SPECIFYING MASTER KEY SYSTEMS



Learning Outcome Statement:

Learn how to write proper masterkeying articles in part's 1, 2, & 3 of the section 008170

Understand the responsibilities of the architect, contractor and hardware supplier in the implementation of the specified masterkey system, based on the specification requirements

Learn how to write proper articles for patented keyways, security, specialty and high security cylinders

Discover the important reason why you need to be at the key meeting



At the conclusion you will be able to:

- Write effective articles that clearly describes the masterkeying requirements for any type project
- Properly describe features and specify specialty, patented keyway, security and high security cylinders
- Clearly understand the responsibilities of each party and communicate their responsibilities ensuring a secure masterkey system for the building owner
- Effectively communicate the specification requirements and lead a masterkey meeting for any size project



Cylinders & Master Keying

1AA 2AA 3AA

Safety Professionals

ONE of the most misunderstood items of door hardware!

AA AB AC AD AE MK MK

AA1 AB1 AC1 AD1 AE1 A1 KA OF KD

AA2 AB2 AC2 AD2 AE2 A2 KA OF KD

AA3 AB3 AC3 AD3 AE3 A3 KA OF KD

A DILEMMA

How to tell somebody something about keying when almost nobody knows what anybody wants.





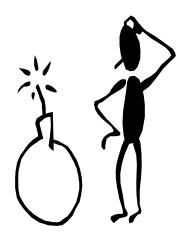
- The architect is thinking the supplier knows.
- The supplier is thinking the manufacturer knows.

WHEN IN FACT

■ It's the manufacturer who knows that it's the Owner who really does know!



■ What the Owner knows, is that someone didn't ask anything about their needs and they ended up with such a mess that nobody would know what's required.





■ The distributor thought their rep. would know how to transform what nobody knows...

Into something somebody in the manufacturer's key records dept. could fix.

WHEN IN FACT





- The key records dept. knows that nobody knows, and it leaves them with the task of telling those who have to know!
- Now everybody knows that the order is late and everybody is to blame!





"Hardware consultants render one of their most useful services by designing a practical and efficient keying system for a facility."

- Because the principles of keying are not understood by those outside the field of locks, a consultant's services are most valuable in guiding the organization of keying, so it will:
 - 1. Function properly
 - 2. Be easy to understand
 - 3. Be practical enough to survive years of usage
 - 4. Provide the security required by the user



Specifying a New Master key system in 08 71 00

- The Finish Hardware section within the construction documents will be a critical place for suppliers to have a better understanding as what is required for any type of projects master key system.
- Within each of the three parts of the specification are articles addressing keying requirements.



PART 1
GENERAL

1.01A Summary:

(To ensure that all cylinders and master keying needs are not included in other sections, you can include a simple article incorporating master keying)

Example:

"Provide all mechanical and electromechanical door hardware, and master key systems for swinging; wood, hollow metal, and aluminum doors".

1.01C Alternates:

(If the owner is asking for an alternate price to enhance the security level of the cylinder type, the request would come here along with references to DIVISON 01 and bid forms)

Example:

Refer to Section 01 23 00 – Alternates, for description of work under this section affected by alternates.

1.01D Allowance:

(This is used when the owner is furnishing their own cylinders and master keying services, keys and system accessories)

Example:

"Allow the sum as specified in Section 01 21 29 - Allowances for all cylinders and required master keying services and accessories as provided by the Owner."

1.02 References:

(There are several industry references for cylinders, and master keying - including this publication. Each one that is referenced within this section is required to be listed here, it is extremely important to include publication editions date)

Example:

"Use these references to estimate, schedule and furnish door hardware products including cylinders and master keying options".

Cylinder & Master Keying references;

- ANSI/BHMA A156.28, Recommended Practices for Mechanical Keying Systems, 2013 edition
- ANSI/BHMA A156.30, American National Standard for High Security Cylinders, 2010 edition

(Confirm that specified manufacturers meet this standard)

DHI Key System Design and Nomenclature, 2016 edition

1.03F Keying Schedule:

(Include instructions for the initiation of the key meeting, when it should take place, who should be in attendance and instructions on how the key schedule is to be laid out for review)

Example:

"Before locking devices, and cylinders are ordered, and upon approval of the door hardware schedule, initiate a key meeting to determine the final keying requirements under the supervision of a certified key systems consultant. At the completion of the key meeting submit four (4) detailed key schedules for approval: include, attendees, date of meeting, and approval signatures. Schedule to show Architectural door number, heading and hardware set number, locking mechanism(s), and its keyset symbol(s).

1.04C Preinstallation Meeting:
(During this meeting it will be critical to include instructions for the installers on how to read the approved key schedule to ensure the correct cylinders and the correct key set is installed on the right door)

Example:

"Include and review along with submitted material, the final key schedule and packaging markings to ensure proper placement of each master keyed cylinder".

1.05A Marking and Packaging:
(Special attention to detail is required here to ensure the marking on each lock or cylinder box corresponds with the approved key schedule and on the hardware schedule)

Example:

"Mark locks and cylinders to correspond with approved key schedule and the approved hardware schedule"

1.05B Jobsite Delivery:

(Here is where you want to address the delivery of key systems components and sensitive documentation effecting the key systems integrity in-addition to the other hardware requirements)

Example:

Cylinders packed with locking devices, example,

"Deliver locking devices with permanent cylinders in compliance with 08 71 00"

Cylinders packed separately; example, "Deliver permanent cylinders in a separate package in compliance with 08 71 00"

After the cylinders have been addressed the following example is required to address the balance of the systems components.

Ship permanent keys, software, and systems confidential information directly to the Owner via registered, return receipt requested, unless otherwise documented and agreed upon by the Owner.

<u>1.05C</u> Storage:

(If cylinders are packed or shipped separately provisions should be made to address the proper storage and accountability of them)

Example:

"Store cylinders in original packaging on shelving to provide easy access, and visibility of all marking, and organized to facilitate inventory procedures".

1.07B Extra Material:

(It is important to keep the material here to minimum amount to avoid expensive unaccounted cost. It is meant to include, but not limited to extra fasteners, installation tools etc. If a small number of key blanks are required here is a recommended article)

Example:

"Furnish 50 key blanks CALL OUT TYPE AND STYLE".

PART 2
PRODUCTS

2.02G.1 "Locking Devices"

Locks with cylinders:

- Be sure to use the correct prefix or suffix's to designate the correct type of cylinder for the locks specified.
 - If not here, then address them separately in a specific article;
 "Cylinders"

Locks less cylinders:

 When specifying locks less cylinders, you will be required to separately create an article; "Cylinders"

Auxiliary locking devices, Exit Devices, Hospital push/pull locks, key-switches, etc.

- Most of these types of locking devices will require a cylinder of some type that can be incorporated into a master key system.
 - The article "Cylinders" is where they will be specified, along with all the proper attachments, cams, collars and accessories.

Part 2 - Products 2.02G.2 "Cylinders"

To Include:

- If the cylinder is to be of the same manufacturer of the specified locking devices; or, of a different manufacturer.
- Include the correct compatible parts and accessories; i.e. Correct cams, tailpieces, cylinder collars to name a few.
- Number of pins.
- Type of cylinder mechanism; fixed core, or interchangeable; either large or small format.
- Key material and type of bow.
 - VKC or special stampings unless specified in 2.04 "Keying"

Lets take a look at an example.

2.02G.2 "Cylinders"

Conventional Cylinders

2.02G.2 (Non-interchangeable core)

Provide 6 pin fixed-core cylinders of the same manufacture of locking devices unless otherwise specified. Provide solid recessed cylinder collars for mortise and rim cylinders. Provide keys of nickel silver incorporating a large bow to accommodate stamping requirements as specified in 2.04 "Keying"

Manufacturer Model Number XXX

2.02G.2. (Interchangeable core)

Provide 6 pin small formatted interchangeable cores and housings. Provide compatible cams, tail-pieces and throw-members to each locking device. Provide solid recessed cylinder collars for mortise and rim housings. Provide keys of nickel silver incorporating a large bow to accommodate stamping requirements as specified in 2.04 "Keying"

Manufacturer Model Number XXX

Now, Let's take a look at a multi-level security cylinder specification.

2.02G.2 "Cylinders"

Patented Security Cylinders

2.02G.2

Panted keyway type cylinders:

Where specified provide fixed core type cylinders with a 6 pin utility patented keyway and keys that are available from authorized distribution. Provide solid recessed cylinder collars for mortise and rim cylinders. Provide keys of nickel silver incorporating a large bow to accommodate stamping requirements as specified in 2.04 "Keying" Manufacturer Model Number XXX

Security Cylinders (NOT – UL437)

Where specified provide fixed core security type cylinders with a 6 pin utility patented keyway and keys that are available from authorized distribution. Cylinder mechanisms to incorporate a utility patented second-locking design to prevent picking. Provide keys of nickel silver incorporating a large bow to accommodate stamping requirements as specified in 2.04 "Keying"

Manufacturer Model Number XXX

2.02G.2 "Cylinders"

Patented High Security Cylinders

2.02G.2

High Security Cylinders (UL437)

Where specified provide fixed core high security type cylinders with a 6 pin utility patented keyway and keys that are available from authorized distribution. Cylinder mechanisms to incorporate a utility patented second-locking design to prevent picking. Cylinder, plug, internal components to be of material that complies with UL-437 criteria to protect against drilling. Provide keys of nickel silver incorporating a large bow to accommodate stamping requirements as specified in 2.04 "Keying"

Manufacturer Model Number XXX

Note:

When specifying security or high security cylinders in an interchangeable core configuration check with your manufacturer to verify its grading according to ANSI/BHMA A156.5 Cylinders

2.04 "Keying"

Here is where you specify all the master keying requirements for the project.

Example:

Establish a new factory designed grand master key system for this project that will meet the owners requirements and future expansion consisting of 2 additional master key groups with a minimum of 100 changes. All keying to be done at the factory where permanent records will be established and maintained. Manufacture to have a minimum of 10 years experience in designing and maintaining master key systems and records. Provide construction master keying for all cylinders where the permanent key will void the construction master keying. Permanent keys bow to be stamped with visual key control markings and delivered directly to the owner upon completion via secured method where signatures can be confirmed and verified.

Furnish the following key quantities:

- 1 each top master key
- 4 each change keys per cylinder or 10 keys per keyed alike group
- 2 each master keys per master key group and selective master key if required 12 each construction master keys.
- NOTE- If interchangeable cores are specified, you will most likely require temporary cores. If specified,
- 2 each systems control keys
- 2 each temporary construction core control keys

Provide systems bitting list directly to the owner in the format required by the owner



2.05 "Key Control"

Here is where you specify Key Control requirements for the project. Example,

Provide a wall mounted key cabinet with sufficient size for this project and expansion to include an additional 100 keys. Provide a complete double tagged system to ensure proper key control initiatives suitable to the owners requirements. Permanent keys to be tagged and cataloged by the owner.

Manufacturer Model Number XXX

Provide key control software compatible with owners requirement along with any assistance or training as requested by the owner.

Manufacturer Model Number XXX



PART 3
EXECUTION

Part 3 - Execution

3.01 "Examination"

- Ensure cylinders are installed on the correct door
- Provide protection if cylinders are subject to wash-down instructions

3.03 "Field Quality Control"

- Ensure cylinders are installed properly and operate with the permanent change key and top level keys per the approved key schedule.
- If an interchangeable core system, here is where the temporary cores are to be replaced with the permanent core installed.
 Address who will be required to perform this function: Supplier, Owner, Contractor.

3.05 "Demonstration"

• Here is where you specify the requirement for the need to demonstrate and instruct the owner on the key system.

Conducting A Successful Key Meeting





SETTING UP THE CONFERENCE

A) Who should attend?

 Owner, (security, engineering, department heads), architects, contractor, distributor, possibly lock manufacturers representative, etc.)

Keep In Mind

■ The order for the locks, with conventional cylinders, cannot be placed with out the keying requirements. SO, it is important to have the meeting as soon as the hardware schedule is approved.

(exception: I.C. Core cylinders. WHY)



SETTING UP THE CONFERENCE

- If the supplier does not make the request, the Architect should require the Contractor to comply with the specifications if it calls for a Keying Conference.
- If no one requests one, the Owner should request the Architect to call one.
- Failure to obtain the information, results in the improper keying and extra expense to the Owner.



SETTING UP THE CONFERENCE

- Time and Place should be convenient to all jobsite, owners office, etc.
- What to bring; blueprints, plans, notes, and samples (especially of the lock with the trim design) to show the owner what was specified and what he is getting.



OWNER

- Should be prepared to discuss each and every door in the building.
- Should be prepared to discuss function and flow of the building.
- Should have had input from others prior to the meeting to determine internal interests, including security.



OWNER (con't.)

- Should tell the supplier if this will be a new key system or an extension of an existing one.
- If to be an extension, furnish supplier with manufacturer's proper identification.
- Should tell supplier of likes and dislikes of any existing buildings or suggestions for the current building.



OWNER (con't.)

- Should know the level of keying (department masters, area masters, floor masters, etc.) in order to satisfy the buildings needs.
- Should express an idea of how the building is to be divided if required.
- Should be prepared to know how many keys are required for each lock, masters keys, etc.

Lock and Key Survey

If you are in the field of BUSINESS ADMINISTRATION, EDUCATION or HOSPITAL ADMINISTRATION you may want to find out how many locks and keys you should CONTROL by distributing these survey sheets to department heads.

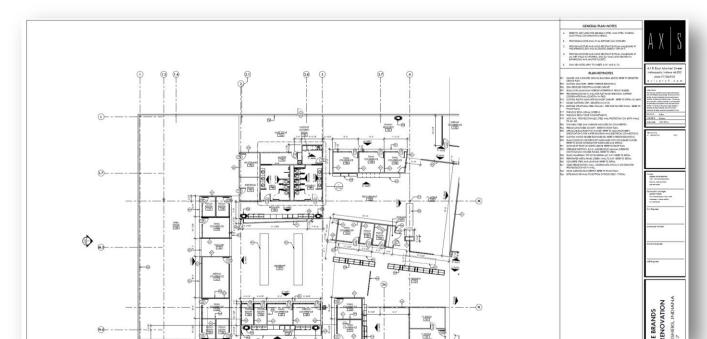
N,	Date
any /ey	Department
	Total Locks
	Ву

Items with Locks	Number of Locks	Hems with Locks	Number of Locks	Items with Locks	Number of Locks
Access Space		Doors (Exterior)		Mail Bags	
Air Conditioning	i	Entrance		Mail Boxes	
Alarms		Fxit		Money Bags	
Athletic Supplies	i			,	
Automotive				Penthouse	
, intollion to	i	Doors (Interior)		Plan Case	
	i	Cafeteria			
Blood Bank		Classroom			
Book Cases	i	Closet		Refrigerators	
Bulletin Boards		Connecting		Rolling Grills	
Dullcan Doards		Elevator		Roof Vents	
	l	Elevator Corridor		TROOF VEHICS	
Cabinets		Entrance		<u> </u>	
Electric		Fan Room		Safe Compartments	
Filing		Fire		Safe Deposit Boxes	
Instrument		Garage		Screens	
Kev		Office		Stop Sink Closet	
Kitchen		Storage Room		Switch Key	
Medicine		Storage Room		Switch Key	
Narcotics	!				
				Tabemacle	
Storage		Drawers			
Supply				Tanks (Oil & Gas)	
Suture Tool		Bench		Thermostat Trailers	
		Cash			
Wardrobe		Drafting Room		Trap Doors	
		Lab. Table		Trucks	
Camera Cases		Safe		Trunks	
Cash Boxes		Tool			
Cash Registers	ļ	Gasoline Pump		ļ	
Chute Doors		Gates		Valves	
Clocks				Vaults	
	ļ	Lockers		Į	
Dark Rooms		Employee			
Desks	ļ	Gym		Watchman's Service	
Display Cases		Paint		Box	
	ļ	Patients		[
Dispensers		Physicians]	
Sanitary Napkin		Student		X-Ray	
Soap		Teachers			
Towel		Tool Room		1	

Figure 12



- Hardware Supplier
 - To study plans, have overall knowledge of the building and master keying.
 - To be able to explain terminology, function of locks, exit devices, etc.
 - Should explain operation of every door with electric locking/unlocking.





- The people attending may not have a clear understanding of keying and keying terminology.
- The supplier should explain the use of the uniform key code symbols; explain to the owner the manufacturer's policy on keys, (especially concerning security, high security & patented keyway, blanks, hierarchy, etc. if applicable.
- Supplier should make owner aware of some type of in-house key control and it's importance as the distribution of the top level keys.



KEYING SYSTEMS AND NOMENCLATURE





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- Be prepared to discuss each and every door in the building to determine the proper function as well any suggestions as to the proper keying.
- The supplier should bring copies of the hardware schedule for everyone in attendance and explain how the flow of the schedule works.

■ The supplier should explain the function of the locks, exit devices, etc. when asked for clarification, to determine the owners requirements if different from the specs.



- Determine if special cylinders/keying is required.
 (Owner should be made aware of options available; i.e. I.C. core, patented keyways, security and high security cylinders, stand alone access control, etc. regardless of the specifications.)
- If patented keyway cylinders, security or high security cylinders are required, supplier should explain the manufacturer's policy including limited distribution of key blanks, authorized signatures, special order forms, etc.



OWNERS QUESTIONS

- Is the project construction master keyed?
 - If YES, how is this accomplished?
 - If NO, how do I protect the new keys?
- Difference between; patented keyway, security & high security cylinders
- Latest key control & key management products
- Is there a key system specialist available to assist me in evaluating my system.

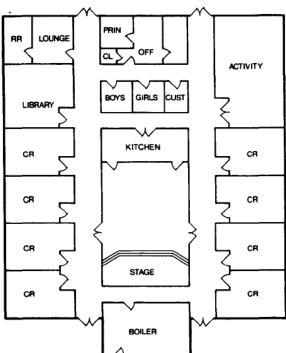


HELPFUL HINTS

Avoid cross keying a convenience that effects security, control, available changes, and expansion of system, possible key interchange.

Key the building not the people.

Keep it simple.





FINAL MEETING

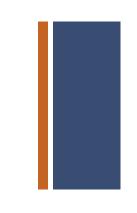
- A final keying schedule should be presented for review and acceptance.
- Copies should be available to all concerned. In addition, supplier should provide floor plan with key sets added as well as a keying schematic.
- The owner should approve the final keying schedule and sign off on it.



KEEP IN MIND

- A Master Key System Is A Convenience.
 - Not a Security System.
- The more levels of keying involved.
 - The less secure the system becomes.





Questions?



