



SECTION 06120

STRUCTURAL WALL PANELS SPECIFICATIONS

Revision 4

For best results, display hidden notes to specifier.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Solid panels, installed as:
  - 1. Structural insulated exterior wall panels.
  - 2. Structural insulated interior wall panels.
  - 3. Structural Insulated roof panels.
  - 4. Structural insulated floor panels.

1.2 RELATED SECTIONS

- A. Section [06090](#) – Wood and Plastic Fastenings
- B. Section [06160](#) - Sheathing
- C. Section [06170](#) - Prefabricated Structural Wood
- D. Section [07210](#) – Building Insulation

1.3 WORK INCLUDES

- A. Furnish and install all pre-fabricated wall, roof and floor panels and accessories required to provide a complete exterior skin package, including all splines, adhesives, fasteners, sill plates and miscellaneous blocking.
- B. Coordinate electrical work with panel fabrication for correct placement of electrical Chases.

1.4 REFERENCES

- A. ASTM E72-98 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction, 2002.
- B. AC-04 – Acceptance Criteria for Sandwich Panels,
- C. ASTM E119 – Fire Tests of Building Construction and Materials.

- D. ASTM C739 – Standard Specification for Cellulosic Fiber (Wood Base) Loose-Fill Thermal Insulation,
- E. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Material,
- F. ASTM C1363-97 – Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
- G. ASTM E 90-02 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions,
- H. ASTM 413-87 – Classification for Rating Sound Insulation.
- I. ASTM 1332-90 – Standard Classification for Determination of Outdoor-Indoor Transmission Class,
- J. ASTM 2235-03 – Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Refer to structural drawings and load tables for performance criteria.
- B. Fire Safety Characteristics:
  - 1. ASTM E-119: 4-3/8" Panels shall have a 1.5 hour fire rating. 7-7/8" panels shall have a 2.5 hour fire rating. (In accordance with test procedure, rating includes installation of ½" gypsum board to meet 15 minute finish rating.)
  - 2. ASTM E-84: Panels shall have a Class 1 rating. Smoke Developed rating of 25 and Flame Spread rating of 25.
- C. Thermal Properties:
  - 1. 4-3/8" panel: Dynamic R-value up to 13.14
  - 2. 7-7/8" panel: Dynamic R-value up to 25.44

#### 1.6 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Furnish manufacturer's customized manual with detailed installation instructions and fabrication and erection drawings for all pre-cut panel systems, including thickness, profile, facing and core materials, anchorage and joint details, panel sizes, rough openings and electrical chases required to erect a complete exterior skin package. Indicate locations of electrical chases by marking on panels. Panels to be numbered to show relationship of one panel to another.
- C. Shop Drawings: Shop Drawings shall be complete with specific instructions for the placement of utilities, windows and doors. All shop drawings, including field measurements of panel length and placement of utilities and window and door openings must be approved before panel production can begin.

## 1.7 QUALITY ASSURANCE

- A. Field Supervision by Manufacturer: If requested, for an additional fee, manufacturer can provide contractor with a representative to provide field supervision on the job site during installation of structural panels. Manufacturer's representative is to have experience on projects of similar type and scope using structural panels.
- B. Preinstallation Meeting: Conduct preinstallation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

## 1.8 SOURCE QUALITY CONTROL

- A. Panels shall be of material specifically designed for exterior wall, interior wall, roof and floor panels. Fabricated work surfaces shall comply with all current codes and regulations.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store Panels in a protected area and supported at least 6" above the ground prevent contact.
- B. Prior to installation, panels shall be covered and protected from exposure to sunlight and moisture.
- C. After installation, all panels shall be covered to prevent contact with water on all exposed panel edges and faces.

## 1.10 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

## 1.11 COORDINATION

- A. Field Measurements: Secure field measurements before preparation of shop drawings and fabrication for proper fabrication and installation of the panels.

## 1.12 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- B. Manufacturer's Warranty: Panel manufacturer shall provide a one year warranty covering reasonable costs of repairing or replacing defective panels, and a warranty during years two through ten (2-10) limited to materials replacement.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Provide Agriboard structural insulated panels manufactured by Agriboard Industries and provided by Ryan Development Company, L.C., Wichita, KS, 67206. Tel: (866) 247-4267. Tel: (316) 630-9223. Fax: (316) 636-9255. Email: [sales@agriboard.com](mailto:sales@agriboard.com). [www.agriboard.com](http://www.agriboard.com).

- B. Substitutions: Not permitted.
- C. Fabricator: Agriboard Industries.

## 2.2 MATERIALS

- A. Structural Panels: Pre-fabricated structural wall, roof and floor panel assemblies, as manufactured by Agriboard Industries, Electra, Texas. Tel: (940) 495-3590. Fax: (940) 495-3597.
  - 1. Panel Assembly: 7-7/8" or 4-3/8" in total thickness, in widths not exceeding 9'-0", and lengths not exceeding 24'-0".
  - 2. Face Material: Exterior and interior panel skin to be a single sheet of 1/2" thick Exposure 1 Oriented Strand Board (OSB), square edges, meeting standards of the American Plywood Association.
    - a. Exposed interior face is to be finished with a clear fire retardant.
  - 3. Core Material: Insulating layer of compressed wheat straw. Each layer 3-1/2" thick each, single layer for 4-3/8" and double layer for 7-7/8" panels. Density equals 13 lbs./cu.ft. minimum.
    - a. Coordinate electrical work with the work of this section so that manufacturer provides chases for conduit where indicated by drawings and as required.
- B. Products provided by panel manufacturer:
  - 1. Panels in sizes and configurations indicated on drawings and required for completion of project.
  - 2. Sill plates.
  - 3. Blocking shown on drawings related to panel installation.
  - 4. Adhesives.
  - 5. Fasteners, ties and screws.
- C. Contractor to provide:
  - 1. Foam Seal at Sill Plate: Ludlow Sill Seal, 1/4" X sill plate width, ribbed polyethylene foam gasket, as manufactured by Tyco International, or as recommended by panel manufacturer.
  - 2. J-bolts: As indicated on drawings and required for completion of project.
  - 3. Crane and other necessary equipment of sufficient capacity for wall and roof panel placement and erection.
    - a. Panel weight: Approximately 14 pounds per square foot.
    - b. Panel size: Maximum size 9 feet X 24 feet.
- D. Evidence of third party testing of panels and ICC approval available.
- E. Physical Properties of Structural Panels:
  - 1. Allowable Compressive Strength of 4' wide 4 3/8" panels: 1953 lb
  - 2. Allowable Compressive Strength of 4' wide 7 7/8" panels: 3878 lb
  - 3. Allowable Flexural Strength of 8' wide 4 3/8" panels: 2820 lb-ft
  - 4. Allowable Flexural Strength of 8' wide 7 7/8" panels: 23435 lb-ft
  - 5. Allowable Flexural Strength of 8' wide 4 3/8" panels: 575 plf
  - 6. Allowable Flexural Strength of 8' wide 7 7/8" panels: 1115 plf
  - 7. Surface Impact Resistance: 9.3 lbs missile with 50.2 fps velocity
  - 8. Smoke Development Rating: 25
  - 9. Flame Spread rating: 25

TABLE 1 – ALLOWABLE TRANSVERSE LOADS

PANEL THICKNESS (inches)	PANEL HEIGHT (feet)	MAXIMUM SPACING OF PROFILE BOARDS (ft-in)	ALLOWABLE TRANSVERSE LOAD (psf)				
			Mid-height Deflection Limits				
			L/120	L/240	L/360	L/600	L/720
4 <sup>3</sup> / <sub>8</sub>	8	4-1 ¾	59	34	24	14	11
		8-3 ½	44	27	19	11	9
		>8-3 ½	28	19	14	9	7
7 <sup>1</sup> / <sub>8</sub>	8	4-1 ¾	165	152	98	53	42
		8-3 ½	115	96	62	35	29
		>8-3 ½	60	35	24	16	14
	10	4-1 ¾	150	136	88	48	38
		8-3 ½	105	87	57	32	26
	12	4-1 ¾	134	120	78	42	34
		8-3 ½	96	78	51	29	24
	14	4-1 ¾	119	104	67	37	30
		8-3 ½	87	69	45	26	21
	16	4-1 ¾	104	88	57	32	25
		8-3 ½	78	60	39	23	18
	18	4-1 ¾	88	73	47	26	21
		8-3 ½	69	51	33	19	16
	20	4-1 ¾	73	57	37	21	17
		8-3 ½	60	43	28	16	13
	22	4-1 ¾	57	41	26	15	12
		8-3 ½	51	34	22	13	11
	24	4-1 ¾	42	25	16	10	8
		8-3 ½	42	25	16	10	8

TABLE 2 – ALLOWABLE SHEAR WALL RACKING LOADS (plf)

PANEL THICKNESS (inches)	ALLOWABLE RACKING LOAD (plf)
4 <sup>3</sup> / <sub>8</sub>	575
7 <sup>1</sup> / <sub>8</sub>	1115

**TABLE 3 – ALLOWABLE AXIAL COMPRESSION LOADS (plf) ON BEARING WALLS WITH TRANSVERSE LOADS**

PANEL THICKNESS (inches)	PANEL HEIGHT (feet)	MAXIMUM SPACING OF PROFILE BOARDS (ft-in)	TRANSVERSE LOAD (psf)									
			5	10	15	20	25	30	35	40	45	50
4 <sup>3</sup> / <sub>8</sub>	8	4-1 <sup>3</sup> / <sub>4</sub>	1712	1565	1418	1272	1125	978	831	684	537	391
		8-3 <sup>1</sup> / <sub>2</sub>	1514	1314	1113	913	713	513	312	112	-	-
		>8-3 <sup>1</sup> / <sub>2</sub>	1287	1009	732	455	177	-	-	-	-	-
7 <sup>7</sup> / <sub>8</sub>	8	4-1 <sup>3</sup> / <sub>4</sub>	1946	1885	1825	1764	1704	1643	1583	1523	1462	1402
		8-3 <sup>1</sup> / <sub>2</sub>	1616	1543	1471	1398	1325	1252	1179	1107	1034	961
		>8-3 <sup>1</sup> / <sub>2</sub>	1241	1132	1024	915	807	698	590	481	373	265
	10	4-1 <sup>3</sup> / <sub>4</sub>	2355	2270	2184	2098	2013	1927	1841	1756	1670	1585
		8-3 <sup>1</sup> / <sub>2</sub>	2040	1949	1857	1766	1674	1583	1492	1400	1309	1217
	12	4-1 <sup>3</sup> / <sub>4</sub>	2355	2237	2118	1999	1880	1761	1642	1523	1404	1285
		8-3 <sup>1</sup> / <sub>2</sub>	2086	2006	1926	1847	1767	1687	1608	1528	1448	1369
	14	4-1 <sup>3</sup> / <sub>4</sub>	2355	2204	2052	1900	1747	1595	1443	1291	1138	986
		8-3 <sup>1</sup> / <sub>2</sub>	2131	1975	1818	1662	1506	1349	1193	1036	880	724
	16	4-1 <sup>3</sup> / <sub>4</sub>	2355	2171	1985	1800	1614	1429	1243	1058	872	687
		8-3 <sup>1</sup> / <sub>2</sub>	2177	1988	1799	1610	1421	1232	1044	855	666	477
	18	4-1 <sup>3</sup> / <sub>4</sub>	2355	2138	1919	1701	1482	1263	1044	825	607	388
		8-3 <sup>1</sup> / <sub>2</sub>	2222	2001	1779	1558	1337	1115	894	673	452	230
	20	4-1 <sup>3</sup> / <sub>4</sub>	2355	2105	1853	1601	1349	1097	845	593	341	89
		8-3 <sup>1</sup> / <sub>2</sub>	2267	2014	1760	1506	1252	999	745	491	237	-
	22	4-1 <sup>3</sup> / <sub>4</sub>	2355	2072	1787	1502	1216	931	645	360	75	-
		8-3 <sup>1</sup> / <sub>2</sub>	2313	2027	1740	1454	1168	882	596	309	23	-
	24	4-1 <sup>3</sup> / <sub>4</sub>	2355	2040	1721	1402	1084	765	446	127	-	-
		8-3 <sup>1</sup> / <sub>2</sub>	2358	2040	1721	1402	1084	765	446	127	-	-

- F. Panel Tolerance:
  1. Squareness: Plus or minus 1/4 in maximum.
  2. Fabricated Panel Length: Plus or minus 1/8 in maximum.
  3. Fabricated Panel Width: Plus or minus 1/8 in maximum.
  
- G. Sub-frame: TimberStrand Grade 1.5E or better (ICC-ES Legacy Report ER-4979), Weyerhaeuser
  
- H. Fasteners for panel assembly:
  1. Isoset 3030D adhesive, Ashland Chemical.
  2. RSS wood screws (ICBO-ES ER-5883), GRK Canada Ltd.
  3. 16 gauge, galvanized 7600CRIII Series Staples, Duo-Fast.

## 2.3 FABRICATION

- A. Fabricate structural insulated panels and accessory items in accordance with manufacturer's recommendations and approved submittals and/or drawings.
  - 1. Make panel lines, breaks and angles sharp and true.
  - 2. Keep plane surfaces free from warp or buckle.
  
- B. Contractor to take field measurements prior to commencement of shop fabrication.
  - 1. Field fabrication is allowed only to ensure proper fit, but keep field fabrication to a minimum with majority of fabrication being done under controlled shop conditions.
  - 2. Where final panel dimensions cannot be established by field measurement before commencement of panel manufacturing, make allowance for field adjustments and thermal movement as recommended by panel manufacturer.
  
- C. Fabricate panels to sizes indicated.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Contractor shall inspect conditions of substrate, grade and other conditions which may affect correct installation of panels. Examine alignment of foundations and structural frames prior to panel erection. Any adverse conditions are to be reported, in writing, to the Agriboard Industries. Do not proceed with installation until adverse conditions are corrected.

### 3.2 INSTALLATION

- A. Installation shall be in strict accordance with manufacturer's published instructions and customized installation manual, details and structural drawings. Any conflicts between these documents are to be resolved in writing. Field modifications resulting from conflicts are to be reviewed by panel manufacturer's engineer and are to be signed and/or sealed in accordance with local governing authorities.

### 3.3 ERECTION

- A. General:
  - 1. Panels are to be installed as shown on drawings and as specified, and in accordance with manufacturer's recommendations.
  - 2. Panels are to be fastened through connecting splines. Fasteners to be spaced 12" on center, on each side of panel, with fasteners provided by manufacturer. Offset fasteners on opposite sides of panel 6", unless instructed otherwise by panel manufacturer.
  
- B. Roof panels are to have minimal temporary roofing applied at time of installation. Apply finished roofing as soon as practical. Wall panels are to have vapor retarder and finish applied to exterior as soon as practical. If vapor retarder and finish application is delayed more than three weeks or repeated exposure to precipitation is expected, apply temporary breathable weather resistant cover to exterior wall. Remove prior to applying permanent finish materials.

## 1.1 CLEANING

- A. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.

## 1.2 PROTECTION

- A. Protect installed product and finish surfaces from damage during construction.
  - 1. Roof panels: Protect panels from weather by roofing materials to provide temporary protection at end of day or when rain or snow is imminent.
  - 2. After installation, cover panels to prevent contact with water on each exposed panel edge and face.