

ADOT Specific Requirements for Reinforced Earth Company Concrete Panel Wall System with Ribbed Steel Strip Reinforcements

ADOT Vendor	Reinforced Earth Company (RECO) 1660 Hotel Circle North; Suite 304, San Diego, CA 92108
General Information	ADOT Pride #: 10092 Approval Date: 10/06/2010 Re-evaluation due: 7/31/2020
Design Standards	More stringent of the following: <ol style="list-style-type: none"> 1. 2008 ADOT Standard Specifications for Road and Bridge Construction. 2. Latest ADOT MSE Wall LRFD Based Special Provisions. [Contact ADOT for latest version at the time of the application of the system to a given project.] 3. FHWA (2009), "Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes; Publication No. FHWA-NHI-09-083; Authors: Berg, R. R., Christopher, B. R., and Samtani, N. C. 4. AASHTO (2010 with Latest Interims) LRFD Bridge Design Specifications.
HITEC Evaluation	Not available
Facing Evaluated	<ul style="list-style-type: none"> • Precast concrete panels of the following shapes: Cruciform; 5 ft x 5 ft square and 5 ft x 10 ft rectangular
Facing Connector	<ul style="list-style-type: none"> • See Drawings 5.1.B (REW), 5.1.B (SQR), and 5.1.B (RLA) for Cruciform; 5 ft x 5 ft square and 5 ft x 10 ft rectangular facing panels, respectively • Drawing 5.1.D. • Drawing 5.1.Q for connection to appurtenances.
Soil Reinforcement Evaluated	<ul style="list-style-type: none"> • Ribbed steel strip reinforcement
Notes/Constraints	<p>In addition to the general design requirements provided in the Design Standards listed above, the following specific requirements apply:</p> <ul style="list-style-type: none"> • Use of the system evaluated herein is subject to ADOT approval based on project- and site-specific evaluation. • Only the system components evaluated as noted above are approved for use. High Adherence (HA) ladder reinforcements were not evaluated. Tolerances shall be the more stringent of those noted in RECO's attached drawings and the Design Standards listed above. • Use of soil reinforcements not connected to the wall face is not allowed. • Soil reinforcement length is measured from back of the facing panel. • Reinforcement pullout shall be calculated based on the default values for steel strip reinforcement provided in the latest AASHTO specification (Design Standard #4 listed above). • Live load shall be considered in accordance with the requirements of Design Standard #2 listed above, i.e., ADOT Special Provisions, for external stability, internal stability and facing panel designs. • The external and internal stability analysis shall be performed using procedures in the example problems in Design Standard #3 listed above and

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Assumptions

- in accordance with the requirements in Design Standard #2 listed above, including the use of the simplified method for internal stability analysis.
- The number of bearing pads between panels shall be in accordance with requirements of Design Standard #2 listed above, i.e., ADOT Special Provisions.
- The facing connectors shall be designed to have adequate life considering corrosion loss based on the design (service) life of the structure noted on the plans or specifications, with a minimum of 75 years design life for permanent structures.
- Due to the nut and bolt connection between the ribbed steel strip reinforcement and the facing panel, a splay angle up to fifteen (15) degrees is permissible. Splay angle is defined as the deviation from the normal to the face of the wall in the horizontal plane at a reinforcing level. Reduction in tensile capacity perpendicular to the wall face due to splay shall be accounted for in the analysis.
- Where soil reinforcements are spliced, butt-ended strips with a plate on top and bottom of butted strips shall be used. The top and bottom plate shall be bolted to each strip similar to the connection of the strip at the wall face.
- The geotextile across the joints at the backface of the facing panels shall meet the requirements of AASHTO M 288.
- All details for penetration of culverts or other objects through the wall face shall be evaluated on a project- and site-specific basis.
- All details for penetration of vertical and horizontal obstructions through the reinforced soil zone shall be evaluated on a project- and site-specific basis. Examples of these obstructions include foundation elements, catch basins, slotted drains, etc.
- Drainage details shall be modified as appropriate to meet project- and site-specific requirements.

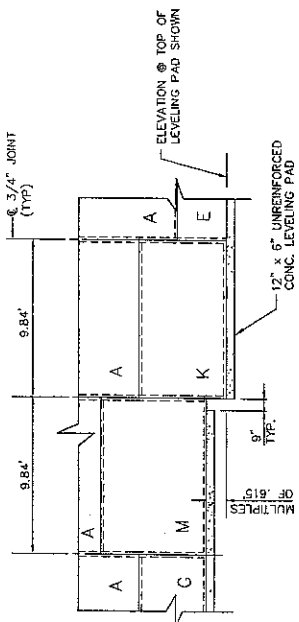
- Vendor submittals shall be in accordance with the design standards and other requirements listed herein.
- ADOT and its design representatives will evaluate the project- and site-specific application of RECO's Concrete Panel system with ribbed steel strip reinforcement and review submittals for approval consideration in strict accordance with the design standards, limitations, and requirements listed herein. Typical details in this package may not be applicable to a given project and will be modified, based on site-specific considerations, as necessary by the designer in consultation with the vendor.
- During construction of the RECO's Concrete Panel system with ribbed steel strip reinforcement, ADOT and its representatives will enforce project- and site-specific acceptance requirements in accordance with the plans and specifications.

**ADOT Specific Requirements for
Reinforced Earth Company Concrete Panel Wall System with
Ribbed Steel Strip Reinforcements**

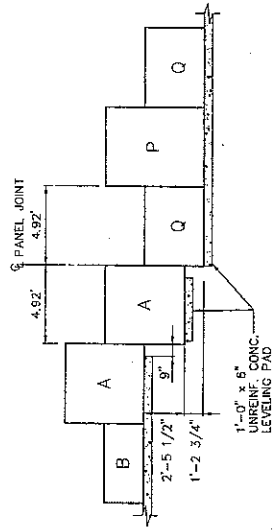
TYPICAL DETAILS

(22 pages)

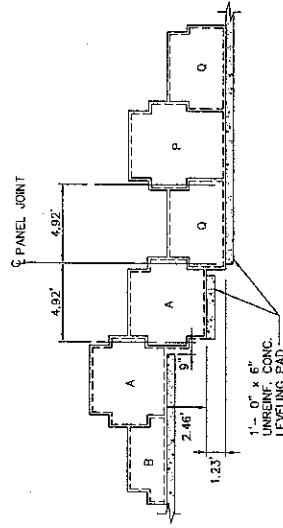
Typical details submitted to ADOT as part of the product approval process are attached. These represent generic details that must be evaluated by the designer based on project- and site-specific requirements. The designer shall also be responsible for ensuring conformance to the constraints and design standards noted in this evaluation.



TYPICAL LEVELING PAD STEP DETAIL (RLA)



TYPICAL LEVELING PAD STEP DETAIL (SQR)



TYPICAL LEVELING PAD STEP DETAIL (REW)

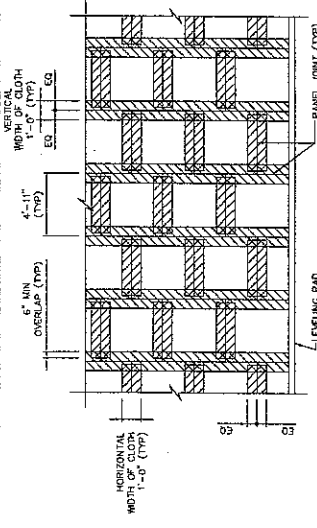
CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.

This drawing contains information proprietary to The Reinforced Earth Company, and is being furnished for the use of [redacted] with this project, and the information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by The Reinforced Earth Company. The Reinforced Earth Company is exclusive licensee in the United States under patents issued to Henri Vidal, and the furnishing of this drawing does not constitute an expressed or implied license under the Vidal patents.

The design contained on these drawings is based on information provided by the owner. On the basis of this information, The Reinforced Earth Company has designed, and is responsible for the internal stability of the structure only. External stability, including foundation and slope stability, is the responsibility of the owner.

REINFORCED EARTH
 1680 Hilda Creek North, Suite 304, San Diego, California 92108
 Ph. (619) 588-2400 Fax (619) 588-2489
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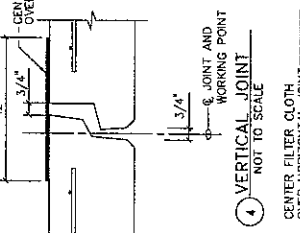
DESIGNED BY:	PROJECT NAME:	ARIZONA DEPARTMENT OF TRANSPORTATION	DATE:
CHECKED BY:	LOCATION:	2010 RE-APPROVAL (L.R.F.D.)	07/21/10
ENG. MANAGER:	OWNER:		REC'D CONTRACT NO.:
	DRAWING COVERS:		DRAWING NO.:
			5.L.A.
			SCALE:
			NTS.



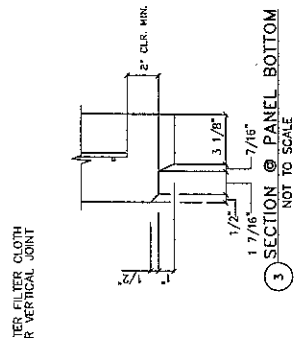
NOTE:
STRIPS OF FILTER CLOTH SHALL BE PLACED ON BACK FACE OF PANEL, CENTERED OVER VERTICAL JOINT. STRIPS TO BE PLACED ON FRONT FACE OF PANEL, USING AN ADHESIVE COMPOUND SUPPLIED BY THE REINFORCER.

PARTIAL ELEVATION - BACK FACE

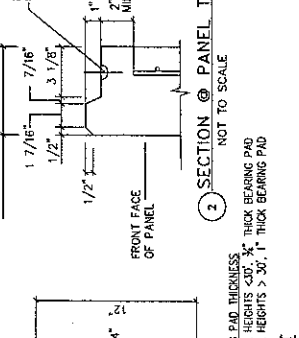
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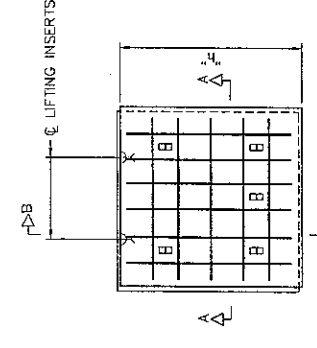
4 VERTICAL JOINT
NOT TO SCALE



3 SECTION @ PANEL BOTTOM
NOT TO SCALE



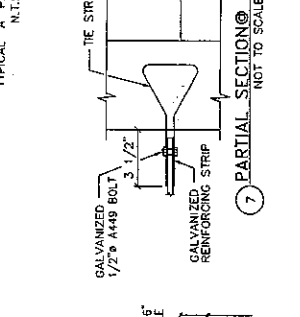
2 SECTION @ PANEL TOP
NOT TO SCALE



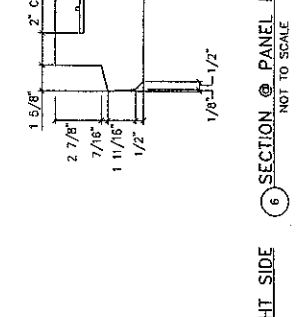
R7 REINFORCEMENT LAYOUT IS THE SAME AS R5, BAR SIZE VARIES SEE TABLE.

WIRE MESH ALTERNATE

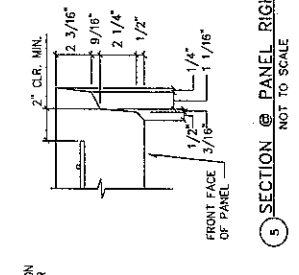
TYPICAL 'A' PANEL SHOWN



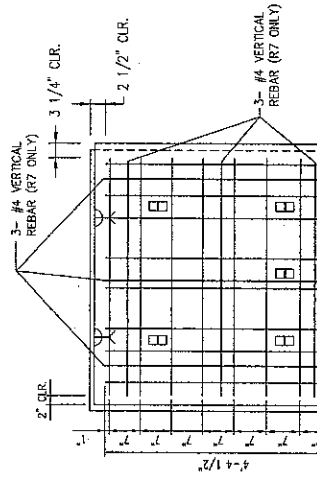
7 PARTIAL SECTION @ TIE STRIP
NOT TO SCALE



5 SECTION @ PANEL RIGHT SIDE
NOT TO SCALE



6 SECTION @ PANEL LEFT SIDE
NOT TO SCALE



CONCRETE COVER ON ALL REINFORCEMENT TO BE 2\"/>

REINFORCEMENT DESIGNATION

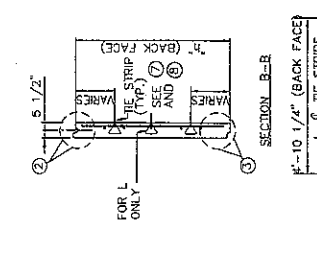
PANEL THICKNESS	REINFORCEMENT DESIGNATION	PANEL REINFORCEMENT (FOR PANEL TYPE 'A')	MAXIMUM ALLOWABLE HORIZONTAL STRESS AT PAVING (FACTORED)
5 1/2\"/>			
5 1/2\"/>			

NOTES:
1A. REINFORCEMENT SHOWN SHALL COMPLY TO THE ASTM A615, GRADE 60, STANDARD. REBAR LAYOUT WILL BE DETAILED AND SHOWN ON PANEL SHOP DRAWINGS.
1B. WELDED WIRE MESH SHALL COMPLY TO ASTM A497, GRADE 60, REFER TO WELDED WIRE MESH ALTERNATE DETAIL FOR SPACING AND CONFIGURATION.
2. 1/2\"/>

3. EXPOSED EDGES (FRONT FACE ONLY).
4. ALL PANELS EXCEPT TYPES M AND N SHALL HAVE TWO BURKE 1-TON SPREAD ANCHORS. PANEL TYPES M AND N SHALL HAVE TWO BURKE 2-TON ERECTION HEAD ANCHORS WITH BOTH TENSION AND SHEAR BARS.
5. PANEL DESIGN STRUCTURAL THICKNESS IS 5 1/2\"/>

6. ACTUAL LOCATION OF REBARS WILL BE ADJUSTED TO ACCOMMODATE PANEL CASTING.
7. PANEL REINFORCEMENT SHALL BE PLACED WITH A MINIMUM 1 3/16\"/>

8. THE 28 DAY COMPRESSIVE STRENGTH CONCRETE f_c SHALL BE 4000 PSI MINIMUM.



CONCRETE COVER ON ALL REINFORCEMENT TO BE 2\"/>

PANEL TYPE	"h"
A & H	4'-10 1/4\"/>
B & D	2'-4 3/4\"/>
C	1'-9 1/2\"/>
E	3'-0 1/4\"/>
F & Q	3'-7 1/2\"/>
G	4'-3\"/>
K	5'-5 3/4\"/>
L & P	6'-1\"/>
M	6'-6 1/2\"/>
N	7'-3 3/4\"/>

VERIFIED WITH RESPECT TO INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.

DESIGNED BY: PROJECT ENGINEER
CHECKED BY: ENGINE MANAGER

REINFORCED EARTH
1800 Kona Circle, North, Suite 304, San Diego, California 92108
Ph. (619) 598-2400 Fax (619) 688-2499

PROJECT NAME	PROJECT NO.	DATE
2010 RE-APPROVAL (L.R.F.D.) <td> <td>07/21/10 </td></td>	<td>07/21/10 </td>	07/21/10

DESCRIPTION	REV.	DATE
5x5 SQR - STANDARD DETAILS		

PROJECT NAME	PROJECT NO.	DATE
2010 RE-APPROVAL (L.R.F.D.) <td> <td>07/21/10 </td></td>	<td>07/21/10 </td>	07/21/10

LOCATION	DATE

ENGINEER	DATE

SCALE	AS SHOWN
5:1 B (SOR)	

RECORD NO.	DATE

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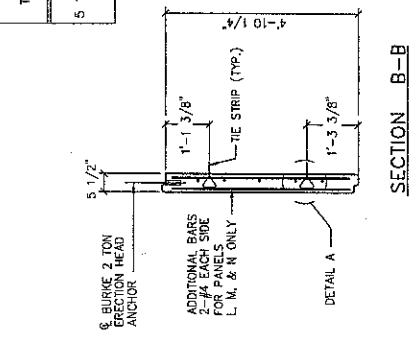
PANEL THICKNESS	REINFORCEMENT DESIGNATION	PANEL REINFORCEMENT (FOR PANEL TYPE "A")	MAXIMUM FACTORED HORIZONTAL STRESS AT FACING (FACTORED)
5 1/2" (MIN.)	R4	10-#4 VERTICAL 5-#4 HORIZONTAL	3.50

- NOTES:
- REINFORCEMENT SHOWN SHALL COMPLY TO THE ASTM A615, GRADE 60 STANDARDS. REBAR LAYOUT WILL BE DETAIL AND SHOWN ON PANEL SHOP DRAWINGS.
 - 1/2" x 1/2" CHAMFER SHALL BE PROVIDED ON ALL EXPOSED EDGES (FRONT FACE ONLY).
 - ALL PANEL TYPES AND OTHER RELATED ELEMENTS WILL BE DETAIL ON SHOP DRAWINGS.
 - ALL PANELS EXCEPT TYPES M AND N SHALL HAVE TWO BURKE 1-TON SPREAD ANCHORS. PANEL TYPES M AND N SHALL HAVE TWO BURKE 2-TON ERECTION HEAD ANCHORS WITH BOTH TENSION AND SHEAR BARS.
 - PANEL DESIGN STRUCTURAL THICKNESS IS 5 1/2" MINIMUM. THIS THICKNESS MUST INCREASE TO ACCOMMODATE ANY ARCHITECTURAL FINISH.
 - ACTUAL LOCATION OF REBARS WILL BE ADJUSTED TO ACCOMMODATE PANEL CASTING.
 - PANEL REINFORCEMENT SHALL BE PLACED WITH A MINIMUM 1 3/16" CLEARANCE FROM THE TIE STRIPS.
 - THE 28 DAY COMPRESSIVE STRENGTH CONCRETE f_c SHALL BE 4000 psi MINIMUM.

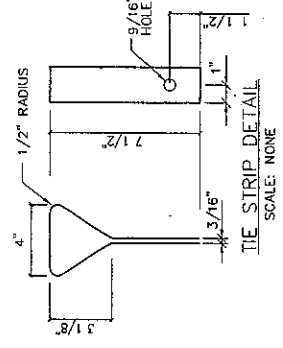
PANEL TYPE	h"
A & H	4-10 1/4"
B & D	2'-4 3/4"
C	1'-9 1/2"
E	3'-0 1/4"
F & Q	3'-7 1/2"
G	4'-3"
K	5'-5 3/4"
L & P	6'-1"
M	6'-8 1/2"
N	7'-3 3/4"

NOTE:
CONCRETE COVER ON ALL REINFORCEMENT TO BE 2" MIN.

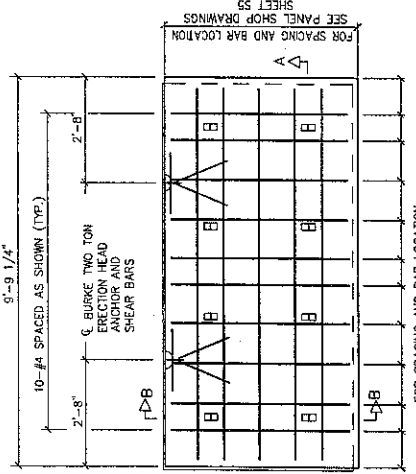
CERTIFIED W/P. RESPECT TO INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.



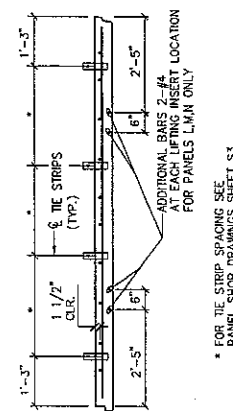
SECTION B-B



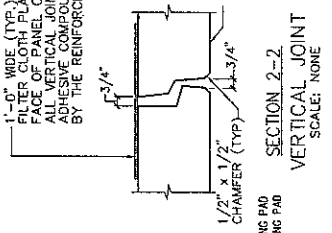
TIE STRIP DETAIL



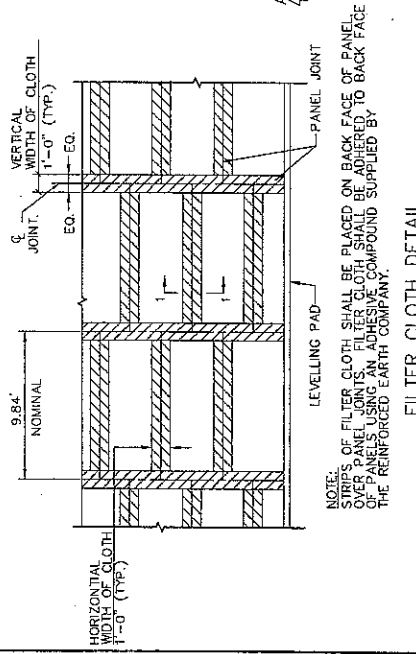
ELEVATION - BACK FACE



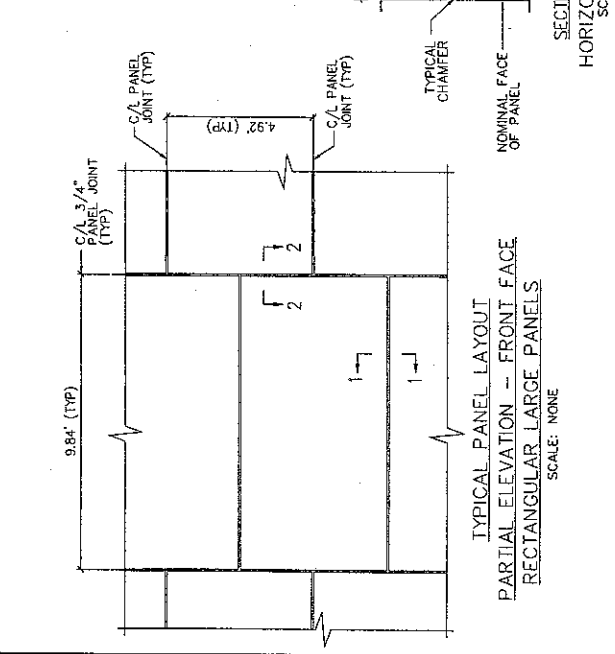
SECTION A-A



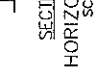
VERTICAL JOINT



PARTIAL ELEVATION - BACK FACE



TYPICAL PANEL LAYOUT



SECTION 1-1

HORIZONTAL JOINT

DESIGNED BY: _____

PROJECT ENGINEER: _____

CHECKED BY: _____

ENG. NUMBER: _____

REVISION: _____

DATE: _____

DESCRIPTION: _____

REINFORCED EARTH

1688 Holla Chok North, Suite 304, San Diego, California 92108

Ph. (619) 688-2400 Fax (619) 688-2489

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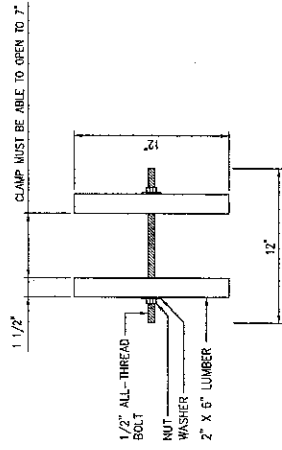
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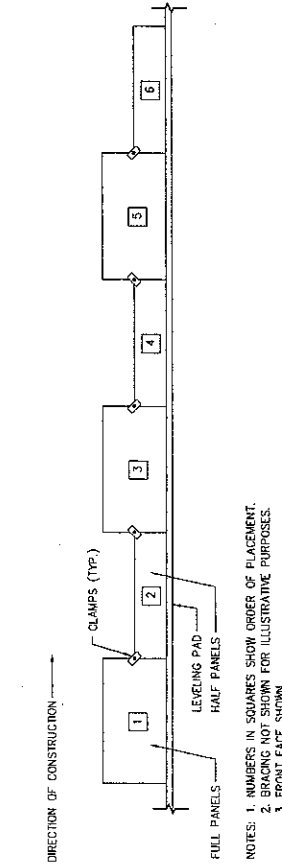
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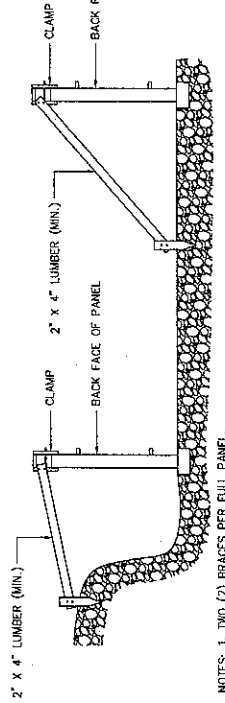


CLAMP DETAIL



PLACEMENT OF PANELS IN INITIAL COURSE

NOTES: 1. NUMBERS IN SQUARES SHOW ORDER OF PLACEMENT.
 2. BRACING NOT SHOWN FOR ILLUSTRATIVE PURPOSES.
 3. FRONT FACE SHOWN.



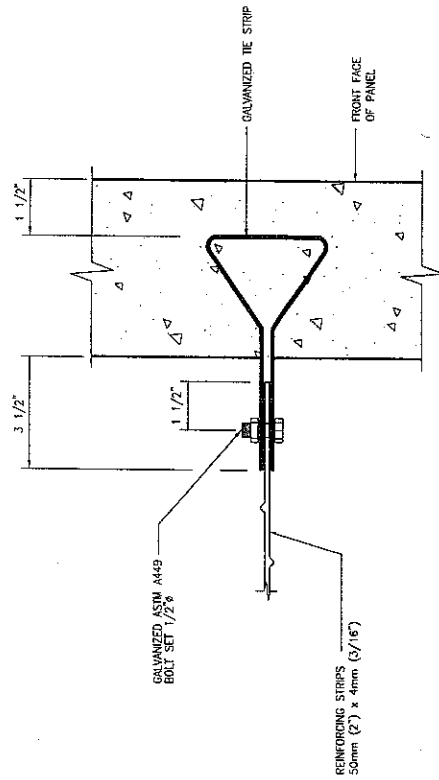
BRACING DETAILS

NOTES: 1. TWO (2) BRAGS PER FULL PANEL.

See Construction Manual for Complete Installation details

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REINFORCED EARTH 1685 Howe Circle North, Suite 304, San Diego, California 92108 Ph. (619) 688-2400 Fax (619) 688-2489 <small>REINFORCED EARTH™ is the registered trademark of The Reinforced Earth Company.</small>	DESIGNED BY: PROJECT ENGINEER: CHECKED BY: ENG. MANAGER:	ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.E.D.)	DATE: 07/21/10
	REVISIONS: REV. DATE DESCRIPTION	PROJECT NAME: LOCATION: ORDER: DRAWING CORRECTIONS:	REVISIONS: REV. DATE DESCRIPTION
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CONNECTION DETAIL

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DESIGNED BY: _____
 PROJECT ENGINEER: _____
 CHECKED BY: _____
 ENG. MANAGER: _____

REINFORCED EARTH COMPANY
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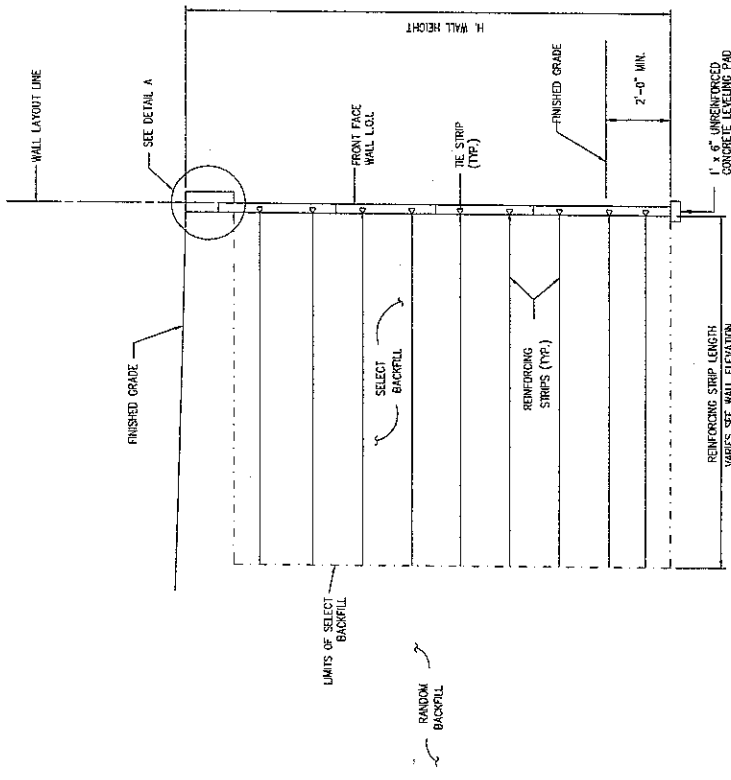
PROJECT NAME: _____
 LOCATION: _____
 OWNER: _____
 DRAWING NO.: _____

ARIZONA DEPARTMENT OF TRANSPORTATION
 2010 RE-APPROVAL (L.R.F.D.)

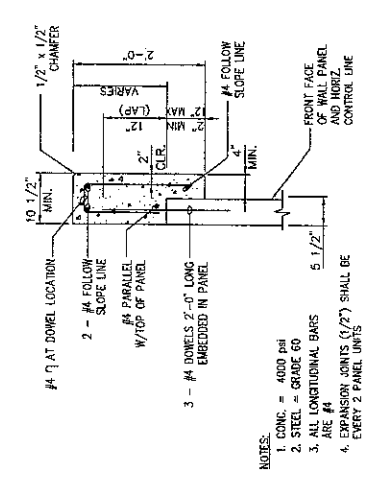
DATE: 07/21/10
 RECD CONTRACT NO.: _____
 SCALE: 5:1
 NTS.

DESCRIPTION: _____
 DATE: _____
 REVISION: _____

CONNECTION DETAIL



MSE WALLS TYPICAL SECTION
SCALE: NOT TO SCALE



DETAIL A: C.I.P. CONC. COPING
SCALE: NOT TO SCALE

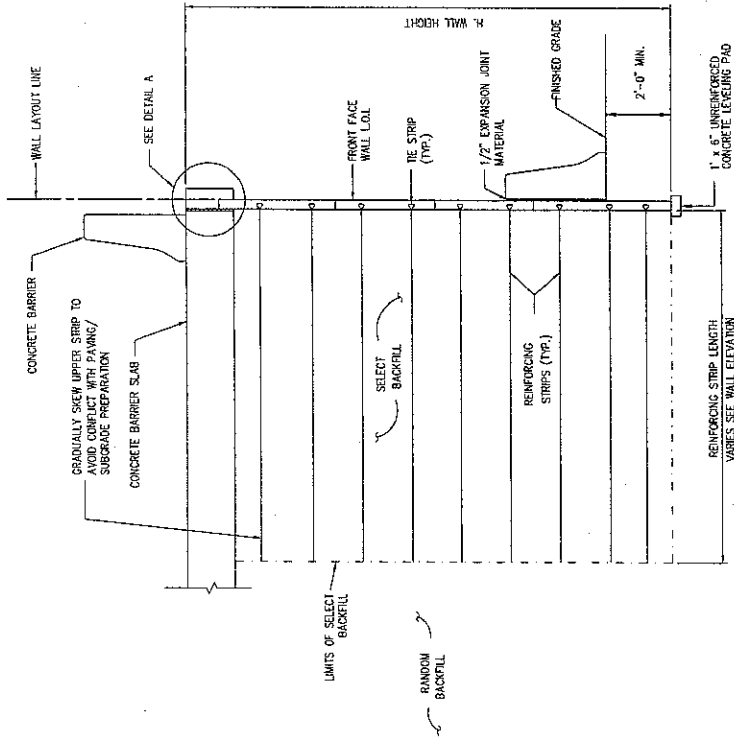
- NOTES:**
1. CONC. = 4000 psi
 2. STEEL = GRADE 60
 3. ALL LONGITUDINAL BARS ARE #4
 4. EXPANSION JOINTS (1/2") SHALL BE EVERY 2 PANEL UNITS

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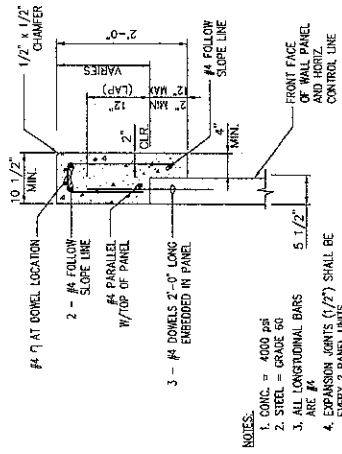
<p>The design contained on these drawings is based on information provided by the owner. On the basis of this information, The Reinforced Earth Company has designed, and is responsible for the internal stability of the structure only. External stability, including foundation and slope stability, is the responsibility of the owner.</p>	<p>This drawing contains information proprietary to The Reinforced Earth Company, and is being furnished for the use of _____ only in connection with this project, and the information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by The Reinforced Earth Company. The Reinforced Earth Company is exclusive licensee in the United States under patents issued to Henri Vidal, and the furnishing of this drawing does not constitute an expressed or implied license under the Vidal patents.</p>	<p>DESIGNED BY:</p>	<p>PROJECT NAME:</p>	<p>ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (I.R.P.D.)</p>	<p>DATE:</p>
		<p>PROJECT ENGINEER:</p>	<p>LOCATION:</p>	<p>RECORD CONTRACT NO.:</p>	<p>07/21/10</p>
		<p>CHECKED BY:</p>	<p>OWNER:</p>	<p>DRAWING NO.:</p>	<p>SCALE:</p>
		<p>ERIC MANAGER</p>	<p>DRAWING COVERS:</p>	<p>TOP OF WALL COPING</p>	<p>AS SHOWN</p>

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619 488-2400 Fax (619) 488-2489

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MSE WALLS TYPICAL SECTION WITH WALL TRAFFIC BARRIER
SCALE: NOT TO SCALE

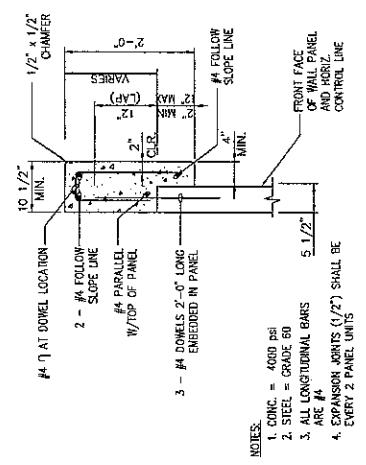
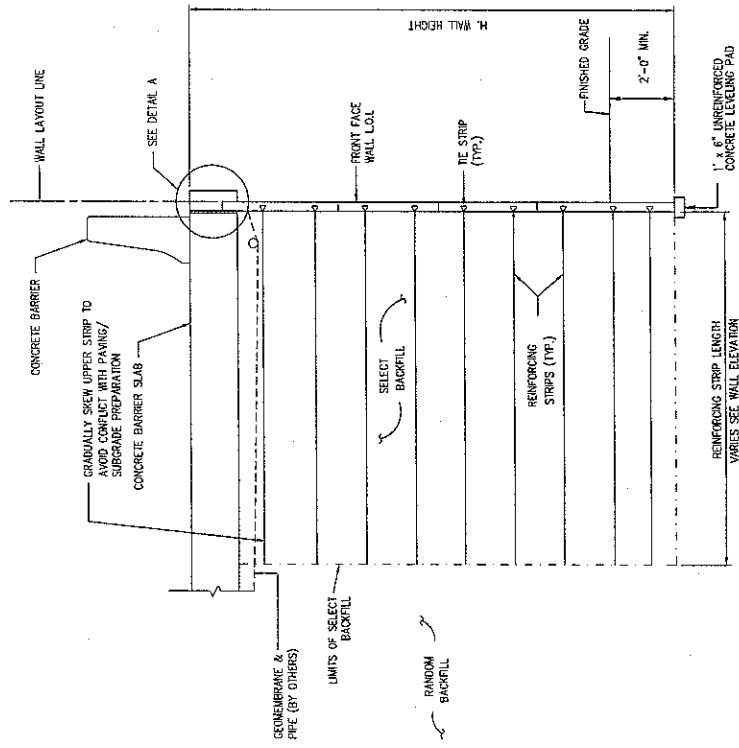


DETAIL A: C.I.P. CONC. COPING
SCALE: NOT TO SCALE

- NOTES:
1. CONC. = 4000 psi
 2. STEEL = GRADE 60
 3. ALL LONGITUDINAL BARS ARE #4
 4. EXPANSION JOINTS (1/2") SHALL BE EVERY 2 PANEL UNITS

CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.

<p>This drawing contains information proprietary to The Reinforced Earth Company, and is being furnished for the project only in connection with this project. The information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by The Reinforced Earth Company. The Reinforced Earth Company is exclusive licensee in the United States under patents issued to Henri Vidal, and the furnishing of this drawing does not constitute an expressed or implied license under the Vidal patents.</p>		<p>The design contained on these drawings is based on information provided by the owner. On the basis of this information, The Reinforced Earth Company has designed, and is responsible for the internal stability of the structure only. External stability, including foundation and slope stability, is the responsibility of the owner.</p>		<p>REINFORCED EARTH 1660 North Oracle North, Suite 304, San Diego, California 92108 Ph. (619) 688-2400 Fax (619) 688-2459 "REINFORCED EARTH" is the registered trademark of The Reinforced Earth Company.</p>		<p>DESIGNED BY: PROJECT ENGINEER: CHECKED BY: ENGR. MANAGER</p>	<p>DATE: DATE: DATE: DATE:</p>	<p>DESCRIPTION: DRAWING CODES:</p>	<p>ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (R.A.P.D.)</p>	<p>PROJECT NAME: LOCATION: OWNER: DRAWING NO. 5-1.0 SCALE: AS SHOWN</p>	<p>DATE: 07/21/10 REG. CONTRACT NO.:</p>
--	--	--	--	--	--	---	--	--	---	---	--

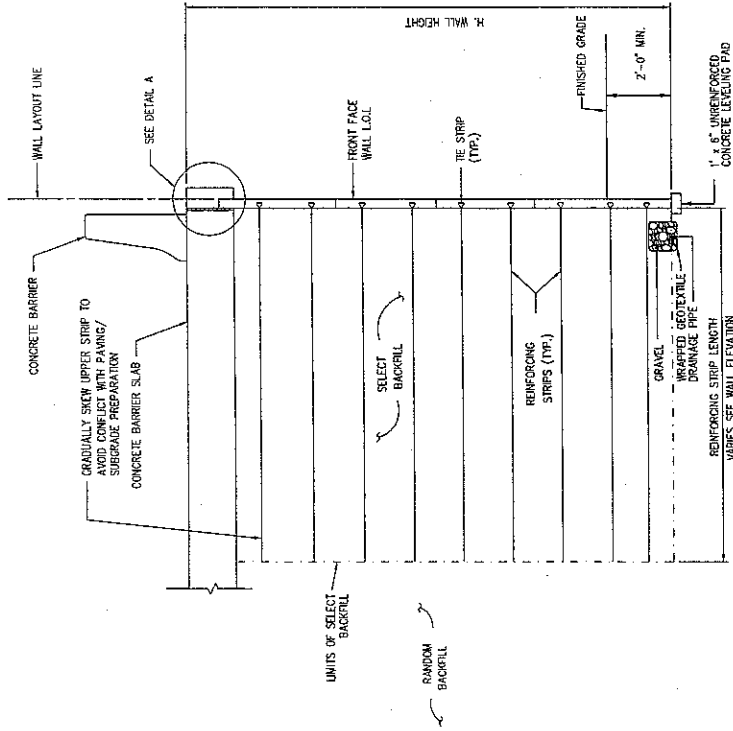


DETAIL A: C.I.P. CONC. COPING
SCALE: NOT TO SCALE

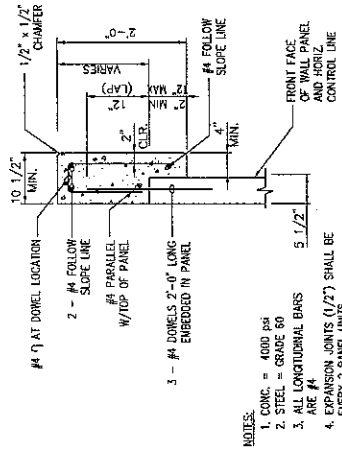
WALL MEMBRANCE FOR DEICING
SCALE: NOT TO SCALE

CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.

DESIGNED BY:	PROJECT ENGINEER:	CHECKED BY:	ENG. MANAGER:	DATE:	REVISION:	DESCRIPTION:	DRAWING COVERS:	DRAWING SCALE:	WALL MEMBRANE FOR DEICING
<p>REINFORCED EARTH 1680 Hobar Circle North, Suite 304, San Diego, California 92108 Ph. (619) 688-2400 Fax (619) 688-2469</p>		<p>"REINFORCED EARTH" is the registered trademark of The Reinforced Earth Company.</p>			<p>The design contained on these drawings is based on information provided by the owner. On the basis of this information, The Reinforced Earth Company has designed, and is responsible for the internal stability of the structure only. External stability, including foundation and slope stability, is the responsibility of the owner.</p>				
<p>This drawing contains information proprietary to The Reinforced Earth Company, and is being furnished for the use of the owner only in connection with this project, and the information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by The Reinforced Earth Company. The Reinforced Earth Company is exclusive licensee in the United States under patents issued to Henri Vidal, and the furnishing of this drawing does not constitute an expressed or implied license under the Vidal patents.</p>		<p>ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)</p>							
DATE	07/21/10	NEED CONTRACT NO.							
DRAWING NO.	5.1.H	DRAWING NO.							
SCALE	NTS	SCALE							



SUBSURFACE DRAINAGE
SCALE: NOT TO SCALE

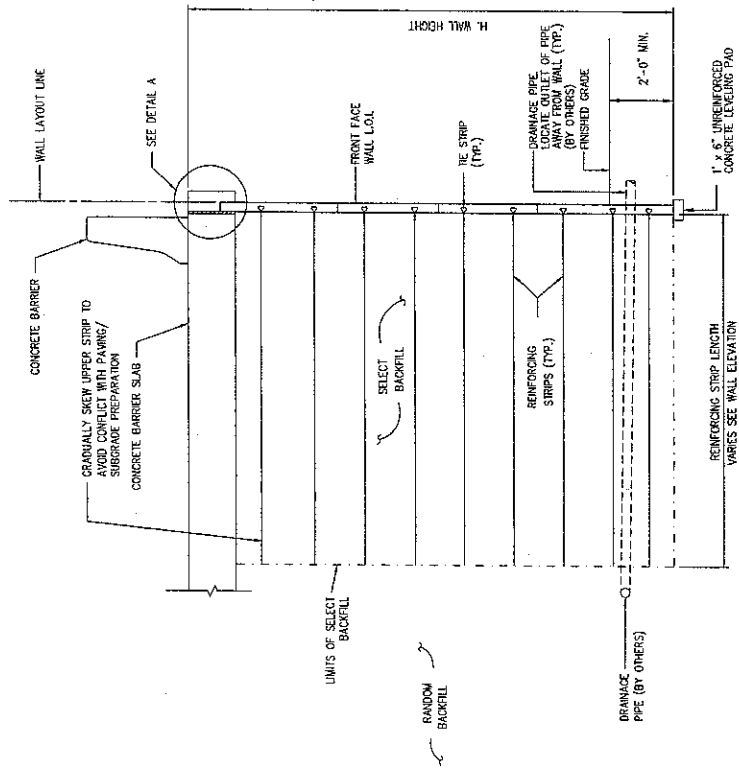


DETAIL A: C.I.P. CONC. COPING
SCALE: NOT TO SCALE

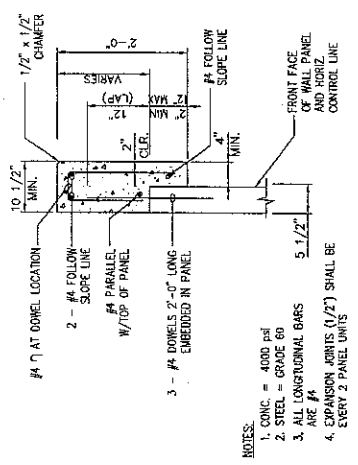
- NOTES:
1. CONC. = 4000 psi
 2. STEEL = GRADE 50
 3. ALL LONGITUDINAL BARS ARE #4
 4. EXPANSION JOINTS (1/2") SHALL BE EVERY 2 PANEL UNITS

CHECKED WITH RESPECT TO INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.

<p>This drawing contains information proprietary to The Reinforced Earth Company, and is being furnished for the use of _____ only in connection with this project, and the information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by The Reinforced Earth Company. The Reinforced Earth Company is a registered trademark of The Reinforced Earth Company. All rights reserved. No part of this drawing may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of The Reinforced Earth Company. This drawing does not constitute an offer of any product or service, and is not intended to be used as a basis for any design or construction. The Reinforced Earth Company is not responsible for any design or construction errors or omissions. The Reinforced Earth Company is not responsible for any design or construction errors or omissions. The Reinforced Earth Company is not responsible for any design or construction errors or omissions.</p>		<p>REINFORCED EARTH[®] 1655 Hotel Circle North, Suite 304, San Diego, California 92108 Ph. (619) 648-2400 Fax (619) 688-2499 The Reinforced Earth Company</p>	<p>DESIGNED BY: PROJECT ENGR: CHECKED BY: ENG. MANAGER</p>	<p>ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)</p>	<p>DATE 07/21/10</p>
<p>PROJECT NAME LOCATION</p>	<p>PROJECT NO.</p>	<p>REVISIONS</p>	<p>DATE</p>	<p>DESCRIPTION</p>	<p>SCALE NTS.</p>
<p>DRAWING NO. 5-11L</p>	<p>DRAWING DATE</p>	<p>DRAWING SCALE</p>	<p>DRAWING NO.</p>	<p>DRAWING DATE</p>	<p>DRAWING SCALE</p>
<p>DRAWING NO. 5-11L</p>	<p>DRAWING DATE</p>	<p>DRAWING SCALE</p>	<p>DRAWING NO.</p>	<p>DRAWING DATE</p>	<p>DRAWING SCALE</p>



SUBSURFACE DRAIN OUTLET
SCALE: NOT TO SCALE

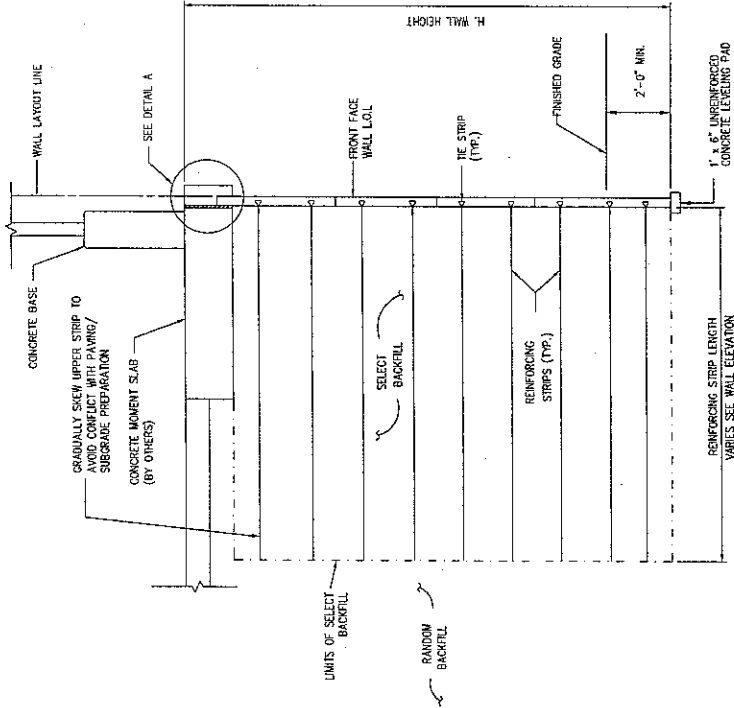


DETAIL A: C.I.P. CONC. COPING
SCALE: NOT TO SCALE

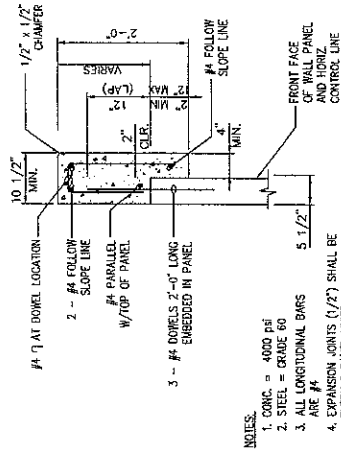
- NOTES:
1. CONC. = 4000 psi
 2. STEEL = GRADE 60
 3. ALL LONGITUDINAL BARS ARE #4
 4. EXPANSION JOINTS (1/2") SHALL BE EVERY 2 PANEL UNITS

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<p>This drawing conveys information proprietary to The Reinforced Earth Company, and is being furnished for the use of [] with this project, and the information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by The Reinforced Earth Company. The Reinforced Earth Company is exclusive licensee in the United States under patents issued to Henri Vidal, and the furnishing of this drawing does not constitute an expressed or implied license under the Vidal patents.</p>	<p>The design contained on these drawings is based on information provided by the owner. On the basis of this information, The Reinforced Earth Company has designed, and is responsible for the internal stability of the structure only. External stability, including foundation and slope stability, is the responsibility of the owner.</p>	<p>Reinforced earth 1880 Hilda Circle North, Suite 304, San Diego, California 92108 Ph. (619) 688-2400 Fax (619) 688-2489 "REINFORCED EARTH" is the registered trademark of The Reinforced Earth Company.</p>	<p>DESIGNED BY: []</p>	<p>PROJECT NAME: []</p>	<p>ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)</p>	<p>DATE: 07/21/10</p>
			<p>PROJECT CODE: []</p>	<p>LOCATION: []</p>	<p>REC. CONTRACT NO. []</p>	
			<p>CHECKED BY: []</p>	<p>OWNER: []</p>	<p>DRAWING NO. []</p>	<p>DRAWING DATE: []</p>
			<p>ENG. MANAGER: []</p>	<p>DESCRIPTION: []</p>	<p>DRAWING CODES: []</p>	<p>SCALE: 5:11</p>
				<p>DESCRIPTION: SUBSURFACE DRAINAGE</p>		<p>SCALE: N.T.S.</p>




MSE WALLS TYPICAL SECTION WITH OVERHEAD LIGHT
SCALE: NOT TO SCALE

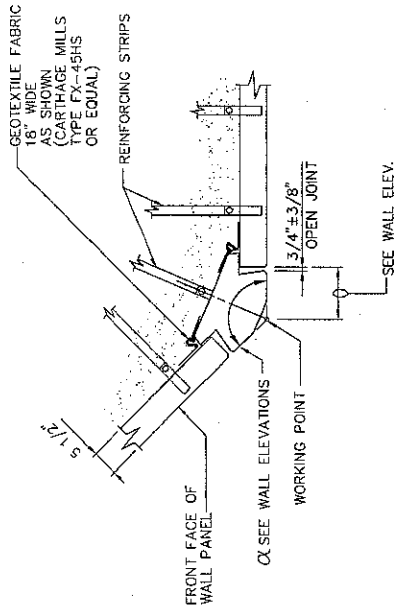


DETAIL A: C.I.P. CONC. COPING
SCALE: NOT TO SCALE

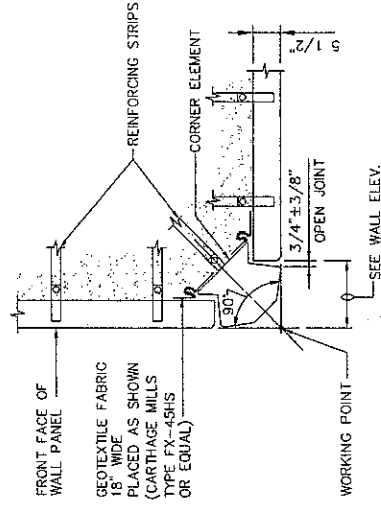
- NOTES:
1. CONC. = 4000 psi
 2. STEEL = GRADE 60
 3. ALL LONGITUDINAL BARS ARE #4
 4. EXPANSION JOINTS (1/2') SHALL BE EVERY 2 PANEL UNITS

CARRIED WITH RESPECT TO INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.

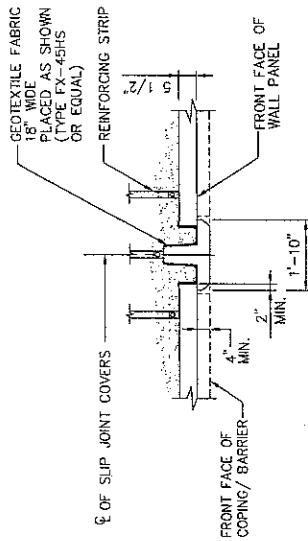
 <p>Reinforced Earth 1660 Red Hill Rd., Suite 204, San Diego, California 92108 Tel. (619) 688-2400 Fax (619) 688-2499</p> <p><small>*REINFORCED EARTH® is the registered trademark of the Reinforced Earth Company.</small></p>		<p>DESIGNED BY: _____</p> <p>PROJECT ENGR: _____</p> <p>CHECKED BY: _____</p> <p>ENR MANAGER: _____</p> <p>REV. _____</p>	<p>DATE: 07/21/10</p> <p>RECORD CONTRACT NO. _____</p> <p>DRAWING NO. 5.1.N</p> <p>SCALE: AS SHOWN</p>
<p>The design contained on these drawings is based on information provided by the owner. On the basis of this information, The Reinforced Earth Company has designed, and is responsible for the internal stability of the structure only. External stability, including foundation and slope stability, is the responsibility of the owner.</p>		<p>PROJECT NAME: ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)</p> <p>LOCATION: _____</p> <p>OWNER: _____</p> <p>DESCRIPTION: TOP OF WALL WITH OVERHEAD LIGHT</p>	<p>DATE: 07/21/10</p> <p>RECORD CONTRACT NO. _____</p> <p>DRAWING NO. 5.1.N</p> <p>SCALE: AS SHOWN</p>
<p>This drawing contains information proprietary to the Reinforced Earth Company, and is being furnished for the use of _____ only in connection with this project, and the information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by the Reinforced Earth Company. The Reinforced Earth Company is exclusive licensee in the United States under patents issued to Henri Vold, and the furnishing of this drawing does not constitute an expressed or implied license under the Vold patents.</p>		<p>PROJECT ENGR: _____</p> <p>CHECKED BY: _____</p> <p>ENR MANAGER: _____</p> <p>REV. _____</p>	<p>DATE: 07/21/10</p> <p>RECORD CONTRACT NO. _____</p> <p>DRAWING NO. 5.1.N</p> <p>SCALE: AS SHOWN</p>



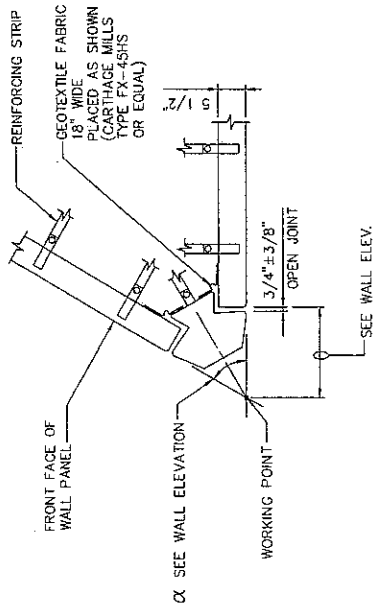
OBTUSE CORNER ELEMENT DETAIL



90° CORNER ELEMENT DETAIL



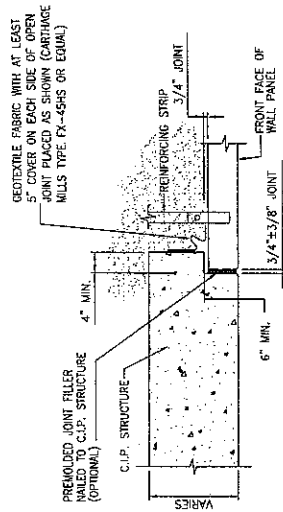
SLIP JOINT COVER DETAIL



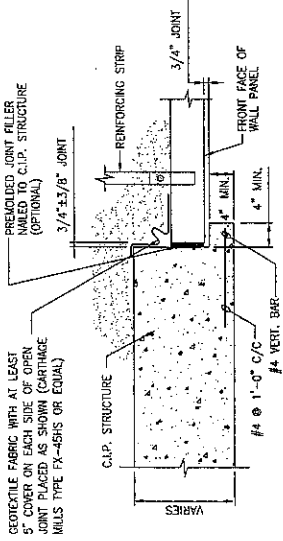
ACUTE CORNER ELEMENT DETAIL

CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.

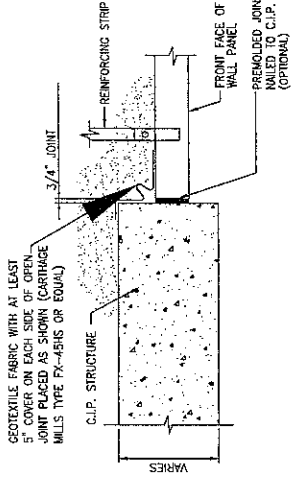
DESIGNED BY:	PROJECT ENGINEER:	PROJECT NAME:	ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)	DATE:	07/21/10
CHECKED BY:	PROJECT ENGR:	LOCATION:		RECORD CONTRACT NO.:	
ENGR. MANAGER:	REV.:	OWNER:		DRAWING NO.:	5.1.0
		DRAWING COVERS:		SCALE:	NTS.
<p>The design contained on these drawings is based on information provided by the owner. On the basis of this information, the Reinforced Earth Company warrants the engineering of the structure with respect to external stability, including foundation and slope stability, is the responsibility of the owner.</p>		<p>This drawing contains information proprietary to The Reinforced Earth Company, and is being furnished for the use of _____ only in connection with this project, and the information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by the Reinforced Earth Company. The Reinforced Earth Company and its subsidiaries are registered owners of patents issued to Hester, Vidal and their associates in connection with this drawing does not constitute an expressed or implied license under the Vidal patents.</p>			
<p>REINFORCED EARTH[®] is the registered trademark of The Reinforced Earth Company.</p>		<p>REINFORCED EARTH[®]</p> <p>1800 Hillside Blvd., North, Suite 304, San Ramon, California 94508 Ph. (916) 678-2400 Fax (916) 678-2459</p>			



BUTT JOINT DETAIL @ C.I.P. STRUCTURES
WITH LIP OR NOTCH



BUTT JOINT DETAIL @ C.I.P. STRUCTURES
WITH LIP OR NOTCH



BUTT JOINT DETAIL @ C.I.P. STRUCTURES
WITHOUT LIP OR NOTCH

CERTIFIED WITH RESPECT TO INTERNAL STABILITY
OF REINFORCED EARTH STRUCTURES ONLY.

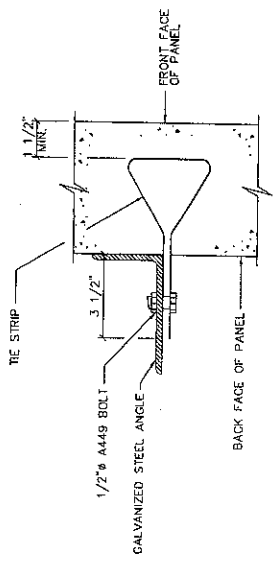
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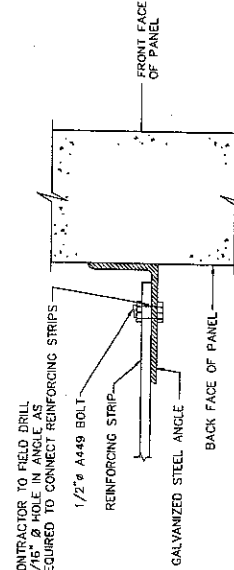
REINFORCED EARTH
 1660 Hwai Circle North, Suite 204, San Diego, California 92108
 Ph. (619) 686-2400 Fax (619) 686-2499

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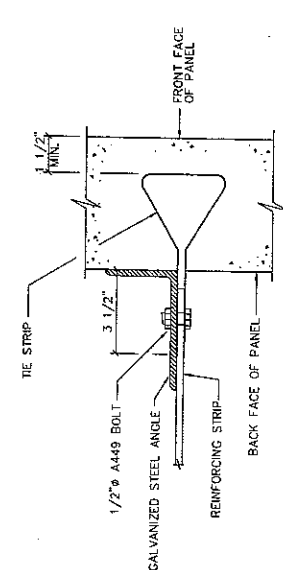
DESIGNED BY:	PROJECT ENGR:	DATE:
DRAWN BY:	CHK. MANAGER:	REV.:
DESCRIPTION:	DATE:	REV.:
PROJECT NAME:	ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)	DATE: 07/21/10
LOCATION:		RECO CONTRACT NO.:
OWNER:		DRAWING NO.:
DRAWING CODES:		5.1.P
SCALE:		SCALE:
END OF WALL DETAILS		N.T.S.



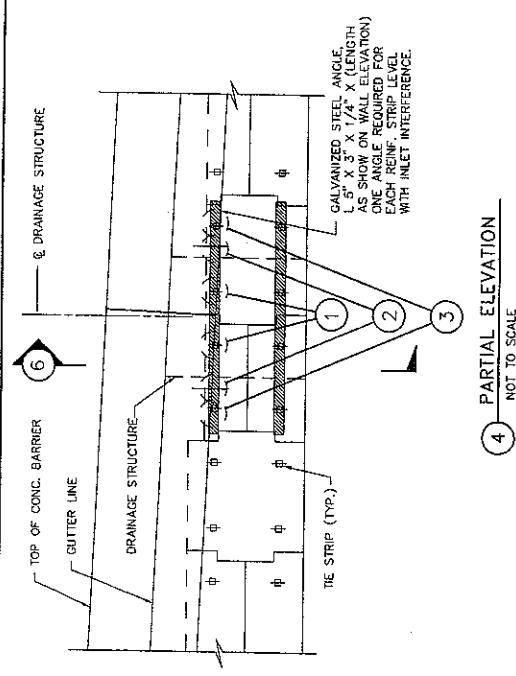
1 CONNECTION DETAIL ANGLE BOLTED TO TIE STRIP NOT TO SCALE



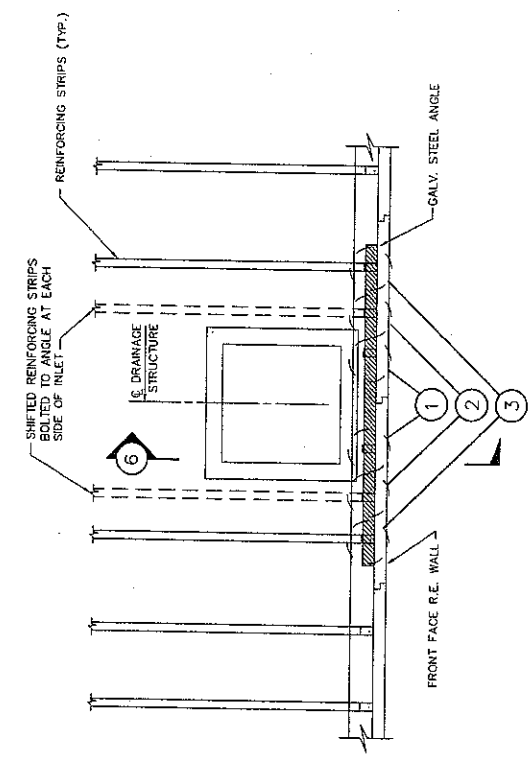
2 CONNECTION DETAIL SHIFTED REINFORCING STRIP BOLTED TO ANGLE NOT TO SCALE



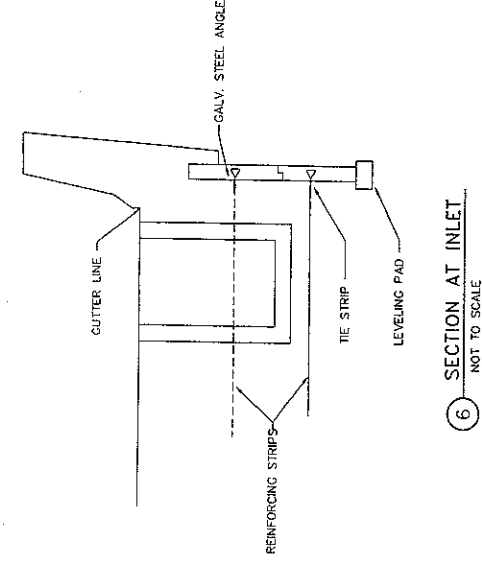
3 CONNECTION DETAIL ANGLE BOLTED TO TIE STRIP WITH REINFORCING STRIP NOT TO SCALE



4 PARTIAL ELEVATION NOT TO SCALE



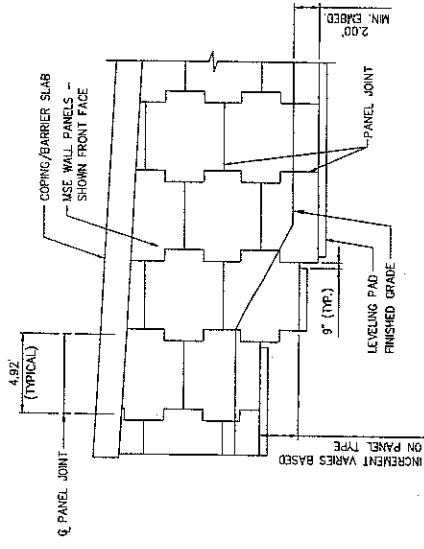
5 PARTIAL PLAN NOT TO SCALE



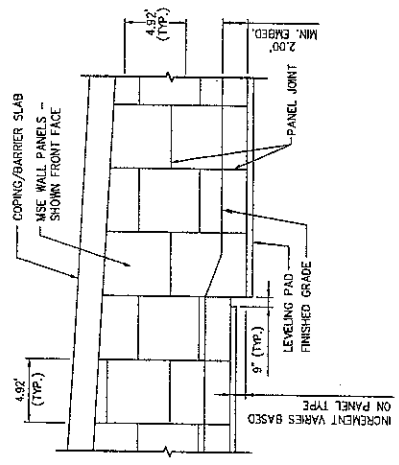
6 SECTION AT INLET NOT TO SCALE

CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.

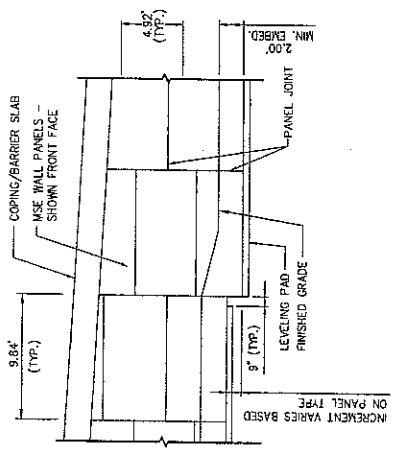
<p>This drawing contains information proprietary to The Reinforced Earth Company, and is being furnished for the use of _____ only in connection with this project, and the information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by The Reinforced Earth Company. The Reinforced Earth Company is exclusive licensee in the United States under patents issued to Henri Vidal, and the furnishing of this drawing does not constitute an expressed or implied license under the Vidal patents.</p>		<p>The design contained on these drawings is based on information provided by the owner. On the basis of this information, The Reinforced Earth Company has designed, and is responsible for the internal stability of the structure only. External stability, including foundation and slope stability, is the responsibility of the owner.</p>		<p>REINFORCED EARTH 1550 Hwy 101, Suite 304, San Diego, California 92108 Ph: (619) 449-2400 Fax: (619) 449-2499</p>		<p>ISSUED BY: _____ PROJECT ENGINEER: _____ CHECKED BY: _____ ERIC MANAGER: _____</p>	<p>PROJECT NAME: _____ LOCATION: _____ OWNER: _____ DRAWING NO.: _____ SCALE: _____</p>	<p>DATE: 07/21/10 RECD CONTRACT NO.: _____ DRAWING NO.: _____ SCALE: _____ AS SHOWN</p>
<p>ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)</p>		<p>DESCRIPTION: _____</p>		<p>CONNECTION TO APURTHERANCES AS SHOWN</p>				



STEPPING OF LEVELING PAD (REW)



STEPPING OF LEVELING PAD (SQR)



STEPPING OF LEVELING PAD (RLA)

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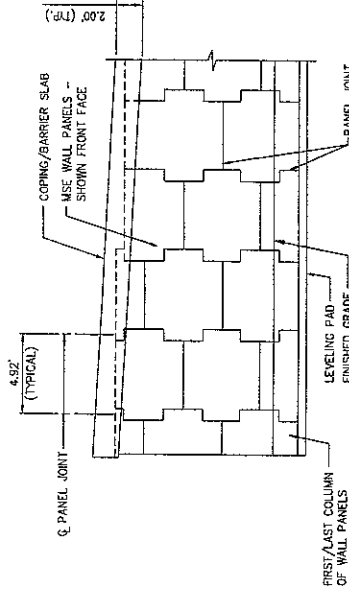
DESIGNED BY:	PROJECT NAME:	ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)	DATE:	07/21/10
DRAWN BY:	LOCATION:		REQ. CONTRACT NO.:	
ENG. MANAGER:	OWNER:		DRAWING NO.:	5.2 A
	DESCRIPTION:	STEPPING OF LEVELING PAD WITH EXISTING AND FINAL GRADES	SCALE:	N.T.S.

REINFORCED EARTH
 1660 Holladay Circle North, Suite 304, San Diego, California 92108
 Ph. (619) 584-2400 Fax (619) 584-2459

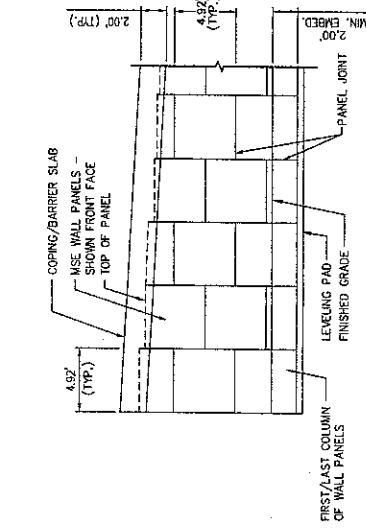
"REINFORCED EARTH" is the registered trademark of The Reinforced Earth Company.

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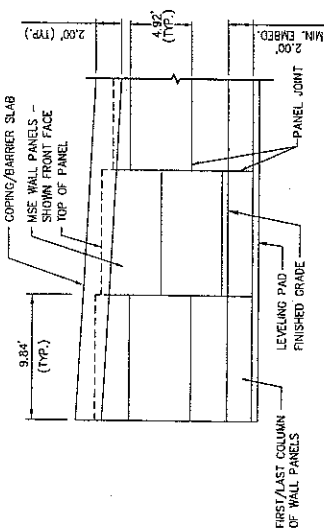


STEPPING OF TOP OF WALL WITH
FINAL GRADE (REW)



NOTE: PANELS ARE STAIR-STEPPED

STEPPING OF TOP OF WALL WITH
FINAL GRADE (SQR)

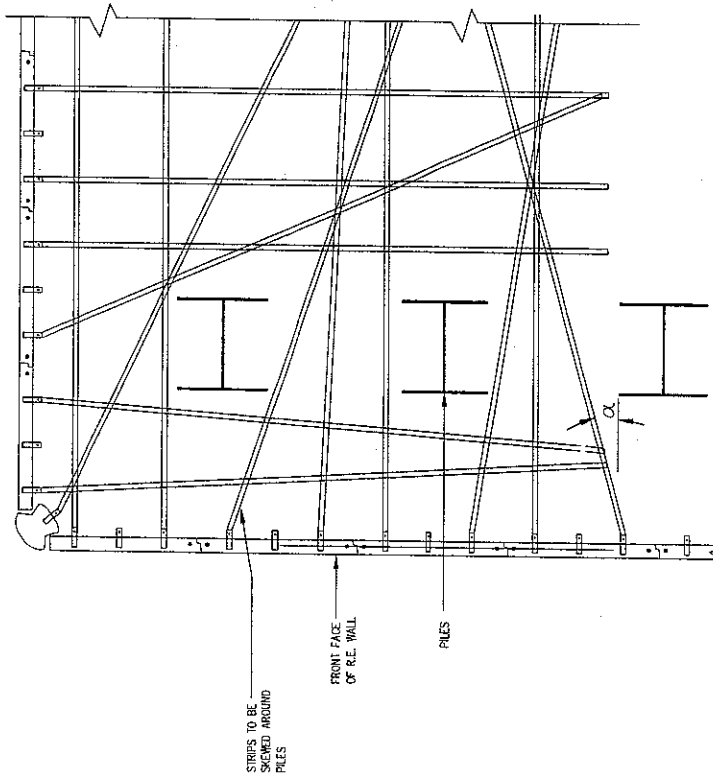


NOTE: PANELS ARE STAIR-STEPPED

STEPPING OF TOP OF WALL WITH
FINAL GRADE (RLA)

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OF REINFORCED EARTH STRUCTURES ONLY.

<p>This drawing contains information proprietary to the Reinforced Earth Company, and is being furnished for the use of [redacted] only in connection with this project, and the information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by the Reinforced Earth Company. The Reinforced Earth Company is exclusive licensee in the United States under patents issued to Henri Vidal, and the furnishing of this drawing does not constitute an expressed or implied license under the Vidal patents.</p>	<p>DESIGNED BY: PROJECT ENGINEER: CHECKED BY: ENGINEER/MANAGER</p>	<p>ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)</p>	<p>DATE: 07/21/10</p>
	<p>REINFORCED EARTH 1860 North Central North, Suite 304, San Diego, California 92108 Ph. (619) 598-2400 Fax (619) 688-2485</p> <p>"REINFORCED EARTH" is the registered trademark of The Reinforced Earth Company.</p>	<p>PROJECT NAME: LOCATION: OWNER: DRAWING NO. 5.2.B SCALE: N.T.S.</p>	<p>REVISIONS: DATE: DESCRIPTION:</p>



TYPICAL STRIP SKEWING DETAIL
AT ABUTMENT PILES

ATTACH REINFORCING STRIPS TO 2. OUT OF 3 TIE STRIPS AT EACH LEVEL OF EACH PANEL TO MINIMIZE SKEWING OF REINFORCEMENTS. ADDITIONAL TIE STRIPS HAVE BEEN PROVIDED BEYOND THOSE REQUIRED BY CALCULATION, IF THE MINIMUM POSSIBLE SKEW ANGLE α 'S GREATER THAN 15' CONTACT A REINFORCED EARTH COMPANY FIELD REPRESENTATIVE PRIOR TO INSTALLATION.

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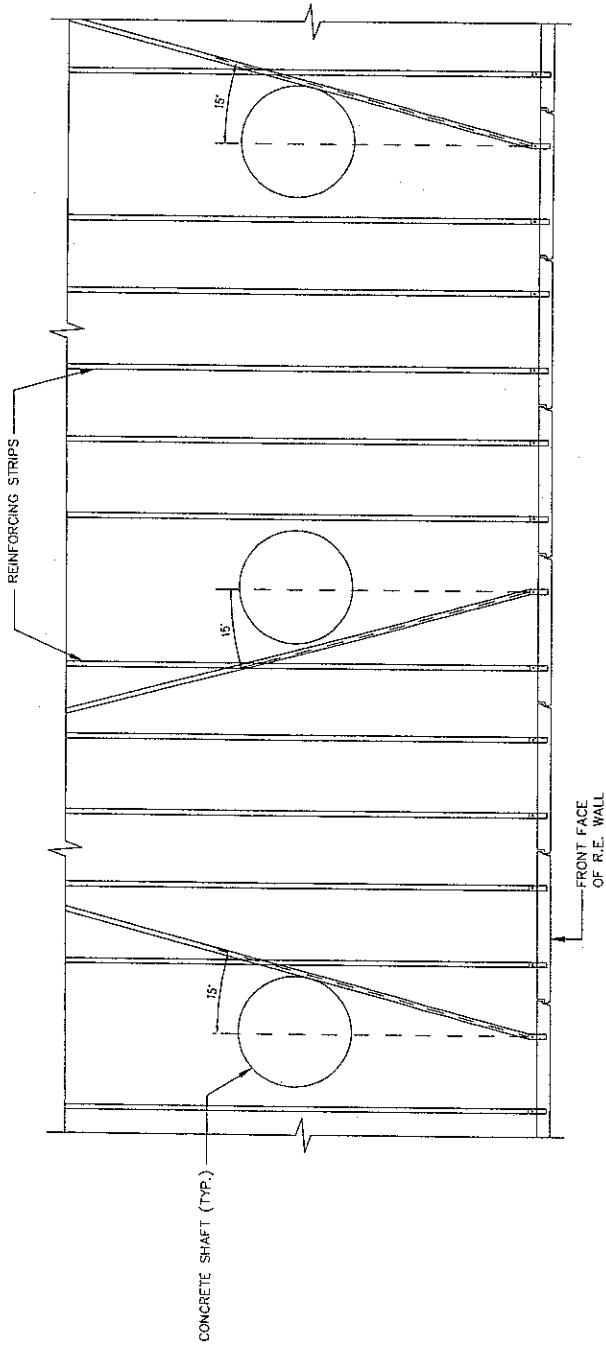
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 Ph. (619) 448-2400 Fax (619) 689-2489

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DESIGNED BY:		DATE:	
PROJECT ENGINEER:		REVISION:	
CHECKED BY:		DATE:	
ENGINEER:		SCALE:	

PROJECT NAME:	ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)
LOCATION:	
DRAWING NO.:	5.2.C
SCALE:	NTS
DESCRIPTION:	PLACEMENT OF REINFORCEMENT AROUND STEEL PILES



NOTE: MAXIMUM IN-FIELD SKEW 15°. IF GREATER SKEW REQUIRED, CONTACT A REINFORCED EARTH FIELD REPRESENTATIVE.

PLACEMENT OF REINFORCEMENT AROUND CONCRETE SHAFTS

CARRIED WITH RESPECT TO INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.

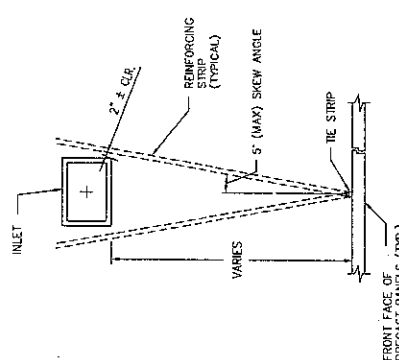
RESPOND BY:	PROJECT ENGINEER	CHECKED BY:	ENG. MANAGER	REV.	DATE	DESCRIPTION	PROJECT NAME	ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)	DATE 07/21/10
PROJECT ENGINEER	CHECKED BY:	ENG. MANAGER	REV.	DATE	DESCRIPTION	PROJECT NAME	ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)	RECORD CONTRACT NO.	DATE 07/21/10
PROJECT ENGINEER	CHECKED BY:	ENG. MANAGER	REV.	DATE	DESCRIPTION	PROJECT NAME	ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)	DRAWING NO.	SCALE 5:2.0
PROJECT ENGINEER	CHECKED BY:	ENG. MANAGER	REV.	DATE	DESCRIPTION	PROJECT NAME	ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)	DRAWING NO.	SCALE 5:2.0
PROJECT ENGINEER	CHECKED BY:	ENG. MANAGER	REV.	DATE	DESCRIPTION	PROJECT NAME	ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)	DRAWING NO.	SCALE 5:2.0
PROJECT ENGINEER	CHECKED BY:	ENG. MANAGER	REV.	DATE	DESCRIPTION	PROJECT NAME	ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)	DRAWING NO.	SCALE 5:2.0

REINFORCED EARTH
 1660 Holl Circle North, Suite 304, San Diego, California 92108
 Ph. (619) 688-2400 Fax (619) 688-2499

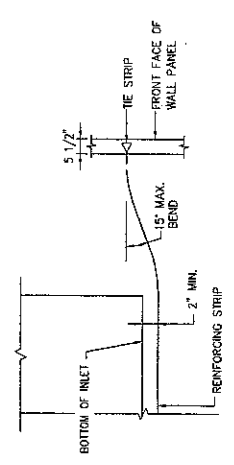
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The design contained on these drawings is based on information provided by the owner. On the basis of this information, the Reinforced Earth Company has designed, and is responsible for the internal stability of the structure only. External stability, including foundation and slope stability, is the responsibility of the owner.

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PLACEMENT OF REINFORCEMENT
AROUND DROP INLETS STRUCTURES



TYPICAL STRIP BENDING
DETAIL AT INLETS

NOTE: BEND TO BE AS GRADUAL AS POSSIBLE.

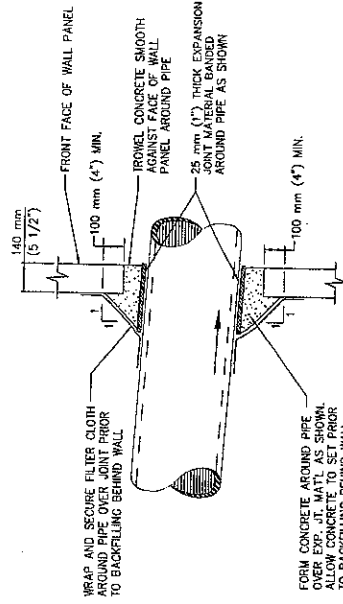
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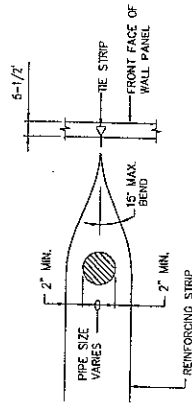
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DESIGNED BY:		ARIZONA DEPARTMENT OF TRANSPORTATION	DATE	07/21/10
PROJECT ENGR:		2010 RE-APPROVAL (L.R.F.D.)	REGO CONTRACT NO.	
CHECKED BY:		LOCATION	DRAWING NO.	
ENG. MANAGER		DRAWING CODES	SCALE	
REV.		DESCRIPTION	DATE	
		PLACEMENT OF REINFORCEMENT AROUND DROP INLETS STRUCTURES		



DETAIL OF PIPE PENETRATION AT WALL FACE



NOTE : BEND TO BE AS GRADUAL AS POSSIBLE.

TYPICAL STRIP BENDING DETAIL AT ANY PROPOSED & EXISTING PIPES

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DESIGNED BY:	PROJECT NO.:	PROJECT NAME:	DATE:
		ARIZONA DEPARTMENT OF TRANSPORTATION 2010 RE-APPROVAL (L.R.F.D.)	07/21/10
DRAWN BY:	CHECKED BY:	LOCATION:	REVISION CONTRACT NO.:
		OTHER	
ENG. NUMBER:	REV.:	REVISIONS:	DRAWING NO.:
			S.Z.F.
			SCALE:
			RTS.
			PLACEMENT OF REINFORCEMENT AROUND PIPE PENETRATIONS