

ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Thursday, January 05, 2012 7:12 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 30 (Part 3 of 3)
Attachments: RAI 376 Supplement 30 Response US EPR DC Part 3 of 3.pdf

Getachew,

Attached is Part 3 of 3 of the response to RAI 376, Supplement 30. This completes the final response to Question 03.08.05-28.

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, January 05, 2012 7:06 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 30 (Part 2 of 3)

Getachew,

Attached is Part 2 of 3 of the response to RAI 376, Supplement 30. Part 3 will be provided in a subsequent email to complete the final response to Question 03.08.05-28.

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, January 05, 2012 6:58 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 30 (Part 1 of 3)

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22, to provide a final response to Question 03.08.05-25. On June 27, 2011, AREVA NP submitted Supplement 23 to provide a revised INTERIM response for Question 03.08.05-28. On July 7, 2011, AREVA NP submitted Supplement 24 to provide an INTERIM response for Question 03.08.05-31. On July 20, 2011, AREVA NP submitted Supplement 25 to provide a revised INTERIM response for Question 03.08.05-31. On July 22, 2011, AREVA NP submitted Supplement 26 to provide a revised INTERIM response to Question 03.08.05-31. On July 29, 2011, AREVA NP submitted Supplement 27 to provide a revised INTERIM response to Question 03.08.05-28. On October 10, 2011, AREVA NP submitted Supplement 28 to provide a revised schedule for the remaining 2 questions. On December 13, 2011, AREVA NP submitted Supplement 29 to provide a revised INTERIM response to Question 03.08.05-31 as it pertains to the EPGB.

The attached file, "RAI 376 Supplement 30 Response US EPR DC Part 1 of 3.pdf" and the file "RAI 376 Supplement 30 Response US EPR DC Part 2 of 3.pdf" and the file "RAI 376 Supplement 30 Response US EPR DC Part 3 of 3.pdf" in subsequent emails provide a technically correct final response to Question 03.08.05-28.

Appended to these files are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the final response to RAI 376 Question 03.08.05-28. Some of the FSAR changes were incorporated in U.S. EPR FSAR Rev. 3 as indicated in the response and are not provided in this supplemental response. The FSAR mark-ups showing the changes included in US EPR FSAR Rev. 3 in redline-strikeout format were provided in RAI 376 Supplement 27. The response provided in this supplement (Supplement 30) and the associated markups provided in this supplement and in Supplement 27 provide a final and complete response to RAI 376 Question 03.08.05-28.

The following table indicates the pages in the response document, "RAI 376 Supplement 30 Response US EPR DC Part 1 of 3.pdf" and "RAI 376 Supplement 30 Response US EPR DC Part 2 of 3.pdf" and "RAI 376 Supplement 30 Response US EPR DC Part 3 of 3.pdf" that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 376 — 03.08.05-28	2	73

The preliminary schedule for a technically correct and complete final response to Question 03.08.05-31 as it pertains to the ESWB is unchanged as provided below. This schedule is being reevaluated and a new supplement with a revised schedule will be transmitted by January 25, 2012.

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-31	October 25, 2010 (Actual) July 22, 2011 (Actual) December 13, 2011 (Actual)	January 25, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Tuesday, December 13, 2011 3:41 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 29 (Part 1 of 2)

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a

revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22, to provide a final response to Question 03.08.05-25. On June 27, 2011, AREVA NP submitted Supplement 23 to provide a revised INTERIM response for Question 03.08.05-28. On July 7, 2011, AREVA NP submitted Supplement 24 to provide an INTERIM response for Question 03.08.05-31. On July 20, 2011, AREVA NP submitted Supplement 25 to provide a revised INTERIM response for Question 03.08.05-31. On July 22, 2011, AREVA NP submitted Supplement 26 to provide a revised INTERIM response to Question 03.08.05-31. On July 29, 2011, AREVA NP submitted Supplement 27 to provide a revised INTERIM response to Question 03.08.05-28. On October 10, 2011, AREVA NP submitted Supplement 28 to provide a revised schedule for the remaining 2 questions.

The attached file, "RAI 376 Supplement 29 Response US EPR DC – PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 29 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" in a subsequent email provide a technically correct revised INTERIM response to Question 03.08.05-31 as it pertains to the EPGB.

Appended to these files are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the revised INTERIM response to RAI 376 Question 03.08.05-31 as it pertains to the EPGB. Because the response contains security-related sensitive information that should be withheld from public disclosure in accordance with 10 CFR 2.390, a public version is provided with the security-related sensitive information redacted. This email and attached file do not contain any security-related information. An unredacted security-related version will be provided in a separate email.

The following table indicates the pages in the response document, "RAI 376 Supplement 29 Response US EPR DC - PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 29 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 376 — 03.08.05-31	2	4

The schedule for the final response to Question 03.08.05-28 remains unchanged. In addition, a preliminary revised schedule for a technically correct and complete final response to Question 03.08.05-31 as it pertains to the ESWB is provided below. This schedule is being reevaluated and a new supplement with a revised schedule will be transmitted by January 25, 2012.

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) July 29, 2011 (Actual)	January 5, 2012
RAI 376-03.08.05-31	October 25, 2010 (Actual) July 22, 2011 (Actual) December 13, 2011 (Actual)	January 25, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
 Charlotte, NC 28262
 Phone: 704-805-2223
 Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Monday, October 10, 2011 4:09 PM

To: Getachew.Tesfaye@nrc.gov

Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)

Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 28

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22, to provide a final response to Question 03.08.05-25. On June 27, 2011, AREVA NP submitted Supplement 23 to provide a revised INTERIM response for Question 03.08.05-28. On July 7, 2011, AREVA NP submitted Supplement 24 to provide an INTERIM response for Question 03.08.05-31. On July 20, 2011, AREVA NP submitted Supplement 25 to provide a revised INTERIM response for Question 03.08.05-31. On July 22, 2011, AREVA NP submitted Supplement 26 to provide a revised INTERIM response to Question 03.08.05-31. On July 29, 2011, AREVA NP submitted Supplement 27 to provide a revised INTERIM response to Question 03.08.05-28.

The schedule for the final response to Questions 03.08.05-28 and 03.08.05-31 has been changed. The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) July 29, 2011 (Actual)	January 5, 2012
RAI 376-03.08.05-31	October 25, 2010 (Actual) July 22, 2011 (Actual)	December 13, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B

From: WELLS Russell (RS/NB)
Sent: Friday, July 29, 2011 5:57 PM
To: 'Getachew Tesfaye'
Cc: WILLIFORD Dennis (RS/NB); ROMINE Judy (RS/NB); LENTZ Tony (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 27 (Part 1 of 3)

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22, to provide a final response to Question 03.08.05-25. On June 27, 2011, AREVA NP submitted Supplement 23 to provide a revised INTERIM response for Question 03.08.05-28. On July 7, 2011, AREVA NP submitted Supplement 24 to provide an INTERIM response for Question 03.08.05-31. On July 20, 2011, AREVA NP submitted Supplement 24 to provide a revised INTERIM response for Question 03.08.05-31. On July 20, 2011, AREVA NP submitted Supplement 25 to provide a revised INTERIM response for Question 03.08.05-31. On July 22, 2011, AREVA NP submitted Supplement 25 to provide a AREVA NP submitted Supplement 26 to provide a revised INTERIM response to Question 03.08.05-31.

The attached file, "RAI 376 Supplement 27 Response US EPR DC (Part 1 of 3).pdf" provides the technically correct and revised INTERIM response to Question 03.08.05-28. Appended to this file are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-28. The remaining parts will be provided in subsequent e-mails.

The following table indicates the page in the response document, "RAI 376 Supplement 27 Response US EPR DC (Part 1 of 3).pdf" that contains AREVA NP's response to the subject question.

Question #	Start Page	End Page
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The schedule for the final response to Question 03.08.05-28 and Question 03.08.05-31 remains unchanged. The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) July 29, 2011 (Actual)	October 10, 2011
RAI 376-03.08.05-31	October 25, 2010 July 22, 2011 (Actual)	November 30, 2011

Sincerely,

Russ Wells for
Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WELLS Russell (RS/NB)
Sent: Friday, July 22, 2011 1:03 PM
To: Tesfaye, Getachew
Cc: WILLIFORD Dennis (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 26 (Part 2 of 2)

Getachew
Attached is part 2 of 2 for the response of RAI No. 376, FSAR Ch 3, Supplement 26.

Russ Wells for
Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WELLS Russell (RS/NB)
Sent: Friday, July 22, 2011 1:01 PM
To: 'Tesfaye, Getachew'
Cc: WILLIFORD Dennis (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 26 (Part 1 of 2)

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14

questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22, to provide a final response to Question 03.08.05-25. On June 27, 2011, AREVA NP submitted Supplement 23 to provide a revised INTERIM response for Question 03.08.05-28. On July 7, 2011, AREVA NP submitted Supplement 24 to provide an INTERIM response for Question 03.08.05-31. On July 20, 2011, AREVA NP submitted Supplement 24 to provide a revised INTERIM response for Question 03.08.05-31.

The attached file, “RAI 376 Supplement 26 Response US EPR DC – PUBLIC (Part 1 of 2).pdf” and the file “RAI 376 Supplement 26 Response US EPR DC - PUBLIC (Part 2 of 2).pdf” in a subsequent email provide a technically correct revised INTERIM response to Question 03.08.05-31 to correct an editorial error on FSAR mark-up page 2.1-5 (on U.S. EPR FSAR Tier 2, Table 2.1-1 (the value showed u = .36, instead of u > and = to .36).

Appended to these files are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-31. Because the response contains security-related sensitive information that should be withheld from public disclosure in accordance with 10 CFR 2.390, a public version is provided with the security-related sensitive information redacted. This email and attached file do not contain any security-related information. An unredacted security-related version will be provided in a separate email.

The following table indicates the pages in the response document, “RAI 376 Supplement 26 Response US EPR DC - PUBLIC (Part 1 of 2).pdf” and the file “RAI 376 Supplement 26 Response US EPR DC - PUBLIC (Part 2 of 2).pdf” that contain AREVA NP’s response to the subject question.

Question #	Start Page	End Page
RAI 376 — 03.08.05-31	2	4

The schedule for the final responses to the remaining questions is unchanged as provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) June 27, 2011 (Actual)	October 10, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual) July 22, 2011 (Actual)	November 30, 2011

Sincerely,

**Russ Wells for
Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.**

7207 IBM Drive, Mail Code CLT 2B

Charlotte, NC 28262

Phone: 704-805-2223

Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)

Sent: Wednesday, July 20, 2011 10:27 AM

To: Tesfaye, Getachew

Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); Miernicki, Michael

Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 25 (Part 1 of 2)

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22, to provide a final response to Question 03.08.05-25. On June 27, 2011, AREVA NP

submitted Supplement 23 to provide a revised INTERIM response for Question 03.08.05-28. On July 7, 2011, AREVA NP submitted Supplement 24 to provide an INTERIM response for Question 03.08.05-31.

The attached file, "RAI 376 Supplement 25 Response US EPR DC – PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 25 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" in a subsequent email provide a technically correct revised INTERIM response to Question 03.08.05-31. Appended to these files are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-31. Because the response contains security-related sensitive information that should be withheld from public disclosure in accordance with 10 CFR 2.390, a public version is provided with the security-related sensitive information redacted. This email and attached file do not contain any security-related information. An unredacted security-related version will be provided in a separate email.

The following table indicates the pages in the response document, "RAI 376 Supplement 25 Response US EPR DC - PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 25 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 376 — 03.08.05-31	2	4

The schedule for the final responses to the remaining questions is unchanged as provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) June 27, 2011 (Actual)	October 10, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual) July 20, 2011 (Actual)	November 30, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, July 07, 2011 1:49 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); Miernicki, Michael
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 24

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed.

AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22, to provide a final response to Question 03.08.05-25. On June 27, 2011, AREVA NP submitted Supplement 23 to provide a revised INTERIM response for Question 03.08.05-28.

The attached file, "RAI 376 Supplement 24 Response US EPR DC - PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 24 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" in a subsequent email provides a technically correct INTERIM response to Question 03.08.05-31. Appended to these files are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-31. Because the response contains security-related sensitive information that should be withheld from public disclosure in accordance with 10 CFR 2.390, a public version is provided with the security-related sensitive information redacted. This email and attached file do not contain any security-related information. An unredacted security-related version will be provided in a separate email.

The following table indicates the page in the response document, "RAI 376 Supplement 24 Response US EPR DC - PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 24 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" that contains AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 376 — 03.08.05-31	2	4

The schedule for the final responses to the remaining questions is unchanged. The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) June 27, 2011 (Actual)	October 10, 2011
RAI 376-03.08.05-31	October 25, 2010 July 7, 2011 (Actual)	November 30, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
 Charlotte, NC 28262
 Phone: 704-805-2223
 Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)

Sent: Monday, June 27, 2011 4:47 PM

To: Tesfaye, Getachew

Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); CORNELL Veronica (External RS/NB)

Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 23

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22 to provide a final response to Question 03.08.05-25.

The attached file, "RAI 376 Supplement 23 Response US EPR DC - INTERIM.pdf (Part 1 of 2).pdf" and the file "RAI 376 Supplement 23 Response US EPR DC - INTERIM.pdf (Part 2 of 2).pdf" in a subsequent email, provide a technically correct INTERIM response to Question 03.08.05-28, as committed. Appended to the file "RAI 376 Supplement 23 Response US EPR DC - INTERIM.pdf (Part 2 of 2).pdf" are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-28.

The following table indicates the respective pages in the response document, "RAI 376 Supplement 23 Response US EPR DC - INTERIM.pdf (Part 1 of 2).pdf" and "RAI 376 Supplement 23 Response US EPR DC - INTERIM.pdf (Part 2 of 2).pdf" that contain AREVA NP's INTERIM response to Question 03.08.05-28.

Question #	Start Page	End Page
RAI 376 — 03.08.05-28	2	50

The schedule for the final response to Question 03.08.05-28 and Question 03.08.05-31 is being revised. The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) June 27, 2011 (Actual)	October 10, 2011
RAI 376-03.08.05-31	October 25, 2010	November 30, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
 Charlotte, NC 28262
 Phone: 704-805-2223
 Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, June 09, 2011 12:46 PM
To: 'Tefsaye, Getachew'
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 22

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011.

The attached file, "RAI 376 Supplement 22 Response US EPR DC.pdf" provides a technically correct and complete FINAL response to Question 03.08.05-25. Appended to this file are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-25.

The following table indicates the pages in the response document, "RAI 376 Supplement 22 Response US EPR DC.pdf" that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 376 — 03.08.05-25	2	5

The schedule for the remaining questions is unchanged. The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376—03.08.05-28	October 25, 2010 (Actual)	July 8, 2011
RAI 376—03.08.05-31	October 25, 2010 (Actual)	July 8, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B

Charlotte, NC 28262

Phone: 704-805-2223

Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)

Sent: Friday, May 20, 2011 5:19 PM

To: 'Tesfaye, Getachew'

Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); CORNELL Veronica (External RS/NB)

Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 21

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted

Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20 to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31.

The schedule for Question 03.08.05-25 is being revised. The schedule for the remaining questions is unchanged.

The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	July 8, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	July 8, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	July 8, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
 Charlotte, NC 28262
 Phone: 704-805-2223
 Email: Dennis.Williford@areva.com

From: WELLS Russell (RS/NB)
Sent: Monday, May 02, 2011 10:30 AM
To: Tesfaye, Getachew
Cc: CORNELL Veronica (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 20

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for

Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively.

Due to changes in the schedule for FSAR Sections 3.7 and 3.8 as discussed with NRC, the schedule for Questions 03.08.05-28 and 03.08.05-31 is being revised. The schedule for the remaining question is unchanged.

The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	May 26, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	July 8, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	July 8, 2011

Sincerely,

Russ Wells

U.S. EPR Design Certification Licensing Manager

AREVA NP, Inc.

3315 Old Forest Road, P.O. Box 10935

Mail Stop OF-57

Lynchburg, VA 24506-0935

Phone: 434-832-3884 (work)

434-942-6375 (cell)

Fax: 434-382-3884

[*Russell.Wells@Areva.com*](mailto:Russell.Wells@Areva.com)

From: WELLS Russell (RS/NB)

Sent: Tuesday, April 19, 2011 7:39 AM

To: 'Tesfaye, Getachew'

Cc: CORNELL Veronica (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)

Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 19

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response

to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted Supplement 18 on March 18, 2011, to provide a revised schedule for Question 03.08.05-25.

The schedule for Question 03.08.05-25 is being revised to allow AREVA NP additional time to address NRC comments. The schedule for the remaining questions is unchanged.

The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	May 26, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	May 4, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	May 26, 2011

Sincerely,

Russ Wells

U.S. EPR Design Certification Licensing Manager

AREVA NP, Inc.

3315 Old Forest Road, P.O. Box 10935

Mail Stop OF-57

Lynchburg, VA 24506-0935

Phone: 434-832-3884 (work)

434-942-6375 (cell)

Fax: 434-382-3884

Russell.Wells@Areva.com

From: WELLS Russell (RS/NB)

Sent: Friday, March 18, 2011 4:43 PM

To: 'Tefsaye, Getachew'

Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)

Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 18

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010,

to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31.

The schedule for Question 03.08.05-25 is being revised to allow AREVA NP additional time to interact with the NRC. The schedule for the remaining questions is unchanged.

The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	April 21, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	May 4, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	May 26, 2011

Sincerely,

Russ Wells

U.S. EPR Design Certification Licensing Manager

AREVA NP, Inc.

3315 Old Forest Road, P.O. Box 10935

Mail Stop OF-57

Lynchburg, VA 24506-0935

Phone: 434-832-3884 (work)

434-942-6375 (cell)

Fax: 434-382-3884

Russell.Wells@Areva.com

From: BRYAN Martin (External RS/NB)

Sent: Friday, February 11, 2011 2:51 PM

To: 'Tefaye, Getachew'

Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)

Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 17

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to

provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29.

The schedule for Question 03.08.05-28 and Question 03.08.05-31 has changed. The schedule for the remaining question is unchanged.

The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	March 30, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	May 4, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	May 26, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Tuesday, February 08, 2011 5:23 PM
To: Tesfaye, Getachew
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 16

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM

responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30.

The attached file, "RAI 376 Supplement 16 Response US EPR DC.pdf" provides technically correct and complete FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29, as committed.

The following table indicates the respective pages in the response document, RAI 376 Supplement 16 Response US EPR DC.pdf," that contains AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376 – 03.08.05-24	2	5
RAI 376 – 03.08.05-26	6	6
RAI 376 – 03.08.05-29	7	7

The schedule for Question 03.08.05-25 is being revised to allow additional time for AREVA NP to address NRC comments. The schedule for the remaining questions is unchanged.

The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	March 30, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Monday, November 22, 2010 7:33 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 15

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010,

to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 27, 2010, to provide a revised schedule for Question 03.08.05-29.

The attached file, "RAI 376 Supplement 15 Response US EPR DC.pdf" provides technically correct and complete FINAL responses to Questions 03.08.05-27 and 03.08.05-30, as committed.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-27.

The following table indicates the respective pages in the response document, RAI 376 Supplement 15 Response US EPR DC.pdf," that contains AREVA NP's response to the subject questions. Please note that the similar table for RAI 376 Supplement 13 listed the RAI question as 354 when it should have been 376. The schedule for the remaining questions is unchanged.

Question #	Start Page	End Page
RAI 376 - 03.08.05-27	2	4
RAI 376 - 03.08.05-30	5	5

The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	February 28, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Wednesday, October 27, 2010 1:24 PM
To: 'Tsfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 14

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31.

The schedule for Question 03.08.05-29 is being revised to allow additional time for AREVA NP to address NRC comments. The schedule for the remaining questions is unchanged.

The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	February 28, 2011
RAI 376-03.08.05-30	N/A	November 22, 2010
RAI 376-03.08.05-31	October 25, 2010 (Actual)	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Monday, October 25, 2010 4:37 PM
To: Tesfaye, Getachew
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 13

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively.

The attached file, "RAI 376 Supplement 13 Response US EPR DC-INTERIM.pdf" provides a technically correct and complete INTERIM response to Questions 03.08.05-28 and 03.08.05-31, as committed.

The following table indicates the respective pages in the response document, RAI 376 Supplement 13 Response US EPR DC - INTERIM.pdf," that contains AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 354 - 03.08.05-28	2	10
RAI 354 - 03.08.05-31	11	12

The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	October 29, 2010
RAI 376-03.08.05-30	N/A	November 22, 2010
RAI 376-03.08.05-31	October 25, 2010 (Actual)	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Thursday, October 07, 2010 2:50 PM
To: 'Tesfaye, Getachew'

Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 12

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted Supplement 11 on September 15, 2010, to provide a revised schedule for the final response to question 03.08.05-30

The schedule for Question 03.08.05-30 is being revised to allow additional time for AREVA NP to address NRC comments. The schedule for the remaining questions is unchanged.

The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	October 29, 2010
RAI 376-03.08.05-30	N/A	November 22, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)

Sent: Wednesday, September 15, 2010 9:21 AM

To: 'Tsfaye, Getachew'

Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)

Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 11

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29.

The schedule for Question 03.08.05-30 is being revised to allow additional time for AREVA NP to interact with the NRC. The schedule for the remaining questions is unchanged.

The schedule for technically correct and complete responses to the remaining 8 questions is unchanged and provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	October 29, 2010
RAI 376-03.08.05-30	N/A	October 14, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Friday, August 27, 2010 4:58 PM
To: 'Tefsaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 10-INTERIM

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to

provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25.

The attached file, "RAI 376 Supplement 10 Response US EPR DC- INTERIM.pdf" provides a technically correct and complete INTERIM response to 2 of the remaining 8 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 376 Supplement 10 Response US EPR DC- INTERIM.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376 — 03.08.05-25	2	3
RAI 376 — 03.08.05-29	4	5

The schedule for technically correct and complete responses to the remaining questions is unchanged and provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	October 29, 2010
RAI 376-03.08.05-30	N/A	September 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Monday, August 16, 2010 12:34 PM
To: 'Tefsaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 9

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to

provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29.

The schedule for INTERIM response to Question 03.08.05-25 is revised to allow AREVA NP additional time to prepare the response. The FINAL response date for Question 03.08.05-25 has not changed. The FINAL response date for Question 03.08.05-30 is being changed to account for the interaction with NRC being scheduled at a later date than the existing FINAL response date.

The attached file, "RAI 376 Supplement 9 Response - INTERIM.pdf" provides a technically correct and complete INTERIM response to 2 of the remaining 8 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 376 Supplement 9 Response - INTERIM.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376 — 03.08.05-26	2	2
RAI 376 — 03.08.05-27	3	5

The schedule for technically correct and complete responses to the remaining 8 questions is changed and provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	September 8, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	September 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Monday, August 09, 2010 5:45 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 8

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed.

The schedule for INTERIM response to Question 03.08.05-29 is revised to allow AREVA NP additional time to prepare the interim response. The final response date for Question 03.08.05-29 has not changed.

The schedule for technically correct and complete responses to the remaining 8 questions is unchanged and provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	August 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Thursday, July 29, 2010 7:56 PM
To: 'Tefsaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); CORNELL Veronica (EXT); VAN NOY Mark (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 7

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010 to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed.

The attached file, "RAI 376 Supplement 7 FINAL Response US EPR DC.pdf" provides technically correct and complete responses to 2 of the remaining 10 questions, as committed.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Questions 03.08.01-48 and 03.08.03-24.

The following table indicates the respective pages in the response document, RAI 376 Supplement 7 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376 — 03.08.01-48	2	3
RAI 376 — 03.08.03-24	4	8

The schedule for technically correct and complete responses to the remaining 8 questions is unchanged and provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 9, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	August 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Monday, July 26, 2010 4:00 PM
To: 'Tefaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); VAN NOY Mark (EXT); CORNELL Veronica (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 6

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, an INTERIM response to question 03.08.05-24.

The attached file, "RAI 376 Supplement 6 Response U.S. EPR DC.pdf" provides a technically correct and complete FINAL response to 3 of the remaining 13 questions, as committed. The schedule for the remaining 10 questions is unchanged.

The following table indicates the respective pages in the response document, "RAI 376 Supplement 6 Response U.S. EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376 — 03.08.01-47	2	3
RAI 376 — 03.08.03-21	4	5
RAI 376 — 03.08.03-22	6	7

The schedule for technically correct and complete responses to the remaining 13 questions is provided below.

Question #	Interim Response Date	Response Date
RAI 376-03.08.01-48	N/A	July 29, 2010
RAI 376-03.08.03-24	N/A	July 29, 2010
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 9, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	August 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Thursday, July 15, 2010 7:13 PM
To: 'Tesyfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); VAN NOY Mark (EXT); CORNELL Veronica (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 5 - Interim

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 376 on April 26, 2010. AREVA NP submitted Supplement 1 to the response on May 20, 2010 to address 1 of the remaining 14 questions. AREVA NP submitted Supplement 2 to the response on June 8, 2010, to change the schedule for responding to Question 03.08.05-30. AREVA NP submitted Supplement 3 to the response on June 24,

2010, to provide a changed schedule based upon the civil/structural re-planning activities and revised RAI response schedule presented to the NRC during the June 9, 2010, Public Meeting, and to allow time to interact with the NRC on the responses. AREVA NP submitted Supplement 4 on July 13, 2010 to provide a revised schedule for question 03.08.05-30. The attached file, "RAI 376 Question 03.08.05-24 Response - INTERIM.pdf" provides a technically correct and complete INTERIM response to 1 of the remaining 13 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 376 Question 03.08.05-24 Response - INTERIM.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376 — 03.08.05-24	2	5

The schedule for technically correct and complete FINAL responses to the remaining 13 questions is unchanged and provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.01-47	N/A	August 17, 2010
RAI 376-03.08.01-48	N/A	July 29, 2010
RAI 376-03.08.03-21	N/A	July 26, 2010
RAI 376-03.08.03-22	N/A	July 26, 2010
RAI 376-03.08.03-24	N/A	July 29, 2010
RAI 376-03.08.05-24	July 15, 2010 Actual	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 9, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	August 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Tuesday, July 13, 2010 6:08 PM
To: 'Tesyfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); CORNELL Veronica (EXT); VAN NOY Mark (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 4

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted Supplement 2 to the response on June 8, 2010, to provide a schedule for the remaining 13 questions, which were affected by the work underway to address NRC comments from the April 26, 2010, audit. AREVA NP submitted RAI No. 376 Supplement 3 on June 24, 2010, to reflect the revised RAI response schedule as a result of the civil/structural re-planning activities.

RAI 376 Supplement 4 revises the schedule for the response to Question 03.08.05-30 to allow time to interact with the NRC on the draft response. The schedule for the remaining 12 questions is unchanged.

The schedule for technically correct and complete responses to the remaining 13 questions is provided below.

Question #	Interim Response Date	Response Date
RAI 376-03.08.01-47	N/A	August 17, 2010
RAI 376-03.08.01-48	N/A	July 29, 2010
RAI 376-03.08.03-21	N/A	July 26, 2010
RAI 376-03.08.03-22	N/A	July 26, 2010
RAI 376-03.08.03-24	N/A	July 29, 2010
RAI 376-03.08.05-24	July 15, 2010	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 9, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	August 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Thursday, June 24, 2010 11:56 AM
To: 'Tefaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); RYAN Tom (AREVA NP INC); VAN NOY Mark (EXT); CORNELL Veronica (EXT); GARDNER George Darrell (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 3

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted Supplement 2 to the response on June 8, 2010, to provide a schedule for the remaining 13 questions, which were affected by the work underway to address NRC comments from the April 26, 2010, audit.

Based upon the civil/structural re-planning activities and revised RAI response schedule presented to the NRC during the June 9, 2010, Public Meeting, and to allow time to interact with the NRC on the responses, the schedule has been changed. The schedule for 03.08.05-30 remains unchanged.

Prior to submittal of the final RAI response, AREVA NP will provide an interim RAI response that includes:

- (1) a description of the technical work (e.g., methodology)
- (2) U.S. EPR FSAR revised pages, as applicable

The revised schedule for an interim response and the technically correct and complete response to these questions is provided below.

Question #	Interim Response Date	Response Date
RAI 376-03.08.01-47	N/A	August 17, 2010
RAI 376-03.08.01-48	N/A	July 29, 2010
RAI 376-03.08.03-21	N/A	July 26, 2010
RAI 376-03.08.03-22	N/A	July 26, 2010
RAI 376-03.08.03-24	N/A	July 29, 2010
RAI 376-03.08.05-24	July 15, 2010	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 9, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	July 14, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 2011

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Tuesday, June 08, 2010 3:32 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); VAN NOY Mark (EXT); CORNELL Veronica (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 2

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions.

The schedule for the response to Question 03.08.05-30 has been changed. The final schedule for this question as well as the remaining questions below will be evaluated based on the information that will be presented at the June 9, 2010, public meeting and subsequent NRC feedback.

Question #	Response Date
RAI 376-03.08.01-47	July 14, 2010
RAI 376-03.08.01-48	August 3, 2010
RAI 376-03.08.03-21	June 24, 2010
RAI 376-03.08.03-22	June 24, 2010
RAI 376-03.08.03-24	August 3, 2010
RAI 376-03.08.05-24	August 3, 2010
RAI 376-03.08.05-25	August 3, 2010
RAI 376-03.08.05-26	August 3, 2010
RAI 376-03.08.05-27	July 14, 2010
RAI 376-03.08.05-28	August 3, 2010
RAI 376-03.08.05-29	August 3, 2010
RAI 376-03.08.05-30	July 14, 2010
RAI 376-03.08.05-31	August 3, 2010

Sincerely,

Martin (Marty) C. Bryan
 U.S. EPR Design Certification Licensing Manager
 AREVA NP Inc.
 Tel: (434) 832-3016
 702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Thursday, May 20, 2010 4:24 PM
To: 'Tesyfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); VAN NOY Mark (EXT); CORNELL Veronica (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 376 on April 26, 2010. The attached file, "RAI 376 Supplement 1 Response US EPR DC.pdf," provides technically correct and complete responses to 1 of the remaining 14 questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.03-23.

The response to one question, 03.08.05-30, cannot be provided at this time due to its dependence on path-to-closure related work-planning currently being rescheduled and reviewed by the NRC.

The following table indicates the respective pages in the response document, "RAI 376 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
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RAI 376-03.08.03-23	2	2
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A complete answer is not provided for 13 of the 14 questions. The schedule for a technically correct and complete response to these questions has been changed and is provided below.

Question #	Response Date
RAI 376-03.08.01-47	July 14, 2010
RAI 376-03.08.01-48	August 3, 2010
RAI 376-03.08.03-21	June 24, 2010
RAI 376-03.08.03-22	June 24, 2010
RAI 376-03.08.03-24	August 3, 2010
RAI 376-03.08.05-24	August 3, 2010
RAI 376-03.08.05-25	August 3, 2010
RAI 376-03.08.05-26	August 3, 2010
RAI 376-03.08.05-27	July 14, 2010
RAI 376-03.08.05-28	August 3, 2010
RAI 376-03.08.05-29	August 3, 2010
RAI 376-03.08.05-30	June 10, 2010
RAI 376-03.08.05-31	August 3, 2010

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Monday, April 26, 2010 12:49 PM
To: 'Tefsaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); RYAN Tom (AREVA NP INC); VAN NOY Mark (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376 (4355,4367,4377), FSAR Ch. 3

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 376 Response US EPR DC.pdf" provides a schedule since a technically correct and complete response to the 14 questions is not provided.

The following table indicates the respective pages in the response document, "RAI 376 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376-03.08.01-47	2	2
RAI 376-03.08.01-48	3	4
RAI 376-03.08.03-21	5	6
RAI 376-03.08.03-22	7	7
RAI 376-03.08.03-23	8	8

RAI 376-03.08.03-24	9	10
RAI 376-03.08.05-24	11	12
RAI 376-03.08.05-25	13	13
RAI 376-03.08.05-26	14	14
RAI 376-03.08.05-27	15	16
RAI 376-03.08.05-28	17	19
RAI 376-03.08.05-29	20	20
RAI 376-03.08.05-30	21	21
RAI 376-03.08.05-31	22	22

A complete answer is not provided for 14 of the 14 questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 376-03.08.01-47	July 14, 2010
RAI 376-03.08.01-48	August 3, 2010
RAI 376-03.08.03-21	June 24, 2010
RAI 376-03.08.03-22	June 24, 2010
RAI 376-03.08.03-23	May 20, 2010
RAI 376-03.08.03-24	August 3, 2010
RAI 376-03.08.05-24	August 3, 2010
RAI 376-03.08.05-25	August 3, 2010
RAI 376-03.08.05-26	August 3, 2010
RAI 376-03.08.05-27	July 14, 2010
RAI 376-03.08.05-28	August 3, 2010
RAI 376-03.08.05-29	August 3, 2010
RAI 376-03.08.05-30	May 20, 2010
RAI 376-03.08.05-31	August 3, 2010

Sincerely,
Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Thursday, March 25, 2010 2:13 PM
To: ZZ-DL-A-USEPR-DL
Cc: Xu, Jim; Hawkins, Kimberly; Miernicki, Michael; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 376 (4355,4367,4377), FSAR Ch. 3

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on March 11, 2010, and on March 24, 2010, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 3673

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D4A536F3)

Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 30 (Part 3 of 3)
Sent Date: 1/5/2012 7:11:48 PM
Received Date: 1/5/2012 7:14:19 PM
From: WILLIFORD Dennis (AREVA)

Created By: Dennis.Williford@areva.com

Recipients:

"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>
Tracking Status: None
"DELANO Karen (AREVA)" <Karen.Delano@areva.com>
Tracking Status: None
"ROMINE Judy (AREVA)" <Judy.Romine@areva.com>
Tracking Status: None
"RYAN Tom (AREVA)" <Tom.Ryan@areva.com>
Tracking Status: None
"Tsfaye, Getachew" <Getachew.Tsfaye@nrc.gov>
Tracking Status: None

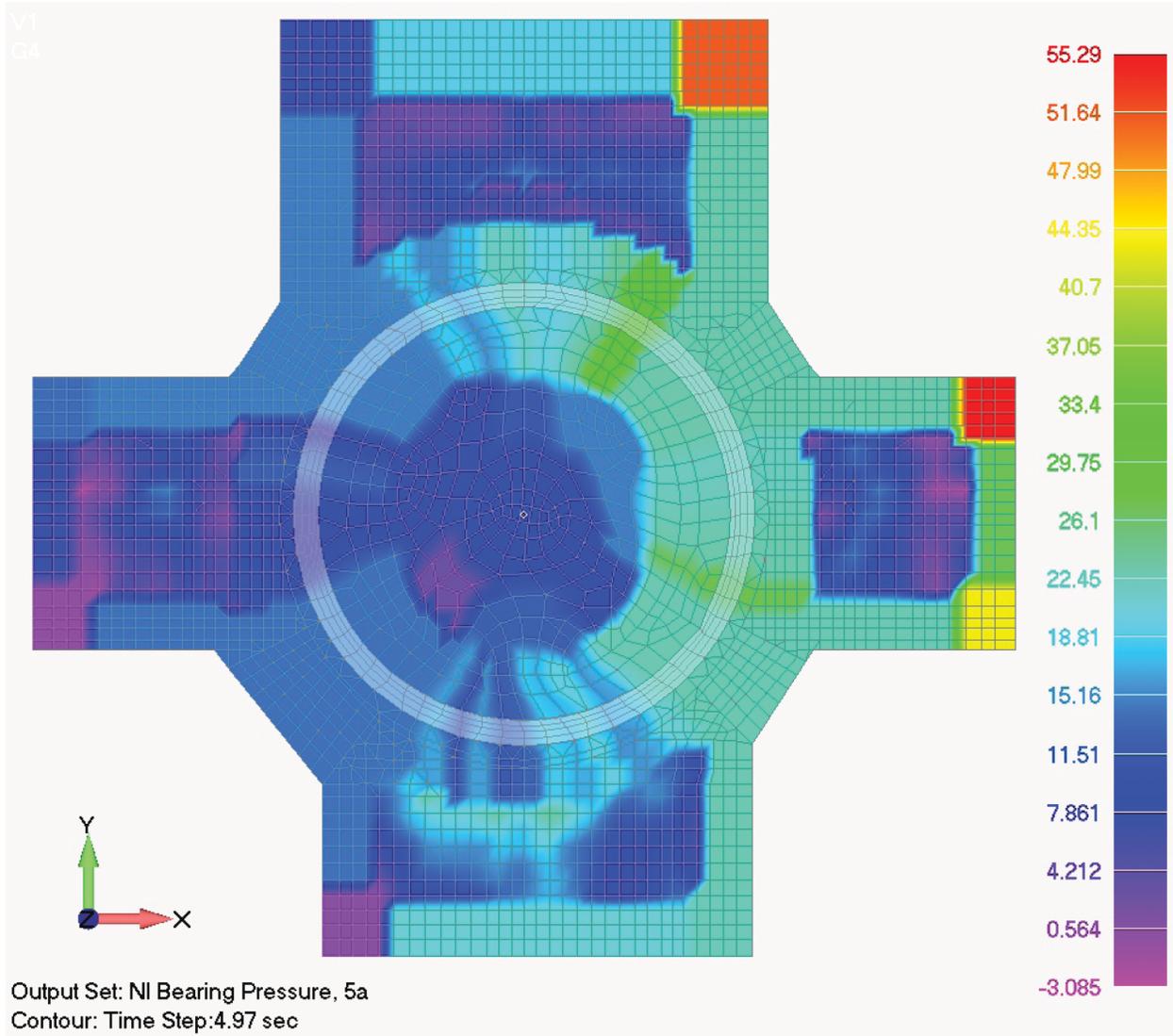
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Figure 3.8.5-28-D: Bearing Pressure, Analysis Case 5ae, Seismic and Dead Load,
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ATTACHMENT 1 COMPARISON OF APPLIED SOIL PRESSURE WITH SOIL PRESSURE IN STABILITY ANALYSIS

1. Cracked Concrete Model

The coefficients of passive soil pressure, K_p , in Table 03.08.05-28-1 are developed using the time history of horizontal displacement of the sidewalls and tendon gallery in the global embedded NI seismic stability, specifically the cracked concrete model. Passive soil pressures for design of the embedded NI building walls and tendon gallery are scaled up from the SASSI analysis such that the maximum pressure on each wall is, at least equal to the passive earth pressure of $K_p=3$. For soil case 4ue, a uniform lateral soil pressure of 43.5 psi (300 kPa) for the wall provides a factor of safety against sliding of at least 1.1. K_p for soil case 5ae is not established because the NI is fully embedded in hard rock in this soil case, and the superstructure static model constrains the lateral movements of the walls below grade.

The fixed base analyses for the Superstructure have the nodes of the bottom surface of the basemat fully constrained in the X, Y, and Z directions. For soil case 5ae which represents hard rock (shear wave velocity 13,124 ft/sec), additionally constraints are applied to the X and Y out-of-plane directions on walls where there is contact with the excavation. The additional constraints are shown in Figure 03.08.05-28-1. Since soil case 5ae is a hard rock, subgrade walls in contact with the excavation are constrained from lateral movement.

The boundary conditions for soil case 5ae prevent both outward (towards the rock) and inward (away from the rock) movement. Inward movement is only expected to occur under hydrostatic or seismic (on the side of the building opposite of the earthquake direction) loading. This will be considered in local design. The design for the below grade portions of the affected walls will be the same as the above grade portions.

Since the additional constraints for soil case 5ae place no constraint on vertical movement, axial loads are properly delivered to the basemat and the global overturning moment is unaffected.

The SASSI Dynamic model for soil case 5ae does not constrain the lateral walls as in the Static Superstructure model. The SASSI Dynamic Model includes a soil representation for the hard rock case of soil case 5ae.

Comparison of the total applied soil pressure in the superstructure static analysis and the passive soil pressure developed from the stability analysis results for various soil conditions are shown in Figures 03.08.05-28-4 through 03.08.05-28-41. The total soil pressure is a combination of static soil pressures with surcharge load and seismic passive soil pressures.

The passive soil pressure in the stability analysis is enveloped by the soil pressures applied in the superstructure static analysis for each soil case. For illustration only, the design pressure upper and lower bounds from each soil case are plotted against the stability analysis maximum soil pressure for each soil case as shown in Figures 03.08.05-28-42 through 03.08.05-28-59. The design pressures from each soil case are applied to the respective soil cases in the static analyses and the governing soil cases are designed accordingly. The upper and lower bound curves are not applied to the model and are not used for design, but are for comparison only. Both the boundary and maximum soil pressure in Figures 03.08.05-28-42 through

03.08.05-28-59 are the maximum and minimum values of the soil cases at the elevation considered, and are an envelope of all soil cases.

The applied soil pressure is also compared to the Wood's soil pressure (with surcharge) for each soil case. This is also shown in Figures 03.08.05-28-4 through 03.08.05-28-41.

2. Uncracked Concrete Model

The coefficients of passive soil pressure, K_p , in Table 03.08.05-28-2 are developed using the time history of horizontal displacement of the side walls and tendon gallery in the global embedded NI seismic stability (uncracked concrete model). The passive soil pressures for design of the embedded NI building walls and tendon gallery are scaled up from the SASSI analysis such that the maximum pressure on each wall is, at least equal to the passive earth pressure of $K_p=3$. For soil case 4ue, a uniform lateral soil pressure of 43.5 psi (300 kPa) for the wall was determined to provide a factor of safety against sliding of 1.1. K_p for soil case 5ae is not established because the NI is fully embedded in hard rock in this soil case, and the superstructure static model constrains the lateral movements of the walls below grade.

The comparison of total applied soil pressure in the superstructure static analysis and the passive soil pressure developed from the stability analysis results for various soil conditions are shown in Figures 03.08.05-28-60 through 03.08.05-28-97. The total soil pressure is a combination of static soil pressures with surcharge load and seismic passive soil pressures.

The passive soil pressures in the stability analysis are enveloped by the soil pressures applied in the superstructure static analysis for each soil case. For illustration only, the design pressure upper and lower bounds from each soil case are plotted against the stability analysis maximum soil pressure of each soil case (see Figures 03.08.05-28-98 through 03.08.05-28-115). The design pressures from each soil case are applied to the respective soil cases in the static analyses, and the governing soil cases are designed accordingly. The upper and lower bound curves are not applied to the model and are not used for design, but are for comparison only. Both the boundary and maximum soil pressures in Figures 03.08.05-28-98 through 03.08.05-28-115 are the maximum and minimum values of the soil cases at the elevation considered, and are an envelope of all soil cases.

The applied soil pressure is also compared to the Wood's soil pressure (with surcharge) for each soil case. This is also shown in Figures 03.08.05-28-60 through 03.08.05-28-97.

The additional loading developed due to the sliding calculated in the basemat analysis is also considered for the design of embedded members. The pressures are not depicted in the tables and figures that follow. Refer to the Response to RAI 371 Question 03.07.02-66 for additional detail on the basemat analysis.

Table 03.08.05-28-1—Maximum K_p Values (Cracked Concrete Case)^{1, 2, 3}

Building	Wall No.	Soil Case						4ue
		1n2ue	1n5ae	2sn4ue	BBBE	BBLB	BBUB	
All	All	2.13	1.29	2.7	0.71	0.73	0.77	Uniform Pressure of 6.26 ksf (300 kPa)

Building	Quadrant No.	Soil Case						4ue
		1n2ue	1n5ae	2sn4ue	BBBE	BBLB	BBUB	
Tendon Gallery	All	0.5	N/A	0.5	N/A	N/A	N/A	N/A

Notes:

1. See Figure 03.08.05-28-2 for wall numbering and Figure 03.08.05-28-3 for the tendon gallery quadrant numbering.
2. Soil case 5ae (hard rock) not established - superstructure static model constrains the lateral movements of below grade walls.
3. Soil cases hfbe, hflb and hfub are the same as soil cases BBBE, BBLB and BBUB, respectively.

Table 03.08.05-28-2—Maximum K_p Values (Uncracked Concrete Case)^{1, 2, 3}

Building	Wall No. ⁽⁴⁾	Soil Case						4ue
		1n2ue	1n5ae	2sn4ue	BBBE	BBLB	BBUB	
Fuel Building	2 (4 and 5)	2.1	0.9	2.4	0.75	0.65	0.7	Uniform Pressure of 6.26 ksf (300 kPa)
Safeguard Building 1	6 (3, 4, 8, and 9)	2.15	1.25	2.75	0.7	0.7	0.7	
Safeguard Building 2/3	10 (7 and 8)	2.1	1.05	2.4	0.7	0.65	0.7	
Safeguard Building 4	11	2.15	1.3	2.7	0.7	0.7	0.65	

Building	Quadrant No.	Soil Case						4ue
		1n2ue	1n5ae	2sn4ue	BBBE	BBLB	BBUB	
Tendon Gallery	All	N/A	N/A	N/A	N/A	N/A	N/A	Uniform Pressure of 7.2 ksf (345 kPa)

Notes:

1. See Figure 03.08.05-28-2 for wall numbering and Figure 03.08.05-28-3 for the tendon gallery quadrant numbering.
2. Soil case 5ae (hard rock) not established - superstructure static model constrains the lateral movements of below grade walls.
3. Soil cases hfbe, hflb and hfub are the same as soil cases BBBE, BBLB and BBUB, respectively.
4. The wall numbers in parentheses are other walls that see passive pressure at the same time as the indicated wall

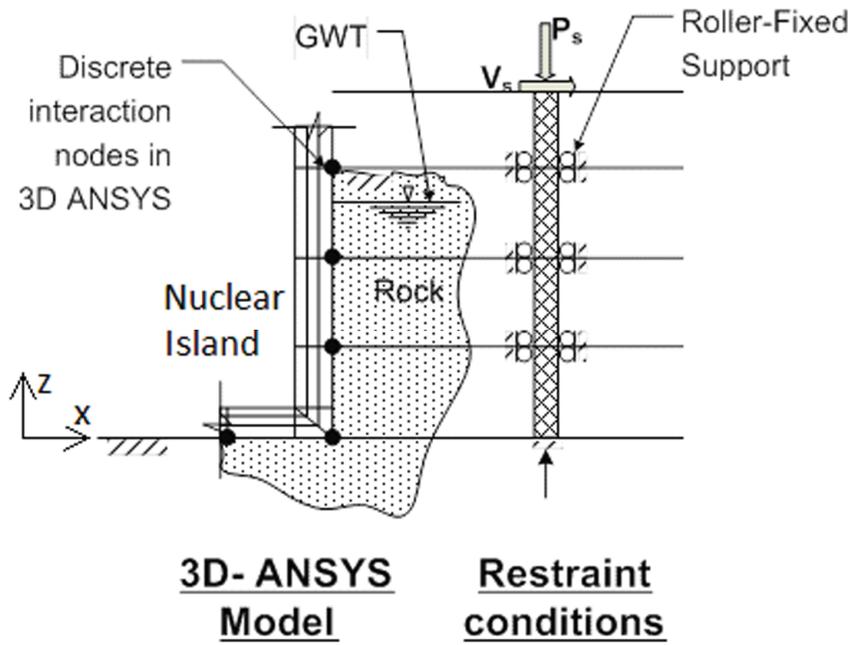


Figure 03.08.05-28-1— Additional Constraints for Soil Case 5ae

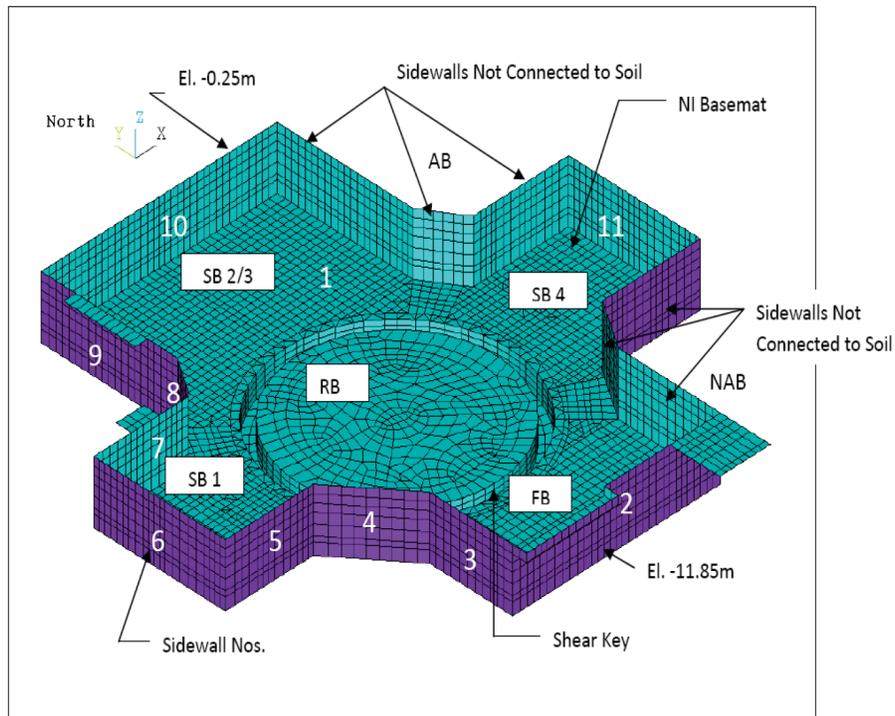


Figure 03.08.05-28-2—NI Wall Numbering

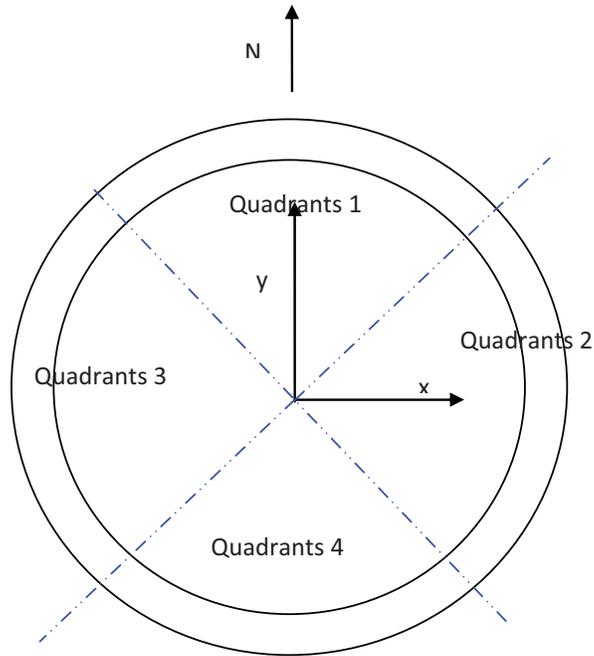


Figure 03.08.05-28-3—Tendon Gallery Quadrant Numbering

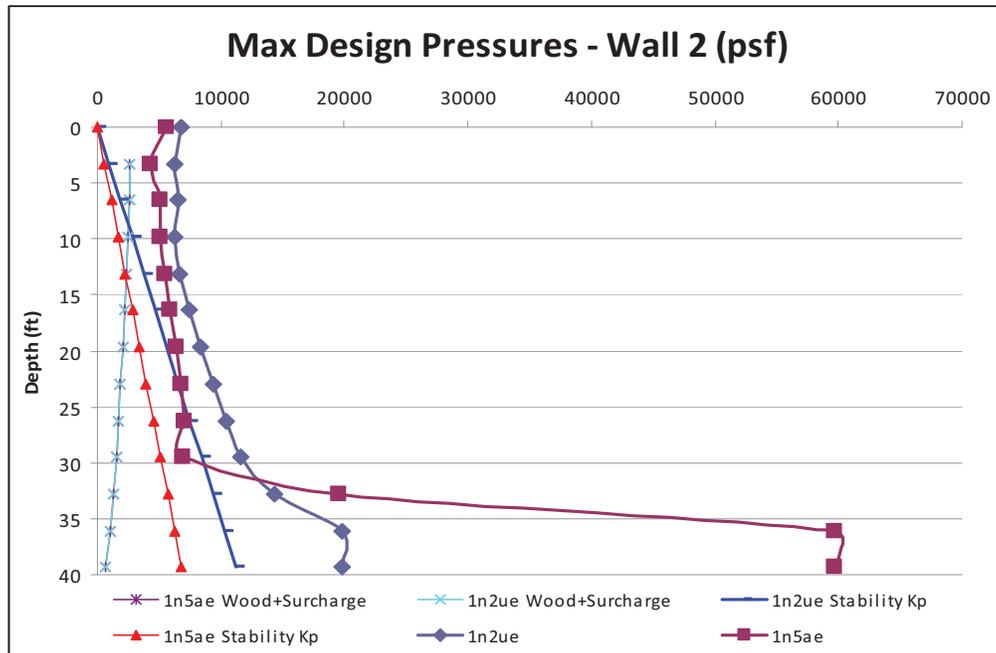


Figure 03.08.05-28-4—Wall 2 - Soil 1n2ue and 1n5ae (Cracked Concrete)

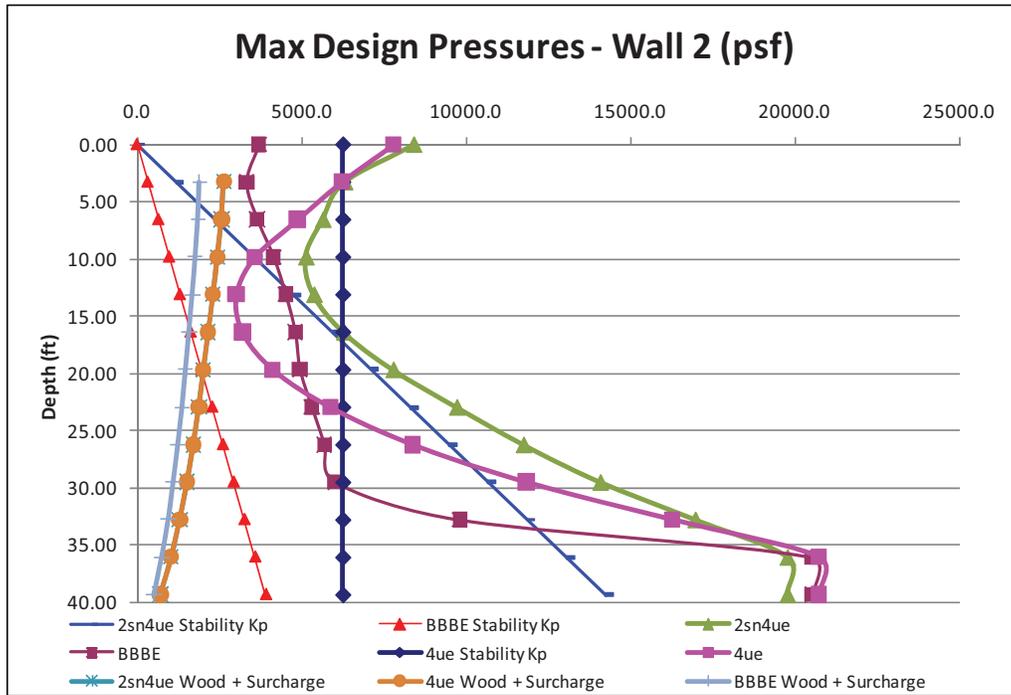


Figure 03.08.05-28-5—Wall 2 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

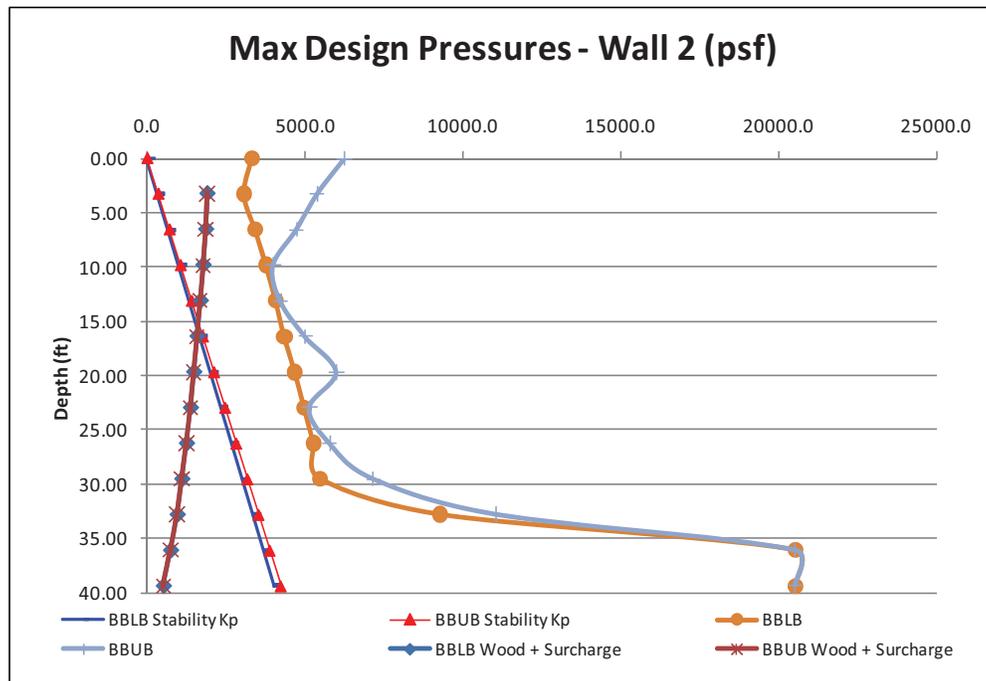


Figure 03.08.05-28-6—Wall 2 - Soil hflb and hfub (Cracked Concrete)

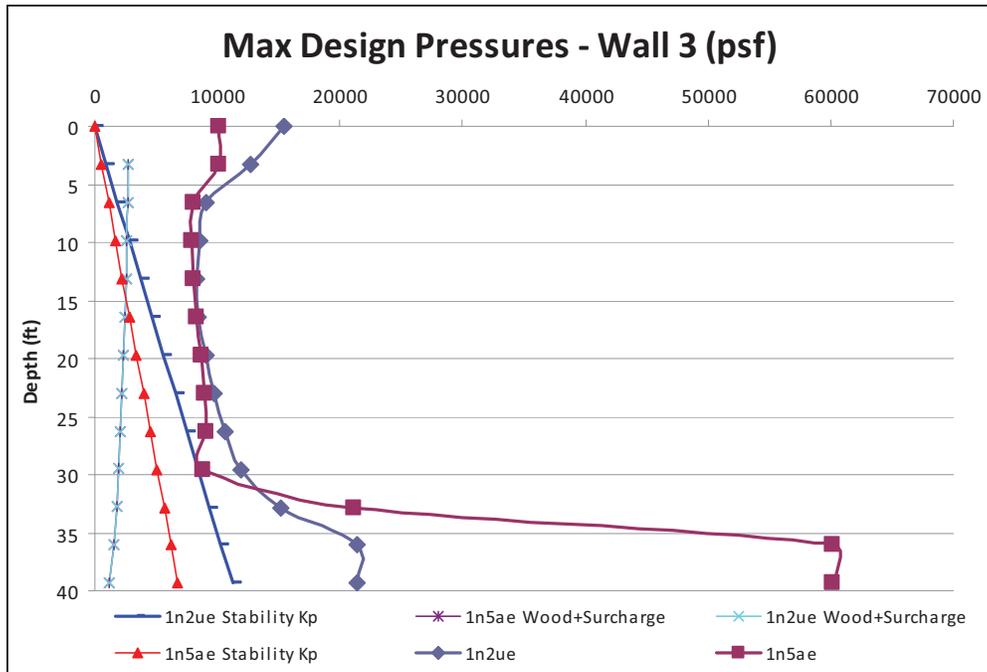


Figure 03.08.05-28-7—Wall 3 - Soil 1n2ue and 1n5ae (Cracked Concrete)

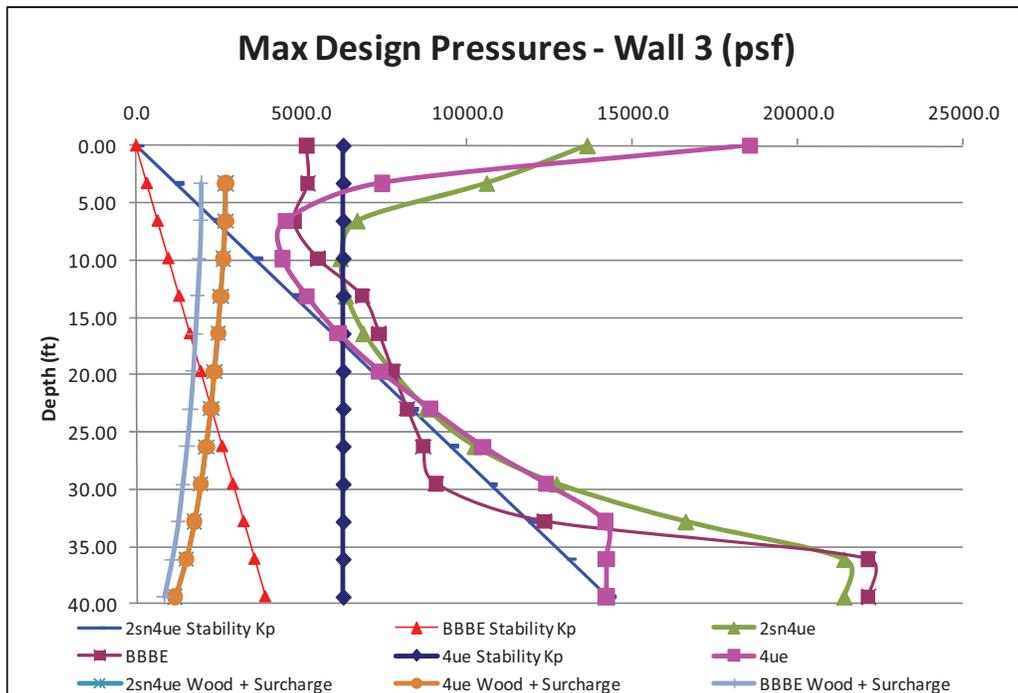


Figure 03.08.05-28-8—Wall 3 - Soil 2sn4ue, 4ue and hfbbe (Cracked Concrete)

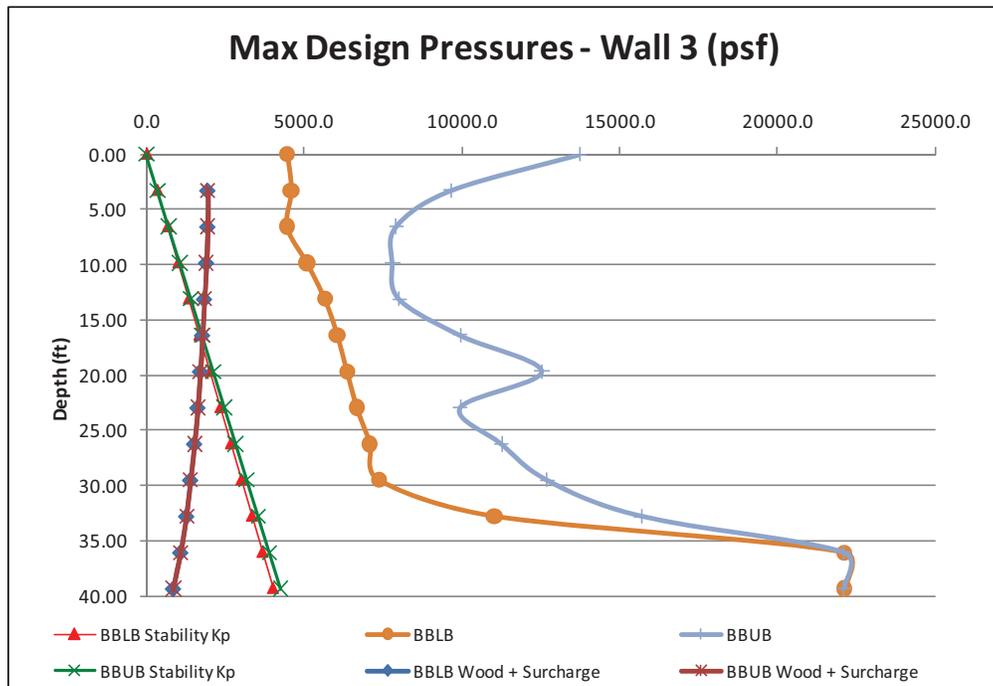


Figure 03.08.05-28-9—Wall 3 - Soil hflb and hfub (Cracked Concrete)

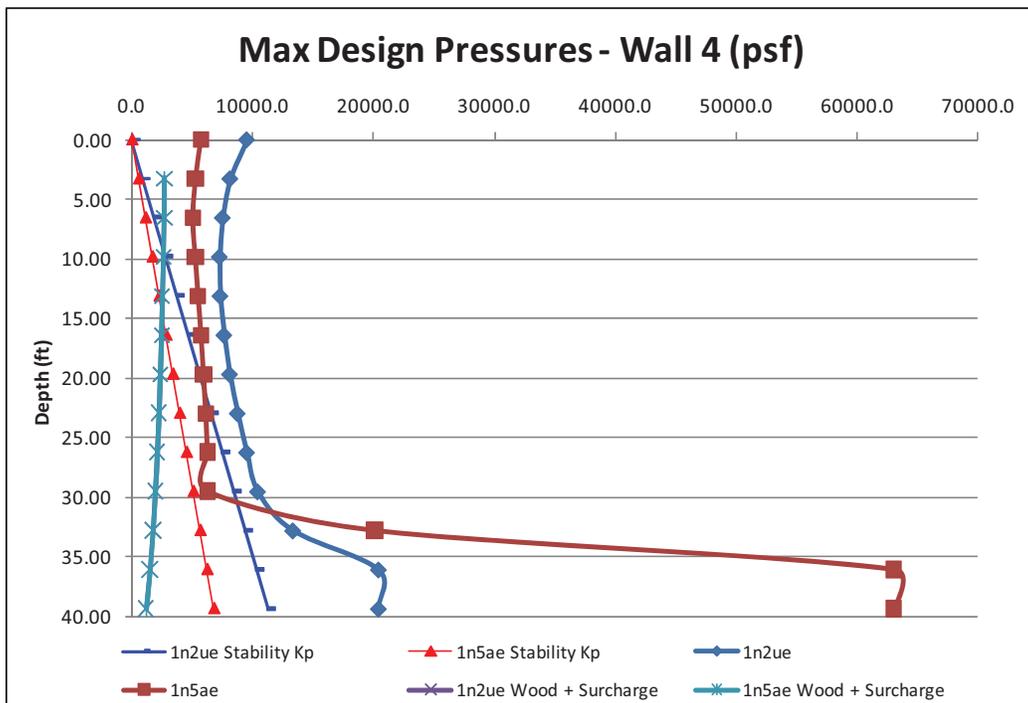


Figure 03.08.05-28-10—Wall 4 - Soil 1n2ue and 1n5ae (Cracked Concrete)

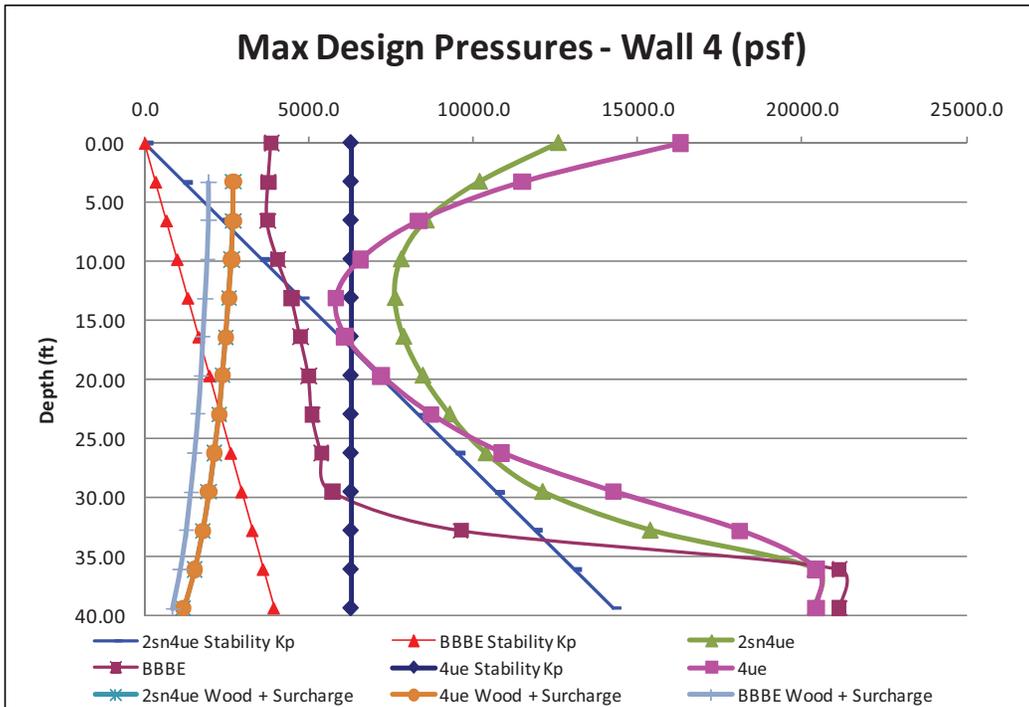


Figure 03.08.05-28-11—Wall 4 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

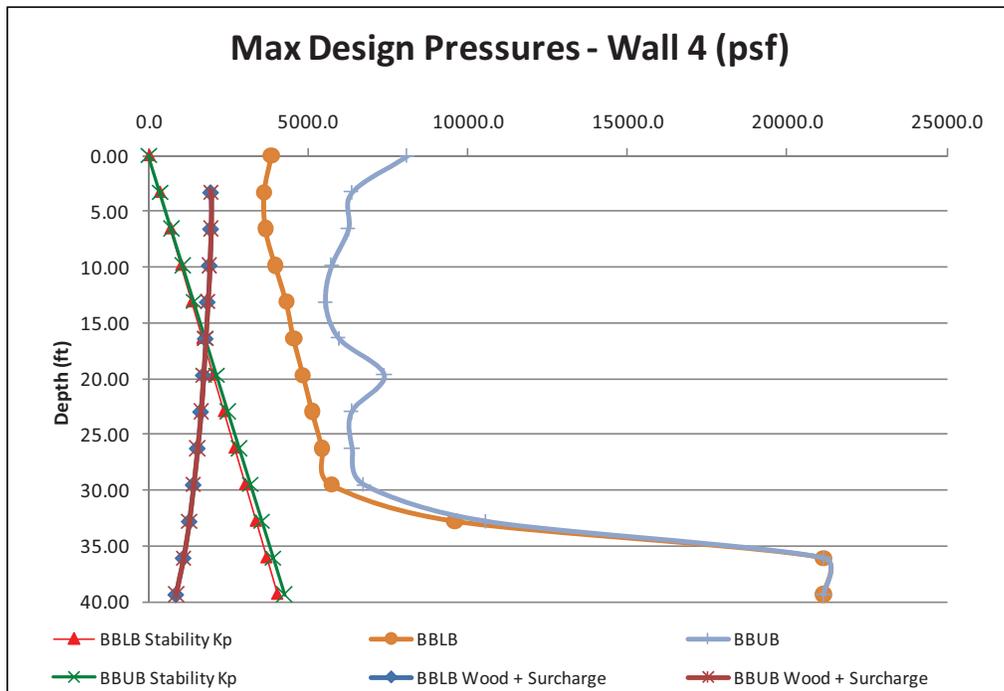


Figure 03.08.05-28-12—Wall 4 - Soil hfbl and hfub (Cracked Concrete)

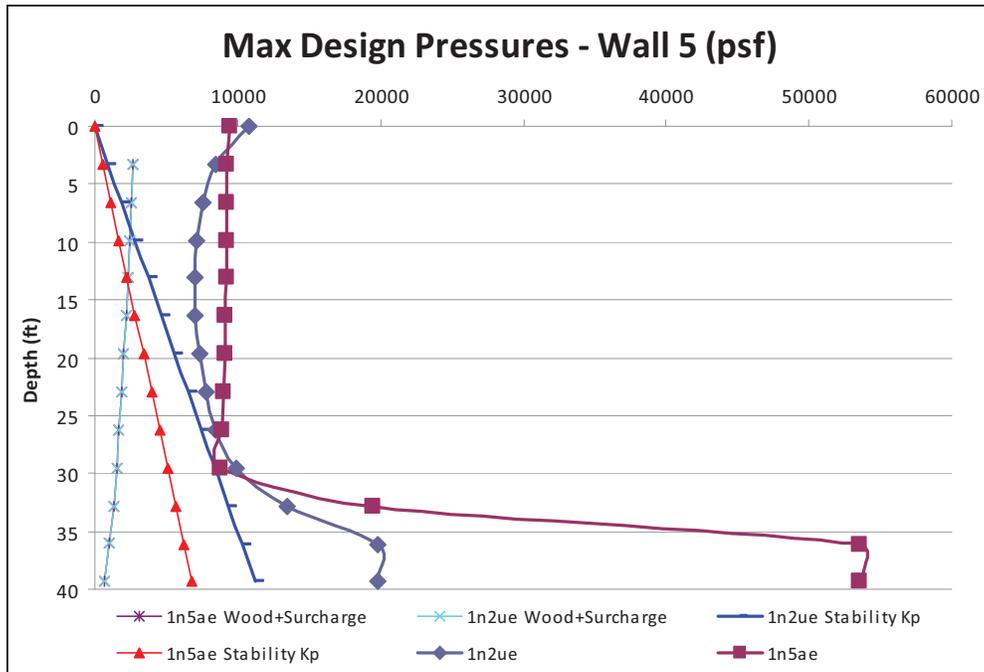


Figure 03.08.05-28-13—Wall 5 - Soil 1n2ue and 1n5ae (Cracked Concrete)

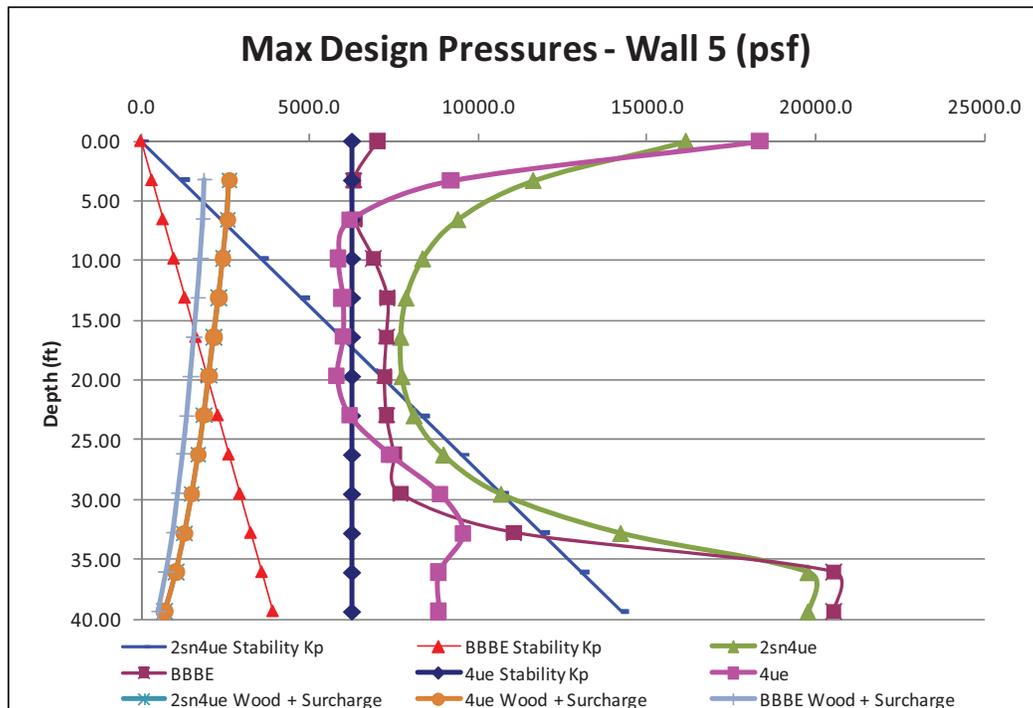


Figure 03.08.05-28-14—Wall 5 - Soil 2sn4ue, 4ue and hfbbe (Cracked Concrete)

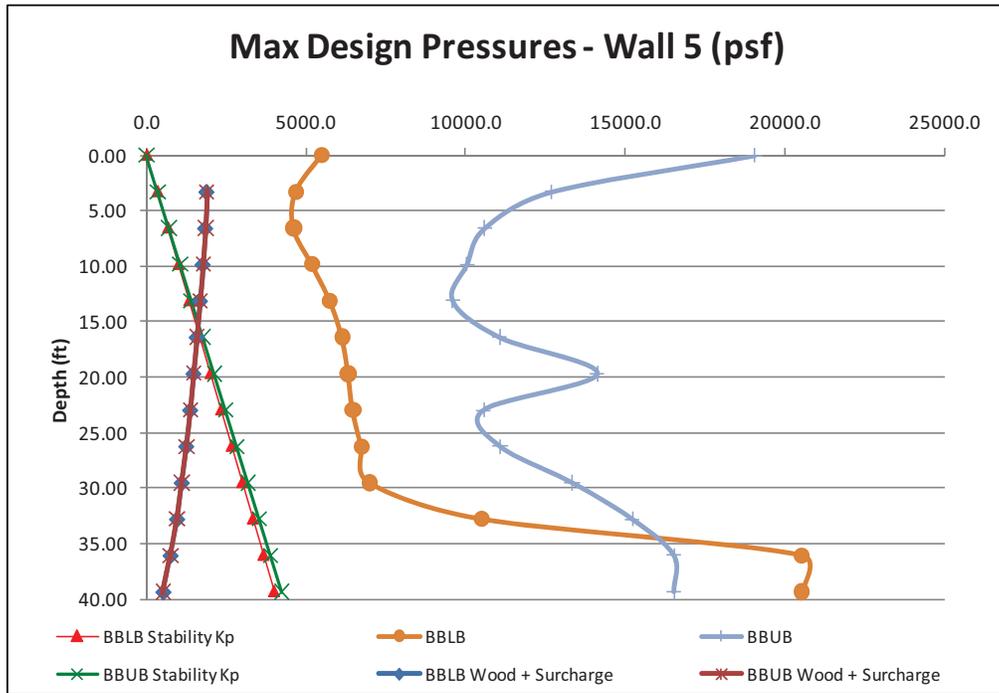


Figure 03.08.05-28-15—Wall 5 - Soil hflb and hfub (Cracked Concrete)

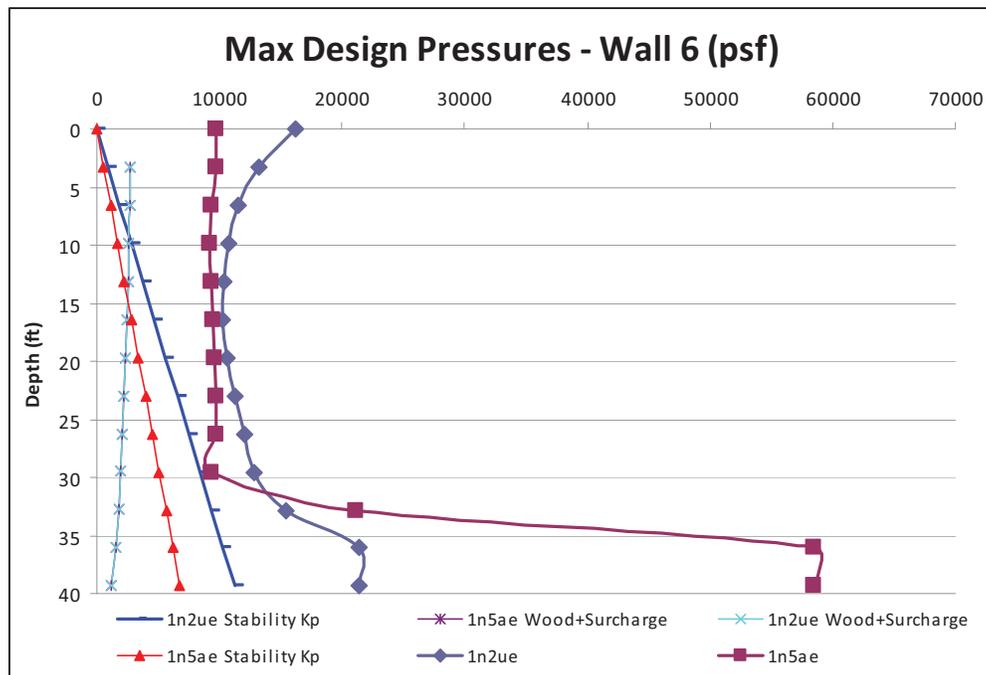


Figure 03.08.05-28-16—Wall 6 - Soil 1n2ue and 1n5ae (Cracked Concrete)

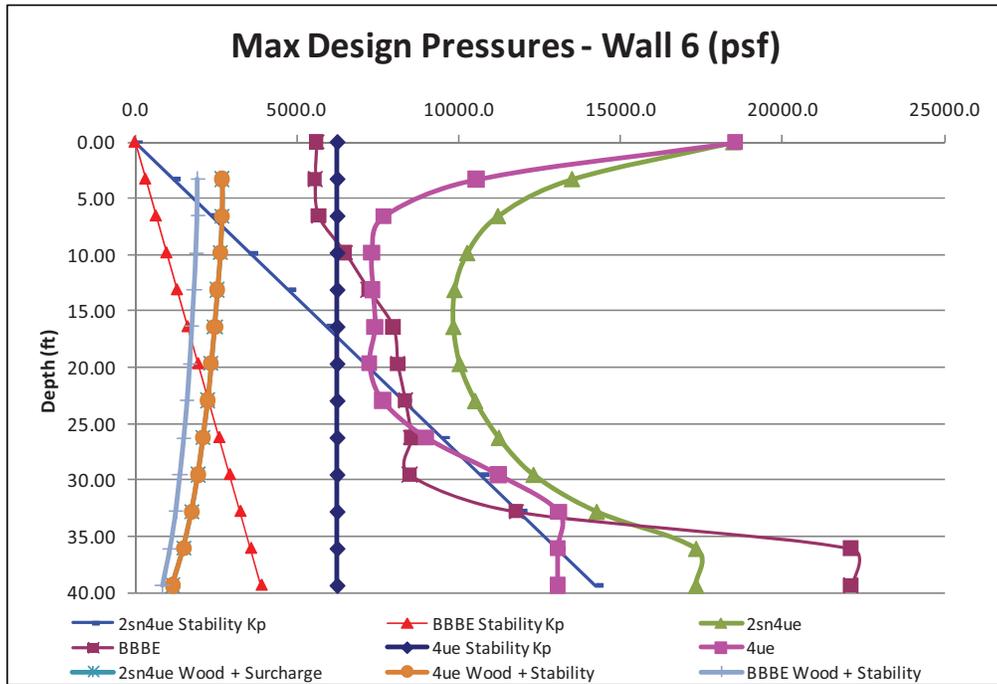


Figure 03.08.05-28-17—Wall 6 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

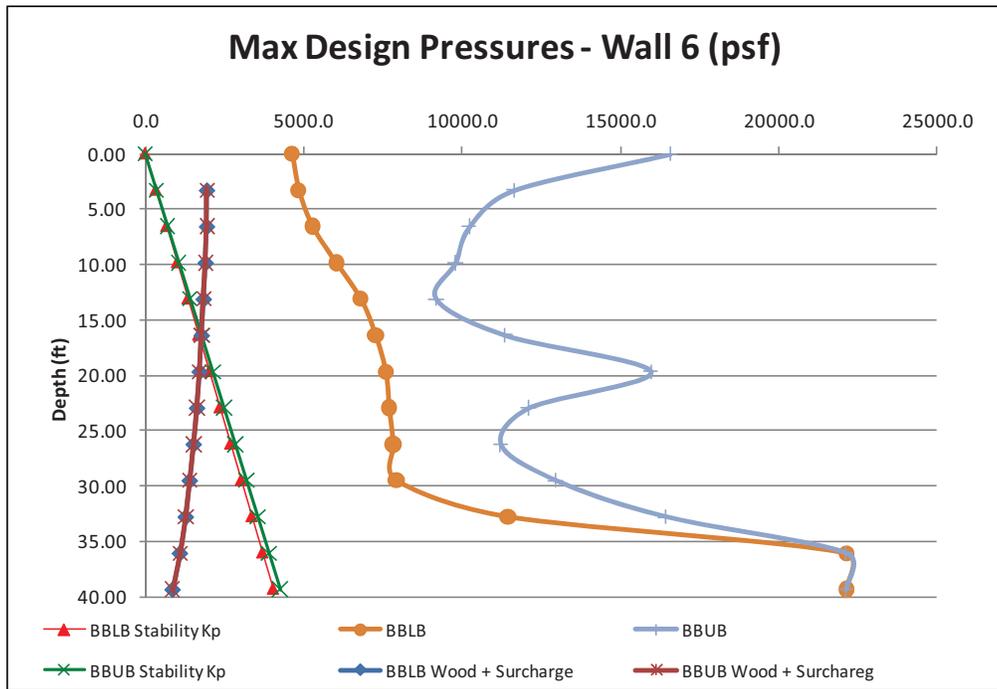


Figure 03.08.05-28-18—Wall 6 - Soil hflb and hfub (Cracked Concrete)

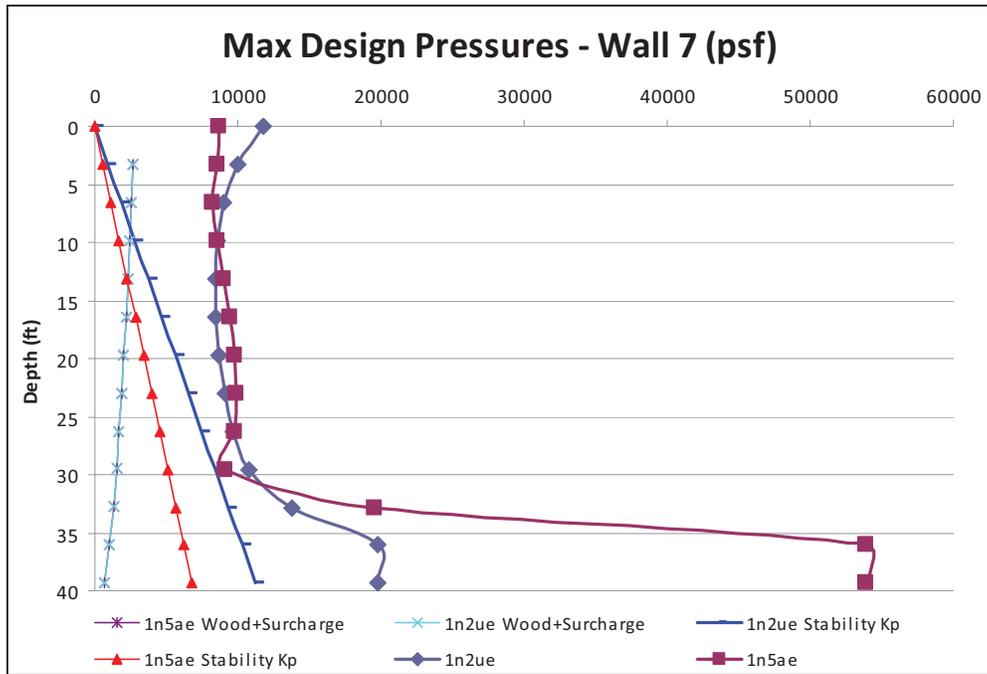


Figure 03.08.05-28-19—Wall 7 - Soil 1n2ue and 1n5ae (Cracked Concrete)

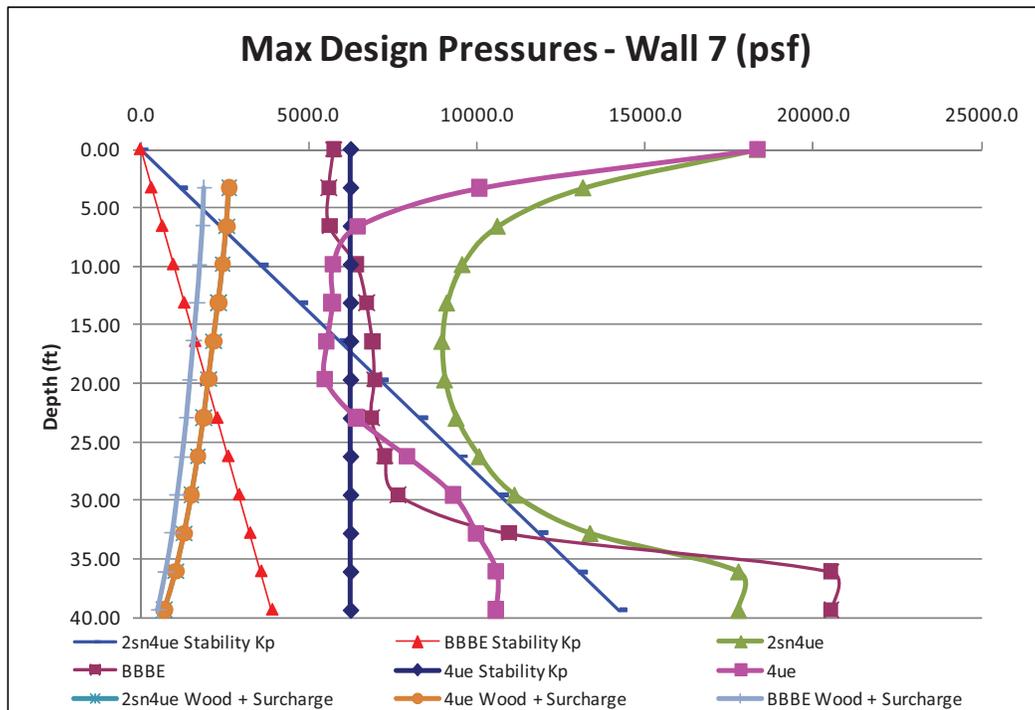


Figure 03.08.05-28-20—Wall 7 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

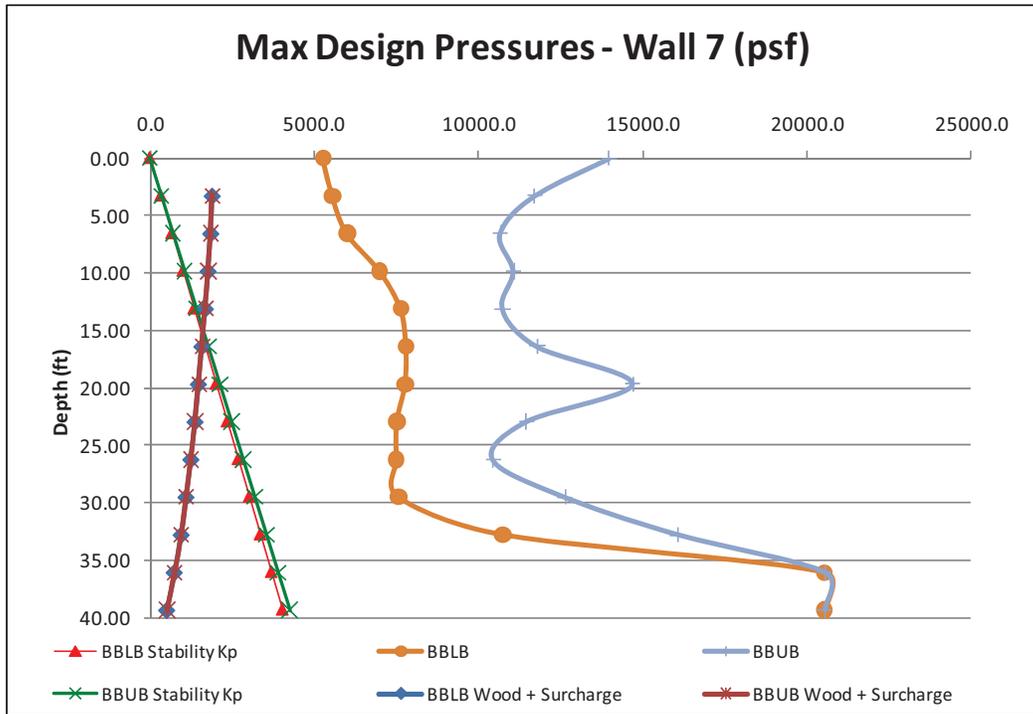


Figure 03.08.05-28-21—Wall 7 - Soil hflb and hfub (Cracked Concrete)

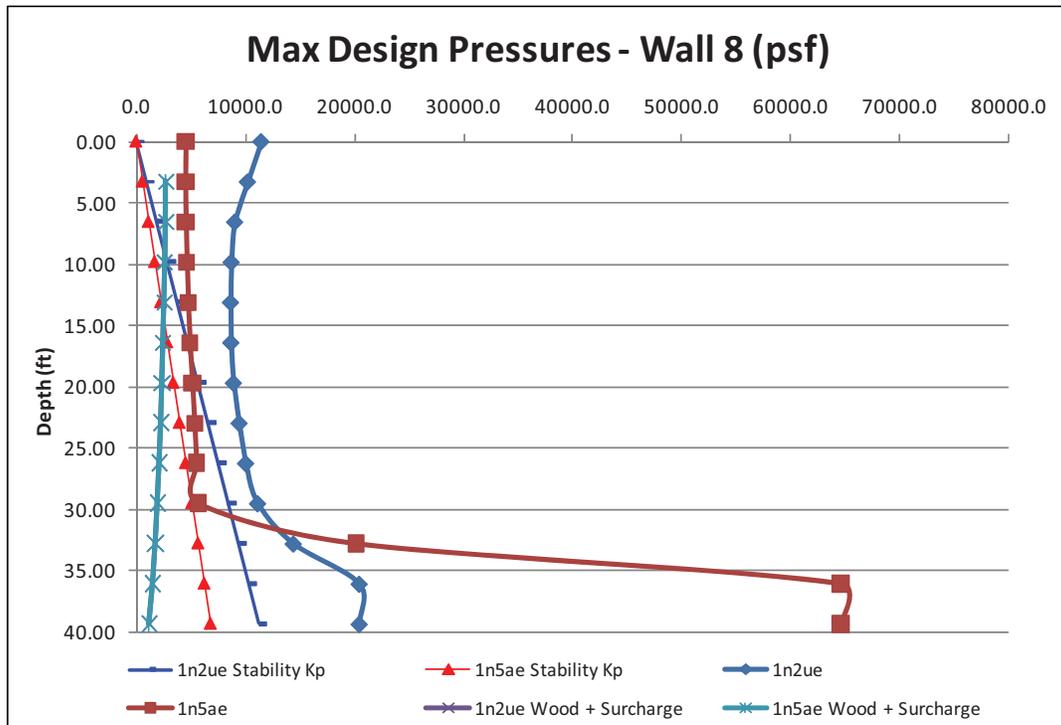


Figure 03.08.05-28-22—Wall 8 - Soil 1n2ue and 1n5ae (Cracked Concrete)

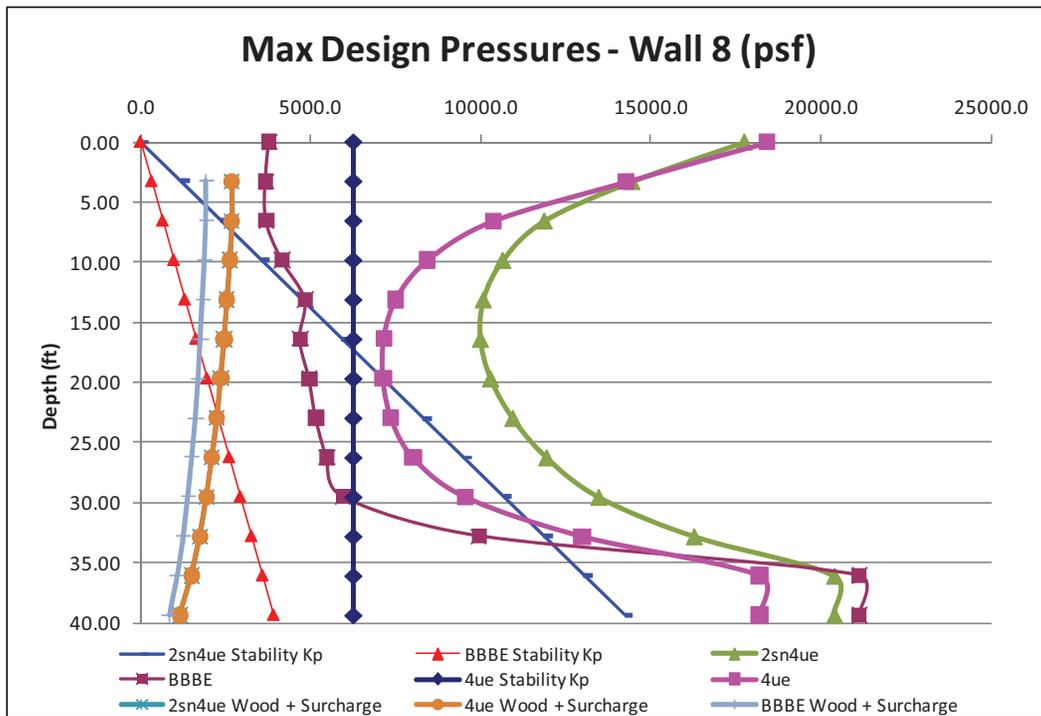


Figure 03.08.05-28-23—Wall 8 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

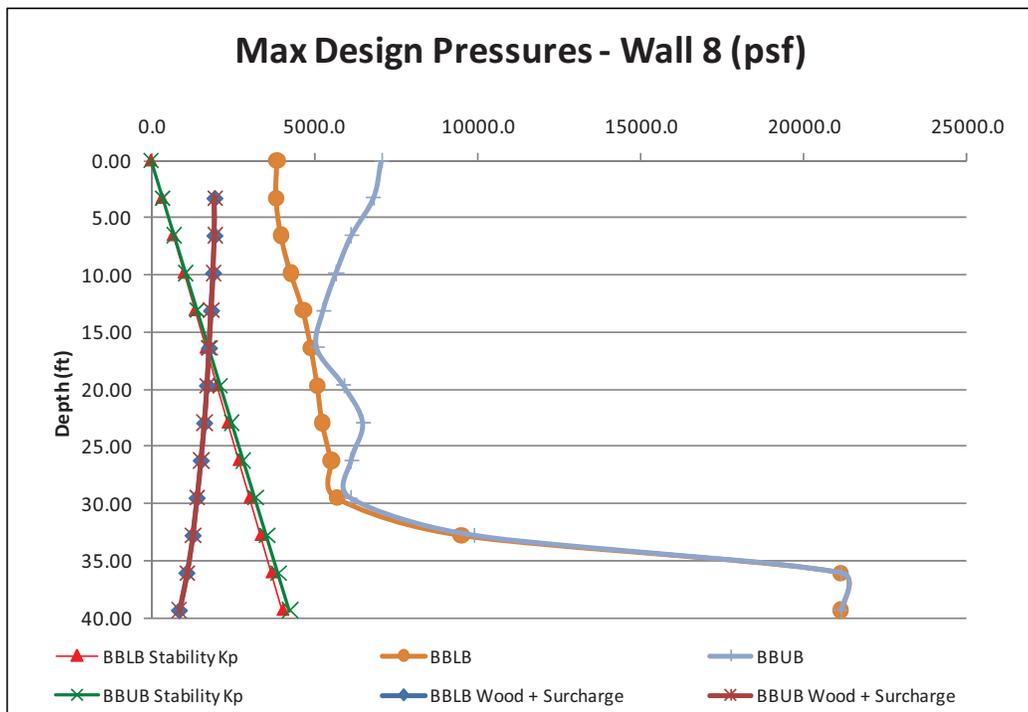


Figure 03.08.05-28-24—Wall 8 - Soil hf1b and hfub (Cracked Concrete)

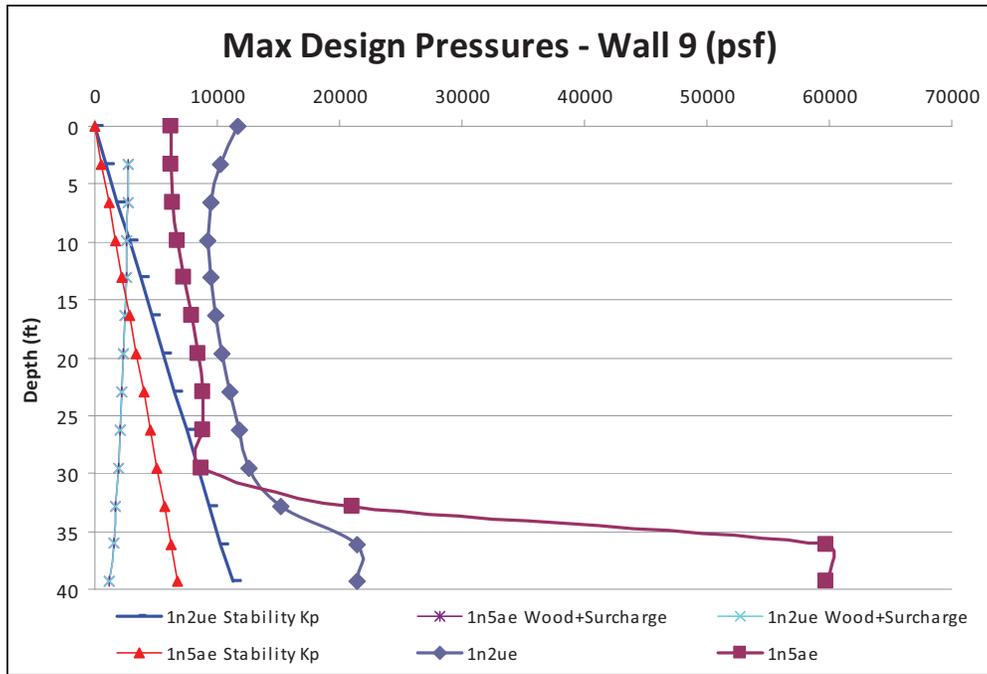


Figure 03.08.05-28-25—Wall 9 - Soil 1n2ue and 1n5ae (Cracked Concrete)

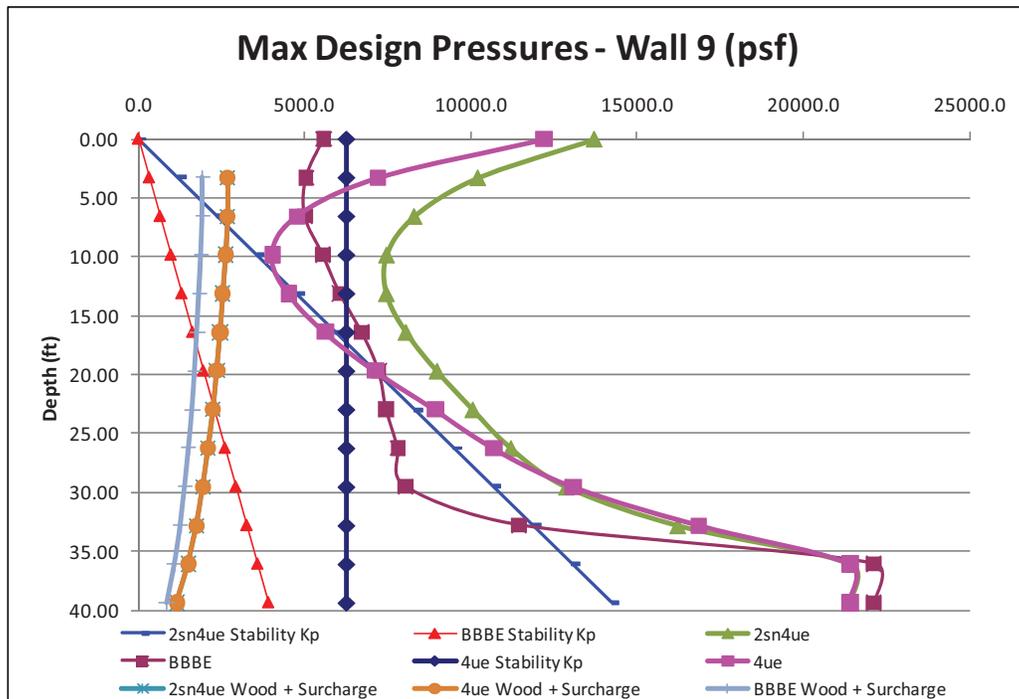


Figure 03.08.05-28-26—Wall 9 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

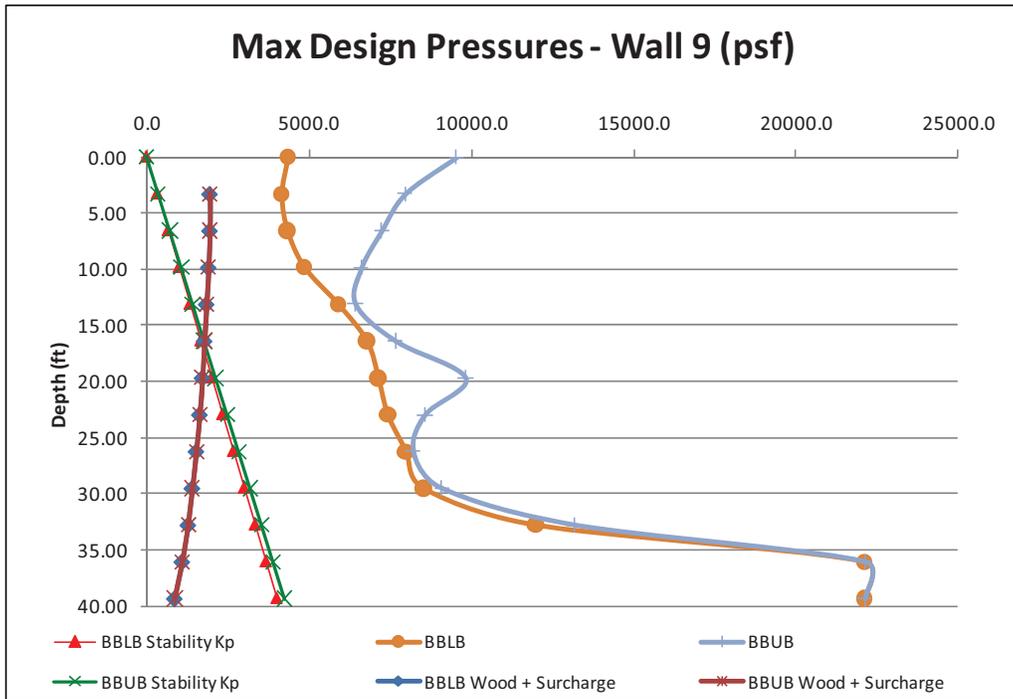


Figure 03.08.05-28-27—Wall 9 - Soil hflb and hfub (Cracked Concrete)

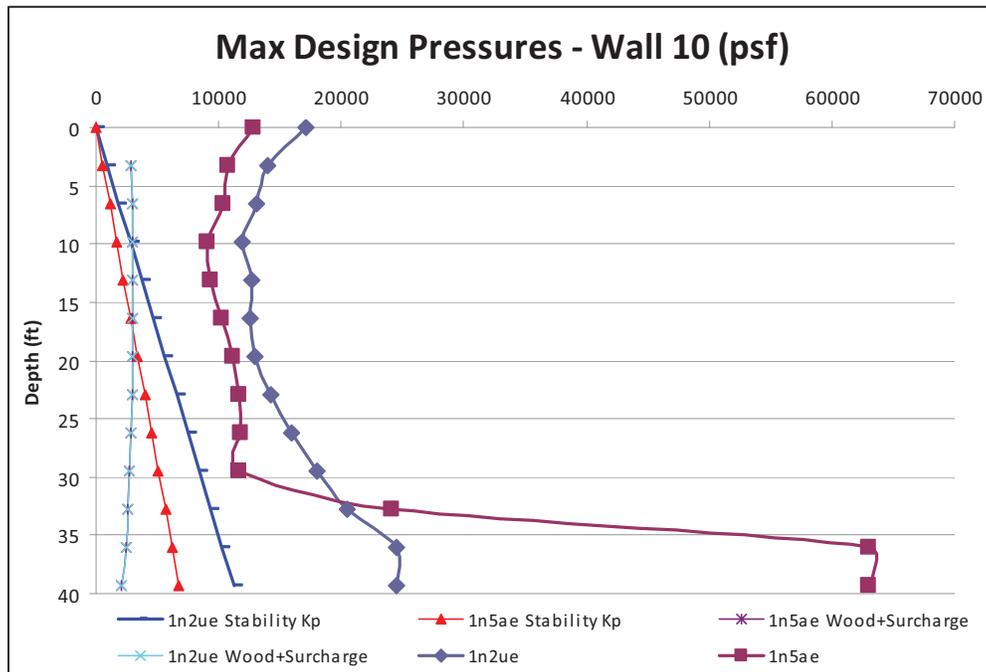


Figure 03.08.05-28-28—Wall 10 - Soil 1n2ue and 1n5ae (Cracked Concrete)

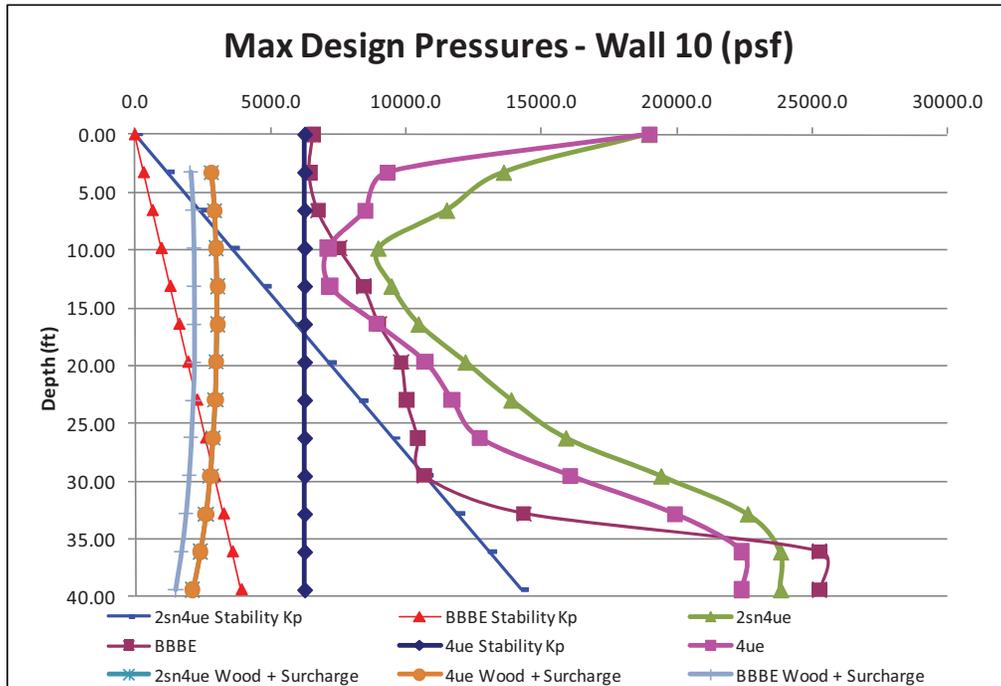


Figure 03.08.05-28-29—Wall 10 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

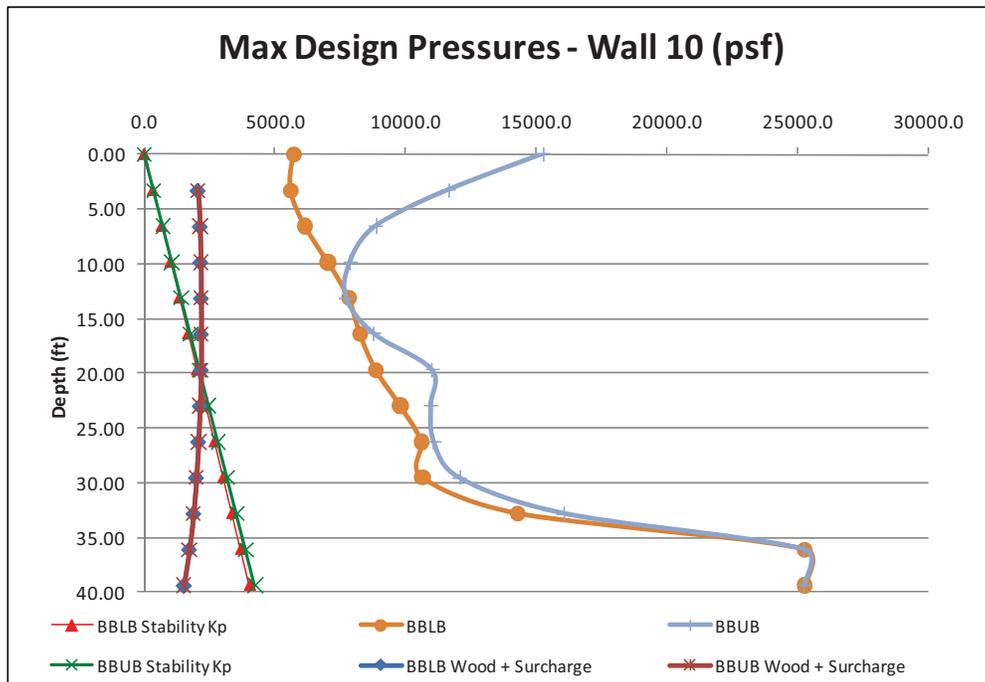


Figure 03.08.05-28-30—Wall 10 - Soil hflb and hfub (Cracked Concrete)

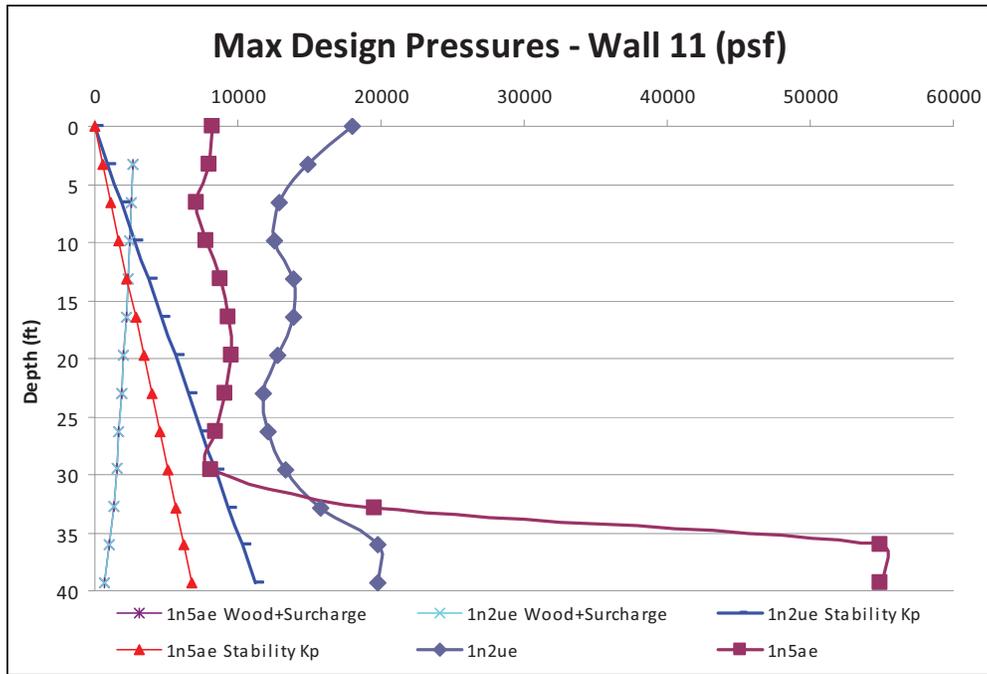


Figure 03.08.05-28-31—Wall 11 - Soil 1n2ue and 1n5ae (Cracked Concrete)

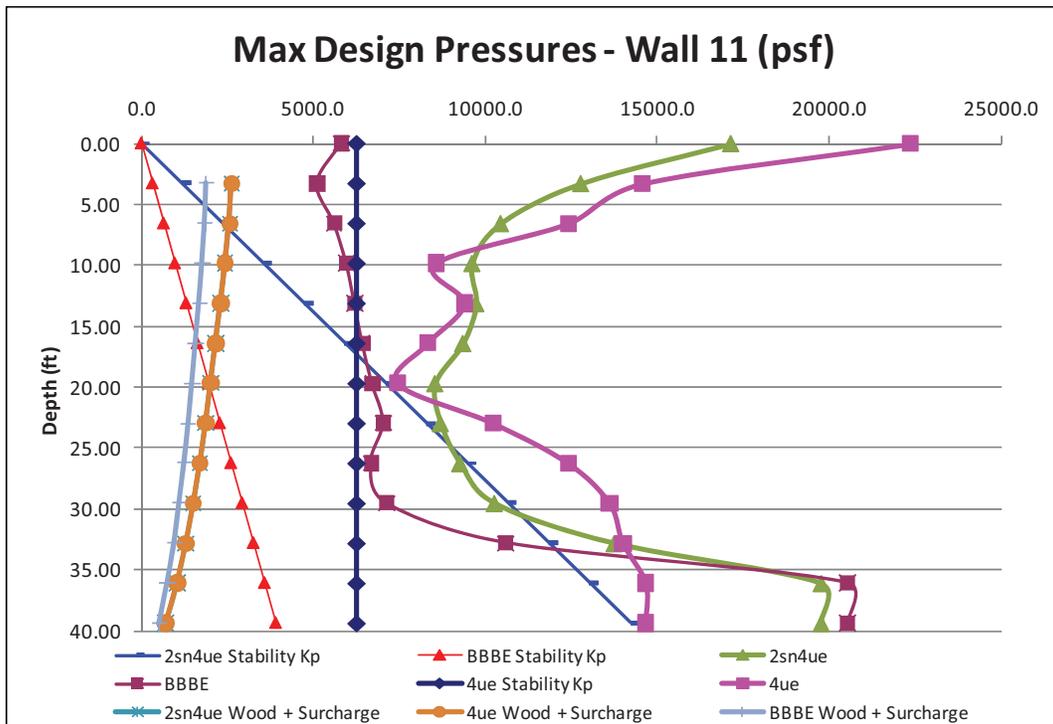


Figure 03.08.05-28-32—Wall 11 - Soil 2sn4ue, 4ue and hfbе (Cracked Concrete)

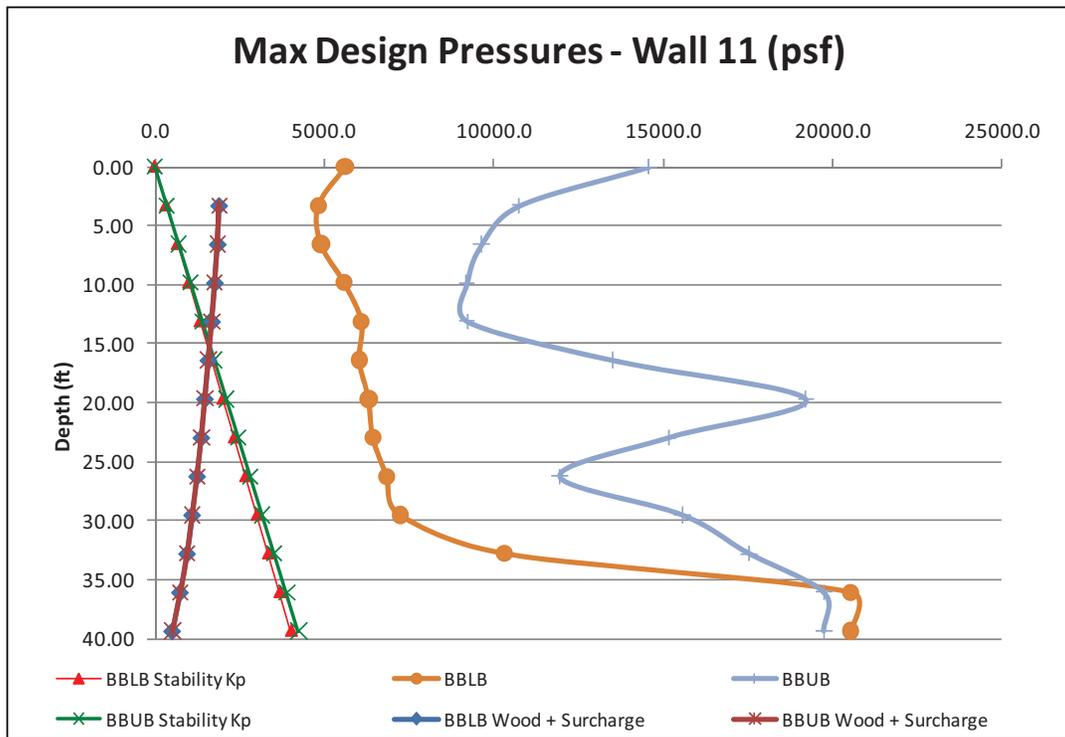


Figure 03.08.05-28-33—Wall 11 - Soil hflb and hfub (Cracked Concrete)

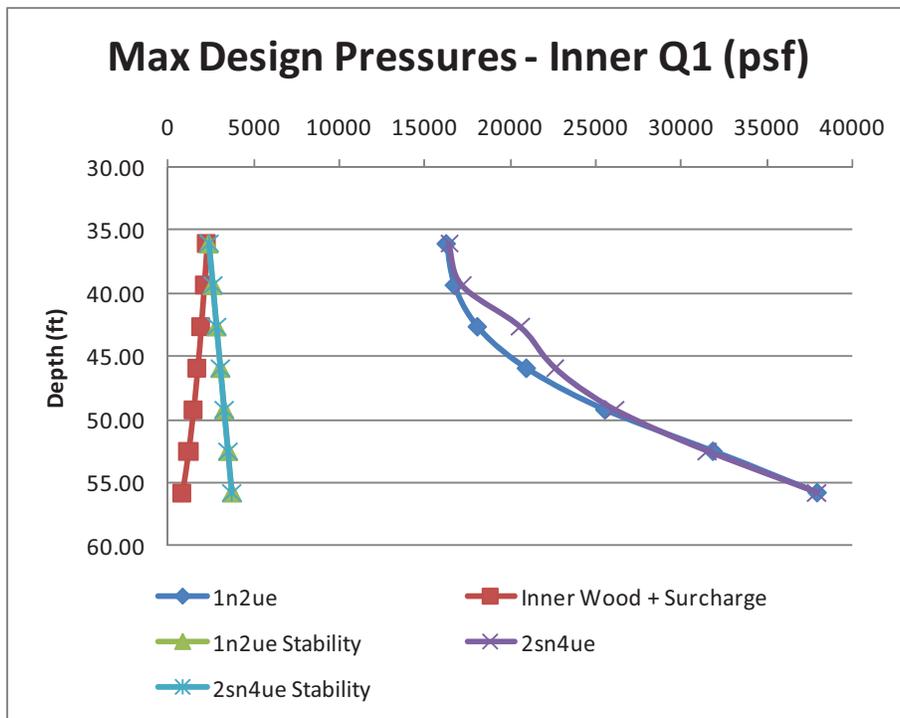


Figure 03.08.05-28-34— Tendon Gallery Inner Q1 – Soil 1n2ue & 2sn4ue (Cracked Concrete)

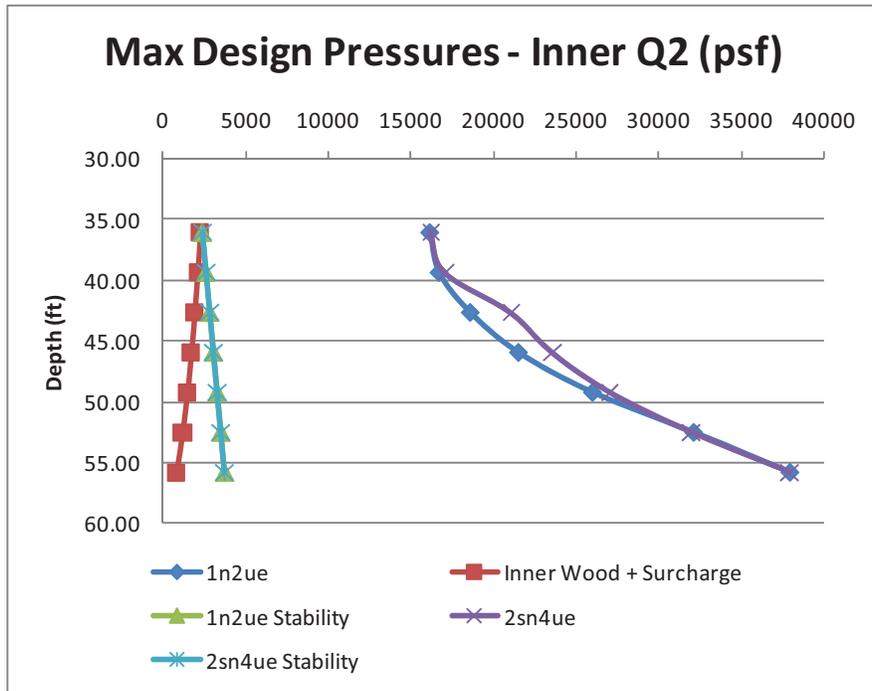


Figure 03.08.05-28-35— Tendon Gallery Inner Q2 – Soil 1n2ue & 2sn4ue (Cracked Concrete)

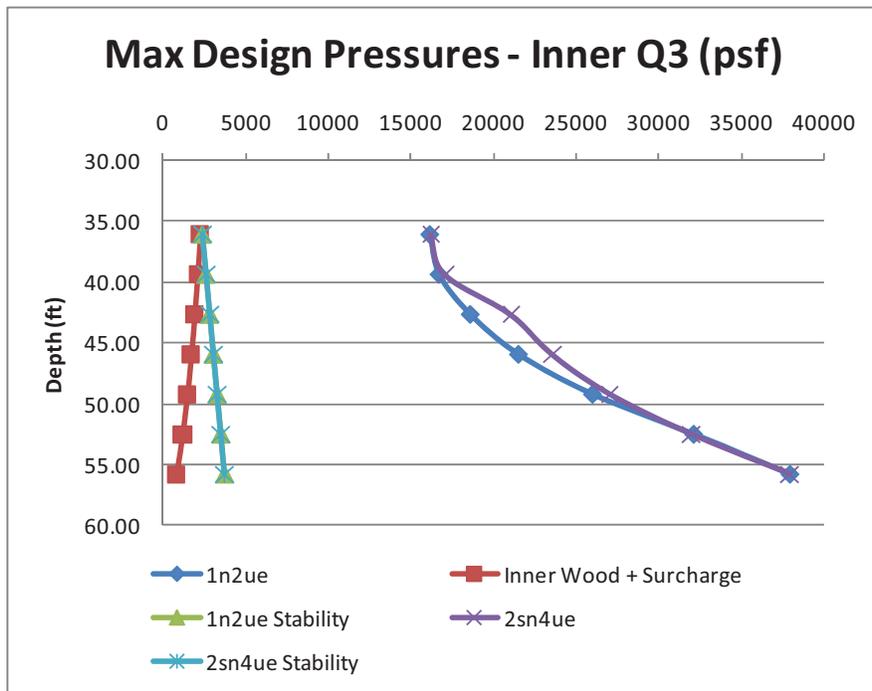


Figure 03.08.05-28-36— Tendon Gallery Inner Q3 – Soil 1n2ue & 2sn4ue (Cracked Concrete)

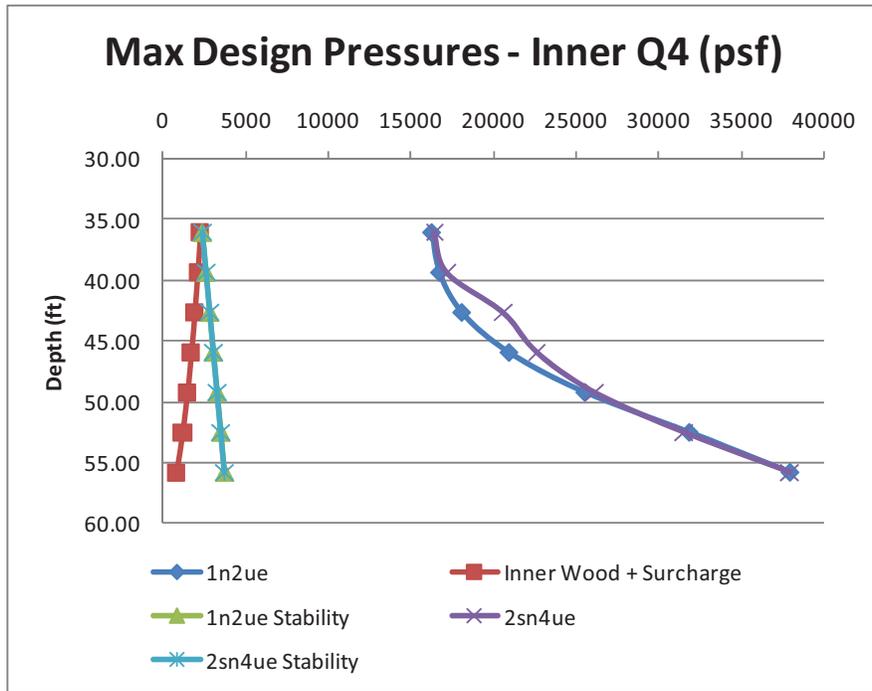


Figure 03.08.05-28-37— Tendon Gallery Inner Q4 – Soil 1n2ue & 2sn4ue (Cracked Concrete)

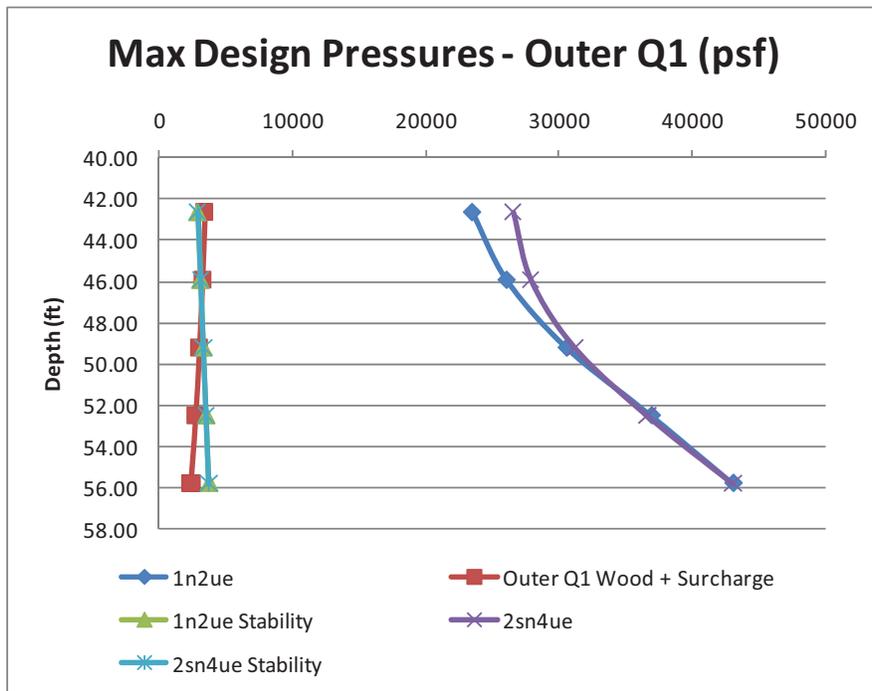


Figure 03.08.05-28-38— Tendon Gallery Outer Q1 – Soil 1n2ue & 2sn4ue (Cracked Concrete)

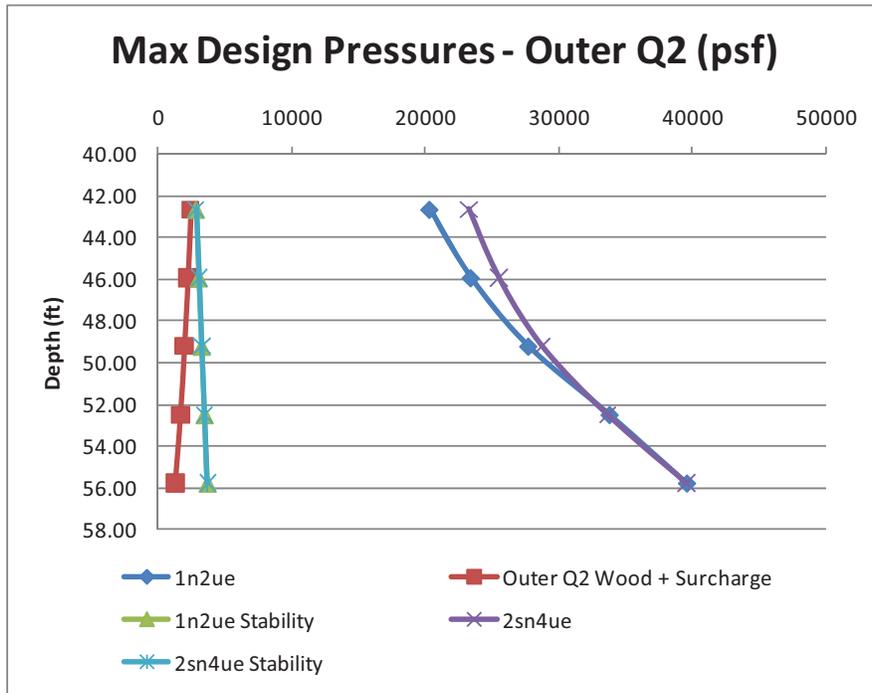


Figure 03.08.05-28-39— Tendon Gallery Outer Q2 – Soil 1n2ue & 2sn4ue (Cracked Concrete)

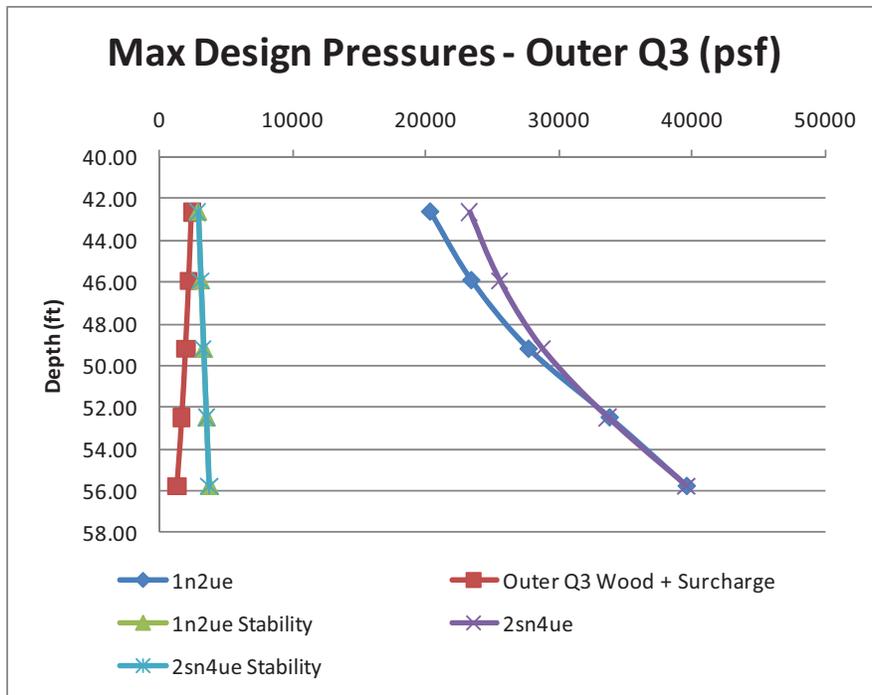


Figure 03.08.05-28-40— Tendon Gallery Outer Q3 – Soil 1n2ue & 2sn4ue (Cracked Concrete)

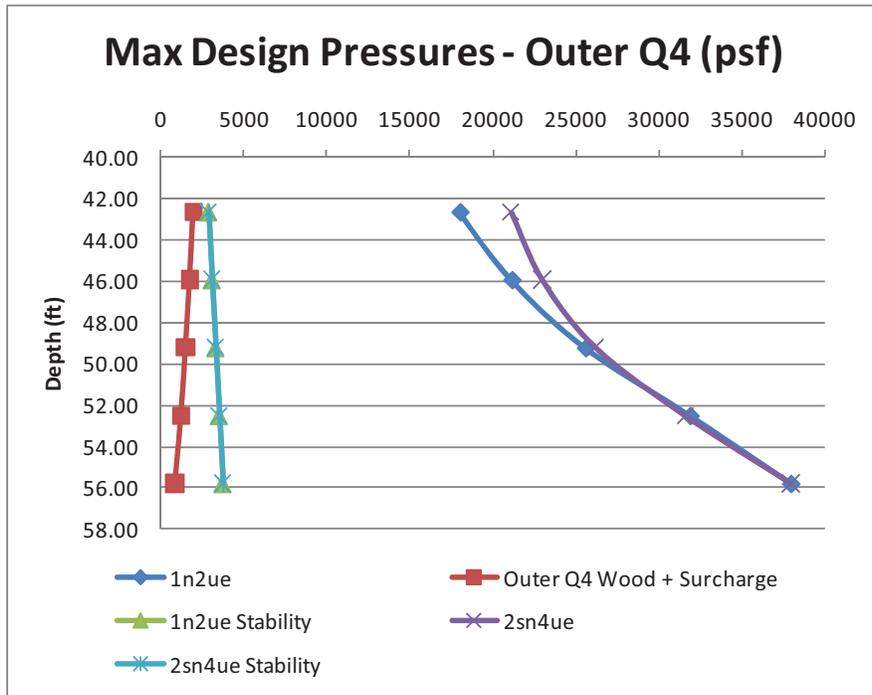


Figure 03.08.05-28-41— Tendon Gallery Outer Q4 – Soil 1n2ue & 2sn4ue (Cracked Concrete)

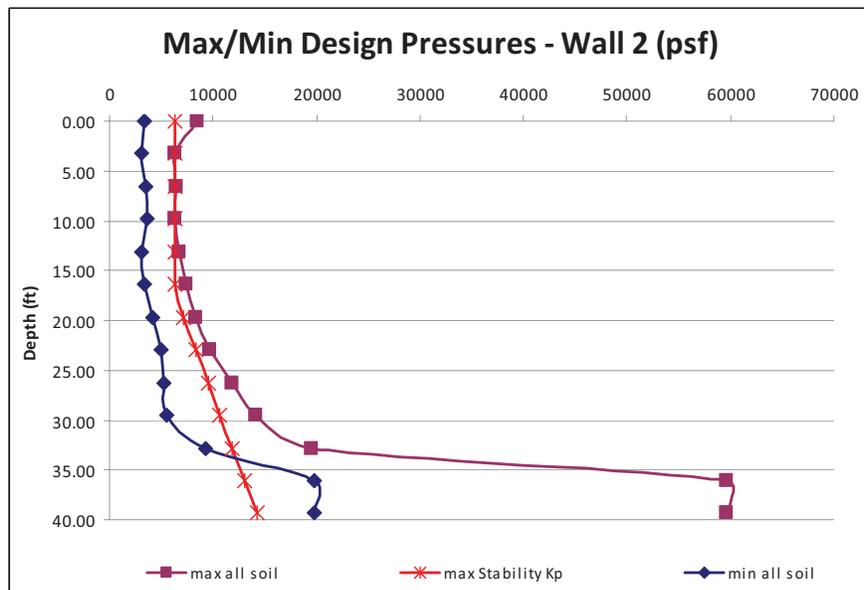


Figure 03.08.05-28-42—Wall 2 – Upper/Lower Bound of all Soil Cases (Cracked Concrete)

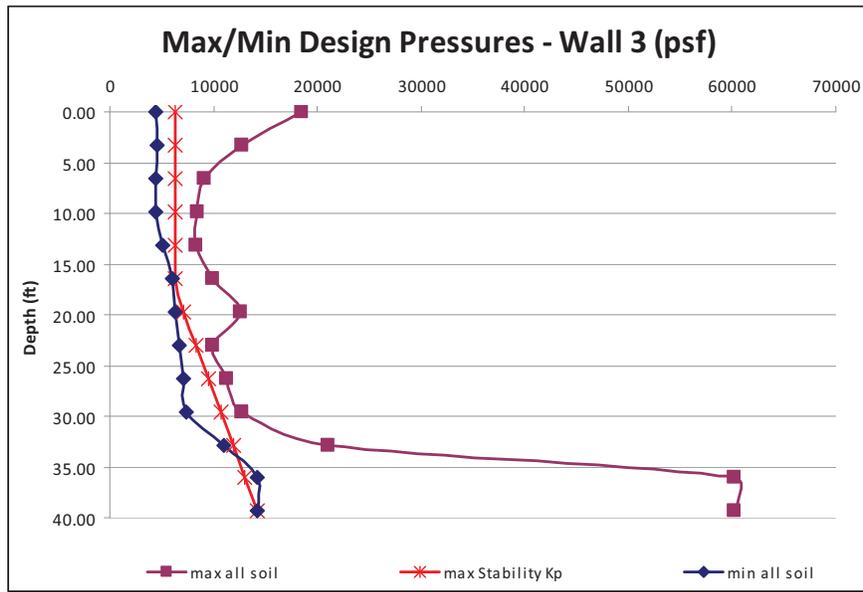


Figure 03.08.05-28-43—Wall 3 – Upper/Lower Bound of all Soil Cases (Cracked Concrete)

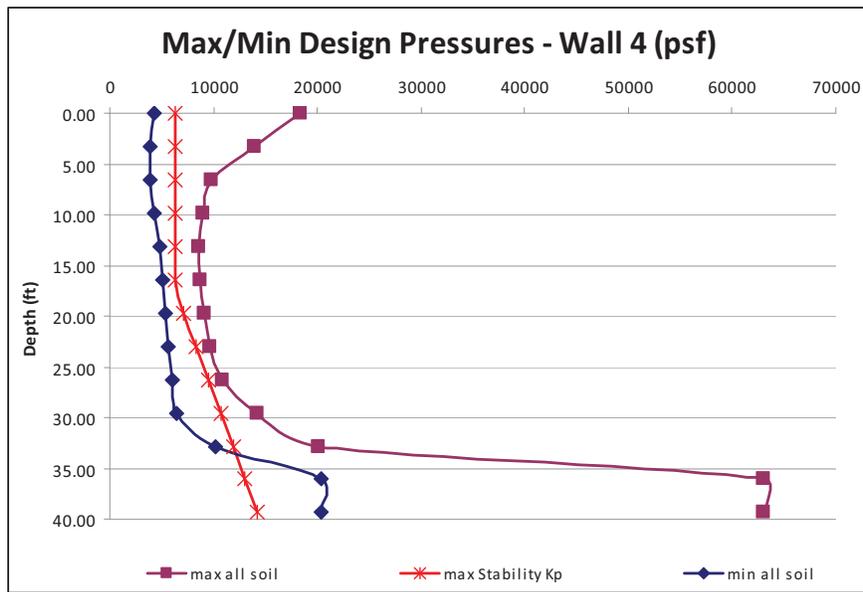


Figure 03.08.05-28-44—Wall 4 – Upper/Lower Bound of all Soil Cases (Cracked Concrete)

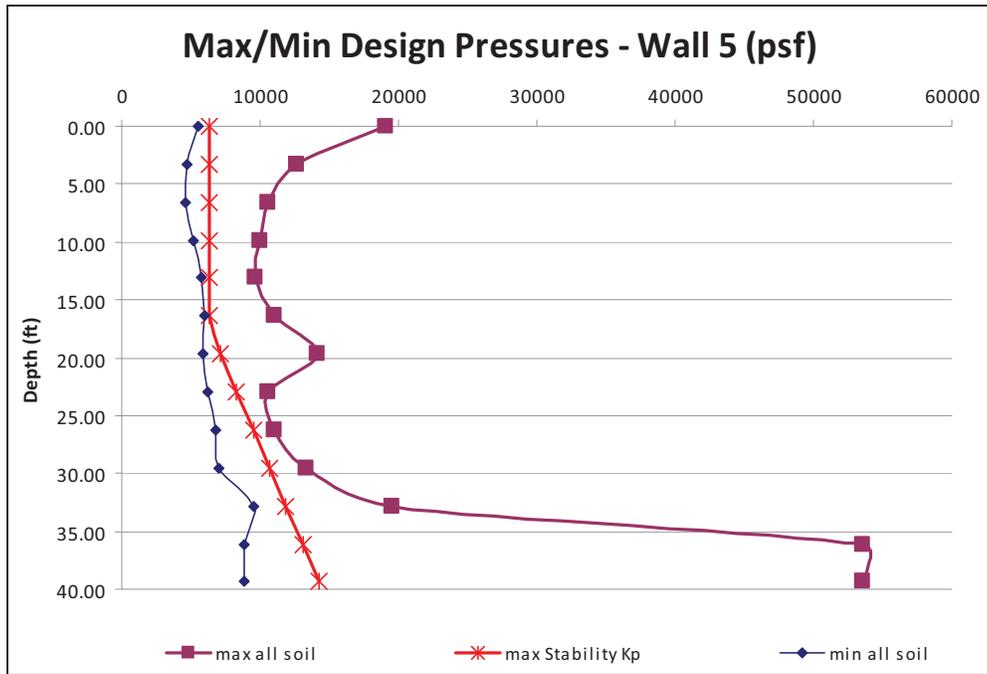


Figure 03.08.05-28-45—Wall 5 – Upper/Lower Bound of all Soil Cases (Cracked Concrete)

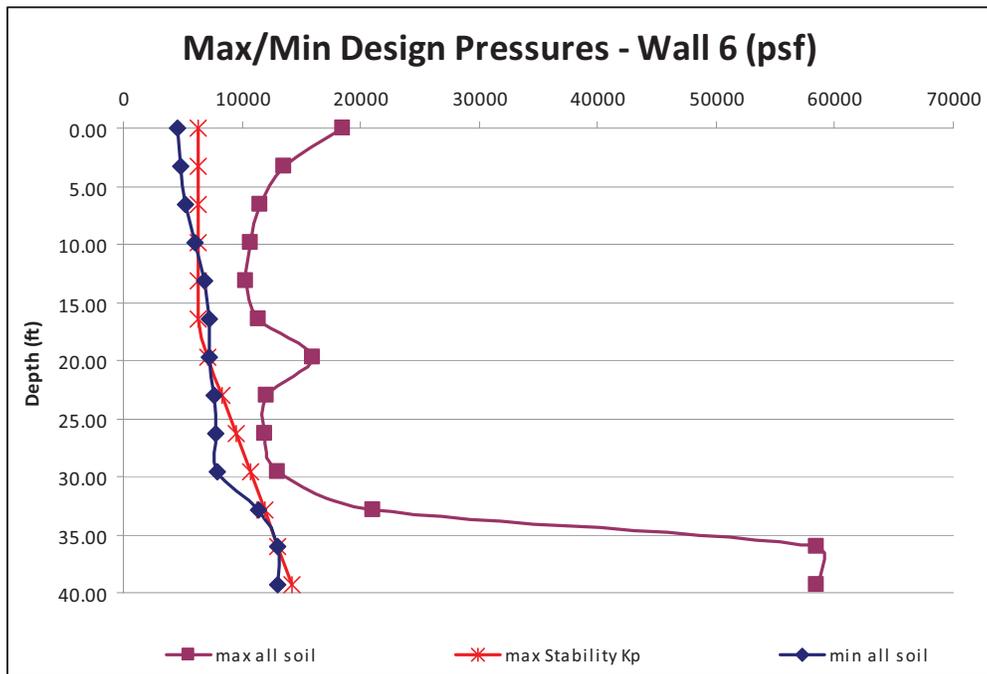


Figure 03.08.05-28-46—Wall 6 – Upper/Lower Bound of all Soil Cases (Cracked Concrete)

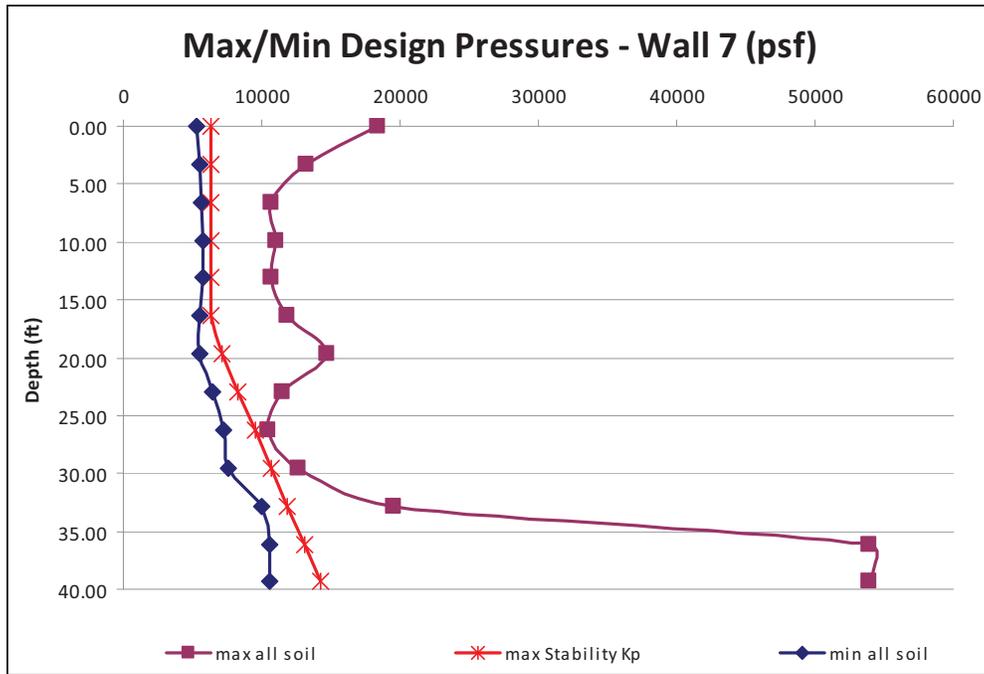


Figure 03.08.05-28-47—Wall 7 – Upper/Lower Bound of all Soil Cases (Cracked Concrete)

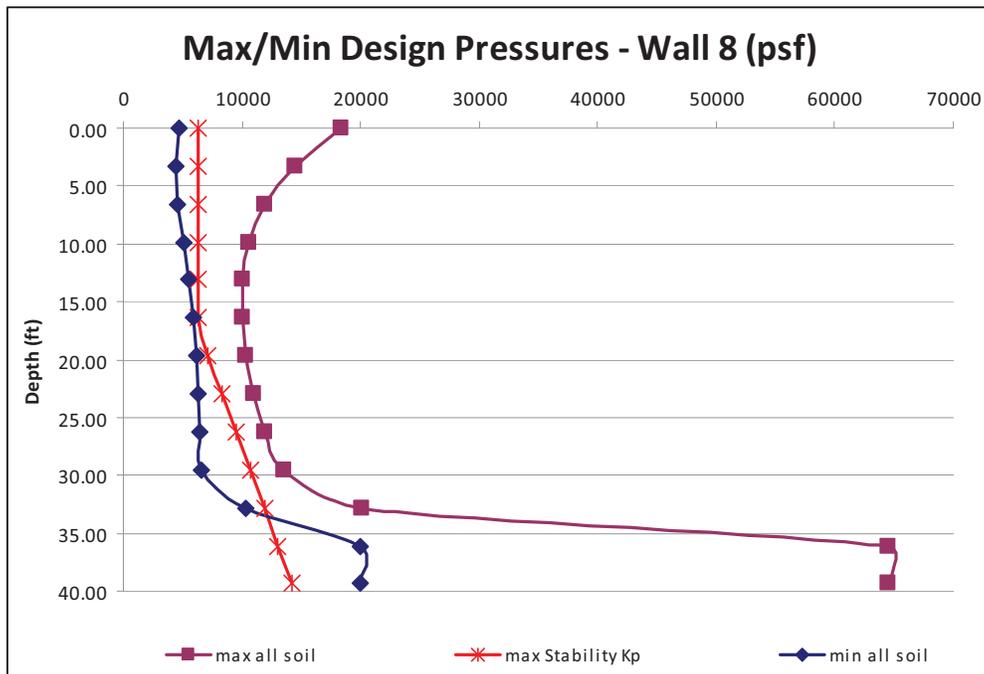


Figure 03.08.05-28-48—Wall 8 – Upper/Lower Bound of all Soil Cases (Cracked Concrete)

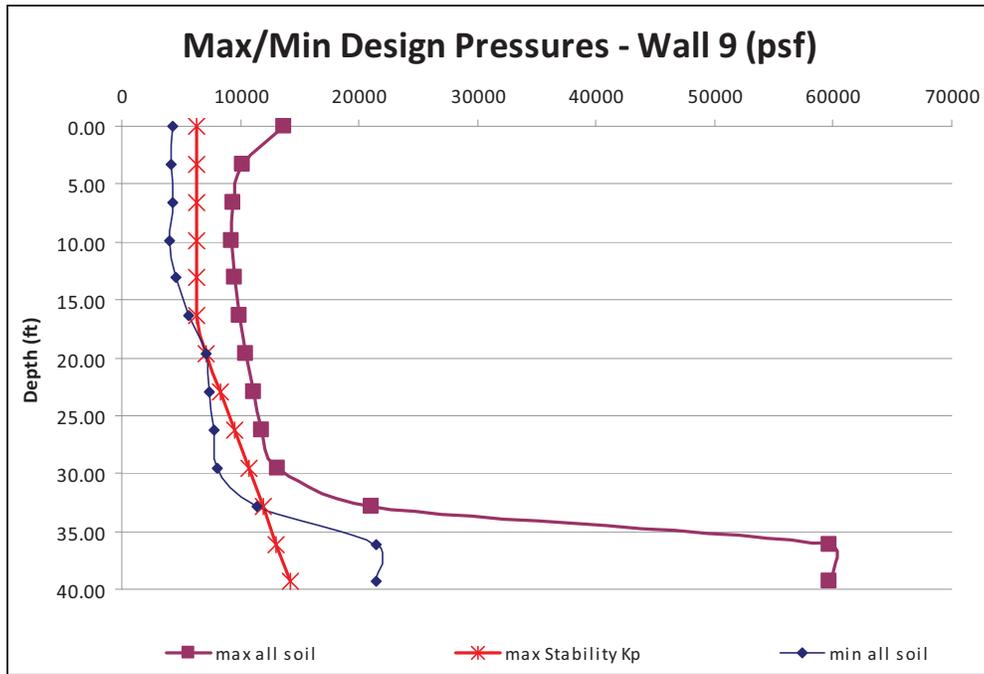


Figure 03.08.05-28-49—Wall 9 – Upper/Lower Bound of all Soil Cases (Cracked Concrete)

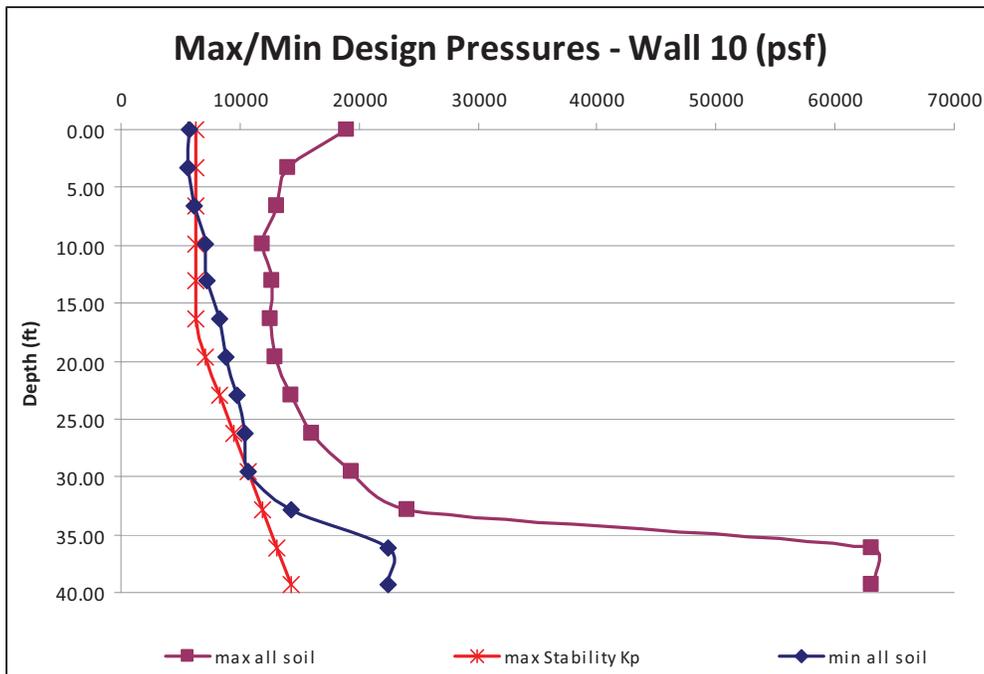


Figure 03.08.05-28-50—Wall 10 – Upper/Lower Bound of all Soil Cases (Cracked Concrete)

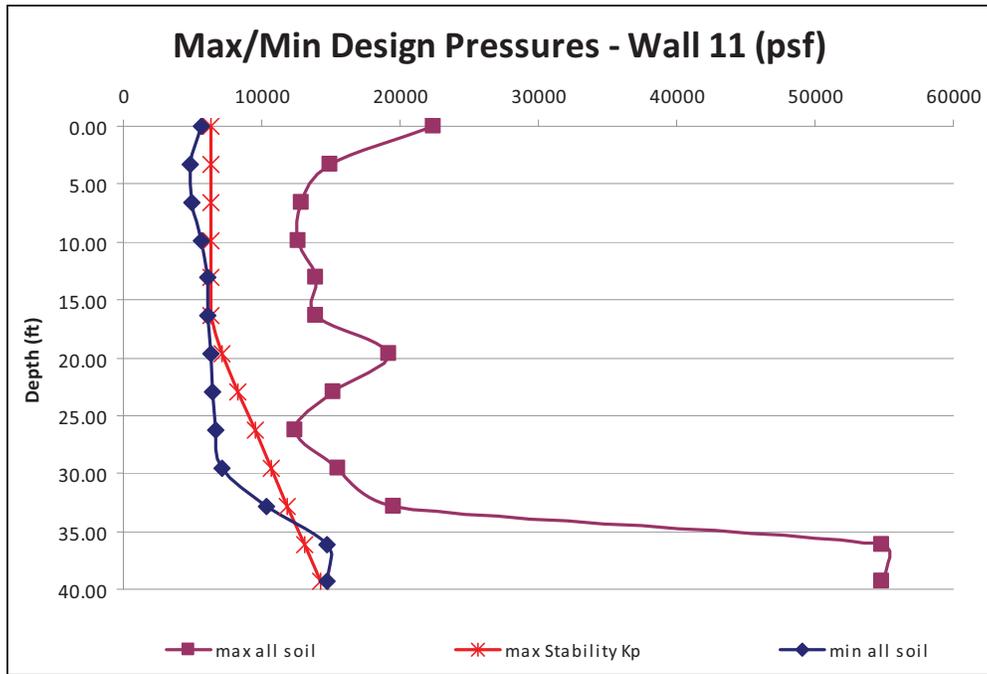


Figure 03.08.05-28-51—Wall 11 – Upper/Lower Bound of all Soil Cases (Cracked Concrete)

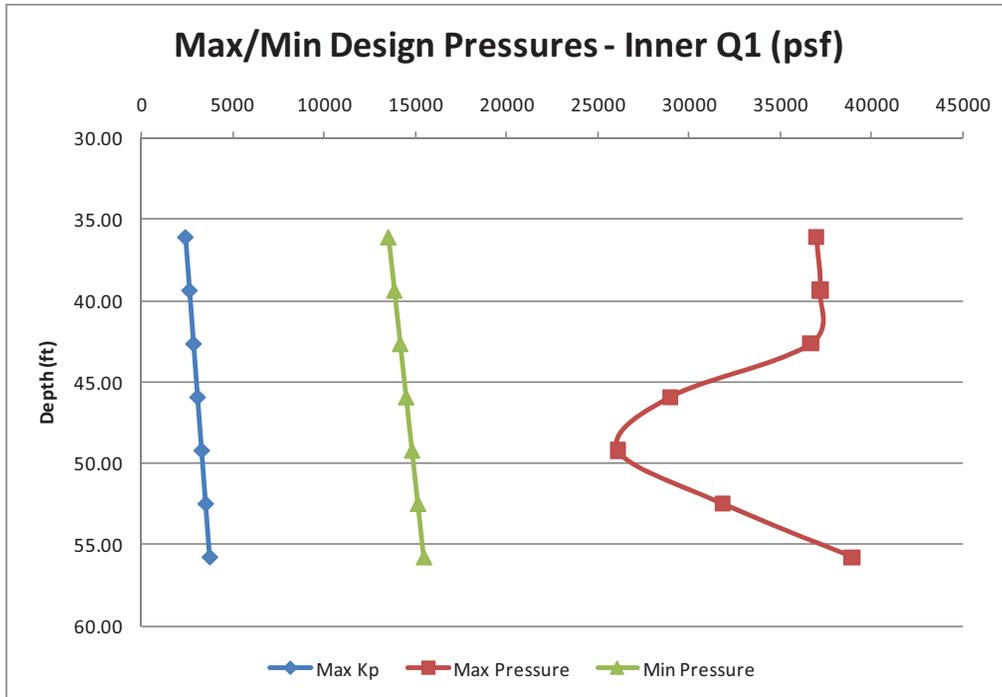


Figure 03.08.05-28-52— Tendon Gallery Inner Q1 – Upper/Lower Bound of All Soil Cases (Cracked Concrete)

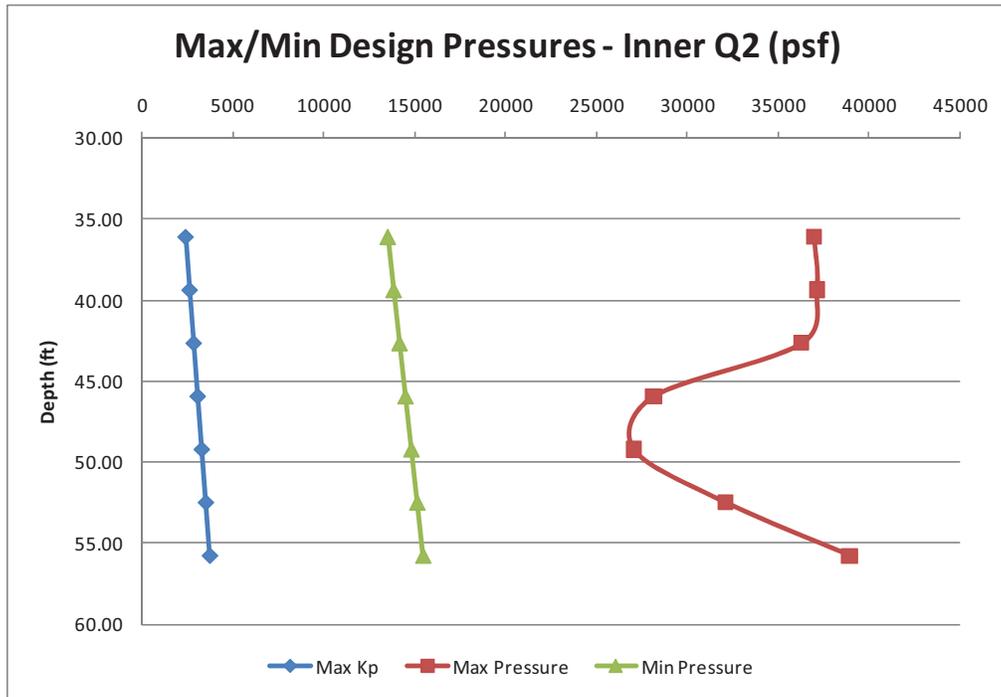


Figure 03.08.05-28-53— Tendon Gallery Inner Q2 – Upper/Lower Bound of All Soil Cases (Cracked Concrete)

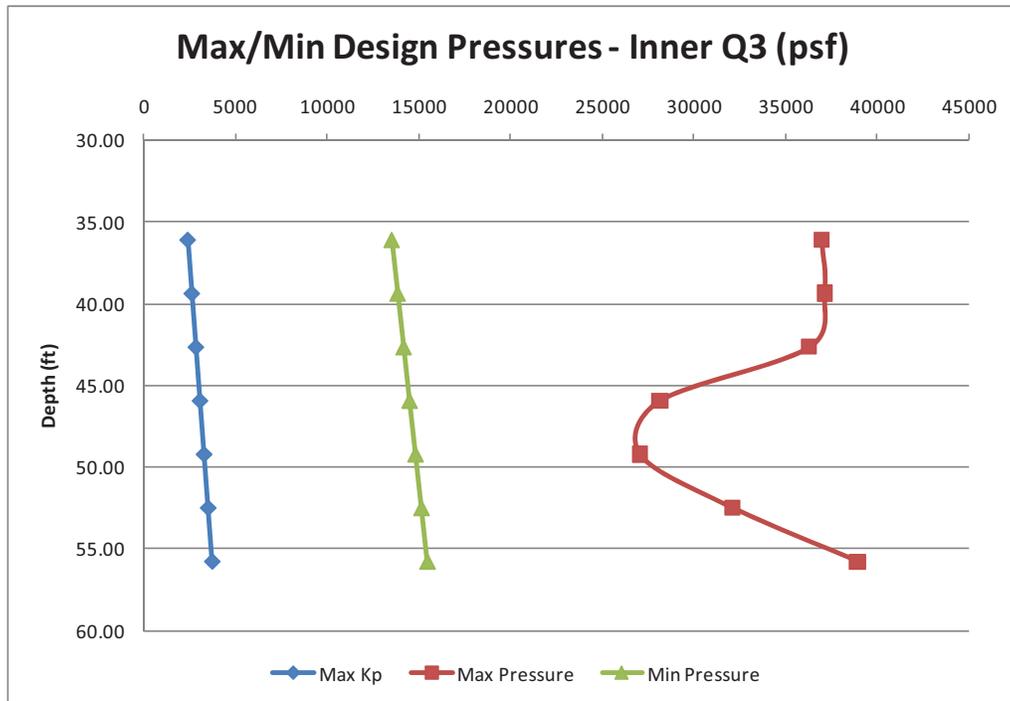


Figure 03.08.05-28-54— Tendon Gallery Inner Q3 – Upper/Lower Bound of All Soil Cases (Cracked Concrete)

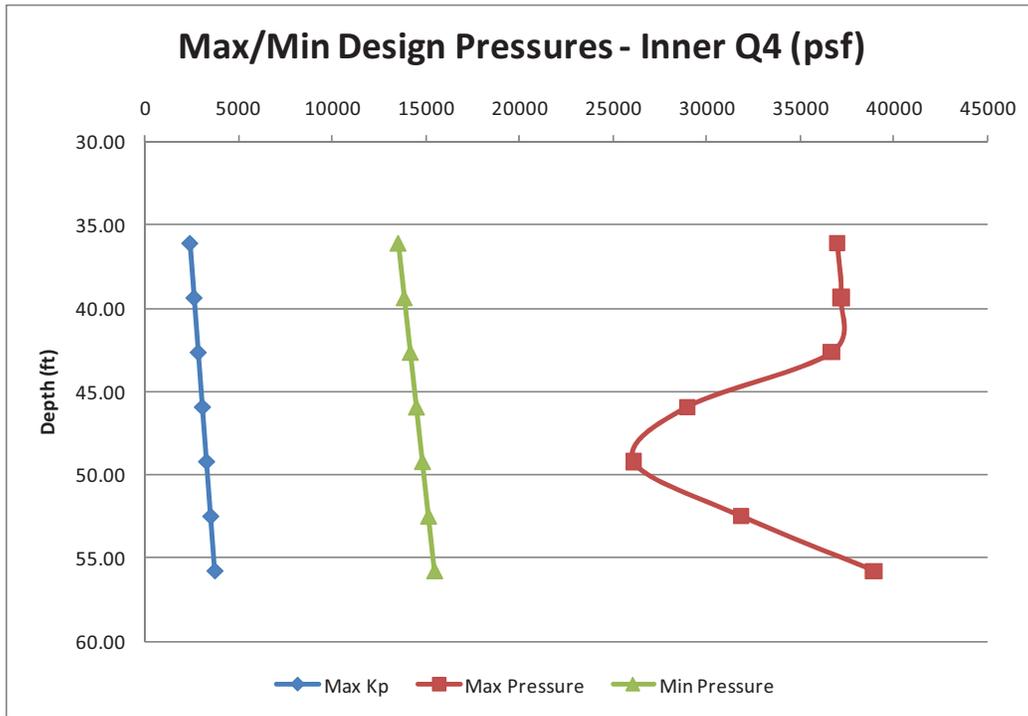


Figure 03.08.05-28-55— Tendon Gallery Inner Q4 – Upper/Lower Bound of All Soil Cases (Cracked Concrete)

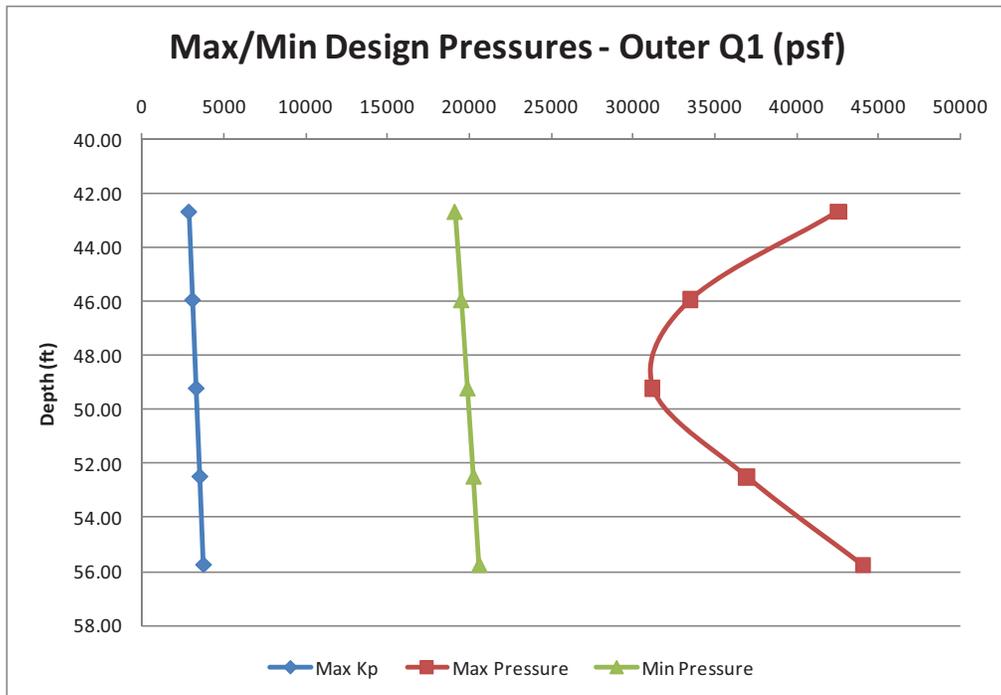


Figure 03.08.05-28-56— Tendon Gallery Outer Q1 – Upper/Lower Bound of All Soil Cases (Cracked Concrete)

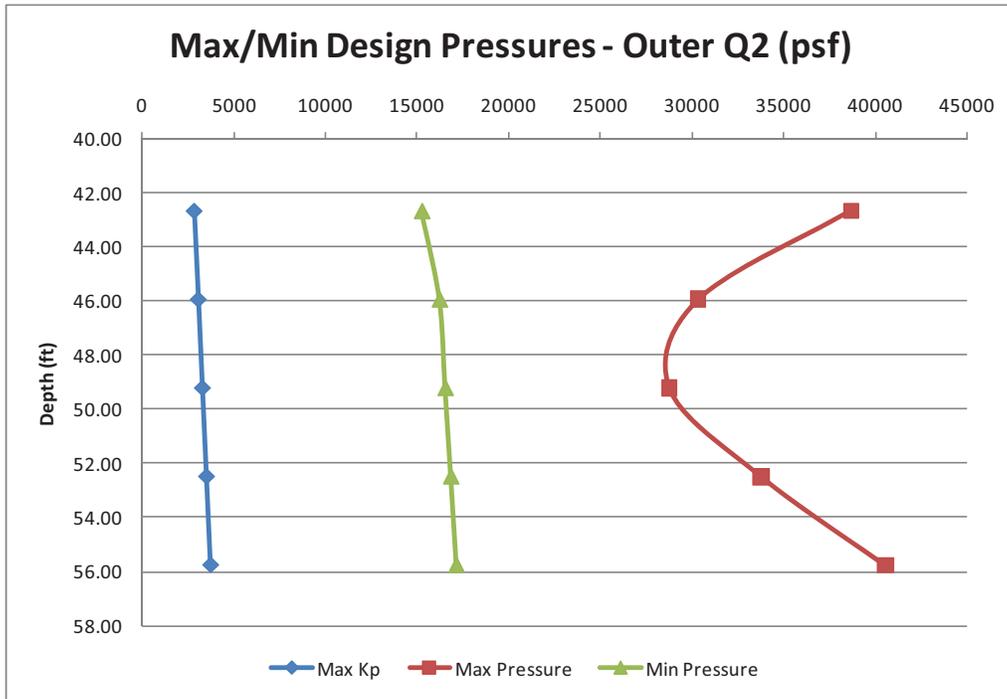


Figure 03.08.05-28-57— Tendon Gallery Outer Q2 – Upper/Lower Bound of All Soil Cases (Cracked Concrete)

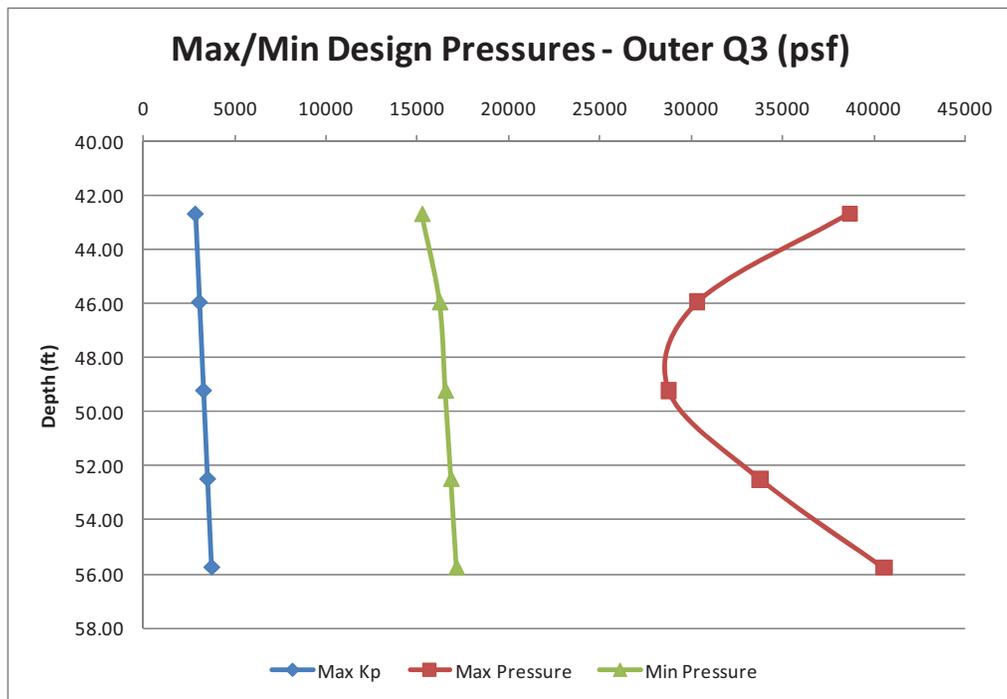


Figure 03.08.05-28-58— Tendon Gallery Outer Q3 – Upper/Lower Bound of All Soil Cases (Cracked Concrete)

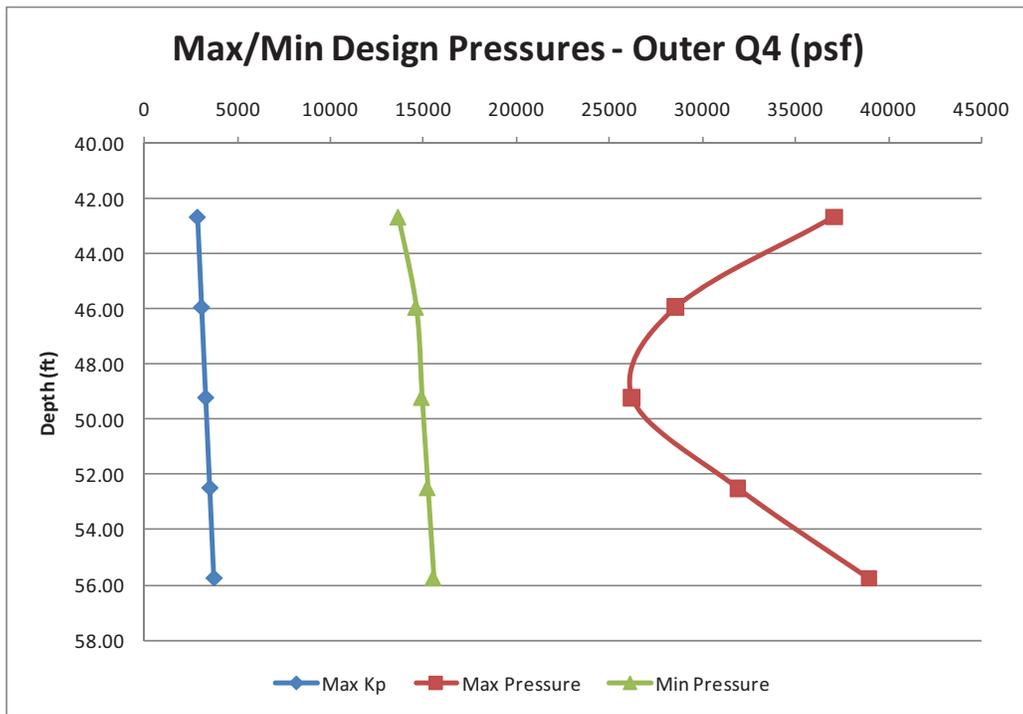


Figure 03.08.05-28-59— Tendon Gallery Outer Q4 – Upper/Lower Bound of All Soil Cases (Cracked Concrete)

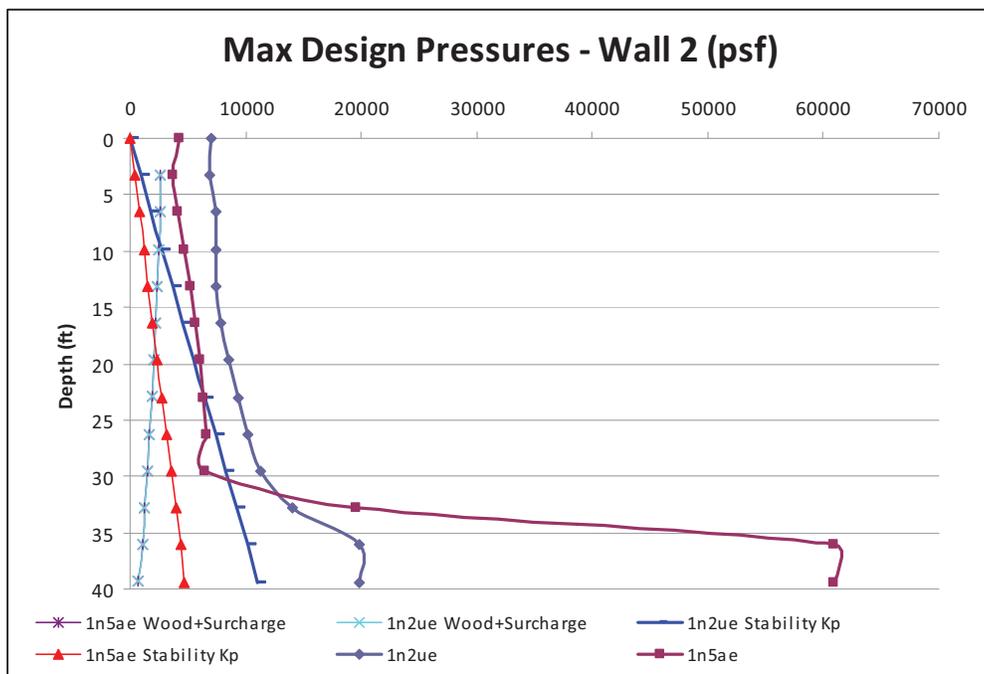


Figure 03.08.05-28-60—Wall 2 - Soil 1n2ue and 1n5ae (Uncracked Concrete)

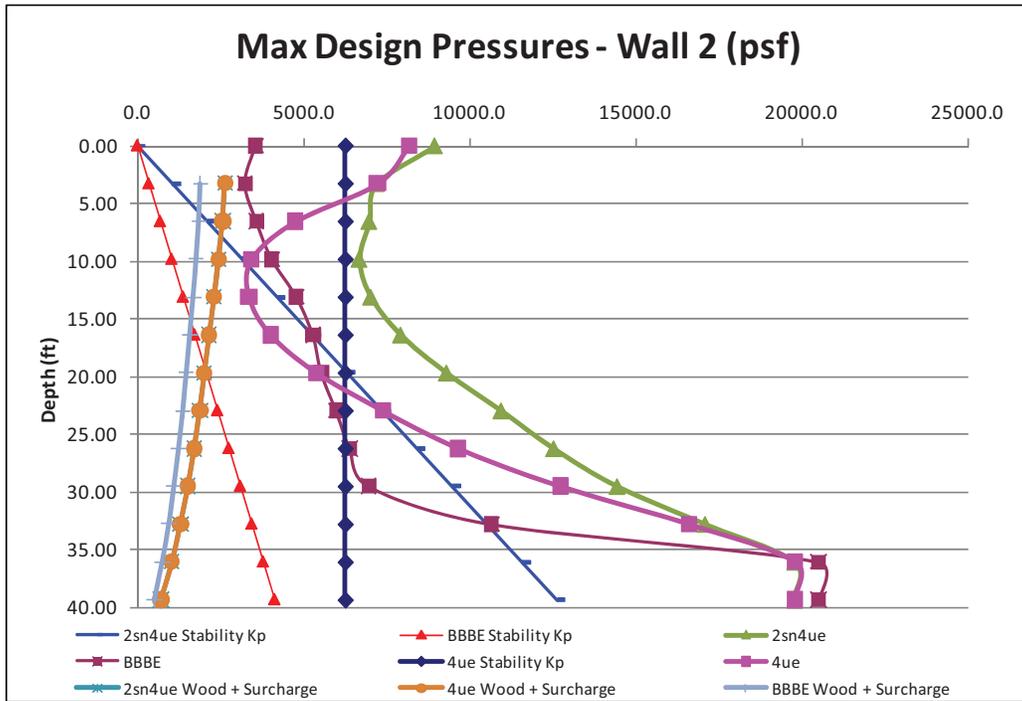


Figure 03.08.05-28-61—Wall 2 - Soil 2sn4ue, 4ue and hfbe (Uncracked Concrete)

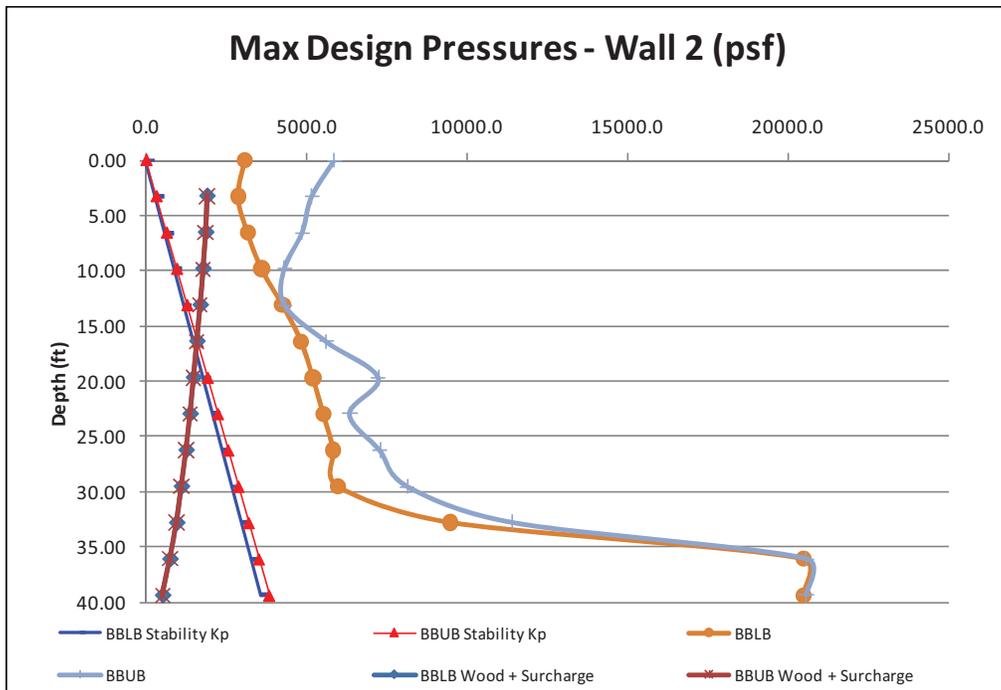


Figure 03.08.05-28-62—Wall 2 - Soil hflb and hfub (Uncracked Concrete)

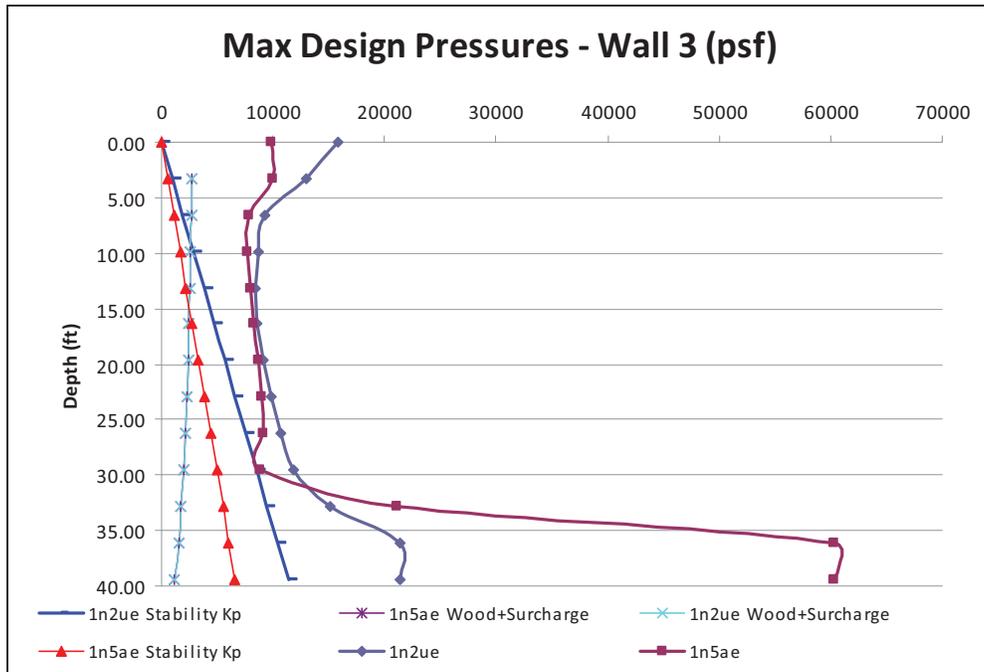


Figure 03.08.05-28-63—Wall 3 - Soil 1n2ue and 1n5ae (Uncracked Concrete)

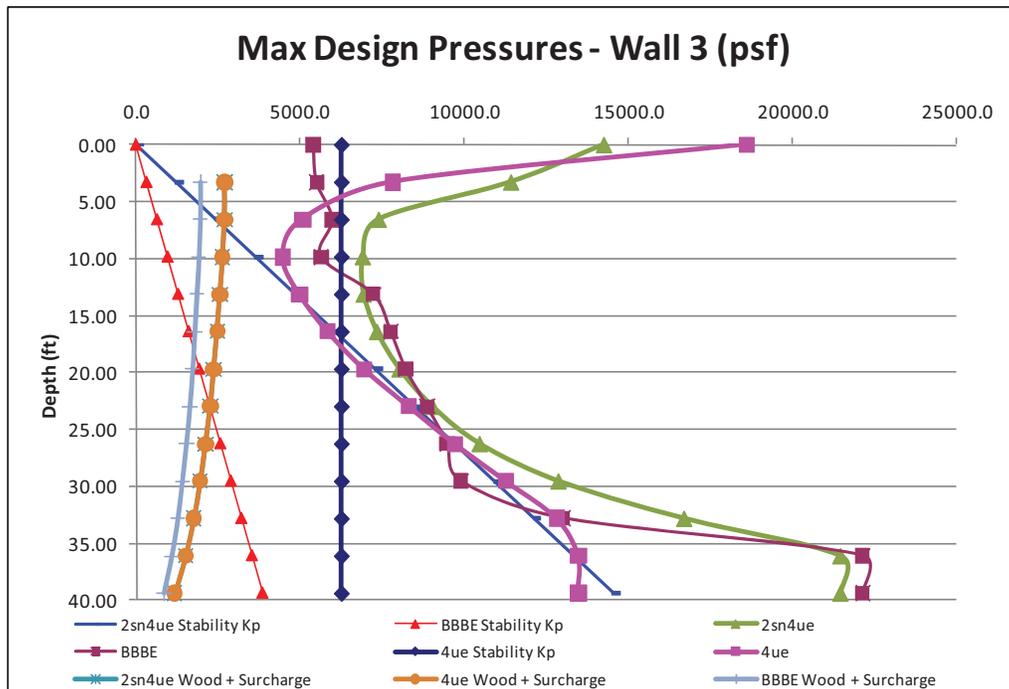


Figure 03.08.05-28-64—Wall 3 - Soil 2sn4ue, 4ue and hbbe (Uncracked Concrete)

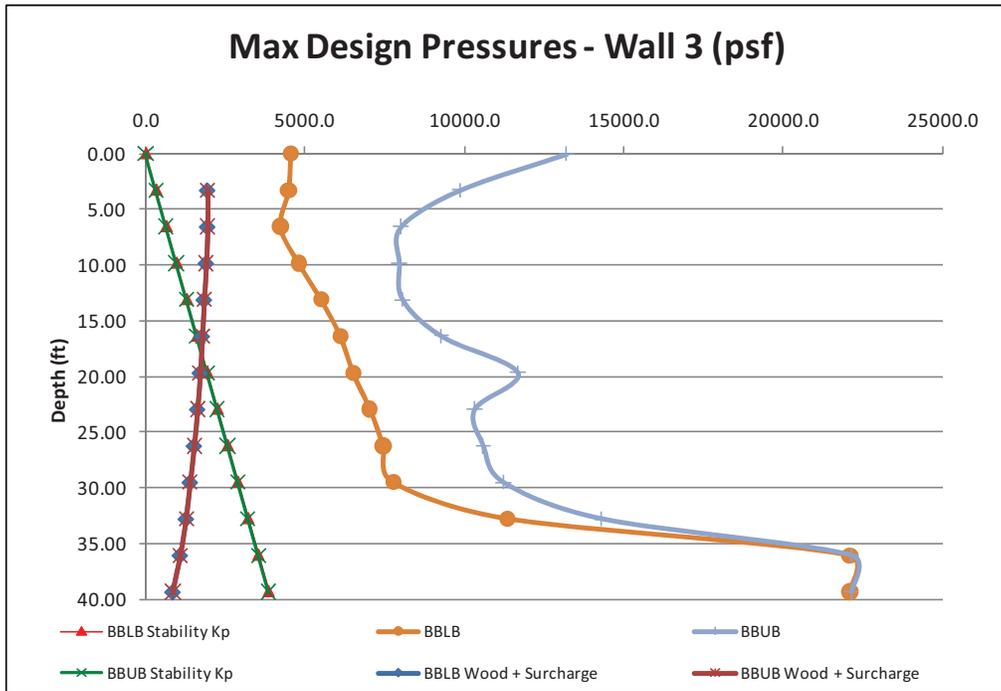


Figure 03.08.05-28-65—Wall 3 - Soil hflb and hfub (Uncracked Concrete)

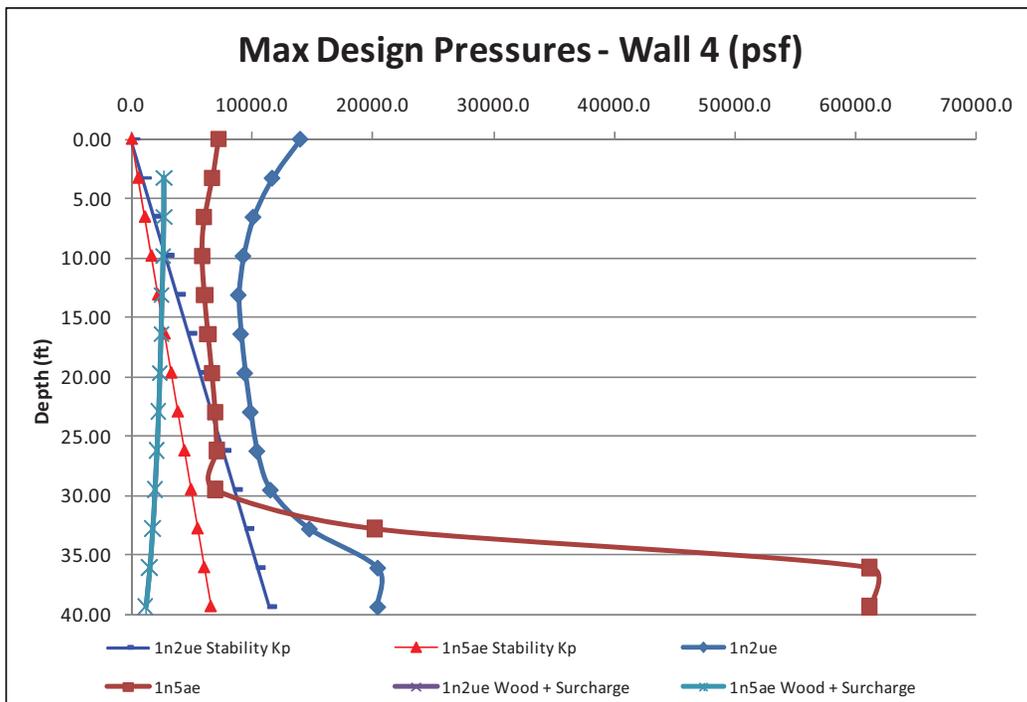


Figure 03.08.05-28-66—Wall 4 - Soil 1n2ue and 1n5ae (Uncracked Concrete)

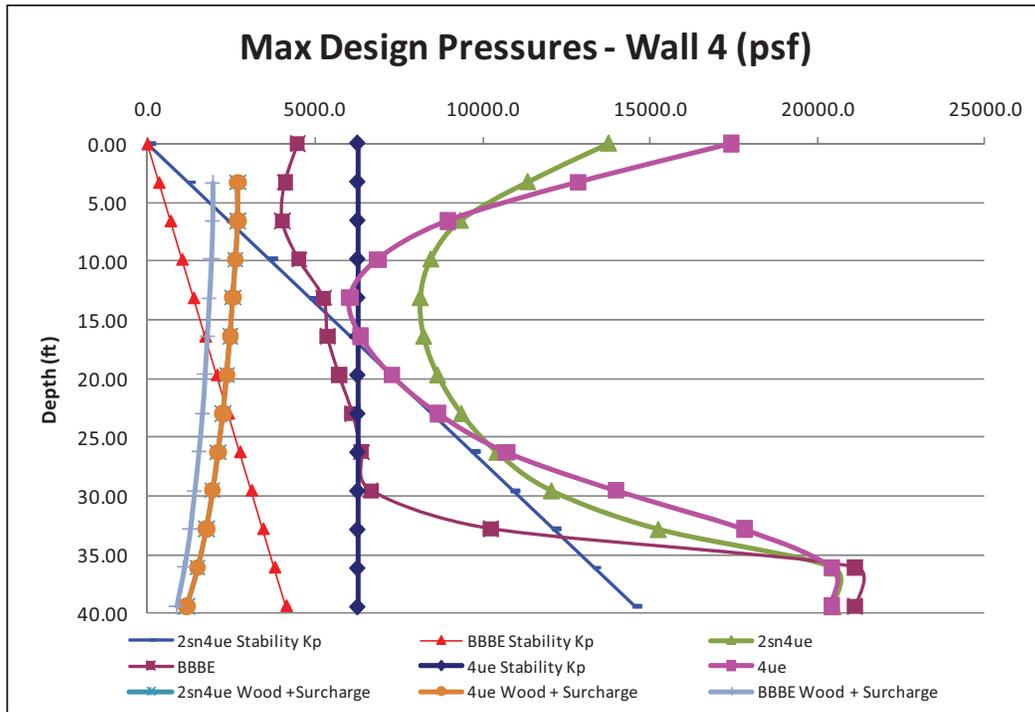


Figure 03.08.05-28-67—Wall 4 - Soil 2sn4ue, 4ue and hfbe (Uncracked Concrete)

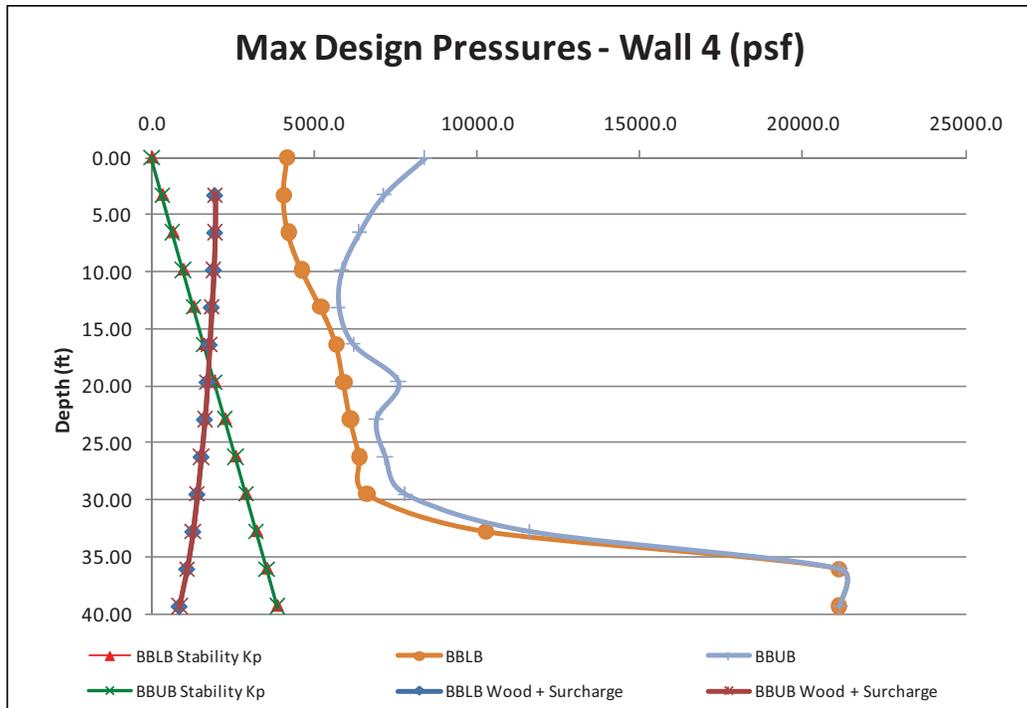


Figure 03.08.05-28-68—Wall 4 - Soil hflb and hfub (Uncracked Concrete)

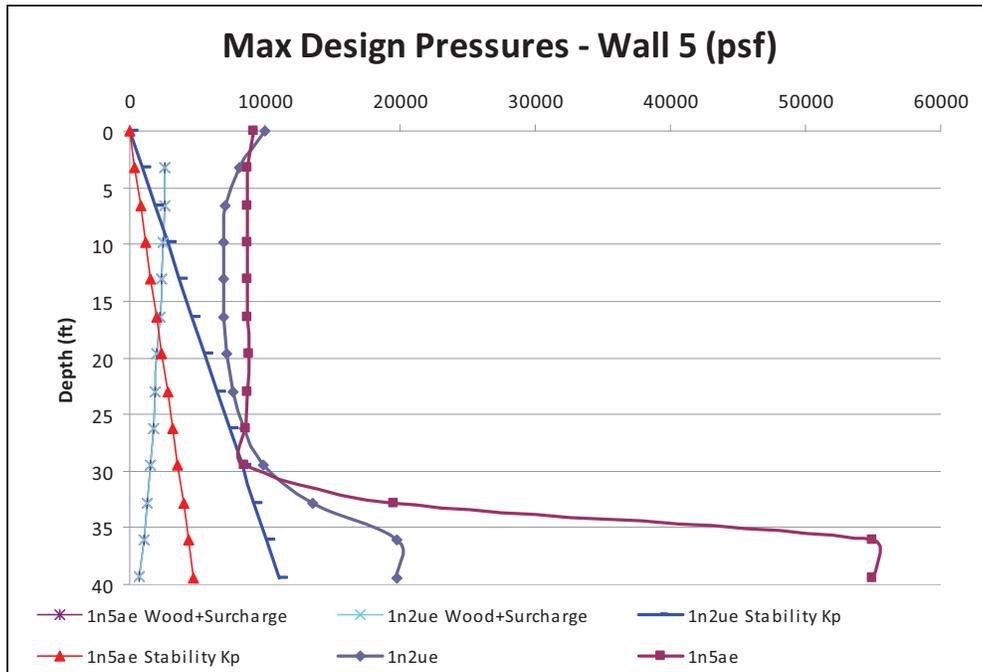


Figure 03.08.05-28-69—Wall 5 - Soil 1n2ue and 1n5ae (Uncracked Concrete)

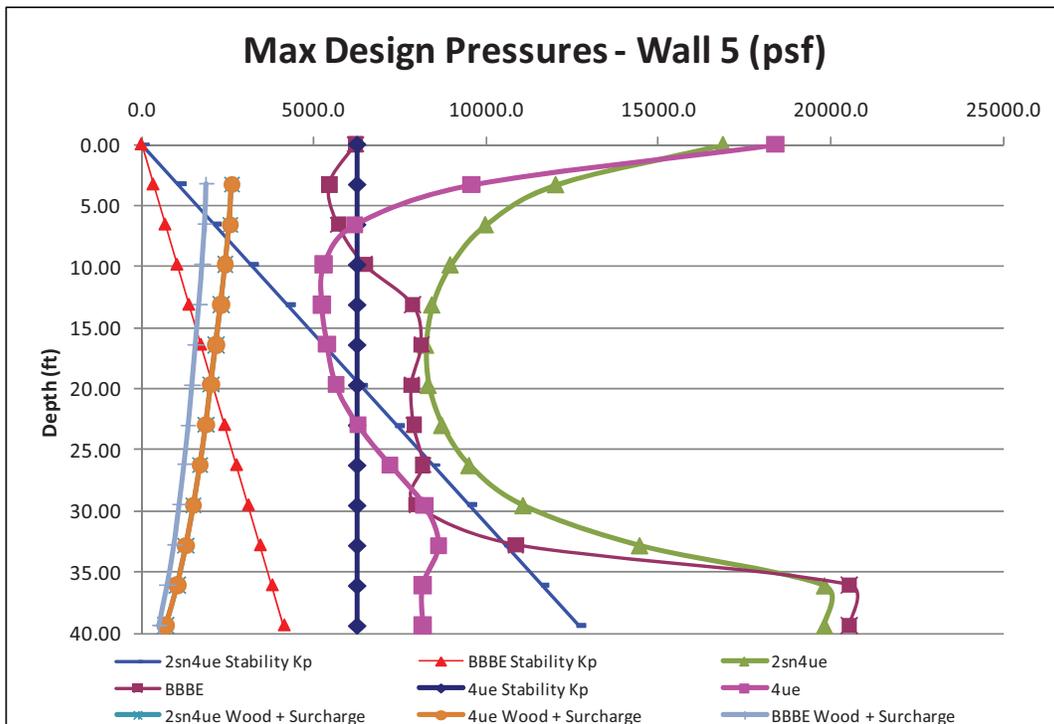


Figure 03.08.05-28-70—Wall 5 - Soil 2sn4ue, 4ue and hbbe (Uncracked Concrete)

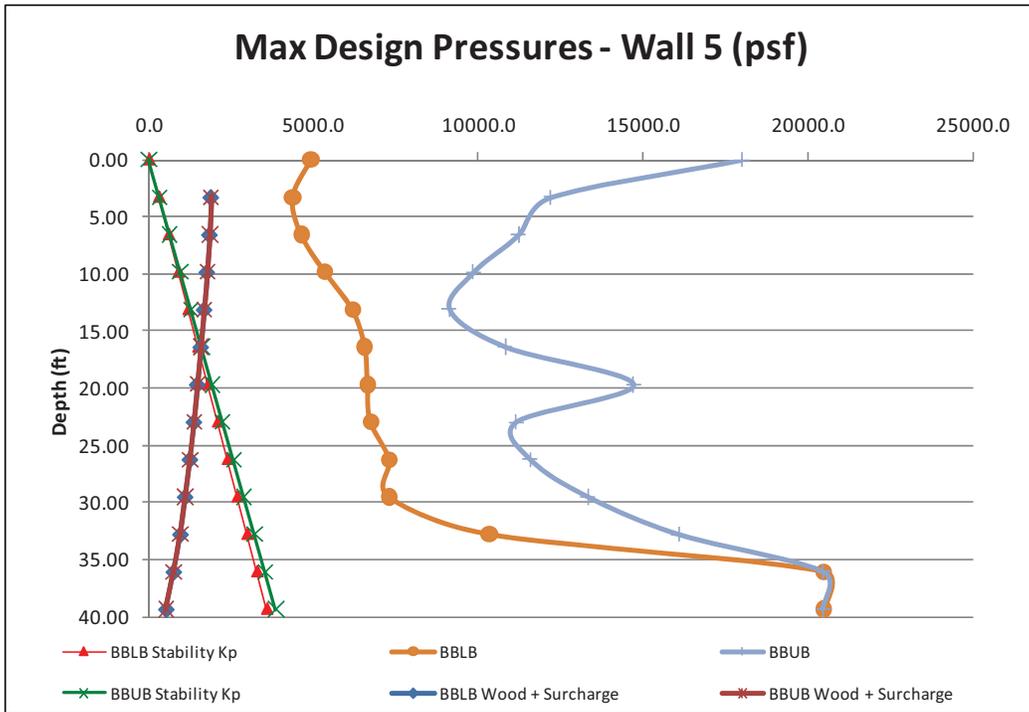


Figure 03.08.05-28-71—Wall 5 - Soil h1lb and hfub (Uncracked Concrete)

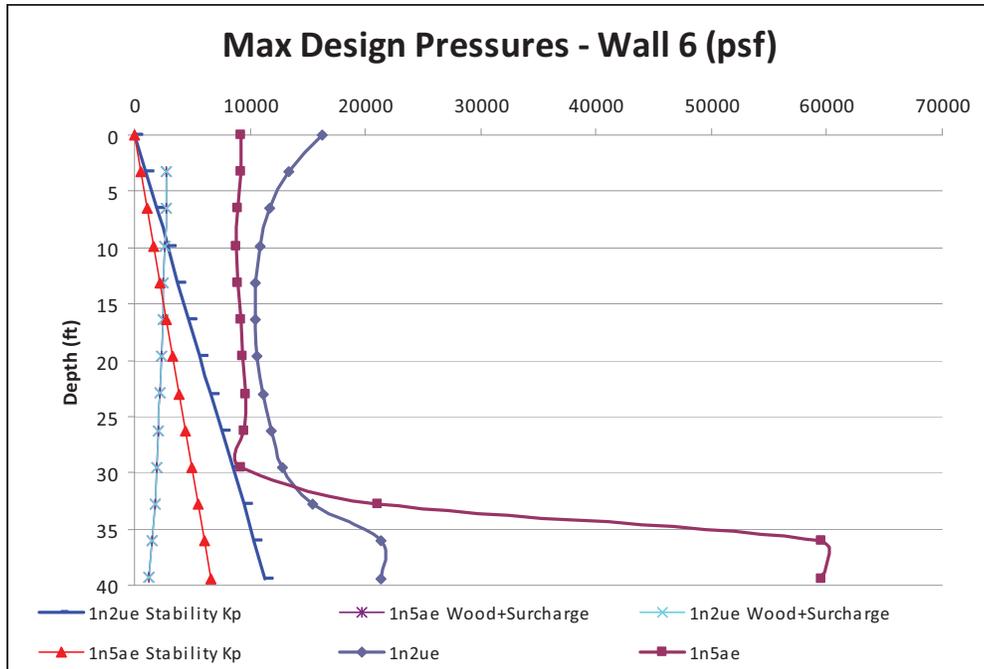


Figure 03.08.05-28-72—Wall 6 - Soil 1n2ue and 1n5ae (Uncracked Concrete)

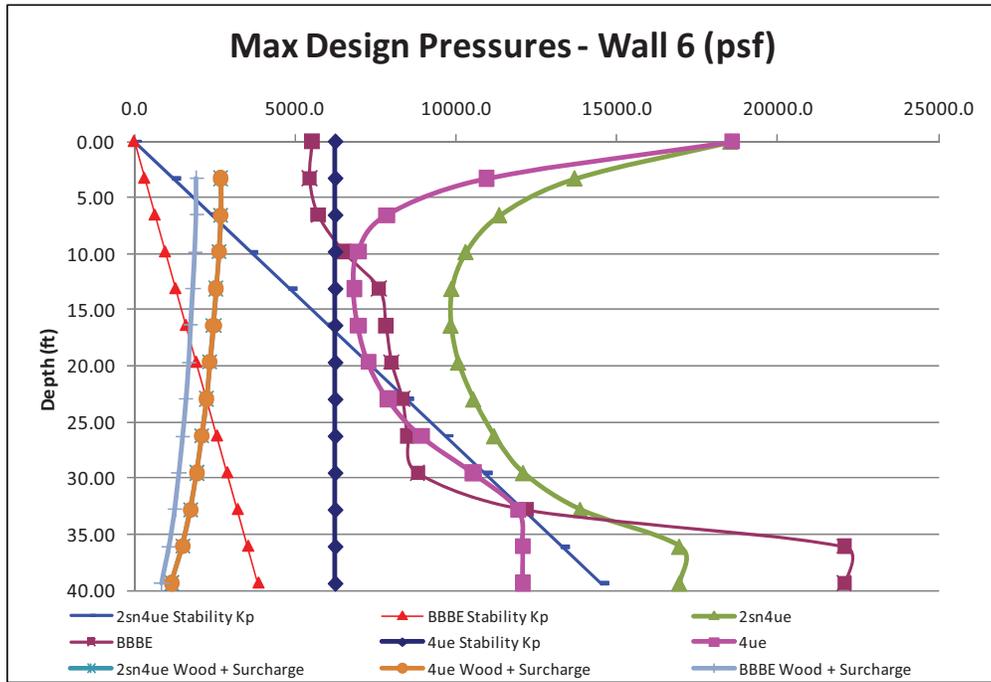


Figure 03.08.05-28-73—Wall 6 - Soil 2sn4ue, 4ue and hfbe (Uncracked Concrete)

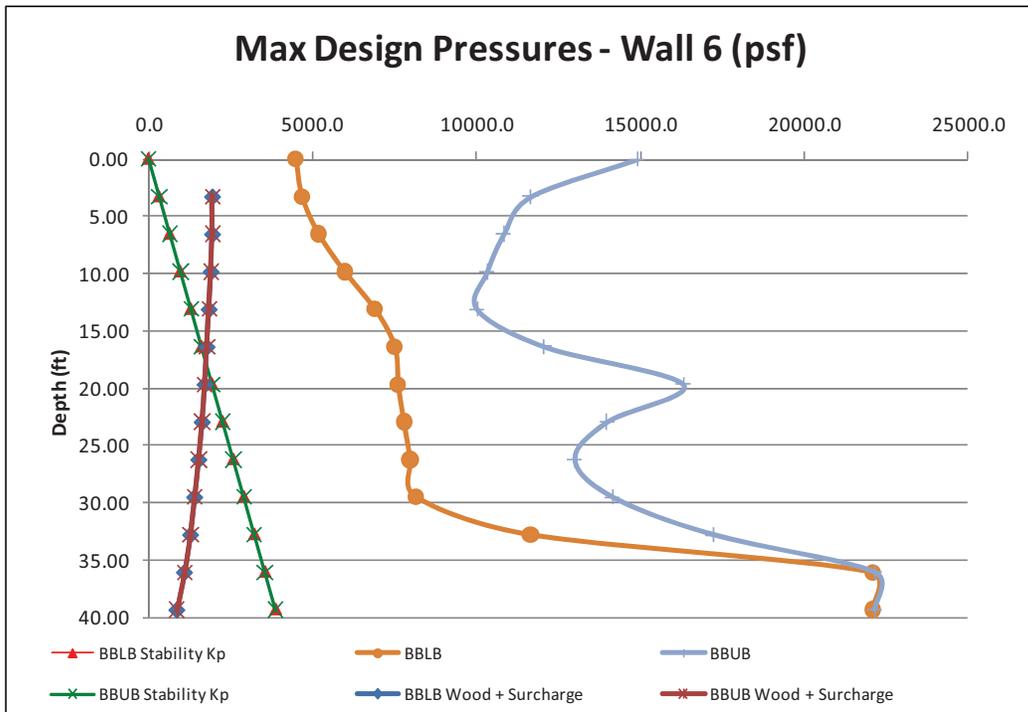


Figure 03.08.05-28-74—Wall 6 - Soil hflb and hfub (Uncracked Concrete)

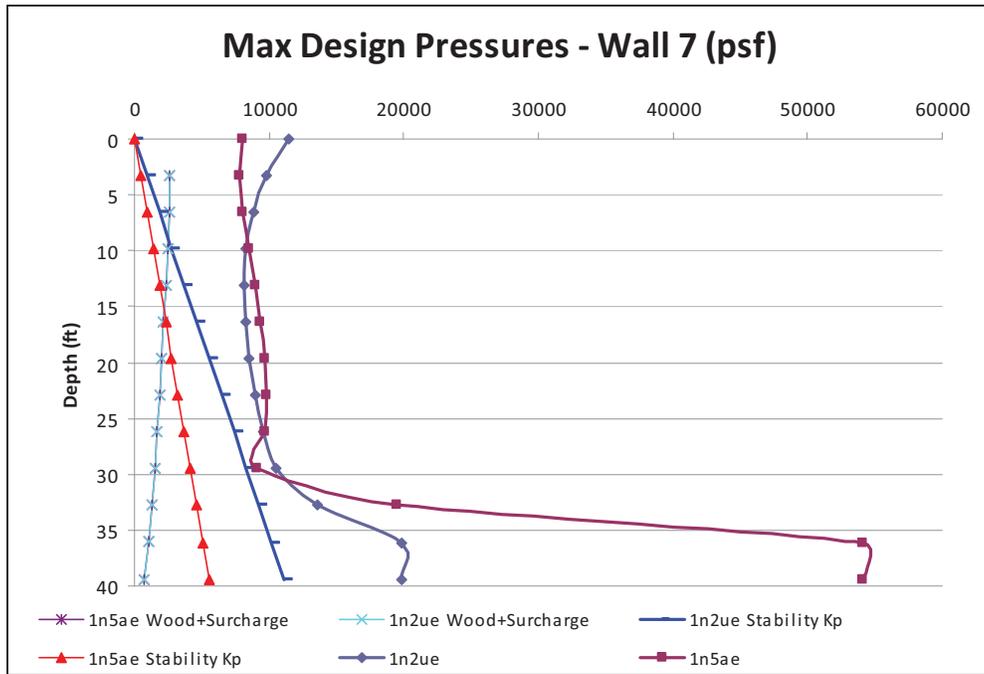


Figure 03.08.05-28-75—Wall 7 - Soil 1n2ue and 1n5ae (Uncracked Concrete)

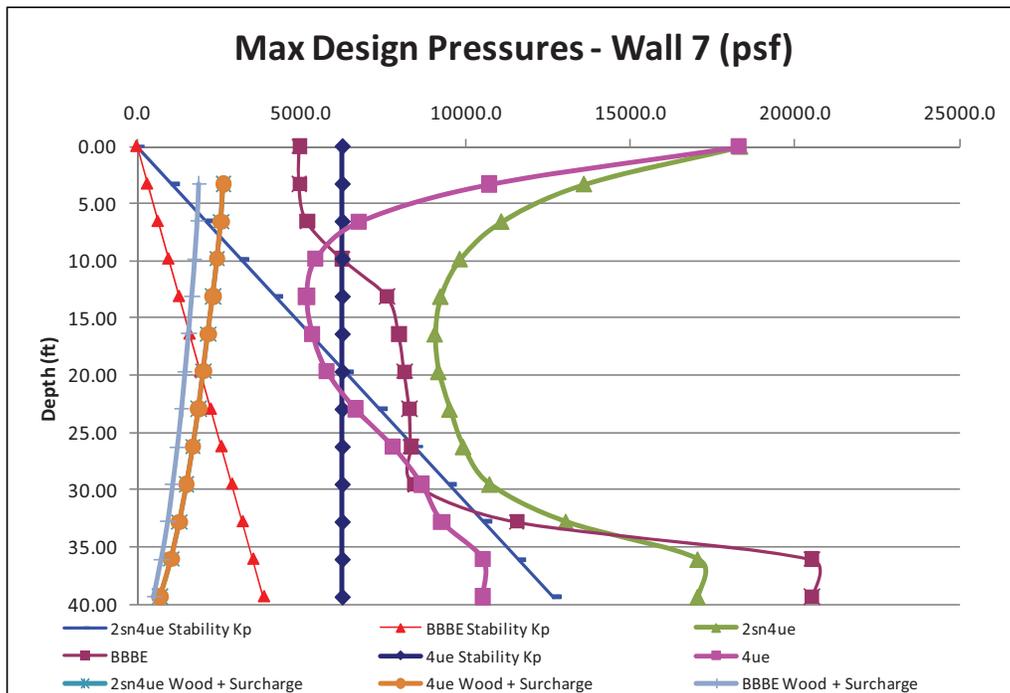


Figure 03.08.05-28-76—Wall 7 - Soil 2sn4ue, 4ue and hfbe (Uncracked Concrete)

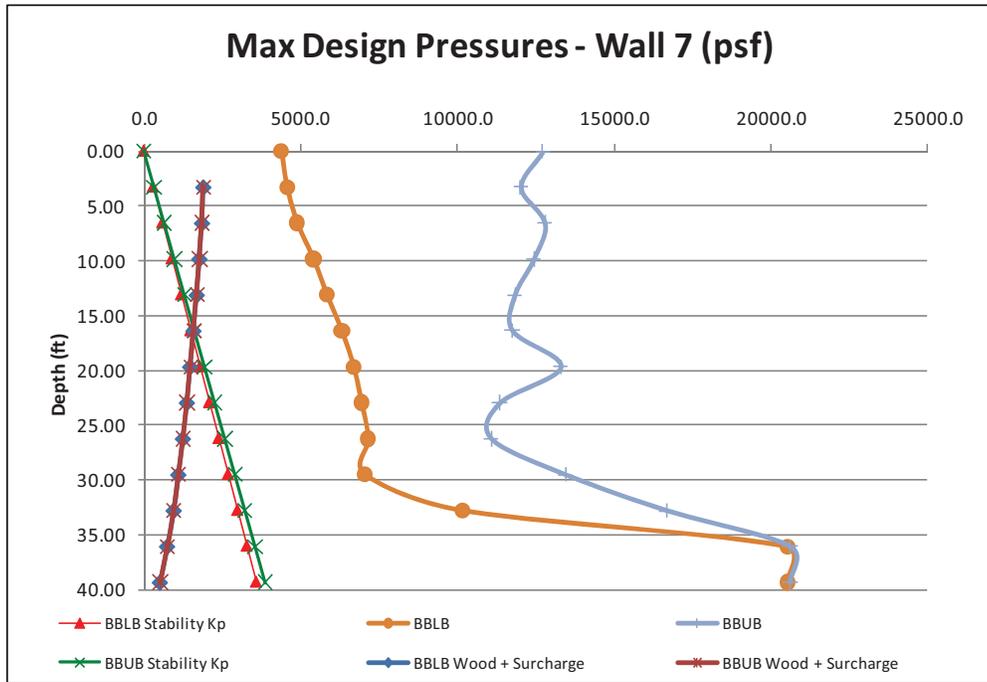


Figure 03.08.05-28-77—Wall 7 - Soil hflb and hfub (Uncracked Concrete)

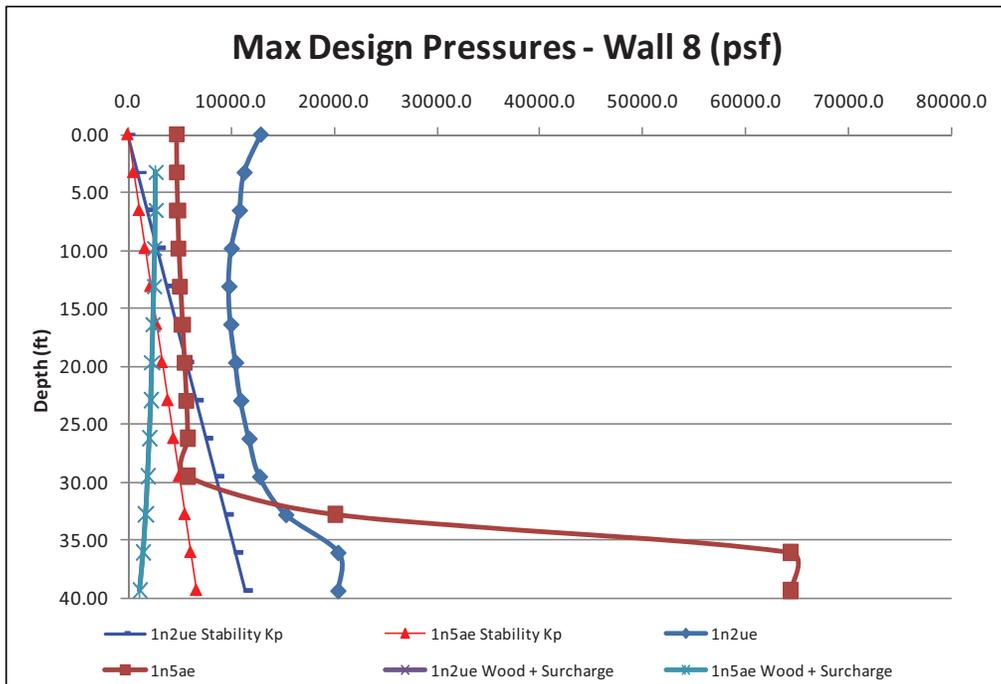


Figure 03.08.05-28-78—Wall 8 - Soil 1n2ue and 1n5ae (Uncracked Concrete)

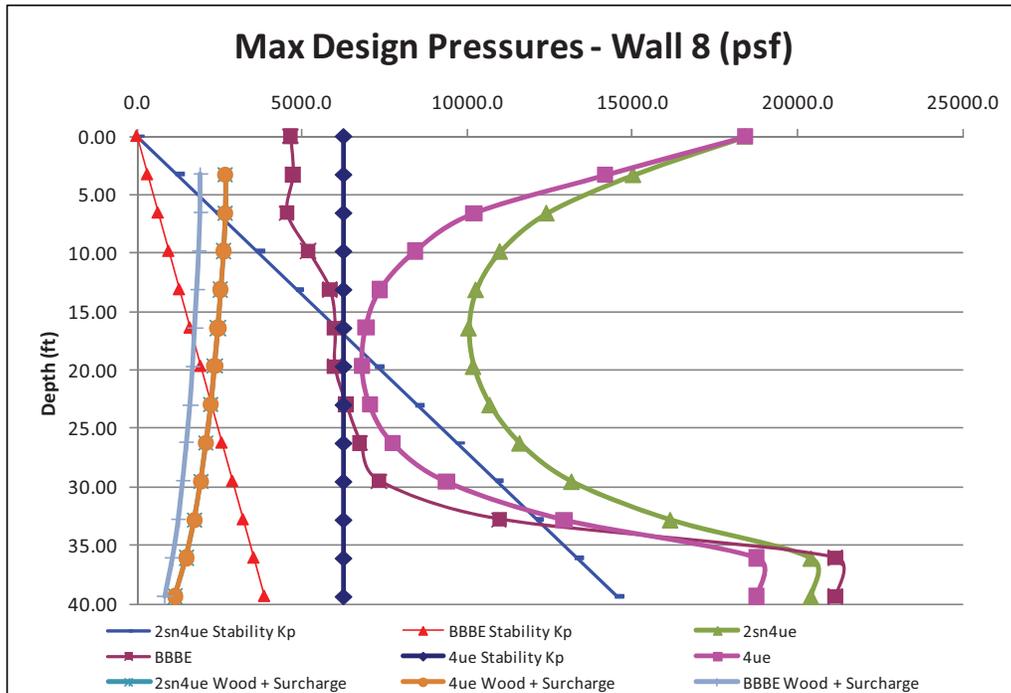


Figure 03.08.05-28-79—Wall 8 - Soil 2sn4ue, 4ue and hfb (Uncracked Concrete)

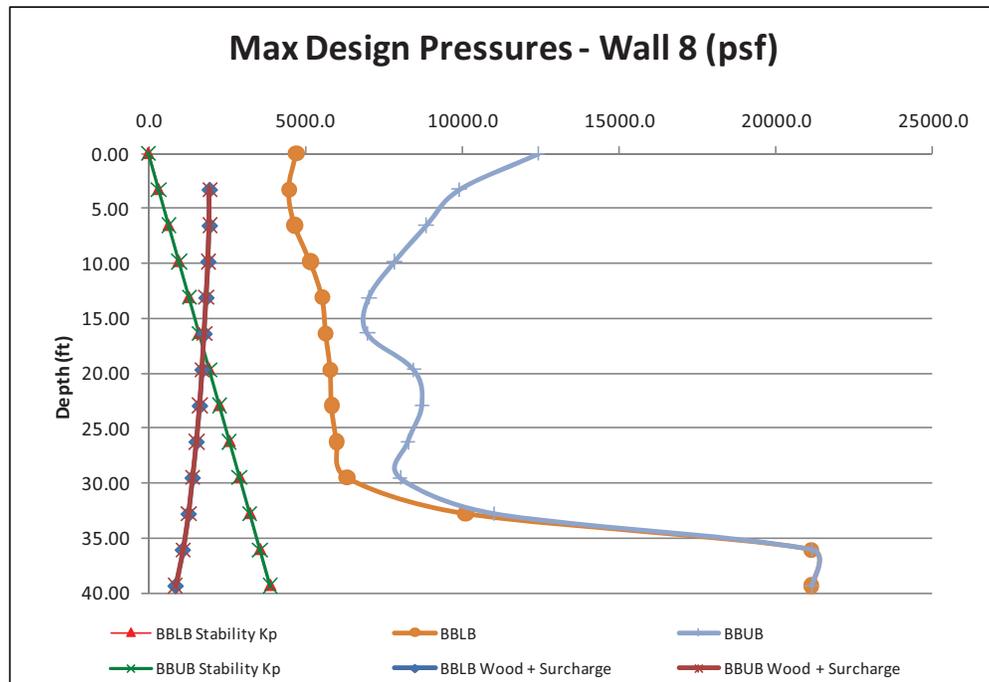


Figure 03.08.05-28-80—Wall 8 - Soil hflb and hfub (Uncracked Concrete)

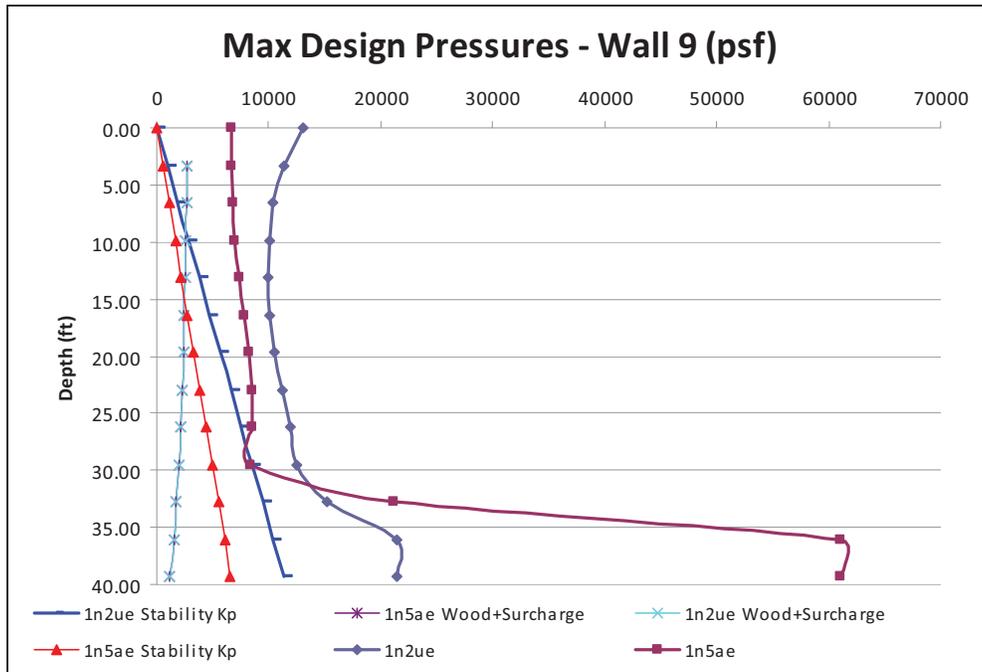


Figure 03.08.05-28-81—Wall 9 - Soil 1n2ue and 1n5ae (Uncracked Concrete)

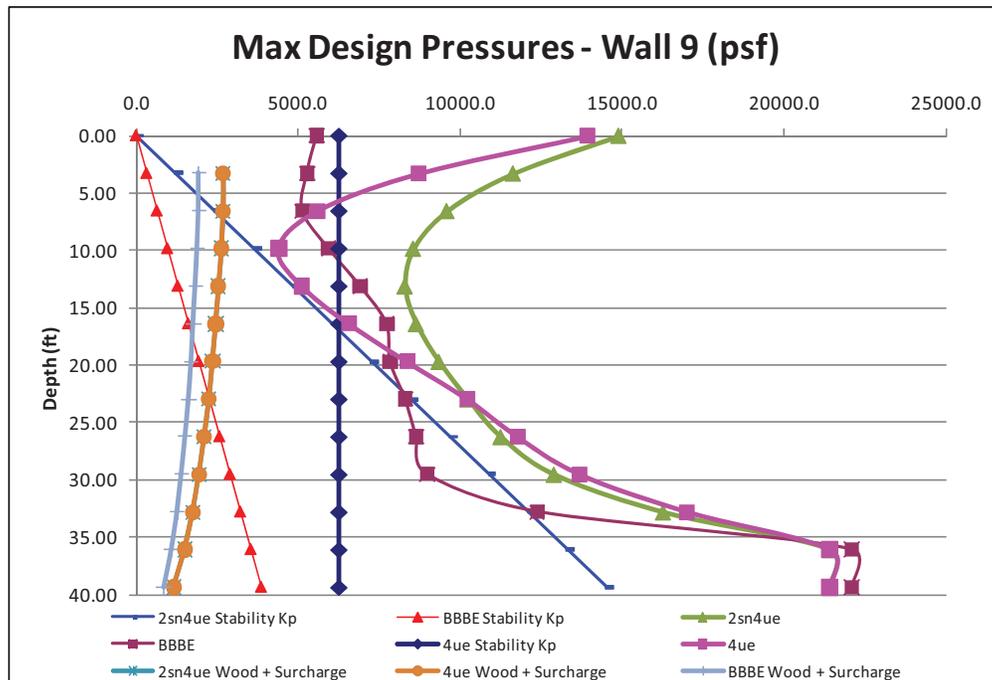


Figure 03.08.05-28-82—Wall 9 - Soil 2sn4ue, 4ue and hbbe (Uncracked Concrete)

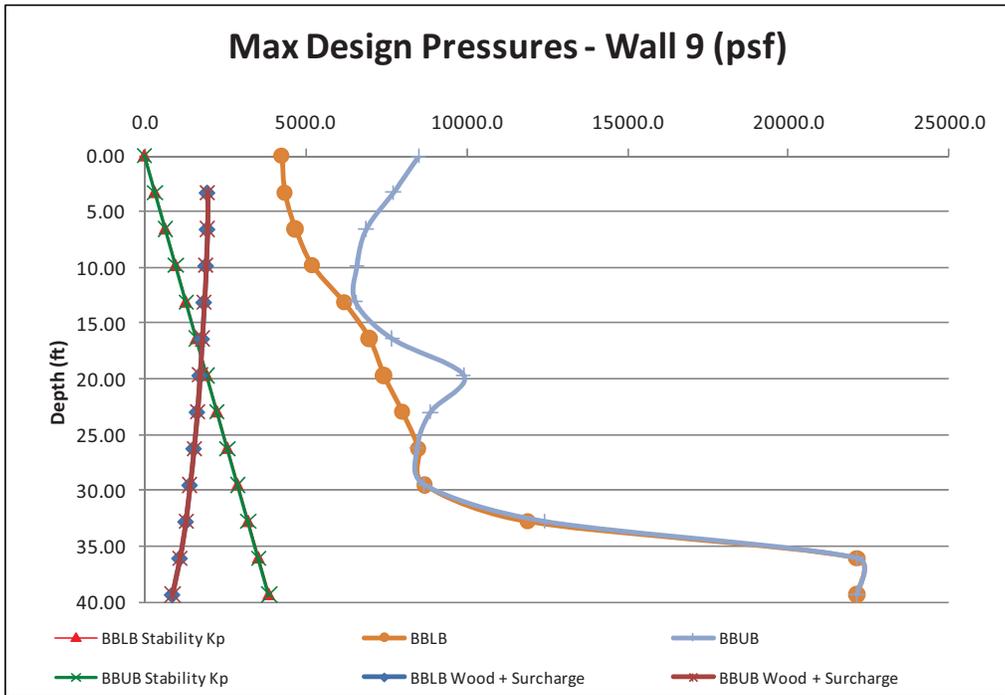


Figure 03.08.05-28-83—Wall 9 - Soil hflb and hfub (Uncracked Concrete)

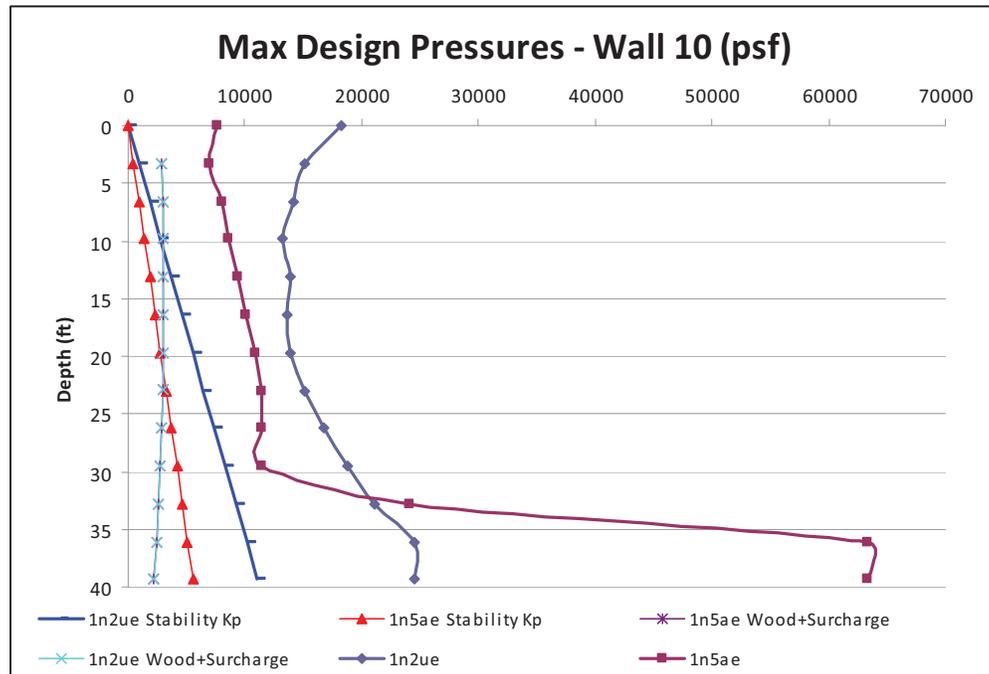


Figure 03.08.05-28-84—Wall 10 - Soil 1n2ue & 1n5ae (Uncracked Concrete)

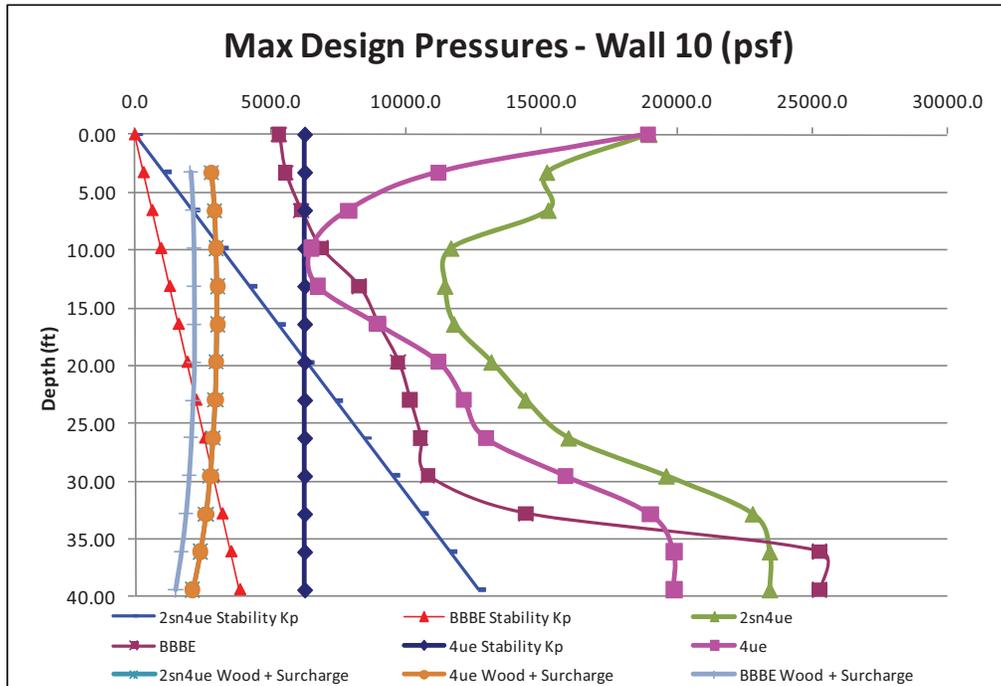


Figure 03.08.05-28-85—Wall 10 - Soil 2sn4ue, 4ue and hfbe (Uncracked Concrete)

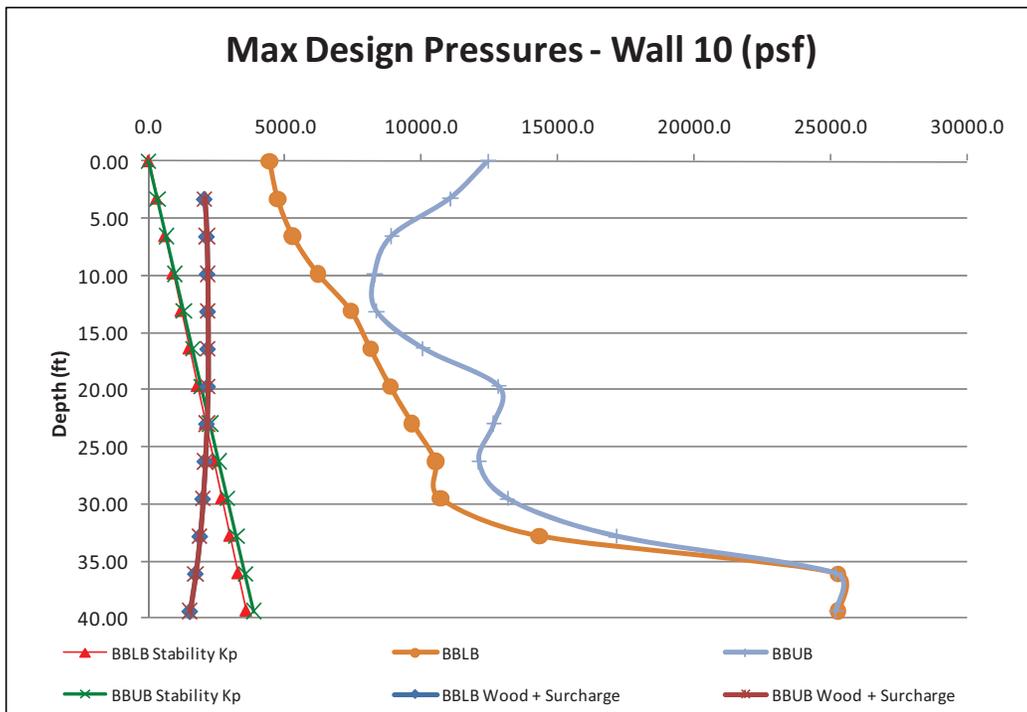


Figure 03.08.05-28-86—Wall 10 - Soil hflb and hfub (Uncracked Concrete)

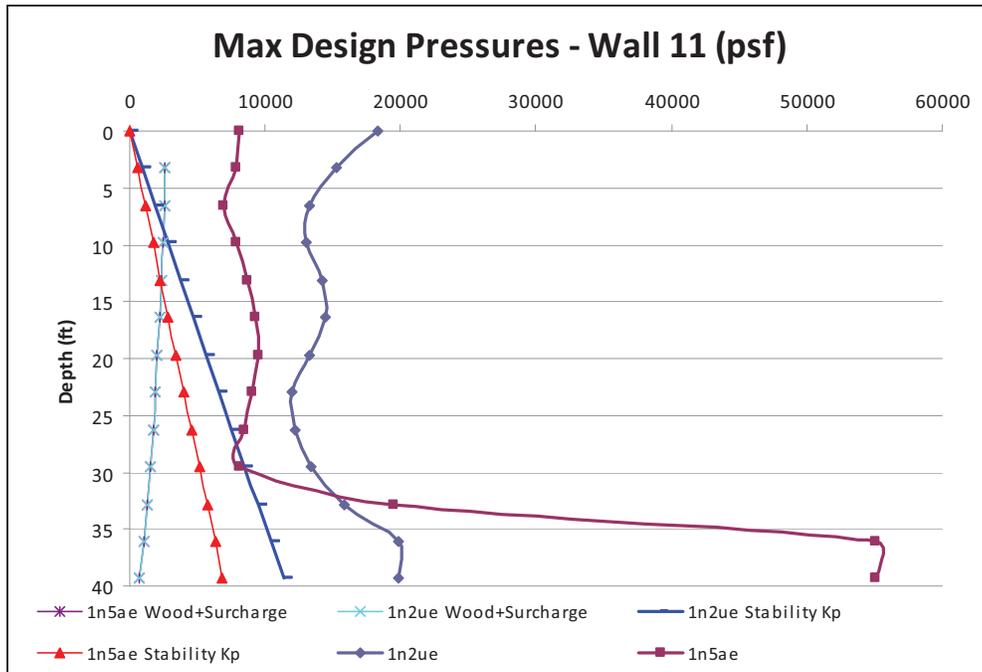


Figure 03.08.05-28-87—Wall 11 - Soil 1n2ue and 1n5ae (Uncracked Concrete)

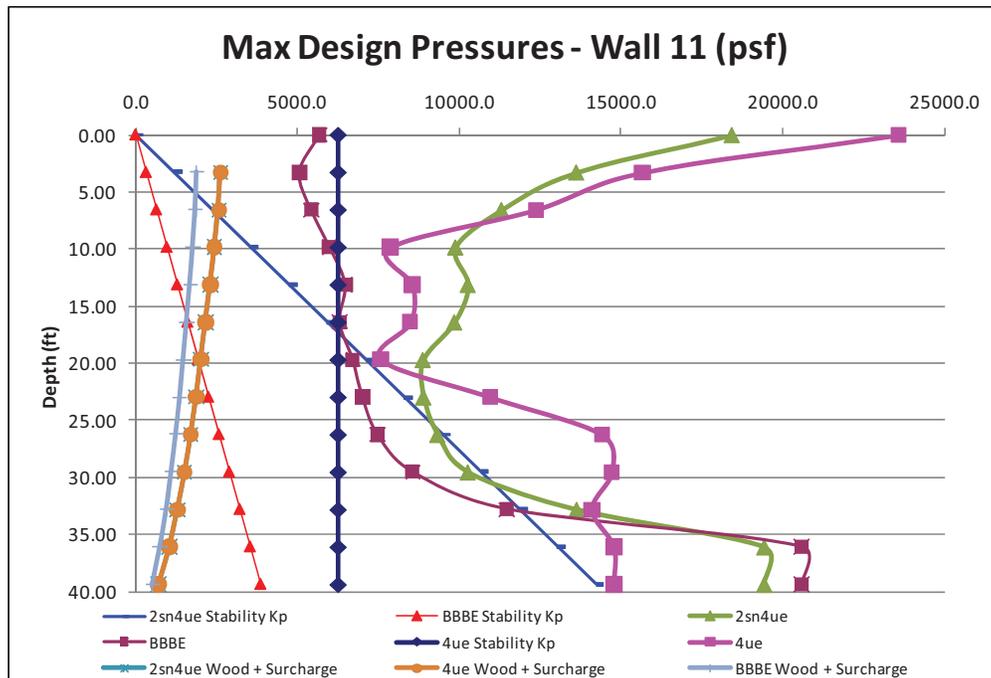


Figure 03.08.05-28-88—Wall 11 - Soil 2sn4ue, 4ue and hfbe (Uncracked Concrete)

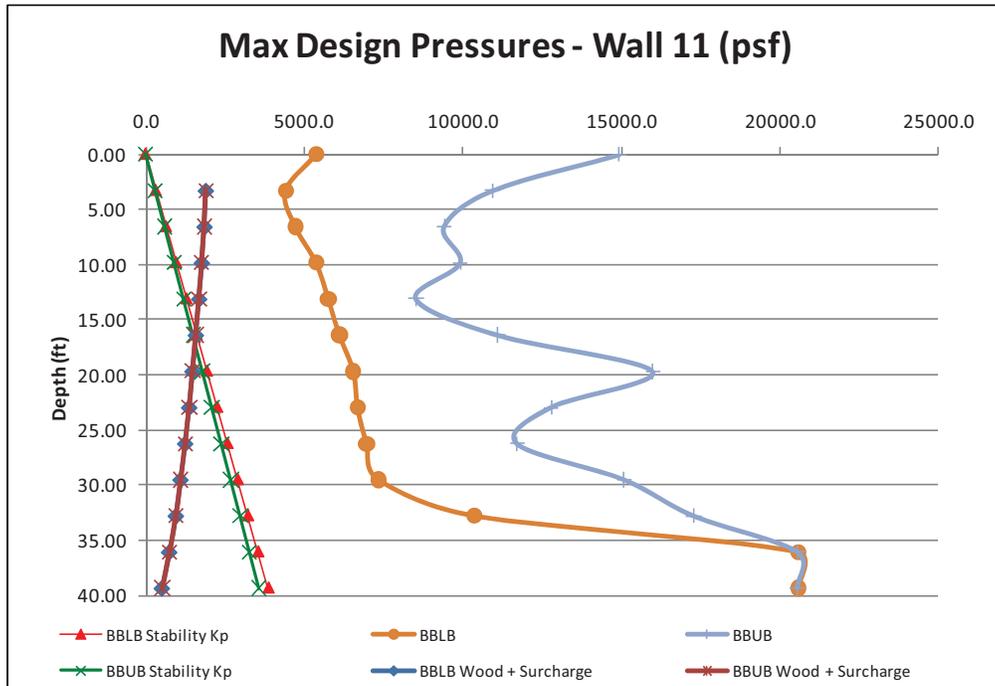


Figure 03.08.05-28-89—Wall 11 - Soil hflb and hfub (Uncracked Concrete)

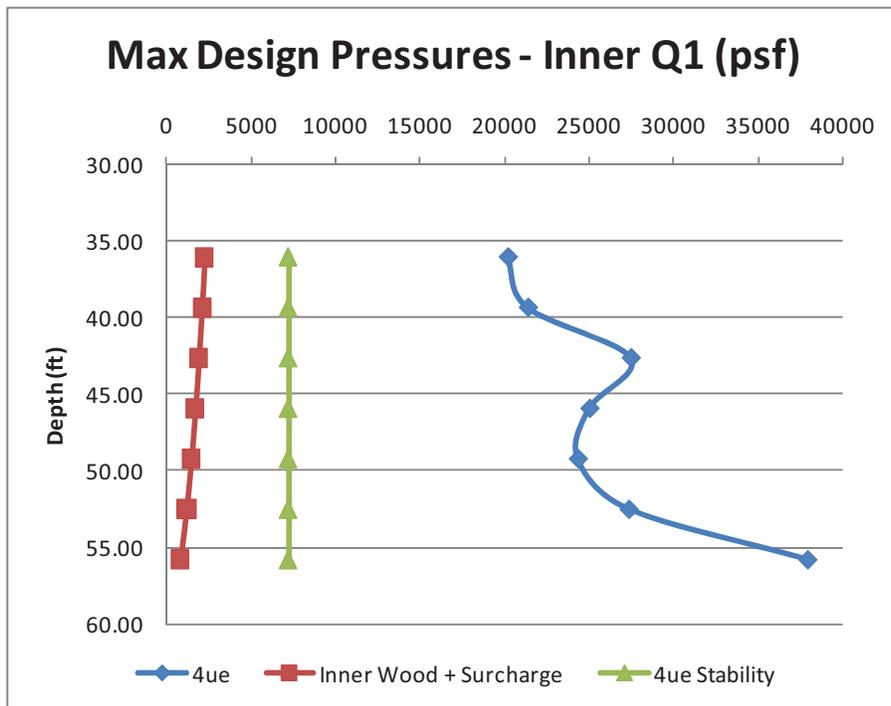


Figure 03.08.05-28-90— Tendon Gallery Inner Q1 – Soil 4ue (Uncracked Concrete)

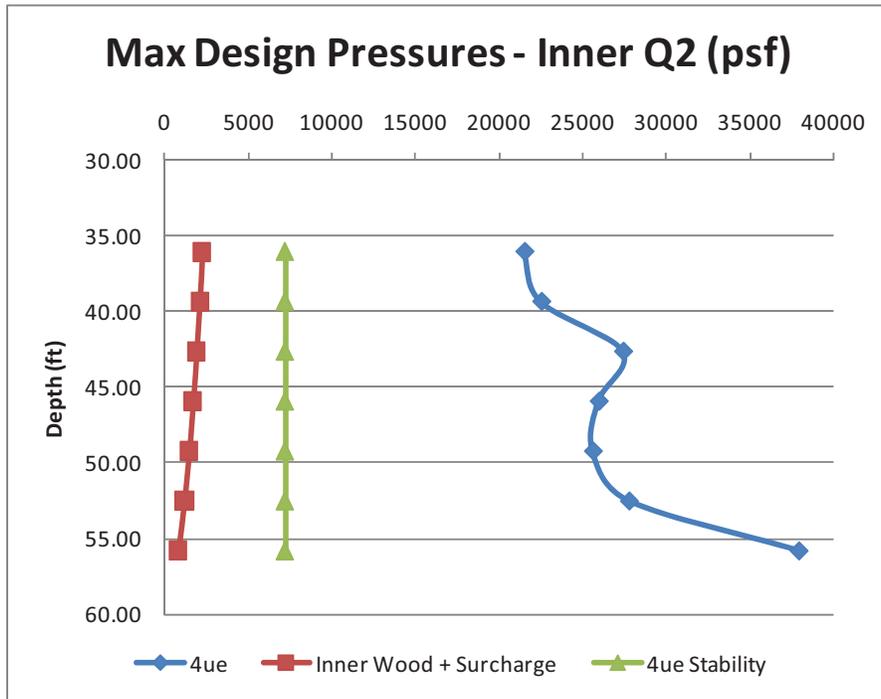


Figure 03.08.05-28-91— Tendon Gallery Inner Q2 – Soil 4ue (Uncracked Concrete)

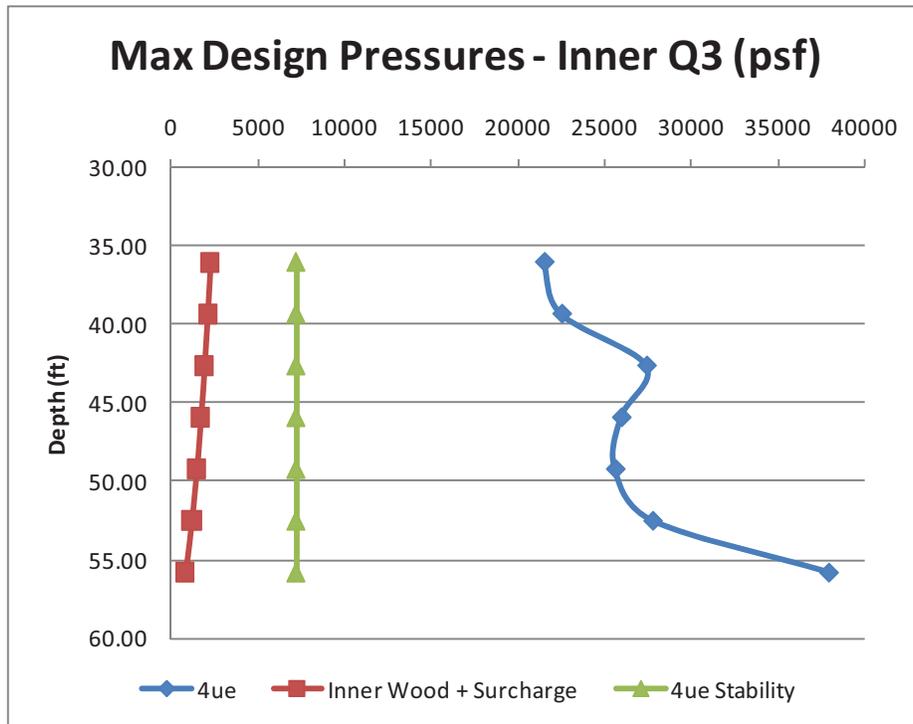


Figure 03.08.05-28-92— Tendon Gallery Inner Q3 – Soil 4ue (Uncracked Concrete)

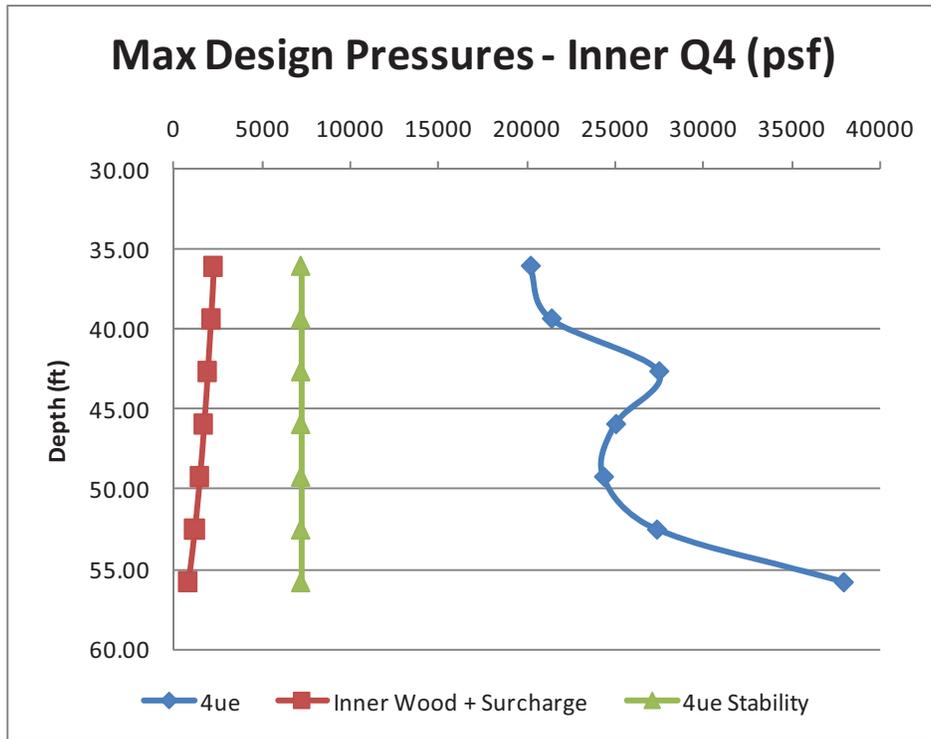


Figure 03.08.05-28-93— Tendon Gallery Inner Q4 – Soil 4ue (Uncracked Concrete)

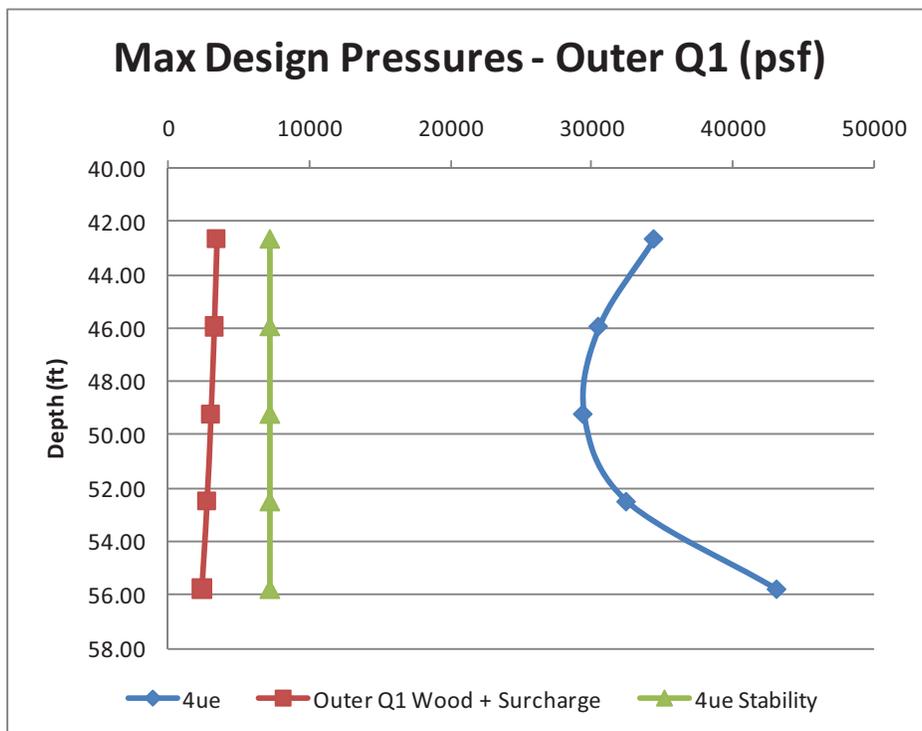


Figure 03.08.05-28-94— Tendon Gallery Outer Q1 – Soil 4ue (Uncracked Concrete)

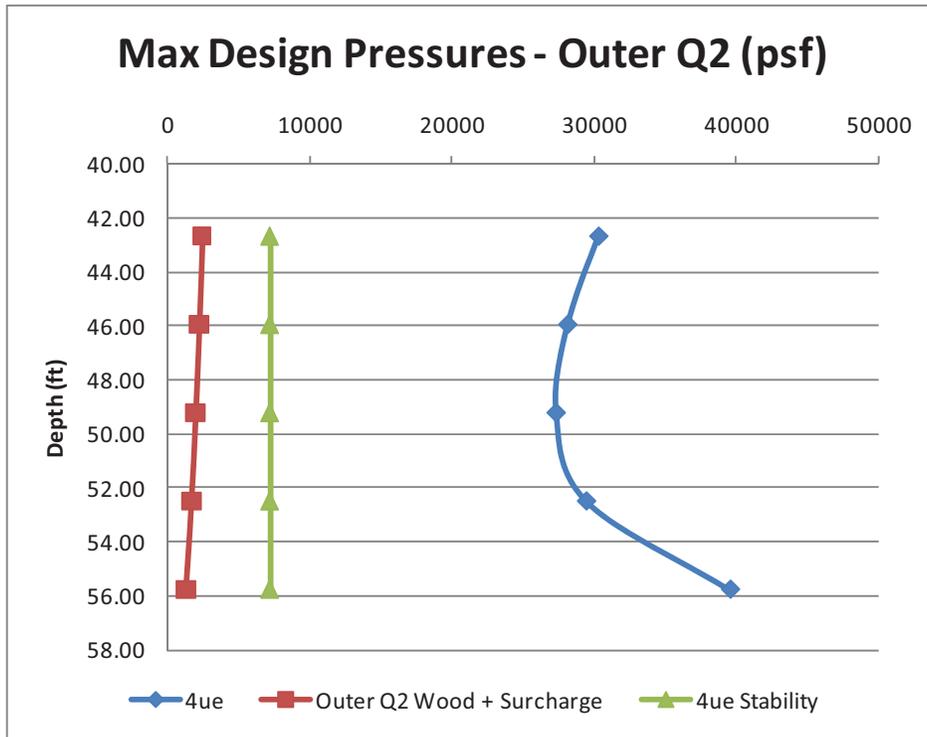


Figure 03.08.05-28-95— Tendon Gallery Outer Q2 – Soil 4ue (Uncracked Concrete)

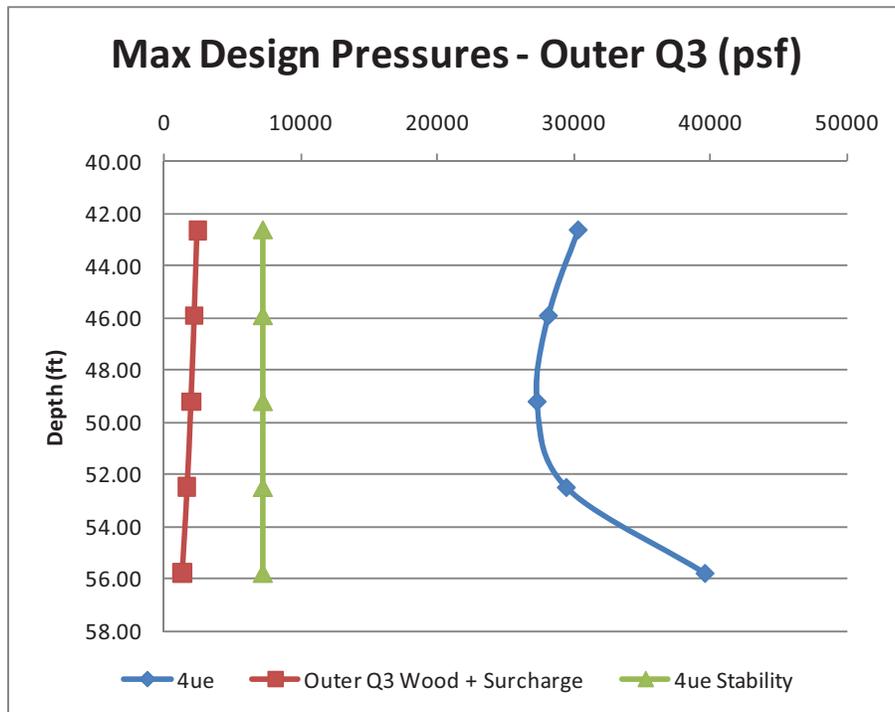


Figure 03.08.05-28-96— Tendon Gallery Outer Q3 – Soil 4ue (Uncracked Concrete)

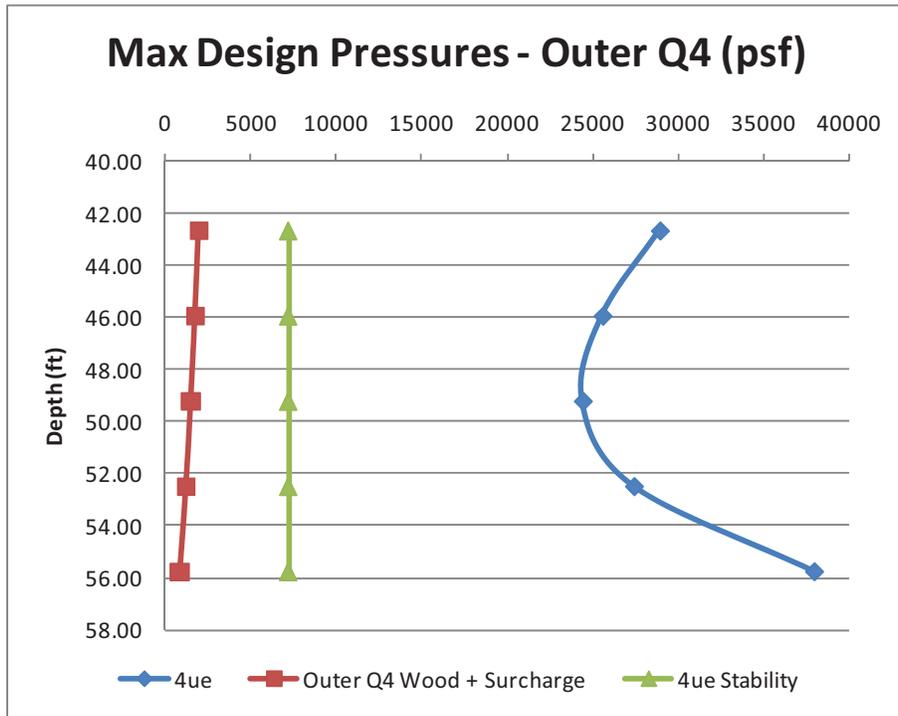


Figure 03.08.05-28-97— Tendon Gallery Outer Q4 – Soil 4ue (Uncracked Concrete)

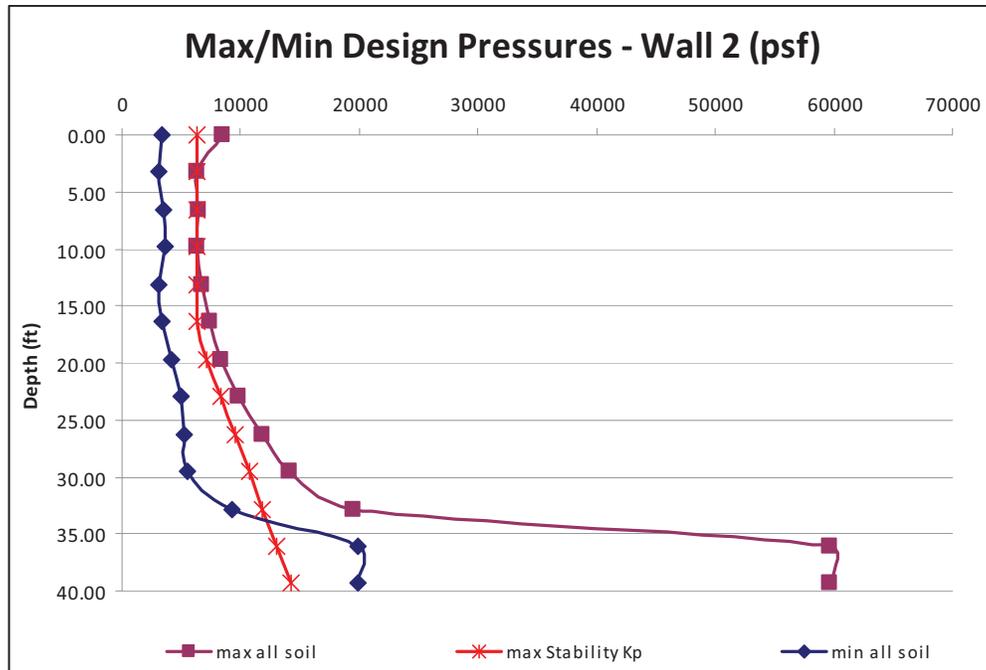


Figure 03.08.05-28-98—Wall 2 – Upper/Lower Bound of all Soil Cases (Uncracked Concrete)

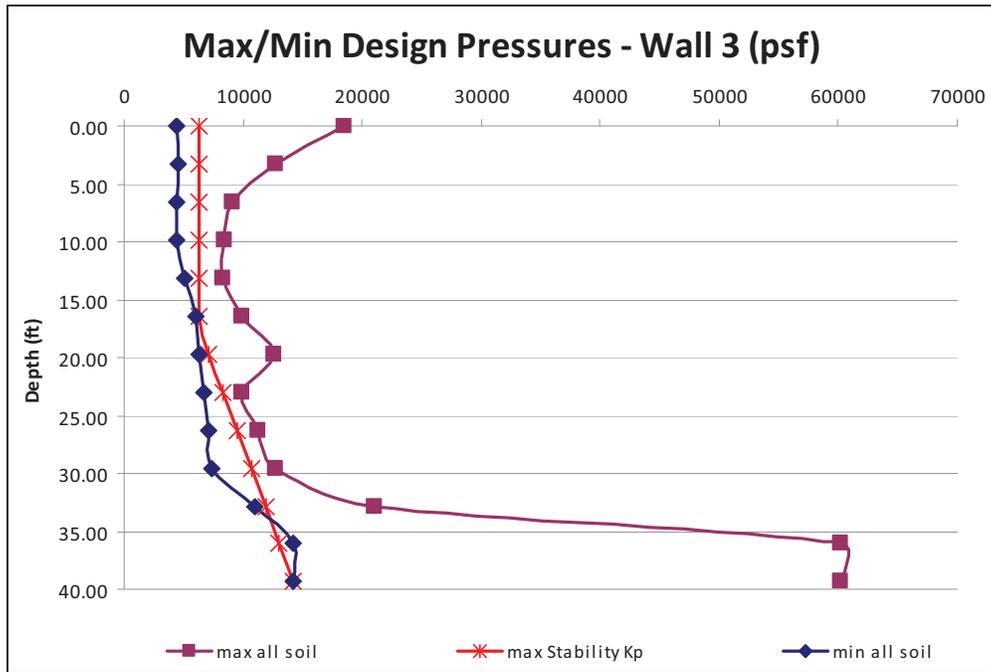


Figure 03.08.05-28-99—Wall 3 – Upper/Lower Bound of all Soil Cases (Uncracked Concrete)

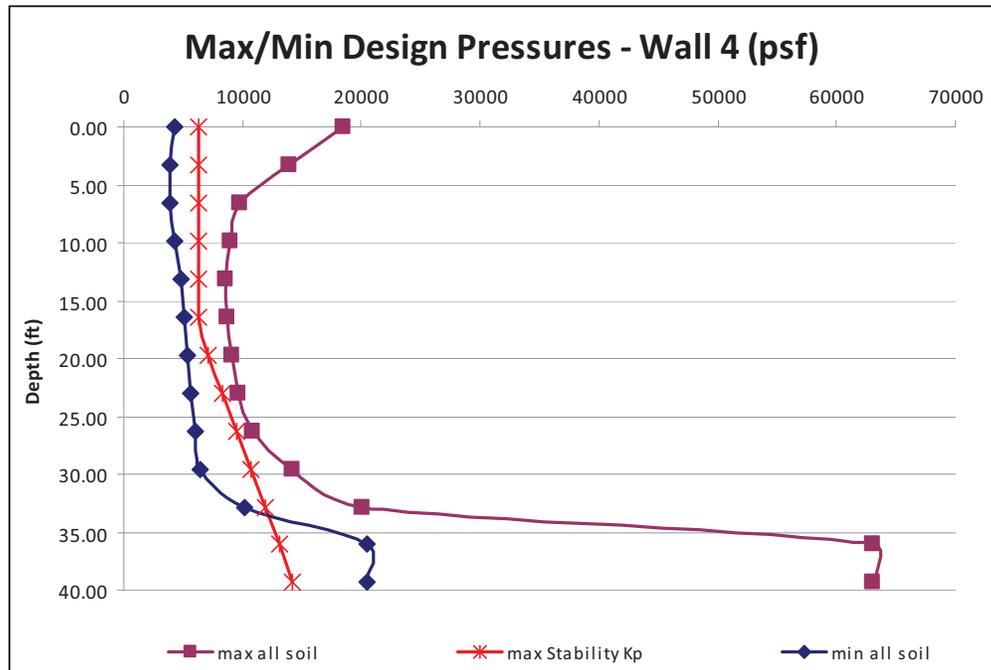


Figure 03.08.05-28-100—Wall 4 – Upper/Lower Bound of all Soil Cases (Uncracked Concrete)

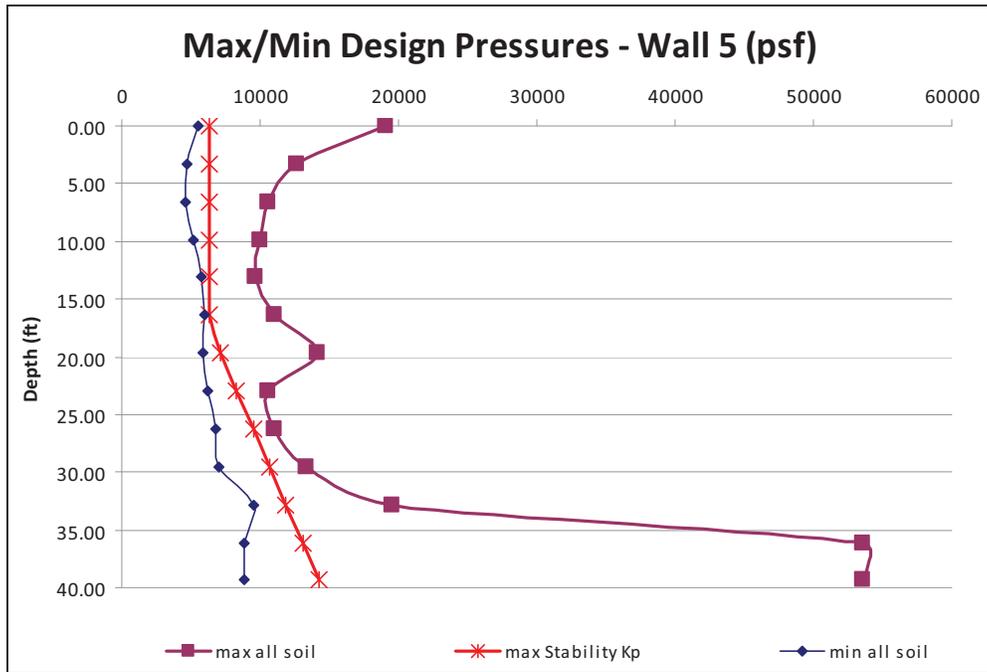


Figure 03.08.05-28-101—Wall 5 – Upper/Lower Bound of all Soil Cases (Uncracked Concrete)

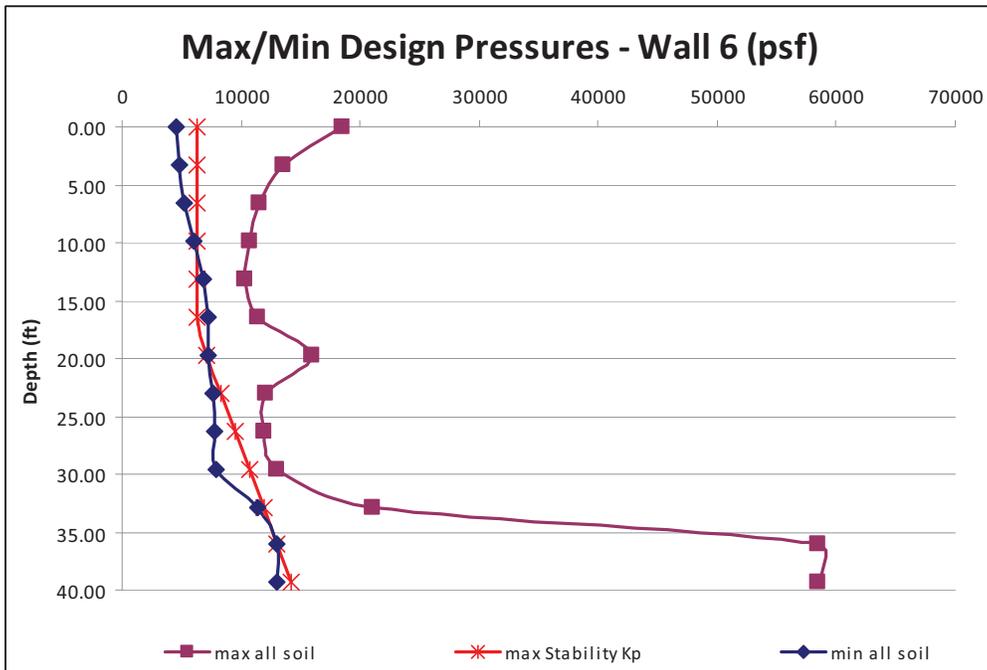


Figure 03.08.05-28-102—Wall 6 – Upper/Lower Bound of all Soil Cases (Uncracked Concrete)

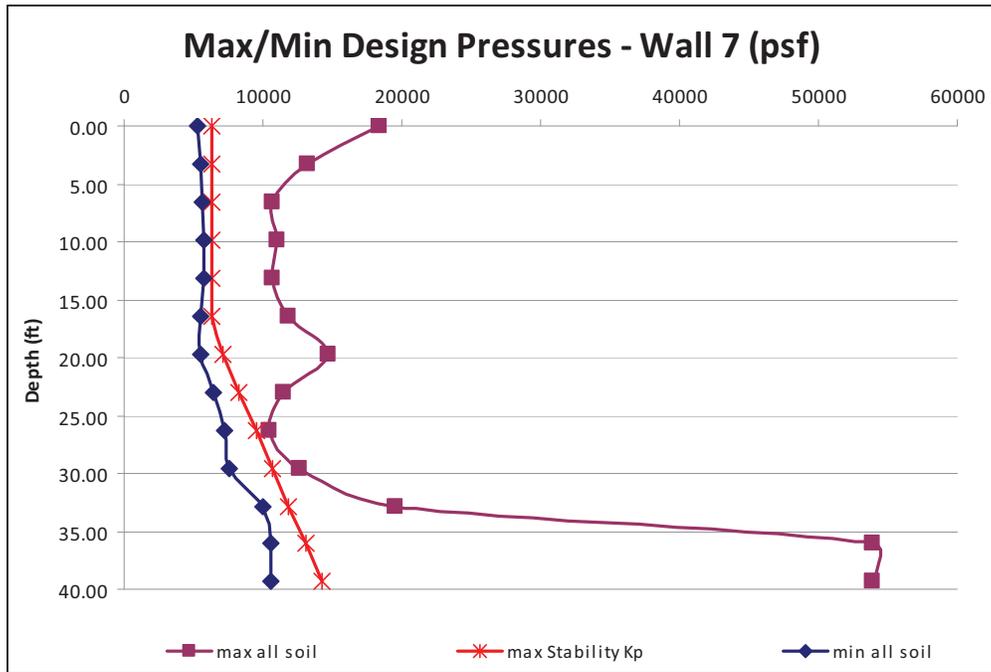


Figure 03.08.05-28-103—Wall 7 – Upper/Lower Bound of all Soil Cases (Uncracked Concrete)

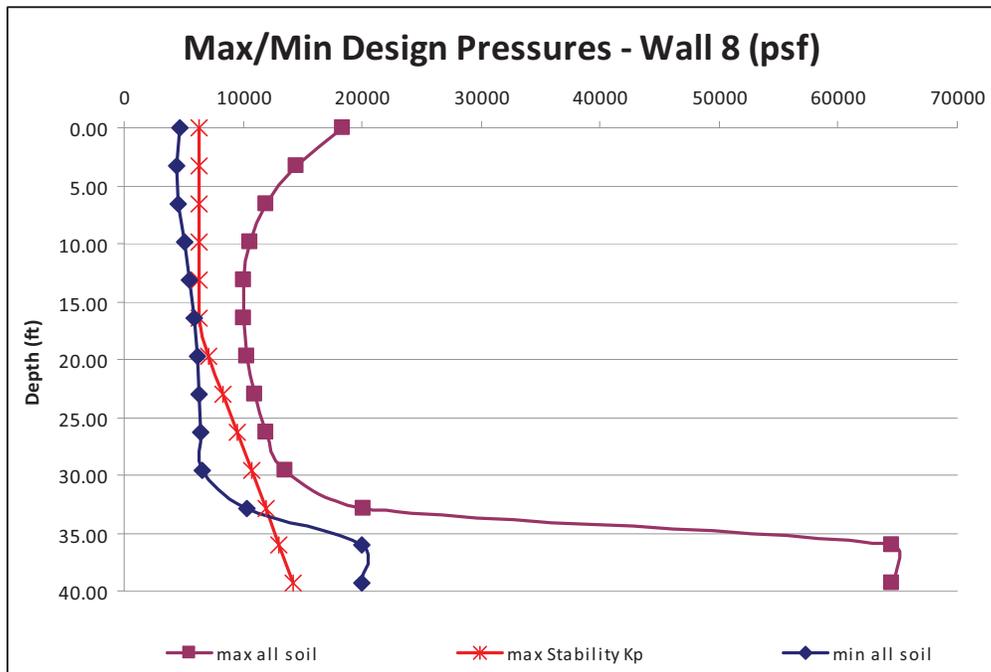


Figure 03.08.05-28-104—Wall 8 – Upper/Lower Bound of all Soil Cases (Uncracked Concrete)

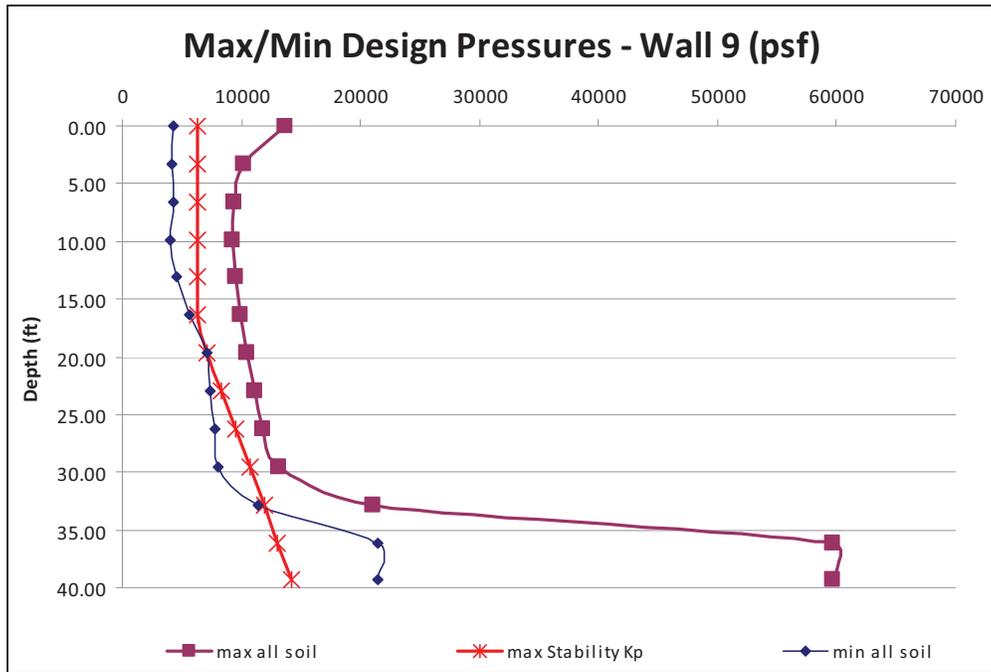


Figure 03.08.05-28-105—Wall 9 – Upper/Lower Bound of all Soil Cases (Uncracked Concrete)

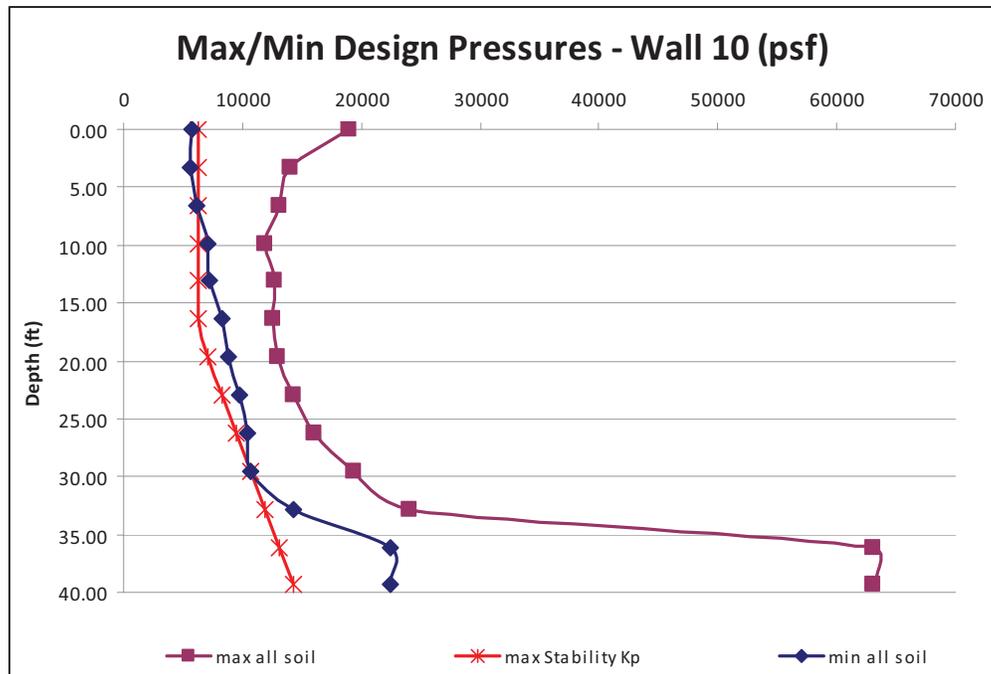


Figure 03.08.05-28-106—Wall 10 – Upper/Lower Bound of all Soil Cases (Uncracked Concrete)

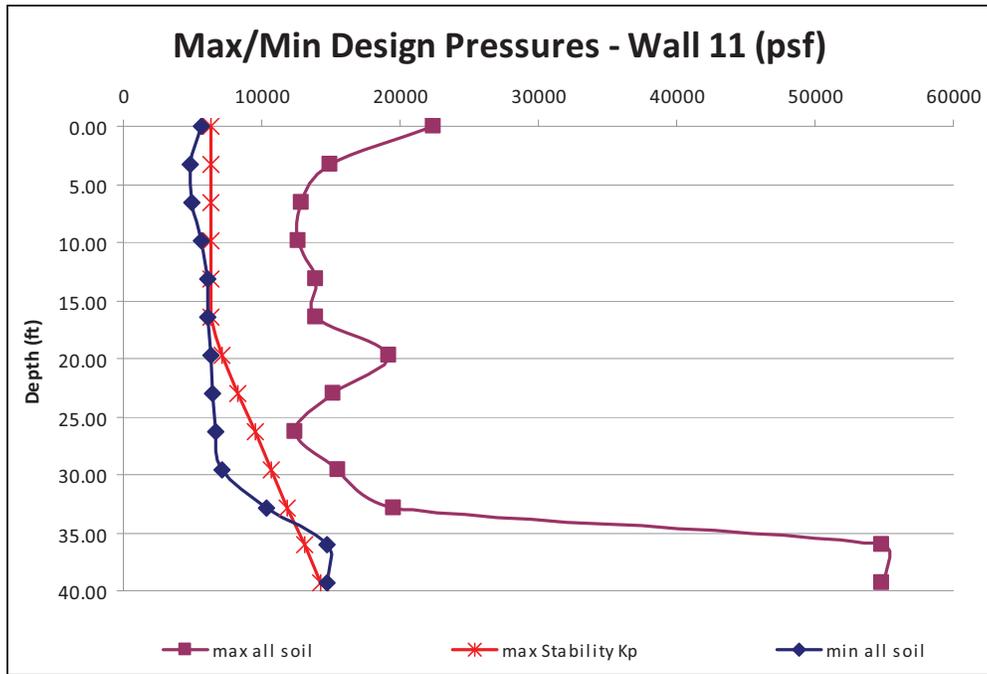


Figure 03.08.05-28-107—Wall 11 – Upper/Lower Bound of all Soil Cases (Uncracked Concrete)

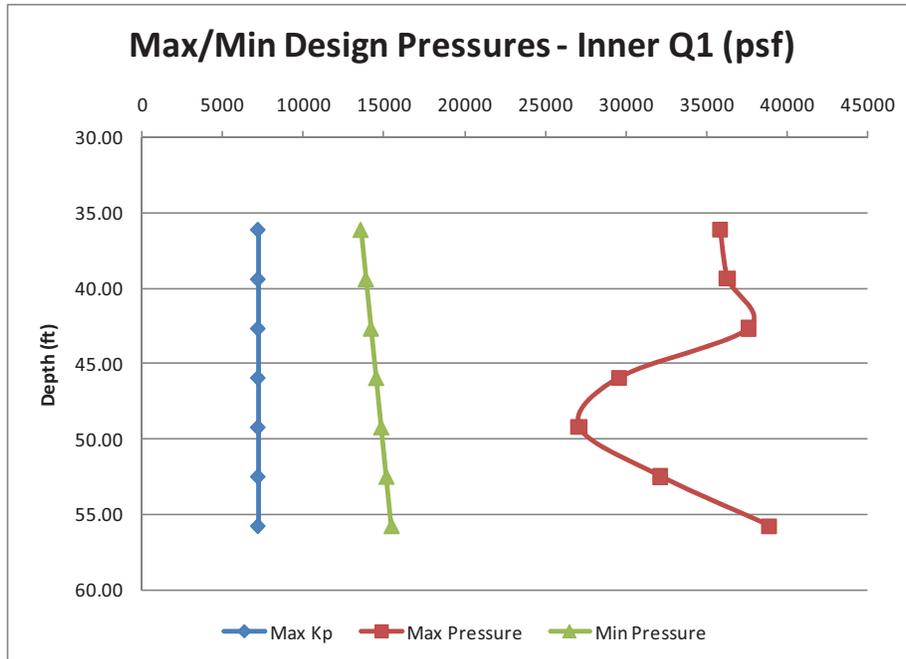


Figure 03.08.05-28-108— Tendon Gallery Inner Q1 – Upper/Lower Bound of All Soil Cases (Uncracked Concrete)

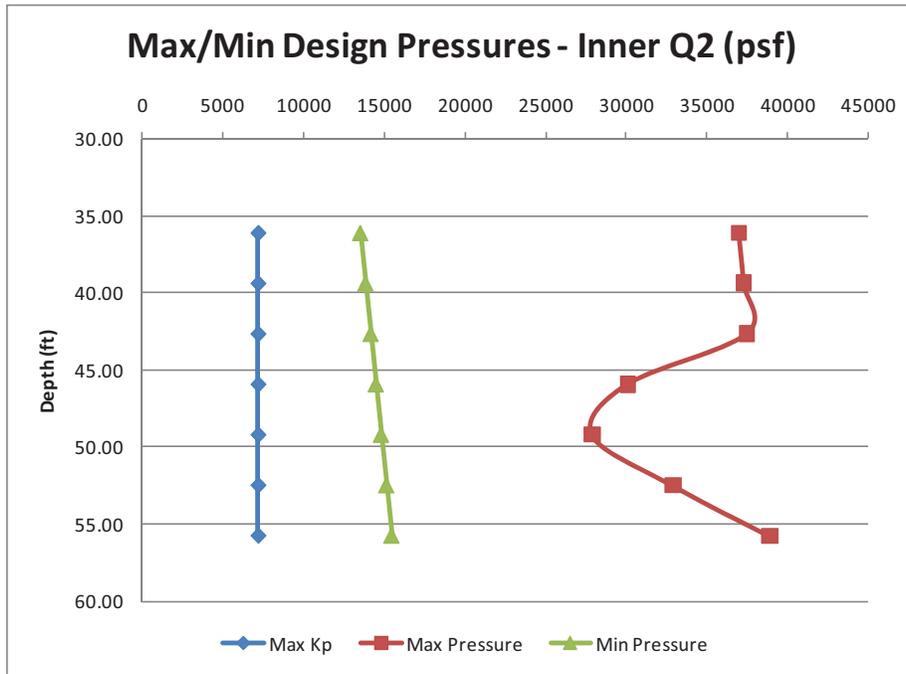


Figure 03.08.05-28-109— Tendon Gallery Inner Q2 – Upper/Lower Bound of All Soil Cases (Uncracked Concrete)

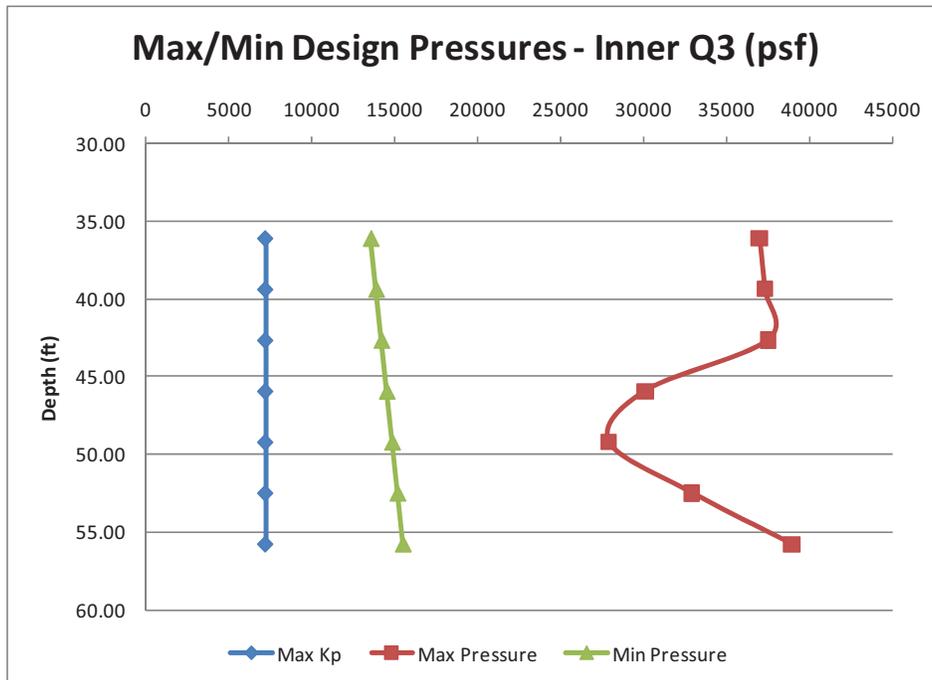


Figure 03.08.05-28-110— Tendon Gallery Inner Q3 – Upper/Lower Bound of All Soil Cases (Uncracked Concrete)

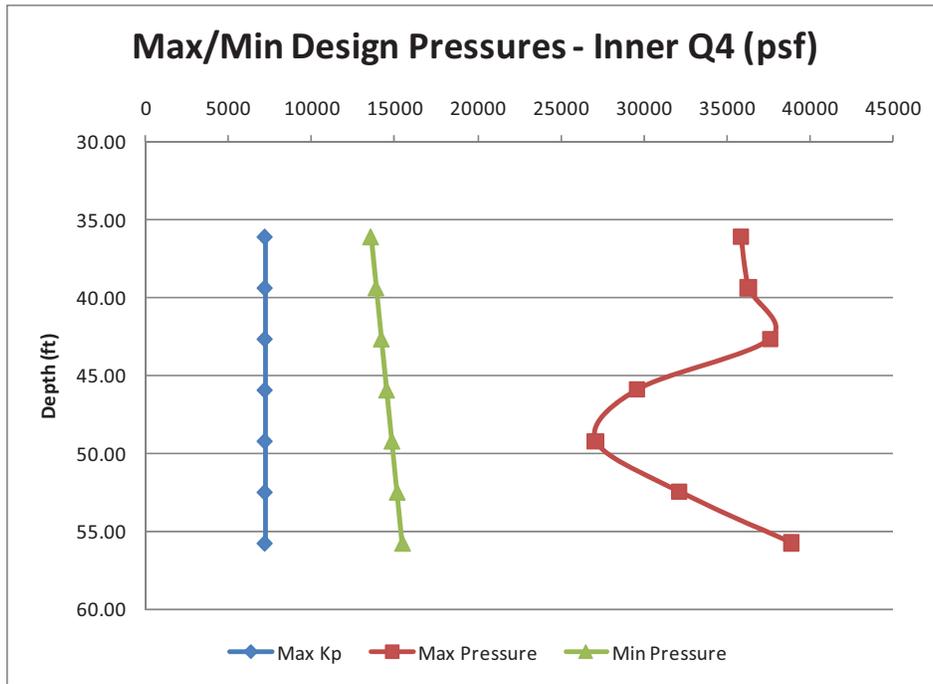


Figure 03.08.05-28-111— Tendon Gallery Inner Q4 – Upper/Lower Bound of All Soil Cases (Uncracked Concrete)

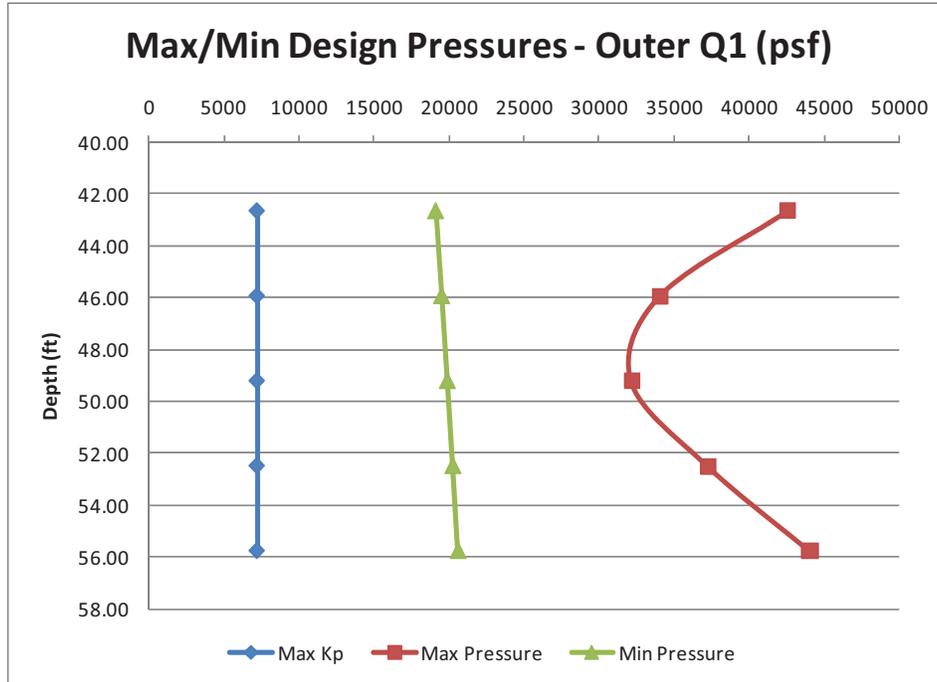


Figure 03.08.05-28-112— Tendon Gallery Outer Q1 – Upper/Lower Bound of All Soil Cases (Uncracked Concrete)

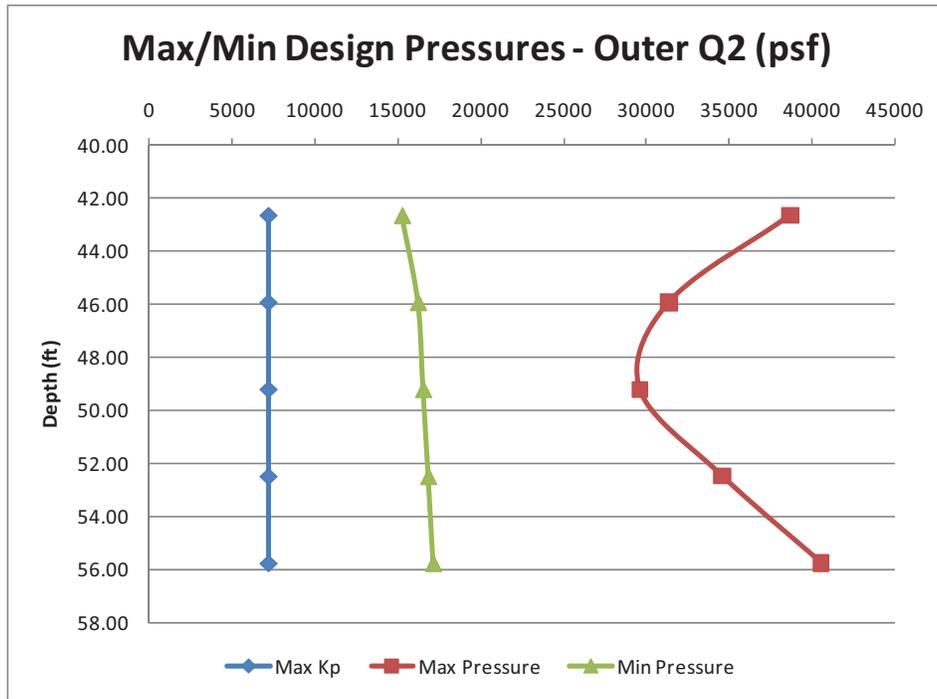


Figure 03.08.05-28-113— Tendon Gallery Outer Q2 – Upper/Lower Bound of All Soil Cases (Uncracked Concrete)

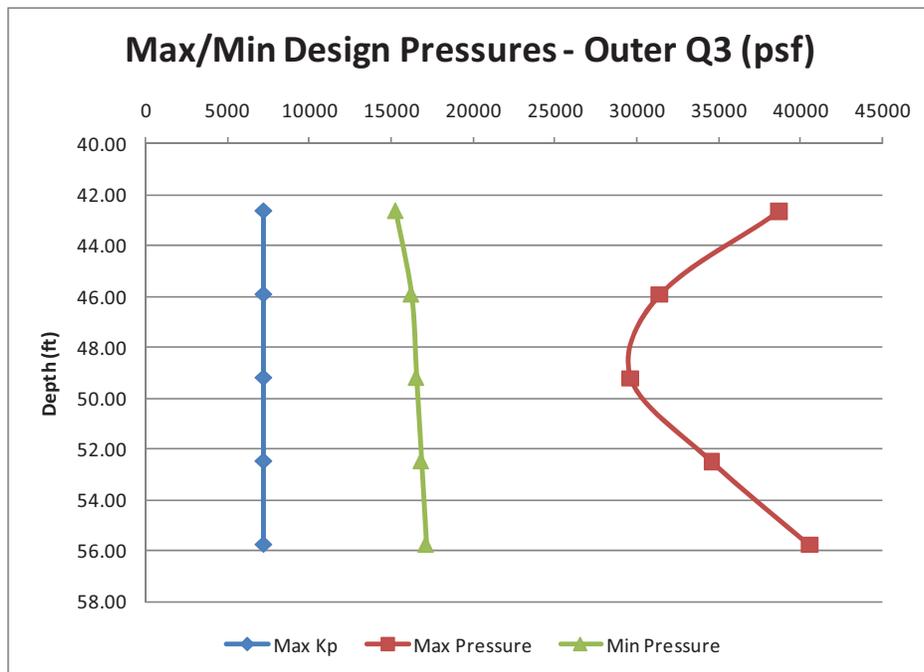


Figure 03.08.05-28-114— Tendon Gallery Outer Q3 – Upper/Lower Bound of All Soil Cases (Uncracked Concrete)

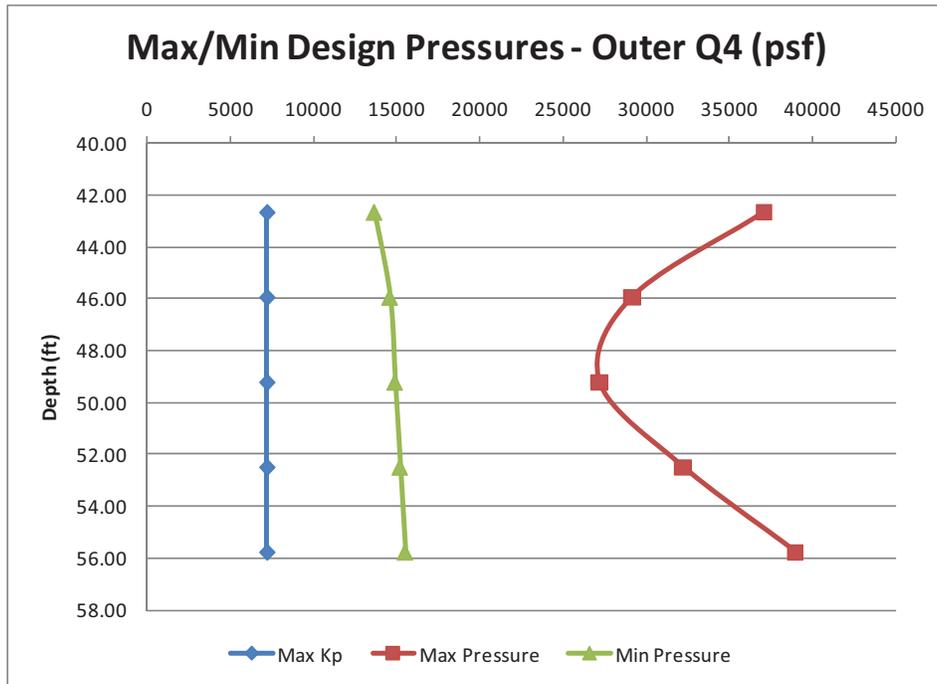


Figure 03.08.05-28-115— Tendon Gallery Outer Q4 – Upper/Lower Bound of All Soil Cases (Uncracked Concrete)

U.S. EPR Final Safety Analysis Report Markups

U.S. EPR Final Safety Analysis Report Markups

**Table 5.0-1—Site Parameters for the U.S. EPR Design
(3 Sheets)**

Tornado	
Parameter	Value(s)
Tornado (maximum speed, pressure drop, radius of maximum rotational speed, rate of pressure drop, missile spectra)	Maximum tornado wind speed of 230 mph. Maximum rotational speed of 184 mph. Maximum tornado pressure drop of 1.2 pounds per square inch at 0.5 psi per second. Radius of maximum rotational speed is 150 ft.
Soil	
Parameter	Value(s)
Soil properties:	
Minimum angle of internal friction (in situ and backfill)	26.6 degrees ⁽⁴⁾
Minimum shear wave velocity	Minimum shear wave velocity (low strain best estimate average value at bottom of basemat) of 1000 feet per second.
Minimum static bearing capacity	Maximum static bearing demand is <u>242,000 lbs/ft²</u> at the bottom of the Seismic Category I structure basemats. The ultimate static bearing capacity divided by 3.0 is greater than or equal to the maximum static bearing demand.
Minimum dynamic bearing capacity	Maximum dynamic bearing demand is 35,000 lbs/ft ² at the toe of the Seismic Category I structure basemats. The ultimate dynamic bearing capacity divided by 2.0 is greater than or equal to the maximum dynamic bearing demand.
Liquefaction potential	No potential for liquefaction under footprint of Seismic Category I structures from site-specific SSE.
Maximum ground water level	Maximum ground water level is 3.3 ft below grade.
Maximum Settlement (across the basemat)	
Tilt Settlement	1/2 inch in 50 ft in any direction.
Slope Failure Potential	No slope failure potential is considered in the design of safety-related SSC for U.S. EPR design certification.

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Table 2.1-1—U.S. EPR Site Design Envelope
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U.S. EPR Site Design Envelope	
Precipitation (Refer to Sections 2.3 and 2.4)	
Rainfall rate	≤19.4 in/hr
Sum of normal winter precipitation event and extreme frozen winter precipitation event ground load.	≤143 psf ⁽¹⁾
Seismology (Refer to Sections 2.5 & 3.7)	
Horizontal SSE Acceleration	0.3g PGA for EUR and 0.21g PGA for HF (CSDRS shapes – See Section 3.7)
Vertical SSE Acceleration	0.3g PGA for EUR and 0.18g PGA for HF (CSDRS shapes – See Section 3.7)
Fault Displacement Potential	No fault displacement is considered for safety-related SSC in U.S. EPR design certification.
Soil (Refer to Section 2.5)	
Minimum Static Bearing Capacity	<div style="border: 1px solid red; padding: 2px; display: inline-block; margin-bottom: 5px;">RAI 376, Q. 03.08.05-28</div> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin-top: 5px;">Maximum static bearing demand is 242,000 lbs/ft² at the bottom of the Seismic Category I structure basemats. The ultimate static bearing capacity divided by 3.0 is greater than or equal to the maximum static bearing demand.</div>
Minimum Dynamic Bearing Capacity	Maximum dynamic bearing demand is 35,000 lbs/ft ² at the toe of the Seismic Category I structure basemats. The ultimate dynamic bearing capacity divided by 2.0 is greater than or equal to the maximum dynamic bearing demand.
Minimum Shear Wave Velocity (Low strain best estimate average value at bottom of basemat)	1000 fps

The COL applicant will address site-specific liquefaction potential. As stated in Section 3.7.1, the evaluation of liquefaction is performed for the seismic level of the site-specific SSE.

2.5.4.9 Earthquake Site Characteristics

Section 3.7.1 describes the seismic design basis for the U.S. EPR. Section 2.5.2 presents a brief summary of the seismic design basis.

Site-specific earthquake site characteristics will be described by the COL applicant.

2.5.4.10 Static Stability

Static stability pertaining to bearing capacity and settlement for the U.S. EPR is described in the following section. Additional information is provided in Section 3.8.5 for the foundations of Seismic Category I structures.

2.5.4.10.1 Bearing Capacity

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The maximum bearing pressure under static loading conditions for the foundation basemat beneath the Seismic Category I structure basemats is 242,000 lbs/ft², which includes the dead weight of the structure and components and 25 percent of the live load. The maximum bearing pressure under safe shutdown earthquake loads combined with other loads, as described in Section 3.8.5, is 35,000 lbs/ft². Refer to Appendix 3E for details of these bearing pressures under the basemat (GDC 2).

A COL applicant that references the U.S. EPR design certification will verify that site-specific foundation soils beneath the foundation basemats of Seismic Category I structures have the capacity to support the bearing pressure with a factor of safety of 3.0 under static conditions, or 2.0 under dynamic conditions, whichever is greater.

2.5.4.10.2 Settlement

Safety-related structures, systems and components are housed primarily in structures supported by the foundation basemat for the NI Common Basemat Structures and independent foundation basemats for the EPGBs and the ESWBs.

Total settlement and differential settlement is dependent on site-specific conditions, construction sequence, loading conditions, and excavation and dewatering plans. It is expected that all elastic settlement and most of the consolidation settlement will occur by the time of completion of construction. There are limited interfaces between systems located on different basemats. The effects of total settlement and differential settlement will be considered where these interfaces occur. As described in Section 3.8.4.1.8 and Section 3.8.4.1.9, the design of safety-related buried conduits and piping is site-specific. These features will be designed for site-specific values of total settlement and differential settlement expected at the interface with the foundation

½" in 50' tilt described in Section 2.5.4.10.2 will be included for both structures. Absolute values of the results will be summed to produce conservative reductions in the shake space between the two structures.

The bounding soil case will produce the most displacement when the frictional resistance available is low, forcing more of the seismic motion energy into sliding the building.

The input motions used in this analysis are associated with the U.S. EPR soil cases. Additionally, a motion set will be generated based on RG 1.60 target spectra anchored to a peak ground acceleration of 0.3 g (see Figures 3.7.1-2 and 3.7.1-3). Three independent motions (i.e., two horizontal and one vertical base line correct for velocity and displacement) will be created in accordance with SRP 3.7.1. The seed records will be taken from the NRC CEUS database representing a magnitude seven earthquake rich in low frequency content. These transient results will be used in lieu of the multiple time history approach required by SRP 3.7.1 and ASCE 43-05.

A bilinear coefficients of friction of $\mu = 0.5$ static and $\mu = 0.25$ dynamic will be analyzed.

The bounding soil case will produce the most displacement when the frictional coefficient is high forcing more of the seismic motion energy into rocking the building.

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The input motions used for analysis will be the Table 3.7.1-6 ~~generic~~ soil cases. A coefficient of friction of $\mu = 0.7$ will be used to maximize the uplift.

Access Building

The Access Building is a non-Seismic Category I structure for which continued operation during an SSE event is not required. The Access Building is classified as Seismic Category II based on its proximity to the NI, a Seismic Category I structure. [[The Access Building is analyzed to site-specific SSE load conditions and designed to the codes and standards associated with Seismic Category I structures so that the margin of safety is equivalent to that of a Category I structure with the exception of sliding and overturning criteria. Because the Access Building does not have a safety function, it may slide or uplift provided that the gap between the Access Building and any Category I structure is adequate to prevent interaction. The effects of sliding, overturning, and any other calculated building displacements (e.g., building deflections, settlement) must be considered when demonstrating the gap adequacy between the Access Building and adjacent Category I structures. The separation gaps between the Access Building and SBs 3 and 4 are 0.98 ft and 1.31 ft, respectively (see Figure 3B-1).]] The walls of the Access Building are not physically connected to the SBs. SB 3 is protected by the aircraft hazard (ACH) shield wall which not only protects

3.8.5.4.5 Design Report

Design information and criteria for Seismic Category I structures are provided in Sections 2.4, 2.5, 3.3, 3.5, 3.7, 3.8.1, 3.8.2, 3.8.3, 3.8.4, and 3.8.5. Design results are presented in Appendix 3E for Seismic Category I structure critical sections. A cross-reference between U.S. EPR FSAR sections and information required by SRP Section 3.8.4 Appendix C is provided in Table 3.8-17.

3.8.5.5 Structural Acceptance Criteria

Limits for allowable stresses, strains, deformations, and other design criteria for Seismic Category I concrete foundations are in accordance with ACI 349-01 and its appendices (GDC 1, GDC 2 and GDC 4). Limits for concrete design include the exceptions specified in RG 1.142. In addition, the portion of the NI Common Basemat Structure foundation basemat that supports the RCB/RSB is in accordance with the ASME Code and RG 1.136 for containment loadings as described in Section 3.8.1.

Limits for the allowable stresses, strains, deformations, and other design criteria for structural steel elements of Seismic Category I foundations are in accordance with ANSI/AISC N690-1994 (R2004), including Supplement 2 (GDC 1, GDC 2 and GDC 4).

The design of Seismic Category I foundations is generally controlled by load combinations containing SSE seismic loads. Stresses and strains are within the ACI 349-01 limits, with the exceptions previously listed. Limits for allowable loads on concrete embedments and anchors are in accordance with Appendix D of ACI 349-06 (Appendix D with exception stated in Section 3.8.1.2.1) and guidance given in RG 1.199 (with exception described in Section 3.8.1.4.10). Portions of the NI Common Basemat Structure foundation basemat that support the RCB/RSB are within the limits in accordance with ASME Code, Section III, Division 2.

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Seismic Category I foundations are required to satisfy the factors of safety against overturning, sliding, and flotation defined in Table 3.8-11. The calculated minimum factors of safety for the NI Common Basemat Structure are provided in

Table 3E.1-39—Minimum Factors of Safety for the Nuclear Island Common Basemat Structure~~Table 3.8-12—Deleted. Minimum Factors of Safety Against Overturning, Sliding, and Flotation for Foundations—NI Common Basemat Structure.~~

Acceptance criteria for soil conditions for the media supporting Seismic Category I foundations are addressed in Section 2.5.

Acceptance criteria for tilt settlement for Seismic Category I foundations are addressed in Section 2.5.

The acceptance criteria for differential settlement of Seismic Category I foundations are based on the site-specific predicted angular distortion, as described in U.S. Army

Engineering Manual 1110-1-1904 (Reference 67). Predicted angular distortion is compared to the angular distortion throughout the basemat in both the east-west and north-south directions in the differential settlement contours. If the predicted angular distortion of the basemat of Seismic Category I structures is less than the angular distortion shown, the site is considered acceptable. Otherwise, further analysis will be required to demonstrate that the structural design is adequate.

Additional acceptance criteria for critical areas of these structures are described in Appendix 3E.

An as-built report is prepared to summarize deviations from the approved design and confirm that the as-built Seismic Category I foundations are capable of withstanding the design basis loads described in Section 3.8.5.3 without loss of structural integrity or safety-related functions.

A COL applicant that references the U.S. EPR design certification will evaluate site-specific methods for shear transfer between the foundation basemats and underlying soil for site-specific soil characteristics that are not within the envelope of the soil parameters specified in Section 2.5.4.2.

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3.8.5.5.1

Nuclear Island Common Basemat Structure Foundation Basemat

Appendix 3E.1 provides details of the design of the NI Common Basemat Structure foundation basemat critical areas.

The ~~minimum~~ static and dynamic bearing ~~pressures~~ demand for the NI Common Basemat Structure foundation basemat ~~are~~ specified in ~~Table 3E.1-40~~ ~~Table 2.1-1~~. The factors of safety against overturning, sliding, and flotation are each greater than or equal to 1.1. The factors of safety for each analysis case are provided in Table 3E.1-39

A differential settlement evaluation is performed for the NI common basemat structure considering both short term (elastic) and long term (heave and consolidation) effects. The evaluation accounts for the construction sequence, building stiffness, and time duration of loading of the NI common basemat structure. The resulting forces and moments throughout the structure are captured by application of soil springs to the same 3D finite element structural model of the basemat and superstructure that is used for design of the basemat. The total settlement for the NI common basemat is expected to be between 0 inches for a hard rock site and up to 5 inches for a soft soil site.

A COL applicant that references the U.S. EPR design certification will compare the NI common basemat site-specific predicted angular distortion to the angular distortion in the relative differential settlement contours in Figure 3.8-124 through Figure 3.8-134, using methods described in U.S. Army Engineering Manual 1110-1-1904. The comparison is made throughout the basemat in both the east-west and north-south

directions. If the predicted angular distortion of the basemat of NI common basemat structure is less than the angular distortion shown for each of the construction steps, the site is considered acceptable. Otherwise, further analysis will be required to demonstrate that the structural design is adequate.

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~~For worst-case loading combinations on the NI Common Basemat Structure foundation basemat, the time history methodology used to calculate sliding and uplift safety factors due to seismic loadings is described in Section 3.8.5.4.2. The calculated values meet the requirements of Table 3.8-11.~~

For worst-case loading combinations on the RB internal structures basemat above the containment liner, the minimum safety factor against sliding is 2.8 and the minimum safety factor against overturning is 1.9.

3.8.5.5.2 Emergency Power Generating Buildings Foundation Basemats

Appendix 3E.2 provides details of the design of the EPGB foundation basemats critical sections.

The ~~minimum~~ static and dynamic bearing ~~demand~~ pressures for the EPGB foundation basemat ~~are will be~~ provided in Table 3E.2-8. The factors of safety against overturning, sliding, and flotation are each greater than or equal to 1.1. The factors of safety for each analysis case are provided in Table 3E.2-7.

A differential settlement evaluation is performed for the EPGB structure considering both short term (elastic) and long term (heave and consolidation) effects.

A COL applicant that references the U.S. EPR design certification will compare the EPGB site-specific predicted angular distortion to the angular distortion in the total differential settlement contours in Figure 3.8-135, using methods described in U.S. Army Engineering Manual 1110-1-1904. The comparison is made throughout the basemat in both the east-west and north-south directions. If the predicted angular distortion of the basemat of EPGB structures is less than the angular distortion shown, the site is considered acceptable. Otherwise, further analysis will be required to demonstrate that the structural design is adequate.

3.8.5.5.3 Essential Service Water Building Foundation Basemats

Appendix 3E provides details of the design of the ESWB foundation basemats critical sections.

Maximum soil bearing pressures under the ESWB foundation basemat are 17,800 pounds per square foot for static loading conditions, and 28,200 pounds per square foot for dynamic loading conditions. For uniformity of site characteristics, the required

Table 3.8-10—Structural Bolting Nut and Washer Materials

Item	ASTM Designation
Nuts	A194 (all grades) A563 (all grades) F1852
Washers	F436

Note:

1. Use of A563 nuts conforms to Appendix X1 of ASTM A563, which provides guidance on the suitability of A563 nuts for specific bolting materials.

Table 3.8-11—Minimum Required Factors of Safety Against Overturning, Sliding, and Flotation for Foundations

Load Combination	Minimum Factors of Safety		
	Overturning	Sliding	Flotation
D + H + W	1.5	1.5	-
D + H + Wt	1.1	1.1	-
D + H + E'	1.1	1.1	-
D + Fb	-	-	1.1

Table 3.8-12—~~Deleted. Minimum Factors of Safety Against Overturning, Sliding, and Flotation for Foundations—NI Common Basemat Structure~~

Load Combination	Minimum Factors of Safety		
	Overturning	Sliding	Flotation
D + H + W	4.5	5.2	-
D + H + Wt	4.3	4.9	-
D + H + E'	1.7 (E-W) 1.9 (N-S)	1.2 (E-W) 1.1 (N-S)	-
D + Fb	-	-	5.0

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Equipment hatch	64'-0"	154
Air lock	4'-11"; 64'-0"	61 each

Foundation Stability

The Nuclear Island Common Basemat Structure is evaluated for stability against overturning, sliding, and floatation for the ~~generic~~ soil profiles used in establishing the certified plant design. The tendon gallery is used as a shear key. The minimum factors of safety for the Nuclear Island Common Basemat Structure are listed in Table 3E.1-39. The calculated factors of safety against overturning, sliding, and floatation satisfy the acceptance criteria.

The sliding and overturning factors are determined using load combination containing dead load (D), lateral earth pressure (H), SSE (E'), hydrostatic load (F) and buoyant force (Fb). It is conservatively assumed that the E' and Fb occur simultaneously. The floatation factor of safety is determined based on dead load (D) and buoyant force (Fb). The dead load used in the analysis includes 25 percent of the live load, which is consistent with the generation of dynamic soil pressure due to SSE.

The static and dynamic bearing pressures for the Nuclear Island Common Basemat Structure are listed in Table 3E.1-40. ~~The maximum foundation edge pressure when seismic loads are included is found to be 31203 psf.~~

Design Criteria

Sections 3.8.1.2, 3.8.2.2, 3.8.3.2, 3.8.4.2, and 3.8.5.2 describe codes, standards, and specifications applicable to the design of the RCB (Concrete), RCB (Steel), RB internal structures, RSB, and NI foundation basemat, respectively.

A global ANSYS Finite Element Model (FEM) (addressed in Sections 3.8.1.4.1, 3.8.3.4.1, 3.8.4.4.2, and 3.8.5.4.2) is developed and loaded with various independent loads and load combinations per the applicable codes and standards and solved to produce forces and moments throughout the structure. Sections 3.8.1.3, 3.8.2.3, 3.8.3.3, 3.8.4.3, and 3.8.5.3 describe loads and loading combinations applicable to the design of NI Common Basemat Structures. The design includes the soil cases shown in Table 3.7.1-6.

The independent loads shown in Table 3E.1-1—Independent Loads Considered in the FEM, are applied to the NI common basemat global ANSYS FEM to analyze and evaluate the overall structural response of the NI Common Basemat Structures as described in Section 3.8.1.4, 3.8.2.4, 3.8.3.4, 3.8.4.4, and 3.8.5.4. Additional loads shown in Table 3E.1-2—Independent Loads Not Considered in the FEM, and addressed in Sections 3.8.1.3, 3.8.2.3, 3.8.3.3, 3.8.4.3, and 3.8.5.3 are not considered by the ANSYS FEM and are independently added and analyzed for in the design process for completeness.

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Table 3E.1-40—Maximum Static and Dynamic Bearing Pressures for the NI Common Basemat Structure

<u>Analysis Case</u>	<u>Static [ksf]</u> <u>(Dead Load)</u>	<u>Dynamic [ksf]</u> <u>(Seismic plus Dead Load)</u>
	<u>Edge</u>	<u>Edge</u>
<u>1n2ue</u>	<u>23.1</u>	<u>30.3</u>
<u>1n2ue-cr</u>	<u>23.1</u>	<u>30.2</u>
<u>1n5ae</u>	<u>18.9</u>	<u>31.4</u>
<u>1n5ae-cr</u>	<u>18.9</u>	<u>27.1</u>
<u>2sn4ue</u>	<u>21.9</u>	<u>30.1</u>
<u>2sn4ue-cr</u>	<u>21.9</u>	<u>30.5</u>
<u>4ue</u>	<u>22.9</u>	<u>31.9</u>
<u>4ue-cr</u>	<u>22.9</u>	<u>30.0</u>
<u>5ae</u>	<u>21.1</u>	<u>26.9</u>
<u>5ae-cr</u>	<u>21.1</u>	<u>26.8</u>
<u>hfbe</u>	<u>18.8</u>	<u>24.1</u>
<u>hfbe-cr</u>	<u>18.8</u>	<u>22.2</u>
<u>hflb</u>	<u>18.9</u>	<u>23.9</u>
<u>hflb-cr</u>	<u>18.9</u>	<u>23.6</u>
<u>hfub</u>	<u>18.4</u>	<u>23.4</u>
<u>hfub-cr</u>	<u>18.4</u>	<u>22.5</u>
<u>Maximum</u>	<u>23.1</u>	<u>31.9</u>

Notes:

- Analysis cases indicated with “-cr” represent the cracked case.

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