SECTION 084236 – BALANCED DOOR ENTRANCES

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Integral balanced door units.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each assembly specified.

Include manufacturer’s specifications and installation instructions.

* + - * 1. Shop Drawings:

Fabrication details and space requirements for units.

Details of each different wall opening condition.

Elevations and details showing sizes of stiles, top and bottom rails, frames and jambs, thresholds.

Details of anchorages, joints, field splices, and connections.

Details of accessories.

Details of moldings, removable stops, and glazing.

Retain first subparagraph below if hardware is electrified.

Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.

Size and location of hardware reinforcements

* + - * 1. Samples: For each type of exposed finish required, in manufacturer's standard sizes.
				2. Quality Control Submittals:

Manufacturer’s warranty.

* + - * 1. Contract Closeout Submittals:

Maintenance Data: for balanced door units to include in maintenance manuals.

* + - 1. QUALITY ASSURANCE
				1. Installer Qualifications: Trained and approved by manufacturer.
			2. DELIVERY, STORAGE AND HANDLING
				1. Materials shall be packed, unloaded, stored, and protected to avoid abuse and damage.
				2. Protect finished surfaces with wrapping and/or strippable coating.
				3. When unloading, remove paper type wrappings that are wet, or which could become wet.
				4. Store inside, if possible, in clean well drained area free of dust and corrosive fumes.
				5. Stack vertically or on edge so that water cannot accumulate on or within materials, using wood or plastic shims between components to provide water drainage and air circulation.
				6. Cover materials with tarpaulins or plastic hung on frames to provide air circulation.
				7. When installing protect materials from lime, mortar, run-off from concrete and copper, weld splatter, acids, roofing tar, solvents, and abrasive cleaners.
			3. WARRANTY
				1. Warranty: Manufacturer agrees to repair or replace components of balanced door units that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

This warranty is not intended to cover adjustments made necessary by the shifting or settling of the building structure.

This warranty is not intended to cover the breakdown of protective coatings when furnished to the architect’s specification and applied as directed.

Labor to replace warranted parts is by others.

Warranty Period: Ten years from date of Substantial Completion.

1. PRODUCTS
	* + 1. MANUFACTURERS

Retain “Ellison Bronze Inc” as basis-of-design manufacturer, refer to website [www.ellisonbronze.com](http://www.ellisonbronze.com) for product selections. Include product name and type specific to project as part of the Basis-of-Design. Manufacturer’s specifications and product sheets are available and should be consulted for limitations and requirements.

* + - * 1. [Basis-of-Design Product:](http://www.specagent.com/Lookup?ulid=12803) Subject to compliance with requirements, provide Ellison Bronze, Inc.; Balanced Doors and Frames [**Model Name**] or comparable product by one of the following:

C.R. Laurence Co., Inc.

Dawson Metal Company.

Stanley Access Technologies.

Or equal.

* + - * 1. Source Limitations: Obtain components of balance door system, including framing and accessories, from single manufacturer.
			1. DESCRIPTION
				1. Entrance and vestibule doors and frames shall be integral “Balanced Door” units consisting of doors, jambs, frames (sidelight and transoms where applicable), thresholds, operating mechanism and finish hardware.
			2. PERFORMANCE REQUIREMENTS
				1. Structural Loads:

Usually indicate on Drawings design loads determined by Project's structural engineer. Verify requirements of authorities having jurisdiction.

Wind Loads: As indicated on Drawings.

Other Design Loads: **[As indicated on Drawings] <Insert loads**>.

The ECCNYS and ASHRAE/IES 90.1 require that all fenestration be certified and labeled by manufacturer for energy performance for thermal transmittance (U-factor), Solar Heat-Gain Coefficient (SHGC), air leakage, and visible transmittance (VT). Energy performance for fenestration products is typically determined for the whole fenestration product or system, which includes the framing, glazing, and the spacer. Coordinate the values selected for energy performance with the glazing selections in Section 088000 "Glazing," and confirm that manufacturer can meet the specified energy performance and can provide certification and labeling. Verify requirements of authorities having jurisdiction.

* + - * 1. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:

Options in subparagraphs below are examples only; revise values to suit climate zone of building envelope as defined by the ECCNYS. Testing for visible light transmittance (VT) is specified in Section 088000 "Glazing."

Thermal Transmittance (U-factor):

Retain "Fixed Glazing and Framing Areas" subparagraph below for sidelights and/or transoms.

Fixed Glazing and Framing Areas: U-factor for the system of not more than [**0.41 Btu/sq. ft. x h x deg F**] [**0.45 Btu/sq. ft. x h x deg F**] [**0.57 Btu/sq. ft. x h x deg F**] [**0.69 Btu/sq. ft. x h x deg F**] <Insert value> as determined in accordance with NFRC 100.

Entrance Doors: U-factor of not more than [**0.68 Btu/sq. ft. x h x deg F**] [**0.77 Btu/sq. ft. x h x deg F**] [**0.83 Btu/sq. ft. x h x deg F**] [**1.10 Btu/sq. ft. x h x deg F**] <Insert value> as determined in accordance with NFRC 100.

Solar Heat-Gain Coefficient (SHGC):

Retain "Fixed Glazing and Framing Areas" subparagraph below for sidelights and/or transoms.

Fixed Glazing and Framing Areas: SHGC for the system of not more than [**0.26**] [**0.35**] [**0.40**] [**0.45**] <**Insert value**> as determined in accordance with NFRC 200.

Entrance Doors: SHGC of not more than [**0.22**] [**0.25**] [**0.35**] [**0.40**] [**0.45**] <**Insert value**> as determined in accordance with NFRC 200.

Air Leakage:

Retain first option in first subparagraph below for maximum air-leakage rate based on ASHRAE/IES 90.1 requirements. Static-air-pressure differential of 1.57 lbf/sq. ft. in second option, equivalent to a 25-mph wind, is ASHRAE/IES 90.1 minimum which is adequate for many buildings. Air-pressure differential in third option is equivalent to a 50-mph wind and is recommended for buildings in which greater control of air quality or humidity is required.

Retain "Fixed Glazing and Framing Areas" subparagraph below for sidelights and/or transoms.

Fixed Glazing and Framing Areas: Air leakage for the system of not more than [**0.06 cfm/sq. ft.**] <**Insert value**> at a static-air-pressure differential of [**1.57 lbf/sq. ft.**] [**6.24 lbf/sq. ft.**] <**Insert value**> when tested in accordance with ASTM E283.

Below is the maximum air-leakage rate based on the ECCNYS and ASHRAE/IES 90.1 for glazed swinging entrance doors. Retain first subparagraph below if required.

Entrance Doors: Air leakage of not more than [**1.0 cfm/sq. ft.**] <**Insert value**> at a static-air-pressure differential of 1.57 lbf/sq. ft.

Condensation Resistance Factor (CRF):

Retain "Fixed Glazing and Framing Areas" subparagraph below for sidelights and/or transoms.

Fixed Glazing and Framing Areas: CRF for the system of not less than [**35**] [**55**] [**70**] <**Insert value**> as determined in accordance with AAMA 1503.

Entrance Doors: CRF of not less than [**57**] [**63**] [**68**] <**Insert value**> as determined in accordance with AAMA 1503.

* + - * 1. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.

Differential values in "Temperature Change" subparagraph below (for aluminum in particular) are suitable for most of the United States.

Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

* + - 1. BALANCED DOORS AND FRAMES
				1. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.

Edit to suit project.

Door Construction:

Retain first option for aluminum and steel balanced doors, retain second option for bronze balanced doors, and retain third and fourth options as required for all-glass balanced doors.

Thickness: [**2- inches**] [**2-3/4- inches] [4-1/2-inches][4-3/4-inches**].

Select “As indicated” for the next subparagraph if the drawings indicate door stile and rail measurements delete the next 3 subparagraphs. If drawings do not indicate the stile and rail measurements, retain the next 3 subparagraphs, and edit accordingly.

Door Design: [**As indicated**].

Retain 2-1/2-inch thickness as minimum for aluminum; 2-3/4 thickness as minimum for steel and bronze doors.

Stiles: **[2-1/2 -inches][2-3/4 -inches][3-inches**].

Retain 2-1/2-inch thickness as minimum for aluminum; 2-3/4 inch as minimum, 3-1/2 inch high or higher is preferred for steel and bronze door.

Top rail: [**2-1/2 -inches] [2-3/4 -inches][3-1/2 inch**].

Retain 6 inch minimum, 10 inch high bottom rail recommended to comply with ADA guidelines

Bottom rail: [**6- inches**][ **10- inches**].

Intermediate vertical and horizontal stainless steel muntins (for true divided light/multi-light construction):

Retain one of the next two subparagraphs. When using muntins made of “bar material” use at minimum 1/4 -inch for applied glass stops. When using muntins made of “sheet material” use at minimum 1-1/2 inch with applied glass stops or flush glazed.

Bar material: [\_\_\_\_\_] inches

Sheet material: [\_\_\_\_\_] inches

Glazing Stops:

Retain glazing stops that apply to the project.

Applied glass stops (glass molding shall be permanently fixed on exterior side and screw attached type on interior side).

Flush (pocket) glazed glass stops (with one removable bar stop at interior side of door at top or bottom rail).

Retain “Glazing” for tempered glass balanced doors. Select one of the next three subparagraphs.

Glazing:

1/2 inch standard clear tempered (monolithic) glass (for doors up to 9 feet high).

3/4 inch standard clear tempered (monolithic) glass (for doors 9 feet to 10 feet high).

As specified in Section 088100 “Glazing.”

Retain one of the next two paragraphs for “Door Finish.” First paragraph is for aluminum finishes and second paragraph is for stainless steel or bronze finishes. Bronze finishes may require lacquer, add “lacquer” with selected door finish if required.

Door Finish: **[Clear anodic finish] [Color anodic finish] [Baked-enamel or powder-coat finish] [High-performance organic finish] [Superior-performance organic finish].**

**Door Finish: [#4 Satin Finish][Polished][Non-Directional]<Insert Finish>.**

* + - * 1. Frames:

Retain “Glazing Stops” for sidelites and transoms.

Glazing stops:

Retain one of the next two subparagraphs.

Applied to framing.

Flush glazed formed into framing.

* + - 1. MATERIALS
				1. Extruded aluminum: alloy 6063-T6.
				2. Aluminum sheet: alloy 5005-H15 or H34 temper.

Type 304 stainless is standard and type 316 is optional (more corrosion resistant, recommended for salt air/corrosive environment) - consult manufacturer for ASSISTANCE. \*

* + - * 1. Stainless steel, 18-8, type 304.
				2. Stainless steel, 18-8, type 316.
				3. Bronze (muntz metal, alloy #280) or naval brass (alloy #464).
			1. HARDWARE
				1. Balanced hardware:

All balanced door hardware, including hydraulic check, shall be cast bronze and shall be cast, machined and assembled by the door and frame fabricator. Exposed hardware shall be finished as specified below.

Cast bronze mechanism and other integral parts must be heavy duty and must be designed to allow variation in adjustments to meet this particular job with respect to door size, door weight and varying or internal building pressures.

Balanced hardware shall consist of the following items:

Cast bronze hydraulic check shall be concealed in the head frame and have first and second speed adjustment. The hydraulic check unit must be removable without requiring the removal of the door, head frame or any other hardware. Closer arms are unacceptable.

Each door to have a heavy duty steel tube hinge shaft 1-3/4 inch diameter with 1/4 inch minimum wall thickness. Hinge shaft to be furnished complete with spring closing mechanism. The spring closer shall be adjustable at the floor to meet varying wind or building conditions. Top and bottom arms shall be one piece bronze castings, welded to hinge shaft. Two piece arms, aluminum arms, or steel painted arms will not be acceptable.

Hardware shall include a spring-cushioned door roller bumper located in the guide channel. The operating mechanism in the head shall include ball bearing pivots, cast bronze hydraulic check and cast bronze door guide channel with minimum dimensions of 2-3/8 inch by 3/4 inch thick and a minimum wall thickness of 9/16 inch.

Means shall be provided which make possible field adjustment for proper perimeter clearance of each door leaf in relation to its finished framework to accommodate on-site conditions.

All doors shall have a semi-automatic hold open device located in the bottom rail.

Doors designated as handicapped entrances shall have a maximum of 8 lbs. spring tension adjustment at pull handle. The clear opening shall be a minimum of 32 inches or greater (depending on local codes). The Ellison hydraulic check shall be adjusted so that from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.

Bronze hardware finish:

Select one of the following.

Cast white manganese bronze (nickel color), satin **[with] [without**] lacquer.

Cast white manganese bronze (nickel color), polished [**with] [without**] lacquer.

Cast bronze, satin **[with] [without**] lacquer.

Cast bronze, polished **[with] [without**] lacquer.

Cast bronze painted to match door and frame material.

Coordinate “Finish Hardware” with Section 087100 “Door Hardware.”

* + - * 1. Finish Hardware: by door manufacturer (except permanent master keyed lock cylinders).

Select one of the following. Consult with manufacturer for other styles of push-pull hardware.

Standard locking hardware:

Retain next subparagraph for tempered glass door.

Bottom rail deadlock.

Retain one of the next four subparagraphs for standard door types.

Deadlock (for single door).

Deadlock and flushbolts (for pair of doors).

Dead latch with lever handle or push paddle (for single door).

Deadlatch with lever handle or push paddle and flushbolts (for pair of doors).

Standard push-pull hardware to be 1 inch diameter straight profile with 12 inch centers, **[stainless steel] [bronze] [aluminum]** in finish as selected from manufacturers standards.

Note: Horizontal pull handles are not recommended due to the swing path of a balanced door with hinge side projecting inward and exterior face of door being in the close proximity to hinge jamb when door is fully opened – consult manufacturer for assistance.\*

Panic hardware to be furnished by the door supplier.

Select one of the following for tempered glass and verify door height limitations. Verify compliance with ADA guidelines/handicap codes

Top latching.

Bottom latching.

Select one of the following for standard type doors. For doors with UBC and Life Safety Code NFPA 101 code requirements touch pad type panic required on Balanced doors - consult manufacturer for assistance. Retain concealed vertical rod type for pair of doors, and rim type for single door.

Concealed vertical rod type.

Rim type.

Temporary cylinders with keys to be provided for mechanical locking hardware.

Permanent master keyed cylinders to be provided by others as specified in separate section.

For other types of mechanical locking or electronic locking hardware consult manufacturer for applicable devices and compatibility with specific type of door construction.

* + - * 1. Thresholds:

Provide at all doors unless otherwise detailed.

Provide woodscrew and rawl plug type fastenings approximately 15 inches on center.

Thresholds shall be set on the finished floor and adequately caulked against water seepage.

Profile:

Select one of the following.

Thresholds shall be 1/2 inch high x 6 inch wide saddle type.

Thresholds shall be width and configuration as indicated on drawings.

Material:

Select one of the following.

Extruded aluminum.

Extruded bronze.

Extruded nickel silver.

Formed **[stainless steel] [bronze**].

Cast bronze.

Cast white bronze (tombasil).

* + - * 1. Weatherstrip:

Shall be manufacturer’s standard polypropylene pile.

Shall occur:

Retain the next two subparagraphs for tempered glass doors.

Concealed at door top and bottom rails.

At both sides of exposed hinge shaft if used.

Retain the next four subparagraphs for standard type doors.

Vertically at meeting stiles on pairs of doors.

Concealed at door top and bottom rails.

At door stops at both hinge and strike jambs.

At both sides of exposed hinge shaft if used.

* + - 1. FABRICATION
				1. Doors:

Retain the next five subparagraphs for steel and bronze door.

Door bodies shall be formed from a minimum of .09 inch thick material.

Formed doors shall have .09 inch thick continuous tie channel frame spot-welded into door body.

Seams between stiles and rails shall be welded and finished to an invisible joint.

Door top and bottom rails shall have spot-welded in .09 inch thick reinforcement channels.

All reinforcing material to be stainless steel and welded to door body. Aluminum, plastic or other glued-in reinforcements or stiffeners are unacceptable.

Retain the next three subparagraphs for aluminum door.

Door bodies shall be formed of a minimum thickness of 0.125mm thick.

Extruded aluminum doors shall be bolted and welded construction for maximum strength.

Glass moldings shall be permanently fixed on exterior side and snap-on type on interior side with vinyl glazing bead.

* + - * 1. Frames:

Retain the next subparagraph for steel and bronze frames.

Frames for door jambs and header (sidelights and transom material where applicable) shall be formed from a minimum of 0.09 inch thick material.

Frames shall be erected without the use of exposed screws where feasible.

Hinge shaft configuration:

Retain one of the next two subparagraphs.

Concealed with portion of hinge jamb to be removable for access to operating hardware.

Exposed with hinge shaft clad in stainless steel (in matching finish to door and/or frame).

* + - 1. Shop inspection
				1. Prior to leaving factory, balanced doors and immediate framing shall be assembled and hung. At this time, adjustment shall be made to provide proper perimeter clearance between door and frame and coordination between door, frame and finish hardware shall be tested.
1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, supports and conditions under which this work is to be performed and notify Director’s Representative, in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.
				2. The floor material shall be solid (not susceptible to either deterioration or heaving), smooth and level and the adjacent work in its proper place prior to the installation of the door and frame system.
				3. Coordination dimensions, tolerances, and method of attachment with other work.
				4. Verify electric power is available and of correct characteristics, if required.
			2. INSTALLATION/ERECTION
				1. Install materials by factory-trained personnel in accordance with installation data provided by manufacturer.
				2. Provide attachments and shims required to fasten system to building structure.
				3. Install entrances plumb, level, square in alignment and true plane.
				4. Install glass in accordance with manufacturer’s instructions.
				5. Install perimeter type sealant, backing materials to installation requirements.
			3. ADJUSTING AND CLEANING
				1. Fit, align, and adjust door assembly.
				2. Adjust door installation and hardware so that doors open and close smoothly.
				3. Adjust speed to comply with applicable codes.
				4. Remove protective materials from finished metal surfaces.
				5. Clean exposed surfaces using materials and methods recommended by manufacturer, exercising care to avoid damage to coatings.
				6. Touch-up damaged coatings and finishes.
			4. PROTECTION
				1. Protect the balanced door entrances for the remainder of the construction period to ensure that the balanced door units will be without damage or deterioration, other than normal weathering, at the time of Substantial Completion.

END OF SECTION 084236