

!" # \$

!% &&

' (' )\*

+ " \*

"  
 , ) \* + " " , - # \$ + \$ " . "  
 # , / \$ " 0 " . 1 " " . \$ 2 \* \$ 1 ,  
 , 3 / " . / \* " \$ " " " 3 \$ \* , \$  
 , 3 # " , " 3 , 3 \* " . / " . 1  
 , \$ " 3 \* " . " # 1 , , 3 / \$ /  
 " " 3 / \* , 3 / \$ " . / \* " \$ " " " 3 \$ \* , \$  
 , 3 # " \$ # / " \*  
 \* " 2 # . 3 " " 3 ,

# 67 -4 89 58 64 6:

7 .\* \$7## " \$" %/  
" 0 3  
!, .  
" " 5 3 5  
/ )3 5 / 3"  
)3 :;\$5 \$" 9" 3  
/ )3 %/ ( )  
3  
4 "\*" 5 / 5 5\* " / / )3 #. - "  
7 27<% " 5 +\*" / +55 5)"  
7 27 77<57=6 7 2  
7 27 947<9" 3 &  
7 27 9%<93 "  
7 27 9<9"\*  
7 27 )>75(<)>75 :. \* ( )  
7 27 -85<- " ' )  
7 27 !76<!" " (( )  
7 27 !46)<! , (' )  
7 27 -< 3\*# :. \* ( )  
7 4%+? <- " 7 @3 \* 9" ( )  
7 4%+? 5<8 : .)3 1 ,:# 93 "  
7 4%+? %<61 .)3 1 ,:# 93 "  
7 4%+? 4<8 : .)3 1 , " \* 93 "  
7 4%+? 9<61 : .)3 1 , " \* 93 " &  
7 2)< / ' )



## ACRONYMS, ABBREVIATIONS, AND DEFINITIONS

) \* + " " , -"#

4 \*" 5 / , + 5 5 % \*#  
5,"

+5

+ " " " 5

-!G7

- \* /! " G" 7 \$ / " , " 1" 2 /" " " " "  
2 2 # "0 1" / " , , 6, -!G7

% \*#

4 \*" 5 / , + 5 5 5," ) \* + " " , -"#

## BACKGROUND

6, " " 7 " /) \* 3 C 7) D " / & , " ,  
+ " " " 5 C + 5D 1, , 1 " / " , + 5  
) \* + " " , -"# \* " , 2 \* " / , " ,  
3 " " \* " " + , \$ " 3\*# / , " 1 / 3  
# l3 " C " " D 7) 3 , " ,

" " " , #3 \$ , 3 " " " " \* " " "  
// \* " " 3\*3 " \* " " " " , 3 \* " ;

## METHODOLOGY

" \* / / 3 / " \* . , 3 #3 , + 5 " + " " 4 .  
5 " 5 C + 455D #3 1

) \* + " " , -"#

4 \* " 5 / , + 5 5 , " % \*#

Doing Business<sup>7</sup> " 2013 Const u!tion Cost Su "e# fo Single%a&il# Ho&es<sup>8</sup> 6, / \$ , \*  
 / , 3\*

## Reference House Configurations

6, / 3 /"\* . ", #3 C Append!es C\$% 3 , " " . " #"  
 , " " " , 5 3 3 "3 \$ C(a a!te isti!s of )e\* Single%a&il# Const u!tion  
 Co&pleted 6, / "\*" " #3 / 3 " . C6"# D " 3\*# /  
 / 1 /"\* . ", 3 , 3 . " C6"# D

# % & " ! '(

# % & " # " "

Slab	54%
Crawlspace	17%
Basement	30%

One-story	53%
Two-story	43%
Three-story	3%

) \* + " " , -"#  
(

% \*#



# ,% !!

! (

"# ! + "

) \* + " " , -"#

4 \*" 5 / , + 5 5 % \*#  
5,"

# APPENDIX A DESCRIPTION AND COST IMPACT OF 2015 IRC CODE CHANGES

## Appendix A-AA: CAZ Testing Appendix

Report Reference No: AA1

+ 55 : <7 26

### Summary of Code Change:

6, ;" " " 7 26 ," C/" #. , @3 D "# , " l3 \* /  
/"\* , / . \* " S 75) \_ 3 \$ / "  
\*#3 " " ; C57=D

### Cost Implication of the Code Change:

+/7 26 " " " / , \$ " 57= l3 # / \* 1,  
" 3" . \*#3 l3 \* 6, 57= / \* " " 1  
% 1, , l3 / " 1, 3 7 57= 1 3 # 2 / , 3 " ,  
"\* " , 1 % , " " l3 #. \$ #3 57= " .# / \*  
"/ , \*#3 " 3" . "/ " " " " " " 1, , 3 3" . @3

) \* + " " , -"#  
&

% \*#

## Report Reference No: FEA2

+55 : < ( (

### Summary of Code Change:

5 3 >= l3 , " 1" " # 1 , # " / " C 94D # # "0"1".  
1" , +5\$ " " 1". " , " , 3 \* , " "  
3 .C 2 D " , # \* / , " " " " , " , . ,  
, 3 "3 , 1" " \*#. # "0"1". \$ , 3 2 , " 1". / "  
1" " 1 " 1 \$ , +5 l3 , " , " , / , " 1". \*3 # " 2

### Cost Implication of the Code Change:

+ " " 1 , , +5\$ , , \* " / #. , , 3 , " , " # #3  
"# , 94 " / 1 , " 2 " " " " , # \* /  
" " 1". , +5\$ , #3 , " " / , " 1". " " /  
" " " " " , / , " " + , " \$ , " ,  
+5 1 3 " " " 2 " , " / , " 1". \$ " , 1  
6"# 947 6, / , 2 # " , / " \* " "  
# % ! !!! " ( 1 " " "& + 5 " " "

% \*#

) \* + " " , -"#  
4 \*# 5 / , +55 5,"

Report Reference No: FEA3

+ 5 5 : <

Summary of Code Change:

7 , " , " / \* " 3 " \*3 # 3 " "

l3 " , 3 " , 3 3 3/" 1 , , 2 / " , "

" / \* 3 " \$ 1 , , " # \* \* , / "

l3 \* / 6"# # " \* " ; 6"# 947( 7 , 1 , 3 " 3

" 1 # . , , " ; , // # " 3 / 2 3

2 1"

# ): % ( " 0 1 \* \* " " " +

Cost Implication of the Code Change:

6, , " \* " / 1 , , \* " l3 \* / 2 3 ,

3 l3 \* , " " " " \* 2 1" l3 \* 6"# 947(

) \* + " " , -"#

4 \* " 5 / , + 5 5 5 , % \*#

**Report Reference No: FEA**

+55 : < ( \$ (

**Summary of Code Change:**

6, , " 2 / \* I3 " \* . " " 3 C44 8D  
 , \* 3 " , " 3 # " \* 6, , " " 2 \* # " \*  
 " " " " / \* " " 44 8 , 2 # " \*

**Cost Implication of the Code Change:**

6"# 947 7 , 1 , " / " 1 44 8 # " " 2 # " \*  
 6"# 947 " , " / \* , " " " 44 8 1 , " # " \* "

# \$: % ! "1 ' ( ! ( 1 !!! 5 1

	" < # ".+ "/	= " &=	6 7	8/
42 " " \$ # . , "				'
G 1 G (U 6"	'			\$
: " 1 53 9 3 "		(		
9 " * G 1		(		
6 % "		(		
"		(		
G 1	'			((
" 0/		(		
:				
) " 3 " % "				
0 1				C \$ ( D

: ! " 5%  
 ) \* % F-1

# \$: % ! "1 ' ( ! ( 1 !!! & + !!

	" < # ".+ "/	= " &=	6 7	.8/
G 1 G (U 6"				

% \* #

4 \* " 5 / , + 55 5, " ) \* + " " , - "#

**Report Reference No: FEA!**

+ 5 5 : < ( ' &

**Summary of Code Change:**

6, " " 1 , " 1, "/ . "; / 1 1 2\* . , # \* "  
I3 6, I3 "/ . "; .1 , " ' " / \* ,  
# \* "

**Cost Implication of the Code Change:**

6, \* " I3 # , " , 3" / 3" / , " " "@ "  
"; + , / , 3 , "1 1" " " " , 1 ., 3 1 , "  
#" \* / 3 " , " I3 I3 " \* " " 1 1 , " I3 , " #  
2\* #. , , " \$ , 1 \$ I3 " , " # I3 , 3 V / "  
// / ;

6"# 947 , 1 , " " / "/ . "; / " I3 " , " "/ .  
"; \* , # " 1 # \* #. , , " \* " \$ 1, , " ,  
\*" 6"# 947 I3 " , " 1 I3 , , "

# % !!! ' > 1 ) \$ ? ! &

) \* + " " , -"#

4 \*" 5 / , + 5 5 5, " % \*#

**Report Reference No: FEA"**

+55 : < (

**Summary of Code Change:**

6, " 2" , 3 /&F 1 3 3" " / / / \*  
 1 # # , , 1 ; , .#3 1 , "\*" / , , /((/  
 3 . . " 1 .#3 l3" / / 3 /1 3 3" " 1 #  
 # G, , .#3 " #3 " 3/" 1 , , / .  
 " " . \*# , 3 \$ , \* " / , , " # " # 1((/

**Cost Implication of the Code Change:**

6, \* " / , " ".1 . , . /,3 " ,3 \$  
 " " 6, 1 " # 6"# 947 #" , l3" .  
 /1 1 " , .,3 " " C, 1 1 l3" .1" "\*" #"  
 2 " " / , 3\*# /1 1 , 1 . / , \* " , .,3 "  
 " D : \* " , " 1" 1" 2 # 3 \* 3 , 1 3 , " " \*"  
 , 6"#

# ,% ! 0 1 " "" 7

(	) "	) "
4 *" G 1 C". ;D		
&F UG : 3 3" "		
7 3* 3*)3 " "	\$	\$&
0 1 .8/	C \$ D	C \$ D

) \* % \*

7 " :"

C \$( D

% \*#

) \* + " " , -"#  
 4 \*" 5 / , + 55 5,"

Report Reference No: FEA#

+ 5 5 : <

Summary of Code Change:

6, / / " 1" , / \* '

Cost Implication of the Code Change:

" 1" 1 , , # 1 " ' l3 " " #  
3 # " " 3 . " 6, / \$ , " 3 ./ "  
/ " 1" " ". " . / 3" " \* 2 . " " \*"  
/" \* / , , 3 \* , 1 0" " "# " / P F, 3 , " 1"  
"# , #. / \* , 3 . 1 , " / " 4 \$ " / " 1"  
3 # 1 , 3 " / " " / " 2 \* " . P

## Appendix A-FDN: Foundation

### Report Reference No: F\$N1

+55 : < ( \$6"# ( C (D

### Summary of Code Change:

! \*3\* ; / / 1 " / 3 1 , 1 "#"  
"3 6, "# 1 , 1/ ; , "# 2" 3 " " 1 " "  
#" " " : / " / ; , " " Q R T , \$ "  
\$ / "# " " . "

### Cost Implication of the Code Change:

6, /3 / ,3 1 " 3\* # 3 \$ / 6, / , " ,  
3 . I3 C+5 D1" \* " " 1 2 / / " 1 .  
, \* \$ " 1" . " / \$ / 6, " ,1 6"# 9%  
# % 1 " " @ (

"3 , /3 \$ / " ( / 1 " / , / ,3 \$  
/3 . , , " 3 # 3 , \* " 1 , , " . " 3"  
1/" \$ 1, " ,3 1 # 3 1 , , " \$ / " " .



## Appendix A-FR: Framing

### Report Reference No: FR1

+ 5 5 : < 6"#

### Summary of Code Change:

6, , " \* " 3" , // , / " 3 3 . , " , " /"\*  
C5: 9D #. \*3 . , " 3" , #. 6, " / 2# . \* " , 3 "  
/ " #. 3 " 11" \* \$ 3, " , 1" " , / " ""  
6, \* 1 , / " " # " " 1" l3 , 3 / " . , " 1" 3 \*  
" 1" # " " \* 3 " " " / #. , + 5 6, " ,  
#3 , / , 5: 9#. \* \$ " 1 , 3 / " /"\* " 3 ,  
"

### Cost Implication of the Code Change:

7: G" W " /"\* 1" \* \* " " . 3 13 , " # l3  
\* , l3 \* / , 3 , + 5\$ " " /"\* /"  
1" , / " & / T\* [( " )-26 #003 5 ( )-34 ( )-3( )2( )-7( )2( )3( ( )-3( ( )-2( )-3( )-3( )-( ) )-3(6)-3(,)2



# :% !! 9 1 ! B " 5 ,? D - ):3

# :% !! 9 1 !

% \*#  
'

4 \*" 5 / , + 5 5 " , -"#  
5,"

) \* + " " , -"#

% \*#

**Report Reference No: FR**

+55 : < & \$ & \$ & \$9 & \$ & \$ & \$ & & \$ & '\$ & ' \$  
9 && \$ & '

**Summary of Code Change:**

6, , " / " \$ 3 @ \$ # "\$ \$ " 0 " "# \$/  
3 " 2 0 !" . " @3 , " 0 3 3  
# "3 #3 3 . , " \* " " , 3 / " 2 0  
6, 1 I3 \* " #" 7G5 %57 Q " % 0% " R

**Cost Implication of the Code Change:**

" \* " 1 , " I3 #. " " 3 . \* " \* \$  
, 0 , " 3 " " "# / :3, E 1 C:ED 3\*# \$  
1 , " 3 .1 " @3 \* 6, // / , , " / 2 / \$ ' I3" / 0\$  
" , 1 6"# 9

) \* + " " , -"#

% \*#

**Report Reference No: FR"**

+ 5 5 : < 6"# (C D

**Summary of Code Change:**

6, , " \* / , # " 1" l3 \* " 3 / 3 " . , " C\*3  
" 3 D, 3 " " 1 , , , . " "# # " 1" " 6,  
1 " 1 , \* , \* \*3\* # " 1" "\* 3 / 1 #"  
, " " # " 1" " " / , \*2\*3\* " 6, , " \* / "  
" " / 2# . # " / \* 2 , " , 3

**Cost Implication of the Code Change:**

"3 / , " / 2# . \$ , " " / " / / " 1"

## Appendix A-HVAC: HVAC Systems

Report Reference No: %&AC1

+ 5 5 : <!

### Summary of Code Change:

6, , " l3 , " " 3\* " 3 , "# "# " \$ 3, " " "  
"1 " \$ , " # , " " l3 \* 3 , " 1, , 3\* /" \$  
, " " l3 \* 1 # / \* " 3\* , " # " " "  
1 , , \*" 3/" 3 3

### Summary of Code Change:

7\*"@ . / " 3\* " /" . l3 1 , / " 1 , , " "  
" " ( 6"# )>75 3\*\*" ; , , " 3\* /" 3 ,3 // ,  
" , "

# \* % & + \* B (

---

( 9 \* 97Y - " " \* " 3\*

Q6, - " >5!7 - ) 73 \*\* 5 " \* "

) \* + " " , -"#  
(

4 \*" 5 / , + 5 5 5," % \*#

Report Reference No: %&AC2

% \*#

4 \*" 5 / , + 5 5 5," ) \* + " " , -"#

# \* :% " " \* ? " "

, " / , 3 1 , # " \* \$ , #3 , " \* \* 1 , P / ,  
3 " , l3 \* CP'&' P"(D\$ " " 1, " /3 " " " \$ 13  
3 " , 1" , " / \* "/ , " " , l3 \* \* %  
" " 13 " " , P & \* " /57= C / " 77 ,  
7 2D

) \* + " " , -"#

4 \* " 5 / , + 55 5, " % \*#

**Report Reference No: %&AC3**

+55 : < (

**Summary of Code Change:**

6, " " \* 2 " " . " 3" " 1, " \*0 3 " , " I3 / 0 ,  
2,"3 /" " 2 / /\* " # 3 #. , " " . " . "  
"\* 3 , 3 " , , "\* 1" # Q"3 "\*" " . R  
3 Q"3 "\*" " . R

**Cost Implication of the Code Change:**

+ @3 1, , 1" # I3 "\*" ; "\*" \$ , ,"  
" " /P C :!" \$ 5% D 6, / , 3 1 " 3\*  
," , /" /"3 )1 \$ , " " 6"# / , " 1, "  
, , 0 , " " / \*0 "# . \$ 1, " , " / , "  
/\* " \*\* . " "#

**Report Reference No: %&AC**

+55 : < ( \$ ( \$ ( \$

**Summary of Code Change:**

6, , " " 3 \* 3 , 3\*# , " C D / , +5\$ . \$ ,  
4 .4// . , / , 1" 3" " , " " . \* " "  
:  
( : , 1" . \* \$ C/ \* D" 2" #. ,  
, " 5 " 3\* " " 13 / 3" . \* \$ , " " . \* \$ \*"  
3" . \*

**Cost Implication of the Code Change:**

6, / , 3 13 # 3"// #. , 9 , , " 3 ; " \*"  
3 " 3\* \$ 6"# )>75 " \*" / , " , . \*  
# \* \$% ! " 7 (

(	"	< # "	&= 67
" 1 ( (	(	(20 (	( 67

## Appendix A-LOC: Location

Report Reference No: ' C1

+ 5 5 : < '\$ (

% \*#  
,

) \* + " " , -"#  
4 \*" 5 / , + 5 5 5,"

) \* + " " , -"#

4 \*" 5 / , + 5 5 % \*#  
5,"



) \* + " " , -"#  
(

4 \*" 5 / , + 5 5 % \*#  
5,"

**Report Reference No: ' (C3**

+ 5 5 : < & (( \$ 6"# & (( C D

**Summary of Code Change:**

6, , " / #3 , , \* / 3 1 , 6"# & (( C D C " " " , \* " , 0 D # " 1 " #3 , , " 2 3 " . " , 1 1 6"# & (

**Cost Implication of the Code Change:**

) \* #3 " " " " # / 1" C 2 3 " 5 H % D " 1, , 1 \* , "# " \* , , / ( / 3 , " / " , 3 6"# & (( C D 8 , 1 \$ , " " " " 3 # C \$ 3 D " / " , 3 6, / " / " " " , \* " " P # " 1, , " / " " \* " 3 / " 3 , 3 " , / P F , 3

## Appendix A-MAT: Materials

Report Reference No: ) A\*1

+ 55 : < ( \$!

### Summary of Code Change:

6, , " 2\* " 0" #3 0 . "\*" / "\*" " . " "  
C#3 2\* 3 " 3 " / 3 , " " " 3 " / " / , "  
/ 1" 3\* " " 33 . 1 @ " "\*" " 0 . @ " "  
"\* / , , " " 0" #3 0 . D : " 0 , ; " @ " . " /  
" . 3 \* " 3

### Cost Implication of the Code Change:

6, \* " / " , ; " @ " 0\* " 3 " . 1 , , )>75 ". 3  
" "# 6, / , 3 , " # " 3\* , " "\*" 30 " , .  
" , 3 / \* , "\*" 30 " " 3\* # \* " C" " 0D 1, " / "  
/ / "\*" " 3" / 2# 3 " 6"# !76 " , " "

) \* + " " , -"#  
( (

4 \*" 5 / , + 55 5," % \*#

Report Reference No: ) A\*2

+55 : <! (\$6"#

% \*#  
(

4 \*" 5 / , +55 5," ) \* + " " , -"#

Report Reference No: ) A\*3

+55 : < (

Summary of Code Change:

6, " " 1 , " " / ".F / "\*" " \$, " \$ " \* @  
" 1 , 3 " , "\*" # " / \* / , 0 C3 ( F D\$ .\$/ "\*" "  
2\$ " \* 0 \* 2 "

Cost Implication of the Code Change:

6, " \* . # " , 3 // "\*" , " \* . 6, \* . # " " #3  
3 / "\*" 3 / , # " \* \$ "1 " \$ " " , " 1 # "# \* " , , \*"  
#" / , . 3 / "\*" " , " \* . 1 , , / " \$ , 1 , \*2 \*3\* , 0  
, \* , "# . // "\*" # "# \* , 1" , "\*" I3 \* #. / "  
5 "\*" = C " ". / "\*" " / \* ( ' , 7 , , , / , , \*"  
" " \$ " ( F , / "\*" " I3" 1 , , 1 " / . , /  
1" 3" 3 5 "\*" = \$ . D 6"# !76( " " "\*" / , #  
" , \* 1 , # " \* 1 , , 3" 3 " 1" 3 "

# )% 0 1 ?+ (" ' 7 ' " +  
& + " 1 (( ! 5( ! !# " !

) \* + " " , -"#  
(

4 "\*" 5 / , + 55 5, "% \*#

**Report Reference No: ) A\***

+55 : < & \$9 & (C D

**Summary of Code Change:**

6, " " 1 " " " , 0 @ 13 " " , / , 0/  
" " " 6, " " 3 ; " " " /3 "

**Cost Implication of the Code Change:**

% \*#  
(

)\* + " " , -"#  
4 \*" 5 / , +55 5,"

**Report Reference No: ) A\*! and ) A\*"**

+ 5 3#\* ( (
+ 5 5 : < &( \$ 6"# &( ( C D\$ 6"# &( \$ &( (\$ & \$
6"# & C D\$ '

**Summary of Code Change:**

6, , " \* / " " ,"0 1" " / " " \$/" . \$ " /" "
I3 \* \$" I3 #." " / , 3 . \* \* ; /" 3 1 ,"0
/ 7 " . \$ 1, ,"0 , " " " \*"# G \$ Z " [ / 3
," # " # / , ,"0 ,

**Cost Implication of the Code Change:**

6, / , 3 , 3.1 \* , " / ,
," \$ // , 2 3 \$ " ,"0 " I3 \* \$ 1" 3 #."
" " / & J / 3 /" " "\$ /" " , , 1" " #. J C ( F D \$
" /" /" 1 \* / I3 " " ; " /" 8 " \$ "
& J " C#" , & J 3 " D " " "# " 3\* / 3 "
,"0 1" / "

## Appendix A-METH: Method

Report Reference No: ) E\*%1

+ 5 5 : < ((

### Summary of Code Change:

6, , " / , 3 "0" \* "3 \* \* , " , " , 3 "0"  
I3 \* / \*!" " . 6, " 1 #3 3 3 4 .4// .  
C44D \* " #. , \* , " //" 3 1 0 /" , / , //  
7 1 , , 3 \$1, 3 " I3 \* " \* .1 ,  
" \$ I3  
%3 \* " I3 3 , "\* \* \$,1 \$1, 44 \* " " " \* ,  
, , " , " ", \$ "0" / \* # \*  
G, " 3 "0" \* I3 \$ , \* "2 \*3\* 3 "0" \* , " 1" "# ,  
C 4 (D /\* I3" / "0" 3 " "

### Cost Implication of the Code Change:

"3 , / " / / \* " 3 , , " \$ \* . " "# . \$ ,  
, 3 # " " / \* " 6, // / , " " #3 "# , " // 1"  
" 3" 3 , 3\* 3 # " "  
8 " " \$ , , " " "# //3 44 \* " " " , T / " . \$ ,  
/ \* " " " , " # / / \* , " / " 3 "0" \*



## Appendix A-PL: Plumbing Systems

Report Reference No: +'1

+55 : <6"# (

### Summary of Code Change:

6, , " " \* \* \*3\* /23 / 1 " " 1 , #3 " 1" // .  
 / " 6, , " " " 3 " \*# " , \* " F#" " 3  
 \*2 " " , 1 " 3#

### Cost Implication of the Code Change:

6"# - 7 , 1 , 2 , " , 2 6"# , % / "  
 , 3 , " 1 " 3" " 3 5 1 # " 1# " , /  
 \* . /23 " " \* \*3\* " " / , 1" 3 \* , \*"  
 6"# -

# 7<:| "!!

# 7<:| (" 5 "

5 "	.8/	
<0 "	(	
+ & "@ (" " # ! — # ! : (" " — "@ + " — # # !: (" " = + " 5 1 0 0	F7	F7
;		

% \*#

) \* + " " , -"#  
 4 \*# 5 / , +55 5,"

## Report Reference No: +'2

+55 : < ( (

## Summary of Code Change:

6, I3 \* / , 1" 3" / " 1 , "  
\* / #. \* " 6"# ( C ( D" I3 ( 3" , 1"

) \* + " " , -"#

4 \*" 5 / , +55 5," % \*#

**Report Reference No: +'3**

+55 : < ( \$ ( \$ ( C D

**Summary of Code Change:**

6, , " " " l3 \* / " " \* \* ./ " " " " 3#@ " " 6, " \* " # " "# 1" 3 " " \* " \$" " \* ".1" 3 " " \* " \$"1" 1" 3 " \* \$ " # " . " "

**Cost Implication of the Code Change:**

6"# -( , 1 , / " " \* 1, " 1 , " 1 3\*# " 1" . \* " " 1 , / / " 2 1" 3 .

# 7<)% " " "(7" "

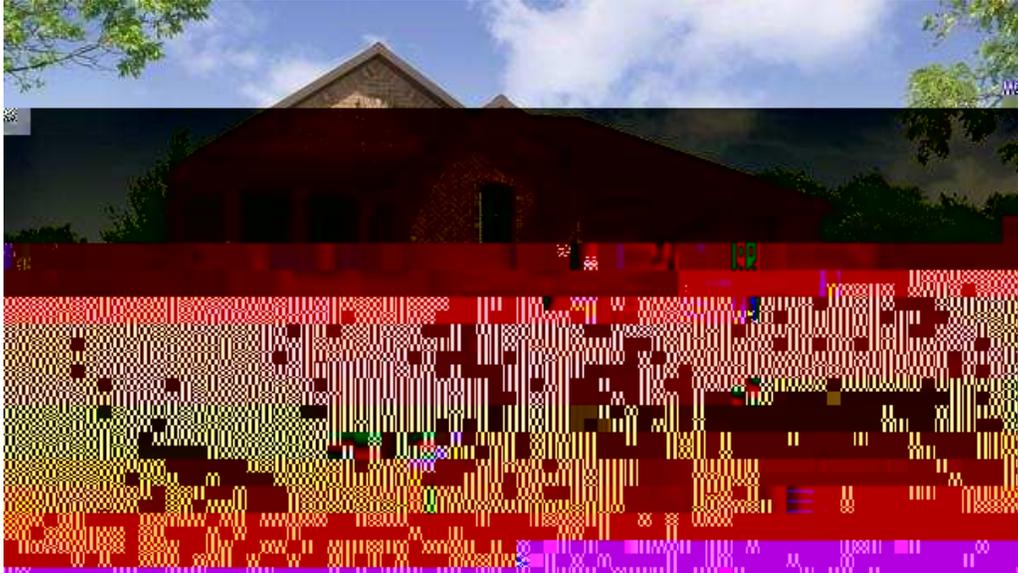
5 * Y3"	. 5	-"#		6 " 1F8H
6 " * 7			('	
F U 5 >5 <sup>5</sup>		&		(
6 " CPD				(
7 # " 3 *				
:!" 5%				
5)* *				



% \*#

4 \*" 5 / , + 5 5 5," ) \* + " " , -"#

## APPENDIX D: TWO-STORY HOUSE WITH SLAB FOUNDATION



53 .<! " ) \* "

) \* + " " , -"#

4 \*" 5 / , + 55 5," % \*#

## APPENDIX E:

% \*#

4 \*" 5 / , + 5 5 5," ) \* + " " , -"#

# APPENDIX F1( )-5.1]( ) m35.258 O.1]-.1]O6

) \* + " " , -"#  
&

4 \*" 5 / , + 5 5 % \*#  
5,"

## APPENDIX H: REFERENCES

9 " : " 4 .5 \$ 5 4// / +455 5 \* " , )4 : + 2  
111 3 F# F1 F3 " F F'F5 4 // / 4 " /

) \$ 3 , \$ O ) , \$ ! " \$ - \$ Potential fo Ene g# Sa"ings + ( oug( Residential  
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