

## BUILDING CODE OR APPLICABLE DESIGN STANDARDS

- INTERNATIONAL BUILDING CODE, 2012 EDITION

## REFERENCED GEOTECHNICAL REPORT IF AVAILABLE/APPLICABLE

- FIRM: **FARGO CONSULTANTS, INC.**
- REPORT NUMBER: **G15-2556**
- DATE: **SEPTEMBER 22, 2015**
- ALLOWABLE BEARING CAPACITY(FOOTING): **2000 PSF**
- RECOMMENDED ACTIVE EQUIVALENT FLUID PRESSURE: **35 PSF** PER NOTE 3.

## GENERAL

- THESE SPECIFICATIONS ARE APPLICABLE ONLY FOR WALLS 1'-6" TO 9'-0" IN RETAINED HEIGHT (H).

- TEMPORARY SLOPE - BY BUILDER, AS REQUIRED FOR SAFETY.

- LOADS AND FACTORS OF SAFETY

ACTIVE PRESSURES USED IN DESIGN FOR THE SOIL BACKFILL WERE DERIVED FROM COULOMB'S THEORY OF SOIL PRESSURE, CORRESPONDING TO A CLEAN GRAVEL-SAND BACKFILL PLACED AS SHOWN WITH AN INTERNAL FRICTION ANGLE OF 33. EQUIVALENT FLUID PRESSURE IS APPROXIMATELY 35 PSF PER FOOT OF RETAINED SOIL DEPTH.

PASSIVE PRESSURES FOR THE SOIL IN FRONT OF THE WALL FOOTING WERE DERIVED FROM COULOMB'S THEORY OF SOIL PRESSURE BASED ON IN-SITU SOIL OR PREPARED COMPACTED FILL PER THE REFERENCED GEOTECHNICAL REPORT ABOVE.

ALLOWABLE BEARING PRESSURES WERE BASED ON THE REFERENCED GEOTECHNICAL REPORT ABOVE. IF NO REPORT WAS MADE AVAILABLE, A MINIMUM ALLOWABLE BEARING PRESSURE OF 1500 PSF WAS USED FOR DESIGN.

SURCHARGE LOADS - UNLESS NOTED OTHERWISE ON THE DETAILS AND SCHEDULES SURCHARGE LOADS ARE NOT EXPECTED FOR STRUCTURES LOCATED WITHIN D=15H DISTANCE FROM RETAINING WALLS.

FACTORS OF SAFETY - A FACTOR OF SAFETY OF 2.0 FOR OVERTURNING AND 1.5 FOR SLIDING WAS USED FOR THE DETAILS AND SCHEDULES SHOWN ON THE FOLLOWING SHEETS.

- UNLESS NOTED OTHERWISE THE RETAINING WALL DETAILS AND SCHEDULES SHOWN DO NOT ACCOUNT FOR GLOBAL SLOPE STABILITY.

IF GLOBAL SLOPE STABILITY IS A CONCERN, A GEOTECHNICAL FIRM WITH EXPERIENCE IN GLOBAL STABILITY ANALYSES SHOULD BE RETAINED IN ORDER TO PROVIDE RECOMMENDATIONS FOR THE WALL DESIGN.

- COMPACTED BACKFILL SHALL BE PROPERLY PLACED AND COMPACTED TO MINIMUM 95 PERCENT OF STANDARD PROCTOR. COMPACTION VERIFICATION BY OTHERS.

- WEEP HOLE DRAINS - PROVIDE MINIMUM 3" Ø WEEP HOLES @ 10'-0".

- IF CONDITIONS CHANGE FROM THOSE DESCRIBED HEREIN, NOTIFY D&E STRUCTURES IMMEDIATELY TO DETERMINE THE EFFECT, IF ANY, ON THE RETAINING WALL DESIGN.

- FORMED VERTICAL CONTROL JOINTS ARE RECOMMENDED TO CONTROL SHRINKAGE CRACK LOCATIONS. CONTROL JOINTS SHOULD BE SPACED AT 20'-0" O.C. MAX. JOINTS SHALL BE AT LEAST 1/2" x 4".

- DRAINAGE, SEWER, OR OTHER MISCELLANEOUS CONDUIT SHALL NOT BE PLACED IN FRONT OF THE TOE OF THE WALL WITHOUT COORDINATION AND APPROVAL WITH D&E STRUCTURES.

## MATERIALS

- ALL MORTAR SHALL BE TYPE "S", 2500 PSI. FULL HEAD & BED JOINT MORTAR IS REQUIRED. TESTING BY OTHERS, IF DESIRED SHALL CONFORM TO ASTM C270.

- ALL STONE SHALL BE EARTH-TONE COLORED, CLEAN, HARD, DENSE AND WEATHER RESISTANT 1/2" TO 18" MILSAP SANDSTONE FROM A MILSAP ROCK QUARRY. THE AVERAGE DENSITY OF THE SANDSTONE SHALL RANGE FROM 135 PCF TO 145 PCF.

- DRAINAGE MATERIAL - ON WALLS OVER 4'-0" IN HEIGHT, USE 1 1/2" TO 3" DIAMETER CRUSHED CONCRETE AND UP TO 6" DIAMETER SANDSTONE ROCK PLACED NOT COMPACTED. SANDSTONE NOT TO EXCEED 20% OF GRAVEL BACKFILL. WRAP IN FILTER FABRIC. FOR WALLS LESS THAN 4'-0" IN HEIGHT, USE 1 1/2" TO 6" CRUSHED CONCRETE OR SANDSTONE ROCK, WITH NO RESTRICTIONS ON PERCENTAGE OF USE FOR EITHER MATERIAL WRAP IN FILTER FABRIC.

- FILTER FABRIC SHALL BE TERRA TEX N045 BY HANES GEO COMPONENTS OR APPROVED EQUAL.

## FOOTINGS

- ALL WALLS SHALL BE PROVIDED WITH A STONE AND MORTAR LEVELING COURSE AT THE BASE.
- ALL WALLS SHALL BE BEDDED IN FIRM IN-SITU OR COMPACTED FILL TO THE MINIMUM DEPTH SPECIFIED ON THE PLAN.

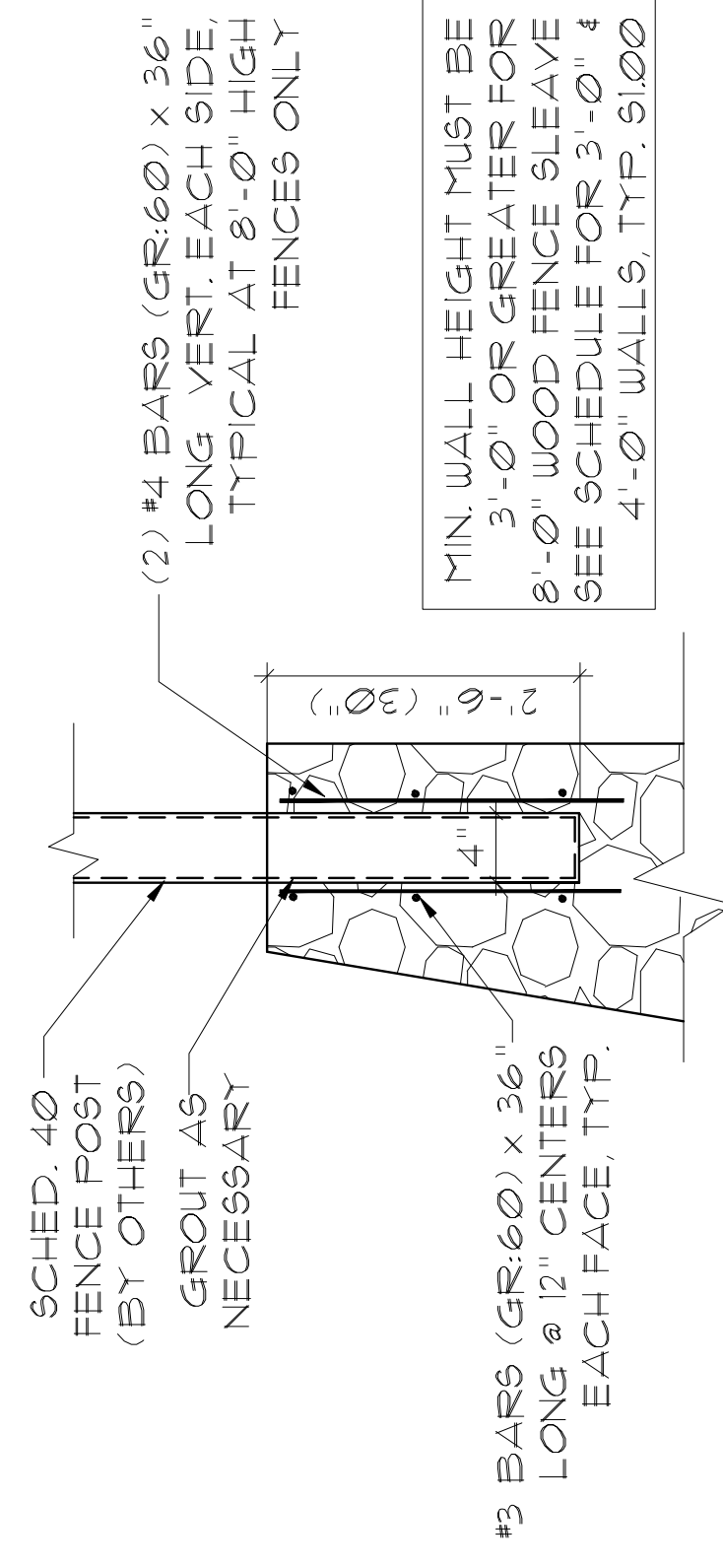
## INSPECTION REQUIREMENTS

- BY OR UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER EXPERIENCED IN RETAINING WALL DESIGN AND CONSTRUCTION.
- FOOTING WIDTH AND EMBEDMENT
- DRAIN INSTALLATION
- CONTROL JOINT LOCATIONS
- INSPECTION IS PERFORMED ONLY TO DEVELOP A GENERAL OPINION REGARDING THE BUILDER'S COMPLIANCE WITH PROJECT SPECIFICATIONS. NO WARRANTY OR GUARANTEE IS PROVIDED.

## EMBED DEPTH NOTES:

IN AREAS WHERE THE SLOPE BELOW THE WALL IS GREATER THAN OR EQUAL TO 3:1, THE MINIMUM EMBED DEPTH SHALL BE 3'-0".

IN AREAS WHERE THE FRONT OF THE WALL IS ADJACENT TO A POND OR SIMILAR BODY OF WATER THE MINIMUM EMBED DEPTH SHALL BE INCREASED BY 1'-4" TO THE SCHEDULED EMBED DEPTH ABOVE.



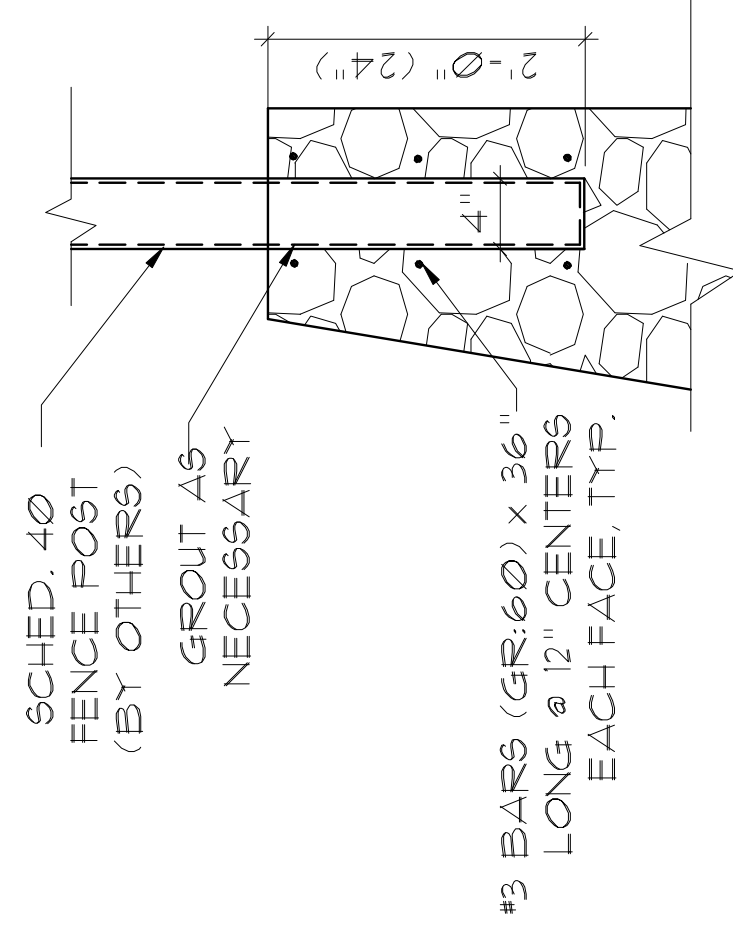
MIN. WALL HEIGHT MUST BE 3'-0" OR GREATER FOR 8'-0" WOOD FENCE SLEAVE SEE SCHEDULE FOR 3'-0", 4'-0", 4'-0" WALLS, TYP. 5100

## FENCE POST EMBED DETAIL - 8'-0" WOOD FENCE

WALL SCHEDULE (8' FENCE)

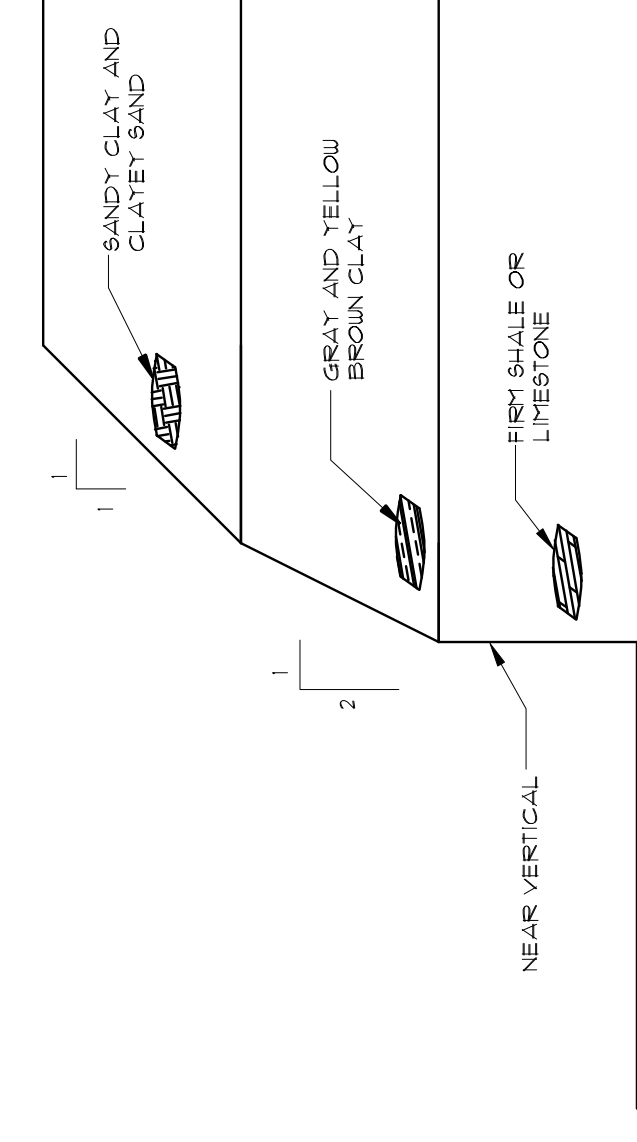
HEIGHT (H)	N/A	N/A	3'	4'
BASE WIDTH (B)	N/A	N/A	25"	27"
TOP WIDTH (B1)	N/A	N/A	12"	12"
EMBEDMENT (t)	N/A	N/A	10"	12"
TOE WIDTH (t <sub>w</sub> )	N/A	N/A	5"	7"

USE THE SCHEDULE ABOVE ONLY WHEN 8'-0" HIGH BOARD-ON-BOARD FENCE POSTS ARE EMBEDDED INTO WALLS BETWEEN 3'-0" & 4'-0" IN HEIGHT. WE STRONGLY RECOMMEND THAT ALL 8'-0" HIGH FENCE POSTS BE PLACED OUTSIDE OF THE WALL HEIGHT OR PLACED INTO RETAINING WALLS WITH HEIGHT LESS THAN 3'-0". 8'-0" HIGH BOARD-ON-BOARD FENCE POSTS ARE NOT ALLOWED.



#3 BARS (GR:60) x 36" LONG @ 12" CENTERS EACH FACE, TYP.

## FENCE POST EMBED DETAIL - 6'-0" WOOD FENCE



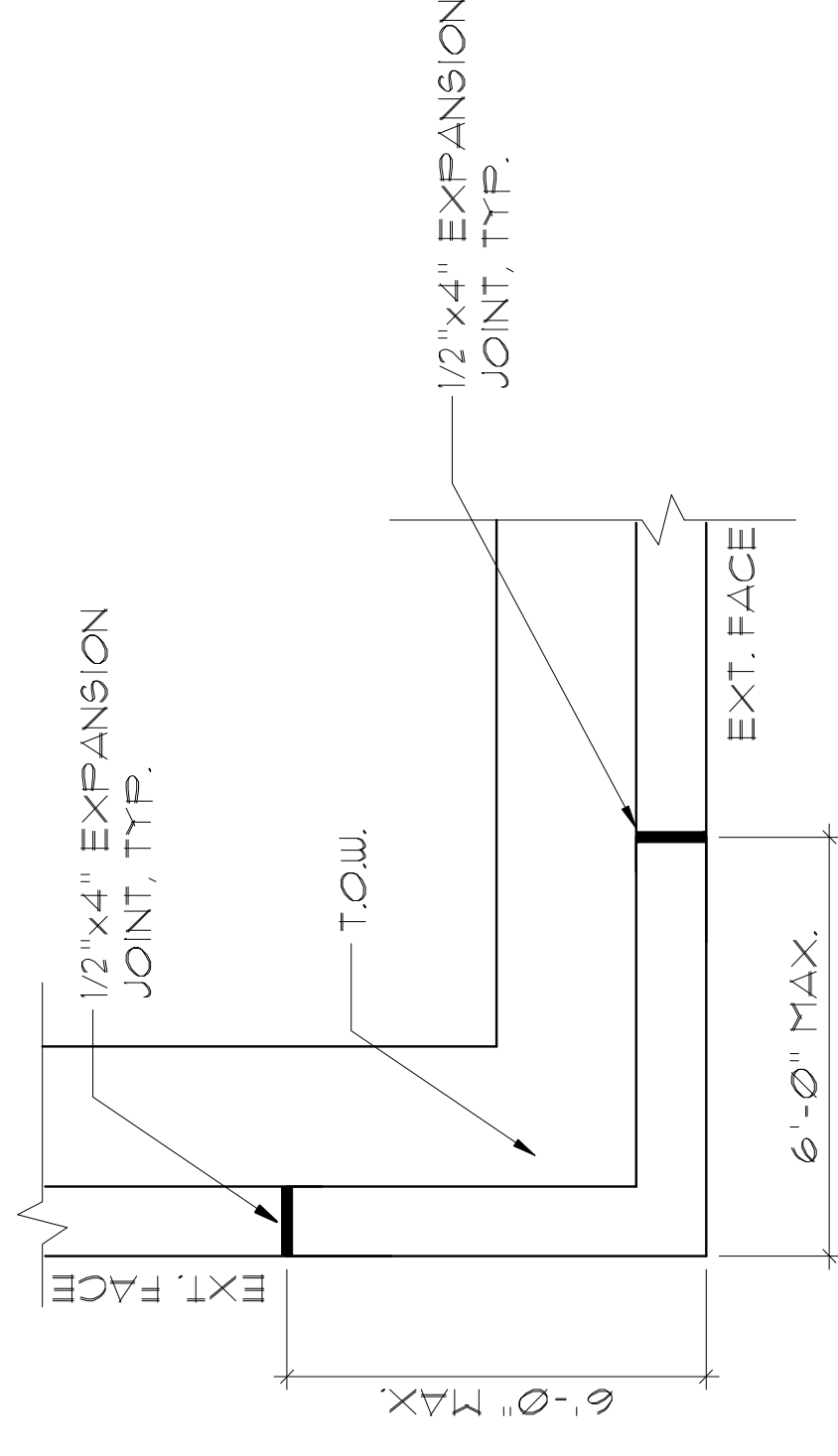
## SLOPE AND BENCHING DIAGRAM - SIMPLE SLOPE

### NOTES:

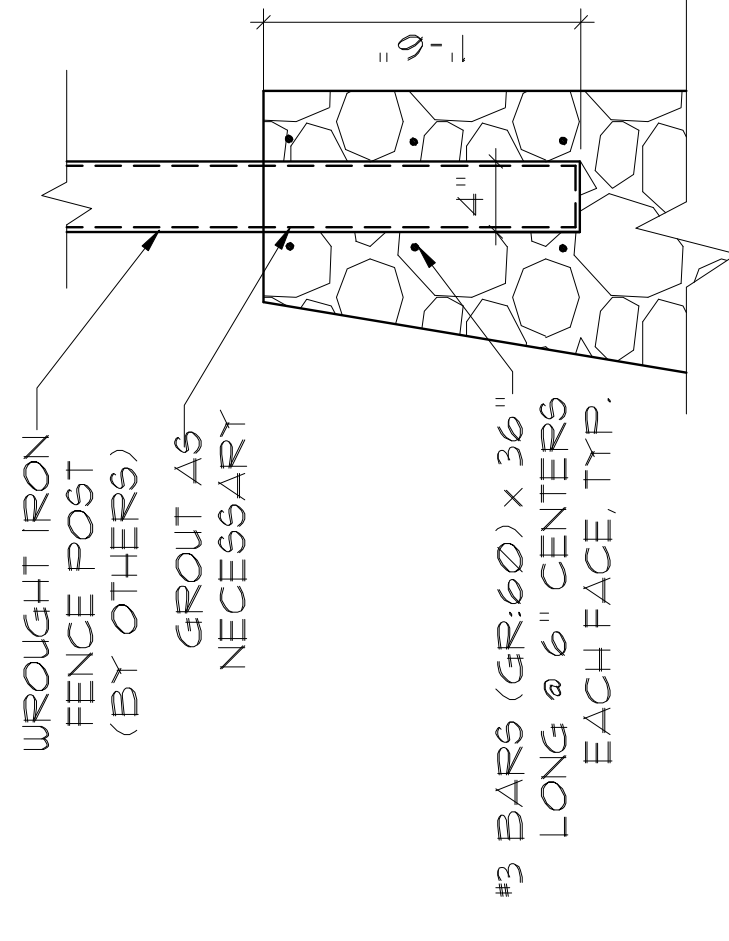
- NO EQUIPMENT OR SPOIL CLOSER THAN 3'-0" OR ONE-HALF THE DEPTH OF EXCAVATION, WHICHEVER IS GREATER, TO TOP OF SLOPE.

- ASSUMES ABSENCE OF GROUNDWATER. SEEPAGE CAN REQUIRE ADJUSTMENTS IN SLOPE ANGLES AND/OR DEWATERING.

- PRIOR TO CONSTRUCTION DAILY OBSERVATIONS OF SLOPE STABILITY REQUIRED. IF QUESTIONS OR CONCERNS REGARDING SLOPE STABILITY ARISE CONTACT D&E STRUCTURES.



## EXPANSION DETAIL AT CORNERS

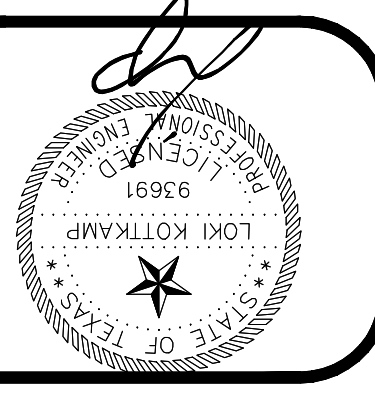


#3 BARS (GR:60) x 36" LONG @ 6" CENTERS EACH FACE, TYP.

## FENCE POST EMBED DETAIL - WROUGHT IRON

REVISIONS

THE ENGINEERS SEAL ON THIS PLAN WAS ELECTRONICALLY AFFIXED BY LOKI MARCH 5, 2016  
LOKI KOTIKRAM  
93691  
STATE OF TEXAS  
REGISTERED PROFESSIONAL ENGINEER



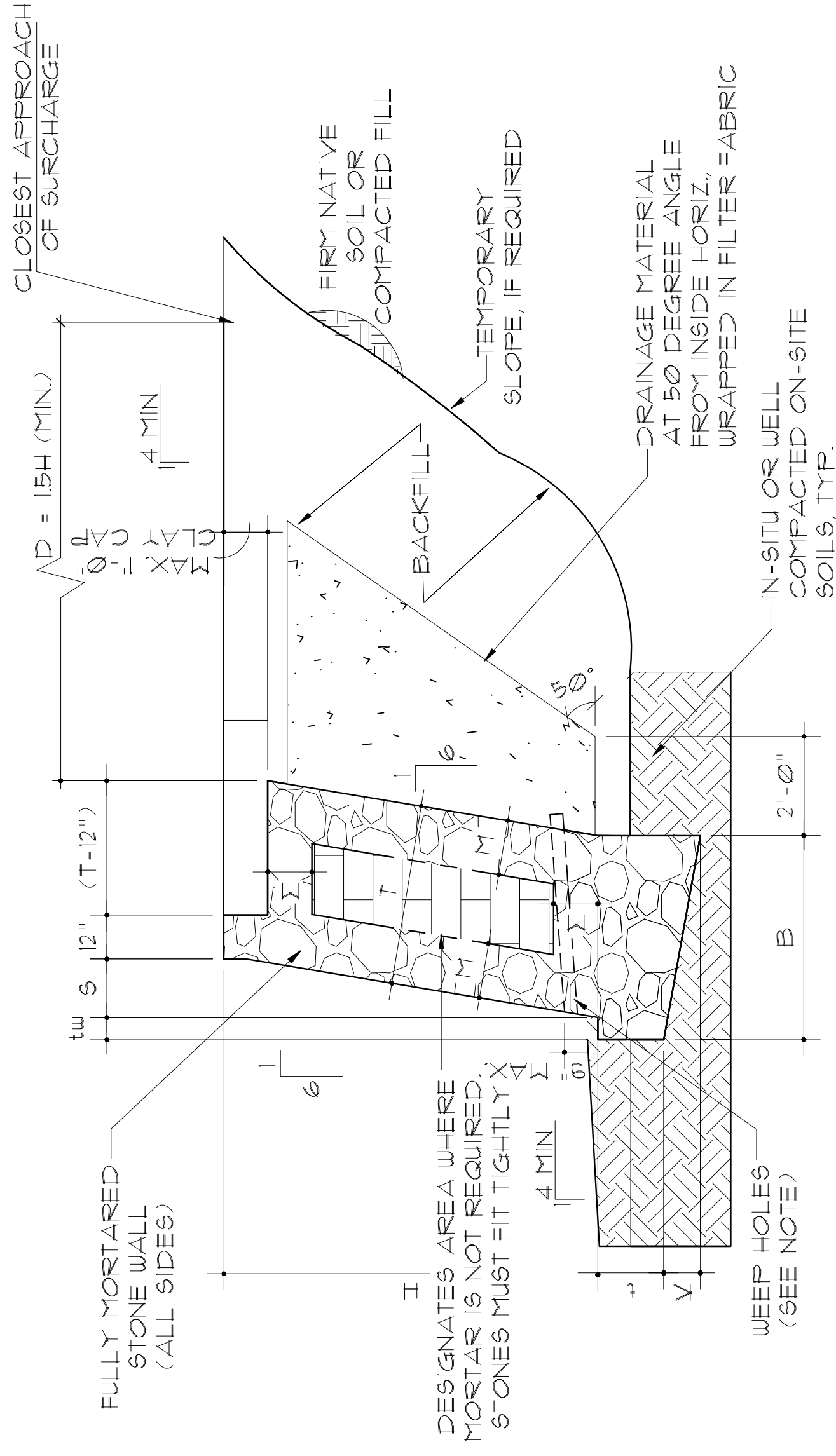
**D&E STRUCTURES**  
CONSULTING ENGINEERS  
TX FIRM REG. #E-870  
1010 E. ARAPHO ROAD, SUITE 106  
RICHARDSON, TX 75081 214-741-3095

WALICO RETAINING WALLS, INC.  
ROCKWALL DOWNS, PH. 3  
ROCKWALL, TEXAS  
PLAN: STANDARD RW NOTES AND DETAILS  
JOHN KING BLVD & DISCOVERY BLVD

JOB #  
220313-1  
DATE  
03/03/16  
DRAWN BY  
CHECKED BY  
UK

SHEET  
**\$1.00**

DESIGNED SPECIFICALLY FOR WALICO  
RETAINING WALLS, INC. FOR MORE INFORMATION  
CONTACT ERIC PADRON OR GARY BARKS  
AT 817-561-4901



**TYPICAL RETAINING WALL SECTION**

WALLS 5'-0" TO 9'-0" IN HEIGHT

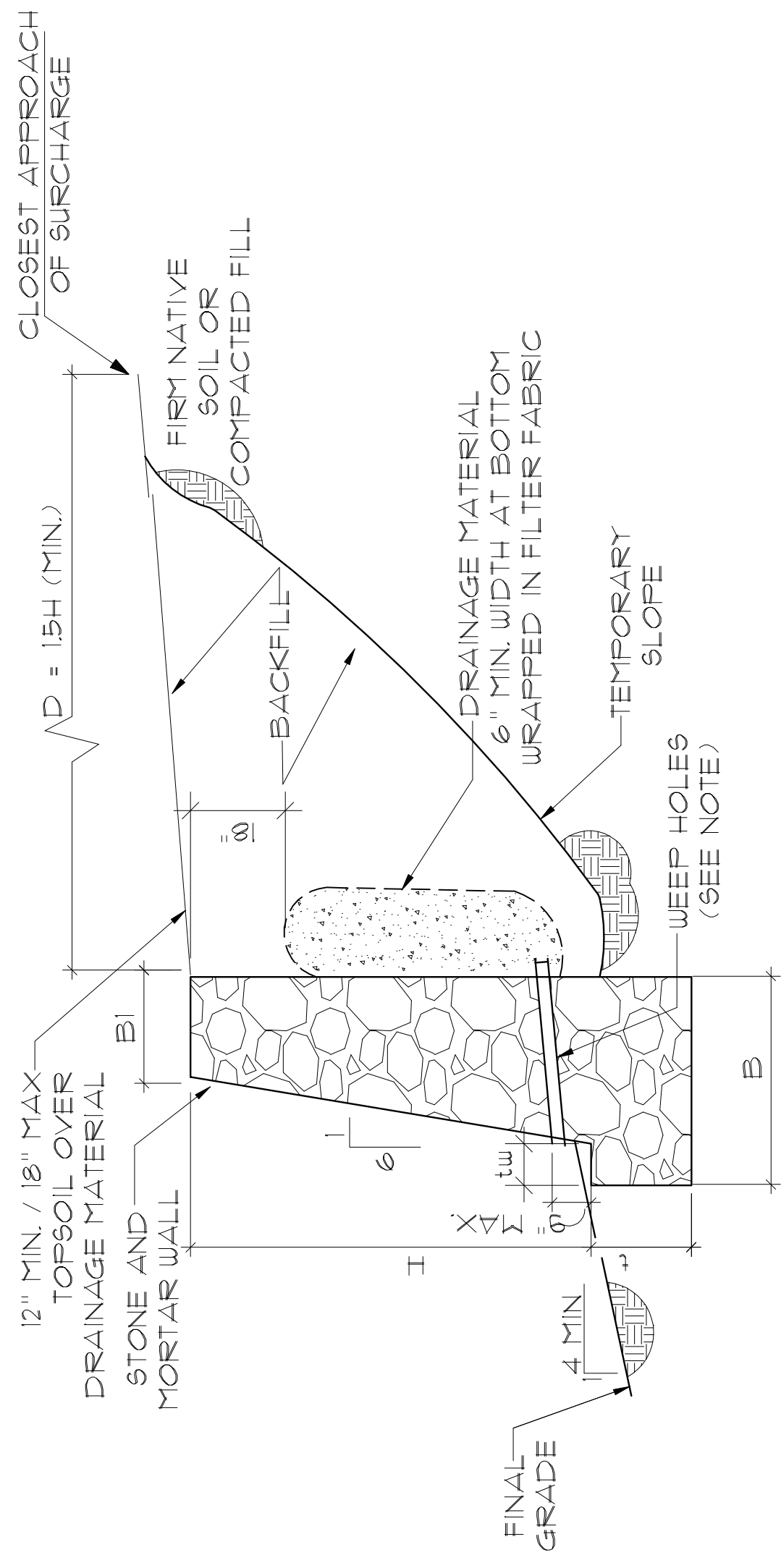
WALL SCHEDULE - ALLOWABLE BRG. PRESSURE = 2000 PSF

HEIGHT (H)	5'	6'	7'	8'	9'
BASE WIDTH (B)	30"	30"	35"	41"	46"
WALL THKNS (T)	27"	27"	31"	36"	40"
EMBEDMENT (t)	24"	24"	24"	24"	24"
MORTAR THICKNESS (M)	8"	10"	10"	12"	14"
BATTER WIDTH (S)	10"	10"	12"	14"	18"
KEY DEPTH (K)	5"	6"	7"	8"	8"
TOE WIDTH (tw)	2"	3"	4"	5"	6"

**SURCHARGE SCHEDULE**

WALL SCHEDULE - SURCHARGE LOADING

HEIGHT (H)	5'	6'	7'	8'	9'
BASE WIDTH (B)	34"	31.5"	35"	36.5"	37.5"
WALL THKNS (T)	29"	34"	39"	45"	50"
EMBEDMENT (t)	24"	24"	24"	24"	24"
MORTAR THICKNESS (M)	10"	12.5"	12.5"	15"	11.5"
BATTER WIDTH (S)	10"	12"	14"	16"	18"
KEY DEPTH (K)	6.5"	7.5"	9"	10"	10"
TOE WIDTH (tw)	2.5"	4"	5"	6.25"	7.5"



**TYPICAL RETAINING WALL SECTION**

WALLS 4'-0" OR LESS IN HEIGHT

WALL SCHEDULE

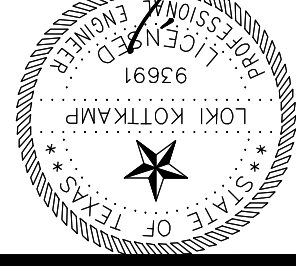
HEIGHT (H)	1.5'	2'	3'	4'
BASE WIDTH (B)	15"	16"	22"	25"
TOP WIDTH (B)	12"	12"	12"	12"
EMBEDMENT (t)	6"	9"	10"	12"
TOE WIDTH (tw)	0"	0"	2"	5"

SCHEDULE - SURCHARGE

HEIGHT (H)	1.5'	2'	3'	4'
BASE WIDTH (B)	18"	20"	28"	31"
TOP WIDTH (B)	12"	12"	12"	12"
EMBEDMENT (t)	6"	11"	13"	15"
TOE WIDTH (tw)	3"	4"	10"	11"

REVISIONS

THE ENGINEERS SEAL ON THIS PLAN  
WAS ELECTRONICALLY AFFIXED BY LOKI  
KOTTKAMP REGISTRATION NO. 93691 ON  
MARCH 3, 2016.



**DFE STRUCTURES**  
CONSULTING ENGINEERS  
TX FIRM REG. #E-870  
1010 E. ARAPHO ROAD, SUITE 106  
RICHARDSON, TX 75081 214-741-3095

WALCO RETAINING WALLS, INC.  
ROCKWALL DOWNS, PH. 3  
ROCKWALL, TEXAS  
PLAN: STANDARD RW NOTES AND DETAILS  
JOHN KING BLVD & DISCOVERY BLVD

JOB # 220313-1  
DATE 03/03/16  
DRAWN BY  
CHECKED BY LK

SHEET  
**S1.01**

REVISIONS

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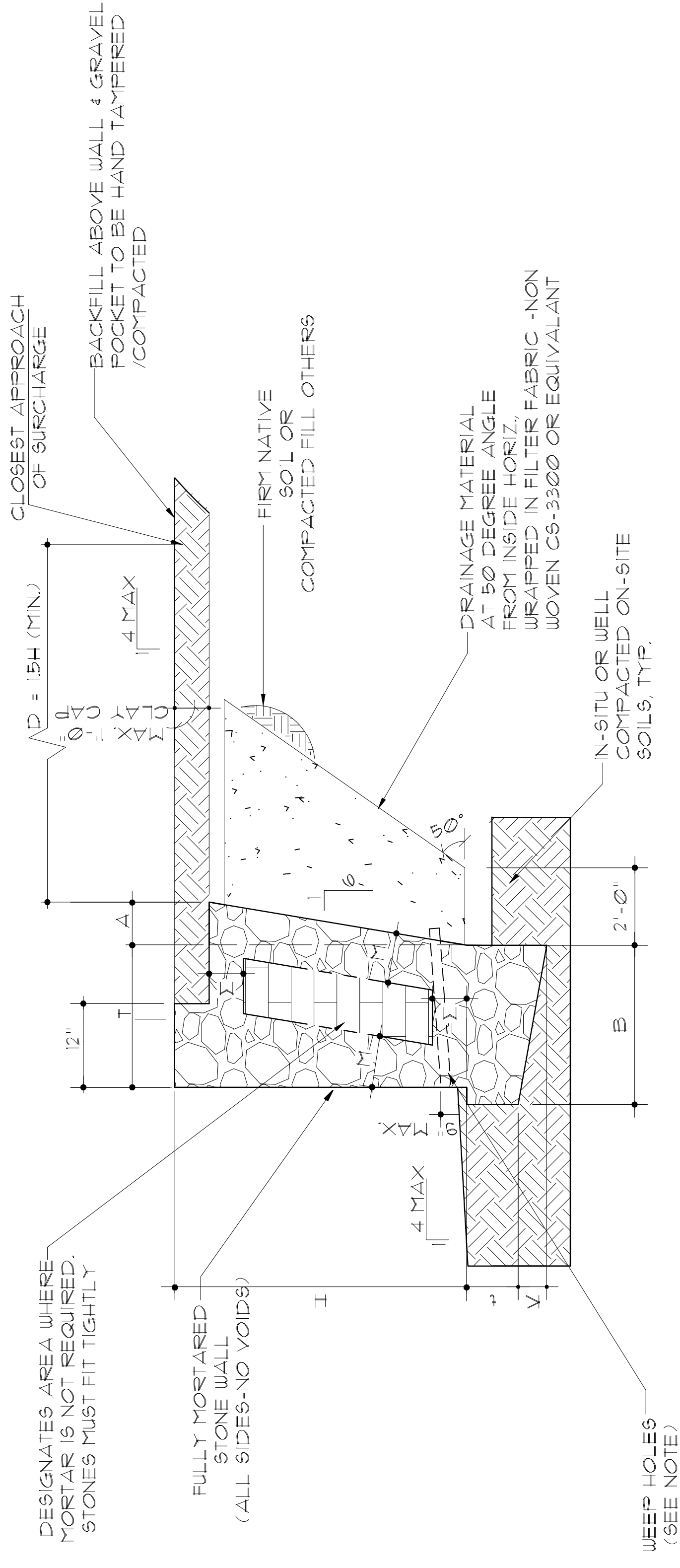


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CHECKED BY LK

SHEET  
**S1.02**



**TYPICAL RETAINING WALL SECTION - VERTICAL FACE ALTERNATE**

WALLS 1'-0" TO 9'-0" IN HEIGHT

WALL SCHEDULE - ALLOWABLE BRG. = 2000 PSF - VERTICAL FACE

HEIGHT (H)	1'-15"	2'	3'	4'	5'	6'	7'	8'	9'
BASE WIDTH (B)	15"	16"	22"	25"	30"	30"	35"	41"	46"
WALL THKNS (T)	-	-	-	-	21"	21"	31"	36"	40"
EMBEDMENT (L)	6"	9"	10"	12"	24"	24"	24"	24"	24"
MORTAR THICKNESS (M)	F	F	F	F	F	F	10"	12"	14"
TOE WIDTH (tw)	0"	0"	0"	2"	3"	3"	4"	5"	6"
BACK FACE TAPER (A)	3"	4"	6"	6"	8"	10"	12"	14"	16"
KEY DEPTH (K)	-	-	-	-	5"	6"	6"	8"	8"

- \* F DESIGNATES FULLY MORTARED WALLS
- \*\* WALL THICKNESS TAPERS FOR WALLS WITH 4'-0" OR LESS IN HEIGHT, AND IS SCHEDULED PER THE DETAIL FOR WALLS GREATER THAN 4'-0" IN HEIGHT.
- FOR WALL HEIGHT INCREMENTS THAT FALL BETWEEN THE HEIGHTS SHOWN ABOVE, USE LINEAR INTERPOLATION FOR WALL PARAMETERS

WALL SCHEDULE - ALLOWABLE BRG. = 2000 PSF - VERTICAL FACE W/SURCHARGE

HEIGHT (H)	1'-15"	2'	3'	4'	5'	6'	7'	8'	9'
BASE WIDTH (B)	18"	20"	27.5"	32"	34"	37.5"	55"	56.5"	57.5"
WALL THKNS (T)	18"	20"	27.5"	29.5"	34"	39"	45"	50"	50"
EMBEDMENT (L)	11.5"	11"	12.5"	15"	24"	24"	24"	24"	24"
MORTAR THICKNESS (M)	F	F	F	F	F	F	10"	12.5"	15"
TOE WIDTH (tw)	0"	0"	0"	2.5"	4"	5"	6.25"	7.5"	7.5"
BACK FACE TAPER (A)	3"	4"	6"	6"	8"	10"	12"	14"	16"
KEY DEPTH (K)	-	-	-	-	6.5"	7.5"	9"	10"	10"

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- FOR WALL HEIGHT INCREMENTS THAT FALL BETWEEN THE HEIGHTS SHOWN ABOVE, USE LINEAR INTERPOLATION FOR WALL PARAMETERS

REVISIONS

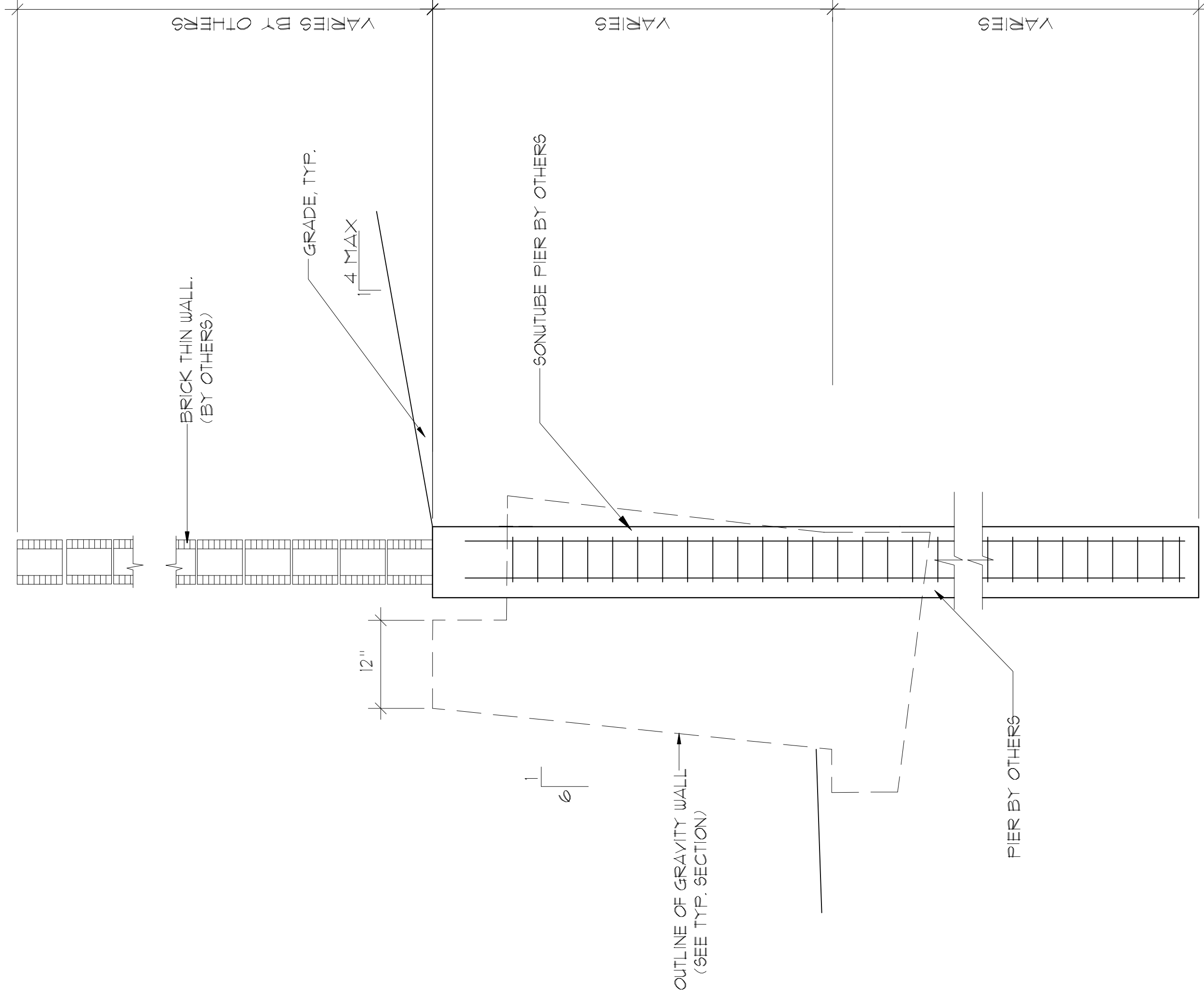
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 MARCH 3, 2016.

LOKI KOTTKAMP  
 LICENSE NO. 93691  
 STATE OF TEXAS  
 PROFESSIONAL ENGINEER

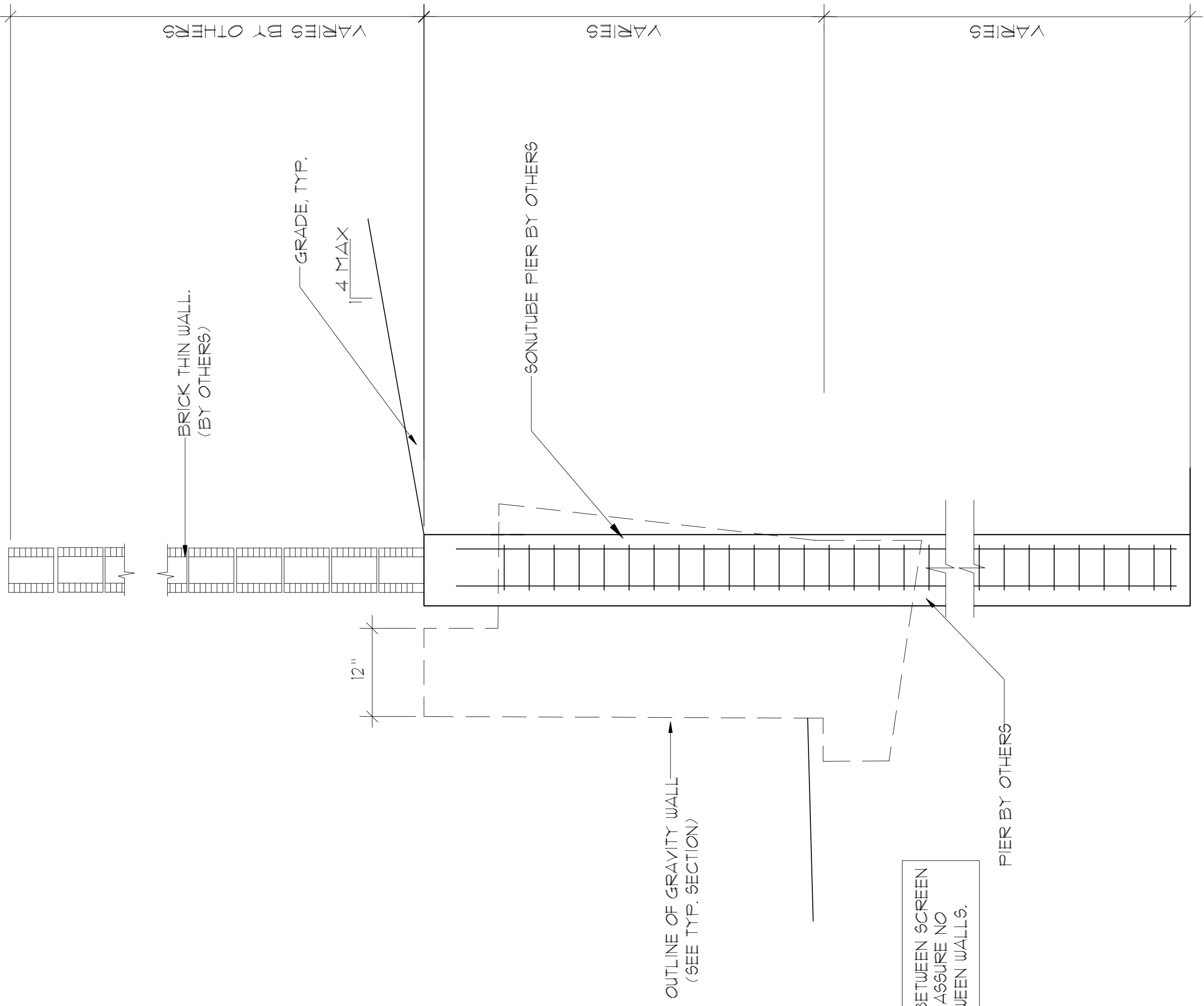
**D&E**  
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JOB # 220313-1  
 DATE 03/03/16  
 DRAWN BY  
 CHECKED BY LK  
 SHEET **S1.03**



TYPICAL CMU/PIER WALL SECTION



TYPICAL CMU/PIER WALL SECTION

ISOLATION JOINTS TO BE USED BETWEEN SCREEN WALLS AND RETAINING WALL TO ASSURE NO MECHANICAL CONNECTIONS BETWEEN WALLS.