OLD ALBEMARLE COUNTY JAIL
PERIMETER WALL STUDY

4th Street NE
Charlottesville, Virginia

Prepared May 28, 2014
for
Albemarle County Public Services
401 McIntire Road
Charlottesville, Virginia 22902-4596

Prepared by:

Daniel S. Suggs Engineering
Consulting Engineers
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Introduction and Objective of Study

The old county jail wall consists of a two wythe brick wall with pilasters spaced approximately every twenty feel along the perimeter. The brick wythes are laid in a running bond pattern with expansion offsets built in at each pilaster. The expansion offsets are, in general, constructed as a horizontal offset expansion loop similar to that often employed in pipe runs without expansion couplings. However, the expansion offsets are not consistent in their design with most constructed in a running bond lap while others are constructed as butted joints; occasionally, both methods are employed within an individual pilaster. The mortar used is a lime base of typical low-to-medium strength that is susceptible to moisture remolding and degradation.

The mortared brick wall rests on a mortared rubble foundation wall. The brick section of the wall is approximately flush with the exterior ground surface on all but the west wall. On the wall inner face, approximately 4 to 5 feet of foundation wall is exposed. Several repairs have been made to the wall over the years, with the most extensive being the concrete overlay to the inner face of the rubble foundation for the entire length of the west wall section.

The objective of this investigation was to determine stability of the perimeter wall since the construction of the new adjoining parking garage to estimate future wall movements, and to provide a basis for estimating wall longevity.

Assumptions and Methodology

Brick, especially old brick, is subject to expansion in width, length, and height due to temperature changes and moisture absorption within the brick. Typically on walls less than 35 feet in height, the critical dimensional changes occur to the length dimensions. For this reason, methods to accommodate linear expansion of the brick are incorporated in the wall, typically at about 20-foot intervals along the wall length. This perimeter wall was constructed to include expansion measures built into the pilasters, which are spaced at 20-foot intervals.

A brick wall displays gross changes much like a monolithic concrete wall. The brick wall will display changes in length, tilt, and cracking in response to internal stresses and environmental changes. However, unlike a monolithic wall, these gross responses are not a direct characteristic of the wall, but an accumulation of such responses by individual bricks and mortar joints. To try to get a sense of movements and stresses within the brick wall, the wall was considered monolithic within 2-foot vertical sections and horizontally between intersecting wall sections. The following conditions were assumed in the evaluation:

1. The corner pilasters were taken as representative in the X and Y planes of the corresponding intersecting wall sections.
2. Each vertical section considered monolithic within each pilaster can move independently over small distances from the adjoining vertical sections within the pilaster.
3. For the purposes of movement analysis, the inner and outer wall wythes were considered monolithic.
4. The brick wall rests on top of the foundation wall and is free to pivot.

The data was collected with the overlying assumption that the overall pilaster stability was dependent on the relative stability of the assumed vertical monolithic sections relative to the other vertical sections within the pilaster in the same plane. This was accomplished by establishing a virtual plane parallel with the pilaster face in both the X and Y planes, and measuring the distance to the pilaster face at known vertical points on the pilaster. The virtual plane was represented by a suspended plumb bob from an anchor set in the pilaster face. By measuring distance from the suspended plumb line and adjusting the values by the distances from the plumb line to the wall face at the set anchor location, it was possible to negate the global movements of the set anchor location from one data collection event to the next. The cumulative data sets were then subjected to a series of polynomial regression analyses to account for exponential—brick and mortar deterioration, settlement, etc.—and linear expansion and contraction influences. Using this approach, it was possible to detect trends in movements of vertical sections within a pilaster, as well as project future movements. All measurement events were performed in early spring or late fall to minimize the effects of ambient air temperatures.

Wall Cracking
Evaluations and Projections

Wall cracks are the result of excessive induced stresses that occur in the walls as a whole, or relatively large portions thereof, as opposed to individual bricks. The location, angle of crack propagation, and starting point of a crack are indicative of the cause of the crack. Typically, cracks that extend vertically can be attributed to stresses caused by expansion and contractions resulting from moisture and temperature changes. Angled cracks are typical of induced moments caused by differential movements, such as foundation settling, severe mortar loss or brick deterioration, etc. Of course, combinations do occur, and all are present within the jail wall. There were 15 cracks that were tracked over the two years of this investigation; most were limited to either the inner or outer wythe of brick. However, instances were noted where both inner and outer wythes cracked due to wall foundation movement, or foundation settlement. It was also noted that several cracks, especially in the northeast corner, had propagated to areas of severe mortar loss that, in effect, became continuations of the cracks.

As a result of cracking the north wall section is nearly severed from the rest of the perimeter wall. At the northwest corner, cracking and mortar loss has completely severed the upper ¾ of the west wall outer wythe and 100% of the inner wythe. Cracking in this region is due to the presence of a large tree, since removed, that was growing immediately outside the perimeter wall for several decades. These cracks are active and subject to continued growth due to foundation movements resulting from

further rotting of the tree roots and mortar degradation. The northeast end of the north wall section is, for all intents and purposes, severed from the east wall section due to a combination of cracks caused by settling of the northeast corner, and severe mortar and brick degradation on the north and east walls. Mortar loss and brick deterioration are severe, especially on the inner wythe of both the north and east wall sections, and on the east outer wythe.

An active cracking scenario is developing in the inner wythe at the southwest corner. The cracks are not reflected in the outer wythe; however, increasing mortar loss in the south wall/outer wythe, especially at the pilaster, is believed to be influencing the noted cracks.

Pilaster
Evaluations and Projections

Three corner pilasters were measured in perpendicular planes to determine overall tilt in each plane, incremental tilt at two-foot intervals, and to determine if any movement trends exist. A fourth pilaster was selected mid-reach of the north wall and the same measurements were taken in the transverse plane of the wall. Measurement projection and movement trend equations were developed through polynomial regression of the collected data and relationships of said data within each pilaster.

A review of the generated regression graphs for each pilaster, both individually and in comparison with the other pilasters, suggest that each of the pilasters tended to act independently, and did not indicate any interrelationship in movement or stability. The indications are that the three corner pilasters are individual structures in various stages of degradation. Considering the three pilasters along the north wall (P2, P3, and P4), for settlement effects from construction of the parking garage, such effects appear to have diminished significantly within the first twelve months of the study.

Accepting that the settlement effects of construction around the perimeter wall have significantly diminished and are essentially irrelevant to future movements of the wall, it can be reasoned that any trends that display non-linear movement are the results of mortar and/or brick degradation. Such movements will continue with further deterioration of the brick and/or mortar until bridging of the deteriorated section or collapse of the wall section occurs.

From a review of the photo logs it is obvious that considerable mortar and brick deterioration has occurred on the inner and outer wythes in the northeast corner of the perimeter wall. Less prominent is the deterioration that has occurred in the southwest corner. A review of the regression curves for pilaster P1 in the southwest corner suggests that deterioration/mortar loss in the outer wythe is impacting the movement and slope of the pilaster. The indication is that the southwest corner and pilaster P1 are in the early stages of brick and mortar deterioration. Similarly, the regression curves for pilaster P3, mid-reach of the north wall, also suggest that mortar loss and deterioration near the wall base is impacting pilaster P3 movement.

Pilaster P2 is unique in that it appears to be stabilizing and only showing effects of mortar and brick degradation in the upper reaches of the north wall component. This is likely the result of separation of the west wall from the pilaster due to cracking, and repairs previously made to the

outer wythe brick at the pilaster base. Even though the pilaster appears to be stabilizing, it is not as structurally stable as it once was due to the loss of the west wall "bracing" effect.

The perimeter wall has, in essence, been broken into the three following segments: south and west walls; north wall; and east wall. This has been caused by cracking of the west wall at pilaster P2 and a combination of cracks and brick and mortar deterioration at pilaster P4. The northeast corner has and continues to experience excessive brick and mortar deterioration. This degradation has reached the point where the application of minor horizontal force could displace bricks and possibly result in collapse of a portion of the wall. The same conditions that exist in the northeast corner appear to be developing at the southwest corner, albeit in an early stage of development.

Excessive mortar loss has occurred in several locations along the top of the perimeter wall, resulting in loose bricks that are subject to displacement, and at select locations along the north wall, and at the southwest corner. The continuation of mortar loss in these areas will persist with continued exposure to weather unless repaired. While some benefit could be realized by repairing selected locations around the wall, the extent of brick and mortar degradation in the northeast corner, the east half of the north wall, and the east wall may render such repairs useless in preserving the entire perimeter wall.

Recommendations

The perimeter wall is in poor condition and remediation measures are necessary for its preservation and the safety of the general public. The brick and mortar deterioration in the northeast corner, along the eastern half of the north wall and the east wall are so extensive that a demo and rebuild would be required to restore structural integrity to these sections of the perimeter wall. Add to that the west wall cracking at the northwest corner, the increasing brick and mortar degradation at the southwest corner, and mortar loss in the foundation wall, the cost of remediation becomes considerable. While partial restoration will address the more serious structural issues that currently exist, it would not resolve the various minor stages of deterioration and cracking that are present throughout the wall structure. Such an approach will, however, prolong the life of the perimeter wall until such time that the minor deterioration and cracking become more extensive, which will inevitably occur, and additional repairs will be necessary.

An alternative to this piecemeal approach that should be considered if restoration of the wall is the desired end result, is demo and rebuild of the complete perimeter wall. This course of action would be more expensive initially, but it would yield a better end product with greater stability and longer life. In the long run, it may be more cost effective than a partial repair approach.

A third approach that may be acceptable is to demo the brick sections of the perimeter wall to a height of 2'±, repair as necessary, and repoint the foundation wall. Such an approach would restore structural integrity to the foundation wall, retain the footprint of the perimeter wall, and reduce the potential for personal injury to the general public. Since there is a 4'-5' difference in ground elevation between the jail courtyard and the surrounding ground, a fence or other restrictive barrier around the entire perimeter wall would be required.

Regardless of the long-term approach selected, the following immediate measures should be considered:

(1) Repair deteriorated/missing brick and mortar at the sallyport door and west side of the sallyport. The sallyport is a distinctive and interesting part of the Old Jail complex and is currently relatively stable. It is reasonable to expect this feature to be included in any future uses of the complex. Cost of repair would not be unreasonable at this time; however, if left unresolved, cost will increase with time.

(2) Limit access to the north wall by locking both gates between the parking garage and the north wall's outer face. This will restrict public access and reduce the potential safety hazard.

(3) Install fencing on the east side to restrict pubic access to the wall. This will reduce the potential safety hazard, in conjunction with item (2) above, which currently exists in the northeast corner due to extreme deterioration and mortar loss.

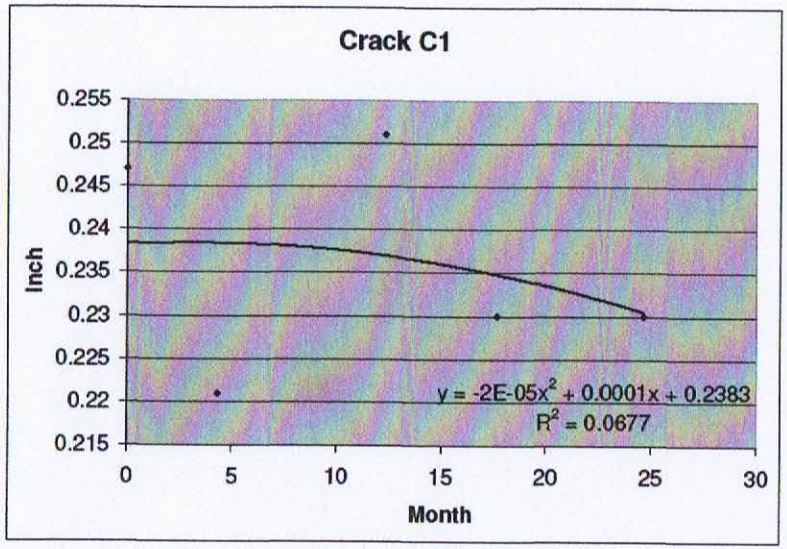
(4) Routinely remove loose brick from the top of the south and west wall sections to reduce the hazard of falling bricks. This is especially warranted on the west wall, due to the existing sidewalk at the base of the wall.

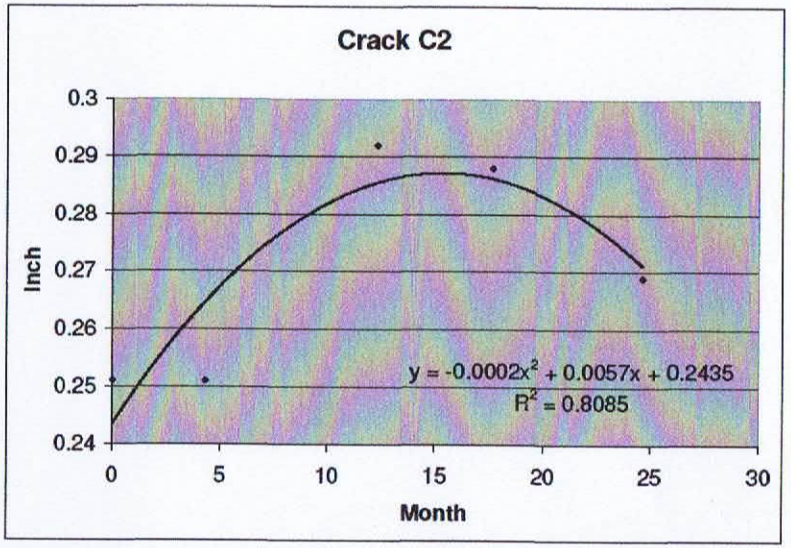
Perimeter Wall Cracks

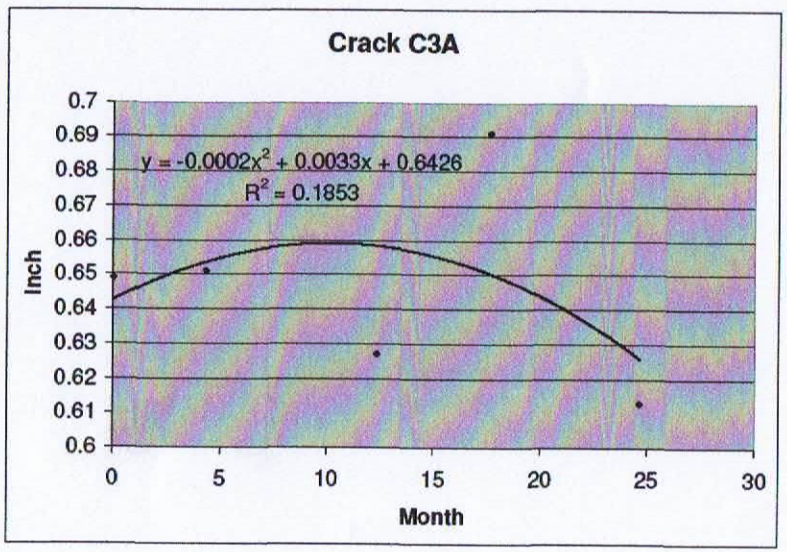
Old County Jail
Perimeter Wall Cracks

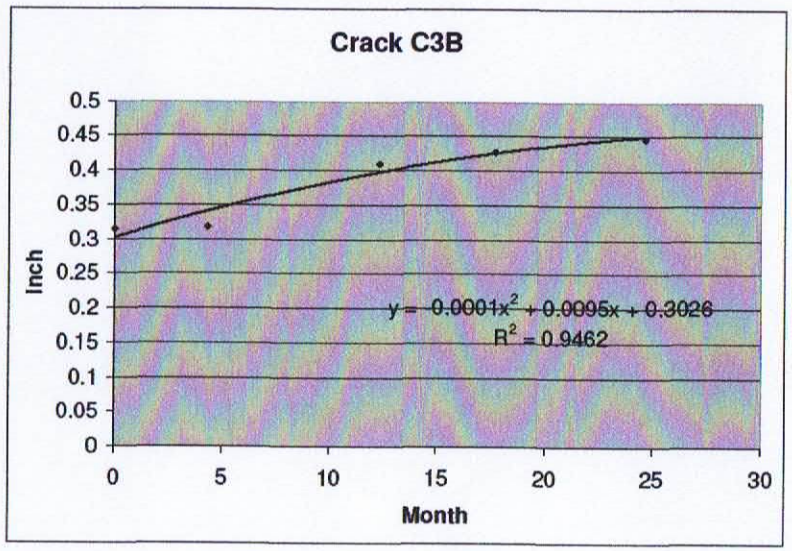
Wall Crack ID	Crack Location	Crack Width Projection Equation	Curve Fit to Data	Comments
C1	South wall, outer wythe, at sally port entrance	$Y = -0.00002 x^2 + 0.0001 x + 0.2383$	Poor	Crack likely caused by stresses resulting from settlement of the west corner of the sally port, and mortar and brick loss each side of the sally port entrance.
C2	West wall, outer wythe	$Y = -0.0002 x^2 + 0.0057 x + 0.2435$	Good	Nonlinear movement most likely caused by settlement of southwest corner pilaster.
C3A	West wall, outer wythe, at northeast pilaster	$Y = -0.0002 x^2 + 0.0033 x + 0.6426$	Poor	Likely cause of crack is previously removed large tree.
C3B	West wall, outer wythe, at northwest pilaster	$Y = -0.0001 x^2 + 0.0095 x + 0.3026$	Very Good	Crack likely started by previously removed large tree. Active crack width has been increasing over time. May be linked to settlement of northwest pilaster or rotting root system of removed tree.
C4	North wall, outer wythe, at location of removed slab	$Y = -0.0002 x^2 + 0.0092 x + 0.0289$	Very Good	Crack likely due to foundation settlement and/or mortar deterioration. Possibly stabilizing.
C5A	North wall, outer wythe, at pilaster near coal shoot gate	$Y = 0.00009 x^2 + 0.003 x + 0.1231$	Fair	Latter data indicates stabilizing. Crack likely caused by wall foundation settlement near northeast corner.
C5B	North wall, outer wythe, at pilaster near coal shoot gate	$Y = -0.0008 x^2 + 0.0255 x + 0.0811$	Good	Crack stabilizing. Crack is continuation of C5A. Crack likely caused by foundation settlement near northeast corner.
C6	North wall, outer wythe, at northeast pilaster	$Y = -0.00003 x^2 + 0.003 x + 0.068$	Poor	Latter data indicates stabilizing. Crack likely caused by foundation settlement at northeast corner.
C7	East wall, outer wythe, at northeast pilaster	$Y = 0.0001 x^2 - 0.0027 x + 0.272$	Fair	Active crack. Crack due to settling of northeast pilaster.
C8	South wall, inner wythe, at interior entrance to sally port	$Y = -0.00004 x^2 + 0.0016 x + 0.0973$	Poor	Data limited to a very narrow range. Crack is fairly stable.
C9	South wall, inner wythe, near southeast corner	$Y = 0.00009 x^2 - 0.0004 x + 0.0785$	Very Good	Crack is active with constantly increasing width. Crack is increasing in length. Crack caused by settling of southwest pilaster.
C10	South wall, inner wythe, at base of southwest pilaster	$Y = 0.00002 x^2 + 0.0012 x + 0.1547$	Good	Crack active with increasing width. Crack likely caused by settlement of southwest pilaster.
C11A	West wall, inner wythe, at northwest pilaster	$Y = -0.0001 x^2 + 0.0023 x + 0.586$	Poor	Data may suggest shift in northwest pilaster. Active crack caused by tree, since removed.
C11B	West wall, inner wythe, at northwest pilaster	$Y = 0.00002 x^2 - 0.0001 x + 0.1461$	Poor	Data may suggest shift in northwest pilaster. Active crack caused by tree, since removed. Crack width increasing.
C12	West wall, foundation overlay, near northwest pilaster	$Y = 0.0002 x^2 - 0.0046 x + 0.0926$	Very Good	Crack width increasing. Crack likely due to rotting of tree roots and settling of foundation at same location—possibly due to rotting roots.
C13	North wall, inner wythe, northeast corner	$Y = -0.0005 x^2 + 0.0118 x + 0.15$	Poor	Active crack. May be stabilizing. Crack likely caused by settlement of northeast corner.
C14	North wall, inner wythe, northeast corner	$Y = -0.00006 x^2 + 0.0018 x + 0.1548$	Fair	Crack appears stable. Crack likely due to settling of northeast corner. Excessive mortar loss below crack is influencing this crack.
C15	North wall, inner wythe, at northeast pilaster	$Y = 0.001 x^2 - 0.0262 x + 0.3722$	Good	Crack is active. Crack likely caused by foundation settling of northeast corner.

Cracks

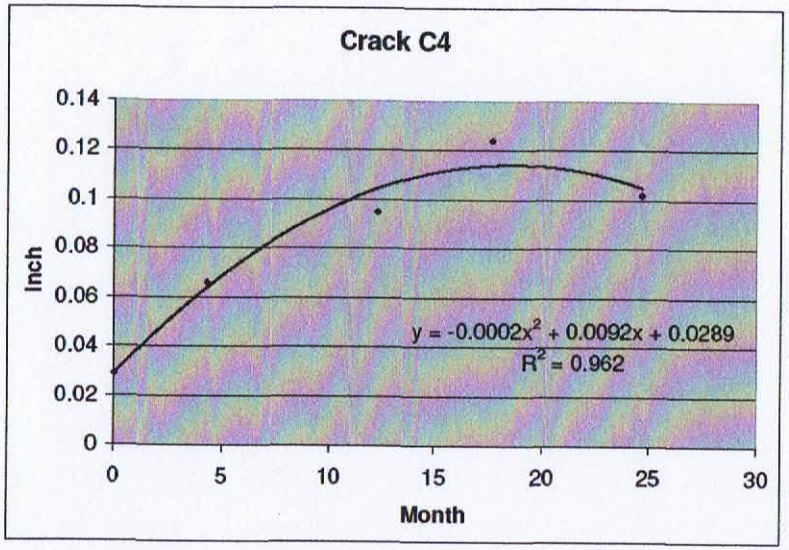

Crack C1
Inch
Month
y = -2E-05x² + 0.0001x + 0.2383
R² = 0.0677

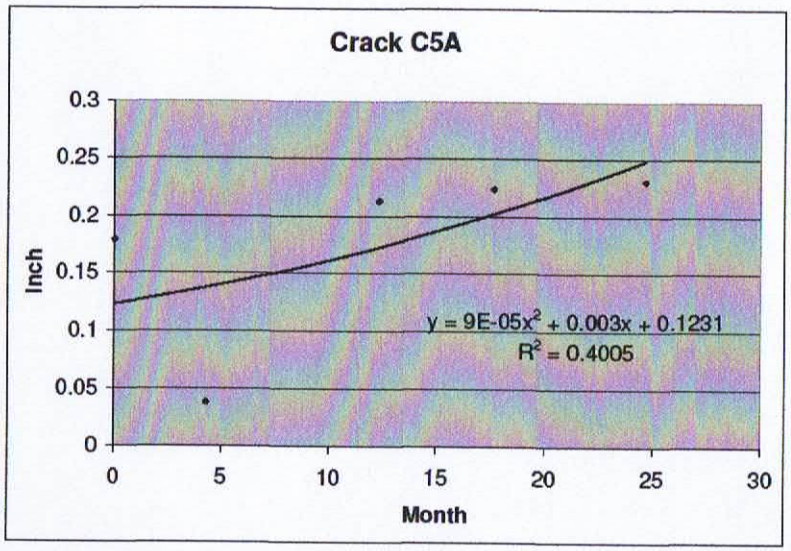

Crack C2
Inch
Month
y = -0.0002x² + 0.0057x + 0.2435
R² = 0.8085

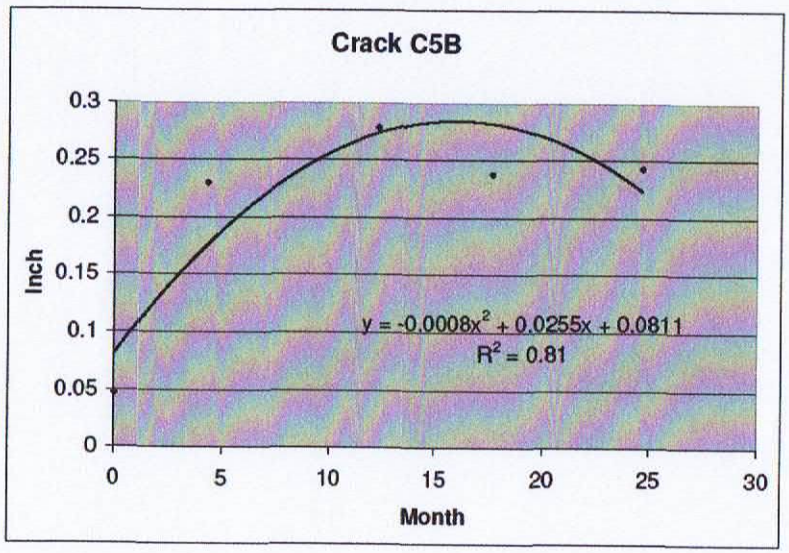

Crack C3A
Inch
Month
y = -0.0002x² + 0.0033x + 0.6426
R² = 0.1853

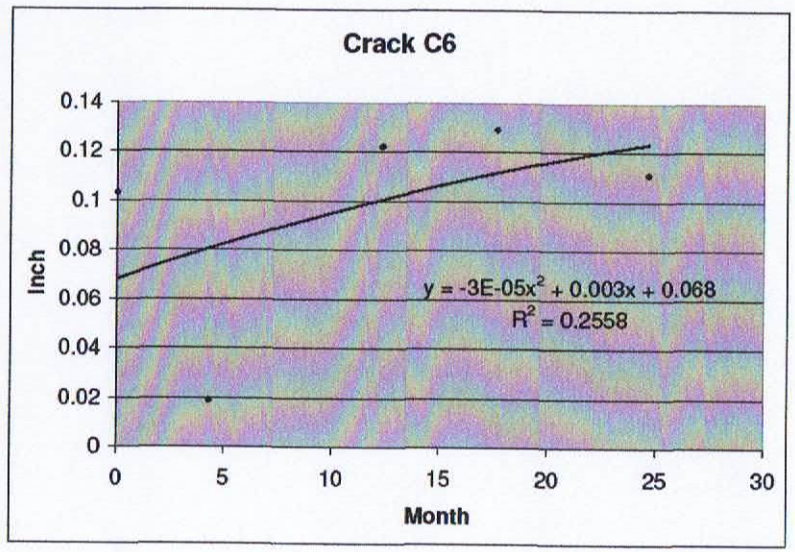

Crack C3B
Inch
Month
y = 0.0001x² + 0.0095x + 0.3026
R² = 0.9462

Cracks

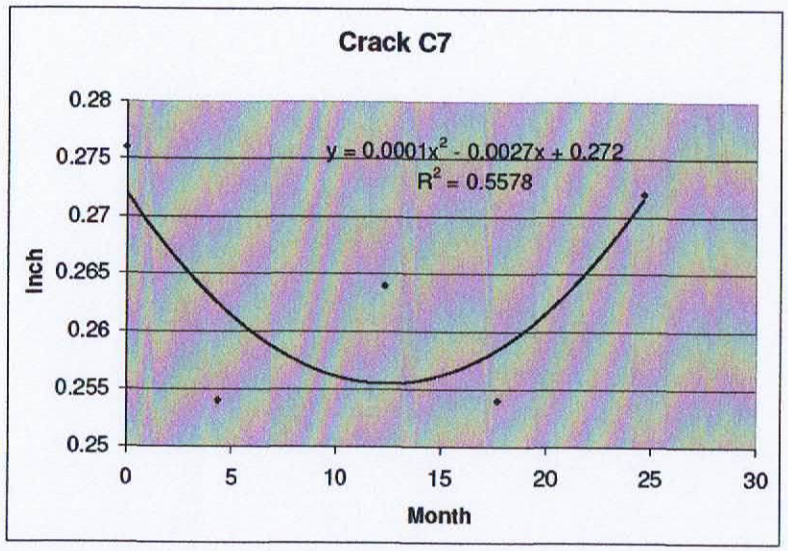

Crack C4
Inch
Month
y = -0.0002x² + 0.0092x + 0.0289
R² = 0.962

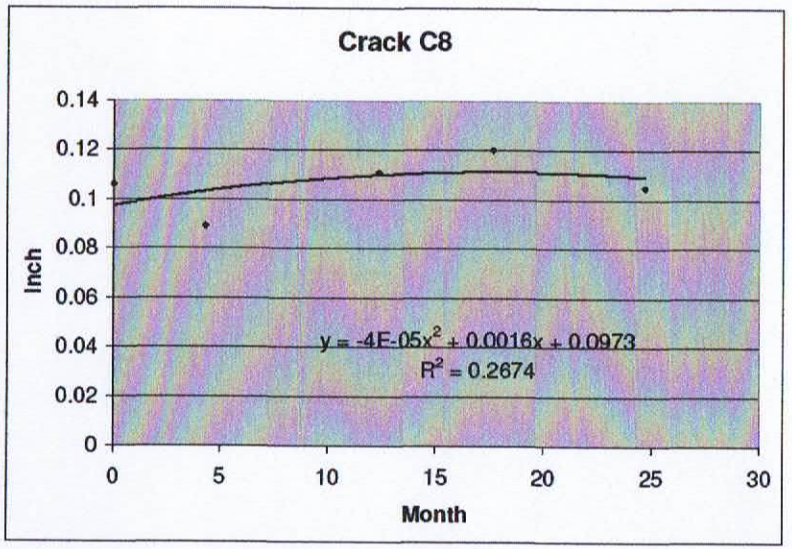

Crack C5A
Inch
Month
y = 9E-05x² + 0.003x + 0.1231
R² = 0.4005

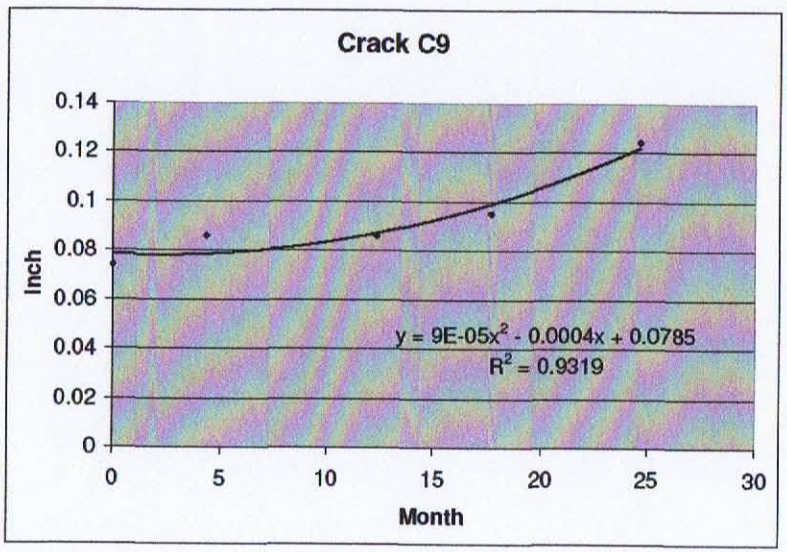

Crack C5B
Inch
Month
y = -0.0008x² + 0.0255x + 0.0811
R² = 0.81

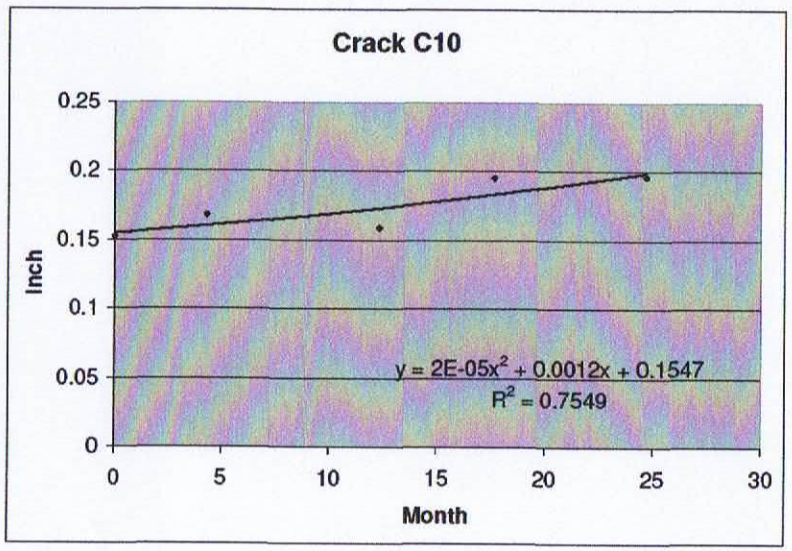

Crack C6
Inch
Month
y = -3E-05x² + 0.003x + 0.068
R² = 0.2558

Cracks

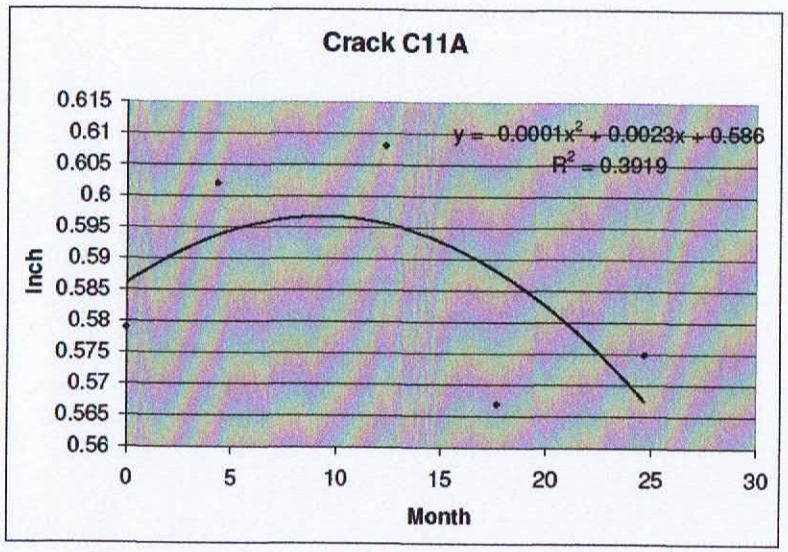

Crack C7
y = 0.0001x² - 0.0027x + 0.272
R² = 0.5578
Inch
Month
0.28
0.275
0.27
0.265
0.26
0.255
0.25
0
5
10
15
20
25
30

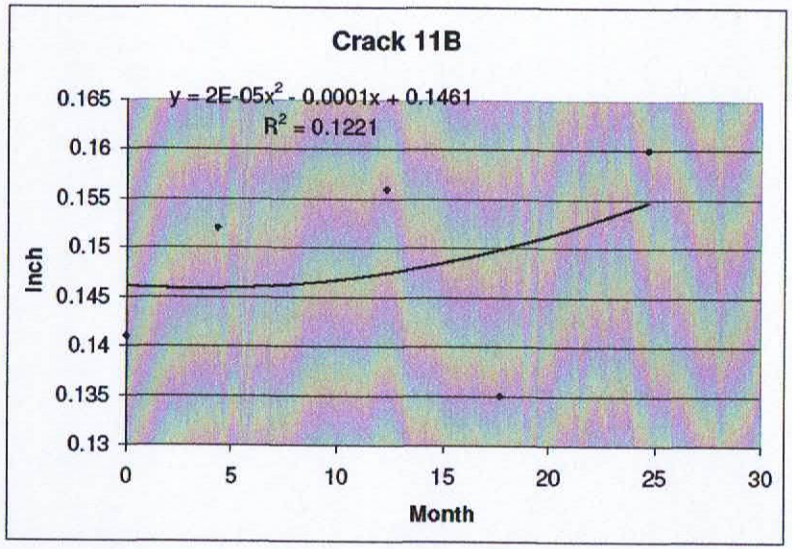

Crack C8
y = -4E-05x² + 0.0016x + 0.0973
R² = 0.2674
Inch
Month
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
5
10
15
20
25
30

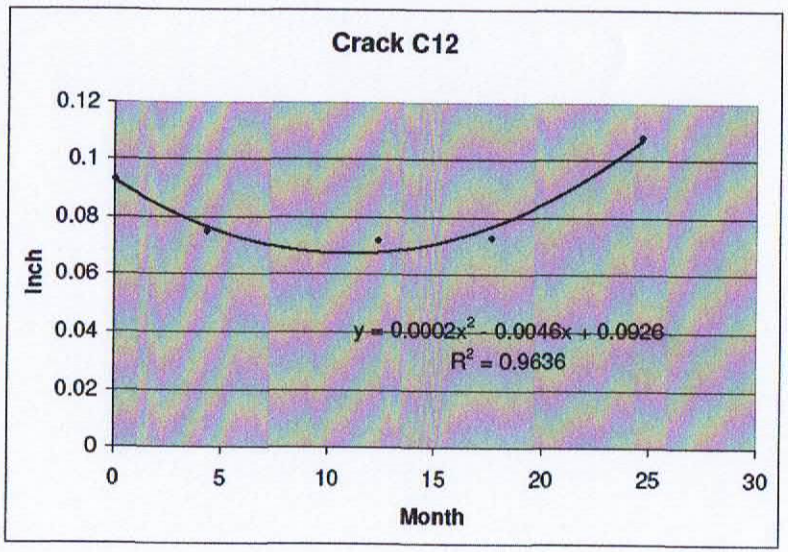

Crack C9
y = 9E-05x² - 0.0004x + 0.0785
R² = 0.9319
Inch
Month
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
5
10
15
20
25
30

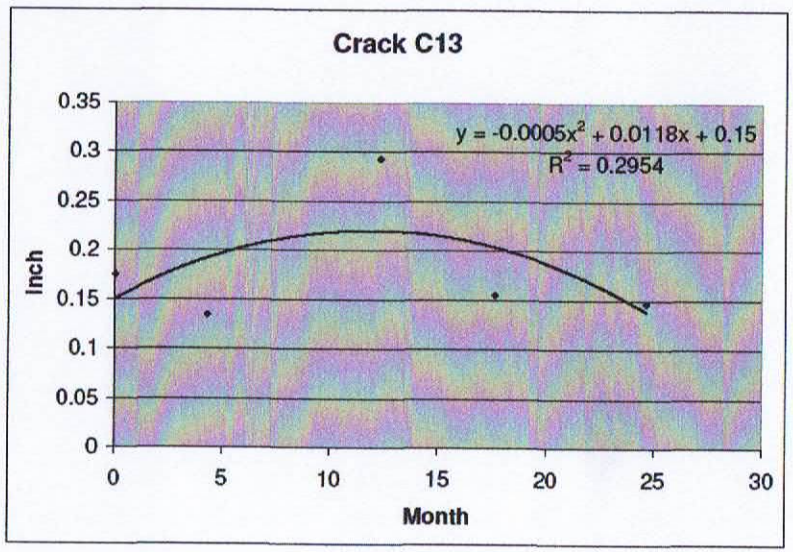

Crack C10
y = 2E-05x² + 0.0012x + 0.1547
R² = 0.7549
Inch
Month
0.25
0.2
0.15
0.1
0.05
0
0
5
10
15
20
25
30

Cracks

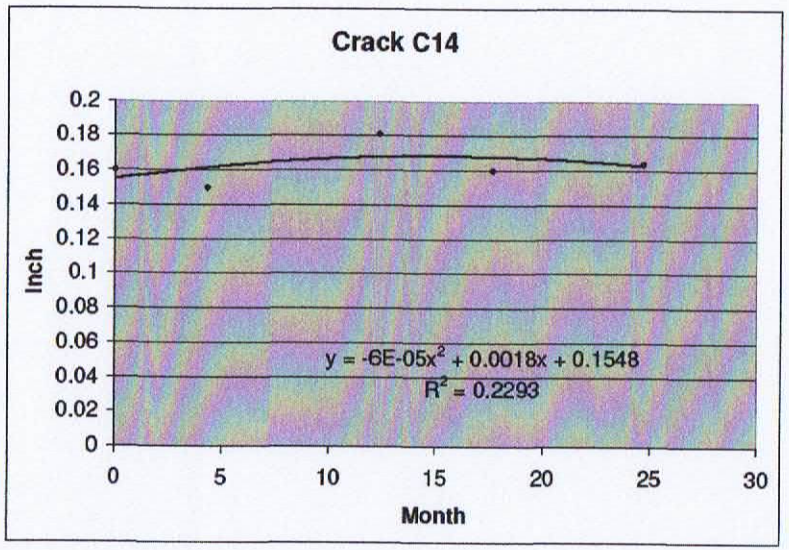

Crack C11A
y = -0.0001x² + 0.0023x + 0.586
R² = 0.3919
Inch
Month
0.615
0.61
0.605
0.6
0.595
0.59
0.585
0.58
0.575
0.57
0.565
0.56
0
5
10
15
20
25
30

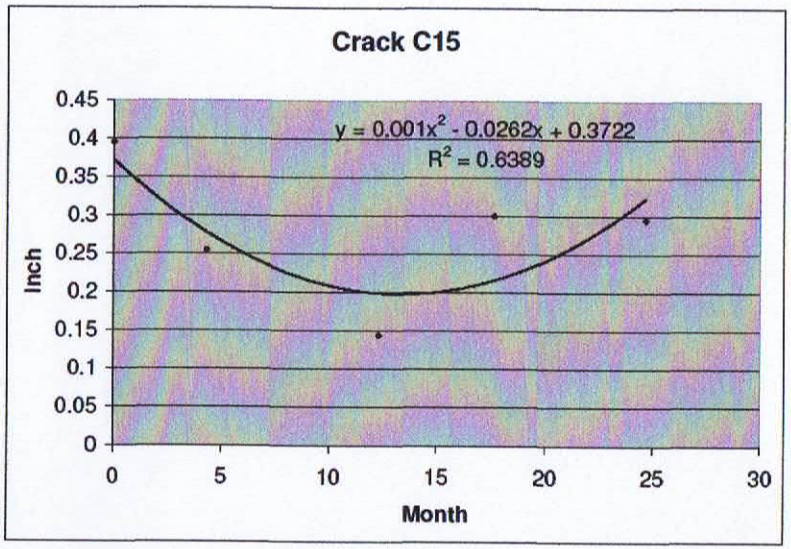

Crack 11B
y = 2E-05x² - 0.0001x + 0.1461
R² = 0.1221
Inch
Month
0.165
0.16
0.155
0.15
0.145
0.14
0.135
0.13
0
5
10
15
20
25
30

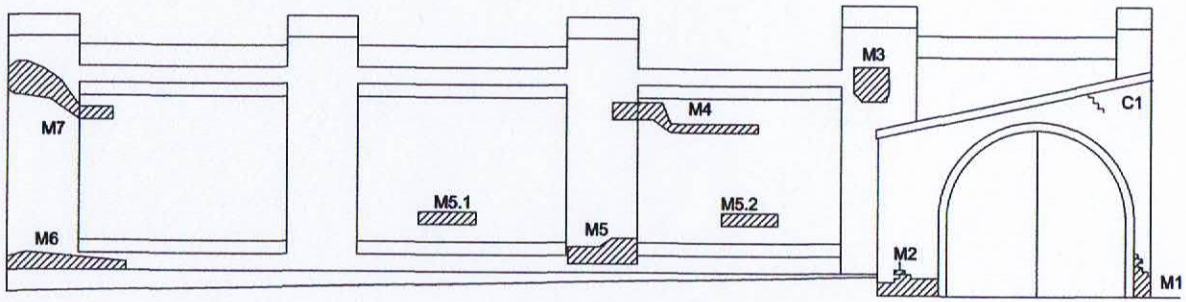

Crack C12
y = 0.0002x² - 0.0046x + 0.0926
R² = 0.9636
Inch
Month
0.12
0.1
0.08
0.06
0.04
0.02
0
0
5
10
15
20
25
30


Crack C13
y = -0.0005x² + 0.0118x + 0.15
R² = 0.2954
Inch
Month
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
5
10
15
20
25
30

Cracks


Crack C14
Inch
Month
y = -6E-05x² + 0.0018x + 0.1548
R² = 0.2293
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
0
5
10
15
20
25
30


Crack C15
Inch
Month
y = 0.001x² - 0.0262x + 0.3722
R² = 0.6389
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0
5
10
15
20
25
30



LEGEND

Significant Mortar Deteration

Significant Cracking

South Wall
Outer Face

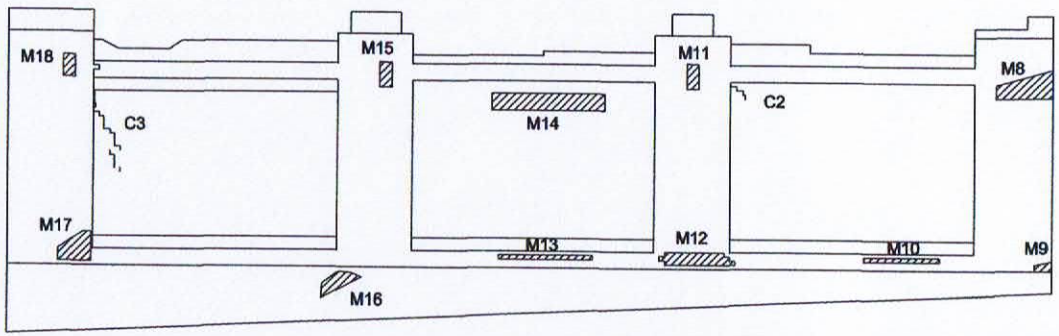
South Wall–Outer Face Significant Cracking						
Significant Crack ID	Crack Width (Inches) 5/21/2011	Crack Width (Inches) 9/29/2011	Crack Width (Inches) 5/30/2012	Crack Width (Inches) 11/10/2012	Crack Width (Inches) 6/12/2013	Photo Reference No.
C1	0.247	0.221	0.251	0.23	0.23	C1_XXX

South Wall–Outer Face Significant Mortar Loss					
Significant Mortar Loss ID	Photo Reference 5/21/2011	Photo Reference 9/21/2011	Photo Reference 5/30/2012	Photo Reference 11/9/2012	Photo Reference 6/12/2013
M1	M1_511	M1_1011	M1_512	M1_1112	M1_613
M2	M2_511	M2_1011	M2_512	M2_1112	M2_613
M3	M3_511	M3_1011	M3_512	M3_1112	M3_613
M4	M4_511	M4_1011	M4_512	M4_1112	M4_613
M5	M5_511	M5_1011	M5_512	M5_1112	M5_613
M5.1		M5.1_1011	M5.1_512	M5.1_1112	M5.1_613
M5.2			M5.2_512	M5.2_1112	M5.2_613
M6	M6_511	M6_1011	M6_512	M6_1112	M6_613
M7	M7_511	M7_1011	M7_512	M7_1112	M7_613

Weather Conditions

5/21/2011	sunny, 75 - 80F
9/29/2011	sunny, 75 - 80F
5/30/2012	partly cloudy to sunny, 83 - 87F
11/9/2012	sunny, 60F; 11/10/12 sunny, 66F
6/12/2013	sunny, 93F

South Wall
Outer Face



LEGEND

Significant Mortar Deteration

Significant Cracking

West Wall
Outer Face

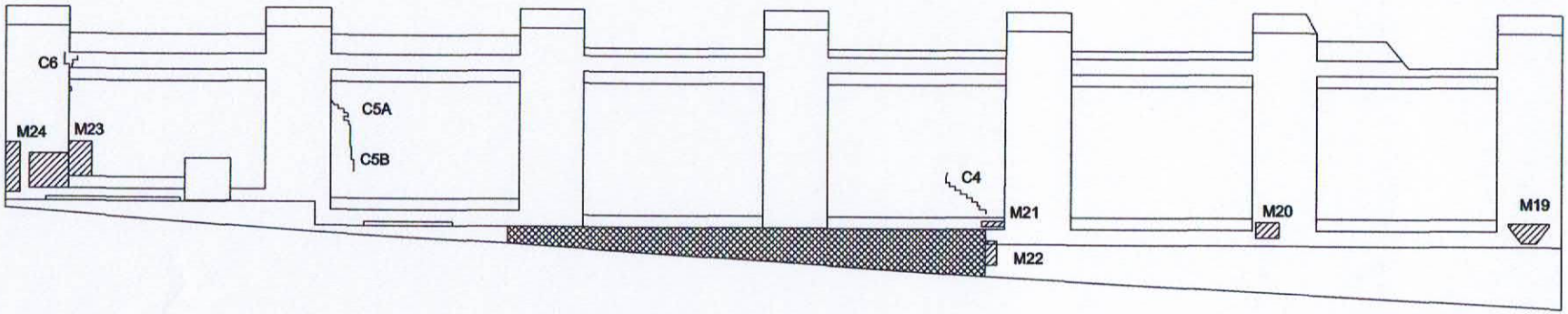
West Wall–Outer Face Significant Cracking						
Significant Crack ID	Crack Width (Inches) 5/21/2011	Crack Width (Inches) 9/29/2011	Crack Width (Inches) 5/30/2012	Crack Width (Inches) 11/10/2012	Crack Width (Inches) 6/12/2013	Photo Reference No.
C2	0.251	0.251	0.292	0.288	0.269	C2_XXX
C3A	0.649	0.651	0.627	0.691	0.613	C3_XXX
C3B	0.315	0.318	0.41	0.427	0.447	C3_XXX

West Wall–Outer Face Significant Mortar Loss					
Significant Mortar Loss ID	Photo Reference 5/21/2011	Photo Reference 9/21/2011	Photo Reference 5/30/2012	Photo Reference 11/9/2012	Photo Reference 6/12/2013
M8	M8_511	M8_1011	M8_512	M8_1112	M8_613
M9	M9_511	M9_1011	M9_512	M9_1112	M9_613
M10	M10_511	M10_1011	M10_512	M10_1112	M10_613
M11	M11_511	M11_1011	M11_512	M11_1112	M11_613
M12	M12_511	M12_1011	M12_512	M12_1112	M12_613
M13	M13_511	M13_1011	M13_512	M13_1112	M13_613
M14	M14_511	M14_1011	M14_512	M14_1112	M14_613
M15	M15_511	M15_1011	M15_512	M15_1112	M15_613
M16	M16_511	M16_1011	M16_512	M16_1112	M16_613
M17	M17_511	M17_1011	M17_512	M17_1112	M17_613
M18	M18_511	M18_1011	M18_512	M18_1112	M18_613

Weather Conditions

5/21/2011 sunny, 75 - 80F
9/29/2011 sunny, 75 - 80F
5/30/2012 partly cloudy to sunny, 83 - 87F
11/9/2012 sunny, 60F; 11/10/12 sunny, 66F
6/12/2013 sunny, 93F

West Wall
Outer Face



LEGEND

Significant Mortar Deteration

Significant Cracking

North Wall
Outer Face

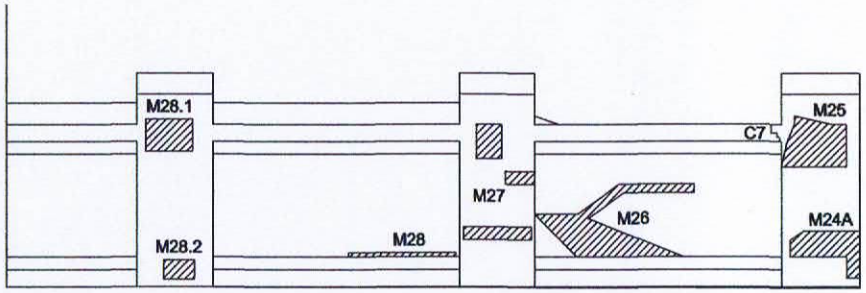
North Wall–Outer Face Significant Cracking						
Significant Crack ID	Crack Width (Inches) 5/21/2011	Crack Width (Inches) 9/29/2011	Crack Width (Inches) 5/30/2012	Crack Width (Inches) 11/10/2012	Crack Width (Inches) 6/12/2013	Photo Reference No.
C4	0.029	0.066	0.095	0.124	0.102	C4_XXX
C5A	0.179	0.038	0.213	0.224	0.231	C5_XXX
C5B	0.047	0.23	0.278	0.238	0.243	C5_XXX
C6	0.103	0.019	0.122	0.129	0.111	C6_XXX

North Wall–Outer Face Significant Mortar Loss					
Significant Mortar Loss ID	Photo Reference 5/21/2011	Photo Reference 9/21/2011	Photo Reference 5/30/2012	Photo Reference 11/9/2012	Photo Reference 6/12/2013
M19	M19_511	M19_1011	M19_512	M19_1112	M19_613
M20	M20_511	M20_1011	M20_512	M20_1112	M20_613
M21	M21_511	M21_1011	M21_512	M21_1112	M21_613
M22	M22_511	M22_1011	M22_512	M22_1112	M22_613
M23	M23_511	M23_1011	M23_512	M23_1112	M23_613
M24	M24_511	M24_1011	M24_512	M24_1112	M24_613

Weather Conditions

5/21/2011 sunny, 75 - 80F
9/29/2011 sunny, 75 - 80F
5/30/2012 partly cloudy to sunny, 83 - 87F
11/9/2012 sunny, 60F; 11/10/12 sunny, 66F
6/12/2013 sunny, 93F

North Wall
Outer Face



LEGEND

Significant Mortar Deteration

Significant Cracking

East Wall
Outer Face

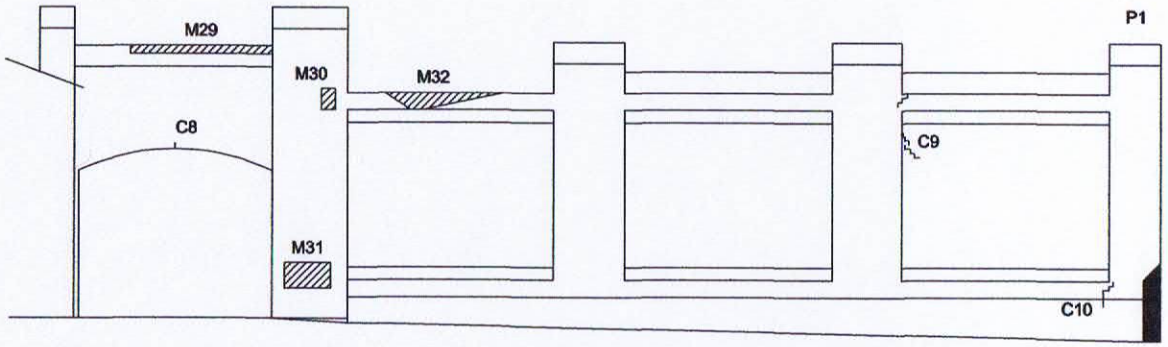
East Wall–Outer Face Significant Cracking						
Significant Crack ID	Crack Width (Inches) 5/21/2011	Crack Width (Inches) 9/29/2011	Crack Width (Inches) 5/30/2012	Crack Width (Inches) 11/10/2012	Crack Width (Inches) 6/12/2013	Photo Reference No.
C7	0.276	0.254	0.264	0.254	0.272	C7_XXX

East Wall–Outer Face Significant Mortar Loss					
Significant Mortar Loss ID	Photo Reference 5/21/2011	Photo Reference 9/21/2011	Photo Reference 5/30/2012	Photo Reference 11/9/2012	Photo Reference 6/12/2013
M24A	M24A_511	M24A_1011	M24A_512	M24A_1112	M24A_613
M25	M25_511	M25_1011	M25_512	M25_1112	M25_613
M26	M26_511	M26_1011	M26_512	M26_1112	M26_613
M27	M27_511	M27_1011	M27_512	M27_1112	M27_613
M28	M28_511	M28_1011	M28_512	M28_1112	M28_613
M28.1		M28.1_1011			
M28.2		M28.2_1011			

Weather Conditions

5/21/2011 sunny, 75 - 80F
9/29/2011 sunny, 75 - 80F
5/30/2012 partly cloudy to sunny, 83 - 87F
11/9/2012 sunny, 60F; 11/10/12 sunny, 66F
6/12/2013 sunny, 93F

East Wall
Outer Face



South Wall
Inner Face

LEGEND

Significant Mortar Deteration

Significant Cracking

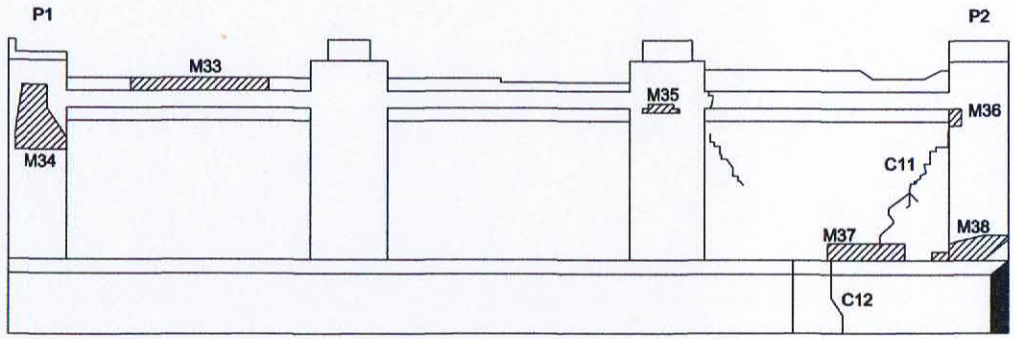
South Wall–Inner Face Significant Cracking						
Significant Crack ID	Crack Width (Inches) 5/21/2011	Crack Width (Inches) 9/29/2011	Crack Width (Inches) 5/30/2012	Crack Width (Inches) 11/11/2012	Crack Width (Inches) 6/11/2013	Photo Reference No.
C8	0.106	0.089	O.111	0.12	0.105	C8_XXX
C9	0.074	0.086	0.086	0.095	0.124	C9_XXX
C10	0.152	0.168	0.159	0.195	0.196	C10_XXX

South Wall–Inner Face Significant Mortar Loss					
Significant Mortar Loss ID	Photo Reference 5/21/2011	Photo Reference 9/30/2011	Photo Reference 5/30/2012	Photo Reference 11/9/2012	Photo Reference 6/11/2013
M29	M29_511	M29_1011	M29_512	M29_1112	M29_613
M30	M30_511	M30_1011	M30_512	M30_1112	M30_613
M31	M31_511	M31_1011	M31_512	M31_1112	M31_613
M32	M32A,B,C_511	M32_1011	M32_512	M32_1112	M32_613

Weather Conditions

5/21/2011 sunny, 75 - 80F
9/29/2011 sunny, 75 - 80F
5/30/2012 partly cloudy to sunny, 83 - 87F
11/9/2012 sunny, 60F; 11/10/12 sunny, 66F
6/11/2013 mostly sunny, 80F

South Wall
Inner Face



West Wall
Inner Face

LEGEND

Significant Mortar Deteration

Significant Cracking

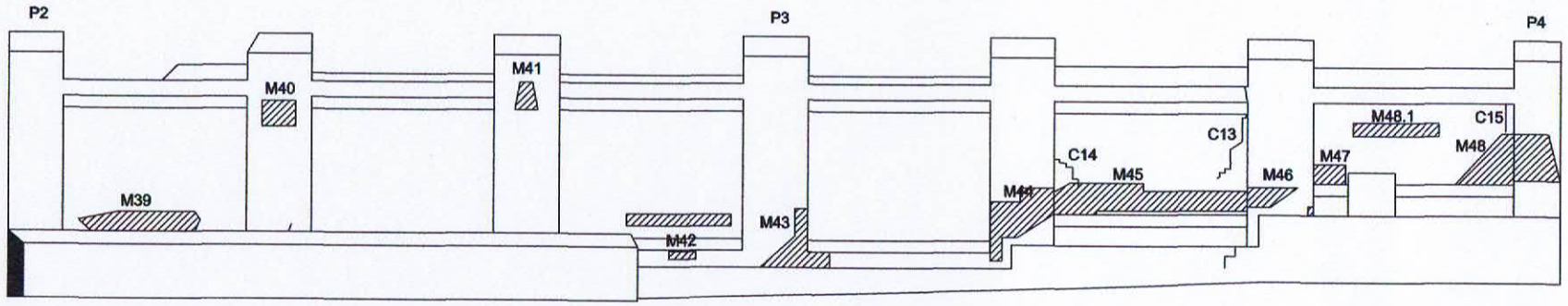
West Wall–Inner Face Significant Cracking						
Significant Crack ID	Crack Width (Inches) 5/21/2011	Crack Width (Inches) 9/29/2011	Crack Width (Inches) 5/30/2012	Crack Width (Inches) 11/10/2012	Crack Width (Inches) 6/11/2013	Photo Reference No.
C11A	0.579	0.602	0.608	0.567	0.575	C11_XXX
C11B	0.141	0.152	0.156	0.135	0.16	C11_XXX
C12	0.093	0.075	0.072	0.073	0.108	C12_XXX

West Wall–Inner Face Significant Mortar Loss					
Significant Mortar Loss ID	Photo Reference 5/21/2011	Photo Reference 9/30/2011	Photo Reference 5/30/2012	Photo Reference 11/9/2012	Photo Reference 6/11/2013
M33	M33_511	M33_1011	M33_512	M33_1112	M33_613
M34	M34_511	M34_1011	M34_512	M34_1112	M34_613
M35	M35_511	M35_1011	M35_512	M35_1112	M35_613
M36	M36_511	M36_1011	M36_512	M36_1112	M36_613
M37	M37_511	M37_1011	M37_512	M37_1112	M37_613
M38	M38_511	M38_1011	M38_512	M38_1112	M38_613

Weather Conditions

5/21/2011	sunny, 75 - 80F
9/29/2011	sunny, 75 - 80F
5/30/2012	partly cloudy to sunny, 83 - 87F
11/9/2012	sunny, 60F; 11/10/12 sunny, 66F
6/11/2013	cloudy, 80F

West Wall
Inner Face



LEGEND

Significant Mortar Deteration

Significant Cracking

North Wall
Inner Face

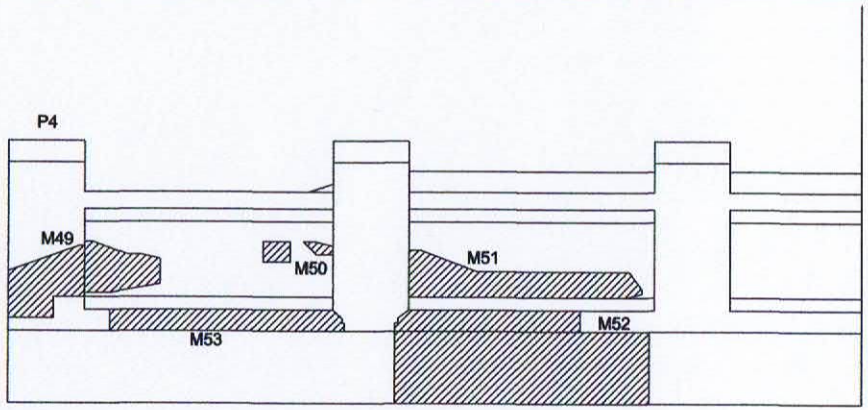
North Wall–Inner Face Significant Cracking						
Significant Crack ID	Crack Width (Inches) 5/21/2011	Crack Width (Inches) 9/29/2011	Crack Width (Inches) 5/30/2012	Crack Width (Inches) 11/10/2012	Crack Width (Inches) 6/11/2013	Photo Reference No.
C13	0.175	0.134	0.293	0.155	0.147	C13_XXX
C14	0.16	0.15	0.181	0.16	0.164	C14_XXX
C15	0.395	0.254	0.144	0.3	0.295	C15_XXX

North Wall–Inner Face Significant Mortar Loss					
Significant Mortar Loss ID	Photo Reference 5/21/2011	Photo Reference 9/30/2011	Photo Reference 5/30/2012	Photo Reference 11/9/2012	Photo Reference 6/11/2013
M39	M39_511	M39_1011	M39_512	M39_1112	M39_613
M40	M40_511	M40_1011	M40_512	M40_1112	M40_613
M41	M41_511	M41_1011	M41_512	M41_1112	M41_613
M42	M42_511	M42_1011	M42_512	M42_1112	M42_613
M43	M43_511	M43_1011	M43_512	M43_1112	M43_613
M44	M44_511	M44_1011	M44_512	M44_1112	M44_613
M45	M45_511	M45_1011	M45_512	M45_1112	M45_613
M46	M46_511	M46_1011	M46_512	M46_1112	M46_613
M47	M47_511	M47_1011	M47_512	M47_1112	M47_613
M48	M48_511	M48_1011	M48_512	M48_1112	M48_613
M48.1		M48.1_1011	M47_512	M47_1112	M47_613

Weather Conditions

5/21/2011	sunny, 75 - 80F
9/29/2011	sunny, 75 - 80F
5/30/2012	partly cloudy to sunny, 83 - 87F
11/9/2012	sunny, 60F; 11/10/12 sunny, 66F
6/11/2013	cloudy, 80F

North Wall
Inner Face



East Wall
Inner Face

LEGEND

Significant Mortar Deteration

Significant Cracking

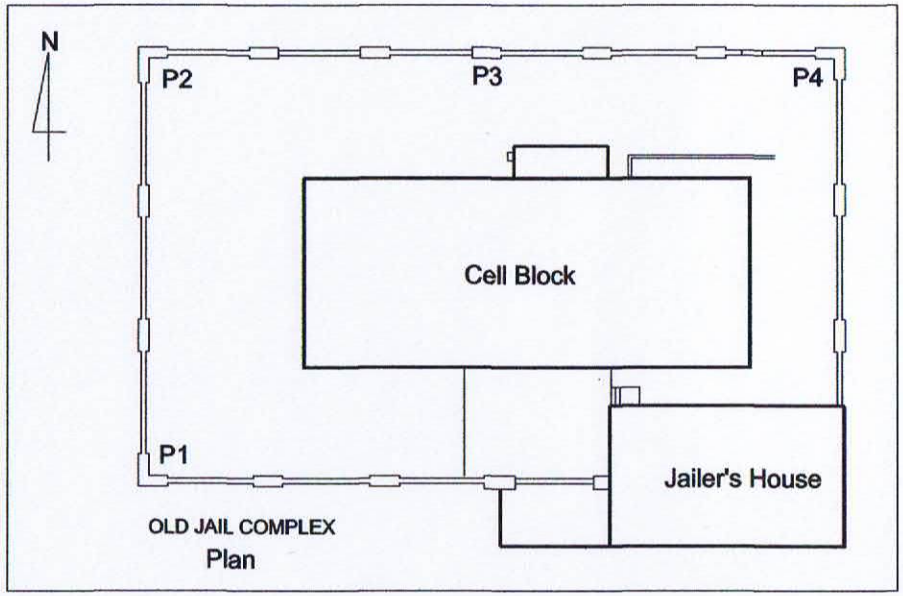
East Wall–Inner Face Significant Mortar Loss					
Significant Mortar Loss ID	Photo Reference 5/21/2011	Photo Reference 9/30/2011	Photo Reference 5/30/2012	Photo Reference 11/9/2012	Photo Reference 6/11/2013
M49	M49_511	M49_1011	M49_512	M49_1112	M49_613
M50	M50_511	M50_1011	M50_512	M50_1112	M50_613
M51	M51A,B_511	M51_1011	M51_512	M51_1112	M51_613
M52	M52_511	M52_511, B	M52_512	M52_1112	M52_613
M53	M53_511		M49-50_512	M49-50_1112	M49-50_613

Weather Conditions

5/21/2011	sunny, 75 - 80F
9/29/2011	sunny, 75 - 80F
5/30/2012	partly cloudy to sunny, 83 - 87F
11/9/2012	sunny, 60F; 11/10/12 sunny, 66F
6/11/2013	cloudy, 80F

East Wall
Inner Face

Pilaster P1



Pilaster 1--Inner Face Normallized Measurements						
Weather Conditions		Overcast to Sunny	Mostly Sunny	Partly Cloudy to Sunny	Partly Cloudy to Sunny	Mostly Sunny
		82-87 F	60 F	83-87 F	72 F	83 F
Pilaster 1 Face	**Vertical Distance Above Foundation**	**Measurement (Inches) 5/22/2011**	**Measurement (Inches) 10/1/2011**	**Measurement (Inches) 5/30/2012**	**Measurement (Inches) 11/11/2012**	**Measurement (Inches) 6/11/2013**
South Wall	10'-11"	0	0	0	0	0
	8'-11"	-0.104	-0.081	-0.082	-0.057	-0.083
	6'-11"	-0.219	-0.221	-0.243	-0.211	-0.217
	4'-11"	-0.194	-0.277	-0.303	-0.169	-0.293
	2'-11"	-0.194	-0.339	-0.35	-0.289	-0.409
West Wall	9'-2"	0	0	0	0	0
	7'-2"	0.051	0.164	0.202	0.199	0.231
	5'-2"	0.24	0.356	0.431	0.31	0.376
	3'-2"	0.062	0.318	0.18	0.176	0.262

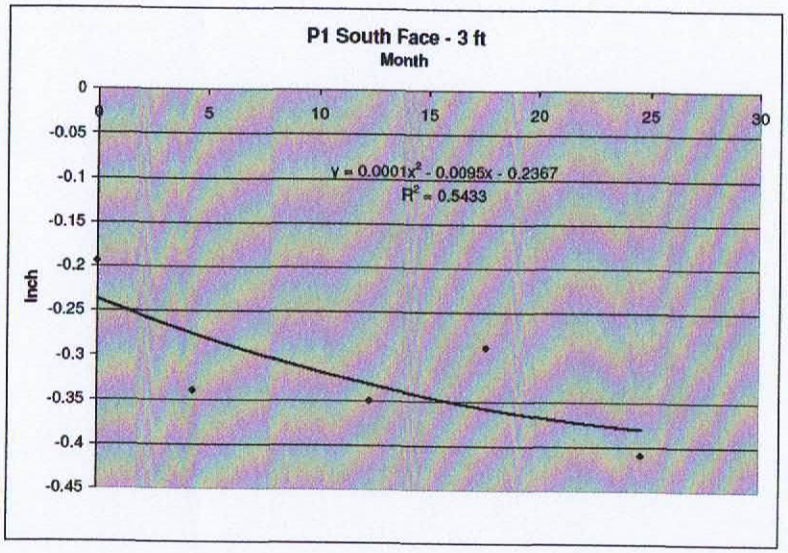
Pilaster P1

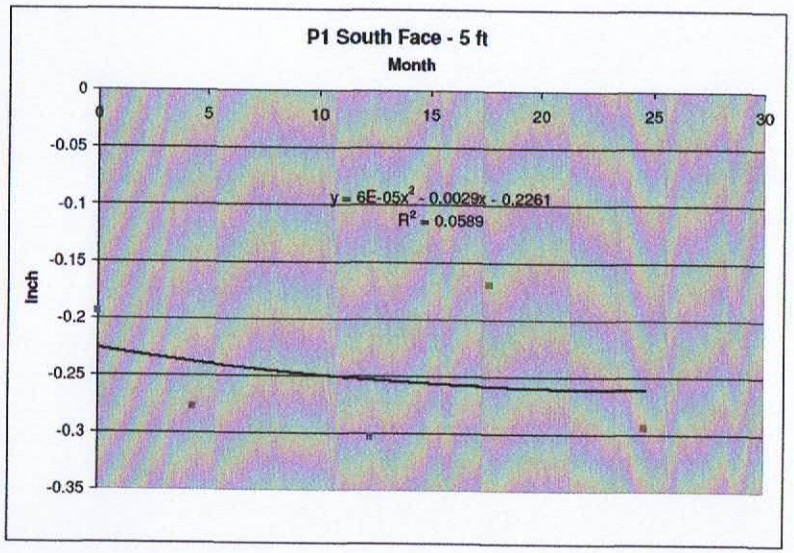
Old County Jail
Perimeter Wall Pilasters

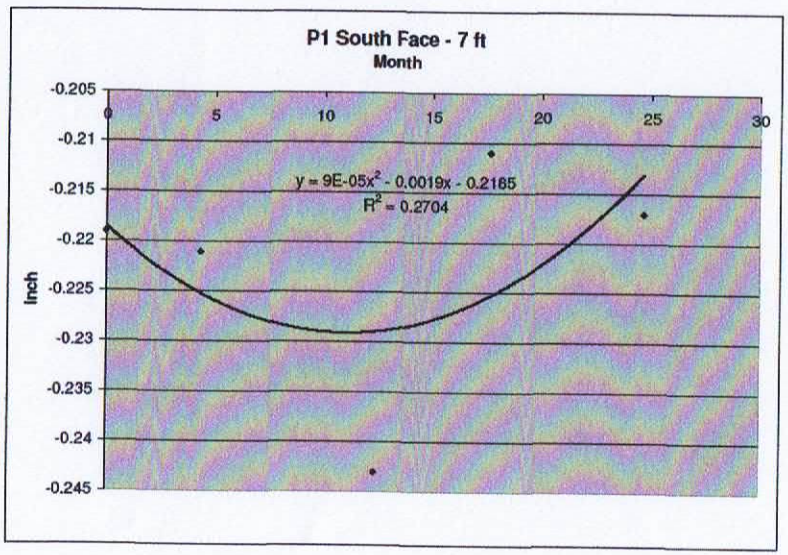
Pilaster ID	Pilaster Location	Feet Above Fdtn Wall	Measurement Projection Equation	Curve Fit to Data	Comments
P1, South Plane	Southwest corner, south inner face	3	$Y = 0.0001\ x^2 - 0.0095\ x - 0.2367$	Fair	Increasingly negative (inward) movement suggested.
		5	$Y = 0.00006\ x^2 - 0.0029\ x - 0.2261$	Poor	Maximum data range of 1/8". Graph indicates a stabilization of measurements.
		7	$Y = 0.00009\ x^2 - 0.0019\ x - 0.2185$	Poor	Graph suggests a slight trend toward outward movement or stabilization.
		9	$Y = -0.0001\ x^2 + 0.0045\ x - 0.1027$	Good	Trend toward stabilization of outward movement.

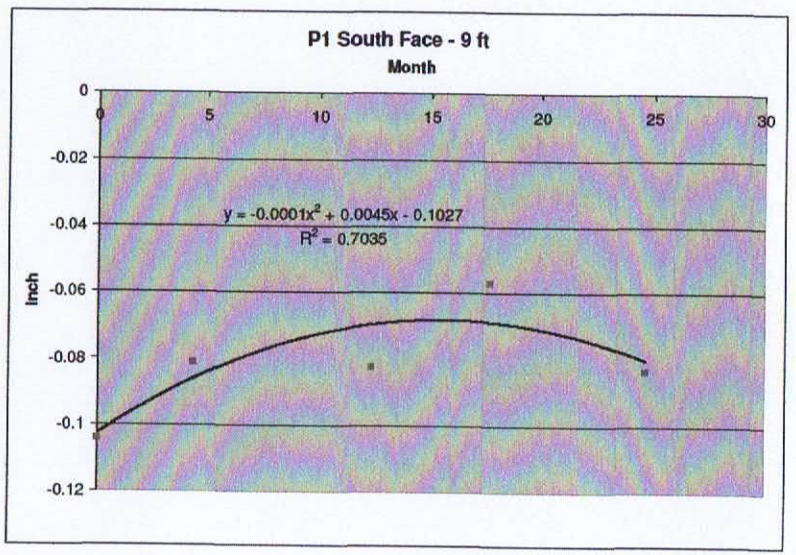
Pilaster ID	Pilaster Location	Segment Location (Feet)	Incremental Slope Projection Equation	Curve Fit to Data	Comments
P1, South Plane	Southwest corner, south inner face	Overall	$Y = 0.000002\ x^2 - 0.0001\ x - 0.0025$	Fair	Increasing movement trend in an inward tilt with possible start of stabilization.
		3-5	$Y = 0.000004\ x^2 - 0.0003\ x - 0.0004$	Good	Increasing movement trend in an inward tilt.
		5-7	$Y = -0.000001\ x^2 - 0.0004\ x - 0.0003$	Poor	Increasing trend in an inward tilt; however, rate of change significantly less than Segment 3-5'.
		7-9	$Y = 0.00001\ x^2 - 0.0003\ x - 0.0048$	Very Good	Significantly more polynomial vs. linear, suggesting a greater brick and mortar deterioration influence on movement. Graph suggests a shift toward outward movement of pilaster face.
		9-11	$Y = -0.000006\ x^2 + 0.0002\ x - 0.0043$	Good	Significantly more polynomial vs. linear. Graph suggests a moderating of wall section movement with possible stabilization.

Pilaster 1

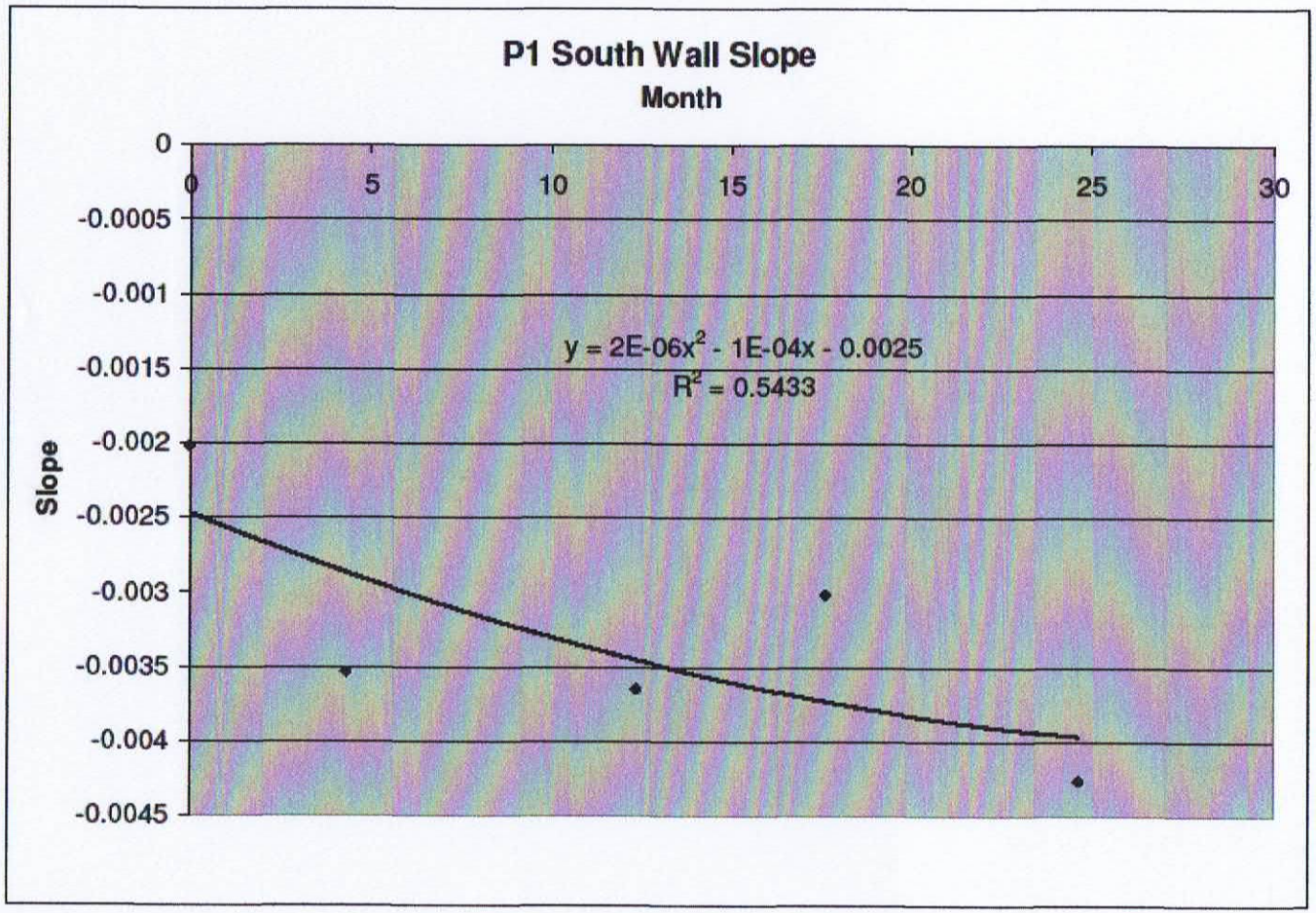

P1 South Face - 3 ft
Month
Inch
y = 0.0001x² - 0.0095x - 0.2367
R² = 0.5433
0
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
-0.35
-0.4
-0.45
0
5
10
15
20
25
30


P1 South Face - 5 ft
Month
Inch
y = 6E-05x² - 0.0029x - 0.2261
R² = 0.0589
0
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
-0.35
0
5
10
15
20
25
30

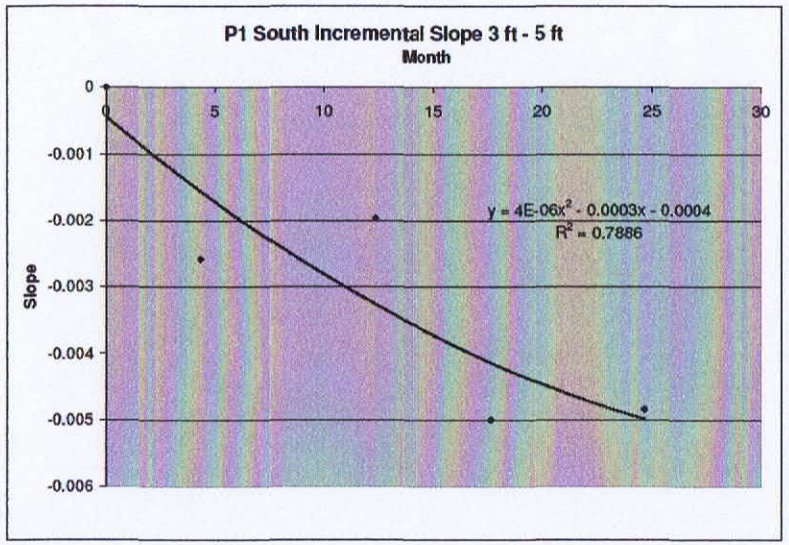

P1 South Face - 7 ft
Month
Inch
y = 9E-05x² - 0.0019x - 0.2185
R² = 0.2704
-0.205
-0.21
-0.215
-0.22
-0.225
-0.23
-0.235
-0.24
-0.245
0
5
10
15
20
25
30

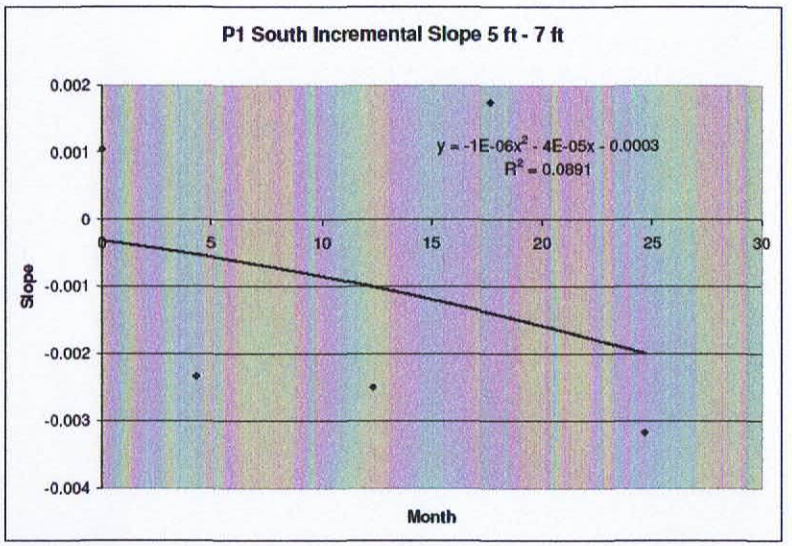

P1 South Face - 9 ft
Month
Inch
y = -0.0001x² + 0.0045x - 0.1027
R² = 0.7035
0
-0.02
-0.04
-0.06
-0.08
-0.1
-0.12
0
5
10
15
20
25
30

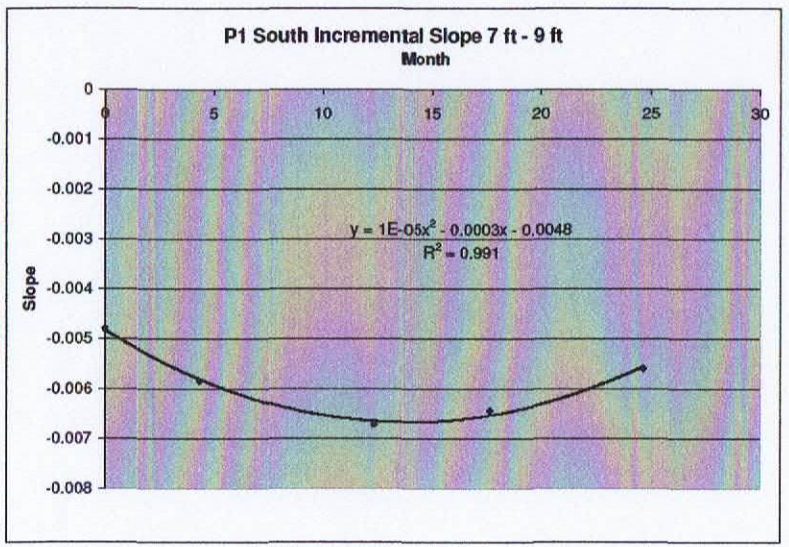
Pilaster 1

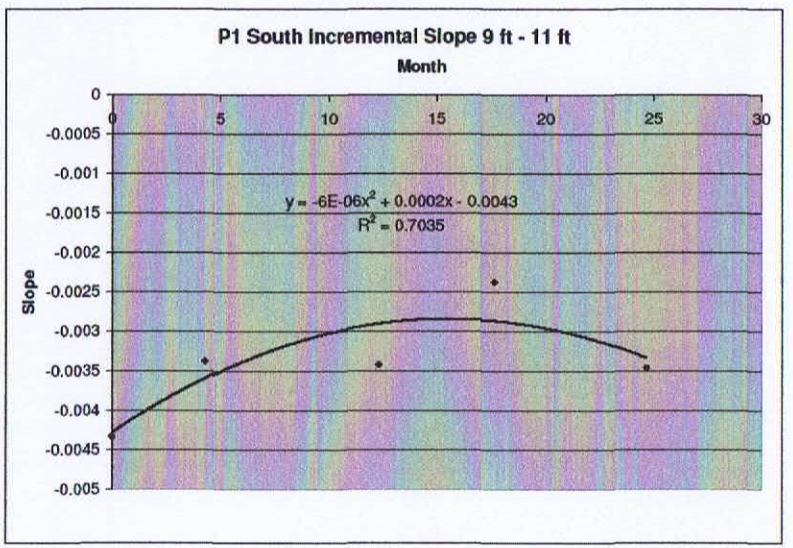

P1 South Wall Slope
Month
Slope
0
5
10
15
20
25
30
0
-0.0005
-0.001
-0.0015
-0.002
-0.0025
-0.003
-0.0035
-0.004
-0.0045
y = 2E-06x² - 1E-04x - 0.0025
R² = 0.5433

Pilaster 1


P1 South Incremental Slope 3 ft - 5 ft
Month
Slope
y = 4E-06x² - 0.0003x - 0.0004
R² = 0.7886
0
-0.001
-0.002
-0.003
-0.004
-0.005
-0.006
0
5
10
15
20
25
30


P1 South Incremental Slope 5 ft - 7 ft
Slope
Month
y = -1E-06x² - 4E-05x - 0.0003
R² = 0.0891
0.002
0.001
0
-0.001
-0.002
-0.003
-0.004
0
5
10
15
20
25
30


P1 South Incremental Slope 7 ft - 9 ft
Month
Slope
y = 1E-05x² - 0.0003x - 0.0048
R² = 0.991
0
-0.001
-0.002
-0.003
-0.004
-0.005
-0.006
-0.007
-0.008
0
5
10
15
20
25
30

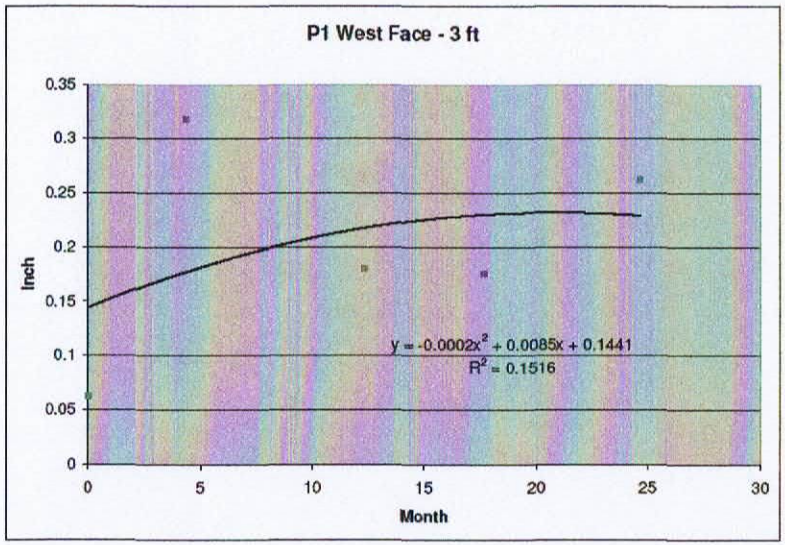

P1 South Incremental Slope 9 ft - 11 ft
Month
Slope
y = -6E-06x² + 0.0002x - 0.0043
R² = 0.7035
0
-0.0005
-0.001
-0.0015
-0.002
-0.0025
-0.003
-0.0035
-0.004
-0.0045
-0.005
0
5
10
15
20
25
30

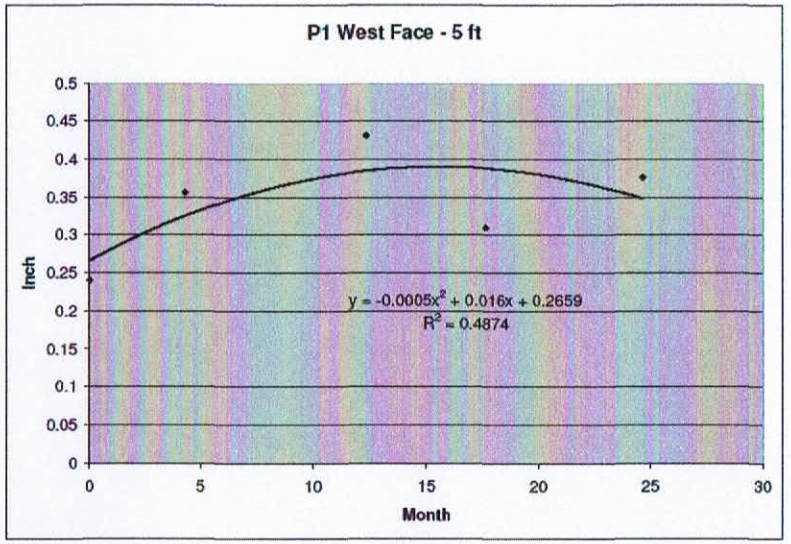
Old County Jail
Perimeter Wall Pilasters

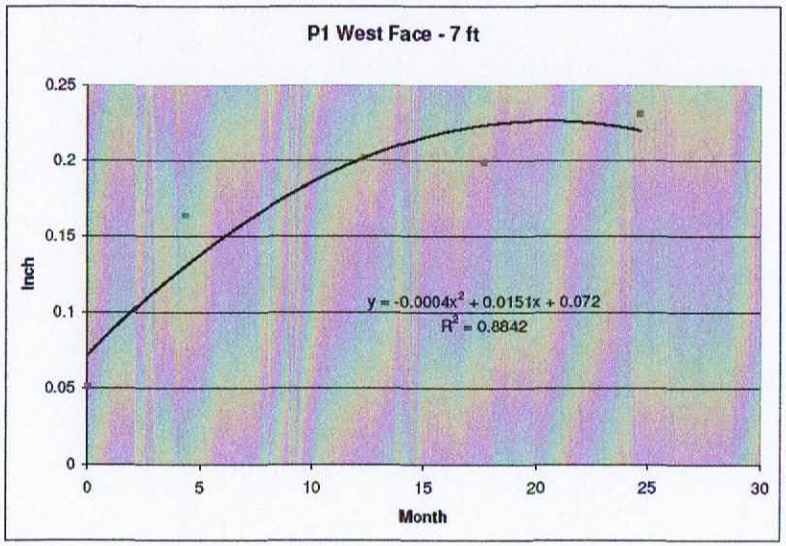
Pilaster ID	Pilaster Location	Feet Above Fdtn Wall	Measurement Projection Equation	Curve Fit to Data	Comments
P1, West Plane	Southwest corner, west inner face	3	$Y = -0.0002 x^2 + 0.0085 x + 0.1441$	Poor	Stabilization of outward movement suggested.
		5	$Y = -0.0005 x^2 + 0.016 x + 0.2659$	Fair	Stabilization of outward movement suggested.
		7	$Y = -0.0004 x^2 + 0.0151 x + 0.072$	Very Good	Stabilization of outward movement suggested.

Pilaster ID	Wall Slope Location	Segment Location (Feet)	Incremental Slope Projection Equation	Curve Fit to Data	Comments
P1, West Plane	Southwest corner, west inner face	Overall	$Y = -0.000003 x^2 + 0.0001 x + 0.002$	Poor	Graph suggests increasing slope to the west with possible stabilization.
		3-5	$Y = 0.00001 x^2 - 0.0003 x - 0.0051$	Poor	Graph suggests possibly searching for stabilization with an inward tilt.
		5-7	$Y = -0.000006 x^2 + 0.00004 x + 0.0081$	Fair	Trending toward a decrease of westward slope.
		7-9	$Y = -0.00002 x^2 + 0.0006 x + 0.003$	Very Good	Trending toward an increase in westward slope with possible stabilization.

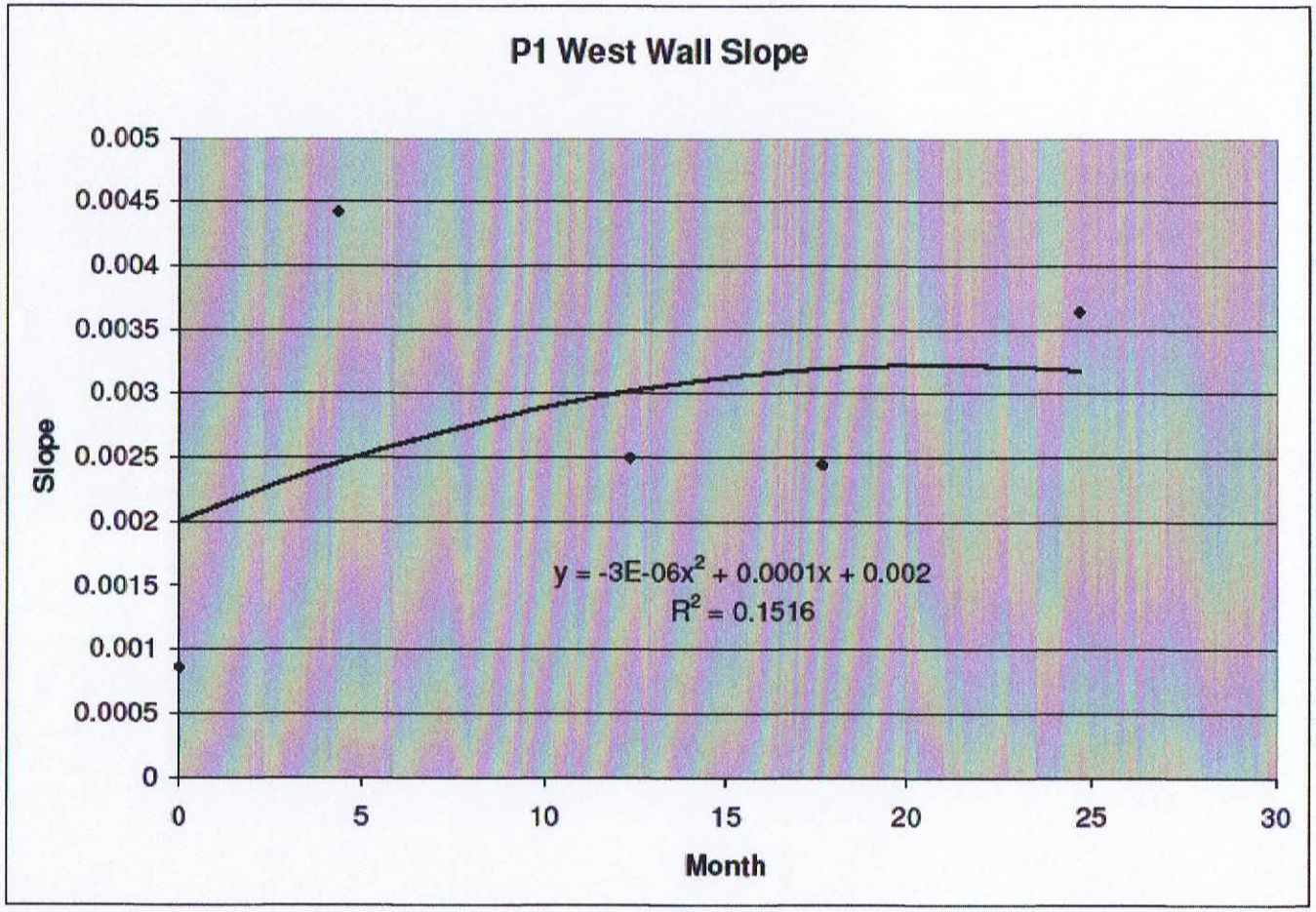
Pilaster 1


P1 West Face - 3 ft
Inch
Month
y = -0.0002x² + 0.0085x + 0.1441
R² = 0.1516

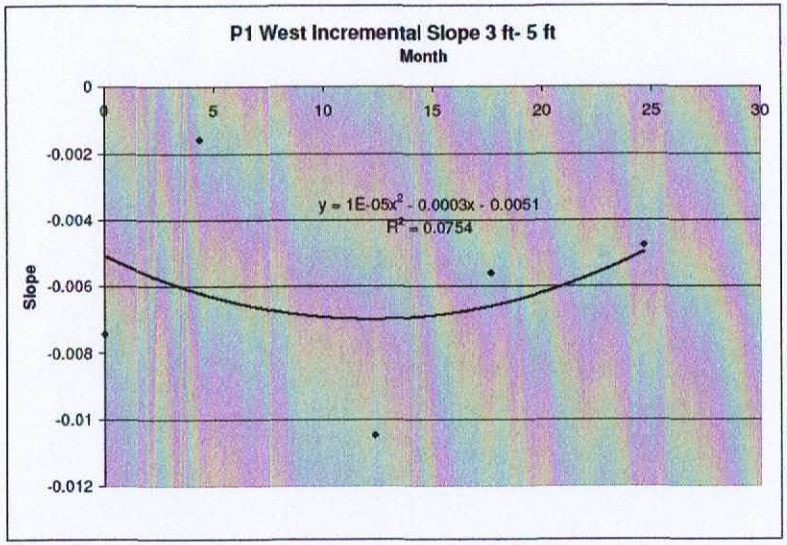

P1 West Face - 5 ft
Inch
Month
y = -0.0005x² + 0.016x + 0.2659
R² = 0.4874

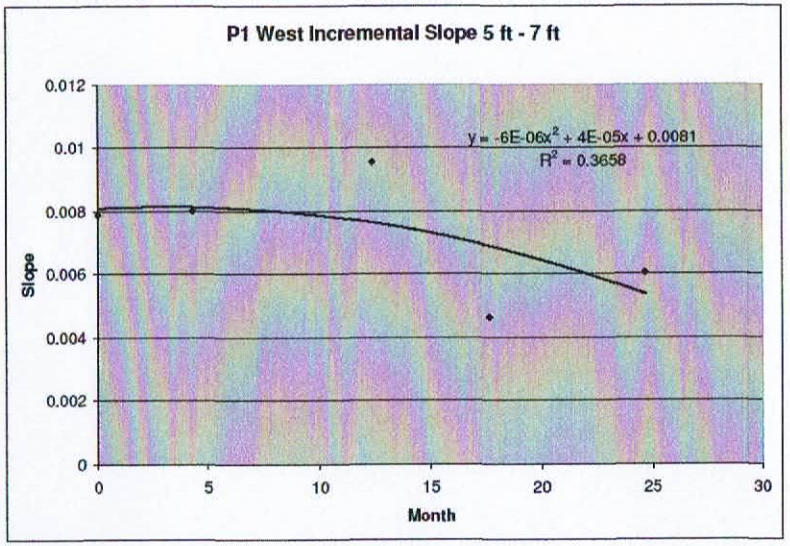

P1 West Face - 7 ft
Inch
Month
y = -0.0004x² + 0.0151x + 0.072
R² = 0.8842

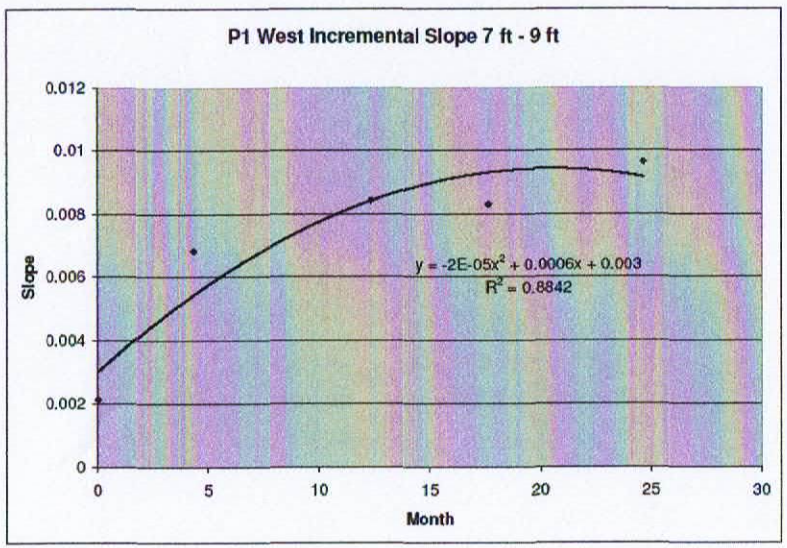
Pilaster 1


P1 West Wall Slope
Slope
0.005
0.0045
0.004
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
0
5
10
15
20
25
30
Month
y = -3E-06x² + 0.0001x + 0.002
R² = 0.1516

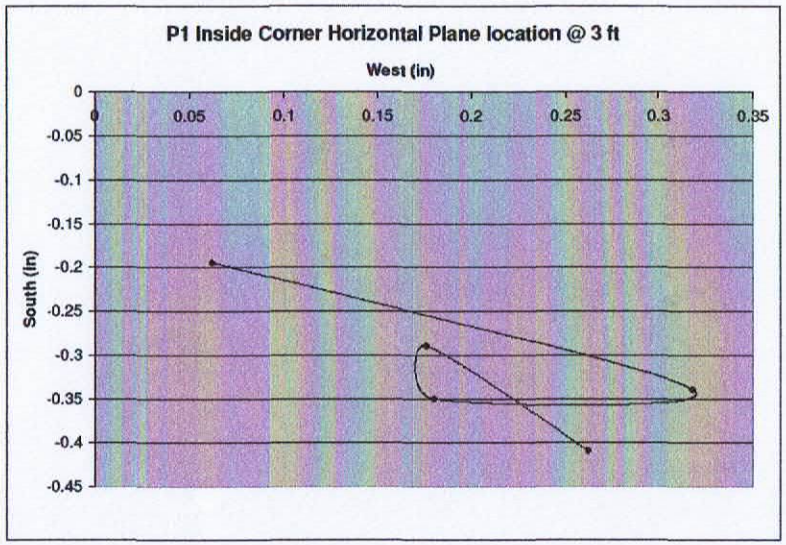
Pilaster 1

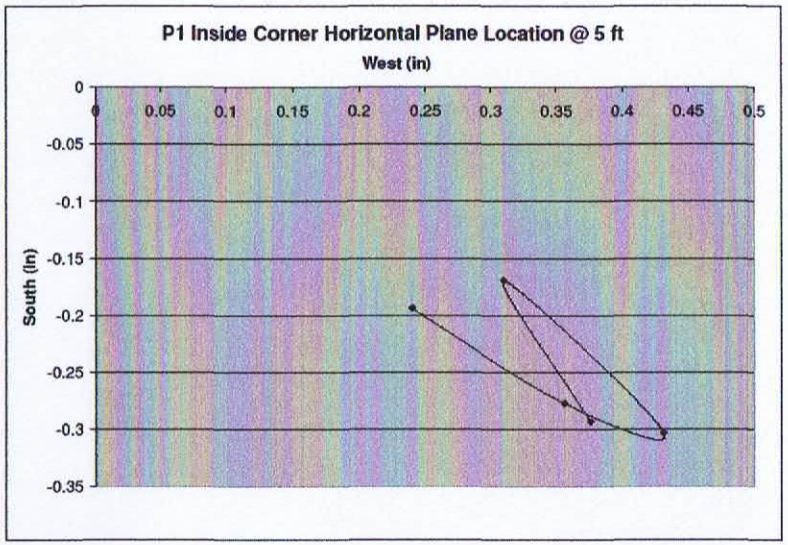

P1 West Incremental Slope 3 ft- 5 ft
Month
Slope
y = 1E-05x² - 0.0003x - 0.0051
R² = 0.0754
0
-0.002
-0.004
-0.006
-0.008
-0.01
-0.012
0
5
10
15
20
25
30

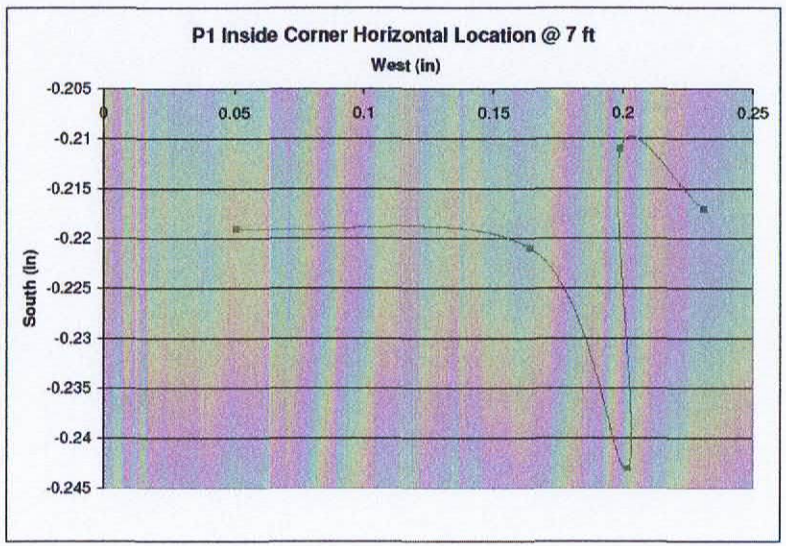

P1 West Incremental Slope 5 ft - 7 ft
Slope
Month
y = -6E-06x² + 4E-05x + 0.0081
R² = 0.3658
0.012
0.01
0.008
0.006
0.004
0.002
0
0
5
10
15
20
25
30


P1 West Incremental Slope 7 ft - 9 ft
Slope
Month
y = -2E-05x² + 0.0006x + 0.003
R² = 0.8842
0.012
0.01
0.008
0.006
0.004
0.002
0
0
5
10
15
20
25
30

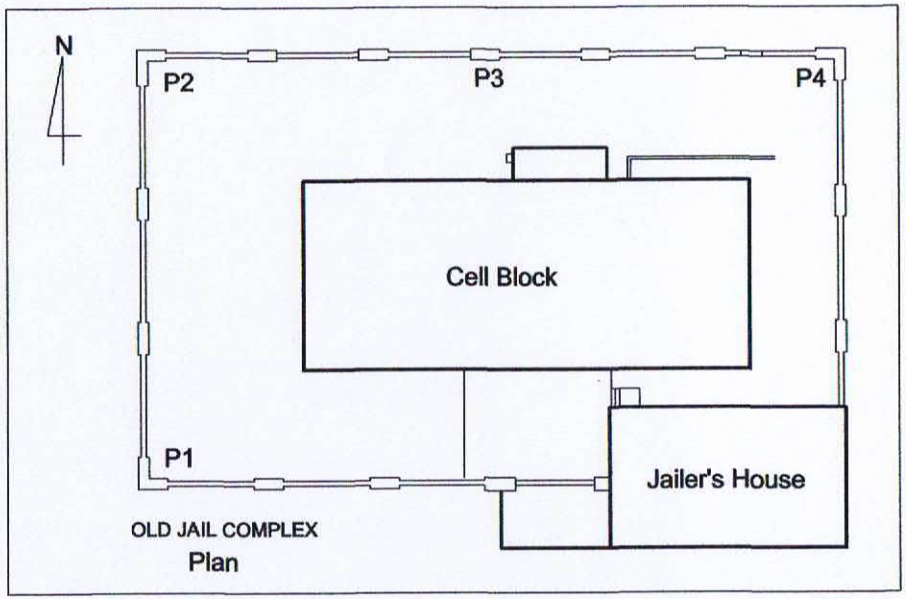
Pilaster 1


P1 Inside Corner Horizontal Plane location @ 3 ft
West (in)
South (in)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
-0.35
-0.4
-0.45


P1 Inside Corner Horizontal Plane Location @ 5 ft
West (in)
South (in)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
-0.35


P1 Inside Corner Horizontal Location @ 7 ft
West (in)
South (in)
0
0.05
0.1
0.15
0.2
0.25
-0.205
-0.21
-0.215
-0.22
-0.225
-0.23
-0.235
-0.24
-0.245

Pilaster P2



Pilaster 2--Inner Face Normalized Measurements						
Weather Conditions		Overcast to Sunny	Overcast to Sunny	Partly Cloudy to Sunny	Partly Cloudy to Sunny	Sunny
		82-87 F	75-79 F	83-87 F	66 F, 72F	83F
Pilaster 2 Face	**Vertical Distance Above Foundation**	**Measurement (Inches) 5/22/2011**	**Measurement (Inches) 9/30/2011**	**Measurement (Inches) 5/30/2012**	**Measurement (Inches) 11/10-11/2012**	**Measurement (Inches) 6/11/2013**
West Wall	9'-1"	0	0	0	0	0
	7'-1"	-0.848	-0.233	-0.172	-0.207	-0.271
	5'-1"	-0.962	-0.309	-0.159	-0.27	-0.258
	3'-1"	-1.009	-0.412	-0.246	-0.338	-0.345
North Wall	8'-10 1/2"	0	0	0	0	0
	6'-10 1/2"	0.123	0.091	0.069	0.086	0.042
	4'-10 1/2"	0.338	0.319	0.374	0.252	0.266
	2'-10 1/2"	0.413	0.359	0.313	0.255	0.276

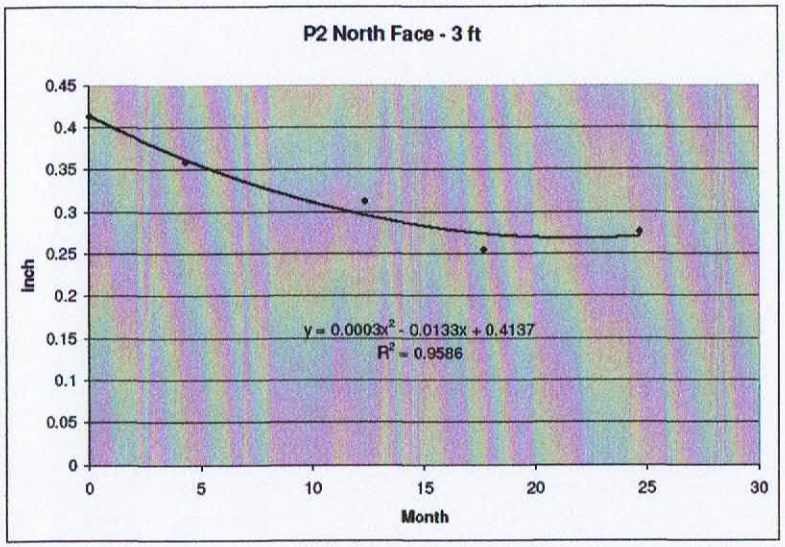
Pilaster
P2

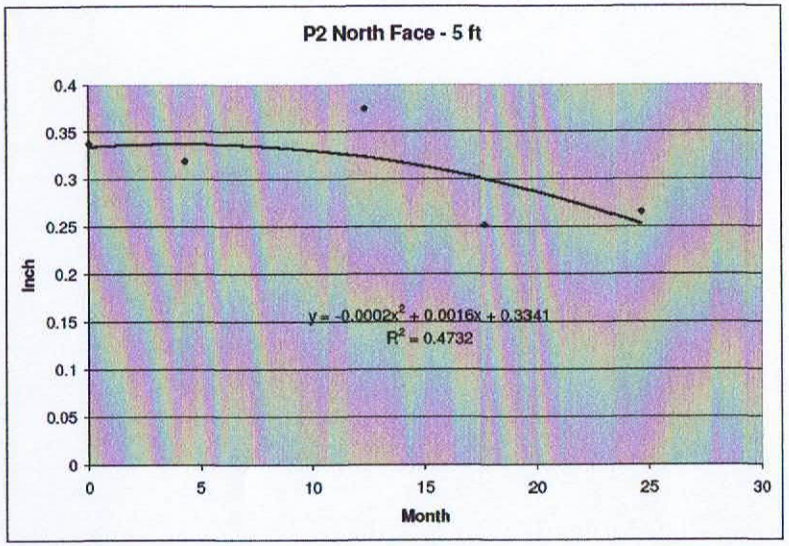
Old County Jail
Perimeter Wall Pilasters

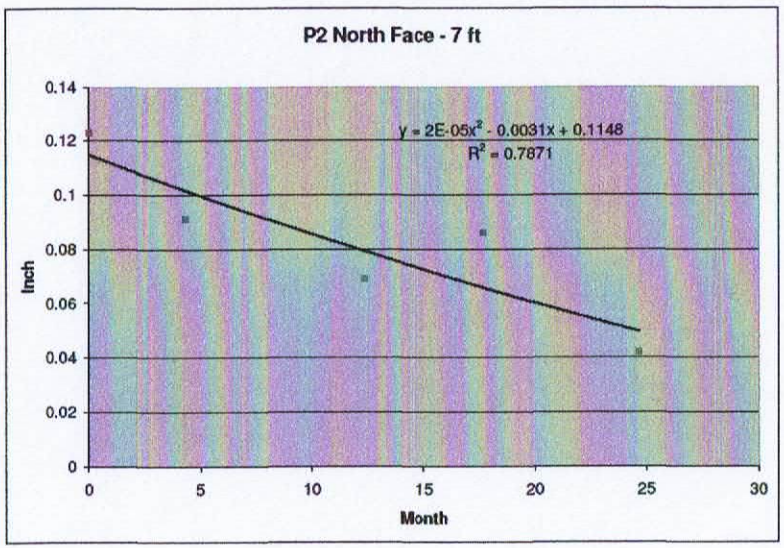
Pilaster ID	Pilaster Location	Feet Above Fdtn Wall	Measurement Projection Equation	Curve Fit to Data	Comments
P2, North Plane	Northwest corner, north wall inner face	3	$Y = 0.0003\ x^2 - 0.0133\ x + 0.4137$	Very Good	Plot suggests possible decrease in outward measurement to possible stabilization.
		5	$Y = -0.0002\ x^2 + 0.0016\ x - 0.3341$	Fair	Trend toward decrease in outward measurement.
		7	$Y = 0.00002\ x^2 - 0.0031\ x + 0.1148$	Good	Trend toward decrease in outward measurement.

	Wall Slope Location	Segment Location (Feet)	Incremental Slope Projection Equation	Curve Fit to Data	Comments
P2, North Plane	Northwest corner, north wall inner face	Overall	$Y = 0.000004\ x^2 - 0.0002\ x + 0.0057$	Very Good	Plot suggests possible stabilization in northward slope.
		3-5	$Y = 0.00002\ x^2 - 0.0006\ x + 0.0033$	Good	Plot suggests increasing outward slope transitioning from inward slope or possible stabilization.
		5-7	$Y = -0.000009\ x^2 + 0.0002\ x + 0.0091$	Poor	Plot suggests possible stabilization.
		7-9	$Y = 0.0000008\ x^2 - 0.0001\ x + 0.0048$	Good	Plot suggests decreasing outward slope.

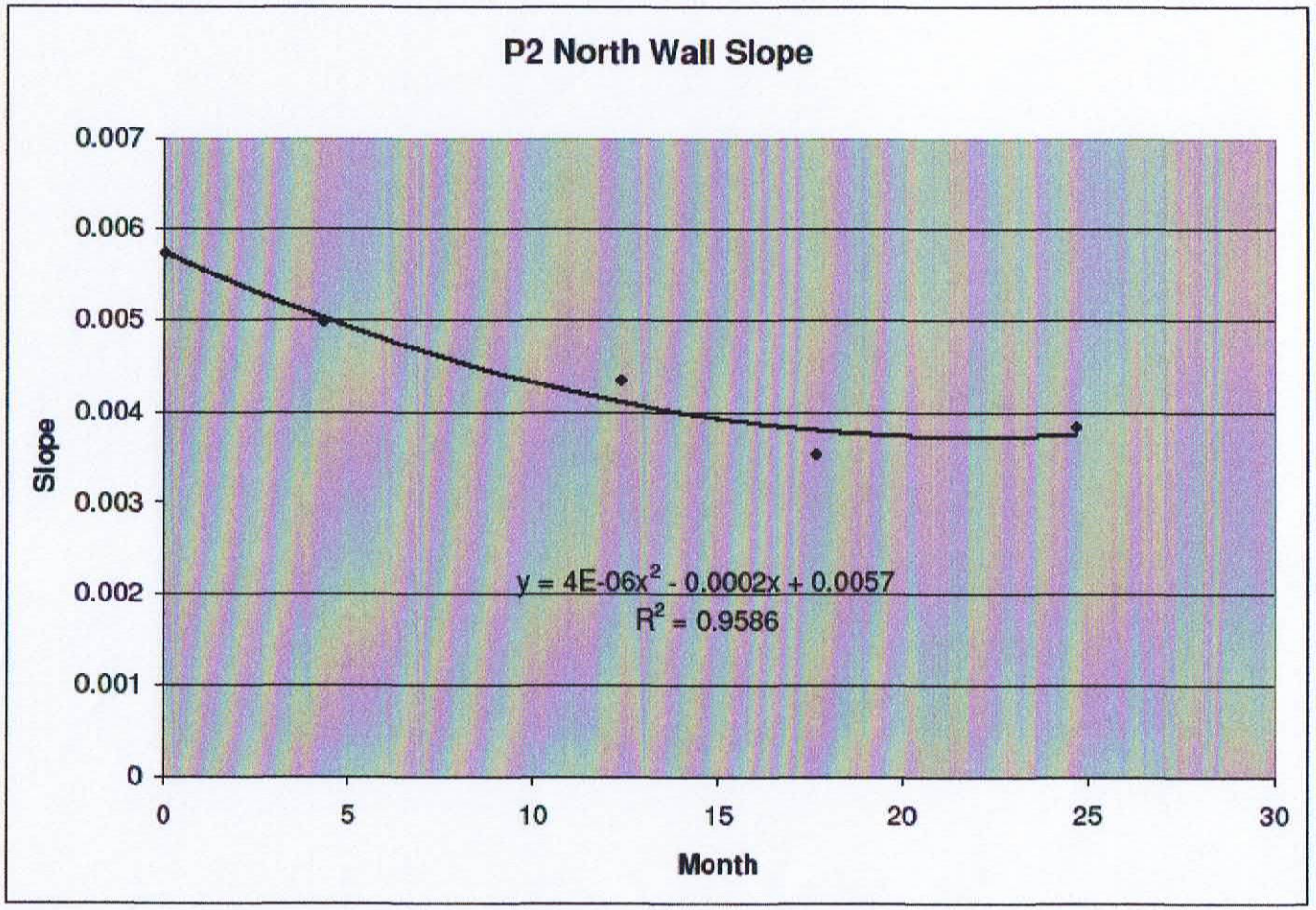
Pilaster 2


P2 North Face - 3 ft
Inch
Month
y = 0.0003x² - 0.0133x + 0.4137
R² = 0.9586

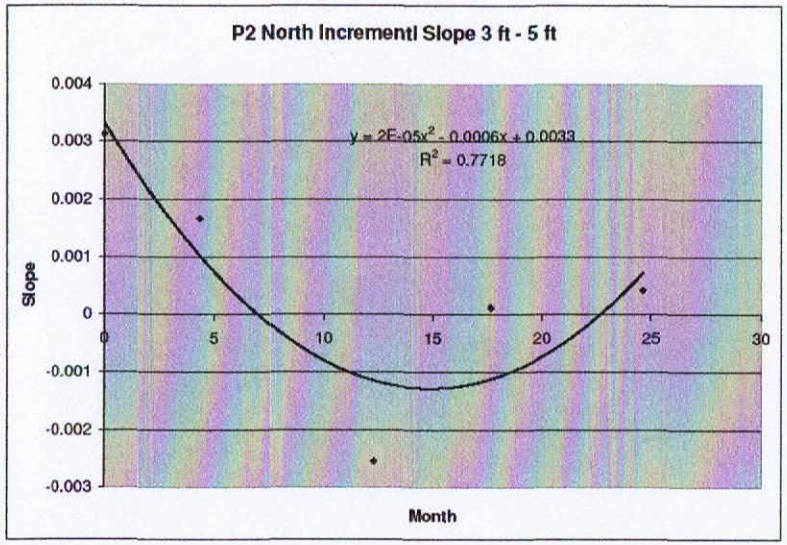

P2 North Face - 5 ft
Inch
Month
y = -0.0002x² + 0.0016x + 0.3341
R² = 0.4732

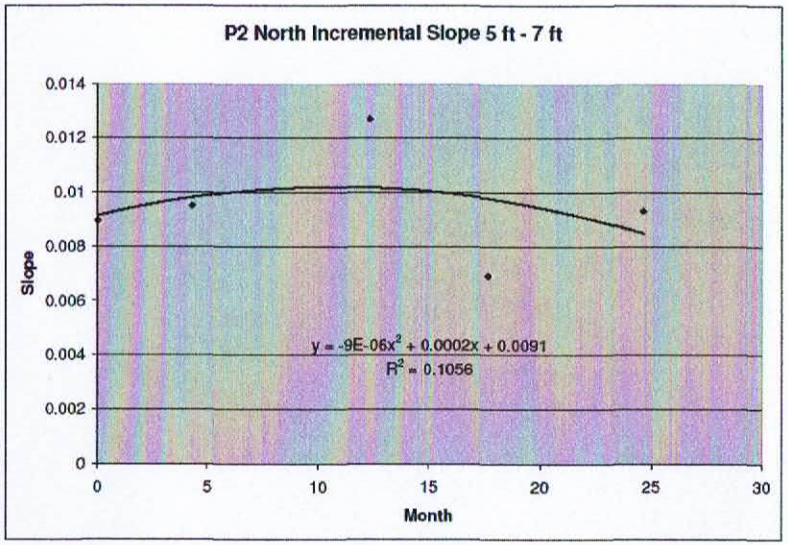

P2 North Face - 7 ft
Inch
Month
y = 2E-05x² - 0.0031x + 0.1148
R² = 0.7871

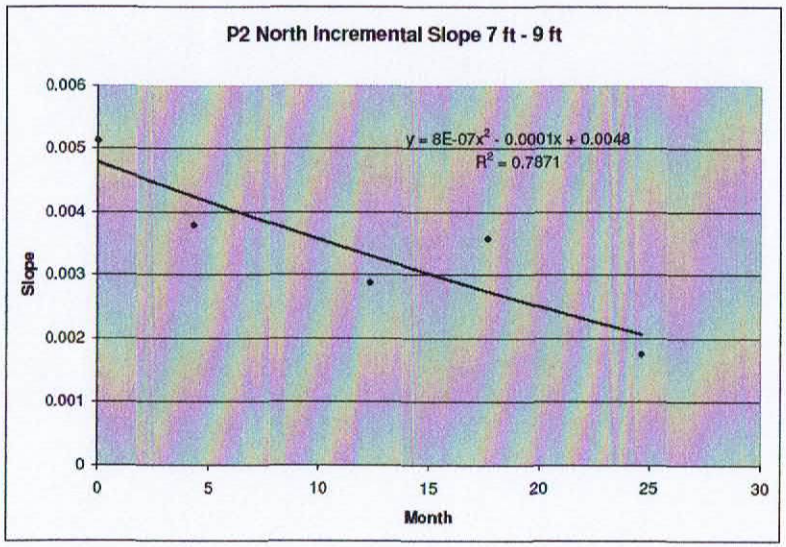
Pilaster 2


P2 North Wall Slope
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
Slope
y = 4E-06x² - 0.0002x + 0.0057
R² = 0.9586
0
5
10
15
20
25
30
Month

Pilaster 2


P2 North Incrementl Slope 3 ft - 5 ft
y = 2E-05x² - 0.0006x + 0.0033
R² = 0.7718
Slope
Month
0.004
0.003
0.002
0.001
0
-0.001
-0.002
-0.003
0
5
10
15
20
25
30


P2 North Incremental Slope 5 ft - 7 ft
y = -9E-06x² + 0.0002x + 0.0091
R² = 0.1056
Slope
Month
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
0
5
10
15
20
25
30

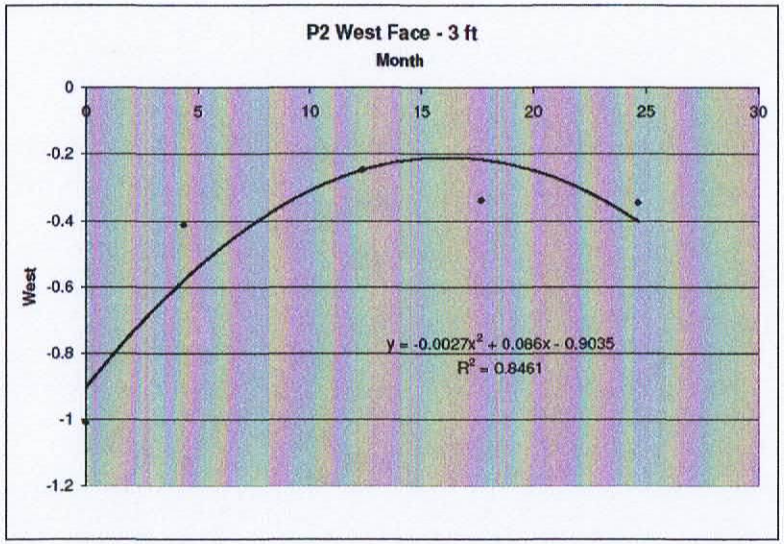

P2 North Incremental Slope 7 ft - 9 ft
y = 8E-07x² - 0.0001x + 0.0048
R² = 0.7871
Slope
Month
0.006
0.005
0.004
0.003
0.002
0.001
0
0
5
10
15
20
25
30

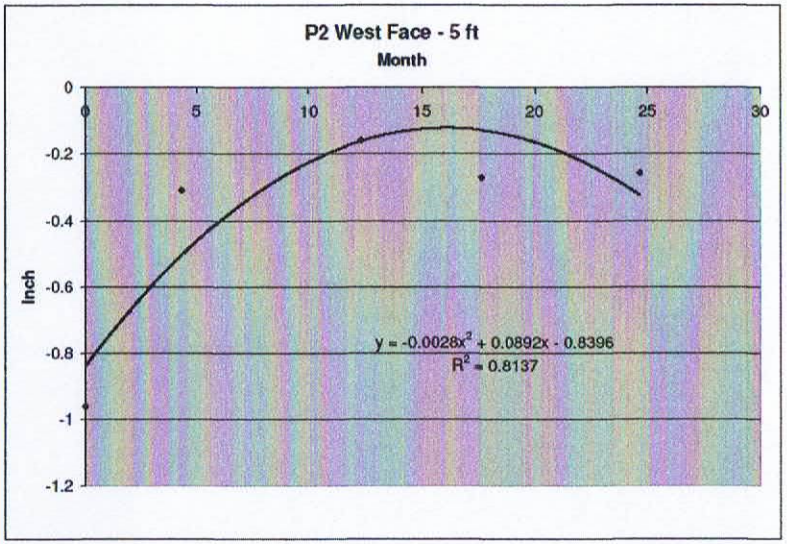
Old County Jail
Perimeter Wall Pilasters

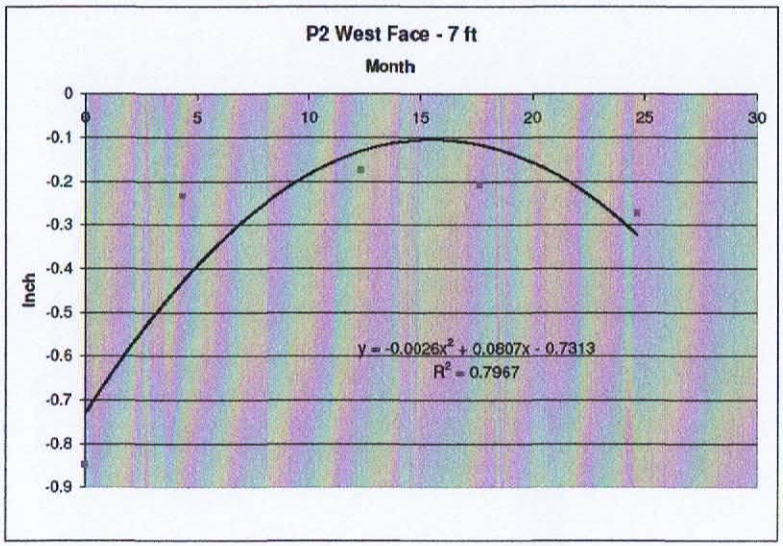
Pilaster ID	Pilaster Location	Feet Above Foundation Wall	Measurement Projection Equation	Curve Fit to Data	Comments
P2, West Plane	Southwest corner, west inner face	3	$Y = -0.0027 x^2 + 0.086 x - 0.9035$	Very Good	Plot suggests possible increase in inward measurement to possible stabilization.
		5	$Y = -0.0028 x^2 + 0.0892 x - 0.8396$	Very Good	Plot suggests possible increase in inward measurement to possible stabilization.
		7	$Y = -0.0026 x^2 + 0.0807 x - 0.7313$	Very Good	Plot suggests possible increase in inward measurement to possible stabilization.

	Wall Slope Location	Segment Location (Feet)	Incremental Slope Projection Equation	Curve Fit to Data	Comments
P2, West Plane	Southwest corner, west inner face	Overall	$Y = -0.00004 x^2 + 0.0012 x - 0.0125$	Very Good	Graph suggests increasing slope to the west with possible stabilization.
		3-5	$Y = 0.000004 x^2 - 0.0001 x - 0.0027$	Poor	Graph suggests possibly searching for stabilization with an inward tilt.
		5-7	$Y = -0.000007 x^2 + 0.0004 x - 0.0045$	Good	Trending toward a decrease of westward slope.
		7-9	$Y = -0.0001 x^2 + 0.0034 x - 0.0305$	Good	Trending toward an increase in westward slope with possible stabilization.

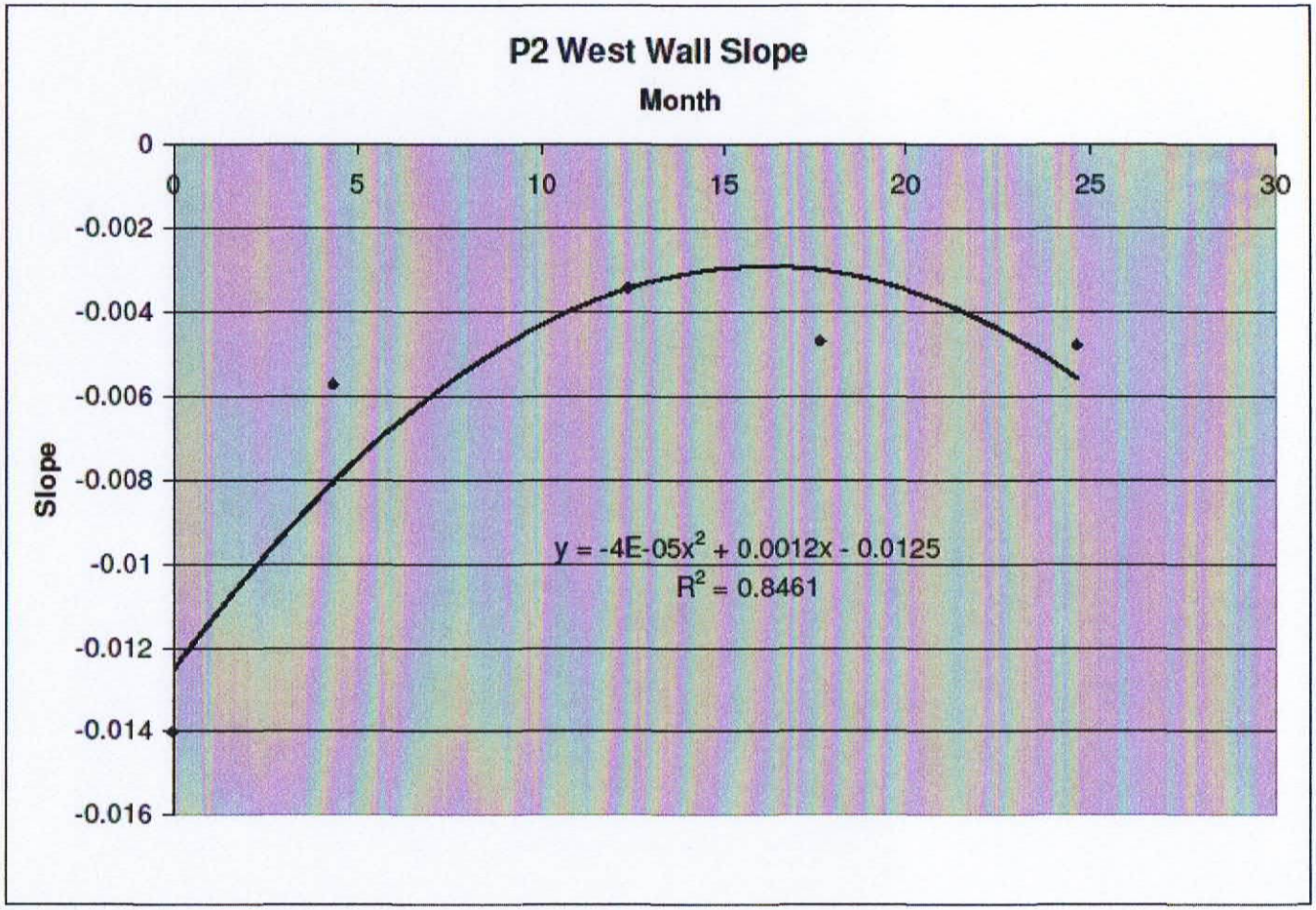
Pilaster 2


P2 West Face - 3 ft
Month
West
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
0
5
10
15
20
25
30
y = -0.0027x² + 0.086x - 0.9035
R² = 0.8461

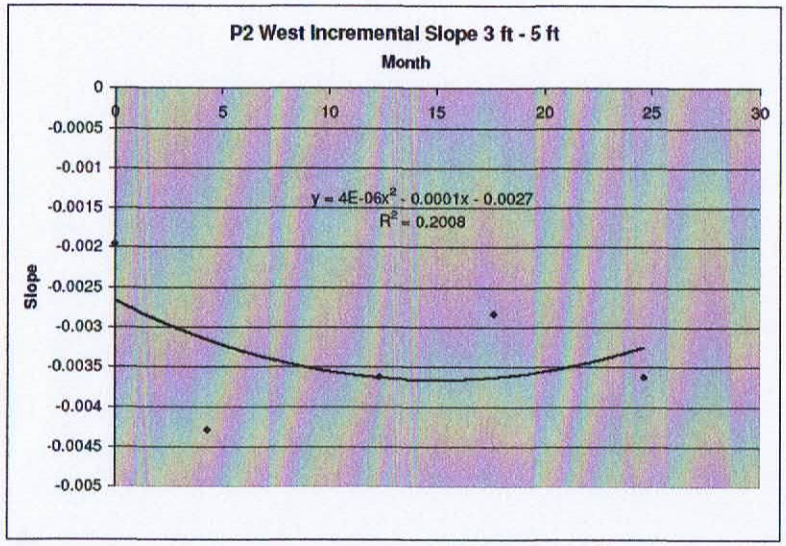

P2 West Face - 5 ft
Month
Inch
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
0
5
10
15
20
25
30
y = -0.0028x² + 0.0892x - 0.8396
R² = 0.8137

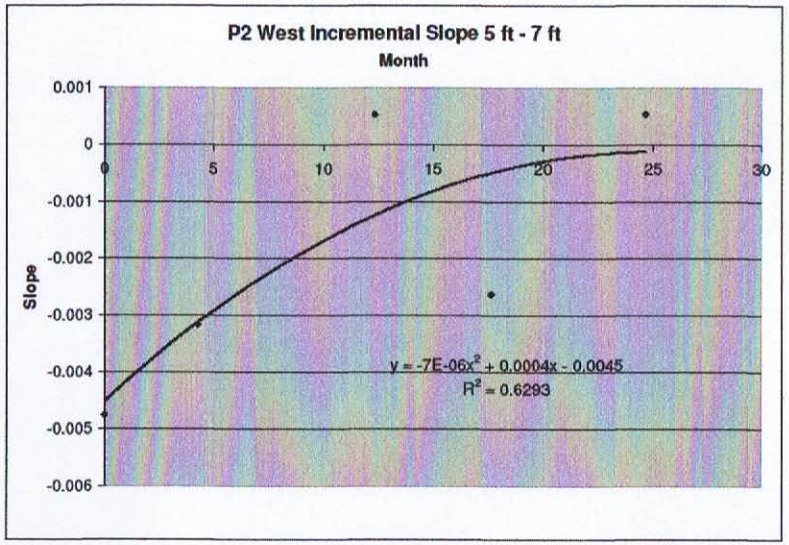

P2 West Face - 7 ft
Month
Inch
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
-0.9
0
5
10
15
20
25
30
y = -0.0026x² + 0.0807x - 0.7313
R² = 0.7967

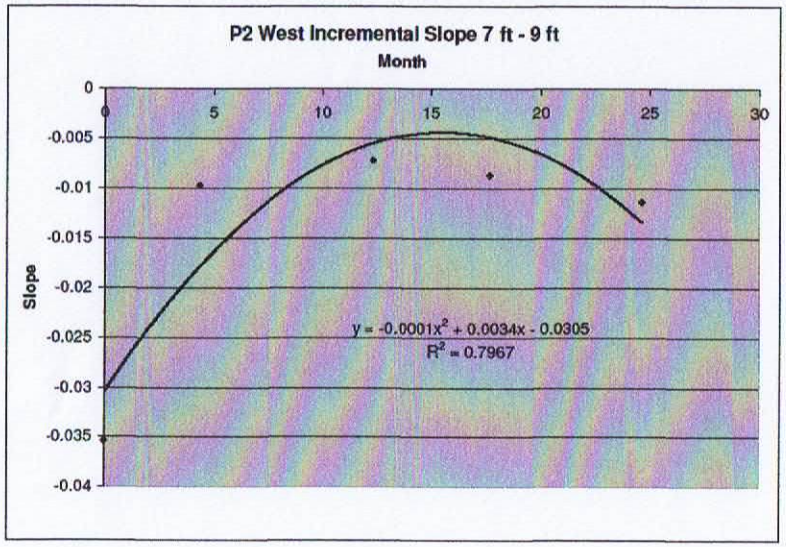
Pilaster 2


P2 West Wall Slope
Month
Slope
0
5
10
15
20
25
30
0
-0.002
-0.004
-0.006
-0.008
-0.01
-0.012
-0.014
-0.016
y = -4E-05x² + 0.0012x - 0.0125
R² = 0.8461

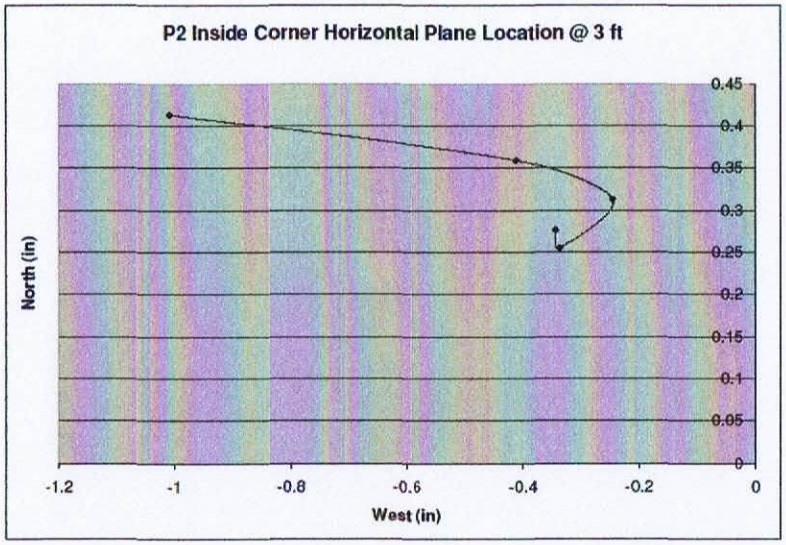
Pilaster 2

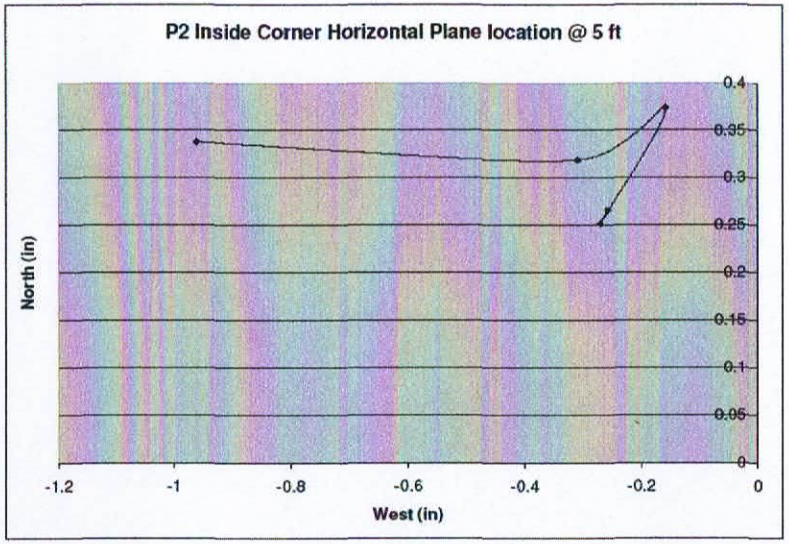

P2 West Incremental Slope 3 ft - 5 ft
Month
Slope
y = 4E-06x² - 0.0001x - 0.0027
R² = 0.2008
0
-0.0005
-0.001
-0.0015
-0.002
-0.0025
-0.003
-0.0035
-0.004
-0.0045
-0.005
0
5
10
15
20
25
30

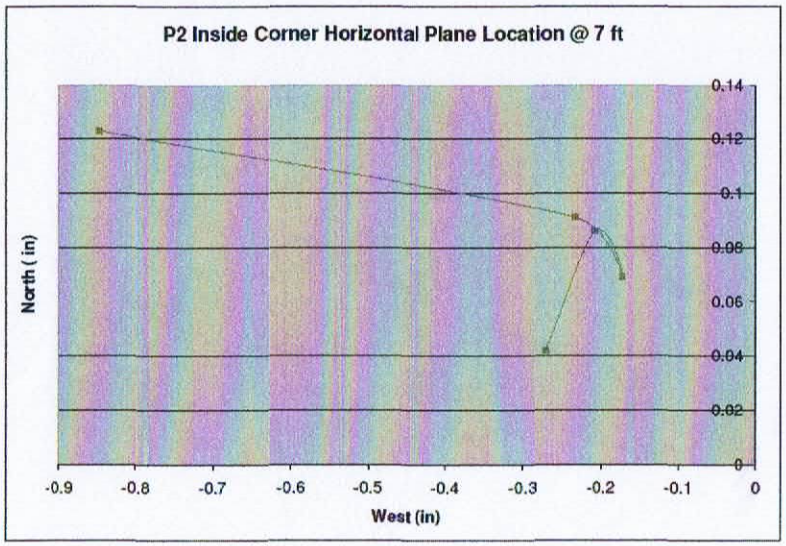

P2 West Incremental Slope 5 ft - 7 ft
Month
Slope
y = -7E-06x² + 0.0004x - 0.0045
R² = 0.6293
0.001
0
-0.001
-0.002
-0.003
-0.004
-0.005
-0.006
0
5
10
15
20
25
30


P2 West Incremental Slope 7 ft - 9 ft
Month
Slope
y = -0.0001x² + 0.0034x - 0.0305
R² = 0.7967
0
-0.005
-0.01
-0.015
-0.02
-0.025
-0.03
-0.035
-0.04
0
5
10
15
20
25
30

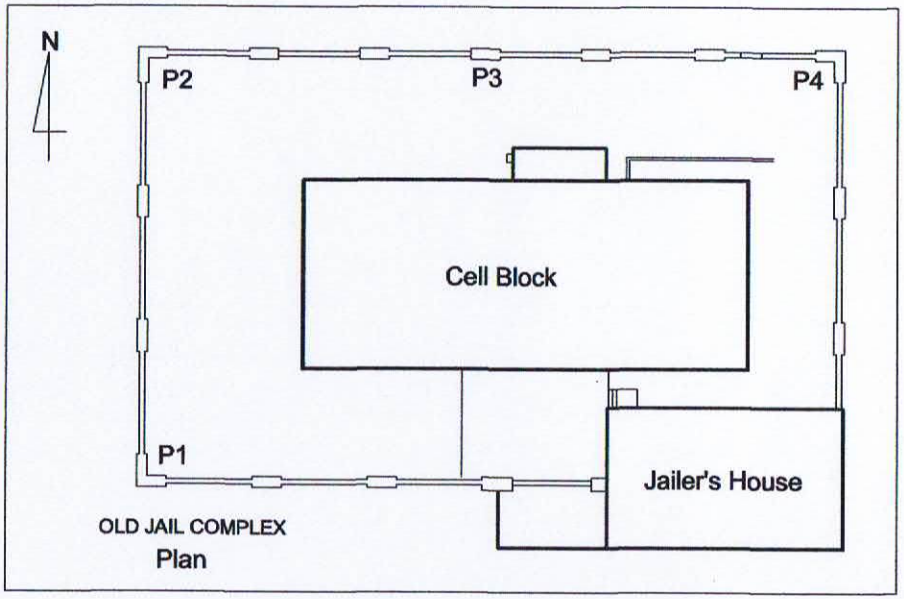
Pilaster 2


P2 Inside Corner Horizontal Plane Location @ 3 ft
North (in)
West (in)
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-1.2
-1
-0.8
-0.6
-0.4
-0.2
0


P2 Inside Corner Horizontal Plane location @ 5 ft
North (in)
West (in)
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-1.2
-1
-0.8
-0.6
-0.4
-0.2
0


P2 Inside Corner Horizontal Plane Location @ 7 ft
North (in)
West (in)
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
-0.9
-0.8
-0.7
-0.6
-0.5
-0.4
-0.3
-0.2
-0.1
0

Pilaster P3



Pilaster 3--Inner Face Normalized Measurements						
Weather Conditions		Overcast to Sunny 82-87F	Overcast to Sunny 75-80F	Partly Cloudy to Sunny 83-87F	Partly Cloudy to Sunny 72F	Sunny 83F
Pilaster 3 Face	Vertical Distance Above Foundation	Measurement (Inches) 5/22/2011	Measurement (Inches) 9/30/2011	Measurement (Inches) 5/30/2012	Measurement (Inches) 11/11/2012 *	Measurement (Inches) 6/11/2013
North Wall	11'-10 1/2"	0	0	0	0	0
	9'-10 1/2"	0.292	0.318	0.316	0.277	0.362
	7'-10 1/2"	0.527	0.616	0.556	0.364	0.655
	5'-10 1/2"	0.613	0.66	0.587	0.549	0.84
	3'-10 1/2"	0.627	0.685	0.694	0.609	0.87

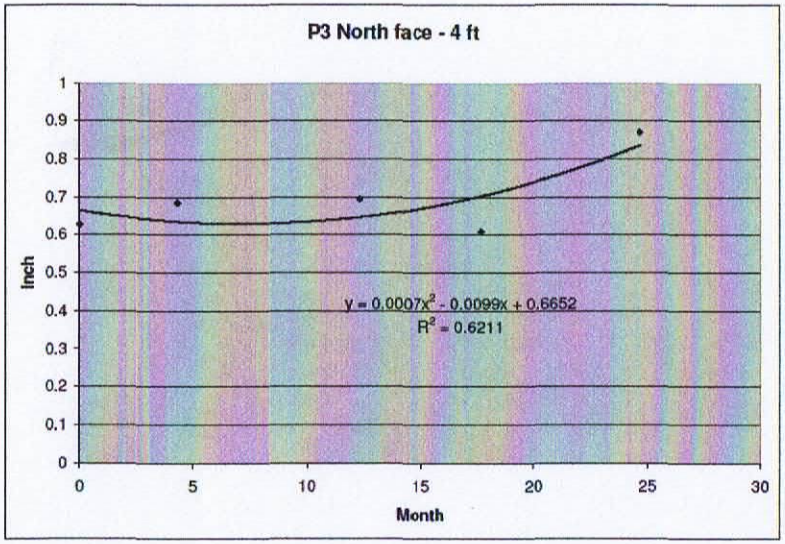
Pilaster P3

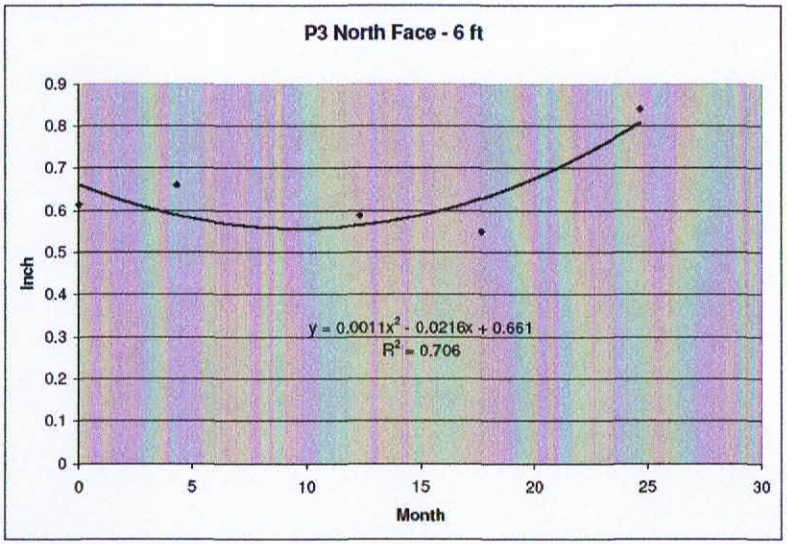
Old County Jail
Perimeter Wall Pilasters

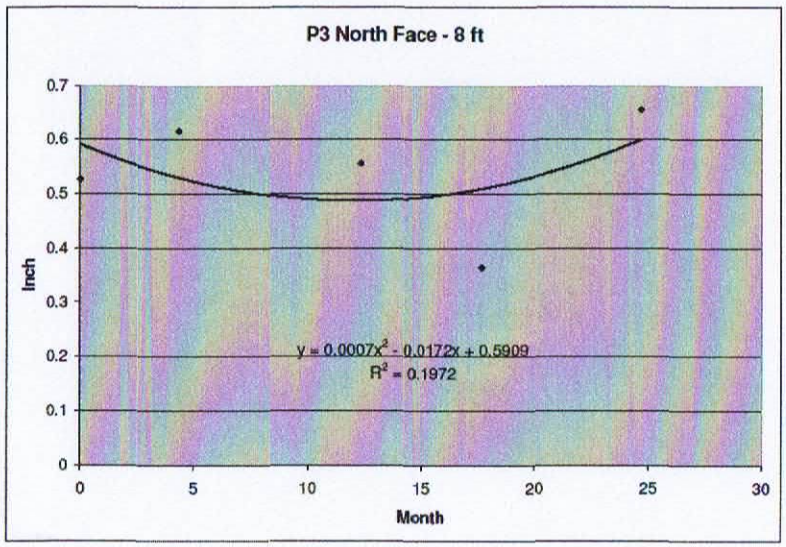
Pilaster ID	Pilaster Location	Feet Above Fdtn Wall	Measurement Projection Equation	Curve Fit to Data	Comments
P3, North Plane	North Wall between P 2 and P4, inner face	4	$Y = 0.0007\ x^2 - 0.0099\ x + 0.6652$	Good	Plot suggests stable to slight increase in outward measurement.
		6	$Y = 0.0011\ x^2 - 0.0216\ x + 0.661$	Good	Plot suggests stable to slight increasing in outward measurement.
		8	$Y = 0.0007\ x^2 - 0.0172\ x + 0.5909$	Poor	Plot suggests stable to slight increase in outward measurement.
		10	$Y = 0.0002\ x^2 - 0.0031\ x + 0.3073$	Fair	Plot suggests stable to slightly increasing outward measurement.

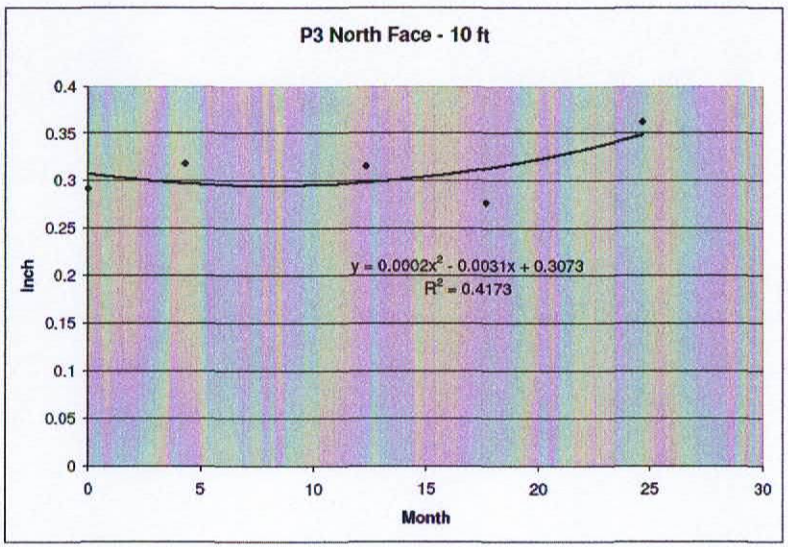
Pilaster ID	Pilaster Location	Segment Location (Feet)	Incremental Slope Projection Equation	Curve Fit to Data	Comments
P3, North Plane	North Wall between P 2 and P4, inner face	Overall	$Y = 0.000007\ x^2 - 0.0001\ x + 0.0069$	Good	Plot suggests stabilization to possible increase in outward slope.
		4-6	$Y = -0.00002\ x^2 + 0.0005\ x + 0.0002$	Good	Plot suggests shift from increasing to decreasing outward slope or possible stabilization.
		6-8	$Y = 0.00002\ x^2 - 0.0002\ x + 0.0029$	Good	Plot indicates increasing outward slope.
		8-10	$Y = 0.00002\ x^2 - 0.0006\ x + 0.0118$	Poor	Plot suggests change in decreasing outward slope to increasing outward slope or possible stabilization.
		10-12	$Y = 0.000008\ x^2 - 0.0001\ x + 0.0128$	Fair	Plot indicates possible stabilization.

Pilaster 3

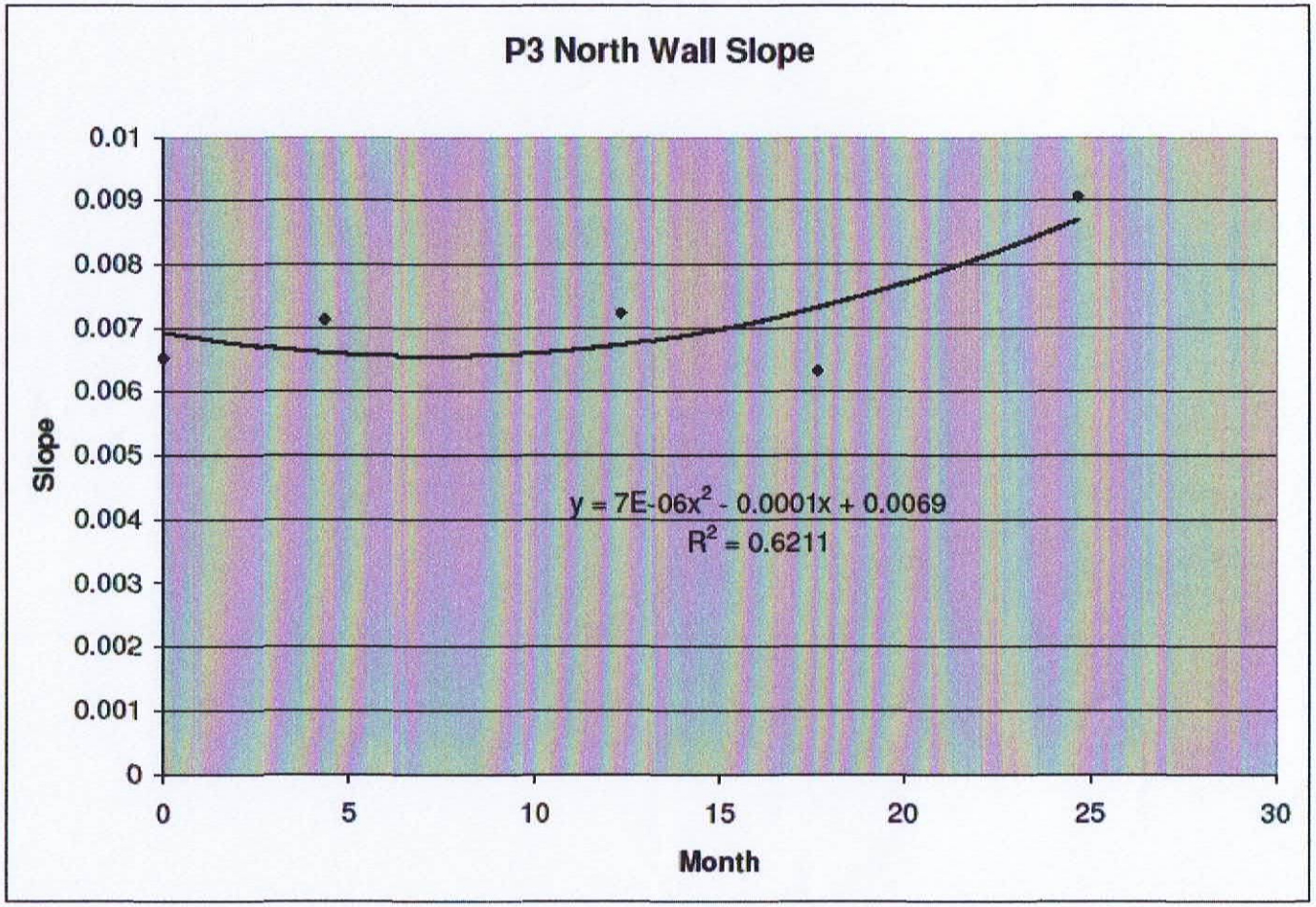

P3 North face - 4 ft
Inch
Month
y = 0.0007x² - 0.0099x + 0.6652
R² = 0.6211


P3 North Face - 6 ft
Inch
Month
y = 0.0011x² - 0.0216x + 0.661
R² = 0.706

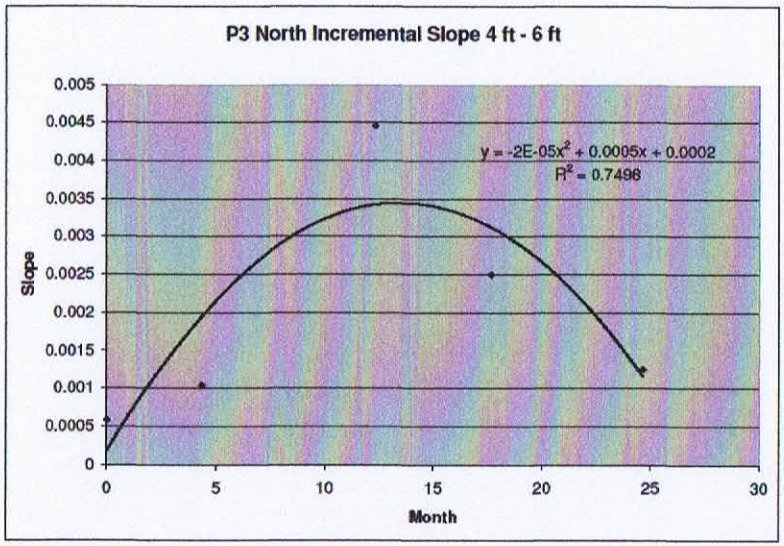

P3 North Face - 8 ft
Inch
Month
y = 0.0007x² - 0.0172x + 0.5909
R² = 0.1972

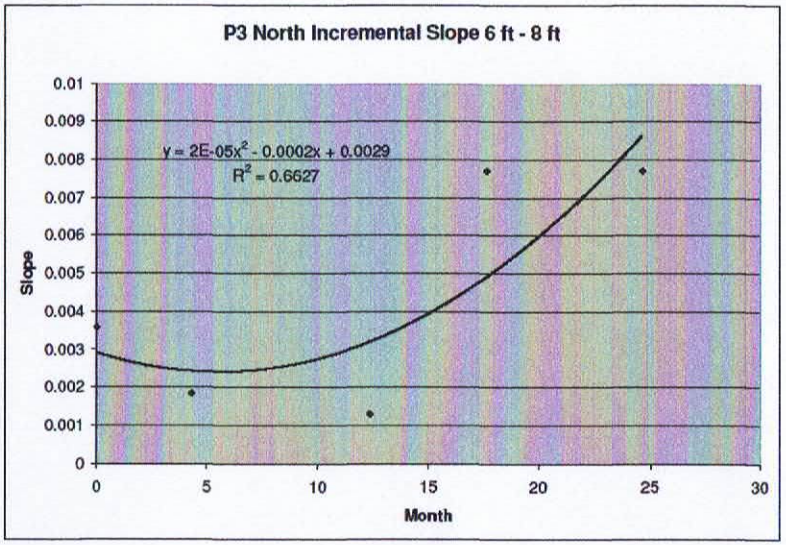

P3 North Face - 10 ft
Inch
Month
y = 0.0002x² - 0.0031x + 0.3073
R² = 0.4173

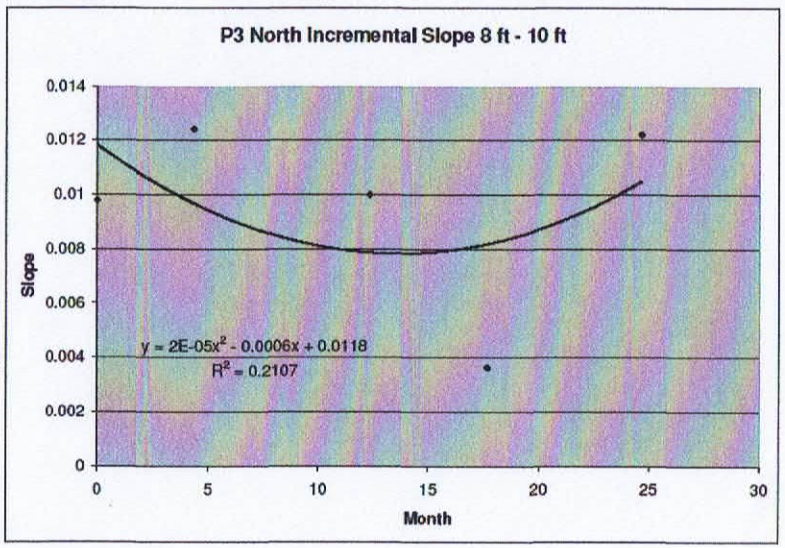
Pilaster 3

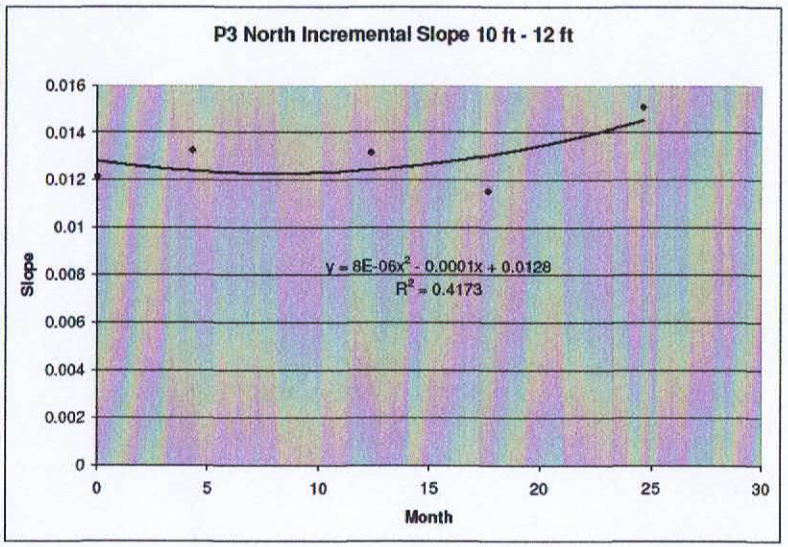

P3 North Wall Slope
Slope
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
0
5
10
15
20
25
30
Month
y = 7E-06x² - 0.0001x + 0.0069
R² = 0.6211

Pilaster 3

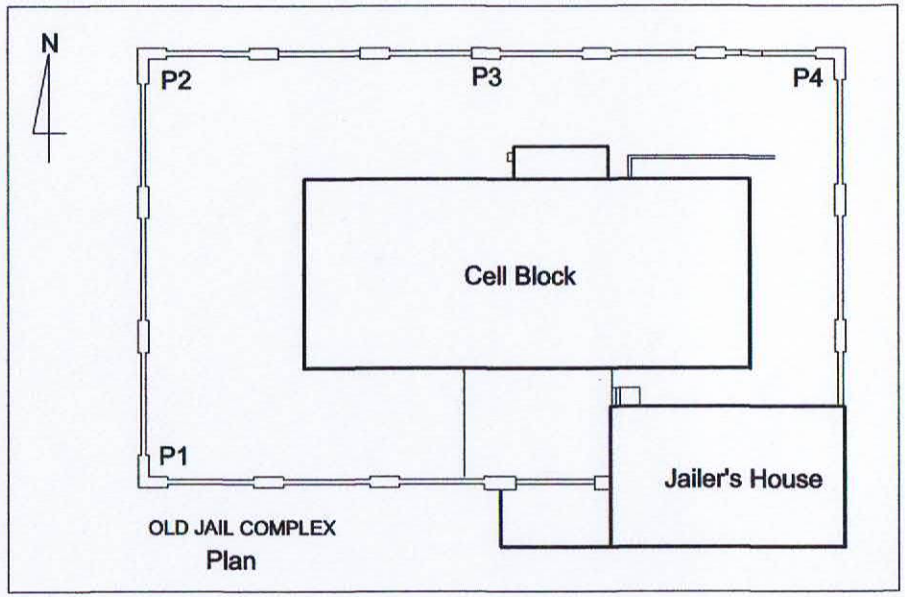

P3 North Incremental Slope 4 ft - 6 ft
y = -2E-05x² + 0.0005x + 0.0002
R² = 0.7498
Slope
Month
0
0.0005
0.001
0.0015
0.002
0.0025
0.003
0.0035
0.004
0.0045
0.005
0
5
10
15
20
25
30


P3 North Incremental Slope 6 ft - 8 ft
y = 2E-05x² - 0.0002x + 0.0029
R² = 0.6627
Slope
Month
0
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01
0
5
10
15
20
25
30


P3 North Incremental Slope 8 ft - 10 ft
y = 2E-05x² - 0.0006x + 0.0118
R² = 0.2107
Slope
Month
0
0.002
0.004
0.006
0.008
0.01
0.012
0.014
0
5
10
15
20
25
30


P3 North Incremental Slope 10 ft - 12 ft
y = 8E-06x² - 0.0001x + 0.0128
R² = 0.4173
Slope
Month
0
0.002
0.004
0.006
0.008
0.01
0.012
0.014
0.016
0
5
10
15
20
25
30

Pilaster P4



Pilaster 4--Inner Face Normalized Measurements						
Weather Conditions		Overcast to Sunny	Sunny	Overcast to Sunny	Sunny	Sunny
		82-87F	75-80F	83-87F	66F	83F
Pilaster 4 Face	**Vertical Distance Above Foundation**	**Measurement (Inches) 5/22/2011**	**Measurement (Inches) 9/29/2011**	**Measurement (Inches) 5/30/2012**	**Measurement (Inches) 11/10/2012**	**Measurement (Inches) 6/11/2013**
North Wall	8'-0"	0.000	0.000	0.000	0.000	0.000
	6'-0"	-0.110	0.043	0.032	-0.031	0.130
	4'-0"	-0.076	-0.010	0.057	-0.022	0.191
	2'-0"	-0.049	0.035	-0.131	-0.005	0.244
East Wall	8'-0"	0	0	0	0	0
	6'-0"	0.034	-0.113	0.031	0.137	0.14
	4'-0"	0.175	-0.029	-0.045	0.006	-0.125
	2'-0"	0.213	0.164	0.005	0.199	0.197

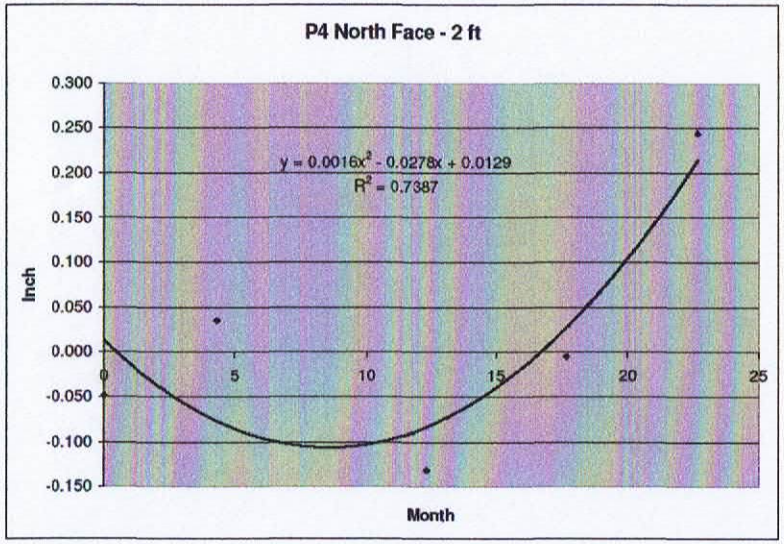
Pilaster
P4

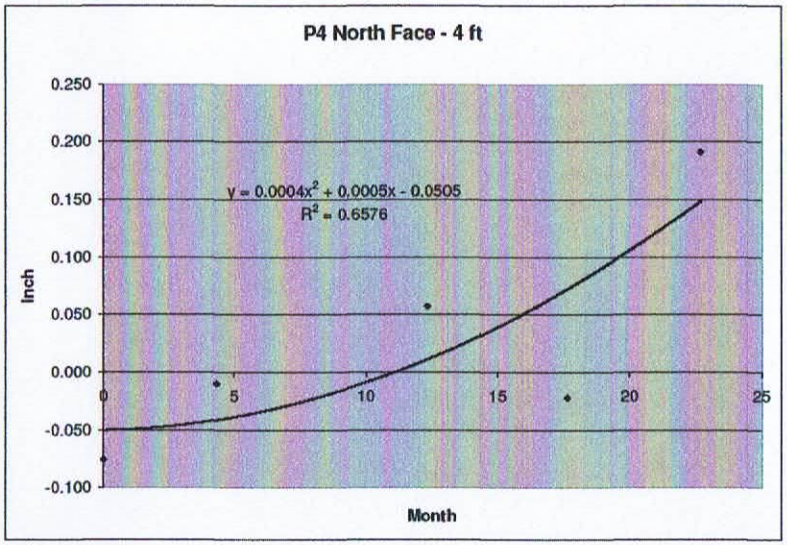
Old County Jail
Perimeter Wall Pilasters

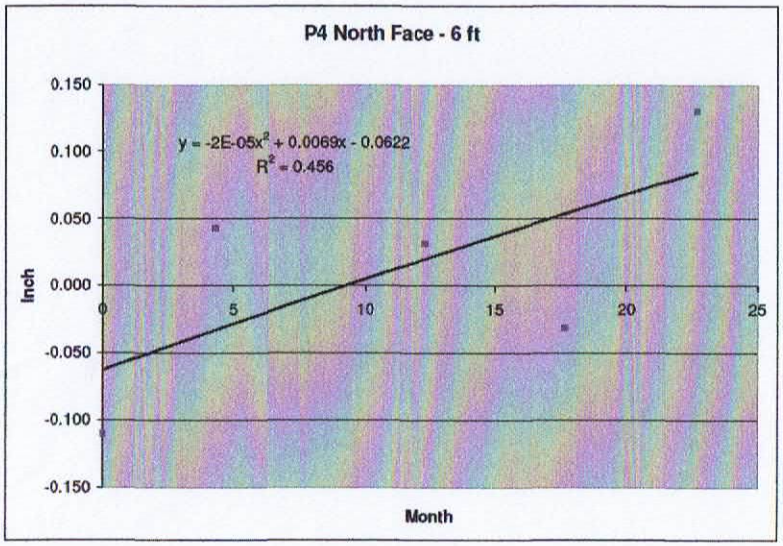
Pilaster ID	Pilaster Location	Feet Above Fdtn Wall	Measurement Projection Equation	Curve Fit to Data	Comments
P4, North Plane	Northeast corner, north wall, inner face	2	$Y = 0.0016\ x^2 - 0.0278\ x + 0.0129$	Good	Plot indicates shift from inward to outward measurement.
		4	$Y = 0.0004\ x^2 + 0.0005\ x - 0.0505$	Good	Plot indicates increasing outward measurement.
		6	$Y = -0.00002\ x^2 + 0.0069\ x - 0.622$	Fair	Plot indicates increasing outward measurement.

Pilaster ID	Pilaster Location	Segment Location (Feet)	Incremental Slope Projection Equation	Curve Fit to Data	Comments
P4, North Plane	Northeast corner, north wall, inner face	Overall	$Y = 0.00002\ x^2 - 0.0004\ x + 0.0002$	Good	Plot suggests change from inward to increasingly outward slope.
		2-4	$Y = 0.00005\ x^2 - 0.0012\ x + 0.0026$	Fair	Plot suggests change from inward to increasingly outward slope or possible stabilization.
		4-6	$Y = 0.00002\ x^2 - 0.0003\ x + 0.0005$	Fair	Plot suggests shift from inward to increasingly outward slope.
		6-8	$Y = -0.0000008\ x^2 + 0.0003\ x - 0.0026$	Fair	Plot suggests increasingly outward slope.

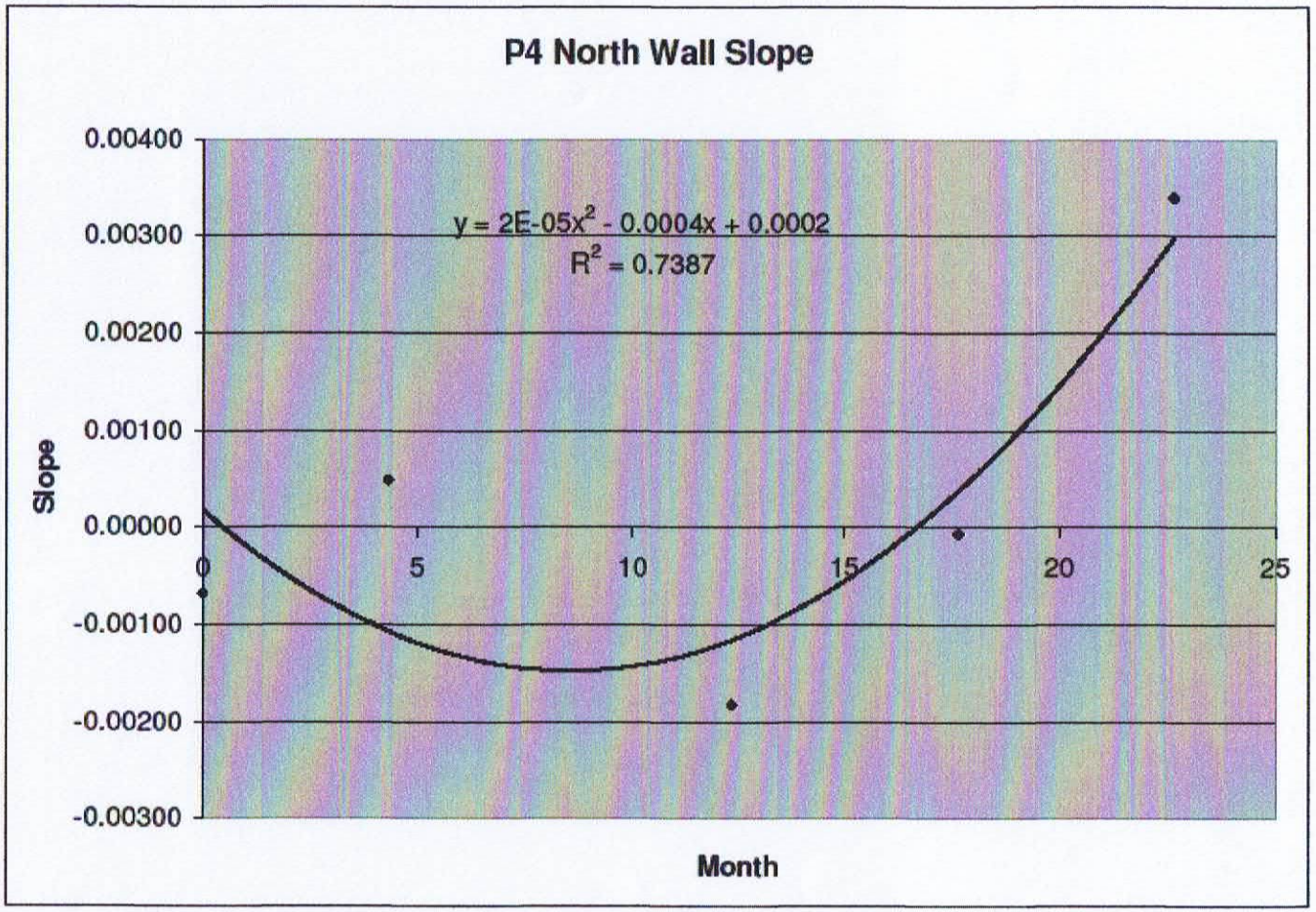
Pilaster 4


P4 North Face - 2 ft
y = 0.0016x² - 0.0278x + 0.0129
R² = 0.7387
Inch
Month
0.300
0.250
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
0
5
10
15
20
25

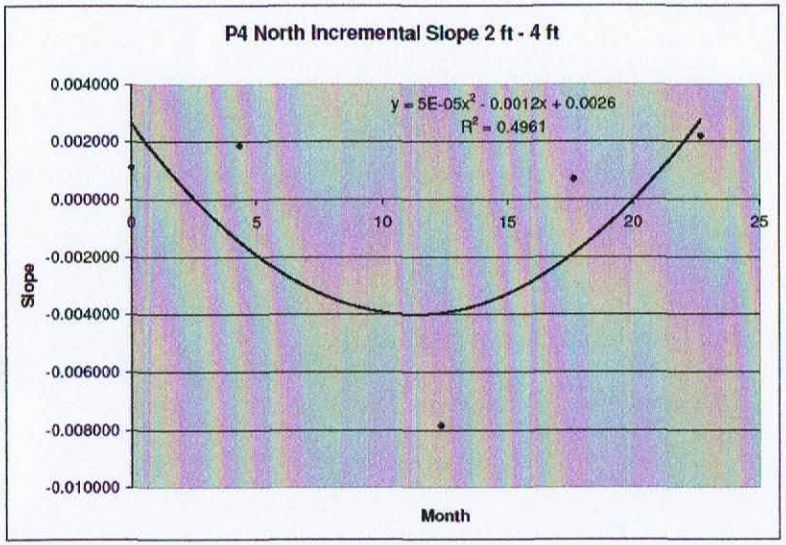

P4 North Face - 4 ft
y = 0.0004x² + 0.0005x - 0.0505
R² = 0.6576
Inch
Month
0.250
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
0
5
10
15
20
25

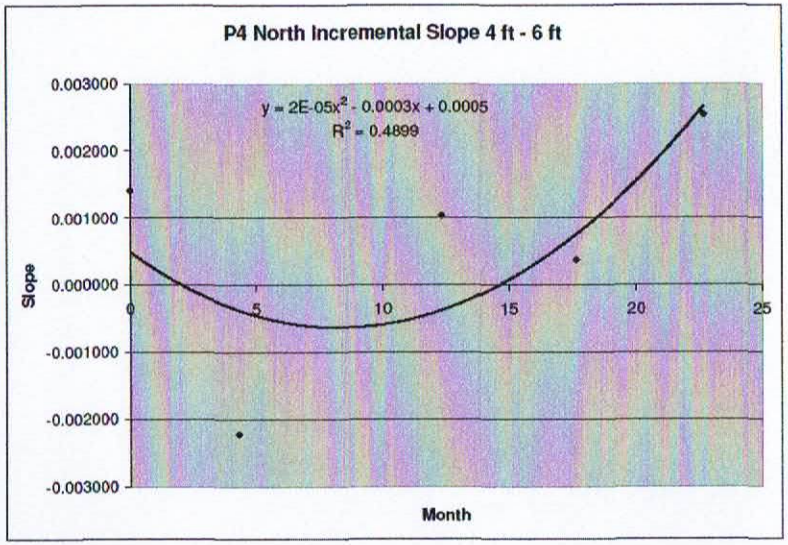

P4 North Face - 6 ft
y = -2E-05x² + 0.0069x - 0.0622
R² = 0.456
Inch
Month
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
0
5
10
15
20
25

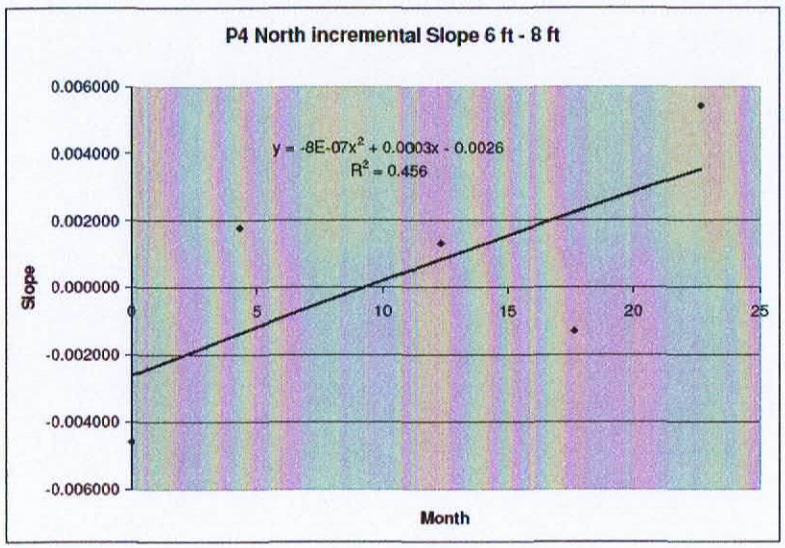
Pilaster 4


P4 North Wall Slope
y = 2E-05x² - 0.0004x + 0.0002
R² = 0.7387
0.00400
0.00300
0.00200
0.00100
0.00000
-0.00100
-0.00200
-0.00300
Slope
0
5
10
15
20
25
Month

Pilaster 4


P4 North Incremental Slope 2 ft - 4 ft
y = 5E-05x² - 0.0012x + 0.0026
R² = 0.4961
0.004000
0.002000
0.000000
-0.002000
-0.004000
-0.006000
-0.008000
-0.010000
0
5
10
15
20
25
Slope
Month


P4 North Incremental Slope 4 ft - 6 ft
y = 2E-05x² - 0.0003x + 0.0005
R² = 0.4899
0.003000
0.002000
0.001000
0.000000
-0.001000
-0.002000
-0.003000
0
5
10
15
20
25
Slope
Month

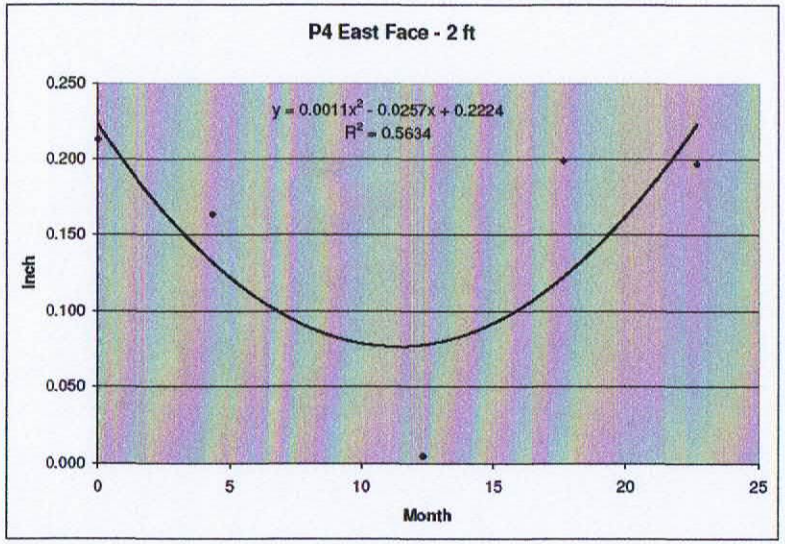

P4 North Incremental Slope 6 ft - 8 ft
y = -8E-07x² + 0.0003x - 0.0026
R² = 0.456
0.006000
0.004000
0.002000
0.000000
-0.002000
-0.004000
-0.006000
0
5
10
15
20
25
Slope
Month

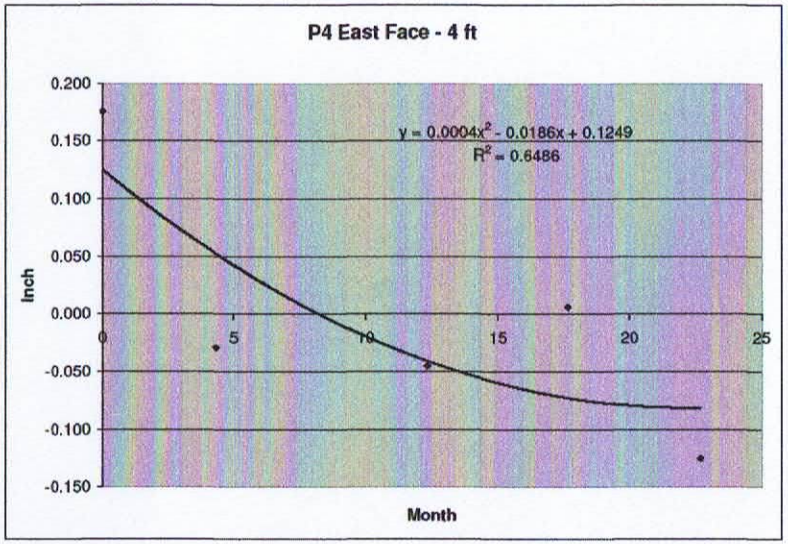
Old County Jail
Perimeter Wall Pilasters

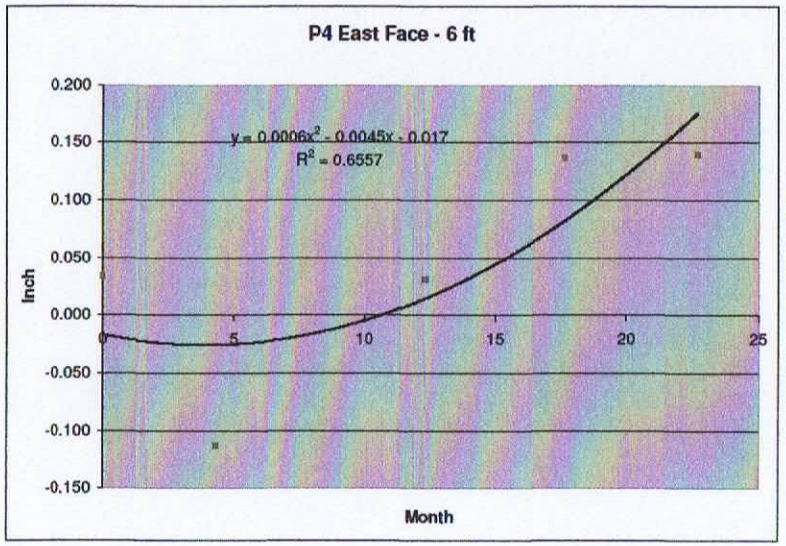
Pilaster ID	Pilaster Location	Feet Above Fdtn Wall	Measurement Projection Equation	Curve Fit to Data	Comments
P4, East Plane	Northeast corner, east inner face	2	$Y = 0.0011\ x^2 - 0.0257\ x + 0.2224$	Fair	Plot suggests change from decreasing to increasing outward measurement or possible stabilization.
		4	$Y = 0.0004\ x^2 - 0.0186\ x + 0.1249$	Good	Plot indicates increasing inward measurement.
		6	$Y = 0.0006\ x^2 - 0.0045\ x - 0.017$	Good	Plot indicates increasing outward measurement.

Pilaster ID	Pilaster Location	Segment Location (Feet)	Incremental Slope Projection Equation	Curve Fit to Data	Comments
P4, East Plane	Northeast corner, east inner face	Overall	$Y = 0.00002\ x^2 - 0.0004\ x + 0.0031$	Fair	Plot suggests change from inward to increasingly outward slope.
		2-4	$Y = 0.00003\ x^2 - 0.0003\ x + 0.0041$	Good	Plot suggests change from inward to increasingly outward slope or possible stabilization.
		4-6	$Y = -0.000006\ x^2 - 0.0006\ x + 0.0059$	Very Good	Plot suggests shift from inward to increasingly outward slope.
		6-8	$Y = 0.00002\ x^2 - 0.0002\ x - 0.0007$	Good	Plot suggests increasingly outward slope.

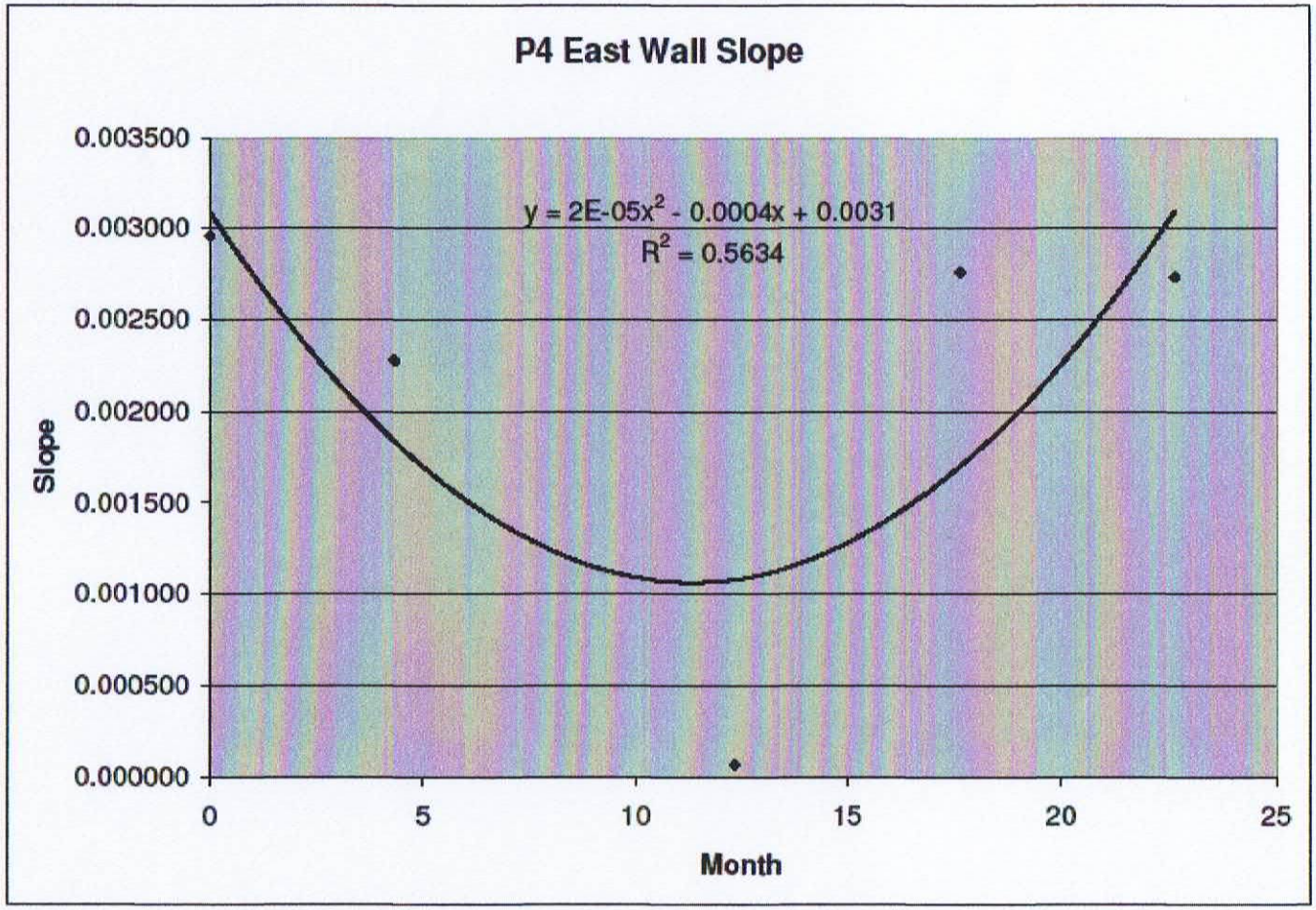
Pilaster 4


P4 East Face - 2 ft
y = 0.0011x² - 0.0257x + 0.2224
R² = 0.5634
Inch
Month
0.250
0.200
0.150
0.100
0.050
0.000
0
5
10
15
20
25

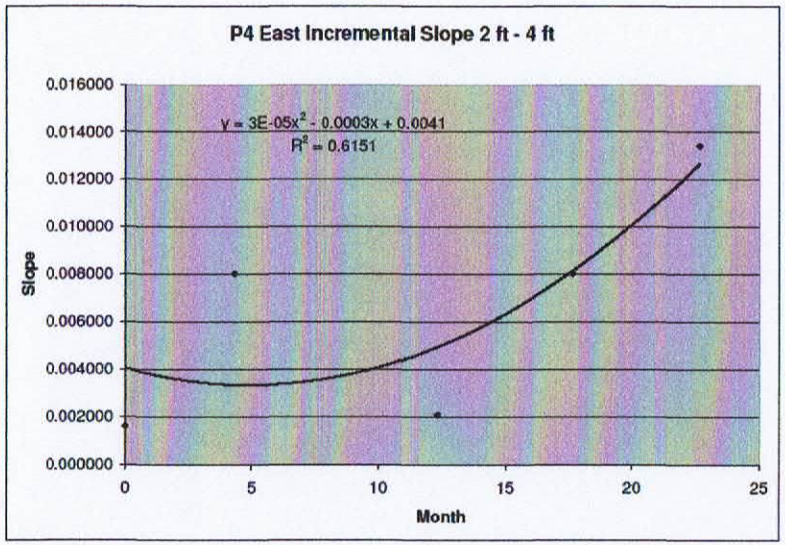

P4 East Face - 4 ft
y = 0.0004x² - 0.0186x + 0.1249
R² = 0.6486
Inch
Month
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
0
5
10
15
20
25

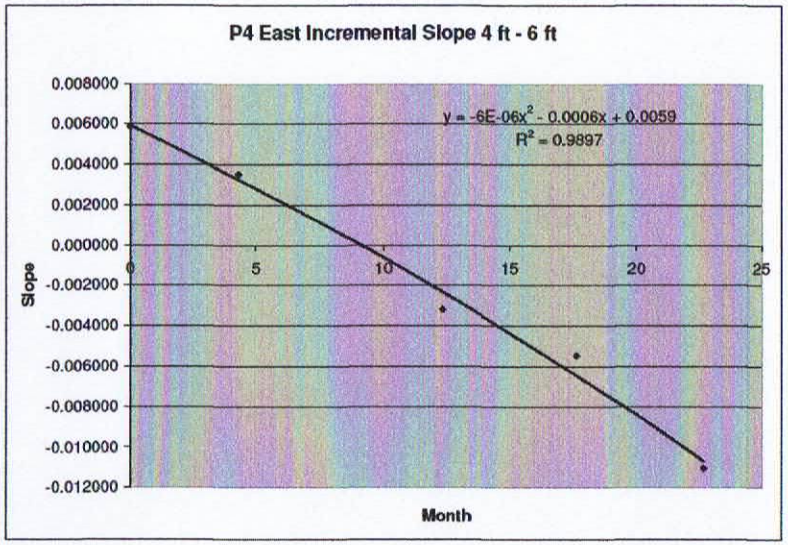

P4 East Face - 6 ft
y = 0.0006x² - 0.0045x - 0.017
R² = 0.6557
Inch
Month
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
0
5
10
15
20
25

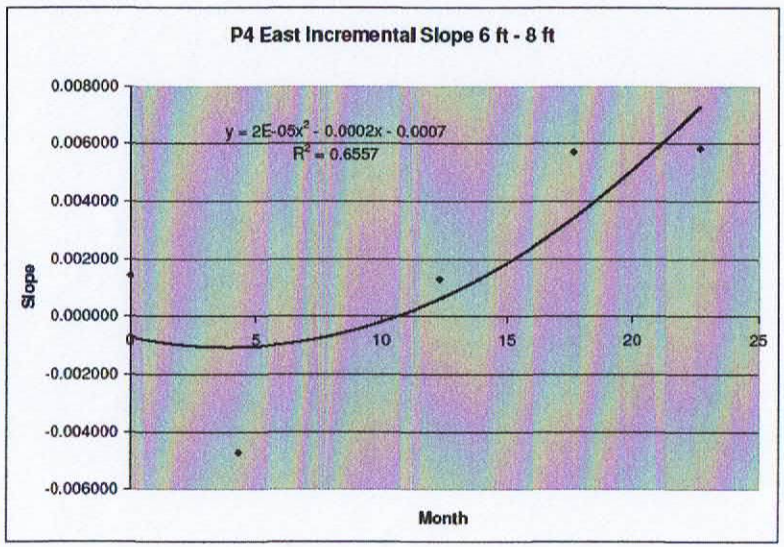
Pilaster 4


P4 East Wall Slope
y = 2E-05x² - 0.0004x + 0.0031
R² = 0.5634
Slope
0.003500
0.003000
0.002500
0.002000
0.001500
0.001000
0.000500
0.000000
0
5
10
15
20
25
Month

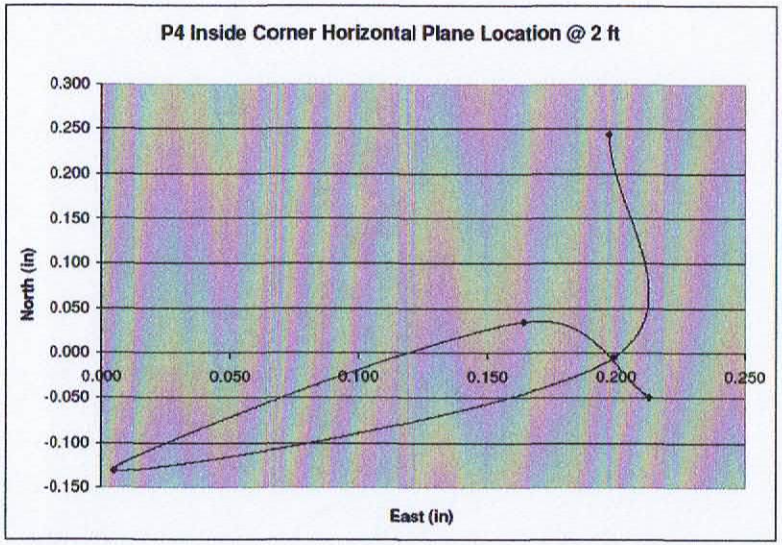
Pilaster 4

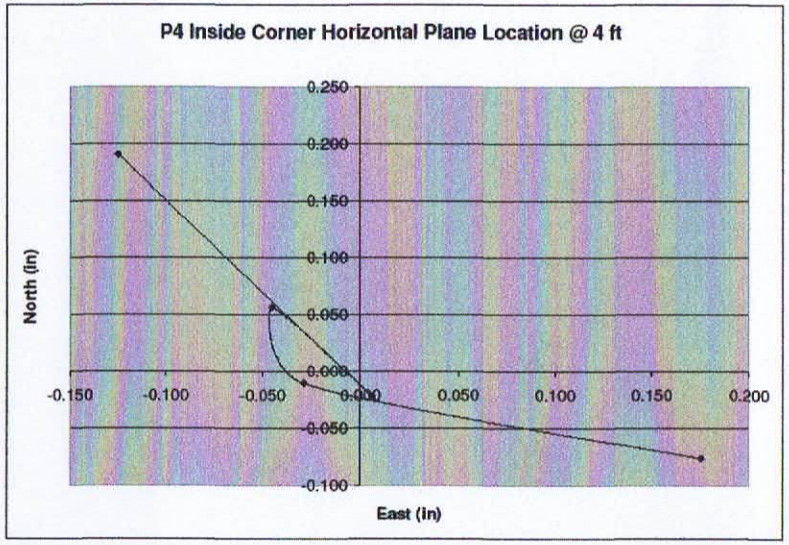

P4 East Incremental Slope 2 ft - 4 ft
y = 3E-05x² - 0.0003x + 0.0041
R² = 0.6151
Slope
Month
0.016000
0.014000
0.012000
0.010000
0.008000
0.006000
0.004000
0.002000
0.000000
0
5
10
15
20
25

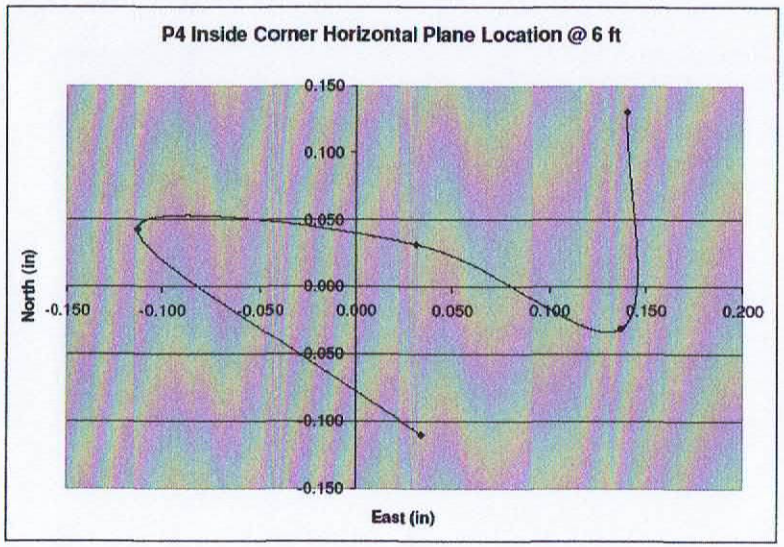

P4 East Incremental Slope 4 ft - 6 ft
y = -6E-06x² - 0.0006x + 0.0059
R² = 0.9897
Slope
Month
0.008000
0.006000
0.004000
0.002000
0.000000
-0.002000
-0.004000
-0.006000
-0.008000
-0.010000
-0.012000
0
5
10
15
20
25


P4 East Incremental Slope 6 ft - 8 ft
y = 2E-05x² - 0.0002x - 0.0007
R² = 0.6557
Slope
Month
0.008000
0.006000
0.004000
0.002000
0.000000
-0.002000
-0.004000
-0.006000
0
5
10
15
20
25

Pilaster 4


P4 Inside Corner Horizontal Plane Location @ 2 ft
North (in)
East (in)
0.300
0.250
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
0.000
0.050
0.100
0.150
0.200
0.250


P4 Inside Corner Horizontal Plane Location @ 4 ft
North (in)
East (in)
0.250
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
-0.100
-0.050
0.000
0.050
0.100
0.150
0.200


P4 Inside Corner Horizontal Plane Location @ 6 ft
North (in)
East (in)
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
-0.150
-0.100
-0.050
0.000
0.050
0.100
0.150
0.200