SECTION 08 7100

door hardware

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LANL MASTER SPECIFICATION SECTION

Word file at <https://engstandards.lanl.gov>

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| Rev. 6 Summary of ChangesMinor changes including sustainable design references. |

Sustainable design:  This Section includes reference to SD that only applies to certain larger projects (e.g., Total Estimated Cost > $5 million) and other projects having SD goals (ref. ESM Ch. 14).  Delete if not applicable.

This template must be edited for each project.  In doing so, specifier must add job-specific requirements.  Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.  Once the choice is made or text supplied, remove the brackets.  Template must also be edited to delete requirements for processes, items, or designs that are not included in the project, add requirements not included herein as well as delete specifier’s notes such as these.  Additional tailoring requirements are contained in ESM [Chapter 1](http://engstandards.lanl.gov/ESM_Chapters.shtml#esm1) Section Z10 Att. F, *Specifications*.

To seek a variance from requirements that are applicable, contact the Engineering Standards Architectural [POC](http://engstandards.lanl.gov/POCs.shtml#arch). Please contact POC with suggestions for improvement as well.

When assembling a specification package, include applicable sections from all Divisions, especially Division 1, General requirements.

Section developed for ML-4 projects.  For ML-1, 2, and 3 applications, additional requirements and independent reviews should be added if increased confidence in procurement or execution is desired; see ESM Chapter 1 Section Z10 Specifications and Quality sections.
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1. GENERAL
	1. SECTION INCLUDES
		1. Hardware for [wood] [hollow steel] [aluminum] [ ] doors.
		2. Thresholds
		3. Gaskets and Edge Seals
	2. lanl furnished and installed equipment
		1. Permanent lock cylinder cores and keying.
	3. RELATED SECTIONS
		1. Section [01 8113.13] [LEED v4 and]Guiding Principles 2020: Requirements for energy efficiency, material composition, and indoor air quality requirements
		2. [Section 08 1100, *Metal Doors and Frames*, for silencers integral with hollow metal frames, for door and frame reinforcements for surface-mounted hardware and for factory pre-fitting, factory pre-machining of doors for door hardware, and door reinforcements for surface-mounted hardware.]
		3. [Section 08 1213, *Hollow Metal Frames*, for silencers integral with hollow metal frames and for door and frame reinforcements for surface-mounted hardware.]
		4. [Section 08 1400, *Wood Doors*, for factory pre-fitting, factory pre-machining of doors for door hardware, and door reinforcements for surface-mounted hardware.]
		5. [Section 28 4600, *Fire Detection and Alarm* [28 3110, *Fire Detection and Alarm* (additions to existing)], Electrical connection to activate door closers.]
		6. [Section 28 1321, *Administrative Access Control System Rough-in*, Electrical connection to activate door locks.]
	4. references

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* + 1. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA).
			- 1. ANSI/BHMA A156.1 Butts and Hinges
				2. ANSI/BHMA A156.2 Bored and Preassembled Locks and Latches
				3. ANSI/BHMA A156.3 Exit Devices
				4. ANSI/BHMA A156.4 Door Controls - Closers
				5. ANSI/BHMA A156.5 Cylinders and Input Devices for Locks
				6. ANSI/BHMA A156.6 Architectural Door Trim
				7. ANSI/BHMA A156.7 Template Hinge Dimensions
				8. [ANSI/BHMA A156.8 Door Controls - Overhead stops and Holders]
				9. [ANSI/BHMA A156.12 Interconnected Locks and Latches]
				10. ANSI/BHMA A156.13 Mortise Locks
				11. [ANSI/BHMA A156.15 Release Devices – Closer Holder]
				12. ANSI/BHMA A156.16 Auxiliary Hardware
				13. ANSI/BHMA A156.18 Materials and Finishes
				14. ANSI/BHMA A156.19 Power Assist and Low Energy Power

 Operated Doors

* + - * 1. ANSI/BHMA A156.21 Thresholds
				2. ANSI/BHMA A156.22 Door Gasketing and Edge Seal Systems
				3. [ANSI/BHMA A156.23 Electromagnetic Locks]
				4. ANSI/BHMA A156.31 Electric Strikes and Frame Mounted Actuators
				5. ANSI/BHMA A156.115 Hardware Preparation In Steel Doors or Steel Frames
				6. ANSI/BHMA A156.115W Hardware Preparation In Wood Doors With Wood Or Steel Frames
		1. ASTM International
			- 1. ASTM E 90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
				2. ASTM E 413 – Classification for Rating Sound Insulation.
		2. Door and Hardware Institute (DHI)
			- 1. DHI Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.
				2. DHI Recommended Locations for Architectural Hardware for Flush Wood Doors.
		3. Federal Specification
			1. [FF-L-2890](https://www.navfac.navy.mil/navfac_worldwide/specialty_centers/exwc/products_and_services/capital_improvements/dod_lock/SecurityHardware/CombinationLocks/ProductInformation/DeadboltDevice.html) (rev. C or latest) - Lock Extension (Pedestrian Door, Deadbolt)
		4. National Fire Protection Association (NFPA)
			- 1. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
				2. NFPA 101 - Life Safety Code.
				3. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives.
				4. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
		5. Underwriters Laboratories (UL)
			- 1. UL 10B – Standard for Fire Tests of Door Assemblies.
				2. UL 10C - Standard for positive pressure fire tests of door assemblies.
				3. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems.
				4. UL 1784 - Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives.

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Edit submittals to include only those absolutely necessary to assure requirements and features that are important for the specific project will be met.

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* 1. Action SUBMITTALS
		1. [Catalog data for each item of hardware. Include whatever information may be necessary to show compliance with the specified requirements, and include instructions for installation and for maintenance of operating parts and finish.]
		2. [Materials list in the form of a final hardware schedule in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.]
		3. [Final Hardware Schedule: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
			+ 1. Type, style, function, size and finish of each hardware item.
				2. Name and manufacturer of each item.
				3. Fastenings and other pertinent information.
				4. Location of hardware set cross-referenced to indications on Drawings.
				5. Explanation of all abbreviations, symbols, codes, etc. contained in schedule.
				6. Mounting locations for hardware.
				7. Keying information.]
				8. [Submittal Sequence: Submit hardware schedule at earliest possible date, particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames). Include with hardware schedule, the project data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.]
	2. CLOSEOUT SUBMITTALS
1. Provide 5-year warranty on materials and installation workmanship on door hardware specified under this Section. Repair or replace all failed items.
2. Provide manufacturer’s standard materials and workmanship warranty for electromechanical door operators.
3. Furnish a complete set of specialized tools and maintenance instructions as needed for LANL's continued adjustment, maintenance, removal and replacement of finish hardware.
	1. coordination
		1. Supply templates to manufacturers for door and frame preparation.
	2. QUALITY ASSURANCE
		1. Regulatory Requirements: Comply with provisions contained in the above referenced nationally-accepted Codes and Standards, unless otherwise specified herein.
		2. Single Source Responsibility: Obtain each type of hardware (locksets, hinges, closers, etc.) from a single manufacturer specializing in the manufacture of that hardware type
		3. Supplier Qualifications: Obtain hardware from a recognized architectural hardware supplier that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project.
		4. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and NFPA 101 requirements. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, or FM Global, for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and frame labels.
	3. product handling
		1. Tag or package each item separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.
		2. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable, so that completion of the Work will not be delayed by hardware losses, both before and after installation.
4. PRODUCTS
	1. general
		1. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are to be indicated in the Final Hardware Schedule. Products listed herein are identified by ANSI/BHMA A156 Series hardware designation numbers. Hardware is to be located in accordance with DHI.
	2. materials and fabrication
5. Drawings show direction of swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
6. Do not use manufacturer's products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required UL labels and approved by LANL.
7. Produce hardware units of basic metal and forming method indicated, using the manufacturer's standard metal alloy, composition, temper and hardness. Construction of hardware units must conform to applicable ANSI A156 series standards for each type hardware item and finish designation indicated. Do not furnish "optional" materials or forming methods, unless specified otherwise.
8. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws.
9. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws unless otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish, or if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
10. Provide concealed fasteners for hardware units that are exposed when door is closed, unless no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex bolt fasteners.
	1. hinges and butts
		1. Conform to ANSI/BHMA A156.1 and ANSI/BHMA A156.7.
		2. Templates: Provide only template-produced units, except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames.
		3. Provide butts of five knuckle; ball bearing type.
		4. Screws: Use Phillips flat-head or machine screws for installation of units, except use Phillips flat-head or wood screws for installation of units into wood. Finish of screw heads shall match surface of hinges or pivots.
		5. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
			* 1. Steel Hinges: Steel pins.
				2. Non-ferrous Hinges: Stainless steel pins.
				3. All Doors: Non-removable pins.
				4. Tips: Flat button and matching plug, finished to match leaves.
				5. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges per door leaf for doors 90 inches or less in height and one additional hinge for each 30 inches of additional height or fraction thereof.
	2. LOCK CORES AND KEYING
		1. Conform to ANSI/BHMA A156.5.
		2. Manufacturer: Best Access Systems, subsidiary of Stanley. Alternate Manufacturers or products will not be accepted.
		3. Cores: Provide Best 7-pin interchangeable core inserts for each type of lockset/exit device indicated.
		4. Keying: Furnish lockset cylinders with cores for use during construction. Provide keys as required to control access during the construction period. Prior to final transfer, provide 2 control keys to LANL for use when installing permanent lockset cores. Permanent cores and keying will be furnished and installed by LANL.
	3. LOCKS, LATCHES AND BOLTS
		1. Mechanical Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.
			* 1. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.
				2. Provide roller type strikes where recommended by manufacturer of the latch and lock units.
		2. Electric Strikes:
			* 1. Comply with ANSI/BHMA A156.31, BHMA Std. 501, Grade 1 requirements and UL 1034, Burglary-Resistant Electric Locking Mechanisms. [At fire-rated openings provide UL listed Fire Door Accessory, category 10B, for use with 3 hour “A” labeled doors.]
				2. Acceptable Manufacturers:
			1. Adams Rite Manufacturing Company
			2. Folger Adam Security Inc.
			3. Hanchett Entry Systems, Inc.
			4. Von Duprin.
				1. Provide Electric strikes that are compatible with types and models of locksets or exit devices being installed.
				2. Provide solenoid actuated, heavy-duty, tamper-resistant electric strikes constructed of corrosion-resistant metals, with stainless steel cases and springs.
				3. Electric strikes shall be non-handed, field-reversible, and horizontally adjustable to compensate for door/frame misalignment.
				4. Electric strike function shall be [Fail-Secure (unlocked when energized)] [Fail-Safe (locked when energized)], with [12] [24] VDC solenoid operating voltage. [NOTE: At fire-rated openings, specify only FAIL-SECURE strikes.]
				5. Electric strikes shall accommodate internal switches for remote monitoring and control as required.
				6. Provide electric strikes with compatible transformers and rectifiers as required to complete the system for voltages specified. Electrical accessories shall be provided by the strike manufacturer.
				7. Finish: Hardware finish code number 630, satin stainless steel, per ANSI/BHMA A156.18.
		3. Lock Throw: Provide 5/8-inch minimum throw of latch and deadbolt used on pairs of doors. [Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.]
		4. Flush Bolt: Provide minimum 1/2 inch diameter rods of brass, bronze or stainless steel, with minimum 12 inch long rod for doors up to 7 feet in height. Provide longer rods as necessary for doors exceeding 7 feet in height.
		5. Mortise Type Locks and Latches:
			1. Conform to ANSI A156.13, Series 1000, Operational Grade 1, Security Grade 2, and be UL listed for use on 3-Hour A label doors.
			2. Manufacturer: Best Access Systems, subsidiary of Stanley. Alternate Manufacturers or products will not be accepted.
			3. Provide 47H Series, heavy-duty mortise locksets with levers and trim items as specified. Provide lockset with type Best cylinder housing that accepts interchangeable 7-pin core as specified in Section 2.4
			4. Levers: Provide [Style 3, solid tube with return levers]. Provide levers at entrances into hazardous areas (i.e. electrical rooms) with a tactile (TL style) finish.
			5. Trim: Provide Style [H, 2-9/16” diameter flat rose] [J, wrought escutcheon plate] to match mortise lockset configuration.
			6. Finish: Hardware finish code number [625, bright chromium plated], per ANSI/BHMA A156.18.
			7. Provide mortise locksets that fit ANSI/BHMA A156.115 and/or A156.115W door preparation.
		6. Cylindrical Type Locksets:
			1. Conform to ANSI/BHMA A156.2, Series 4000, Grade 1, and provide UL listing for use on 3-Hour A label single swinging doors.
			2. Manufacturer: Best Access Systems, subsidiary of Stanley. Alternate Manufacturers or products will not be accepted.
			3. Provide 9K Series, extra heavy-duty cylindrical locksets with levers and trim Items as specified. Provide lockset with interchangeable 7-pin core as specified in Section 2.4.
			4. Levers: Provide [Style 14] [Style 15] [ ] return levers. Provide levers at entrances to hazardous areas (i.e. electrical rooms) with a tactile (TL style) finish.
			5. Trim: Provide Style D, 3-1/2” convex rose to match lever.
			6. Finish: Hardware finish code number [625, bright chromium plated], per ANSI/BHMA A156.18.
			7. Provide cylindrical locksets that fit ANSI/BHMA A156.115 and/or A156.115W door preparation as modified to meet additional manufacturer recommendations.

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Vault Type Room (VTR) doors require special applications of lockset hardware. Edit G. below according to type of door(s) — in-swinging, out-swinging, single leaf or double leaf, exit device or lever, and with access controls (badge reader which is typical of all VTR entries). Confirm selections with LANL Lock Shop. (Note, for self-perform by LANL, lock shop personnel perform installation).

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* + 1. [VTR Door Locksets:
			1. Conform to Fed Spec FF-L-2890C, Type [II, PDPL (Lever with access control badge reader)] [IV, PDLAP (Exit device on inside, lever outside, with access control badge reader)] and Kaba Mas X-10 combination lock.
			2. Manufacturer: Sargent & Greenleaf, Model 2890C or approved equal.
			3. Strikes: [#2 for out-swing door.] [#3 for in-swing door.] [#4 for double doors.]]
	1. Exit devices
		1. Conform to ANSI/BHMA A156.3, Grade l. [Exit devices at fire-rated openings shall comply with the requirements of NFPA 80 and NFPA 101.]
		2. Acceptable Manufacturers:
			1. Von Duprin
			2. Sargent
			3. Corbin Russwin
			4. Dorma Architectural Hardware.
		3. [Flush and Wide Stile Doors
			1. Provide Series [Von Duprin 98] [Von Duprin 99] touchbar type [exit rated] [fire rated], [rim] [surface vertical rod] [concealed vertical rod] exit devices.]
		4. [Narrow Stile Doors]
			1. Provide Series [Von Duprin 33A] [Von Duprin 35A] touchbar type [exit rated] [fire rated], [rim] [surface vertical rod] [concealed vertical rod] exit devices.]
		5. Where closers are installed on doors equipped with exit devices, provide exit devices with keyed dogging to hold push bar down and latch bolt in the retracted position. Provide devices with field convertible hex key dogging to high security cylinder dog operation.
		6. Provide non-handed exit devices and capable of direct field conversion for all available trim functions.
		7. Provide exit devices with hydraulic sound dampers.
		8. All working parts to be made of stamped steel.
		9. Latch bolts to be self-lubricating to reduce friction and wear.
		10. All rim and vertical rod exit devices to be capable of electric trim activation. Provide Manufacturer’s available accessory products, including power supplies, monitoring switches and controls to complete the system. All components to be UL listed.
		11. Trim: Provide exit device trim to accept 7 pin interchangeable cores as specified in Article 2.4.
		12. Finish: Hardware finish code number [625, bright chromium plated] [626, satin chromium plated], per ANSI/BHMA A156.18.
	2. OPERATORS, CLOSERS, AND DOOR CONTROL DEVICES
		1. Powered Door Operators

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NOTE: When specifying powered door operators, the design requirements are to be coordinated to ensure operator, card readers, actuators, and electric strike functionality.

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* + - 1. Comply with requirements of ANSI A156.19 and the ADA. Provide UL listed operators per UL 325 for self-closing doors [and for use at fire-rated openings.]
			2. Acceptable Manufacturers:
1. LCN Closers, an Ingersoll-Rand Business
2. Dorma Architectural Hardware
3. Stanley
	* + 1. Operators to be surface mount low energy electromechanical units complete with controls and actuators.
			2. Operator opening force, time delay, and the opening, closing and back check speeds are to be individually adjustable.
			3. Operators to include a vestibule function for sequencing operation of two units.
			4. Operators to have on/off strike switch to delay operation while locking device releases.
			5. Provide operators with a Push & Go feature to activate low energy or power assist with the door.
			6. Provide operator with a safety feature that reverses the direction of door travel if it contacts an object during either opening or closing.
			7. Provide operators with a power boost feature to increase latching force to ensure secure latching in severe wind or stack conditions.
			8. Operator power supply to provide [12VDC] [24 VDC] outputs to power card readers, electric locking devices, and other peripherals.
			9. Actuators to be hardwired [12VDC] [24VDC] round [4-1/2 inch] [6 inch] diameter stainless steel touch plates with engraved blue-filled handicapped symbol. Actuators to be installed in manufacturer’s standard flush or surface mounting boxes to be located on a vertical surface or free-standing post near the controlled door.
			10. Finish: Manufacturer’s standard painted or dark bronze anodized aluminum.
		1. Door Closers
			1. Conform to ANSI/BHMA A156.4, [Type C02011, hinge-side mounting, for interior and exterior in-swinging doors] [Type CO2021, parallel arm mounting, for exterior and corridor out-swinging doors]. Closers to be surface type with modern [full] [slim line] covers.
			2. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit depending upon size of door, exposure to weather and anticipated frequency of use. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.
			3. Access-free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units for door opening force and delayed action closing.
			4. Closer Finish: Select manufacturers’ standard powder-coated or painted finish to match other hardware installed at opening.
		2. Door Stops
			1. Conform to ANSI/BHMA A156.16. Stops shall be ANSI/BHMA L42101, L42251, L12141 or L12161, as applicable. Provide gray resilient parts for exposed bumpers.
	1. DOOR TRIM UNITS
		1. Fasteners: Provide manufacturer's standard exposed fasteners, either machine screws or self-tapping screws, for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units).
		2. Fabricate edge trim items of anodized aluminum in length of not more than 1/2 inch nor less than 1/16 inch smaller than door dimension.
		3. Fabricate kickplates not more than 1-1/2 inches less than door width and 12 inches high. Kickplates shall conform to ANSI/BHMA A156.6, Type J102. Plates shall be a minimum of 0.050 inch thick stainless steel with ANSI/BHMA A156.18 code 630 finish.
	2. DOOR SEALS AND GASKETS
		1. Manufacturers:
			1. National Guard Products, Inc.
			2. Assa Abloy / Pemko
		2. Provide self-adhesive [intumescent] [neoprene] [silicone] products complying with ANSI/BHMA A156.22. Provide [seals] [gaskets] for [20] [45] [60] [90] minute rated door perimeter.
		3. Fire Gasketing
			1. [Hollow Metal fire doors rated up to 3 hours/Wood fire doors rated up to 1-1/2 hours.
4. UL 10B Classified, complying with NFPA 252.]
	* + 1. [IBC Positive Pressure Hollow Metal fire doors rated up to 3 Hours/Wood fire doors rated up to 1-1/2 Hours.
5. UL 10C Classified, complying with IBC Positive Pressure requirements.
6. Category “J” listed.]
	* 1. Smoke Gasketing
			1. [Edge Sealing System
7. Required for Category “B” listed Wood fire doors to meet IBC Positive Pressure requirements.
8. Category “G” listed.]
	* + 1. [Smoke and Draft Control Gasketing
9. For use on all “S” labeled IBC Positive Pressure doors.
10. Category “H” listed.
11. Comply with UL 1784, NFPA 105 and IBC Positive Pressure requirements.]
	* + 1. [Combination Edge Sealing System and Smoke Draft Control Gasketing
12. Required for Category “B” Listed Wood fire doors to meet Positive Pressure and “S” Label requirements.
13. Category “G” and “H” Listed.
14. Acoustical Gasketing.
15. [Can be used on Positive Pressure assemblies].
16. Category “J” listed.
17. Tested to ASTM E 90 and ASTM E 413.
18. Automatic Door Bottoms and Thresholds.]
	* + 1. Smoke Assembly: [Any UL10C classified threshold, automatic door bottom, door sweep or door shoe may be installed (although not required) on an “S” label door without affecting the label.]
			2. Acoustical Assembly: Provide automatic door bottoms and compatible thresholds as tested to ASTM E 90 and ASTM E 413.
	1. WEATHERSTRIPPING
		1. General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf. Provide non-corrosive fasteners as recommended by manufacturer for application indicated. Provide weatherstripping with manufacturer’s standard clear or bronze anodized finish.
		2. Replaceable Seal Strips: Provide only units for which resilient seal is easily replaceable and readily available from stocks maintained by manufacturer.
	2. THRESHOLDS
		1. General: Comply with ANSI/BMHA A156.21. Except as otherwise indicated, provide standard metal threshold unit of type, size and profile as scheduled. Finish: manufacturer’s standard [mill finish aluminum] [stainless steel].
	3. HARDWARE FINISHES
		1. Provide matching finishes for hardware units at each door or opening, except as otherwise specified. Reduce differences in color and textures as much as commercially possible where base metal or metal forming process is different for individual units of hardware at the same opening.
		2. Provide finishes which match those established by ANSI/BHMA A156.18.
		3. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.
19. eXECUTION
	1. inspection
		1. Verify that doors and frames are ready to receive hardware and that dimensions are as [indicated on shop drawings.], [instructed by the manufacturer.]
		2. Verify that power supply is available to power operated devices.
	2. INSTALLATION
		1. Installation of electric door strikes and VTR locksets and exit devices will be done by LANL using certified locksmiths.
	3. ADJUSTING
		1. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
		2. Door Closers: Adjust sweep period and delay period, backcheck and latch speed, to comply with accessibility and functional requirements.
		3. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
	4. CLEANING AND PROTECTION
		1. Clean adjacent surfaces soiled by door hardware installation.
		2. Clean operating items as necessary to restore proper function and finish.
		3. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.
	5. HARDWARE SCHEDULE

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The following is an example of an acceptable hardware schedule depicting the minimum amount of information required to be provided (double leaf doors are used for this example). Other formats providing the same information are acceptable.

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| SET # | APPLIES TO | QTY | MFTR | DESCRIPTION | MODEL | FINISH |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | Double leaf doors #001, 002 & 006 | 1 1/2 Pair | Stanley Commercial | Butt Hinge(active leaf) | FB199 | 651 |
| 1 1/2 Pair | Stanley Commercial | Concealed Electric Butt Hinge (inactive leaf) | CECB199-18 | 651 |
| 1 Ea | Sargent | Rim Exit Device w/ night latch trim (active leaf) | 8800 | 629 |
| 1 Ea | Hanchett Entry Systems | Electric Strike | 9600 | 629 |
| 1 Ea | Hager | Flush Bolts w/ Dustproof Strike (inactive leaf) | 282D & 280X | 651 |
| 1 Ea | Best (GFE) | Key Core | 1C7G1 | - |
| 1 Ea | Norton | Closer | 8501M | - |
| 2 Ea | Battalion | Kickplate | 5U656 | 630 |
| 1 Set | NGP, Inc | Astragal | 149MA | - |
| 1 Ea | - | Threshold – FB SST ¼” X 7” w/ beveled edges | - | 630 |
| 1 Set | NGP, Inc | Gasket | 170NA | - |
| 1 Ea | NGP, Inc | Door Bottom | 95WH | - |

END OF SECTION

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Do not delete the following reference information:

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

THE FOLLOWING STATEMENT IS FOR LANL USE ONLY

This project specification section is based on LANL Master Specification Section 08 7100, Rev. 6, dated August 4, 2022.