



# G13-01 Secure Storage Rooms (SSR)

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## Physical Security Guide Lead Agency Publication G13-01

**This Guide replaces all previous versions of G1-029**

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## Definitions

**Authority Having Jurisdiction** - Normally the local city, municipality or county building inspector. For Canadian Forces Bases the Authority Having Jurisdiction will be the Canadian Forces Fire Marshall.

**Attack Side** - The side of the door or wall that is exposed to the adversary.

**Base-line Threat** - Threat(s) that are common to government departments in Canada under normal security conditions, as specified in the *Operational Security Standard on Physical Security*.

**Day Door** - A door to a secure room or vault with a primary lock which when unlocked in the morning by the person responsible is still secured by a secondary lock (usually electronic access control) which can be opened (until the primary lock is re-locked) by authorized assistants.

**Design-Basis Threat (DBT)** - The threat(s) which the specific protection measure (equipment, procedure or policy) is designed to mitigate. Unless specified otherwise, RCMP protective designs and guides are meant to mitigate a DBT based upon the Base-line Threat.

**Compromise** - The unauthorized access to, disclosure, destruction, removal, modification, use or interruption of assets or information.

**Hinge Pair** - Industry practice is to specify hinges by pairs. For example, doors with 3 hinges are specified as "1½ pair".

**Maximum Security Pin** - A hinge pin that has been fixed after insertion by welding, pinning, or other permanent means to prevent hinge pin removal without the use of special tools. Set screws are not permitted. Affords greater security than a Non-Removable Pin. (ref.: ANSI 156.1 (2006)).

**Non-Removable Pin** - A hinge pin secured by a set screw or other equivalent means (ref.: ANSI 156.1 (2006)).

**Open Shelf Storage** - Storage other than in approved security containers and safes. Open shelf storage includes storage where records are kept in containers or commercial fire and/or water resistant containers.

**Safety Stud** - A projecting member on one surface of a full mortise leaf that engages a hole in the opposite leaf when the door is closed. (ref.: ANSI 156.1 (2006))

**Security Container** - A totally enclosed container or specially designed room functioning as a storage container (e.g.: Secure Storage Room).

**Secure Room (SR)** - Term used to denote a room constructed to specifications of the RCMP Guide G1-029. Although not an RCMP-endorsed practice, these rooms were commonly constructed to create security zones, secure working rooms (or suites), as well as for secure storage (the original intended application).

**Secure Storage Room (SSR)** - The formal term and abbreviation used to identify a room which is designed to the specifications of the RCMP Guide G13-01.

*Note: The term "Secure Storage Room" does not automatically replace the term "Secure Room" (level 1 or 2). Existing Secure Rooms should only be referred to as Secure Storage Rooms (SSRs) if they are actually being used in a manner consistent with this guide.*

**Threat and Risk Assessment (TRA)** - A consideration of the assets and the threats to those assets in consideration of the sum of the security measures in place or anticipated. The RCMP and CSEC have jointly developed and promote the use of a formal procedure, checklists, valuation tables and associated training for conducting a TRA in the Federal Government called the Harmonized Threat and Risk Assessment (HTRA).

**Vibration Detector** - A system of one or more sensors to detect vibrations created by impact and powered cutting tools. Approved systems have a sensitivity / detection algorithm to ensure that ambient and incidental noises or vibrations due to normal activity will not initiate false alarms.

**Zones** - Defined in Reference B.

## Abbreviations

**AHJ** - Authority Having Jurisdiction

**CCVE** - Closed Circuit Video Equipment

**Ga** - Sheet metal gauge indicating the standard thickness of the sheet metal

**IDS** - Intrusion Detection System

**SEG** - Security Equipment Guide

**SCIF** - Secure Compartmented Information Facility

**SR** - Secure Room (+ suffix indicating Secure Room "Type" as per earlier versions of G1-029)

**SOR** - Statement of Requirements

**SSR** - Secure Storage Room

**TRA** - Threat and Risk Assessment

**OD** - Outside diameter

**oc** - On centre

**Ø** - Bar diameter

## References

- A. [Policy on Government Security](#)
- B. [Operational Security Standard on Physical Security](#)
- C. [G1-001 RCMP Security Equipment Guide \(SEG\)](#)
- D. [HRSDC Fire Commissioner: Standard for Records Storage](#)
- E. [HRSDC Fire Commissioner Technical Interpretation: Door and Door Release Hardware with One Release Operation](#)
- F. [Lock-Up Requirements for Protected A and Protected B Information \(published under the "Storage" section of the RCMP Security Equipment Guide\)](#)

## Referenced Commercial Standards

These standards are available for purchase from their respective standards associations, or from standards vendors such as [IHS Standards](#), [the ANSI Store](#) or [Techstreet](#)

**ANSI/ BHMA A156.4: Door Controls-Closers**  
[American National Standards Institute](#)

**ANSI/BHMA A156.1:** *Butts and Hinges*

[American National Standards Institute](#) / Builders Hardware Manufacturers Association

**ASTM A627-03:** *Standard Test Methods for Tool-Resisting Steel Bars, Flats, and Shapes for Detention and Correctional facilities*

[American Society for Testing and Materials](#)

**ASTM F1267-07:** *Standard Specification for Metal Expanded Steel*

[American Society for Testing and Materials](#)

**CAN/CGSB-1.60:** *Interior Alkyd Gloss Enamel Paint*

[Canadian General Standards Board](#)

**CSDMA 08 11 13:** *Recommended Specification for Commercial Steel Door and Frame Products*

[Canadian Steel Door Manufacturer's Association](#)

**EMMA 557-99:** *Standard for Expanded Metal, Introduction, Product Selection Considerations, Terminology, Manufacturing Process, Manufacturing Tolerances and Applications.*

[Expanded Metal Manufacturers Association](#)

**HMMA 840-07:** *Guide Specification for Installation and Storage of Hollow Metal Door and Frame*

[Hollow Metal Manufacturers Association](#)

**HHMA 810-09 (NAAMM Standard):** *Hollow Metal Doors*

[Hollow Metal Manufacturers Association](#)

**SSMA:** *Product Specifications*

[Steel Stud Manufacturers Association](#)

## **PART I (For use by the Department or Agency)**

Advances in portable tool technology have changed the nature of *overt force* and *skilled force* attacks. In addition, large-capacity memory devices can now store significant amounts of information and the threat to personal information has greatly increased due to identity theft.

**In light of these technological and threat evolutions, it is recommended that a TRA be conducted on all existing Secure Rooms (or similar spaces constructed using previous G1-029 version specifications) to determine if modifications are warranted.**

### **Significant Changes introduced with the G13-01:**

- There is an emphasis on the Secure Storage Room (SSR) as a special type of approved security container (essentially an alternative to using numerous approved security containers) and on its application consistent with that design premise. The name has been changed from Secure Room (SR) to Secure Storage Room (SSR) to further emphasize the design intent.
- In the past, Secure Room levels (1 or 2) were determined essentially by the choice of metal used in the walls. This guide now permits the selection of one or the other based on cost, availability and construction preference.
- Windows and false ceilings are not part of the Secure Storage Room design and are highly discouraged. When they must be used, compensatory measures will be required. The RCMP can provide guidance on a case-by-case basis.
- There is a new emphasis on the early detection of forced entry.

- This guide attempts to optimize the use of commercial-off-the-shelf (COTS) material and components. Widely accepted commercial standards are referenced whenever practical.

## How to Use This Guide

**This Guide (particularly Part 1) is intended for use by qualified security practitioners and departmental security staff to select appropriate Secure Storage Room features and Intrusion Detection System (IDS) components and develop a Statement of Requirements (SOR) to guide the designer responsible for its design and construction.**

### Process

Once the SOR is established, appropriately cleared architects, engineers or qualified builders/ designers should be engaged to develop detailed drawings and specifications. These should incorporate the features and components specified in the SOR and ensure the design conforms to overall project requirements (where part of a larger project) and all applicable codes and facility "fit-up" standards. IDS design and installation should ideally be done by departmental security personnel. Departments without alarm and intrusion system sections should engage an independent (without ties to vendors or installers) consultant to assist with developing the IDS architecture and help manage the contract and procurement process. They can also be helpful with developing commissioning criteria.

The rationale for any component or feature selection (as well as the nature of the asset and the design-basis threat) should only be divulged to the architect, designer and contractor on a need-to-know basis and only if they have the appropriate security clearance. Consideration should be given to classifying the rationale and key security features.

*Note:* The fact that a SSR may store classified information does not in itself imply the SSR construction details should have the same classification. It does imply the construction details (as well as purpose and name of the SSR) should be adequately protected.

Segregation of details and distribution on a need-to-know basis will often be sufficient. The architect or designer should be provided with formal guidance / direction on the preparation of drawings for tender or sub-trades to ensure that sensitive information is not inappropriately divulged. For example, the purpose or name of the room should not appear on widely disseminated drawings, specifications or other contract documents. A generic or numeric name should be used. Sub-trades should receive only enough information to perform their work (eg: partial building drawings and system schematics which do not identify adjacent activities or security-related system details). Security requirements should be incorporated into contract documents where feasible to ensure enforceability.

### Purpose of the Secure Storage Room

A Secure Storage Room is intended to function as an approved storage container for *open-shelf storage* of a large amount of classified or highly sensitive non-national (Protected) information or assets. A Secure Storage Room is essentially a "security container" and subject to the same zoning requirements.

**Unless all mandatory technical and application specifications in this Guide are met, the room does not qualify as an approved Secure Storage Room (SSR) and should not be referred to as an SSR.**

### Fire Protection

Fire requirements (legislation) ALWAYS supersede security requirements (policy) so good planning and early consultation with the local AHJ is very important to avoid issues which may result in the removal or modification to security features.

Sprinklers are not an integral component of a Secure Storage Room and should not be added inside an SSR unless required by the AHJ. If additional fire protection is required, records can be stored in commercial fire rated containers placed inside the Secure Storage Room. Inert gas fire suppression systems can also be used.

Additional or Type X drywall sheets can be installed to meet code requirements (or as required by the AHJ). If necessary, an appropriately labelled fire door can be used instead of the specified door. Please note that there are specific requirements for mounting locks and hardware on fire rated doors. Contact the local AHJ for assistance and guidance on fire and safety issues.

### **Slab-to-Slab**

Secure Storage Room walls must be slab-to-slab (from the finished floor to the underside of structural concrete roof or floor) or continue across the ceiling to form a continuous secure enclosure (Secure Ceiling). Where the space above the Secure Ceiling (measured to the underside of the limiting structural component) exceeds 6 inches, the space should be closed and secured or electronically monitored. In rare cases, the floor may also need special treatment. Consult the RCMP for advice.

## **Design-Basis Threat and Secure Storage Room Design Premise**

Secure Storage Rooms primarily protect against surreptitious attacks but also detect and delay forced entry. The SSR is designed for location in a Security Zone or High Security Zone in a federal government building (or CISD-approved equivalent in contractor facilities) in urban centres. SSR constructed in remote locations may require additional safeguards.

A Vulnerability Assessment should be conducted to determine if a potential adversary can access the perimeter (or any space above or below) of the SRR undetected and unobserved for long periods of time. If so, additional measures are required to limit access or *actively* monitor activity in the perimeter areas.

Floors and ceilings are assumed to be constructed of highly intrusion-resistant materials such as structural concrete, reinforced concrete block or concrete on steel (roofs and floors). Wood or steel assemblies should be steel-strengthened and vibration-monitored the same as the walls.

### **Vestibules**

A vestibule was included with the original Secure Room design for two purposes: to limit the swinging motion of hand tools and to provide better sound isolation at the door. With respect to the first objective, the most viable forced entry threat to the SSR door and hardware is now from powered portable tools and a vestibule does little to reduce it. In fact, a vestibule now becomes a possible space for an adversary to hide while attacking the door (or the wall around it). The vestibule is also not needed to enhance sound isolation at the door when the SSR is used as intended – as a records storage room.

Therefore, exterior vestibules are not required (though still permitted) for construction of a SSR. Any vestibule that is built should be constructed so as to permit observation of activities within it (eg: glazed walls or door).

A “day door” function is facilitated by use of SEG-listed locks which provide this function where departmental policy accepts the practice. To be approved for this function, the electronic access controls must work only when the mechanical lock is “open” (locking the mechanical lock must mechanically disengage the electronics so that attacks by compromising the access controls are not possible).

Well-defined and enforced operating procedures are necessary when using “day doors”. Users must not be permitted to use the electronic locking mechanism in place of the mechanical lock for extended periods (especially overnight and weekends).

## **Intrusion Detection Systems (IDS)**

While the sheet steel on the walls provides some force resistance, its main use is to transmit vibrations from force attacks to vibration sensors. The RCMP has tested and approved a vibration detector for SSR walls which is listed in the SEG. Detection systems (e.g. motion sensors) located inside the Secure Storage Room may also be employed, although they do not detect the adversary until he/she has already gained entry, thereby reducing the available response time.

The selection table suggests what type of detection system should be used for various situations. In all cases, the alarm systems must generate reliable, timely and appropriate response.

## **Plumbing and Electrical Pass-through Construction**

Minimize plumbing and electrical pass-throughs in SSR walls where possible. Do not locate pass-throughs in the Critical Attack Area. Where pass-throughs are required, frame openings within 1 inch (25mm) of the pipe/conduit and secure to the stud framing at minimum two places. Extend the wall protection material to within  $\frac{3}{4}$ " (20 mm) of the edge of the opening. Extend gypsum wall board to the edge of the pipe or conduit. Seal all gaps with fire rated or acoustic sealant. Recommended product standard: ASTM E 814 (UL 1479) or CAN/ULC S115, or as required by the AHJ.

Where necessary to accommodate pipe or conduit movement or expansion, pipes and conduit may be enclosed in a close-fitting sheet metal sleeve and the sleeve mechanically fastened to the stud framing at two places (minimum). Clearance between the sleeve and pipe or conduit should be kept to a minimum and not exceed  $\frac{1}{4}$ ".

Steel bars should be installed to delay access of a person through a duct with a cross-sectional area greater than 96 square inches and a smallest dimension greater than 6". They may be omitted if a TRA determines that unauthorized entry through these ducts is not a threat.

Note that Man Bars do not prevent the introduction of deleterious material (e.g. water, toxic fumes). If a TRA identifies such threats as viable, all ducts and openings may require additional mitigation measures (e.g.: filters or dampers). Contact the RCMP for advice.

## **Door Locks**

A code-compliant (single motion, single action) door lock that accepts approved combination locks has been approved and is listed in the SEG.

## **Two-Person Integrity**

Some SEG-listed electronic combination locks permit the application of a two-person integrity (both persons must dial the lock open) policy. This is one of the most effective security measures that can be applied to sensitive information storage.

## **Screws**

Screws (including "security screws") are not approved for attaching wall protection material (steel sheet or mesh) to steel studs. Wall protection must be attached by welding or rivets.

Standard drywall screws are permitted for attaching gypsum wall board over steel protection sheeting to metal or wood studs.

Self-tapping sheet metal screws are permitted for attaching anti-spread and cross-bracing to metal studs.

Use minimum 38mm (1-1/2") long #7 (or larger) wood (not drywall) screws spaced at 300mm o.c. (with appropriate washers) to attach steel protection material to wood joists or wood studs.

## **Statement of Requirements**

Where the department (client) is not also the designer, a Statement of Requirements (SOR) should be developed to tell the designer exactly what is required and to identify selected construction options from those presented in the General Specifications in Part II.

The SOR and all documentation leading to the selection of SSR specifics should be considered sensitive and treated accordingly.

**Do not tell the designer why a selection has been made unless the designer has a need to know.**

### Advice and Guidance

Royal Canadian Mounted Police  
 Departmental Security Branch  
 Physical Security Section  
 1426 St. Joseph Boulevard  
 Ottawa, Ontario K1A 0R2  
 Email: [Sec-Equip@rcmp-grc.gc.ca](mailto:Sec-Equip@rcmp-grc.gc.ca)

**Table 1**  **Security Recommendations**

Sensitivity	Security Measures
<p><b>Protected A</b> <b>Protected B</b></p>	<p><b>SSR not required.</b> “Lock-Up” the information (see reference F)</p> <p>A storage room constructed in close conformance to this guide will greatly exceed the minimum “lock up” physical security requirements. The following are recommended alternatives for SSR for storage of Protected A/B:</p> <ul style="list-style-type: none"> <li>• ½” plywood instead of sheet or mesh steel</li> <li>• UL 634 door contact and IDS (where recommended in TRA)</li> <li>• ANSI 156.13 Grade 1 mortise lock with UL 437 High Security (keyed) Cylinder</li> </ul>
<p><b>Protected C</b></p>	<p><b>Non-Life Threatening</b></p> <ul style="list-style-type: none"> <li>• <b>Locate SSR in Security Zone</b></li> <li>• Vibration detection on walls (and Secure Ceiling if applicable)</li> <li>• IDS inside the SSR</li> <li>• Consider additional compartmentalization <sup>1</sup></li> <li>• SEG-listed combination locks approved for Top Secret / Protected C, OR SEG-listed locks approved for Secret (if supported by the DSO)</li> </ul> <p><b>Life Threatening</b></p> <ul style="list-style-type: none"> <li>• <b>Locate SSR in High Security Zone</b> (exterior constructed as recommended in TRA)</li> <li>• Vibration detection on walls (and ceiling or floor if applicable)</li> <li>• Motion detection (or other IDS) inside the SSR</li> <li>• Additional compartmentalization <sup>1,2</sup></li> <li>• Two-person authentication <sup>3</sup></li> <li>• Formal TRA to ensure the adequacy of measures</li> </ul>

	<ul style="list-style-type: none"> <li>• SEG-listed combination locks approved for Top Secret / Protected C</li> </ul>
<b>Confidential</b>	<p><b>Locate SSR in Security Zone</b></p> <ul style="list-style-type: none"> <li>• Motion detection (or other IDS) inside the SSR</li> <li>• Keyed mortise locks. ANSI/BHMA 156.13 Grade 1 or select from SEG</li> <li>• High Security Cylinders: UL 437, ANSI 156.30 Level "A" or ANSI 156.5 Grade 1A <sup>4</sup></li> <li>• Commercial electronic keypad locks are permitted but 'scramble' keypads are preferred. Specify ANSI/BHMA A156.30 level "B"(minimum) or UL 1034</li> </ul>
<b>Secret</b>	<p><b>Locate SSR in Security or High Security Zone</b></p> <ul style="list-style-type: none"> <li>• Vibration detection on walls (and floors or ceiling if applicable)</li> <li>• Motion detection (or other IDS) inside the SSR</li> <li>• SEG-listed combination lock</li> </ul>
<b>Top Secret</b>	<p><b>Locate SSR in High Security Zone</b></p> <ul style="list-style-type: none"> <li>• Vibration detection on walls (and Secure Ceiling if applicable)</li> <li>• Motion detection (or other IDS) inside the SSR</li> <li>• Consider additional compartmentalization for need-to-know <sup>2</sup></li> <li>• Consider two person authentication <sup>3</sup></li> <li>• SEG-listed combination locks approved for Top Secret</li> <li>• Formal TRA to ensure the adequacy of all storage, alarm and response measures</li> </ul>

### Table Notes

<sup>1</sup> UL 687 labelled Burglar Resistant safes provide significant additional force resistance (as well as compartmentalization for need-to-know segregation). Although the Secure Storage Room provides early detection and some delay, the safe's resistance time should closely correspond to the assured response time for an appropriate response.

<sup>2</sup> Additional compartmentalization is recommended where the need-to-access principle is still a concern (see Reference B paragraph 7.6.7). Information can be compartmentalized by using commercial locking containers/cabinets. UL 437 high security keyed locks are recommended.

<sup>3</sup> Procedural and/or technological mitigation measures should also be considered.

<sup>4</sup> Consider the use of High Security cylinders with "chip technology" (e.g. CLIQ™) for audit purposes (only).

### General Notes:

A) Where a TRA determines that a particular threat is well-mitigated by other aspects of security the DSO may decide that one or more of the recommended measures are not required.

B) The Communications Security Establishment of Canada (CSEC) requires certain equipment to be placed in a Secure Room (previously the SR-2). Additional security features such as emanations protection may be required, but the RCMP can only advise on the construction of a Secure Storage Room as designed for records storage. Contact CSEC Client Services: [comsecclientservices@cse-cst.gc.ca](mailto:comsecclientservices@cse-cst.gc.ca)

## Frequently Asked Questions

Q1: Why does Protected "C" in a Secure Storage Room still require a safe?

A1: The nature of the threat to Classified information differs significantly from the threat to Protected "C" (especially Life Threatening) information. Secure Storage Rooms are an alternative to approved security containers and must provide at least the same protection. Protected "C" (especially Life Threatening) is considered susceptible to sustained force attacks by a motivated adversary and thus needs significant force resistance. This can best be assured by using UL 687 Burglar Resistant safes with at least a 1 hour rating for the additional compartmentalization. Safes also provide additional compartmentalization for need-to-know.

Q2: How do the Secure Storage Room requirements relate to those for a Secure Server Room as specified in G1-031?

A2: The functions of the rooms are different. Secure Storage Rooms are designed for the storage of records. They are not intended for the processing of information (or for occupancy). Servers are vulnerable to different threats than stored records, and server rooms generally have extensive electrical, air conditioning, vents and ducts, and other systems in the room (and through the walls).

Q3: The Operational Security Standard on Physical Security says Confidential information can be stored in an Operations Zone. Why does Table 1 recommend that the Secure Storage Room for Confidential information be in a Security Zone?

A3: The Secure Storage Room should be in a Security Zone because of the elevated risks associated with storing large amounts of information on open shelves. The "periodic monitoring" requirement for an Operations Zone does not provide assurance that an adversary will not benefit from long periods of unmonitored activity. The concern is that without effective 24/7 monitoring, an adversary could gain access and operate without detection for an extended period of time. Access might be by insecure ceiling spaces or by un-alarmed/ un-monitored exit doors or elevators. If a TRA reveals that the Operations Zone is sufficiently secure that unauthorized access is highly improbable, then the DSO may permit a Secure Storage Room to be located there.

Q4: The space assigned to us for a Secure Storage Room is adjacent to a public space or non-departmental occupant. What should we do?

A4: A Secure Storage Room should never be placed against exterior walls other than those made of reinforced concrete or reinforced concrete blocks (all voids filled). Secure Storage Rooms can normally be placed adjacent to subterranean (basement) walls and walls at least 3 storeys above an accessible surface (ground or roof) without additional safeguards.

Q5: We have an existing double steel door and would like to keep it for our Secure Storage Room as it makes it easier to use a forklift. Can we use it?

A5: If the door and frame meet the basic construction requirements of this Guide you may be able to secure one of the doors to provide satisfactory security when closed and secured. One way to do this would be to install heavy duty locking bars at the top and bottom that can be secured with padlocks (to ensure users do not open them and leave them open). The bars should have a diameter of at least 30mm and be connected to the door with two guides that are welded or riveted to the door and spaced at least 300mm apart. The bars must project at least 30mm into a pocket or guide welded or riveted to the frame or secure wall. The bars should have a design that prevents unlocking when the padlock is attached.

This approach requires strict adherence to policy and procedure and should be used with discretion. A custodian should be appointed to hold the keys to the padlocks and be responsible for ensuring the secondary door is secured.

Q6: Are there any restrictions on wall switches or outlets on Secure Storage Room walls?

A6: The Secure Storage Room walls were tested without holes or penetrations. Surface mounted fixtures should be used where possible. Where a fixture must be set into the wall, it should be located as far as possible from the door. The fixture box must be steel and welded or riveted to the steel wall sheathing. All cables and wires should be encased in steel/EMT conduit.

Through penetrations are to be avoided. Where penetrations must be made on both sides of the wall, they should be offset at least 300mm from each other.

Q7: The G13-01 uses mandatory language with words like "required" but isn't it a 'guide'?

A7: As Lead Agency, the RCMP is delegated the authority to design, test, evaluate and approve security equipment. Each department or agency has the authority to decide if it will use RCMP approved equipment or designs – either as approved or modified in some way. To be approved, a Secure Storage Room must be constructed to the RCMP design specifications. If all RCMP specifications are not met, it is not an RCMP approved Secure Storage Room and should not be referred to as a Secure Storage Room (SSR).

Q8: What if the AHJ requires the SSR to have two means of egress?

A8: This should not occur when the room is kept to its original design purpose as a (relatively) small records storage room since the secondary exit is determined by occupancy and floor area. If this situation arises, the second exit door should not have any locking hardware on the outside.

Q9: Can I build an SSR in a wooden building?

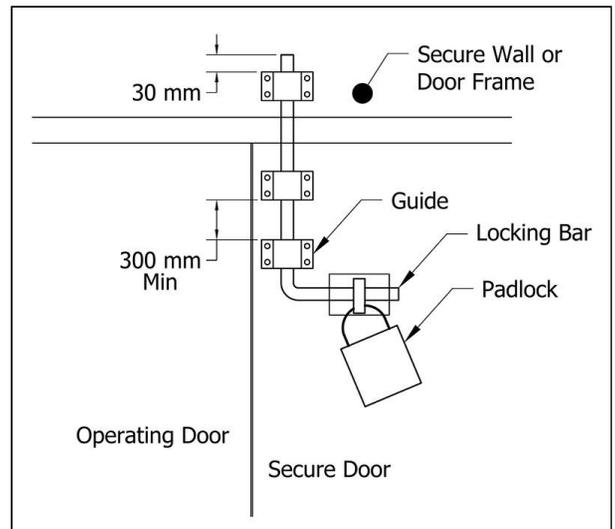
A9: The SSR was designed for location in a Security or High Security Zone within a typical government building in an urban environment. For other situations, conduct a TRA taking into consideration the threat, the asset and the sum of all protection measures (e.g.: location on a military base, regular patrols and fast response, etc.). While not explicit in this guide, operational security measures that are sufficient and assured can offset minor gaps in the level of physical protection afforded by wooden floor and ceiling construction. Metal protection material and vibration sensors should be installed on both the floor and ceiling of an SSR constructed in a wooden building – contact the RCMP for additional guidance.

Q10: We are putting in an enforcement unit in a warehouse bay with a main floor and a mezzanine floor that will be open to the main floor. However, there will be enclosed offices on this floor. There are plans for two evidence/secure storage rooms on the main floor underneath the mezzanine floor. The floor will not be slab concrete. What should we do?

A10: Where the roof (mezzanine floor) is made of wood (wood or composite joists with plywood sub-flooring), we recommend that the roof have expanded metal mesh (3/4" - #9F as called for in the wall construction) secured to the underside (secure side) of the roof joists and a vibration detector (sensor) installed in contact with the mesh on the secure side. The sensor mounting plate can be installed adjacent to the roof joist (preferred solution). Cabling for the roof sensor should be run on the secure side of the SR ceiling (i.e. in surface mounted conduit) to where it joins the other sensor cabling in the common conduit to the alarm control panel.

Q11: Can I install the door lock at a different height to accommodate accessibility requirements?

A11: Ordinarily installing the door lock 44 inches above floor level will accommodate accessibility requirements for all users. If the lock is being installed less than 42 inches above floor level, the anti-



spread bracing (between the door frame and adjacent stud – located 48 inches above the floor) should be lowered to within 6 inches of the lock center-line, or additional anti-spread bracing installed 6 inches or less below the lock center-line.

Q12: Can I change the lock height (e.g., to accommodate a handicapped person)?

A12: Yes. If the lock height is shifted more than about 150mm (6") we recommend also shifting the anti-spread bracing to match.

## **PART 2 - SSR Construction Specifications**

### **SSR General Construction and Assembly Specifications**

**Note:** The specifications in this Part should be modified as required and incorporated into the Project Contract Documents by the Designer in accordance with client requirements (ideally outlined in a detailed SSR Statement of Requirements) and overall project and code requirements.

Extend wall partition framing slab to slab.

### **Wall Framing (Figure 1)**

Top and Bottom Tracks:

SSMA standard: 1- 5/8" x 6", 18ga (600T162-43); OR

Preferred: 2" x 6", 18ga (600T200-43)

Secure top and bottom steel stud track to both slabs at 300mm oc using any expanding (preferably double expanding) mechanical fastener. Non-expanding (e.g. "Tapcon") screws are not acceptable.

Studs:

SSMA standard: 1- 5/8" x 6", 18ga (600S162-43: 33ksi); OR

Preferred: 2" x 6", 18ga (600S200-43: 33ksi)

Space studs at 300 mm oc and secure to the top and bottom tracks with welds or rivets (not screws).

Install double (jamb) studs at the door frame opening. Install the door frame as per HMMA 840-07, part 3 A, B, C, D and E (except that screws shall be replaced with steel rivets).

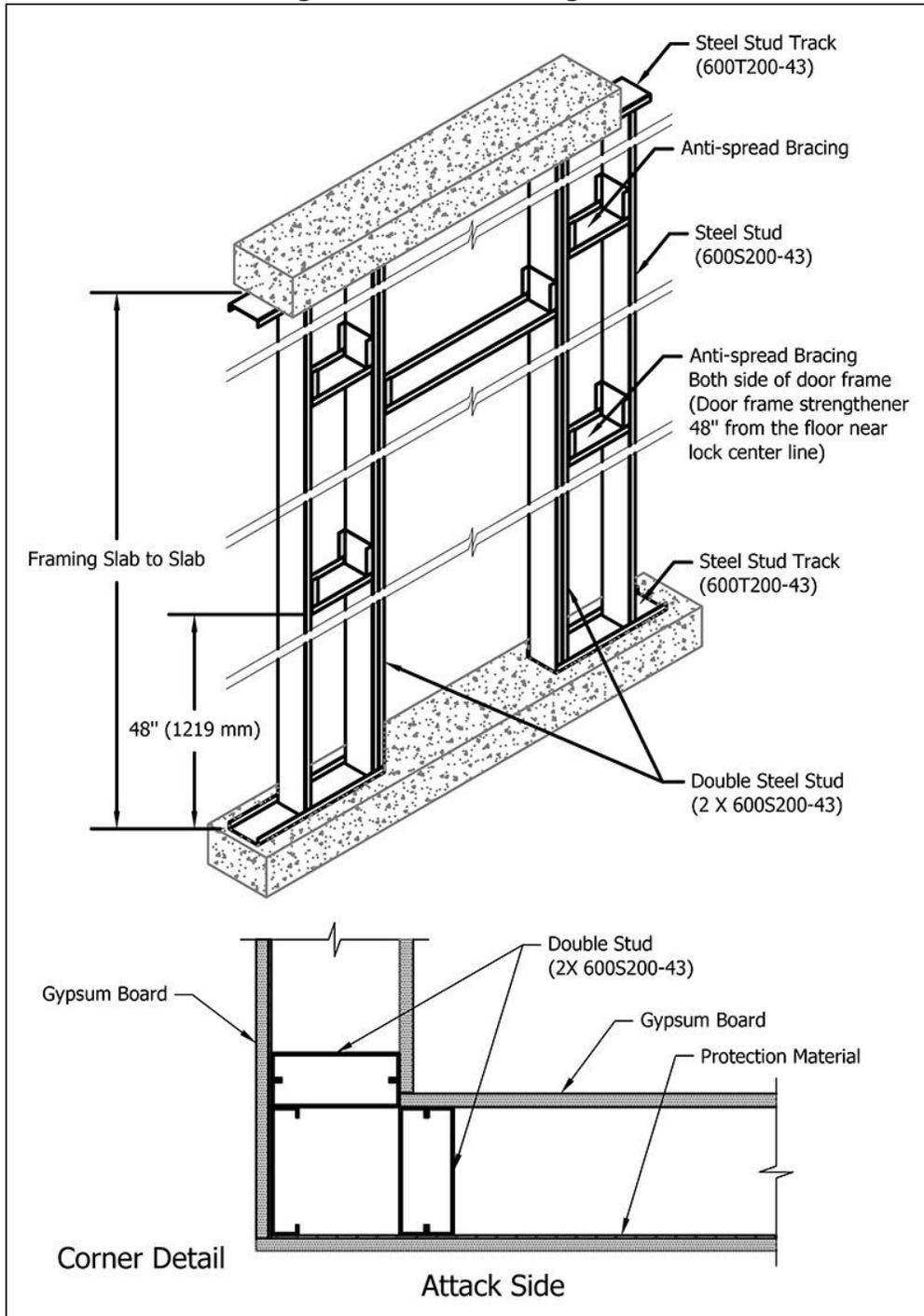
Install anti-spread bracing approximately 48" from the bottom of the wall between the door frame double stud and the adjacent stud on both sides of the frame.

Construct wall corners with double studs.

#### **Notes:**

1. Leaving a small gap and using drywall sheets to brace frame sections during wall erections is permitted provided steel sheets on the attack side are continuous over all gaps.
2. Drawings of doubled studs are representative. Connect and orient doubled studs as per standard industry practice.

**Figure 1: Wall Framing Detail**



## Wall Protection Material (Figures 2 to 5)

Wall protection material may be one of two options:

**Flattened Metal Mesh:** To EMMA 557-99. Style ¾-9F: nominal strand thickness of 0.120" (0.108" to 0.132"). Diamond opening of 0.563" x 1.688".

OR

**Sheet Steel:** 16 Ga, A1008 / A1008M (cold rolled) or A1011/ A1011M (hot rolled) or equivalent.

Mount on the outside (attack side) of the room. Support all edges by anti-spread bracing, studs or corners. Align the sheet edges at every vertical and horizontal seam on the centre line of the steel stud or anti-

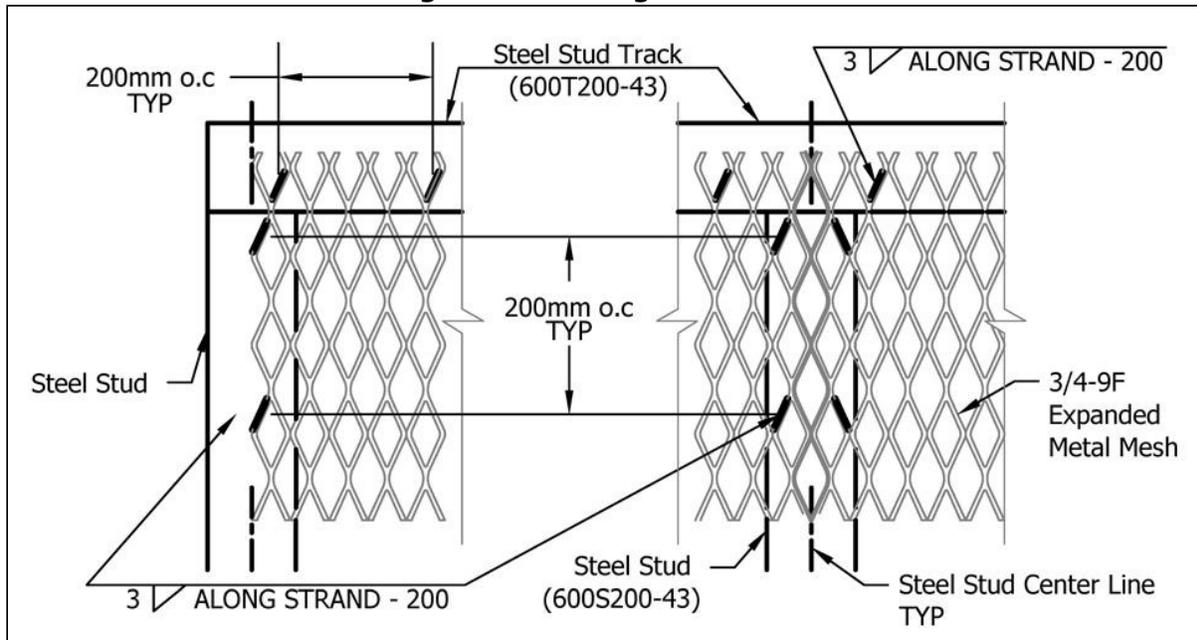
spread bracing and secure all sheets with welds or rivets.

**Note:** Screws (including "security screws") are **NOT** acceptable for permanently attaching the protection material (steel or steel mesh). Screws may be used to "tack" the sheets in place pending riveting or welding. Temporary screws do not need to be removed.

### Welding (Permitted Method)

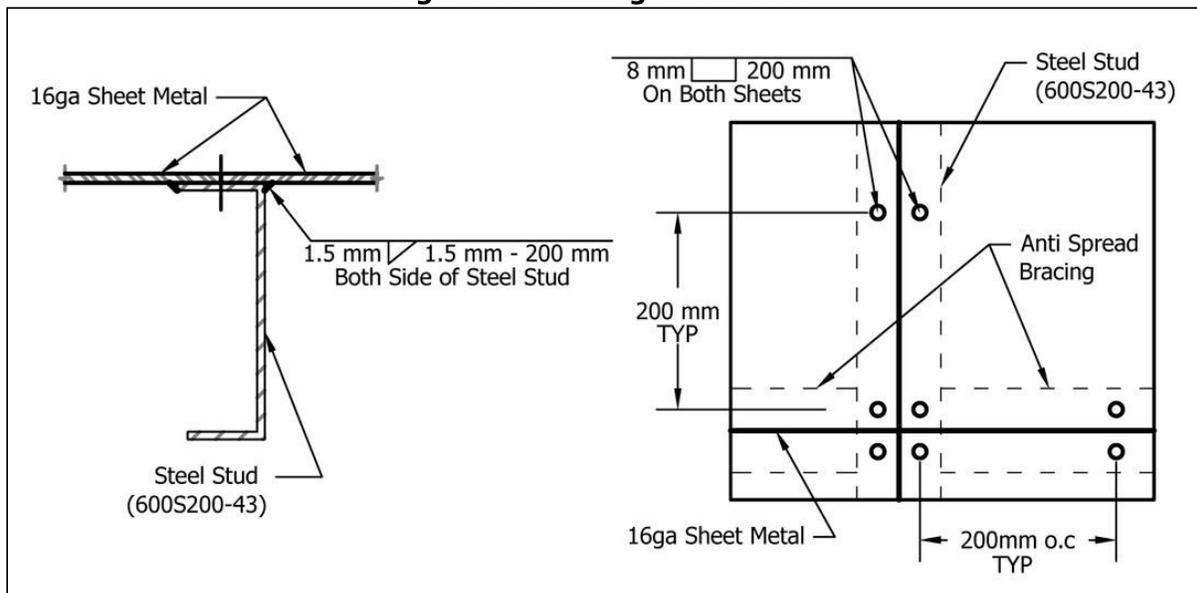
**Steel mesh (Figure 2):** 3mm fillet weld along the strand at 200mm oc

**Figure 2: Welding Steel Mesh**



**Steel Sheet (Figure 3):** 1.5mm fillet weld 15mm long at 200mm oc **OR** 8mm plug weld at 200mm oc

**Figure 3: Welding Sheet Steel**



**Rivets (Preferred Method) (Figure 4):**

**Steel sheet:** 3/16" steel rivets at 200mm o.c.

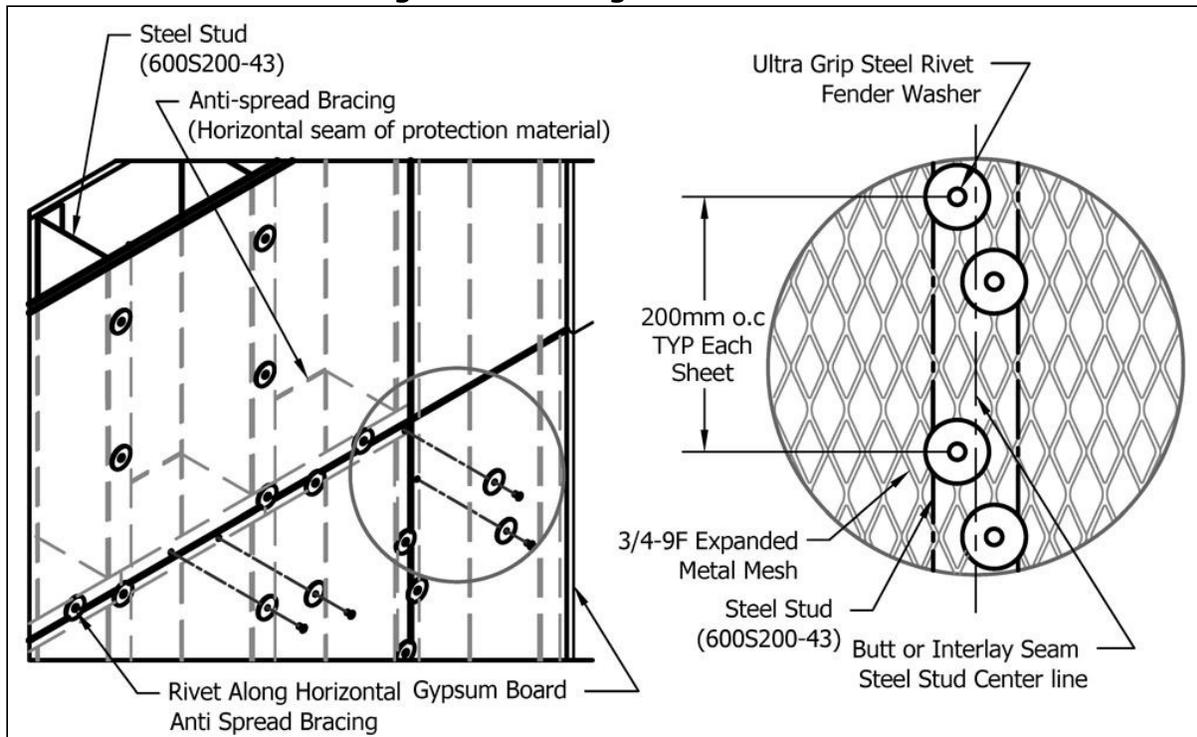
**Steel mesh:** 3/16" steel rivets and "fender" washer (1 1/2 " OD, 3/16" ID) at 200mm o.c.

**Suggested material:**

Rivets: 3/16" steel pop rivet: Speaneur part #301-440

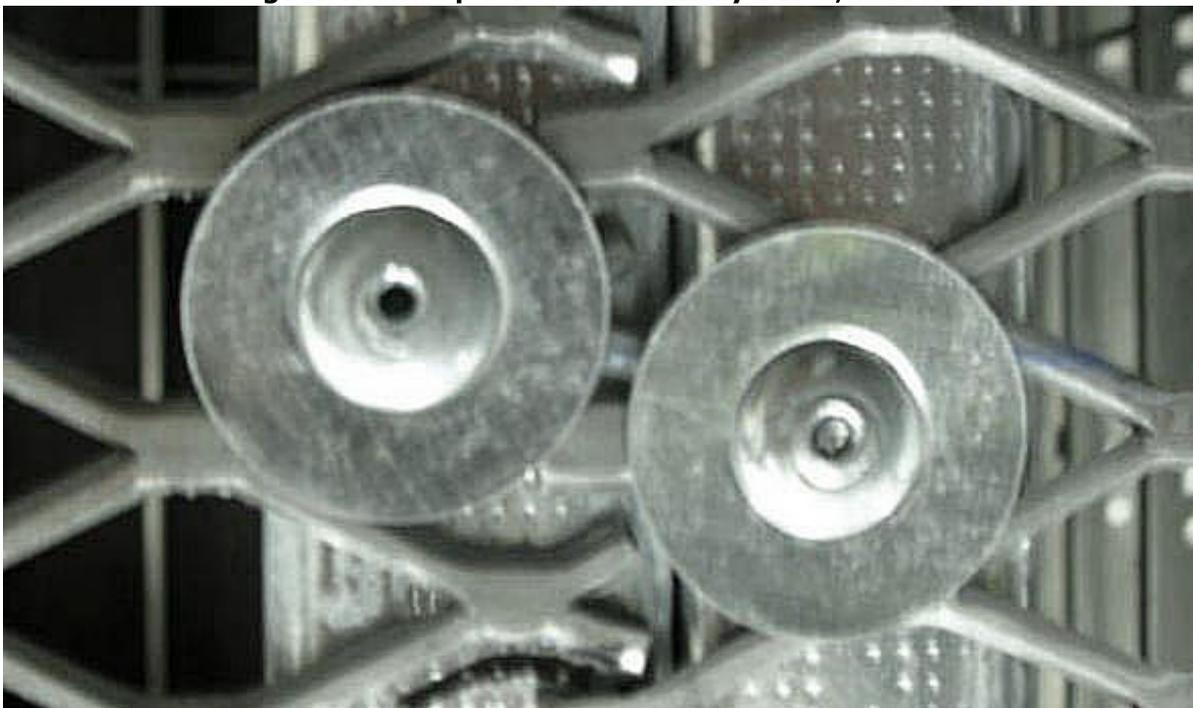
Washers: 1 1/2 " OD, 3/16" ID "fender" washer: Fastenal part #1133204

**Figure 4: Riveting Sheet or Mesh**



**Steelemesh Interlay Seam (Figure 5):**

**Figure 5: Example of Mesh Interlay Seam, Riveted**

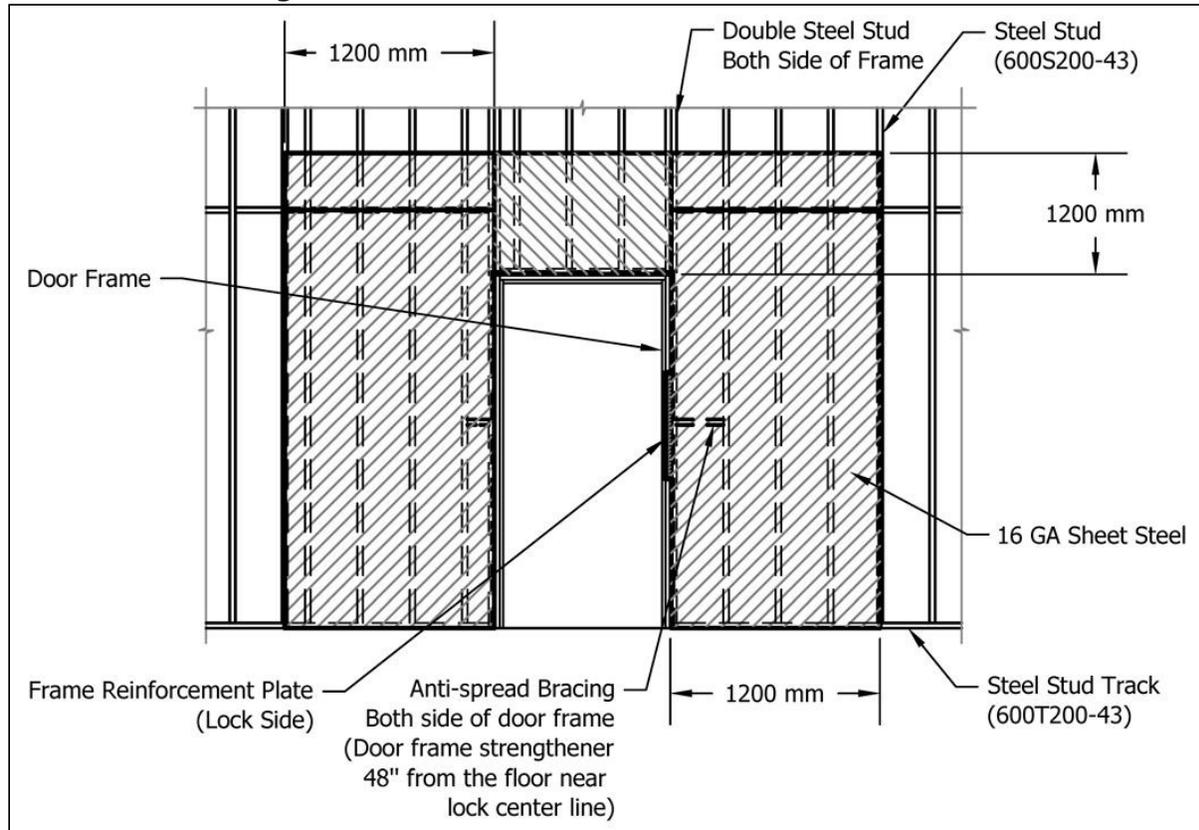


## Critical Attack Area (Figure 6)

16 ga. (1.6 mm) steel sheet, HR Commercial quality, ASTM A366, matte finish, shall extend 1200mm around the door frame on the inside of the secure storage room and be attached as per selected rivet or welding requirements for protection material.

**Note:** Perforations for services, conduits or ducts are not permitted in the Critical Attack Area.

**Figure 6: Critical Attack Area Wall Reinforcement**



### Wall Finishing Details

Install 16mm gypsum wall boards on both sides of the wall (interior is optional). Standard drywall screws are acceptable for attaching the drywall.

Apply continuous bead of fire-rated acoustic sealing on both sides of the top and bottom tracks. ASTM E814 (UL1479), ASTM E1966 (UL 2079) or CAN/ ULC S115 test standards with a fire/ smoke rating acceptable to the Authority Having Jurisdiction (AHJ).

Paint exterior surface of wall with one coat primer/sealer and one coat of gloss enamel. Primer/sealer must extend above drop ceilings to the bottom of structural ceiling. Paint must be uniform and without blemishes. Joints must not be visible. Custom colors should be considered.

### Door, Frame and Hardware

#### Door and Frame:

Commercial Steel Door and frame compliant with section 08-11-13 of CDMA Publication: *Recommended Specification for Commercial Steel Door and Frame Products*.

Door may be specified as fire rated where required.

Doors wider than 900mm (36") should be avoided. Double doors will require special measures.

**Door:**

Face Gauge: 16 gauge (1.6 mm) steel

Construction: Laminated core with vertical steel stiffeners at 150mm oc (stiffeners welded or laminated to each face sheet with voids between stiffeners filled with fiberglass or mineral batt type material).

Caps: 'Flush Closing Channel' or 'Flush Channel' top and bottom.

Ref: NAAMM 810-09 Part 2. A. Figures E and F for edge details.

Edges: all edges and top and bottom caps to be continuously welded and ground smooth.

Door handing: (must be specified as per client requirements).

**Frame:**

Gauge: 16 gauge (1.6mm) steel

Frame construction: Welded or fully field welded 3-piece "knock-down" (for retrofit applications).

Anchors: "Z" shape steel wall anchors welded to frame.

Reinforcing at latch: as per lock manufacturer recommendations. Lock specifications must be provided to the supplier/manufacturer to provide necessary reinforcing requirements.

**Locks:** Select according to Table 1.

**Hinges:** to ANSI/BHMA A156.1 Grade 2 and ANSI A8112 (Steel Material Standard)

Full mortise, five knuckles, ball bearings, standard weight. Three (3) hinges per door (minimum).

Minimum Dimensions: 114mm (4 ½") x 114mm (4 ½") x 3.4mm (0.124") thick.

Hinges mounted with barrels on the attack side ("reverse-hung" or outwards opening) must have non-removable pins (NRP), maximum security pins (MSP) or safety studs/reverse safety studs. Note that these require special ordering instructions.

Suggested products:

- [Hager](#) (Catalogue item BB1279)
- [Stanley Architectural Hardware](#) (Catalogue item FBB179)
- Mont-Hard (Canada). Mont-Hard products are carried by [Montreal Hinge](#) (Catalogue item BB-1079)

**Door closer:** Overhead style ANSI A156.4 Grade 1

Suggested product: Ingersol-Rand LCN 4040 series

**Threshold:** Aluminum (or other metal) interlocking style with hook strip installed on door.

The SSR should qualify for exception from building code "Barrier-free path" requirements when used only to store records. However, where wheelchair accessibility is required, two recommended products are:

- [PEMKO](#) (model 114): PEMKO (Toronto) 866-243-9816 (sales)
- [Zero International](#) (model 73A)

**Door contacts:** UL 634 High Security Switch - level 1 or level 2.

**Door installation:** The door is generally installed as regular hung (opening into the Secure Storage Room), but it can be reverse hung (opening out) in exceptional cases.

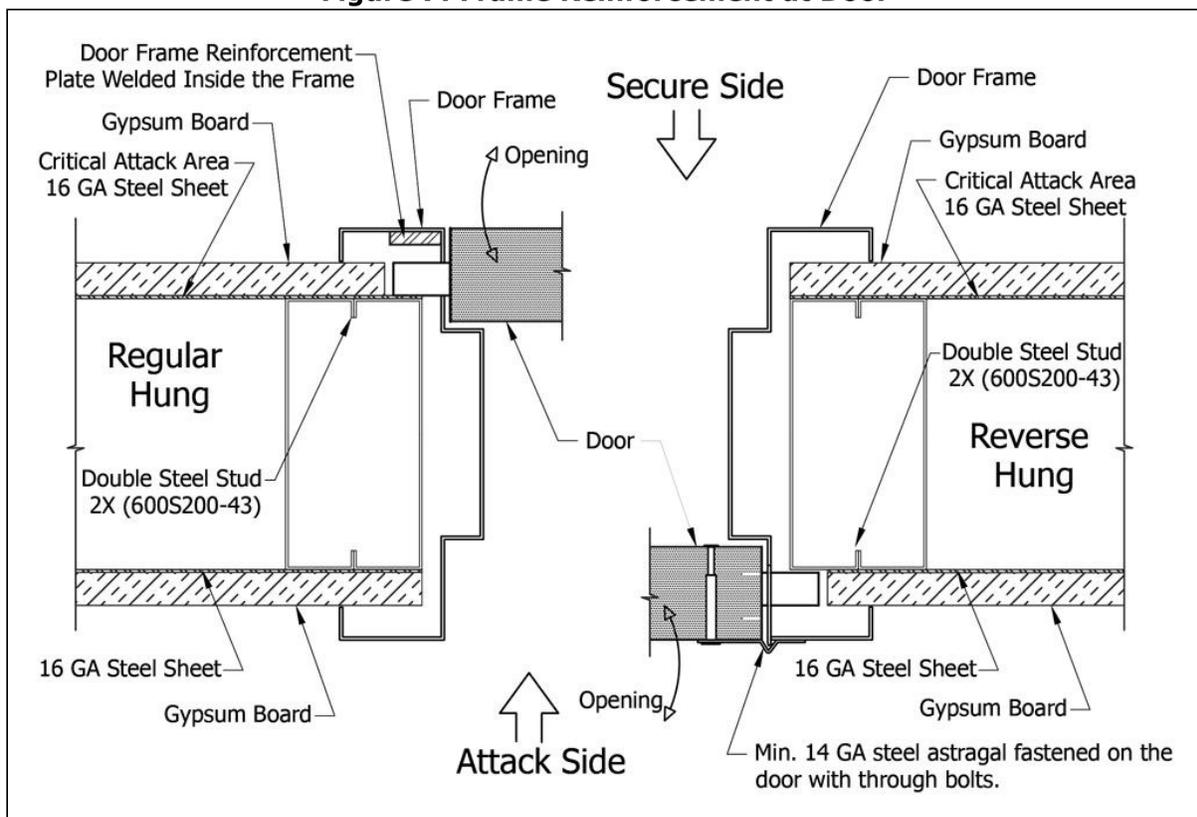
**Frame reinforcement at the lock area (Figure 7):**

Secure a 6.4mm x 25mm x 610mm steel plate inside the frame using tack welds on every edge. Align the centre of the plate with the lock bolt.

For reverse hung doors, install a steel astragal covering the entire lock edge of the door AND the unmodified strike plate. The astragal should be at least 14 ga (2 mm) thick, should overlap the door frame by at least 25mm. Attach with minimum 6mm (1/4") diameter steel carriage bolts spaced at 250mm oc and at least 25mm from mortise lock pocket. Carriage bolt heads must be on the attack side.

Suggested product: Zero International #43STST

**Figure 7: Frame Reinforcement at Door**



## Ventilation Duct Pass-throughs

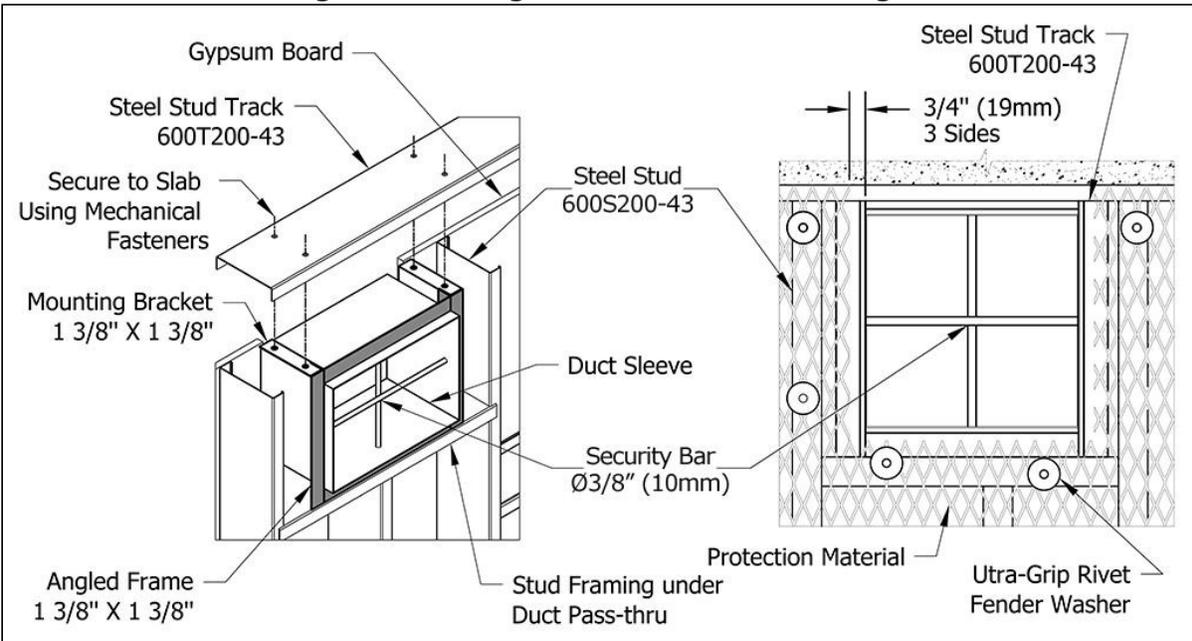
**Note:** Where superior resistance to cutting is required, man bars can be specified as tool-resistant steel (grade 1 or 2) per ASTM A627.

**Ceiling mount: (Figure 8)**

1. Duct sleeve to be at least the same thickness as duct passing through.
2. The overall dimension of the sleeve must be slightly greater than the duct.
3. Construct frames of 1- 3/8" x 1- 3/8" x 1/8" angle steel welded around duct sleeve (ceiling mount brackets are recommended).
4. Space 3/8" Ø steel bars at 6" oc and weld to the frame.

5. Secure the duct sleeve to the structural ceiling with mechanical fasteners.
6. Cut protection material  $\frac{3}{4}$ " max from the edge of the duct opening (3 sides)
7. Apply fire-rated caulking between duct sleeve and finished wall.

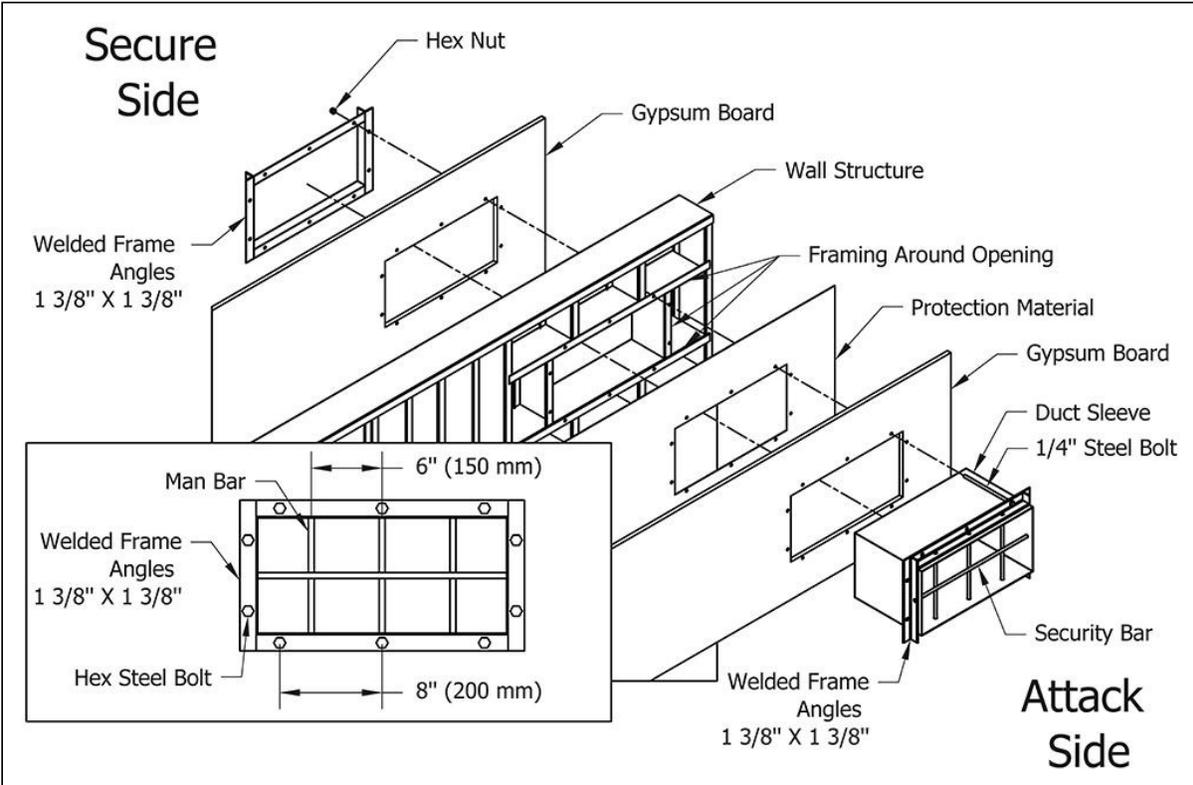
**Figure 8: Ceiling Mount Duct Pass-Through**



**Surface Mount: (Figure 9)**

1. Duct sleeve to be at least the same thickness as the duct passing through.
2. The overall dimension of the sleeve must be slightly greater than the duct.
3. Construct frame on each side of the wall of 1-  $\frac{3}{8}$ " x 1-  $\frac{3}{8}$ " x  $\frac{1}{8}$ " angle steel welded around duct sleeve.
4. Space  $\frac{3}{8}$ " dia man bars at 6" oc and weld to the frame.
5. Secure duct sleeve with  $\frac{1}{4}$ " dia bolts and hex nuts (inside the room) at 8" oc around the outside duct sleeve. The bolt head shall be on the attack side and be welded in at least three places to the angle frame.
6. Framing around duct sleeve is required.
7. Apply fire-rated caulking between duct sleeve and finished wall.

**Figure 9: Surface Mount Duct Pass-Through**



Date Modified: 2014-05-01



# G13-02 Secure Demising Wall (SDW)

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## Physical Security Guide Lead Agency Publication G13-02

Issued: July 2013

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## Definitions

**Authority Having Jurisdiction** - Normally the local city, municipality or county building inspector. For Canadian Forces Bases the Authority Having Jurisdiction will be the Canadian Forces Fire Marshall.

**Attack Side** - The side of the door or wall that is exposed to the adversary.

**Base-line Threat** - Threats common to government departments in Canada, under normal security conditions, as defined in the *Operational Security Standard on Physical Security*.

**Designer** - A qualified person (architect, engineer, technologist or other) tasked to develop the specific project design (drawings and specifications) based on the client-generated Statement of Requirements (SOR) and conforming to the overall project and code requirements.

**Secure Demising Wall** - A force-resistant wall constructed according to RCMP Guide G13-02.

**Secure Working Room** - A specially designed room, suite of rooms or spaces used for the processing and open shelf storage of classified information.

**Statement of Requirements** - The client-generated list of project-specific requirements (especially selection of optional alternatives) for the SDW. The SOR should be developed from the advisory information in Part I of this Guide, along with specialist advice as required.

**Open Shelf Storage** - Storage other than in approved security containers and safes. Open shelf storage includes storage where records are kept in containers or commercial fire and/or water resistant containers.

**Zones** - Defined in Reference B.

## Abbreviations

**dB** - Decibel

**Ga** - Sheet metal gauge indicating the standard thickness of the sheet metal

**SR** - Secure Room (+ suffix indicating Secure Room "Type" as per earlier versions of G1-029)

**SDW** - Secure Demising Wall

**SSR** - Secure Storage Room

**SWR** - Secure Working Room

**SOR** - Statement of Requirements

**STC** - Sound Transmission Classification

**TRA** - Threat and Risk Assessment

**ID** - Inside diameter

**OD** - Outside diameter

**oc** - On centre

**Ø** - Bar diameter

## References

A. [Policy on Government Security](#)

B. [Operational Security Standard on Physical Security](#)

## Referenced Commercial Standards

The following standards are available for purchase from their respective standards associations, or from standards vendors such as [IHS Standards](#), [the ANSI Store](#) or [Techstreet](#)

**ASTM A627-03:** *Standard Test Methods for Tool-Resisting Steel Bars, Flats, and Shapes for Detention and Correctional facilities*

[American Society for Testing and Materials](#)

**ASTM F1267-07:** *Standard Specification for Metal Expanded Steel*

[American Society for Testing and Materials](#)

**CAN/CGSB-1.60:** *Interior Alkyd Gloss Enamel Paint*

[Canadian General Standards Board](#)

**EMMA 557-99:** *Standard for Expanded Metal, Introduction, Product Selection Considerations, Terminology, Manufacturing Process, Manufacturing Tolerances and Applications.*

[Expanded Metal Manufacturers Association](#)

**SSMA:** *Product Specifications*

[Steel Stud Manufacturers Association](#)

## PART 1 (For use by the Department or Agency)

### How to Use This Guide

This Guide is intended to assist qualified security practitioners and departmental physical security staff to develop a Statement of Requirements (SOR) for the construction of a Secure Demising Wall (SDW).

Qualified architects or designers should be engaged to turn the SOR into detailed drawings and specifications – incorporating all client-specified features and components and ensuring that the design conforms to overall project requirements and all applicable codes and facility “fit-up” standards.

**The rationale for any component or feature (as well as the purpose of a space or nature of the asset) should only be divulged to architects, designers or contractors on a need-to-know basis.**

They may require a security clearance to receive this information.

Segregation of details and distribution on a need-to-know basis will often be sufficient. **The architect or designer should be provided with formal guidance / direction on the preparation of drawings for tender or sub-trades to ensure that sensitive information is not inappropriately divulged.** For example, the purpose or name of the room should not appear on widely disseminated drawings, specifications or other contract documents. A generic or numeric name should be used. Sub-trades should receive only enough information to perform their work (eg: partial building drawings and system schematics which do not identify adjacent activities or security-related system details). Security requirements should be incorporated into contract documents where feasible to ensure enforceability.

### General

For many years, various departments have been using portions of the construction specifications from the G1-029 Secure Room Guide <sup>1</sup> to construct walls around departmental space (e.g., in office towers), working

spaces, operations rooms, High Security Zones, etc.

This guide was developed specifically for the construction of a secure demising wall and to help avoid inappropriate use of the Secure Storage Room Guide (see note 1). Having a name, abbreviation, definition and guide number specifically for a Secure Demising Wall (SDW) also makes it easier to reference source material without confusion.

The wall design in this Guide is a tested and recommended light weight construction to adequately mitigate the design-basis threat against typical government offices in standard urban settings. It provides moderate resistance to force attacks (including those using portable cutting tools) and very good detection of such attacks (when approved vibration detection equipment is installed as recommended). This wall construction **is not** appropriate where a TRA has identified a need to provide an assured resistance to entry by sustained force attacks. UL-rated vaults or custom-designed barriers should be considered for such situations.

**Note 1** - The Secure Room Guide G1-029 was updated in 2013 and renamed the G13-01 Secure Storage Room Guide to better reflect its intended application.

## Application

Secure Demising Walls (SDW) are suitable for physically separating an Operations Zone from a Public/Reception Zone, or (when recommended in a TRA) to separate a Security Zone from an Operations zone or compartmentalize within a particular zone.

Secure Demising Walls facilitate detection and provide a delay to permit interception by an *appropriate* response within a reasonable time. It should be stressed that a rapid and appropriate response is key to the effectiveness of any delay and detection/ alarm security system.

## Sound Reduction

An SDW was not designed for speech security and should never be the separation between a Sensitive Discussion Area (SDA) and a Public Zone. An SDA should be a room located in a Security Zone (whose perimeter walls may be a SDW).

However, sound reduction should normally be included to reduce nuisance noise and minimize the opportunistic overhearing of conversations which - although not classified - may still be considered sensitive.

Construction resulting in an STC of 54-55 dB is generally adequate for SDW applications.

The following assembly will provide an STC rating of approximately 54-55:

- Two layers of 16 mm fire-rated gypsum board
- One layer of sheet or expanded mesh steel
- Steel studs spaced 300 mm oc
- 150 mm thick glass fiber batts between studs
- Resilient metal channels spaced 400 mm apart
- One layer of 16 mm fire-rated gypsum board

This rating is for the wall assembly without pass-throughs or gaps. Acoustic caulking must be applied between the gypsum board and all adjacent surfaces to prevent sound leakage through spaces and gaps.

Doors installed with typical commercial seals (or acoustic seals improperly installed or adjusted) will generally not provide better than 35 dB sound reduction even when the doors are acoustically rated. As the

intent of a SDW is not acoustic isolation (and many applications will involve commercial architectural doors and windows for visibility, public impact and accessibility), this should not be an issue. Vestibules can be helpful.

## **Fire Protection**

Double panel or Type X drywall sheets may be installed as required to meet fire code requirements. Friction fit (batt) insulation must be used. Sprayed-on insulation must not be used as it may interfere with the transmission of vibrations along the sheet steel.

## **Slab-to-Slab**

Secure Demising Walls should be slab-to-slab, i.e., from the finished structural floor to the underside of the structural roof /ceiling. Where roofs or floors are of wood or steel frame construction they should be steel reinforced the same as the walls. Where this is not feasible, other mitigation measures will be required. For guidance regarding the construction of a secure ceiling or floor, please contact the RCMP.

## **Secure Demising Wall Built Adjacent to Another Wall**

When building Secure Demising Walls adjacent to non-departmental walls (e.g. leased spaces where modifications to the existing walls are not permitted under the occupancy instrument), the protective material will need to be installed on the secure (inside) side of the wall and all electrical and alarm wiring should be in surface-mounted conduit.

## **Ducts and Other Service Penetrations**

Minimize ducts and service pass-throughs in Secure Demising Walls where possible. Do not locate pass-throughs in the Critical Attack Area around doors. Where pass-throughs are required, openings should be framed with studs to within 1" (25mm) of the pipe/conduit and the pipe or conduit secured to the stud framing at minimum two places. The wall protection material should be extended to within ¾" (20 mm) of the edge of the opening. Extend gypsum wall board to the edge of the pipe or conduit. Caulk all gaps with fire rated sealant. Recommended standard: ASTM E 814 (UL 1479) and CAN/ULC S115 or as required by the AHJ.

Where necessary to accommodate pipe or conduit movement or expansion, pipes and conduits may be enclosed in a close-fitting sheet metal sleeve and the sleeve mechanically fastened to the stud framing at minimum two places. Clearance between the sleeve and the pipe or conduit should be kept to a minimum and not exceed ¼".

Steel bars (see Figures 8 & 9) should be installed in ducts in Public or Reception Zones to delay access of a person through a duct. They may be omitted if it is determined in a TRA that it is not a viable threat due to other security controls. Note that Man Bars do not prevent possible destruction, modification or interruption to assets within by introduction of water or other material through a duct. If a TRA identifies such threats, all ducts and openings may require additional mitigation measures (e.g.: filters or dampers).

## **Vibration Detector**

While the sheet steel on the walls provides moderate force resistance, one of the main reasons for the steel sheets on the wall is to transmit vibrations from force attacks to vibration sensors. A volumetric intrusion detection sensor (e.g. motion sensor) located in the room or space is also recommended, but will not detect the adversary until he/she has already defeated the SDW, doors, windows or components and gained entry. As the purpose of intrusion detection is to generate a response in time to intercept the adversary, detection only upon entry reduces the available response time.

The RCMP has tested and approved a vibration detector for use with the SDW, which is listed in the G1-001 Security Equipment Guide (SEG). To ensure detection as per approval testing, the detectors must be installed directly on the steel at a stud/ joist using the base plates provided by the manufacturer.

Sensors should be spaced following the manufacturer's recommended spacing with at least one sensor per wall segment to ensure good attack detection. A sensor should also be installed on the door (in addition to a magnetic contact switch to detect if a door is opened surreptitiously) to ensure good detection of cutting or pounding attacks against the door/lock.

## **Doors, Locks and Windows**

Doors and windows installed in a SDW should provide moderate resistance to force attacks. Options may include: burglar-resistant glazing, security films, exterior security grilles or screens (typically of expanded metal mesh on steel frames) or lockable steel rolling window shutters. Due to the wide diversity of products and applications, the RCMP has not developed standard guidance for these items.

## **Statement of Requirements**

Where the department (client) is not also the Designer, a Statement of Requirements (SOR) should be developed to tell the Designer exactly what is required and to identify selected construction options from those presented in the General Specifications in Part II.

The SOR and all documentation leading to the selection of room or wall specifics should be considered sensitive and treated accordingly.

**Do not tell the designer why a selection has been made unless the designer has a need to know.**

# **PART 2 - SDW Construction Specifications**

**Note:** The specifications in this Part should be modified as required and incorporated into the Project Contract Documents by the Designer in accordance with client requirements (ideally outlined in a detailed SDW Statement of Requirements) and overall project and code requirements.

## **Wall Framing (Figure 1)**

Extend wall partition framing slab to slab.

Top and Bottom Tracks:

SSMA standard: 1- 5/8" x 6", 18ga (600T162-43); OR  
2" x 6", 18ga (600T200-43) (Preferred Option)

Secure top and bottom steel stud track to both slabs at 300mm oc using any expanding (preferably double expanding) mechanical fastener. Non-expanding (e.g. "Tapcon") screws are not acceptable.

Studs:

SSMA standard: 1- 5/8" x 6", 18ga (600S162-43: 33ksi); OR  
2" x 6", 18ga (600S200-43: 33ksi) (Preferred Option)

Space studs at 300 mm oc and secure to the top and bottom tracks with welds or rivets (not screws).

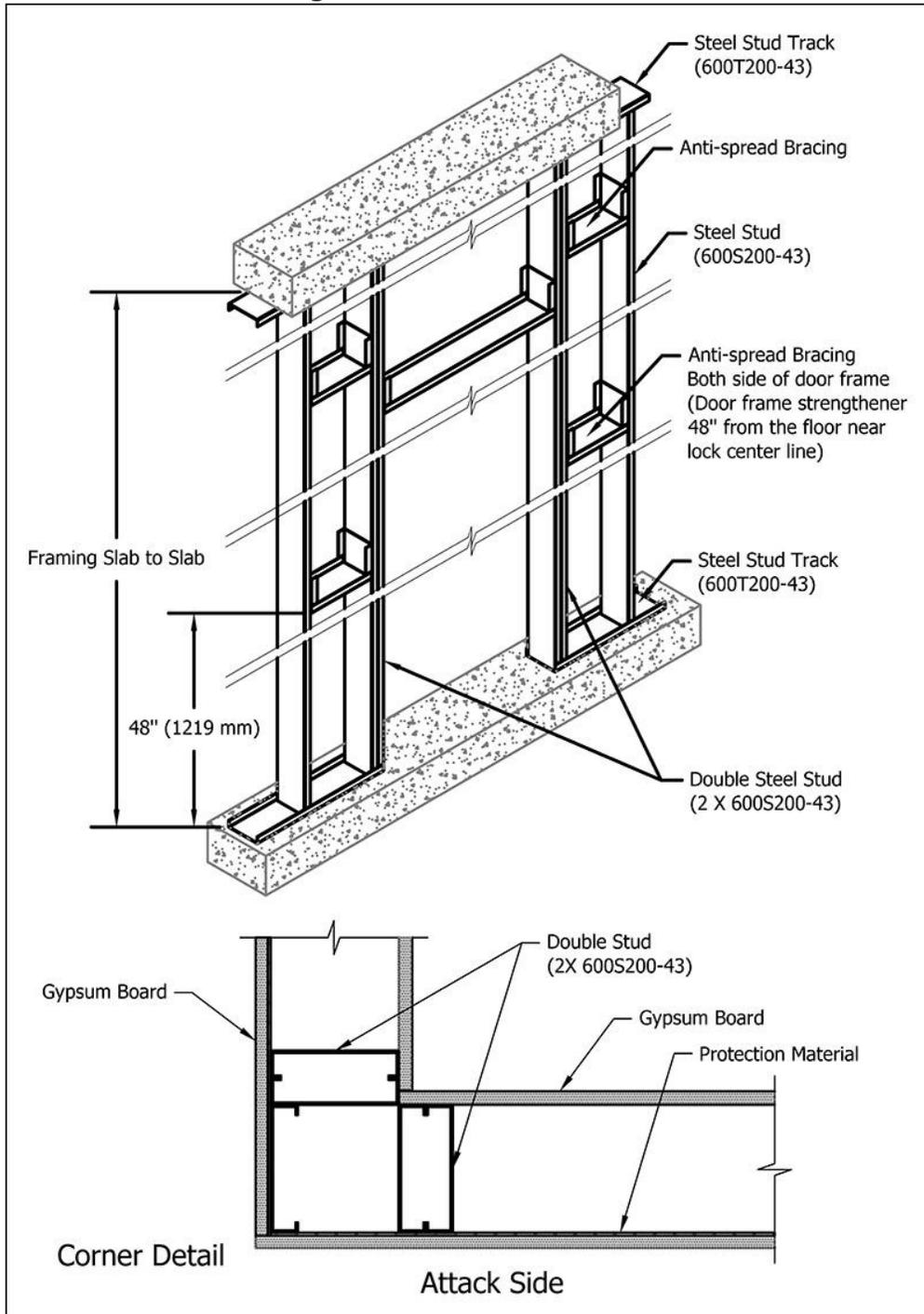
Install double (jamb) studs at the door frame opening. Install the door frame as per HMMA 840-07, part 3 A, B, C, D and E (except that screws shall be replaced with steel rivets).

Install anti-spread bracing approximately 48" from the bottom of the wall between the door frame double stud and the adjacent stud on both sides of the frame.

Construct wall corners with double studs.

**Notes:** Leaving a small gap and using drywall sheets to brace frame sections during wall erections is permitted provided steel sheets on the attack side are continuous over all gaps.

**Figure 1: Wall Construction**



## Wall Protection Material (Figures 2 to 5)

Wall protection material may be one of two options:

**Flattened Metal Mesh:** To EMMA 557-99. Style  $\frac{3}{4}$ -9F: nominal strand thickness of 0.120" (0.108" to 0.132"). Diamond opening of 0.563" x 1.688".

OR

**Sheet Steel:** 16 Ga, A1008 / A1008M (cold rolled) or A1011/ A1011M (hot rolled) or equivalent.

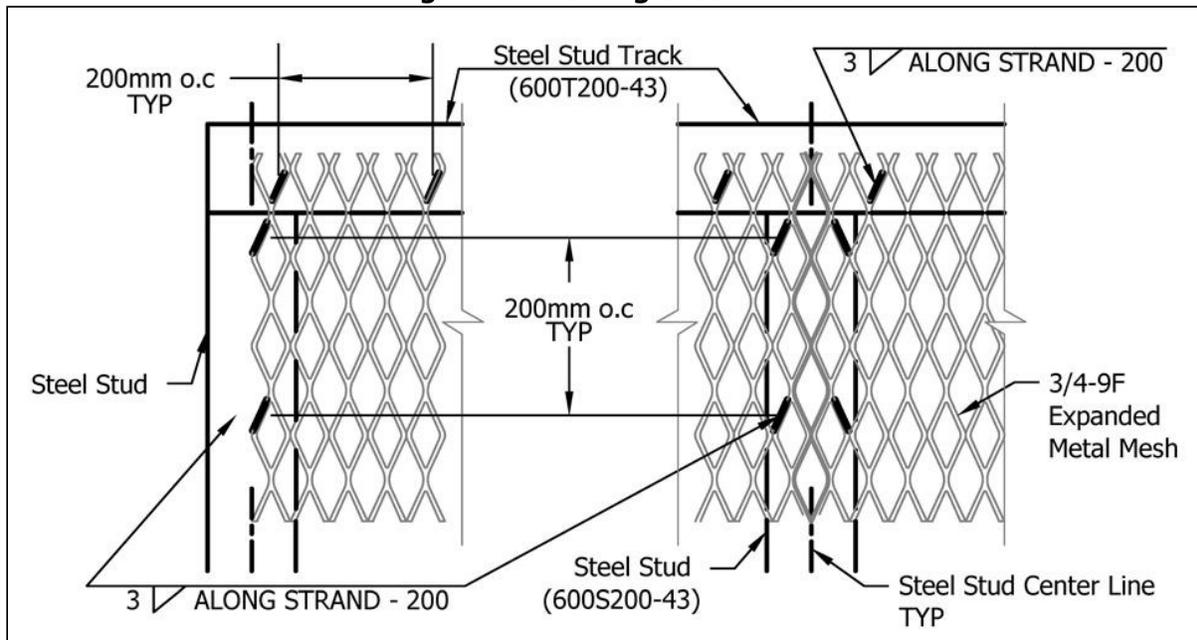
Mount on the outside (attack side) of the room. Support all edges by anti-spread bracing, studs or corners. Align the sheet edges at every vertical and horizontal seam on the centre line of the steel stud or anti-spread bracing and secure all sheets with welds or rivets.

**Note:** Screws (including "security screws") are **NOT** acceptable for permanently attaching the protection material (steel or steel mesh). Screws may be used to "tack" the sheets in place pending riveting or welding. Temporary screws do not need to be removed.

**Welding (Alternate Method)**

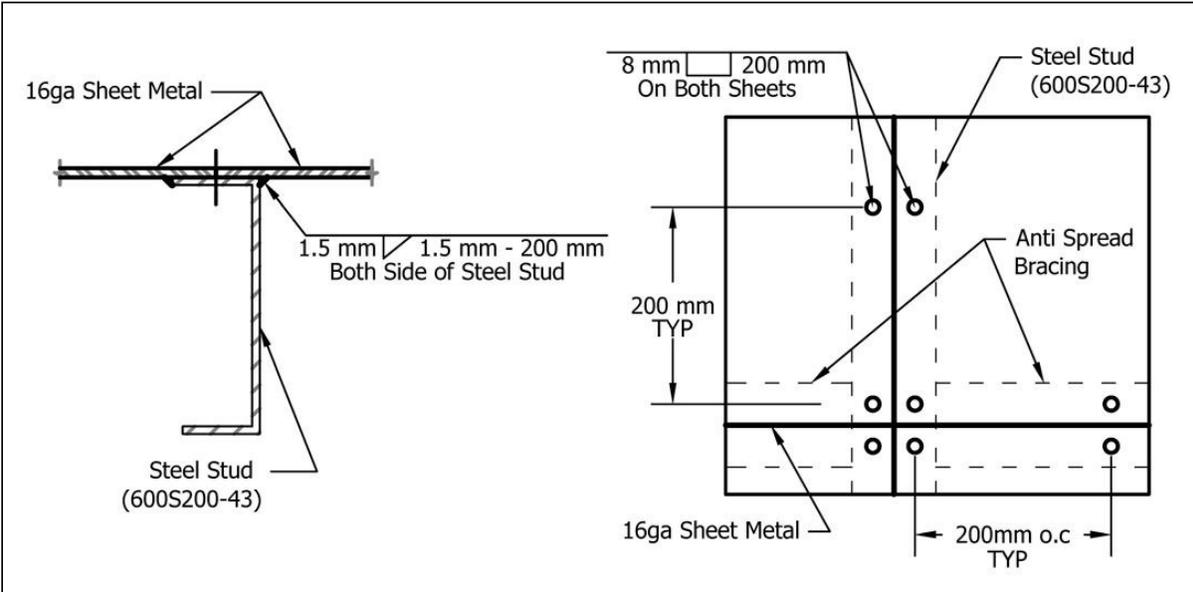
**Steel mesh (Figure 2):** 3mm fillet weld along the strand at 200mm oc

**Figure 2: Welding Steel Mesh**



**Steel Sheet (Figure 3):** 1.5mm fillet weld 15mm long at 200mm oc **OR** 8mm plug weld at 200mm oc

**Figure 3: Welding Sheet Steel**



**Rivets (Preferred Method) (Figure 4):**

**Steel sheet:** 3/16" steel rivets at 200mm o.c.

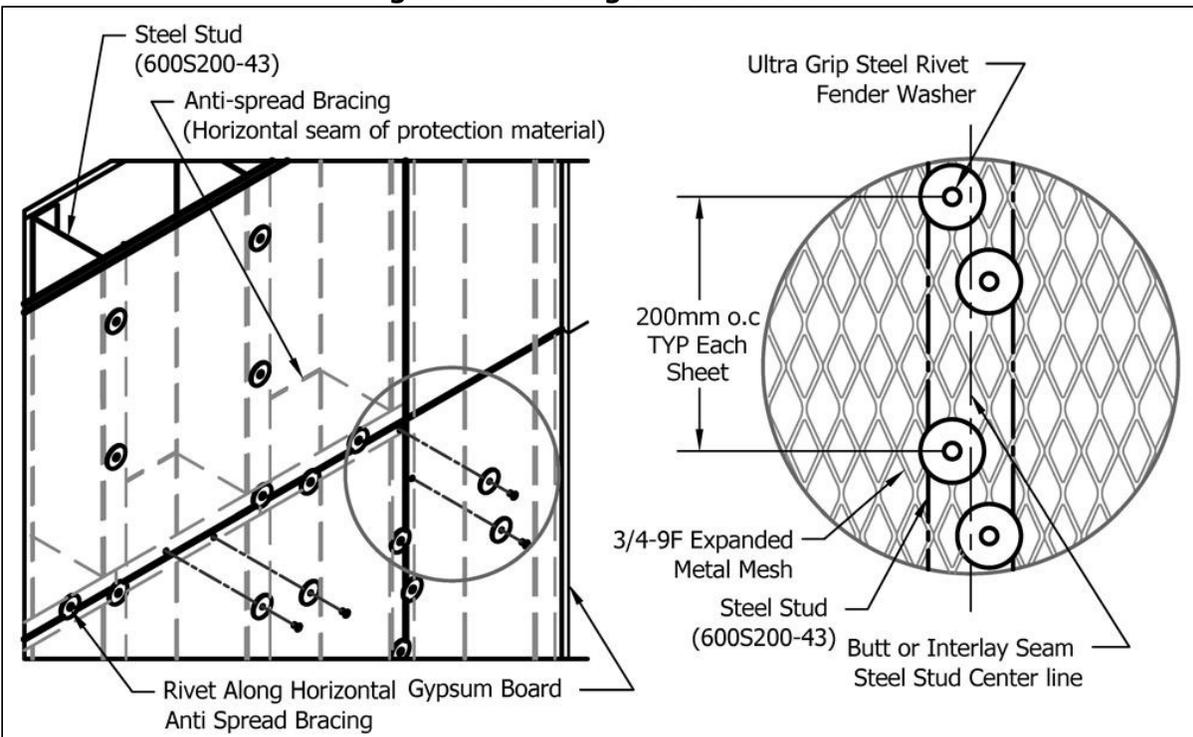
**Steel mesh:** 3/16" steel rivets and "fender" washer (1 1/2" OD, 3/16" ID) at 200mm o.c.

**Suggested material:**

Rivets: 3/16" steel pop rivet: Speaneur part #301-440

Washers: 1 1/2" OD, 3/16" ID "fender" washer: Fastenal part #1133204

**Figure 4: Riveting Sheet or Mesh**



**Steelemesh Interlay Seam (Figure 5):**

**Figure 5: Example of Mesh Interlay Seam, Riveted**

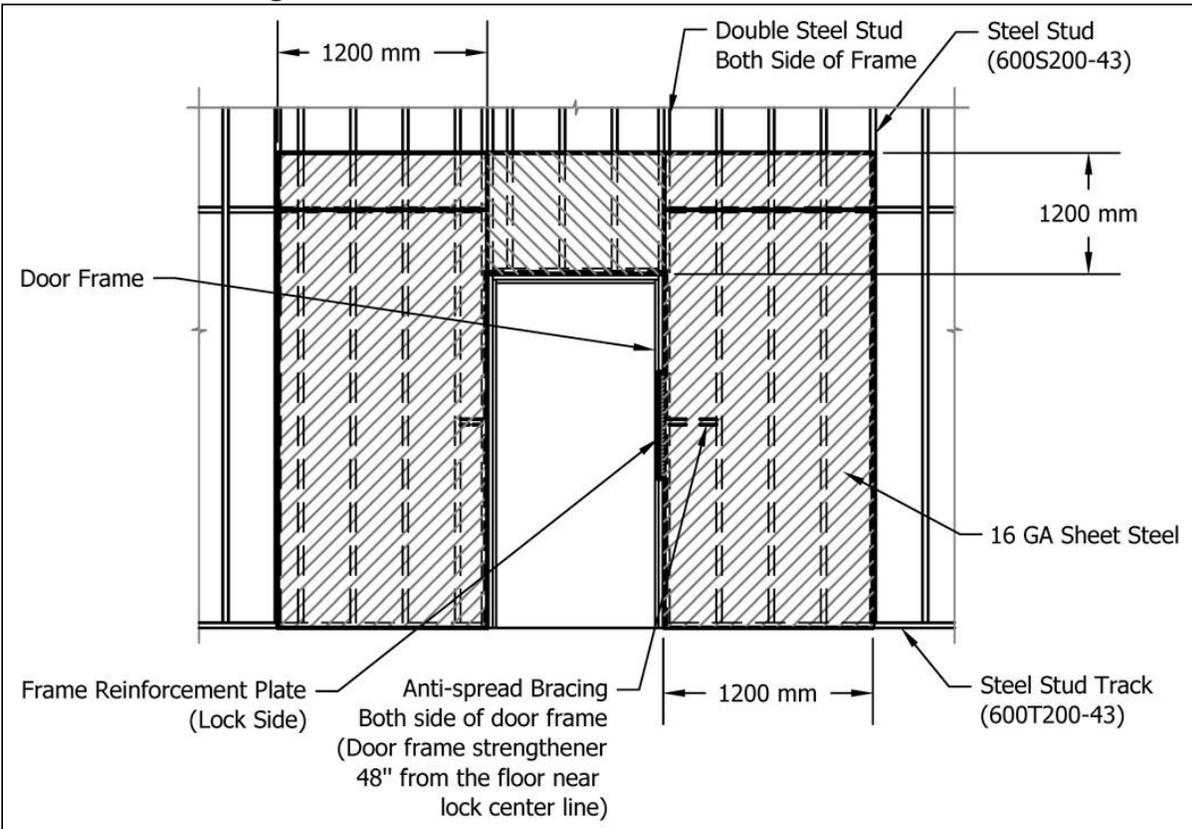


### **Critical Attack Area (Figure 6)**

Install 16 ga sheet steel on the inside of the room and extend 1200 mm from the edge of the door frame. Attach as per rivet or welding requirements for selected method.

**Note:** Perforations for services, conduits or ducts are not permitted in the Critical Attack Area.

**Figure 6: Critical Attack Area Wall Reinforcement**



### Wall Finishing Details

Attach drywall on both sides using standard drywall screws.

Apply fire-rated sealant continuously on both sides of the top and bottom of partition.

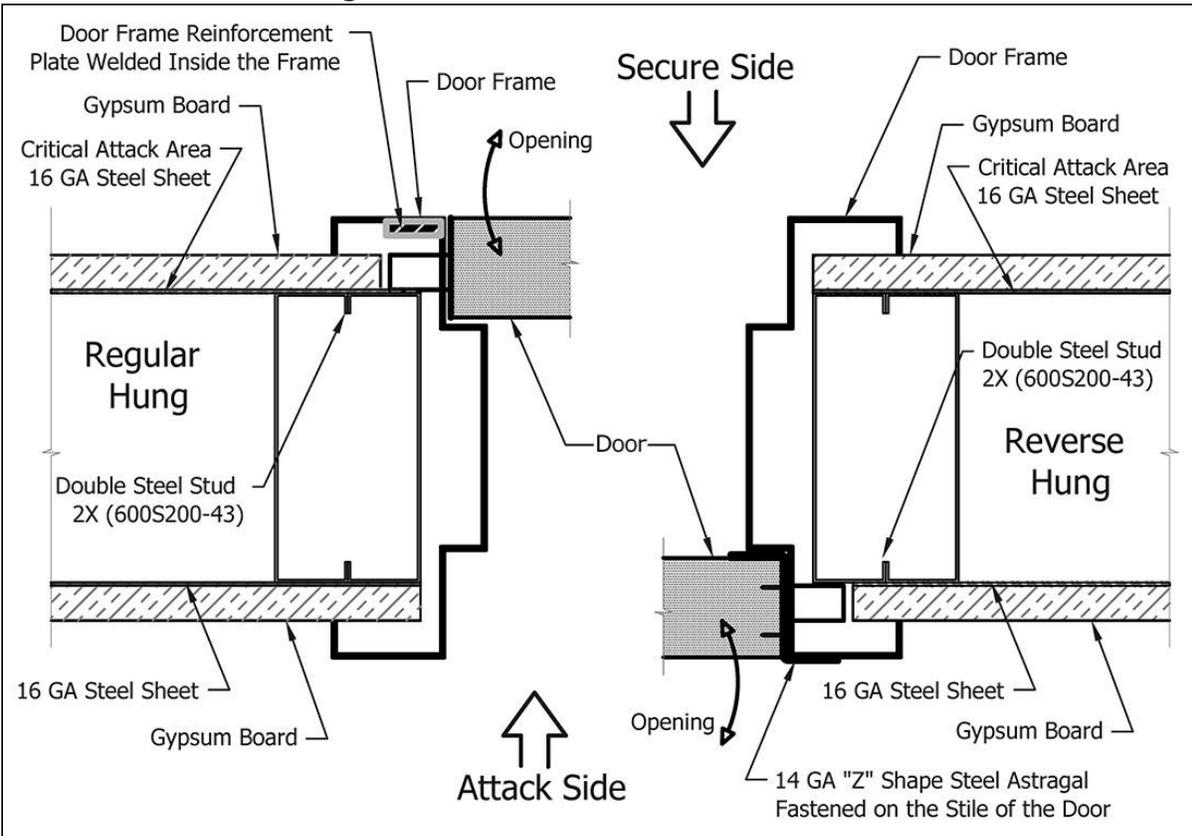
ASTM E814 (UL1479), ASTM E1966 (UL 2079) or CAN/ ULC S115 test standards with a fire/ smoke rating acceptable to the Authority Having Jurisdiction (AHJ).

Paint exterior surface of wall slab-to-slab. Paint must be uniform and without blemishes. Joints must not be visible. Recommended: 1 coat primer/sealer and 1 coat alkyd, gloss enamel conforming to CAN/CGSB-1.60.

### Frame reinforcement at Door (where appropriate) (Figure 7):

Secure a 6.4 mm x 25 mm x 610 mm steel plate inside the frame and align centre with the lock bolt.

**Figure 7: Frame Reinforcement at Door**



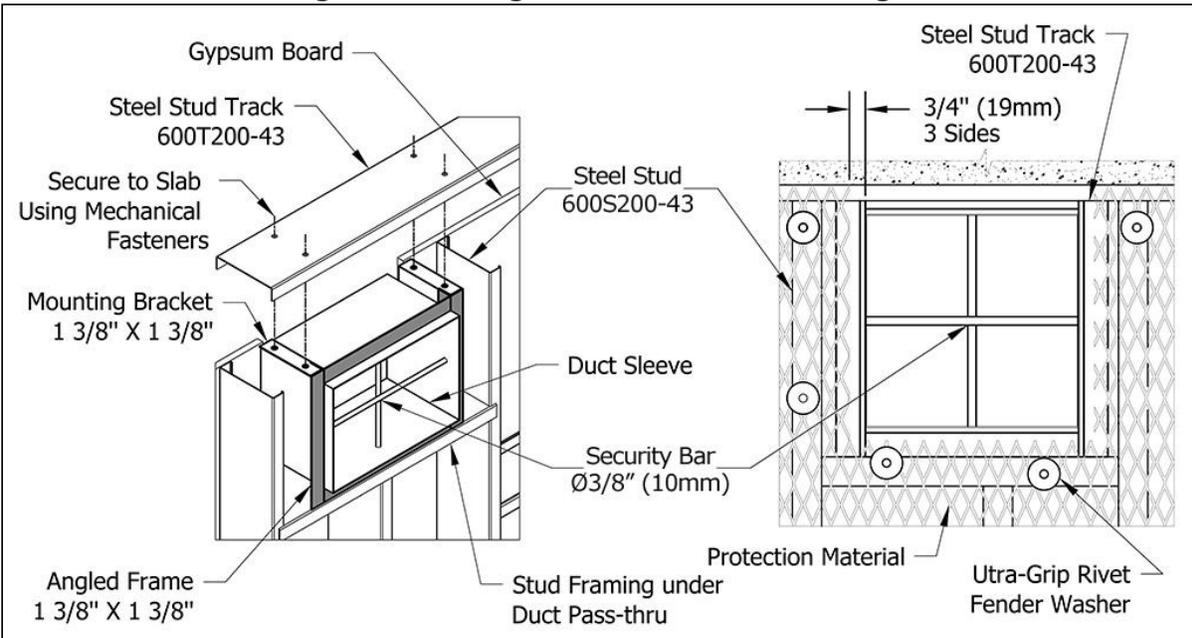
## Ventilation Duct Pass-throughs

**Note:** Where superior resistance to cutting is required, steel bars can be specified as tool-resistant steel (grade 1 or 2) per ASTM A627.

### Ceiling mount: (Figure 8)

1. The duct sleeve must be at least the same thickness as the duct passing through.
2. The overall dimension of the sleeve must be slightly greater than the duct.
3. Construct frames of 1- 3/8" x 1- 3/8" x 1/8" angle steel welded around duct sleeve (ceiling mount brackets are recommended).
4. Space 3/8" Ø steel bars at 6" oc and weld to the frame.
5. Secure the duct sleeve to the structural ceiling with mechanical fasteners.
6. Cut protection material 3/4" max from the edge of the duct opening (3 sides)
7. Apply fire-rated caulking between duct sleeve and finished wall.

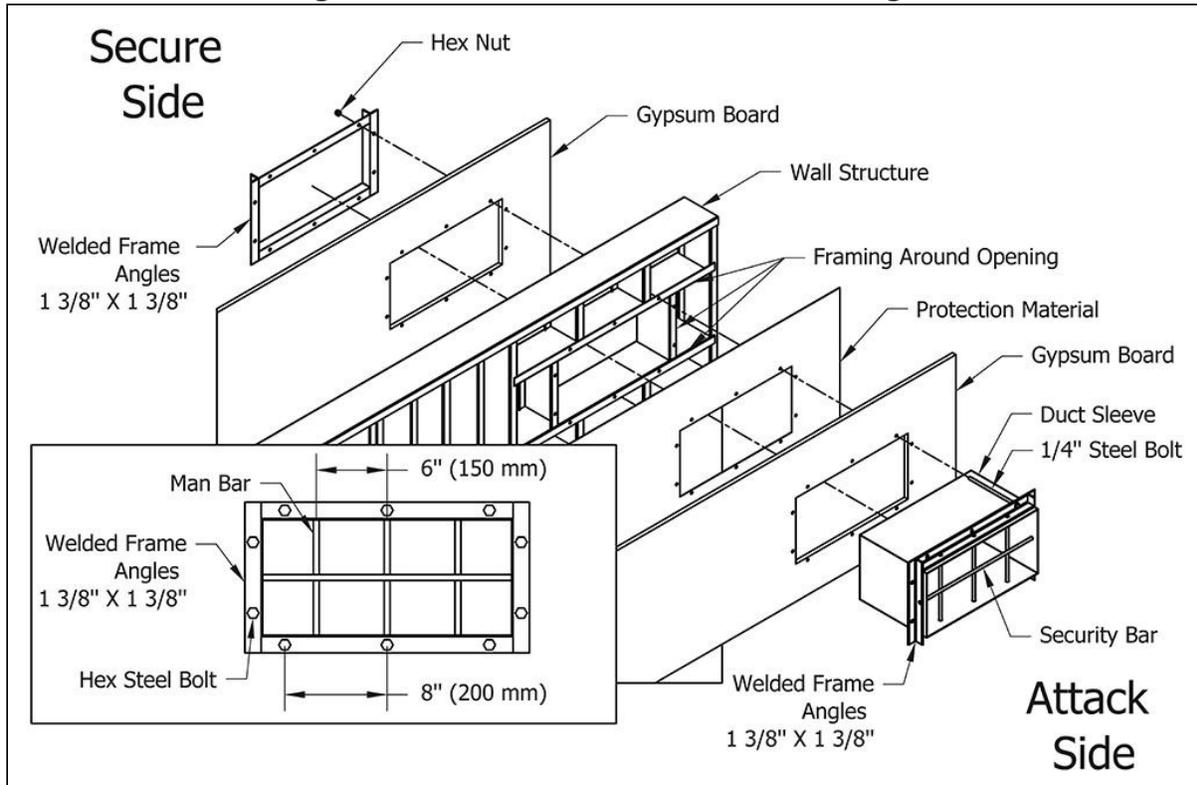
**Figure 8: Ceiling Mount Duct Pass-Through**



**Surface Mount: (Figure 9)**

1. The duct sleeve must be at least the same thickness as the duct passing through.
2. The overall dimension of the sleeve must be slightly greater than the duct.
3. Construct frame on each side of the wall of 1- 3/8" x 1- 3/8" x 1/8" angle steel welded around duct sleeve.
4. Space 3/8" dia man bars at 6" oc and weld to the frame.
5. Secure duct sleeve with 1/4" dia bolts and hex nuts (inside the room) at 8" oc around the outside duct sleeve. The bolt head shall be on the attack side and be welded in at least three places to the angle frame.
6. Framing around duct sleeve is required.
7. Apply fire-rated caulking between duct sleeve and finished wall.

**Figure 9: Surface Mount Duct Pass-Through**



## Advice and Guidance

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