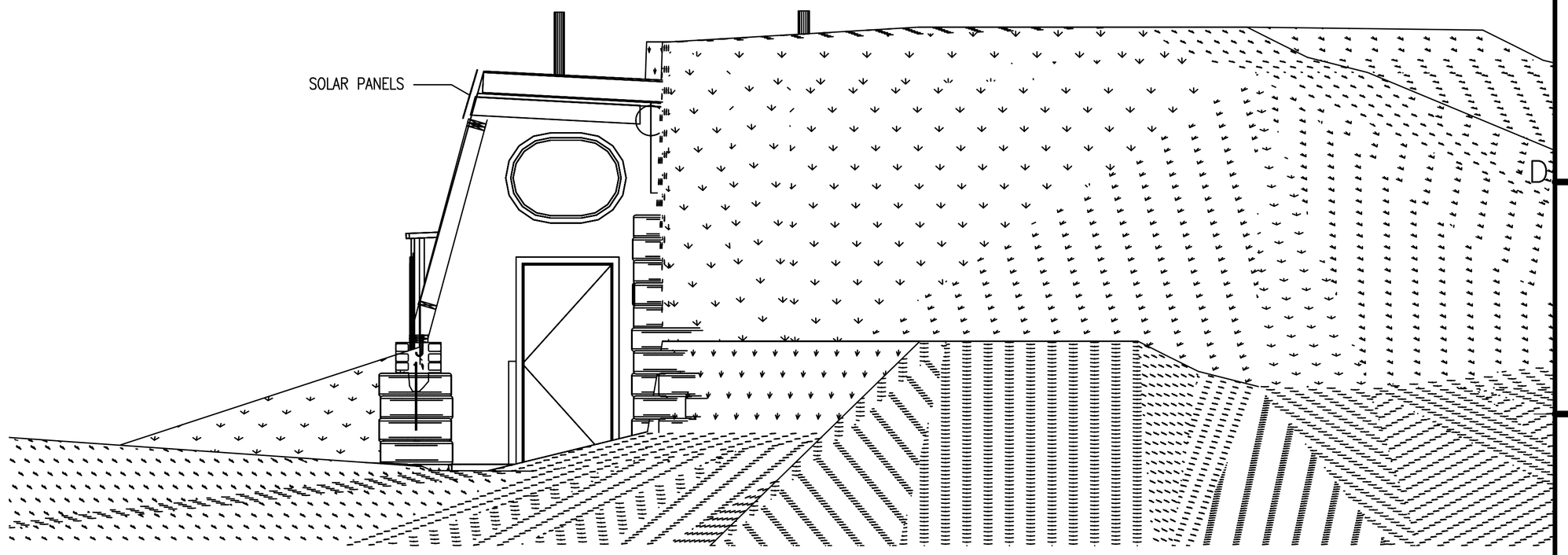
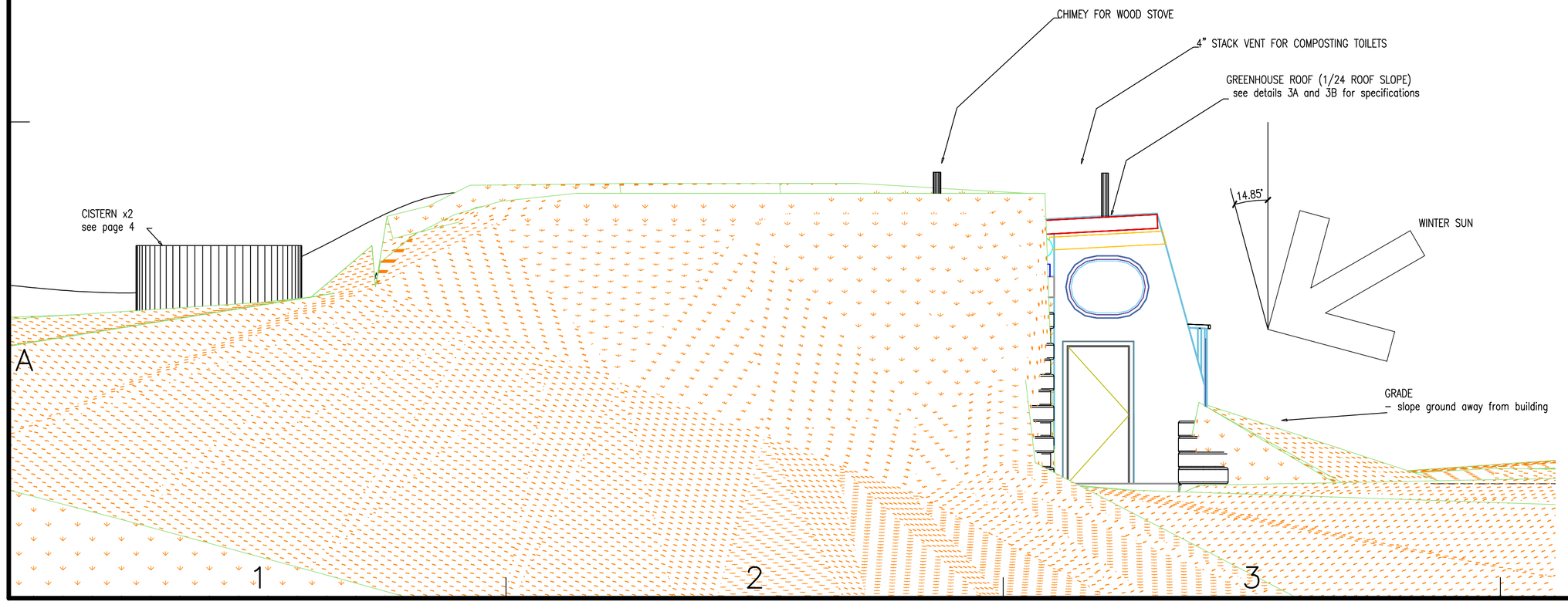
EAST ELEVATION



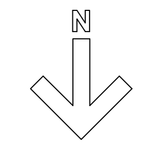
Rammed Earth Wall Construction Specifications (excerpted from Earthship Volume III by M. Reynolds)

1. Automobile tires come in sizes called 13,14, 15 and 16. These sizes relate to the radius of the tire in inches, #13 tires being the smallest tires used in a bearing wall and #16 being the largest. These sizes will be specified in different parts of the structure as such.
2. TIRE WALLS AS FOUNDATION
   In that a tire wall is already wider than its required foundation, it becomes a monolith which is both wall and foundation.
   A. The first course of tires in any tire wall must be leveled and dug into undisturbed soil free of organic surface matter such as plants, tree roots or other bio-degradeable substances.
   B. The first course of tires must be as large in diameter or larger in diameter than any other tire in the wall.
   C. Tire walls over six courses high must have a ground course of tires #15 or larger exclusively.
3. COURSING
   A. All tire walls must use staggered running bond coursing.
   B. Joints between tires on any given course must be aligned with the central area of all tires on courses above and below. No joint between tires on any given course may align with any joints on the courses above or below.
   C. Half tire techniques as outlined in article 4 must be used to maintain running bond coursing.
4. HALF TIRE TECHNIQUES (CONCRETE HALF TIRES)
   Concrete half tires must use a mix of 3 parts cement – 4 parts sand – 5 parts gravel with engineering fibres. All tires adjacent to concrete half blocks must be porcupined (see Earthship Volume III pp. 2–4) with 16d nails to lock concrete to tires.
5. BEARING WALLS
   A. Bearing walls built from earth rammed automobile tire casings must follow articles 1 through 4 of this code.
   B. All bearing walls built from earth rammed automobile tire casings mst have a continuous bond beam of wood or concrete as described in Earthship Vol I pp. 101–103 or Earthship Vol III pp. 6–9.
   C. All bearing walls eight courses or higher for their entire length built from earth rammed automobile tire casings must have a continuous bond beam that connects to a continuous bond beam on adjacent non bearing tire walls.
8. PLATES AND BOND BEAMS
   A. All tire walls that are an integral part of the roofed building shall have a continuous wood or concrete bond beam. This bond beam shall be anchored to the tire wall with ½" anchor bolts set in concrete every other tire or 1/2" rebar driven down through three courses of tires and bent over the top of the wood plate or set in the concrete bond beam.
   B. Wood bond beam plates shall be no less than 4" thick and twelve inches wide. Wood bond beam plates can be made up of two (2) 2x12's with 6 mil plastic between the rammed earth tire wall and the wood bond beam plate. The bottom bond beam plate must be treated lumber. Joints in the lower layer of lumber shall never be closer than 2'–0" away from joints in the upper layer of lumber. Upper and lower layers of lumber shall be laminated with (6) 16d nails per running foot.
   C. Concrete bond beams shall be a minimum of 8" deep x 8" wide and have two pieces of 1/2" rebar continuous.
11. LENGTH OF WALLS
   A. In that rammed earth tire walls are not made of a rigid material that is sensitive to expansion and contraction cracks, there is no limit on the length of an earth rammed tire wall.
12. HEIGHT OF WALLS
   A. The maximum height for a straight earth rammed tire wall which is an integral part of a structure with a roof or floor load is 10 feet. At this point a wood or concrete bond beam must be installed as per section 8 of this code.
13. LOADING OF WALLS
   A. Loading on earth rammed tire walls must be distributed loading only from joists, beams or rafters setting on a continuous wood or concrete bond beam as per article 8 of this code.
14. FILL OF WALLS
   A. Earth rammed tire walls can be filled or rammed with any type of earth, clay sand or rock fill.
   B. All tire casings must be packed tight to 90% compaction.
15. VOID FILLING
   A. All voids between tires in earth rammed tire walls must be packed solid with mud in a four coat procedure described in Earthship Volume I pages 174–175 unless specific conditions require this packing to be done with concrete.
17. JOINTS
   A. All joints and connections in earth rammed tire walls must be designed and assembled in such a way that no voids occur within the earth rammed tire wall. These voids must be filled with concrete or 90% compacted earth contained in a double layer of metal lathe or a rubber tire casing.
   B. All joints and connections in earth rammed tire walls must employ over lapped tires and joining methods so as not to result in stacked joints occurring over each other.



WEST ELEVATION

NORTH ARROW



GENERAL NOTES
1. ALL WORK TO CONFORM TO 2006 BC Building Code.
2. BUILDING DESIGNED UNDER PART 9 OF BUILDING CODE. STRUCTURAL ELEMENTS OF BUILDING DESIGNED UNDER PART 4 OF BUILDING CODE.
3. THIS BUILDING IS INTENDED FOR RESIDENTIAL OCCUPANCY (GROUP C).
4. IF NOTES CONFLICT WITH SCALED DIMENSIONS, NOTES TAKE PRECEDENCE.
5. ALL FRAMING LUMBER TO BE DRY 2&BTR SPF UNLESS OTHERWISE NOTED
6. ALL LINTELS TO BE 2–2X10 UNLESS OTHERWISE NOTED.
7. Refer to Page 5 for rammed earth wall construction details.

FOUNDATION NOTES
1. FOOTINGS ARE TO BEAR ON UNDISTURBED LEVEL SOIL BELOW FROST LEVEL DEVOID OF ANY ORGANIC MATERIAL AND STEPPED AS REQUIRED TO MAINTAIN THE REQUIRED DEPTH BELOW FINAL GRADE.
2. MIN. SOIL BEARING PRESSURE OF 2000 PSI.
3. CONCRETE: 3,000 PSI (20 MPa)
4. CONCRETE SLABS TO HAVE CONTROL JOINTS AT 25' (MAXIMUM) EACH WAY.
5. ALL WOOD IN CONTACT WITH CONCRETE TO BE PRESSURE TREATED OR PROTECTED WITH 15# ROLLED ROOFING.

REVISIONS

Nov 21, 08	Initial Draft Drawings
February 18, 09	Full rough set (no engineering)
February 27, 09	Added water collection and gray water
March 2, 09	Plans for submission to building authority

PROJECT: Burkholder Earthship (7391 Yellowhead 5 Hwy South)
CAD DWG FILE: C:\HSBPROJECTS\DRAWINGS\EARTHSHELTER\BURKHOLDER.E
DRAWN BY: C. Newton
Ground Snow Load: Ss = 2.5 kPa (Rain Load Sr = 0.3 kPa)

SHEET TITLE
Elevations - North & South
Scale: ¼"=1'

SHEETNUMBER
SHEET **5** OF **7**