of beams, columns and trusses. Worked examples include connection design and detailing. Tabulated section properties are given for generic C sections.

*Building design using cold*formed *steel sections: an architect's guide(61).* Gives information on the range of light steel framing and cold formed steel products that are used in buildings. Includes manufacturers' addresses and other sources of information.

ECCS has produced a series of guides. Details are available from the SCI.

7 INTERFACES WITH NON-STRUCTURAL COMPONENTS

This Section contains information covering all aspects associated with a given interface, covering both design and construction issues. This information is given so that the structural designer has an understanding of issues which may only touch on his sphere of responsibility, but which may, perhaps unknowingly, be affected by his decisions. Exact limits of responsibility will depend on the procurement process adopted for a particular project.

7.1   Services

Although the design of services is not normally the responsibility of the structural designer, he should be aware how his decisions will affect the design and installation of the services.

Services may represent over 30% of the total building cost, compared with the structure cost of less than 20% ""). In highly serviced buildings, the structural designer should therefore give serious consideration to structural systems which facilitate service integration @*) since this can result in major savings in time, cost and conflict. The potential savings may more than outweigh any increase in frame cost.

A beam and slab system which minimises the depth of the structural floors can be used to release a greater volume in which services can be routed, Composite floors employing certain types of steel decking allow services to be hung from the slab at virtually any location. By grouping services into ducts they can be installed in one continuous process, making installation independent of the building operation.

Communication between the structural designer and the services engineer must be effective, with early two-way transmission of final information where possible, so that modifications and delays are avoided. The structural designer needs to be aware of service positions so that he can detail openings, and include the necessary service loading in his design.   This is particularly true when services are concentrated in specific regions, because significant localised loading may occur. Unfortunately the services engineer is often appointed late in the design process, so the structural designer may not possess all the final information he requires when designing the frame.

For a high rise building, the structural designer should also allow for the need to support cleaning gantries, safety wires, etc.   Clear and early transmission of information to him is necessary, to avoid details for support points being included as an afterthought.