NATIONAL BUREAU OF STANDARDS REPORT

10 215

Cross Index:

OPERATION BREAKTHROUGH MATRIX
CONSTRUCTION SPECIFICATIONS INSTITUTE UNIFORM SYSTEM
DEPARTMENT OF
AND URBAN

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to

Department of Housing and Urban Development

NBS

U.S. DEPARTMENT OF COMMERCE
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NATIONAL BUREAU OF STANDARDS REPORT

NBS PROJECT

September 1, 1970

NBS REPORT

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Cross Index:

OPERATION BREAKTHROUGH MATRIX
CONSTRUCTION SPECIFICATIONS INSTITUTE UNIFORM SYSTEM

by

James L. Haecker
Scientific and Professional Liaison Section
Building Research Division
Institute for Applied Technology

to

Department of Housing and Urban Development

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U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
Cross Index:

Operation Breakthrough Matrix  
Construction Specifications Institute Uniform System

Abstract

This report is a cross-index between the matrix intercepts from NBS 10 200, "Guide Criteria for the Design and Evaluation of OPERATION BREAKTHROUGH Housing Systems" and the broadscope and narrowscope titles of the widely used Construction Specifications Institute, "Uniform System."

The cross-index is based on the original work of Everett G. Spurling, Jr., A.I.A., Consultant to the Building Research Division, National Bureau of Standards, and is intended to serve as a convenient reference to architects and other decision makers in the building construction process.
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The criteria in the four volumes of NBS 10 200 were organized according to matrix intercepts between 12 (A-L) Built Elements and 9 (1-9) Attributes. The matrix represents a departure from more conventional means of identification of building materials and construction processes. Durability of flooring, for example, would be found according to the matrix in Section D 8 (Built Element "D" is Floor-ceiling and Attribute "8" is Durability/Time Reliability) and lighting fixtures and fire safety would be found in Section K 4 (Built Element "K" is Lighting Elements and Attribute "4" is Fire Safety).

Figure 1 is the Guide Criteria Matrix. Not all intercepts are necessarily relevant. Figure 2 is a list of the broadscope and narrowscope titles of the divisions of the Uniform System. Division 1 of the Uniform System is not applicable on the matrix because general requirements lie outside the scope of the guide criteria.
<table>
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<th>Guide Criteria Matrix</th>
<th>Attributes</th>
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<td><strong>1</strong>  <strong>2</strong>  <strong>3</strong>  <strong>4</strong>  <strong>5</strong>  <strong>6</strong>  <strong>7</strong>  <strong>8</strong>  <strong>9</strong></td>
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<tr>
<td>Structure</td>
<td><strong>A</strong></td>
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<td><strong>B</strong></td>
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<tr>
<td>Inter-Dwelling</td>
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<tr>
<td>Walls and Doors,</td>
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<td>Intra-Dwelling</td>
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<td>Floor-Ceiling</td>
<td><strong>D</strong></td>
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<tr>
<td>Walls, Doors,</td>
<td><strong>E</strong></td>
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<tr>
<td>and Windows</td>
<td></td>
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<tr>
<td>Roof-Ceiling, Ground</td>
<td><strong>F</strong></td>
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<tr>
<td>Floor, Ground Floor</td>
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<tr>
<td>Fixtures and</td>
<td><strong>G</strong></td>
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<td>Hardware</td>
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<td>Plumbing</td>
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<td>Communications</td>
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<td>Lighting Elements</td>
<td><strong>K</strong></td>
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<tr>
<td>Enclosed Spaces</td>
<td><strong>L</strong></td>
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Fig. 1
Construction Specifications Institute, Uniform System

DIVISION 1 GENERAL REQUIREMENTS

0101 SUMMARY OF THE WORK
0110 SCHEDULES & REPORTS
0120 SAMPLES & SHOP DRAWINGS
0130 TEMPORARY FACILITIES
0140 CLEANING UP
0150 PROJECT CLOSEOUT
0160 ALLOWANCES
0170 ALTERNATES

DIVISION 2 SITE WORK

0210 CLEARING OF SITE
0220 EARTHWORK
0230 PILING
0235 CAISSONS
0240 SHORING AND BRACING
0250 SITE DRAINAGE
0255 SITE UTILITIES
0260 ROADS & WALKS
0270 SITE IMPROVEMENTS
0280 LAWNS & PLANTING
0290 RAILROAD WORK
0295 MARINE WORK

DIVISION 3 CONCRETE

0310 CONCRETE FORMWORK
0320 CONCRETE REINFORCEMENT
0330 CAST-IN-PLACE CONCRETE
0340 PRECAST CONCRETE
0350 CEMENTITIOUS DECKS

DIVISION 4 MASONRY

0410 MORTAR
0420 UNIT MASONRY
0440 STONE
0450 MASONRY RESTORATION

DIVISION 5 METALS

0510 STRUCTURAL METAL
0520 OPEN-WEB JOISTS
0530 METAL DECKING
0540 LIGHTGAGE FRAMING
0550 MISCELLANEOUS METAL
0570 ORNAMENTAL METAL
0580 SPECIAL FORMED METAL

DIVISION 6 CARPENTRY

0610 ROUGH CARPENTRY
0620 FINISH CARPENTRY
0630 GLUE-LAMINATED WOOD
0640 CUSTOM WOODWORK

DIVISION 7 MOISTURE PROTECTION

0710 WATERPROOFING
0715 DAMPROOFING
0720 BUILDING INSULATION
0730 SHINGLES & ROOFING TILES
0740 PREFORMED ROOFING & SIDING
0750 MEMBRANE ROOFING
0760 SHEET METAL WORK
0770 WALL FLASHING
0780 ROOF ACCESSORIES
0790 CALKING & SEALANTS

DIVISION 8 DOORS, WINDOWS, GLASS

0810 METAL DOORS & FRAMES
0820 WOOD DOORS
0830 SPECIAL DOORS
0850 METAL WINDOWS

0860 WOOD WINDOWS
0870 FINISH HARDWARE
0875 OPERATORS
0880 WEATHERSTRIPPING
0885 GLASS & GLAZING
0890 CURTAINWALL SYSTEM
0896 STOREFRONT SYSTEM

DIVISION 9 FINISHES

0910 LATH & PLASTER
0925 GYPSUM DRY WALL
0930 TILE WORK
0940 TERRAZZO
0945 VENEER STONE
0950 ACOUSTICAL TREATMENT
0955 WOOD FLOORING
0965 RESILIENT FLOORING
0970 SPECIAL FLOORING
0980 SPECIAL COATINGS
0990 PAINTING
0995 WALL COVERING

DIVISION 10 SPECIALTIES

1010 CHALKBOARD & TACKBOARD
1013 CHUTES
1015 COMPARTMENTS & CUBICLES
1020 DEMOUNTABLE PARTITIONS
1023 DISAPPEARING STAIRS
1025 FIREFIGHTING DEVICES
1030 FIREPLACE EQUIPMENT
1035 FLAGPOLES
1037 FOLDING GATES
1040 IDENTIFYING DEVICES
1050 LOCKERS
1053 MESH PARTITIONS
1055 POSTAL SPECIALTIES
1060 RETRACTABLE PARTITIONS
1065 SCALES
1067 STORAGE SHELVING
1070 SUN CONTROL DEVICES
1075 TELEPHONE BOOTHs
1080 TOILET & BATH ACCESSORIES
1085 VENDING MACHINES
1090 WARDROBE SPECIALTIES
1095 WASTE DISPOSAL UNITS

DIVISION 11 EQUIPMENT

1110 BANK EQUIPMENT
1115 COMMERCIAL EQUIPMENT
1118 DARMROOM EQUIPMENT
1120 ECCLESIASTICAL EQUIPMENT
1130 EDUCATIONAL EQUIPMENT
1140 FOOD SERVICE EQUIPMENT
1150 GYMNASIUM EQUIPMENT
1155 INDUSTRIAL EQUIPMENT
1160 LABORATORY EQUIPMENT
1163 LAUNDRY EQUIPMENT
1165 LIBRARY EQUIPMENT
1170 MEDICAL EQUIPMENT
1180 MORTUARY EQUIPMENT
1185 PARKING EQUIPMENT
1188 PRISON EQUIPMENT
1190 RESIDENTIAL EQUIPMENT
1197 STAGE EQUIPMENT

DIVISION 12 FURNISHING

1210 ARTWORK
1220 BLINDS & SHADES
1230 CABINETS & FIXTURES

1240 CARPETS & MATS
1250 DRAPERY & CURTAINS
1260 FURNITURE
1270 SEATING

DIVISION 13 SPECIAL CONSTRUCTION

1310 AUDIOMETRIC ROOMS
1315 BOWLING ALLEYS
1320 BROADCASTING STUDIOS
1325 CLEAN ROOMS
1330 CONSERVATORIES
1335 HYPERBARIC ROOMS
1340 INCINERATORS
1345 INSULATED ROOMS
1360 INTEGRATED CEILINGS
1365 OBSERVATORIES
1360 PEDESTAL FLOORS
1366 PREFABRICATED STRUCTURES
1370 RADIATION PROTECTION
1375 SPECIAL CHIMNEY CONSTRUCTION
1380 STORAGE VAULT
1385 SWIMMING POOL
1390 ZOO STRUCTURES

DIVISION 14 CONVEYING SYSTEMS

1410 DUMBWAITE RS
1420 ELEVATORS
1430 HOISTS & CRANES
1440 LIFTS
1450 MATERIALS HANDLING SYSTEMS
1460 MOVING STAIRS & WALKS
1470 PNEUMATIC TUBE SYSTEMS

DIVISION 15 MECHANICAL

1501 GENERAL PROVISIONS
1510 BASIC MATERIALS & METHODS
1520 WATER SUPPLY SYSTEM
1525 SOIL & WASTE SYSTEM
1529 ROOF DRAINAGE SYSTEM
1530 PLUMBING FIXTURES & TRIM
1535 GAS PIPING SYSTEM
1540 SPECIAL PIPING SYSTEMS
1550 FIRE EXTINGUISHING SYSTEM
1557 FUEL HANDLING SYSTEMS
1560 STEAM HEATING SYSTEMS
1565 HOT WATER HEATING SYSTEM
1575 CHILLED WATER CIRCULATING SYSTEM
1577 DUAL-TEMPERATURE SYSTEM
1578 HEAT PUMP
1580 AIR-TEMPERING SYSTEM
1590 REFRIGERATION
1595 HVC CONTROLS & INSTRUMENTS

DIVISION 16 ELECTRICAL

1601 GENERAL PROVISIONS
1610 BASIC MATERIALS & METHODS
1620 ELECTRICAL SERVICE SYSTEM
1630 ELECTRICAL DISTRIBUTION SYSTEM
1640 LIGHTING FIXTURES
1650 COMMUNICATION SYSTEMS
1659 CLOSED-CIRCUIT TELEVISION
1670 ELECTRICAL POWER EQUIPMENT
1680 ELECTRICAL COMFORT SYSTEM
1690 ELECTRICAL SYSTEM CONTROLS & INSTRUMENTS
1695 LIGHTNING PROTECTION SYSTEM

Fig. 2
DIVISION 1 - GENERAL REQUIREMENTS

<table>
<thead>
<tr>
<th>Reference Numbers</th>
<th>Description</th>
<th>Notes</th>
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<td>0110</td>
<td>Schedules and Reports</td>
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<td>Samples and Shop Drawings</td>
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DIVISION 2 - SITE WORK

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<td>Clearing of Site</td>
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<td>0211</td>
<td>Demolition</td>
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<td>0212</td>
<td>Structures Moving</td>
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<td>0213</td>
<td>Clearing and Grubbing</td>
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<tr>
<td>0220</td>
<td>Earthwork</td>
<td>A1, A2, A8</td>
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<td>0221</td>
<td>Grading</td>
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<td>0222</td>
<td>Excavating and Backfilling</td>
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</tr>
<tr>
<td>0223</td>
<td>Dewatering</td>
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<tr>
<td>0224</td>
<td>Subdrainage</td>
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<tr>
<td>0225</td>
<td>Soil Poisoning</td>
<td></td>
</tr>
<tr>
<td>0226</td>
<td>Soil Compaction Control</td>
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<tr>
<td>0227</td>
<td>Soil Stabilization</td>
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<td>0230</td>
<td>Piling</td>
<td>A1, A2, A4, A7, A8</td>
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* Note: italicized numbers have been arbitrarily assigned by CSI where vacancies occur in the Uniform System.
Reference Numbers

0235 Caissons A1, A2, A4, A8
0240 Shoring and Bracing A1, A2, A3, A4, A8
0241 Sheetig
0242 Underpinning
0250 Site Drainage N/A
0255 Site Utilities N/A
0260 Roads and Walks N/A
0261 Paving
0262 Curbs and Gutters
0263 Walks
0264 Road and Parking Appurtenances
0270 Site Improvements N/A
0271 Fences
0272 Playing Fields
0273 Fountains
0274 Irrigation System
0275 Yard Improvements
0280 Lawns and Planting N/A
0281 Soil Preparation
0282 Lawns
0283 Ground Cover and Other Plants
0284 Trees and Shrubs
0290 Railroad Work N/A
0295 Marine Work N/A
0296 Boat Facilities
0297 Protective Marine Structures
0298 Dredging

DIVISION 3 - CONCRETE

0310 Concrete Formwork A1, A2, A4, A8, C1, C2, C4, C8, D1, D2, D4, D8, E1, E2, E4, E8, F1, F2, F4, F8
0320 Concrete Reinforcement A1, A2, A4, A7, A8, C1, C2, C4, C8, D1, D2, D4, D8, E1, E2, E4, E7, E8, F1, F2, F4, F8
0330 Cast-In-Place Concrete A1, A2, A4, A5, A7, A8, C1, C2, C4, C5, C8, C9, D1, D2, D4, D5, D8, E1, E2, E4, E5, E7, E8, F1, F2, F4, F5, F7, F8
0331 Heavyweight Aggregate Concrete D1, D2, D4, D5, D8, E1, E2, E4, E5, E7, E8, F1, F2, F4, F5, F7, F8
0332 Lightweight Aggregate Concrete
0333 Post-Tensioned Concrete
0334 Nailable Concrete
<table>
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<th>Reference Numbers</th>
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<td>0335</td>
<td>Specially Finished Concrete</td>
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<td>0336</td>
<td>Specially Placed Concrete</td>
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<td>Precast Concrete</td>
<td>F1, F2, F4, F5, F7, F8</td>
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<td>0341</td>
<td>Precast Concrete Panels</td>
<td>F1, F2, F4, F5, F7, F8</td>
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<td>0342</td>
<td>Precast Structural Concrete</td>
<td>F1, F2, F4, F5, F7, F8</td>
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<td>0343</td>
<td>Precast Prestressed Concrete</td>
<td>F1, F2, F4, F5, F7, F8</td>
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<td>0350</td>
<td>Cementitious Decks</td>
<td>F1, F2, F4, F5, F7, F8</td>
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<td>0351</td>
<td>Poured Gypsum Deck</td>
<td>F1, F2, F4, F5, F7, F8</td>
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<td>0352</td>
<td>Insulating Concrete Roof Decks</td>
<td>F1, F2, F4, F5, F7, F8</td>
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<td>0353</td>
<td>Cementitious Unit Decking</td>
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<td>Mortar</td>
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<td>C1, C2, C4, C5, C8, C9, E1, E2, E4, E5, E7, E8</td>
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<td>0420</td>
<td>Unit Masonry</td>
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<td>0421</td>
<td>Brick Masonry</td>
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<td>0422</td>
<td>Concrete Unit Masonry</td>
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<td>0423</td>
<td>Clay Backing Tile</td>
<td>C1, C2, C4, C5, C8, C9, E1, E2, E4, E5, E7, E8</td>
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<td>0424</td>
<td>Clay Facing Tile</td>
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<td>0425</td>
<td>Ceramic Veneer</td>
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<td>0426</td>
<td>Pavers</td>
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<td>0427</td>
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<td>0428</td>
<td>Gypsum Unit Masonry</td>
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**DIVISION 5 - METALS**

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0610 Rough Carpentry
0611 Framing and Sheathing
0612 Heavy Timber Work

0620 Finish Carpentry
0621 Wood Trim
0622 Millwork
0623 Wood Siding

0630 Glue-Laminated Wood

0640 Custom Woodwork
0641 Custom Cabinetwork
0642 Custom Panelwork

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0711 Membrane Waterproofing
0712 Hydraulic Waterproofing
0713 Liquid Waterproofing
0714 Metallic Oxide Waterproofing

0715 Dampproofing
0716 Bituminous Dampproofing
0717 Silicone Dampproofing
0718 Cementitious Dampproofing
0719 Preformed Vapor Barrier

0720 Building Insulation

0730 Shingles and Roofing Tiles
0731 Asphalt Shingles
0732 Asbestos-Cement Shingles
0733 Wood Shingles
0734 Slate Shingles
0735 Clay Roofing Tiles
0736 Concrete Roofing Tiles
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  0811 Hollow Metal Doors and Frames
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  0812 Aluminum Doors and Frames
            L4, L9
  0813 Stainless Steel Doors & Frames
  0814 Bronze Doors and Frames
  0815 Metal Storm and Screen Doors

0820 Wood Doors
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  0830 Special Doors
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0831 Sliding Metal Firedoors
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  0832 Metal-Covered Doors
  0833 Coiling Doors and Grilles
  0834 Plastic-Faced Doors
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0836  Overhead Doors
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0850  Metal Windows
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0875  Operators
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0880  Weatherstripping
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0916  Plaster

0917  Stucco

0918  Acoustical Plaster

0919  Plaster Moldings & Ornaments

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0926  Gypsum Drywall System

0927  Gypsum Drywall Finishing
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0931  Ceramic Tile

0932  Ceramic Mosaics

0933  Quarry Tile
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0934 Glass Mosaics
0935 Conductive Ceramic Tile

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0956 Wood Strip Flooring
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0965 Resilient Flooring D3, D4, D5, D6, D7, D8
0966 Resilient Tile Flooring
0967 Resilient Sheet Flooring
0968 Conductive Resilient Floors

0970 Special Flooring D3, D4, D5, D6, D7, D8
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1020  Demountable Partitions  B1, B4, B5, B6, B7, B8, B9  C1, C4, C5, C6, C7, C8, C9
1023  Disappearing Stairs  F1, F2, F3, F4, F5, F8, F9
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1030  Fireplace Equipment  B3, B4, B7, B8, B9
1031  Fireplace Accessories
1032  Fireplace Dampers
1033  Prefabricated Fireplace
1035  Flagpoles  N/A
1037  Folding Gates  N/A
1040  Identifying Devices  G3, G4, G8  L3, L4
1041  Directory & Bulletin Boards
1042  Painted Signs
1043  Plaques
1044  Three-Dimensional Signs
1050  Lockers  G3, G4, G5, G7, G8, G9
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1055  Postal Specialties  G4, G5, G7, G8, G9
1060  Retractable Partitions  B1, B4, B5, B6, B7, B8, B9
1061  Coiling Partitions
1062  Folding Partitions
1065  Scales  N/A
1067  Storage Shelving  G1, G4, G8
1070  Sun Control Devices  E1, E2, E4, E6, E7, E8
1075  Telephone Booths  J4, J5, J8, J9
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1085  Vending Machines  N/A or G3, G4, G5, G7, G8, G9
1090  Wardrobe Specialties  N/A
1095  Waste Disposal Units  G3, G4, G5, G7, G8, G9  L4
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1097  Waste Compactors

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1178 Surgery Equipment
1179 Therapy Equipment
1180 Mortuary Equipment N/A
1185 Parking Equipment N/A
1188 Prison Equipment N/A
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1320 Broadcasting Studios N/A
1325 Clean Room N/A
1330 Conservatory N/A
1335 Hyperbaric Rooms N/A
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1420 Elevators J1, J2, J3, J4, J5, J7, J8, J9
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1440 Lifts N/A
1450 Materials Handling System N/A
1460 Moving Stairs and Walks N/A
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1653 Public Address System
1654 Paging System
1655 Nurses' Call System
1656 Alarm and Detection Systems
1657 Clock and Program System
1658 Audio-Video Reproducers
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<td>J3, J4, J5, J7, J8</td>
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<td>Motors and Motor Controls</td>
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<td>Lightning Protection System</td>
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