



Faculty of Architecture and Built Environment

BDR 212 CONSTRUCTION DRAWING

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REPORT ON CONSTRUCTION DRAWING

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Introduction

Construction drawings are sometimes referred to as working drawings. These drawings are used by all involved in construction of an actual building of design.

These drawings provide all the information, both graphic and written about the project. It is specific information. For example, the paint colour to be applied to the walls will be listed by manufacturers name, phone number, the paint color number and name, and type of finish (latex, enamel) to be used.

Detailed information is given about everything in the project. Walls, doors, furniture, equipment, lighting, outlets, demolition and so on, are all specified. Graphic symbols are used to represent walls, doors, furniture, etc.

Dimensions are used to define the location of these components. Text is used to further describe them or to point specific elements of the design. Legends are used to describe doors, finishes, lighting, etc. Standard drawing symbols are used to cross reference information. This information is explained through demolition plans, floor plans, interior or exterior elevations, reflected ceiling plans and detail drawings. Together they are produced on drawing sheets. The sheets are A4 size or A3 size or A1 size or A0 size. The size is based on the type of project and the amount of information required to explain it.

The drawing set is typically made up of two parts, architectural and engineering. (For some projects separate structural drawings are also required.)

The architectural set consists of the items described above. Millwork is considered to be part of the architectural set. The engineering set describes the electrical, mechanical and plumbing as required.

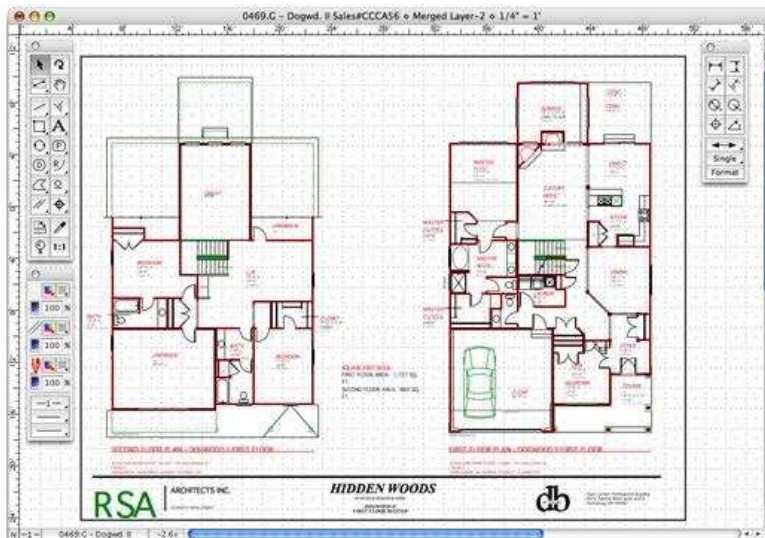
The complete drawing set (architectural and engineering) is used for pricing the project. Two or more general contractors are provided with the same set of drawings. This way everyone has the same information and it is fair to all. No one general contractor has any more or less information than the other one when pricing.

The set of drawings must comply with all codes. They are submitted to the local building department in order to obtain a building permit for the construction work. A building permit is issued after all the drawings are checked and approved by the department. The set can be large, 30 or more pages, or small, 15 pages. This all depends on the type of project. A Shopping Centre would require many drawings. A home renovation is a smaller set.

An interior designer or architect creates this set of drawings for the owner. They are qualified in both design and code compliance.

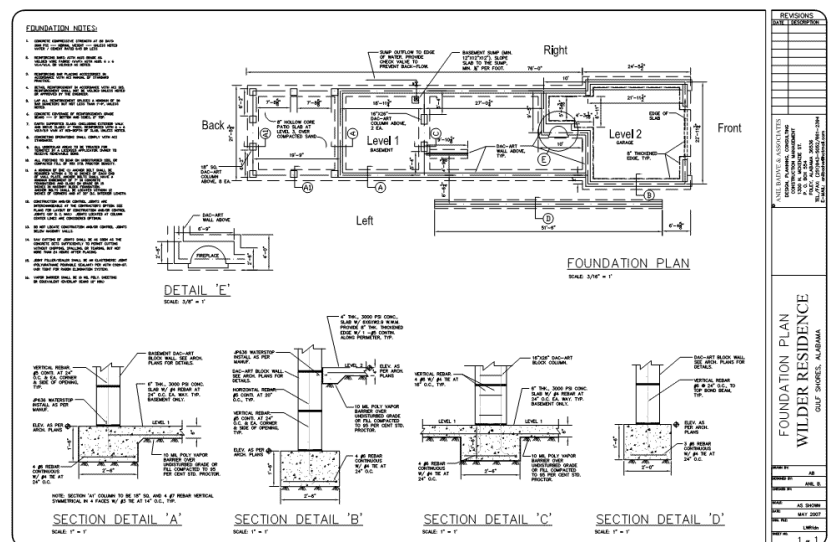
Construction drawings are considered to be a legal document. They are part of the written contract between the owner and designer as well as the owner and contractor.

Everyone involved in the project, the owner, the interior designer or architect, and the general contractor all reference these drawings during the building process.



On the left you see a sample of Architectural construction drawing.

On the right you see a sample of an Engineering construction drawing.



Purpose of Construction Drawing

An architect or an engineer usually prepares construction drawings for commercial projects; however, these services are also available to homeowners. Contractors may also be a useful resource when preparing construction drawings. Regardless of who prepares these documents, all drawings must be detailed, accurate, neat, and complete.

The purpose of preparing and submitting a complete set of construction drawings:

- Help the homeowner to envision the entire project.
- Assist in planning and estimating the cost and time for the project.
- Prevent unpleasant surprises and last minute changes.
- Provide all parties involved (homeowners, contractors, inspectors, plan reviewers, etc.) with clear instructions regarding layout, materials, and the expected finished product.
- Expedite the plan review process.
- Enable the Development Service Department to provide better service by identifying potential code problems and recommending solutions.

Methods of Construction Drawing

There are mainly two methods of creating construction drawings that is Manual Drafting and the other is Computer Aided Design (CAD).

Manual Drafting

This kind of drafting requires much more time effort because drawings have to be done by hand and requires the following items:

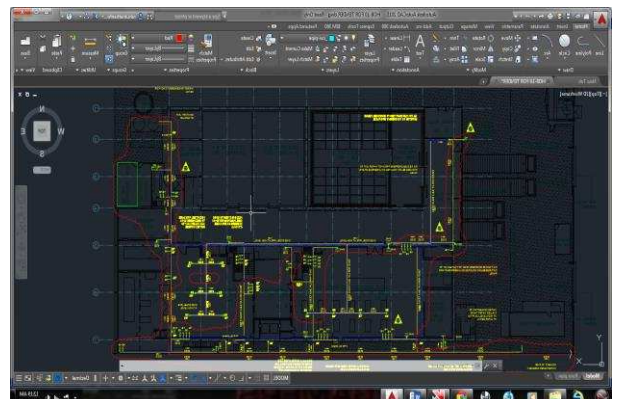
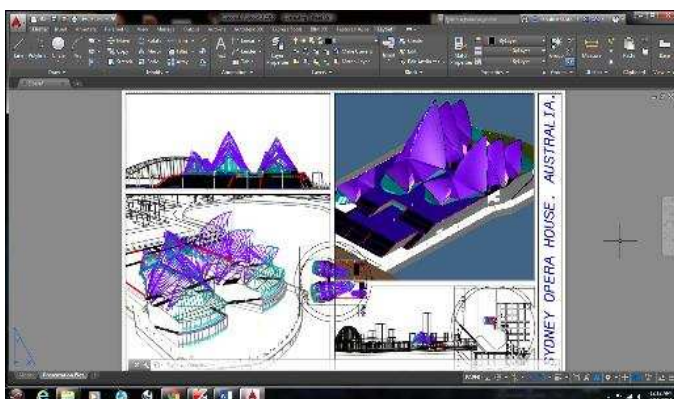
- Equipment: eg pencil, pen, compasses, adjustable set square, eraser, drawing board, scale rule, dividers, protractors, french curves, stencils
- Materials: paper; media
- Paper: detail paper; cartridge paper; tracing paper; paper sizes (A0, A1, A2, A3, A4)
- Media: pencil (HB, H, 2H); pen (0.2–0.25 mm and 0.4–0.5 mm) and ink.



Pictured here is a student is doing manual Drafting.

Computer Aided Drafting

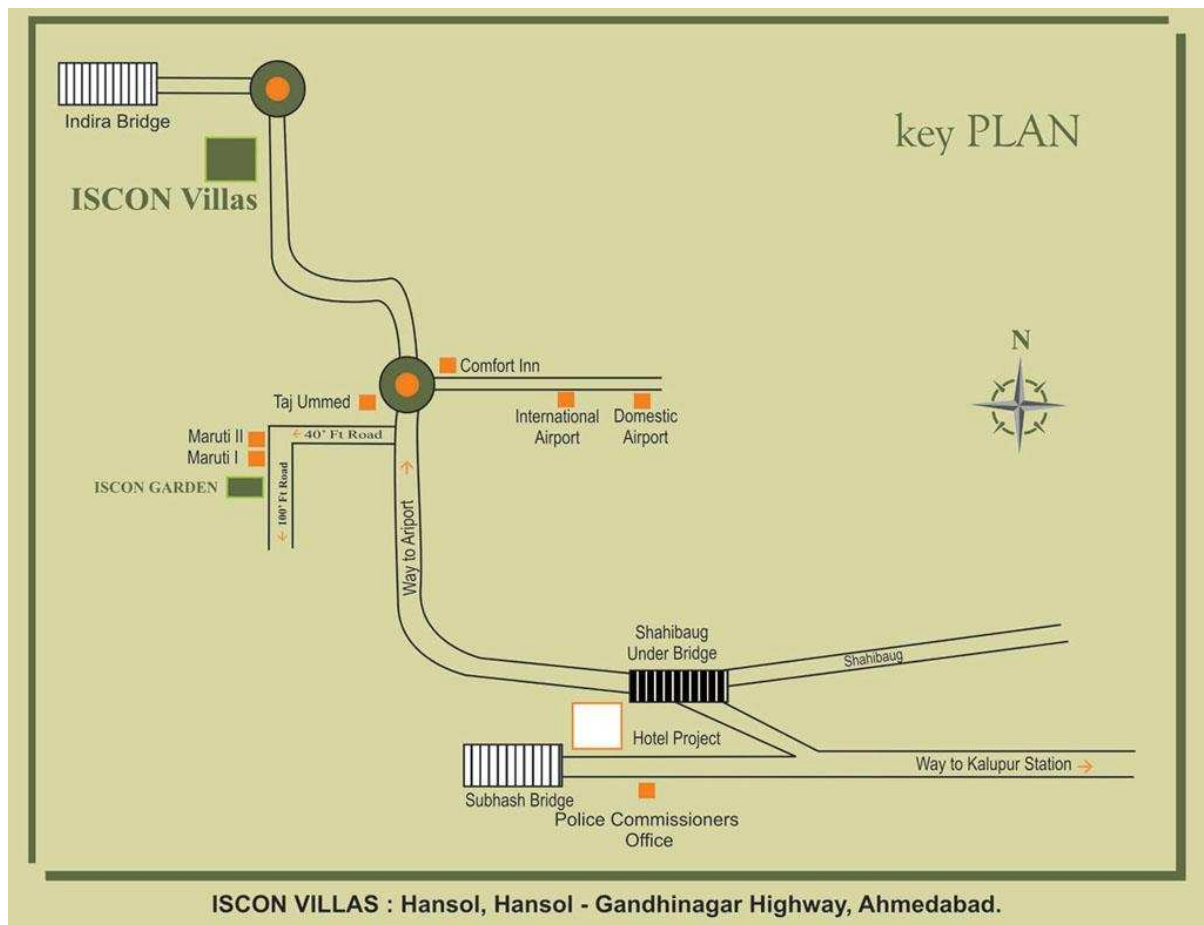
CAD is a much faster and precise way to producing drawing in this fast paced construction age. Makes designing easier and you can view the actual complete building before construction by 3D modeling. There's variety CAD software's available to name some AutoCad, VectorWorks, Revit and ArchiCad.



Sample Construction Drawings

Key Plan

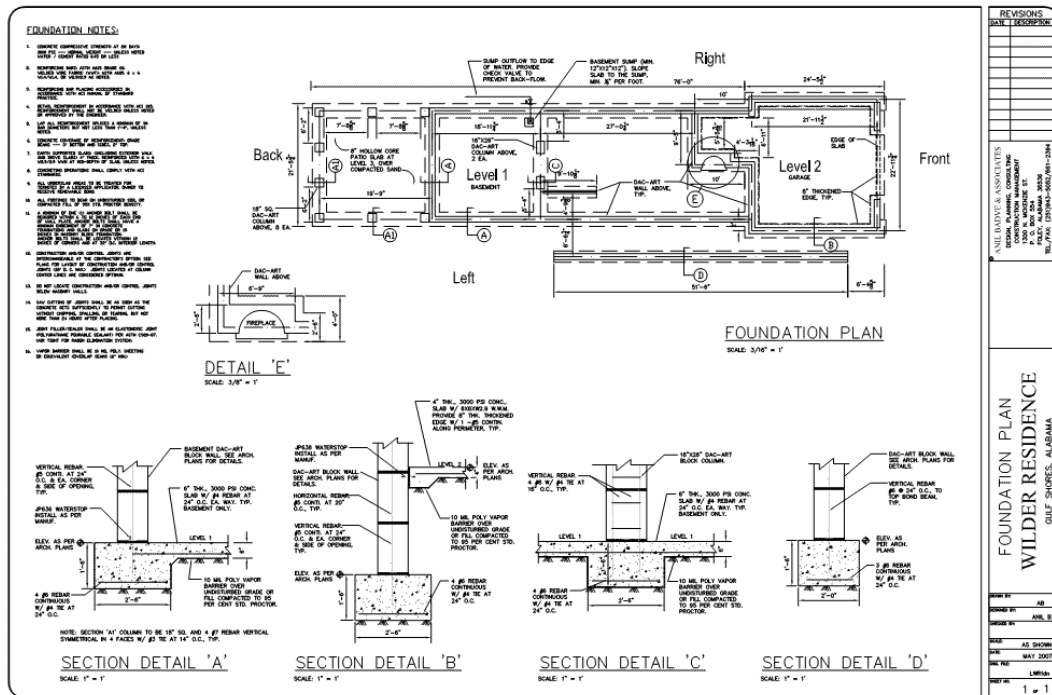
A key plan is generally used when only a part of a plan is being shown, there will be a smaller version of the entire document, showing which part that particular page is showing (i.e. via hatch or shading etc.) A Site Plan is a registered lot plan, showing the dimensions and angles of the property boundary and shows placement of things such as buildings, trees etc. and usually will show contours.



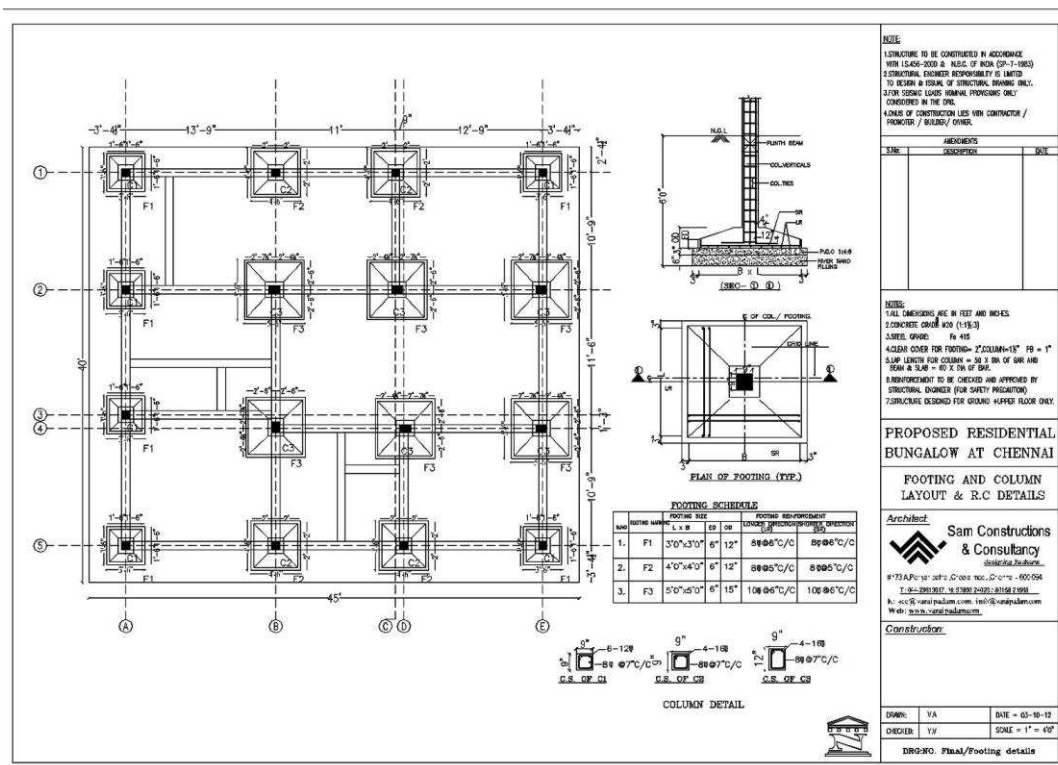
This is a sample Key plan.

Footing Layout

A foundation layout or plan is a plan showing the schematics of the foundation or support system of a project or building. The layout varies in the types of foundation, from footing to deep foundation. It shows the plane view of a structure that is slightly below the level of the top of the foundation wall.

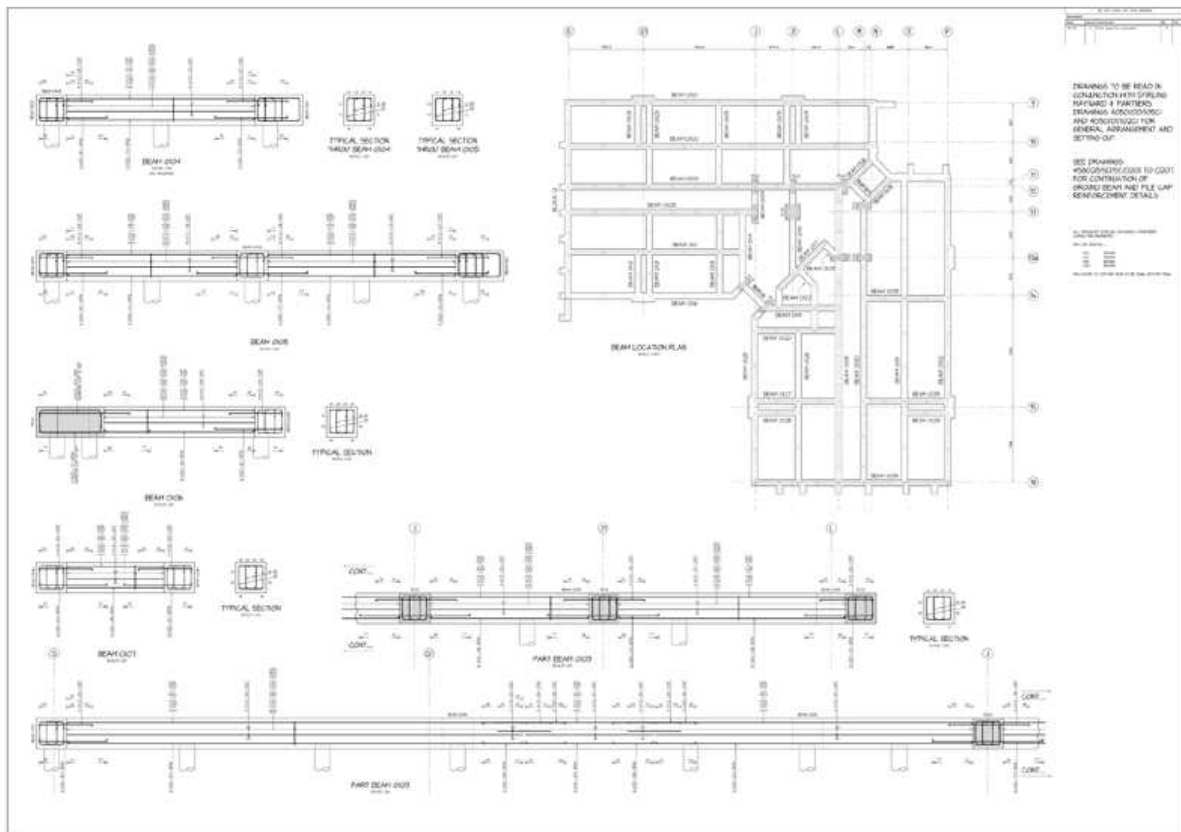


Sample drawings of footing layout.



Details of Ground Beams

A ground beam is a reinforced concrete beam used to supporting walls, joists, etc., at or near ground level. It is usually resting directly upon the ground or supported at both ends by piers. Ground beams are designed to support brick or block work or form a permanent shutter to the edge of a concrete floor slab. By installing ground beam, poor ground conditions are reduced.

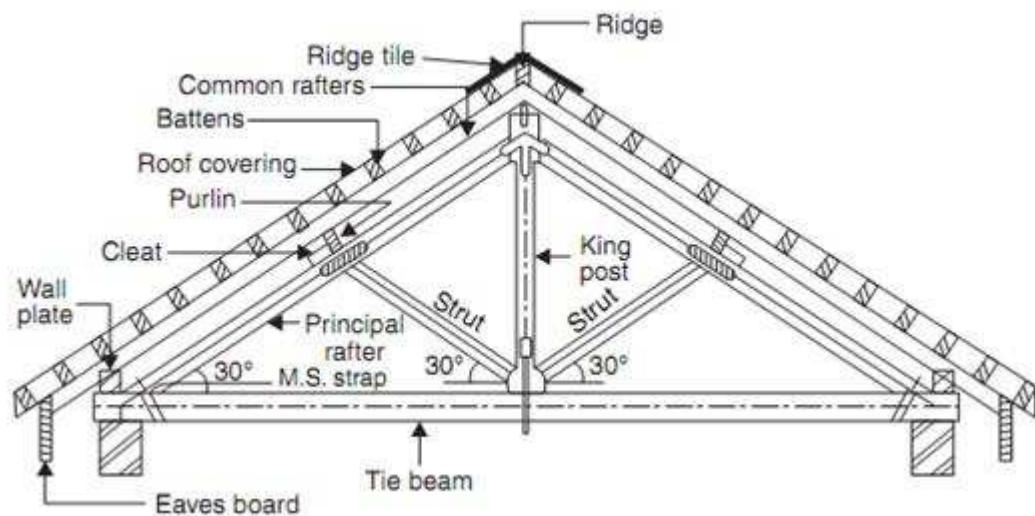


Above is image of Ground Beam details.

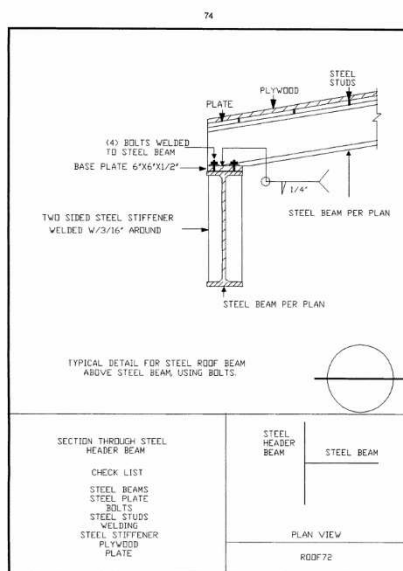
Below is an image of ground beams being constructed.

Roof Beams

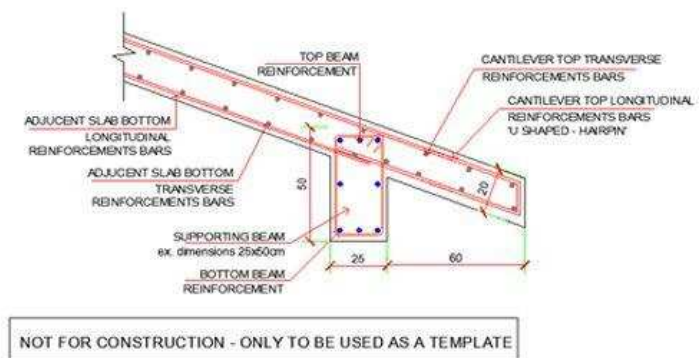
Roof beams must be designed to hold up a *structural load* including what is called *dead load*, its own weight and the weight of the roof covering, and additional loading called the *environmental load* such as snow and wind. Flat roofs may also need to be designed for *live loads* if people can walk on them. In the United States, building codes specify the loads in pounds per square foot which vary by region. The load and *span* (distance between supports) defines the size and spacing of the rafters and trusses. Roof beam types differ from timber to concrete and steel construction for roof.



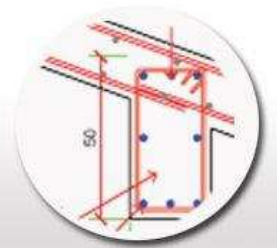
Timber roof beam detail.



Steel roof beam detail.



REINFORCED CONCRETE SLOPED ROOF SLAB OVERHANG CANTILEVER DETAIL



Concrete roof beam detail.

Conclusion

It can be concluded that construction drawing is the most effective way of commutating to design Ideas from paper to reality. As we live in the rapid developing world, one can only say the future of construction drawing looks bright as methods and the skills of drawing development. In the end it all sums up to the time and precision of the drawings.

Reference

The following websites has been used to aid in my research of my report:

- 1) : <http://artdraughtmans.blogspot.com/2011/01/what-is-construction-drawing.html>
- 2) <http://www.tucsonaz.gov/files/dsd/ReviewChecklist.pdf>
- 3) http://www.varaipadam.com/img/gallery/01_Detailing-1/big/big11.jpg
- 4) http://geohen.co.uk/examples/examples/rcdetails_files/collage_lb_image_page5_6_1.png