

SECTION 07 46 23 PALMWOOD EXTERIOR CLADDING

Durapalm® PalmShell™ Solid Black Palm Rainscreen Cladding

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes solid black palm (*Borassus Flabellifer*) exterior palm cladding of the groove/lap profile, installed as an open- or closed-joint rainscreen over a ventilated cavity.
- B. Related Requirements:
 - 1. Section 06 10 00 – Rough Carpentry: Wall sheathing and wood furring/battens forming the rainscreen cavity.
 - 2. Section 07 25 00 – Weather Barriers: Water-resistive barrier and air barrier behind cladding.
 - 3. Section 07 62 00 – Sheet Metal Flashing and Trim: Metal flashing, closures, and drip edges.
 - 4. Section 07 92 00 – Joint Sealants: Sealants at penetrations and terminations.

SPEC NOTE: *Edit the Related Requirements list to match the Project Manual. Delete Sections not used.*

1.2 REFERENCE STANDARDS

- A. ASTM D143 – Standard Test Methods for Small Clear Specimens of Timber.
- B. ASTM D2395 – Density and Specific Gravity of Wood and Wood-Based Materials.
- C. ASTM D4442 – Direct Moisture Content Measurement of Wood and Wood-Base Materials.
- D. ASTM E84 / UL 723 – Surface Burning Characteristics of Building Materials.
- E. USGBC LEED v4 / v4.1 – Building Design and Construction.

1.3 DEFINITIONS

- A. Black Palm: Solid material milled from the dense outer-trunk fibrovascular zone of *Borassus Flabellifer*, a monocot palm; also traded as Palmyra, Sugar, Toddy, Tala, Lontar, and Doub Palm. Not a dicot hardwood; contains no growth rings, sapwood/heartwood distinction, knots, or ray tissue.
- B. Rainscreen: Cladding assembly installed over a drained and ventilated cavity, in which the cladding sheds bulk water and a separate water-resistive barrier provides the drainage plane.
- C. S4S: Surfaced (dressed) four sides.

1.4 ACTION SUBMITTALS

- A. Product Data: Manufacturer's current technical data sheet, profile dimensions, physical and mechanical properties, finish systems, and installation guidelines for each product specified.
- B. Samples:
 - 1. Initial Selection: Manufacturer's finish and species range samples.

2. Verification: Two (2) full-profile pieces not less than 12 in. long, showing the natural range of color, fiber density, and figure, and the specified finish.

SPEC NOTE: *Black palm is intrinsically variable piece-to-piece. Require a verification sample and a mock-up (Article 1.7) so the design team sets realistic expectations for color and figure range. Aesthetic variation is not a warrantable defect.*

1.5 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Certificate: Certifying that products comply with specified requirements, including species, grade, and moisture content at shipment.
- B. Fire-Test Reports: Where a fire classification is required, submit ASTM E84 and/or EN 13501-1 reports for the untreated product and, if applicable, for the approved intumescent coating system.
- C. Field Environmental Data: Where required, RH and temperature logging records for the installed environment from delivery through the warranty period.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Cleaning, re-finishing, and refresh intervals for the finish system used.
- B. Warranty Documentation: Executed manufacturer warranty at durapalm.com

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm regularly engaged in the manufacture of architectural palm-wood products with not less than ten (10) years of documented experience.
- B. Installer Qualifications: A firm experienced in the installation of exterior wood or rainscreen cladding of comparable scope, acceptable to the manufacturer.
- C. Mock-Up:
 1. Construct a field mock-up not less than [48 in. by 48 in.] including a typical outside corner, one horizontal termination, and the specified finish, over the actual cavity/furring and water-resistive barrier assembly.
 2. Obtain Architect's approval of appearance, color/figure range, joint dimensions, and fastening before proceeding. Approved mock-up establishes the standard for the Work and may remain as part of the completed Work if undisturbed.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, protective packaging.
- B. Store material indoors or under cover, off the ground, flat-stacked on stickers, protected from direct sunlight, precipitation, standing water, and mechanical damage.
- C. Do not deliver material until the rainscreen exterior work is complete or building is suitable for exterior application of PalmShell Cladding.

1.9 FIELD CONDITIONS

- A. Acclimatization: Unbundle and flat-stack material on stickers at the installation location for a minimum of seventy-two (72) hours prior to installation, so that material moisture content equilibrates with the ambient environment.
- B. As a solid botanical material, black palm exchanges moisture with the surrounding air and will move with sustained changes in humidity. Coordinate installation sequence, gaps, and fastening to accommodate normal seasonal dimensional movement.

SPEC NOTE: PalmShell™ is intended for exterior/rainscreen use and, if left unfinished, weathers naturally to a silver-grey patina. Unlike interior Durapalm® products it is not tied to a conditioned 35–55% RH service envelope, but solid palm wood still exchanges moisture with the ambient environment. Where any portion of the Work occurs in a sheltered, semi-enclosed, or otherwise stabilized exposure, coordinate finish and acclimatization to that condition. In arid or desert climates ambient RH is frequently below 20%; extended acclimatization and/or a defined finishing for moisture-management may be required.

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard twenty-five (25) year limited warranty against defects in material, commencing at [Substantial Completion] [the project Taking-Over Certificate], conditioned upon installation in accordance with the manufacturer's published Installation and Handling Guidelines and, for conditioned interior applications, upon continuous maintenance of the specified service environment.
- B. Natural color, fiber-density, and figure variation, and the natural weathering/patina of unfinished exterior material, are inherent characteristics and are not defects under the warranty. Warranty located at durapalm.com

SPEC NOTE: Confirm warranty term, commencement, and any project-specific conditions with Smith & Fong before issue. The cut sheet's 25-year term was written for a specific hospitality project; the standard commercial term may differ.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Durapalm® PalmShell™ solid black palm exterior cladding by Smith & Fong Company.
 - 1. Smith & Fong Company, 394 Bel Marin Keys Blvd., Suite 6, Novato, CA 94949, USA.
 - 2. Telephone: +1 415 896 0577 / +1 866 835 9859. Email: info@durapalm.com. Web: durapalm.com
- B. Substitutions: [Not permitted.] [Under provisions of Section 01 25 00 – Substitution Procedures.]

2.2 CLADDING MATERIAL

- A. Species: Borassus Flabellifer L. (black palm); family Arecaceae. Solid, single-species material milled exclusively from the dense outer-trunk fibrovascular zone.
- B. Raw-Material Basis: Agriculturally retired palms harvested at the end of their productive sap, fruit, and palm-sugar cycle. Not forest-grown, old-growth, or CITES-listed material. Species is not CITES-listed and not IUCN-threatened.
- C. Grade: Manufacturer's premium architectural grade; selected outer-trunk material only.
- D. Moisture Content at Shipment: Average 12 percent (kiln-dried).
- E. Typical Physical and Mechanical Properties (outer-trunk material at 12 percent moisture content, per published species data):

Average dried weight	970 kg/m ³ (61 lb/ft ³)
Specific gravity (12% MC)	0.97
Janka hardness	3000lbs(1363kg) average
Modulus of rupture (MOR)	137.6 MPa (19,950 lbf/in ²)
Modulus of elasticity (MOE)	15.60 GPa (2,262,000 lbf/in ²)
Crushing strength (parallel to grain)	70.3 MPa (10,190 lbf/in ²)

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|-------------------------------|-----------------------------------|
| Radial / tangential shrinkage | ~5.5% / ~5.5% (green to oven-dry) |
| T/R ratio | ~1.0 (symmetrical dimensional |
| movement) | |
| Decay resistance | High level of exterior durability |
- F. Dimensional Behavior: With no growth rings or ray tissue, shrinkage is approximately equal in the radial and tangential planes ($T/R \approx 1.0$), so parallel members tend to move uniformly rather than cupping or twisting differentially across humidity cycles.

2.3 CLADDING PROFILE AND DIMENSIONS

- A. Profile: Groove/lap (shiplap-style) interlocking edge profile designed for concealed or semi-concealed fastening and rainscreen installation over a ventilated cavity.
- B. Nominal Dimensions:
 - 1. Length: 2,439 mm (96 in.).
 - 2. Fully Exposed Width: 88 mm (3.45 in.).
 - 3. Thickness: 20 mm (3/4 in.).
- C. Surface: S4S, surfaced four sides, sanded to accept finish.
- D. Tolerances: Cross-section ± 2 mm; straightness ≤ 6 mm bow/crook per 1,000 mm.

SPEC NOTE: *PalmShell is milled for single groove/lap profile above (96 in. x 3.45 in. x 3/4 in.). Other cross-sections and solid battens/lumber are available on request under the Durapalm® Black Palm Lumber line; add a separate product paragraph if battens or slats are also required. Only the dense outer-zone material is used, so wide boards and long continuous lengths are not available in this species.*

2.4 ACCESSORIES

- A. Fasteners: Corrosion-resistant [Type 316 stainless steel] [silicon bronze] fasteners of type, length, and gauge recommended by the manufacturer for the substrate and exposure. Pre-drilling is required; the dense fibers will split if fasteners are driven without pilot holes.
- B. Furring / Battens: Pressure-preservative-treated wood or composite furring forming a continuous drained and ventilated cavity, sized per Shop Drawings, done by others. Section 06 10 00.
- C. Trim, Starter, and Closure Profiles: Matching palmwood or manufacturer-approved metal trim, corner, starter, and vented closure profiles.
- D. Water-Resistive / Air Barrier: Provided under Section 07 25 00; verify compatibility and continuity with cladding attachment.

2.5 FINISHES

- A. Unfinished (Natural Weathering): Material installed raw; exposed surfaces weather over time to a silver-grey patina. Acceptable for exterior use given the material's inherent weather resistance.
- B. Field-Applied Finish: Exterior-grade [penetrating clear UV-resistant finish] [natural linseed oil] applied per finish manufacturer's instructions. Apply a sanding sealer before stain or topcoat to equalize the uneven absorption between the dense dark fibers and the lighter matrix and to avoid blotching.
- C. Fire-Rated Coating (Optional): Where a fire classification is required, an approved intumescent system (e.g., ICRO ECL) achieving Euroclass B-s1,d0. Untreated material is typically Class C (ASTM E84) / Class 3, application by approved contractor.

SPEC NOTE: Select ONE finish approach in Article 2.5 and coordinate with the elevations. If any assembly must meet a specific flame-spread / Euroclass rating (e.g., for building height, occupancy, or KSA/GCC code), retain paragraph C and require the corresponding fire-test reports under Article 1.5.

2.6 FABRICATION

- A. Mill and machine with high tooth count, carbide tooling; the palm fiber bundles rapidly dull high-speed-steel cutters. Use sharp tools, shallow passes, and a high feed-to-speed ratio to minimize tear out and splintering.
- B. Where surface machining is performed, pre-condition with sanding sealer or wood hardener to equalize density prior to final sanding.

2.7 SOURCE QUALITY CONTROL

- A. Inspect material for compliance with specified species, grade, profile, dimensions, and moisture content prior to shipment. Aesthetic variation within the natural range is acceptable and is not cause for rejection.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that substrate, sheathing, water-resistive/air barrier, furring, and flashings are complete, continuous, dry, and correctly located to receive cladding.
- B. Verify that a continuous, drained, and ventilated rainscreen cavity is provided behind the cladding.
- C. Do not begin installation until unsatisfactory conditions have been corrected. Commencement constitutes acceptance of substrate conditions.

3.2 PREPARATION

- A. Acclimatize material as specified in Article 1.9 prior to installation.
- B. Blend material from multiple bundles at the working site so that natural color and figure variation is distributed evenly across each elevation.

3.3 INSTALLATION

- A. Install in accordance with the manufacturer's published Installation and Handling Guidelines, approved Shop Drawings (done by installer/contractor), and the approved mock-up.
- B. Rainscreen Cavity: Maintain the ventilated cavity clear and continuous; provide vented closures at top and bottom terminations to allow drainage and airflow while excluding pests.
- C. Setting: Install cladding [horizontally] [vertically] with the groove/lap profile fully engaged. Maintain uniform reveals and consistent end joints; stagger end joints and locate over furring.
- D. Fastening: Pre-drill all fastener locations. Fasten to furring with corrosion-resistant fasteners at the spacing shown on Shop Drawings. Do not overdrive. Allow for normal seasonal movement at ends and terminations.
- E. Trim and Terminations: Install corner, starter, edge, and closure trim; integrate with flashing at heads, sills, penetrations, and transitions to shed water to the drainage plane.
- F. Field Cutting: Seal all field-cut ends with a compatible end-grain sealer before installation.

3.4 FIELD QUALITY CONTROL

- A. Verify engagement of the groove/lap profile, reveal uniformity, fastener type and spacing, cavity ventilation, and flashing integration against the approved mock-up and Shop Drawings.
- B. Where required, record installed-environment RH and temperature per Article 1.5.

3.5 CLEANING

- A. Clean exposed surfaces. Do not use abrasive cleaners, or silicone-based polishes. Re-finish per the finish manufacturer's instructions where a finish is specified.

3.6 PROTECTION

- A. Protect installed cladding from mechanical damage, staining, and adjacent wet trades through the remainder of construction. Replace damaged material that cannot be restored to the approved appearance.

END OF SECTION 07 46 23