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SMACNA's HVAC Bid Specification Reference Manual



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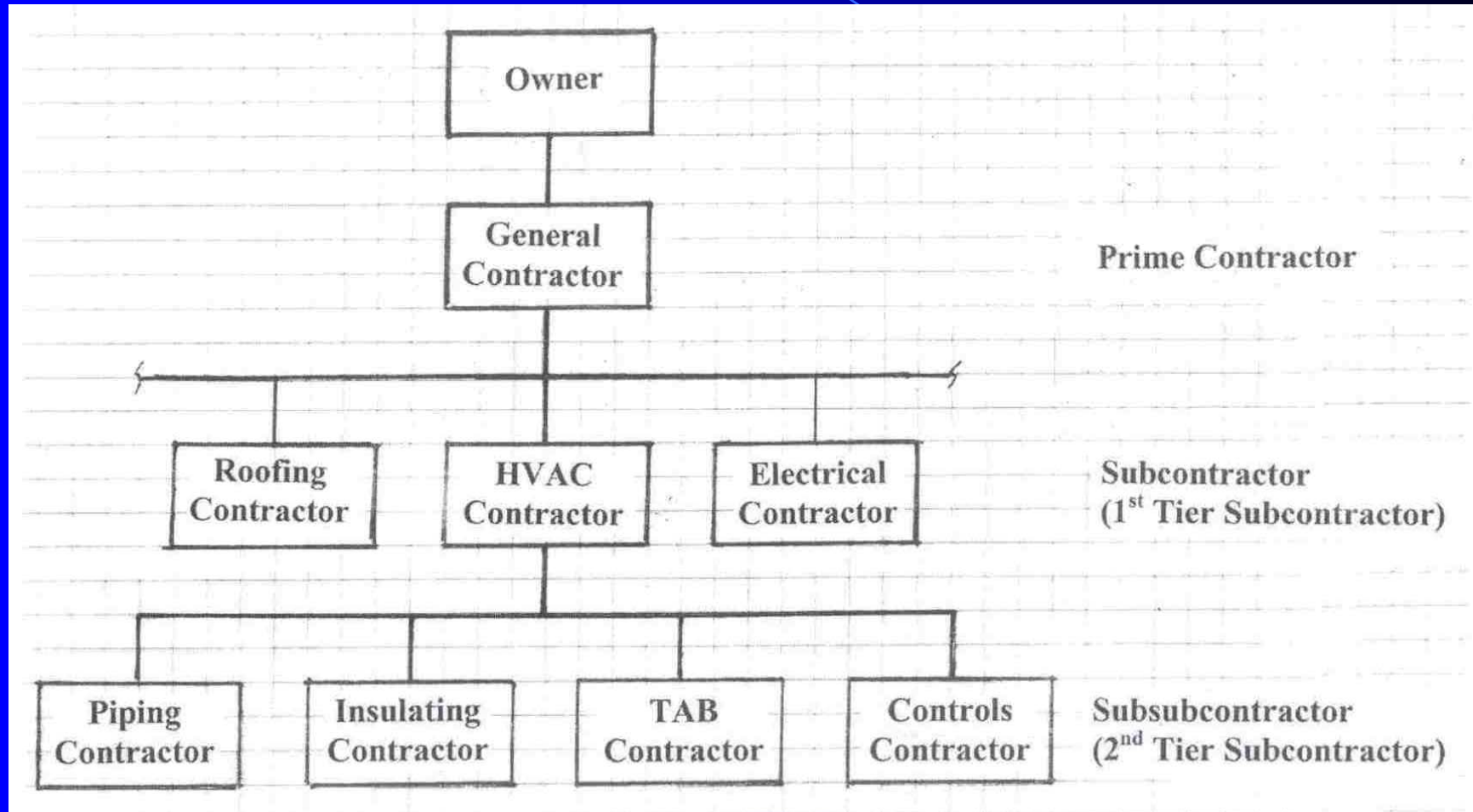
HVAC Contractor Defined

HVAC contractor is the firm that is responsible for the installation for the complete HVAC system in accordance with the scope of work defined by the contract documents.

HVAC Contractor Responsibilities

- Planning The Installation
- Procuring Materials & Equipment
- Determining Means & Methods
- Performing The Installation
- System Startup & Commissioning

Typical Project Organization



BSRM Purpose

The purpose of the BSRM is to assist the HVAC contractor in the preparation of its bid, the designer in the preparation of the construction documents including plans and specifications, and the owner in the preparation of bid and contract documents.

Use OF HVAC BSRM: Owner & Designer Outcomes

- Ensure complete HVAC bid package.
- More accurate bids.
- Smaller bid spread.
- Increased installation quality.
- More efficient installation.
- Reduced changes & disputes.
- Greater value.

Use OF HVAC BSRM: HVAC Contractor Outcomes

- Identify administrative and technical requirements that could impact the cost of performing the work.
- Identify potential problem areas to avoid.
- Prepare competitive bids that are complete that address all of the contract requirements.
- Reduce contractual and construction risk.
- Improve profitability.

HVAC BSRM Divisions

Division 00 Procurement & Contracting
Requirements

Division 01 General Requirements

Division 23 Heating, Ventilating, & Air
Conditioning

HVAC BSRM Parts

Part I Administrative Requirements

Part II Technical Requirements

HVAC BSRM – Part I

Administrative Requirements

- Section 1 Introduction
- Section 2 Project Contractual Requirements
- Section 3 Bidding Process & Procedures
- Section 4 CSI MasterFormat™ Overview
- Section 5 Project Procurement & Contracting (Div 00)
- Section 6 Project General Requirements (Div 01)
- Section 7 HVAC Suggested Work Categories
- Section 8 SMACNA Reference Publications
- Section 9 Scope Expansion Opportunities
- Section 10 Specification Issues

HVAC BSRM – Part II

Technical Requirements

23 00 00	HVAC System Requirements
23 10 00	Facility Fuel Systems
23 20 00	HVAC Piping & Pumps
23 30 00	HVAC Air Distribution
23 40 00	HVAC Air Cleaning Devices
23 50 00	Central Heating Equipment
23 60 00	Central Cooling Equipment
23 70 00	Central HVAC Equipment
23 80 00	Decentralized HVAC Equipment

What Are Specifications?

- Specifications are written instructions concerning project requirements.
- Drawings show what is to be built.
- Specifications describe:
 - How the project is to be constructed.
 - What results are to be achieved.

Drawings Defined

AIA A201/Paragraph 1.1.5

The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

Specifications Defined

AIA A201/Paragraph 1.1.6

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.

Specifications “Specify” Technical Requirements

- Materials
- Workmanship
- Operating Characteristics
- Other Characteristics

Types Of Specifications

- Descriptive (Open)
- Prescriptive (Closed)
- Performance

Avoid Mixed Specifications

Prescriptive Specification

The traditional method of specifying materials or techniques found in design-bid-build documents.

The range of acceptable products, manufacturers, and techniques, to be adhered to by the builder is stipulated in detail. Prescriptive specifications are often used by a design-builder to contract with trade contractors and vendors.

Design-Build Institute of America, "Design-Build Definitions,"
Design-Build Manual of Practice, Document Number 103, October, 1996.

Performance Specification

A specification expressed in terms of an expected outcome or acceptable performance standard. Often is used in design-build criteria to articulate the owner's requirements.

Design-Build Institute of America, "Design-Build Definitions," *Design-Build Manual of Practice*, Document Number 103, October, 1996.

Avoid Performance Specification Problems

*Always Ensure That There Are
Measurable Performance
Criteria Specified*

Codes & Standards

- Shorthand way of requiring minimum industry requirements.
- Codes and standards are often unique to each specification section.
- Codes and standards often available for all three specification parts: general, products, & execution.
- Know and understand the codes and standards.

Impact Of “Specs”

- Cost
- Schedule
- Quality

Faster - Better - Cheaper

Construction Quality: How Is It Defined?

*Quality is conformance to
established requirements.*

Construction Industry Institute (CII), Quality Management Task Force
definition.

The Associated General Contractors of America, *An Introduction To Total
Quality Management*, AGC of America, Washington, D.C., 1992, p. 12.

*Quality Is Determined By The
Contract Documents*

Contract Documents Defined

AIA A201/Paragraph 1.1

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement; these form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein.

Construction Contract

- Owner-Contractor Agreement
- Contract Conditions:
 - General
 - Supplemental
 - Special
- Drawings
- Specifications
- Addenda Issued Prior To Contract
- Other Documents Listed In Agreement
- Modifications Issued After Contract

Coordination Between Drawings & Specifications

- Drawings and specifications are meant to be complementary.
- What is called for by one is understood to be required by the other.
- Conflicts often resolved through document order of precedence included in the contract.

Order Of Precedence

- Construction contracts sometimes contain an order of precedence in the event that there is a conflict between contract documents.
- The order of precedence determines the requirements of which of the conflicting documents take precedence.
- AIA documents do not include an order of precedence. AGC documents do.

Sustainable Construction

LEED: Energy & Atmosphere

EA P1 Fundamental Building Commissioning

EA P2 Minimum Energy Performance

EA P3 Fundamental Refrigerant Management

EA C1 Optimize Energy Performance

EA C3 Enhanced Commissioning

EA C4 Enhanced Refrigerant Management

EA C5 Measurement & Verification

Example HVAC System Related Prerequisites & Credits

Sustainable Construction

LEED: Indoor Environ Quality

- EQ P1 Minimum IAQ Performance
- EQ P2 Environmental Tobacco Smoke (ETS) Control
- EQ C1 Outdoor Air Delivery Monitoring
- EQ C2 Increased Ventilation
- EQ C3.1 Const IAQ Mgt Plan: During Construction
- EQ C3.2 Const IAQ Mgt Plan: Before Occupancy
- EQ C4.1 Low-Emitting Mtls: Adhesives & Sealants
- EQ C4.2 Low-Emitting Mtls: Paints & Coatings
- EQ C6.2 Controllability Of Systems: Thermal Comfort
- EQ C7.1 Thermal Comfort: Design
- EQ C7.2 Thermal Comfort: Verification

Example HVAC System Related Prerequisites & Credits

What Makes A Good “Spec”?

- Project Specific
- Accurate & Consistent
- Up To Date
- Concise Language
- Coordinated With Drawings

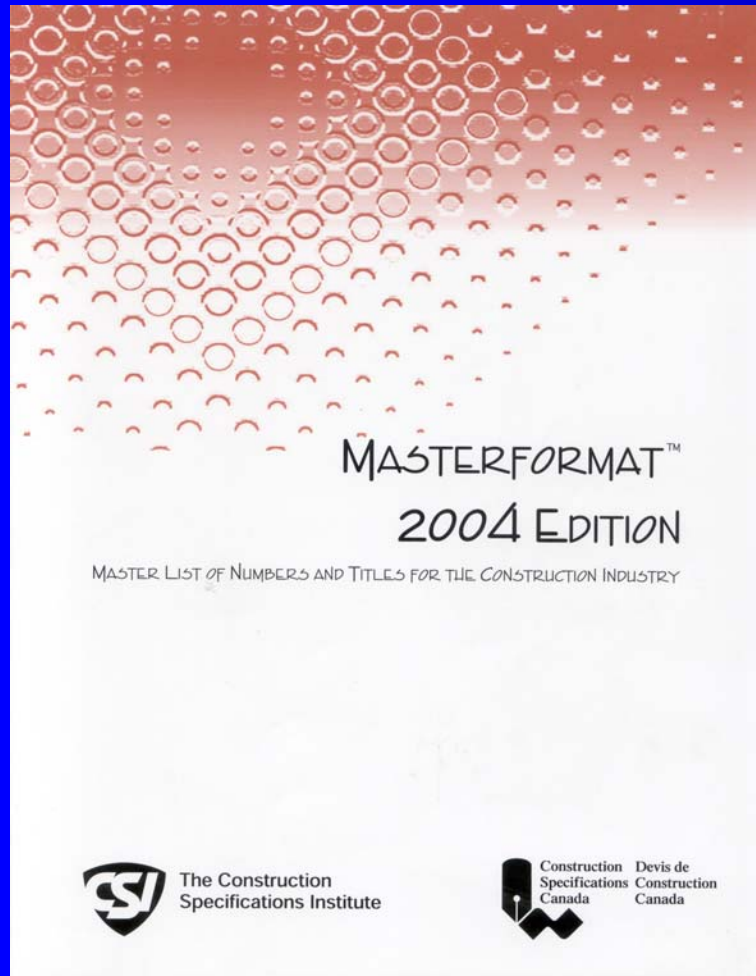
Know “Spec” Requirements



*Education is what
you get when you
read the specs ...*

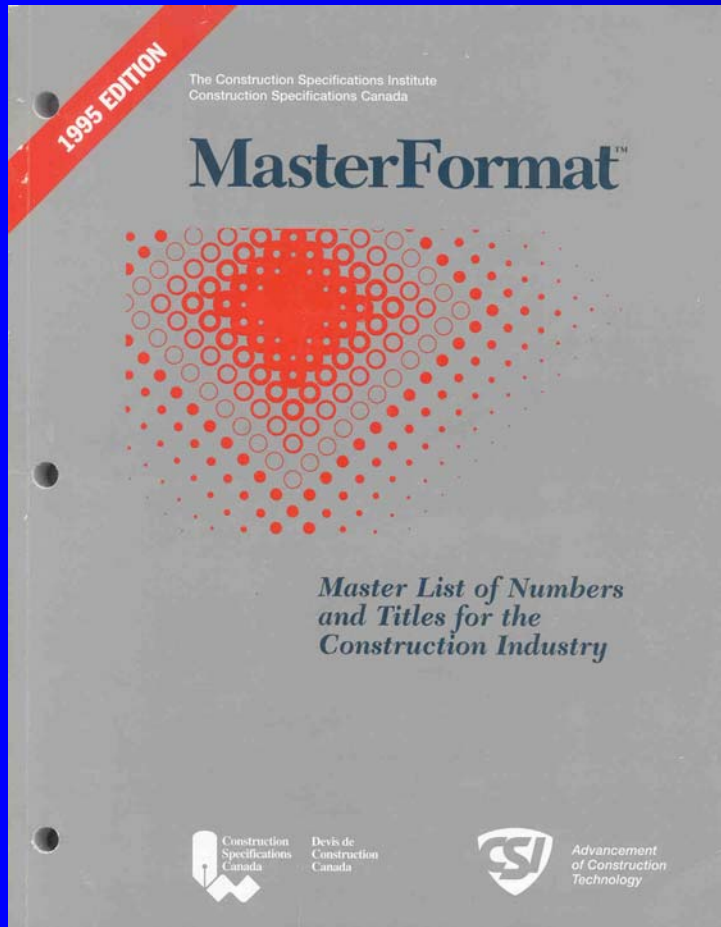
*Experience is what
you get when you
don't ...*

Construction Specifications Institute MasterFormat Background



- The Construction Specifications Institute (CSI) is a professional organization whose purpose is to promote better organization and communication of construction project information.
- *MasterFormat* is a trademark of CSI.
- *MasterFormat* is a list of numbers and titles for organizing information about construction requirements, products, and activities into a standard sequence.
- Current *MasterFormat* edition is the 2004 edition.
- *MasterFormat* organizes products and information into 5 groups and 33 major divisions (Level 1 titles).
- Sixteen division format was first introduced in 1963 and was expanded to 49 (16 for future use) in the 2004 edition.

Superseded CSI 1995 MasterFormat™ Former 16 Division Format



- Division 1 General Requirements
- Division 2 Site Construction
- Division 3 Concrete
- Division 4 Masonry
- Division 5 Metals
- Division 6 Wood & Plastics
- Division 7 Thermal & Moisture Protection
- Division 8 Doors & Hardware
- Division 9 Finishes
- Division 10 Specialties
- Division 11 Equipment
- Division 12 Furnishings
- Division 13 Special Construction
- Division 14 Conveying systems
- Division 15 Mechanical
- Division 16 Electrical

Old Divisions 15 & 16 = New Facility Services Subgroup

2004 CSI MasterFormat™ Hierarchy

Example: Rectangular Metal Ducts

CATEGORY	LEVEL	EXAMPLE	
		NUMBER	DESCRIPTION
Group	---	---	Specifications
Subgroup	---	---	Facility Services
Division	1	<u>23</u>	HVAC
Section	2	23 <u>31</u> 00	HVAC Ducts & Casings
Subsection	3	23 31 <u>13</u>	Metal Ducts
Sub-Subsection	4	23 31 13. <u>13</u>	Rectangular Metal Ducts
User Defined	5	23 31 13.13. <u>XYZ</u>	Internal Use (e.g. Acctg)

1995 CSI MasterFormat™ = 15810

Construction Specifications Institute Standard Specification Groups

- Procurement & Contracting Requirements Group
 - Procurement & Contracting Requirements (Division 00)
- Specifications Group
 - General Requirements Subgroup (Division 01)
 - Facility Construction Subgroup (Divisions 02 - 19)
 - Facility Services Subgroup (Divisions 20 - 29)
 - Site & Infrastructure Subgroup (Divisions 30 - 39)
 - Process Equipment Subgroup (Divisions 40 - 49)

CSI 2004 MasterFormat™

Procurement & Contracting Requirements Group

00 10 00	Solicitation
00 20 00	Instructions For Procurement
00 30 00	Available Information
00 40 00	Procurement Forms & Supplements
00 50 00	Contracting Forms & Supplements
00 60 00	Project Forms
00 70 00	Conditions Of Contract
00 80 00	Revisions, Clarifications, & Modifications

***Procurement & Contracting Requirements
Group Consists Of Only Division 00 –
Procurement & Contracting***

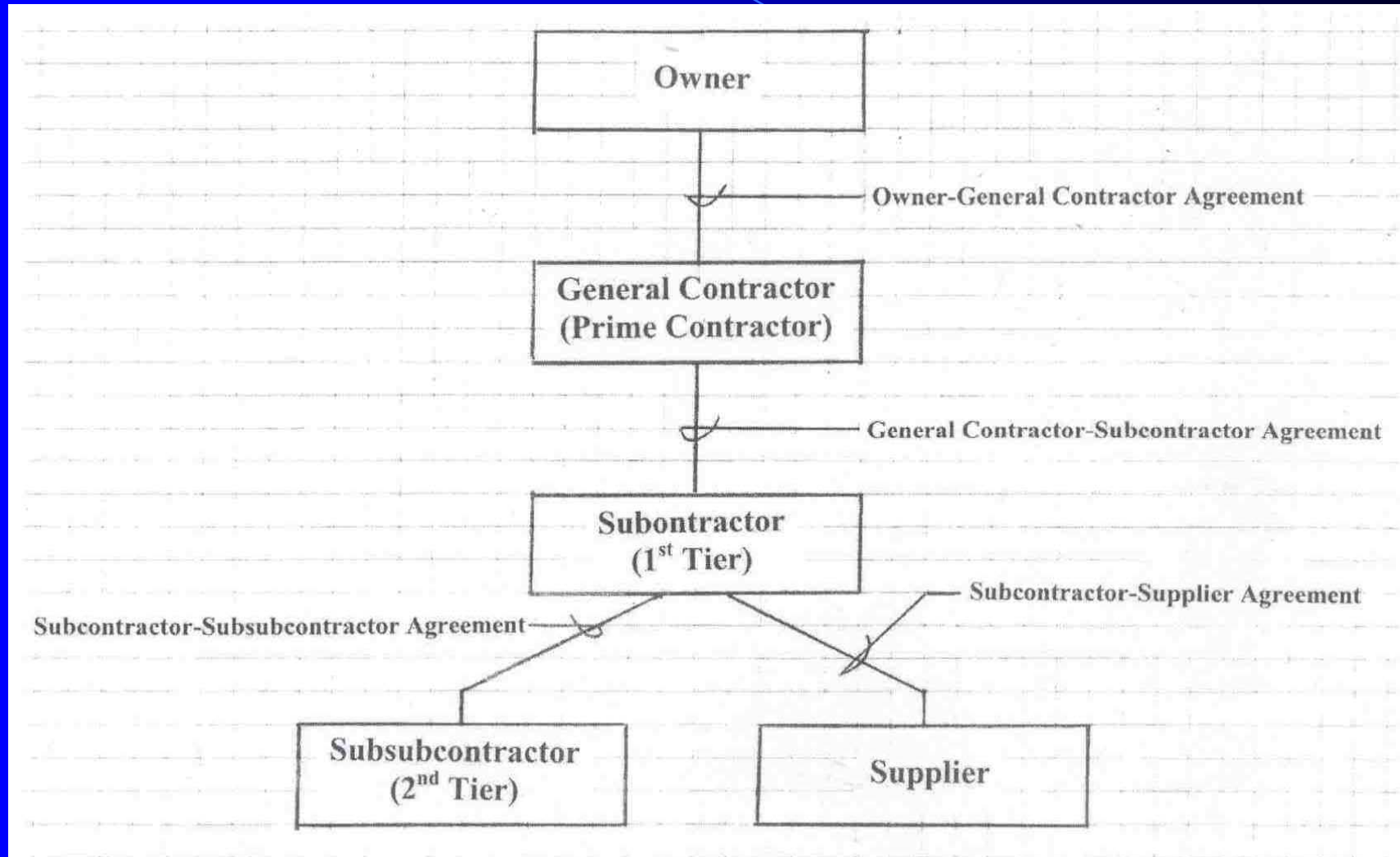
CSI 2004 MasterFormat™ Specifications Group

General Requirements Subgroup

01 10 00	Summary
01 20 00	Price & Payment Procedures
01 30 00	Administrative Requirements
01 40 00	Quality Requirements
01 50 00	Temporary Facilities & Controls
01 60 00	Product Requirements
01 70 00	Execution & Closeout Requirements
01 80 00	Performance Requirements
01 90 00	Life Cycle Activities

***General Requirements Subgroup Consists Of
Only Division 01 – General Requirements***

Construction Contract Chain



“Flow-Through Clause”

AIA A201/Paragraph 5.3.1

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner and Architect.

CSI 2004 MasterFormat™ Specifications Group

Facility Construction Subgroup

Division 02	Existing Conditions
Division 03	Concrete
Division 04	Masonry
Division 05	Metals
Division 06	Wood, Plastics, & Composites
Division 07	Thermal & Moisture Protection
Division 08	Openings
Division 09	Finishes
Division 10	Specialties
Division 11	Equipment
Division 12	Furnishings
Division 13	Special Construction
Division 14	Conveying Equipment

Architectural Sheet Metal

CSI 2004 MasterFormat™ Specifications Group

Facility Services Subgroup

Division 21 Fire Suppression

Division 22 Plumbing

Division 23 HVAC

Division 24 Reserved For Future Expansion

Division 25 Integrated Automation

Division 26 Electrical

Division 27 Communications

Division 28 Electronic Safety & Security

MasterFormat™ Breakout = Opportunity

2004 CSI MasterFormat™

Division 21 – Fire Suppression

CSI Level 2 Content

- 21 00 00 Fire Suppression General Requirements
- 21 10 00 Water-Based Fire Suppression System
- 21 20 00 Fire-Extinguishing Systems
- 21 30 00 Fire Pumps
- 21 40 00 Fire-Suppression Water Storage

2004 CSI MasterFormat™

Division 22 – Plumbing

CSI Level 2 Content

22 00 00 Plumbing General Requirements

22 10 00 Plumbing Piping & Pumps

22 30 00 Plumbing Equipment

22 40 00 Plumbing Fixtures

22 50 00 Pool & Fountain Plumbing Systems

22 60 00 Gas & Vacuum Systems For
Laboratory & Healthcare Facilities

2004 CSI MasterFormat™

Division 23 – HVAC

CSI Level 2 Content

23 00 00	HVAC General Requirements
23 10 00	Facility Fuel Systems
23 20 00	HVAC Piping & Pumps
23 30 00	HVAC Air Distribution
23 40 00	HVAC Air Cleaning Devices
23 50 00	Central Heating Equipment
23 60 00	Central Cooling Equipment
23 70 00	Central HVAC Equipment
23 80 00	Decentralized HVAC Equipment

SMACNA Guide Specifications Under Development

(Specifier Note: The purpose of this guide is to assist in correctly specifying sheet metal ducts and their installation. The Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) provides this guide for information purposes. The specifier needs to edit the guide to fit the needs of each specific project. Contact SMACNA or a SMACNA member for assistance with selections. Throughout this specifications guide, there are "Specifier Notes" to assist in the editing of the file. This guide follows the MasterFormat 2004 Section numbers and titles. Specifier needs to coordinate these numbers and titles with sections included for the specific project.

SECTION 23 31 13

METAL DUCTS

PART 1 GENERAL

1.01 SECTION INCLUDES

(Specifier Note: Include only the information that is required for any specific project.)

- A. Rectangular metal ducts.
- B. Round, spiral, and flat-oval ducts.
- C. Metal duct fittings.
- D. Duct liner.
- E. Hangers and supports.
- F. Sealants, tapes and gaskets.

1.02 RELATED SECTIONS

- A. Section 01 33 00 – Submittal Procedures.
- B. Section 01 33 23 – Shop Drawings, Product Data, and Samples.
- C. Section 01 60 00 – Product Requirements.
- D. Section 01 73 00 – Execution.
- E. Section 01 78 23 – Operation and Maintenance Data.
- F. Section 01 78 39 – Project Record Documents.
- G. Section 01 91 13 – General Commissioning Requirements.
- H. Section 07 90 00 – Joint Protection.
- I. Section 09 97 13 – Steel Coatings.

Project Name/Project Number/

23 31 13 - 1

METAL DUCTS

23 31 13 Metal Ducts

23 33 13 Dampers

23 33 19 Duct Silencers

23 33 23 Turning Vanes

23 33 33 Duct Mtd Access Doors

23 33 43 Flexible Connectors

23 33 46 Flexible Ducts

2004 CSI MasterFormat™

Division 25 – Integrated Automation

CSI Level 2 Content

- 25 00 00 Integrated Automation General Requirements
- 25 10 00 Integrated Automation Network Equipment
- 25 30 00 Integrated Automation Instrumentation & Terminal Devices
- 25 50 00 Integrated Automation Facility Controls
- 25 90 00 Integrated Automation Control Sequences

HVAC Contractor Opportunity

21st Century Buildings

- Purpose of a building is to provide a controlled environment for occupants.
- Building is a collection of systems that provide a controlled environment.
- Systems' integration is the key to effective and efficient building operations.
- Buildings will be optimized as a system.
- Traditional approach: optimize building subsystems leaving building suboptimal.
- Building quality will be measured by its ability to efficiently support the activity it houses - not its utility bills.

MEP Systems Establish Environment

Words For Today ...

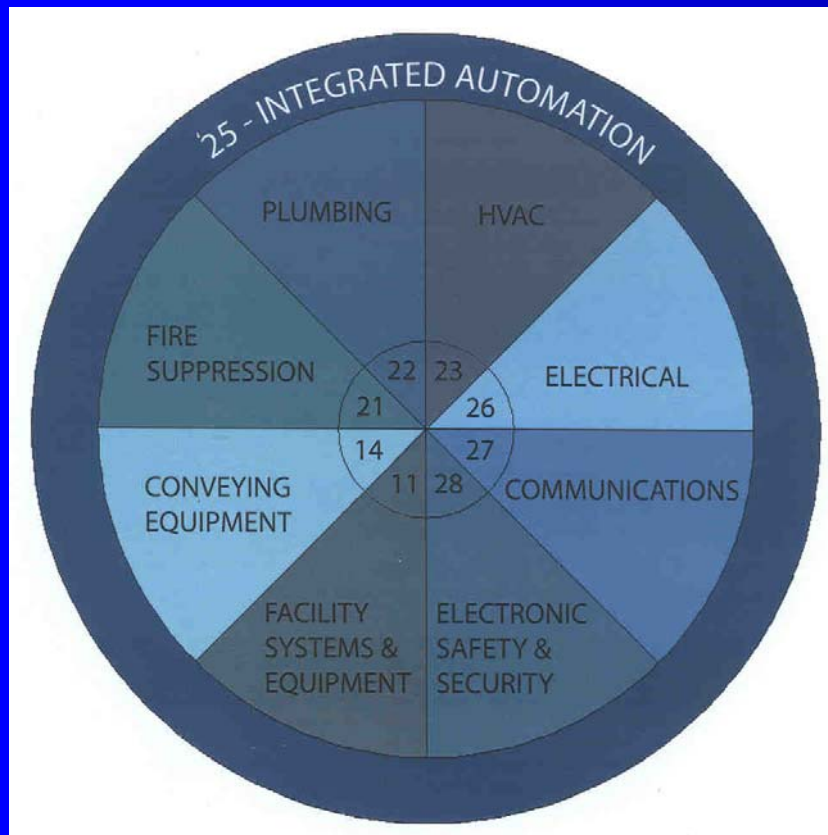


*Convergence
&
Interoperability*

New Challenge: Systems Integration

2004 CSI MasterFormat™

Division 25 – Integrated Automation Relationship To Other CSI Divisions



21 Fire Suppression

22 Plumbing

23 HVAC

26 Electrical

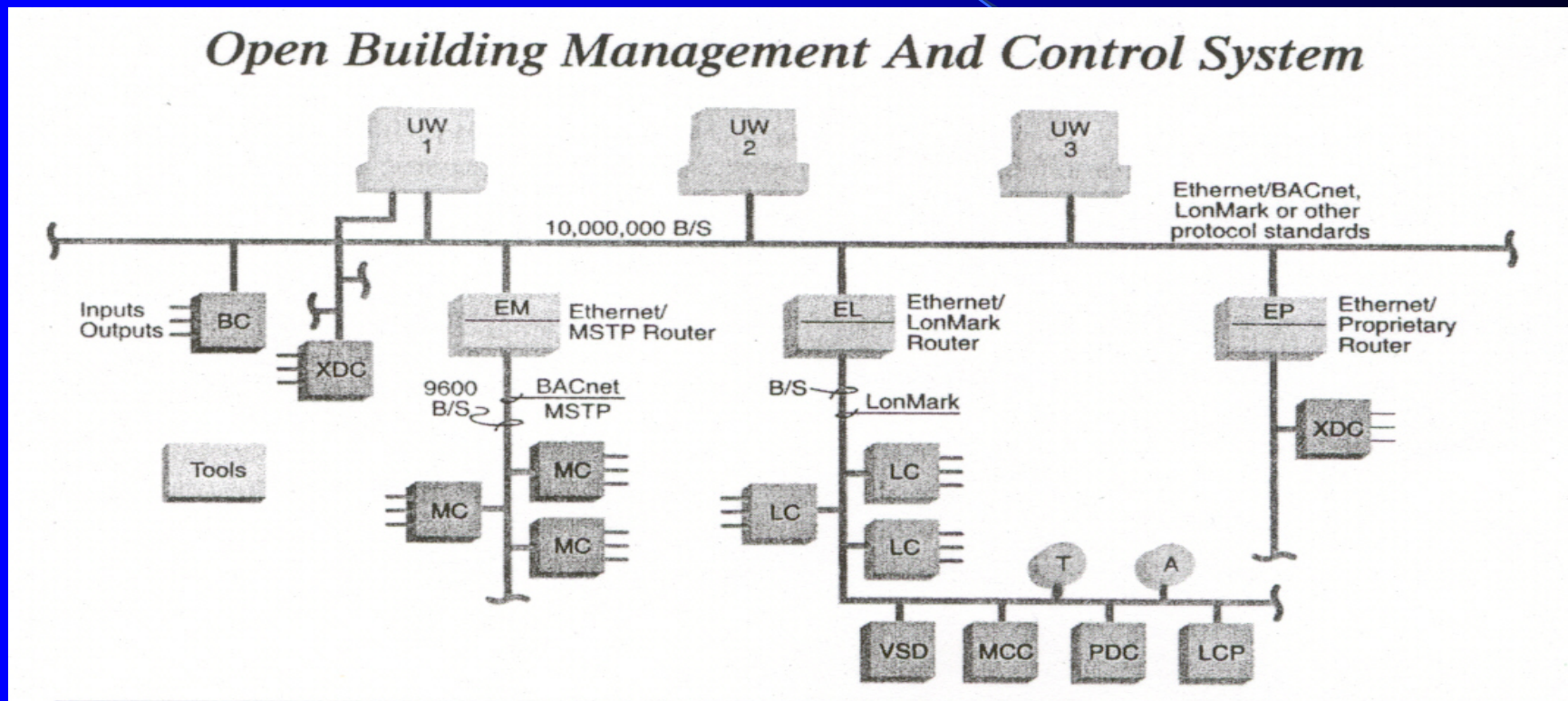
27 Communication

28 Safety & Security

11 Facility Systems & Equip

14 Conveying Equipment

Open Architecture Control Systems: LonMark & BACnet



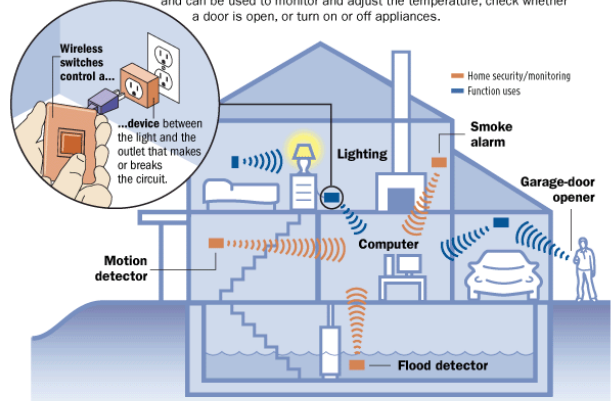
Benjamin Stein & John S. Reynolds, *Mechanical and Electrical Equipment for Buildings*, John Wiley & Sons, 2000, p. 484

ZigBee (IEEE Std 802.15.4)

Wireless Bldg Controls

Way Beyond 'The Clapper'

At home, ZigBee sensors and switches build a network of appliances that can talk to each other, and to a central computer. This technology is less expensive than Wi-Fi or Bluetooth, and can be used to monitor and adjust the temperature, check whether a door is open, or turn on or off appliances.




Wireless switches control a... device between the light and the outlet that makes or breaks the circuit.

Home security/monitoring
Function uses

Lighting
Smoke alarm
Garage-door opener
Computer
Motion detector
Flood detector

Air Traffic Control
How ZigBee compares to the two major wireless-networking technologies:

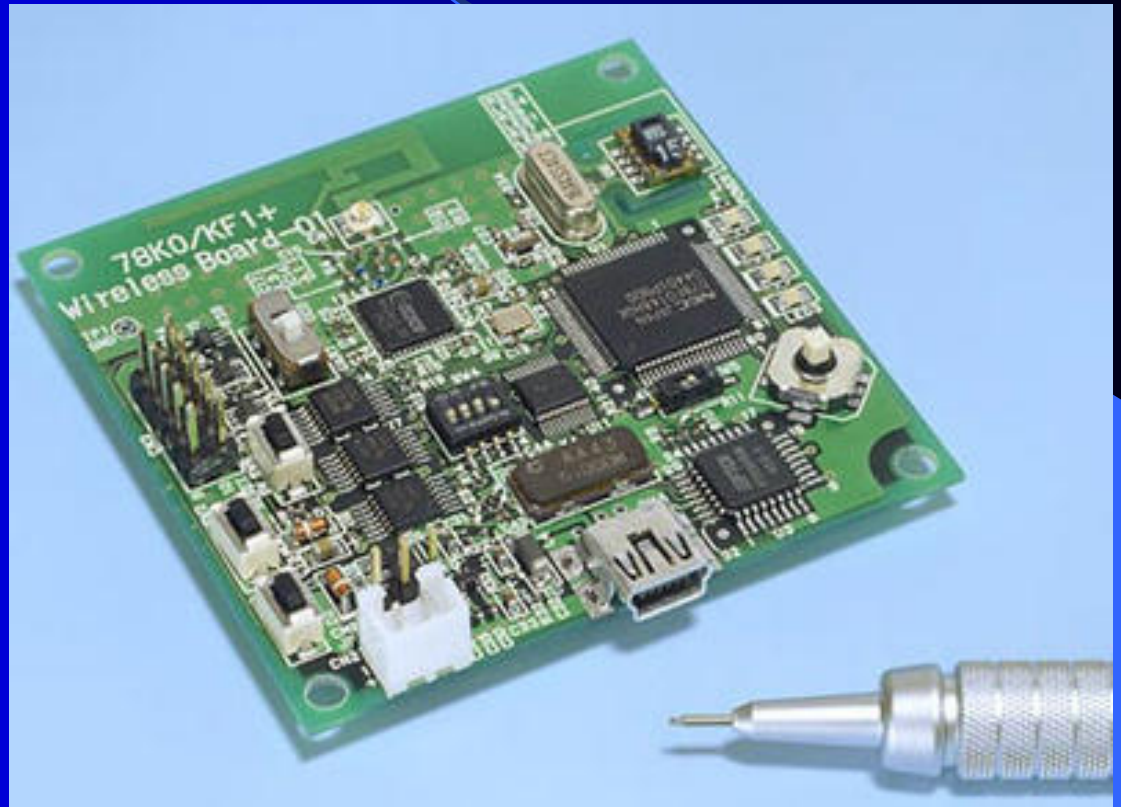
NAME	BANDWIDTH megabits/sec	BATTERY LIFE	USES
Wi-Fi	11.00	1-3 hours	Internet browsing, PC networking, video monitors
Bluetooth	1.00	4-8 hours	Hands-free cell phone, headsets, wireless print
ZigBee	0.25	2-3 years	Wireless switches and sensors, meter readings



Environmental use
Scientists planted sensors to monitor nesting conditions of **Leach's storm petrel**, left, a rarely-observed seabird.

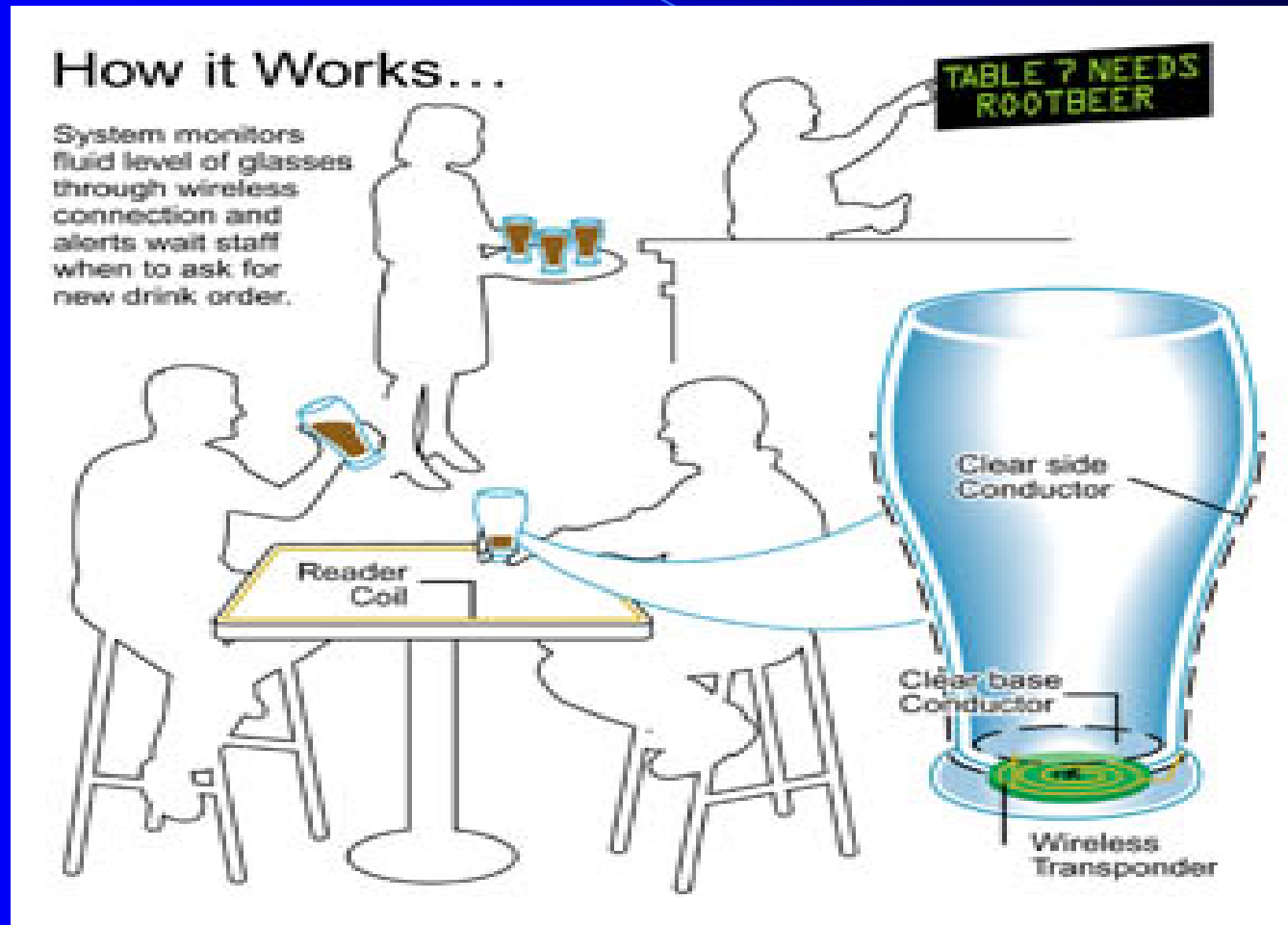
Agricultural use
A vineyard installed sensors that track climate changes to help predict when certain grapes are ready to pick.

Source: WSJ research
Rich Francione/The Wall Street Journal



Self-Organizing, Self-Healing Mesh Network

Mitsubishi “iGlassware”



Mitsubishi Electric Research Laboratories (MERL)
<http://www.merl.com/projects/iGlassware/>

2004 CSI MasterFormat™

Division 26 – Electrical

CSI Level 2 Content

- 26 00 00 Electrical General Requirements
- 26 10 00 Medium-Voltage Electrical Distribution
- 26 20 00 Low-Voltage Electrical Transmission
- 26 30 00 Facility Electrical Power Generating &
Storing Equipment
- 26 40 00 Electrical & Cathodic Protection
- 26 50 00 Lighting

2004 CSI MasterFormat™

Division 27 – Communications

CSI Level 2 Content

- 27 00 00 Communications General Requirements
- 27 10 00 Structured Cabling
- 27 20 00 Data Communications
- 27 30 00 Voice Communications
- 27 40 00 Audio-Video Communications
- 27 50 00 Distributed Communications &
Monitoring Systems

2004 CSI MasterFormat™

Division 28 – Electronic Safety & Security

CSI Level 2 Content

28 00 00 Electronic Safety & Security General Requirements

28 10 00 Electronic Access Control & Intrusion Detection

28 20 00 Electronic Surveillance

28 30 00 Electronic Detection & Alarm

28 40 00 Electronic Monitoring & Control

CSI 2004 MasterFormat™ Specifications Group

Site & Infrastructure Subgroup

Division 31 Earthwork

Division 32 Exterior Improvements

Division 33 Utilities

Division 34 Transportation

Division 35 Waterway & Marine Construction

CSI 2004 MasterFormat™ Specifications Group

Process Equipment Subgroup

- Division 40 Process Integration
- Division 41 Material Processing & Handling Equipment
- Division 42 Process Heating, Cooling, & Drying Equipment
- Division 43 Process Gas & Liquid Handling, Purification, & Storage Equipment
- Division 44 Pollution control Equipment
- Division 45 Industry-Specific Manufacturing Equipment
- Division 46 Reserved For Future Use*
- Division 47 Reserved For Future Use*
- Division 48 Electrical Power Generation

Industrial Sheet Metal

CSI 2004 MasterFormat™ Specifications Group Standard Specification Sections

- A specification section covers one or more segments of a project.
- Specification sections are included as needed to meet the project requirements.

CSI 2004 MasterFormat™ Specifications Group

Example Specification Section

23 64 00 Packaged Water Chillers

23 64 13 Absorption Chillers

23 64 13.13 Direct-Fired Absorption Chillers

23 64 13.16 Indirect-Fired Absorption Chillers

23 64 16 Centrifugal Water Chillers

23 64 23 Scroll Water Chillers

23 64 26 Rotary-Screw Water Chillers

CSI MasterFormat™ Intent

- It was never CSI's intention for *MasterFormat*™ to be arranged to correspond with specialty contractor and trade assignments.*
- The purchasing specialty contractor and the installing trade are not relevant to *MasterFormat*™ organization.
- The purpose of the *MasterFormat*™ organization is to link construction requirements between complementary documents.

*The Construction Specifications Institute, *MasterFormat*™ 2004 Edition: *Master List of Numbers and Titles for the Construction Industry*, 2004, p. 12.

CSI 2004 MasterFormat™

Discipline & Trade Jurisdictions

MasterFormat's organizational structure used in a project manual does not imply how the work is assigned to various design disciplines, trades, or subcontractors. MasterFormat is not intended to determine which particular elements of the project manual are prepared by a particular discipline. Similarly, it is not intended to determine what particular work required by the project manual is the responsibility of a particular trade. A particular discipline or trade is likely to be responsible for subjects from multiple Divisions, as well as from multiple Subgroups.

The Construction Specifications Institute, MasterFormat™ 2004 Edition: Master List of Numbers and Titles for the Construction Industry, 2004, p. 12.

SMACNA Contractor Opportunity Hierarchy

- Air Distribution Contractor
- HVAC System Contractor
- Mechanical System Contractor
- Environmental System Contractor

Air Distribution Contractor Scope Of Services

- Sheet Metal:
 - Fabrication
 - Installation
- Air Distribution Equipment:
 - Procure
 - Install
- HVAC Dry Systems (Portion Division 23)
- Second Tier Subcontractor
- Business As Usual

HVAC System Contractor Scope Of Services

- Air Distribution:
 - Sheet Metal
 - Air Distribution Equipment
- Piping
- Insulation
- Equipment (Wet)
- Water Treatment
- HVAC Controls
- Test & Balance

Self Perform Versus Subcontract

HVAC System Contractor: Advantages

- Establishes Firm As HVAC Expert
- Perform All Of CSI Division 23:
 - Greater Control Of Scope
 - Less Scope Overlaps & Gaps
- Higher On Food Chain:
 - First Tier Subcontractor
 - Closer To \$'s
- Potential Higher Profits
- Greater Control Of Schedule & Work Sequence
- More Project Opportunities
- More After-Installation Service Opportunities

HVAC System Contractor: Disadvantages

- Increased Contract Size & Scope
- Subcontract Procurement & Contracting
- Subcontract Management
- Wet-Side Equipment Procurement
- Multiple Trade Management
- System Performance Risk

Mechanical Systems Contractor

- HVAC (Division 23)
- Plumbing (Division 22)
- Fire Suppression (Division 21)

*Advantages & Disadvantages
Same As HVAC Contractor*

Environmental Systems Contractor

Scope Of Services

- Option #1:
 - HVAC Systems Contractor (Division 23)
 - Integrated Automation (Division 25)
- Option #2:
 - Mechanical Systems Contractor:
 - HVAC (Division 23)
 - Plumbing (Division 22)
 - Fire Suppression (Division 21)
 - Integrated Automation (Division 25)

Mechanical Systems Contractor Evolving From The Dry Side

- For Starters:
 - Self-Perform Your Traditional Work
 - Subcontract Other Work
- Gain Expertise:
 - Bidding Subcontracts
 - Forming Subcontracts
 - Managing Subcontracts
- Profitably Expand Your Firm's Scope Of Services

2004 CSI MasterFormat™

Scope Expansion Opportunities

Division 05 - Metals

05 10 00	Structural Metal Framing
05 20 00	Metal Joists
05 30 00	Metal Decking
05 40 00	Cold-Formed Metal Framing
05 50 00	Metal Fabrications
05 70 00	Decorative Metal

2004 CSI MasterFormat™

Scope Expansion Opportunities

Division 07 - Thermal & Moisture Protection

- 07 15 00 Sheet Metal Waterproofing
- 07 27 16 Sheet Metal Membrane Air Barriers
- 07 31 16 Metal Shingles
- 07 32 19 Metal Roof Tiles
- 07 41 13 Metal Roof Panels
- 07 42 13 Metal Wall Panels
- 07 46 16 Aluminum Siding
- 07 46 19 Steel Siding
- 07 61 00 Sheet Metal Roofing
- 07 62 00 Sheet Metal Flashing & Trim
- 07 63 00 Sheet Metal Roofing Accessories

2004 CSI MasterFormat™

Scope Expansion Opportunities

Division 07 - Thermal & Moisture Protection

07 71 00 Roof Specialties

- 07 71 13 Manufactured Copings
- 07 71 16 Manufactured Counterflashing Systems
- 07 71 19 Manufactured Gravel Stops & Facias
- 07 71 23 Manufactured Gutters & Downspouts
- 07 71 26 Reglets
- 07 71 29 Manufactured Roof Expansion Joints
- 07 71 33 Manufactured Scuppers

2004 CSI MasterFormat™

Scope Expansion Opportunities

Division 07 - Thermal & Moisture Protection

07 72 00 Roof Accessories

07 72 13 Manufactured Curbs

07 73 23 Relief Vents

07 72 26 Ridge Vents

07 72 33 Roof Hatches

07 72 36 Smoke Vents

07 72 46 Roof Walkways

07 73 53 Snow Guards

07 72 63 Waste Containment Assemblies

07 86 00 Smoke Seals

07 87 00 Smoke Containment Barriers

2004 CSI MasterFormat™

Scope Expansion Opportunities

Division 8 - Openings

08 90 00 Louvers & Vents

08 91 00 Louvers

08 92 00 Louvered Equipment Enclosures

08 95 00 Vents

2004 CSI MasterFormat™

Scope Expansion Opportunities

Division 10 - Specialties

10 22 00	Partitions
10 26 00	Wall & Door Protection
10 51 00	Lockers
10 71 13	Exterior Sun Control Devices
10 73 00	Protective Covers
10 74 00	Manufactured Exterior Specialties
10 82 00	Grills & Screens

2004 CSI MasterFormat™

Scope Expansion Opportunities

Division 14 - Conveying Equipment

14 91 00 Facility Chutes

14 91 13 Coal Chutes

14 91 23 Escape Chutes

14 91 33 Laundry & Linen Chutes

14 91 82 Trash Chutes

The background is a blue gradient, transitioning from a lighter blue on the left to a darker blue on the right. A thin, light blue curved line starts from the upper left and arcs towards the center. A spotlight effect, represented by a semi-transparent blue cone, originates from the center and points towards the bottom right corner.

Questions?