wall performs over time and not only at installation.

C. Irrigation: Automatic, controller-operated 1/4-inch drip irrigation at 6-inch emitter spacing along trays [drain-to-waste / metered with no runoff] [recirculating for interior, optional per SpecSheet]. Excess water is collected by a catch basin at interior walls and by a French drain or similar at exterior walls (David Bishop, Oct 18, 2026).

D. Applications: [Interior] [Exterior] [Interior and exterior] walls, in [residential] [hospitality] [commercial] occupancies.

2.3 PERFORMANCE REQUIREMENTS

A. Root Volume: Provide soil modules not less than 5 inches (127 mm) in diameter by 12 inches (305 mm) in length, with three plants per module as the standard density (per Elevation SpecSheet). **[ELEVATION TO CONFIRM: growing media brand — proprietary compost-blend vs. Berger-M2]**

B. System Weight: Design saturated operating weight of 15 lb/sq. ft. (73.2 kg/sq. m). This is the total installed saturated weight of the complete assembly, including plants, saturated growing media, soil modules, trays, steel panels, channel strut, mounting hardware, irrigation lines on the wall, and all other system components. Do not use dry shipping weight.

1. Design channel strut, attachment, and backing for this saturated operating weight.

[EDITOR'S NOTE: Measured saturated weight with mature foliage was approximately 12 lb/sq. ft. The 15 lb/sq. ft. figure is specified as a conservative design value and includes everything (David Bishop, Oct 18, 2026). Many living wall systems are designed for loads up to about 25 lb/sq. ft.; Elevation's system is comparatively light. An older Elevation Introduction guide stated 20 lb/sq. ft.; use 15 lb/sq. ft. as directed by David. Verify structural support with the project structural engineer before backing or framing is detailed. The system has no trough or gutter.]

C. Structural Performance: Design support frame and attachment to resist dead loads (saturated operating weight), wind loads, and seismic loads per CBC Chapter 16 and ASCE/SEI 7, including Chapter 13 for nonstructural components, for the Project's risk category, site class, and exposure. **[ELEVATION TO CONFIRM: delegated-design responsibility and any available test data or standard calculations]**

1. Wind: Exterior walls: design wind pressures per CBC for the location and height.

2. Seismic: Component importance factor and amplification factors per ASCE/SEI 7 Chapter 13, as determined by the Project structural engineer.

D. Plant and Media Retention: Panels/modules shall retain growing media and plants under design wind and seismic loads and under irrigation. **[ELEVATION TO CONFIRM: test data or design basis]**

E. Irrigation Performance:

1. Provide uniform water delivery to every planting zone. Operating pressure at the drip line shall be regulated to approximately 30 psi (Introduction guide). Design flow: **[ELEVATION TO CONFIRM: flow rate, gpm per zone or per sq. ft.]**.
2. Distribution: 1/4-inch drip line with emitters at 6-inch spacing, run along the bottom of each tray, threaded through eyelets on each side of the tray and continuing through the next tray, providing two emitters per tray (David Bishop Oct 18, 2026; Introduction guide). Vertical supply: 1/2-inch or 3/4-inch flex tubing up the panels (Introduction guide).
3. Zone the system to account for differences in exposure and moisture from top to bottom of wall.
4. Water use: **[ELEVATION TO CONFIRM: typical water use per sq. ft. (optional; provide on a project only where required, not published)]**. For exterior walls, document water use as required by MWELO or the local ordinance and CALGreen.

F. Drainage Performance: The system has no trough or gutter (David Bishop, Oct 18, 2026). Trays include integrated pooling zones and drainage channels with reduced water requirements and standing water below the root zone (Elevation SpecSheet). Interior walls require a catch basin at the base of the wall to collect excess irrigation water. Exterior walls typically require a French drain or similar at the base of the wall (David Bishop, Oct 18, 2026). Where a building drain or planter drain is used, protect finished floors with an overflow path if that drain is blocked.

G. Interior Lighting Performance: For most interior tropical plants, provide light at the planting face of 250 to 500 foot-candles (FC); some species benefit from considerably more (David Bishop, Oct 18, 2026). Match the plant palette to the measured light at each zone of the wall. Photoperiod: **[ELEVATION TO CONFIRM: photoperiod, hours per day]**. Measure light at the planting face, not as general room illumination.

H. Fire Performance: **[ELEVATION TO CONFIRM: available ASTM E84 or other fire test data]** Where the wall is an interior finish, comply with CBC Chapter 8 for the occupancy. For exterior walls, comply with CBC Chapter 14 as applicable to the construction type.

[EDITOR'S NOTE: Verify fire performance requirements with the authority having jurisdiction, especially for exterior walls on buildings of Type I through IV construction and for interior walls in exits or corridors.]

2.4 COMPONENTS

A. Channel Strut and Mounting:

1. Channel strut: Stainless steel, attached to the vertical substrate (Elevation SpecSheet / Introduction guide).
2. Stand-off / air gap: Offset the steel panels from the substrate as shown on Elevation shop drawings / SpecSheet schematic (typical stand-off dimensions on SpecSheet schematic approximately 1.25 inches and 1.42 inches at the mounting key). Keep moisture away from the building surface (Introduction guide).

3. Fasteners and anchors: Corrosion-resistant, compatible with strut, panel, and substrate. Compatible with wood framing, steel studs, concrete, or CMU (SpecSheet). Use stainless steel at coastal exterior locations. Isolate dissimilar metals.

B. Steel Panels:

1. Galvanized steel mesh panels, standard 2 ft wide by 3 ft high, bi-directional orientation, W2.0X3.0, approximately 1/4-inch wire (Elevation SpecSheet schematic: "Bi-Directional 1/4\" Galvanized Steel Panels").
2. Hang panels on channel strut with Varden™ mounting / twist-lock keys (SpecSheet / Introduction guide).

C. Living Wall Trays:

1. Material: Injection-molded, BPA-free polypropylene; may include recycled / reprocessed content; UV-stable for exterior use (SpecSheet).
2. Size: 12-inch horizontal by 6-inch vertical increments (SpecSheet).
3. Features: Integrated pooling zones and drainage channels; natural aspiration / root-friendly geometry; reduced water requirements with standing water below the root zone; accepts soil modules for individual plant swaps (SpecSheet).
4. Hang trays on the steel panels. Plants and soil modules shall be individually replaceable without removing adjacent trays or panels.

D. Soil Modules:

1. Mesh tubes, 5-inch diameter by 12-inch length, standard; recyclable, BPA-free polypropylene mesh with patented mesh technology for natural soil aspiration (SpecSheet). Introduction guide also describes photodegradable nylon mesh soxx; **[ELEVATION TO CONFIRM: publish polypropylene (SpecSheet) or nylon (Introduction), or both as acceptable]**.
2. Filled with growing media per Paragraph E.

E. Growing Media:

1. Composition: Elevation proprietary compost-blend organic media engineered for water efficiency, reduced leaching, high oxygenation, and lightweight load (SpecSheet). **[ELEVATION TO CONFIRM: growing media brand — proprietary compost-blend vs. Berger-M2 named in Introduction guide]**
2. Free of weed seeds, pests, pathogens, and debris.

F. Irrigation:

1. Point of connection: Dedicated water supply with isolation valve, by Division 22 [or Division 32] unless indicated otherwise.
2. Backflow preventer: **[ELEVATION TO CONFIRM: backflow device type and who furnishes it]**, complying with the CPC and the water purveyor's requirements (SpecSheet requires backflow per code).
3. Filtration: **[ELEVATION TO CONFIRM: filter type and mesh rating]** (SpecSheet requires a filter).
4. Pressure regulation: Pressure regulator / PSI reducer sized for approximately 30 psi at the drip line (Introduction guide).
5. Vertical supply: 1/2-inch or 3/4-inch flex tubing run vertically up the panels (Introduction guide).

6. Distribution: 1/4-inch drip line with emitters at 6-inch spacing, run along the bottom of each tray, threaded through eyelets on each side of the tray and continuing through the next tray (two emitters per tray). UV-resistant where exposed. (David Bishop Oct 18, 2026; Introduction guide.)
7. Controller: **[ELEVATION TO CONFIRM: controller make/model]**, automatic, multi-zone, with [remote monitoring] [flow sensing] [moisture sensing] [leak alarm]. Programmable timers are encouraged (Introduction guide). SpecSheet allows optional smart sensor technology.
8. Fertigation: **[ELEVATION TO CONFIRM: fertigation/injector equipment, standard or optional]**.
9. [Recirculating systems: Optional for interior installations per SpecSheet. Tank, pump, float controls, and overflow when used.]
10. Master valve and flush points at the ends of distribution runs.

G. Drainage (No Trough):
1. The Elevation system does not include a trough or gutter (David Bishop, Oct 18, 2026).
2. Rely on tray integrated pooling zones and drainage channels and on metered drip irrigation (SpecSheet).
3. Interior walls: Provide a catch basin at the base of the wall to collect excess irrigation water. Exterior walls: Provide a French drain or similar at the base of the wall (David Bishop, Oct 18, 2026).
4. The SpecSheet accessory list includes "cachebasins and containment, as required." Coordinate catch basin size, finish, and any drain connection with the Architect.

H. Lighting (Interior Walls):
1. Horticultural LED fixtures selected to deliver the light level in Article 2.3 at the planting face, with color rendering acceptable for the space. **[ELEVATION TO CONFIRM: fixture basis of design]**
2. Lighting controls: Timer or connection to the building lighting control system for the photoperiod.
3. [Feature lighting: wall washing, uplighting, or integrated accent lighting, as indicated.]
4. Fixtures accessible for service from the maintenance access zone.

I. Moisture Barrier: [By others, Division 07.] [Provided by Installer: ELEVATION TO CONFIRM product.] Continuous moisture barrier behind the full extent of the planted face, lapped into flashings and any approved drain or containment accessory.

J. Architectural Framing/Trim Surround: [Wood: species ___] [Composite] [Powder-coated steel] [Aluminum] [Millwork by Division 06], as indicated on Drawings.

2.5 PLANT MATERIAL

A. Quality: Plants shall comply with ANSI Z60.1 for the plant type and container size. Plants shall be healthy, vigorous, true to name, free of pests and disease, with well-developed root systems.

B. Density and Size: Standard — three plants per 12-inch soil module, evenly spaced (Elevation SpecSheet). Container size at installation as shown on the Planting Plan.

C. Pre-Growing: Optional bench-grow / pre-grow per SpecSheet. Plants shall be acclimated to the project light and exposure before installation. **[ELEVATION TO CONFIRM: standard pre-grow period and lead time when used]**

D. Plant Palette: As indicated on the Planting Plan. Select species for the measured light, orientation, sun exposure, wind, temperature, coastal conditions, irrigation regime, and maintenance program.
    1. Palette categories: [Ornamental] [Tropical] [Succulent] [Edible] [Climate-appropriate/drought-tolerant].
    2. Arrangement: Plant in zones or bands for color and texture as indicated, so the wall reads in layers rather than as one flat surface.

[EDITOR'S NOTE, REFERENCE PALETTES FROM ELEVATION PROJECTS, FOR INFORMATION ONLY: The Portola Hotel & Spa exterior coastal wall in Monterey, CA, is 155 sq. ft. with 783 bench-grown plants of 9 species: Echeveria 'Lily Pad', Calandrinia spectabilis, Echeveria imbricata, Aeonium arboreum, Carex oshimensis 'Evergold', Asparagus densiflorus, Crassula arborescens, Crassula spp., and Thaumatophyllum 'Xanadu' (Philodendron 'Xanadu'). A Corona del Mar residential wall is 30 ft. long in an ipe frame, with 1,440 plants of 8 species planted in bands of purple and green. Select plants for each project's own conditions.]

E. Substitutions of plant species: Only with the Architect's approval, and with equal or better suitability for the conditions.

2.6 FABRICATION

A. Fabricate support frame and panels/modules to the dimensions shown on approved Shop Drawings, verified by field measurement.

B. Pre-plant panels/modules off site where the system requires it, and grow them in for the period in Article 2.5 before delivery.

C. Pre-assemble irrigation headers and manifolds where practical, and pressure-test before delivery.

D. Finish exposed frame and trim components to match approved Samples.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, backing, waterproofing, flashing, and points of connection, with the Installer present, for compliance with requirements and approved Shop Drawings.
    1. Verify that backing and blocking are in place at attachment locations.
    2. Verify that the moisture barrier is complete, continuous, and tested where required by Division 07.
    3. Verify that water supply with backflow prevention, drain, and power are installed at the locations shown and are operational.
    4. Verify static water pressure at the POC.
    5. For interior walls: Verify that light levels at the planting face meet requirements.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Starting installation means the Installer accepts the conditions.

3.2 PREPARATION

A. Protect adjacent finishes, floors, and equipment from water, growing media, and debris.

B. Lay out the channel strut, steel panels, trays, and POCs from approved Shop Drawings.

3.3 INSTALLATION

A. Install the system per approved Shop Drawings and the manufacturer's written instructions.

B. Channel Strut and Steel Panels: Install channel strut plumb, level, and true, anchored to backing at the spacing on approved Shop Drawings. Hang galvanized steel panels with Varden™ mounting / twist-lock keys. Maintain the specified stand-off / air gap. Seal penetrations through the moisture barrier with a compatible sealant or as required by the Division 07 manufacturer.

C. Trays: Snap / hang trays onto the steel panels per Elevation's written instructions so trays are secure against movement (SpecSheet).

D. Irrigation: Install vertical flex supply and 1/4-inch drip lines along the bottom of each tray, threading through tray eyelets and continuing through adjacent trays. Install controller, filtration, pressure regulation to approximately 30 psi, [fertigation,] and [monitoring] equipment. Connect to the water POC downstream of the backflow preventer. Flush lines before operating emitters.

E. Soil Modules and Media: Install filled soil modules into trays. Pre-moisten media as recommended by Elevation.

F. Plant Material: Install plants per the Planting Plan at three plants per 12-inch soil module unless otherwise indicated. Seat root systems in full contact with the growing media. Water in immediately after planting.

G. Drainage: Verify tray drainage channels are clear. Install the catch basin at interior walls, and the French drain or similar at exterior walls, before planting. Do not install a trough or gutter unless the Architect specifically requires an approved accessory.

H. Lighting: Where in scope, install and aim fixtures per the approved lighting layout.

I. Framing/Trim: Install the surround true to line, concealing strut, panel edges, and irrigation components as detailed.

3.4 IRRIGATION STARTUP AND TESTING

A. Pressure Test: Before planting, test irrigation piping at **[ELEVATION TO CONFIRM: test pressure and duration]** with no leaks.

B. Flow and Distribution Test: Operate each zone. Verify approximately 30 psi at the drip line, flow, and uniform wetting across the full height and width of the wall. Verify emitters at 6-inch spacing along each tray. Confirm that excess water behaves as designed without a trough (no uncontrolled spill onto finished floors).

C. Controller Programming: Program the controller for the initial establishment schedule. Verify alarms and monitoring where provided.

D. Drainage Observation: Observe a full irrigation cycle and confirm drainage performance without a trough: excess water is collected by the catch basin (interior) or the French drain or similar (exterior). Where a floor drain or planter drain is used, verify the overflow path.

E. Submit a startup and test report to the Architect.

3.5 FIELD QUALITY CONTROL

A. Inspections: Installer shall inspect the frame, attachment, irrigation, drainage, and planting before concealment and at completion.

B. Interior light verification: Measure and record light levels at the planting face at completion, with lighting operating.

C. Correct any deficiency and retest.

D. Remove and replace work that does not comply with requirements.

3.6 ESTABLISHMENT PERIOD

A. Duration: **[ELEVATION TO CONFIRM: establishment period length]** from completion of planting.

B. During the establishment period, the Installer shall monitor and adjust irrigation, groom plants, and replace dead or declining plants.

C. Final Acceptance criteria: **[ELEVATION TO CONFIRM: acceptance criteria, e.g. coverage and maximum plant loss]**. Plants healthy and vigorous; irrigation and drainage operating without leaks; system clean.

D. Final Acceptance inspection: The Architect, Owner, and Installer will inspect at the end of the establishment period. The Installer shall correct deficiencies, and the establishment period will be extended until the criteria are met.

3.7 CLEANING

A. Remove growing media, plant debris, packaging, and construction debris from the wall, trays, and adjacent surfaces.

B. Clean tray drainage channels, any approved drain screens, and filters.

C. Clean exposed frame, trim, and fixtures.

3.8 PROTECTION

A. Protect the installed wall from construction dust, paint overspray, physical damage, and interruption of water or power until Final Acceptance.

B. Notify the Contractor in writing that the water supply, power, and lighting serving the wall shall not be shut off without notice to the Installer.

C. Replace plants damaged by other trades at the Contractor's expense.

3.9 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Manual: Include as-built irrigation layout and zones, controller programming, equipment data, plant list with care requirements, the routine maintenance program, shut-off locations, emergency procedures, and contact information.

B. As-Built Drawings: Record the final panel layout, plant zones, irrigation, and POCs.

C. Warranty documents and the executed maintenance agreement.

3.10 DEMONSTRATION AND TRAINING

A. Train the Owner's personnel in controller operation, water and power shut-off, alarm response, what to watch for between maintenance visits, and how to contact the Installer.

B. Training duration: [___ hours]. Training may be combined with the Final Acceptance inspection.

3.11 EXTRA MATERIALS

A. [Optional: Furnish spare emitters, drip line, filter elements, and fittings, in quantities equal to [___] percent of installed, packaged and labeled.]

3.12 MAINTENANCE SCHEDULE

A. Provide maintenance per Article 1.13 on the following schedule. Frequencies to be confirmed by Elevation.

Task	Interior walls	Exterior walls
Routine service visit (inspection, grooming, pruning)	Twice per month (typical)	Twice per month (typical)
Irrigation review: emitter and distribution check, leak check	Each visit	Each visit
Controller schedule review and seasonal adjustment	Each visit; seasonal reprogramming	Each visit; seasonal reprogramming

Filter cleaning	**[ELEVATION TO CONFIRM]**	**[ELEVATION TO CONFIRM]**
Drainage path check (no trough); overflow check where a drain is used	Each visit	Each visit
Nutrition / fertigation check and adjustment	**[ELEVATION TO CONFIRM]**	**[ELEVATION TO CONFIRM]**
Pest and disease monitoring	Each visit	Each visit
Replacement of dead or declining plants	As needed, per warranty terms	As needed, per warranty terms
Light level verification at planting face	**[ELEVATION TO CONFIRM]**	N/A
Remote monitoring / alarm review (if provided)	Continuous	Continuous
Annual system review and report to Owner	Annually	Annually

APPENDIX: INFORMATION DAVID NEEDS TO PROVIDE

Every bracketed yellow placeholder that reads ELEVATION TO CONFIRM maps to a row in this table. Values below marked "Filled from existing Elevation SpecSheet (Dec 15, 2025) and/or Introduction guide / David (Oct 18, 2026)" were removed from this open-items list and written into Parts 1–3. Remaining rows still need confirmation.

#	Item	Where used	What is needed
1	Spec contact email	2.1.B	The email address to publish in the manufacturer paragraph.
2	Design responsibility for frame and anchorage	1.5.C, 2.3.C	Does Elevation provide stamped structural calculations (delegated design) under a California-licensed engineer, or must the project structural engineer design attachment?
4	Irrigation flow rate	2.3.E, 2.4.F	Design flow (gpm per zone or per sf). Pressure at POC is 30 psi per Introduction guide; emitter layout is filled.
5	Filtration mesh/micron	2.4.F	Filter type and mesh/micron rating (SpecSheet requires a filter; rating not stated).
6	Controller make/model	2.4.F	Standard controller make/model; Wi-Fi/cloud monitoring yes/no. SpecSheet allows optional smart sensors.
7	Backflow preventer furnishing	2.4.F	Device type (e.g., RPZ vs. double check) and who furnishes it. SpecSheet requires backflow per code.
8	Fertigation equipment	2.4.F	Injector/dosing type, nutrient program, standard or optional.
9	Water use per sf (optional, not published)	2.3.E	Optional figure. Typical daily or weekly water use per sf, interior and exterior, for use on a project only where MWELO / CALGreen documentation requires it. Not published in Elevation marketing or guides (David Bishop, Oct 18, 2026).
10	Interior lighting target	2.3.G, 2.4.F	Photoperiod (hours per day) and preferred fixture. Light intensity is filled: 250–500 FC for most interior tropical plants (David Bishop, Oct 18, 2026).
11	Growing media brand confirmation	2.4.E	SpecSheet: Elevation proprietary compost-blend. Introduction guide names Berger-M2 as standard. Confirm which to publish, or both.
12	Establishment period and	3.6	Duration and measurable

	acceptance		acceptance criteria (% coverage, maximum % plant loss).
13	Maintenance visit frequency and schedule	1.13, 3.12	Visit frequency filled: twice per month, typical; frequency varies by project (David Bishop, Oct 18, 2026). Still needed: initial maintenance term and renewal terms.
14	Maintenance response time	1.13	Response time for irrigation failure or leak calls.
15	Fire performance data	2.3.H	Any ASTM E84 or other fire test data for trays/media, or confirmation that none exists.
16	Wind and seismic testing or calculations	2.3.C, 2.3.D	Whether test data or standard calculations exist, or whether each project is engineered.
17	Waterproofing scope	1.2, 2.4.G	Whether Elevation furnishes the moisture barrier behind the wall or it is always by others.
18	Irrigation pressure test	3.4.A	Test pressure and hold duration Elevation uses for startup testing.
19	Proprietary vs. open specification	2.1	SpecSheet says substitutions not permitted without written approval. Confirm whether this CSI guide stays "or approved equal" or becomes sole-source.
20	Trade name in open specs	2.1.B, 2.2.A	SpecSheet names "Elevation Living Wall System by Varden™" and trays by Verdtech, Inc. Confirm Varden™ / Verdtech naming for published architect specs.

END OF SECTION 09 77 53