

**Procedure for Wiring a Mechanically Stabilized EarthWall For Taking Potential Readings
Chemical Procedure # M&T C-MSE1**

*** This procedure does not purport to address all the safety concerns associated with its use. It is the responsibility of the user of this procedure to establish appropriate health and safety practices and dispose of hazardous materials in an approved manner.*

Equipment and Materials:

Personal Protective Equipment (PPE)

Wire, Red #10 AWG Stranded (for Zinc Bar)

Wire, Blue #10 AWG Stranded (for Steel Plate)

Round Connector with Solder Insert (Suitable for #10 AWG) (Avail. From Br. Maint.)

“Bernz-O-Matic” for soldering connections (Propane)

Wire, Green #12 AWG Stranded (Connector ends made up with in the lab office.)

Wire, Blue #12 AWG Stranded (Connector ends made up with in the lab office.)

Wire, Black #12 AWG Stranded (Connector ends made up with in the lab office.)

Wire, Red #12 AWG Stranded (Connector ends made up with in the lab office.)

Copper-Copper Sulfate(liq.) Reference Cell 2 each

Distilled Water 2 gallons

Duct Seal, GB #DS110 or equivalent

Electrical Tape, High Quality (Scotch 88)

Isolation Bars (12 terminals with through holes) NS10(IEC664-1) 400 volt

Wet Location 4 x 4 x 4 Box with Cover

3/4” PVC conduit with terminal adapters

3 x 5 Steel Plate with Red #10 Stranded Wire (Supply Steel Plates 3”x5”x3/8” to Gene at Br. Maint.)

1 x 1 x 6 Pure Zinc Bar (ASARCO) with Blue #10 Str. (Fabricated by Gene Atkinson, Br. Maint.)

1/4”x 2 1/4” “Thundertoggle” Wall Anchors

1/4” Masonry Bit

5/8” or 3/4” Masonry Bit

Hammer Drill, 3/4” capacity

Ground Clamps (for wire connection to Reinforcing Mats) C-Type with bolt – Minerallac 600 Fits 1/2” flange (1/4”-20 tapped holes) telex (630-543-7080)

Wire Nuts, Red, Buchanan B-caps

Wire Nuts, Red, Permanent Seal Wire Connectors (Low voltage DC) (Avail. From Br. Maint.)

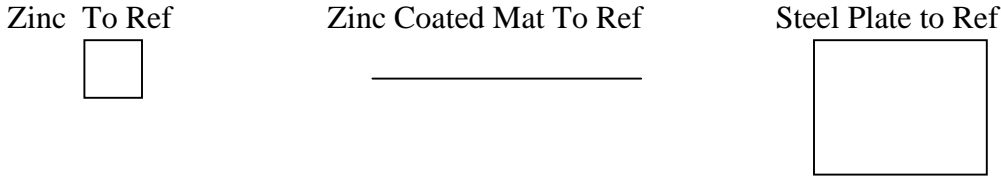
Voltmeter/Ammeter with Variable Ranges and Clamp Leads

Generator, Portable (Full of Gas)

1 1/2” or 2” PVC (white) Conduit (For reference cell)

Screwdriver, Battery Powered Drill (For taking covers on/off)

Taking Measurements at the Access Box After Completion:



Typical mV readings

-1.0045 mV

-1.0055 mV

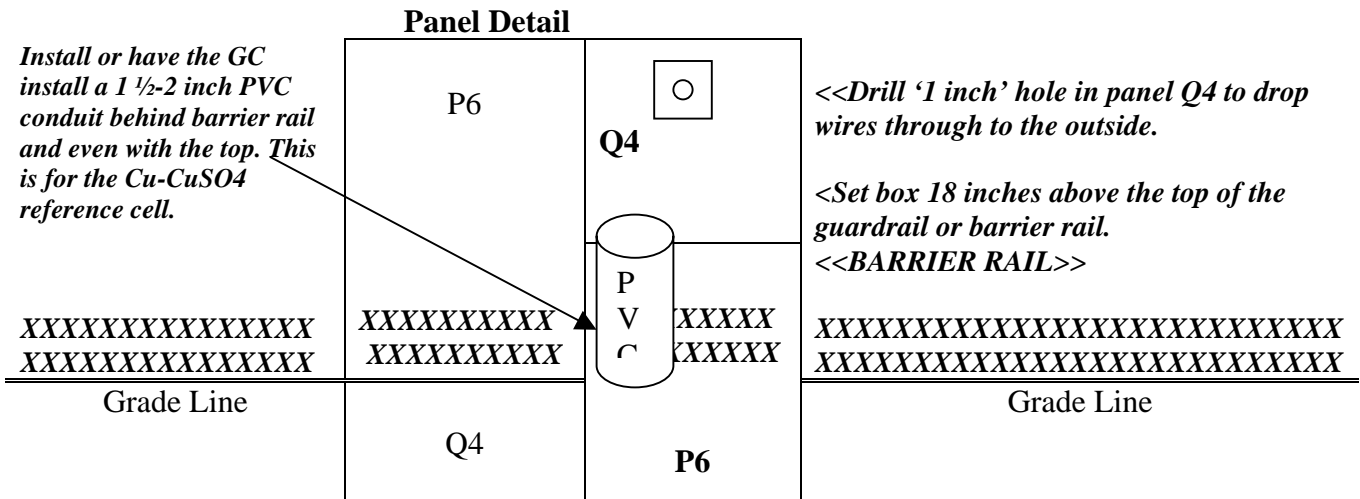
-0.5400 mV

FIGURE 1.

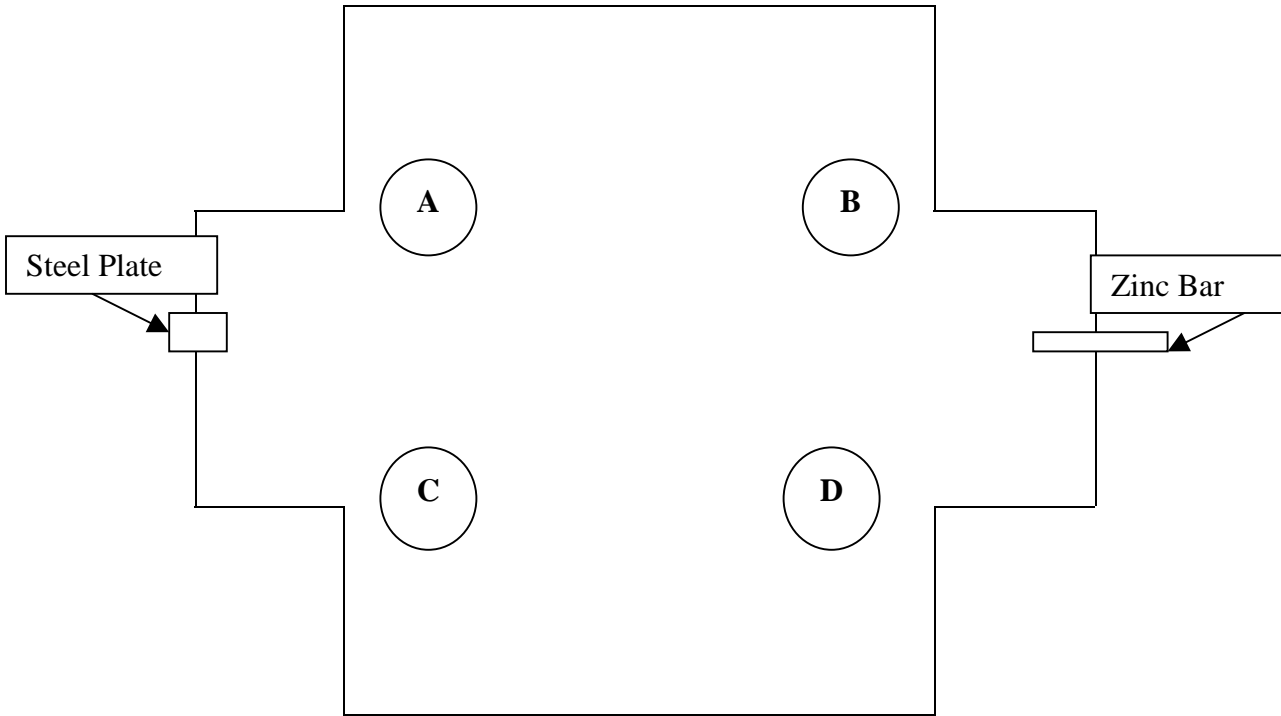
- When Zinc Coated Mat or Strap readings increase toward the Steel plate reading this indicates loss of the zinc coating on the mat or strap over time. Typically a mat or strap has enough coating to last 18 years. Design life of a wall is 75 years.
- The Surface area of the plates and bar are very important. They should not be changed during future installations or different readings will result from varying current density(cd).

Coordinating Installation of the Wiring at the Jobsites:

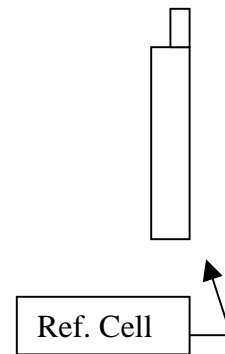
- One should coordinate with the General Contractor(GC) and the Inspector at the project. Get cell phone nos, exchange cards, etc. Let the GC decide on a definite time that you can do the installation. Have him CALL if they have changed the time the stone is to be placed. If possible, ask the GC to drill a 3/4" hole in a "Q4" panel (Above where the access box is to be located, FIGURE 2). This will save a lot of waiting time. Then the GC can hang the wires through to the outside of the wall when he gets up to that point. If he won't do this use the hammer drill and generator that should be in the State Vehicle.
- Review the MSE wall detail with the Inspector on the large plans.
- Note that wall panels (NCDOT Approved) may have up to 8 strap fasteners. Each panel has a lifting eye. See the diagram below(FIGURE 2).



* P6 indicates that there are 6 strap connections in the back and the panel is 6 feet in height.

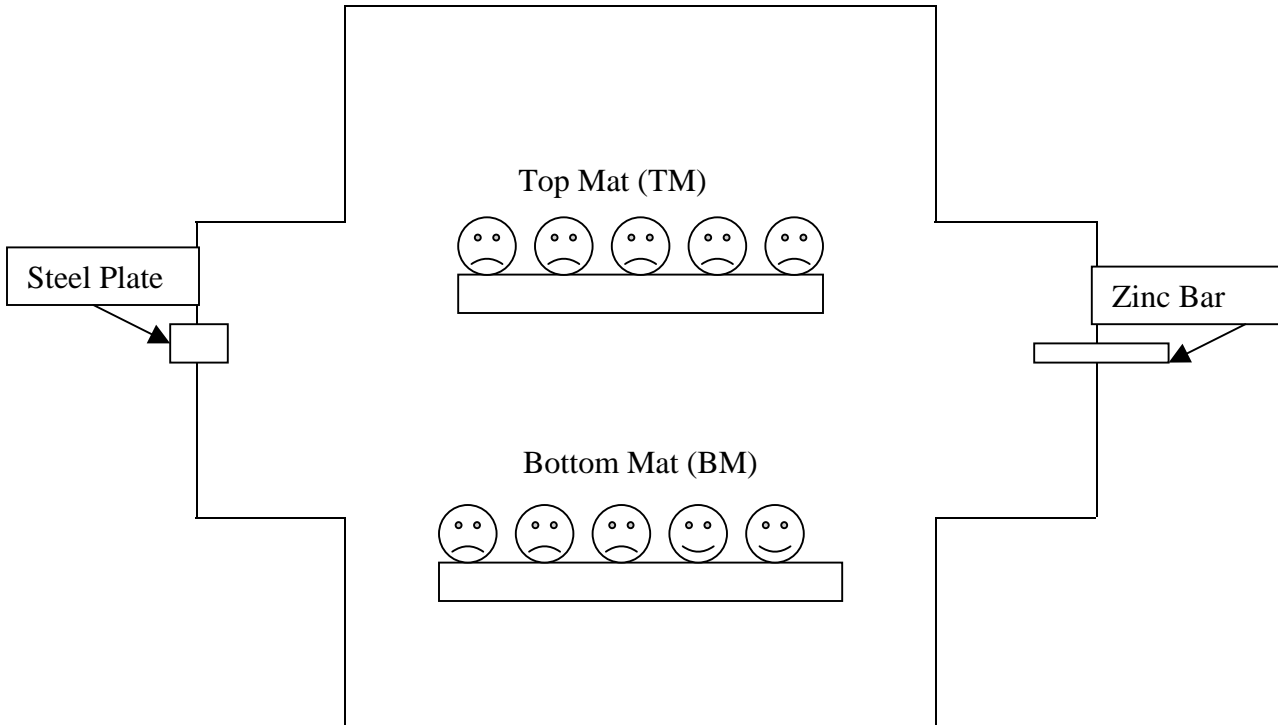


Zinc Bar	Red #10	Stranded Wire
Steel Plate	Blue #10	Stranded Wire
(A)	Black #12	Stranded Wire
(B)	Red #12	Stranded Wire
(C)	Blue #12	Stranded Wire
(D)	Green #12	Stranded Wire

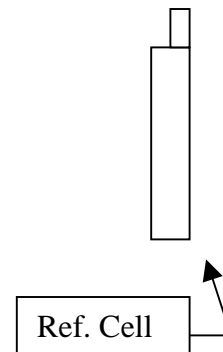


To take Electrical Potential Readings, connect the black test meter lead to the reference cell and connect the red test meter lead to each component in the above sequence.

To read amperage, connect the red test meter lead to the steel plate and connect the black test meter lead to each component in the above sequence.

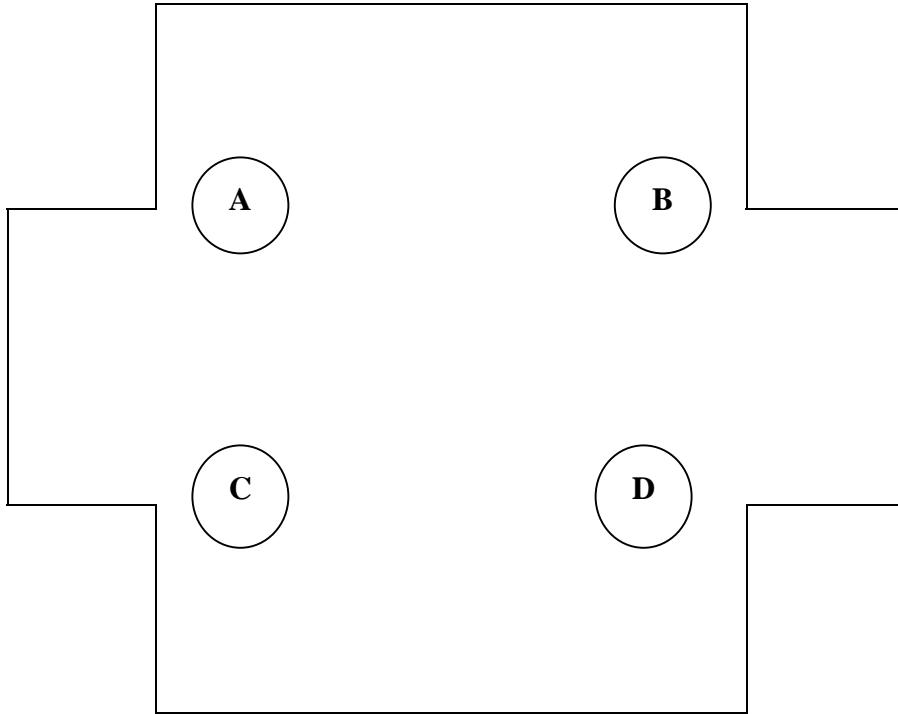


Zinc Bar	Red #10	Stranded Wire
Steel Plate	Blue #10	Stranded Wire
TM	Black #12	Stranded Wire
BM	Red #12	Stranded Wire
N/A	Blue #12	Stranded Wire
N/A	Green #12	Stranded Wire

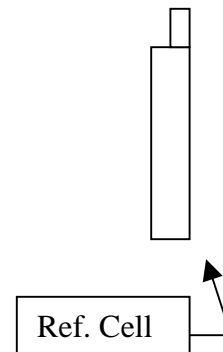


To take Electrical Potential Readings, connect the black test meter lead to the reference cell and connect the red test meter lead to each component in the above sequence.

To read amperage, connect the red test meter lead to the steel plate and connect the black test meter lead to each component in the above sequence.

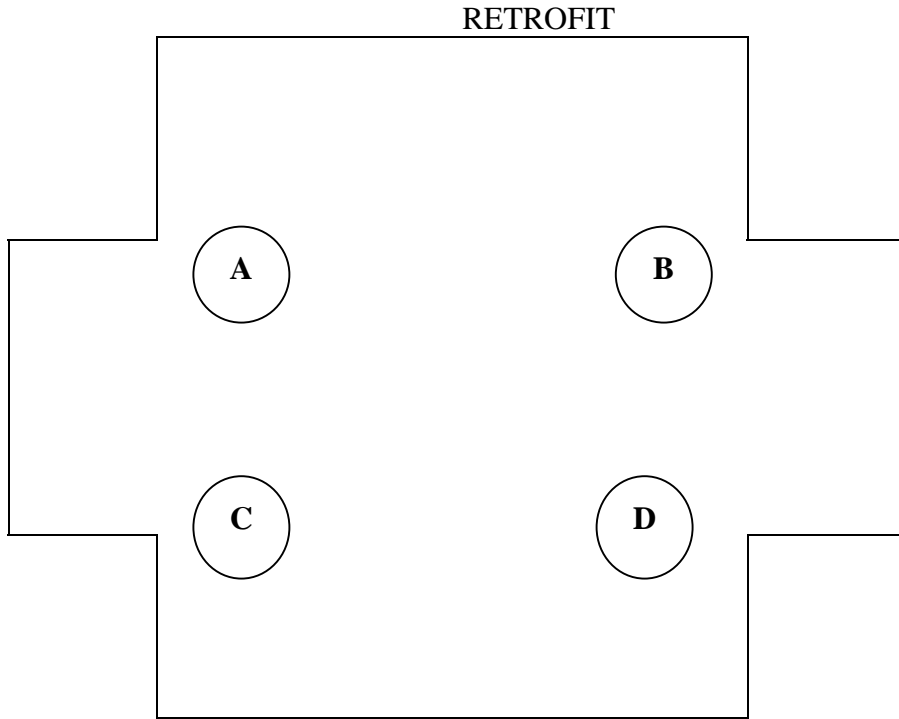


N/A	Red #10	Stranded Wire
N/A	Blue #10	Stranded Wire
A	Black #12	Stranded Wire
B	Red #12	Stranded Wire
C	Blue #12	Stranded Wire
D	Green #12	Stranded Wire

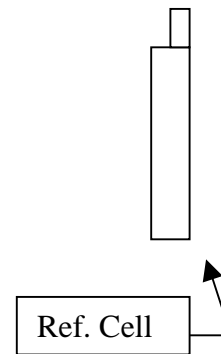


To take Electrical Potential Readings, connect the black test meter lead from meter to the reference cell and connect the red test meter lead to each component in the above sequence.

To read amperage, connect the red test meter lead to the steel plate and connect the black test meter lead to each component in the above sequence.



N/A	Red #10	Stranded Wire
N/A	Blue #10	Stranded Wire
A	Black #12	Stranded Wire
B	Red #12	Stranded Wire
C	Blue #12	Stranded Wire
D	Green #12	Stranded Wire



To take Electrical Potential Readings, connect the black test meter lead from meter to the reference cell and connect the red test meter lead to each component in the above sequence.

To read amperage, connect the red test meter lead to “A” and connect the black test meter lead to each remaining component in the above sequence, B, C, D. The red lead may be connected to “D” and black lead connected to A, B, C.

*In some cases A and C may be connected within the concrete panel, in which case A and, as well as, B and D may be treated as a single component.