



OVERHEAD DOOR DESIGN GUIDE

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DFCM OVERHEAD DOOR DESIGN GUIDE-

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1. OVERVIEW

Many of the State's projects have large openings to provide access for equipment and vehicles. These openings often create challenges for the spaces that they serve. Conditioning the space as well as keeping the elements and pests out is problematic. DFCM's High Performance Building Standard, section 5.0 (http://dfcm.utah.gov/downloads/design_manual/design_requirements.pdf), requires buildings to be designed, detailed, and built to achieve either a 0.1 or 0.25 CFM/SF @ 75 PA leakage rate. This is not an easy task. The intent of this design guide is to provide project teams assistance in their efforts to provide the State a tight building envelope.

In addition to providing a project a well performing door, consideration should be given to possibly extending the exterior air barrier into the interior wall and ceiling surfaces served by the large openings. This effort coupled with interior man doors with rubber type sweeps and seals will provide increased energy savings, HVAC performance, and occupant comfort for years.

The products highlighted here happened to perform well when field tested on a DFCM project in 2015, due to the care of installation, seals and detailing. It is expected that other similar products will perform equally as well if detailed and installed in a similar manner.

2. PRODUCTS

Commercial Insulated Sectional Overhead Doors-

- a. **Model-** Basis of design or approved equal- Overhead Door Corporation, model 592 & 599 series, consider series 596 & 580 depending on usage. Wayne Dalton, model Thermospan, 200 series.
 - i. **Door Assembly-**insulated door with rabbeted meeting rails to form weathertight joints & full-width interlocking structural rigidity
 1. Panels- min. 2" Insulated, thermally broken
 2. Thermal value-foamed in place polyurethane, R-value min. 17.5
 3. Exterior steel- 24 gauge hot-dip galvanized
 4. Back cover- 26 gauge painted steel
 5. Center and end stiles- 16 gauge
 - ii. **Finish-** surface type, texture and color by designer, min. two coat baked on polyester or epoxy coating
 - iii. **Glazing-**optional, if used required to be insulated, low-e, tempered
 - iv. **Weather Seals-**provide continuous flexible exterior weather seals, provide rubber header seal and secondary seal, provide jamb seals & guide seals, provide PVC bulb-type strip at bottom section
 - v. **Hardware, operator and controls-** determined case by case based on usage and budget
- b. **Performance requirements-**
 1. wind loads per project specific wind load conditions and charts
 2. all components from single manufacturer
 3. min. 10,000 cycles
- c. **Submittals-**
 1. Provide product data
 2. Shop drawings
 3. Manufacturer certificates
 4. Operation and Maintenance Data
- d. **Quality assurance-**
 1. Provide mfr. and installer qualifications
 2. Provide min. 2 year warranty on install and 3 year on components
 3. Mock-up- for material compatibility and sub-contractor sequencing provide min. 48" long mock up for seals or in-situ mock on one door prior to installation of remaining doors. Include

all associated trades and materials, mock up performed by actual installers.

Commercial Rolling Doors-

- a. **Model-** Basis of design products or approved equal: CornellCookson Thermwiser Max & Overhead Door Corporation Stormlite AP Model 627
 - ii. **Door Assembly-**interlocking roll-formed with slat locking system
 1. Slat profile- flat, insulated, end lock & wind lock
 2. Thermal value-foamed in place polyurethane, R-value min. 8
 3. Exterior & interior steel- 24 gauge galvanized
 4. Center and end stiles- 16 gauge
 - iii. **Finish-** surface type, texture and color by designer, min. two coat baked on polyester or epoxy coating
 - iv. **Glazing-**optional, if used required to be insulated, low-e, tempered
 - v. **Weather Seals-**provide continuous flexible exterior weather seals, provide rubber header seal and secondary seal, provide jamb seals & guide seals, provide PVC bulb-type strip at bottom section
 - vi. **Hardware, operator and controls-** determined case by case based on usage and budget
- b. **Performance requirements-**
 1. wind loads per project specific wind load conditions and charts
 2. all components from single manufacturer
 3. min. 20,000 cycles
 4. IECC 2012 Section C402.4.3 Infiltration requirements with an independently tested value of less than .3CFM/FT².
- c. **Submittals-**
 5. Provide product data
 6. Shop drawings
 7. Manufacturer certificates
 8. Operation and Maintenance Data
- d. **Quality assurance-**
 9. Provide mfr. and installer qualifications
 10. Provide min. 2 year warranty on install and 3 year on components
 11. Mock-up- for material compatibility and sub-contractor sequencing provide min. 48" long mock up for seals or in-situ mock on one door prior to installation of remaining doors. Include all associated trades and materials, mock up performed by actual installers.

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3. ELEVATION, SECTIONS AND DETAILS - see attached design guide detail sheet, these details apply to both sectional and rolling doors.

4. CONSTRUCTABILITY & INSTALLATION CONSIDERATIONS

- a. **HPBS-** All new state of Utah building projects over 1 million dollars are required to meet DFCM High Performance Building Standards which includes an air test leakage performance level of not more than 0.1 cfm/ft. This standard is very strict standard and requires particular attention to overhead door detailing and installation. These types of openings are historically the most difficult areas to control air leakage. Most projects will have a 3rd party envelope commissioning agent perform a whole building air test to ensure to ensure this criteria has been met.
- b. **Envelope commissioning-** Design and construction teams should engage the third party envelope commissioning agent in overhead door product selection, detailing, shop drawing review and the construction mock-up and overhead door installation processes.
- c. **Envelope interface-**
 - i. **Weather/Air Barrier-** A continuous weather barrier is required on all projects to help achieve performance criteria.
 - ii. **Compatible materials-** all materials need to be compatible, weather barrier, seals, adhesives and sealants, designers and contractors to check with manufacturer requirements and limitations, contact mfr. rep. as necessary.
 - iii. **Door seals-** Door seals to be continuously fully adhered to jambs and head conditions with silicone or mfr. Recommended adhesives and sealants that are compatible with both the seal and substrate
 - iv. **Surface preparation-** All surfaces to receive seals need to be cleaned, leveled and prepped with compatible primer/sealer to receive weather seals
- d. **Mock-ups-** Multiple trade interface-
 - i. Pre-installation meetings with all trades involved with the opening are critical for success.

INSULATED SECTIONAL OVERHEAD DOOR

BASIS OF DESIGN MODEL
Overhead Door Corporation Model 592 & 599

RELATED WORK
Opening preparation, miscellaneous or structural metal work, access panels, finish or field painting, field electrical wiring, wire, conduit, fuses and disconnect switches are in the Scope of Work of other divisions or trades.

SECTIONS
Sections will be 24 ga. roll-formed galvanized and will have a nominal thickness of 2". Doors will have rabbeted meeting rails to form weathertight joints and provide full-width interlocking structural rigidity. Center and end stiles will be 16 ga. steel, formed and fastened as integral structures with the rolled sections. End stiles will be channel-shaped to 2" deep. Back cover will be 26 ga steel. Deflection of door in the horizontal position will not exceed 1/120 of the door width.

TRACK
Track is 2" and angle mounted.

INSULATION
Insulation will be composed of foamed in place polyurethane providing insulation factors of min. 17.5 R-Value.

HARDWARE
Hinges and fixtures will be galvanized steel. Full-floating ball-bearing rollers will have hardened steel races. roller sizes will be adequate for design requirements and limitations.

WEATHERSTRIP
Provide continuous flexible exterior weather seals, provide header seal and secondary brush seal, provide jamb seals & guide seals, provide PVC bulb-type strip at bottom section.

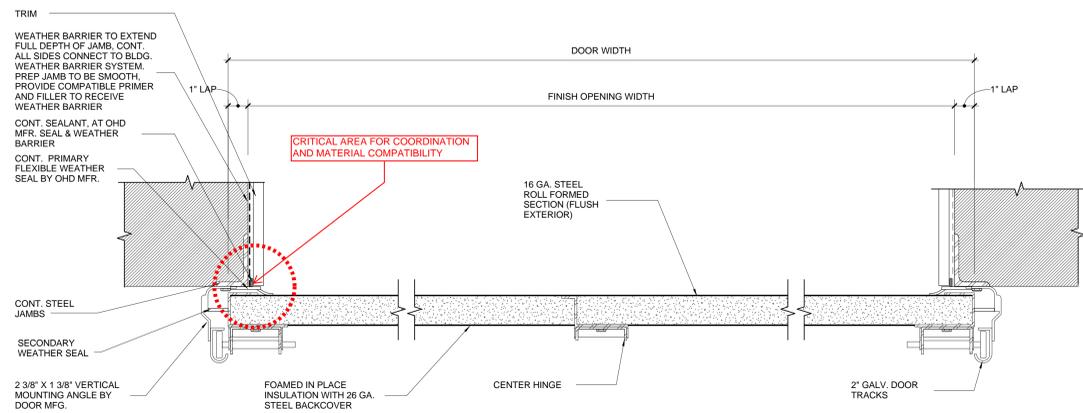
FINISH
Paint will be baked-on polyester or epoxy coating.

OPERATION
TBD, electric or manual

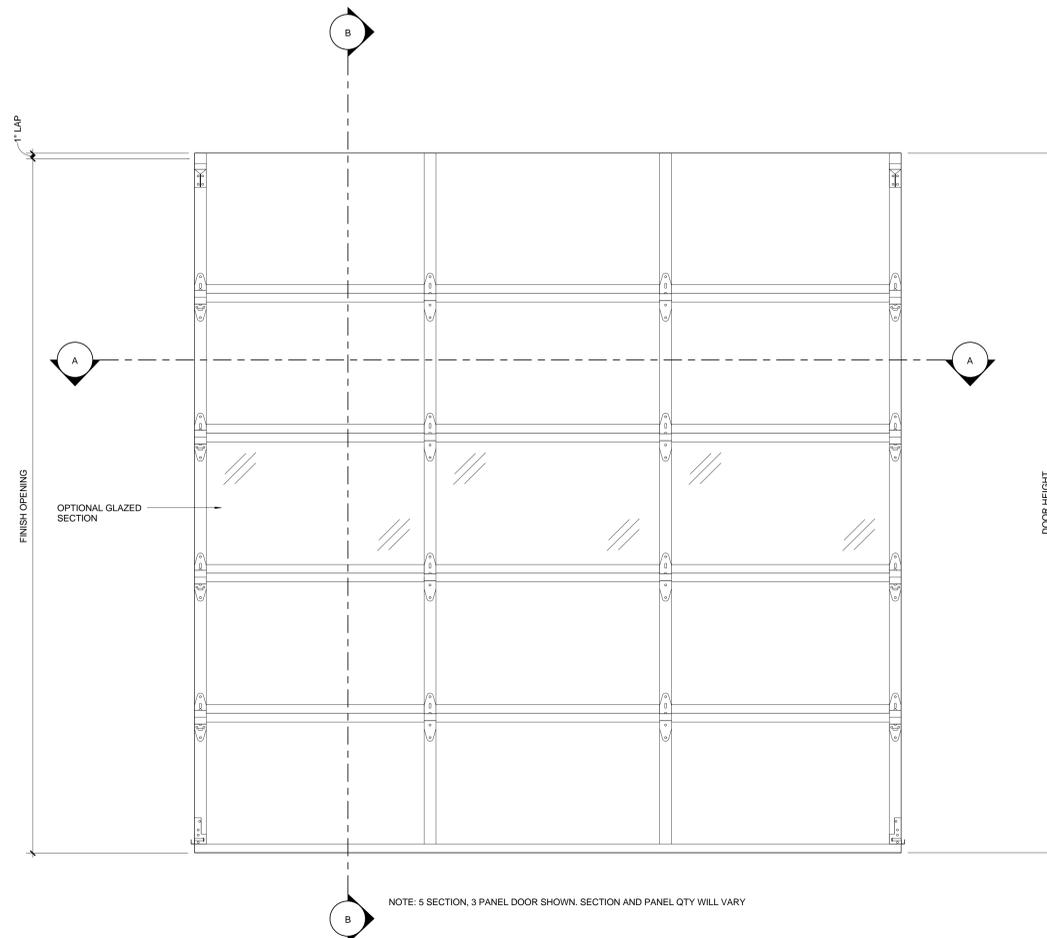
INSTALLATION
Install doors in accordance manufacturer instructions and standards, using on authorized distributor.

SPRINGS 10,000 CYCLE (STANDARD)
SHAFT TYPE: TUBE SHAFT

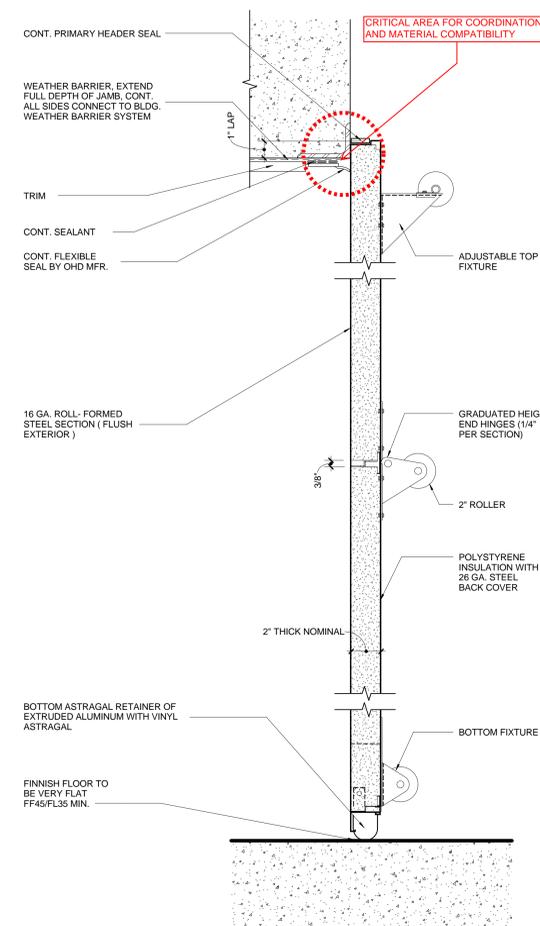
NOTE: FOR ROLLING DOORS PROVIDE SIMILAR DETAILING TO THIS SHEET



3 Section "A-A"
3" = 1'-0"



1 Interior Elevation
1" = 1'-0"



2 Section "B-B"
3" = 1'-0"

DFCM SECTIONAL DOOR DESIGN GUIDE DETAILS



Sample installed over head sectional door.



Missing primary jamb seal.

Fill voids in jamb and prep substrate for seal.



Fill voids in head and prep substrate for seal.

Missing primary header seal.



Installed jamb seal.

Overlap seals to form cont. air barrier.

Installed bottom seal.