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ABSTRACT

Basic information and guidelines on the use of URBS components are provided for use by architects and engineers. The URBS system was developed in response to the competitive bidding on performance specifications, incorporating user requirements, economic constraints, industry capability and trade practices. The essence of the URBS Project--the systems approach--requires that components and materials be coordinated at their design stage so that the user requirements, production, site installation, maintenance, appearance, and cost can be considered simultaneously. There are five components in the program--(1) structure-ceiling, (2) heating-ventilating-cooling, (3) partitions, (4) bathrooms, and (5) furnishings. (TC)

UNIVERSITY RESIDENTIAL BUILDING SYSTEM

URBS COMPONENTS
PRELIMINARY DESIGN MANUAL

University of California
Office of the President
Vice President—Physical Planning and Construction

January, 1969

ADDITIONAL INFORMATION

The Building Systems section of the Office of Vice President—Physical Planning and Construction is prepared to assist in your usage of the URBS components. Please feel free to request such assistance.

Mr. Howard W. Engberg, A.I.A., Assistant Project Director, is available for consultation at:

Suite 400, 2054 University Avenue
Berkeley, California 94704
Telephone: 642-1699

Further information, as it becomes available, will be distributed to all holders of record of this Design Manual.

R. Clayton Kantz, A.I.A.
Project Director

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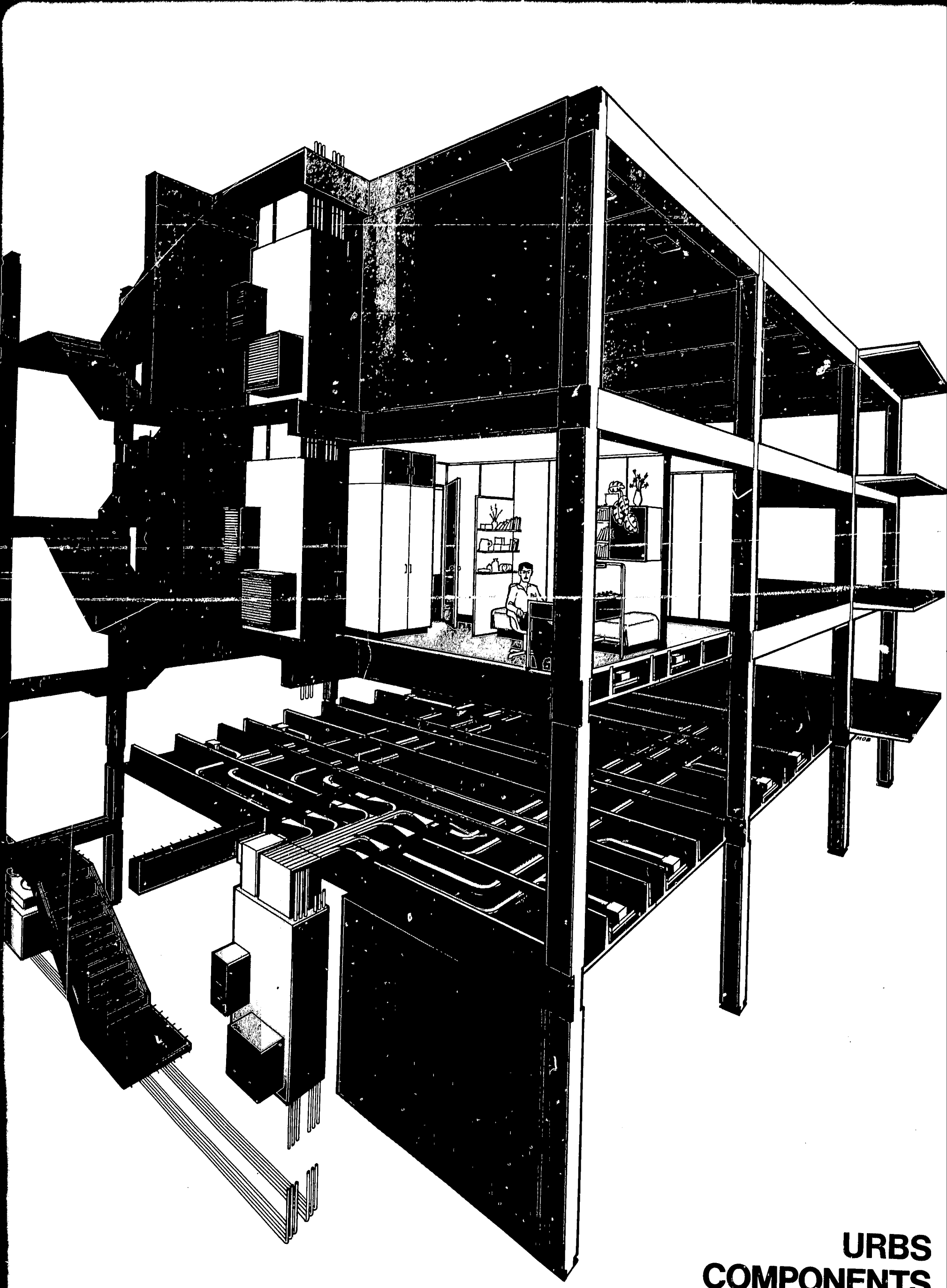

URBS COMPONENTS

URBS COMPONENTS
PRELIMINARY DESIGN MANUAL

1.0 INTRODUCTION

The purpose of the Manual is to provide architects and engineers with basic information and guidelines on the use of URBS components. Detailed information, including unit prices, will be added as soon as available from the URBS component contractors.

1.1 University Student Housing

University student housing in America derives from twin concepts of economy and appropriate social patterns. The traditional configuration—the double-loaded corridor plan—is that of identical two-student rooms opening from each side of the corridor. A number of such rooms, grouped together to form a floor or a 'house,' share certain facilities such as bathrooms and lounges. The spoken argument for the widespread use of this plan configuration is primarily economic; the unspoken argument is the built-in ease of student control.

1.2 This characteristic pattern, which emerged by default perhaps, rather than from conviction, is now subject to scrutiny. The student of today is less ready to accept an imposed formula and is more interested in the expression of his individuality. The huge physical scale of our institutions and the effect this has on the students is also a concern. There is new interest in those forms of buildings which assist in breaking down the scale into something more intimate and meaningful to the individual.

2.0 NATURE OF STUDENT HOUSING

The general nature of the university student housing to be constructed under the URBS project has been determined by an extensive user requirement[1] study. The basic needs, in addition to privacy and quiet, are variety and adaptability to change.

2.1 Variety

2.1.1 An extensive variety of building shapes is possible using the URBS components, although configuration of structural framing must be on a rectilinear basis.

2.1.2 There is no limitation on building size or site. Some buildings may accommodate a few as 40–50 students; others may have 500 or more, whether the site is level or sloping.

2.1.3 Student housing must accommodate undergraduate graduate men and women, and married students with and without children. Their differing requirements must be appropriately accommodated. The URBS system accommodates rooms of many different sizes.

2.2 Adaptability

2.2.1 University policy may result in a differing mix of students during the life of the building, so the URBS system permits easy conversion to different kinds of student use. Buildings which begin as undergraudate halls may become graduate halls, or even single and married student apartments.

2.2.2 Students' needs change during the life of a building, so the buildings must be able to respond to these needs.

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[1] URBS Publication 5, March 1969.

2.2.3 Present trends in campus organization indicate a need for buildings which may, at the ground level, convert from residential to academic use.

2.2.4 Developments in communication technology require that new equipment can easily be accommodated. The student housing of the future may require communication links with the library, closed circuit TV and computer consoles. Rights of way for future equipment must be considered.

2.2.5 Adaptability is not limitless because of the constraints of cost and design. For example, bathrooms, stairs, elevators and shear walls will be fixed in location. Adaptability can only be achieved within the boundaries set by these elements; the degree required must be decided upon first as a program decision by the campus, and later in the building design process by the architect.

2.2.5.1 The URBS components will enable kitchens to be added later to a living unit, but only if provisions for gas, electricity, water and waste are made at the beginning. The kitchen's air exhaust is included in the URBS HVC component.

2.2.5.2 Similarly, spaces may be converted from residential to academic use, if HVC, lighting and power requirements are considered in the beginning.

3.0 URBS CONCEPTUAL FRAMEWORK

The URBS system has been developed in response to the competitive bidding on performance specifications,[1] incorporating user requirements, economic constraints, industry capability and trade practices.

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[1] URBS Publicatior 2, May 1968.

3.1 An important part of the URBS conceptual framework is the Flexible Living Area (FLA).

3.1.1 A FLA consists of a one-hour fire-rated envelope defined by floor, partitions and ceiling, up to 2,000 square feet in area, and designed for ten students maximum at initial occupancy. One-hour fire-rated fixed and demountable partitions and furniture may be disposed to form various living, social, and study arrangements within this area.

3.1.2 Plates 1, 2, 3, 4, and 5 in Part V, Introduction to Performance Specifications,[1] show some of the spatial forms which the FLA may take. Note that the FLA allows for variety of social arrangements. Since the FLA itself may be defined by one-hour demountable partitions, its size may change during the life of the buildings.

3.1.3 Space within the FLA accounts for the individual and small group student living, sleeping, studying and social spaces.

3.1.4 The social, administrative and recreational spaces which related to the building or complex will generally be located on the first floor, and will likely have different requirements from the residential space, particularly with respect to occupancy, HVC and lighting.

3.1.5 Future conversion from living to academic space is anticipated. This will occur primarily on the first floor; however, faculty offices and seminar spaces may occur anywhere.

3.2 Flexible Living Area: Services

The FLA may form a unit of service. Methods of service are based on two concepts:

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[1] URBS Publication 2, May 1968.

3.2.1 One concept is in the FLA providing for vertical and horizontal services—HVC, plumbing, electrical and communication. Their requirements must be considered from the outset in formulating solutions accommodating future change. Penetration on the one-hour envelope should be infrequent and in a controlled manner, for reasons of cost and safety. Note that while the FLA may form a unit of service, the vertical shaft space allows this unit to be a subdivision of a larger unit, such as the domestic water or electrical service.

3.2.2 The second concept is that the bathroom in each FLA provides a center of service, for each FLA will contain at least one bathroom. Bathroom locations will be fixed, and their chases must stack one above the other. This enables each FLA to have vertical shaft space in relation to the bathrooms, for communication, plumbing or HVC purposes. The FLA can thus become, if it is appropriate to the building services, a self-contained unit of service. It is not, however, a mandatory requirement that it do so.

The first floor of some buildings may change from the typical repetitive floor plan of upper floors to allow for public, social and recreational rooms. Thus, the normal pattern of bathrooms may not be followed on the first floor. To accommodate this, the URBS system allows for increased furred space between first and second floors, if required, and the ability to move plumbing and HVC shafts horizontally as appropriate to keep first floors free of these elements.

4.0 NON-URBS SYSTEM COMPONENTS

4.1 Those parts of a building not provided by the URBS components will be designed by the executive architect, and bid and contracted for in the traditional manner. However, these non-URBS parts—such as exterior wall, fenestration, foundations, elevators, electrical service, and plumbing distribution—will be influenced by the URBS components.

4.2 URBS does not provide for specific components used in large assembly, dining, kitchen and educational spaces. These areas will be designed completely by the architect. He may, however, use URBS components where appropriate.

4.3 The Building Systems section of VP-PPC is available to assist in coordination of URBS and non-URBS components.

5.0 THE SYSTEMS APPROACH

5.1 The increasing complexity of modern buildings requires a high degree of coordination in the design of the components used to construct the building. The earlier in the design process that this coordination begins, the more effective the end result is likely to be.

5.2 The essence of the URBS project—the systems approach—requires that components and materials are coordinated at their design stage, so that the user requirements, production, site installation, maintenance, appearance and cost can all be considered simultaneously to the appropriate degree.

5.3 In the URBS program, there are five components:

Structure-Ceiling
Heating-Ventilating-Cooling
Partitions
Bathrooms
Furnishings

5.4 As of this writing only the three compatible components (S-C, P, HVC) are expected to be under contract initially. The Furnishings component contract is still under advisement, and the Bathroom component is expected to be rebid.

5.5 The three compatible components were required to be bid on a basis necessitating a high degree of design cooperation among bidders to assure an integrated design proposal.

6.0 THE URBS SYSTEM

6.1 After award of contracts by the University, the URBS components go through a period of development during which the details will be refined and coordinated. Prototypes will be built, and testing completed. Detailed unit pricing will be established by the time the testing is completed. It is expected that preliminary unit prices will be available a few weeks after contract award.

6.2 When development and testing has been completed an Information Manual will be published giving executive architects and engineers full information on the URBS components, including details and pricing, to facilitate their incorporation in the working drawings for each URBS housing project.

6.3 The URBS components provide a range of choice from which the executive architect can select the appropriate mix for his individual design. The traditional relationship of the executive architect to the owner is not changed by the URBS process, nor is that of the architect's engineering consultants to the architect. The structural engineer must select those members, from the range available, which will result in a safe economical building. The mechanical engineer will

select from the heating and/or cooling units and elements those which will satisfy his computed loading requirements.

6.4 In order for the University to meet its commitment to the manufacturers, the executive architect is required to utilize the URBS components wherever they are suitable. The URBS specifications referred specifically to the residential portion of the residence hall, including student rooms, hallways, apartments, bathrooms, small lounges and ancillary spaces. The HVC system has been generally sized to meet the requirements of these spaces, and is also suitable for other areas with comparable loading, such as offices, seminar rooms, game and recreation rooms.

6.5 The executive architect is expected to design in such a way as will exploit the component features, in performance and economy, to their utmost. Since the components will be mass produced for a number of housing projects, the executive architect may not request custom detail alternations of the components.

6.6 The Building Systems section of VP-PPC is available to answer questions at any time concerning the use of the URBS components within the URBS procedures.

7.0 URBS COMPONENT CONTRACTORS AND SYSTEM DESIGNERS

7.1 Structure-Celing Component

7.1.1 The 'Triposite' component was sponsored by the Portland Cement Association. Design was by Hellmuth, Obata, and Kassabaum, Architects, St. Louis, and Interpace Corporation, Pomona, California.

7.2 Heating-Ventilating-Cooling Component

7.2.1 Design was by Ayres & Hayakawa, Los Angeles, for the Chrysler Corporation.

7.2.2 Component Contractor is the Chrysler Corporation, Airtemp Division, Dayton, Ohio. Installation will be by Western-Allied Corporation, Los Angeles.

7.3 Partitions Component

7.3.1 The design was by Vaughan Interior Walls, Inc., Los Angeles, and U. S. Gypsum Corporation, Chicago.

7.3.2 Component Contractor is Vaughan Interior Walls, Inc., Los Angeles.

7.4 Component contracts will be assigned by the University to the General Contractor for each URBS housing project.

8.0 URBS STRUCTURE-CEILING COMPONENT

8.1 General Description

8.1.1 The 'Triposite' component is a structure from the grade level up allowing for the integration of mechanical, electrical and non-URBS components or services. The structural design meets the Uniform Building Code, 1967 edition, and meets or exceeds the requirements of the URBS Performance Specifications.[1]

8.1.2 The structural floors and roof use a inverted precast tee member with a cast-in-place slab as the top plane. This top element acts as the compression member and diaphragm.

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[1]URBS Publication 2, May 1968 (available to all executive architects).

8.1.3 Triposite uses precast stairs, columns, shear walls and spanning members tied together as a monolithic structure by cast-in-place beams, floor slabs and shear wall connections. The composite technique uses both precast and cast-in-place concrete to their best advantage, and simplifies all connections.

8.1.4 Triposite provides, within the structural depth of 18 inches, a cross-section of 36 x 14 inches as a plenum for HVC and non-URBS services, such as electrical distribution.

8.1.5 The plenum works basically as an HVC return air space with the HVC supply being ducted or piped through it. HVC and other services can move through the plenum space, parallel to the tees, and transversally through the tees through a series of 10 x 8-inch oval holes in the stems of the tees and in the cast-in-place beams. Special provision can be made for rectangular ducts up to 16 x 8 inches where required.

8.1.6 Electrical services are run through the plenum by the use of conduit and junction boxes. From the junction box, electrical services can be brought to the base or head of a partition or to a floor-mounted receptacle through an easily-drilled hole in the floor. A floor-mounted receptacle can be moved with the same adaptability as the demountable partitions, on multiples of four inches. Telephone service and coaxial cable can be handled in the same manner.

NOTE: To permit vertical service entry, partitions should not be located along the line of the stem of a tee or a beam.

8.1.7 Accessibility for both mechanical and electrical services is accomplished by use of precast concrete access panels placed in the cast-in-place floor slab on the precast concrete spanning members. These panels can be removed with a suction device. The panels will be 12 x 36 inches, although access up to 36 x 36 inches can be provided. Access is also available through the HVC diffuser openings in the ceiling. Ceiling diffuser openings for future use are temporarily plugged.

8.1.7.1 The number and location of access panels are determined by the requirements of the mechanical and electrical system, and the adaptability desired.

8.1.8 Any exterior wall material can be used. The cast-in-place beam maintains a constant depth completely around the building. This, together with the constant exterior column dimension and the suggested arrangement of all columns having a constant exterior face relationship to the module line, will be under review in the development period. Although the concept lends itself easily to an exposed frame, it is not mandatory, for the cast-in-place beam can hold inserts or shelf angles for applied treatment, or can receive an integral architectural treatment.

8.1.9 All minimum reinforcement coverage requirements of UBC 1967 will be met in design and construction. Joints between precast concrete spanning members will be filled with field-applied grout where required.

8.1.10 Expansion joints, where required for buildings with very large floor areas, will be handled with split columns and double beams using standard expansion joints for cast-in-place concrete structures. This separation will be furnished on any building exceeding 200 feet in any direction.

8.1.11 Differential camber between spanning members will be taken out by field welding of rods precast in the members.

8.2 Miscellaneous Items

8.2.1 All tolerances will be held within the requirements of Part VI, Section I, Paragraph F5 of the URBS Performance Specifications.[1]

8.2.2 Stairways will be precast concrete, and will be detailed in the URBS Information Manual.

8.2.3 Structure is designed in accordance with the loads specificed in the URBS Performance Specifications and any attachments not exceeding these loads can be accommodated.

8.2.4 Accoustically, the structural component will equal or surpass STC 50 through the floors, with an Impact Noise Ratio (INR) of +1.

8.3 Fabrication Process

All precast members will be cast in a central plant. The following guidelines will be followed:

8.3.1 All members will be cast in steel frames.

8.3.2 Concrete slump will be between 1-1/2 and 3 inches.

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[1]URBS Publication 2, May 1968.

8.3.3 Minimum strength for stripping forms will be:

For columns and walls – 2,000 psi
For spanning members – 3,500 psi

8.3.4 All precast members will be steam cured.

8.3.5 All precast products will be so handled that the maximum tensile stress in the concrete will be 420 psi.

8.3.6 Tolerances on the length of precast spanning members shall be ± 1/2 inches.

8.4 Erection Process

8.4.1 Columns will be cast and erected in either two- or three-story heights. Each column will be braced with two braces.

8.4.2 Shoring and soffit boards for the cast-in-place beams will be installed and leveled.

8.4.3 Spanning members will be placed on the beam soffit forms.

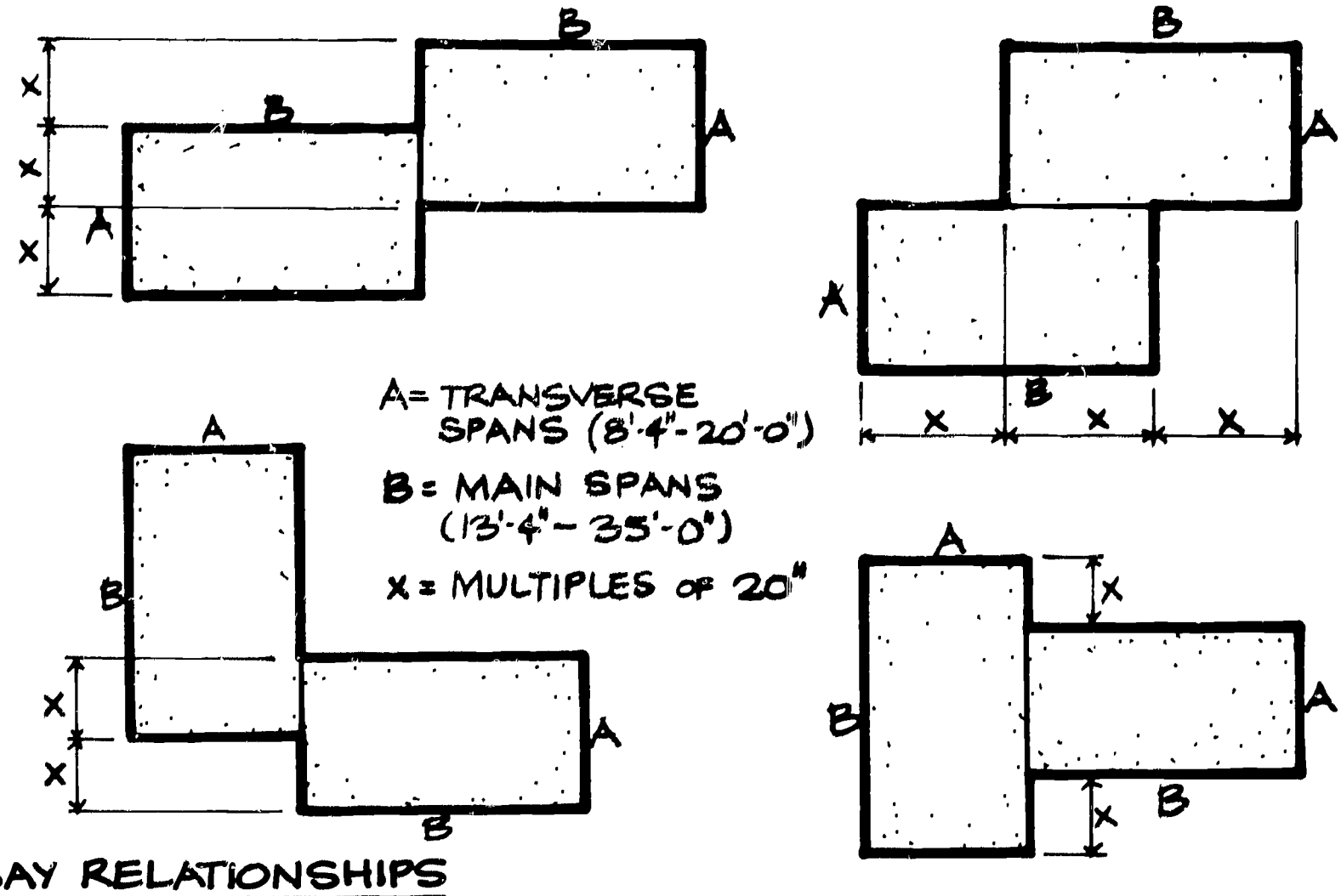
8.4.4 The beams will be cast in place.

8.4.5 When the beams have reached sufficient strength, the forms will be removed and moved to the floor above.

8.4.6 After installation of all utilities, the expendable forms will be placed and the floor slab cast.

8.4.7 All inserts, openings, projections or other such items required for non-URBS work can be furnished as extra items.

8.4.8 Interpace Corporation, as the prime contractor for the Structure-Ceiling Component, will precast all units as shown and be responsible for all construction. Subcontractors to Interpace

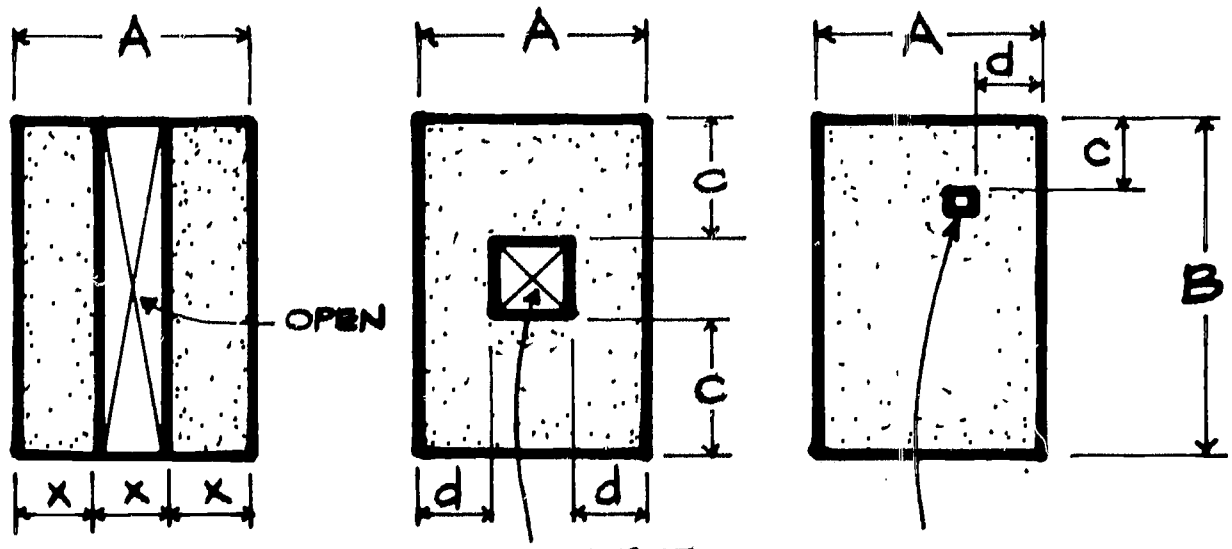


A= TRANSVERSE SPANS (8'-4"-20'-0")

B= MAIN SPANS (13'-4"-35'-0")

X= MULTIPLES OF 20"

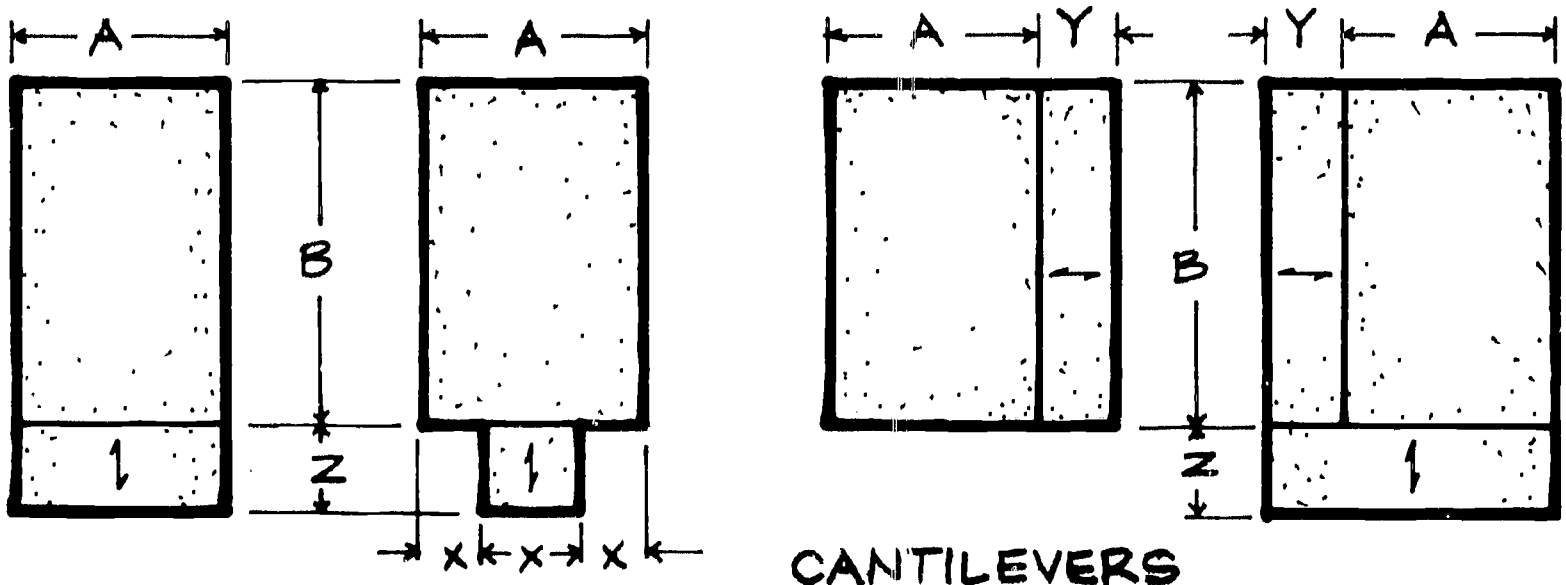
BAY RELATIONSHIPS



HOLES UP TO 40" SQUARE

HOLES UP TO 12" SQUARE

FLOOR PENETRATIONS



CANTILEVERS

Y= 5'-0"; Z= 5'-0" or 6'-8"

URBS STRUCTURE - CEILING COMPONENT

1

Corporation will transport and erect the precast concrete members, install cast-in-place concrete, and spray texture on finished ceiling areas.

8.5 System Restrictions

8.5.1 Above grade level, the Structure-Ceiling component permits structures up through 13 stories in height. Floor-to-ceiling heights to be used are: 8, 10, 12 and 14 feet. The ceiling-to-floor structural depth is one foot-six inhces (1'6'') and is constant for all spans. Available spans are in multiples of 20 inches from 13 feet 4 inches minimum, to 35 feet 0 inches maximum. The longer spans are the most economical.

8.5.2 Drawing Plate 1

8.5.2.1 Bay Relationships. 'X' must be in multiples of 20 inches. 'X' is preferred to be 8 feet 4 inches or greater, but this is not essential.

8.5.2.2 Floor Pentrations. In full span openings, the width 'X' is to be a minimum of 5 feet 0 inches.

Holes up to 40 inches square must avoid tee stems and all beams.

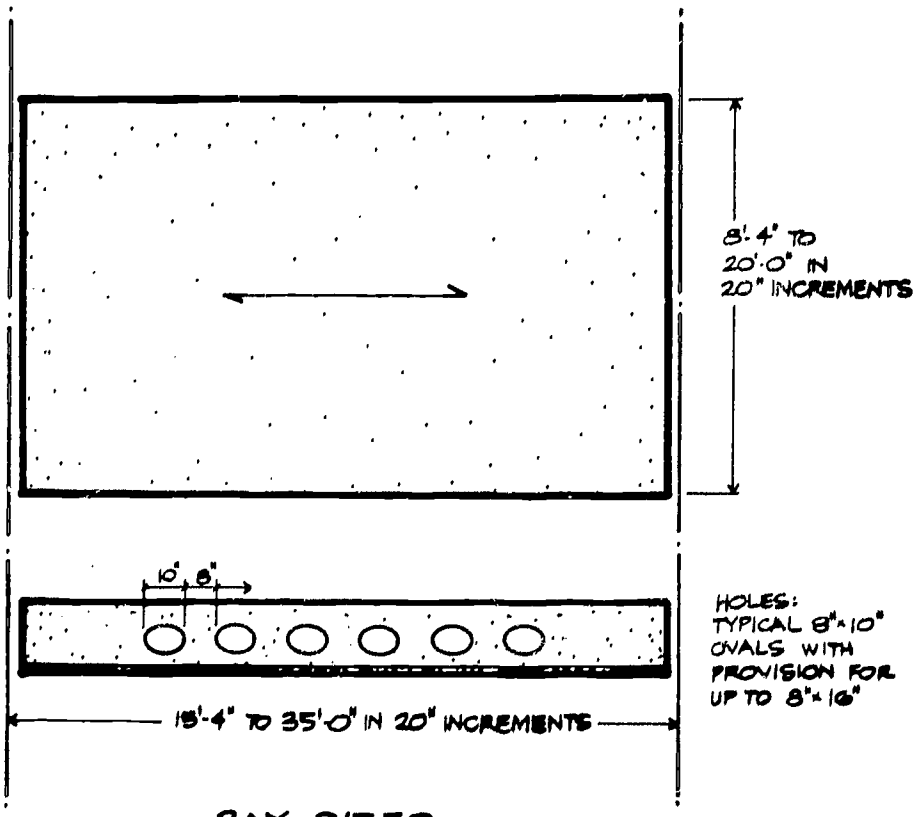
Holes up to 12 inches square must avoid having curbs above floor slab level.

8.5.2.3 Cantilevers. Restrictions are as shown, with 'X' in multiples of 20 inches.

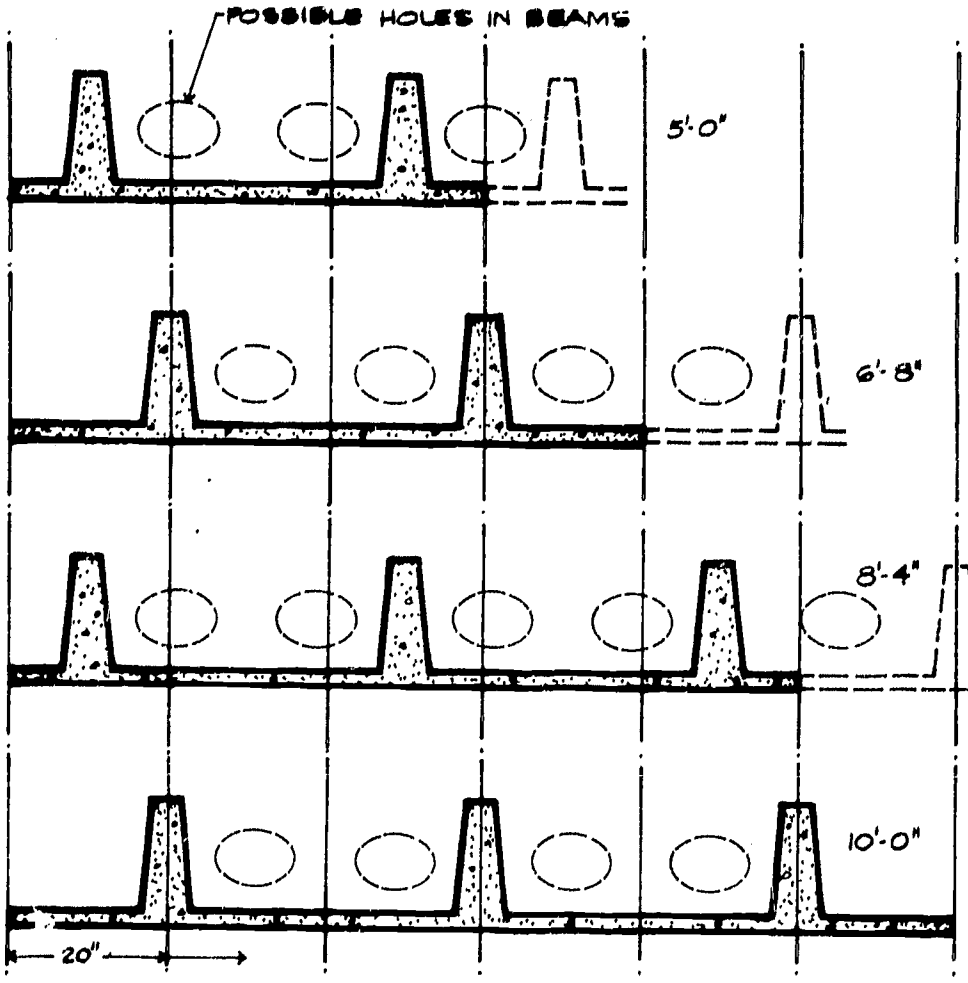
9.0 URBS HVC COMPONENT

9.1 General Description

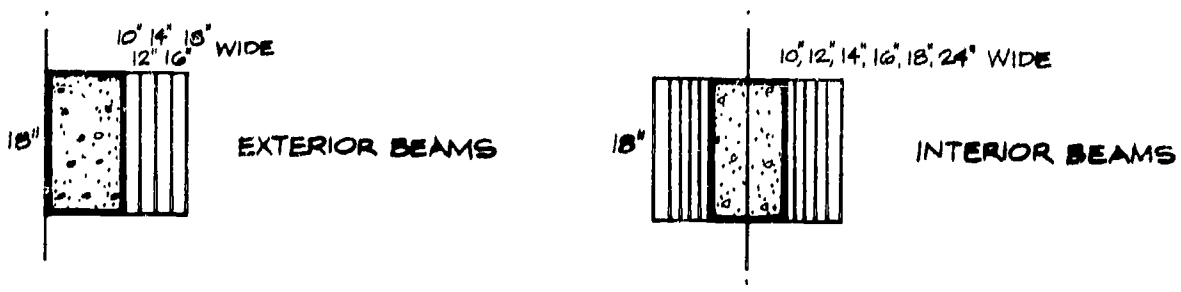
9.1.1 The basis of this component is a Multizone Unit serving an area of up to about 2,000 square feet and/or eight zones. The unit is



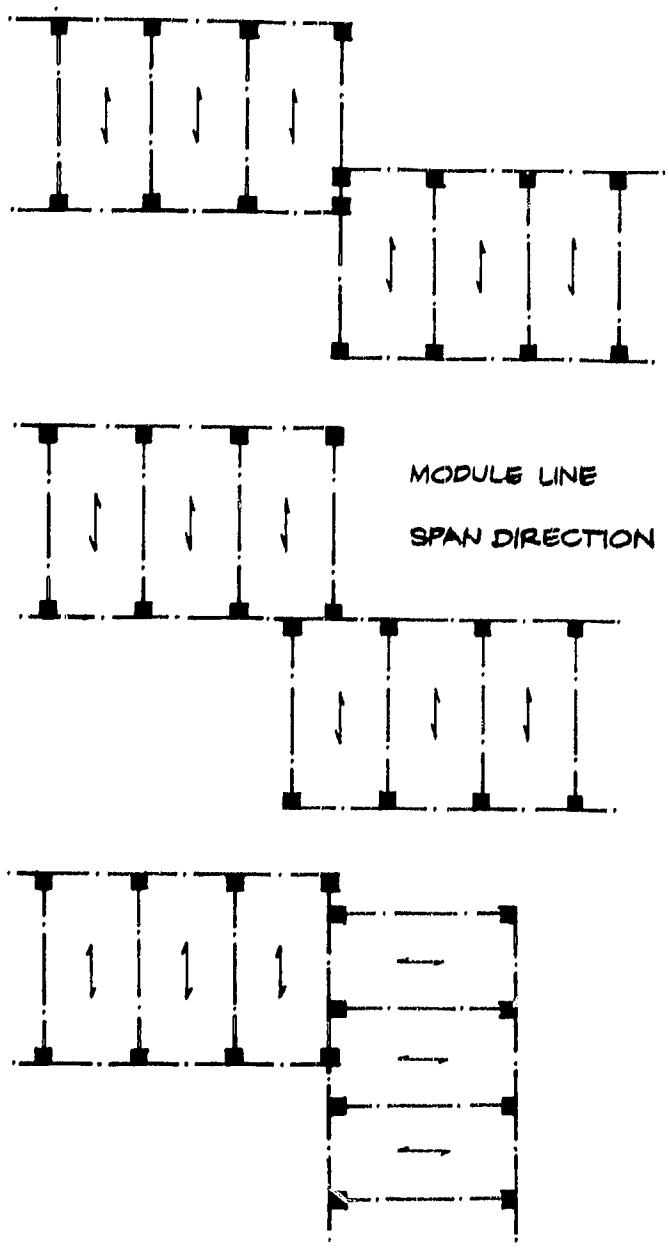
BAY SIZES



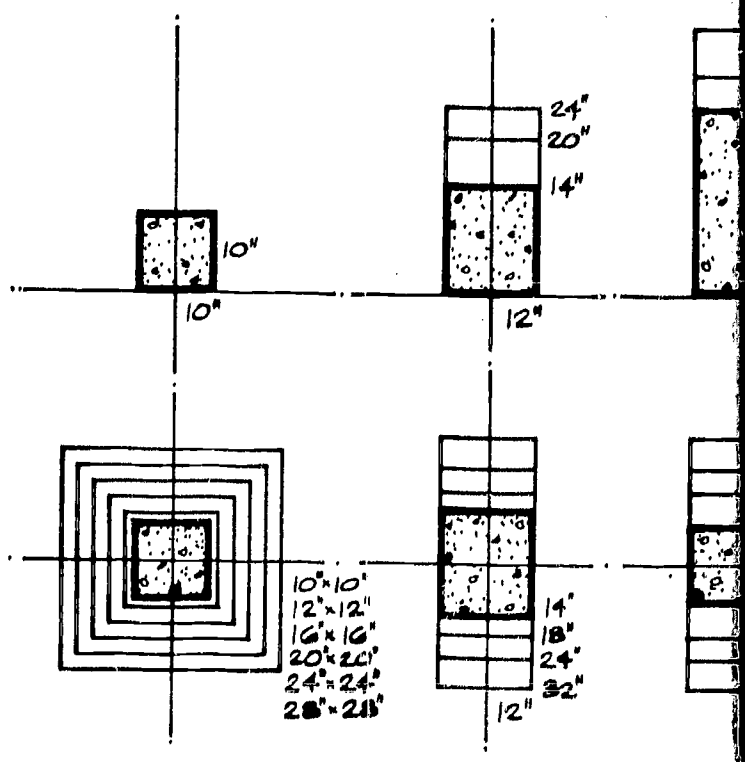
SPANNING MEMBERS



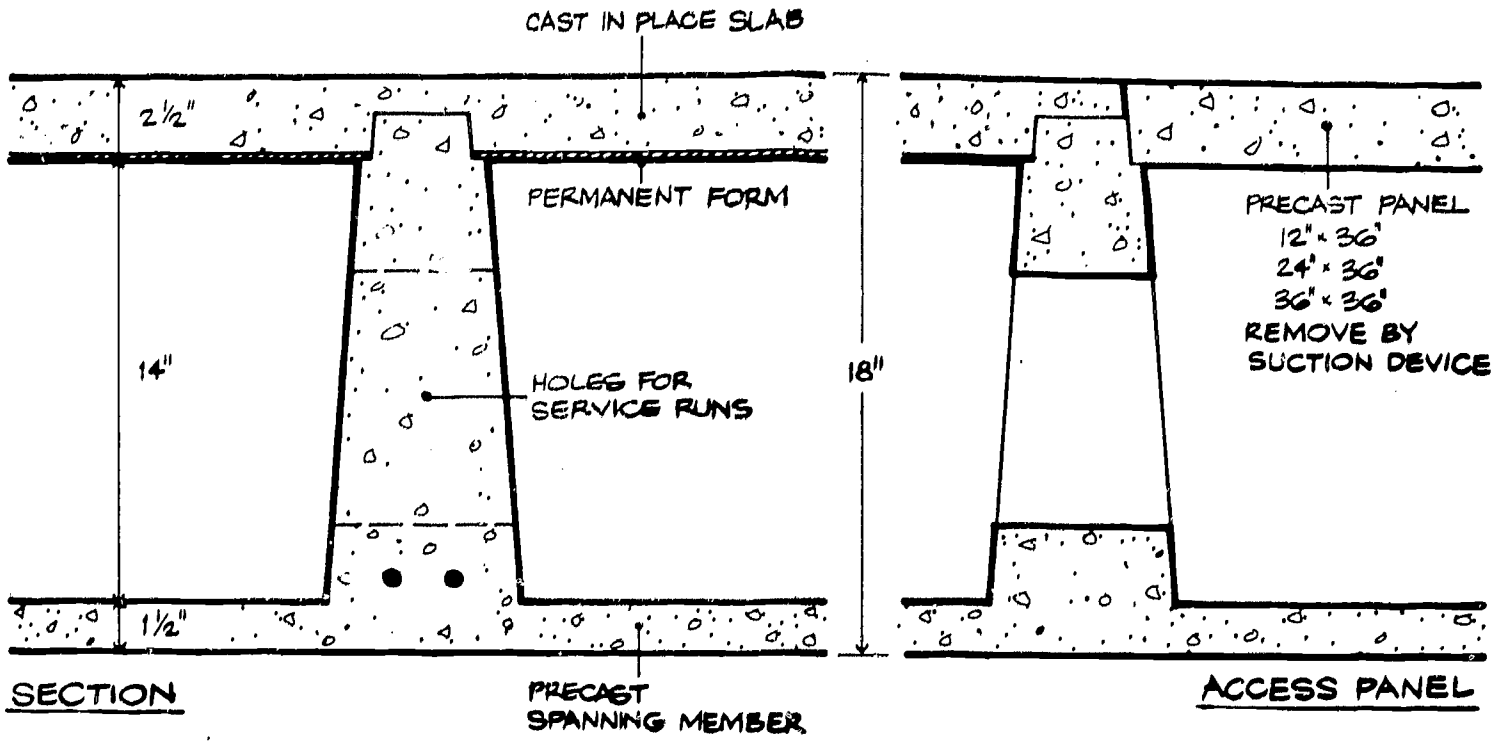
BEAMS



MODULE RULES

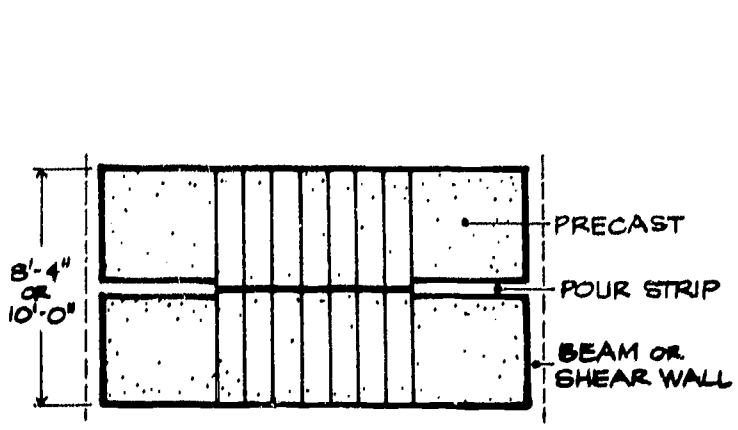


COLUMNS - 1 THROUGH 4 STORY
1 STORY COLUMNS ARE: 9'-6", 11'-

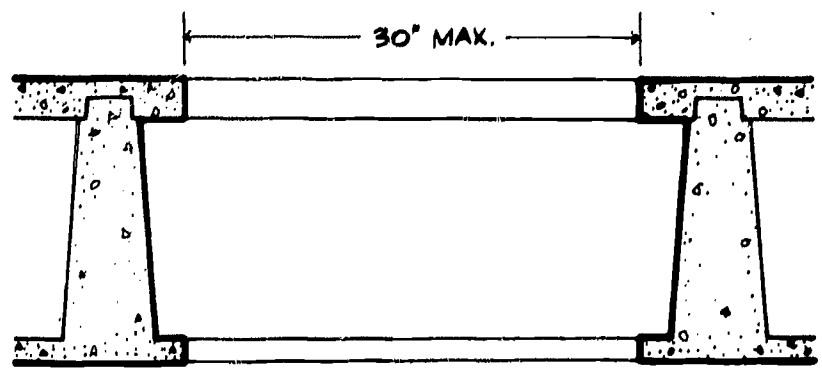


SECTION

ACCESS PANEL

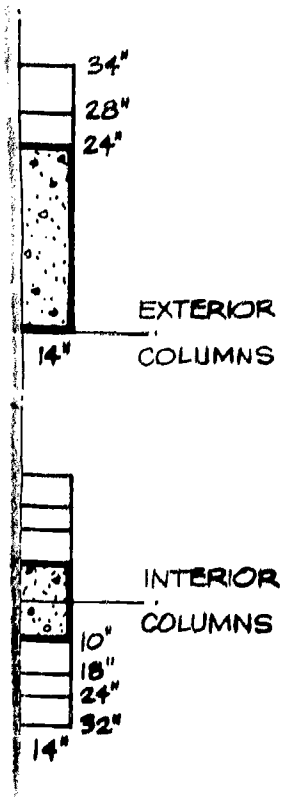


STAIRS

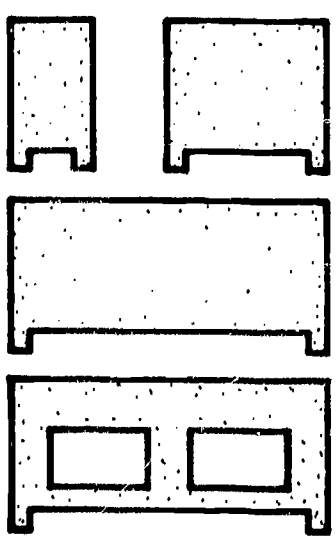


MAXIMUM HOLE SIZE IS 30" x 60"

HOLES IN SLAB

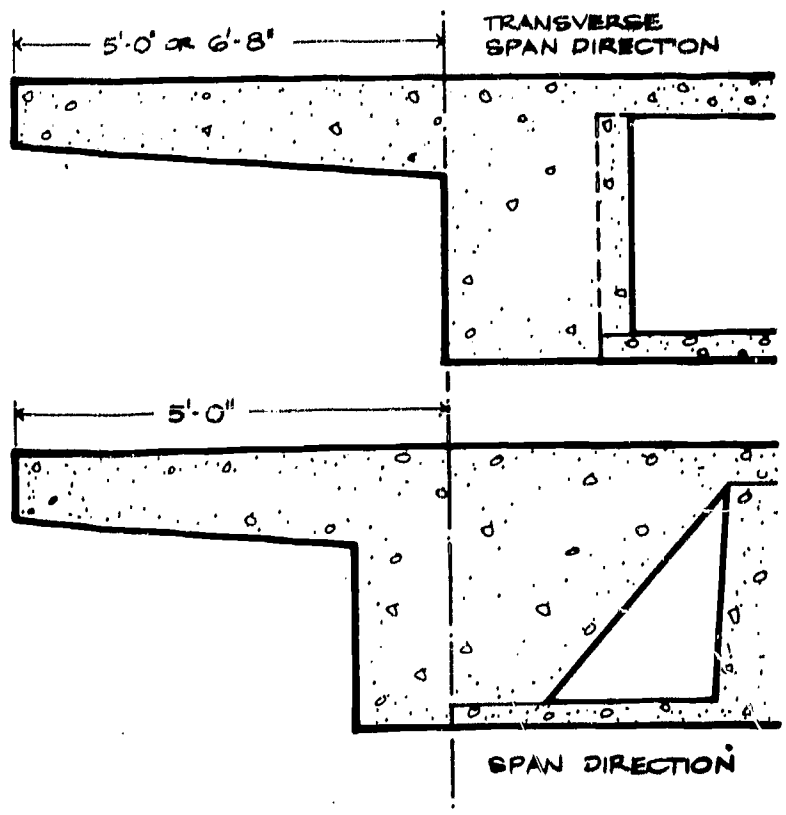


6", 13'-6" AND 15'-6"



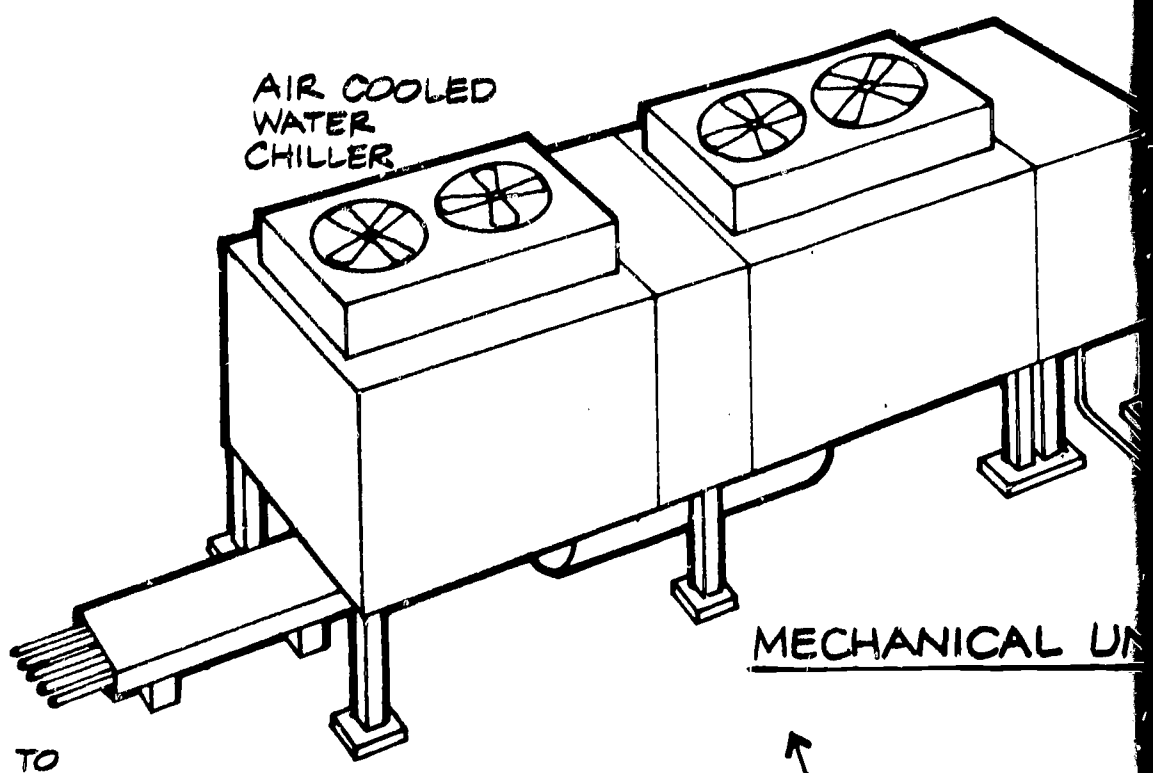
SHEAR WALLS

9'-6" HIGH PRECAST
6", 8", 10" AND 12" THICK



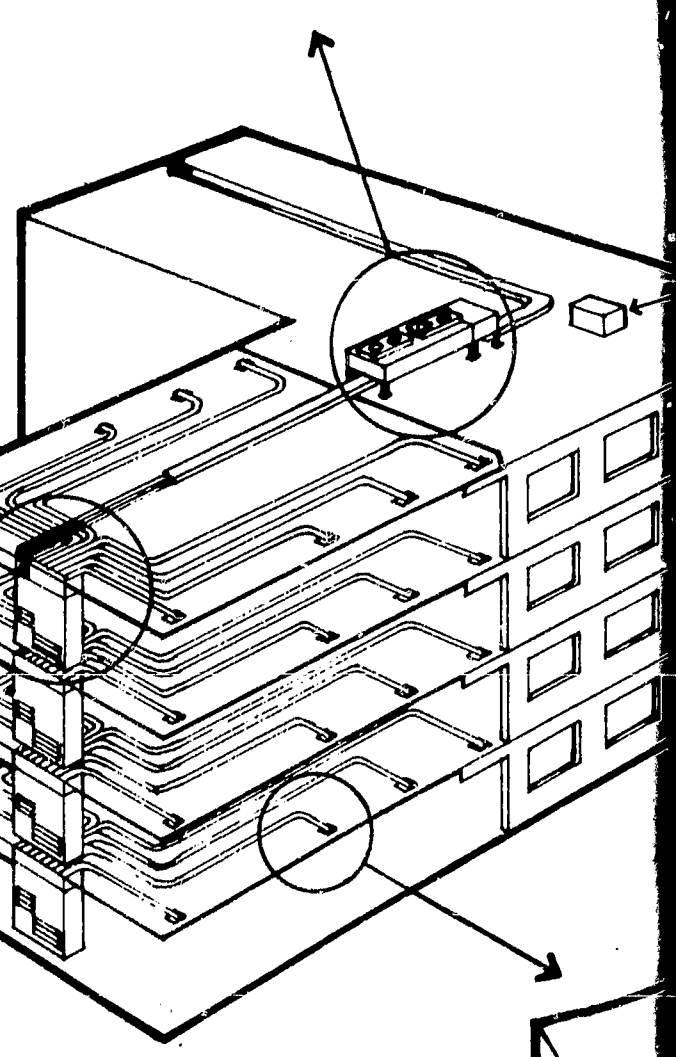
CANTILEVERS

URBS STRUCTURE - CEILING COMPONENT 2



MECHANICAL UN

PIPING TO
MULTIZONE UNITS

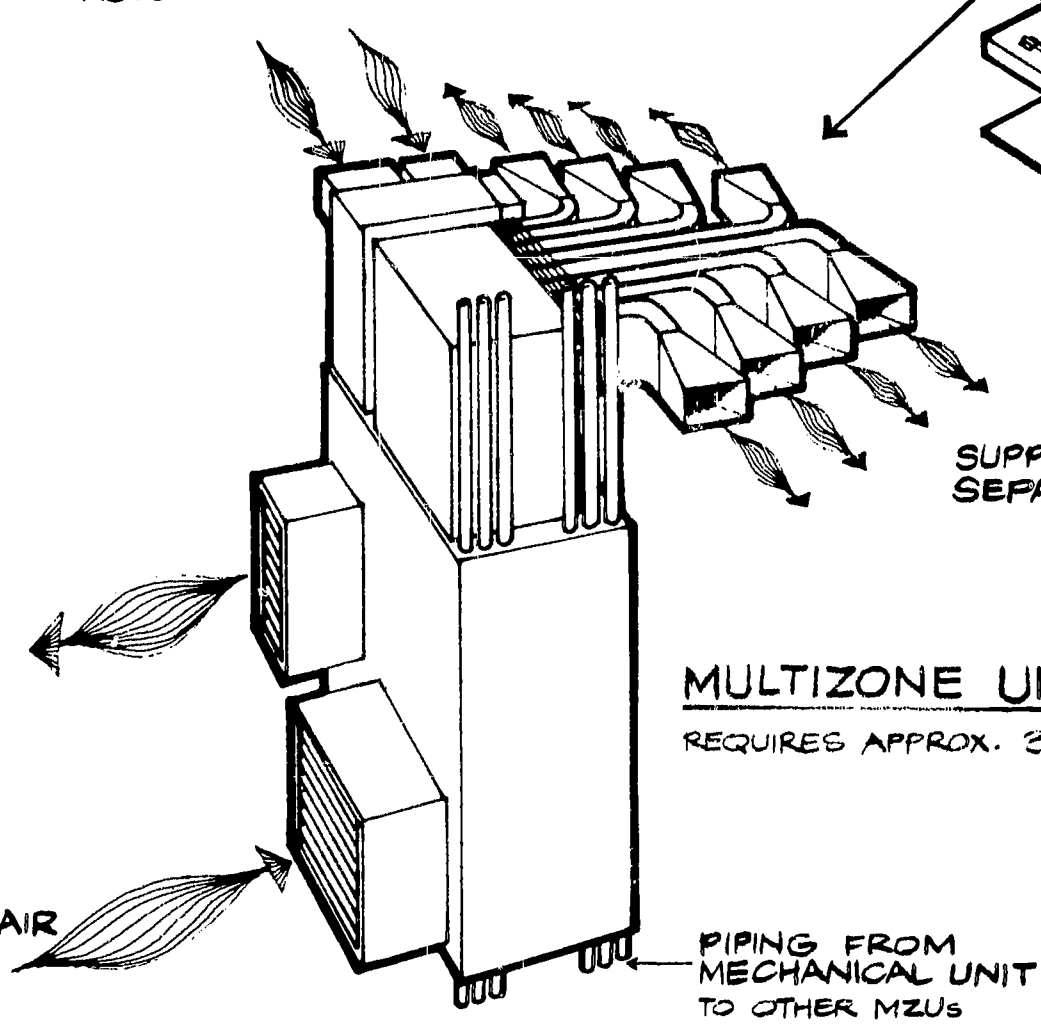


RETURN AIR

SUPPLY AIR TO
SEPARATE ZONES

EXHAUST AIR

FRESH AIR

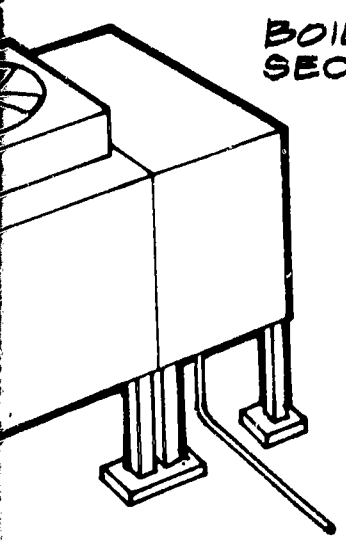


MULTIZONE UNIT

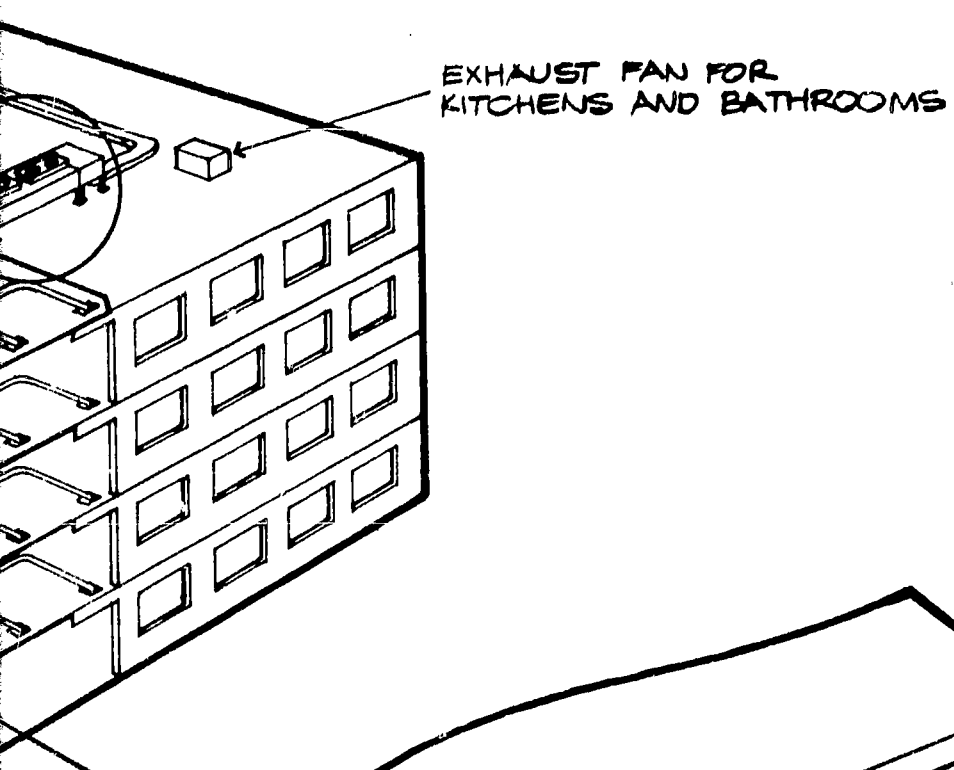
REQUIRES APPROX. 3'×6' AREA

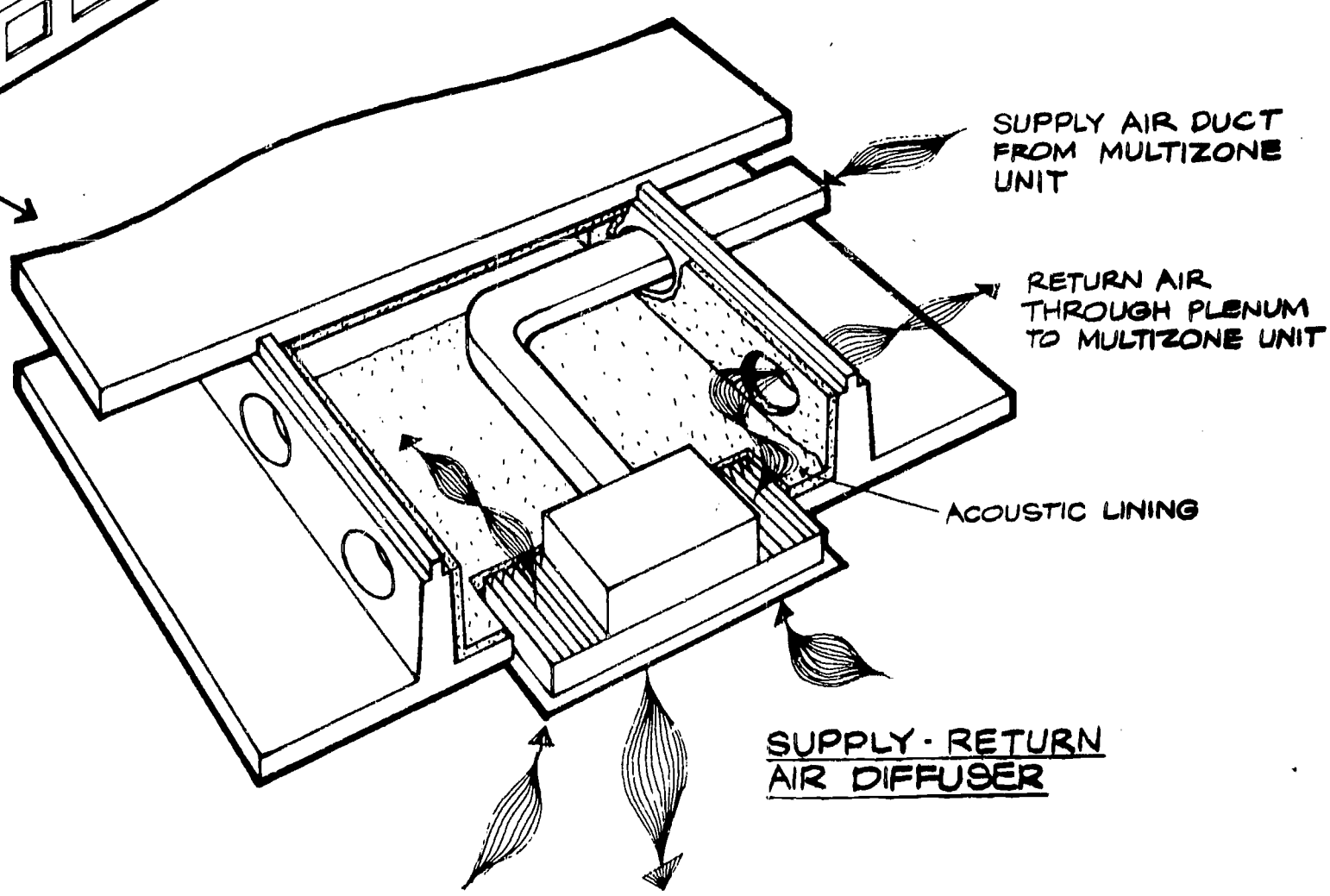
PIPING FROM
MECHANICAL UNIT
TO OTHER MZUs

U



ANICAL UNIT





URBS HEATING, VENTILATING & COOLING COMPONENT 3

served with chilled water (if cooling is provided), hot water, and electrical power. Multizone Units are located preferably outside walls[1] to provide economizer cycle (ability to introduce 100 percent outside air during mild weather) and stacked above each other on each floor.

9.1.2 Multizone Units are served by a mechanical unit mounted on roof, in basement, or outside the building. The mechanical unit consists of a factory packaged central chilled water and hot water plant. However, Multizone Units can also be served by campus central plant, if available.

9.1.3 All air supply is ducted to ceiling diffusers, with a ceiling plenum return. Recirculation of air is limited to area served by Multizone Unit. The locations of ceiling diffusers and cutoffs for return air are determined by the mechanical engineer and installed by the component contractor.

9.1.4 Ceiling diffusers incorporate supply and return section in the same housing, and will be mounted near the outside wall, above windows, so that wall relocation does not affect diffuser location.

9.1.5 Fixed quantities of exhaust air are provided for bath and toilet rooms, and for kitchens. Air balance can be designed to slightly pressurize buildings at all time for odor and dust control.

9.1.6 Control is low voltage wiring to thermostats.

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[1]Multizone Units can be mounted at interior buildings with ducts on shaft to provide outside and exhaust air.

9.2 Multizone Units

9.2.1 The factory packaged unit consists of supply and return exhaust fans, hot and chilled water coils, filters, zone mixing dampers, controls, wiring and piping, all enclosed in a sheet metal cabinet.

The unit comes in four sizes: 1200, 2000, 3000, and 4000 CFM nominal. The largest housing is approximately 30 inches wide x 72 inches deep and 6 feet 6 inches high.[1]

9.2.2 The Multizone Unit can be installed against walls or partitions with one inch clearance. Rear of cabinet is designed to butt up against non-URBS louvers in outside walls.

9.2.3 All required access to equipment is located at front of cabinet. The enclosure for unit must have double doors to provide full access to face of unit.

9.2.4 Power wiring to starters and disconnect switches is mounted within cabinet. Vandalproof manual start and stop switches are located outside of unit on enclosing wall.

9.2.5 Water and condensate drain pipes, plus conduit and wire, are mounted within the cabinet so that field labor is limited to connections from top of unit to bottom of unit on floor above.

9.2.6 Filter efficiency is 45 percent by NBS dust spot test, and designed for replacement once per year.

9.2.7 Long life bearings, 150 percent rated belt drives, and vibration isolation mounts are provided on fans and motors.

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[1]Size of units may change slightly during development program.

9.2.8 Fin tube water coils, shut off and balancing cocks in branch lines, and insulated drip pan are provided. No automatic control valves in water lines.

9.2.9 Air passages are designed for minimum air turbulence, and the cabinet is provided with sound absorbing material.

9.2.10 Zone mixing dampers are modulated by electric motors controlled by room thermostats in outside air.

9.2.11 Units for HV only are provided with heating coil, but designed to receive future cooling coil, drip pan and chilled water piping. No alterations to temperature controls are required.

9.1.12 Units are designed for maintenance only once per year.

9.3 Mechanical Units

9.3.1 Heating assembly, if campus central plant is not used, consists of gas fired hot water boiler, circulating pump and controls, induced draft fan, low water and other safety controls, all factory packaged and enclosed in weather-proofed sheet metal cabinet.

9.3.2 Cooling assembly, if campus central plant is not used, consists of two direct expansion compressors piped to single chiller with split circuits, up blast air cooled condenser with head pressure control provided for each compressor, heat exchanger, circulating pump and controls, all factory packaged and enclosed in weatherproofed sheet metal cabinet. Cooling is optional and not mandatory.

9.3.3 Chilled and hot water pumps are close coupled type.

9.3.4. All moving equipment is mounted on vibration isolators and designed for low noise level.

9.3.5 Legs of units will be attached to steel plates designed to rest on ribbed rubber vibration isolation pads (by URBS), if mounted where vibration is critical, as on roof.

9.3.6 All controls, starters, disconnects and switches are mounted on panel in unit, and prewired and tested at factory.

9.3.7 Where future cooling is required, cooling assembly is to be mounted adjacent to heating assembly, and wiring extended for main switchboard (on first floor) in the empty conduit installed at time of construction.

9.4 Piping and Utilities

9.4.1 Gas pipe is extended from submeter on first floor to mechanical unit (URBS).

9.4.2 Electric feeders are extended from submeter on first floor to Multizone Units and mechanical units (URBS). When heating assembly only is installed, empty conduit is to be installed in building sized for a future cooling assembly.

9.4.3 Black iron hot water pipes (by URBS) are extended from heating assembly to risers. Pipes mounted outside building are insulated and weather-proofed. Pipes inside building and within Multizone Units are uninsulated.

9.4.4 Black iron chilled water pipes are installed when cooling assembly is added. Pipes are extended from cooling assembly to risers. Pipes mounted outside building are insulated and weather-proofed. Insulated pipes are connected to risers at Multizone Units on the lower floors.

9.4.5 Uninsulated copper condensate drain line is installed when cooling assembly is added. Connectors are installed between Multizone Units on each floor and drain extended to spill over a floor sink on first floor.

9.4.6 Size of piping in risers does not change.

9.5 Exhaust Fans

9.5.1 Exhaust fans are on continuous operation for simplicity of controls, and to maintain air balance in building.

9.5.2 Toilet exhaust with grilles at ceiling of toilet rooms, and duct-work above ceiling, are connected to duct riser leading up to roof mounted exhaust fan. Make up air is from adjacent rooms or corridor through transfer duct in ceiling.

9.5.3 Kitchen exhaust is through roof mounted exhaust fan and duct risers with capped outlets on each floor. Weighted damper at fan inlet to provide for relieving excessive pressure when branch duct manual dampers are all closed.

9.5.4 Each branch duct connector is terminated with 22-inch long elbow turned up in duct riser to eliminate need for automatic fire dampers.

9.6 Features of HVC Component

9.6.1 Separate Multizone Units allow shutting off the unit when space is unoccupied.

9.6.2 Minimum floor area within occupied area. No large central shafts or equipment taking up assignable floor area are required.

9.6.3 Maximum design flexibility. The Multizone Units can be located anywhere at an outside wall, or at the interior if ducts are provided.

9.6.4 Ability to introduce 100 percent outside air in any specific space where occupancy changes require higher than specified ventilation rates.

9.6.5 Economizer cycle available to provide some cooling on HV option.

9.6.6 Easy access to all major equipment in mechanical units in most instances. Multizone Units can be located off public areas and access for maintenance is limited to once a year.

9.6.7 No water treatment or drain problems by using air cooled condensers.

9.6.8 Cooling easily added to HV options. Multizone HV Units can be purchased with cooling coils for future use, if desired, to minimize change-over disturbance within occupied areas.

9.6.9 Simple and easy to maintain controls. All replacement parts readily available.

9.6.10 Combination supply and return air terminals provided with vandal-proof devices for manual adjustments of volume and direction of blow.

9.6.11 Campus central plant energy easily accommodated at each building by extending hot water and chilled water mains into building and connecting to base of risers. Riser pipes sized for up-feed system. Install heat exchanger if central plant energy is steam or high temperature hot water. Chilled water is used directly.

9.6.12 Changes in georgraphical location easily accommodated by proper selection of Multizone Units and mechanical units. Additional stories easily accommodated by increasing size of riser pipes and conduits, adding Multizone Units on new floor and selecting proper mechanical units.

9.6.13 Multizone Units are out of sight; mechanical units are of low silhouette design with clean lines. Combination supply and return air terminal units provide uniform appearance at single locations.

9.6.14 Stop-start switches for all roof-mounted exhaust fans are located at mechanical unit. Switches for Multizone Units are on wall of enclosure for local operation by maintenance personnel. All controls vandal-proofed. Room thermostats provided with specified features for 'warmer' or 'cooler' settings.

9.6.15 Complete installation of supply ducts in precast tees prior to pouring slab for Structure-Ceiling component.

9.7 Installation Procedure

9.7.1 Locate openings, inserts, holes, and the like in structure.

9.7.2 Install combination ceiling supply and return terminal units in precast tees at plant. Some supply ducts can also be installed at plant.

9.7.3 Rough-in gas and electric power to mechanical units.

9.7.4 Rig in Multizone Units.

9.7.5 Connect riser pipes and conduit between Multizone Units.

9.7.6 Rig in mechanical unit, and fans on roof; and install pipes and conduit.

9.7.7 Install room thermostats and run control wiring. Install stop-start switches for Multizone Units.

9.7.8 Install toilet exhaust registers.

9.7.9 Fill water systems and conduct pressure tests.

9.7.10 Start and adjust all systems, and make air balance.

9.7.11 All deliveries of equipment, material and all items of work to be compatible with the overall building schedule.

9.8 Maintenance

9.8.1 The Chrysler Corporation is prepared to offer a total maintenance program, including service outlined below, and the repair and replacement of all parts as required to maintain the specified performance.

9.8.2 Equipment requiring maintenance:

9.8.2.1 Multizone Units: One service call per year.

9.8.2.2 Mechanical Unit: Routine check every 30 days.

9.8.2.3 Controls: Estimate one hour per year for approximately 20 percent of zones and one hour per year per mechanical unit.

9.9 The URBS HVC component contractor will be responsible for the following:

9.9.1 Shop drawings for each URBS housing project.

9.9.2 Supply and installation of complete mechanical solution, including supervision, in all URBS housing projects.

9.9.3 Attachment to, and passage through, work of other URBS components, including vibration isolators, flashing, waterproofing, air-sealing, fire dampers, sound damping, air diffusers, and grilles and louvers on the interior of the building.

9.9.4 Plumbing piping and electrical equipment and wiring forming a part of the installation.

9.9.5 Control devices including wiring and tubing.

9.9.6 Testing in place, adjustment and balancing.

9.9.7 Guarantee.

9.9.8 A long-term maintenance contract (optional with University).

9.9.9 Maintenance Manuals.

9.9.10 As-built drawings.

9.9.11 Safety for installation and operation.

9.9.12 Complete gas and electric service distribution from HVC equipment to the submeter and subpanel serving it, including valves and switching devices required by HVC equipment at such submeters and subpanels.

9.10 Excluded From the HVC Component

9.10.1 Holes in work of other components.

9.10.2 Plumbing not forming a part of the mechanical HVC solution.

9.10.3 Grilles and louvers on the exterior of the building.

9.10.4 Service entrance equipment and metering facilities.

9.10.5 Gas and electric service distribution and equipment not a part of, or not exclusively serving, the HVC equipment in this component.

9.10.6 Mechanical system for central kitchens, dining halls and large assembly spaces (URBS components may be used for these spaces at the option of the architect).

9.10.7 Miscellaneous ductwork not a part of mechanical solution as described herein.

9.10.8 Domestic hot water system.

10.0 URBS PARTITIONS COMPONENT

10.1 General Description

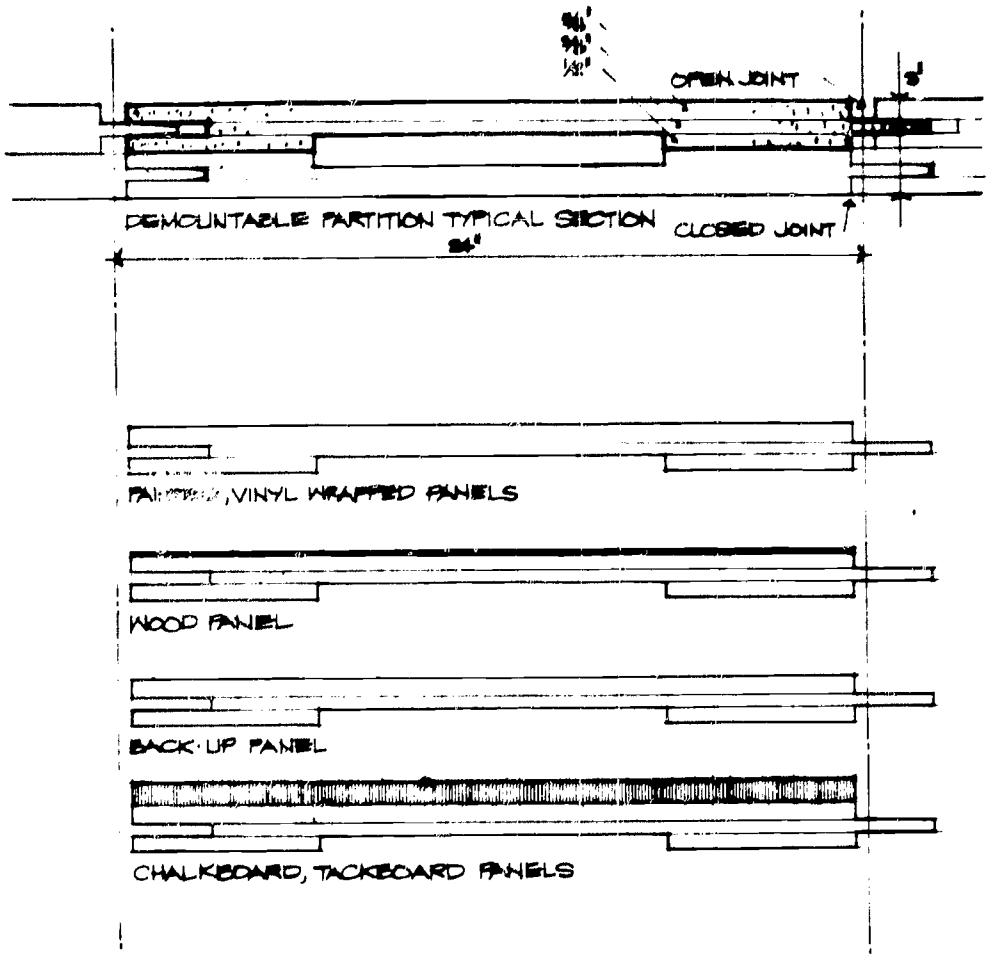
10.1.1 URBS partitions come in two basic types—fixed and demountable. The same finish materials, trim, and exposed details are used throughout for both types.

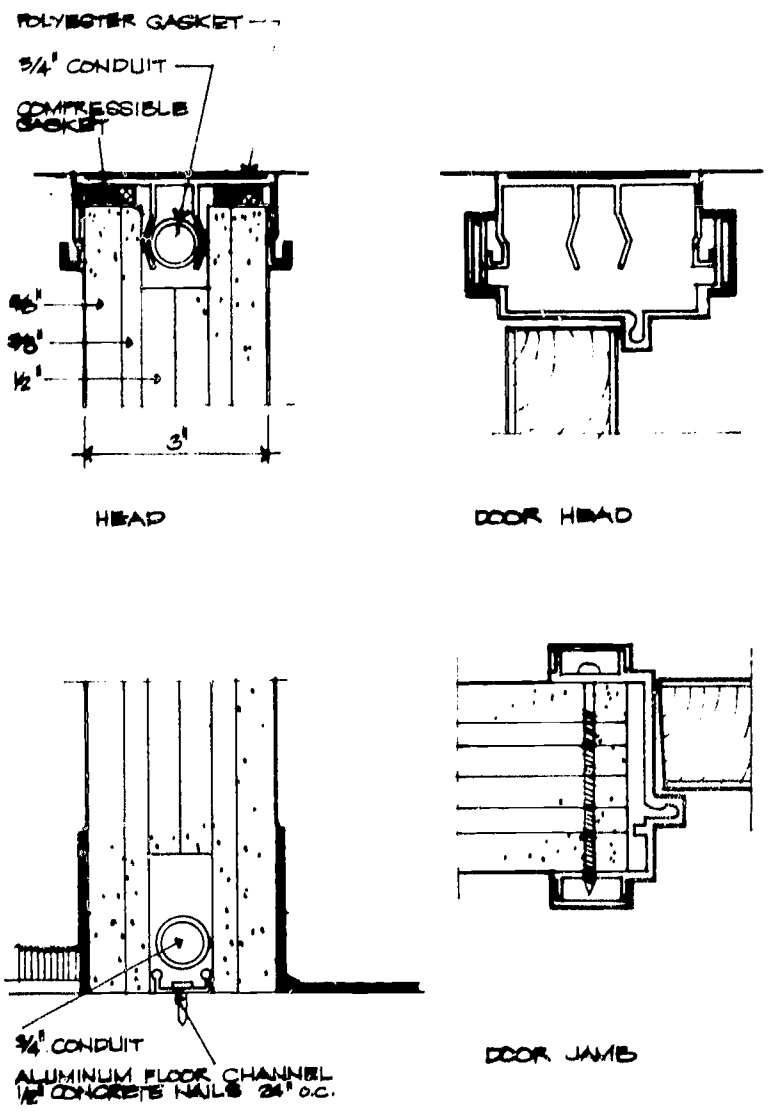
10.1.2 The relocatable partition is an all gypsum, progressively demountable design in which opposite faces of a wall can be removed independently. Joints between the 24-inch wide panels can contain a furniture standard to which wall-hung furniture may be attached, can be left empty with a 3/4-inch reveal, or can be closed to present a flush, single line joint.

10.1.3 The fixed partitions use 2-1/2-inch steel studs with two layers of 5/8-inch gypsum board on each side. The joint treatment options include a furniture standard, a reveal, and a flush joint, just as for the demountable type.

10.2 Horizontal Dimensions

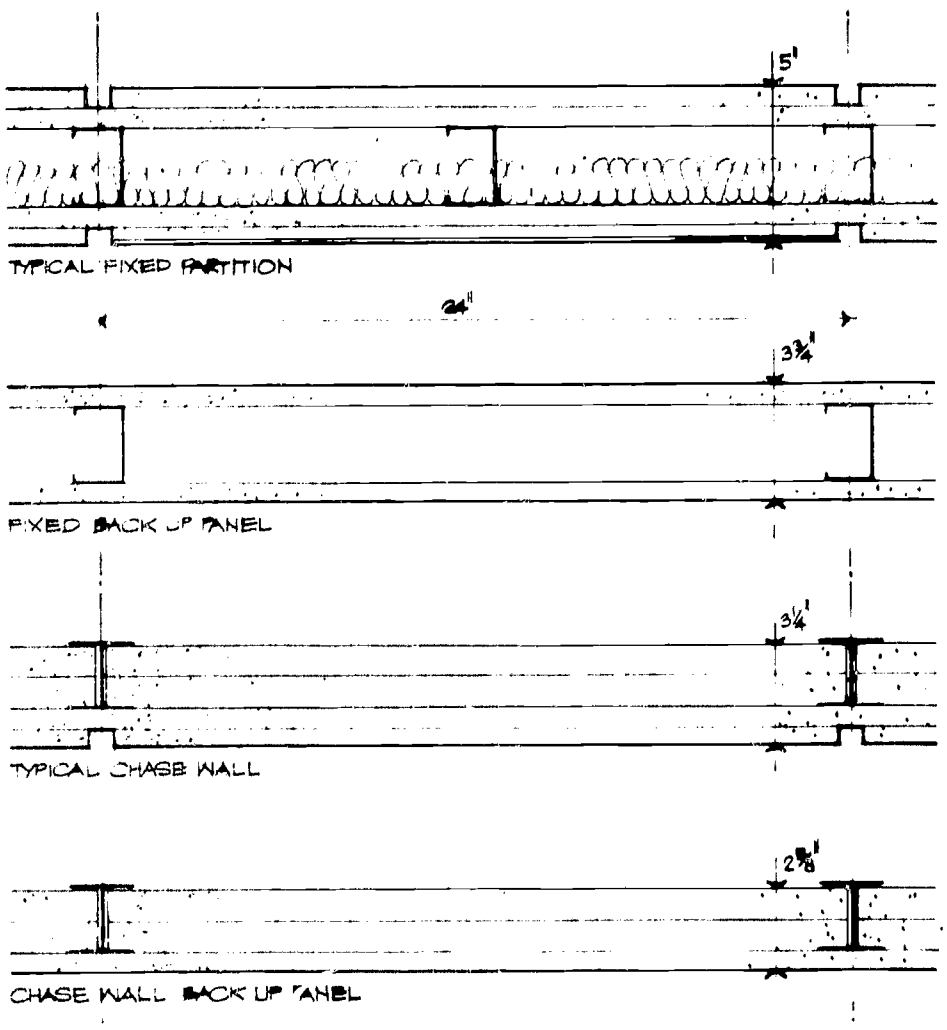
10.2.1 Planning and relocation module = 4 inches.

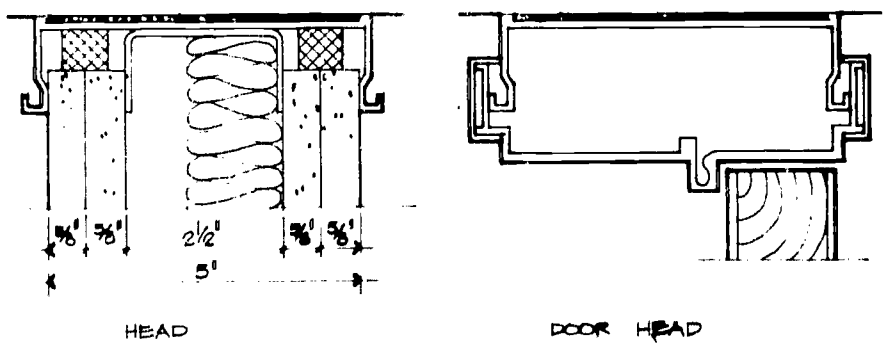


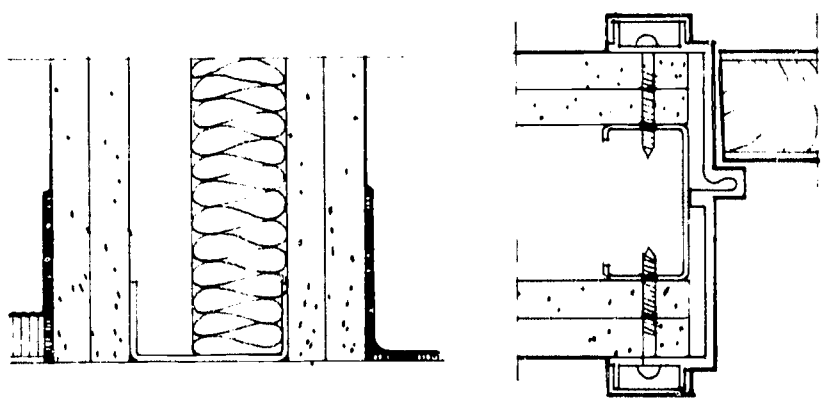


DEMOUNTABLE PARTITIONS - TYPICAL SECTIONS

TYPICAL DETAILS



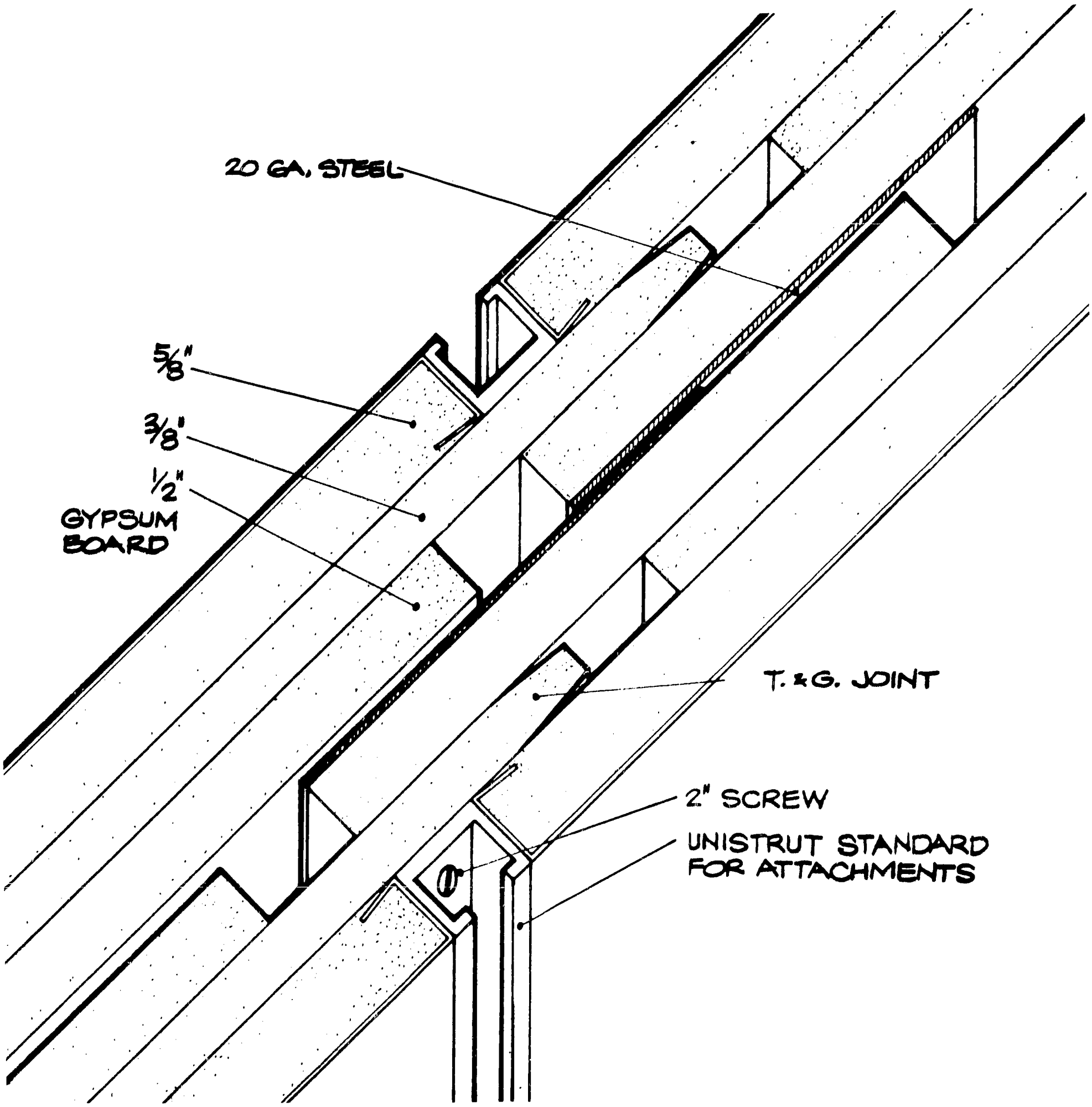




FIXED PARTITIONS - TYPICAL SECTIONS

TYPICAL DETAILS

URBS PARTITION COMPONENT



URBS PARTITION COMPONENT 5

10.2.2 Demountable partitions panel width = 24 inches, field cut as required to meet 4-inch planning module.

10.2.3 Thickness = demountable 3 inches, fixed 5 inches.

10.3 Vertical Dimensions

10.3.1 Demountable partition height = 8 feet, 10 feet.

10.3.2 Fixed partition heights = 8 feet, 10 feet, 12 feet and 14 feet.

10.4 Surface Types

10.4.1 The following surface types are provided:

10.4.1.1 Paint — 10 colors of a high durability matte finish paint.

10.4.1.2 Vinyl — 10 colors of a stipple textured medium weight vinyl wall covering.

10.4.1.3 Wood — 3 colors of a rough surfaced plywood, including redwood.

10.4.1.4 Back-up — an unfinished gypsum board surface for the Application non-system veneers.

10.4.1.5 Glass — Clear glass and clear wire glass are available.

10.4.1.6 Chalkboard — 4 colors of panels attach to the furniture standards.

10.5 Doors

10.5.1 Room doors in widths of 28 inches, 32 inches, and 36 inches are provided in full height frames.

10.5.2 Closet doors are also provided; these do not meet the STC 27 requirement or typical doors.

10.6 Utilities

10.6.1 The URBS system does not provide any electrical material. Space is provided internally for the passage of 3/4-inch EMT vertically,

and horizontally in the head and base in each partition panel. Conventional electrical boxes can be used.

10.6.2 Chase walls can be built with the URBS partitions to enclose large boxes and lines.

10.7 Trim

10.7.1 All exposed metal trim is color anodized aluminum.

10.7.2 Head trim provides integral picture hanging track.

10.7.3 Base trim includes 10 colors of resilient vinyl base and toe base.

10.8 Performance Characteristics

10.8.1 Fire rating — all partitions provide a one-hour fire rating.

10.8.2 Acoustics — STC 50 for fixed partitions
STC 40 for demountable partitions
STC 27 for doors

10.8.3 Surface Durability — paint and vinyl surfaces provide abrasion, stain and water resistance comparable to Type II vinyl coverings.

10.9 Attachments

10.9.1 Head and base channels are nailed to concrete floor and ceiling.

10.9.2 Furniture, shelving, chalkboards, and tackboards can be attached to furniture standards.

10.10 The URBS Partitions component contractor will be responsible for the following:

10.10.1 Supply and Installation

Complete Partitions component in all URBS housing projects in compliance with schedules established by the University.

Finishes both field and factory applied
Glass and glazing
Door and hinges
Chalkboard
Tackboard
Provision for the attachment of units in Furnishings, HVC, and Bathroom component

Bases and trim

Shelf brackets and brackets for the attachment of wall-hung Furnishings

All holes for other components passing through partitions

10.10.2 Complete shop drawings for each URBS housing project.

10.10.3 Inspection and supervision of all installations.

10.10.4 Cleanup

10.10.4.1 All Partitions component surfaces.

10.10.4.2 Removal of all scrap material associated with this contractor's installation.

10.10.5 Replacement units, with performance at least equal to, and appearance compatible with the original, shall be available through December 30, 1985.

10.11 Not included in this component.

10.11.1 Exterior walls.

10.11.2 Bathroom interiors.

10.11.3 Wiring, switches, conduit, and convenience outlets.

10.11.4 The supply and installation of door hardware, except for hinges and sealing devices.

10.11.5 All grilles over vents or holes through partitions.

9.3.5 Legs of units will be attached to steel plates designed to rest on ribbed rubber vibration isolation pads (by URBS), if mounted where vibration is critical, as on roof.

9.3.6 All controls, starters, disconnects and switches are mounted on panel in unit, and prewired and tested at factory.

9.3.7 Where future cooling is required, cooling assembly is to be mounted adjacent to heating assembly, and wiring extended for main switchboard (on first floor) in the empty conduit installed at time of construction.

9.4 Piping and Utilities

9.4.1 Gas pipe is extended from submeter on first floor to mechanical unit (URBS).

9.4.2 Electric feeders are extended from submeter on first floor to Multizone Units and mechanical units (URBS). When heating assembly only is installed, empty conduit is to be installed in building sized for a future cooling assembly.

9.4.3 Black iron hot water pipes (by URBS) are extended from heating assembly to risers. Pipes mounted outside building are insulated and weather-proofed. Pipes inside building and within Multizone Units are uninsulated.

9.4.4 Black iron chilled water pipes are installed when cooling assembly is added. Pipes are extended from cooling assembly to risers. Pipes mounted outside building are insulated and weather-proofed. Insulated pipes are connected to risers at Multizone Units on the lower floors.

9.4.5 Uninsulated copper condensate drain line is installed when cooling assembly is added. Connectors are installed between Multizone Units on each floor and drain extended to spill over a floor sink on first floor.

9.4.6 Size of piping in risers does not change.

9.5 Exhaust Fans

9.5.1 Exhaust fans are on continuous operation for simplicity of controls, and to maintain air balance in building.

9.5.2 Toilet exhaust with grilles at ceiling of toilet rooms, and duct-work above ceiling, are connected to duct riser leading up to roof mounted exhaust fan. Make up air is from adjacent rooms or corridor through transfer duct in ceiling.

9.5.3 Kitchen exhaust is through roof mounted exhaust fan and duct risers with capped outlets on each floor. Weighted damper at fan inlet to provide for relieving excessive pressure when branch duct manual dampers are all closed.

9.5.4 Each branch duct connector is terminated with 22-inch long elbow turned up in duct riser to eliminate need for automatic fire dampers.

9.6 Features of HVC Component

9.6.1 Separate Multizone Units allow shutting off the unit when space is unoccupied.

9.6.2 Minimum floor area within occupied area. No large central shafts or equipment taking up assignable floor area are required.

9.6.3 Maximum design flexibility. The Multizone Units can be located anywhere at an outside wall, or at the interior if ducts are provided.

9.6.4 Ability to introduce 100 percent outside air in any specific space where occupancy changes require higher than specified ventilation rates.

9.6.5 Economizer cycle available to provide some cooling on HV option.

9.6.6 Easy access to all major equipment in mechanical units in most instances. Multizone Units can be located off public areas and access for maintenance is limited to once a year.

9.6.7 No water treatment or drain problems by using air cooled condensers.

9.6.8 Cooling easily added to HV options. Multizone HV Units can be purchased with cooling coils for future use, if desired, to minimize change-over disturbance within occupied areas.

9.6.9 Simple and easy to maintain controls. All replacement parts readily available.

9.6.10 Combination supply and return air terminals provided with vandal-proof devices for manual adjustments of volume and direction of blow.

9.6.11 Campus central plant energy easily accommodated at each building by extending hot water and chilled water mains into building and connecting to base of risers. Riser pipes sized for up-feed system. Install heat exchanger if central plant energy is steam or high temperature hot water. Chilled water is used directly.

9.6.12 Changes in georgraphical location easily accommodated by proper selection of Multizone Units and mechanical units. Additional stories easily accommodated by increasing size of riser pipes and conduits, adding Multizone Units on new floor and selecting proper mechanical units.

9.6.13 Multizone Units are out of sight; mechanical units are of low silhouette design with clean lines. Combination supply and return air terminal units provide uniform appearance at single locations.

9.6.14 Stop-start switches for all roof-mounted exhaust fans are located at mechanical unit. Switches for Multizone Units are on wall of enclosure for local operation by maintenance personnel. All controls vandal-proofed. Room thermostats provided with specified features for 'warmer' or 'cooler' settings.

9.6.15 Complete installation of supply ducts in precast tees prior to pouring slab for Structure-Ceiling component.

9.7 Installation Procedure

9.7.1 Locate openings, inserts, holes, and the like in structure.

9.7.2 Install combination ceiling supply and return terminal units in precast tees at plant. Some supply ducts can also be installed at plant.

9.7.3 Rough-in gas and electric power to mechanical units.

9.7.4 Rig in Multizone Units.

9.7.5 Connect riser pipes and conduit between Multizone Units.

9.7.6 Rig in mechanical unit, and fans on roof; and install pipes and conduit.

9.7.7 Install room thermostats and run control wiring. Install stop-start switches for Multizone Units.

9.7.8 Install toilet exhaust registers.

9.7.9 Fill water systems and conduct pressure tests.

9.7.10 Start and adjust all systems, and make air balance.

9.7.11 All deliveries of equipment, material and all items of work to be compatible with the overall building schedule.

9.8 Maintenance

9.8.1 The Chrysler Corporation is prepared to offer a total maintenance program, including service outlined below, and the repair and replacement of all parts as required to maintain the specified performance.

9.8.2 Equipment requiring maintenance:

9.8.2.1 Multizone Units: One service call per year.

9.8.2.2 Mechanical Unit: Routine check every 30 days.

9.8.2.3 Controls: Estimate one hour per year for approximately 20 percent of zones and one hour per year per mechanical unit.

9.9 The URBS HVC component contractor will be responsible for the following:

9.9.1 Shop drawings for each URBS housing project.

9.9.2 Supply and installation of complete mechanical solution, including supervision, in all URBS housing projects.

9.9.3 Attachment to, and passage through, work of other URBS components, including vibration isolators, flashing, waterproofing, air-sealing, fire dampers, sound damping, air diffusers, and grilles and louvers on the interior of the building.

9.9.4 Plumbing piping and electrical equipment and wiring forming a part of the installation.

9.9.5 Control devices including wiring and tubing.

9.9.6 Testing in place, adjustment and balancing.

9.9.7 Guarantee.

9.9.8 A long-term maintenance contract (optional with University).

9.9.9 Maintenance Manuals.

9.9.10 As-built drawings.

9.9.11 Safety for installation and operation.

9.9.12 Complete gas and electric service distribution from HVC equipment to the submeter and subpanel serving it, including valves and switching devices required by HVC equipment at such submeters and subpanels.

9.10 Excluded From the HVC Component

9.10.1 Holes in work of other components.

9.10.2 Plumbing not forming a part of the mechanical HVC solution.

9.10.3 Grilles and louvers on the exterior of the building.

9.10.4 Service entrance equipment and metering facilities.

9.10.5 Gas and electric service distribution and equipment not a part of, or not exclusively serving, the HVC equipment in this component.

9.10.6 Mechanical system for central kitchens, dining halls and large assembly spaces (URBS components may be used for these spaces at the option of the architect).

9.10.7 Miscellaneous ductwork not a part of mechanical solution as described herein.

9.10.8 Domestic hot water system.

10.0 URBS PARTITIONS COMPONENT

10.1 General Description

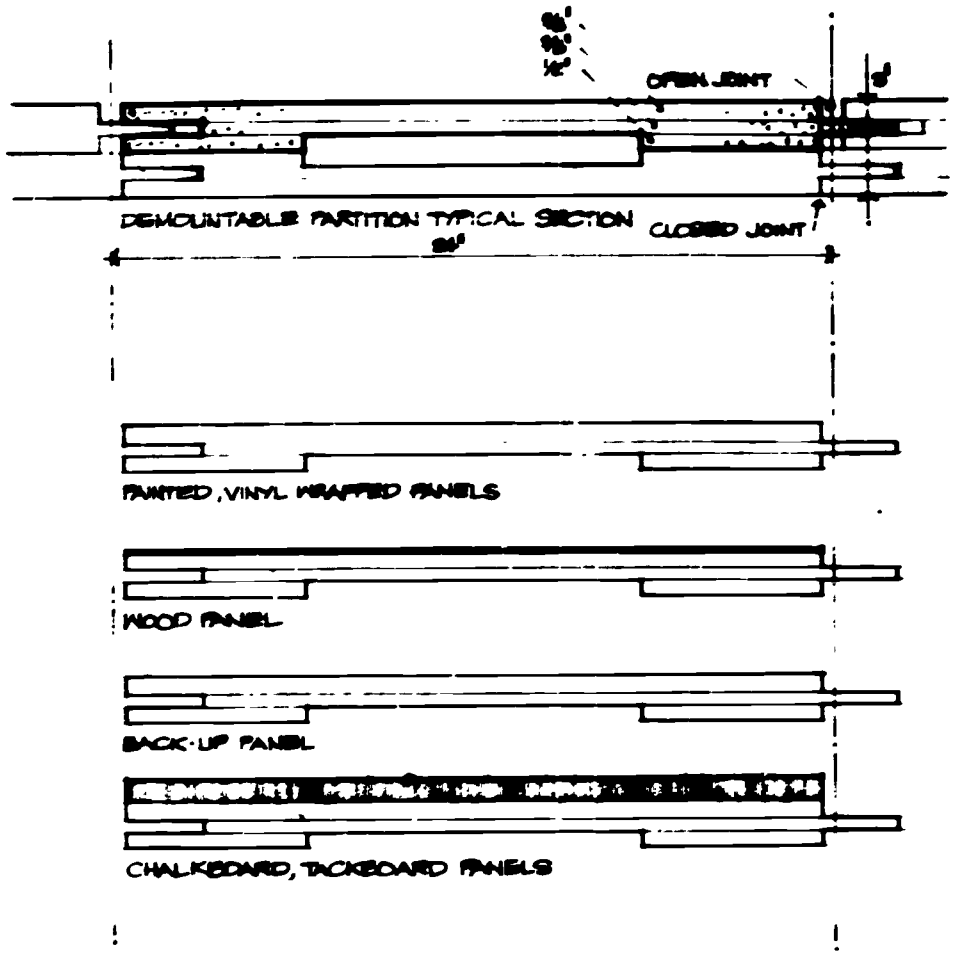
10.1.1 URBS partitions come in two basic types—fixed and demountable. Th same finish materials, trim, and exposed details are used throughou for both types.

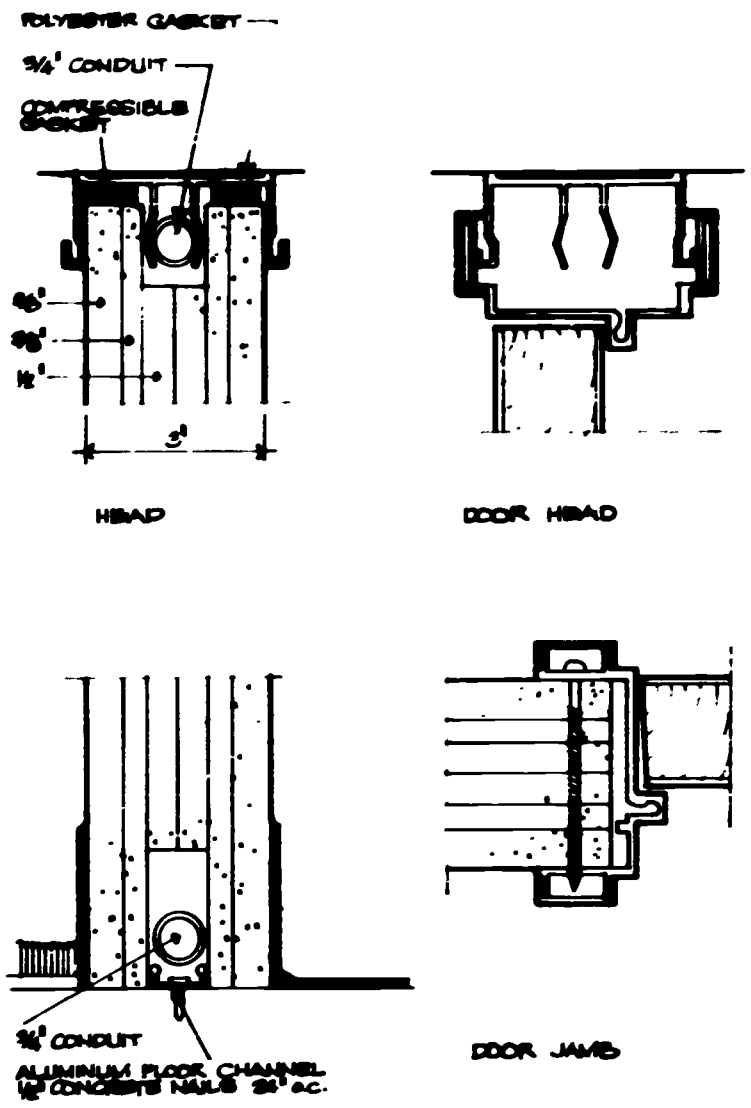
10.1.2 The relocatable partition is an all gypsum, progressively demountab design in which opposite faces of a wall can be removed independent Joints between the 24-inch wide panels can contain a furniture stan dard to which wall-hung furniture may be attached, can be left empt with a 3/4-inch reveal, or can be closed to present a flush, single line joint.

10.1.3 The fixed partitions use 2-1/2-inch steel studs with two layers of 5/8-inch gypsum board on each side. The joint treatment options in clude a furniture standard, a reveal, and a flush joint, just as fo the demountable type.

10.2 Horizontal Dimensions

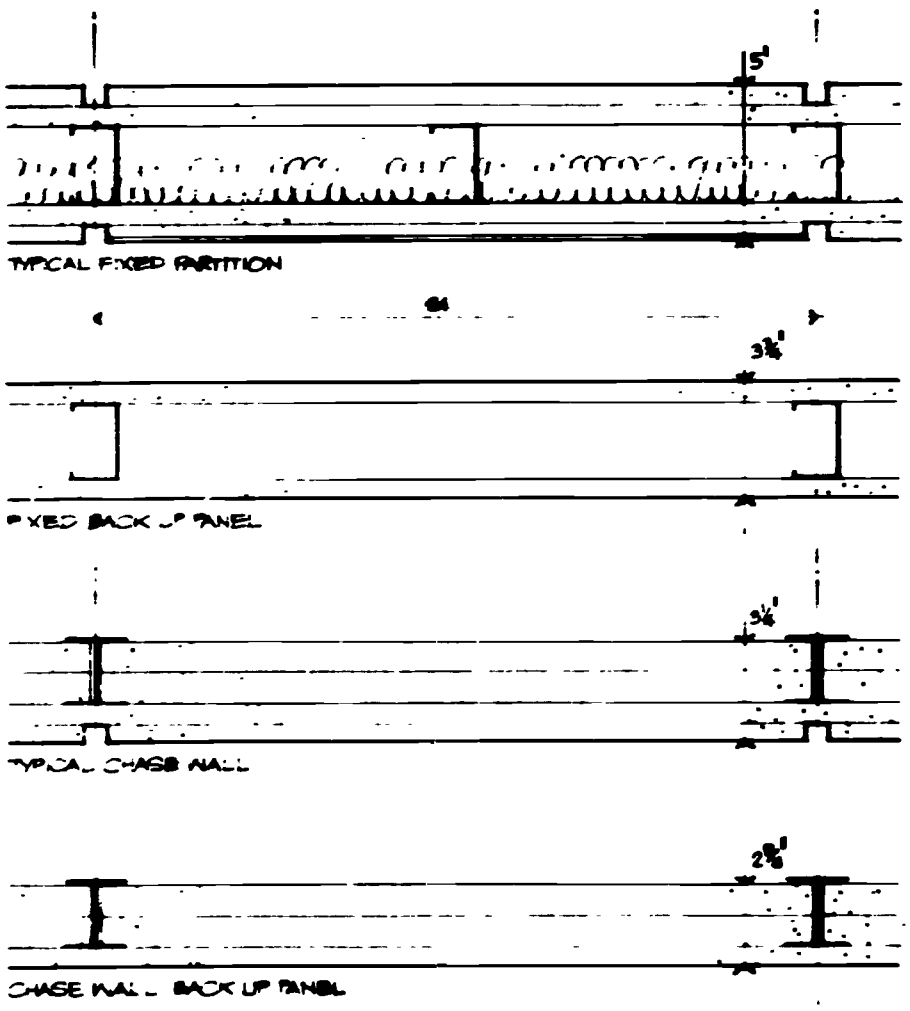
10.2.1 Planning and relocation module = 4 inches.

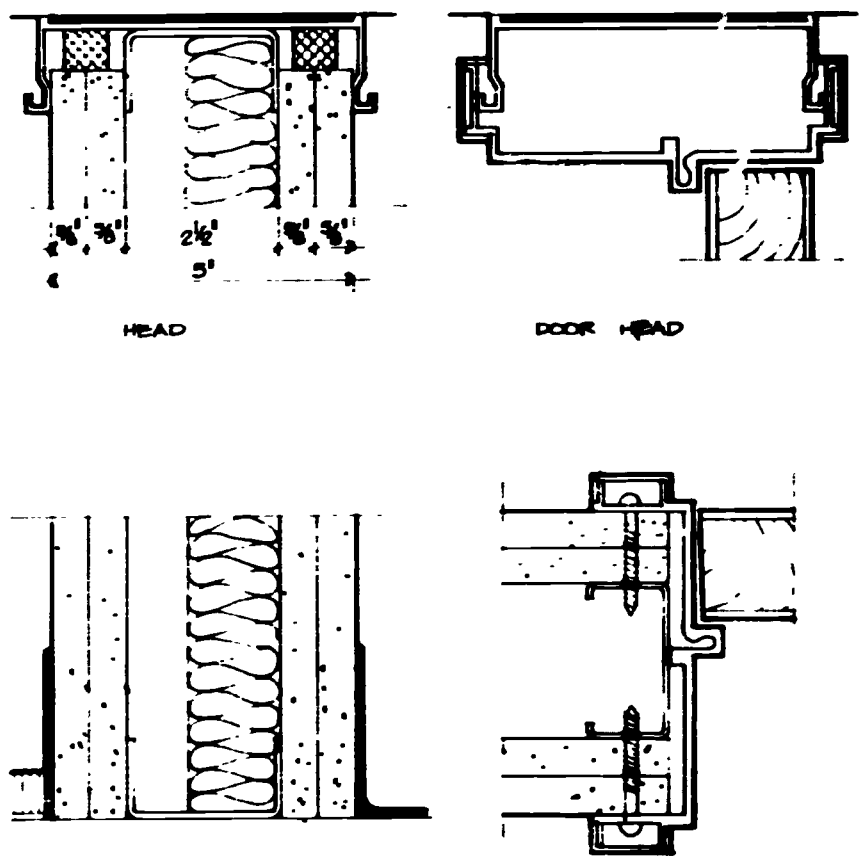




DEMOUNTABLE PARTITIONS - TYPICAL SECTIONS

TYPICAL DETAILS

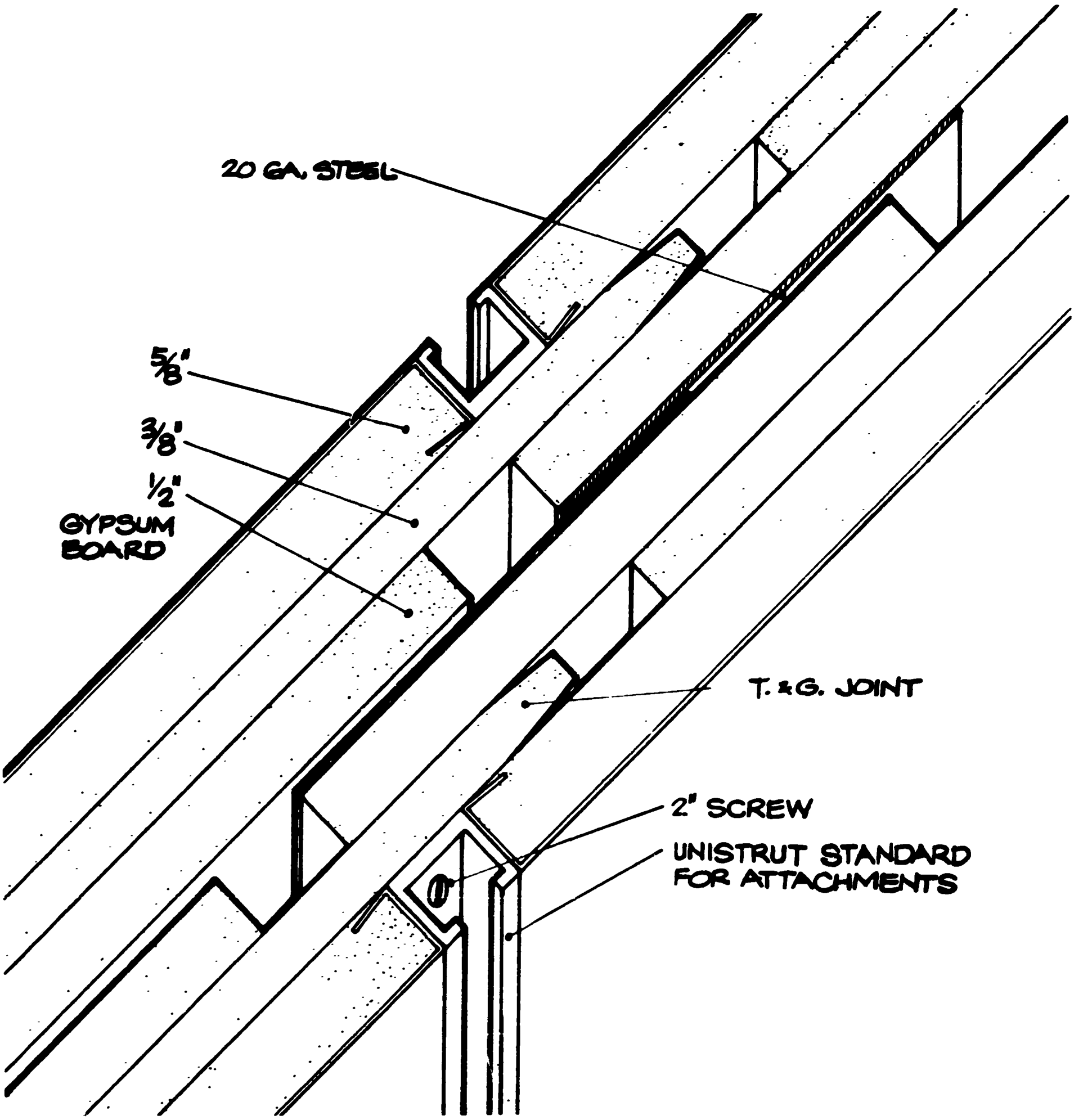




FIXED PARTITIONS - TYPICAL SECTIONS

TYPICAL DETAILS

URBS PARTITION COMPONENT



URBS PARTITION COMPONENT 5

10.2.2 Demountable partitions panel width = 24 inches, field cut as required to meet 4-inch planning module.

10.2.3 Thickness = demountable 3 inches, fixed 5 inches.

10.3 Vertical Dimensions

10.3.1 Demountable partition height = 8 feet, 10 feet.

10.3.2 Fixed partition heights = 8 feet, 10 feet, 12 feet and 14 feet.

10.4 Surface Types

10.4.1 The following surface types are provided:

10.4.1.1 Paint — 10 colors of a high durability matte finish paint.

10.4.1.2 Vinyl — 10 colors of a stipple textured medium weight vinyl wall covering.

10.4.1.3 Wood — 3 colors of a rough surfaced plywood, including redwood.

10.4.1.4 Back-up — an unfinished gypsum board surface for the Application non-system veneers.

10.4.1.5 Glass — Clear glass and clear wire glass are available.

10.4.1.6 Chalkboard — 4 colors of panels attach to the furniture standards.

10.5 Doors

10.5.1 Room doors in widths of 28 inches, 32 inches, and 36 inches are provided in full height frames.

10.5.2 Closet doors are also provided; these do not meet the STC 27 requirement or typical doors.

10.6 Utilities

10.6.1 The URBS system does not provide any electrical material. Space is provided internally for the passage of 3/4-inch EMT vertically,

and horizontally in the head and base in each partition panel. Conventional electrical boxes can be used.

10.6.2 Chase walls can be built with the URBS partitions to enclose large boxes and lines.

10.7 Trim

10.7.1 All exposed metal trim is color anodized aluminum.

10.7.2 Head trim provides integral picture hanging track.

10.7.3 Base trim includes 10 colors of resilient vinyl base and toe base.

10.8 Perfo-mance Characteristics

10.8.1 Fire rating — all partitions provide a one-hour fire rating.

10.8.2 Acoustics — STC 50 for fixed partitions
STC 40 for demountable partitions
STC 27 for doors

10.8.3 Surface Durability — paint and vinyl surfaces provide abrasion, stain and water resistance comparable to Type II vinyl coverings.

10.9 Attachments

10.9.1 Head and base channels are nailed to concrete floor and ceiling.

10.9.2 Furniture, shelving, chalkboards, and tackboards can be attached to furniture standards.

10.10 The URBS Partitions component contractor will be responsible for the following:

10.10.1 Supply and Installation

Complete Partitions component in all URBS housing projects in compliance with schedules established by the University.

Finishes both field and factory applied
Glass and glazing
Door and hinges
Chalkboard
Tackboard
Provision for the attachment of units in Furnishings, HVC, and Bathroom component

Bases and trim

Shelf brackets and brackets for the attachment of wall-hung Furnishings

All holes for other components passing through partitions

10.10.2 Complete shop drawings for each URBS housing project.

10.10.3 Inspection and supervision of all installations.

10.10.4 Cleanup

10.10.4.1 All Partitions component surfaces.

10.10.4.2 Removal of all scrap material associated with this contractor's installation.

10.10.5 Replacement units, with performance at least equal to, and appearance compatible with the original, shall be available through December 30, 1985.

10.11 Not included in this component.

10.11.1 Exterior walls.

10.11.2 Bathroom interiors.

10.11.3 Wiring, switches, conduit, and convenience outlets.

10.11.4 The supply and installation of door hardware, except for hinges and sealing devices.

10.11.5 All grilles over vents or holes through partitions.