

Drawings and Specifications

February 23, 2010
Northern Housing Conference



MILESTONE

'INTEGRATED CONSTRUCTION SOLUTIONS'

- New Homes
- Renovations
- Commercial Buildings
- Structural Insulated Panels

- Project Management
- Construction Management
- Design
- Working Drawings and Specifications
- Estimating
- Inspection

- Carpentry
- Construction Supervision
- Products
- Studies
- Testing
- Training

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- Established in 2005 with the assistance of the Nishnawbe Aski Development Fund and Aboriginal Business Canada

■ 2007 Winner

“ CMHC Building Communities Award”

At the 17th Annual NADF Business Awards



Construction Documents

- **Contract**
 - Agreement
 - Definitions
 - General Conditions
 - Supplementary Conditions

- **Division 0**
- **Bidding Requirements**
 - Invitation to Bid
 - Instructions to Bidder
 - Bid Forms

- **Division 1**
- **General Requirements**

- **Technical Specifications**
 - Division 2 through 16

- **Drawings**
 - Site Plan
 - Foundation Plan
 - Floor Plans
 - Elevations
 - Sections
 - Details
 - Schedules

- **Changes**
 - Addenda
 - Change Notices
 - Site Instructions

Contract

- Contract Forms
- CCDC 2 – Stipulated Price Contract
- CCA 5 – Construction Management Contract
- CCA 17 – Stipulated Price Contract for Trade Contractors on Construction Management Projects

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- CCDC 2 – Stipulated Price Contract
 - Three Components
 - Agreement
 - Definitions
 - General Conditions

■ Agreement

- A-1 The Work
- A-2 Agreements and Amendments
- A-3 Contract Documents
- A-4 Contract Price
- A-5 Payment
- A-6 Receipt of and Address for Notice
- A-7 Language of the Contract
- A-8 Succession

- Definitions

- General Conditions

- Part 1 – General Provisions
- Part 2 – Administration of the Contract
- Part 3 – Execution of the Work
- Part 4 – Allowances
- Part 5 – Payment
- Part 6 – Changes
- Part 7 – Default Notice
- Part 8 – Dispute Resolution
- Part 9 – Protection of Persons and Property
- Part 10 – Governing Regulations
- Part 11 – Insurance – Bonds
- Part 12 – Indemnification – Waiver - Warranty

■ Supplementary Conditions

- Modifications or additions to the General Conditions to suit specific project requirements.
- These should be forwarded to legal and insurance counsel for review.

The Intent of Specifications

- Specifications must be read and interpreted together with all the construction documents in combination.
- The drawings and any other graphical representations supplement the written word.
- The specifications and drawings translate the design concept into a detailed description of a building.
- Specifications compliment and permit simplification of the drawings.
- Limit the role of the drawings to address form, shape, dimension and location.
- Describe requirements for quality and workmanship that the drawings may not be able to address.
- Specifications are included in the Tender Documents to allow all bidders to prepare their bids on an equal basis.
- Specifications become part to the Construction Contract.

The Importance of Specifications

- CCDC 2
- GC 1.1.9 If there is a conflict within Contract Documents: the order of priority of documents, from highest to lowest, shall be
 - The agreement between the Owner and the Contractor
 - The Definitions
 - The Supplementary Conditions
 - The General Conditions
 - Division 1 of the Specifications
 - Divisions 2 through 16 of the Specifications
 - Material and Finishing Schedules
 - Drawings.

Types of Specifications

■ Performance

- Aimed at achieving a standard of performance

■ Prescriptive

- Detailed statement of ingredient and proportion.

■ Proprietary

- Specific selection by the spec writer. “Naming names”

Organization of the Specifications

- Div. 0
 - Bidding and Contract Documents
- Div. 1
 - Non Technical Requirements
- Div 2 – 16
 - Technical Requirements of the Work.

Anatomy of a Specification

- 3 Part Section Format
 - Part 1 General
 - Part 2 Products
 - Part 3 Execution

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- **Product Delivery, Storage and Handling**, being the description of acceptable standards for such items.
 - **Site Conditions**, being the establishment and maintenance of proper environmental conditions.
 - **Alternatives**, being a procedure for submitting possible substitutions for specified products.
 - **Guarantee / Warranty**, being a request for specific warranty or guarantee periods.

Part 1: General

- **Work Included**, being a brief description of the unit of work or the general scope of the section.
- **Related Work**, being identification of work specified in other sections but directly affecting this work.
- **Standards**, being criteria established by testing authorities that must be met by the product.
- **Quality Assurance**, being criteria necessary for evaluation and to ensure compliance with the product requirements.
- **Submittals**, being requests for additional data in the form of shop drawings, test reports, samples etc.

Part 2: Products

- **Material**, being specific statements about product characteristics and standards or names of acceptable products and manufacturers.
- **Mixes**, being statements of proportions and procedures for mixing various products.
- **Fabrication and Manufacture**, being descriptions of the criteria necessary to ensure the proper production of products for the project.

Part 3: Execution

- **Inspection**, being instructions to ensure that the work done under previous sections is in condition to receive the work of this section.
- **Preparation**, being preliminary activities necessary to permit the work of this section to proceed properly.
- **Installation**, being a description of the activities necessary to accomplish the work of this section.

Div. 0 - Bidding Requirements

- Three Main Documents
- Invitation to Bid
- Instructions to Bidders
- Bid Forms

■ Invitation to Bid

- Project Title
- Identification of Principals
 - Designer
 - Owner
- Time and Place for Receipt of Bids
- Project Description
- Type of Contract
- Examination and Procurement of Documents
- Bid Security – Bid Bond
- Bonds – Labor & Material, Performance

■ Instructions to Bidders

- Form of Bid
- Preparation of Bid
- Submission of Bid
- Examination of Documents and Site
- Interpretation of Documents
- Withdrawal and Modifications of Bid
- Award of Contract
- Rejection of Bids

■ Bid Form

- Addressee
- Name & Address of Bidder
- Project Identification
- Acknowledgement
- Alternates
- Time of Completion
- Acknowledgement of Addenda
- Signature of Bidder
- (CCDC -10 Stipulated Price Bid)

Div. 1

■ General Requirements

- Summary of Work
- Allowances
- Regulatory Requirements
- Measurement and Payment
- Project Meetings
- Submittals / Testing
- Construction Temporary Facilities
- Commissioning of Systems
- Final Cleaning
- Contract Closeout

Div. 2 – Div. 16 Technical Specifications

- Div. 2 Site Work
- Div. 3 Concrete
- Div. 4 Masonry
- Div. 5 Metals
- Div. 6 Wood & Plastics
- Div. 7 Thermal & Moisture Protection
- Div. 8 Doors and Windows
- Div. 9 Finishes
- Div. 10 Specialties
- Div. 11 Equipment
- Div. 12 Furnishings
- Div. 13 Special Construction
- Div. 14 Conveying systems
- Div. 15 Mechanical
- Div. 16 Electrical

Drawings

- Drawings are a means of communicating information in a two dimensional format using lines, symbols and text. They are a graphical representation of the proposed building.
- Drawings provide:
 - Location of the component;
 - Name of the component;
 - Size and dimension;
 - Shape and form;
 - Connection details.

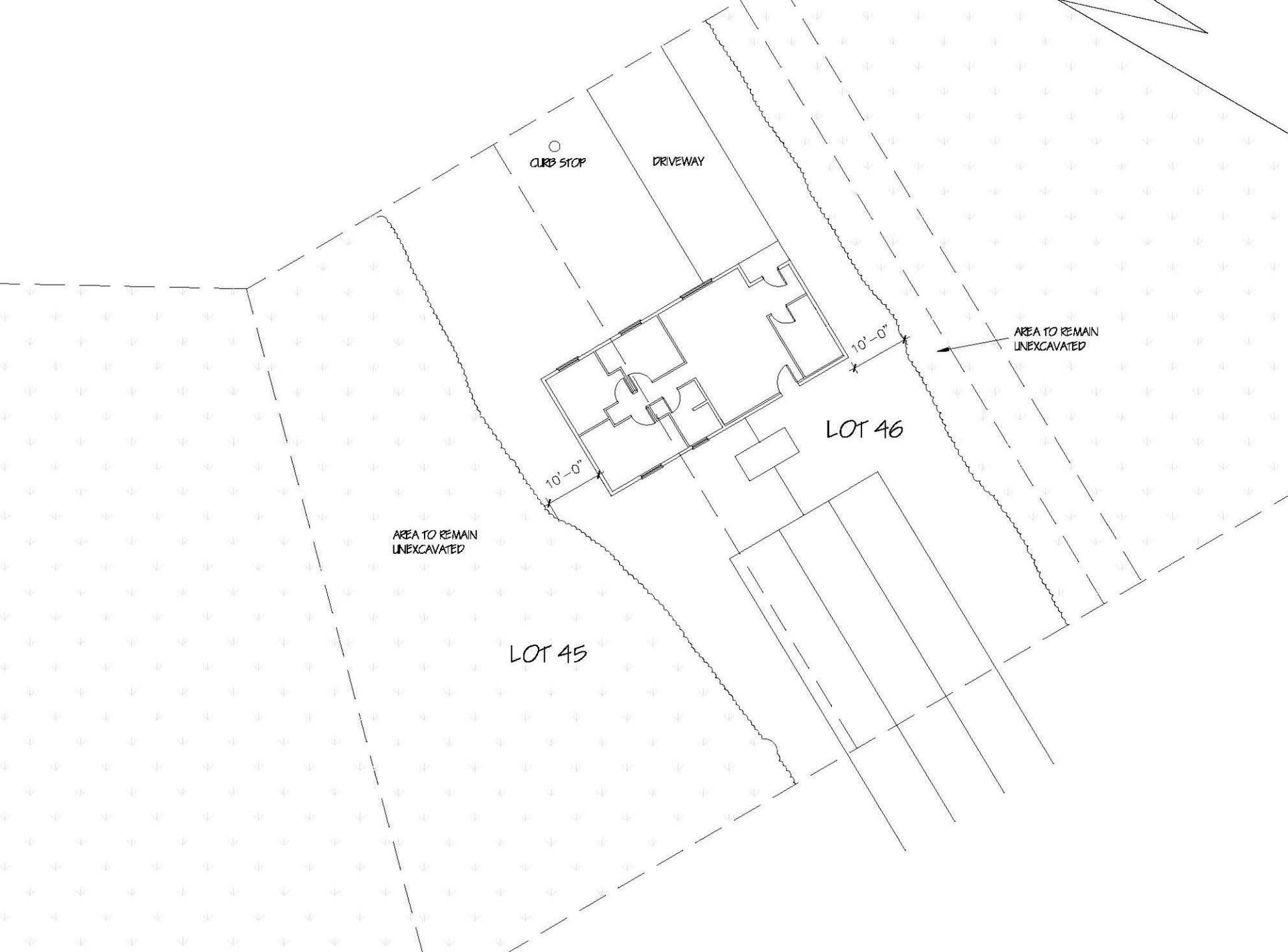
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- **The drawings are used by:**
 - **The designer**, to communicate the project particulars to the project team.
 - **The owner**, to ensure the project meets their requirements and to form part of the contract with the contractor.
 - **Bidders**, to prepare bids and obtain bids from their suppliers and subcontractors.
 - **The contractor**, to guide them in carrying out the work and to form part of the contract with the owner.
 - **The 'authority having jurisdiction'**, to verify that the project conforms to existing regulations.

Drawing Types

- Plans (site plan, foundation plan, roof plan & floor plans)
- Elevations
- Sections
- Details
- Schedules

Site Plan

- A Site Plan identifies buildings and other features in relation to property boundaries. It must identify the proposed changes to the lot created by the project. Most of the information required for the site plan can be found on the property survey.
- A Site Plan typically includes the following information;
 - Title, scale and north arrow,
 - Proposed construction indicating use, shape, size and dimension,
 - Position of the proposed construction on the site,
 - Set backs to all property lines,
 - Property lines and dimensions,
 - Rights of way and easements,
 - Septic tanks, beds and wells (if applicable),
 - Piped water and sewer connections (if applicable),
 - Existing grades and proposed grades,
 - Existing buildings or structures,
 - Driveway, parking and sidewalk areas,
 - Reference elevations (benchmarks),



CURB STOP

DRIVEWAY

LOT 46

LOT 45

AREA TO REMAIN UNEXCAVATED

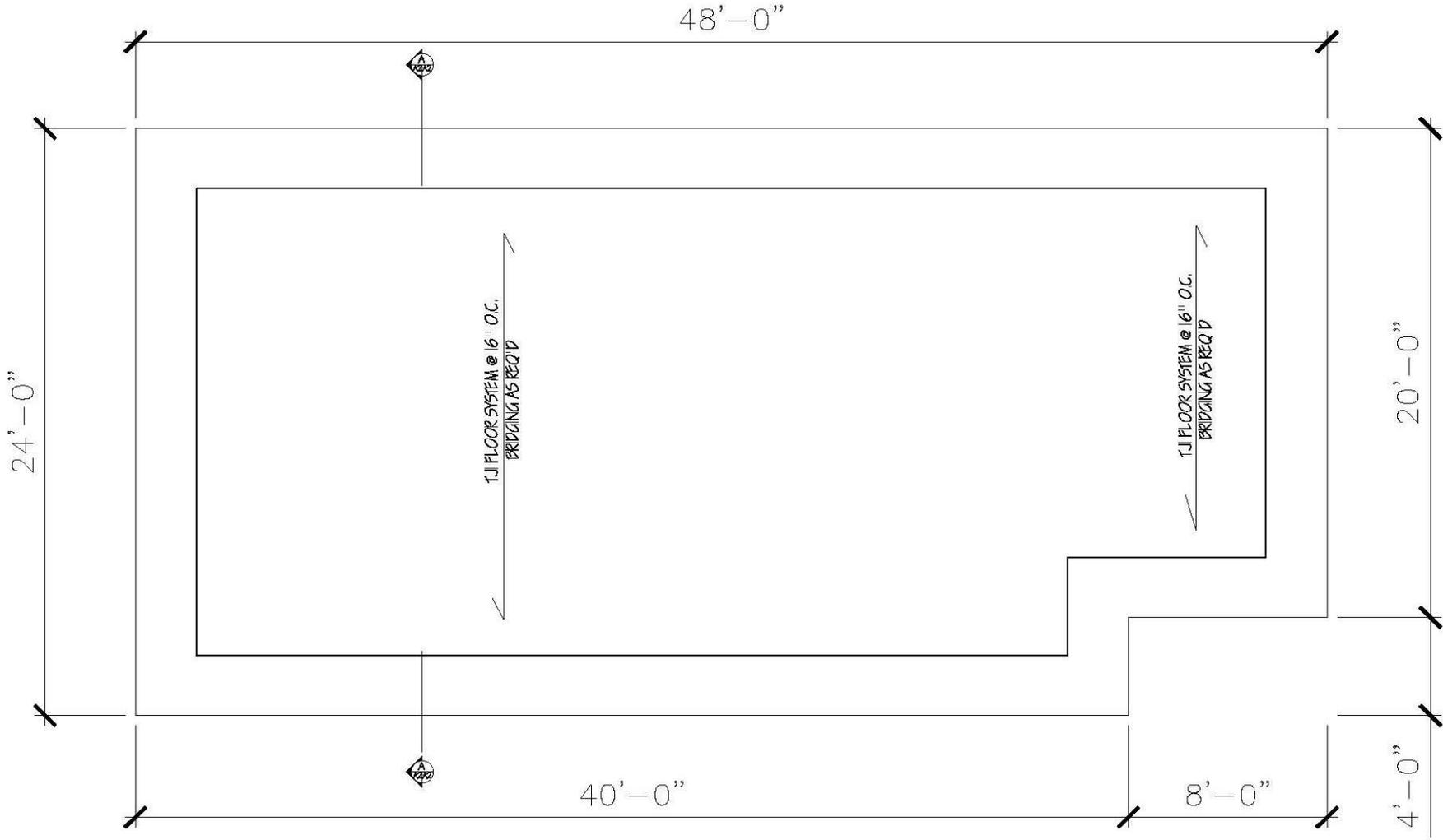
AREA TO REMAIN UNEXCAVATED

10'-0"

10'-0"

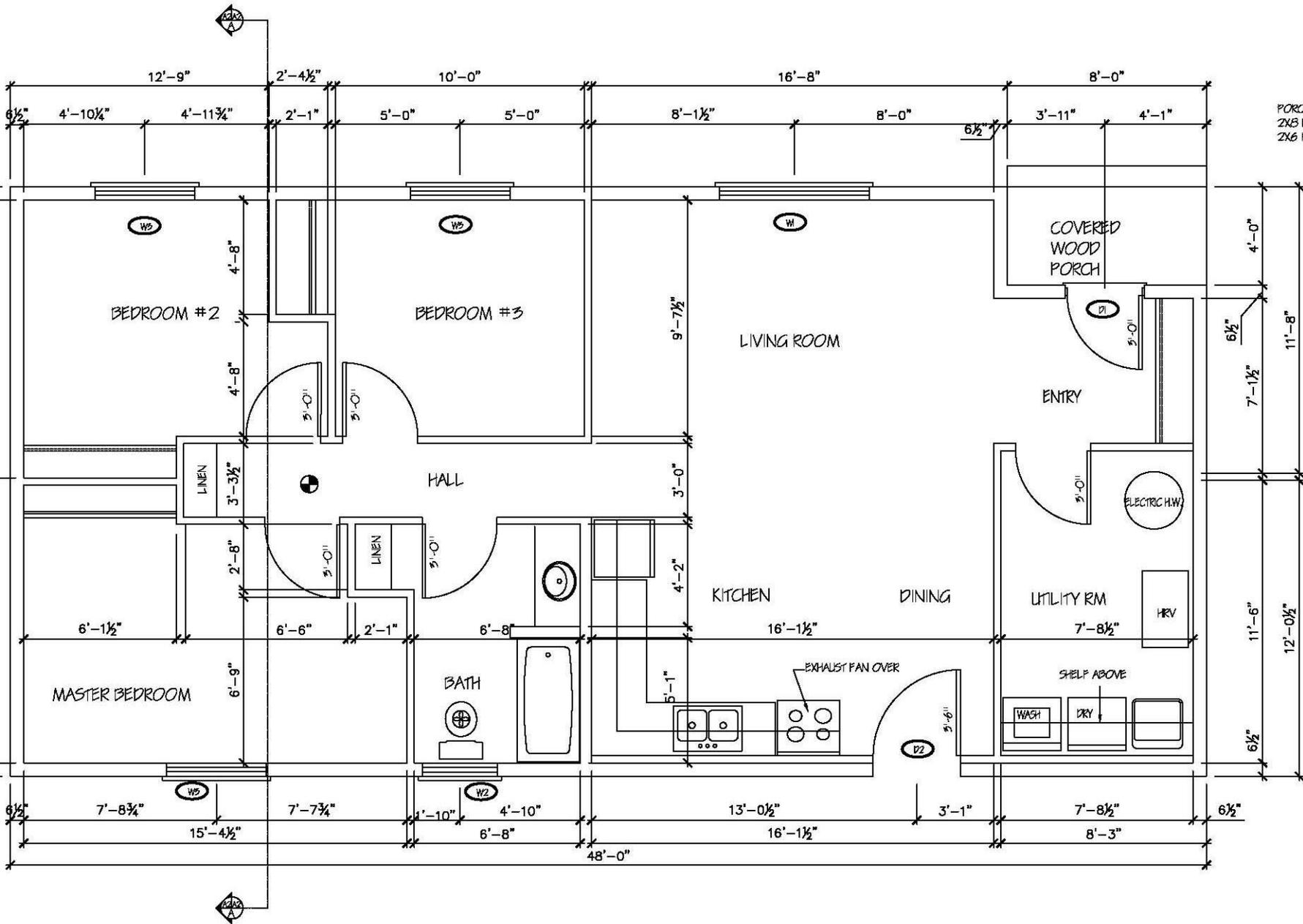
Foundation Plan

- A Foundation Plan shows foundation type and dimensions, including footing and column locations and dimensions. The size, direction and spacing of structural members must be shown.
- A Foundation Plan typically includes the following information;
 - Title and Scale,
 - Footing construction and dimension,
 - Foundation wall construction and dimension,
 - Slab construction,
 - Structural member dimension, location and material,
 - Drainage system,
 - Sump pit and pump,
 - Window size and location,
 - References to cross sections and details.



Floor Plans

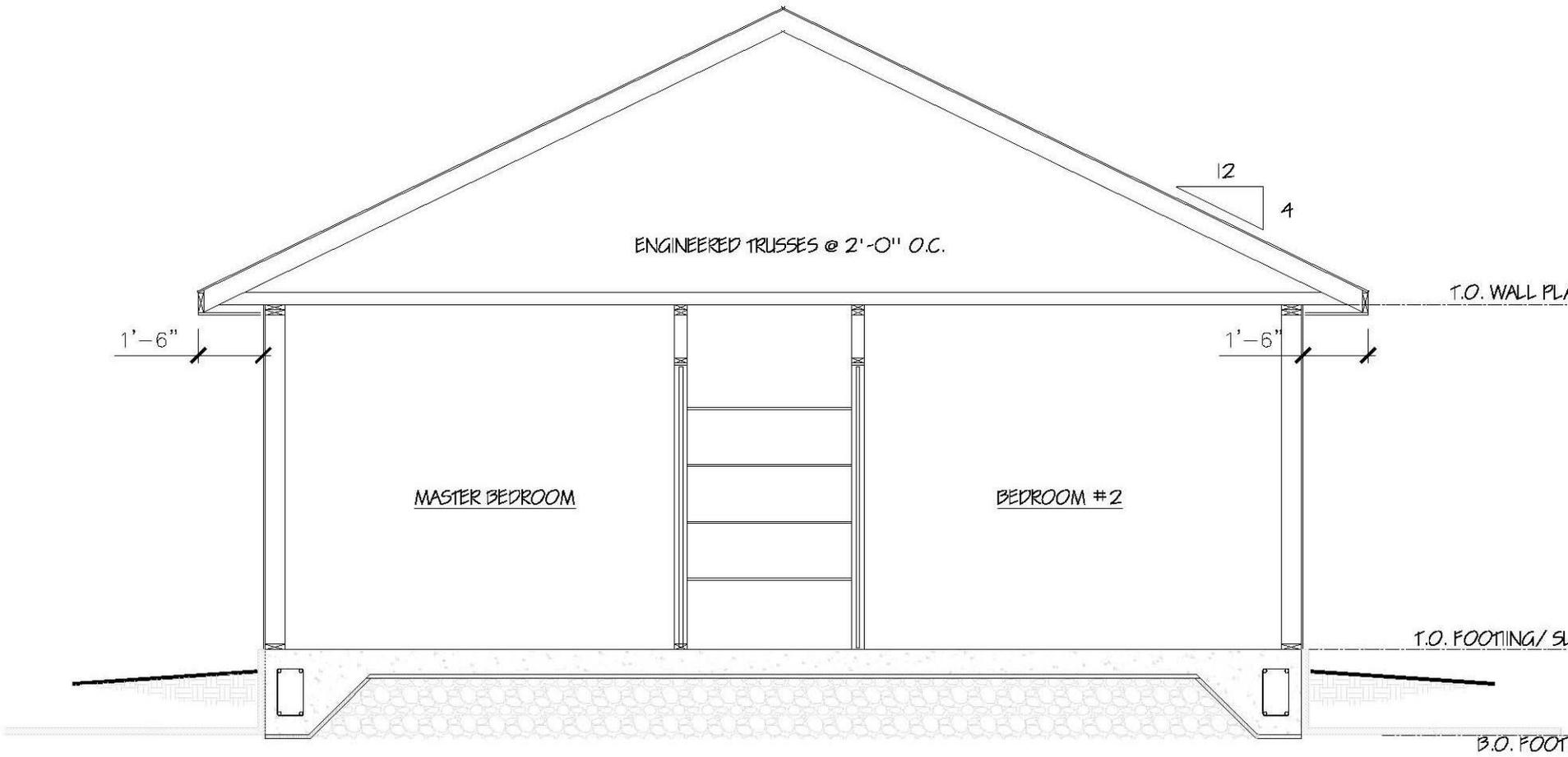
- Floor Plans provide a 'birds eye view' of the different floor levels. They show scaled dimensions of the project, including rooms, spaces and other features. The size direction and spacing of structural members must be shown.
- A Floor Plan typically includes the following information;
 - Title and scale,
 - Exterior wall dimension and construction,
 - Interior partition location, dimension and construction,
 - Out to Out building dimensions,
 - Door and window size and location,
 - Room names,
 - Structural member dimension, location and material,
 - Plumbing fixtures,
 - Fans,
 - Heating appliances,
 - References to cross sections and details.



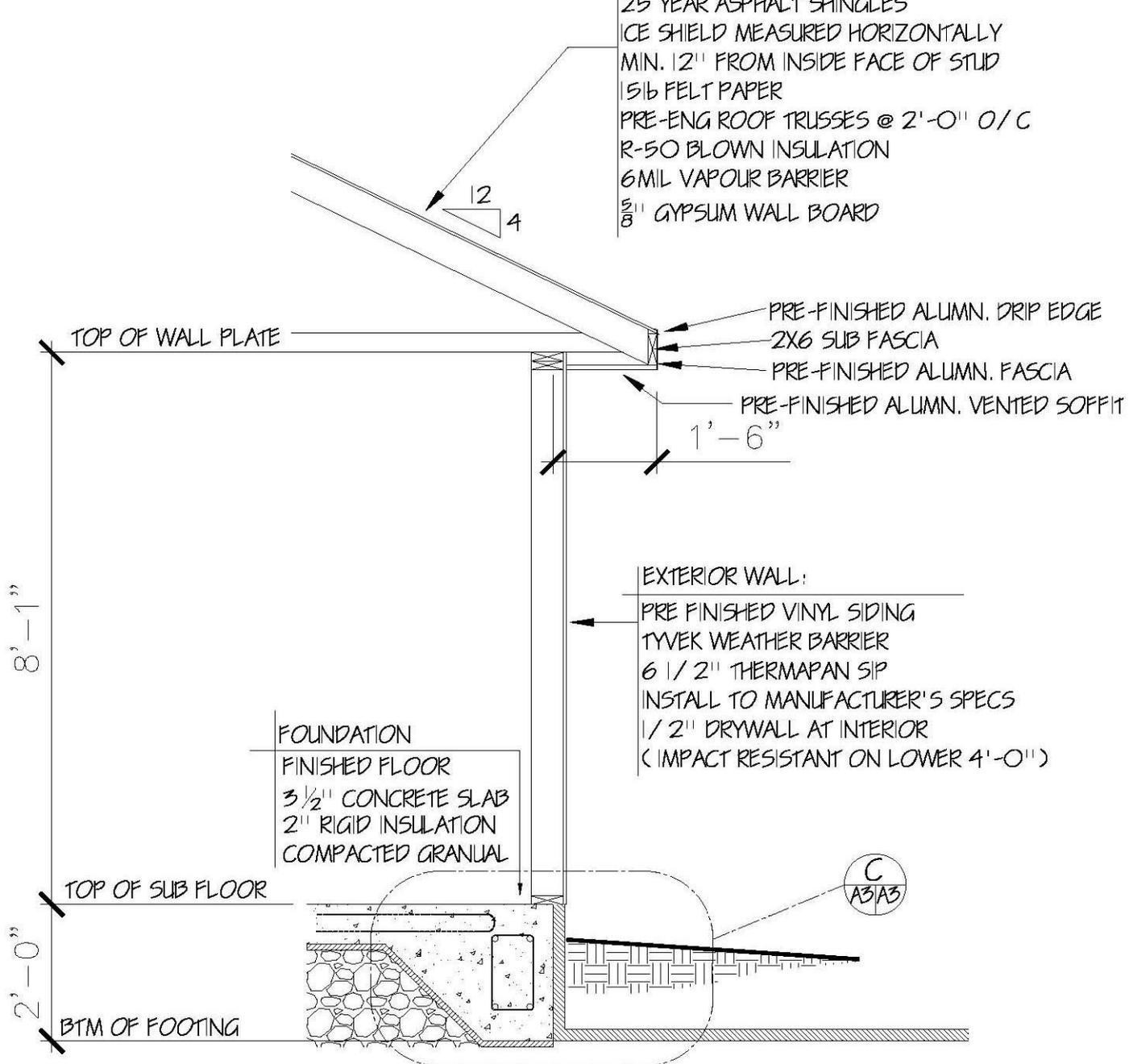
PORCH DECK
 2X8 P.T. JOISTS
 2X6 P.T. DECKING

Sections

- Sections show a view along an imaginary line cut through the building, showing its structural and construction elements. The section exposes and identifies construction elements of the roof, walls, floors and foundation.
- A section typically includes the following information;
 - Title and scale,
 - Building components (walls, roof, floors, foundation etc.),
 - Top of top plate elevation,
 - Top of floor sheathing elevation,
 - Top of finish grade elevation,
 - Bottom of footing elevation,
 - Height dimensions,
 - Size and type of materials,
 - Roof pitch.



SECTION A
12/12



B WALL DETAIL

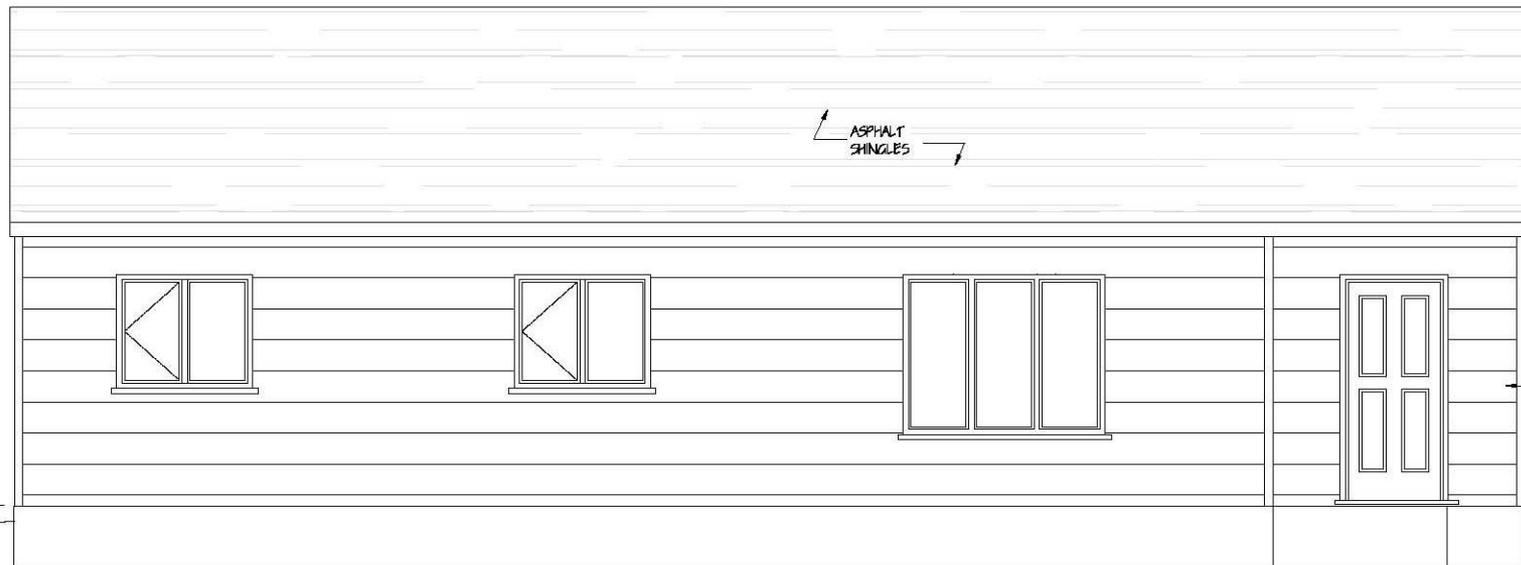
Elevations

- Elevations show the exterior views of a building for each building face. The drawings indicate the exterior finish information.
- An elevation typically includes the following information;
 - Title and scale,
 - Exterior building elements (windows, gutters etc.),
 - Exterior finishes and materials,
 - Top of top plate elevation,
 - Top of floor sheathing elevation,
 - Top of finish grade elevation,
 - Height dimensions,
 - Roof pitch,
 - Exterior stairs, guards & handrails,
 - Roof venting
 - Window types.

2. WALL PLATE
106'-8 1/4"

2. FOOTING/ SUBFLOOR
98'-7 1/4"

2. FOOTING
96'-7 1/4"



ASPHALT SHINGLES

CORNER POST

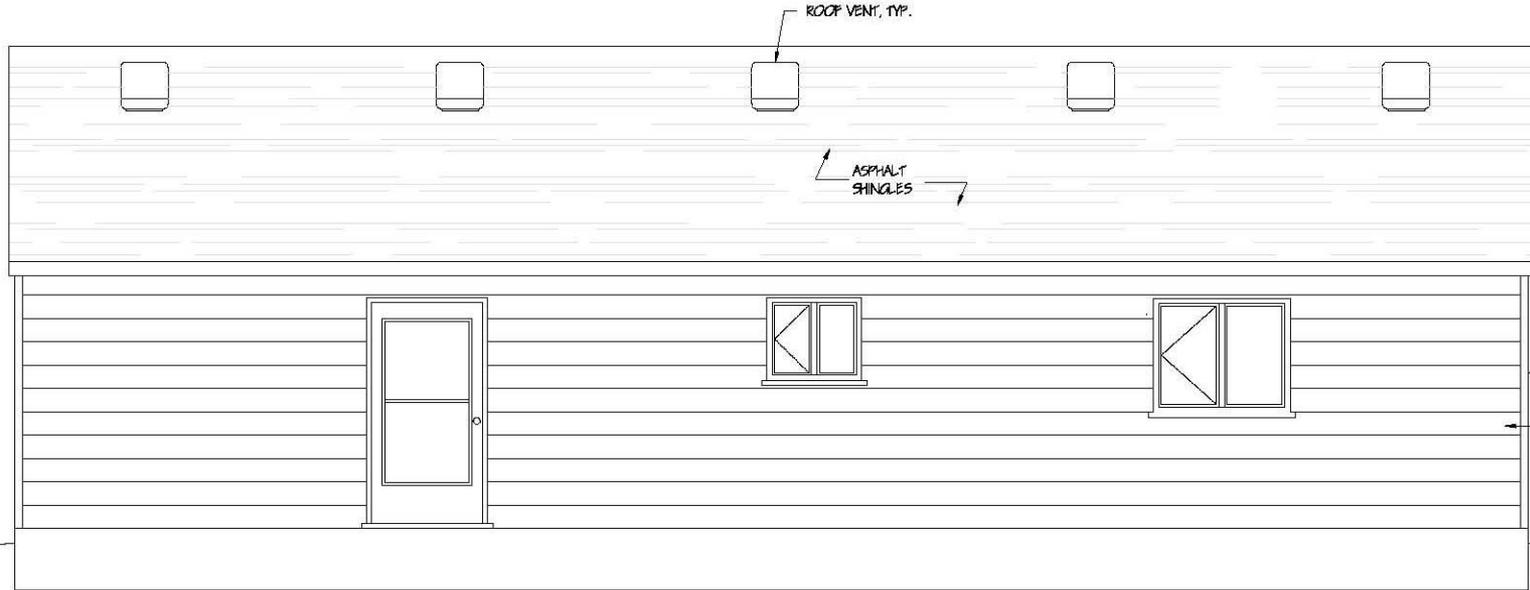
PREFINISHED HARDBOARD SIDING

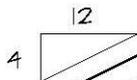
FIN. GRADE

2. WALL PLATE
106'-8 1/4"

FOOTING/ SUBFLOOR
3'-7 1/4"

FOOTING
3'-7 1/4"





T.O. WALL PLATE
EL: 106'-8 1/4"

1'-6"

1'-6"

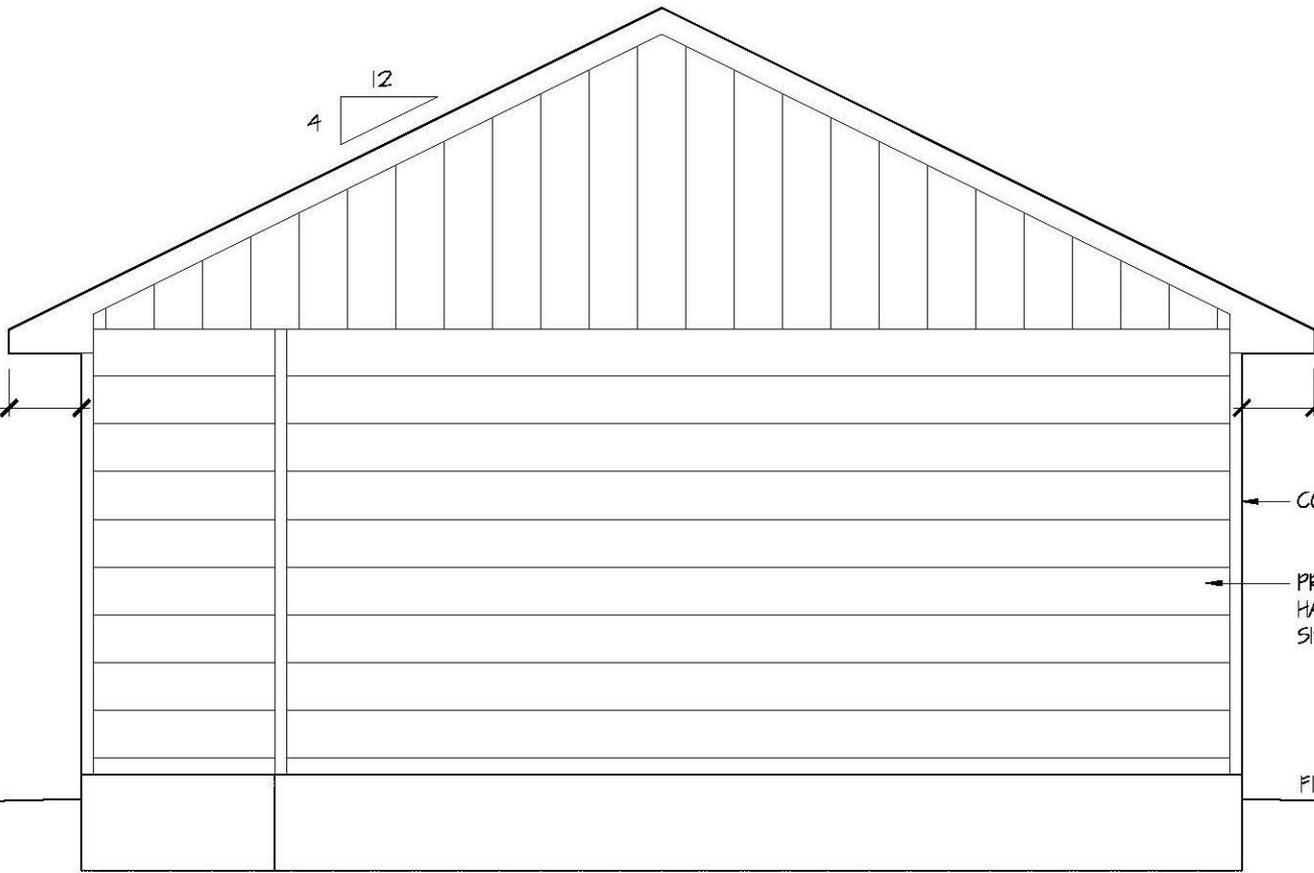
CORNER POST

PREFINISHED
HARDBOARD
SIDING

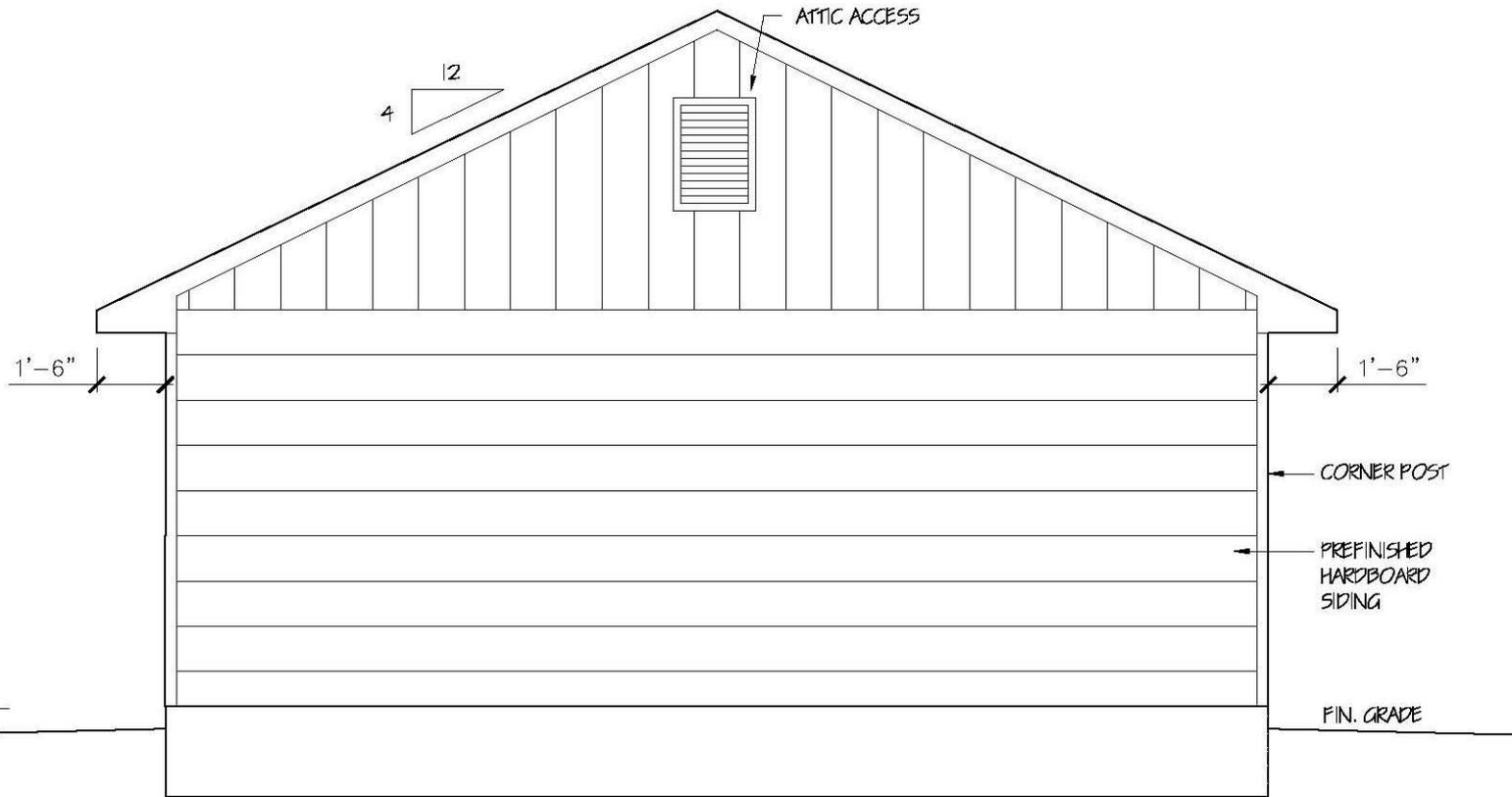
FIN. GRADE

T.O. FOOTING/ SUBFLOOR
EL. 98'-7 1/4"

B.O. FOOTING
EL. 96'-7 1/4"



T.O. WALL PLATE
EL: 106'-8 1/4"

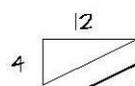


T.O. FOOTING/ SUBFLOOR
EL: 98'-7 1/4"

B.O. FOOTING
EL: 96'-7 1/4"

FIN. GRADE

ATTIC ACCESS



CORNER POST

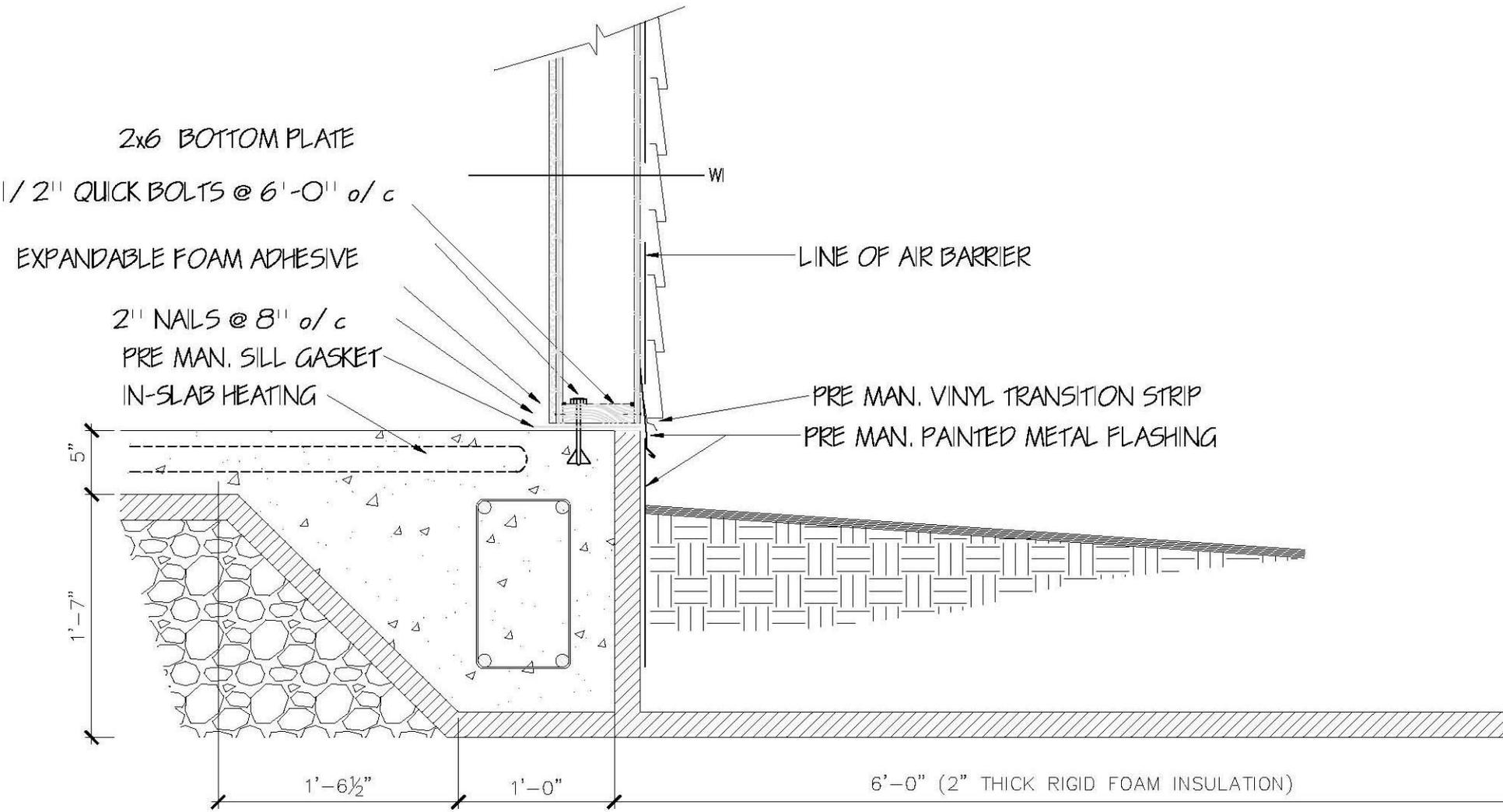
PREFINISHED HARDBOARD SIDING

1'-6"

1'-6"

Details

- Details are large scale drawings to provide information on the assembly and interrelationship of various materials and components. Details sometimes illustrate typical conditions but are more useful in depicting special or unusual conditions.
- The following elements should be detailed;
 - Walls, including intersections with floors and roofs,
 - Stairs,
 - Any custom construction component.



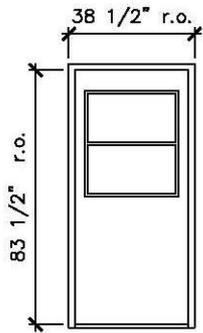
C
A3 | A3

FOUNDATION/ SILL DETAIL

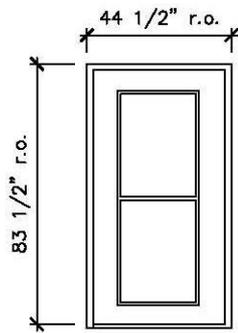
SCALE: 1" = 1'-0"

Schedules

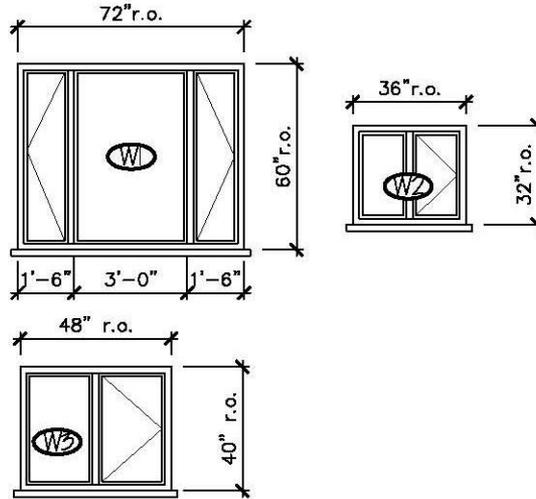
- When appropriate information can be presented in a schedule – usually a list or table containing information on similar construction elements.
- Typical elements presented in this format are;
 - Doors and frames,
 - Door hardware,
 - Windows,
 - Room finishes.



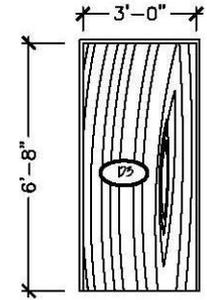
STEEL INSULATED DOOR
 C/ W VINYL CLAD 7" JAMB -
 DUAL LOW E ARGON GAS
 FILLED VENTING LITE
 ENERGY STAR RATED



STEEL INSULATED DOOR
 C/ W VINYL CLAD 7" JAMB -
 DUAL LOW E ARGON GAS
 FILLED VENTING LITE
 ENERGY STAR RATED



NOTE: ALL WINDOWS TO BE PVC
 DOUBLE GLAZED LOW E ARGON
 GAS FILLED GLAZING
 ENERGY STAR RATED
 W1, W2, W3 C/ W 7" JAMB



INTERIOR DOORS TO BE PREHLING
 HOLLOW MASONITE - MEDIUM OAK
 PREFINISHED SLABS C/ W
 MATCHING JAMB AND STOP

Changes

- Addenda
 - Changes made prior to bid closing (to be included in the bid)
- Change Order
 - Changes to the contract documents after execution of the agreement and including adjustment to the contract sum and contract time.
- Supplemental Instructions
 - Changes to the contract documents after execution of the agreement that do not include adjustment to the contract sum and contract time.

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- In all cases, the final set of working drawings, together with the construction documents (bid forms, contract forms, contract conditions and specifications) must provide clear, concise, accurate and sufficient information needed to;
 - Prepare accurate construction cost estimates,
 - Obtain a building permit or approval from ‘authorities having jurisdiction’ and
 - Construct the project.

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- **Well formulated contract documents are the key to minimizing changes and avoiding disputes and delays during construction.**
 - **This is the Owners most powerful tool in assuring a positive outcome.**