



TRANSBAY JOINT POWERS AUTHORITY

Maria Ayerdi-Kaplan • Executive Director

January 14, 2010

Steven C. Hood
Millennium Partners
735 Market Street, 4th Floor
San Francisco, CA 94103

Subject: Transbay Transit Center Program
Buttress Construction Documents

Dear Mr. Hood,

In accordance with the Easement Agreement dated October 10, 2008, between the Transbay Joint Powers Authority (TJPA) and Mission Street Development LLC, we are attaching for your review three copies of the Buttress Construction Documents (drawings and specifications).

With this submittal we are soliciting feedback from your designers regarding the design of the Buttress to enable TJPA to complete the design and construct the Buttress. These documents should be reviewed in conjunction with the Report on the Preliminary Design of the Buttress for Limiting Excavation-Induced Deformations at 301 Mission Street previously provided to you with our letter of November 18, 2009.

Additionally, we are requesting responses from your designers to the questions outlined below to allow our designers to better understand your building's design and performance as they finalize the Buttress Construction Documents. Accompanying the correspondence you will find three plates referenced in the questions to assist.

General

- 1.0 For what magnitude of movement have the utility service connections been designed?
- 2.0 For the building systems which are adversely affected by building movement, e.g., below-grade waterproofing (including penetration seals), exterior drainage (exterior door thresholds, sidewalk cross-falls, driveway and service entrance drainage), exterior skin/ cladding, elevators, expansion joints, finishes, etc., how much total movement can be accommodated without affecting their performance?
- 3.0 What are the pile design criteria and installation criteria issued to the original contractor? What is the pile head displacement used in the design?

Tower Settlement

- 1.0 Treadwell and Rollo, in their letter referenced by DeSimone to the San Francisco Department of Building Inspection of February 25, 2009, reported that the settlement of the tower core was 8.3 inches and estimated that approximately 2 to 4 inches of additional settlement could occur in the future. Please see Plate 1-1 and 1-2 attached. On the basis of these current data, how much additional total and differential settlement is now expected under the tower?

- 2.0 What are the reasons for larger than anticipated settlements at the tower core? Does Treadwell and Rollo remain of the opinion that the additional settlement is due to longer dewatering and limited effectiveness of predrilling of piles?
- 3.0 What is the explanation for the differential settlements at the south end of the tower? Please see Plate 2 attached, which is based on surveyed settlement marker elevations.
- 4.0 Does the observed differential movement, shown in Plate 2, affect the structural performance of the 301 Mission building? How much movement can the structure accommodate?
- 5.0 What amount of total measured settlement is from undrained deformation and what settlement is from consolidation?
- 6.0 Is the Old Bay Clay stressed into the virgin compression zone, or is the settlement entirely due to recompression?
- 7.0 What is the estimated degree of consolidation of the Old Bay Clay at this time? How long will it take to reach 95% consolidation?
- 8.0 Is the slow rate of observed settlement within the last 9 months an indication of slow primary consolidation, or is the settlement secondary compression?

Foundation Design

- 1.0 In the foundation design, was the assumption made that the 10-foot mat and the piles would perform as a rigid block? At what depth was it assumed that the building load was applied?
- 2.0 Was the full dead load plus full live load used to calculate the building settlement, or was a reduced live load used?

Seismic Considerations

- 1.0 What are the periods of vibration, mass participation factors and mode shapes for the first 5 modes of the tower?
- 2.0 What is the shear corresponding to the maximum shear and bending moment capacity of the lateral system of the tower?
- 3.0 What is the maximum base shear and moment that the structure is able to deliver to the foundation?

In order to expedite the review process, we are requesting that we meet the week of January 25, 2010, to review the responses to the above questions and any comments generated from your review of the Buttress Construction Documents.

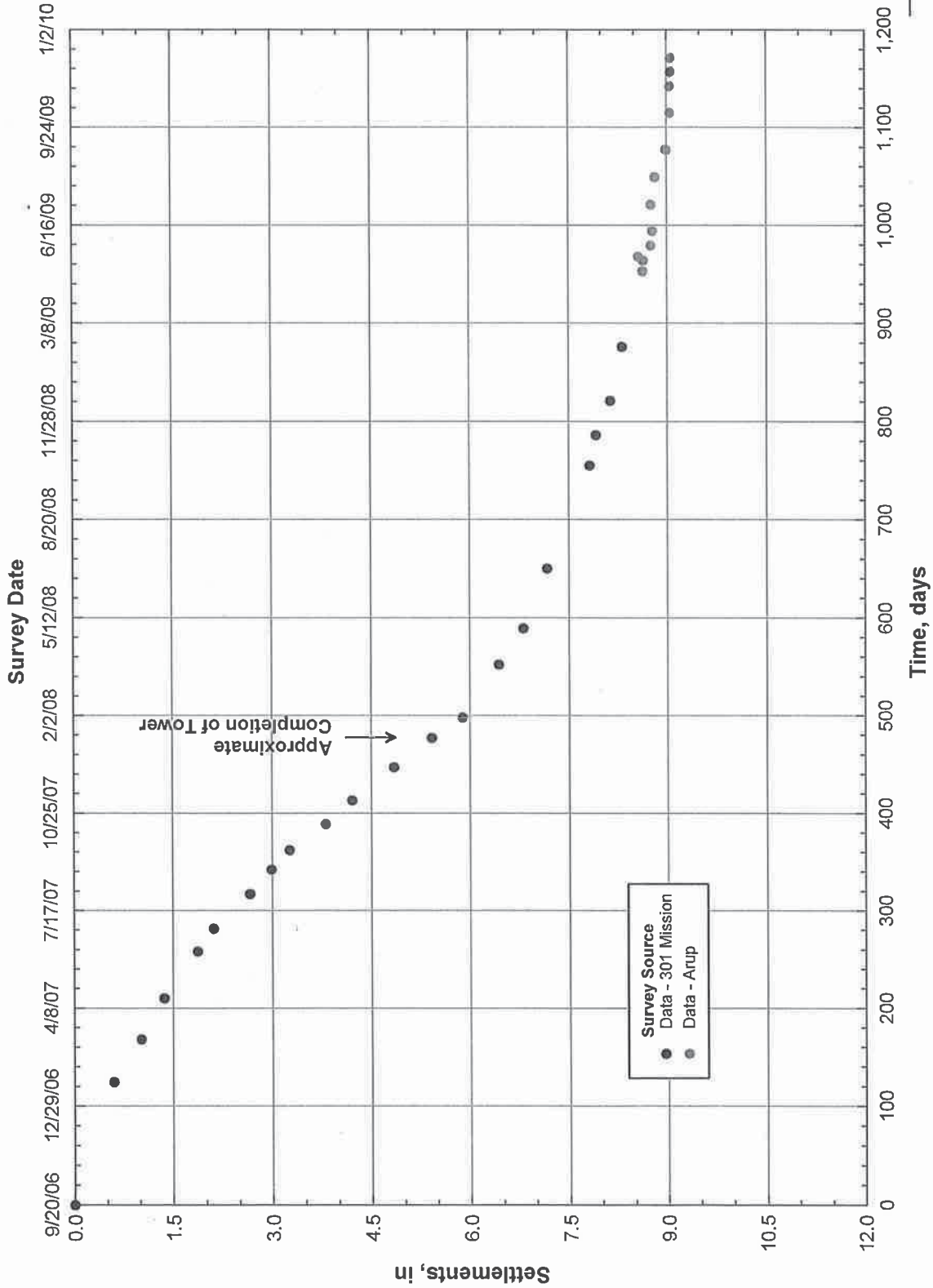
Yours truly,

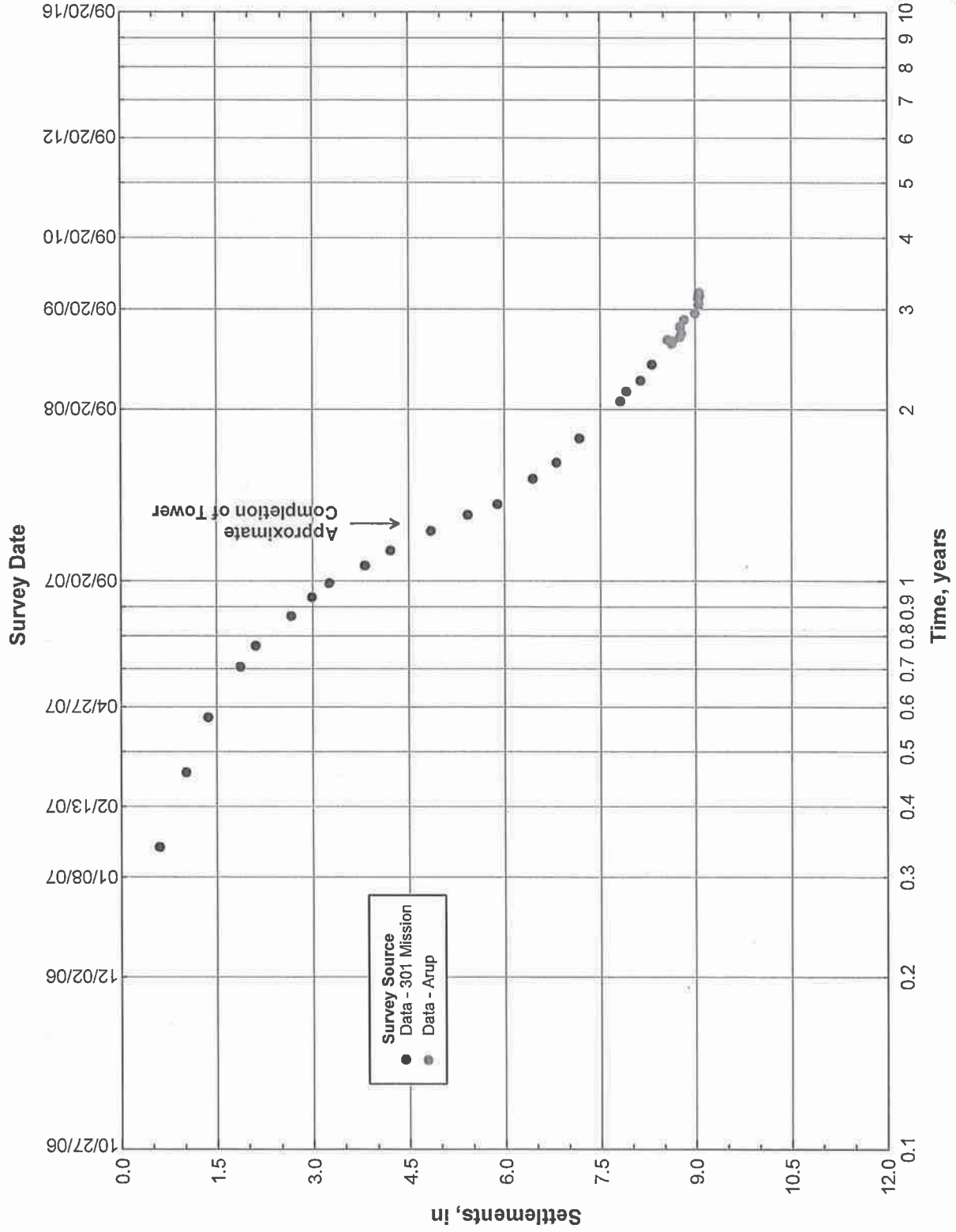


Brian R. Dykes, P.E.
Principal Engineer
Transbay Joint Powers Authority

Enclosure: Buttress Construction Documents

cc: R. Volenec, N. Riordan, B. Gibbons, Document Control





SURVEYED SETTLEMENT OF THE 301 MISSION TOWER: LOG TIME SCALE
 Transbay Transit Center
 301 Mission Performance
 Transbay Joint Powers Authority
 San Francisco, California

January 2010
ARUP

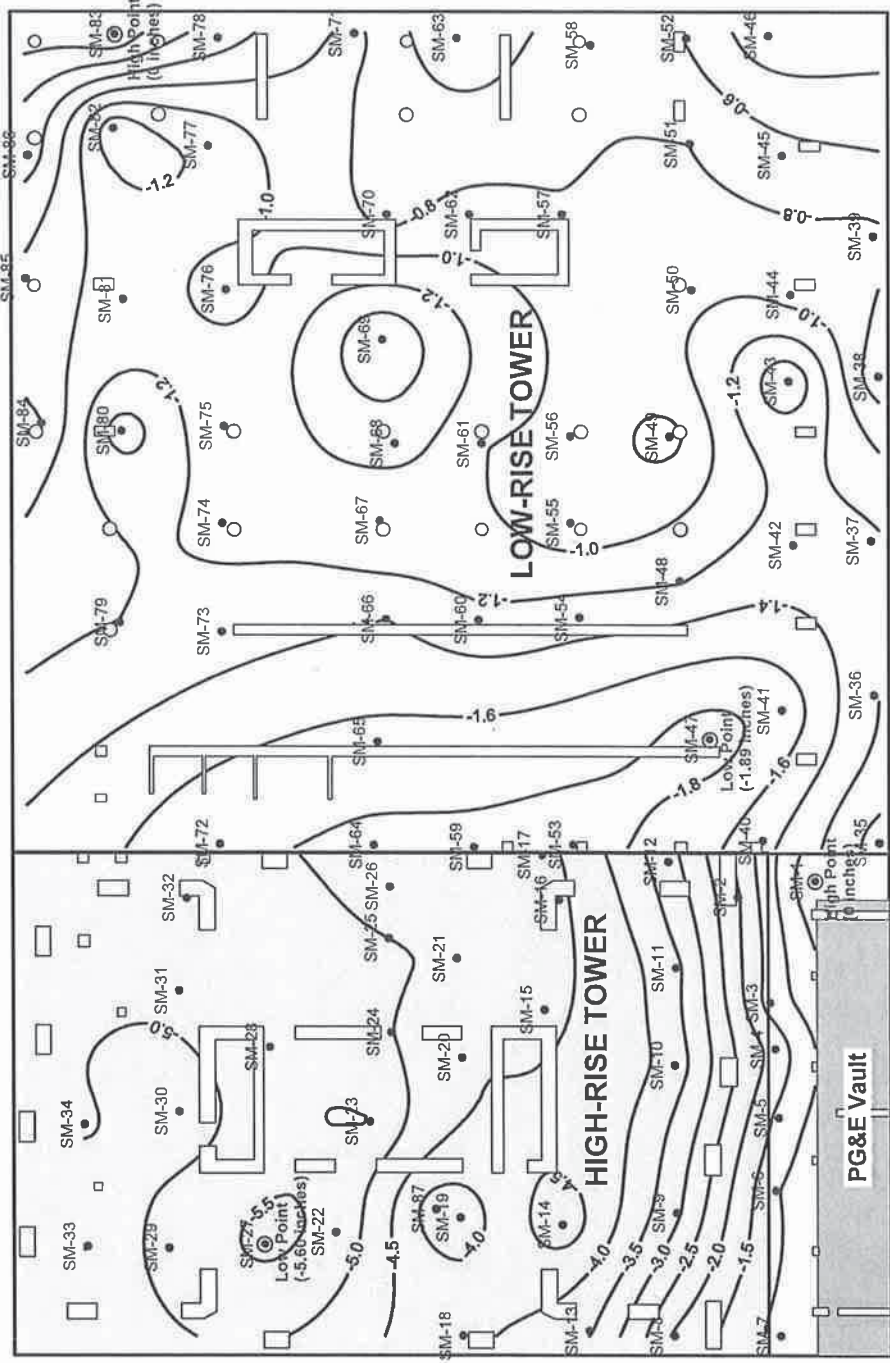
PLATE 1-2

Q:\13224214 Internal Project Data\4-05 Reports & Normal\005 Memo Question to 301 Mission\Plate\Plate 1-2 Tower Settlements vs Log Time with Arup Survey.grf

Mission Street

Beale Street

Fremont Street



High-Rise Tower ← Mid-Rise Parking Structure → Transbay Terminal

Date of Survey Reading:
November 5, 2009

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	High-Rise Tower	Low-Rise Tower
High-Rise Tower	0.467 feet (5.60 inches)	0.157 feet (1.89 inches)



Approximate Scale: 1" = 25'

Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on November 5, 2009.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

**DIFFERENTIAL FLOOR ELEVATION (INCHES)
 FROM SURVEYED SETTLEMENT MARKERS
 FOR THE 301 MISSION BUILDINGS**

Transbay Transit Center
 301 Mission Performance
 Transbay Joint Powers Authority
 San Francisco, California

January 2010



From: Brian Dykes <bdykes@transbaycenter.org>
Sent: Monday, March 15, 2010 10:59 AM
To: Sean Jeffries; Steven Hood; rgolesorkhi@treadwellrollo.com; derrick.roorda@de-simone.com
Cc: Robert Beck; Andrew W. Schwartz; Sheryl Bregman
Subject: Results of Settlement Surveys at 301 Mission Street
Attachments: 2010-03-12_Memo_301 Mission Settlement Results.pdf

CONFIDENTIAL INFORMATION

In accordance with the easement agreement between Millennium Partners and the TJPA, attached are the results of the settlement surveys at 301 Mission Street as recorded from April 2009 to March 1st 2010. This information is not for public release.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://temporaryterminal.org/webcam>

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To	Brian Dykes (TJPA)	Reference number
		132242/dk
cc	Robert Beck (TJPA) Gerry McClelland (PMPC), Randy Volenec (PCPA) George Metzger (AAI)	File reference
From	Deme Koutsoftas Nick O'Riordan	Date
		March 12, 2010
Subject	Transbay Transit Center: Results of Settlement Surveys at the 301 Mission Property	

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority (TJPA) through Pelli Clark Pelli Architects (PCPA), Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center (TTC) prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009 in anticipation of construction commencing in 2010 on the east end of the TTC.

Progress results of the monitoring program were presented in a memorandum dated October 15, 2009, which described the instrumentation, the scope of the monitoring program and results measured up to September 1, 2009. This memorandum updates the results of the monitoring program to include the measurements made between September 1, 2009 and March 1, 2010.

1. Plate 1 summarizes the results of the latest survey conducted on March 1, 2010 as floor elevations at the first basement level under the Tower and the Podium structures. Comparison of the high and low points under the high-rise Tower indicate a maximum differential settlement of 5.8 inches; and under the Podium of approximately 2 inches.
2. Plate 2 summarizes differential floor elevations based on the latest survey of March 1, 2010, and it is just another way of presenting the data shown on Plate 1.
3. Plate 3 shows contours of incremental settlements determined from the surveys, conducted on April 30, 2009 (baseline) and the latest survey of March 1, 2010. The results indicate an incremental settlement under the Tower of up to 0.76 inches, and under the Podium of 0.2 inches. The middle and east side of the Podium appear to be fairly level.
4. Plates 4 and 5 present plots of settlements versus time from selected monitoring points under the Tower and Podium, respectively. Over the approximately 300-day monitoring period the settlements under the Tower range from 0.25 to 0.76 inches. As reflected in Plate 3, there is an area of differential settlements along the southern portion of the Tower and the portion of the basement below the driveway where differential settlements are developing and appear to be increasing with time.
5. Under the Podium the incremental settlements are very small as reflected by the plot of settlements versus time on Plate 5. The differential settlements appear to be increasing with time between the Podium and the Tower. Near the north end of the interface between the two areas the incremental differential settlement measured over the duration of the monitoring program is approaching 0.5 inches, while at the southern end the incremental differential settlement is on the order of 0.2 inches.

March 12, 2010

Page 2 of 2

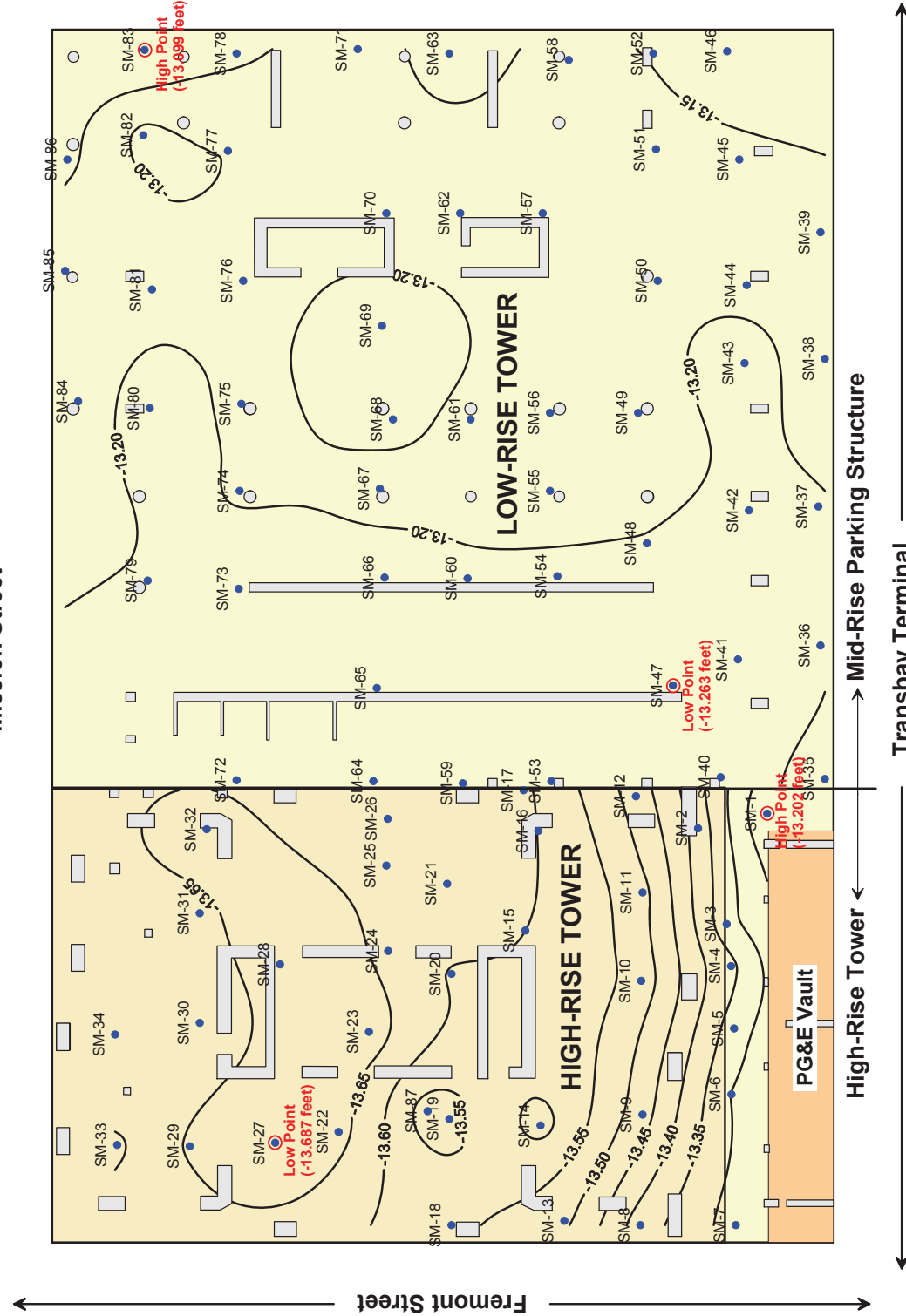
-
6. The results of the current monitoring program have been combined with settlement data provided by Millennium partners, and are presented on a semi-logarithmic plot on Plate 6.
 7. Periodic surveys of settlements will continue on a monthly basis until construction of the Transbay Transit Center begins.

List of Plates

- | | |
|---------|---|
| Plate 1 | Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – March 1, 2010 |
| Plate 2 | Differential Floor Elevation (Inches) – March 1, 2010 Survey |
| Plate 3 | Contours of Settlements Measured at the First Level Basement of the 301 Mission Street Structure Between April 30, 2009 and March 1, 2010 |
| Plate 4 | Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through March 1, 2010. |
| Plate 5 | Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Midrise: April 30, 2009 through March 1, 2010 |
| Plate 6 | Settlements of the 301 Mission Tower Including Monitoring During Construction |

Mission Street

Fremont Street

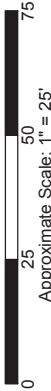


Date of Survey Reading:
March 01, 2010

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

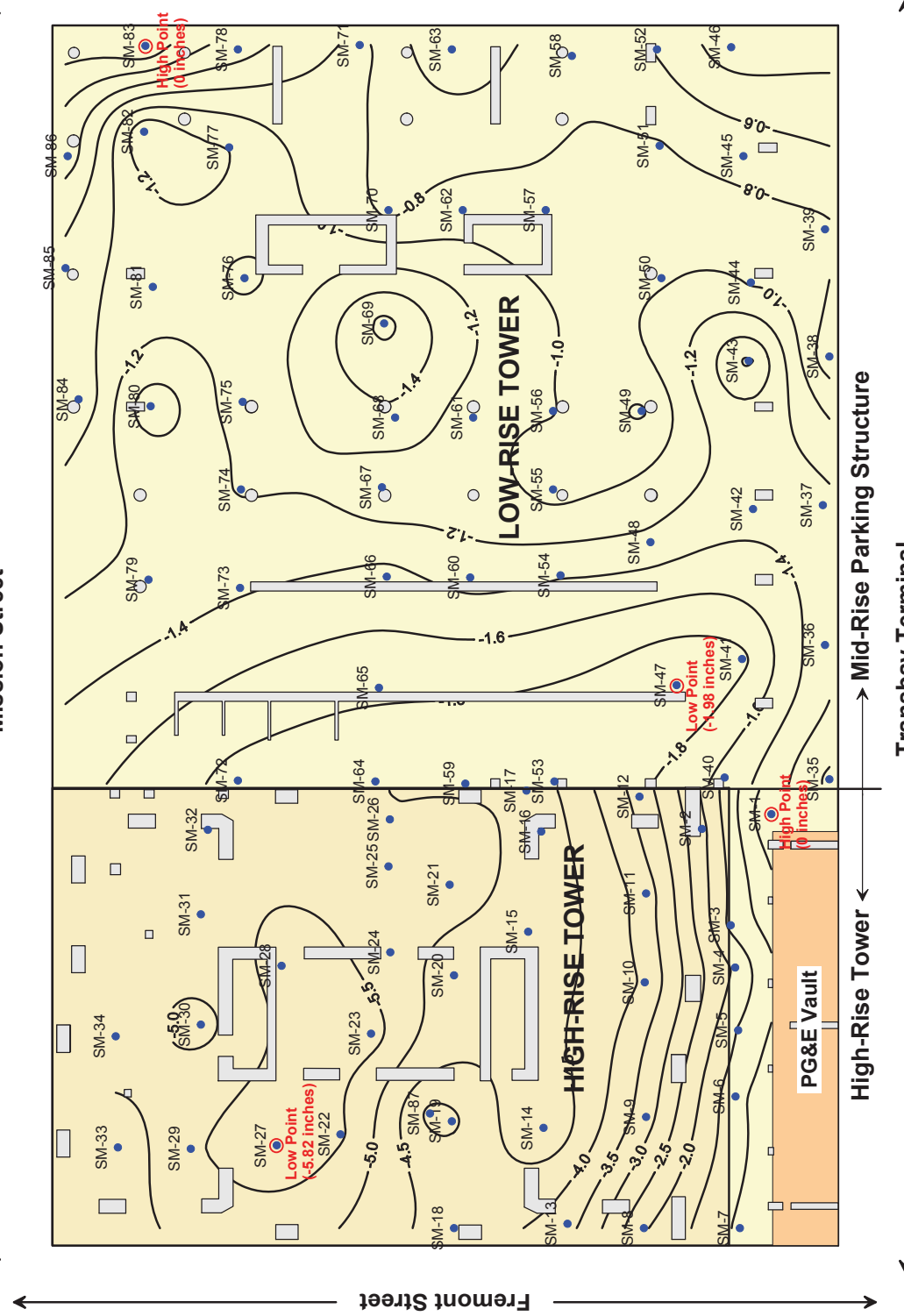
Maximum Differential	
High-Rise Tower	0.485 feet (5.82 inches)
Low-Rise Tower	0.165 feet (1.98 inches)

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on March 1, 2010.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.



Mission Street

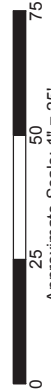
Fremont Street



Date of Survey Reading:
March 1, 2010

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	Low-Rise Tower
0.485 feet (5.82 inches)	0.165 feet (1.98 inches)



Approximate Scale: 1" = 25'

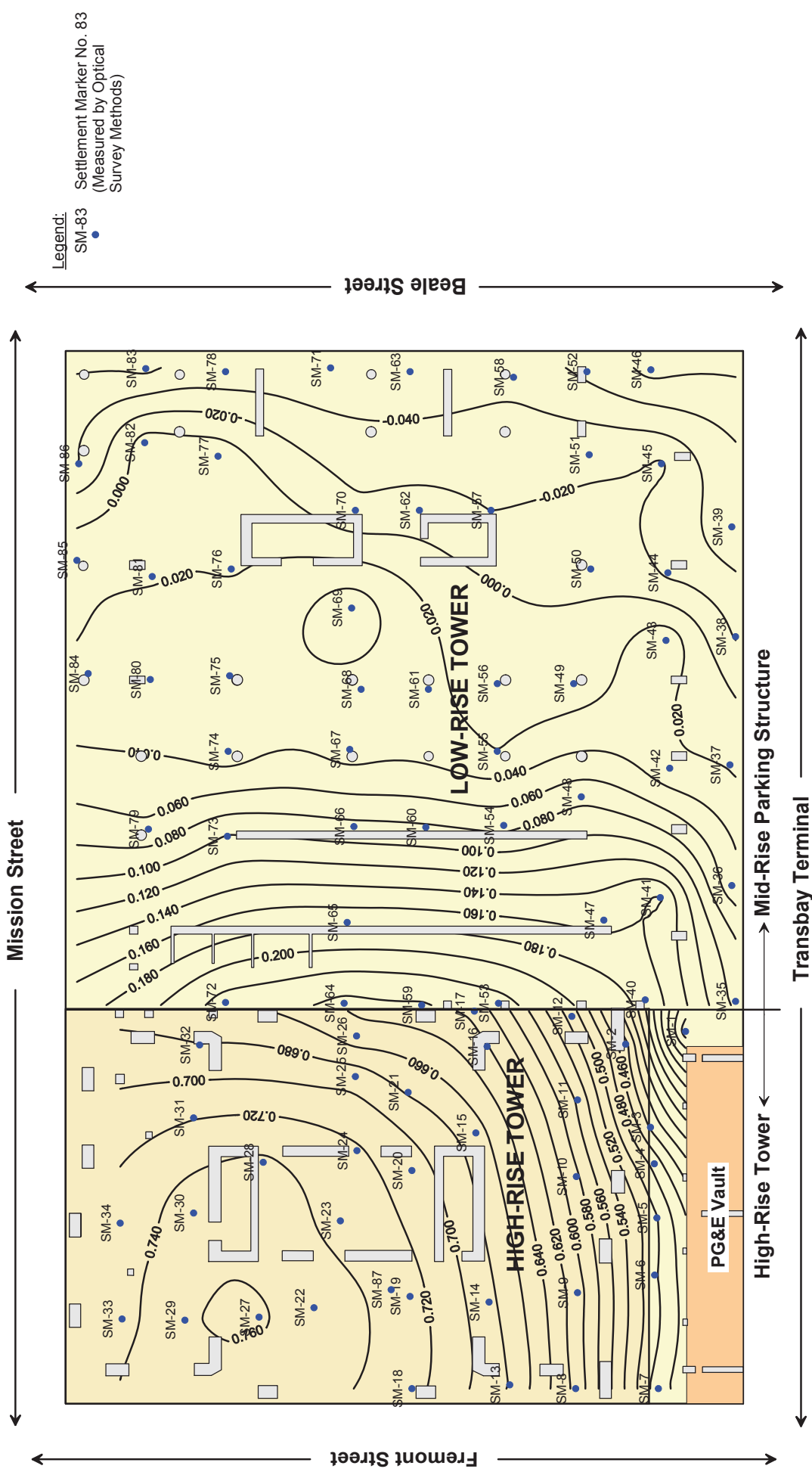
- Notes:
- Contours represent differential elevation, in inches, between the highest point and all other points taken on March 1, 2010. Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 - The PG&E vault is inaccessible for monitoring.
 - Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATION (INCHES)
MARCH 1, 2010 SURVEY
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

March 2010

ARUP

PLATE 2



Legend:

SM-83

●

Settlement Marker No. 83
(Measured by Optical
Survey Methods)

CONTOURS OF SETTLEMENTS MEASURED AT THE
FIRST LEVEL BASEMENT OF THE 301 MISSION STREET
STRUCTURE BETWEEN APRIL 30, 2009 AND MARCH 1, 2010

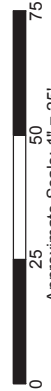
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

March 2010

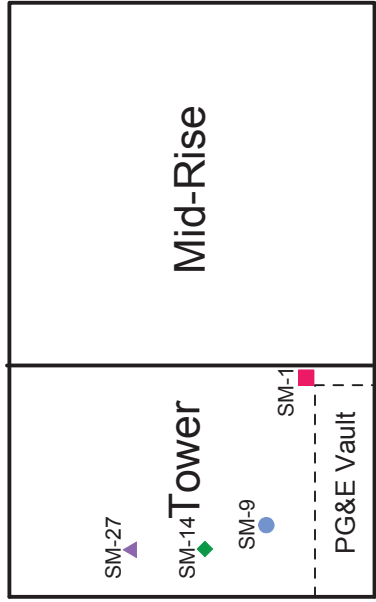
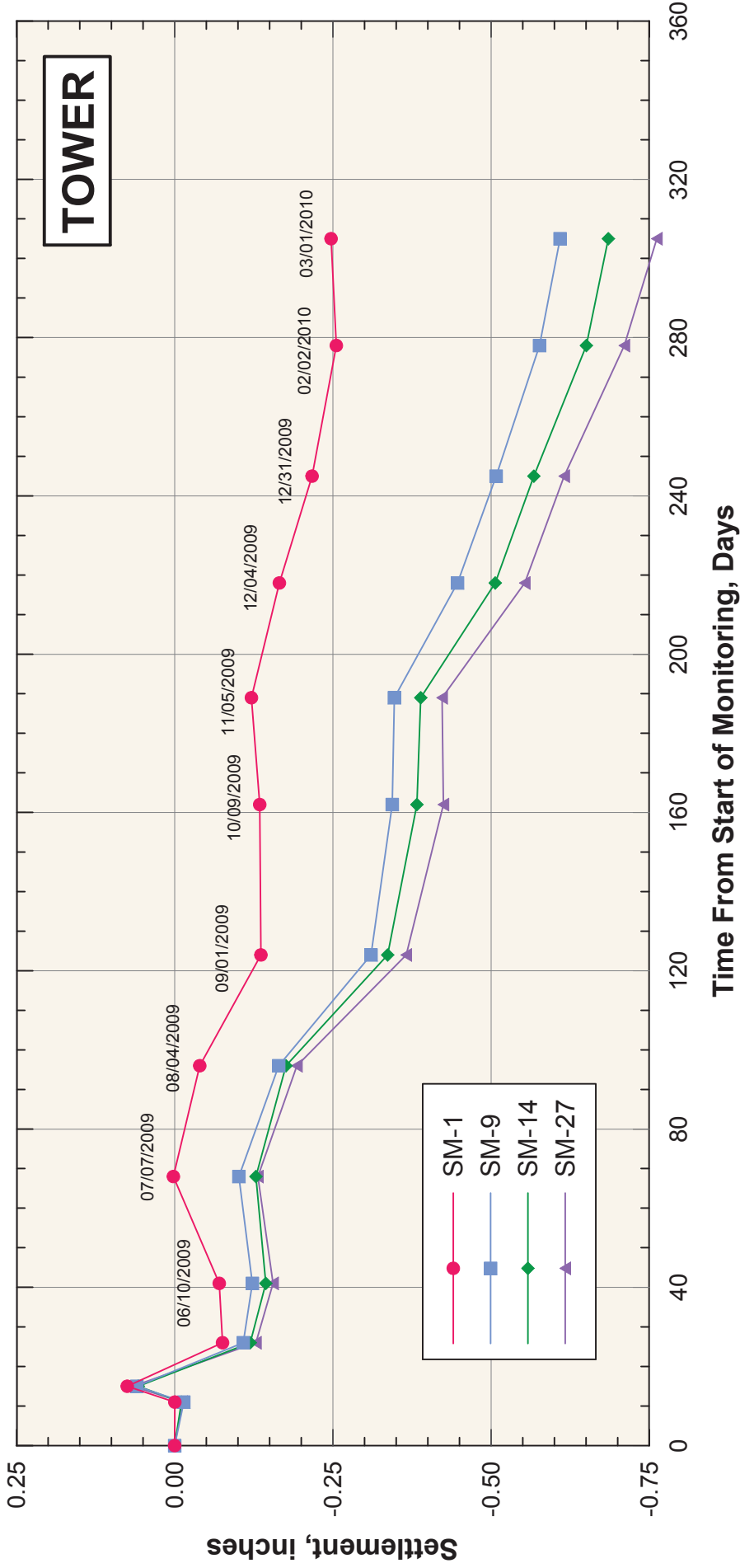
ARUP

PLATE 3

Notes:
Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on March 1, 2010.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.
Negative values of settlement (within Low-rise Tower) indicate uplift.



Approximate Scale: 1" = 25'



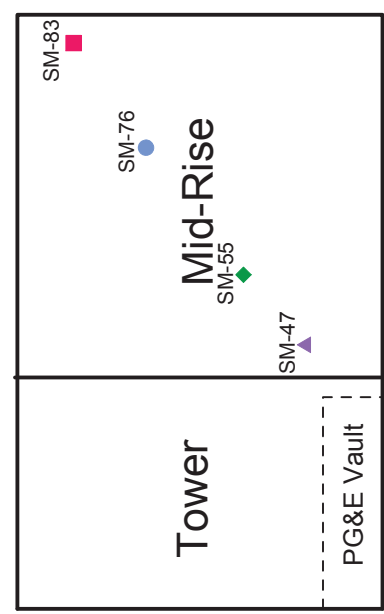
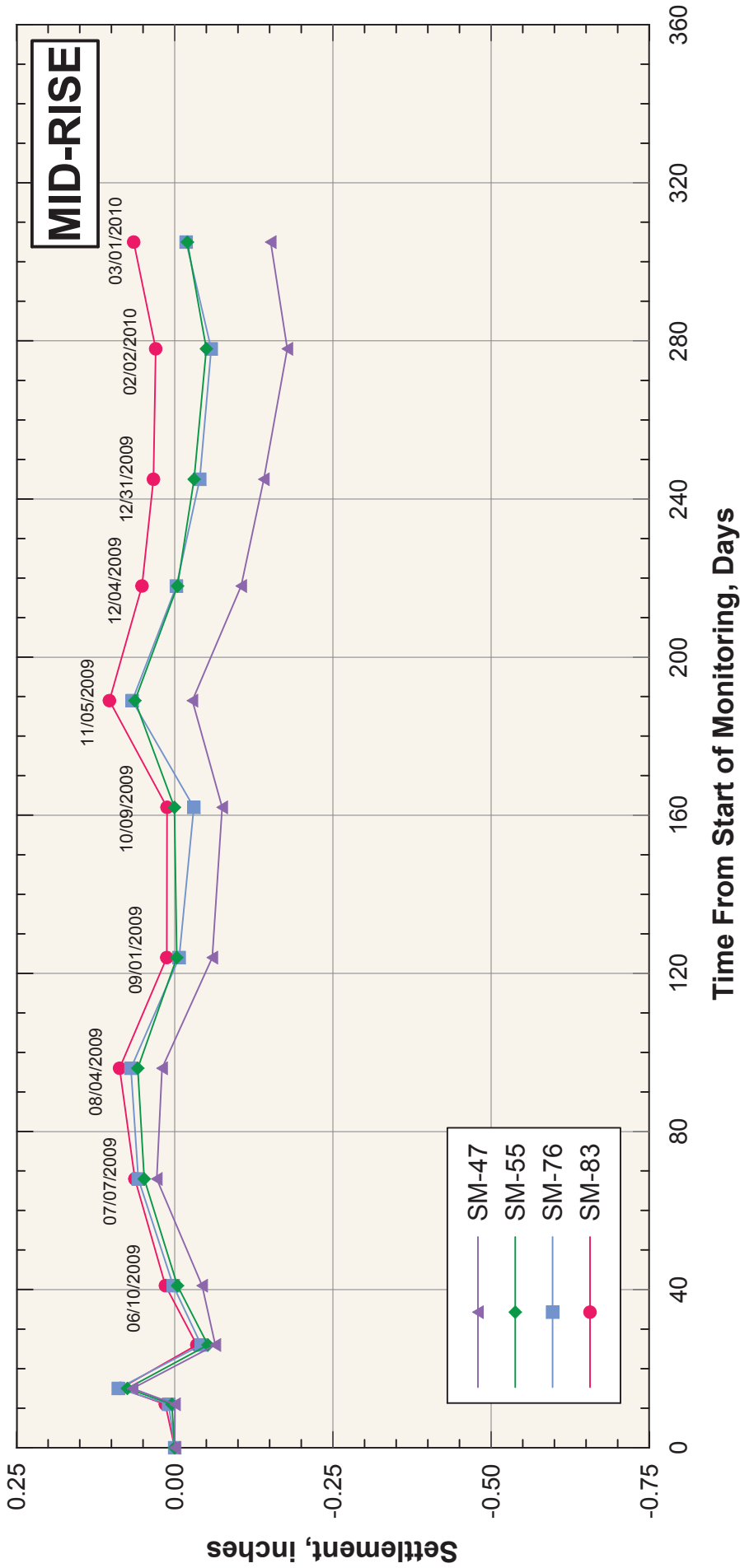
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH MARCH 1, 2010**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

March 2010





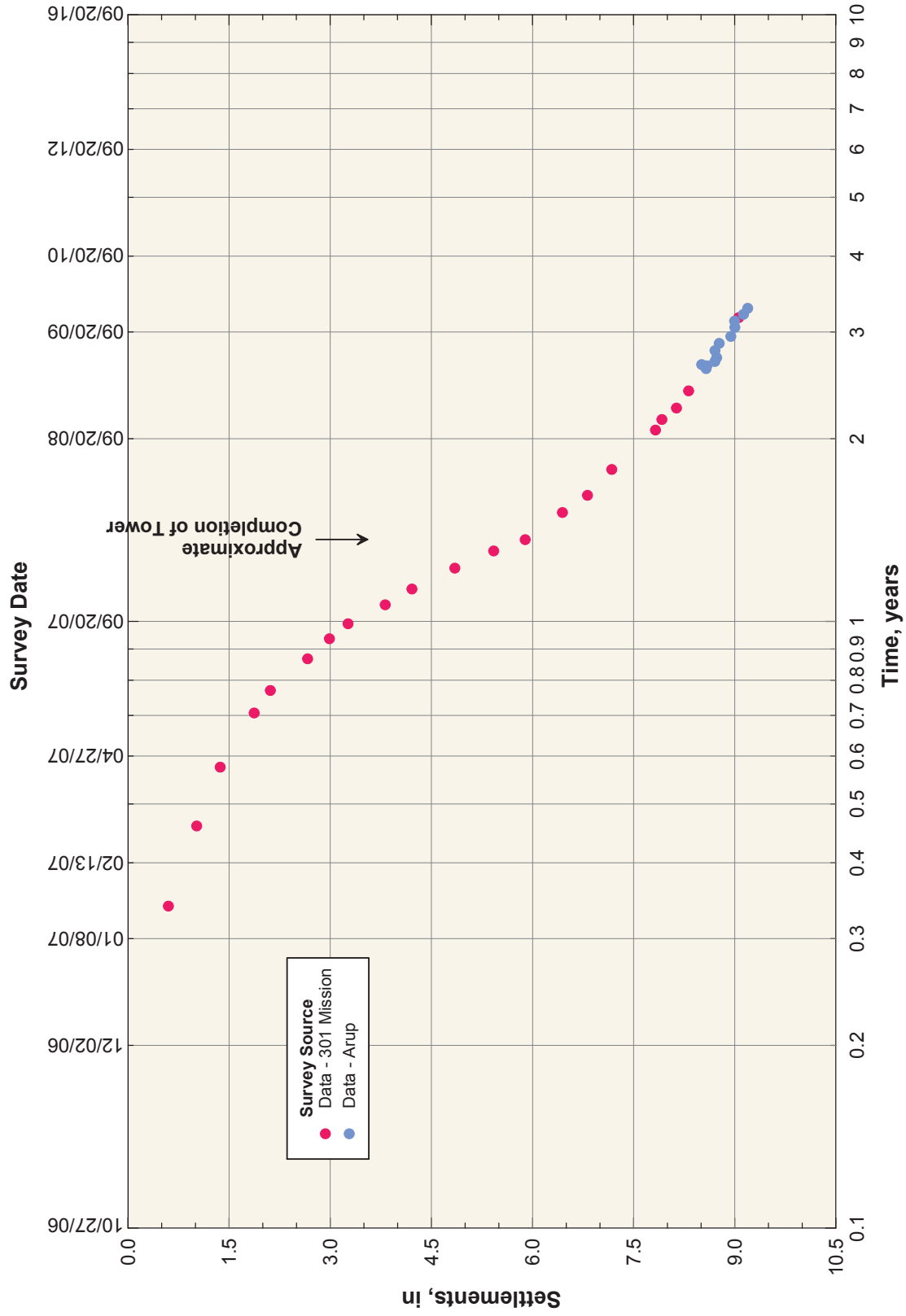
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MIDRISE:
APRIL 30, 2009 THROUGH MARCH 1, 2010**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

March 2010





**SETTLEMENTS OF THE 301 MISSION TOWER
INCLUDING MONITORING DURING CONSTRUCTION**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

March 2010

ARUP

PLATE 6

From: Brian Dykes
Sent: Friday, October 29, 2010 9:41 AM
To: Steven Hood; John Luciano
Subject: FW: Settlement of 301 Mission tower

Steve and John,
As per your request, I am sending you the latest settlement plot.
Brian.

From: Nick O'Riordan [<mailto:nick.oriordan@arup.com>]
Sent: Wednesday, October 20, 2010 9:04 AM
To: Brian Dykes
Cc: DeeDee Maggi; Kevin Clinch
Subject: Settlement of 301 Mission tower

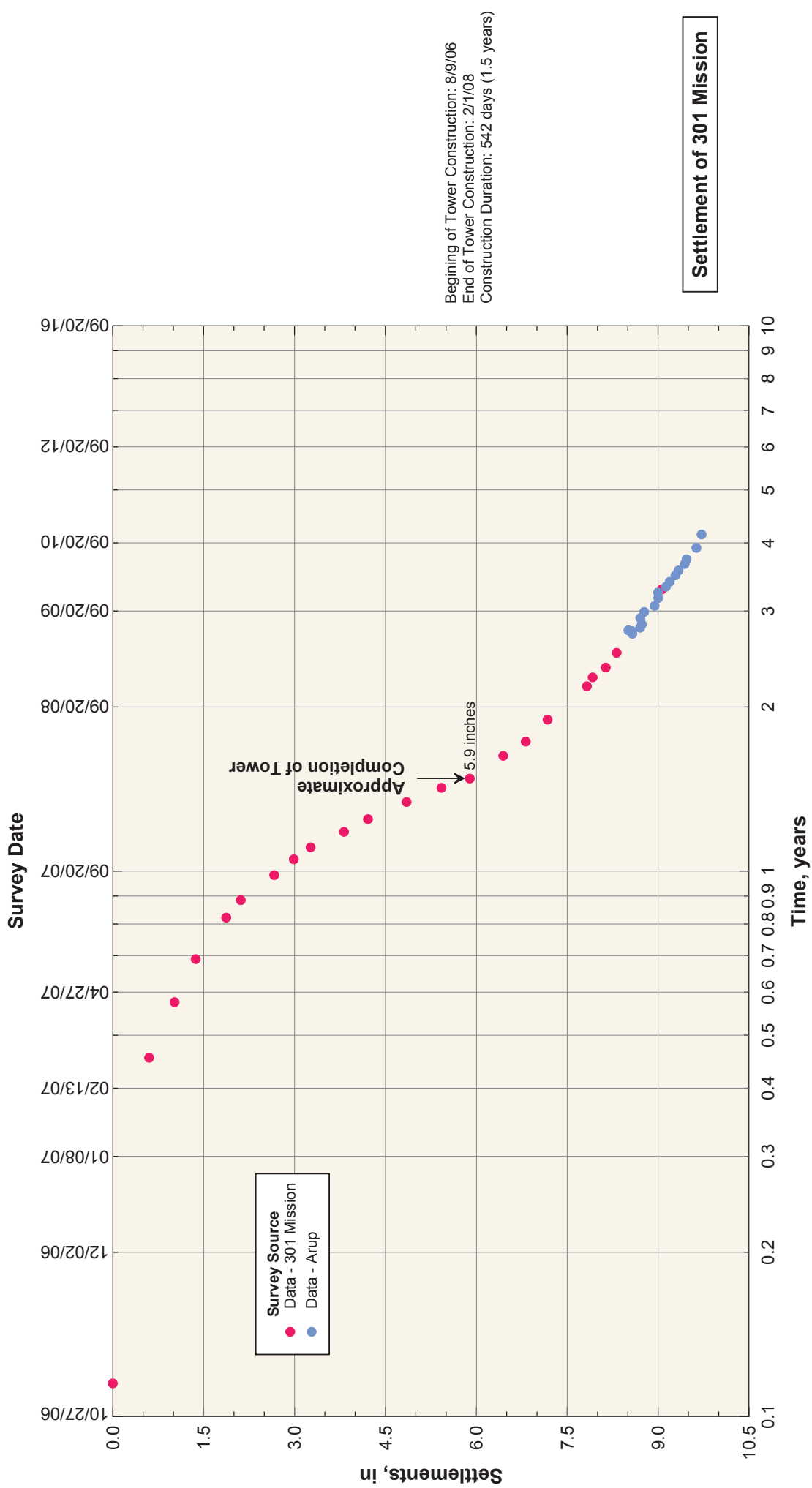
Brian, As discussed yesterday, I attach the current settlement plot. The most recent survey date was 30 September. The trend continues, but with a slight reduction in creep rate over the past 6 months. Regards Nick

Nick O'Riordan
Principal | Leader Geotechnics

Arup
560 Mission Street, 7th Floor, San Francisco, CA 94105, USA
t +1 415 957 9445 d +1 415 963 3886
f +1 415 963 3886 m +1 415 774 6506
www.arup.com

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

From: Brian Dykes
Sent: Friday, January 14, 2011 4:31 PM
To: Steven Hood; John Luciano; Sean Jeffries
Cc: Nick O'Riordan
Subject: December Settlement Monitoring at 301 Mission Street
Attachments: 2011-01-05 Memo_301 Mission Settlement - Dec 2010 Survey.pdf

Categories: Adjacent Properties

Steve,

In response to your request during last month's demolition of the old Transbay Terminal I requested that Arup provide the latest settlement monitoring readings as surveyed during December.

Attached is the Arup memo dated January 5, 2011 with the plots of the survey records taken on December 9, 2010.

These records show that the tower building has continued to settle at the same rate that has been observed for the past 19 months (04/30/09 – 12/09/10).

Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	January 5, 2011
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number	132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference	4-05 112
Subject	Transbay Transit Center: Results of December 2010 Settlement Survey at 301 Mission Property Page 1 of 1		

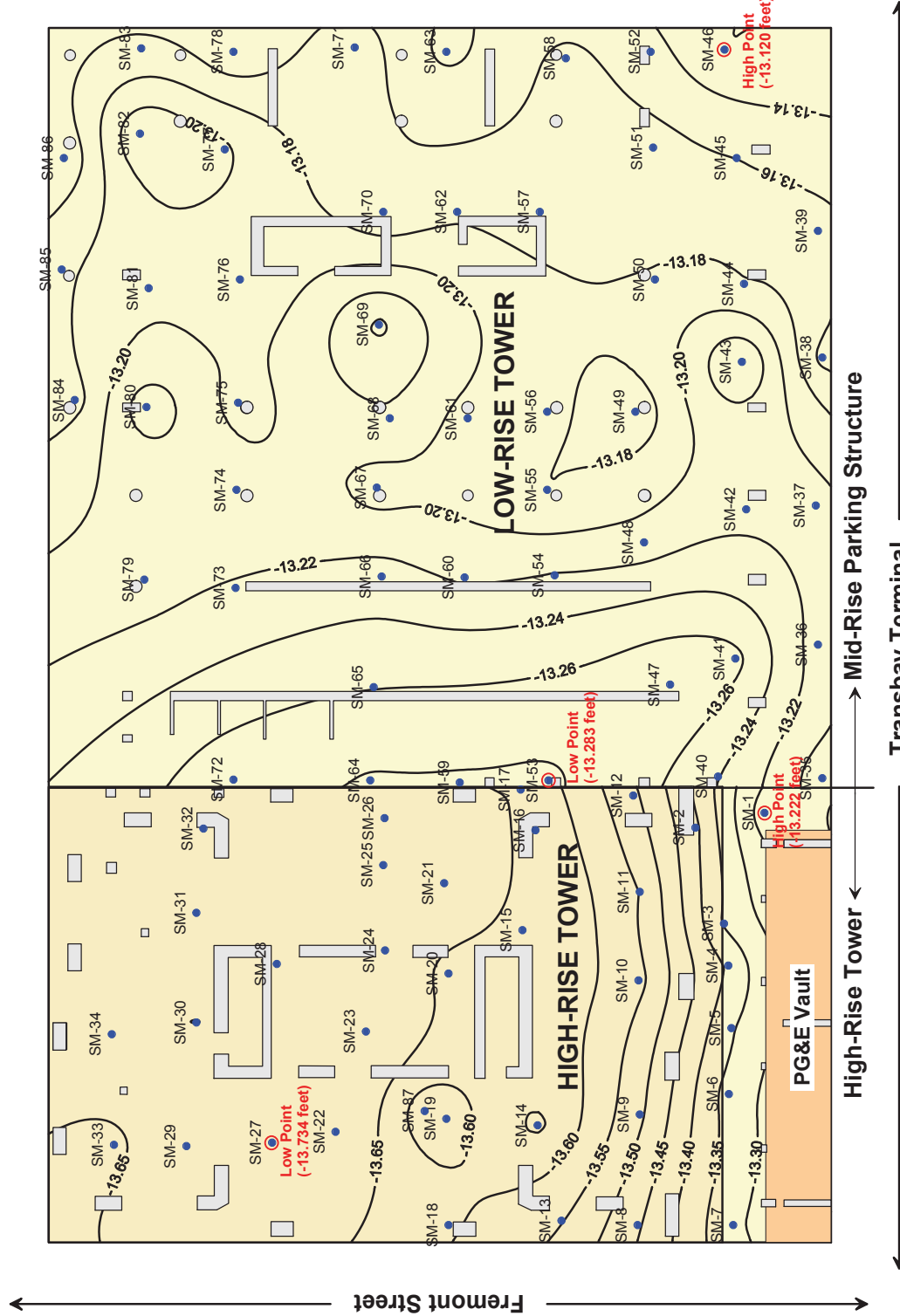
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated March 12, 2010 with measurements made through December 2010.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – December 9, 2010
- Plate 2 Differential Floor Elevation (Inches) – December 9, 2010 Survey
- Plate 3 Contours of Settlements Measured at the First Level Basement of the 301 Mission Street Structure Between April 30, 2009 and December 9, 2010
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through December 9, 2010.
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through December 9, 2010
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction

Mission Street

Fremont Street

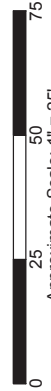


Date of Survey Reading:
December 9, 2010

Legend:

SM-83 Settlement Marker No. 83
(Measured by Optical
Survey Methods)

Maximum Differential	
High-Rise Tower	0.512 feet (6.14 inches)
Low-Rise Tower	0.163 feet (1.96 inches)



Approximate Scale: 1" = 25'

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on December 9, 2010.

Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - DECEMBER 9, 2010

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

January 2011

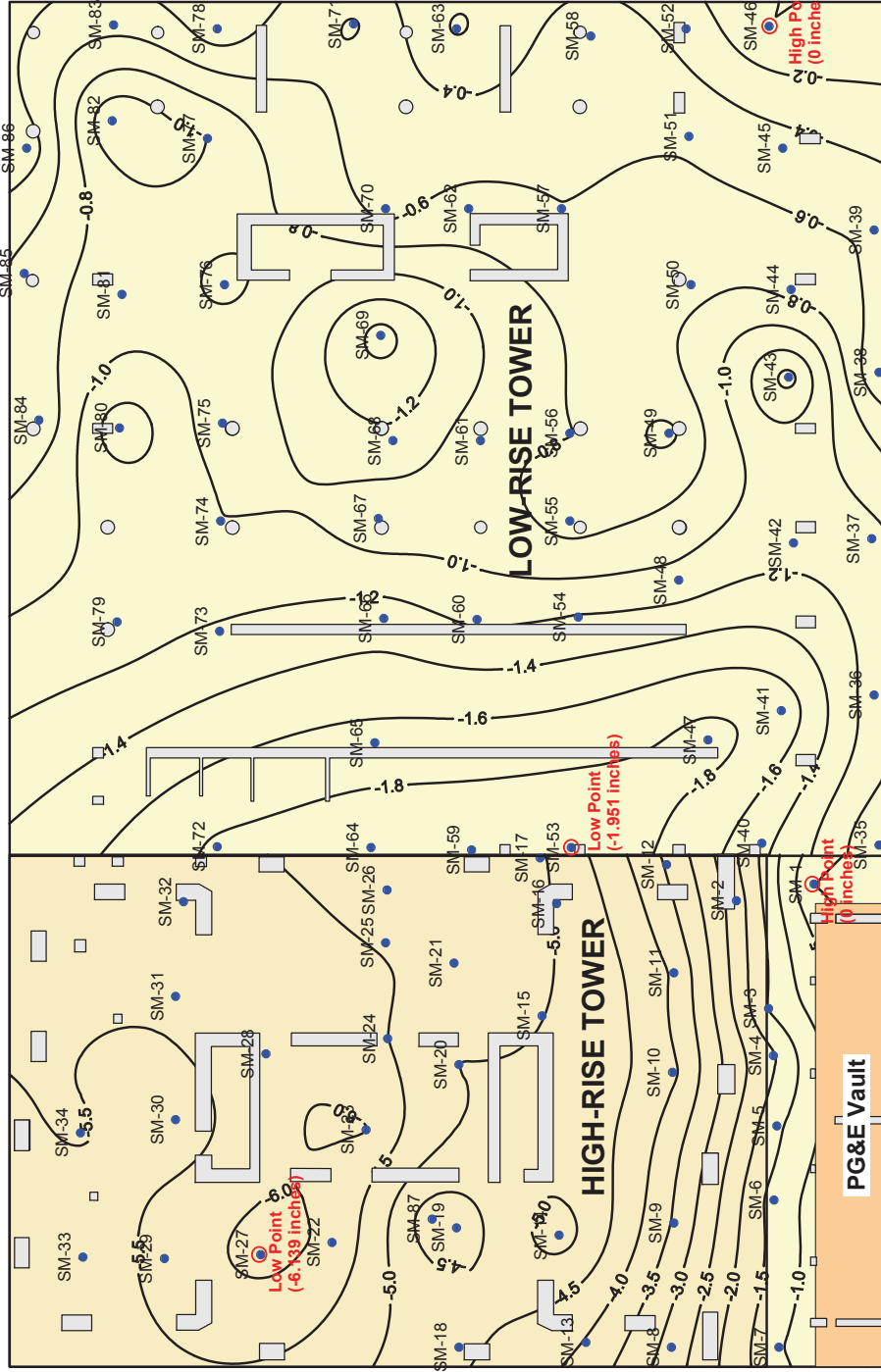


PLATE 1

Mission Street

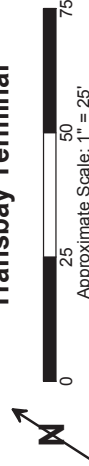
Fremont Street

Beale Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower ← Mid-Rise Parking Structure → Transbay Terminal



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on December 9, 2010.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
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 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 DECEMBER 9, 2010 SURVEY

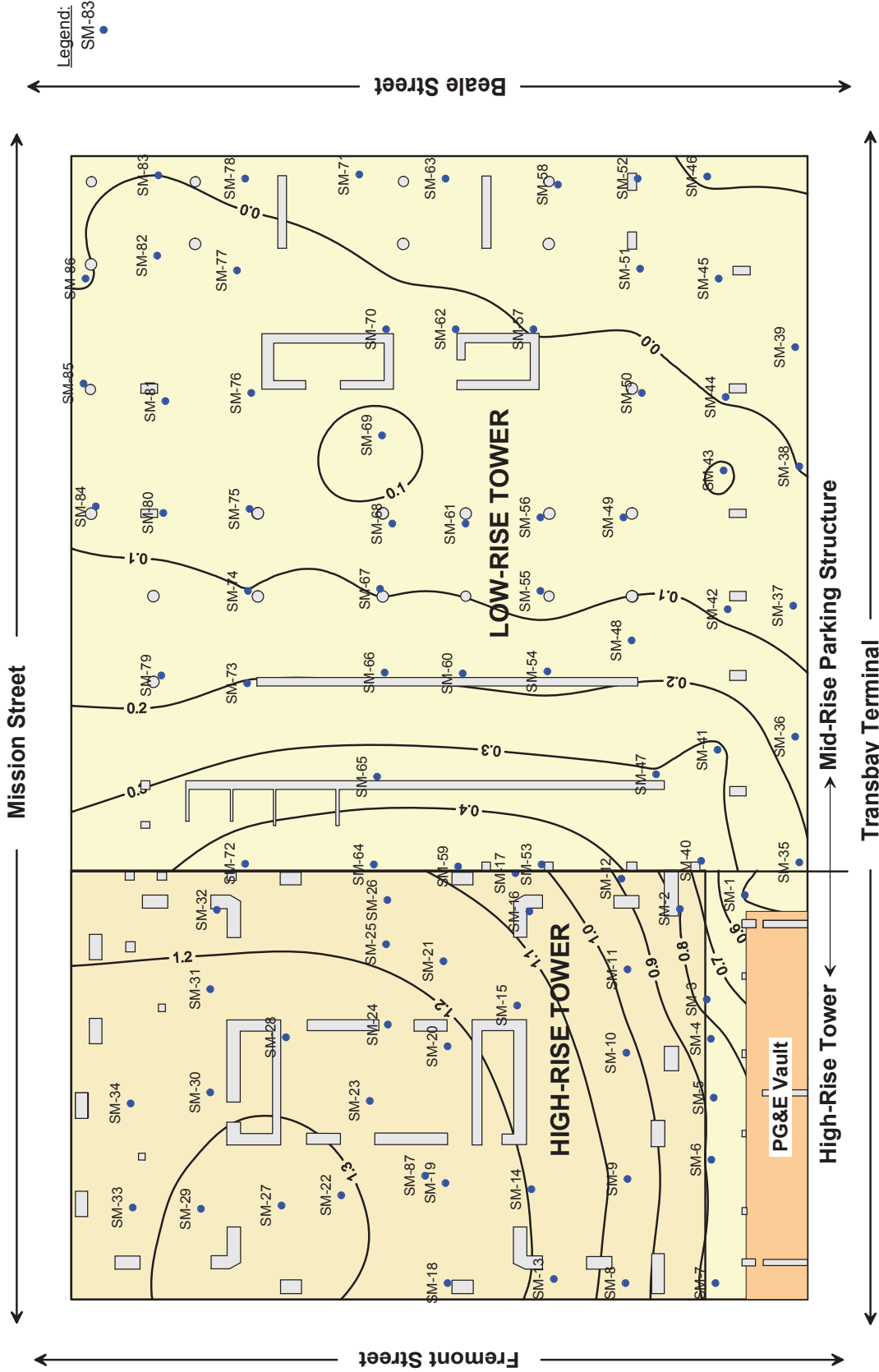
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

January 2011

ARUP

PLATE 2

Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on December 9, 2010.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.

ARUP
 January 2011
 Transbay Joint Powers Authority
 301 Mission Monitoring
 San Francisco, California

CONTOURS OF SETTLEMENTS MEASURED AT THE
 FIRST LEVEL BASEMENT OF THE 301 MISSION STREET
 STRUCTURE BETWEEN APRIL 30, 2009 AND DECEMBER 9, 2010

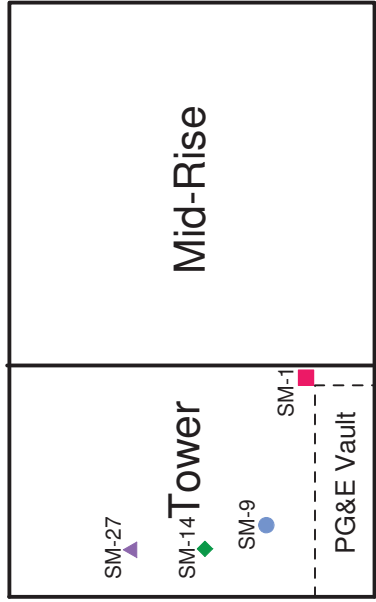
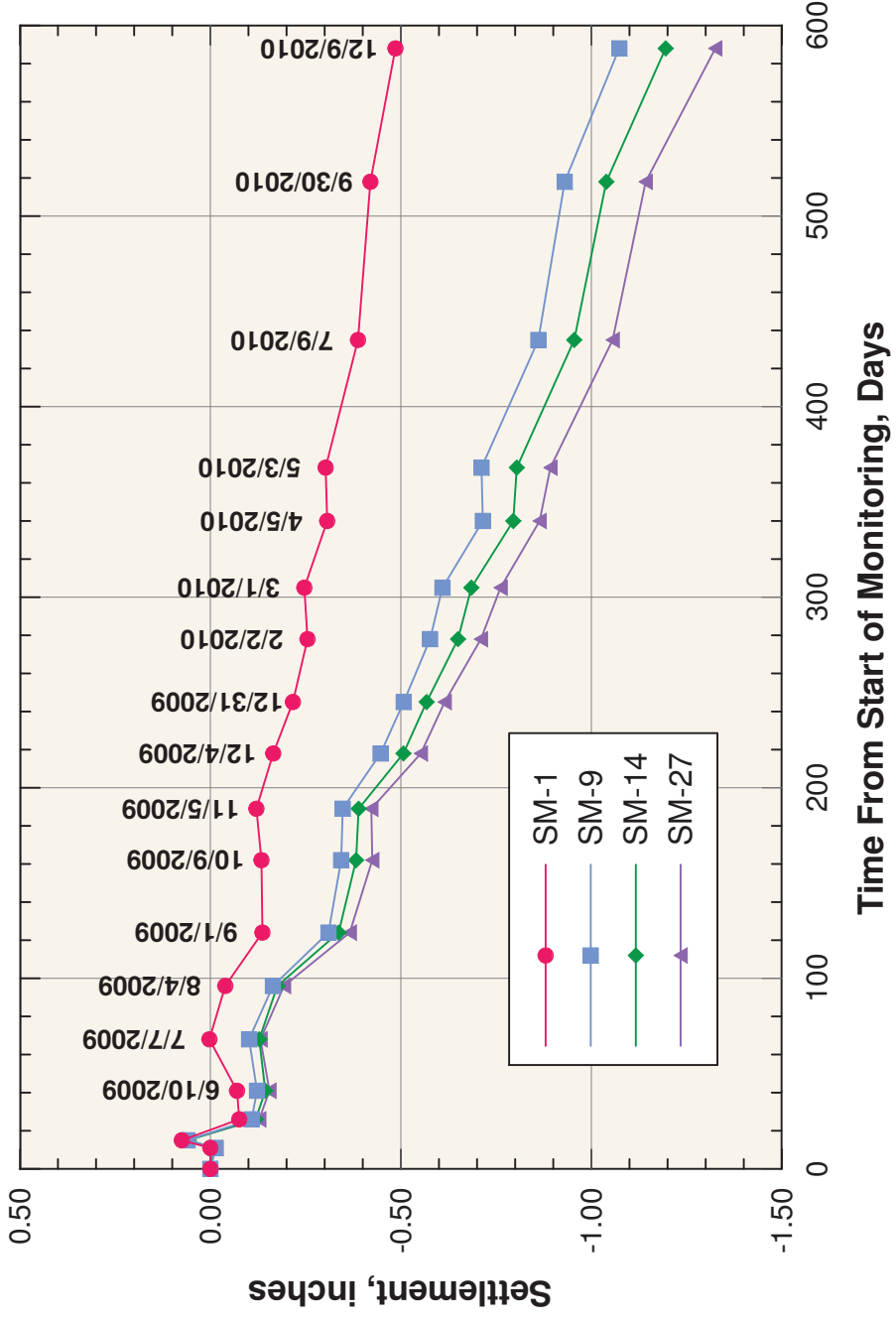
Transbay Transit Center
 301 Mission Monitoring
 San Francisco, California

PLATE 3



Approximate Scale: 1" = 25'

TOWER



Note:
Initial (Baseline) reading
taken on 04/30/09

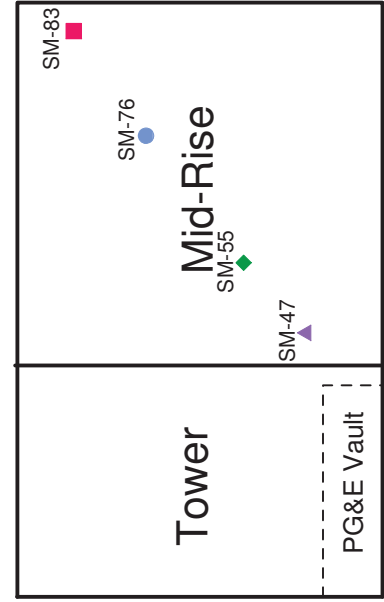
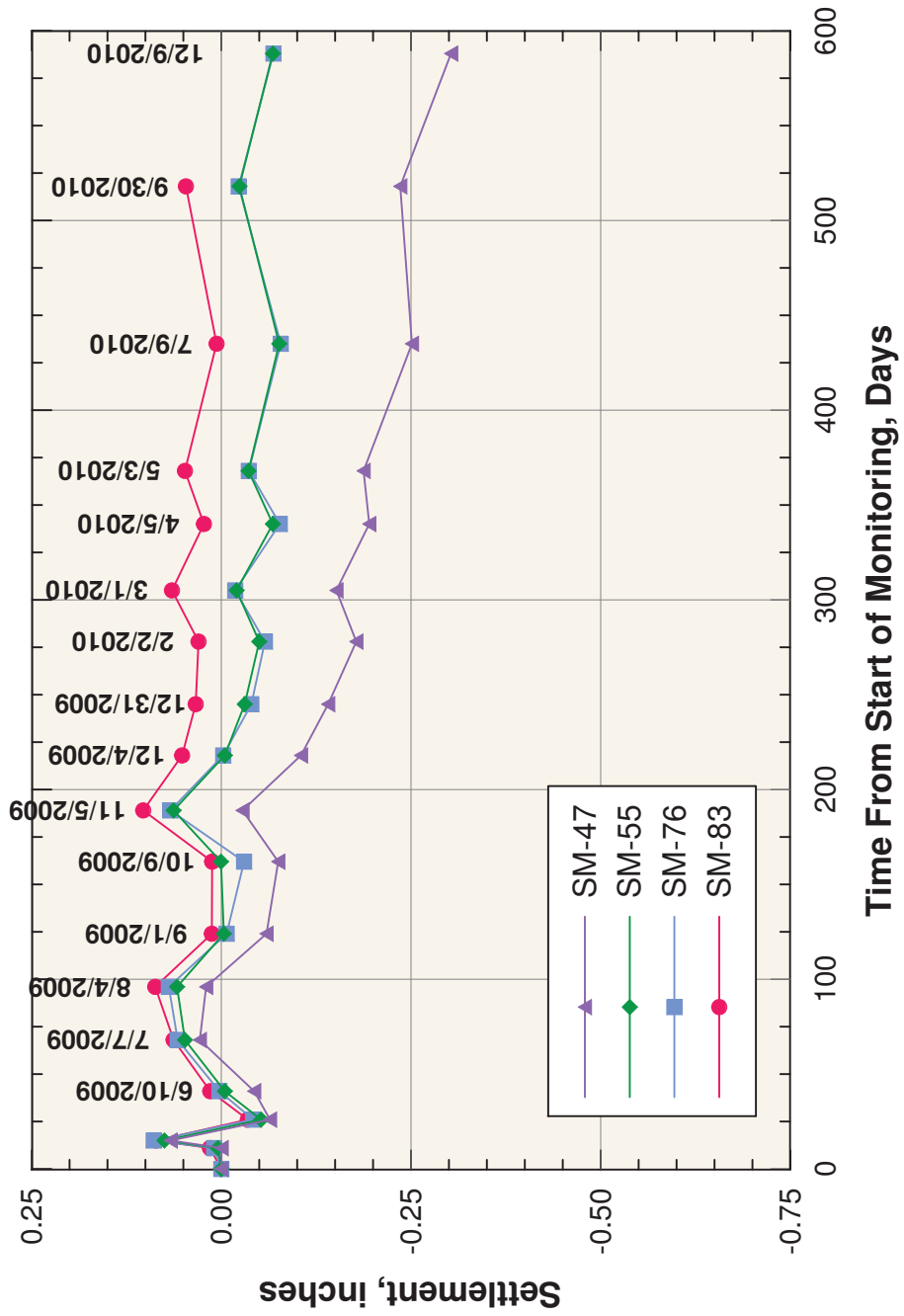
**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH DECEMBER 9, 2010**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

January 2011



MID-RISE



Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH DECEMBER 9, 2010**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California



From: Brian Dykes
Sent: Monday, February 28, 2011 2:57 PM
To: Steven Hood; John Luciano
Cc: Rebecca Armenta
Subject: 301 Mission Street Settlement Readings February 2011
Attachments: 2011-02-24 Memo_301 Mission Settlement - Feb 2011 Survey.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Adjacent Properties

Steven,
Here are the latest plots of the settlement readings as recorded on February 4, 2011.
Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date February 24, 2011
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference 4-05 117
Subject	Transbay Transit Center: Results of February 2011 Settlement Survey at 301 Mission Property	Page 1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated January 5, 2011 with measurements made through February 2010.

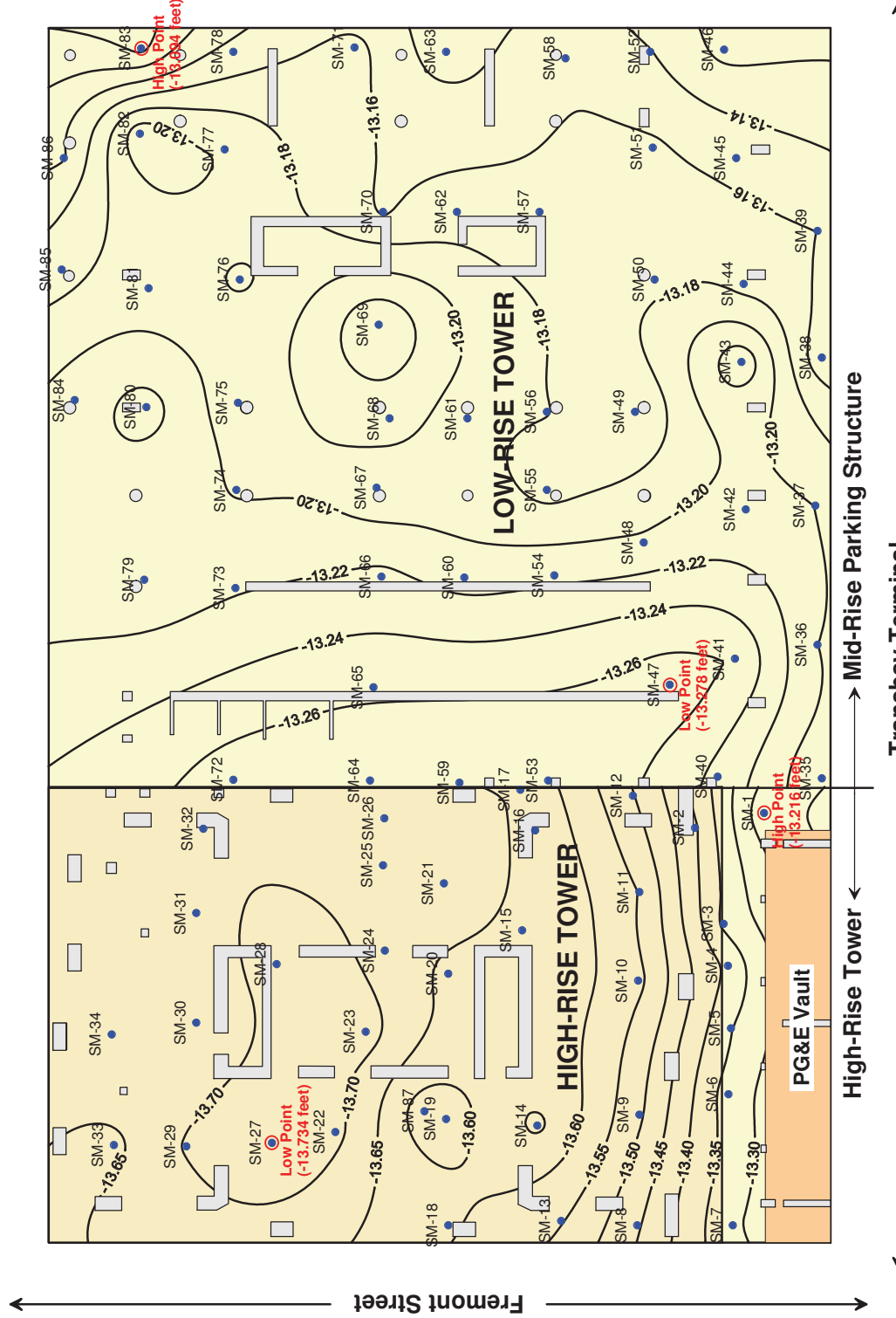
List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – February 4, 2010
- Plate 2 Differential Floor Elevation (Inches) – February 4, 2010 Survey
- Plate 3 Contours of Settlements Measured at the First Level Basement of the 301 Mission Street Structure Between April 30, 2009 and February 4, 2010
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through February 4, 2010.
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through February 4, 2010
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction

Note Typo: references to "2010" on this page should read "2011"

Mission Street

Fremont Street

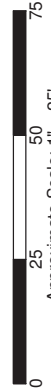


Date of Survey Reading:
February 4, 2011

Legend:

SM-83 Settlement Marker No. 83
(Measured by Optical
Survey Methods)

Maximum Differential	
High-Rise Tower	0.518 feet (6.22 inches)
Low-Rise Tower	0.184 feet (2.21 inches)



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on February 4, 2011.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - FEBRUARY 2011
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

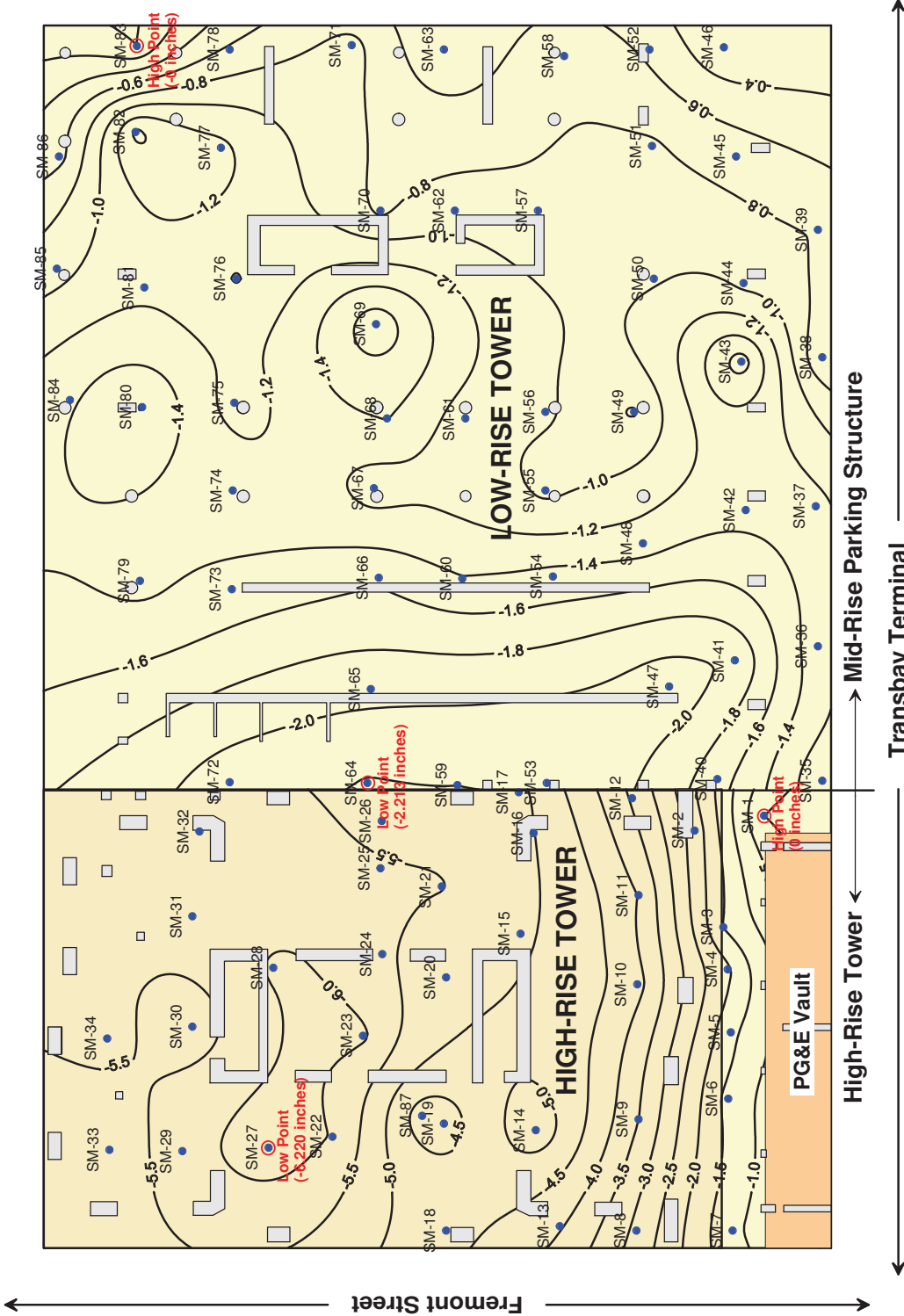
February 2011

ARUP

PLATE 1

Mission Street

Beale Street



Legend:

SM-83

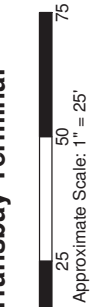
Settlement Marker No. 83
(Measured by Optical
Survey Methods)

High-Rise Tower

Low-Rise Tower

PG&E Vault

Transbay Terminal



Notes:

Contours represent differential elevation, in inches, between the highest point and all other points taken on February 4, 2011.

Level B-1 at Mid-Rise Parking Structure is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

The PG&E vault is inaccessible for monitoring.

Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATION (INCHES)
FEBRUARY 4, 2011 SURVEY

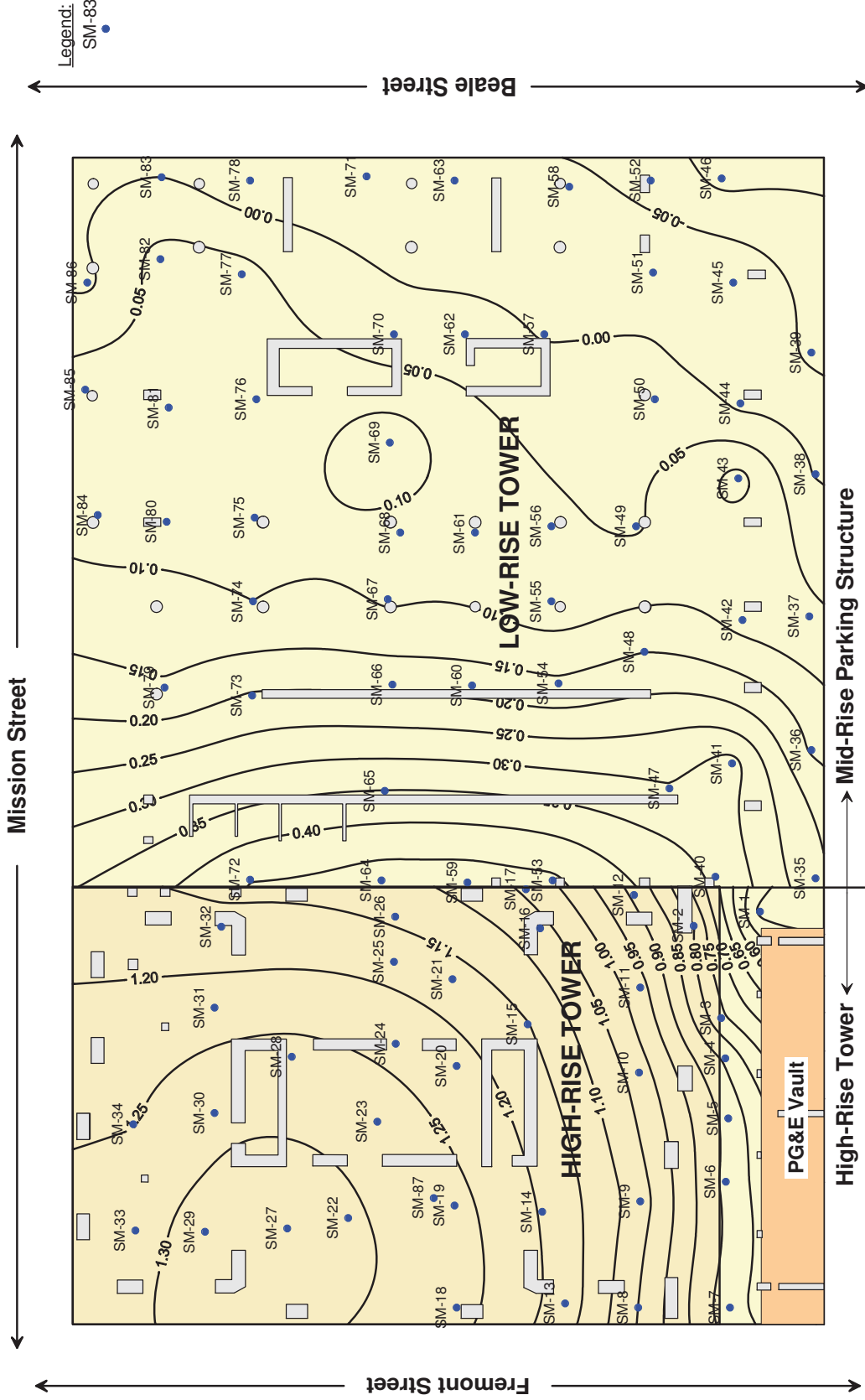
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

February 2011

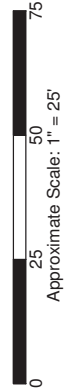
ARUP

PLATE 2

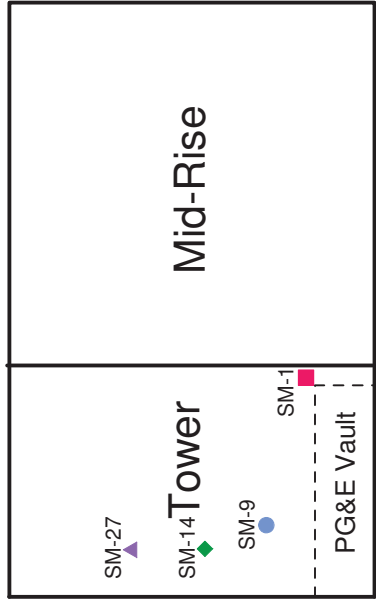
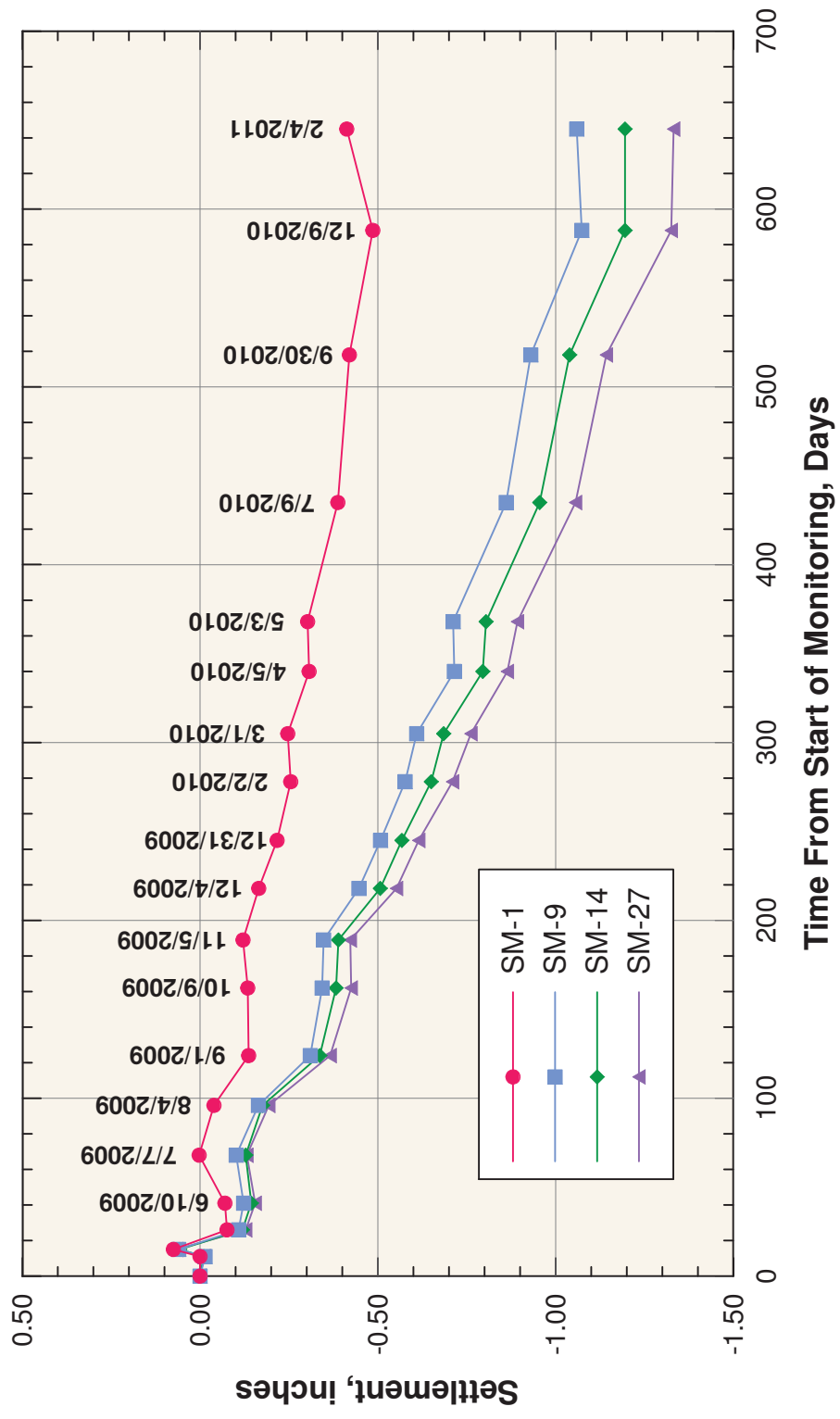
Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on February 4, 2011.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.



TOWER



Note:
Initial (Baseline) reading
taken on 04/30/09

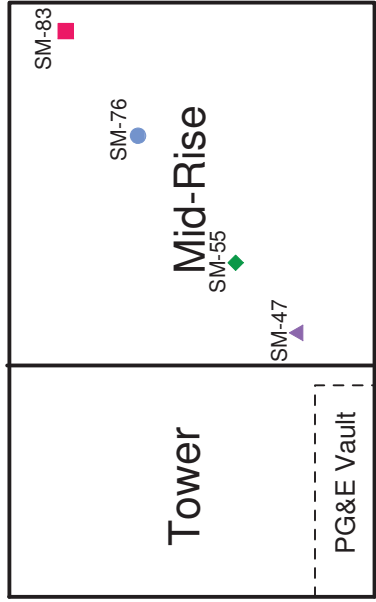
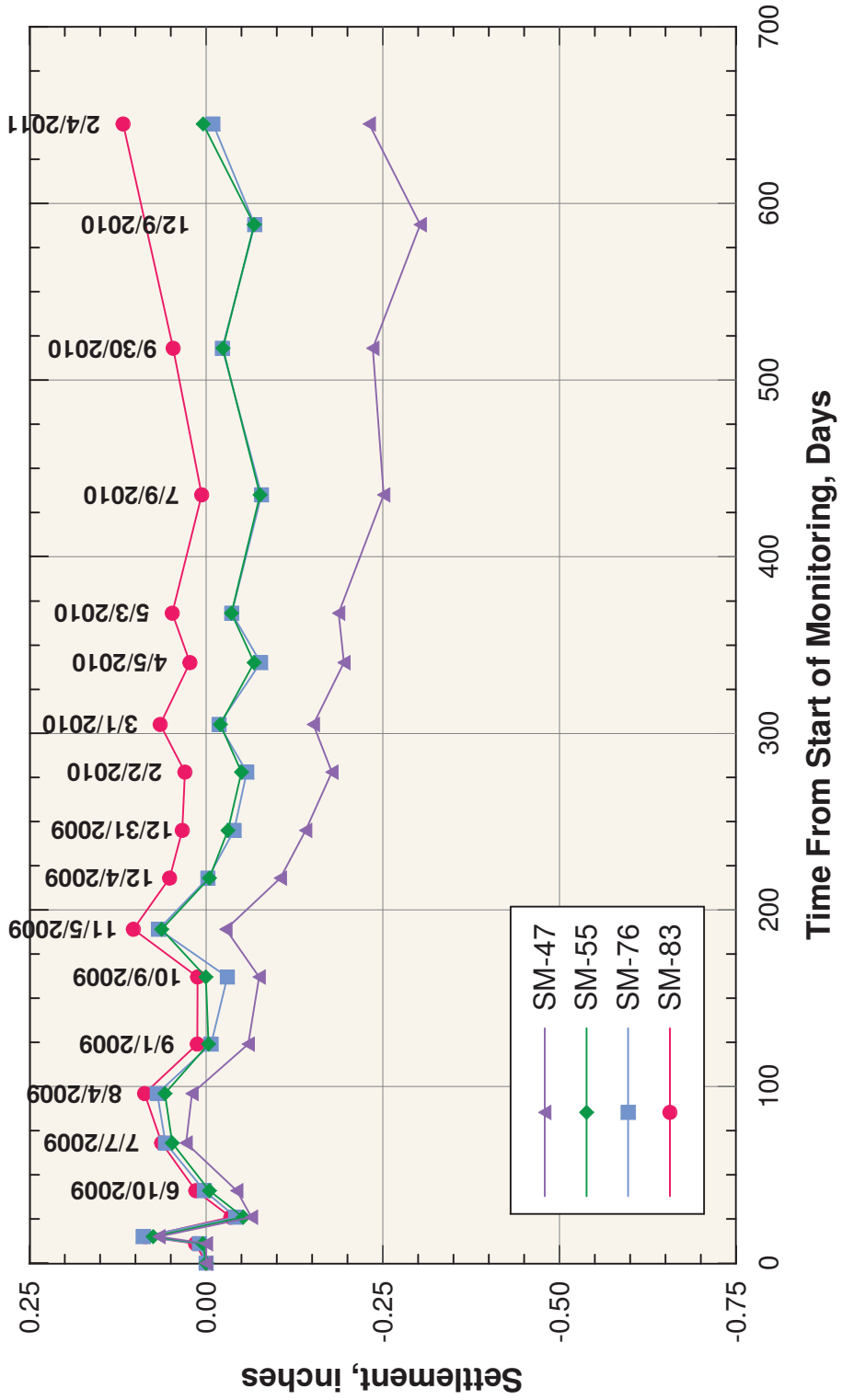
**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH FEBRUARY 4, 2011**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

February 2011



MID-RISE



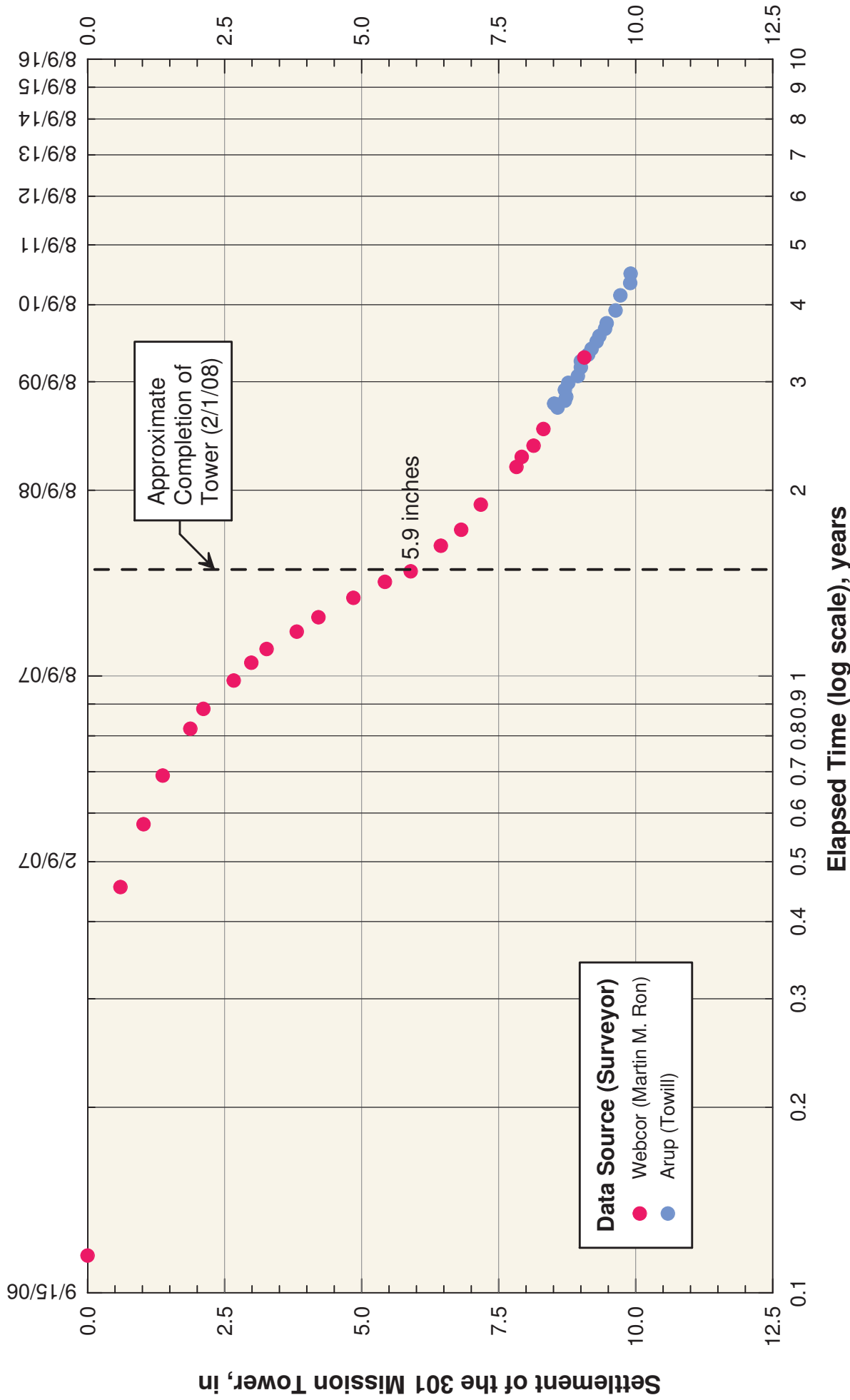
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH FEBRUARY 4, 2011**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

February 2011





Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

February 2011



From: Brian Dykes
Sent: Tuesday, May 03, 2011 7:51 AM
To: Steven Hood
Cc: Rebecca Armenta
Subject: FW: TTC - 301 Mission Settlement - March 2011 Survey
Attachments: 2011-04-12 Memo_301 Mission Settlement - March 2011 Survey.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Adjacent Properties

Steve,
Here are the settlement marker readings taken at the end of March.
Sorry for the delay in sending them to you.
Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Tuesday, April 12, 2011 5:25 PM
To: Brian Dykes
Cc: Robert Beck; Emilio Cruz; 'rvolenec@pcparch.com'; George Metzger; Nick O'Riordan; Kevin Clinch; DeeDee Maggi
Subject: TTC - 301 Mission Settlement - March 2011 Survey

Brian,

Please find the attached pdf which is a revised version of the 301 Mission settlement memo based on our late March settlement marker readings. This survey was originally scheduled for early April but was moved forward so we would have this reading a few days before the pile extraction began.

Let me know if you have any questions.

Cheers,
Stephen

Stephen McLandrich PE
Senior Engineer | Geotechnics Group

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA
t +1 415 957 9445 d +1 415 946 0245
f +1 415 957 9096
www.arup.com

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date April 12, 2011
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference 4-05 124
Subject	Transbay Transit Center: Results of March 2011 Settlement Survey at 301 Mission Property	Page 1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated January 5, 2011 with measurements made through March 2010.

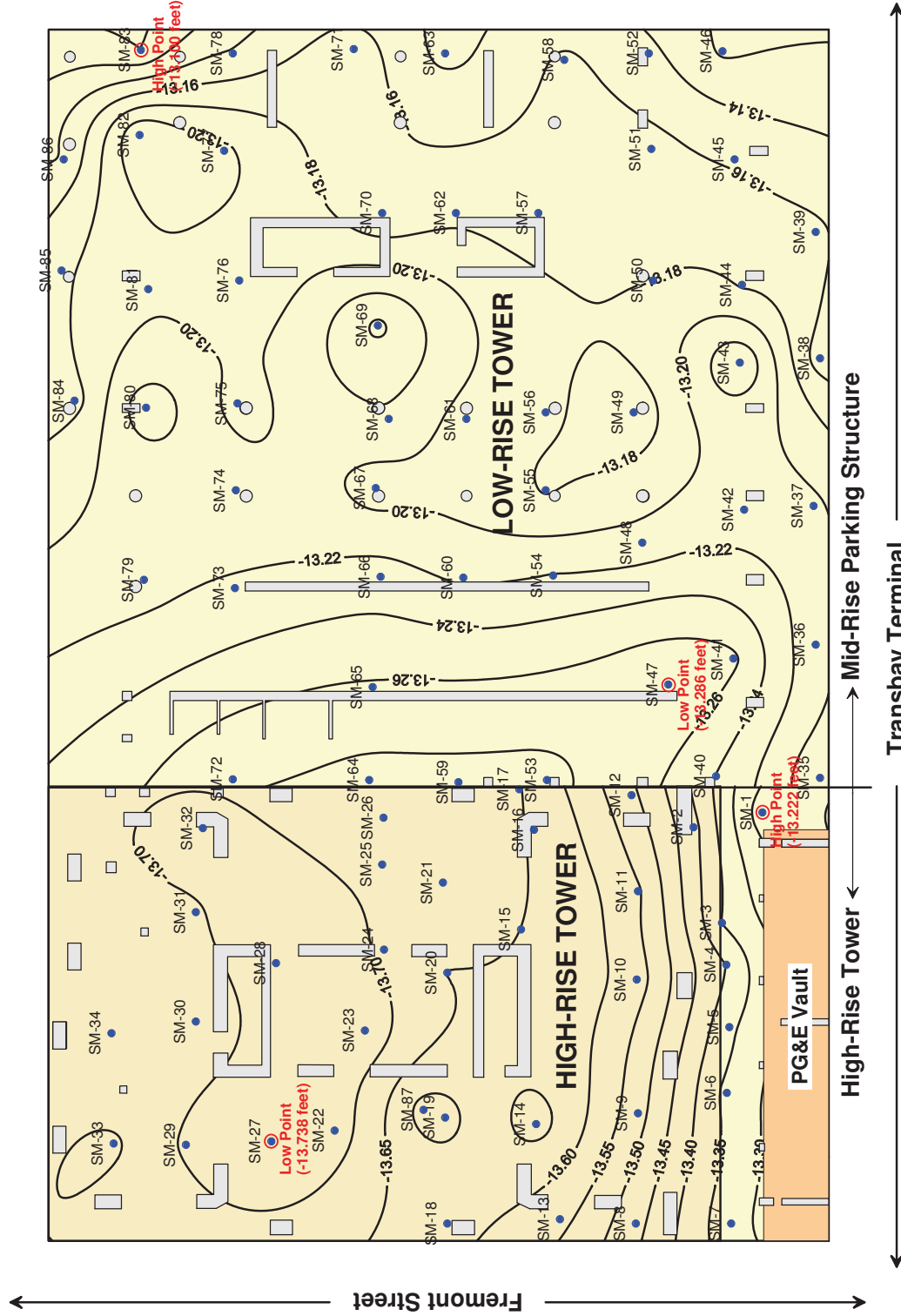
List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – March 24, 2010
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- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction

Note Typo: References to "2010" on this page should read "2011"

Mission Street

Fremont Street

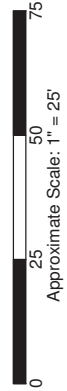


Date of Survey Reading:
March 24, 2011

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical
Survey Methods)

Maximum Differential	
High-Rise Tower	0.515 feet (6.185 inches)
Low-Rise Tower	0.186 feet (2.228 inches)

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on March 24, 2011.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.



FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - MARCH 24, 2011
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

April 2011
ARUP
PLATE 1

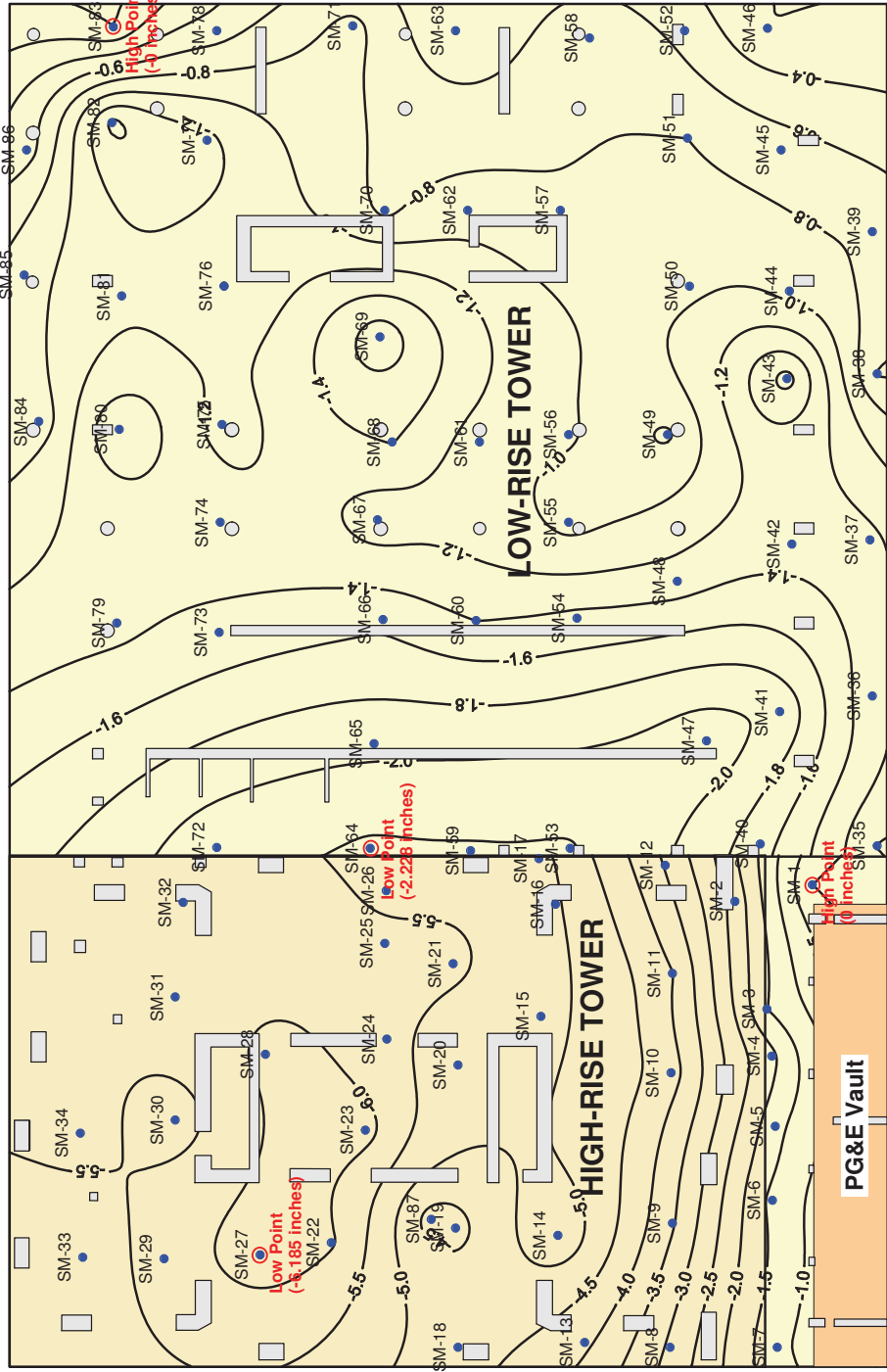
Mission Street

Fremont Street

Legend:

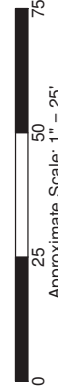
SM-83
Settlement Marker No. 83
(Measured by Optical
Survey Methods)

Beale Street



High-Rise Tower ← Mid-Rise Parking Structure

Transbay Terminal



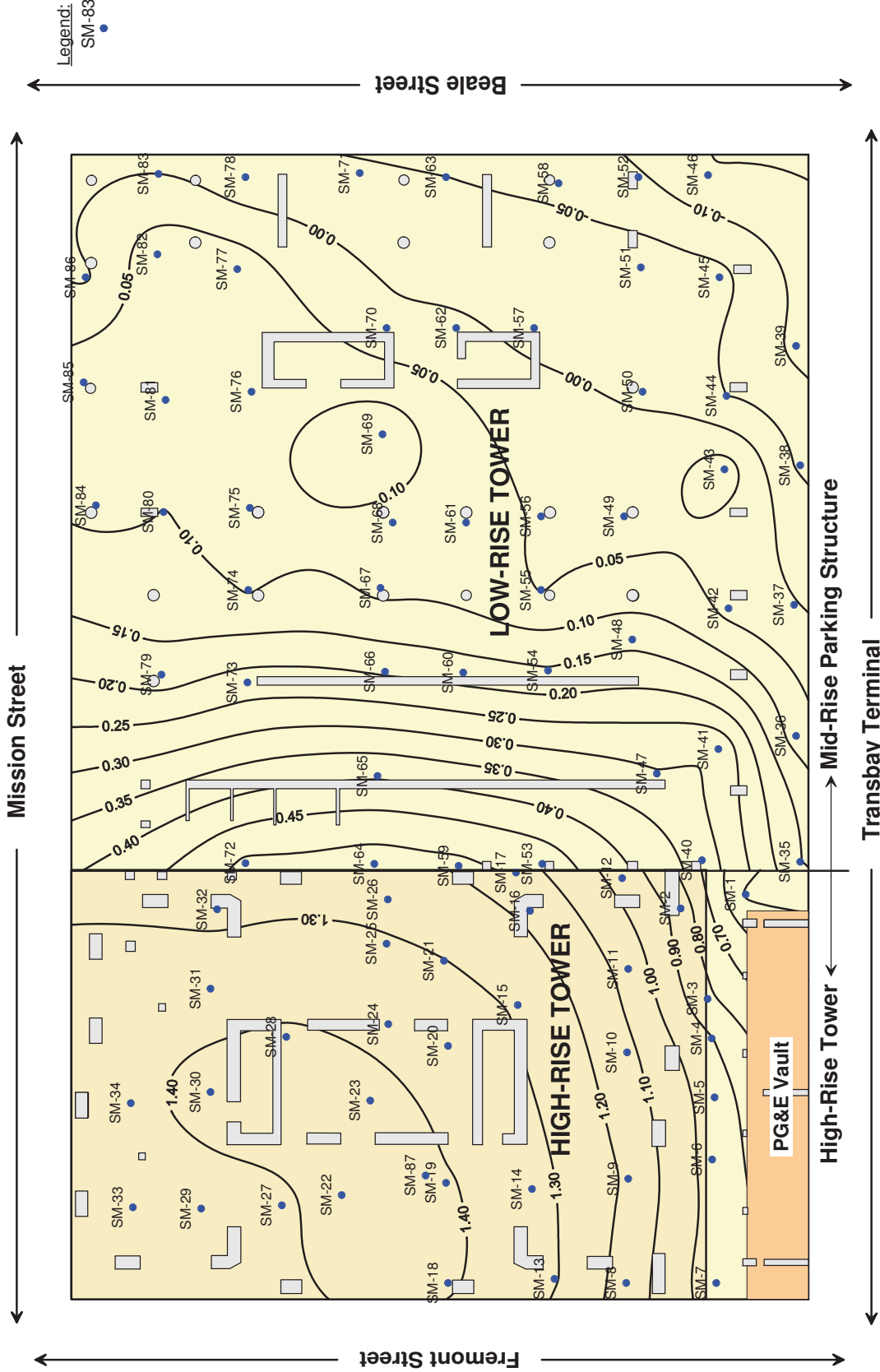
Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on March 24, 2011.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
MARCH 24, 2011 SURVEY
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California
 April 2011

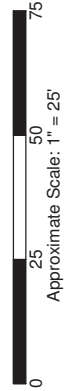


PLATE 2

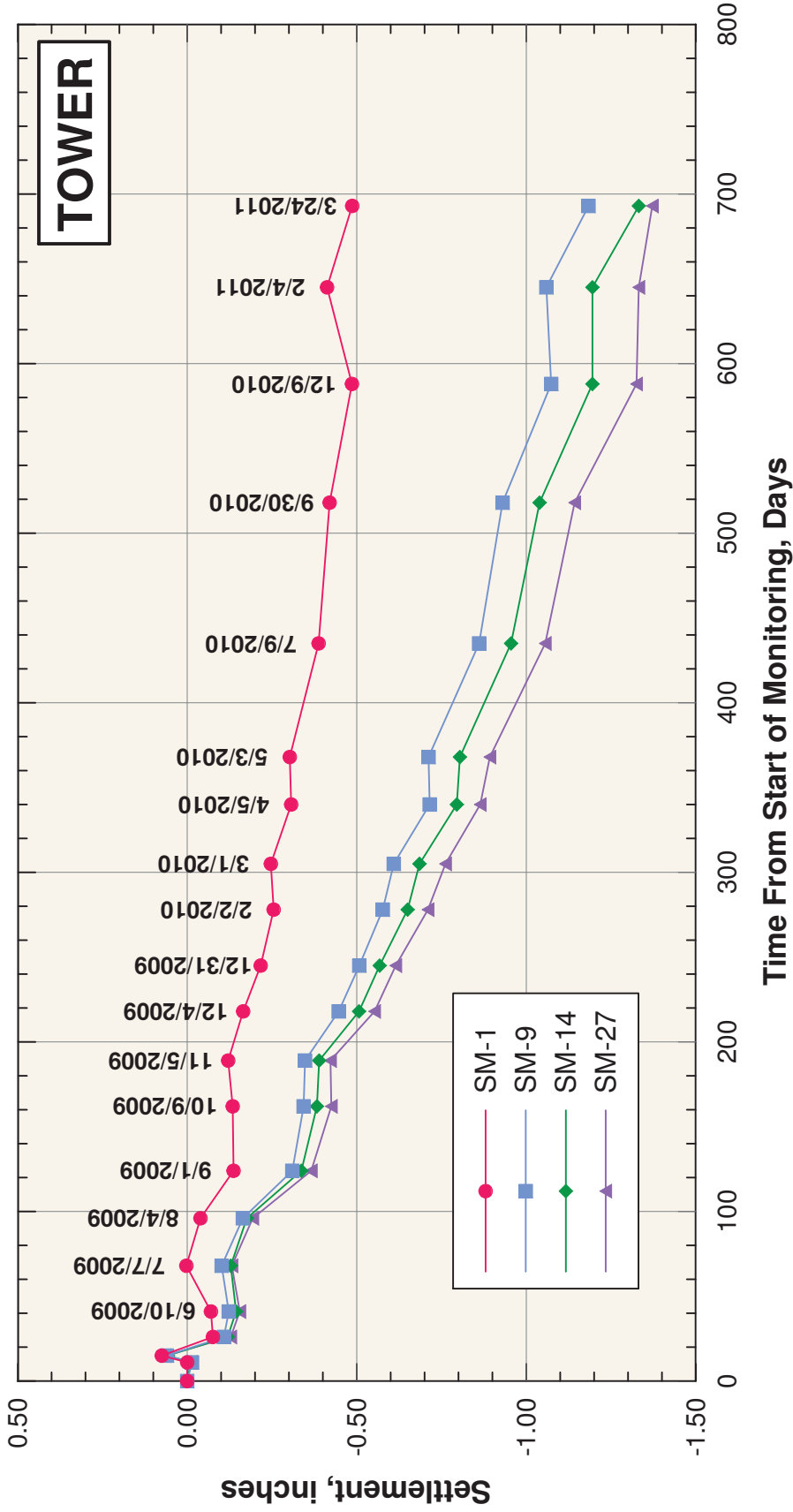
Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



Notes:
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 Negative values of settlement (within Low-rise Tower) indicate uplift.



CONTOURS OF SETTLEMENTS MEASURED AT THE
 FIRST LEVEL BASEMENT OF THE 301 MISSION STREET
 STRUCTURE BETWEEN APRIL 30, 2009 AND MARCH 24, 2011



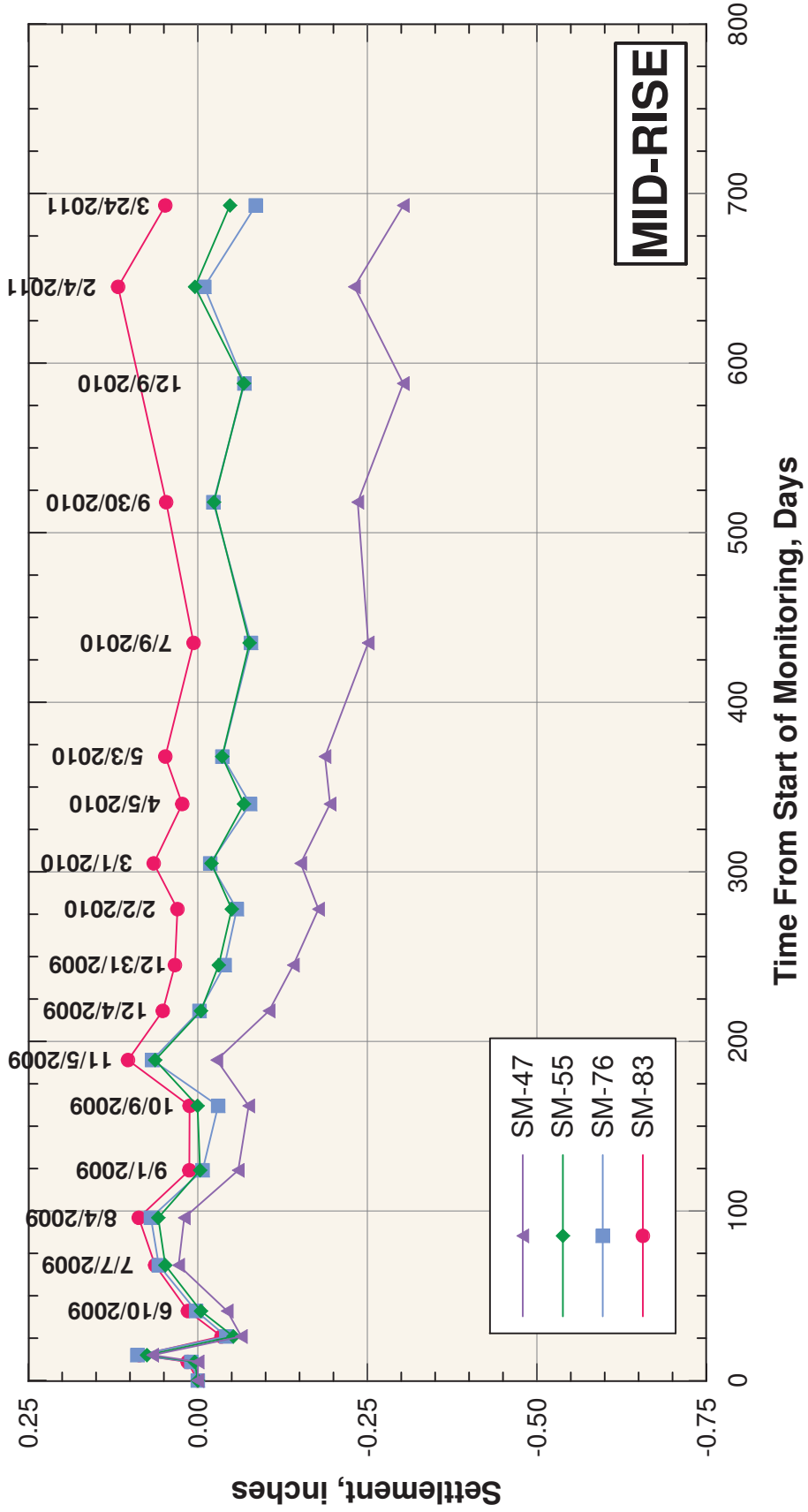
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH MARCH 24, 2011**

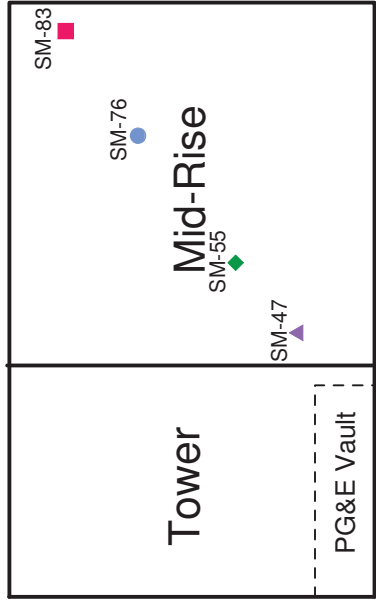
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

April 2011





Time From Start of Monitoring, Days



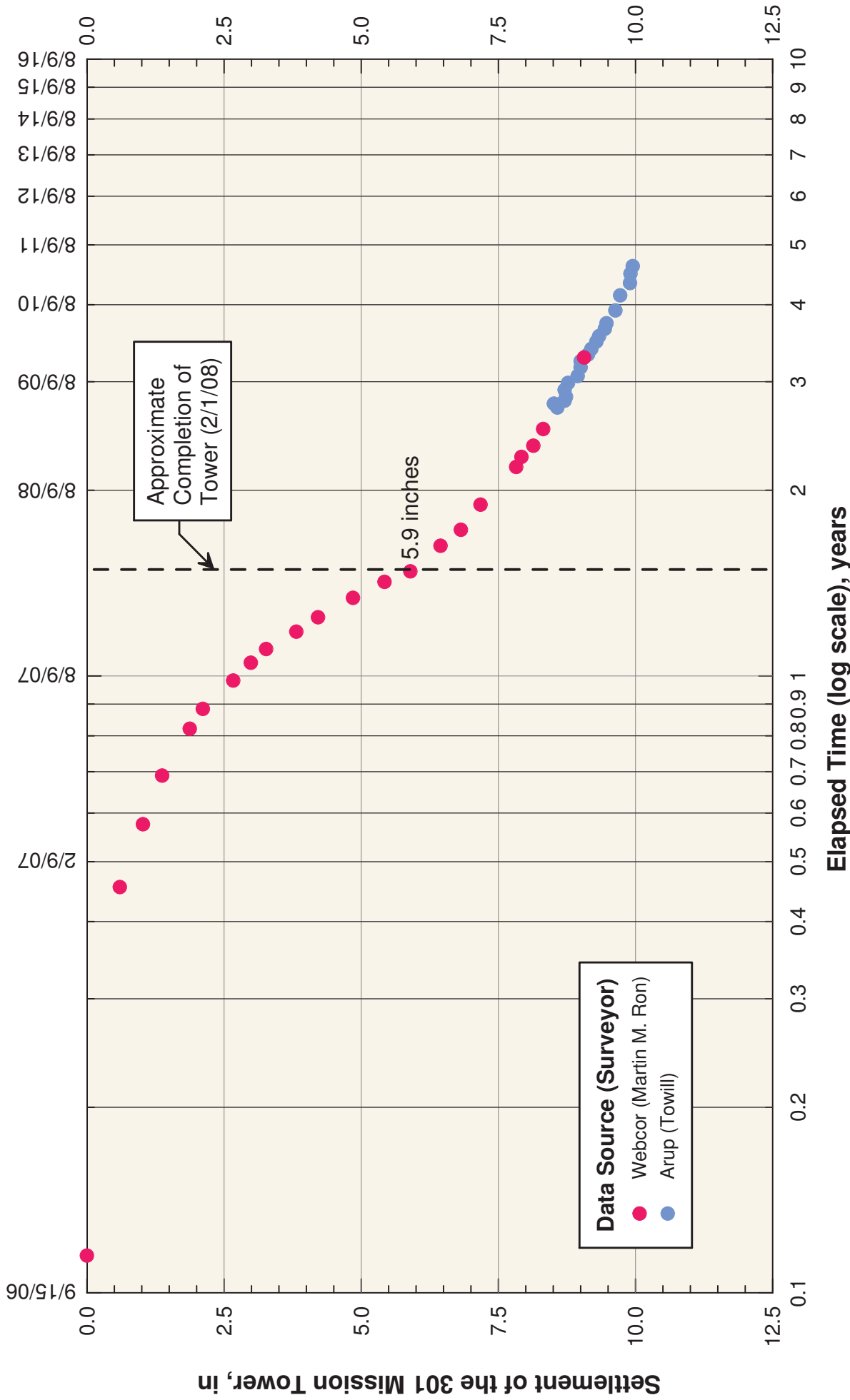
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH MARCH 24, 2011**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

April 2011





Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

April 2011



From: Brian Dykes
Sent: Friday, June 24, 2011 3:37 PM
To: Steven Hood; John Luciano
Cc: Rebecca Armenta
Subject: Settlement Records at 301 Mission Street
Attachments: 2011-06-24 Memo_301 Mission Settlement - May 2011 Survey.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Adjacent Properties

Steve,
Here is the report of the settlement readings taken on May 31, 2011.
The next readings will be taken during the work week starting July 5th.
Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date June 24, 2011
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference 4-05 136
Subject	Transbay Transit Center: Results of May 2011 Settlement Survey at 301 Mission Property	Page 1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated April 12, 2011 with measurements made through May 2010.

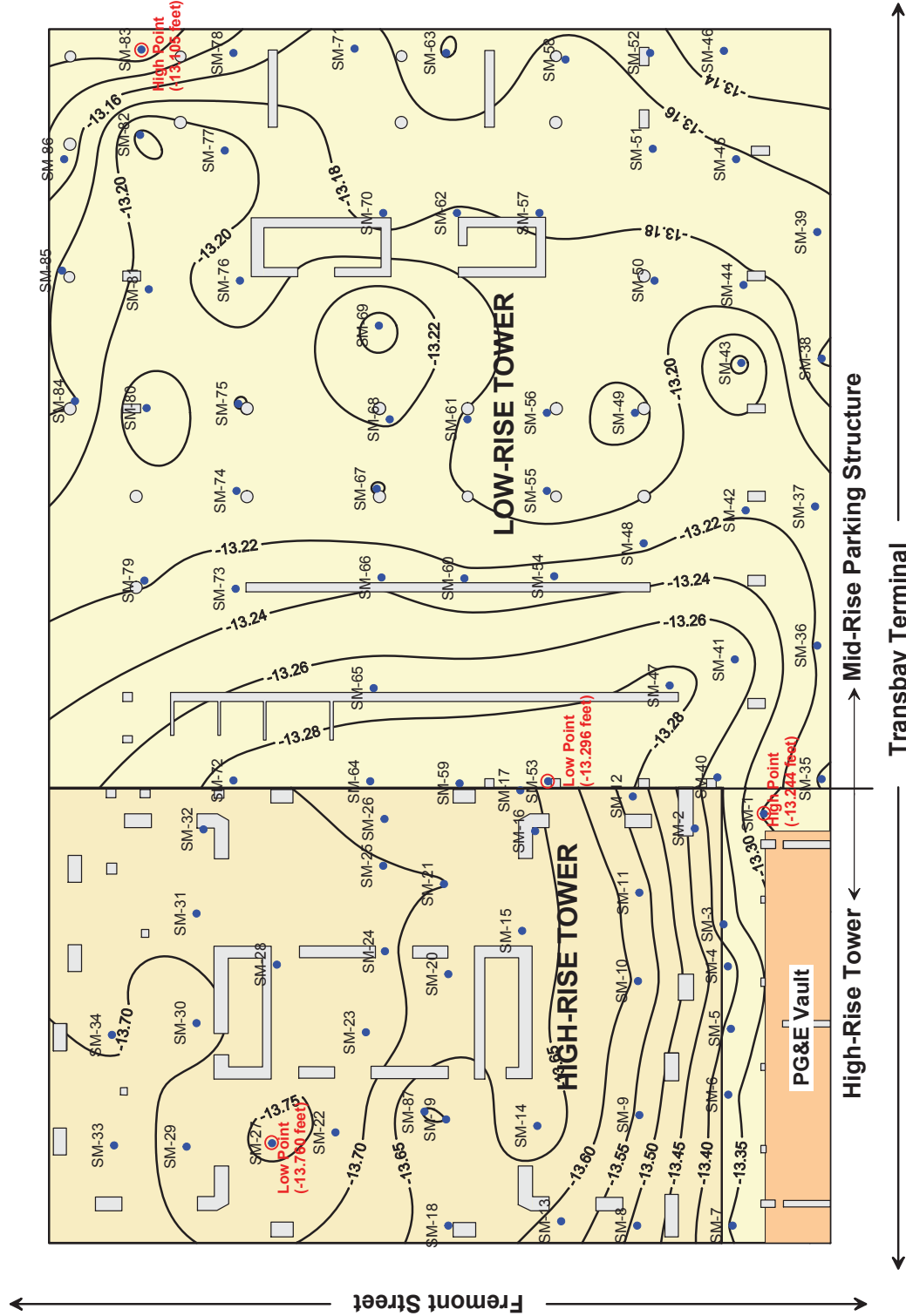
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Note Typo: references to "2010" on this page should read "2011"

Mission Street

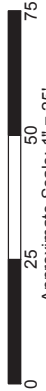
Fremont Street



Date of Survey Reading: May 31, 2011

Legend: SM-83 Settlement Marker No. 83 (Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.516 feet (6.192 inches)
Low-Rise Tower	0.191 feet (2.292 inches)



Approximate Scale: 1" = 25'

C:\132424\Internal\Project Data\4-05 Reports & Narratives\105_301 Mission - May Survey\Plates\Differential Elevation_Alt (2011.05.31).srf

Notes:
 Contours represent elevation, in feet (CCSF Datum), from survey readings taken on May 31, 2011.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
 OF 301 MISSION PROPERTY:
 PERIODIC SURVEY - MAY 31, 2011

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

June 2011

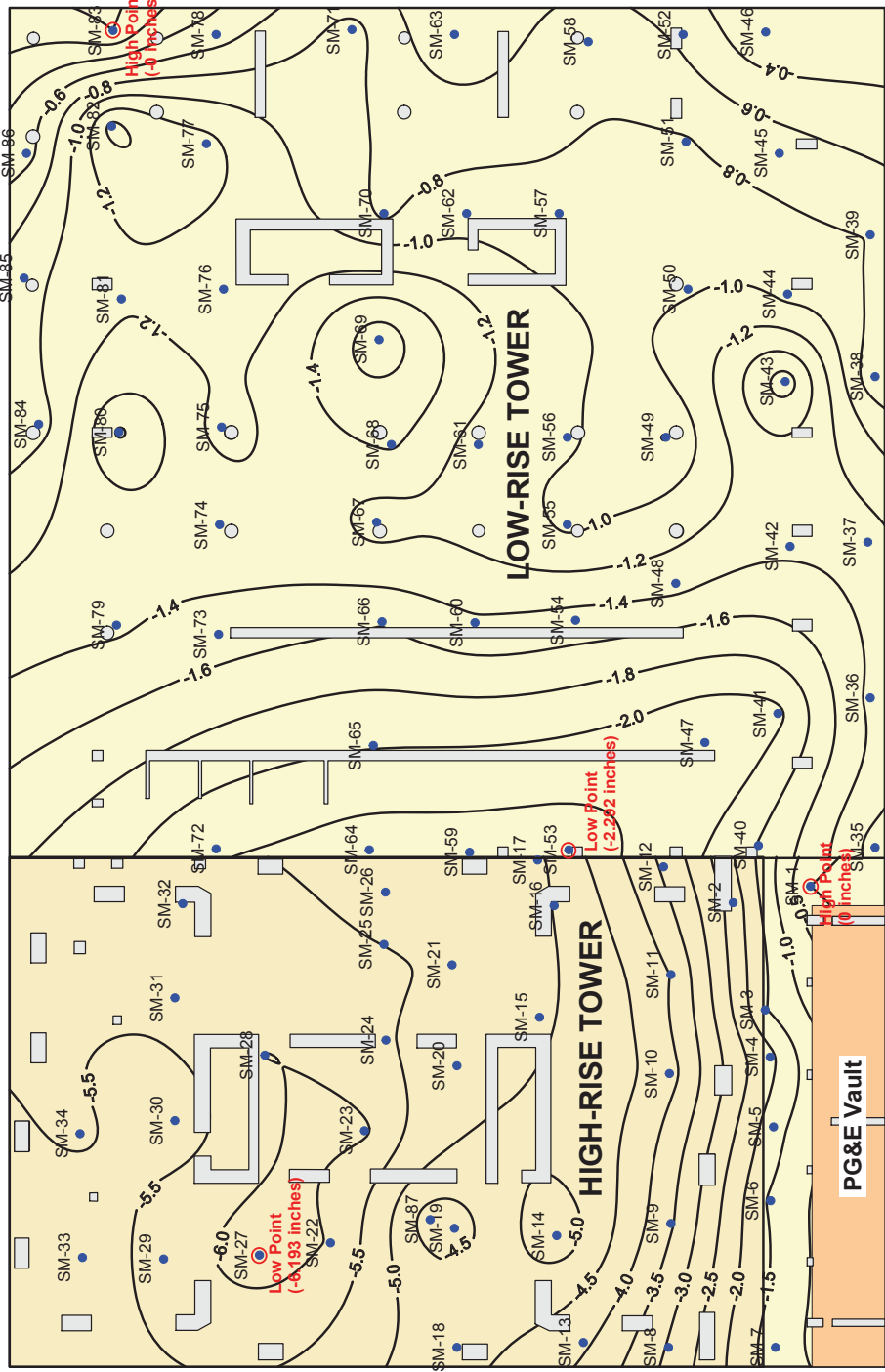
ARUP

PLATE 1

Mission Street

Fremont Street

Beale Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower

Low-Rise Tower

PG&E Vault

Mid-Rise Parking Structure

Transbay Terminal

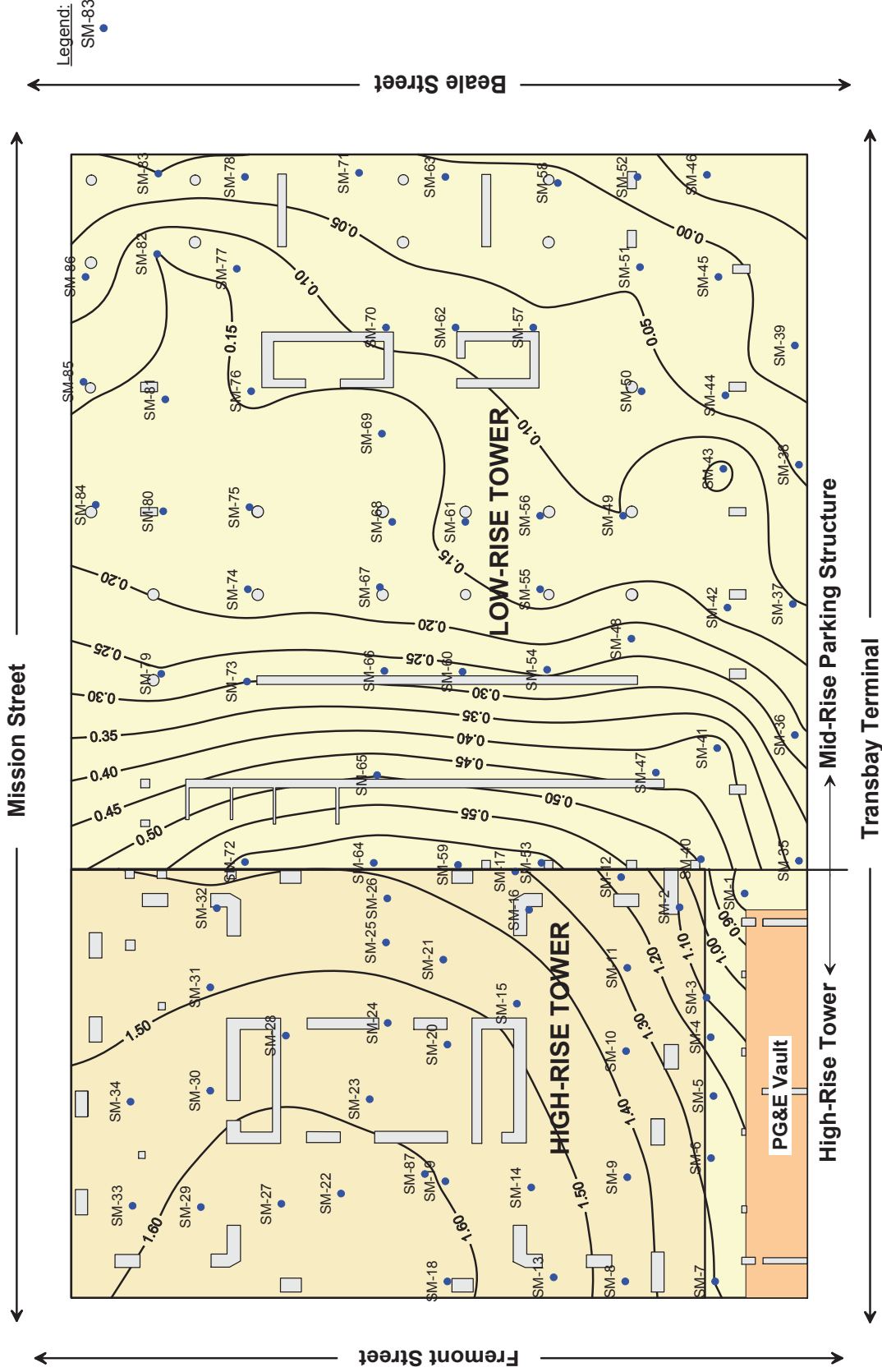


Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on May 31, 2011.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
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DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 MAY 31, 2011 SURVEY
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California
 June 2011

ARUP

PLATE 2



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

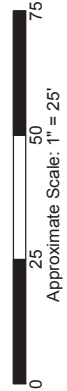
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 FIRST LEVEL BASEMENT OF THE 301 MISSION STREET
 STRUCTURE BETWEEN APRIL 30, 2009 AND MAY 31, 2011**

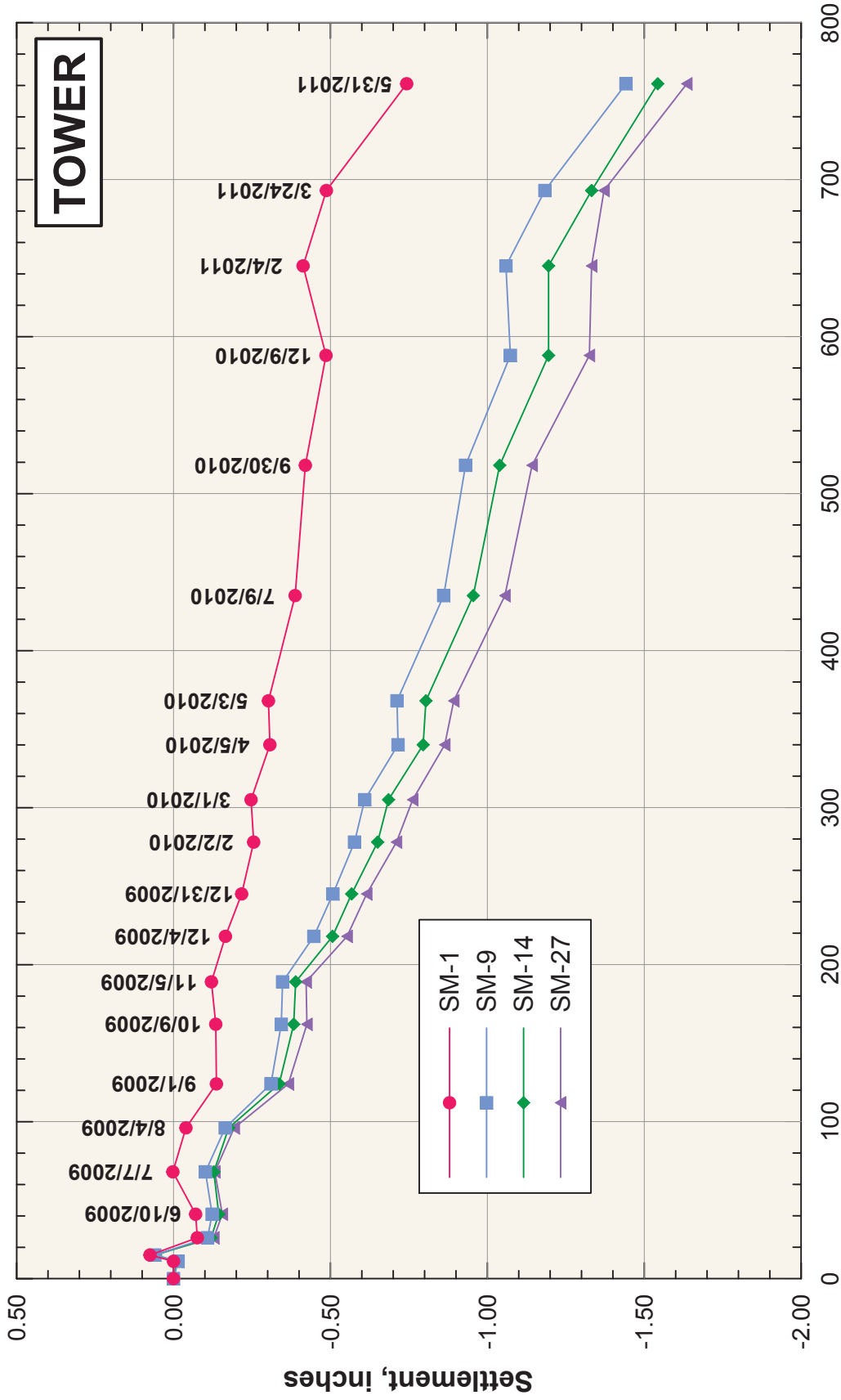
Transbay Transit Center
 301 Mission Street
 Transbay Joint Powers Authority
 San Francisco, California

June 2011

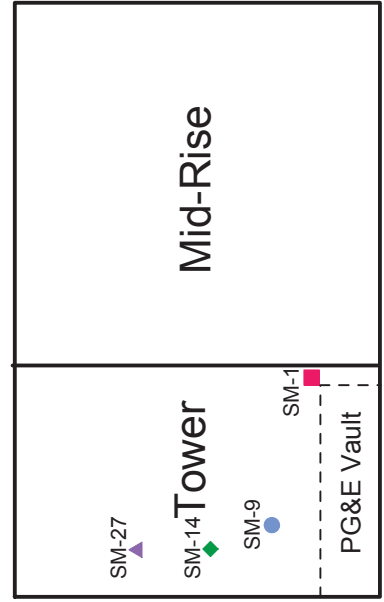


Notes:
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 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.





Time From Start of Monitoring, Days



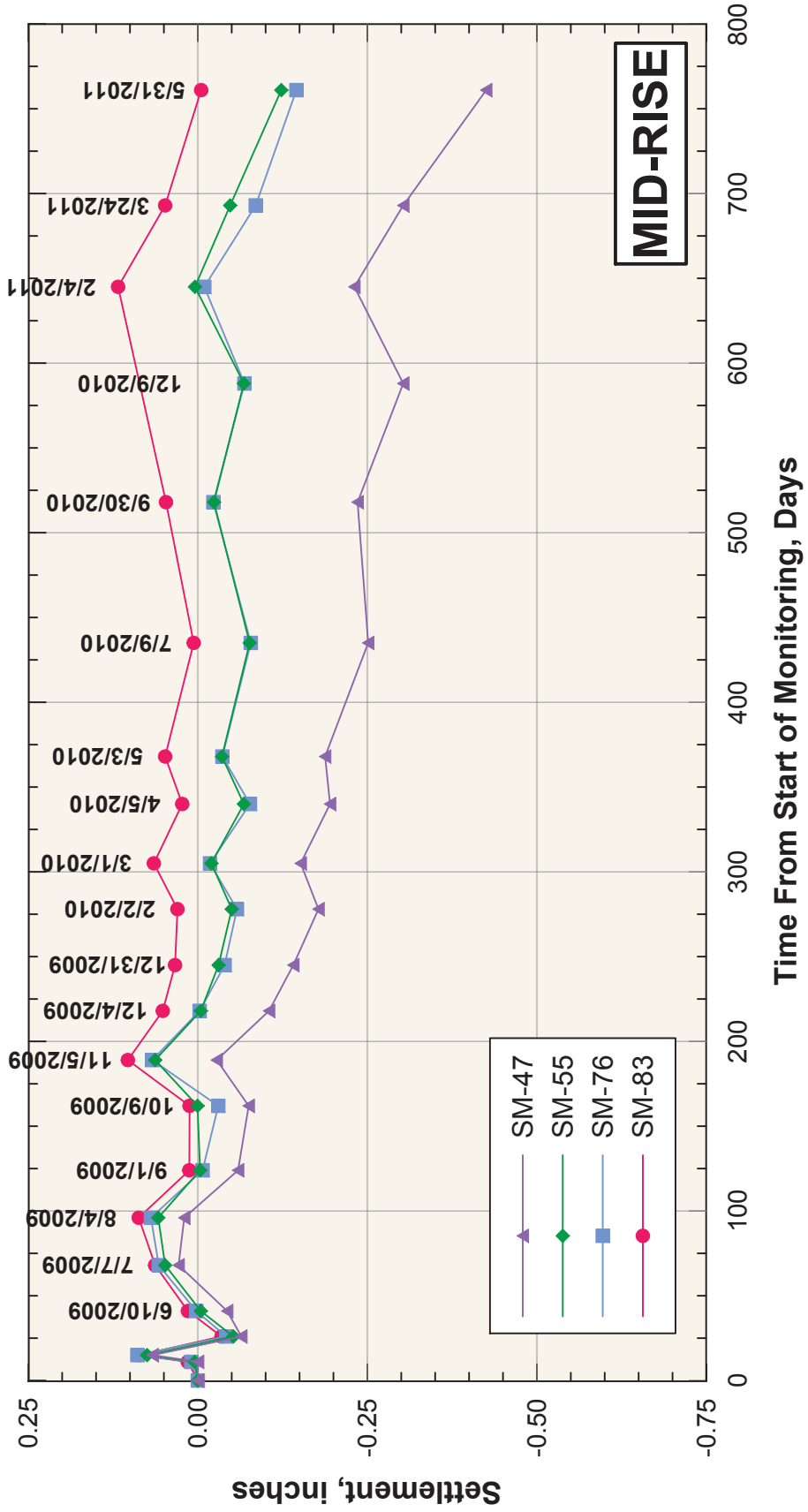
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
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APRIL 30, 2009 THROUGH MAY 31, 2011**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

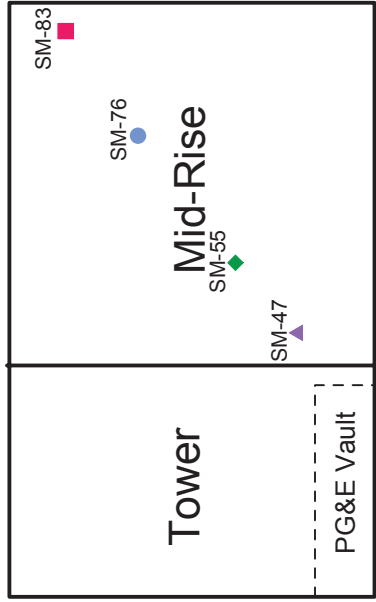
June 2011





Time From Start of Monitoring, Days

MID-RISE



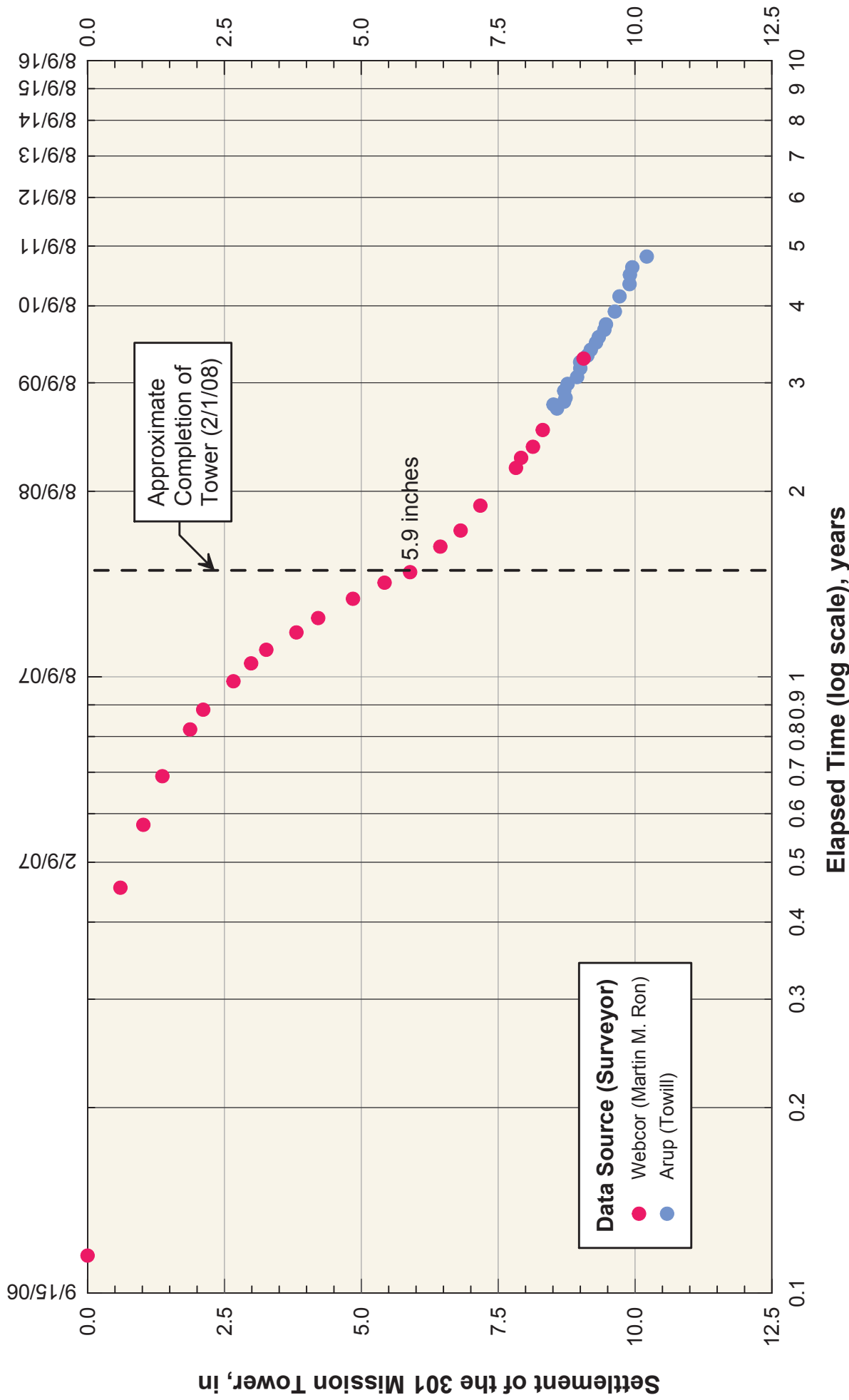
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH MAY 31, 2011**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2011





Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

June 2011



From: Brian Dykes
Sent: Thursday, October 06, 2011 11:10 AM
To: Steven Hood
Cc: John Luciano
Subject: RE: Building Survey
Attachments: 2011-08-26 Memo_301 Mission Settlement - July 2011 Survey.pdf

Categories: Adjacent Properties

Steven,
The surveyors were in the tower during the week ending September 9, which is on the two monthly schedule for these readings.
I do not have the results, but expect them shortly.
They will be passed on to you when I get them.
The previous readings were taken on July 7 and I did not receive them until August 26 just before my vacation in Europe.
I left verbal instructions for Arup to pass them to you.
In case they did not follow through, I have attached a copy for you above.
Brian.

From: Steven Hood [<mailto:shood@MillenniumPtrs.com>]
Sent: Thursday, October 06, 2011 10:32 AM
To: Brian Dykes
Cc: John Luciano
Subject: Building Survey

Brian I noticed the surveyors were in the tower a couple of weeks ago, do you the results of their work and are you planning on sharing it?

Steven C. Hood
Millennium Partners
301 Mission Street, Level B1
San Francisco, CA 94105
† 415.874.4707 f 415.874.4750

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For more information please visit <http://www.messagelabs.com/email>

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	August 26, 2011
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number	132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference	4-05 142
Subject	Transbay Transit Center: Results of July 2011 Settlement Survey at 301 Mission Property	Page	1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated June 24, 2011 with measurements made through July 2011.

Arup has installed an additional nine settlement markers in the floor at basement level B-5. These settlement markers were surveyed three separate times in order to establish a baseline reading. The results of this monitoring are presented in Plates 7 and 8 of this memorandum.

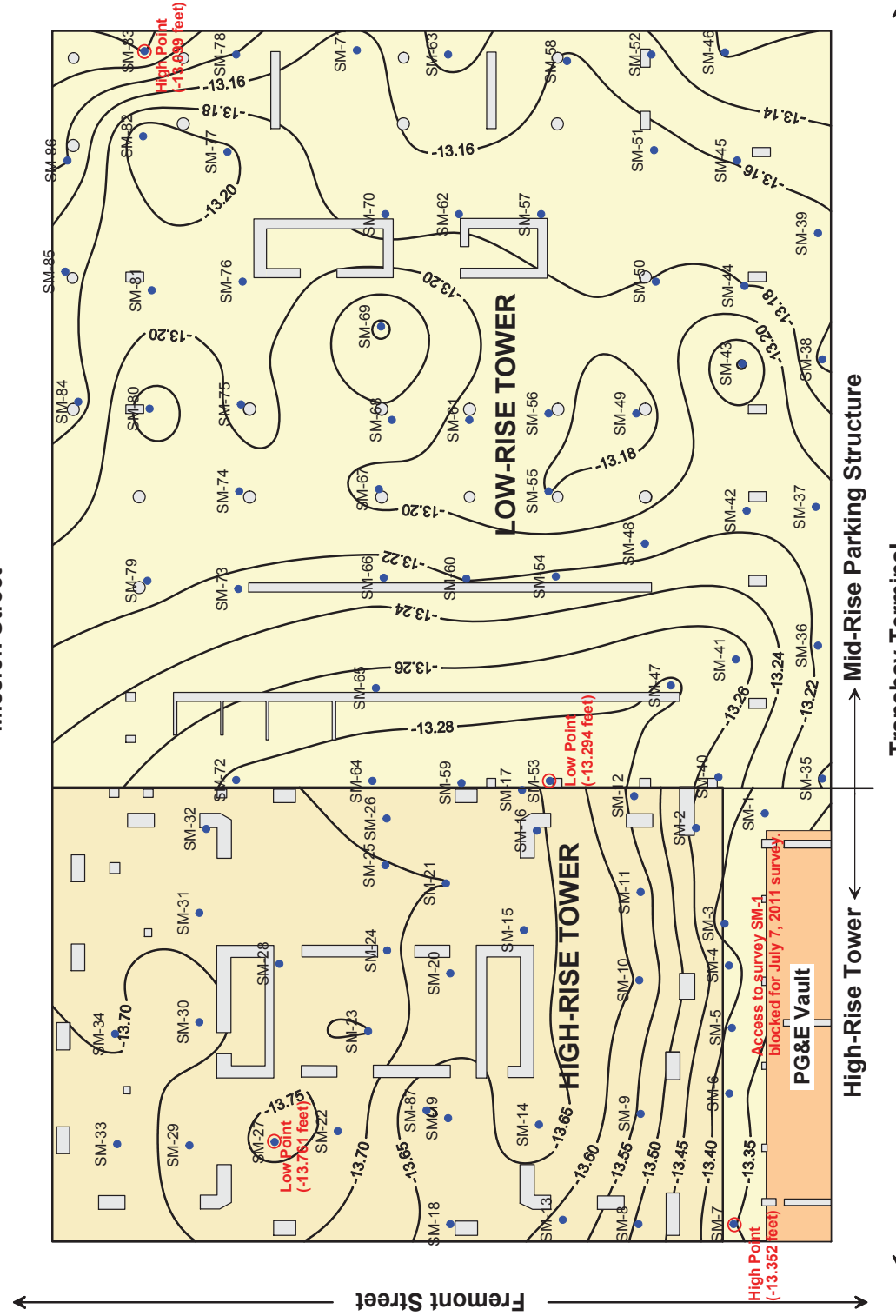
List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – July 7, 2010
- Plate 2 Differential Floor Elevation (Inches) – July 7, 2010 Survey
- Plate 3 Contours of Settlements Measured at the First Level Basement of the 301 Mission Street Structure Between April 30, 2009 and July 7, 2010
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through July 7, 2010.
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through July 7, 2010
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: July 7, Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: July 7, 2011 Survey

Note Typo: references to "2010" on this page should read "2011"

Mission Street

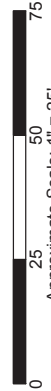
Fremont Street



Date of Survey Reading:
July 7, 2011

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical
Survey Methods)

Maximum Differential	
High-Rise Tower	0.409 feet (4.908 inches)
Low-Rise Tower	0.195 feet (2.340 inches)



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on July 7, 2011.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

High-Rise Tower ← Mid-Rise Parking Structure → Transbay Terminal

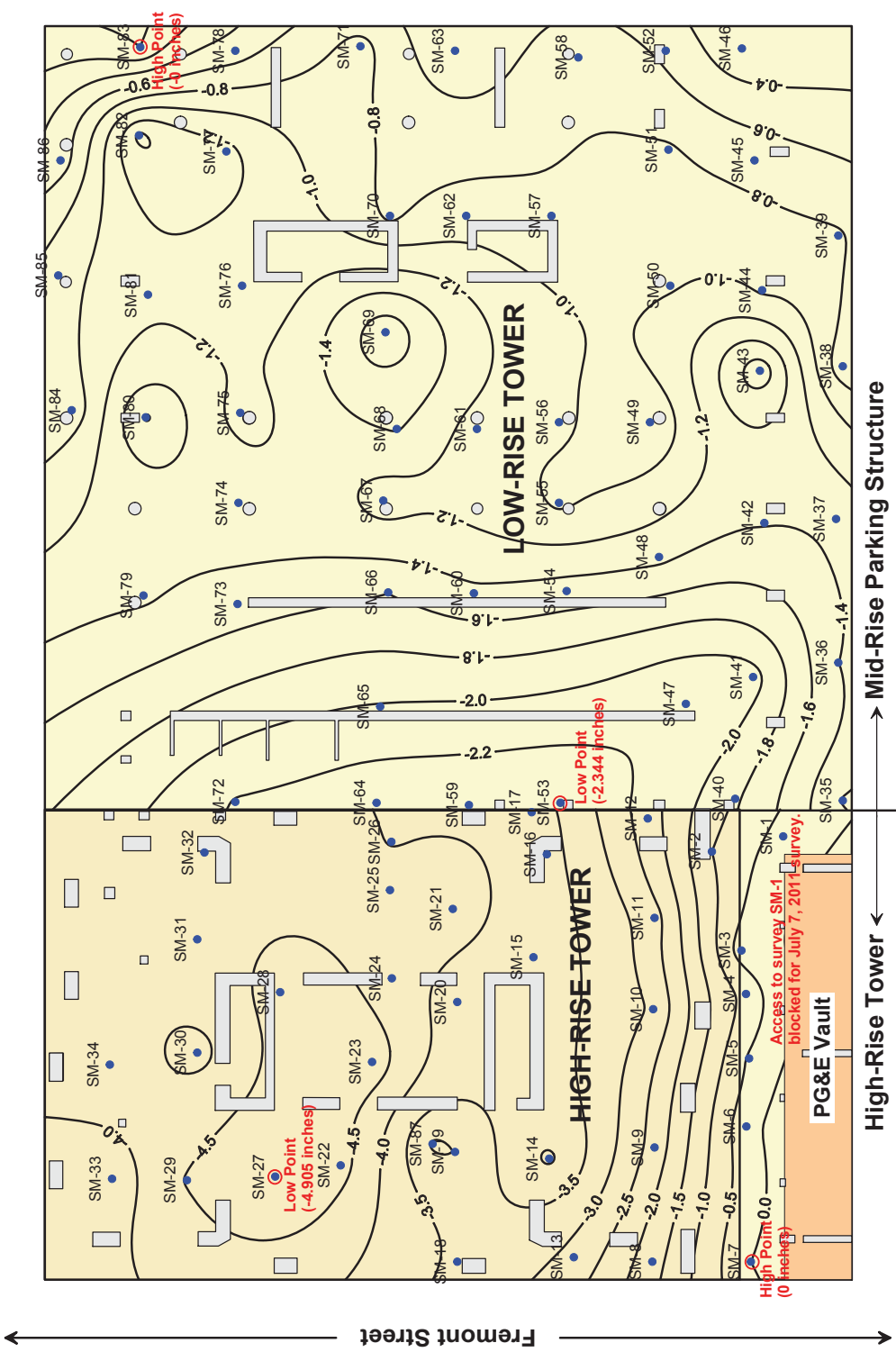
Beale Street

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - JULY 7, 2011
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

August 2011
ARUP
PLATE 1

Mission Street

Beale Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

Fremont Street

Beale Street

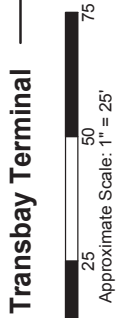
High-Rise Tower

Low-Rise Tower

PG&E Vault

Mid-Rise Parking Structure

Transbay Terminal



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on July 7, 2011.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 JULY 7, 2011 SURVEY

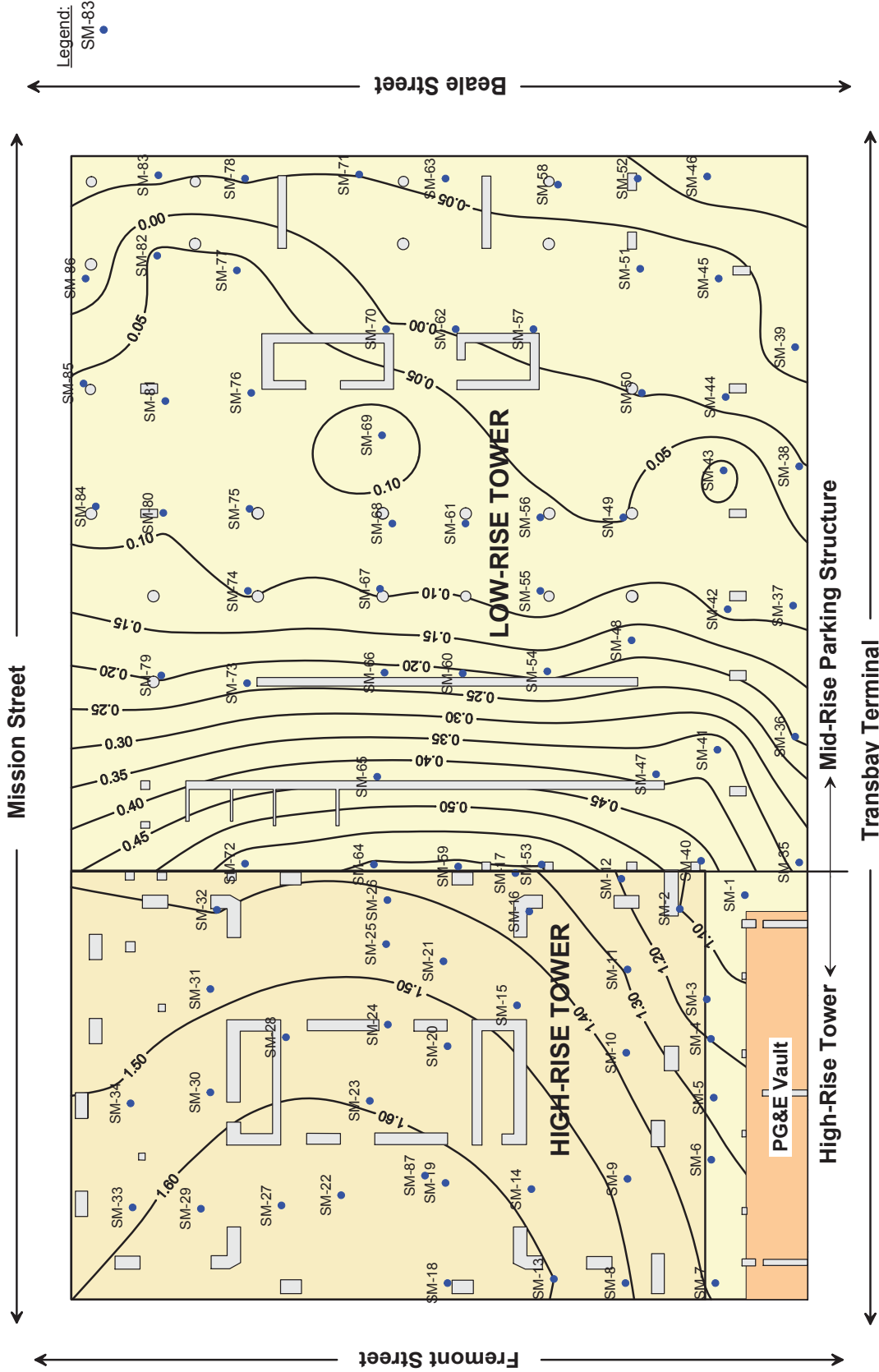
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

August 2011

ARUP

PLATE 2

Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



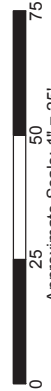
**CONTOURS OF SETTLEMENTS MEASURED AT THE
 FIRST LEVEL BASEMENT OF THE 301 MISSION STREET
 STRUCTURE BETWEEN APRIL 30, 2009 AND JULY 7, 2011**

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

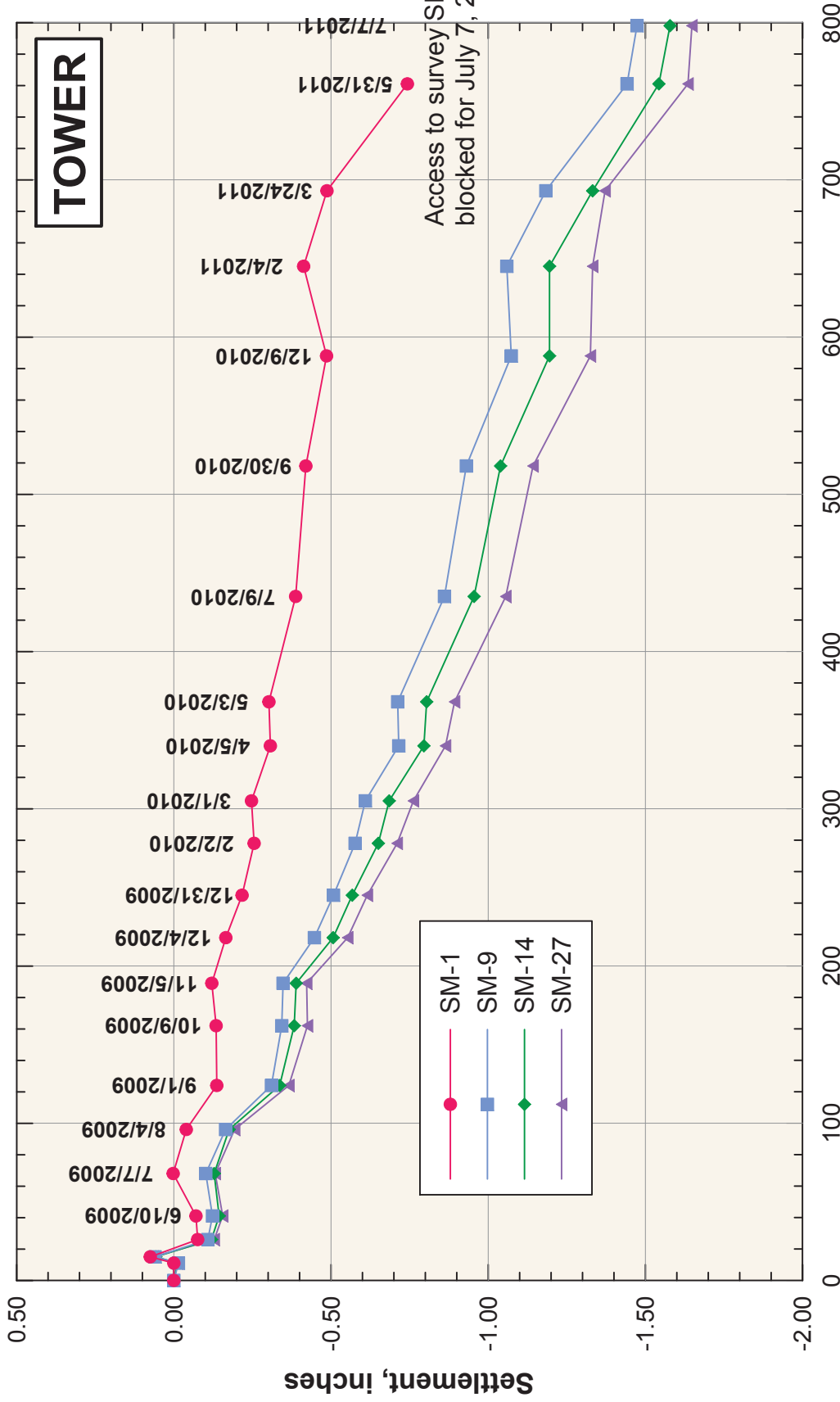
August 2011



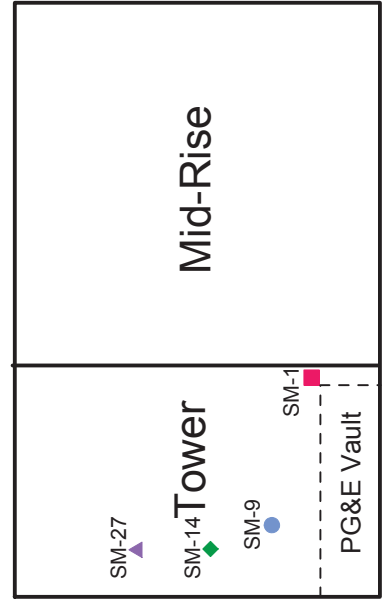
Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on July 7, 2011.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.



Approximate Scale: 1" = 25'



Time From Start of Monitoring, Days



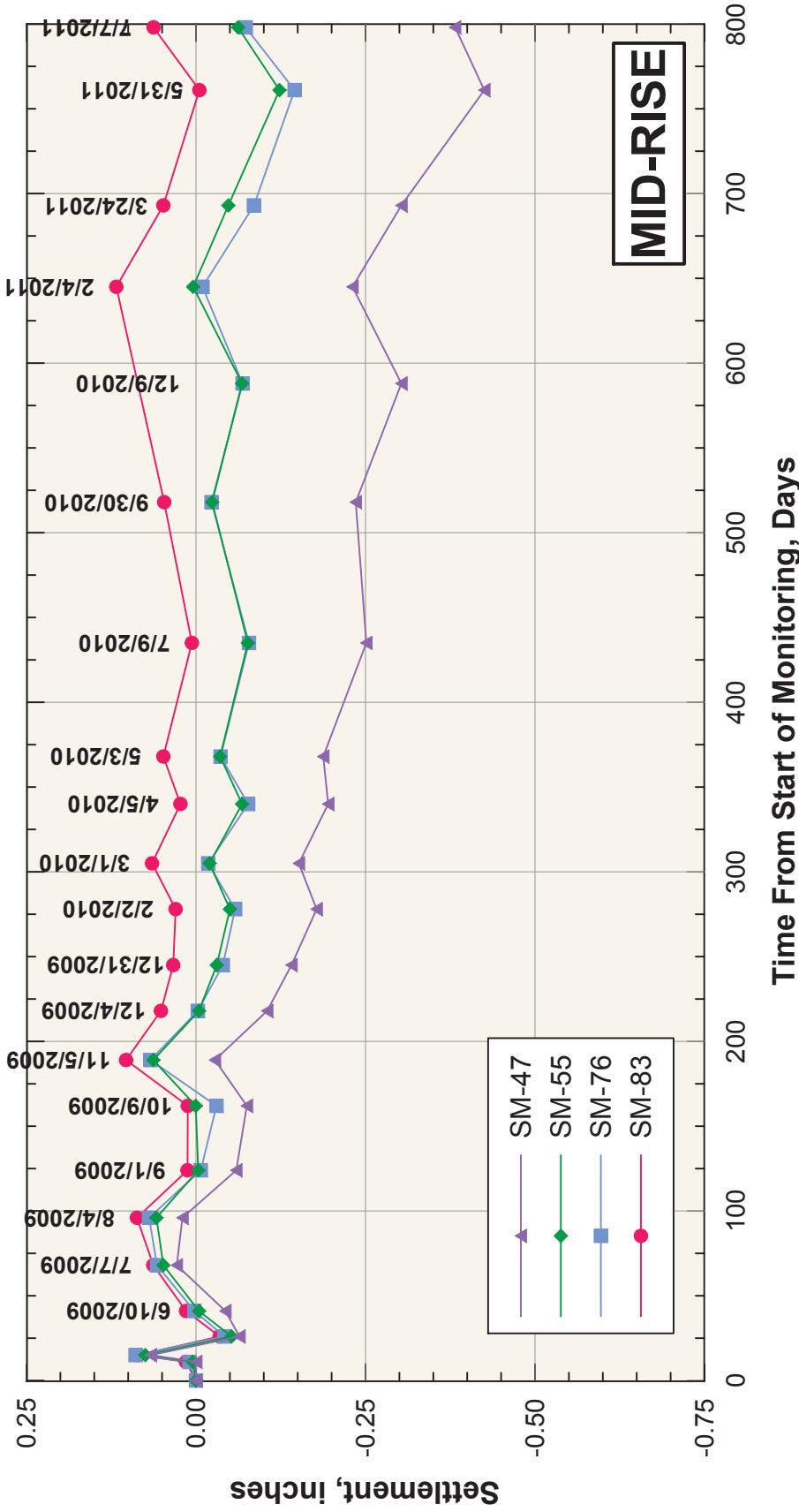
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH JULY 7, 2011**

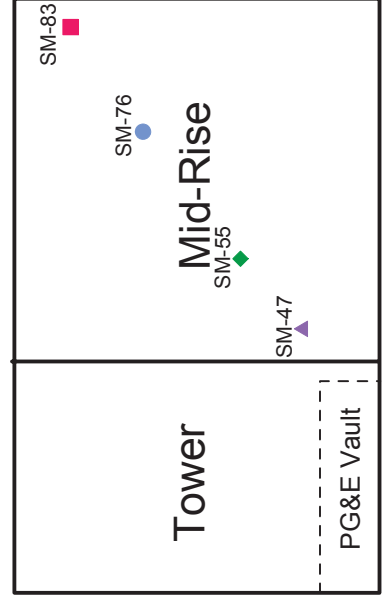
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

August 2011





Time From Start of Monitoring, Days



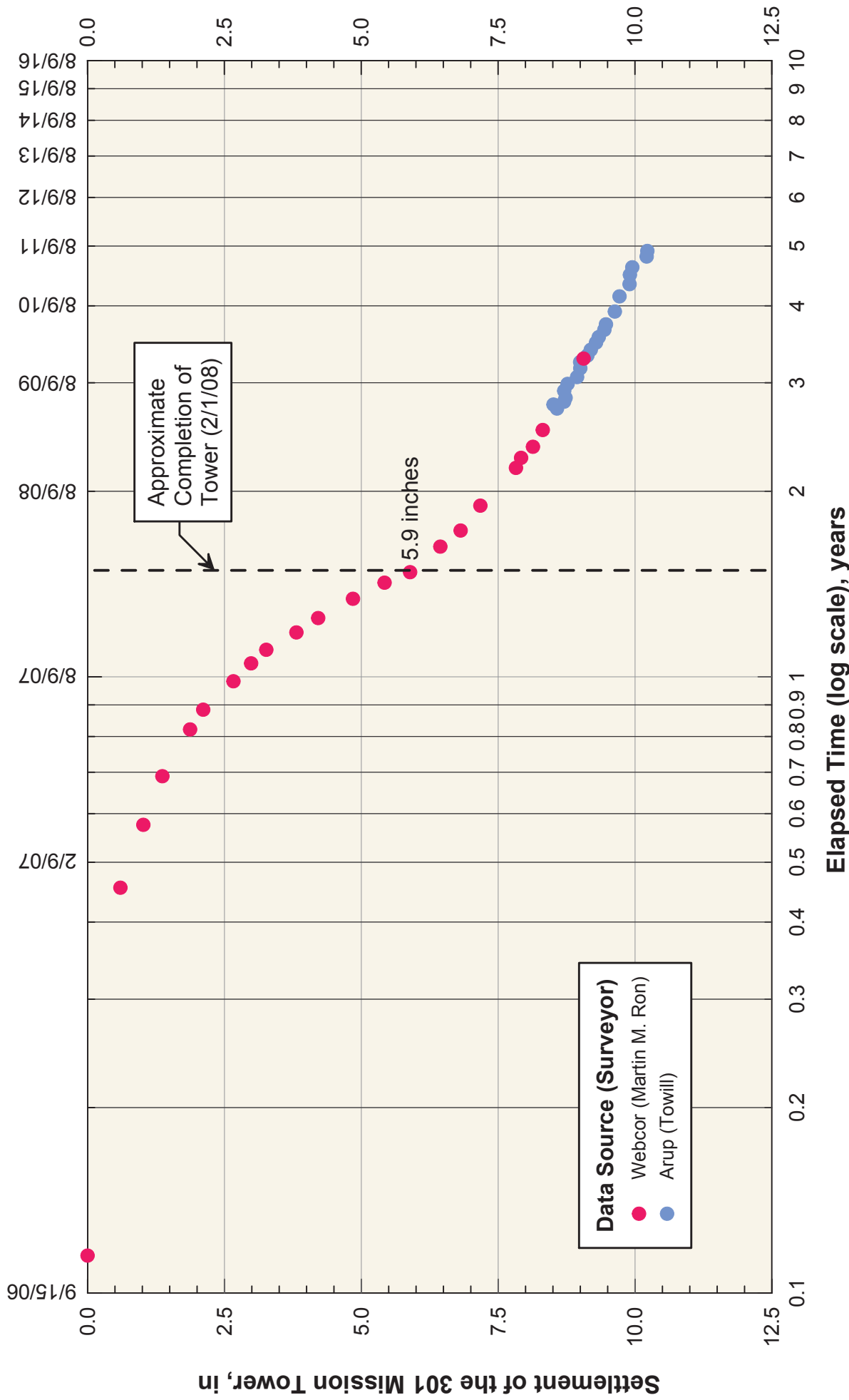
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH JULY 7, 2011**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

August 2011





Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

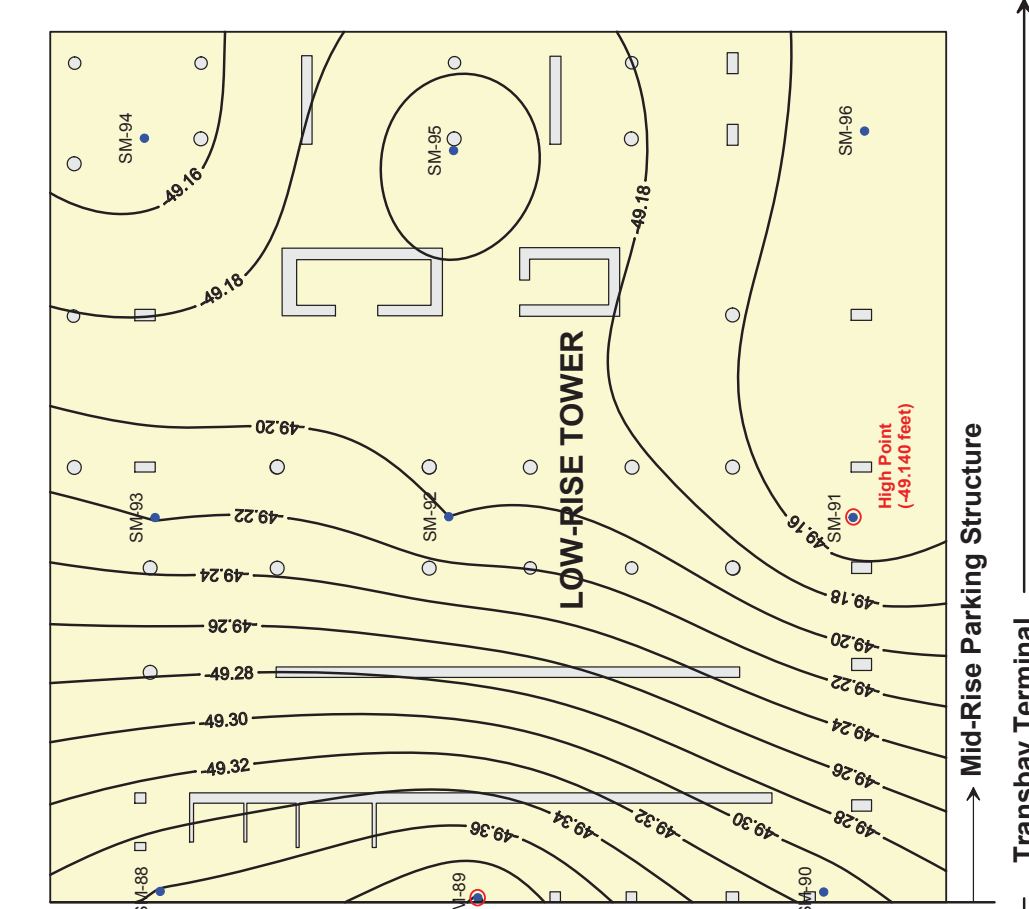
SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

August 2011



Mission Street



Date of Survey Reading:
July 7, 2011

Legend:
 SM-88 Settlement Marker No. 88
 (Measured by Optical Survey Methods)

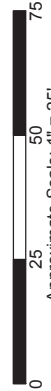
Maximum Differential
B-5 Level Basement
0.261 feet (3.132 inches)

Fremont Street

Beale Street



Notes:
 Contours represent elevation, in feet (CCSF Datum), from survey readings taken on July 7, 2011.



Approximate Scale: 1" = 25'

Q:\13224\Internal Project Data\4-05 Reports & Narratives\142 301 Mission - July Survey\Plates\B-5 Elevations (2011.07.07).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
 OF 301 MISSION PROPERTY: JULY 7, 2011 SURVEY

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California
 August 2011



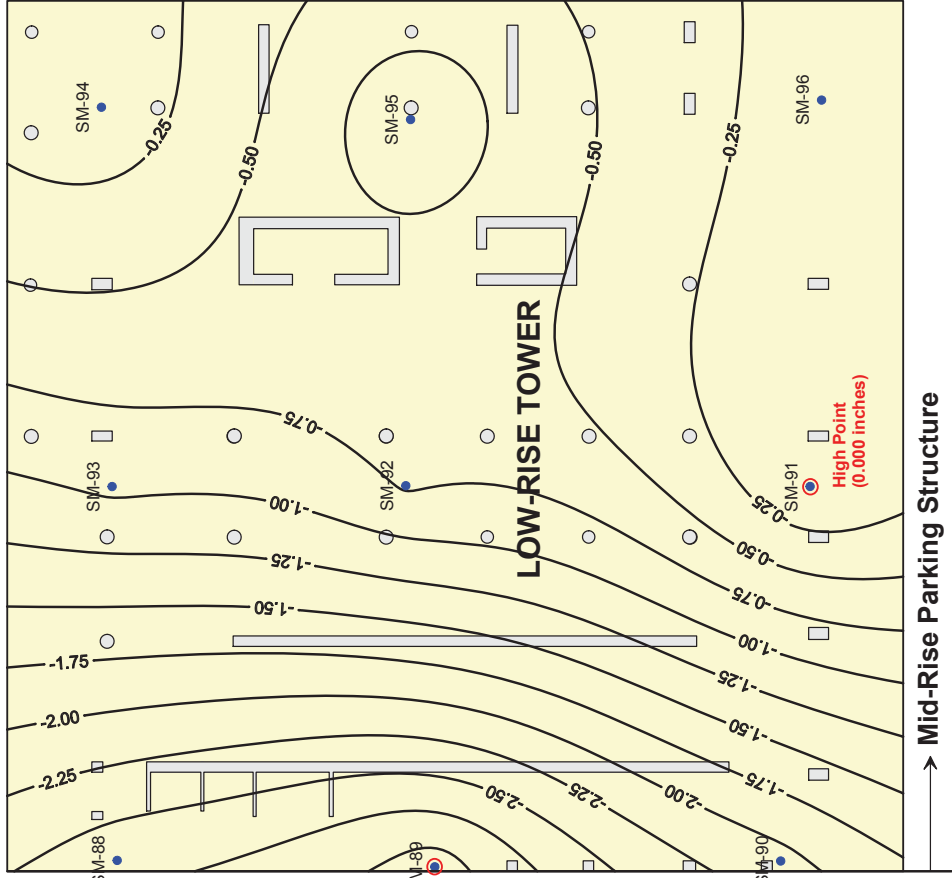
PLATE 7

Mission Street

Mission Street

Fremont Street

Fremont Street



Mid-Rise Parking Structure

Transbay Terminal

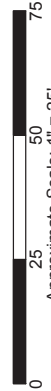
Date of Survey Reading:
July 7, 2011

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.261 feet (3.132 inches)



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on July 7, 2011.



Approximate Scale: 1" = 25'

Q:\13224\Internal Project Data\4-05 Reports & Narratives\142 301 Mission - July Survey\Plates\B-5 Differential Elevations (2011.07.07).srf

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: JULY 7, 2011 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

August 2011

ARUP

PLATE 8

From: Brian Dykes <bdykes@transbaycenter.org>
Sent: Tuesday, October 11, 2011 8:25 AM
To: Steven Hood; John Luciano
Cc: Rebecca Armenta; Stephen McLandrich; Robert Beck
Subject: FW: 301 Mission - September Survey Results
Attachments: 2011-10-10 Memo_301 Mission Settlement - September 2011 Survey.pdf

Steven and John,

Please see the attached memo which contains the settlement records taken on September 8, 2011.

The total settlement curve on plate # 6 is still following the same rate as has been recorded since Arup started taking readings in April 2009.

The maximum total settlement under the tower is now 10.5 inches.

The settlement recorded between April 2009 and September 2011 as shown on plate # 4 is 1.8 inches at markers 9 & 14.

The next set of readings is scheduled to be taken early next month.

Regards, Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Monday, October 10, 2011 5:39 PM
To: Brian Dykes; Robert Beck; Emilio Cruz; 'Randy Volenec'; George Metzger
Cc: Nick O'Riordan; Kevin Clinch; DeeDee Maggi
Subject: 301 Mission - September Survey Results

Brian,

Please find the attached memo which contains the latest results of the 301 Mission settlement marker survey.

Note, I am NOT sending these memos directly to Steve Hood and John Luciano but I can if you would like.

Let me know if you have any questions.

Cheers,
Stephen

Stephen McLandrich PE
Senior Engineer | Geotechnics Group

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA
t +1 415 957 9445 d +1 415 946 0245
f +1 415 957 9096 c +1 415 310 1095
www.arup.com

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	10 October 2011
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number	132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference	4-05 145
Subject	Transbay Transit Center: Results of September 2011 Settlement Survey at 301 Mission Property Page 1 of 1		

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated August 26, 2011 with measurements made through September 2011.

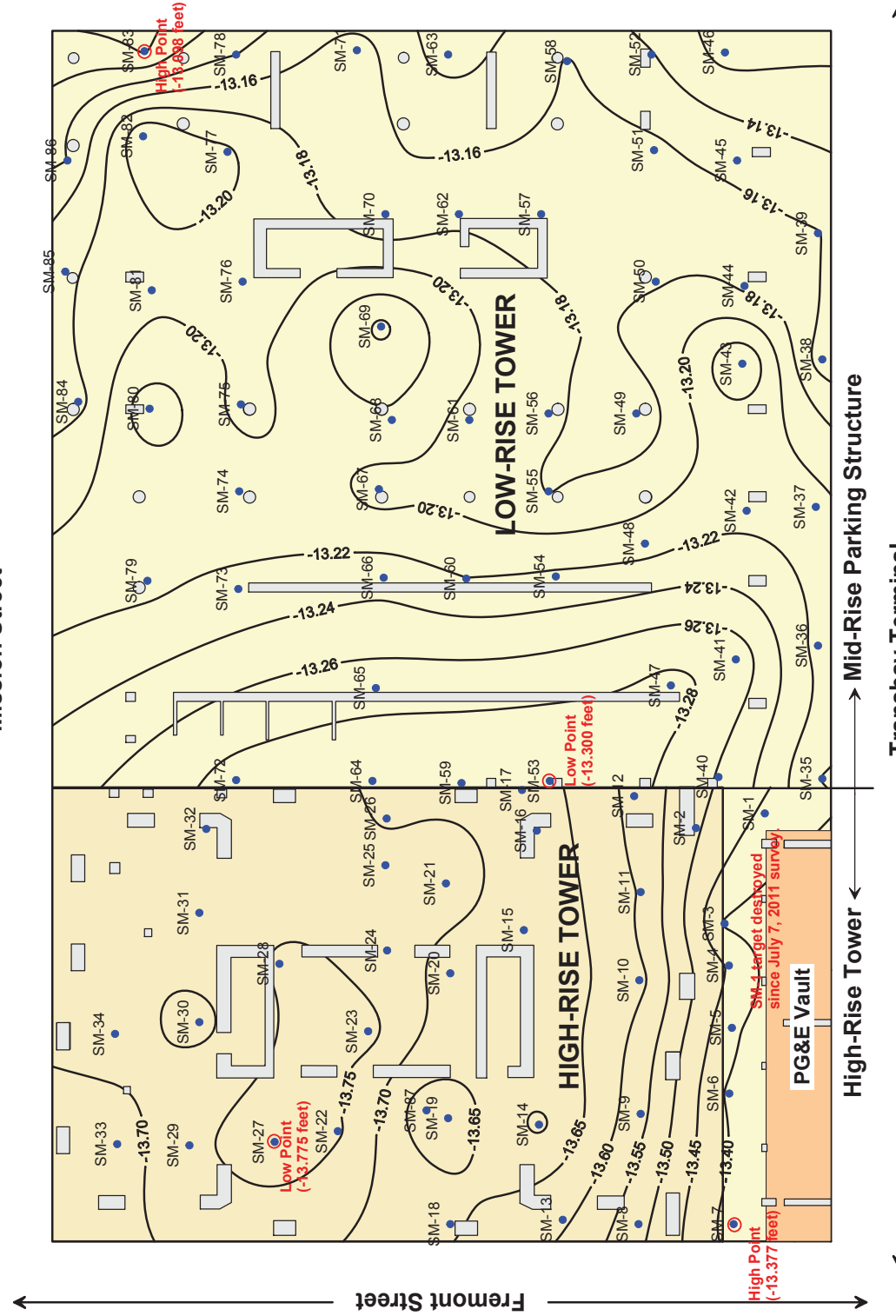
List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – September 8, 2010
- Plate 2 Differential Floor Elevation (Inches) – September 8, 2010 Survey
- Plate 3 Contours of Settlements Measured at the First Level Basement of the 301 Mission Street Structure Between April 30, 2009 and September 8, 2010
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through September 8, 2010.
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through September 8, 2010
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: September 8, 2011 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: September 8, 2011 Survey

Note Typo: references to "2010"
on this page should read "2011"

Mission Street

Fremont Street

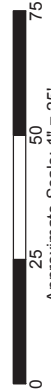


Date of Survey Reading:
September 8, 2011

Legend:

SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.398 feet (4.774 inches)
Low-Rise Tower	0.202 feet (2.422 inches)



Approximate Scale: 1" = 25'

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on September 8, 2011.

Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - SEPTEMBER 8, 2011

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

October 2011

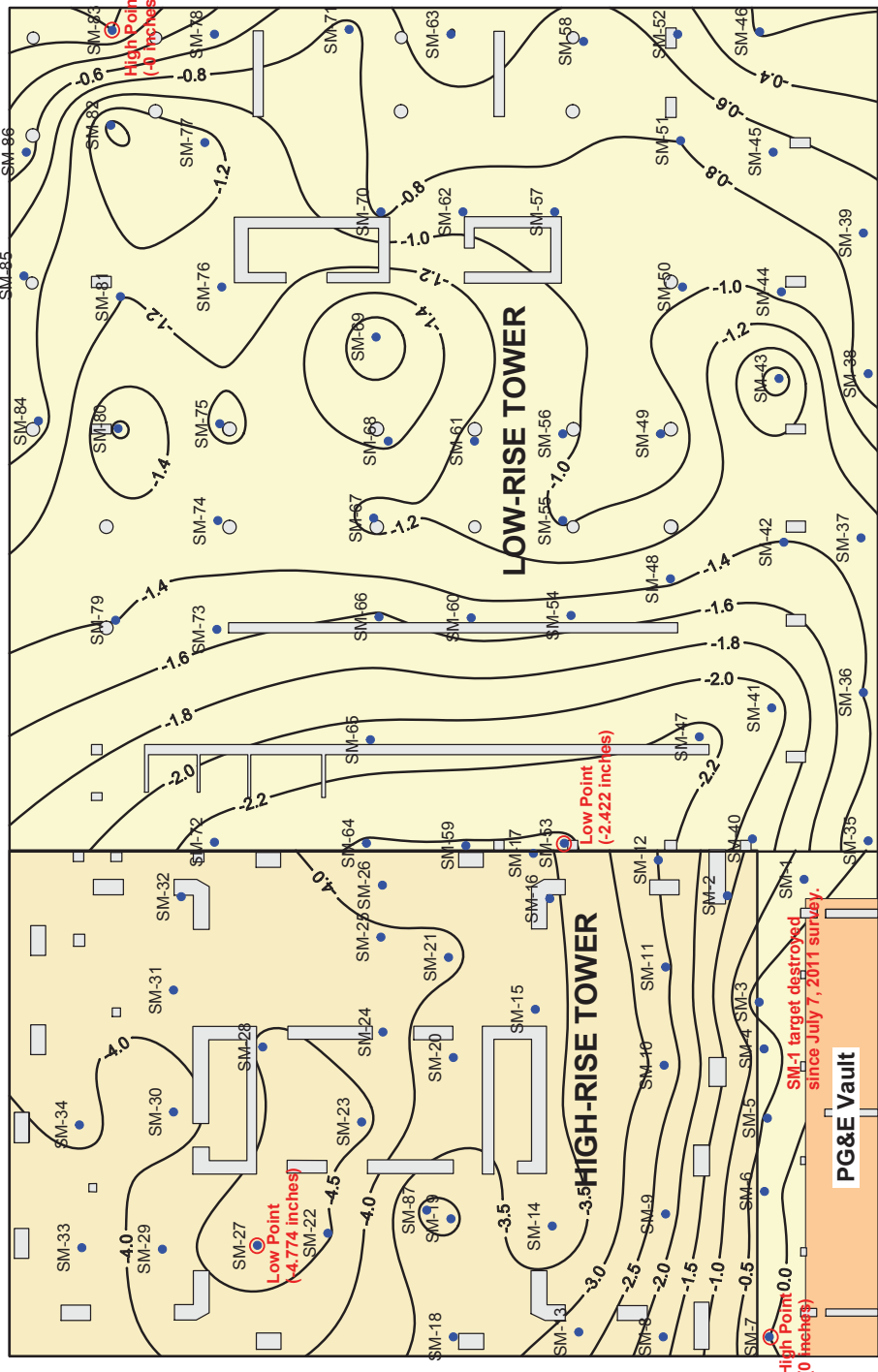
ARUP

PLATE 1

Mission Street

Fremont Street

Beale Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower

Low-Rise Tower

PG&E Vault

Mid-Rise Parking Structure

Transbay Terminal



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on September 8, 2011.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 SEPTEMBER 8, 2011 SURVEY

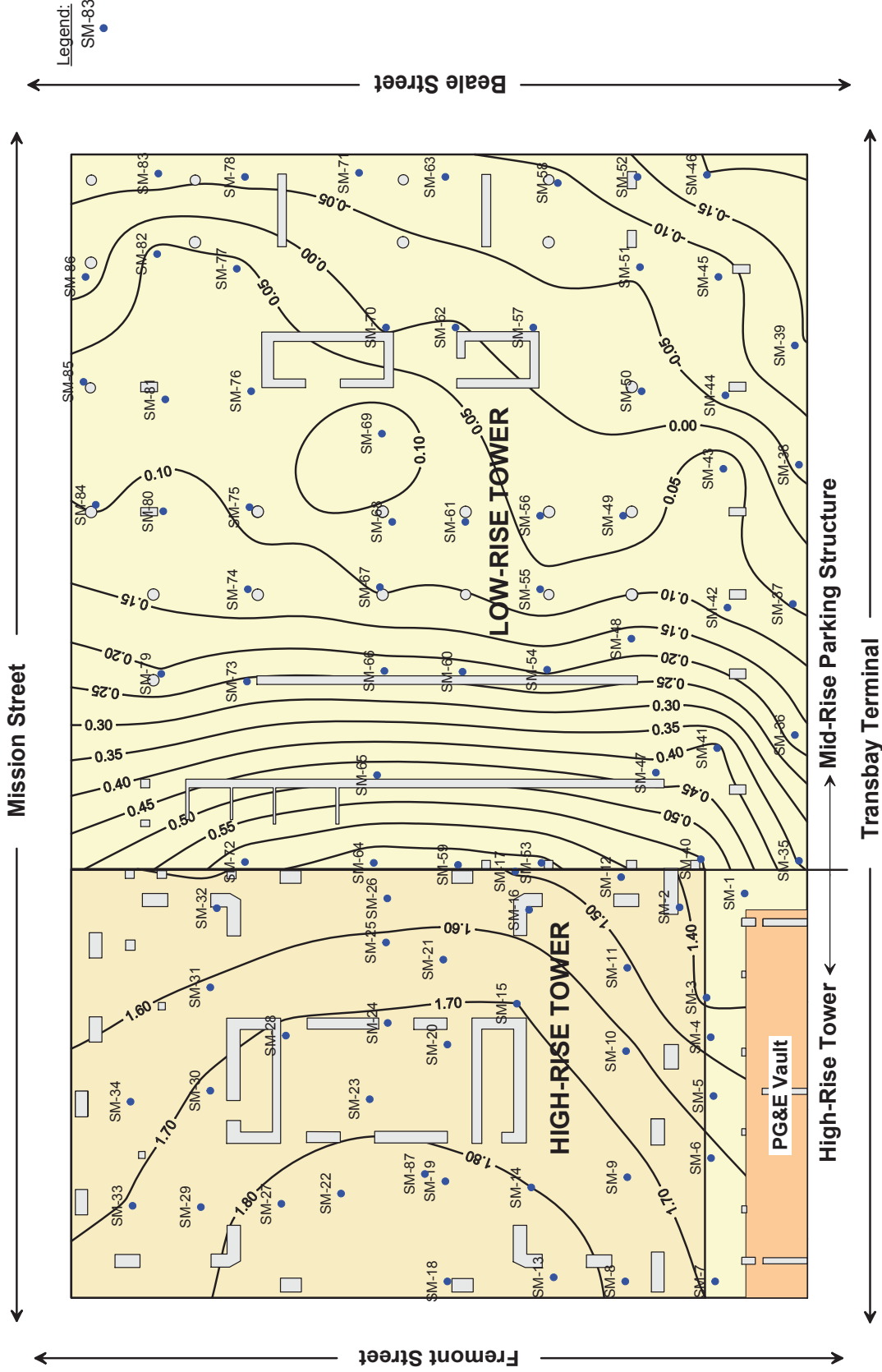
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

October 2011

ARUP

PLATE 2

Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on September 8, 2011.
 Level B-1 at Mid-Rise Parking Structure is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.

Notes:

Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on September 8, 2011.

Level B-1 at Mid-Rise Parking Structure is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

The PG&E vault is inaccessible for monitoring.

Negative values of settlement (within Low-rise Tower) indicate uplift.

Approximate Scale: 1" = 25'

0 25 50 75

J:\S-F\1320001322424 Internal Project Data\4-06 Reports & Narratives\145-301 Mission - September Survey\Plates\Elevation changes AI (2011.09.09).srf

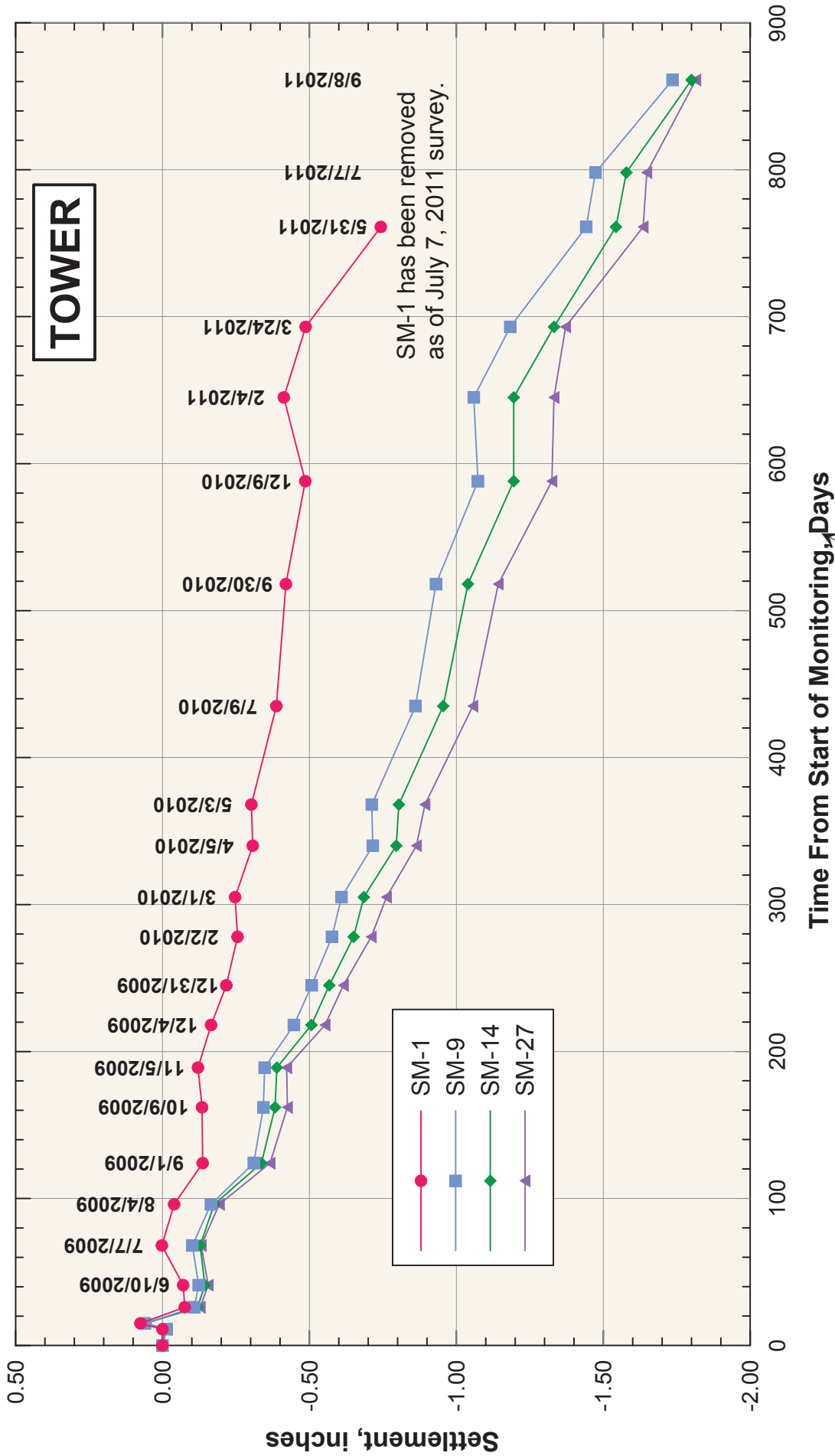
October 2011

Transbay Joint Powers Authority
 301 Mission Monitoring
 Transbay Transit Center
 San Francisco, California

ARUP

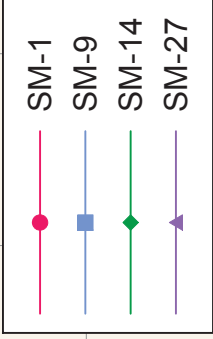
PLATE 3

CONTOURS OF SETTLEMENTS MEASURED AT THE
 FIRST LEVEL BASEMENT OF THE 301 MISSION STREET
 STRUCTURE BETWEEN APRIL 30, 2009 AND SEPTEMBER 8, 2011

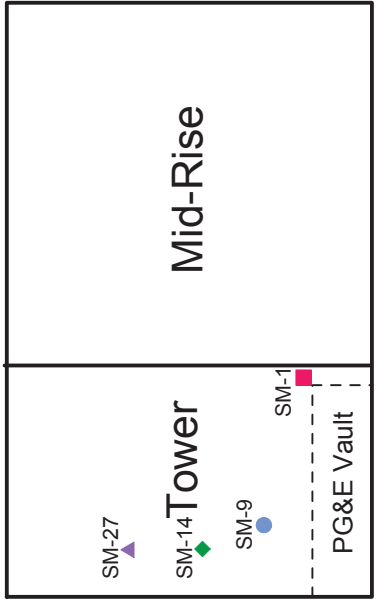


TOWER

SM-1 has been removed as of July 7, 2011 survey.



Time From Start of Monitoring, Days



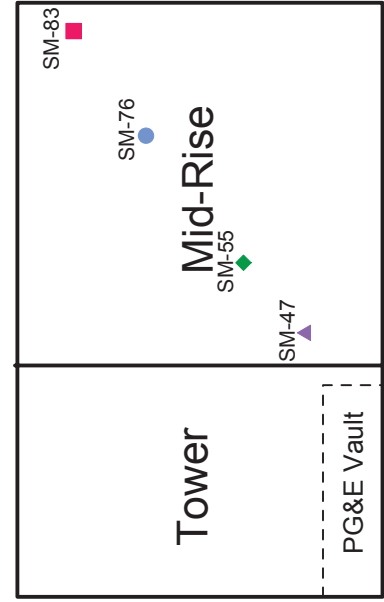
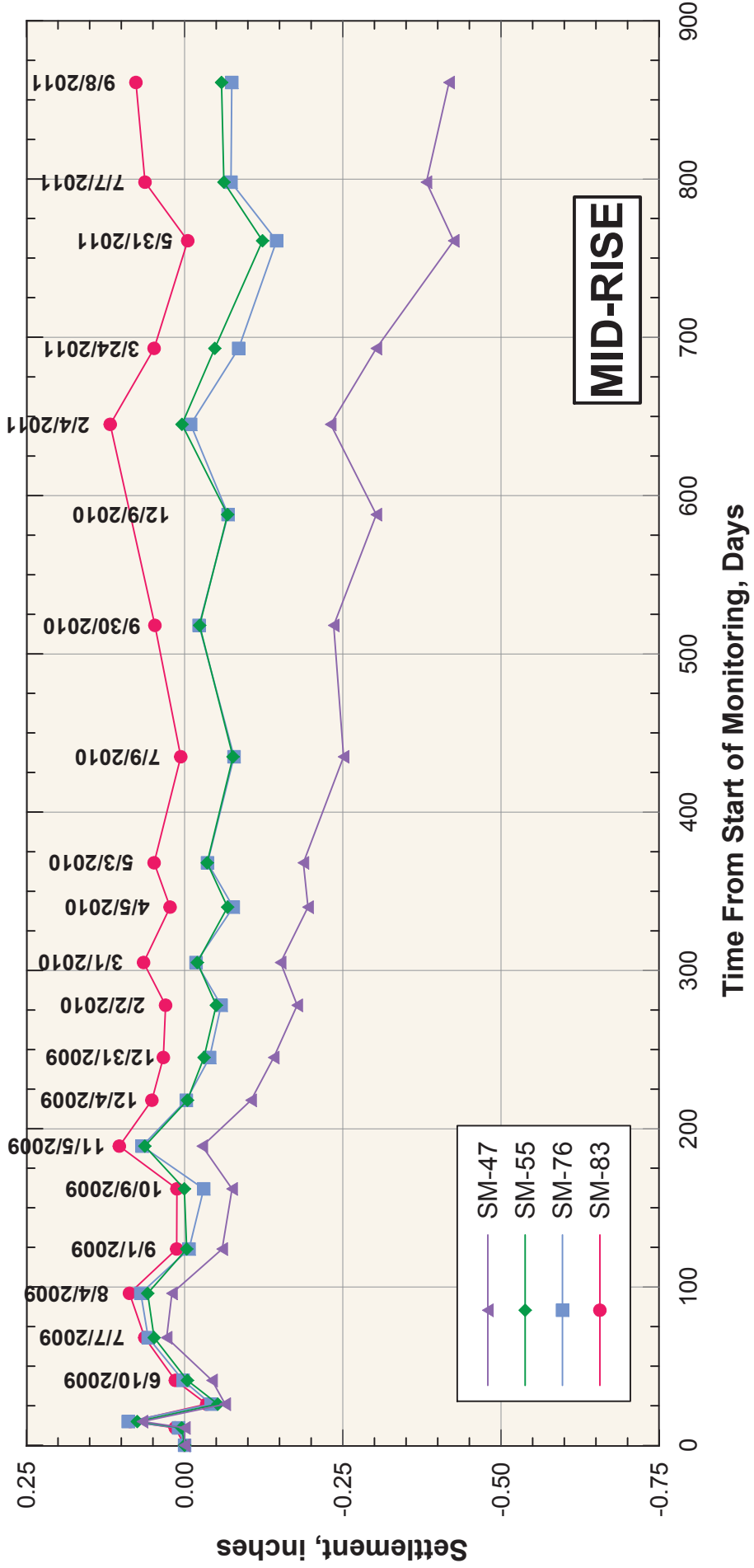
Note:
Initial (Baseline) reading taken on 04/30/09

SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH SEPTEMBER 8, 2011

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

October 2011

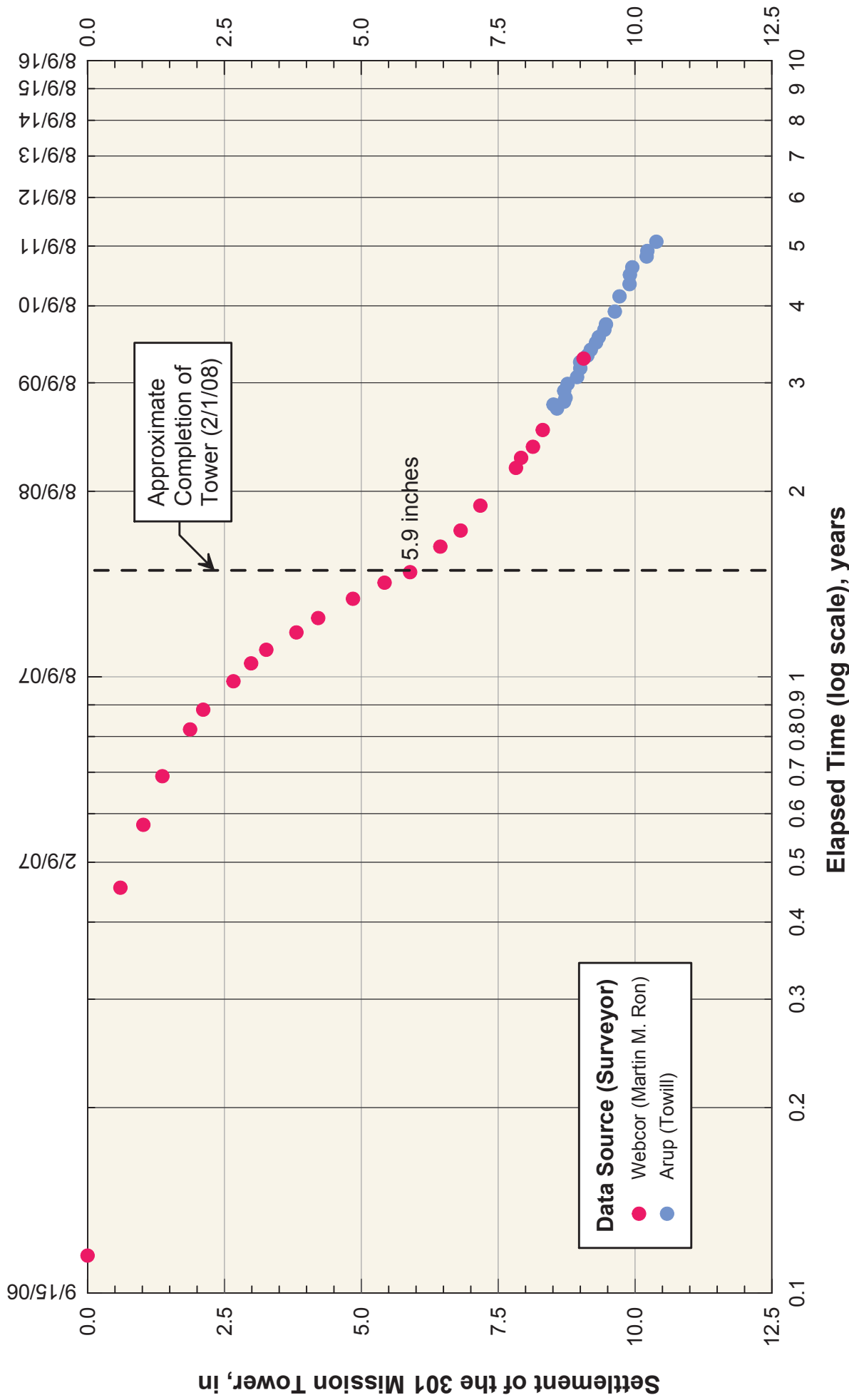
ARUP



Note:
Initial (Baseline) reading
taken on 04/30/09

October 2011
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California





Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

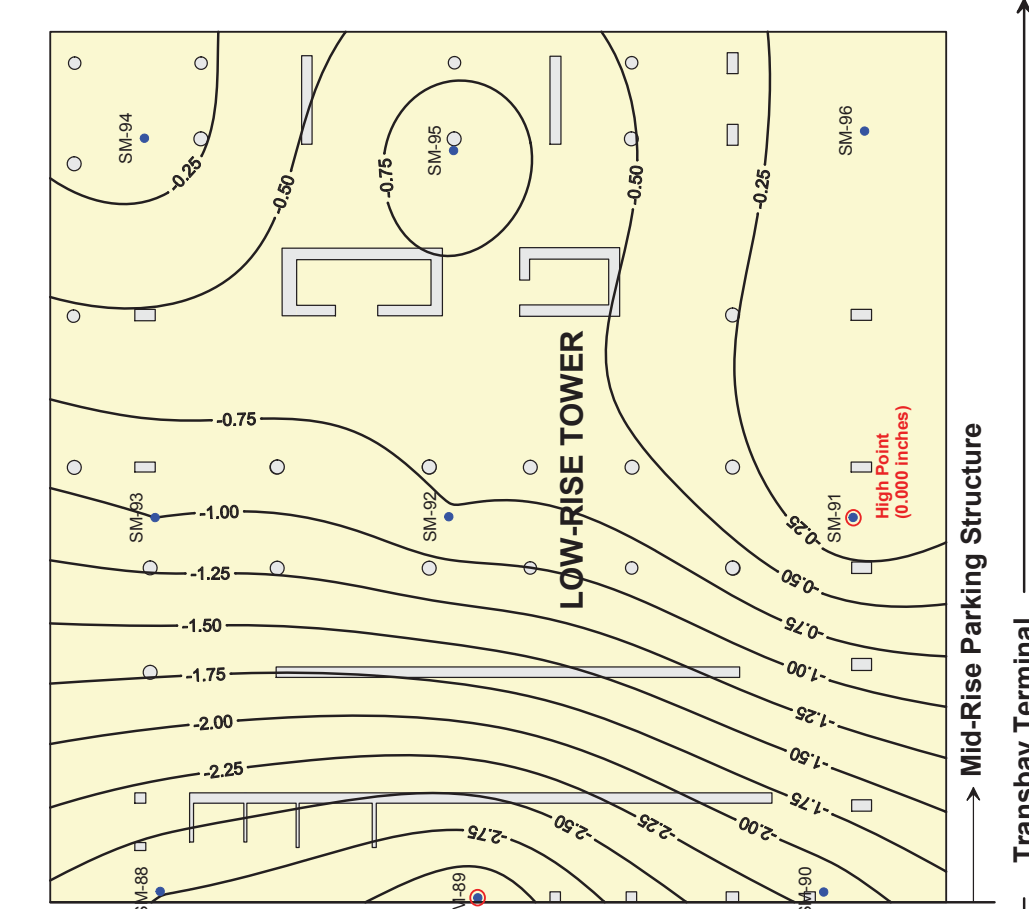
SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

October 2011



Mission Street



Mid-Rise Parking Structure

Transbay Terminal

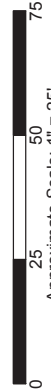
Date of Survey Reading:
September 8, 2011

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.268 feet (3.218 inches)

Fremont Street

Fremont Street



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on September 8, 2011.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: SEPTEMBER 8, 2011 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

October 2011

ARUP

PLATE 8

From: Brian Dykes <bdykes@transbaycenter.org>
Sent: Friday, October 28, 2011 8:27 AM
To: Steven Hood; John Luciano
Cc: Robert Beck; Rebecca Armenta
Subject: FW: 301 Mission - October Survey
Attachments: 2011-10-25 Memo_301 Mission Settlement - October 2011 Survey.pdf

Steven and John,
Attached above are the settlement readings taken on October 20, 2011.
This set of readings was taken on the same day that we poured the concrete for the 12th buttress pile.
I agree with the statement below that we have not found any increased settlements.
Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Tuesday, October 25, 2011 3:31 PM
To: Brian Dykes; Robert Beck; Emilio Cruz; 'Randy Volenec'; George Metzger
Cc: Nick O'Riordan; Kevin Clinch; DeeDee Maggi
Subject: 301 Mission - October Survey

Brian,

Please find the attached memo which summarizes the results of the October 20th survey of the settlement points in 301 Mission. We accelerated the survey date about 2 to 3 weeks in order to catch any negative consequences from the buttress installation. The results do not suggest an impact from the buttress construction activities.

The next survey is scheduled for the week of December 19th.

Let me know if you have any questions.

Cheers,
Stephen

Stephen McLandrich PE
Senior Engineer | Geotechnics Group

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA
t +1 415 957 9445 d +1 415 946 0245
f +1 415 957 9096 c +1 415 310 1095
www.arup.com

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	25 October 2011
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number	132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference	4-05 146
Subject	Transbay Transit Center: Results of October 2011 Settlement Survey at 301 Mission Property	Page	1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated October 25, 2011 with measurements made through October 2011.

Note Typo: should refer to "October 10, 2011" report

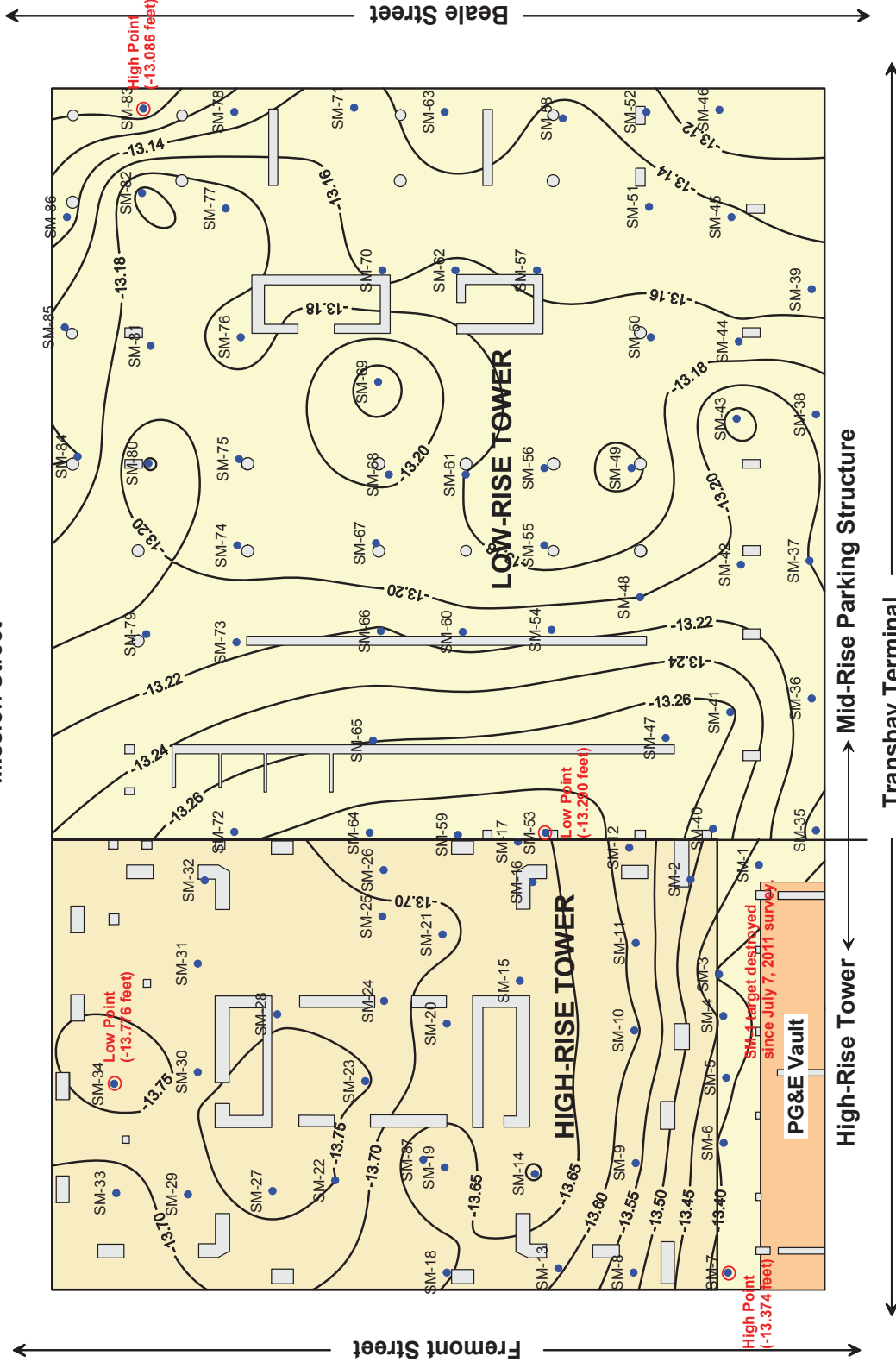
List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – October 20, 2010
- Plate 2 Differential Floor Elevation (Inches) – October 20, 2010 Survey
- Plate 3 Contours of Settlements Measured at the First Level Basement of the 301 Mission Street Structure Between April 30, 2009 and October 20, 2010
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through October 20, 2010.
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through October 20, 2010
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: October 20, 2011 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: October 20, 2011 Survey

Note Typo: references to "2010" on this page should read "2011"

Mission Street

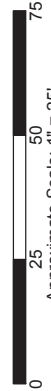
Fremont Street



Date of Survey Reading:
October 20, 2011

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.402 feet (4.824 inches)
Low-Rise Tower	0.204 feet (2.447 inches)

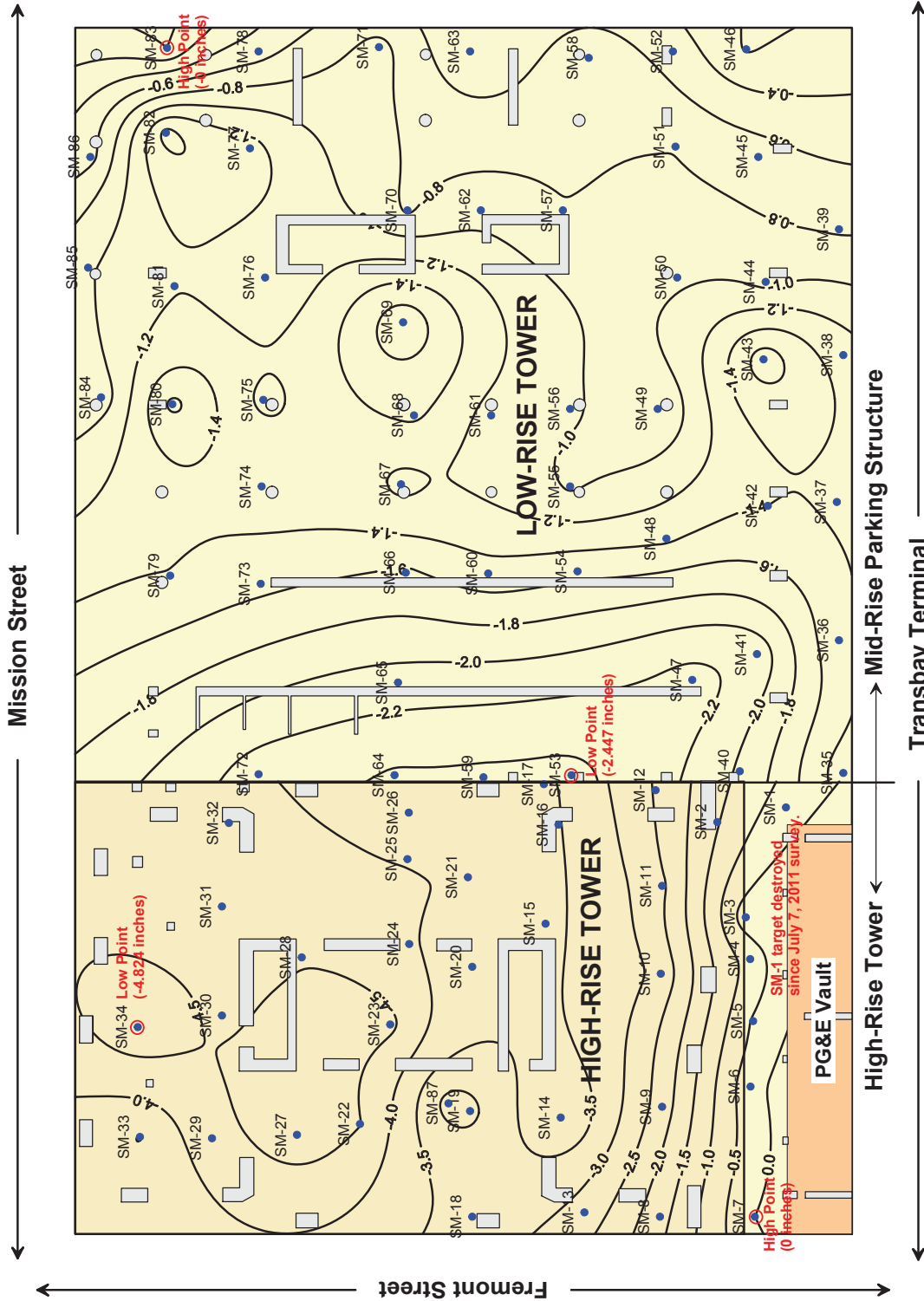


Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 20, 2011.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - OCTOBER 20, 2011
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

October 2011
ARUP
PLATE 1



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

**DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 OCTOBER 20, 2011 SURVEY**

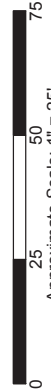
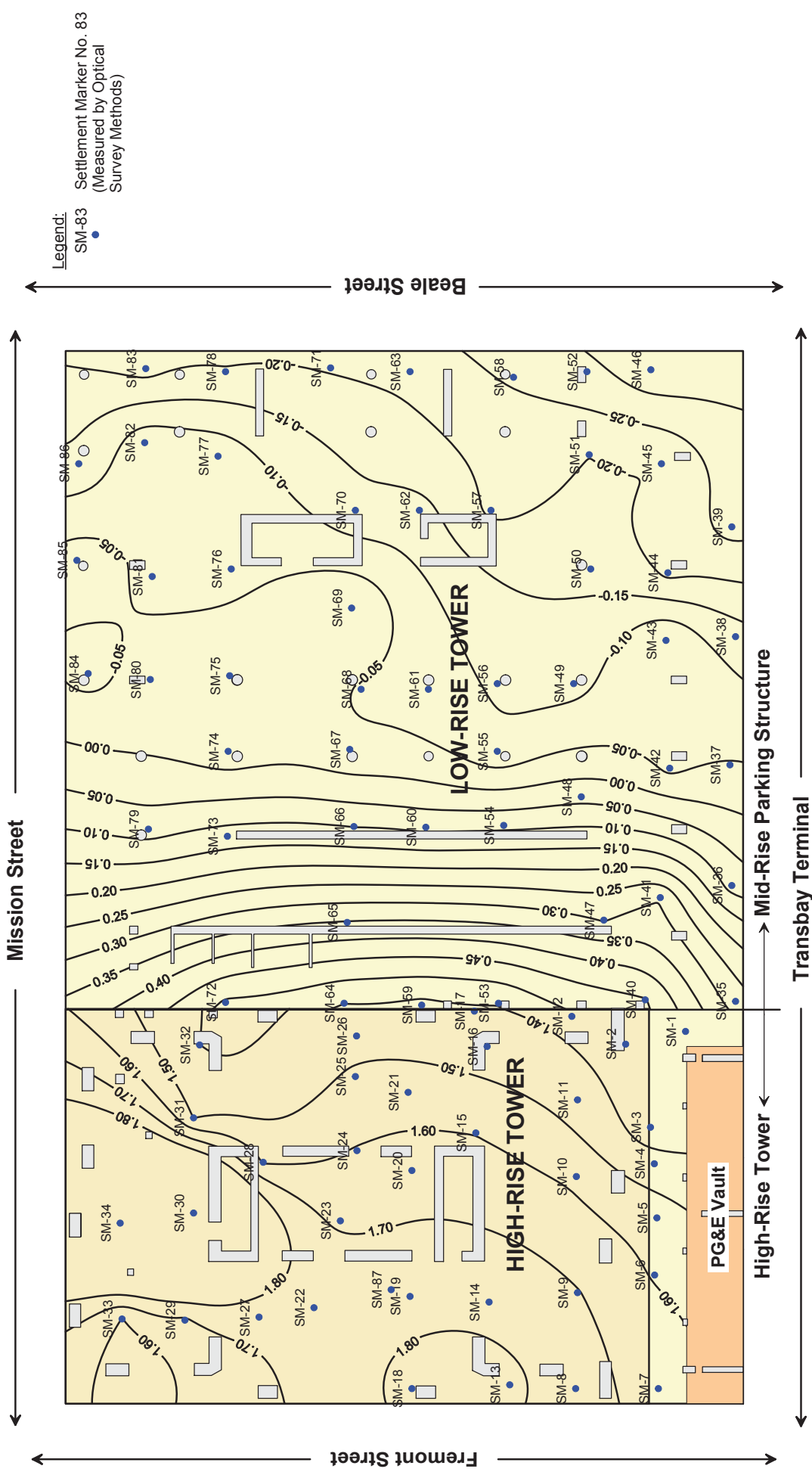
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

October 2011



Notes:

- Contours represent differential elevation, in inches, between the highest point and all other points taken on October 20, 2011.
- Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
- The PG&E vault is inaccessible for monitoring.
- Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.



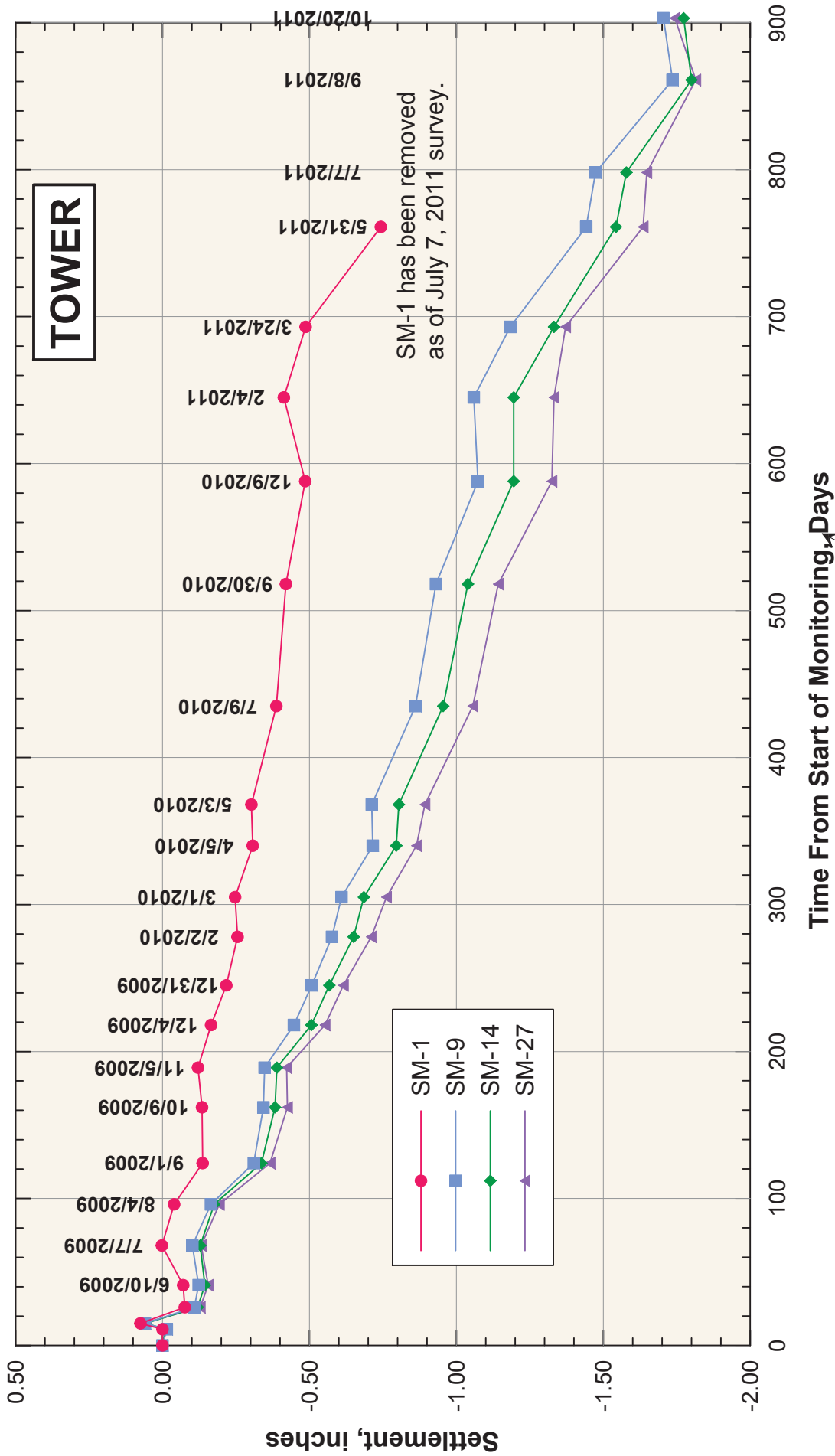
Approximate Scale: 1" = 25'

Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on October 20, 2011.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.

CONTOURS OF SETTLEMENTS MEASURED AT THE FIRST LEVEL BASEMENT OF THE 301 MISSION STREET STRUCTURE BETWEEN APRIL 30, 2009 AND OCTOBER 20, 2011
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

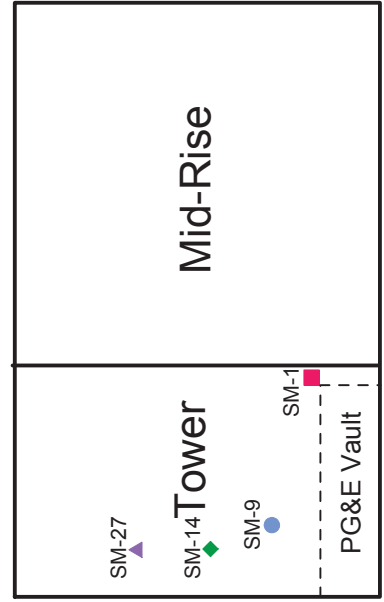
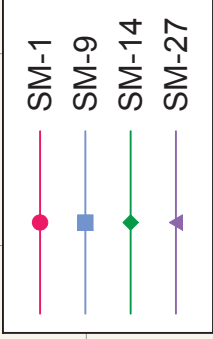
October 2011





TOWER

SM-1 has been removed as of July 7, 2011 survey.



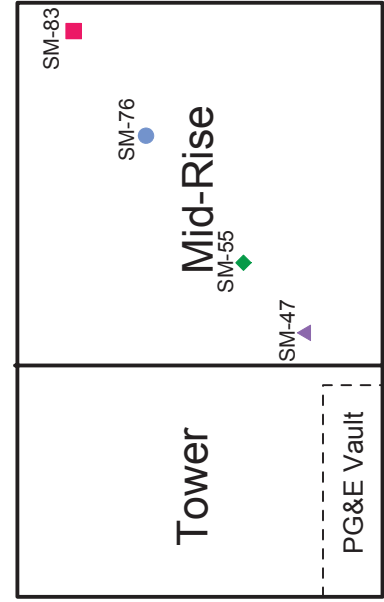
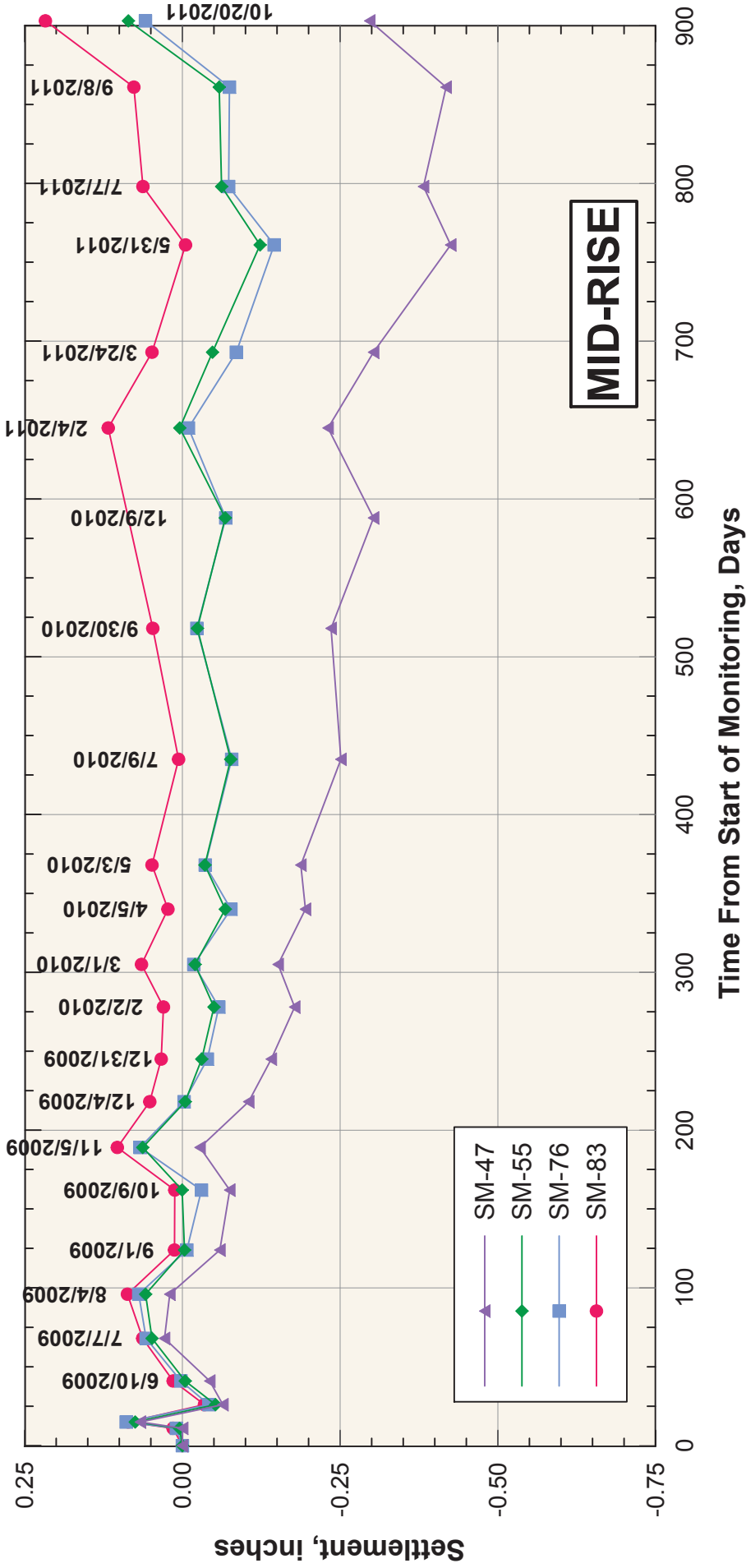
Note:
Initial (Baseline) reading taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH OCTOBER 20, 2011**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

October 2011

ARUP

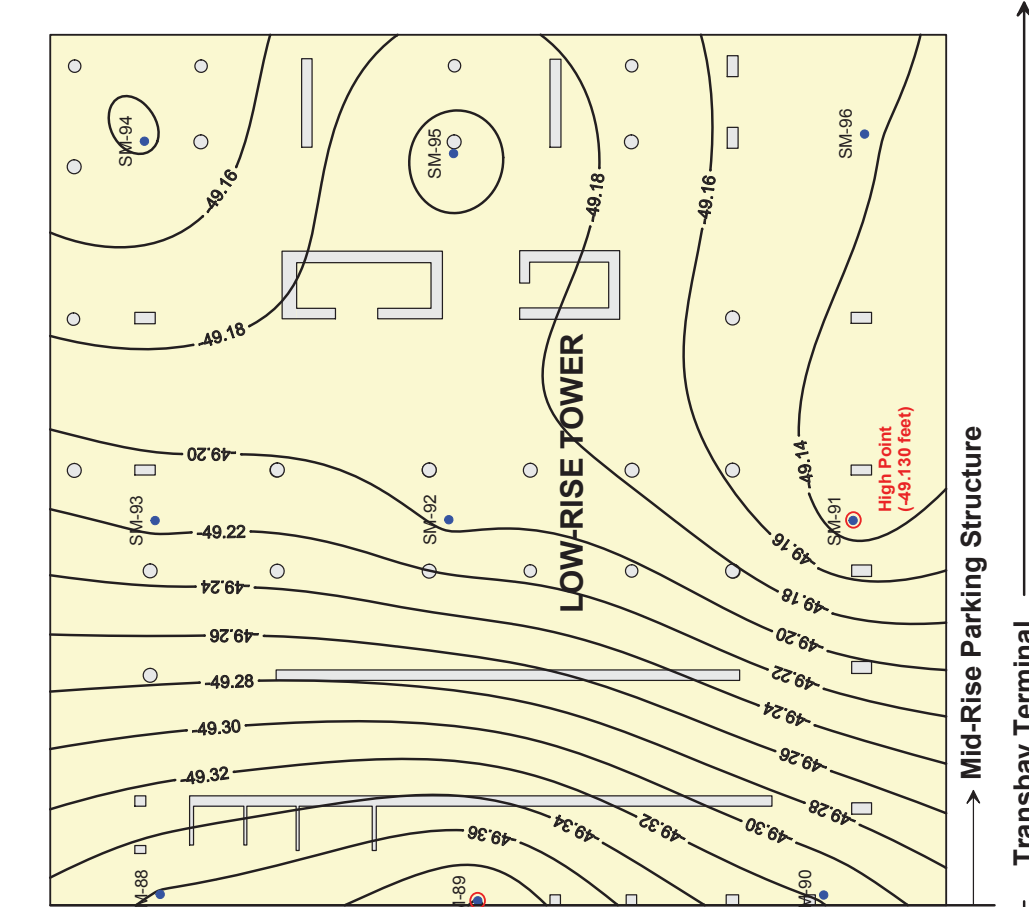


Note:
Initial (Baseline) reading
taken on 04/30/09

October 2011
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California



Mission Street



Date of Survey Reading:
October 20, 2011

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

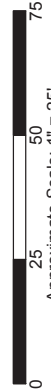
Maximum Differential
B-5 Level Basement
0.271 feet (3.252 inches)

Fremont Street

Beale Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on September 8, 2011.



Approximate Scale: 1" = 25'

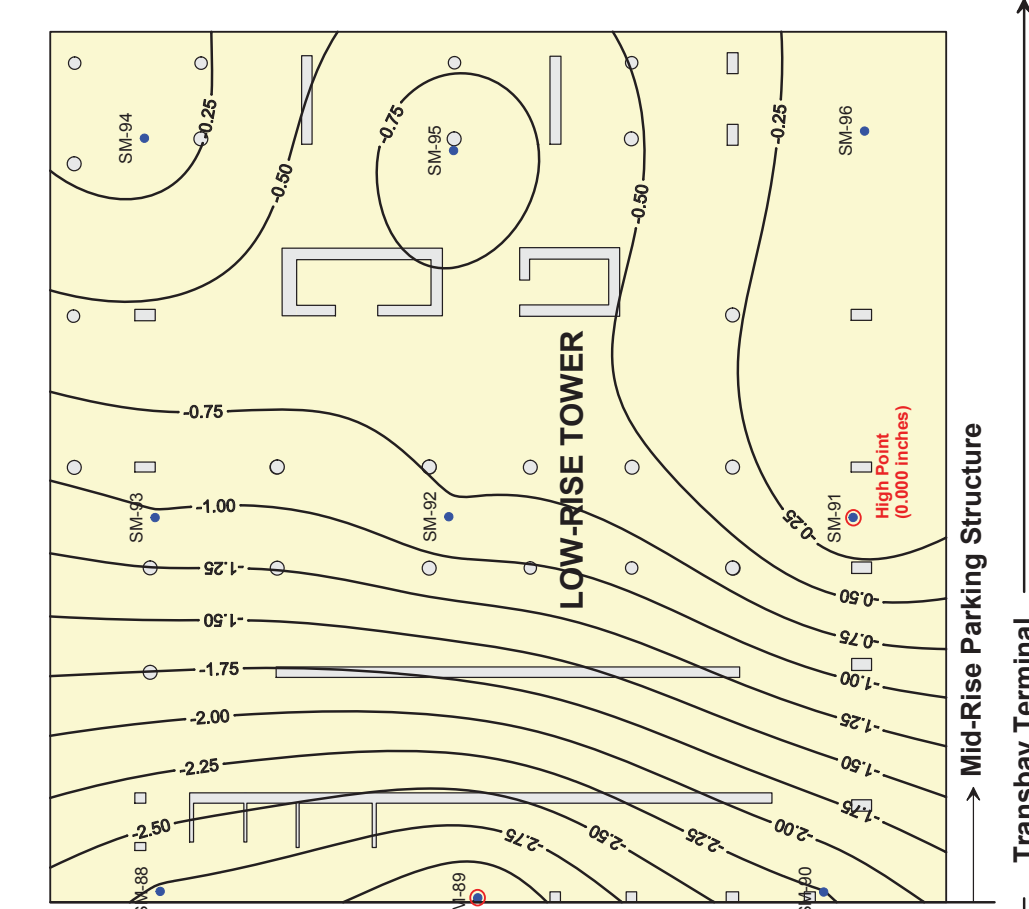
J:\S\F\1320004\1322424 Internal Project Data\4-05 Reports & Narratives\46-301 Mission - Oct 2011 Survey\PlatesB-5 Elevations (2011.10.20).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: OCTOBER 20, 2011 SURVEY
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California
October 2011



PLATE 7

Mission Street



Date of Survey Reading:
October 20, 2011

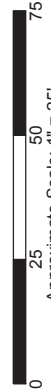
Legend:
 SM-88 Settlement Marker No. 88
 (Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.271 feet (3.252 inches)

Fremont Street



Notes:
 Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 20, 2011.



Approximate Scale: 1" = 25'



From: Brian Dykes <bdykes@transbaycenter.org>
Sent: Monday, January 23, 2012 3:52 PM
To: Steven Hood; John Luciano
Cc: Robert Beck; Nick O'Riordan; Stephen McLandrich; Rebecca Armenta
Subject: Monitoring Records at 301 Mission Street
Attachments: 2011-12-23 Memo_301 Mission Settlement - December 2011 Survey.pdf; 2012-01-20 Memo_Crack Gauge Survey.pdf

Steve and John,

Attached above are the following two memoranda from Arup:

1. December 23rd memo on settlement marker readings which on plate 6 (page 7 of 9) show the same rate of settlement as recorded over the last 3 years.
2. January 20th memo on crack gauge readings recorded in late December and early January which record the movements over the last 6 to 18 months since the gauges were installed. No significant movements were observed except at those markers highlighted in deep red on plates 1-4 (pages 14-18). Most of these highlighted crack widths increased by 0.5 mm in the zones towards the two southern corners of the tower basement. However, the maximum observed increase is 1.1 mm at Mission Street on the north side of the basement.

Presently, Arup is preparing another series of memoranda which I expect to forward to you in early February. These will cover the following areas of measurements:

1. Tape extensometers between building columns.
2. Tilt meters inside the building.
3. Utility crossings between the tower and the atrium.
4. Utility penetrations from the sidewalks into the building.
5. Inclinator readings on the south outside the building.
6. Piezometers reading ground water levels around the outside of the building.

Regards, Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	23 December 2011
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number	132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference	4-05 150
Subject	Transbay Transit Center: Results of December 2011 Settlement Survey at 301 Mission Property Page 1 of 1		

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated October 25, 2011 with measurements made through December 2011.

Settlement Markers SM-01 and SM-02 were destroyed during patching of the floor in their locations. These two points will be replaced by four additional settlement markers, SM-97 through SM-100. Currently, only SM-97 and SM-98 have been installed due to additional floor patching work. Their locations can be seen in the floor plan in Plate 1.

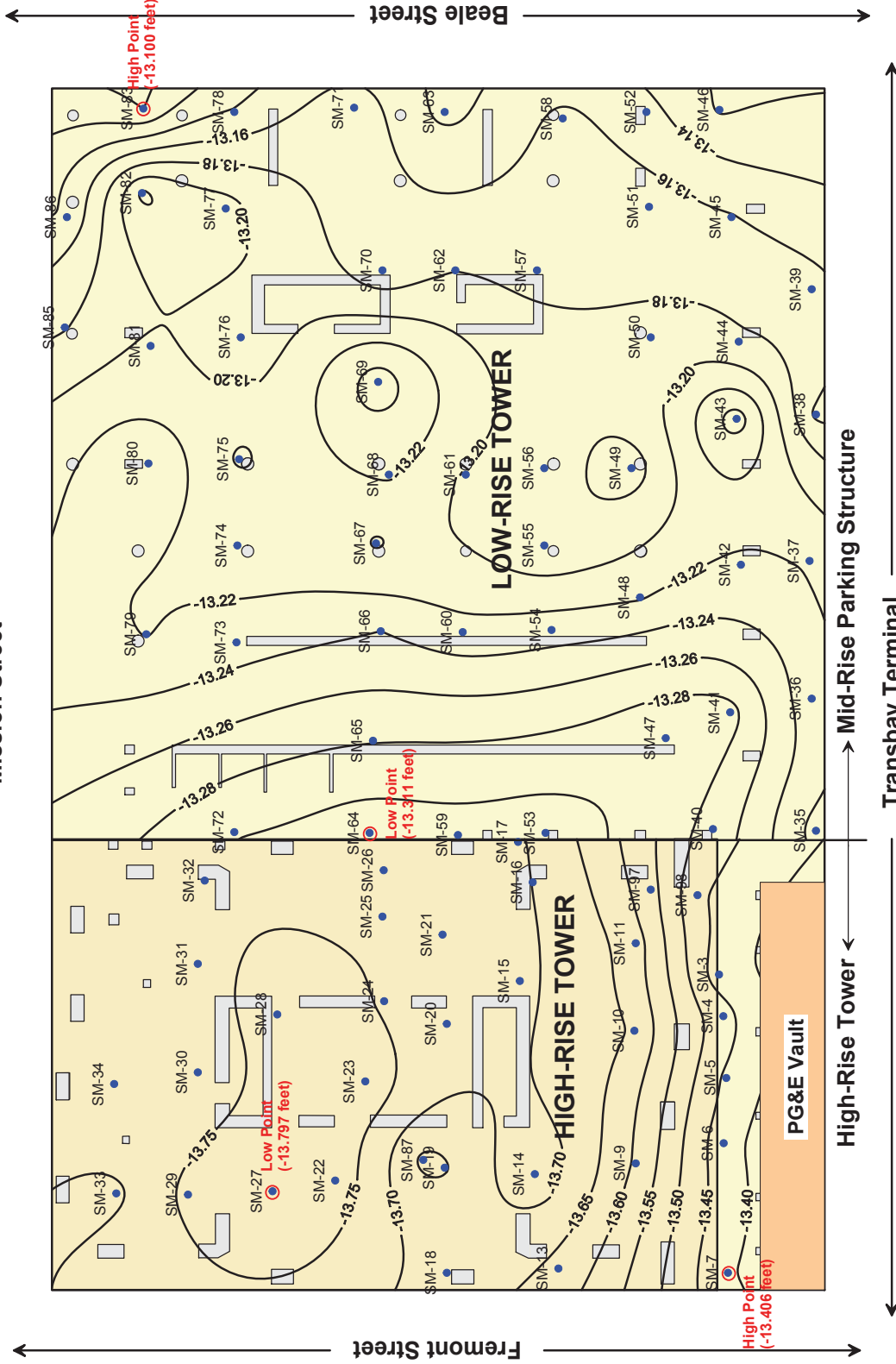
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Note Typo: references to "2010"
on this page should read "2011"

Mission Street

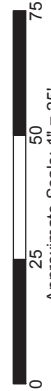
Fremont Street



Date of Survey Reading:
December 14, 2011

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical
Survey Methods)

Maximum Differential	
High-Rise Tower	Low-Rise Tower
0.392 feet (4.700 inches)	0.211 feet (2.533 inches)



Approximate Scale: 1" = 25'

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on December 14, 2011.

Level B-1 at Mid-Rise Parking Structure is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - DECEMBER 14, 2011

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

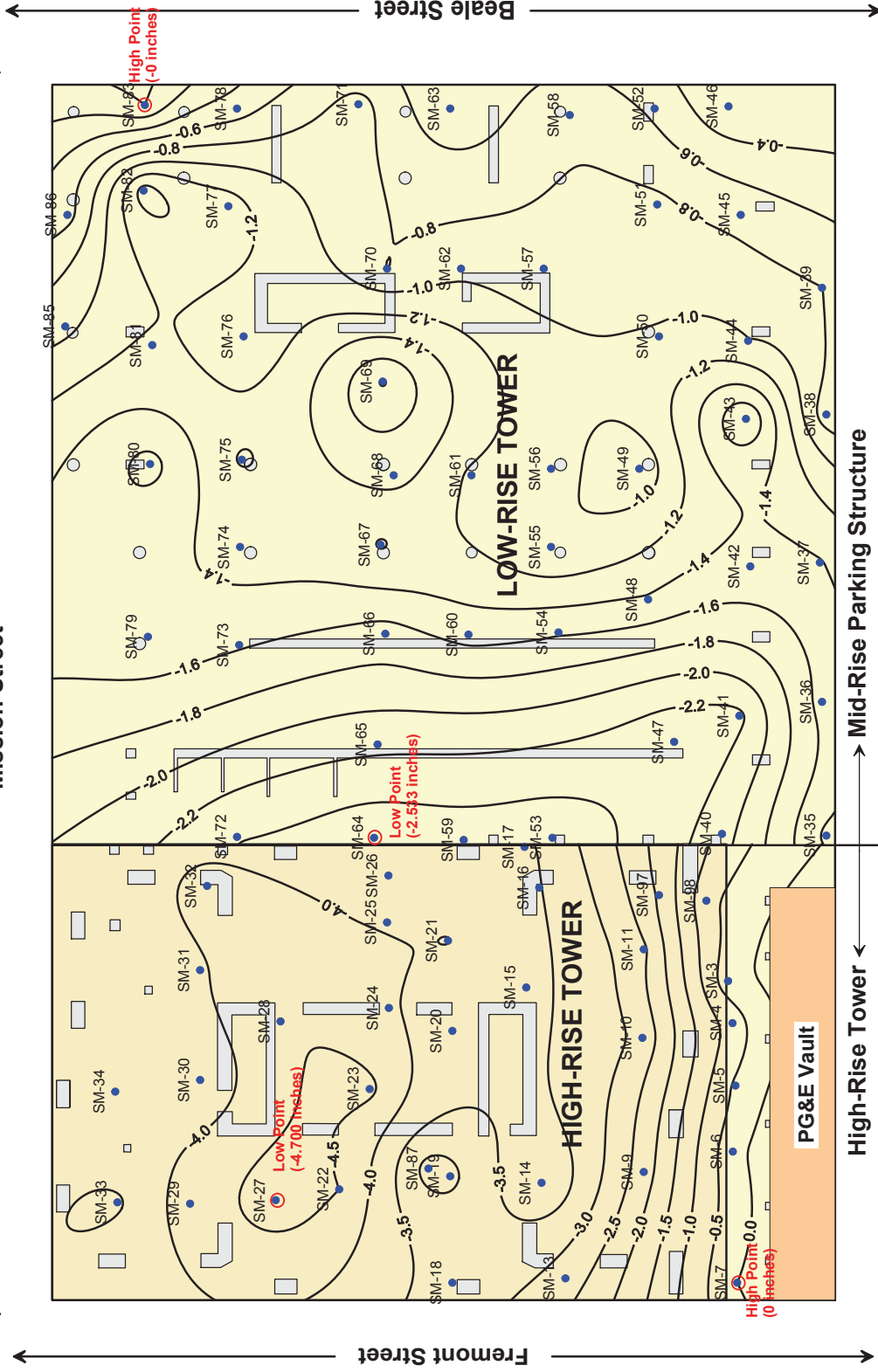
December 2011

ARUP

PLATE 1

Mission Street

Fremont Street



High-Rise Tower

Low-Rise Tower

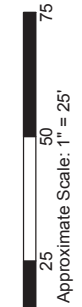
Mid-Rise Parking Structure

PG&E Vault

High-Rise Tower

Mid-Rise Parking Structure

Transbay Terminal



Notes:

- Contours represent differential elevation, in inches, between the highest point and all other points taken on December 14, 2011.
- Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
- The PG&E vault is inaccessible for monitoring.
- Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

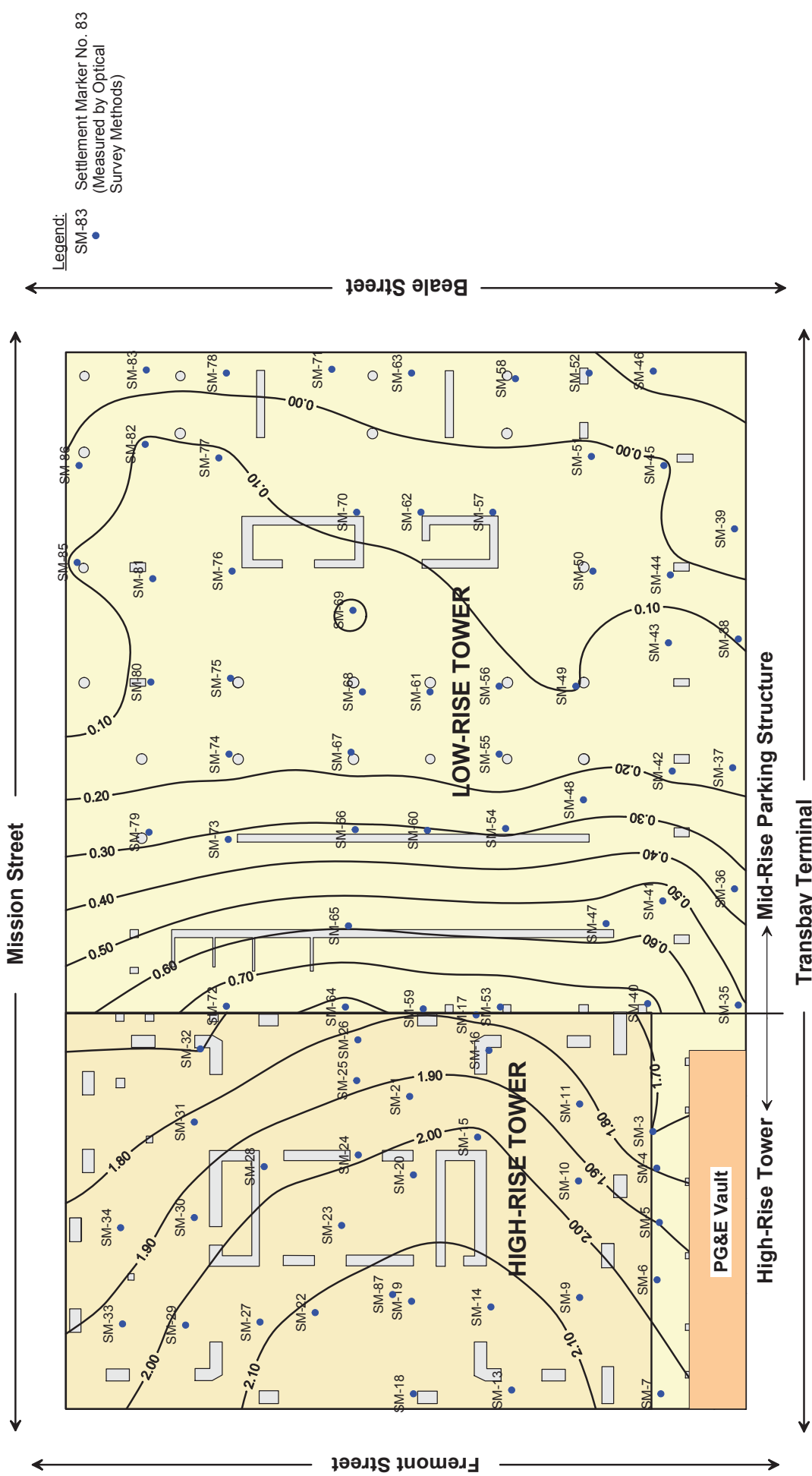
Legend:

- SM-83 Settlement Marker No. 83 (Measured by Optical Survey Methods)

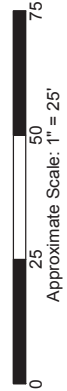
DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
DECEMBER 14, 2011 SURVEY
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

December 2011
ARUP

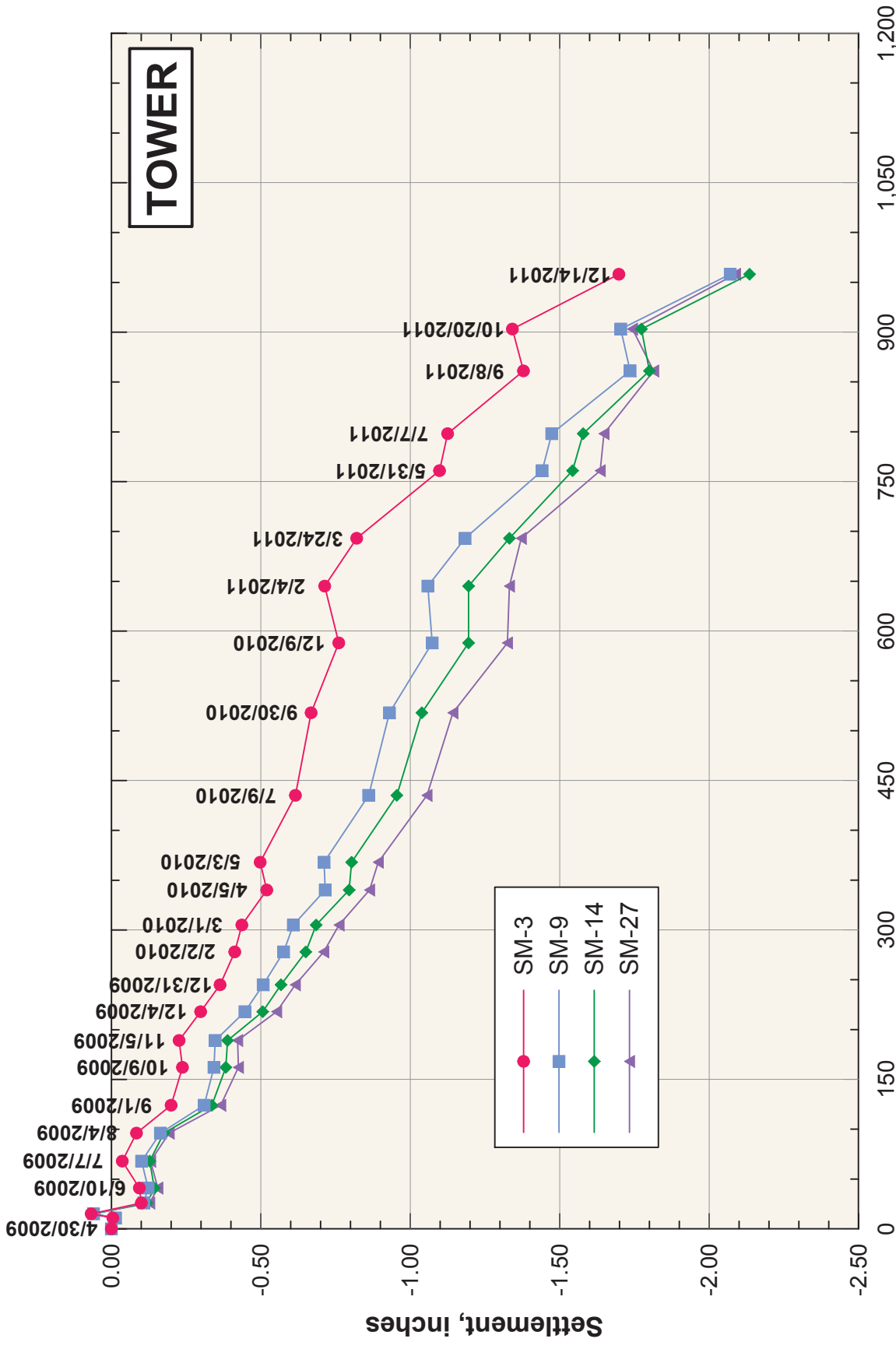
PLATE 2



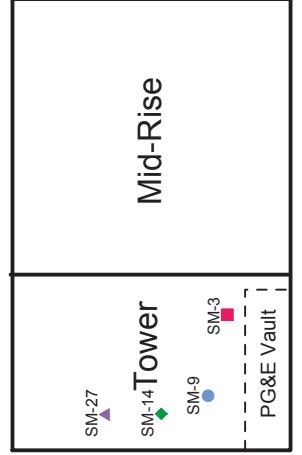
Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on December 14, 2011.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.



CONTOURS OF SETTLEMENTS MEASURED AT THE FIRST LEVEL BASEMENT OF THE 301 MISSION STREET STRUCTURE BETWEEN APRIL 30, 2009 AND DECEMBER 14, 2011



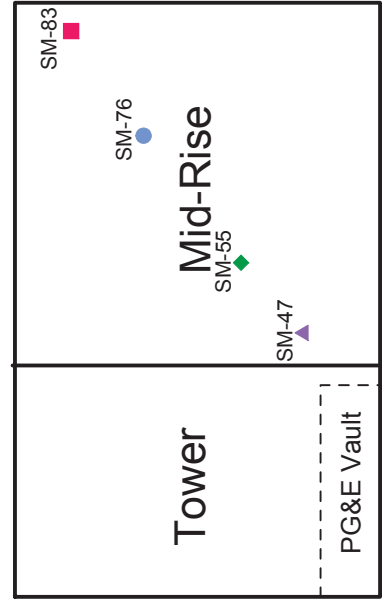
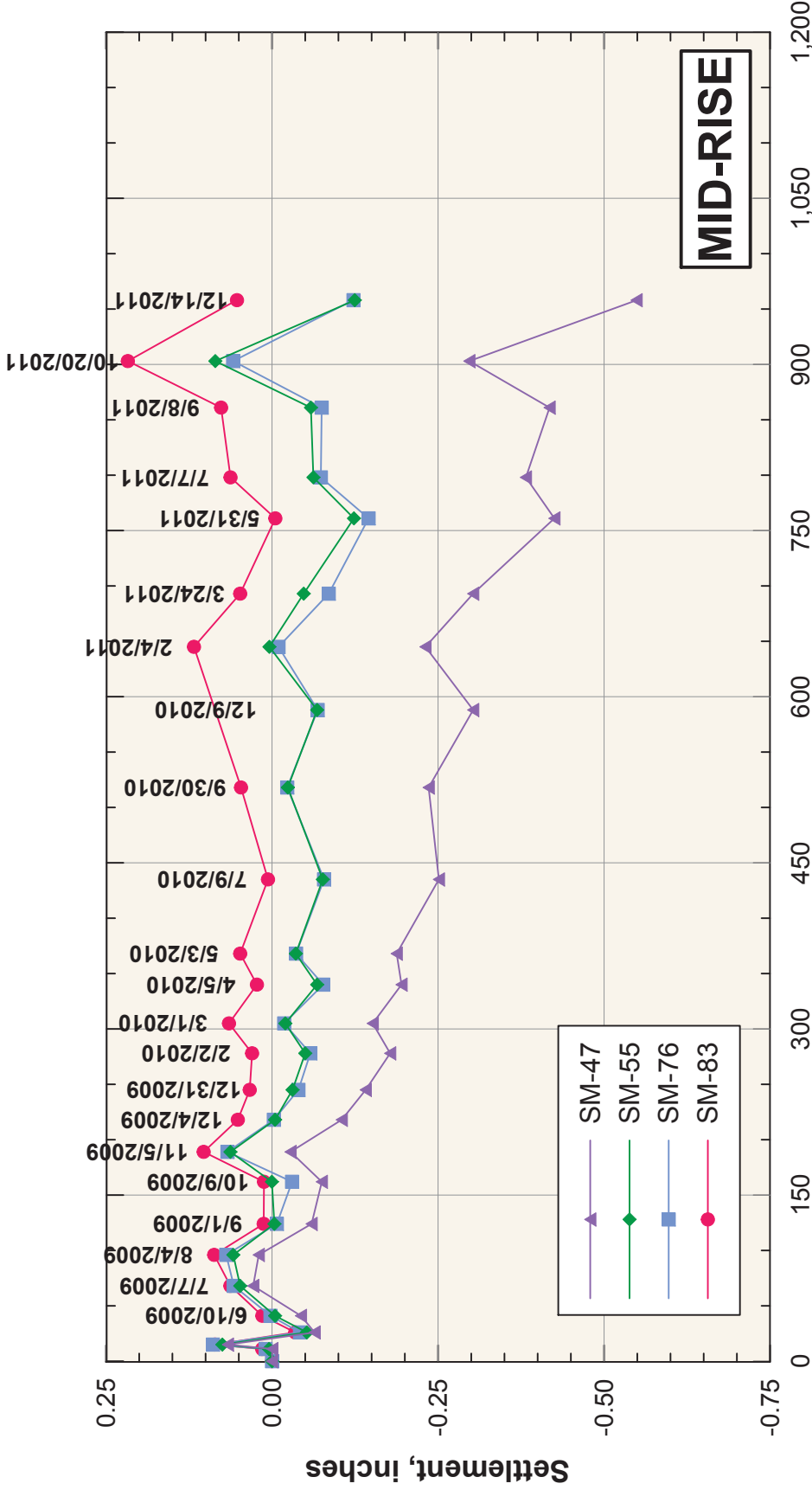
SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH DECEMBER 14, 2011



Note:
Initial (Baseline) reading
taken on 04/30/09

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California





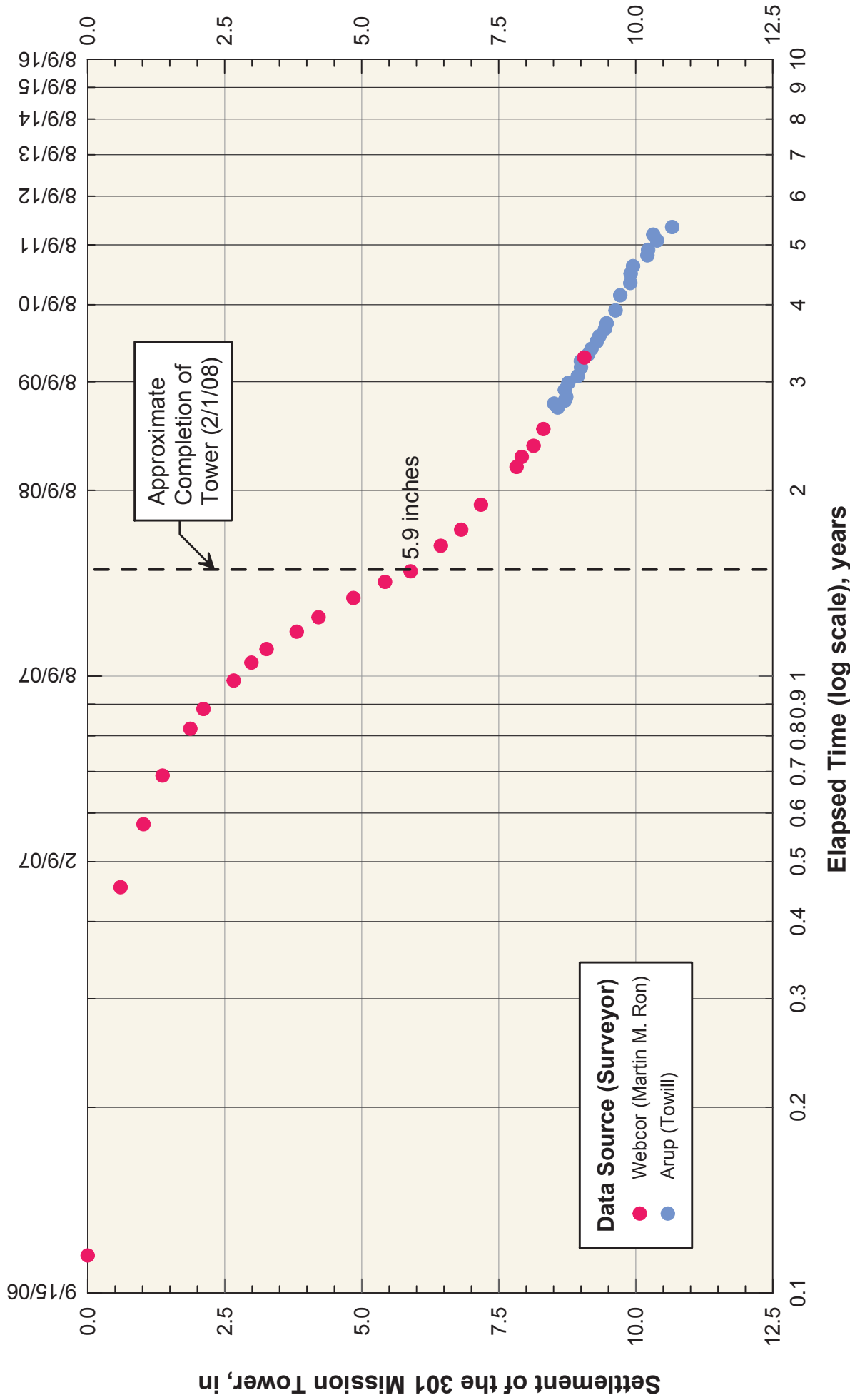
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH DECEMBER 14, 2011**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

December 2011





Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

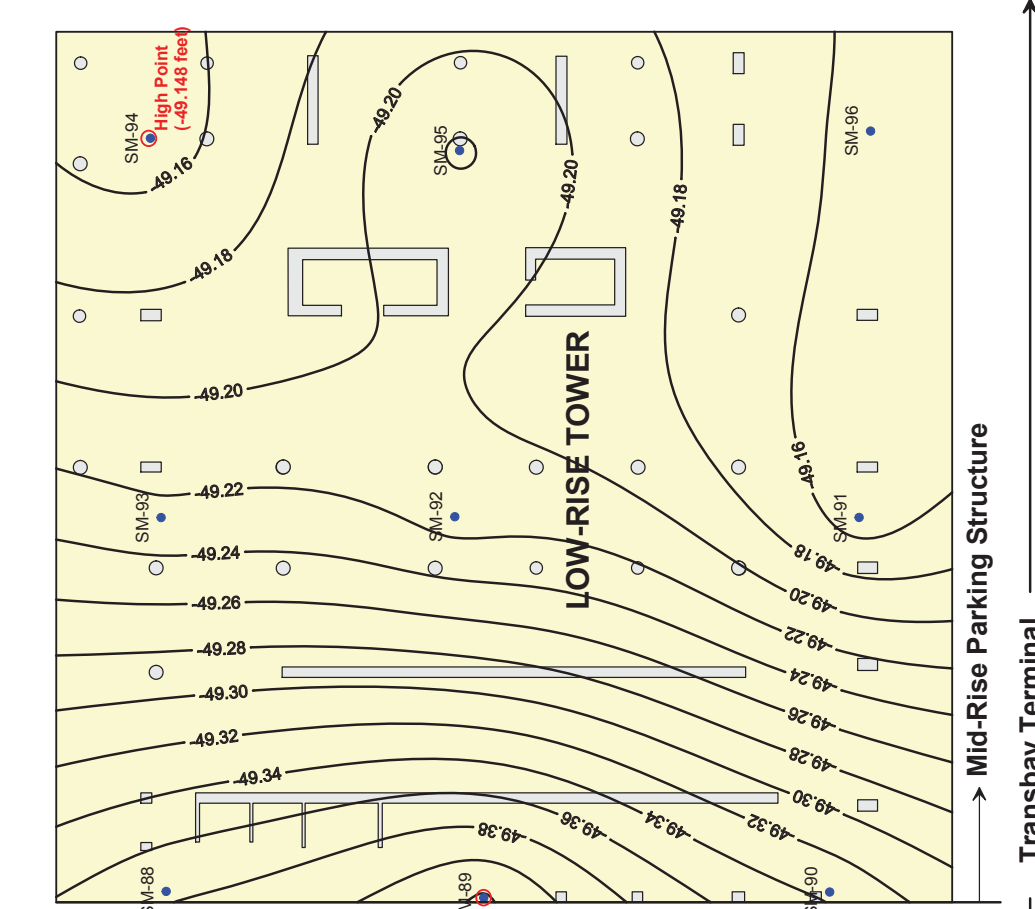
SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

December 2011



Mission Street



Date of Survey Reading:
December 14, 2011

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.275 feet (3.298 inches)

Beale Street

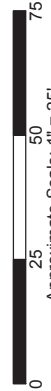
Fremont Street

Mid-Rise Parking Structure

Transbay Terminal

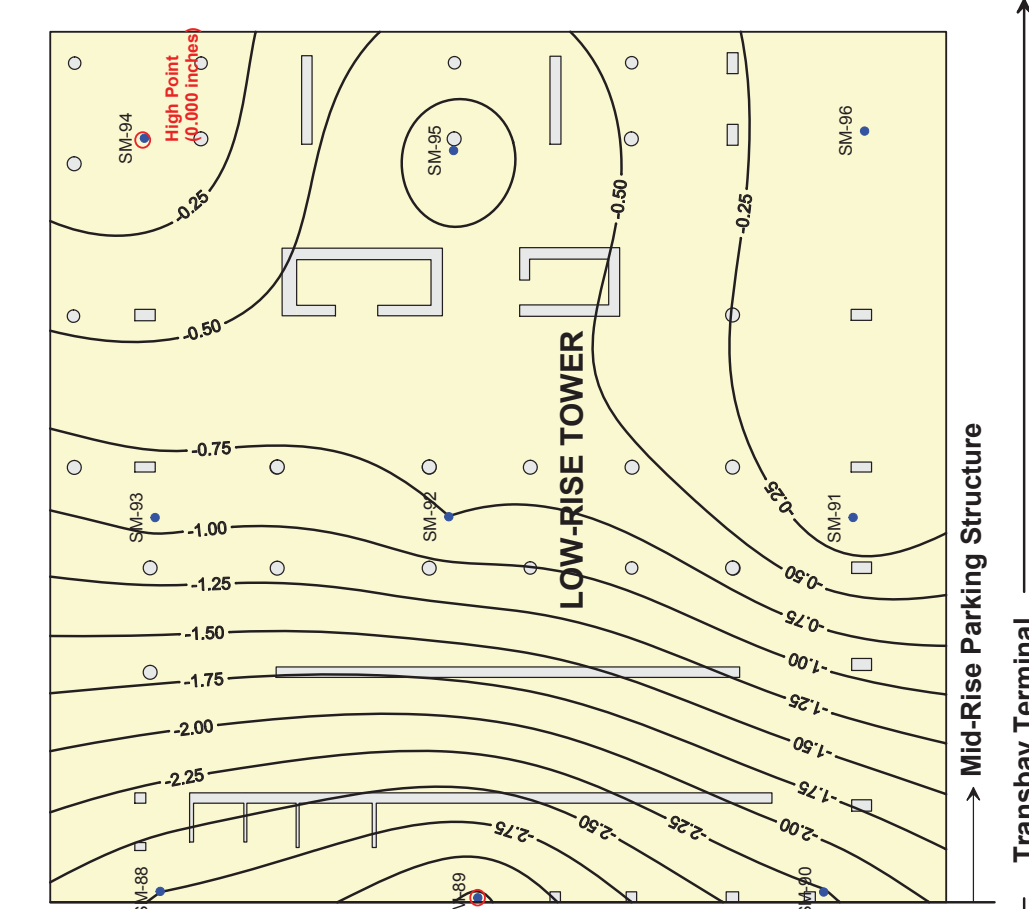


Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on December 14, 2011.



Approximate Scale: 1" = 25'

Mission Street



Date of Survey Reading:
December 14, 2011

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.275 feet (3.298 inches)

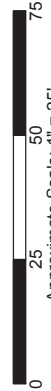
Fremont Street

Fremont Street

Beale Street

Mid-Rise Parking Structure

Transbay Terminal



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on December 14, 2011.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: DECEMBER 14, 2011 SURVEY
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

December 2011
ARUP

PLATE 8

From: Brian Dykes <bdykes@transbaycenter.org>
Sent: Tuesday, March 20, 2012 10:19 AM
To: Steven Hood; John Luciano
Cc: Robert Beck; Ed Sum; Nick O'Riordan
Subject: FW: 301 Mission Monitoring - March Survey
Attachments: 2012-03-07 Memo_301 Mission Settlement - March 2012 Survey.pdf

Steve,

Here are the latest settlement readings taken on March 7, 2011.

As shown on plate 6, the total maximum settlement recorded to date is now almost 11 inches and the average rate has not changed over the last four years.

Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Monday, March 19, 2012 6:32 PM
To: Brian Dykes
Cc: Robert Beck; rvolenec@pcparch.com; George Metzger; Emilio Cruz; Nick O'Riordan; Kevin Clinch; DeeDee Maggi
Subject: 301 Mission Monitoring - March Survey

Brian,

Here are the results of the latest monitoring survey of the settlement markers in the 301 Mission basement.

Let me know if you have any questions.

Regards,
Stephen

Stephen McLandrich PE GE
Senior Geotechnical Engineer

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA
t +1 415 957 9445 d +1 415 946 0245
f +1 415 957 9096 c +1 415 310 1095
www.arup.com

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date 19 March 2012
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference 4-05 160
Subject	Transbay Transit Center: Results of March 2012 Settlement Survey at 301 Mission Property	Page 1 of 1

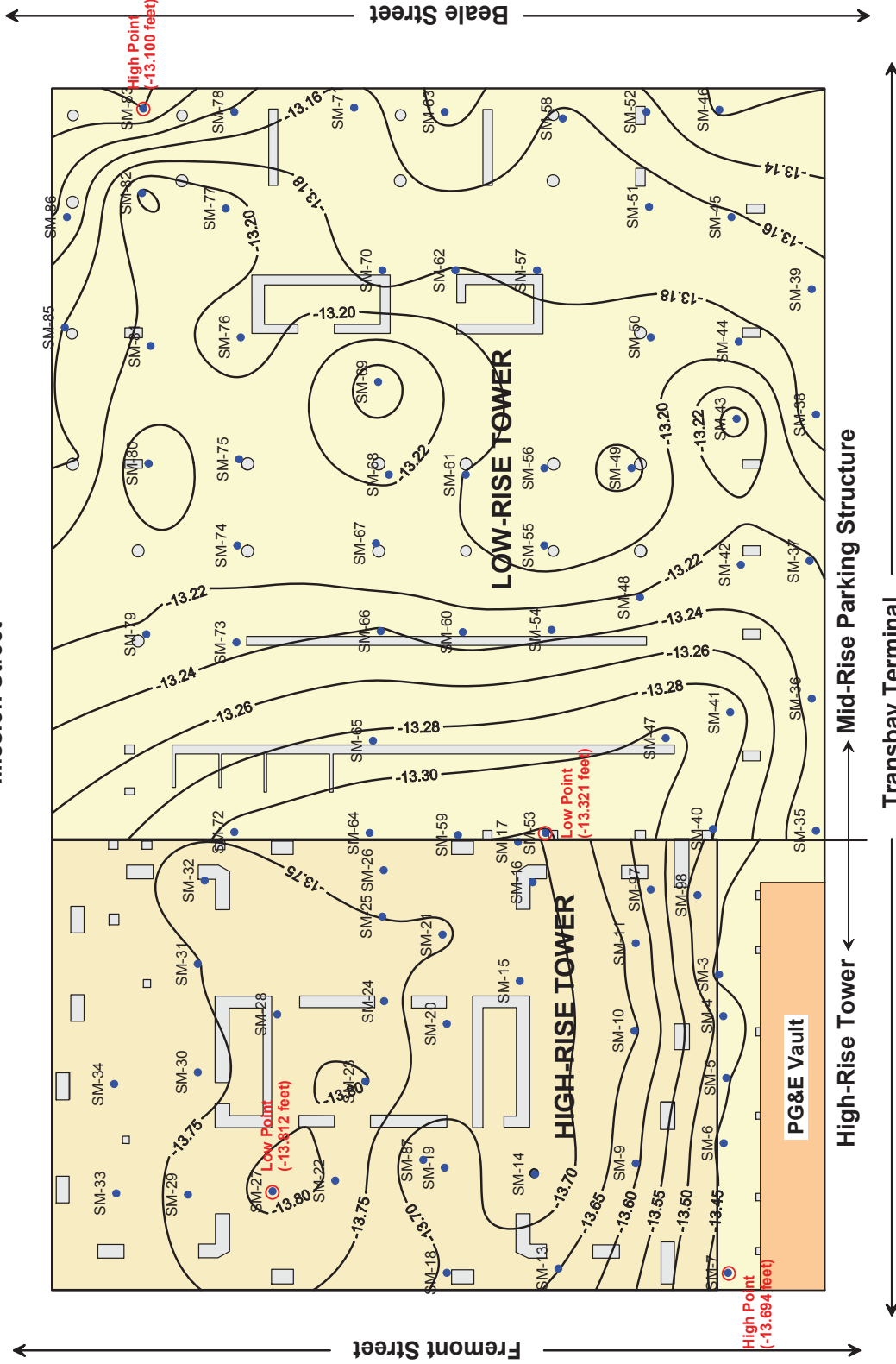
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Mission Street

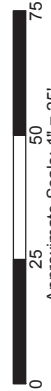
Fremont Street



Date of Survey Reading:
March 7, 2012

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.391 feet (4.694 inches)
Low-Rise Tower	0.221 feet (2.654 inches)



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on March 7, 2012.
Level B-1 at Mid-Rise Parking Structure is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - MARCH 7, 2012
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

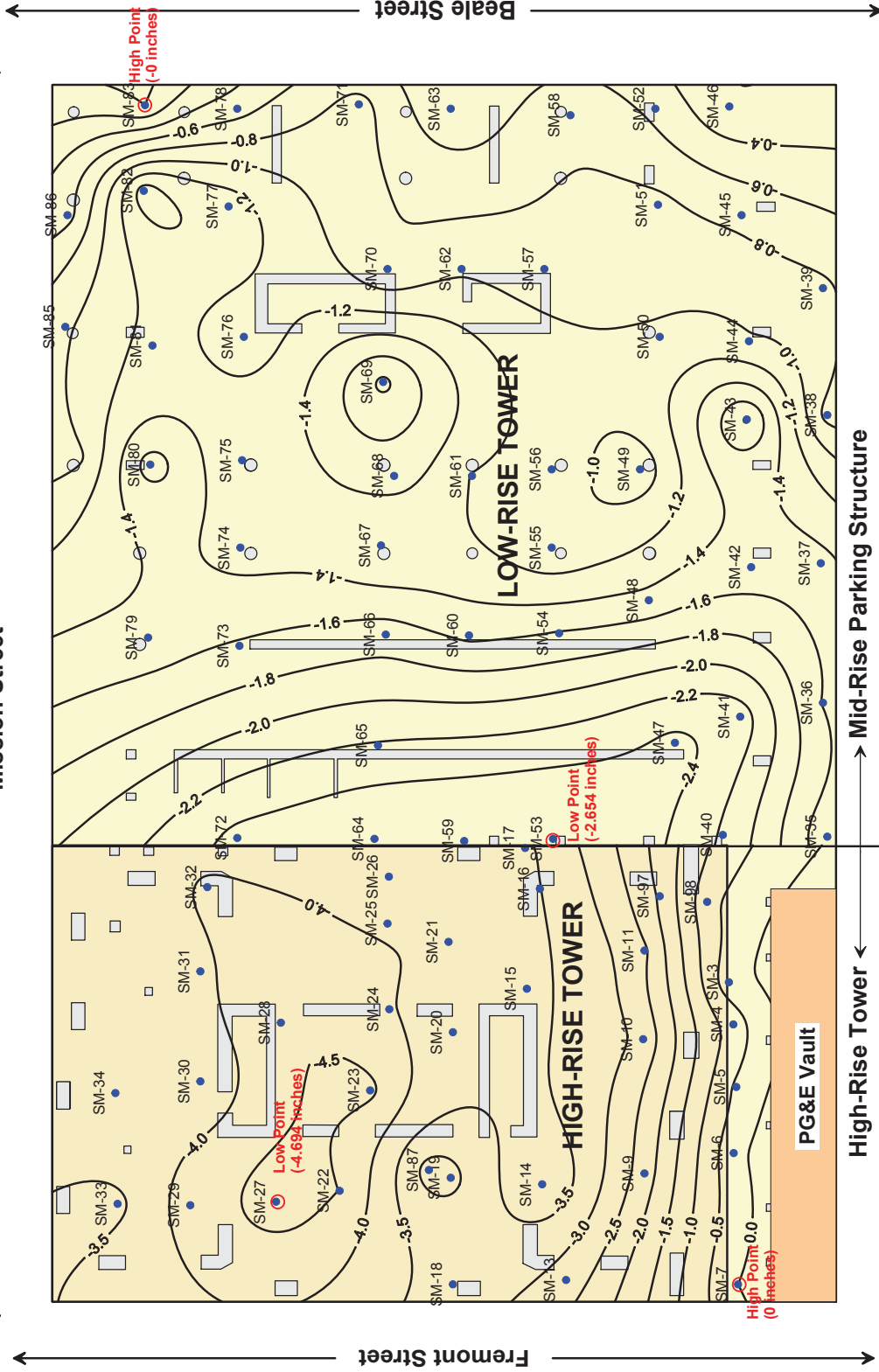
March 2012



PLATE 1

Mission Street

Fremont Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower ← Mid-Rise Parking Structure → Transbay Terminal



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on March 7, 2012.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

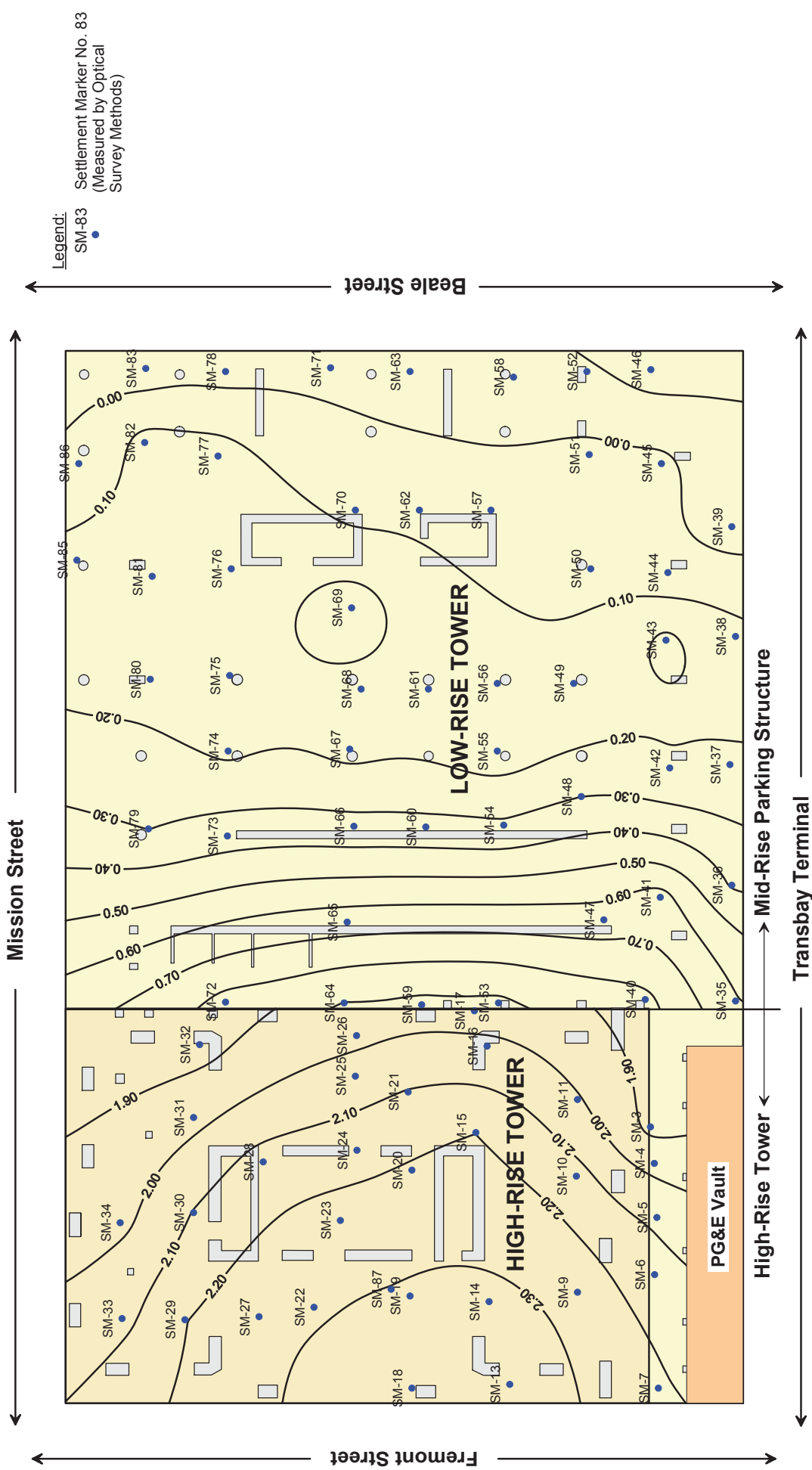
DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 MARCH 7, 2012 SURVEY

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

March 2012

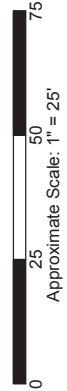
ARUP

PLATE 2



Notes:

- Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on March 7, 2012.
- Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
- The PG&E vault is inaccessible for monitoring.
- Negative values of settlement (within Low-rise Tower) indicate uplift.

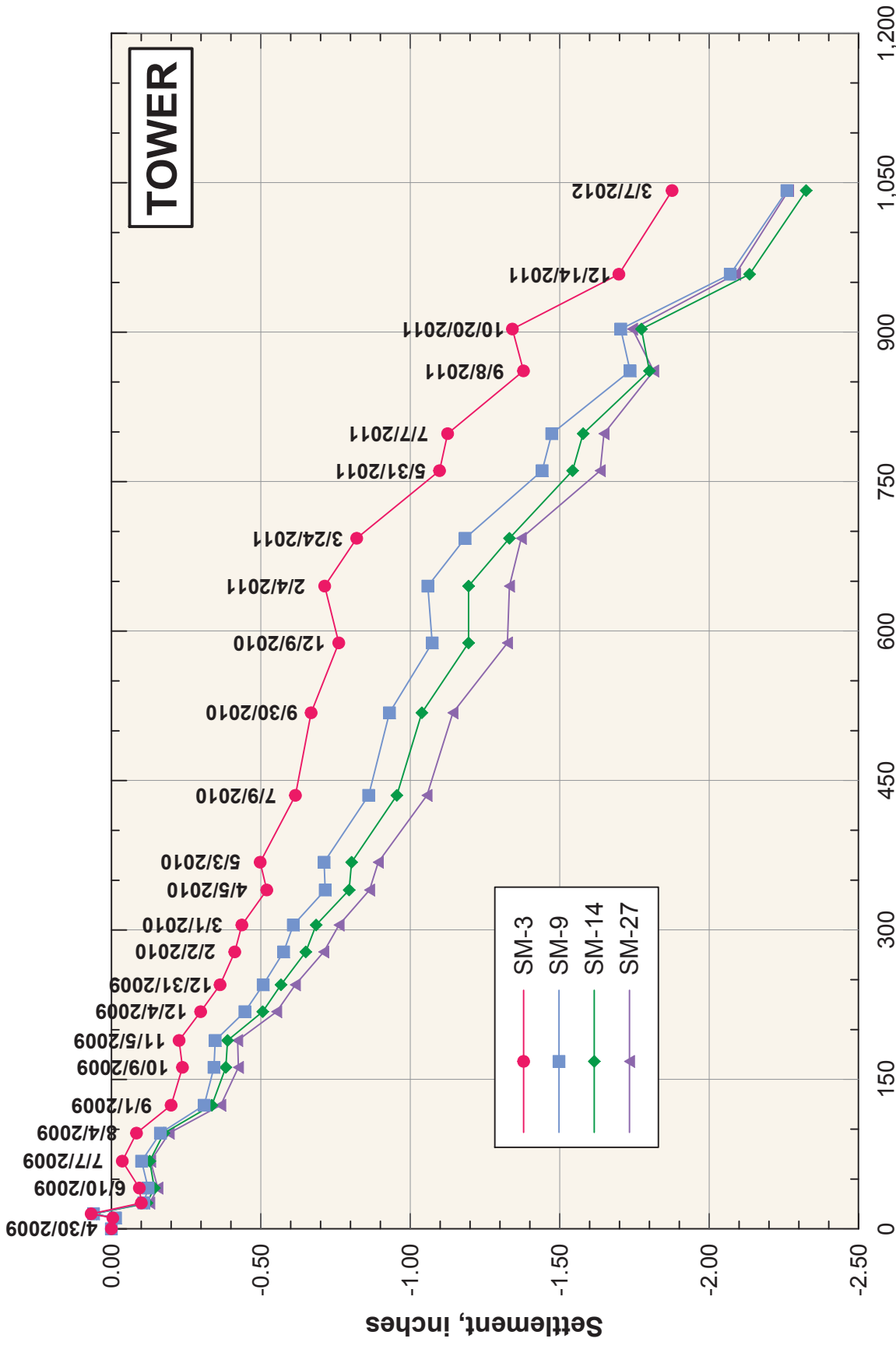


CONTOURS OF SETTLEMENTS MEASURED AT THE FIRST LEVEL BASEMENT OF THE 301 MISSION STREET STRUCTURE BETWEEN APRIL 30, 2009 AND MARCH 7, 2012

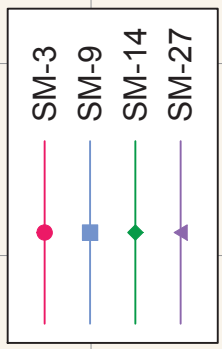
Transbay Transit Center
 301 Mission Street
 Transbay Joint Powers Authority
 San Francisco, California

March 2012





TOWER



**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH MARCH 7, 2012**

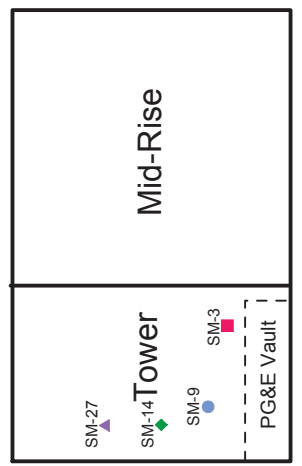
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

March 2012

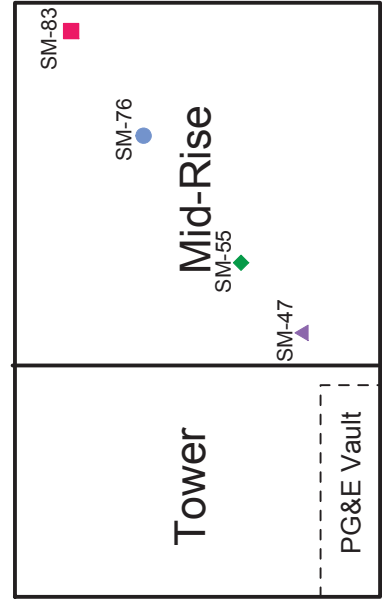
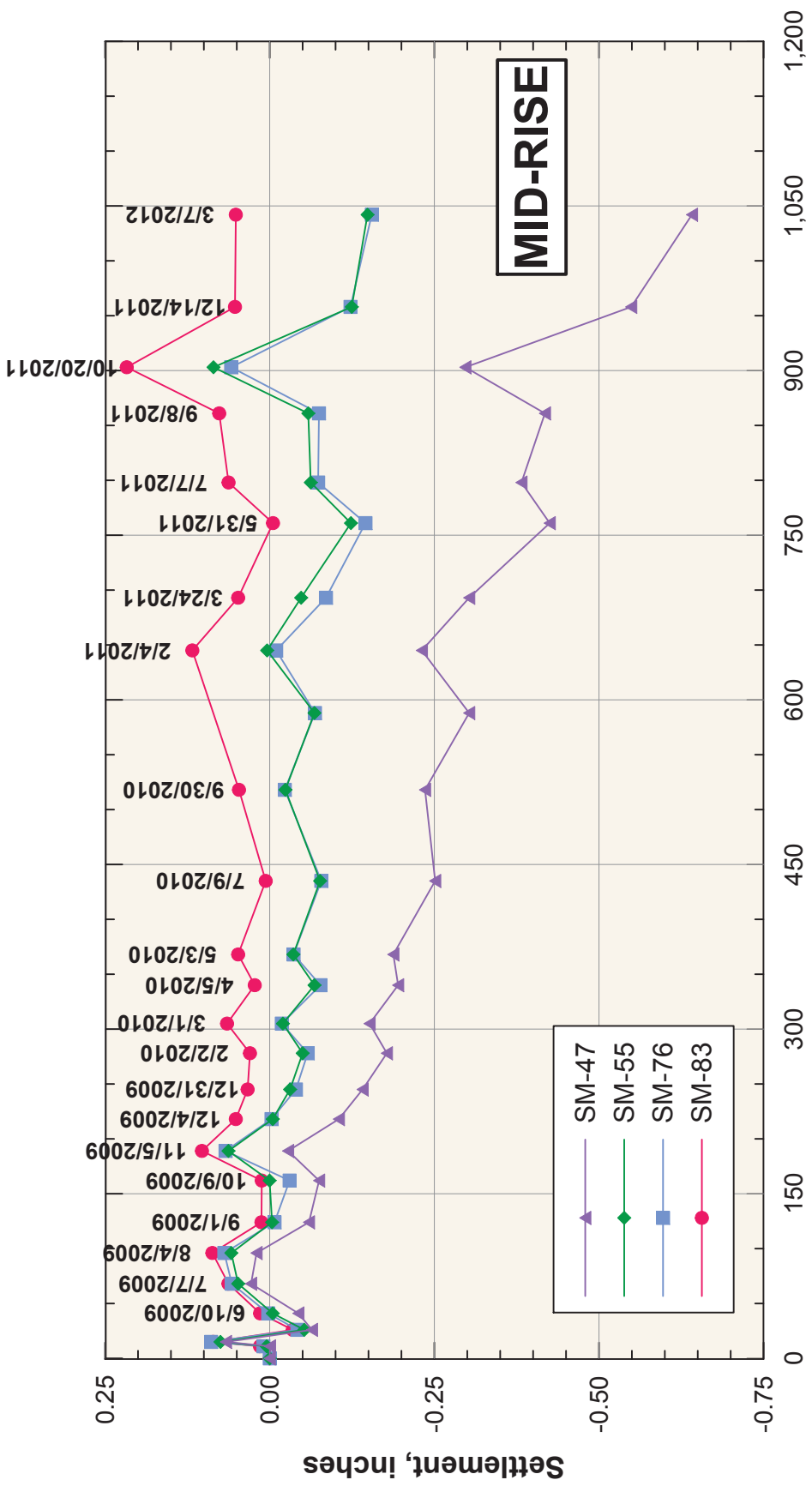
ARUP

PLATE 4

Time From Start of Monitoring, Days



**Note:
Initial (Baseline) reading
taken on 04/30/09**



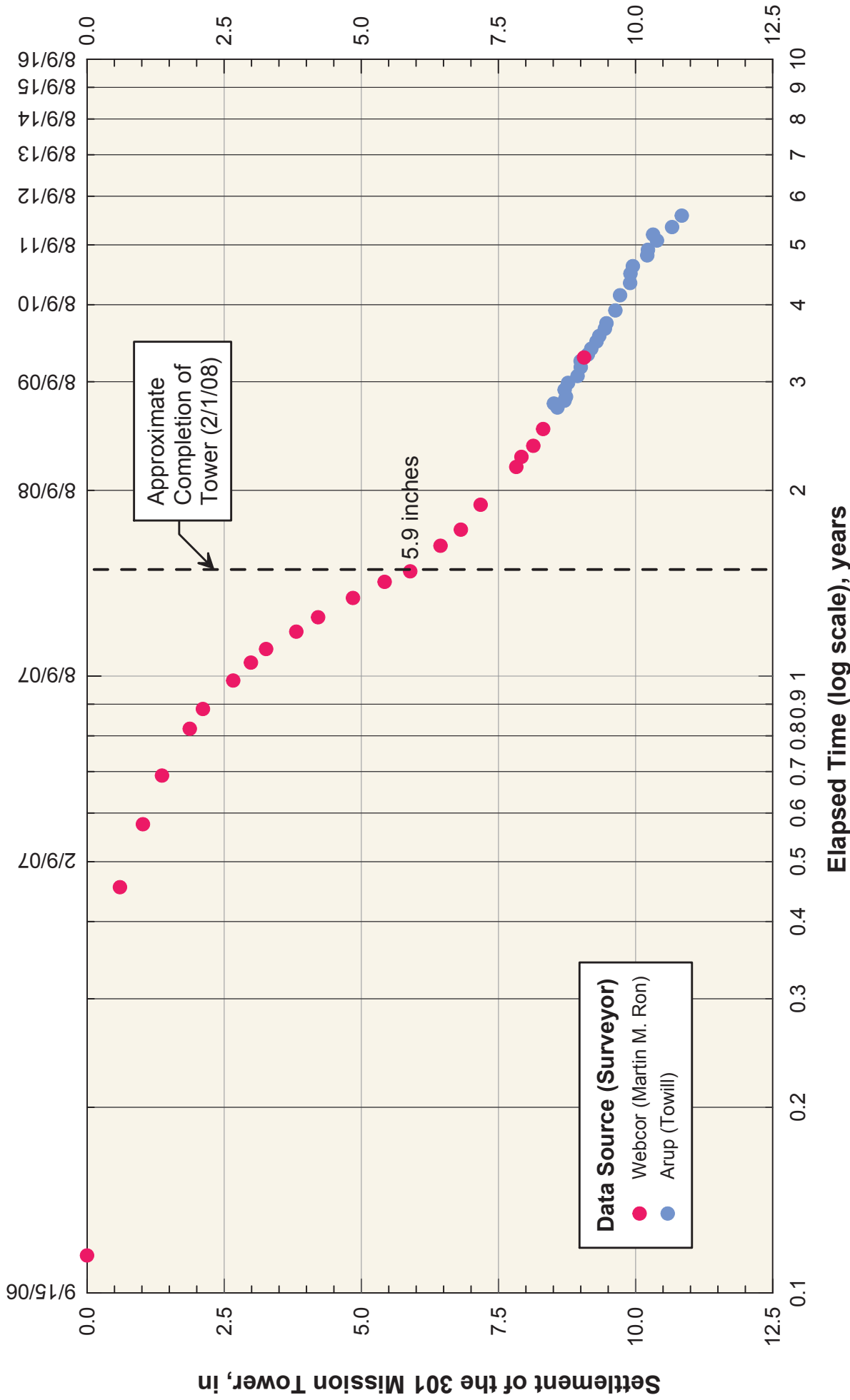
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH MARCH 7, 2012**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

March 2012

ARUP



Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

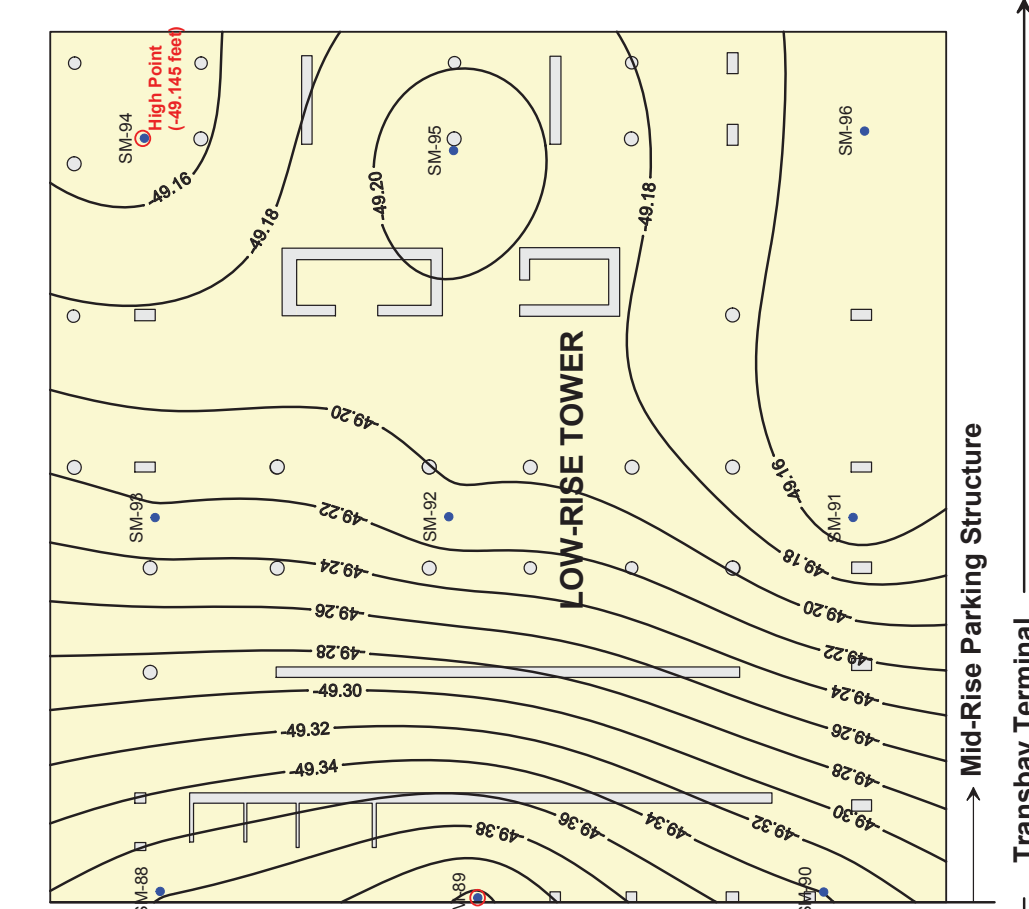
SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

March 2012



Mission Street



Date of Survey Reading:
March 7, 2012

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

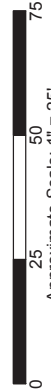
Maximum Differential
B-5 Level Basement
0.280 feet (3.358 inches)

Beale Street

Fremont Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on March 7, 2012.



Approximate Scale: 1" = 25'

J:\S-F\132000\132224\Internal Project Data\4-05 Reports & Narratives\160 301 Mission - Mar 2011 Survey\PlateB-5 Elevations (2012.03.07).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: MARCH 7, 2012 SURVEY

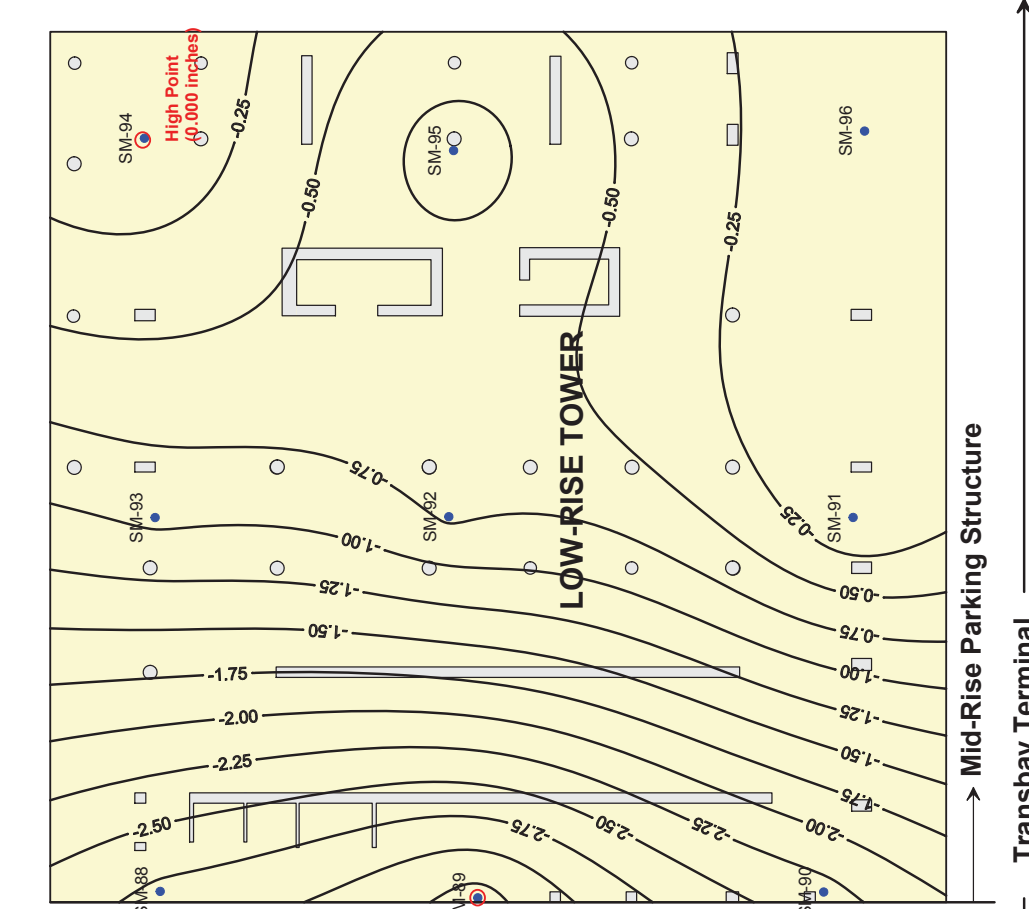
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

March 2012



PLATE 7

Mission Street



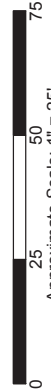
Date of Survey Reading:
March 7, 2012

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.280 feet (3.358 inches)

Fremont Street

Beale Street



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on March 7, 2012.

**DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5; MARCH 7, 2012 SURVEY**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California
March 2012



Memorandum

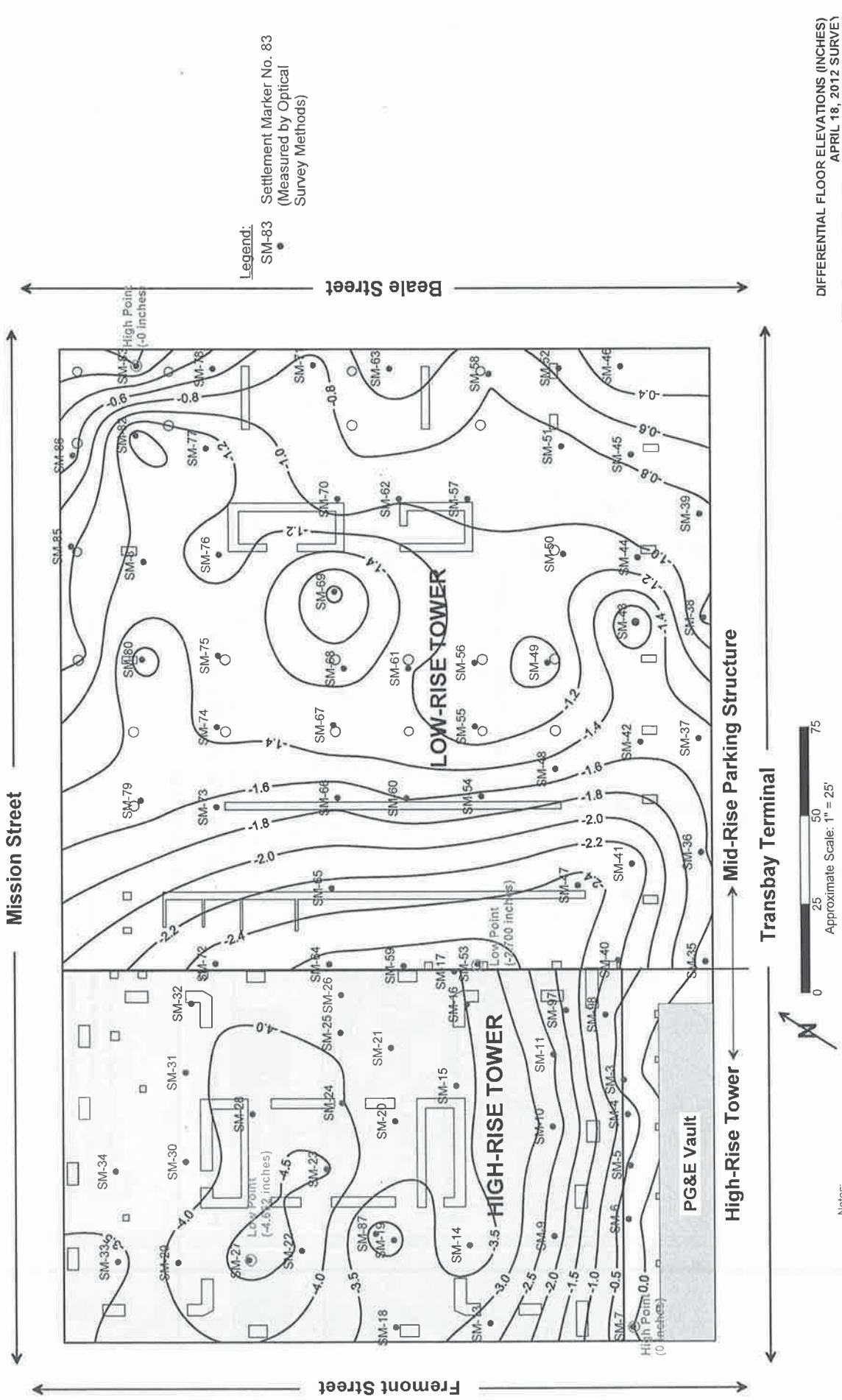


To	Brian Dykes (TJPA)	Date 27 April 2012
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference 4-05 165
Subject	Transbay Transit Center: Results of April 2012 Settlement Survey at 301 Mission Property	Page 1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated March 7, 2011 with measurements made through April 2012.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – April 18, 2012
- Plate 2 Differential Floor Elevation (Inches) – April 18, 2012 Survey
- Plate 3 Contours of Settlements Measured at the First Level Basement of the 301 Mission Street Structure Between April 30, 2009 and April 18, 2012
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through April 18, 2012.
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through April 18, 2012
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: April 18, 2012 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: April 18, 2012 Survey



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 APRIL 18, 2012 SURVEY

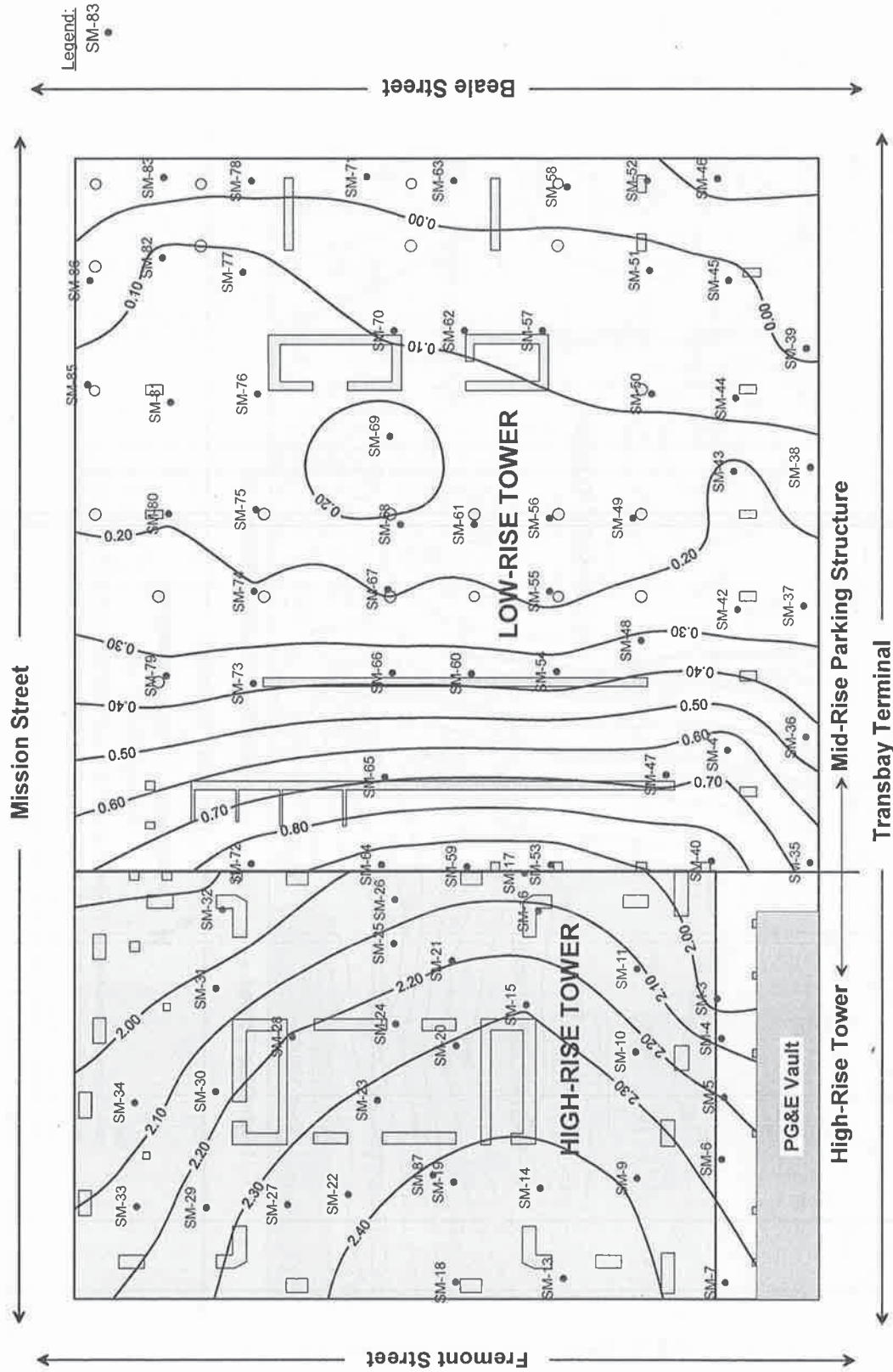
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

April 2012

ARUP

PLATE 2

Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on April 18, 2012.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.



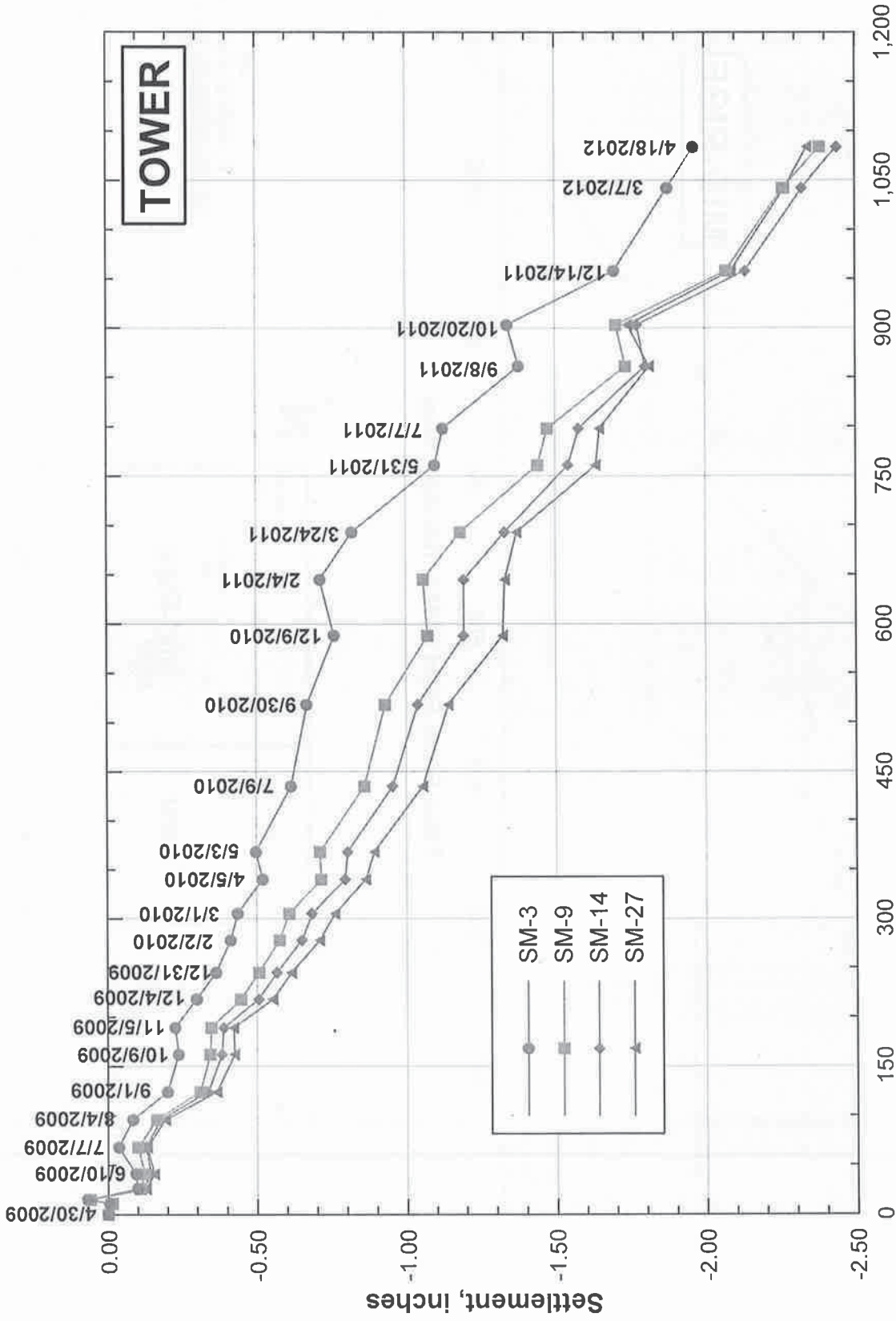
Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

CONTOURS OF SETTLEMENTS MEASURED AT THE
 FIRST LEVEL BASEMENT OF THE 301 MISSION STREET
 STRUCTURE BETWEEN APRIL 30, 2009 AND APRIL
 30, 2012
 Transbay Transit Center
 301 Mission Street
 Transbay Joint Powers Authority
 San Francisco, California

ARUP

Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on April 18, 2012.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.





TOWER

SM-3
SM-9
SM-14
SM-27

Time From Start of Monitoring, Days

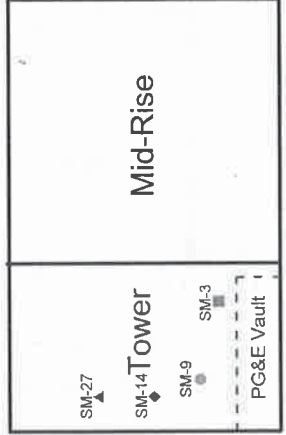
SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH APRIL 18, 2012

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

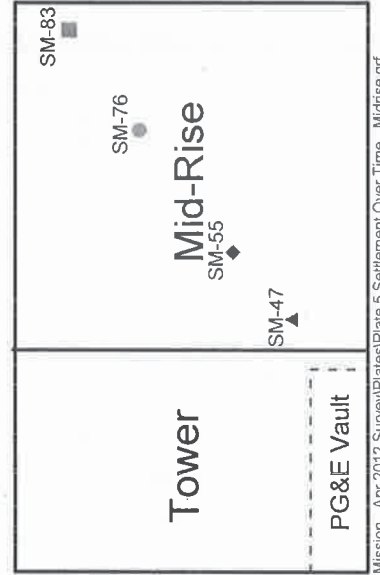
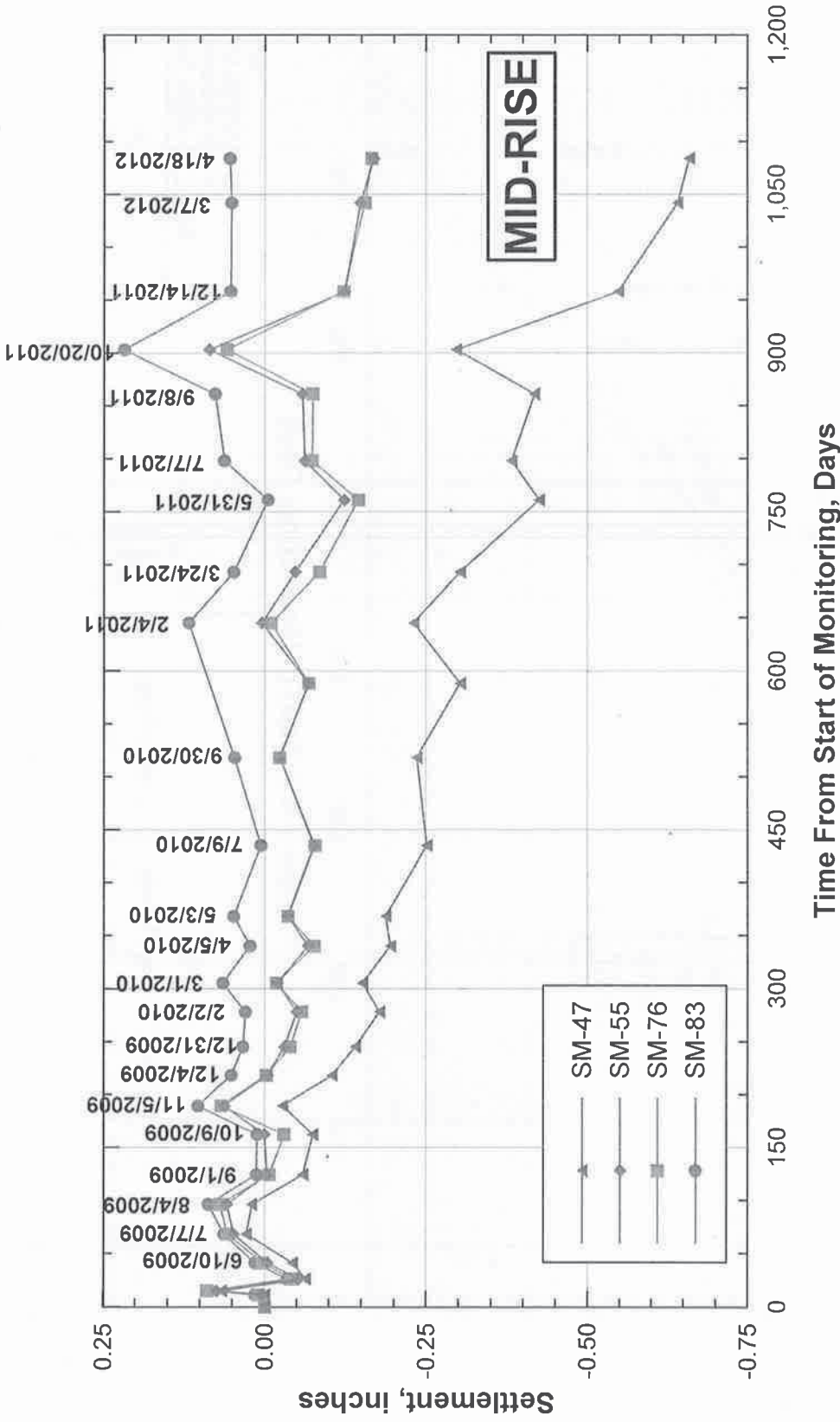
April 2012

ARUP

PLATE 4



Note:
Initial (Baseline) reading
taken on 04/30/09



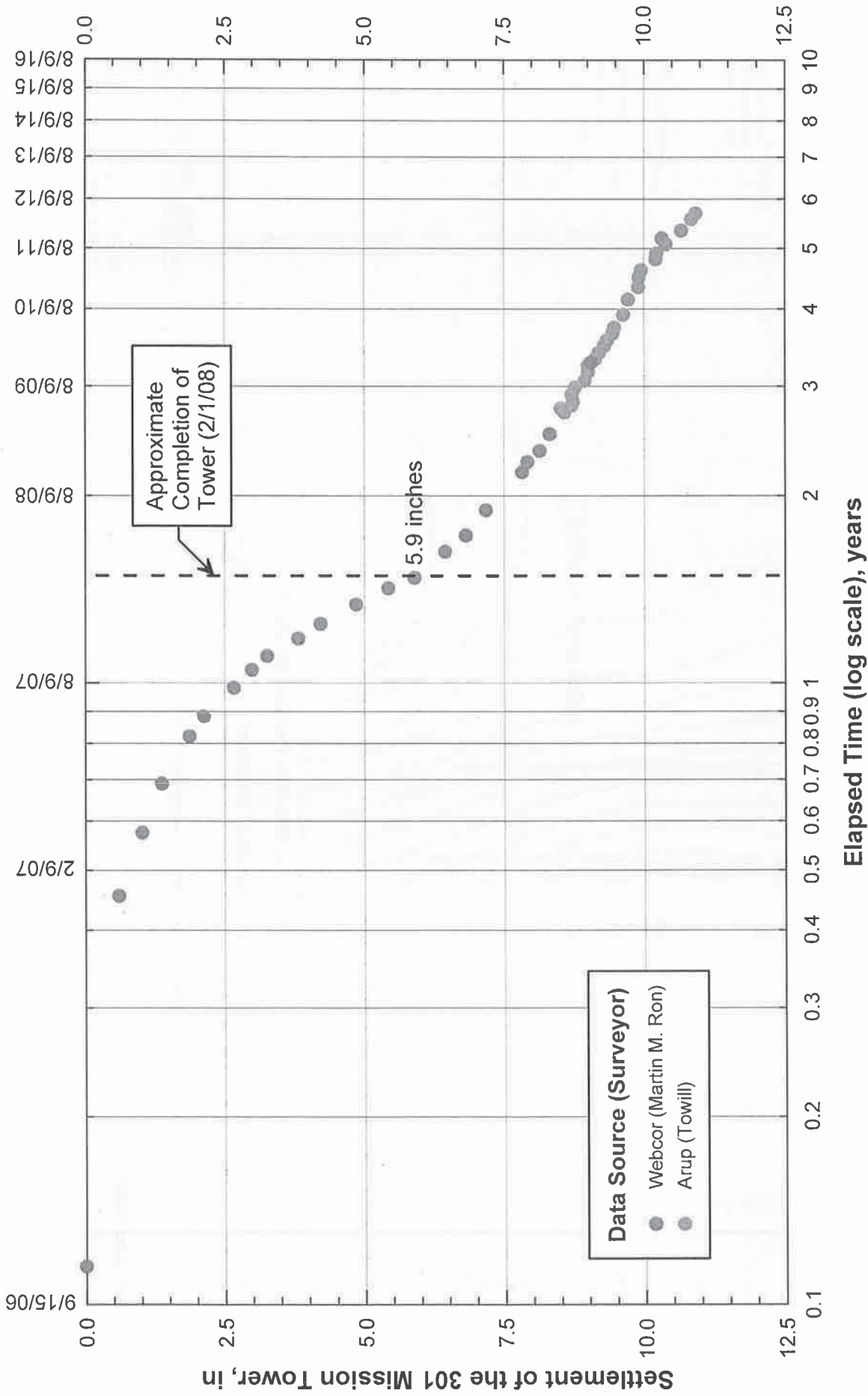
**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH APRIL 18, 2012**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

April 2012



Note:
Initial (Baseline) reading
taken on 04/30/09



Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

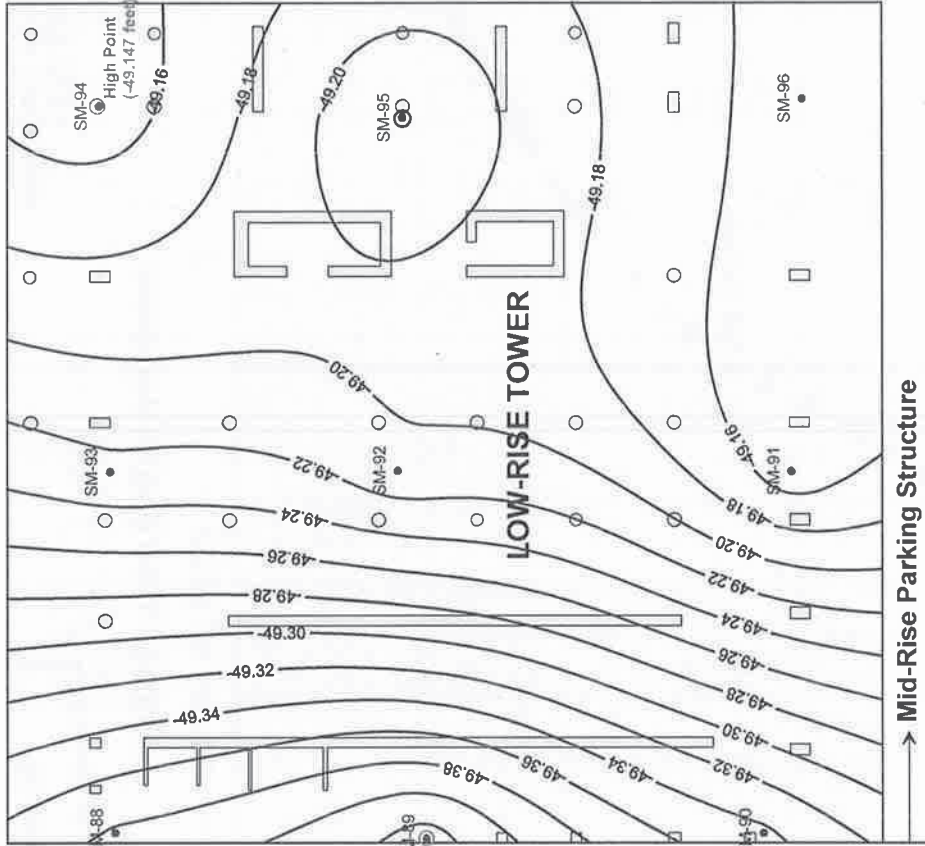
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

April 2012



Mission Street

Fremont Street



Date of Survey Reading:
April 18, 2012

Legend:

SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.283 feet (3.394 inches)

Beale Street

Mid-Rise Parking Structure

Transbay Terminal

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on April 18, 2012.



Approximate Scale: 1" = 25'

J:\Internal Project Data\Reports & Narratives\301 Mission - Apr 2012 Survey\Plates\B-5 Elevations (2012.04.18).sr1

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: APRIL 18, 2012 SURVE

Transbay Transit Center
301 Mission Monitormt
Transbay Joint Powers Authority
San Francisco, California

April 2012

ARUP

PLATE 7

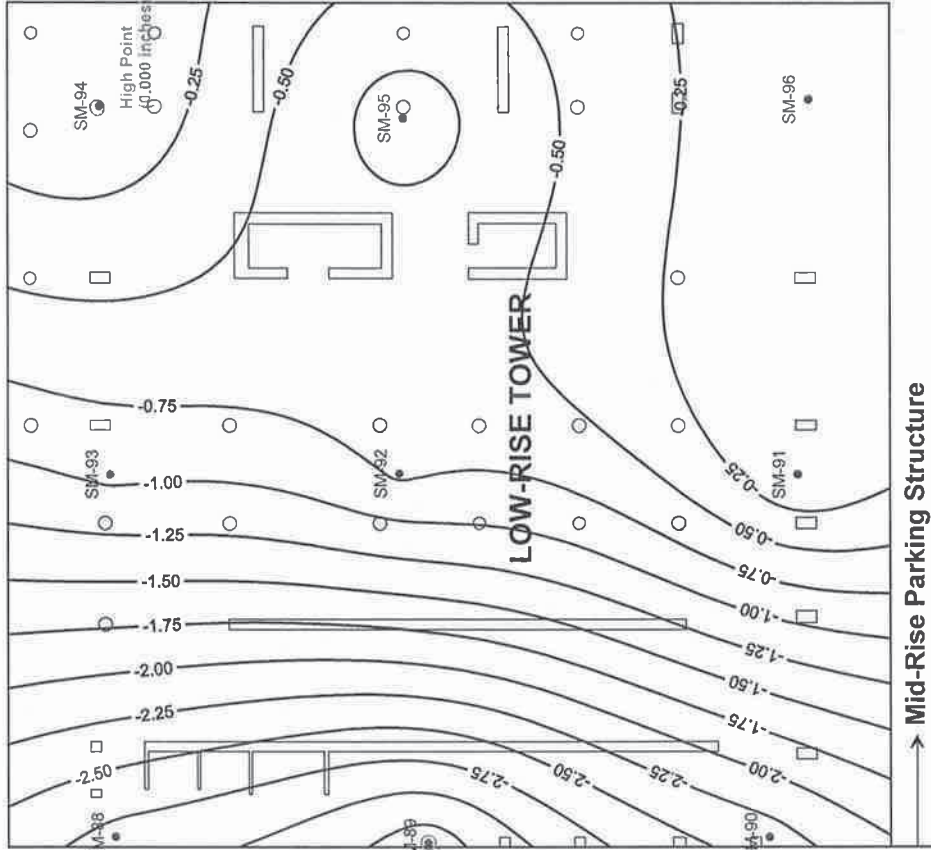
Mission Street

Fremont Street

Beale Street

Mid-Rise Parking Structure

Transbay Terminal



Date of Survey Reading:
April 18, 2012

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.283 feet (3.394 inches)



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on April 18, 2012.

**DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: APRIL 18, 2012 SURVEY**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

April 2012

ARUP

PLATE 8

From: Brian Dykes <bdykes@transbaycenter.org>
Sent: Wednesday, July 11, 2012 5:26 PM
To: Steven Hood
Cc: Stephen McLandrich; Robert Beck; Ed Sum; Nila Gonzales
Attachments: 2012-07-06 Memo_301 Mission Settlement - Jun 2012 Survey.pdf

Steve,

I have attached a July 6th memo from Arup which provides the latest set of settlement marker readings recorded in the basements at 301 Mission Street.

The settlement under the tower as shown on plate 4 which has been measured by our surveyors over the last 3 years has added 2.5 inches.

The total settlement as shown on plate 6 is now 11 inches, which includes 8.5 inches measured by your surveyor before we started recording in April 2009.

Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

NOTE: This e-mail communication and any attachments hereto are covered by the Electronic Communications Privacy Act, 18 U.S.C. Sections 2510-2521, and are legally privileged. The information contained herein is confidential, and is intended only for the use of the individual or entity to whom it is addressed. If you are not the intended recipient of this e-mail communication (or an employee or agent responsible for delivering this communication to its intended recipient(s)), you are hereby notified that any retention, copying or further distribution of this e-mail communication and any attachments is strictly prohibited. If you are not the intended recipient, please notify the sender by telephoning 415-597-4620, or by forwarding an e-mail reply message addressed to TransAdmin@TransbayCenter.org confirming that you have already destroyed (deleted) the original e-mail communication and any and all copies thereof. Thank you.

Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	6 July 2012
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number	132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference	4-05 174
Subject	Transbay Transit Center: Results of June 2012 Settlement Survey at 301 Mission Property	Page	1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated April 27, 2011 with measurements made through June 2012.

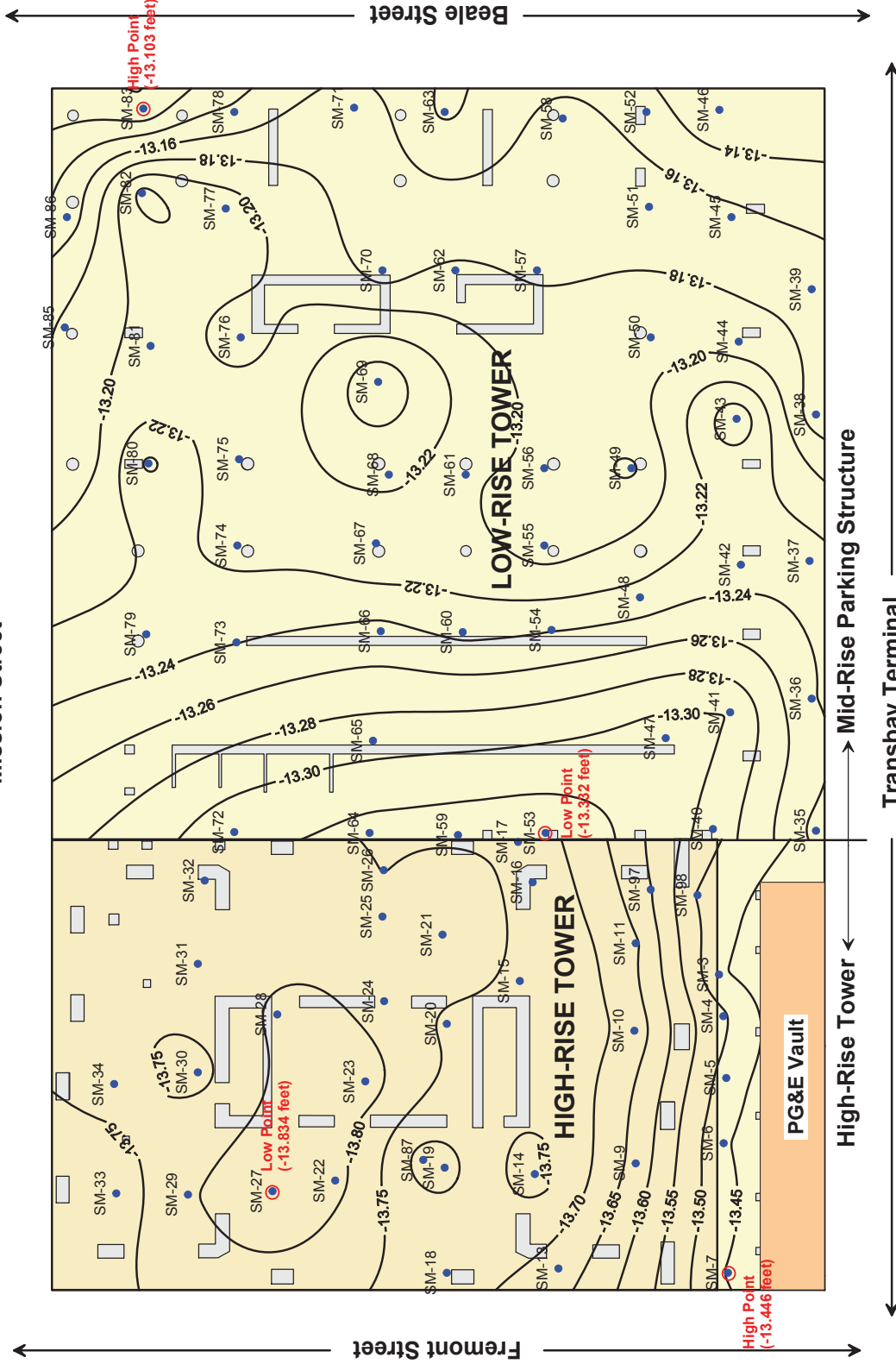
Note Typo: should refer to "April 27, 2012" report

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – June 13, 2012
- Plate 2 Differential Floor Elevation (Inches) – June 13, 2012 Survey
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- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: June 13, 2012 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: June 13, 2012 Survey

Mission Street

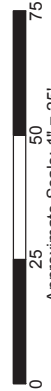
Fremont Street



Date of Survey Reading:
June 13, 2012

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.388 feet (4.654 inches)
Low-Rise Tower	0.229 feet (2.751 inches)



Approximate Scale: 1" = 25'

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 13, 2012.

Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY
PERIODIC SURVEY - JUNE 13, 2012

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

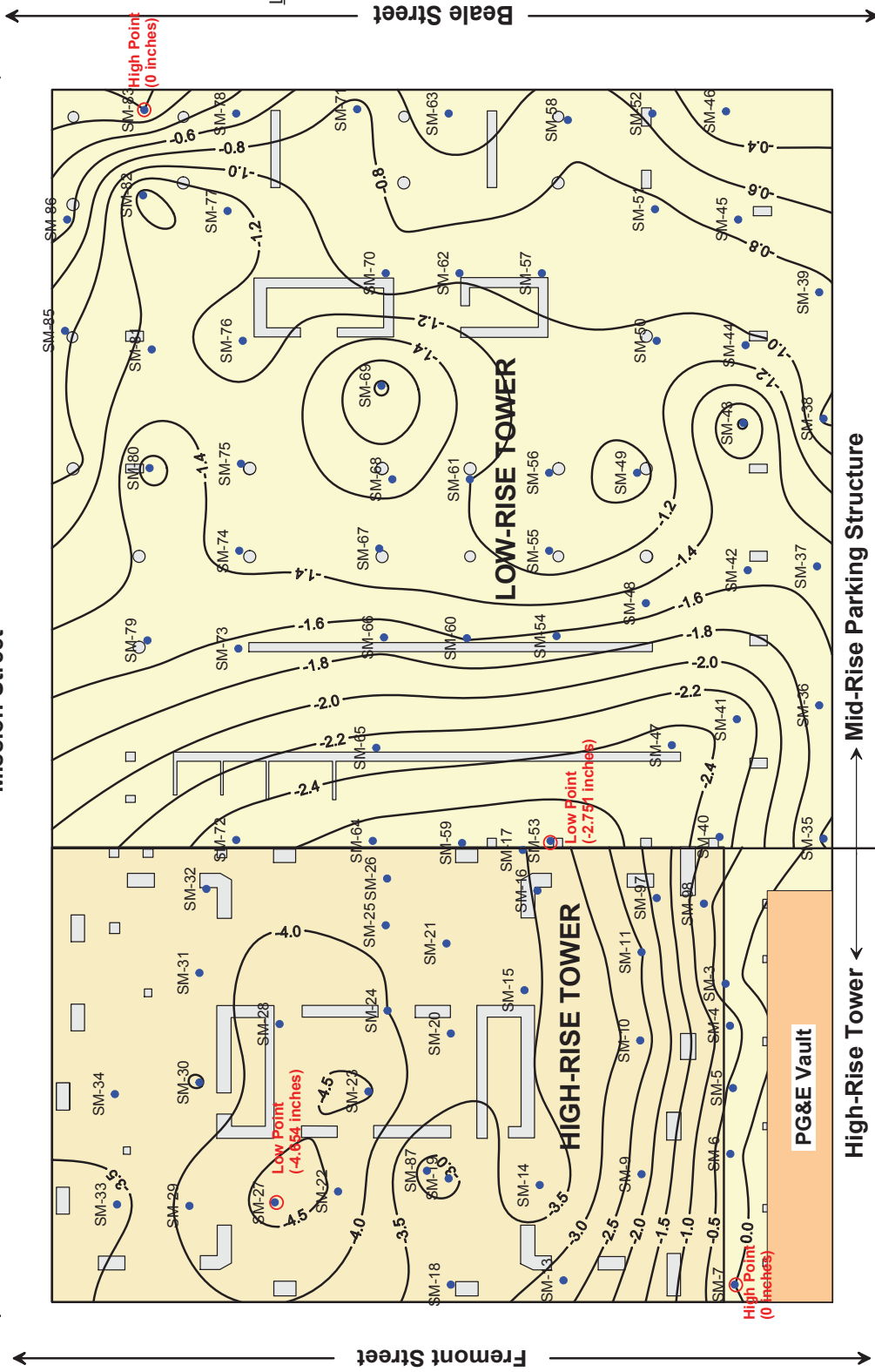
July 2012

ARUP

PLATE 1

Mission Street

Fremont Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

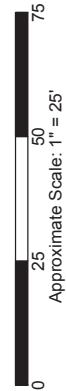
High-Rise Tower

Low-Rise Tower

PG&E Vault

Mid-Rise Parking Structure

Transbay Terminal



Notes:
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 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

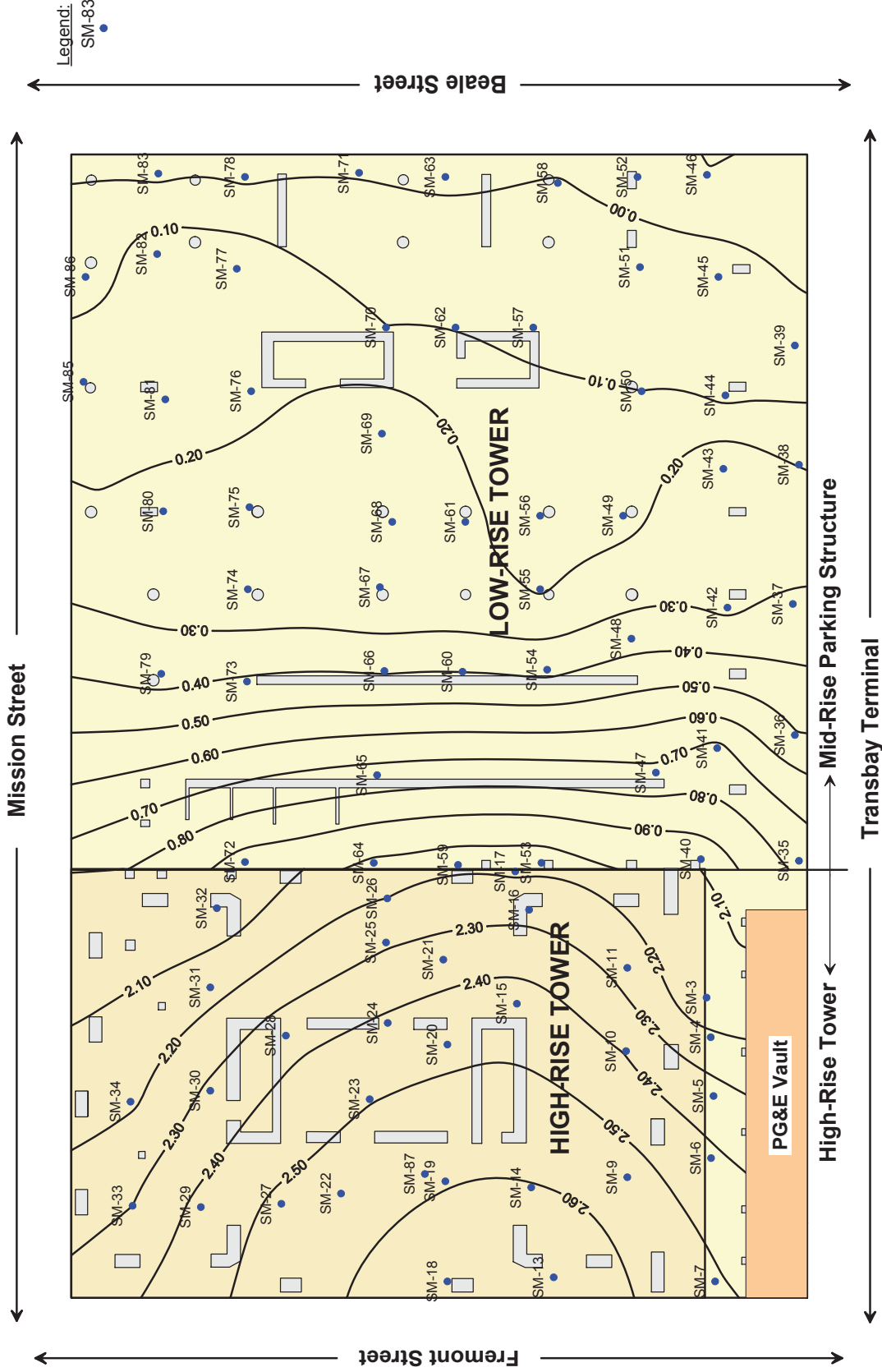
DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
JUNE 13, 2012 SURVEY

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

July 2012

ARUP

PLATE 2



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

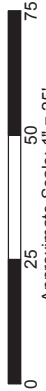
**CONTOURS OF SETTLEMENTS MEASURED AT THE
 FIRST LEVEL BASEMENT OF THE 301 MISSION STREET
 STRUCTURE BETWEEN APRIL 30, 2009, AND JUN**

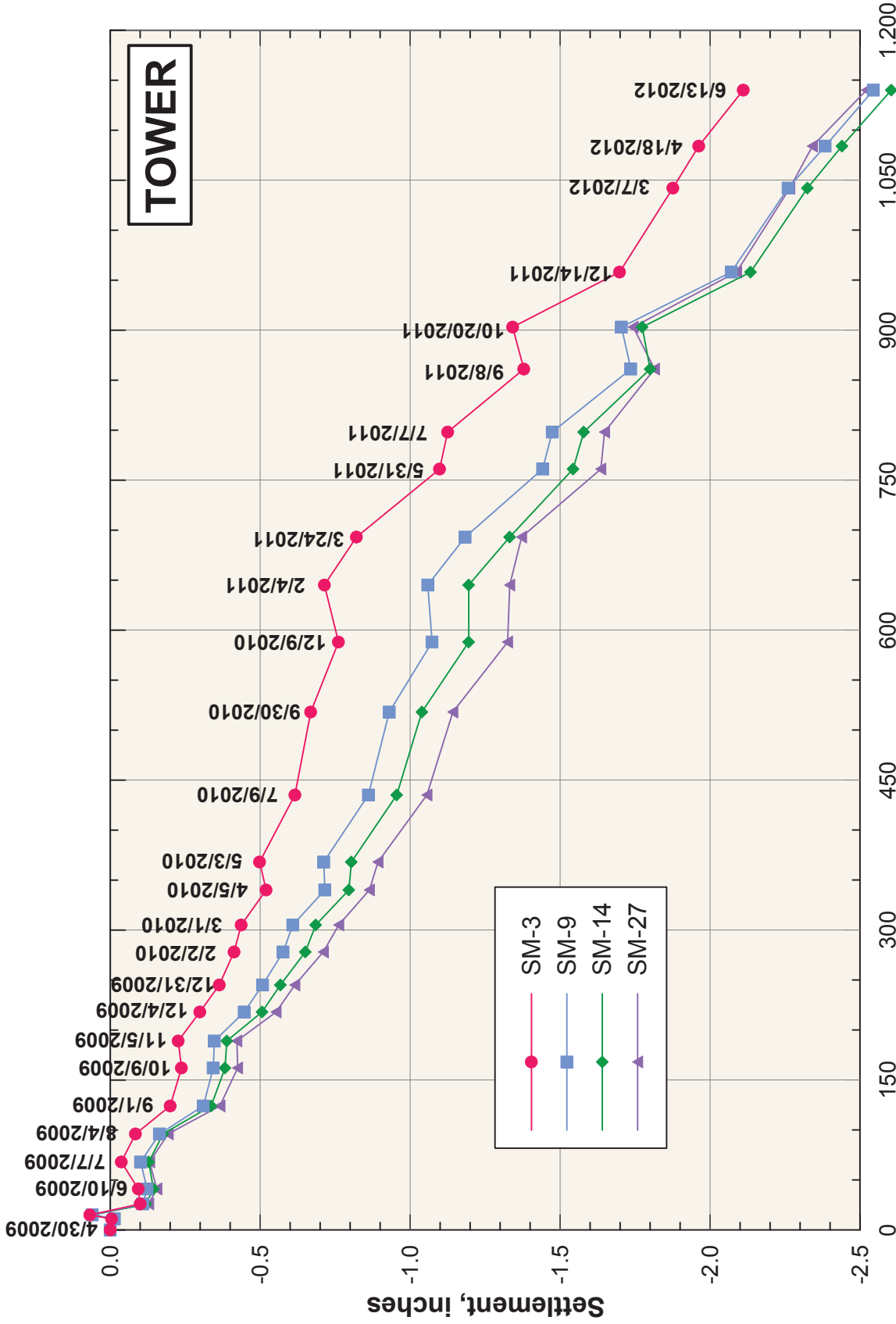
Transbay Transit Centre
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

July 2012

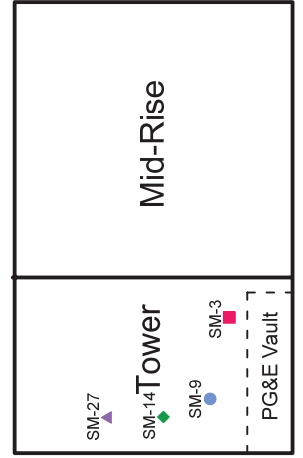


Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on June 13, 2012.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.





Time From Start of Monitoring, Days



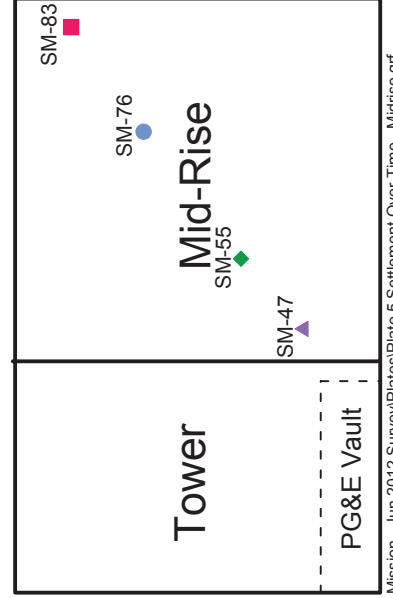
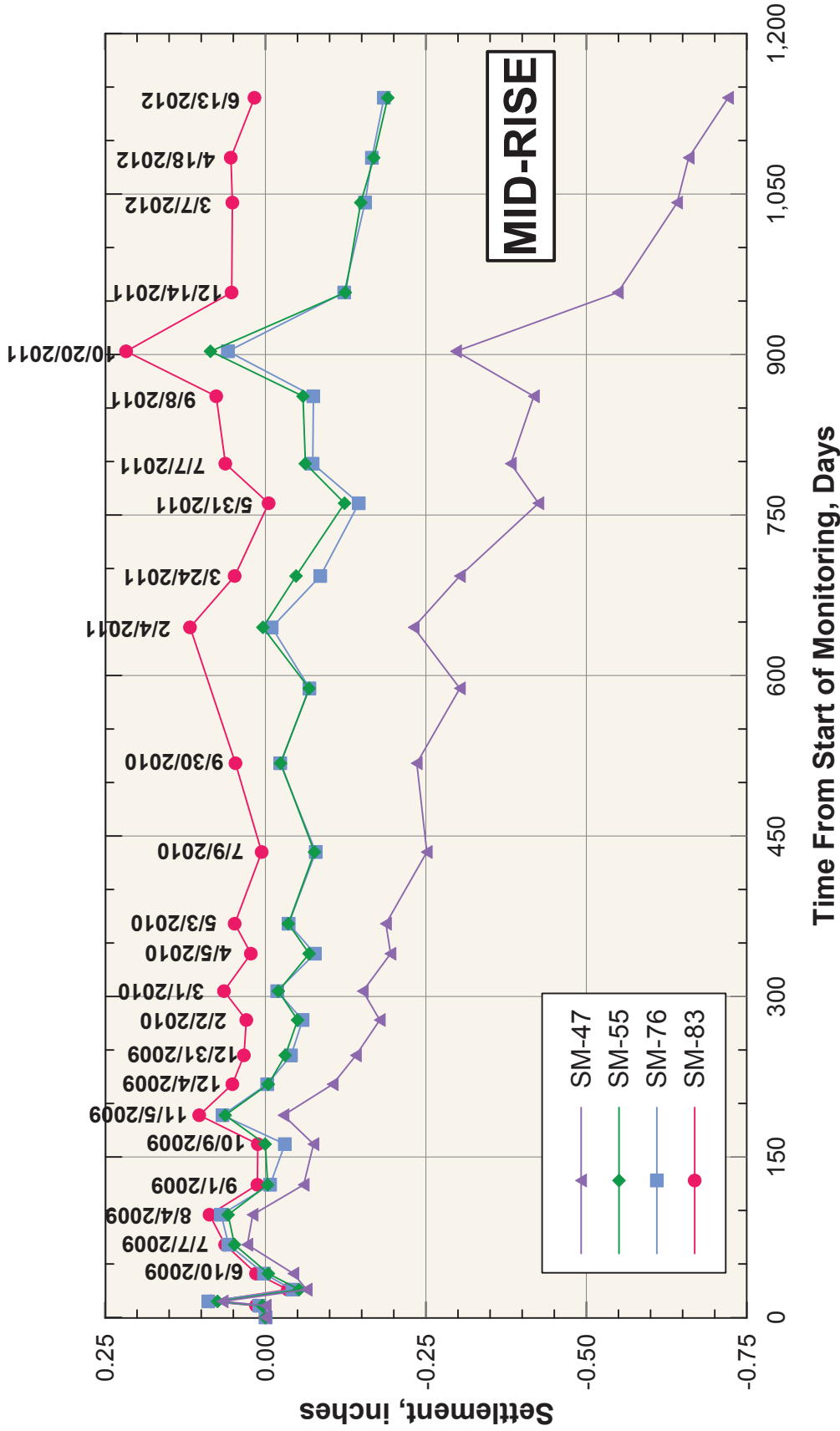
Note:
Initial (Baseline) reading
taken on 04/30/09

SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH JUNE 13, 2012

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

July 2012

ARUP



Note:
Initial (Baseline) reading
taken on 04/30/09

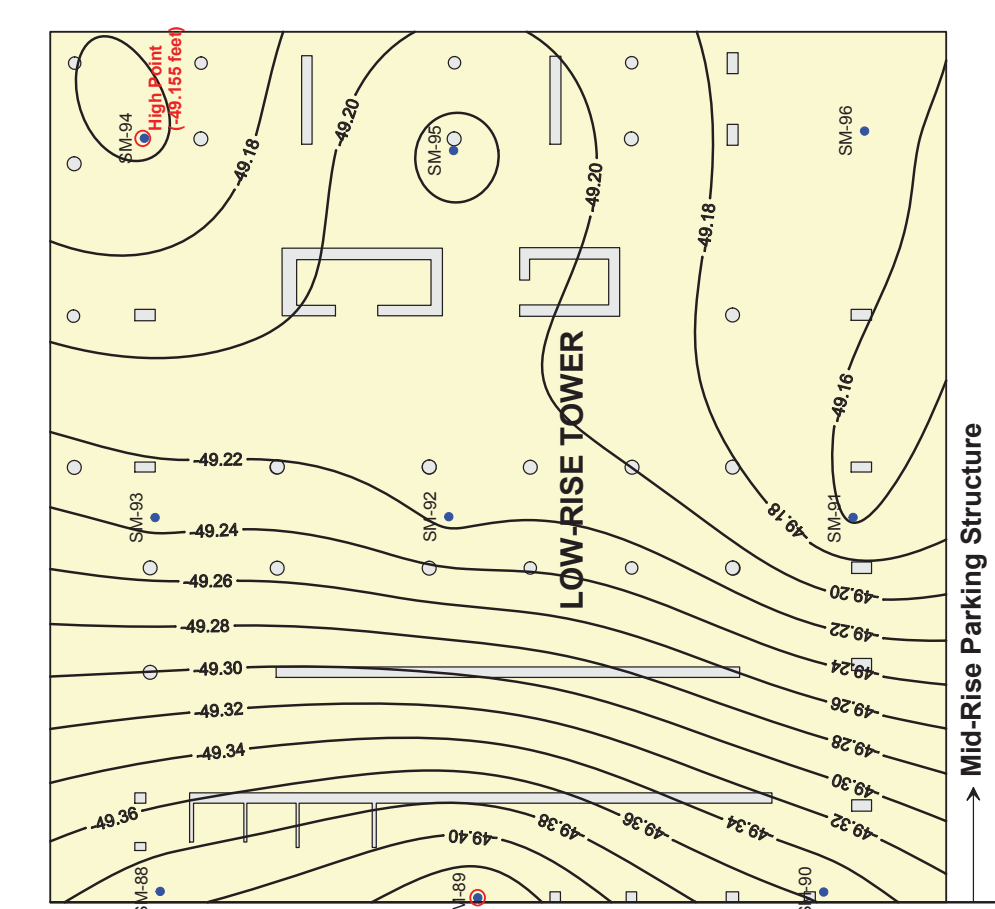
**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH JUNE 13, 2012**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

July 2012



Mission Street



Date of Survey Reading:
June 13, 2012

Legend:
 SM-88 Settlement Marker No. 88
 (Measured by Optical Survey Methods)

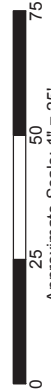
Maximum Differential
B-5 Level Basement
0.285 feet (3.421 inches)

Fremont Street

Beale Street



Notes:
 Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 13, 2012.



Approximate Scale: 1" = 25'

J:\Internal Project Data\Reports & Narratives\301 Mission - Jun 2012 Survey\B-5 Elevations (2012.06.13).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
 OF 301 MISSION PROPERTY: JUNE 13, 2012 SURVEY

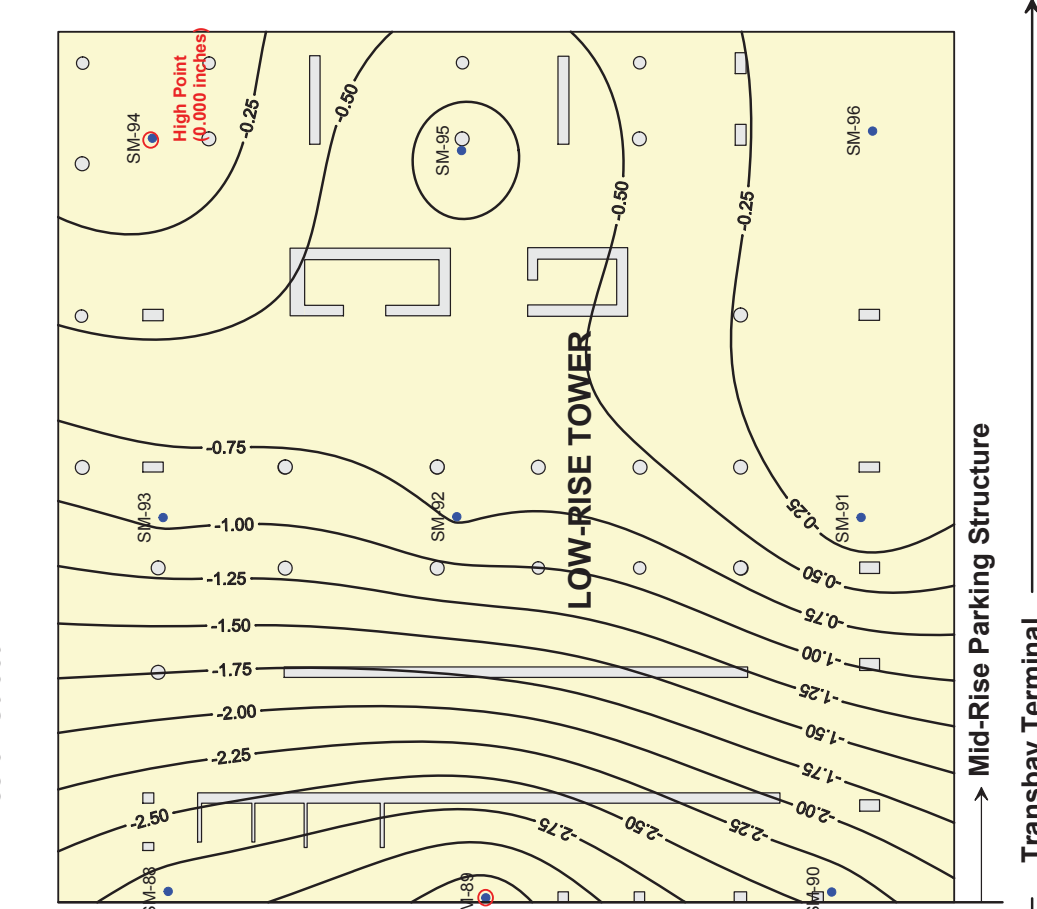
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

July, 2012



PLATE 7

Mission Street



Mid-Rise Parking Structure

Transbay Terminal

Date of Survey Reading:
June 13, 2012

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

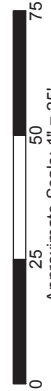
Maximum Differential
B-5 Level Basement
0.285 feet (3.421 inches)

Beale Street

Fremont Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 13, 2012.



Approximate Scale: 1" = 25'

J:\Internal Project Data\Reports & Narratives\301 Mission - Jun 2012 Survey\B-5 Differential Elevations (2012.06.13).srf

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: JUNE 13, 2012 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

July, 2012

ARUP

PLATE 8

From: Brian Dykes <bdykes@transbaycenter.org>
Sent: Wednesday, August 22, 2012 2:52 PM
To: Steven Hood
Cc: Nick O'Riordan; Stephen McLandrich; Robert Beck; Ed Sum; Nila Gonzales
Subject: Inclinometer & Settlement Readings
Attachments: 2012-08-22 Memo_301 Mission Inclinometer Update Aug 2012.pdf; 2012-08-22 Memo_301 Mission Settlement - Aug 2012 Survey.pdf

Steven,
Further to our meeting on Thursday, August 16th I am sending you the attached memos regarding the inclinometer and settlement survey readings as of August 2012.
Please forward them to other members of your team as you decide are appropriate.

Regards, Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date 22 August 2012
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242-60/SMM
From	Stephen McLandrich (Arup) Nick O'Riordan (Arup) Kevin Clinch (Arup)	File reference 4-05 181
Subject	Transbay Transit Center: Results of August 2012 Settlement Survey at 301 Mission Property	Page 1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated July 6, 2012 with measurements made through August 2012.

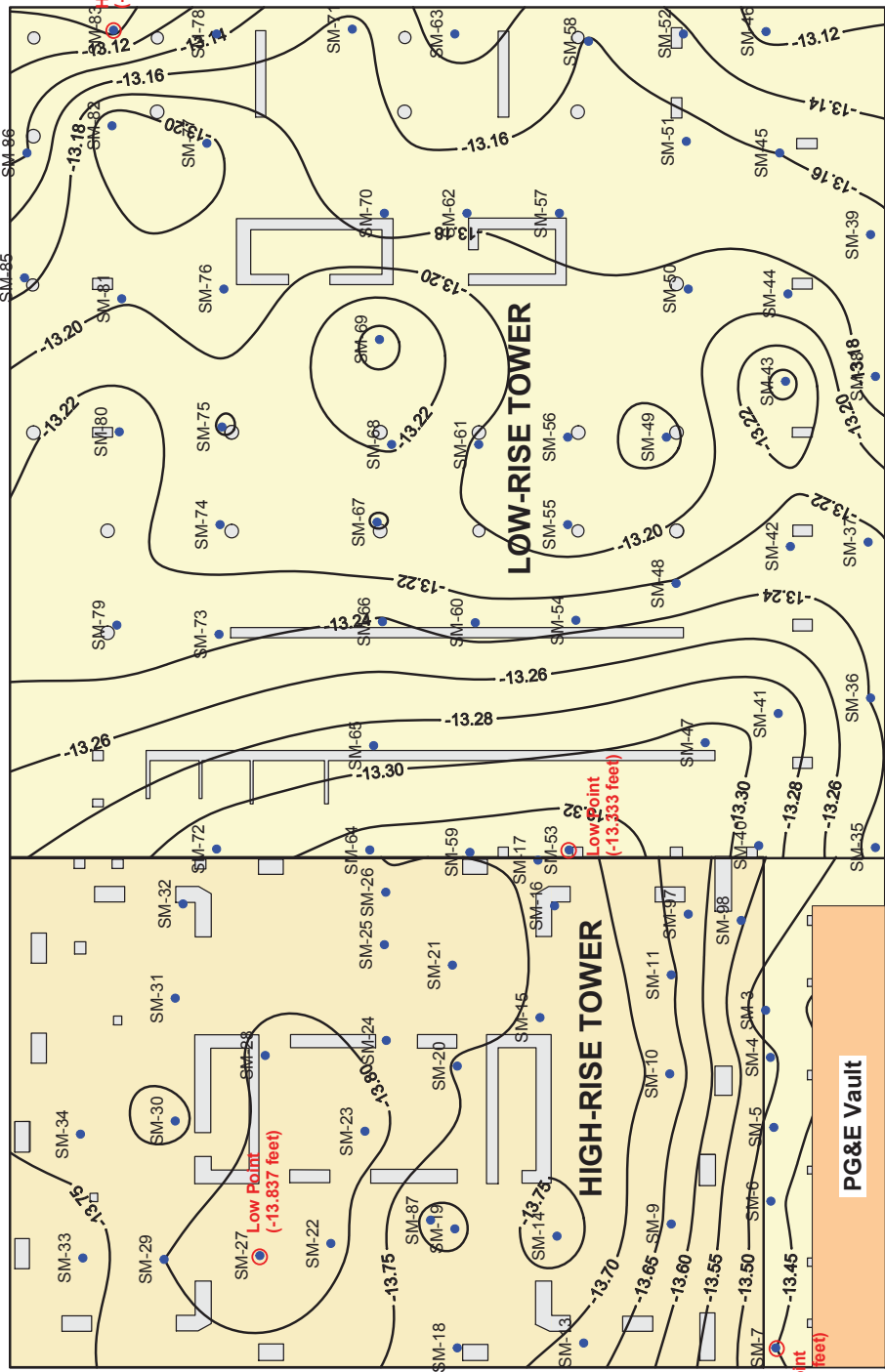
List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – August 13, 2012
- Plate 2 Differential Floor Elevation (Inches) – August 13, 2012 Survey
- Plate 3 Contours of Settlements Measured at the First Level Basement of the 301 Mission Street Structure Between April 30, 2009 and August 13, 2012
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through August 13, 2012.
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through August 13, 2012
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: August 13, 2012 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: August 13, 2012 Survey

Mission Street

Beale Street

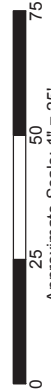
Fremont Street



Date of Survey Reading:
August 13, 2012

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.387 feet (4.640 inches)
Low-Rise Tower	0.238 feet (2.852 inches)



Approximate Scale: 1" = 25'

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on August 13, 2012.

Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY
PERIODIC SURVEY - AUGUST 13, 2012

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

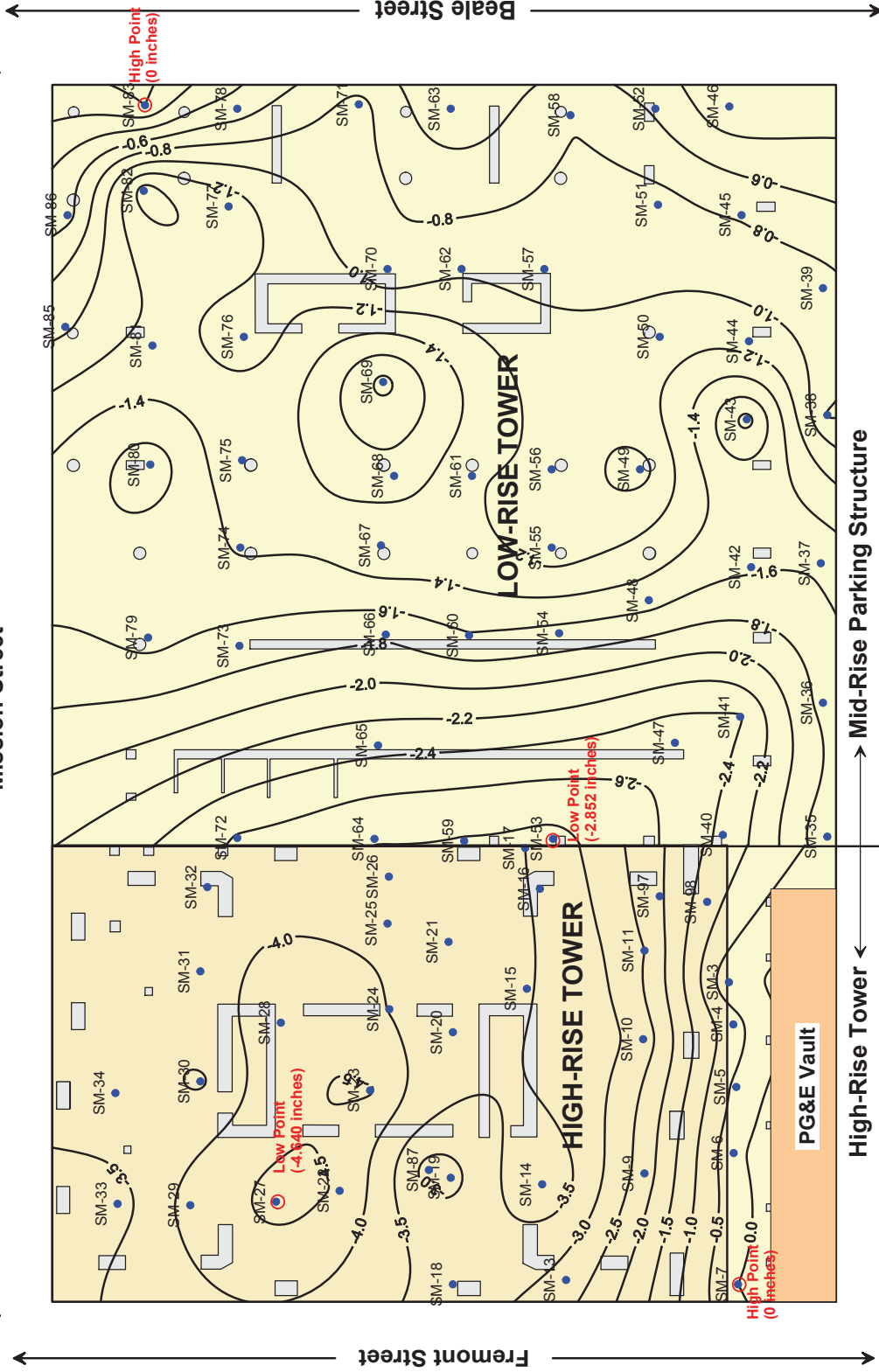
August 2012



PLATE 1

Mission Street

Fremont Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower ← Mid-Rise Parking Structure

Transbay Terminal



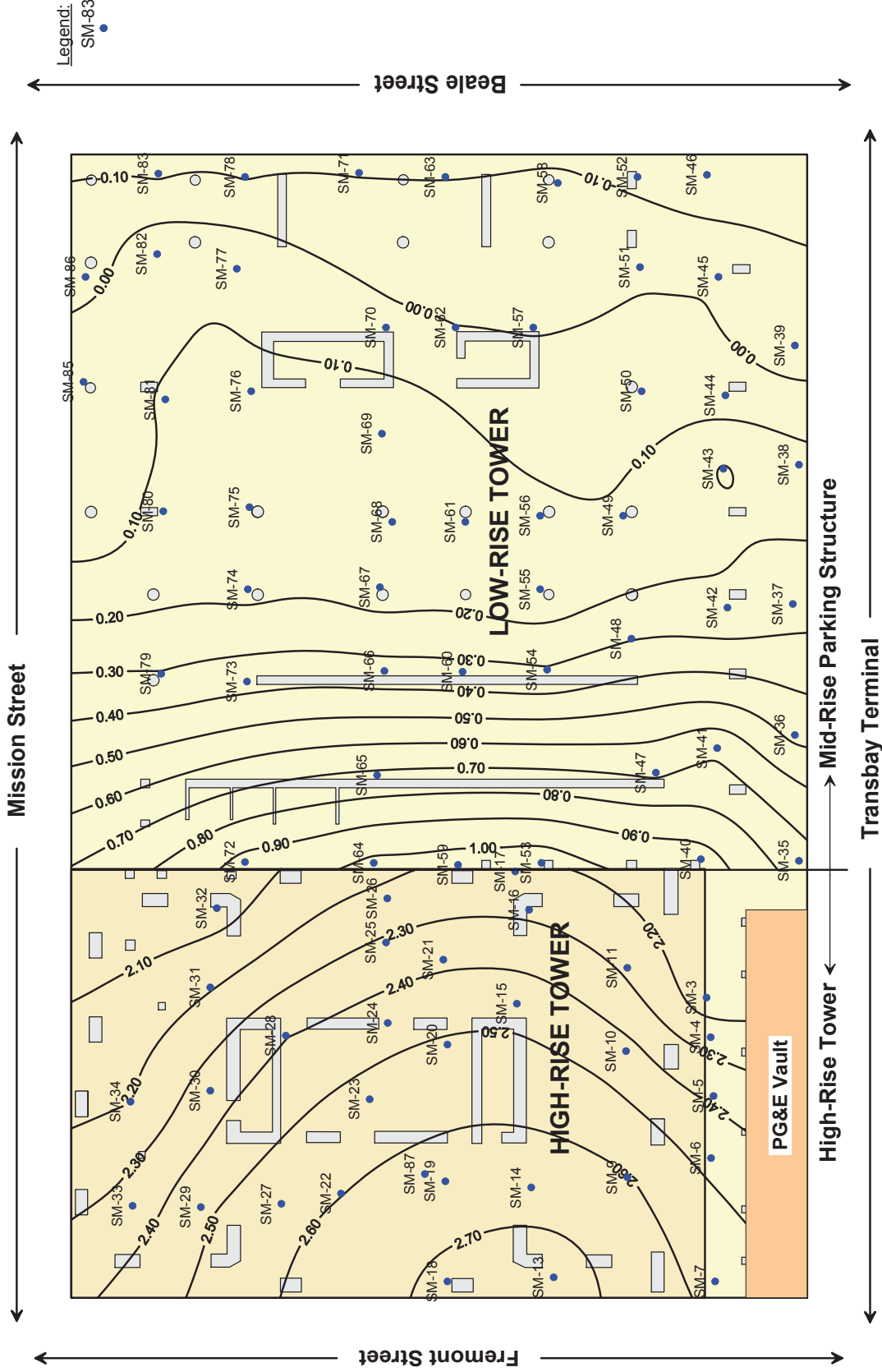
Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on August 13, 2012.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 AUGUST 13, 2012 SURVEY

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California
 August 2012

ARUP

PLATE 2



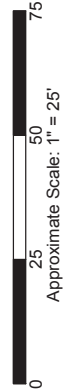
CONTOURS OF SETTLEMENTS MEASURED AT THE FIRST LEVEL BASEMENT OF THE 301 MISSION STREET STRUCTURE BETWEEN APRIL 30, 2009 AND AUG

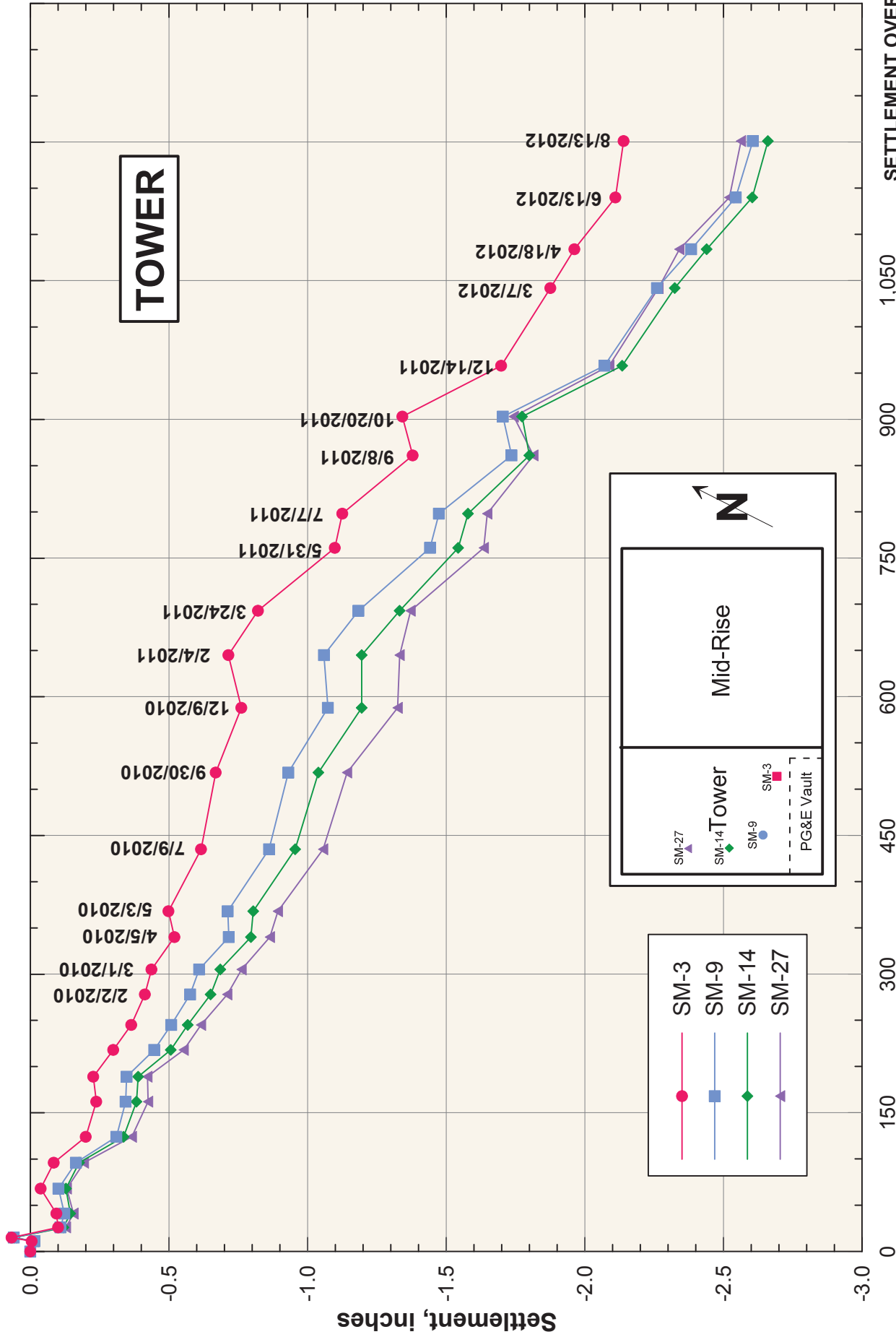
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

August 2012



Notes:
Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on August 13, 2012.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.
Negative values of settlement (within Low-rise Tower) indicate uplift.





TOWER



- SM-3
- SM-9
- SM-14
- SM-27

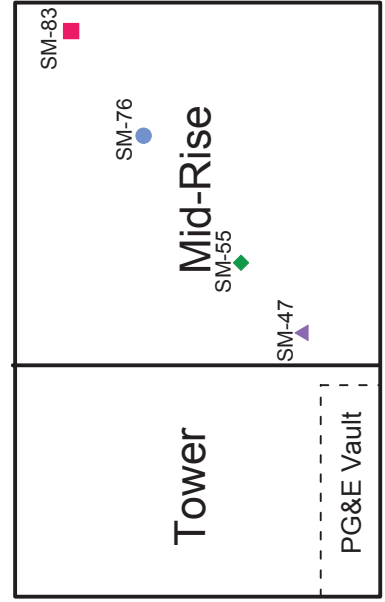
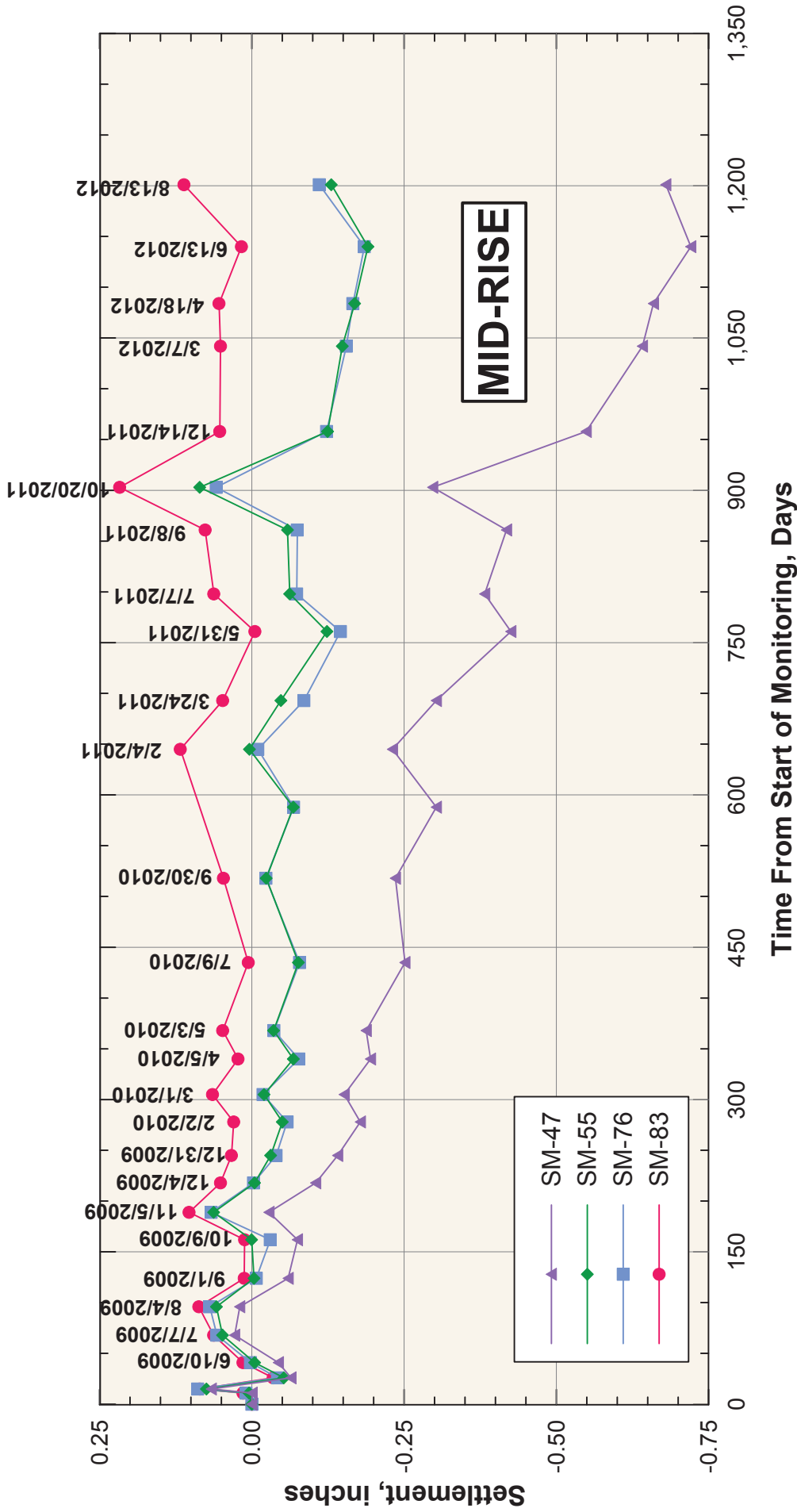
SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH AUGUST 13, 2012

Note:
Initial (Baseline) reading
taken on 04/30/09

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

August 2012

ARUP



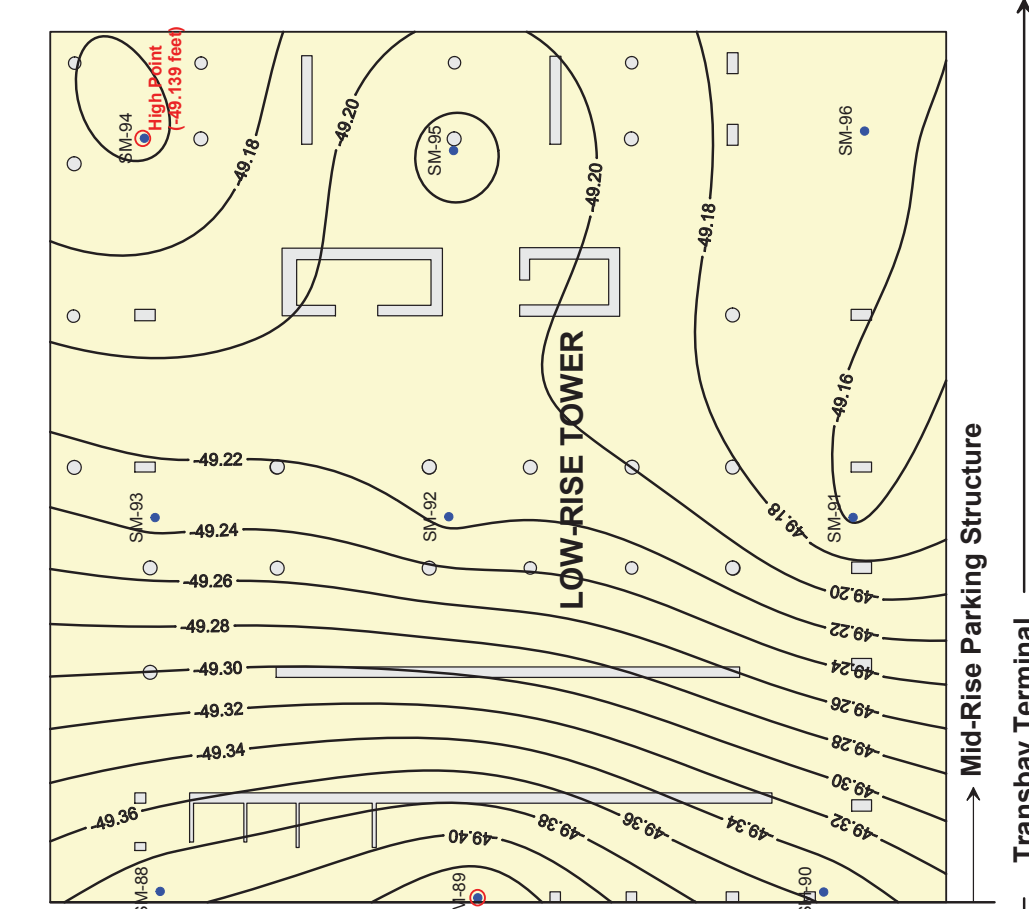
Note:
Initial (Baseline) reading
taken on 04/30/09

SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH AUGUST 13, 2012

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

August 2012
ARUP

Mission Street



Date of Survey Reading:
August 13, 2012

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

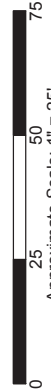
Maximum Differential
B-5 Level Basement
0.293 feet (3.516 inches)

Fremont Street

Beale Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on August 13, 2012.



Approximate Scale: 1" = 25'

J:\S\F\132000\1322424 Internal Project Data\4-05 Reports & Narratives\181 301 Mission - Aug 2012 Survey\Plates\B-5 Elevations (2012.08.13).srf

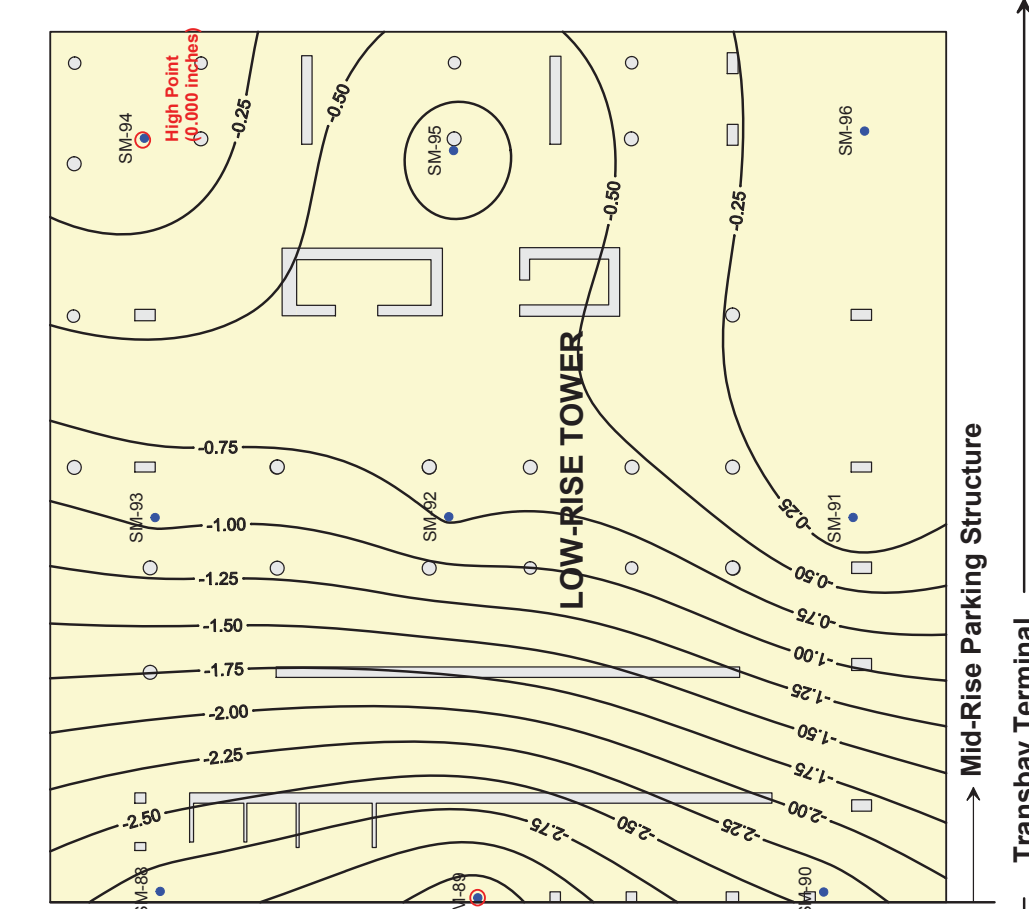
FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: AUGUST 13, 2012 SURVE

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California
August 2012



PLATE 7

Mission Street



Date of Survey Reading:
August 13, 2012

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.293 feet (3.516 inches)

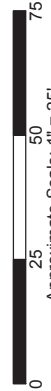
Fremont Street

Beale Street

LOW-RISE TOWER

Mid-Rise Parking Structure

Transbay Terminal



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on August 13, 2012.

**DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5; AUGUST 13, 2012 SURVEY**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

August 2012

ARUP

PLATE 8

From: Brian Dykes
Sent: Friday, November 16, 2012 1:46 PM
To: Steven Hood
Subject: Latest Settlement Readings at 301 Mission Street

Steven,
Attached is the latest set of settlement readings taken by Arup.
Regards, Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	06 November 2012
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number	132242-60/SMM
From	Michael Gardner (Arup) Stephen McLandrich (Arup)	File reference	4-05 187
Subject	Transbay Transit Center: Results of October 2012 Settlement Survey at 301 Mission Property	Page 1 of 1	

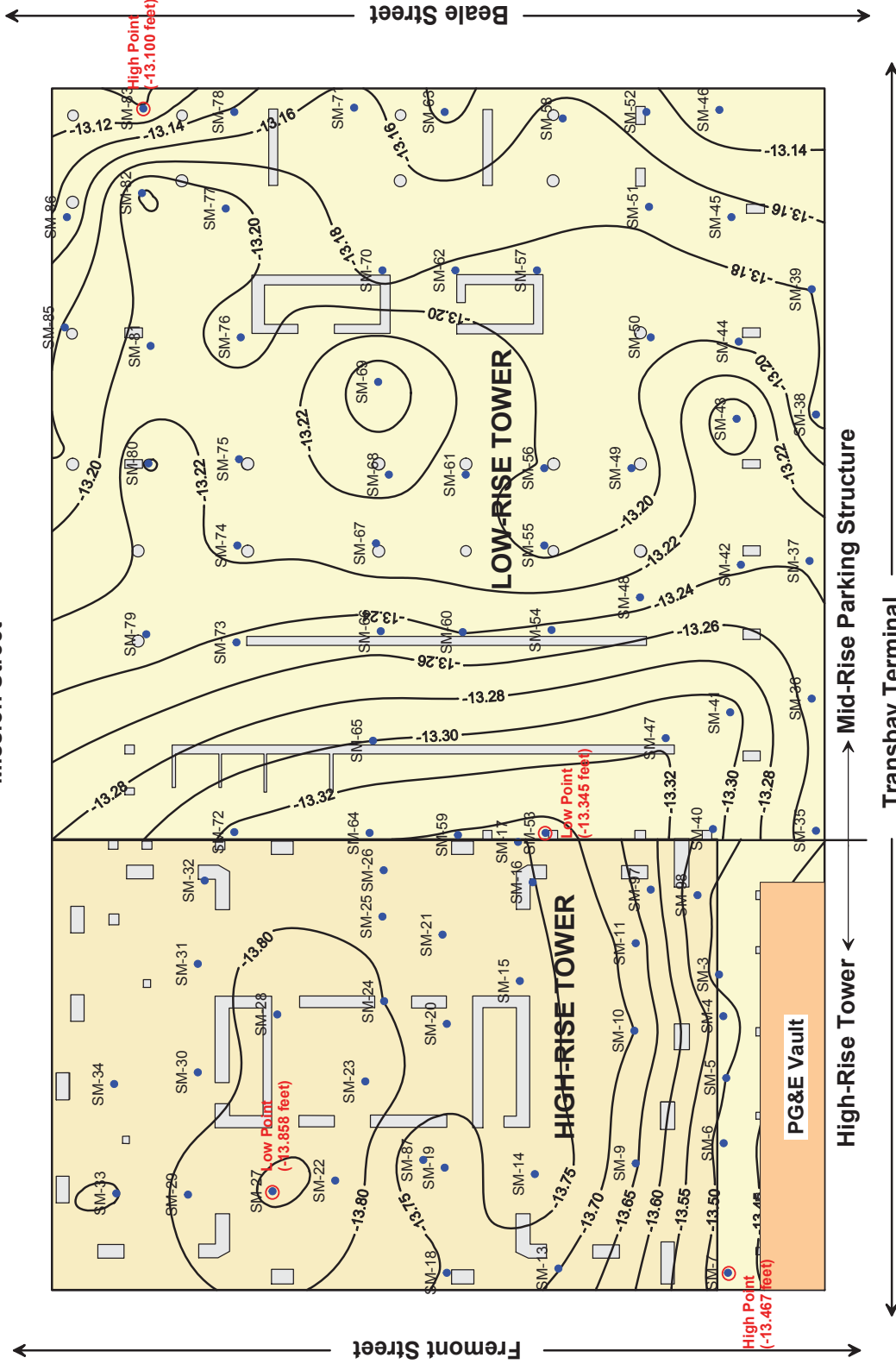
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated August 22, 2012 with measurements made through October 2012.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – October 12, 2012
- Plate 2 Differential Floor Elevation (Inches) – October 12, 2012 Survey
- Plate 3 Contours of Settlements Measured at the First Level Basement of the 301 Mission Street Structure Between April 30, 2009 and October 12, 2012
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- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: October 12, 2012 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: October 12, 2012 Survey

Mission Street

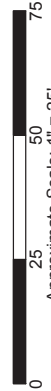
Fremont Street



Date of Survey Reading:
October 12, 2012

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.390 feet (4.685 inches)
Low-Rise Tower	0.246 feet (2.946 inches)



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 12, 2012.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - OCTOBER 12, 2012
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

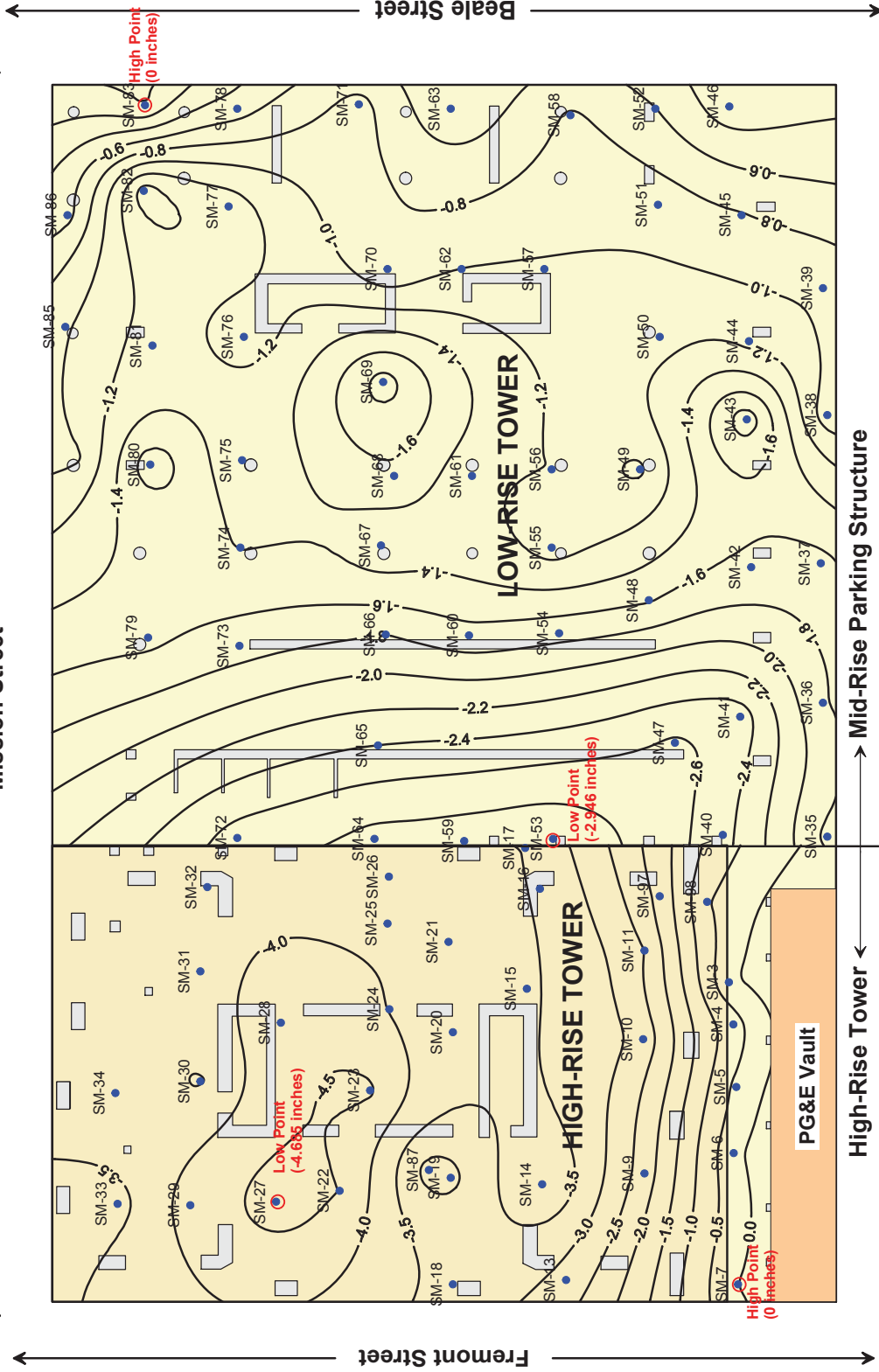
November 2012



PLATE 1

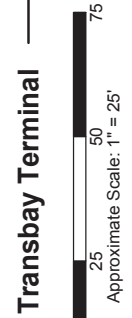
Mission Street

Fremont Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower ← Mid-Rise Parking Structure
 Transbay Terminal



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on October 12, 2012.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

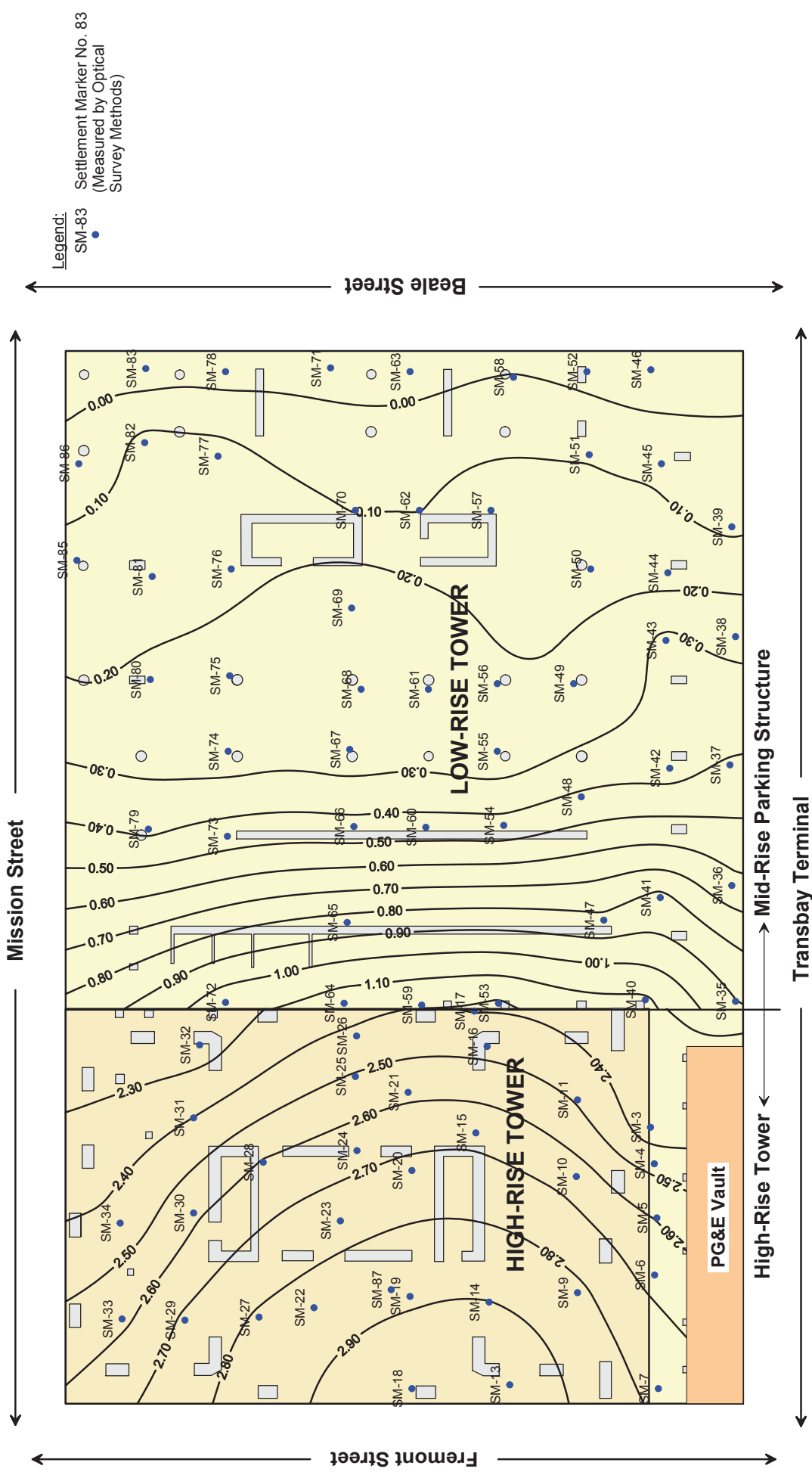
DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
OCTOBER 12, 2012 SURVEY

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

November 2012

ARUP

PLATE 2



Legend:
 SM-83
 • (Settlement Marker No. 83, Measured by Optical Survey Methods)

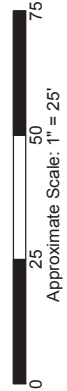
CONTOURS OF SETTLEMENTS MEASURED AT THE FIRST LEVEL BASEMENT OF THE 301 MISSION STREET STRUCTURE BETWEEN APRIL 30, 2009 AND OCT

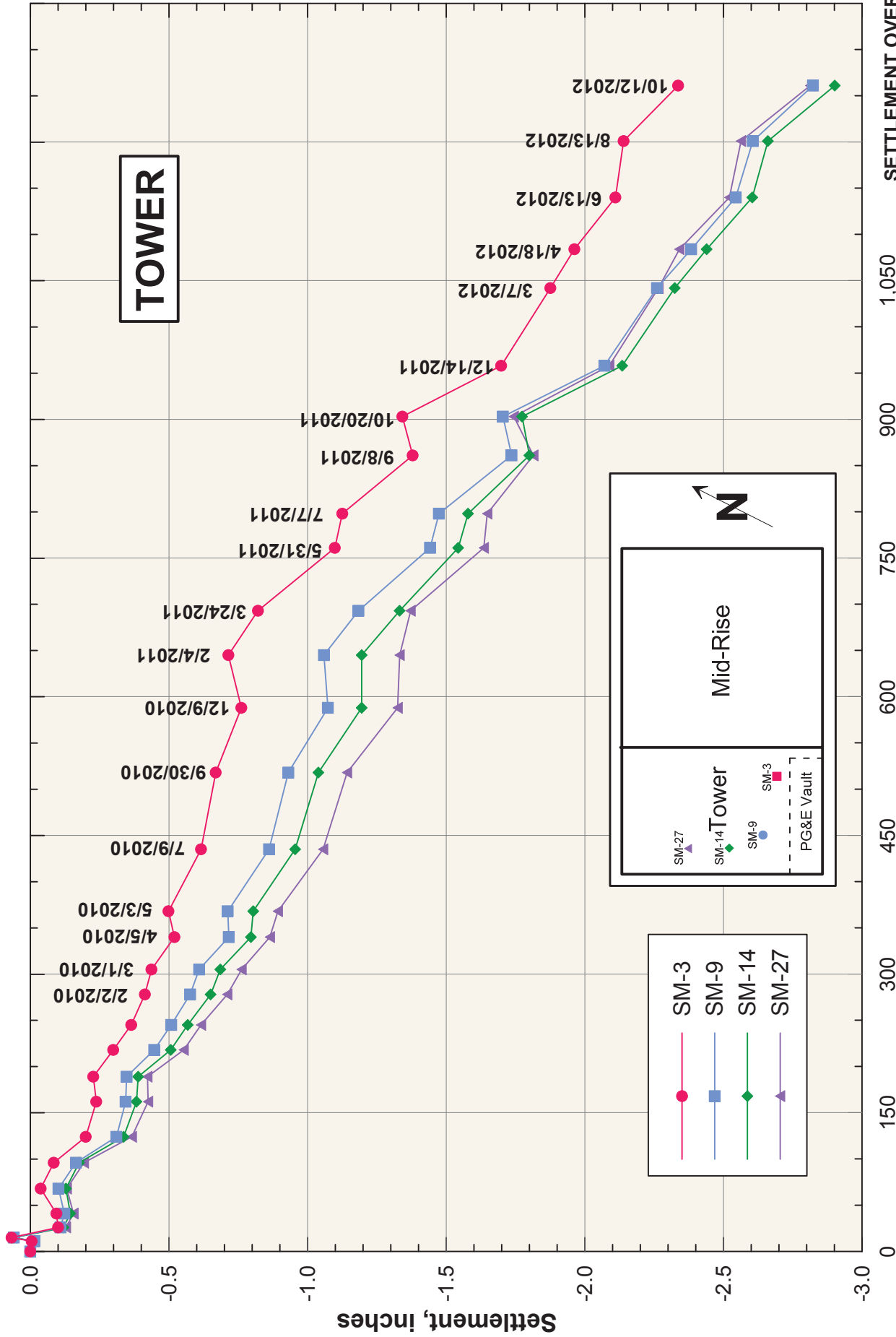
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

November 2012



Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on October 12, 2012.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.



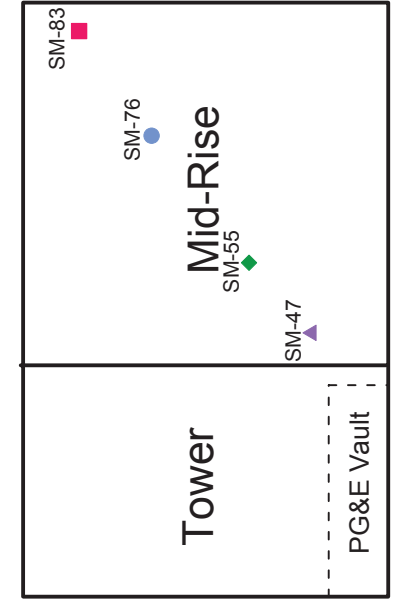
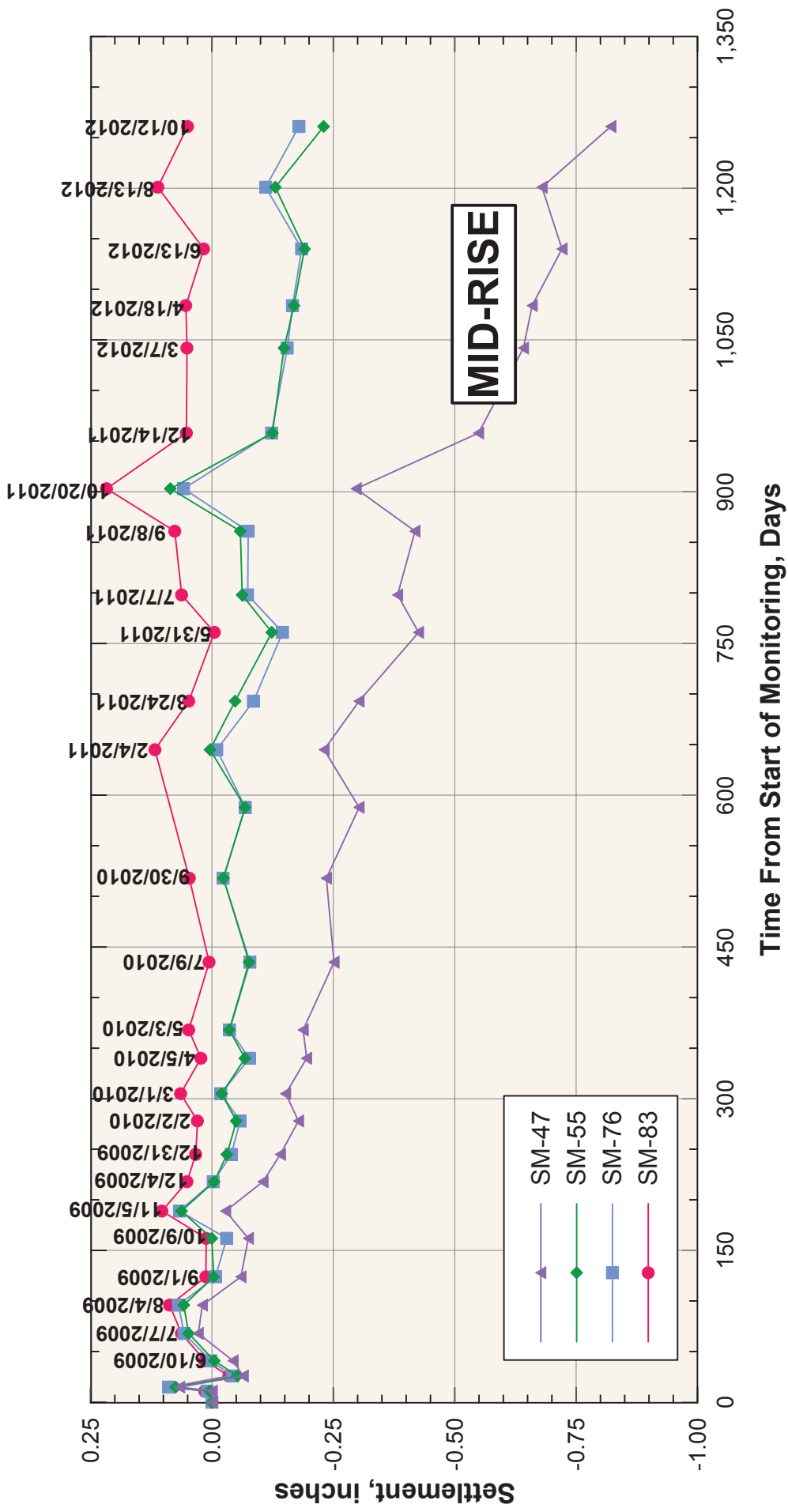


SETTLEMENT OVER TIME
 FLOOR ELEVATIONS AT LEVEL B-1
 OF 301 MISSION PROPERTY- TOWER:
 APRIL 30, 2009 THROUGH OCTOBER 12, 2012

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

Note:
 Initial (Baseline) reading
 taken on 04/30/09

November 2012
ARUP

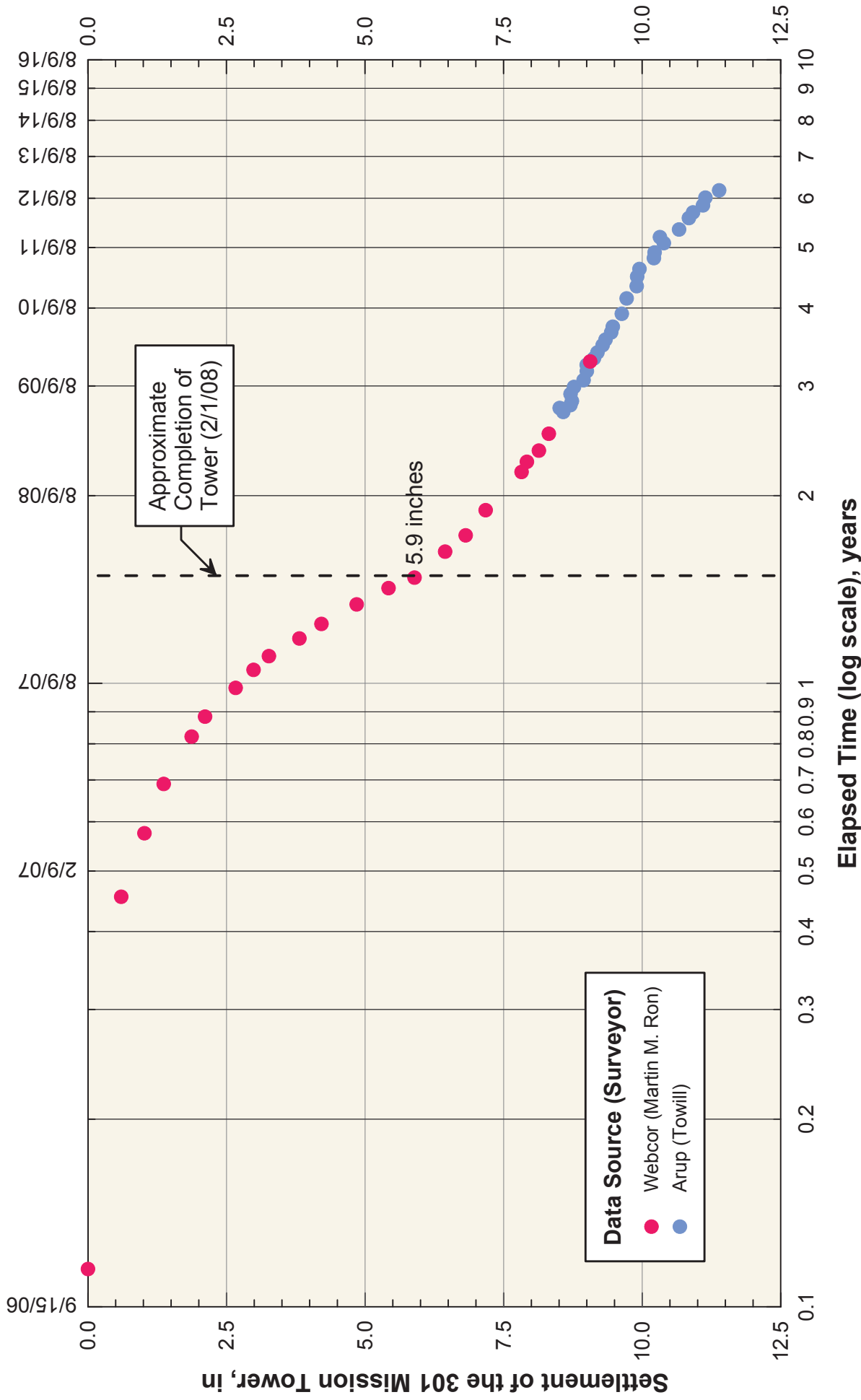


Note:
Initial (Baseline) reading
taken on 04/30/09

SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH OCTOBER 12, 2012

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

November 2012
ARUP



Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

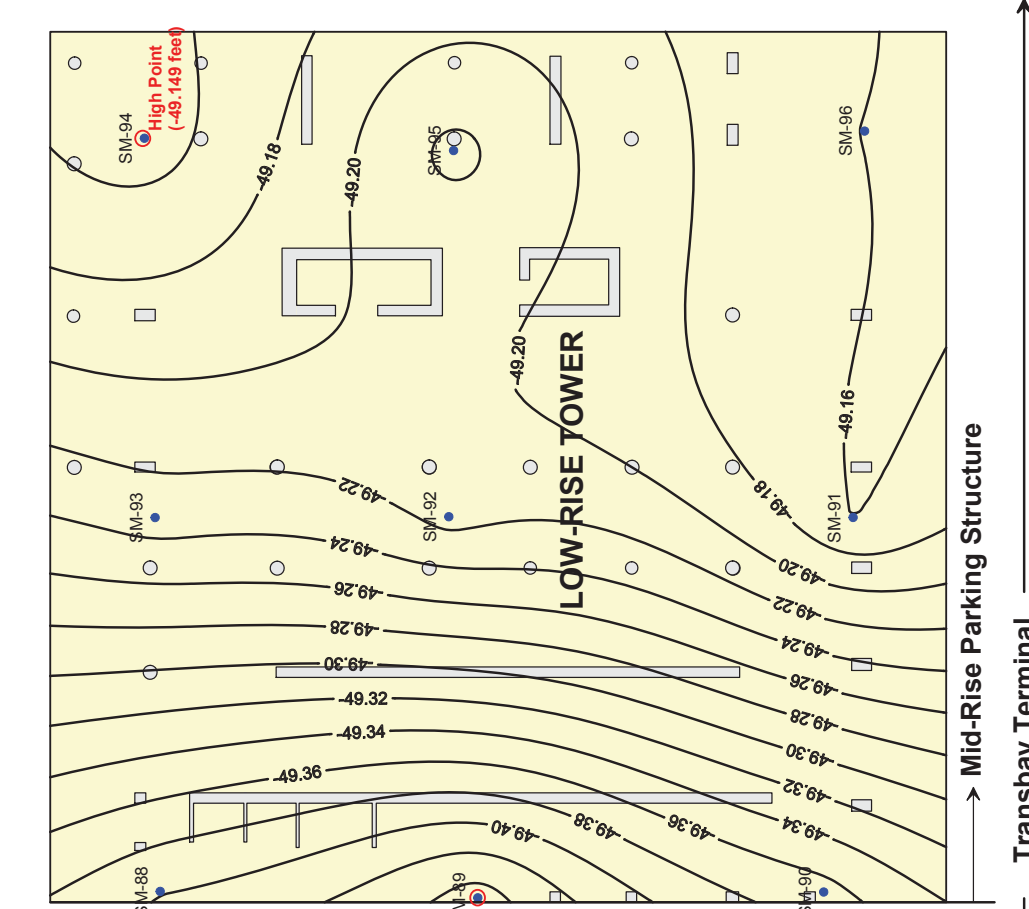
SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

August 2012



Mission Street



Date of Survey Reading:
October 12, 2012

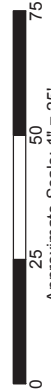
Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.301 feet (3.611 inches)

Fremont Street

Beale Street

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 12, 2012.



Approximate Scale: 1" = 25'

J:\S-F\132000\1322424 Internal Project Data\4-05 Reports & Narratives\181_301 Mission - Aug 2012 Survey\Plates\B-5 Elevations (2012.08.13).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: OCTOBER 12, 2012 SURVEY

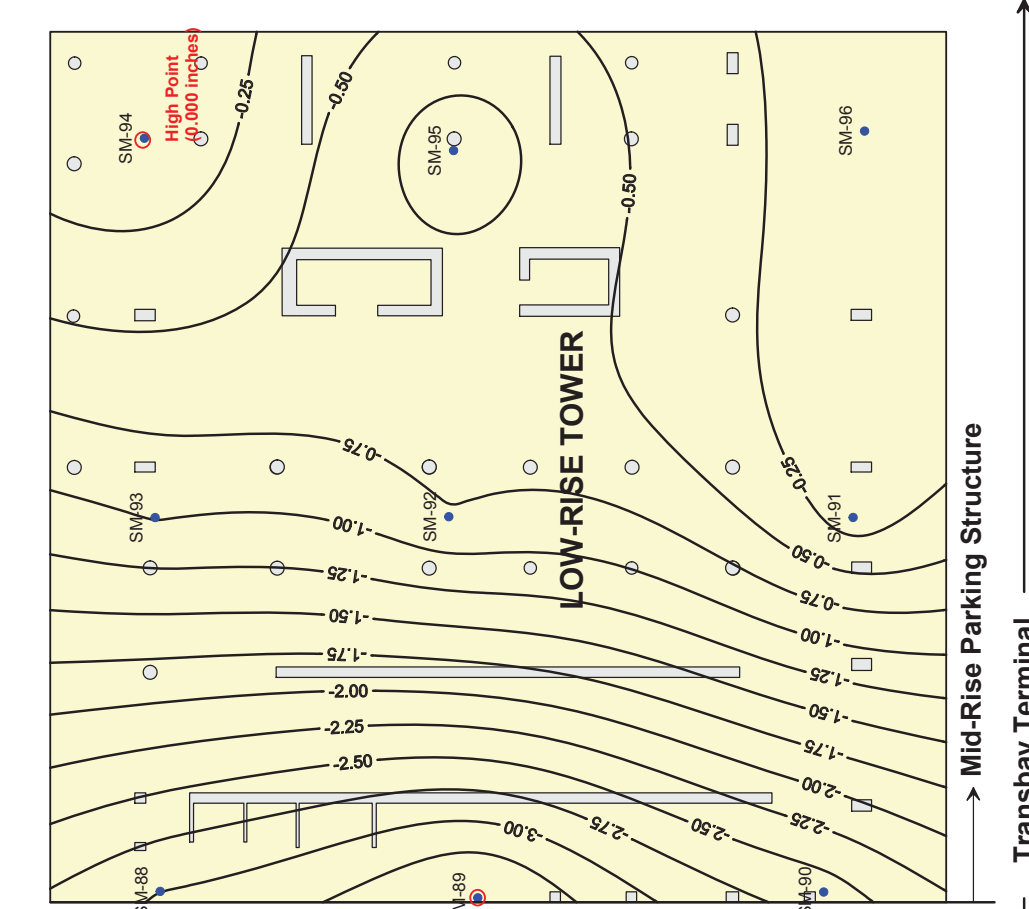
Transbay Transit Center
301 Mission Monitoring
Transbay - Joint Powers Authority
San Francisco, California

November 2012



PLATE 7

Mission Street



Date of Survey Reading:
October 12, 2012

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.301 feet (3.611 inches)

Fremont Street

Fremont Street

Beale Street

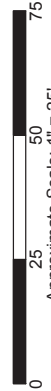
Mid-Rise Parking Structure

Transbay Terminal



Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 12, 2012.



Approximate Scale: 1" = 25'

J:\S\F\132000\1322424 Internal Project Data\4-05 Reports & Narratives\81_301 Mission - Aug 2012 Survey\Plates\B-5 Differential Elevations (2012.08.13).sr

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: OCTOBER 12, 2012 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay - Joint Powers Authority
San Francisco, California

November 2012



PLATE 8

From: Brian Dykes <bdykes@transbaycenter.org>
Sent: Monday, January 28, 2013 3:12 PM
To: Steven Hood
Cc: Robert Beck; Nila Gonzales
Subject: December Settlement Readings at 301 Mission Street
Attachments: 2013-01-17 Memo_301 Mission Settlement - Dec 2012 Survey.pdf

Steve,
Attached is the report of the settlement readings up to the latest survey taken on December 26, 2012.
The next readings are scheduled to be taken in February 2013.
Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	17 January 2013
Copies	Robert Beck (TJPA) Emilio Cruz (PMPC) Randy Volenec (PCPA) George Metzger (AAI)	Reference number	132242-60/SMM
From	Stephen McLandrich (Arup)	File reference	4-05 195
Subject	Transbay Transit Center: Results of December 2012 Settlement Survey at 301 Mission Property Page 1 of 1		

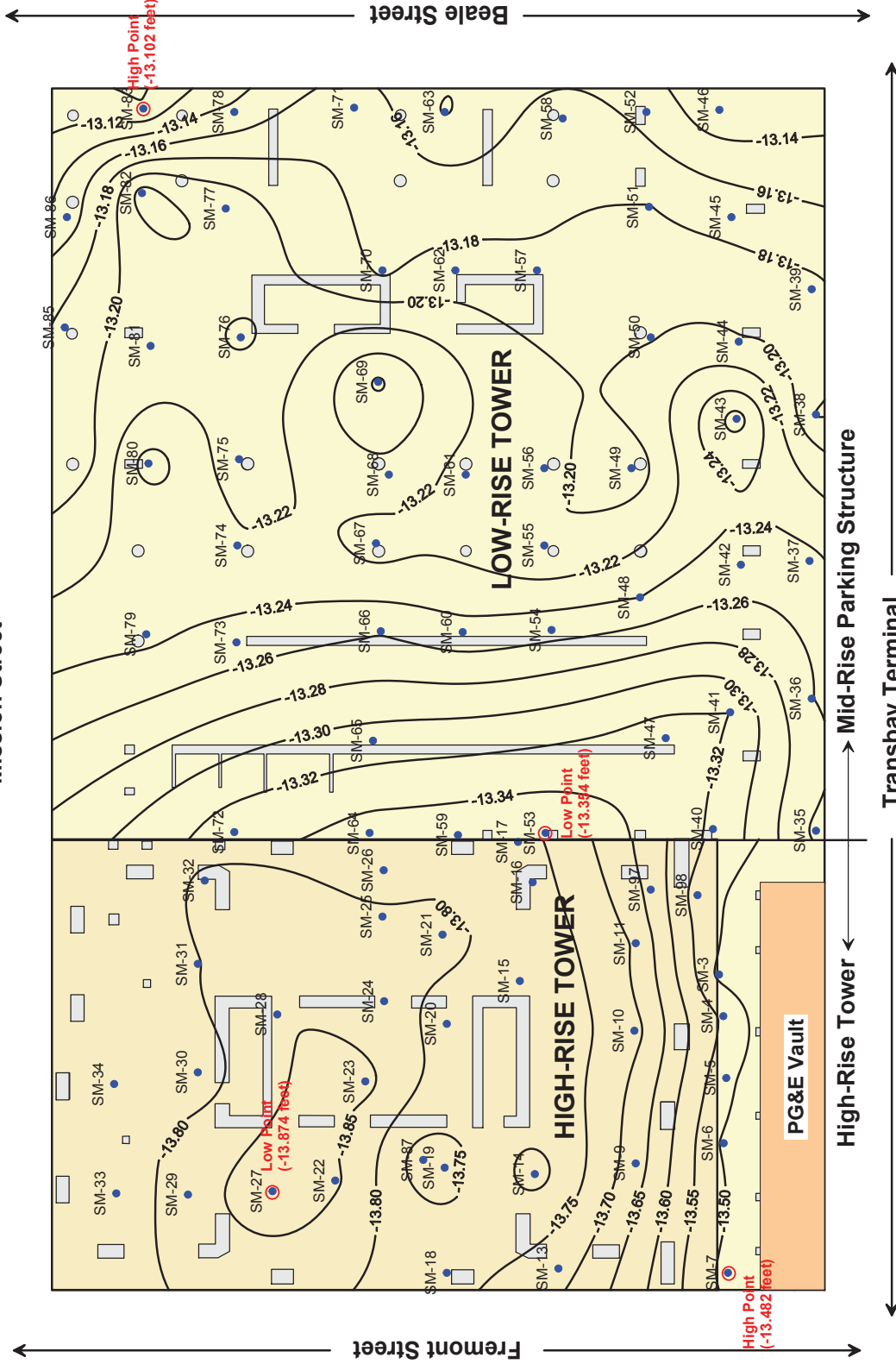
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated November 6, 2012 with measurements made through December 2012.

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- Plate 2 Differential Floor Elevation (Inches) – December 26, 2012 Survey
- Plate 3 Contours of Settlements Measured at the First Level Basement of the 301 Mission Street Structure Between April 30, 2009 and December 26, 2012
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- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: December 26, 2012 Survey

Mission Street

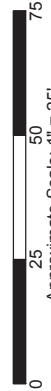
Fremont Street



Date of Survey Reading:
December 26, 2012

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.392 feet (4.700 inches)
Low-Rise Tower	0.253 feet (3.034 inches)



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on December 26, 2012.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY;
PERIODIC SURVEY - DECEMBER 26, 2012
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

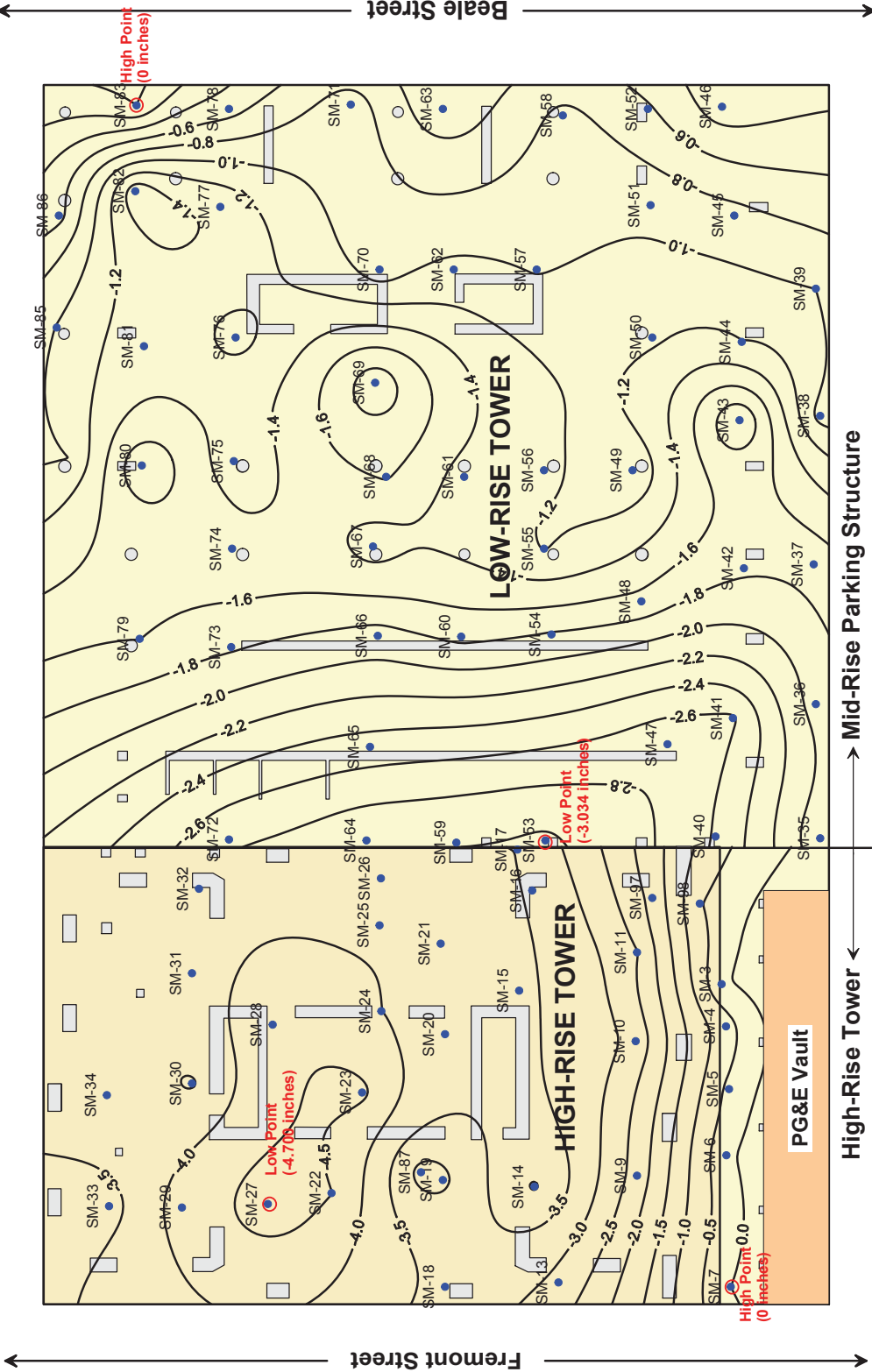
January 2013



PLATE 1

Mission Street

Beale Street

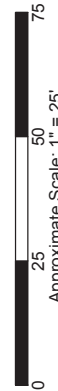


Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

Mid-Rise Parking Structure

High-Rise Tower

Transbay Terminal



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on December 26, 2012.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

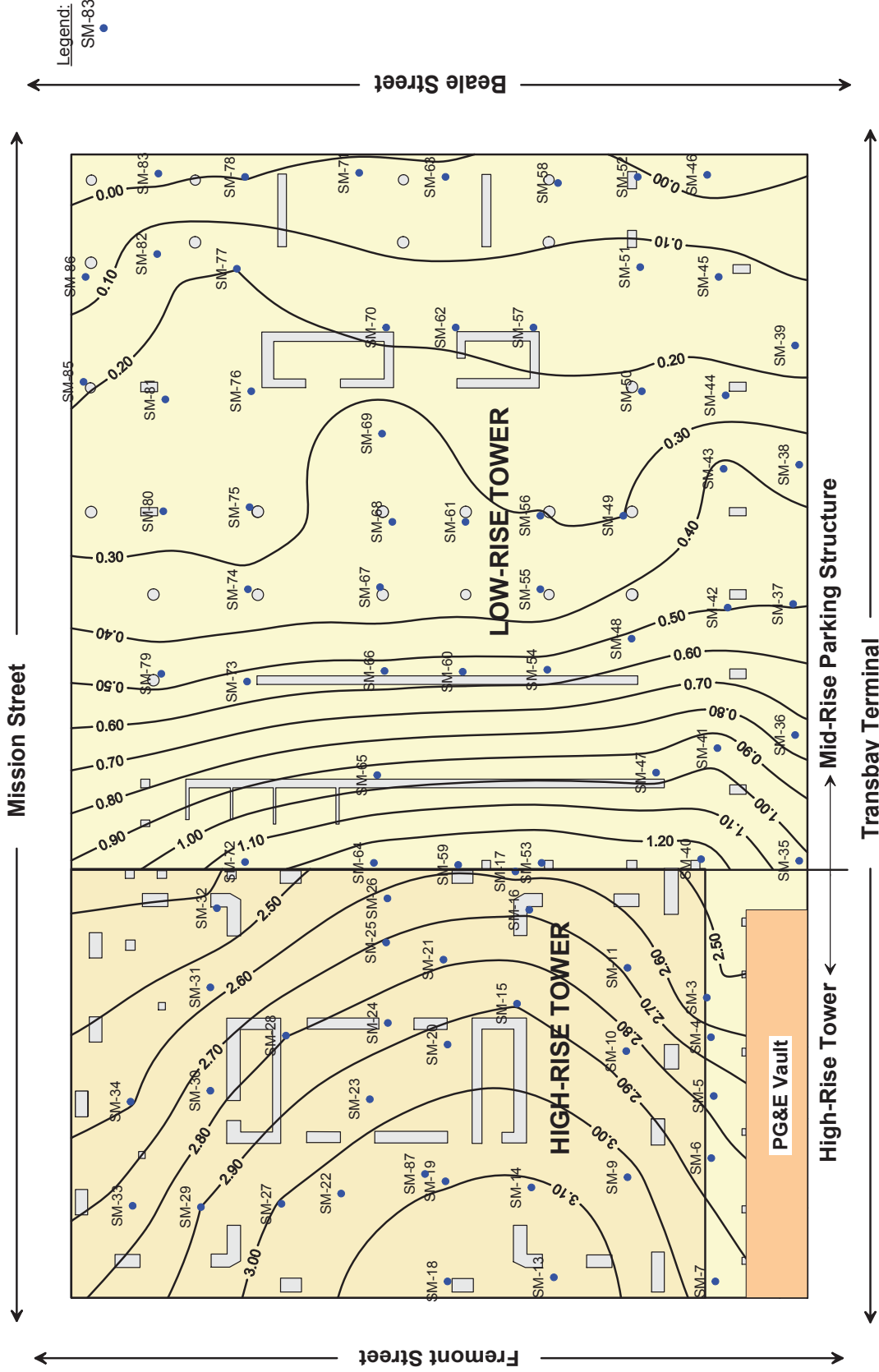
DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 DECEMBER 26, 2012 SURVEY

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

January 2013

ARUP

PLATE 2



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

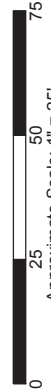
**CONTOURS OF SETTLEMENTS MEASURED AT THE
 FIRST LEVEL BASEMENT OF THE 301 MISSION STREET
 STRUCTURE BETWEEN APRIL 30, 2009 AND DEC**

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

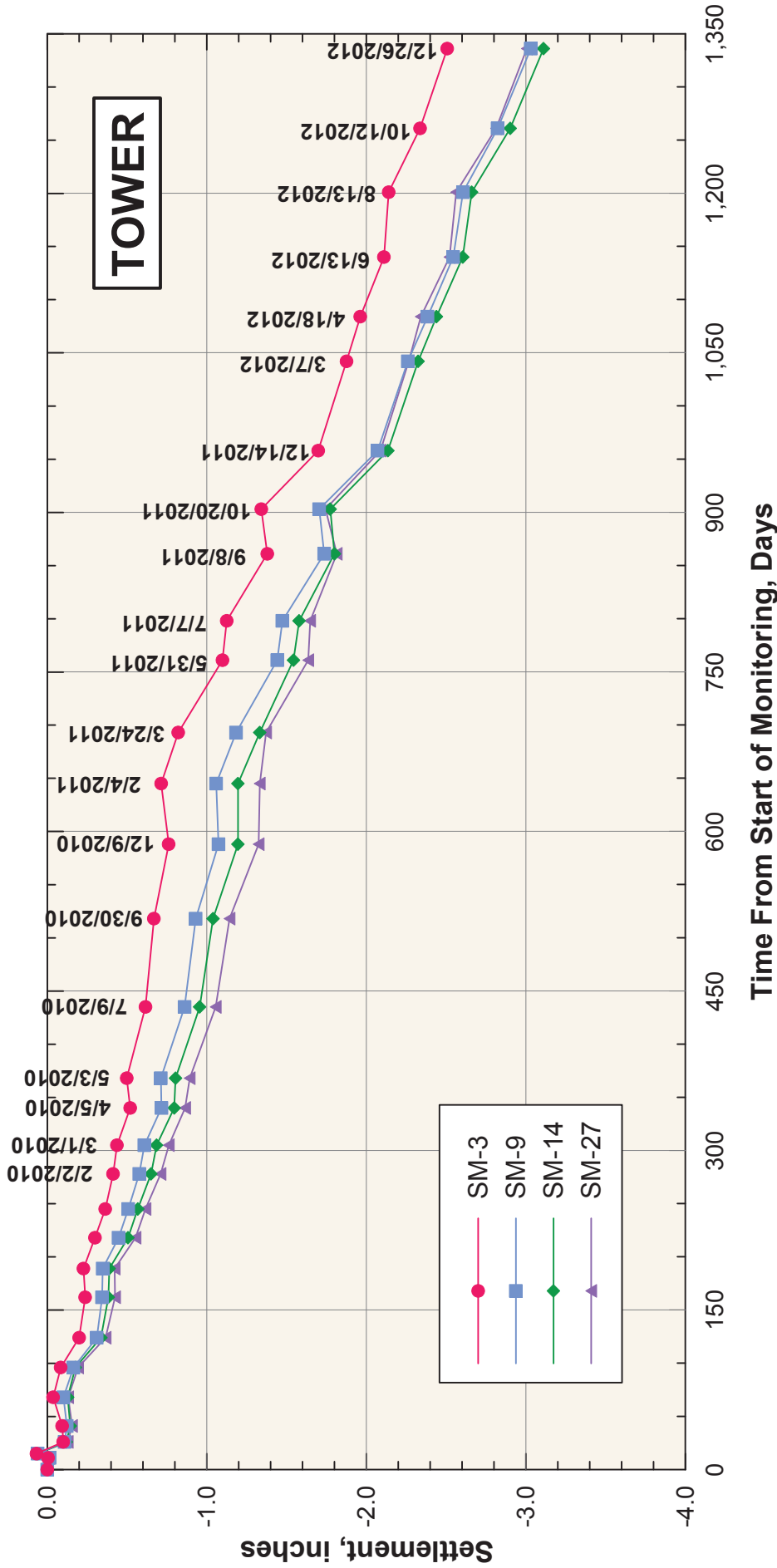
January 2013



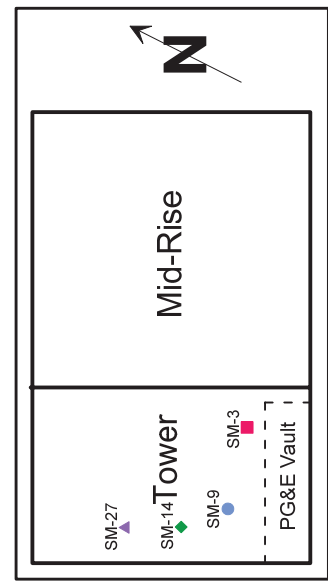
Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on December 26, 2012.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.



Approximate Scale: 1" = 25'



Note:
Initial (Baseline) reading
taken on 04/30/09

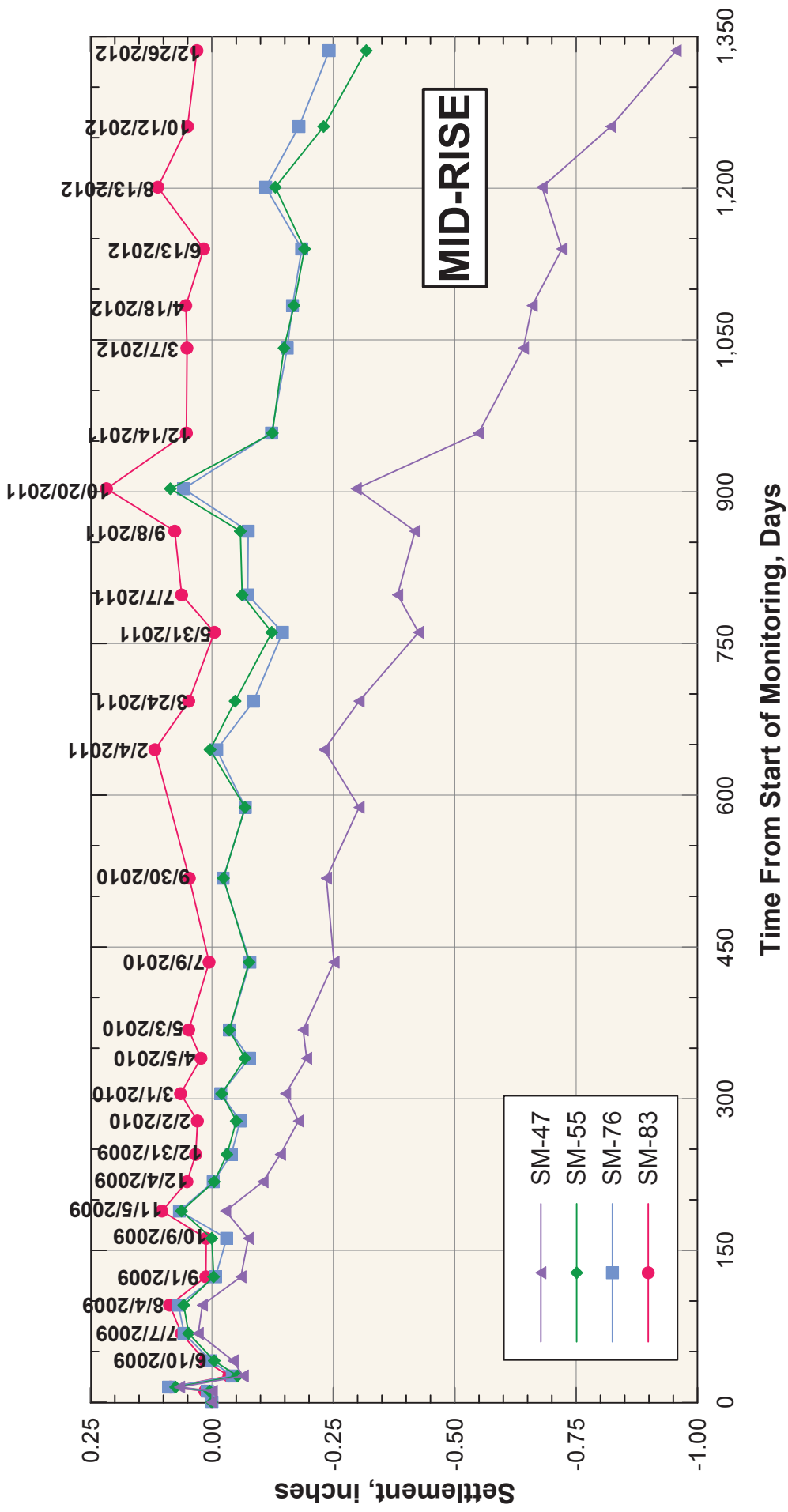


**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH DECEMBER 26, 2012**

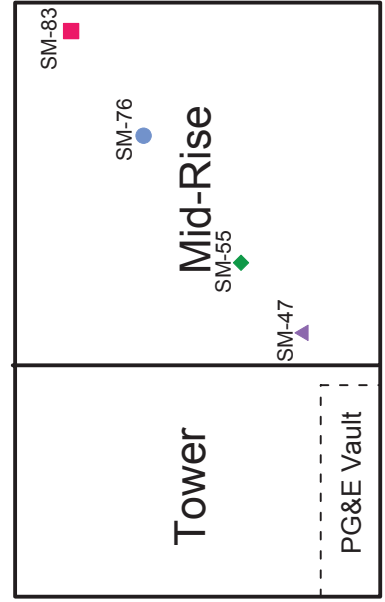
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

January 2013





MID-RISE



Note:
Initial (Baseline) reading
taken on 04/30/09

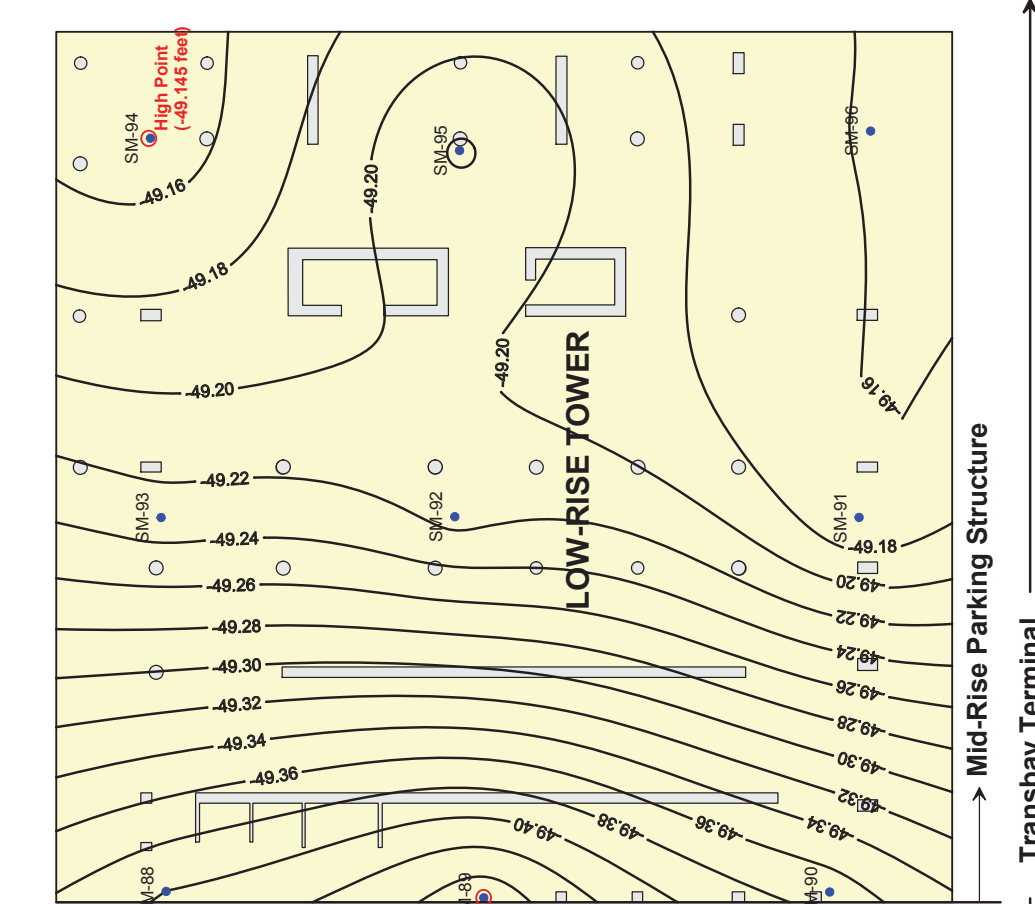
**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH DECEMBER 26, 2012**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

January 2013



Mission Street



Mid-Rise Parking Structure
Transbay Terminal

Date of Survey Reading:
December 26, 2012

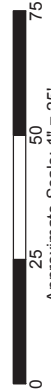
Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.310 feet (3.718 inches)

Fremont Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on December 26, 2012.



Approximate Scale: 1" = 25'

J:\S-F1320001\322424 Internal Project Data\4-05 Reports & Narratives\105-301 Mission - Dec 2012 Survey\PlateB-5 Elevations (2012.12.26).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: DECEMBER 26, 2012 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

January 2013

ARUP

PLATE 7

From: Brian Dykes <bdykes@transbaycenter.org>
Sent: Monday, June 17, 2013 1:46 PM
To: Steven Hood
Cc: Dennis Turchon; Robert Beck
Subject: 301 Mission Street Settlement Monitoring Feb/Mar 2013
Attachments: 2013-03-27 Memo_301 Mission Settlement - Feb 2013 Survey.pdf; 301 Mission Monitoring Survey 021313.xls

Steve,
Here are the survey monitoring readings of the raw data recorded on 2/13/13 and the memo from Arup dated 3/27/13.
Regards, Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	27 March 2013
Copies	Robert Beck (TJPA) Randy Volenec (PCPA) George Metzger (AAI)	Reference number	132242-60/SMM
From	Stephen McLandrich (Arup)	File reference	4-05 204
Subject	Transbay Transit Center: Results of February 2013 Settlement Survey at 301 Mission Property	Page 1 of 1	

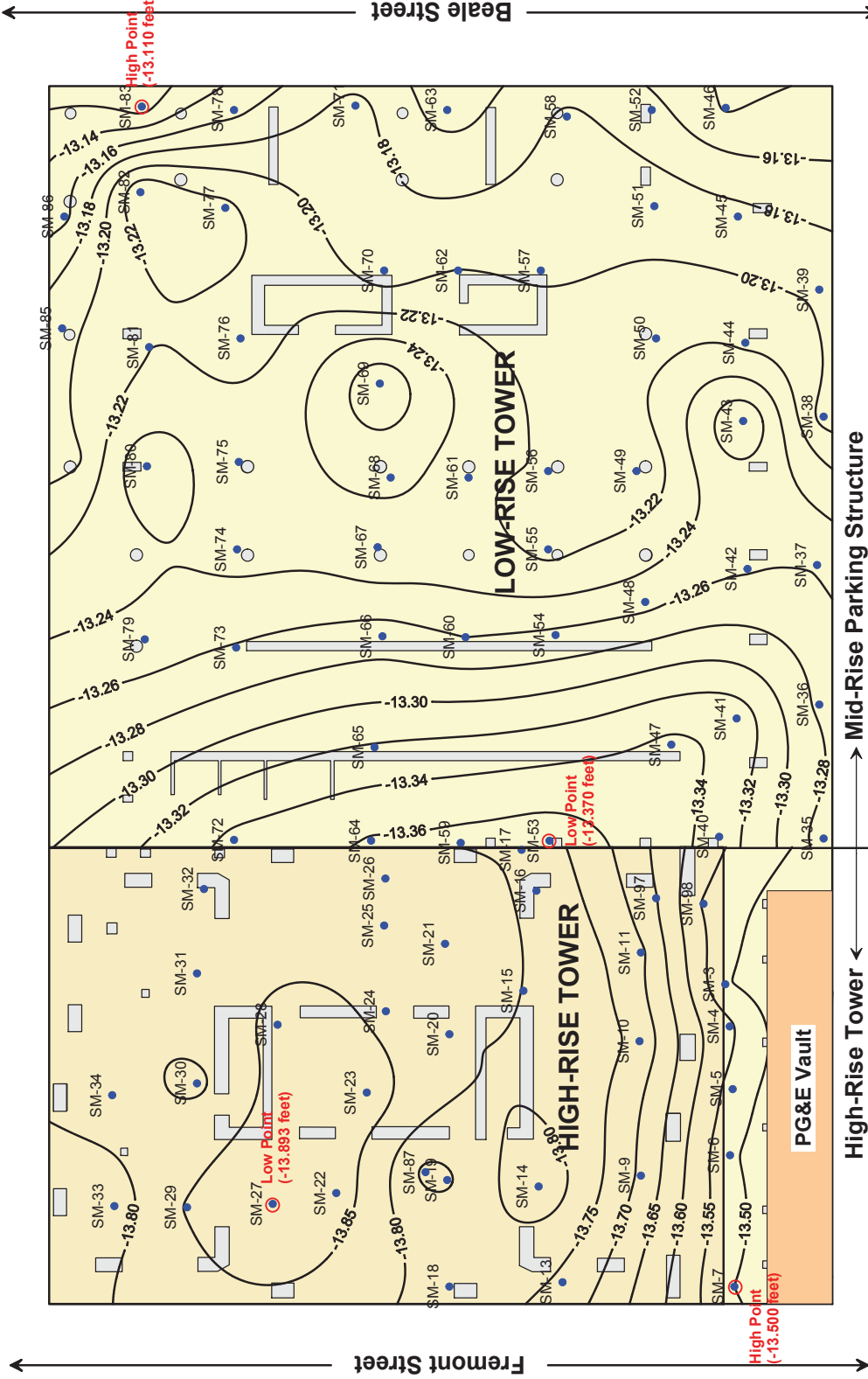
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated January 17, 2013 with measurements made through February 2013.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – February 13, 2013
- Plate 2 Differential Floor Elevation (Inches) – February 13, 2013 Survey
- Plate 3 Contours of Settlements Measured at the First Level Basement of the 301 Mission Street Structure Between April 30, 2009 and February 13, 2013
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through February 13, 2013
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through February 13, 2013
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: February 13, 2013 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: February 13, 2013 Survey

Mission Street

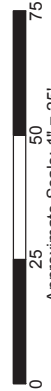
Fremont Street



Date of Survey Reading:
February 13, 2013

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.394 feet (4.723 inches)
Low-Rise Tower	0.259 feet (3.114 inches)



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on February 13, 2013.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - FEBRUARY 13, 2013
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

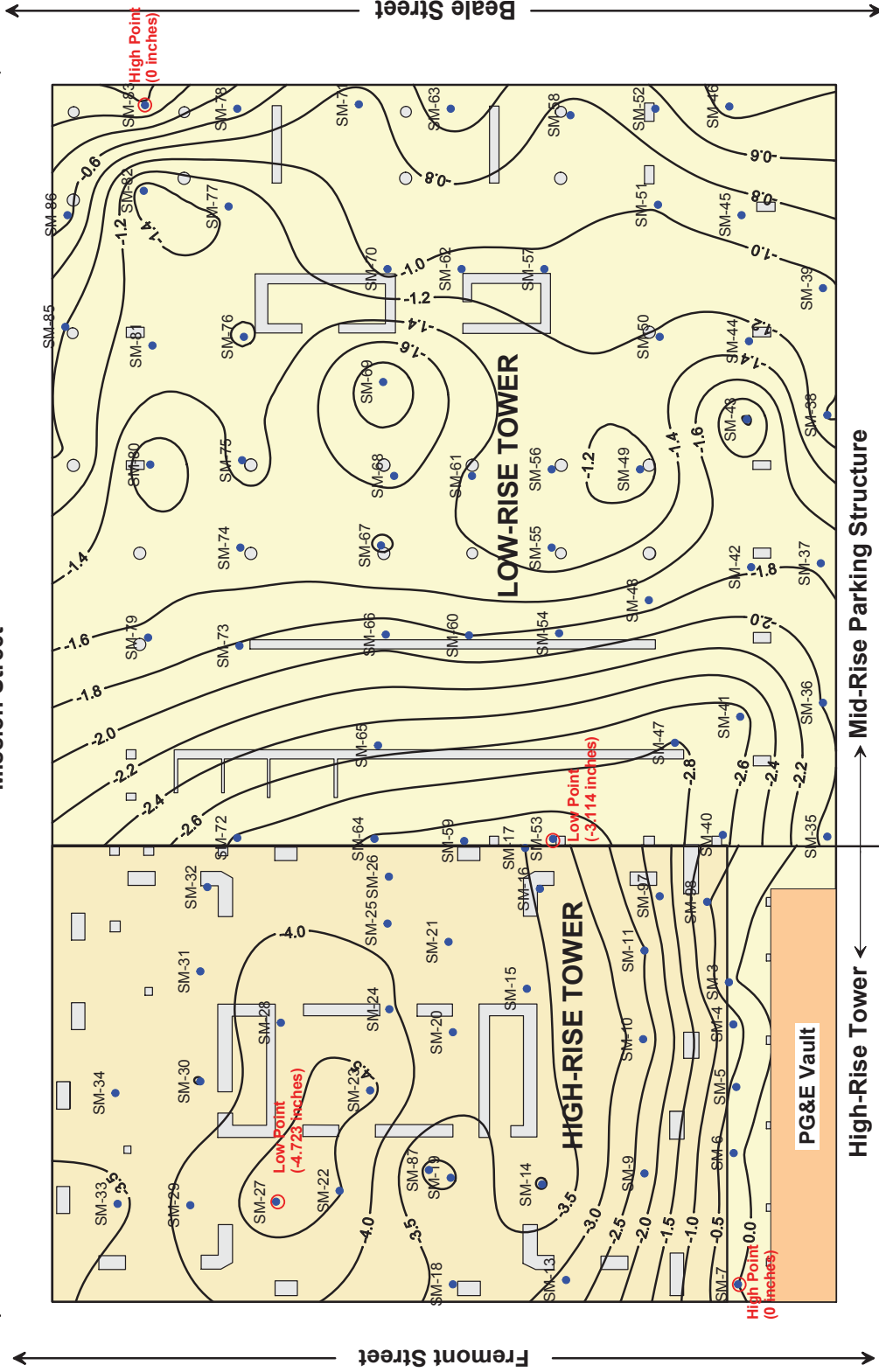
March 2013



PLATE 1

Mission Street

Fremont Street



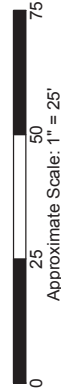
Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower

Low-Rise Tower

Mid-Rise Parking Structure

Transbay Terminal



Notes:

Contours represent differential elevation, in inches, between the highest point and all other points taken on February 13, 2013.

Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

The PG&E vault is inaccessible for monitoring.

Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

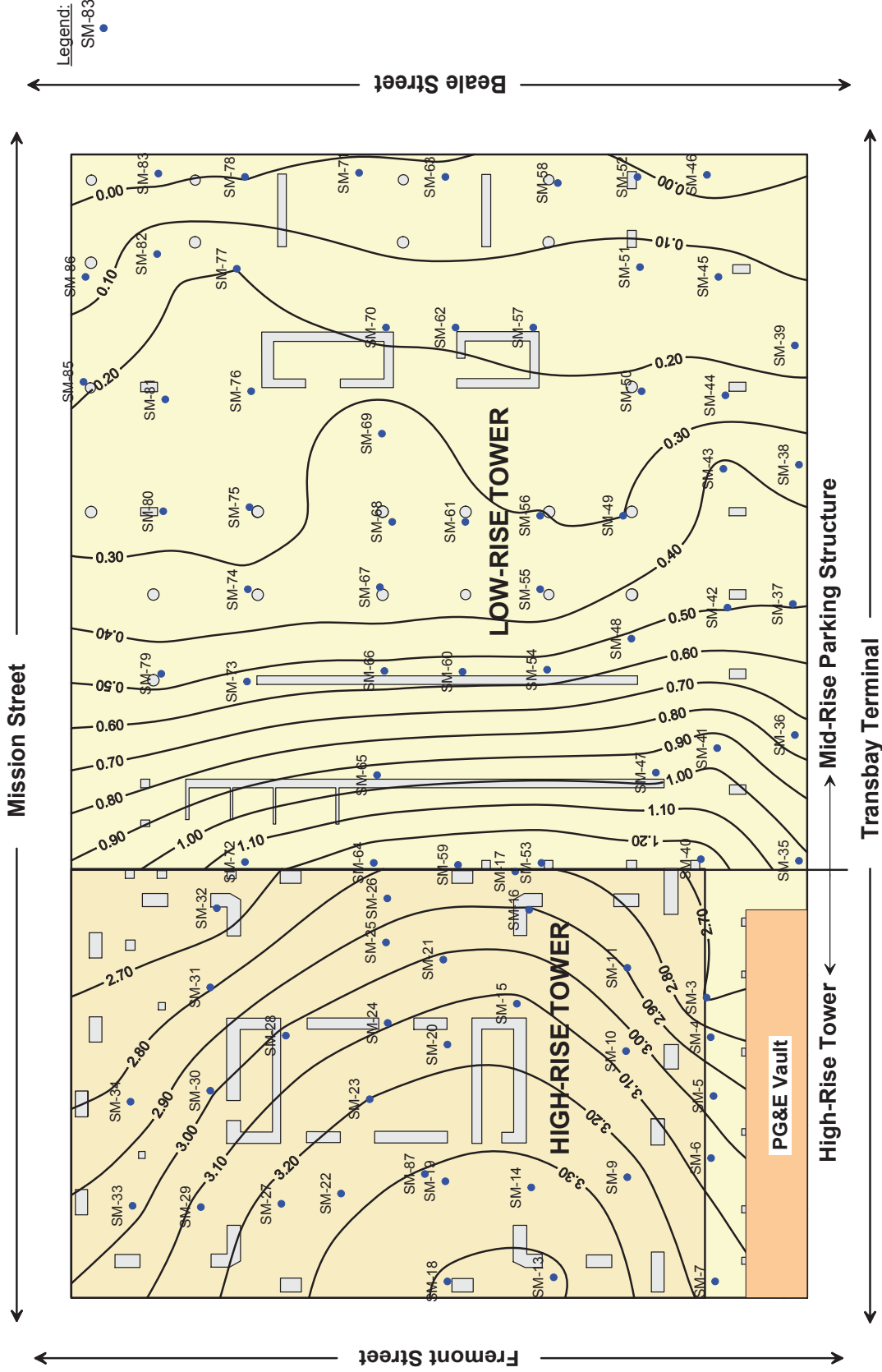
DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 FEBRUARY 13, 2013 SURVEY

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

March 2013

ARUP

PLATE 2



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

CONTOURS OF SETTLEMENTS MEASURED AT THE
 FIRST LEVEL BASEMENT OF THE 301 MISSION STREET
 STRUCTURE BETWEEN APRIL 30, 2009 AND FEB

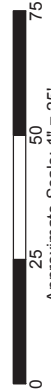
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

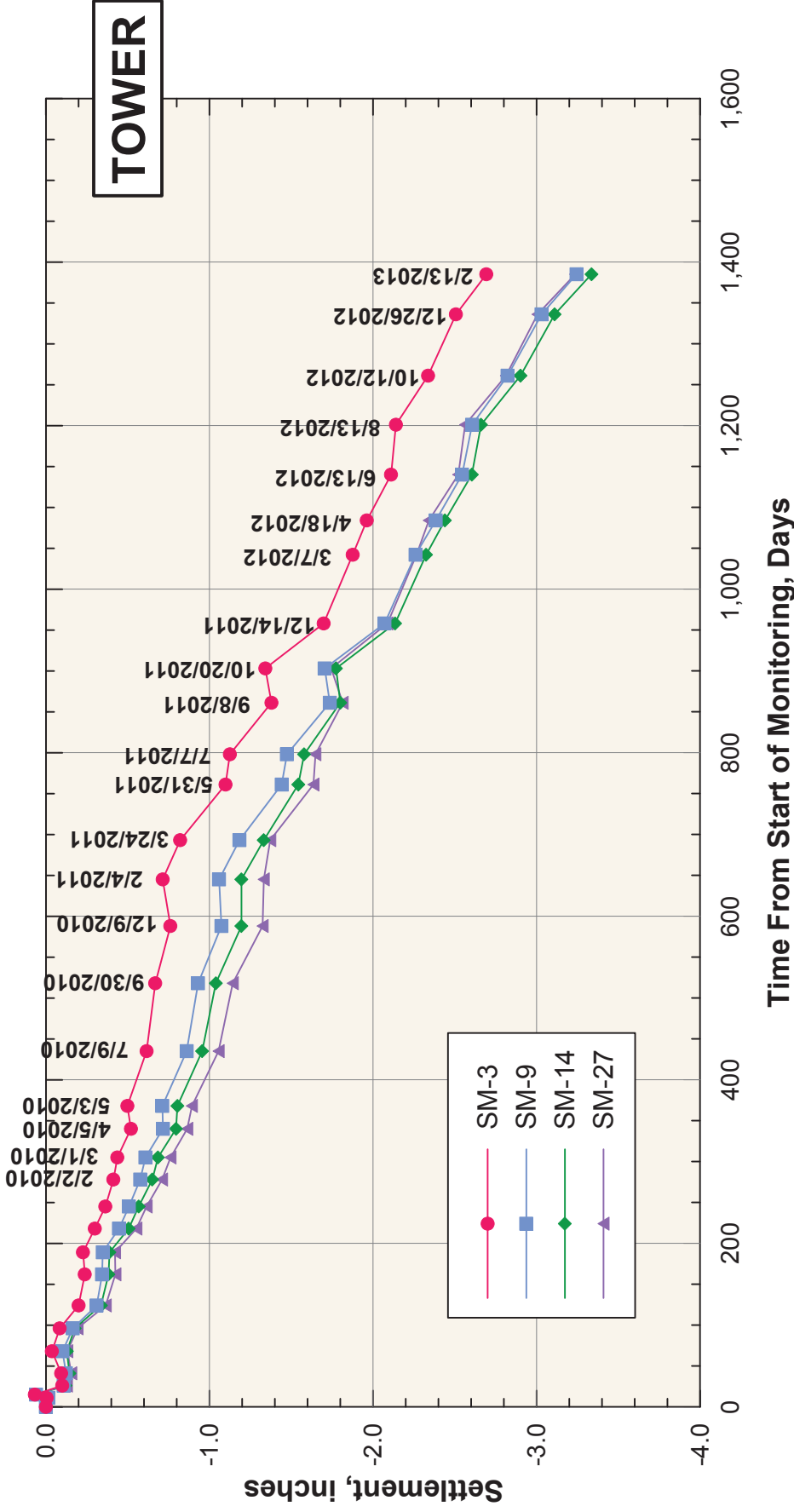
March 2013



PLATE 3

Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on February 13, 2013.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.





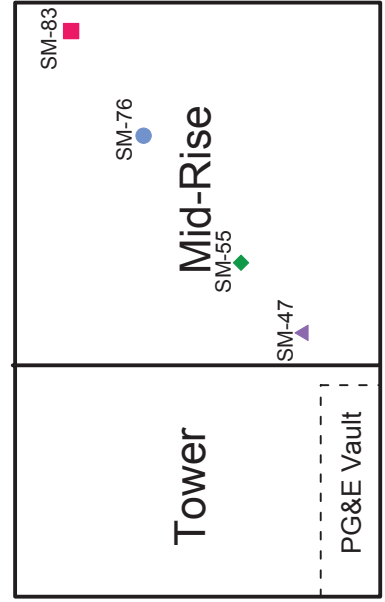
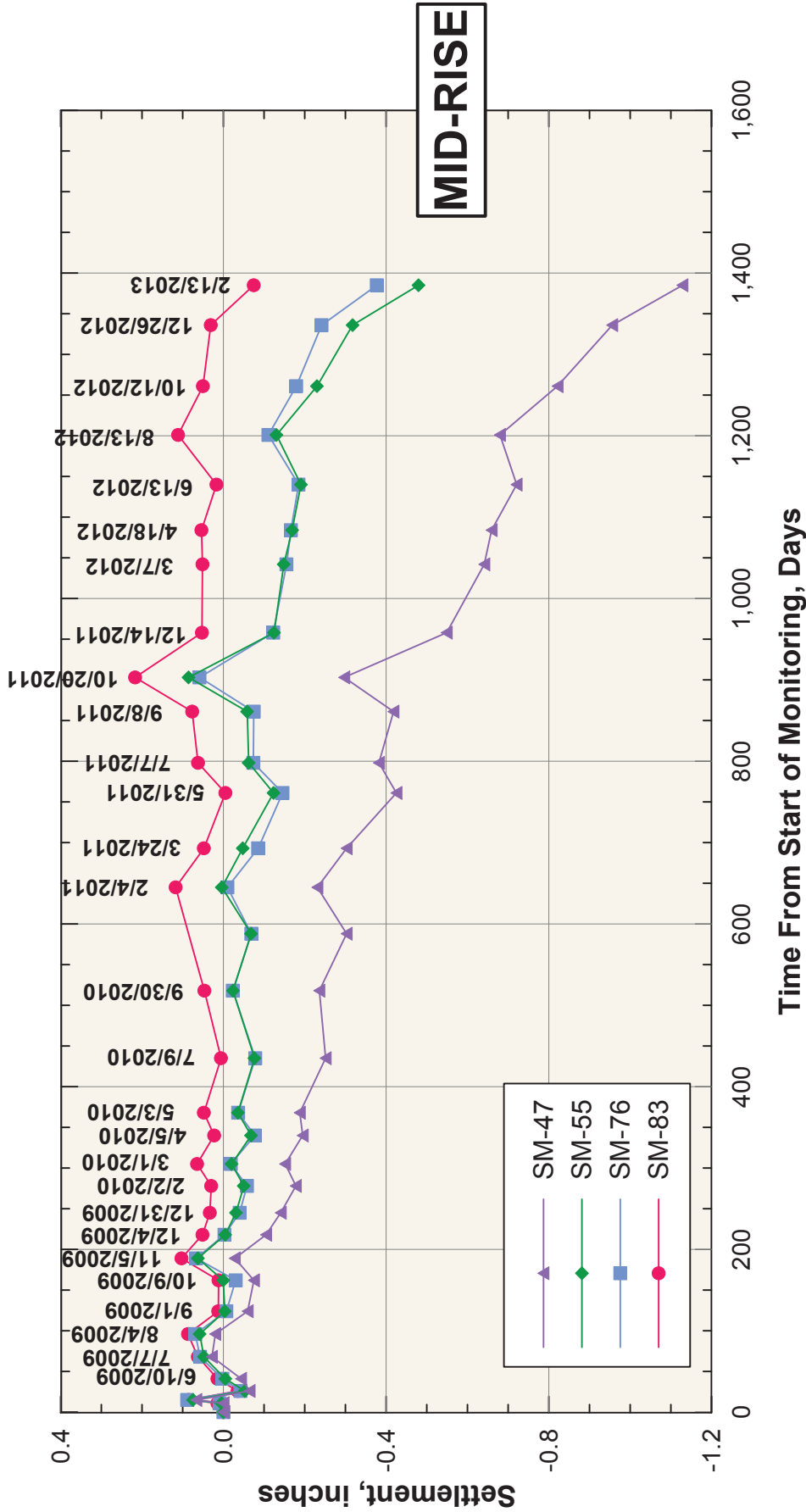
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH FEBRUARY 13, 2013**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

March 2013



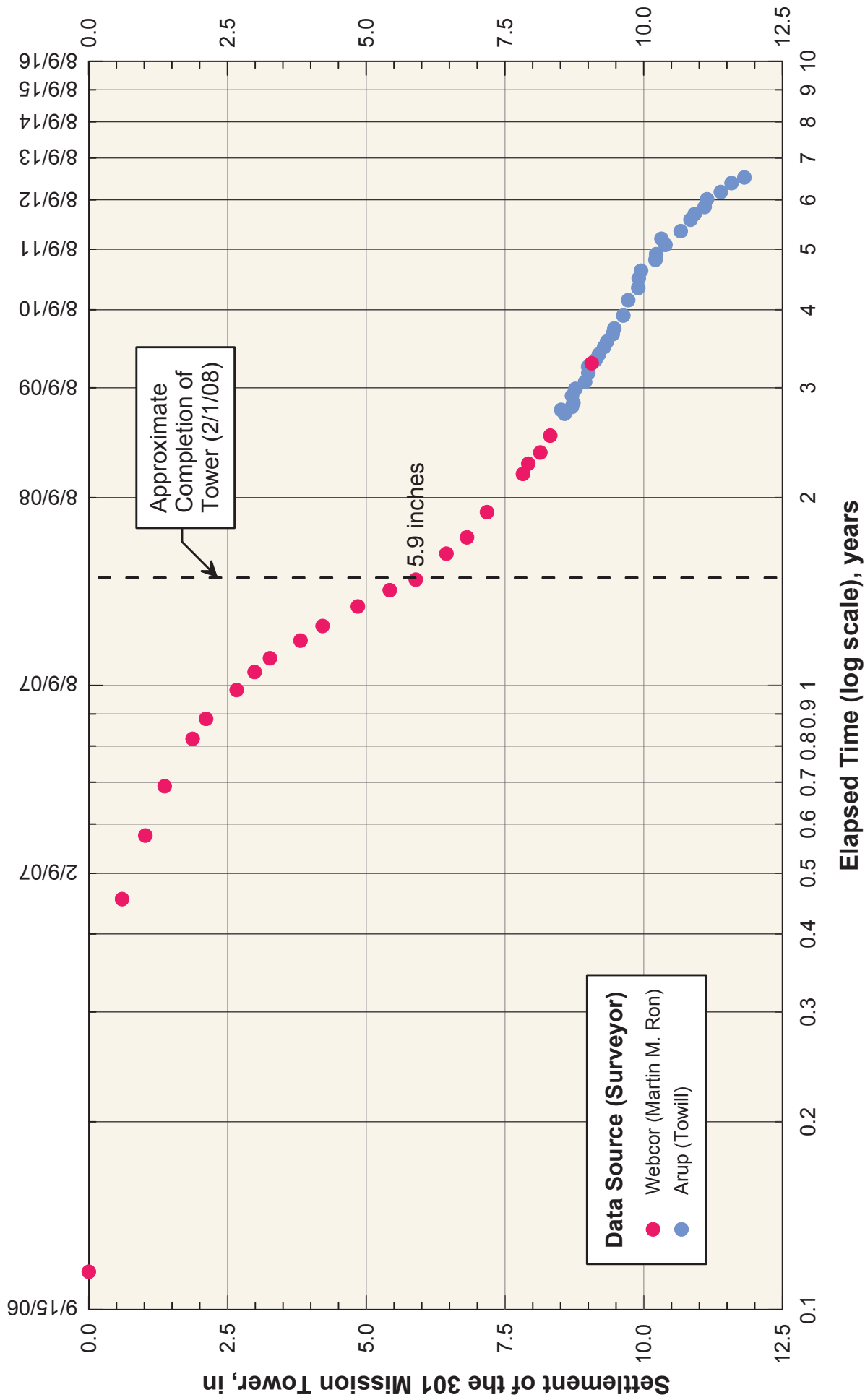


Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH FEBRUARY 13, 2013**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

March 2013
ARUP



Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

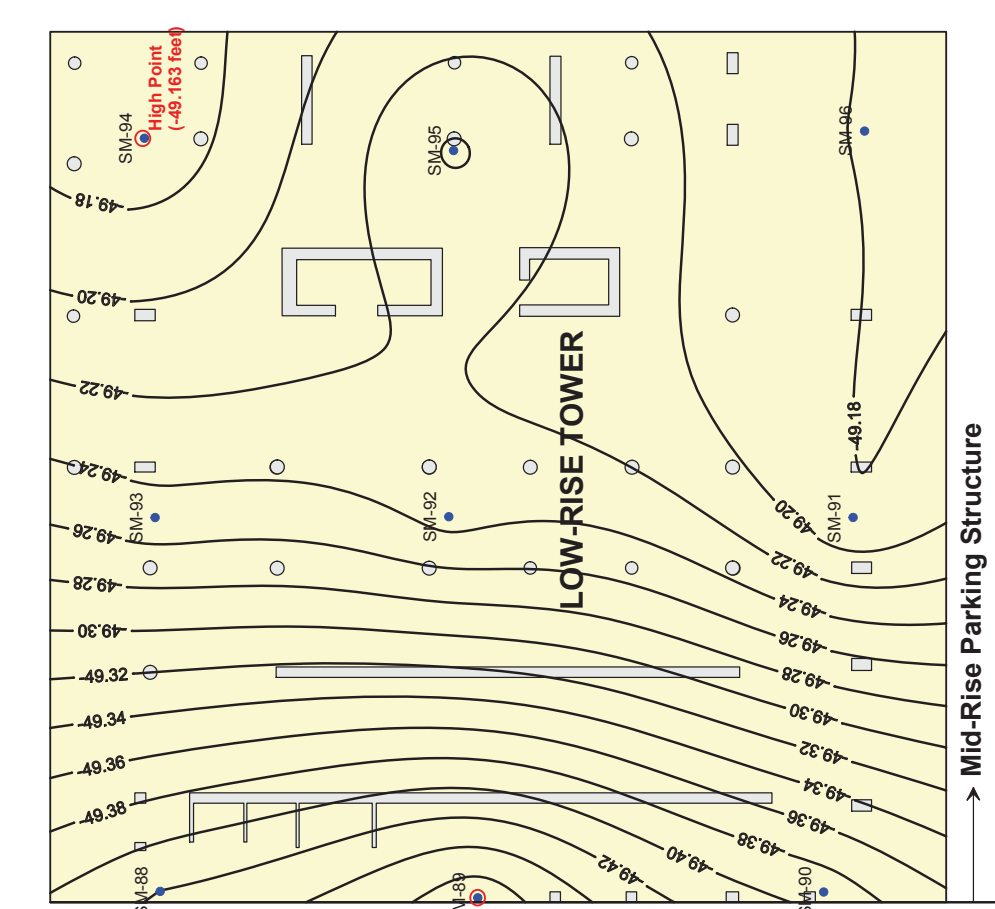
SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

March 2013



Mission Street



Date of Survey Reading:
February 13, 2013

Legend:
 SM-88 Settlement Marker No. 88
 (Measured by Optical Survey Methods)

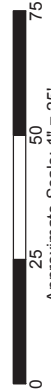
Maximum Differential
B-5 Level Basement
0.311 feet (3.734 inches)

Fremont Street



Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on February 13, 2013.



Approximate Scale: 1" = 25'

J:\S\F\132000\1322424 - Internal Project Data\4-05 Reports & Narratives\204-301 Mission - Feb. 2013 Survey\Plates\B-5 Elevations (2013.02.13).sr

Mid-Rise Parking Structure

Transbay Terminal

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: FEBRUARY 13, 2013 SURVEY

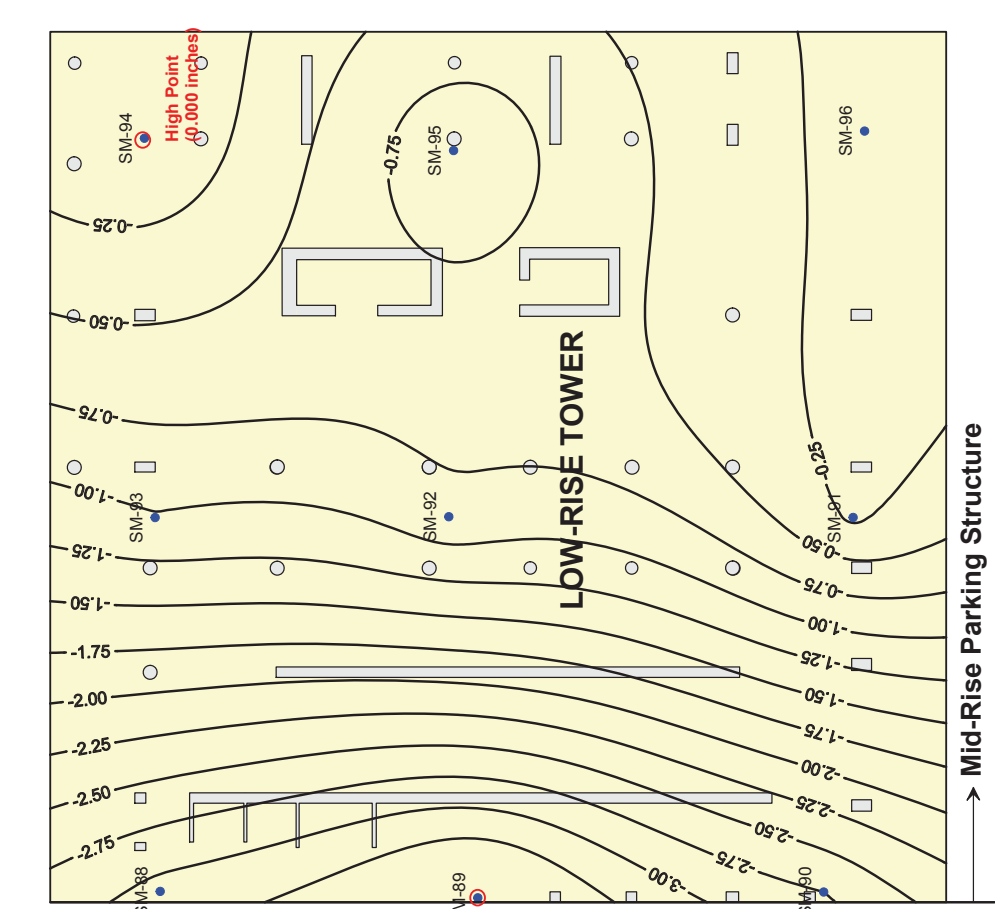
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

March 2013



PLATE 7

Mission Street

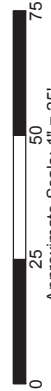


Date of Survey Reading:
February 13, 2013

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.311 feet (3.734 inches)

Fremont Street



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on February 13, 2013.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: FEBRUARY 13, 2013 SURVEY
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

March 2013



PLATE 8

From: Brian Dykes
Sent: Tuesday, July 16, 2013 5:35 PM
To: 'Steven Hood'
Cc: Dennis Turchon; Stephen McLandrich; 'Nick O'Riordan'
Subject: 301 Mission Settlement Monitoring

Steven,
Here are the last two settlement monitoring memos from Arup and the raw data records for the same times.
Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

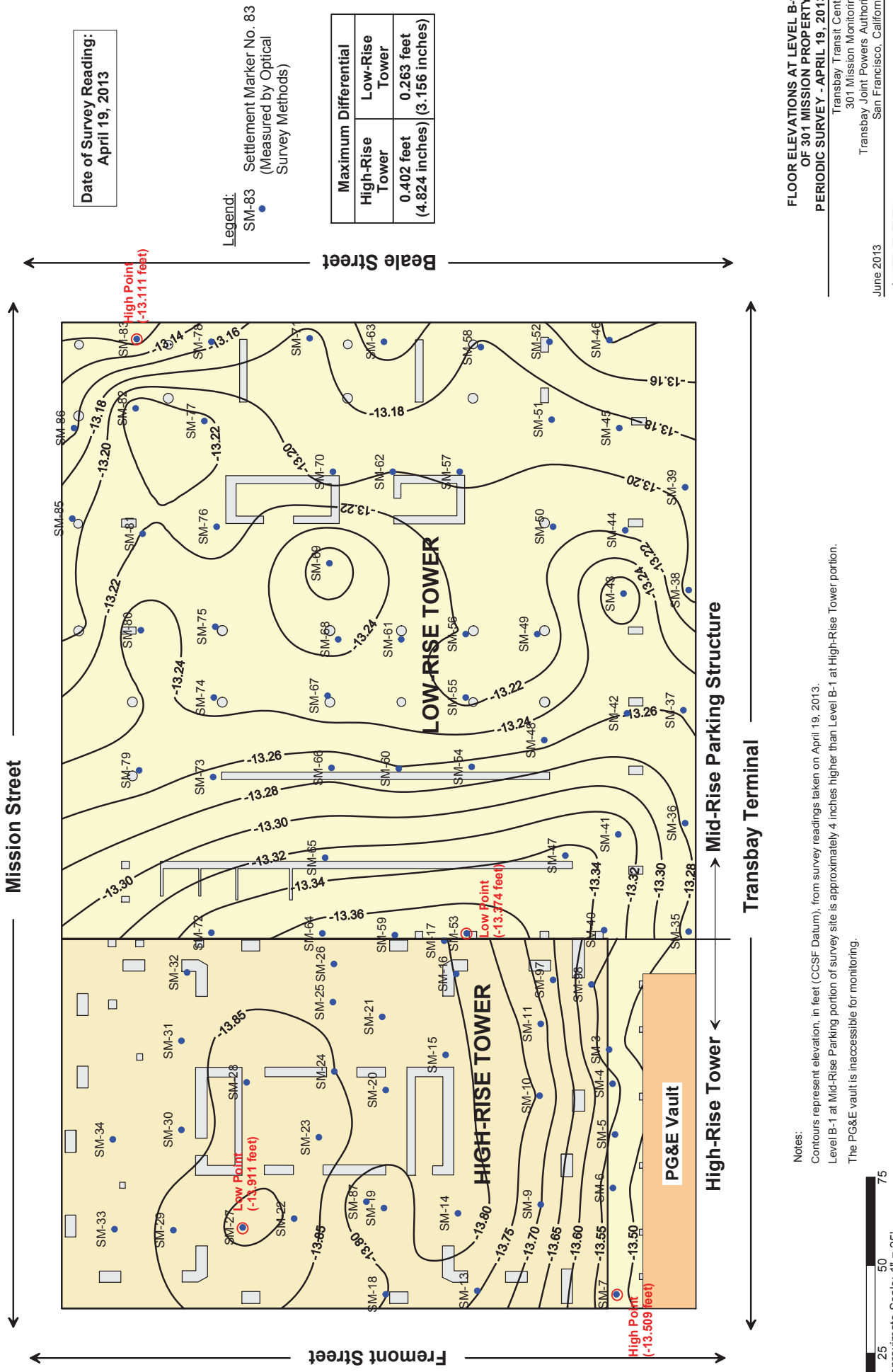
ARUP

To	Brian Dykes (TJPA)	Date 28 June 2013
Copies	Robert Beck (TJPA) Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242-60/MHG
From	Michael Gardner (Arup)	File reference 4-05 212
Subject	Transbay Transit Center: Results of April 2013 Settlement Survey at 301 Mission Property	Page 1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated March 27, 2013 with measurements made through April 2013.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – April 19, 2013
- Plate 2 Differential Floor Elevation (Inches) – April 19, 2013 Survey
- Plate 3 Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St. Structure Between 04/30/2009 and 04/19/2013
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through April 19, 2013
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through April 19, 2013
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: April 19, 2013 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: April 19, 2013 Survey



Date of Survey Reading:
April 19, 2013

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	Low-Rise Tower
0.402 feet (4.824 inches)	0.263 feet (3.156 inches)

FLOOR ELEVATIONS AT LEVEL B-1 OF 301 MISSION PROPERTY
PERIODIC SURVEY - APRIL 19, 2013
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

ARUP

PLATE 1

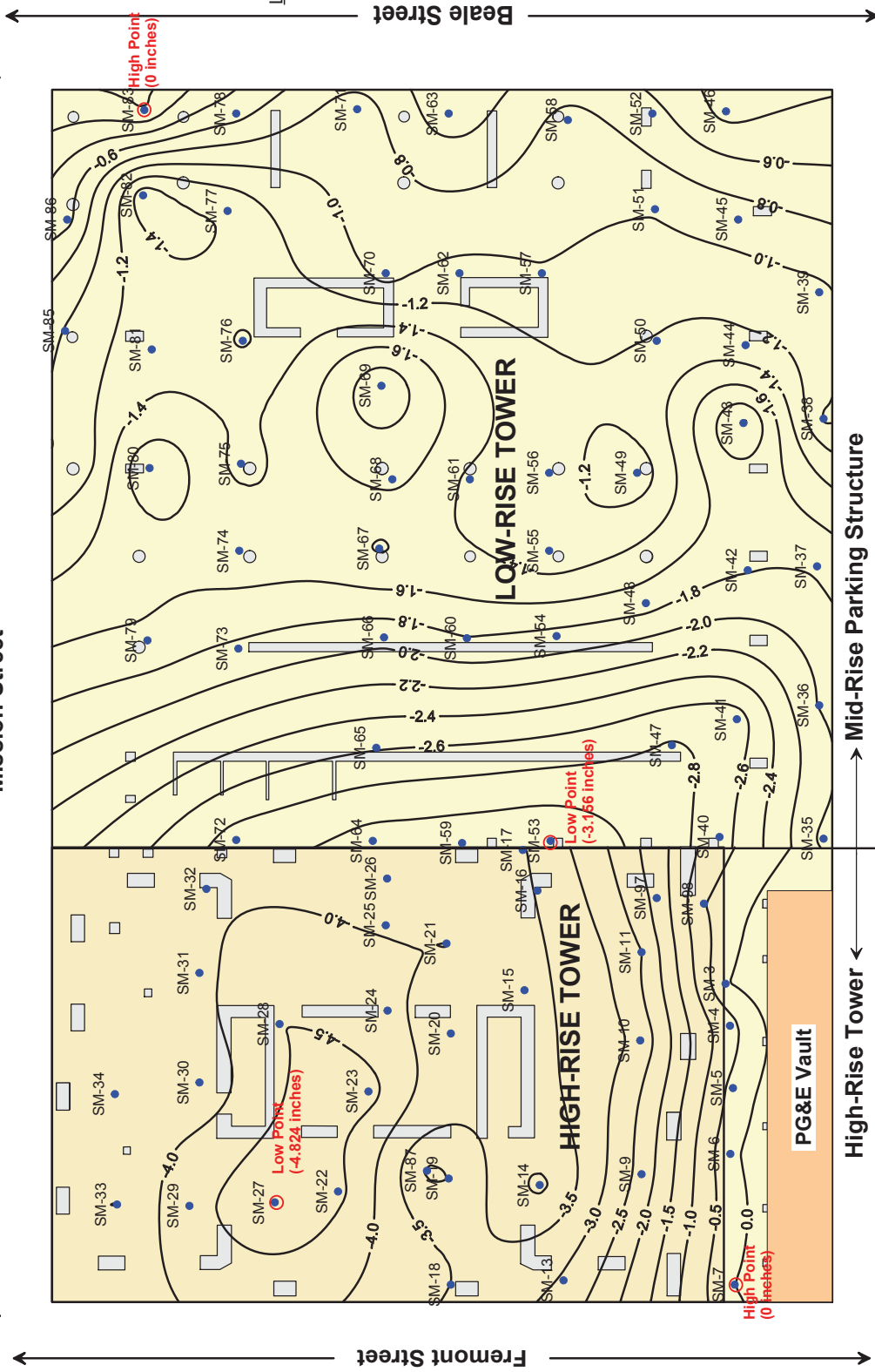
Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on April 19, 2013.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.



Approximate Scale: 1" = 25'

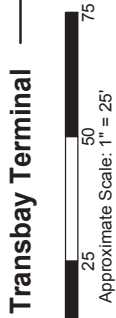
Mission Street

Fremont Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower ← Mid-Rise Parking Structure → Transbay Terminal



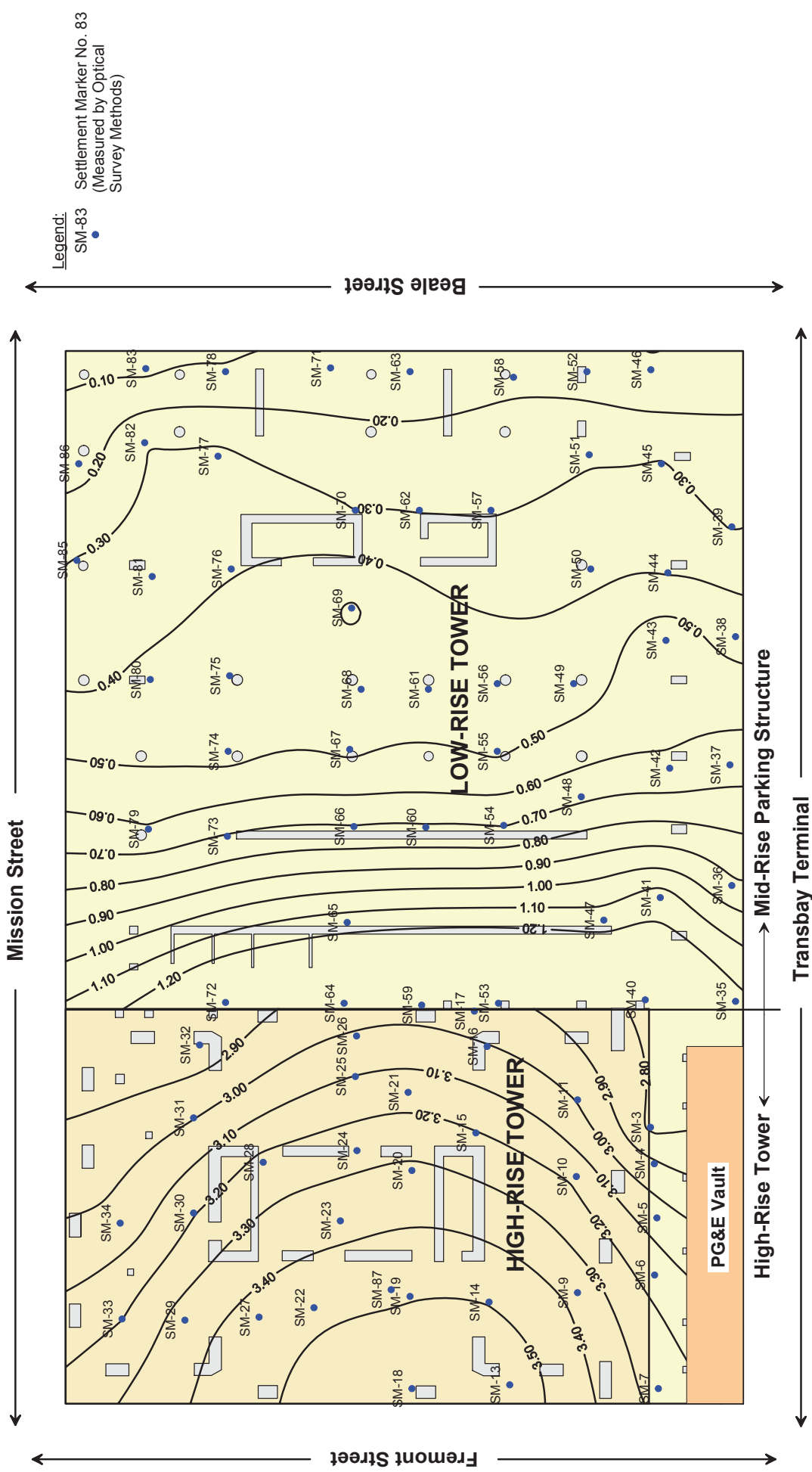
Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on April 19, 2013.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 APRIL 19, 2013 SURVEY

Transbay Transit Centre
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

June 2013
 ARUP

PLATE 2



Legend:

SM-83

Settlement Marker No. 83
(Measured by Optical
Survey Methods)

CONTOURS OF SETTLEMENTS MEASURED AT THE
1ST LEVEL BASEMENT OF THE 301 MISSION ST
STRUCTURE BETWEEN 04/30/2009 AND 04/19/2013

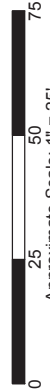
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2013

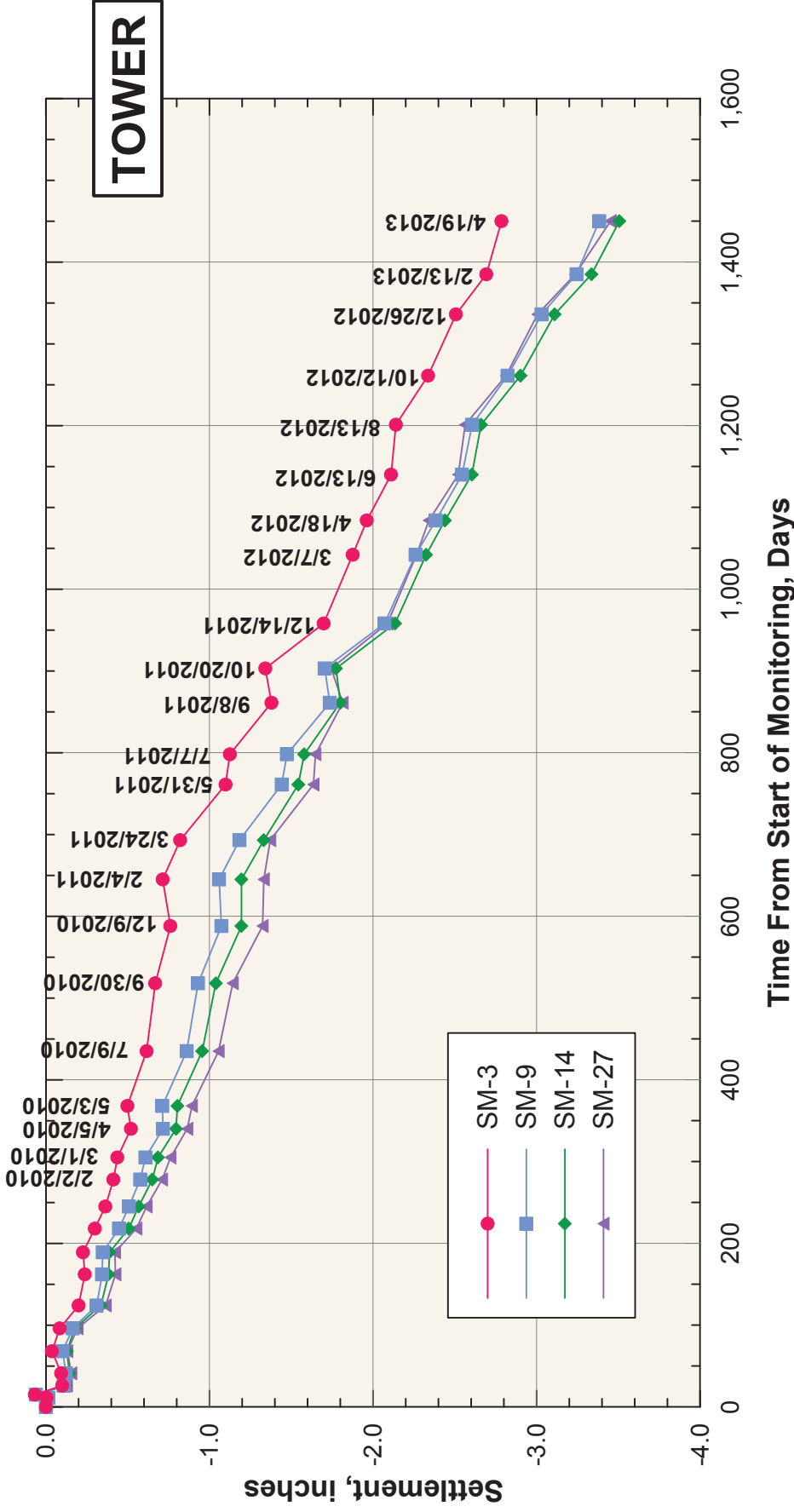
ARUP

PLATE 3

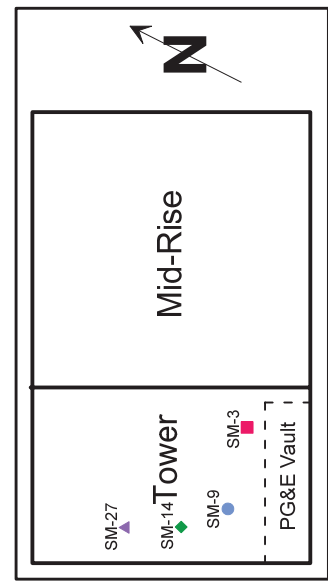
Notes:
Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on April 19, 2013.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.
Negative values of settlement (within Low-rise Tower) indicate uplift.



Approximate Scale: 1" = 25'



Time From Start of Monitoring, Days



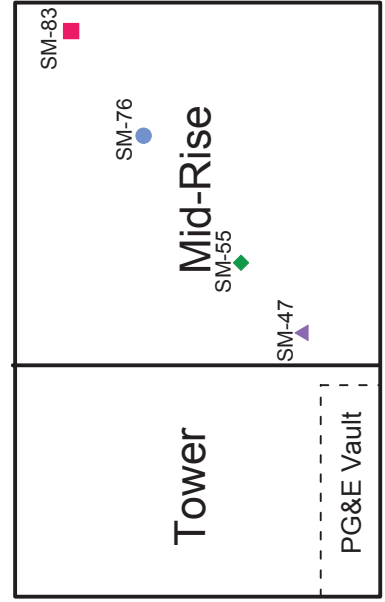
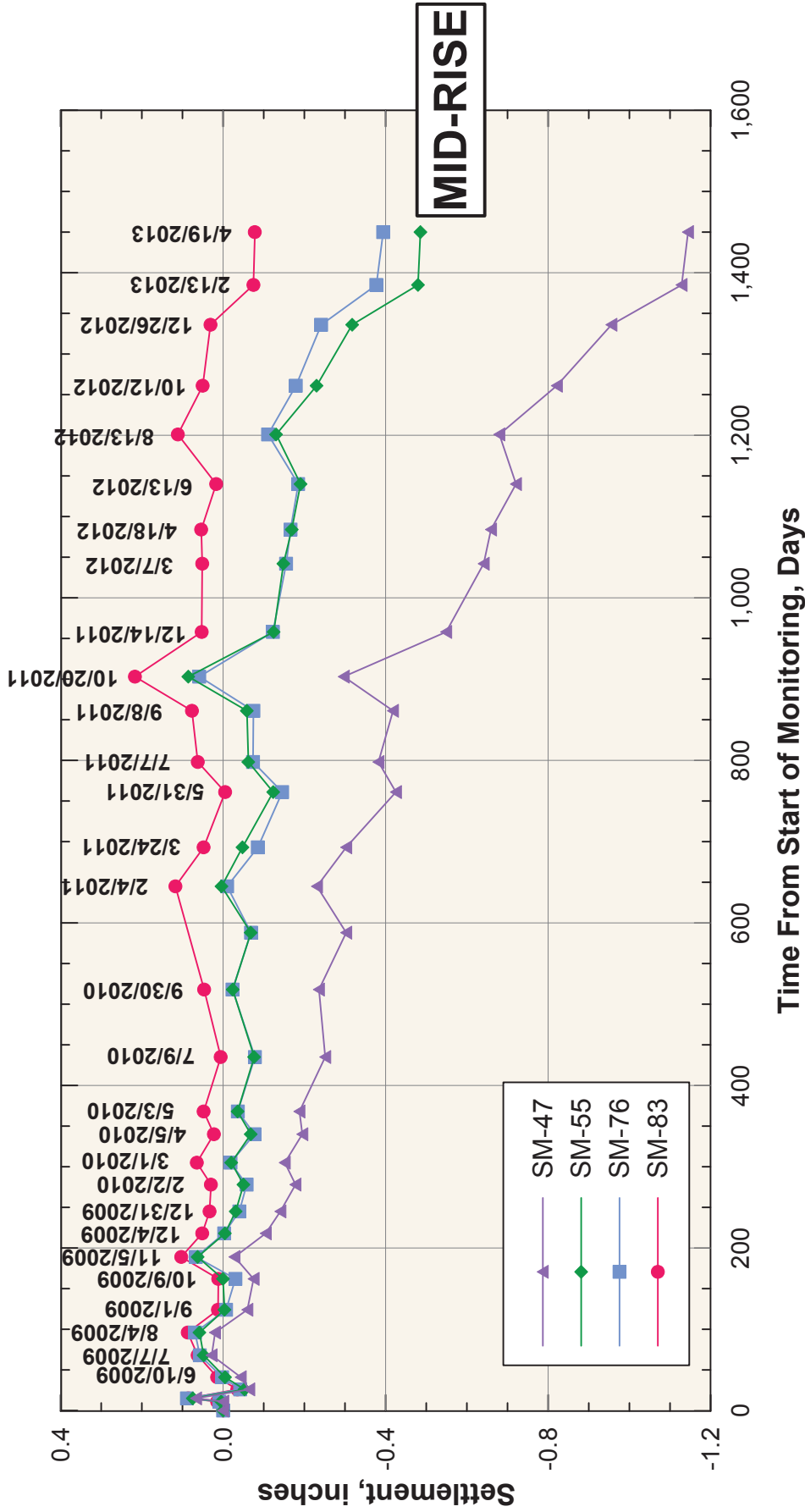
Note:
Initial (Baseline) reading
taken on 04/30/09

SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH APRIL 19, 2013

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2013





Note:
Initial (Baseline) reading
taken on 04/30/09

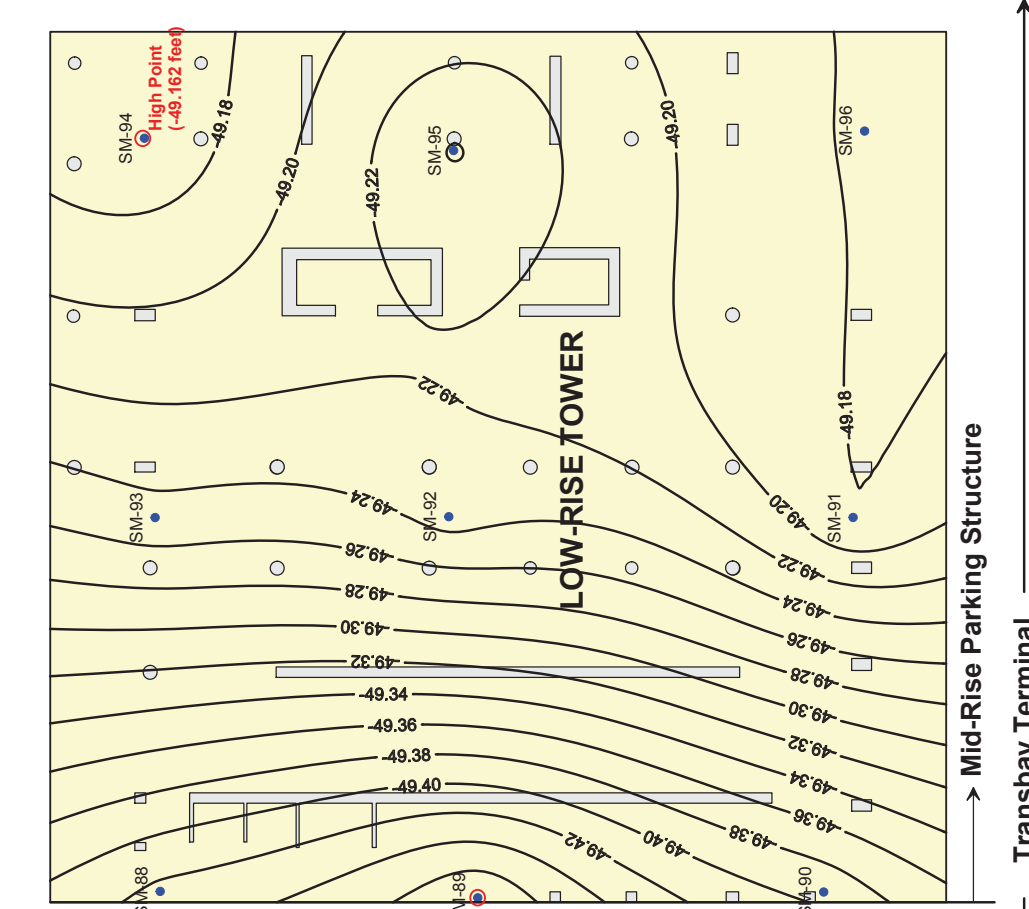
**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH APRIL 19, 2013**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2013



Mission Street



Date of Survey Reading:
April 19, 2013

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

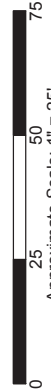
Maximum Differential
B-5 Level Basement
0.317 feet (3.799 inches)

Fremont Street

Beale Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on April 19, 2013.



Approximate Scale: 1" = 25'

J:\S\F\1320001\322424 Internal Project Data\4-05 Reports & Narratives\2.301 Mission - April 2013 Survey\Plates\B-5 Elevations (2013.04.19).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: APRIL 19, 2013 SURVEY

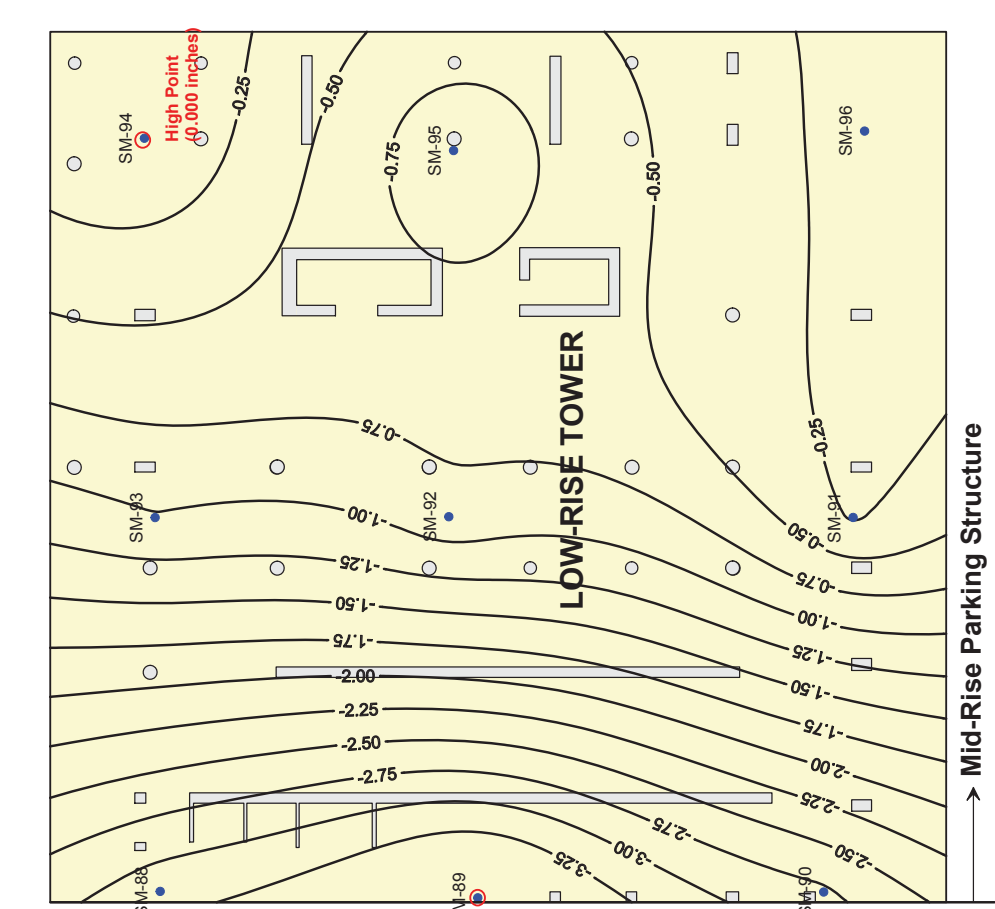
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2013



PLATE 7

Mission Street



Mid-Rise Parking Structure

Transbay Terminal

Date of Survey Reading:
April 19, 2013

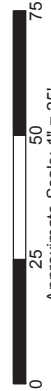
Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.317 feet (3.799 inches)

Fremont Street

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on April 19, 2013.



Approximate Scale: 1" = 25'

J:\S-F\1320001\322424 Internal Project Data\4-05 Reports & Narratives\2.301 Mission - April 2013 Survey\Plates\B-5 Differential Elevations (2013.04.19).srf

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5; APRIL 19, 2013 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2013

ARUP

PLATE 8

Memorandum

ARUP

To	Brian Dykes (TJPA)	Date 28 June 2013
Copies	Robert Beck (TJPA) Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242-60/MHG
From	Michael Gardner (Arup)	File reference 4-05 213
Subject	Transbay Transit Center: Results of June 2013 Settlement Survey at 301 Mission Property	Page 1 of 1

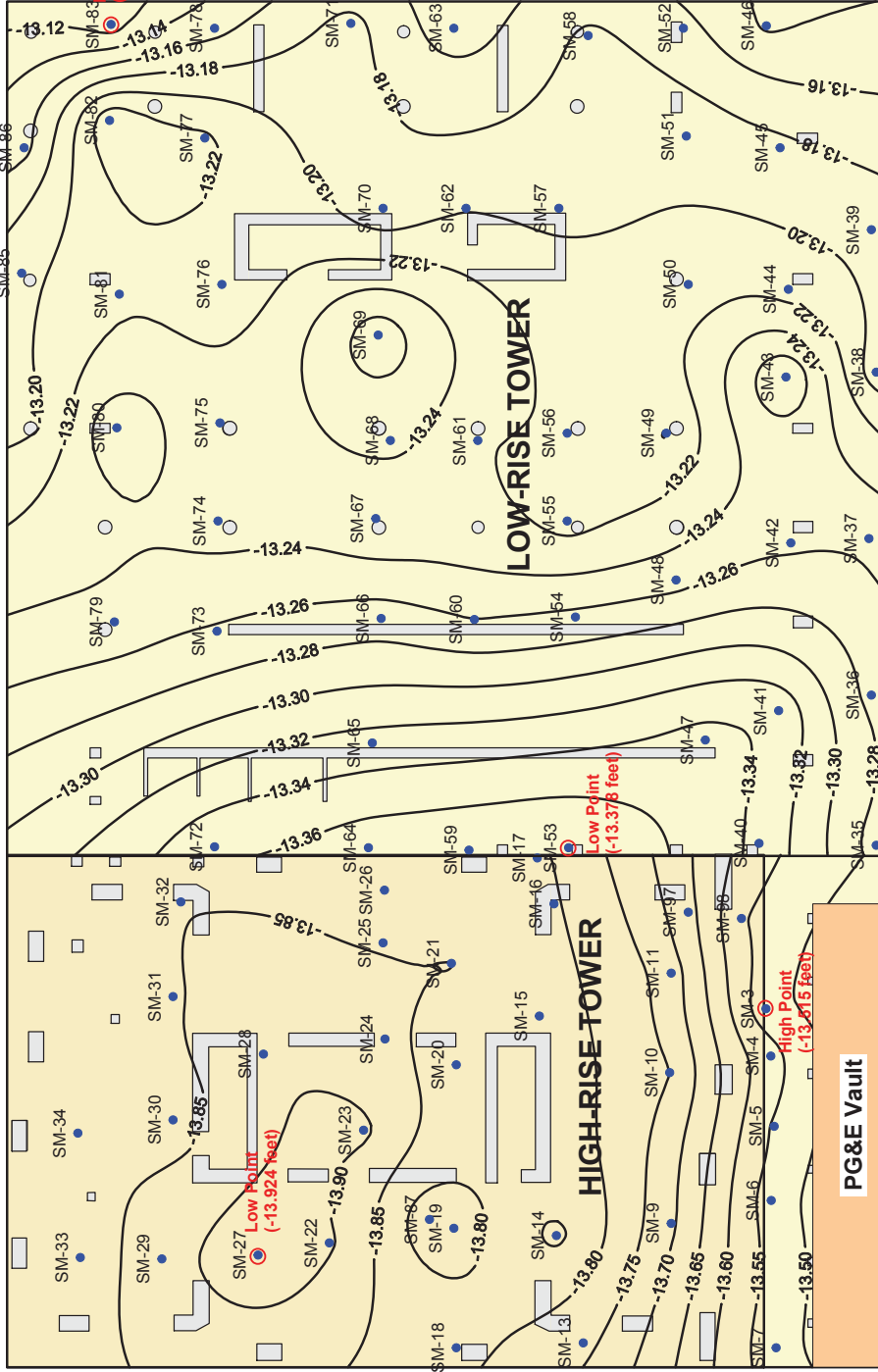
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated June 28, 2013 with measurements made through June 2013.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – June 3, 2013
- Plate 2 Differential Floor Elevation (Inches) – June 3, 2013 Survey
- Plate 3 Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St. Structure Between 04/30/2009 & 06/03/2013
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through June 3, 2013
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through June 3, 2013
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: June 3, 2013 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: June 3, 2013 Survey

Mission Street

Fremont Street

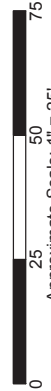


Date of Survey Reading:
June 3, 2013

Legend:

SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.409 feet (4.912 inches)
Low-Rise Tower	0.269 feet (3.228 inches)



Approximate Scale: 1" = 25'

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 3, 2013.

Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

The PG&E vault is inaccessible for monitoring.

Beale Street

Mid-Rise Parking Structure

Transbay Terminal

High-Rise Tower

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY
PERIODIC SURVEY - JUNE 03, 2013

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

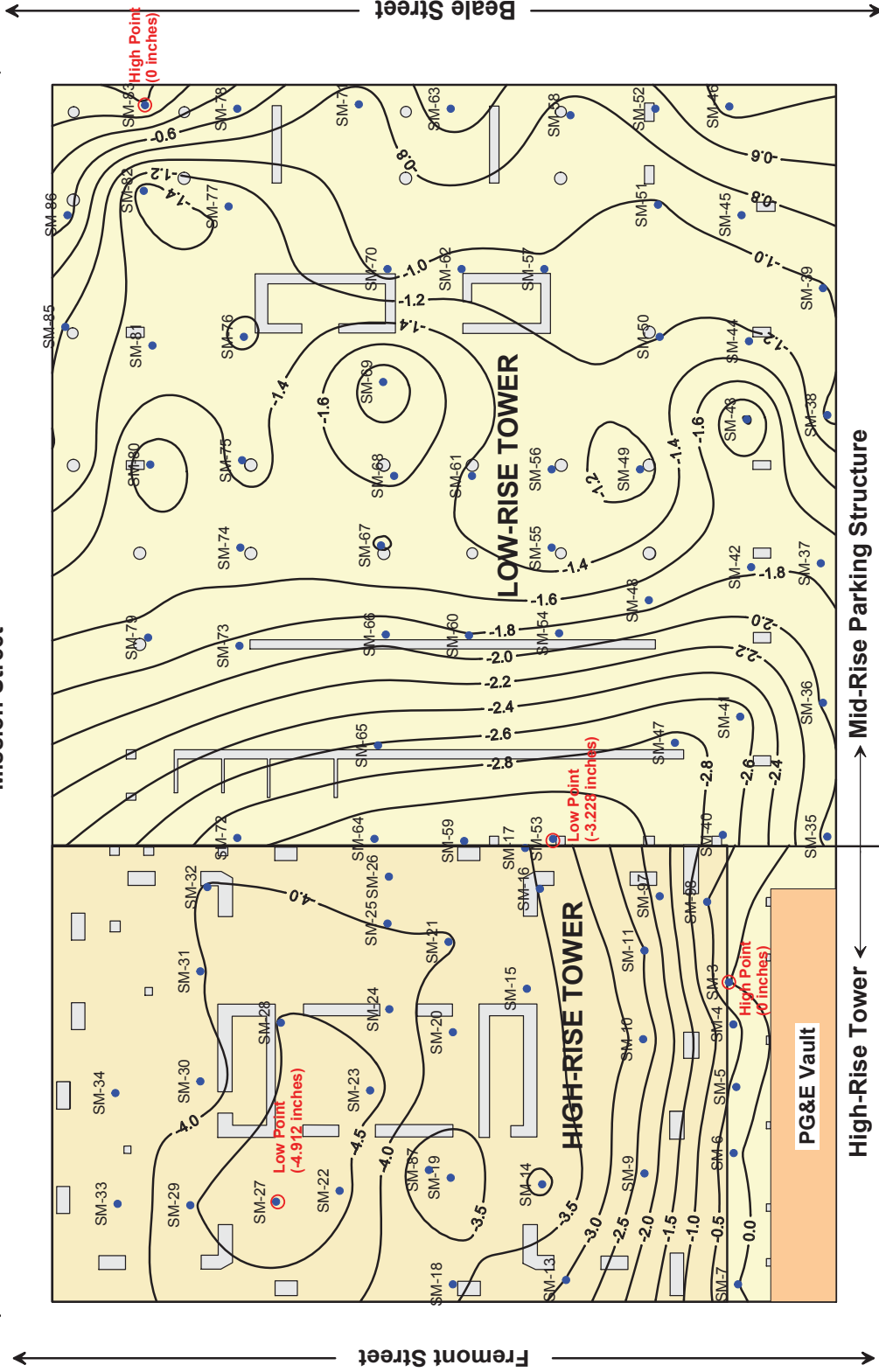
June 2013

ARUP

PLATE 1

Mission Street

Fremont Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower ← Mid-Rise Parking Structure → Transbay Terminal

High-Rise Tower ← Transbay Terminal →



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on June 3, 2013.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 JUNE 03, 2013 SURVEY

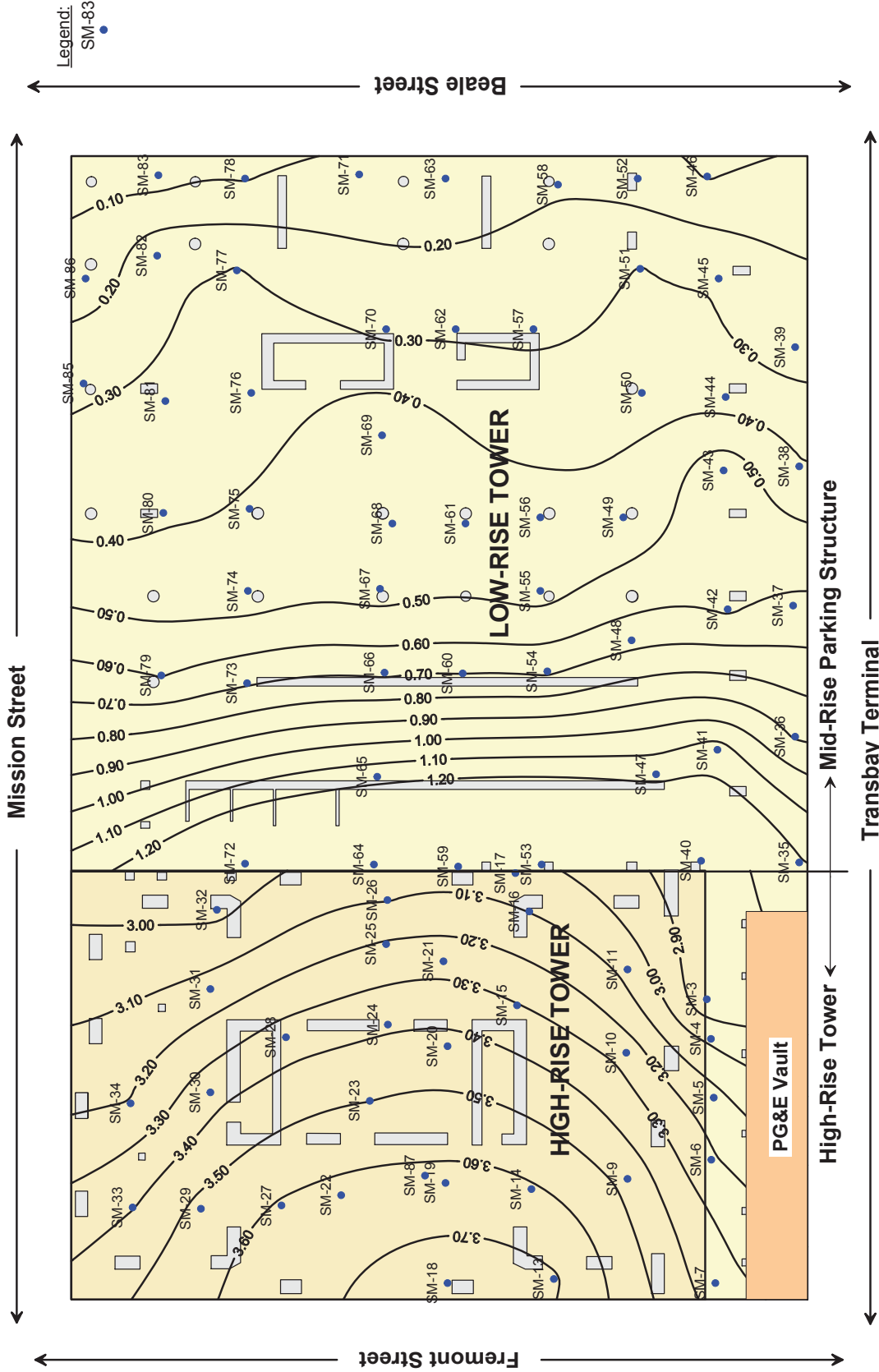
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

June 2013

ARUP

PLATE 2

Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



CONTOURS OF SETTLEMENTS MEASURED AT THE
 1ST LEVEL BASEMENT OF THE 301 MISSION ST
 STRUCTURE BETWEEN 04/30/2009 & 06/03/2013

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

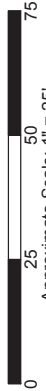
June 2013



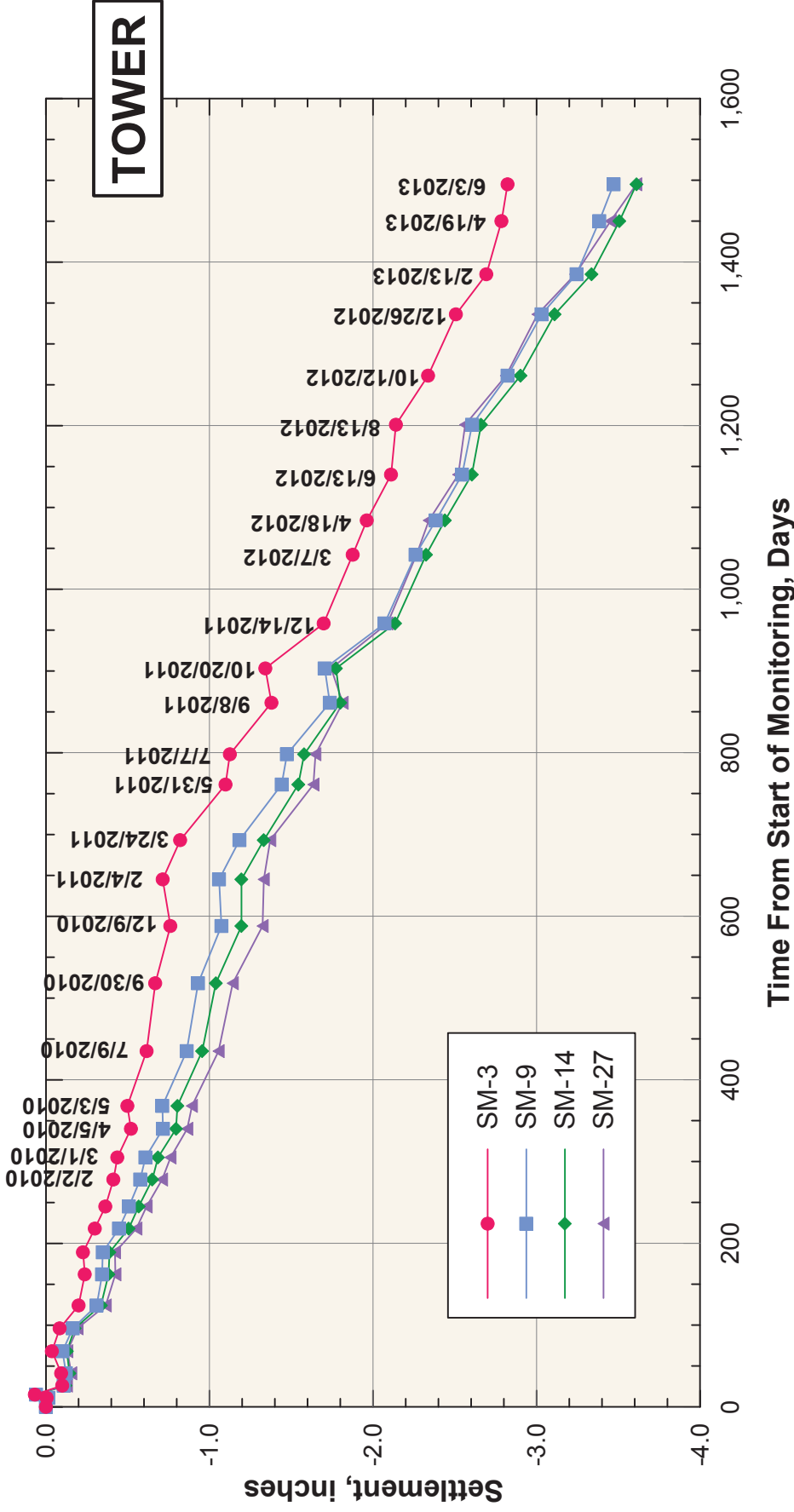
PLATE 3

Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on June 3, 2013.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.

Negative values of settlement (within Low-rise Tower) indicate uplift.



Approximate Scale: 1" = 25'

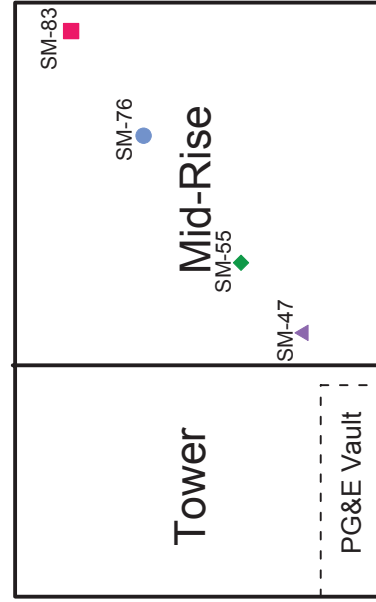
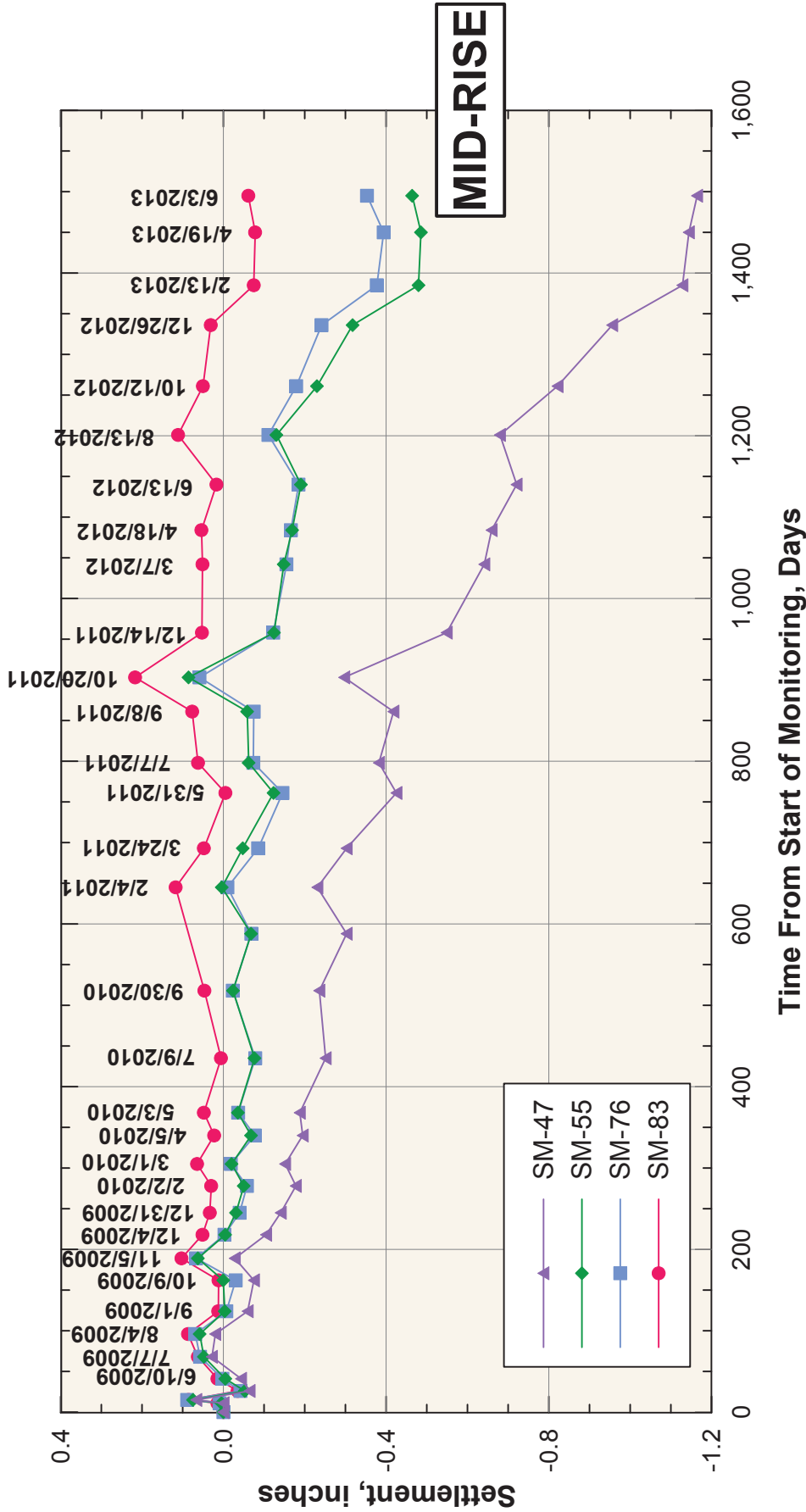


Note:
Initial (Baseline) reading
taken on 04/30/09

SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH JUNE 03, 2013

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2013
ARUP



Note:
Initial (Baseline) reading
taken on 04/30/09

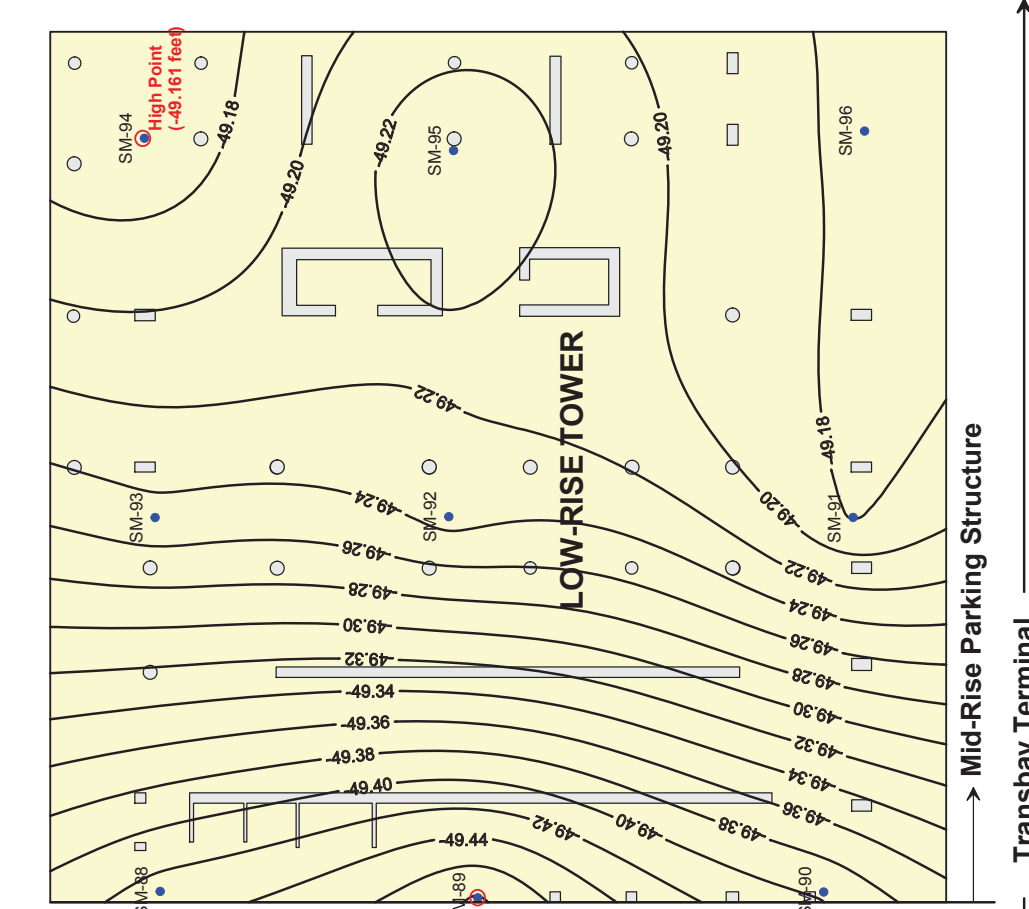
**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH JUNE 03, 2013**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2013



Mission Street



Date of Survey Reading:
June 3, 2013

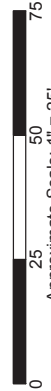
Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.322 feet (3.860 inches)

Fremont Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 3, 2013.



Approximate Scale: 1" = 25'

J:\S\F\1320001\1322424 Internal Project Data\4-05 Reports & Narratives\2 13 01 Mission - June 2013 Survey\Plates\B-5 Elevations (2013.06.03).sfr

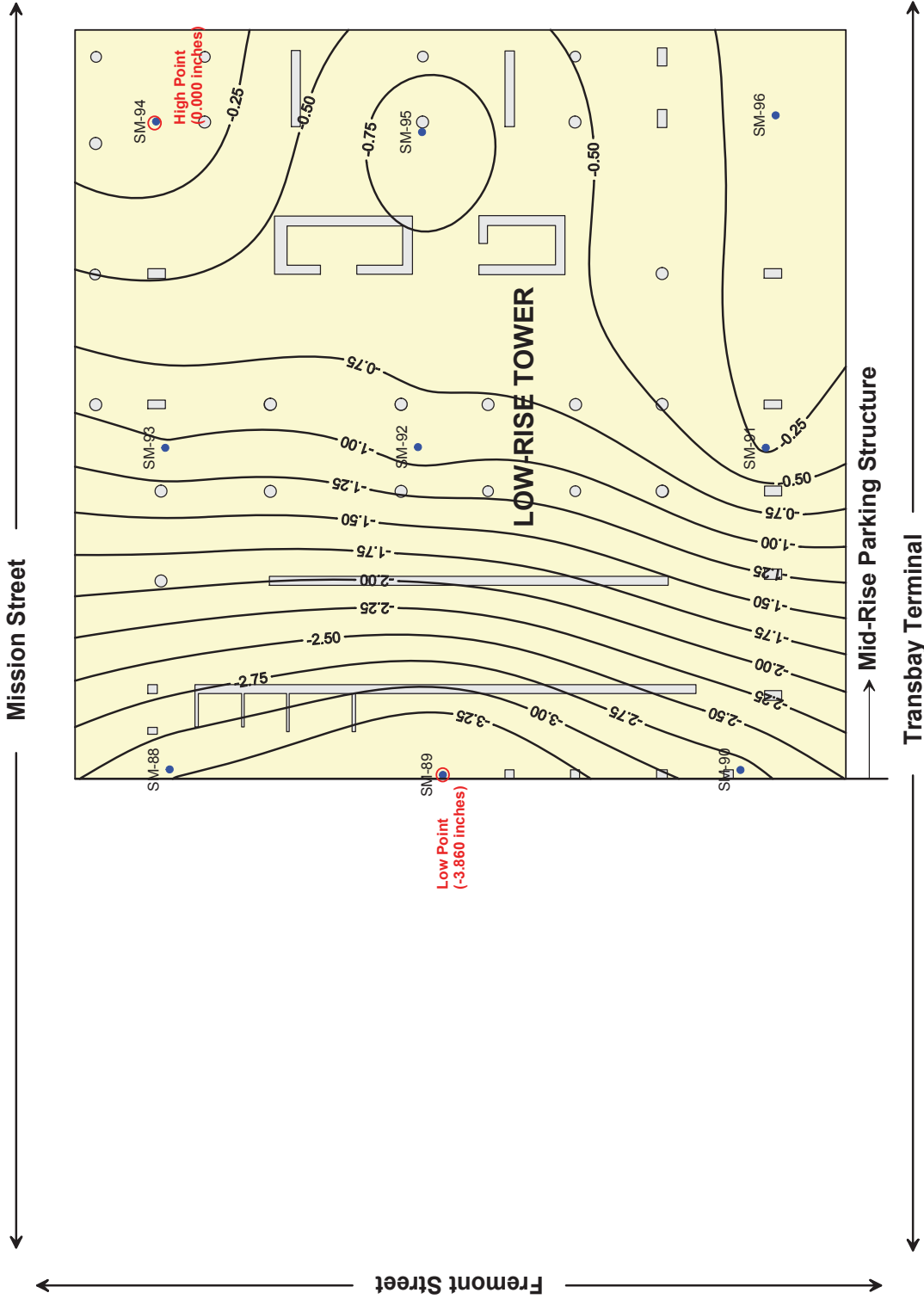
FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: JUNE 03, 2013 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2013



PLATE 7

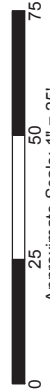


Date of Survey Reading:
June 3, 2013

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.322 feet (3.860 inches)

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 3, 2013.



Approximate Scale: 1" = 25'

**DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: JUNE 03, 2013 SURVEY**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2013



From: Brian Dykes <bdykes@transbaycenter.org>
Sent: Wednesday, November 20, 2013 1:51 PM
To: Steven Hood
Subject: FW: TTC - 301 Mission October Survey Memo
Attachments: 2013-11-13 Memo_301 Mission Settlement - Oct 2013 Survey.pdf

Steven,
Here is the October settlement memorandum from Arup. I now have the raw data readings and will forward them next.
Regards, Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Wednesday, November 13, 2013 11:37 AM
To: Brian Dykes
Cc: Nick O'Riordan; Dennis Turchon; George Metzger; 'rvolenec@pcparch.com' (rvolenec@pcparch.com)
Subject: TTC - 301 Mission October Survey Memo

Brian,

Please find the attached memorandum which shows the October 2013 readings of the 301 Mission survey.

Please let me know if you have any questions.

Regards,
Stephen

Stephen McLandrich PE GE
Senior Geotechnical Engineer

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA
t +1 415 957 9445 d +1 415 946 0245
f +1 415 957 9096 c +1 415 310 1095
www.arup.com

Arup named ENR California's
DESIGN FIRM OF THE YEAR 2013

Memorandum

ARUP

To	Brian Dykes (TJPA)	Date 13 November 2013
Copies	Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242-60/MHG
From	Stephen McLandrich (Arup)	File reference 4-05 213
Subject	Transbay Transit Center: Results of October 2013 Settlement Survey at 301 Mission Property	Page 1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated June 28, 2013 with measurements made through October 2013.

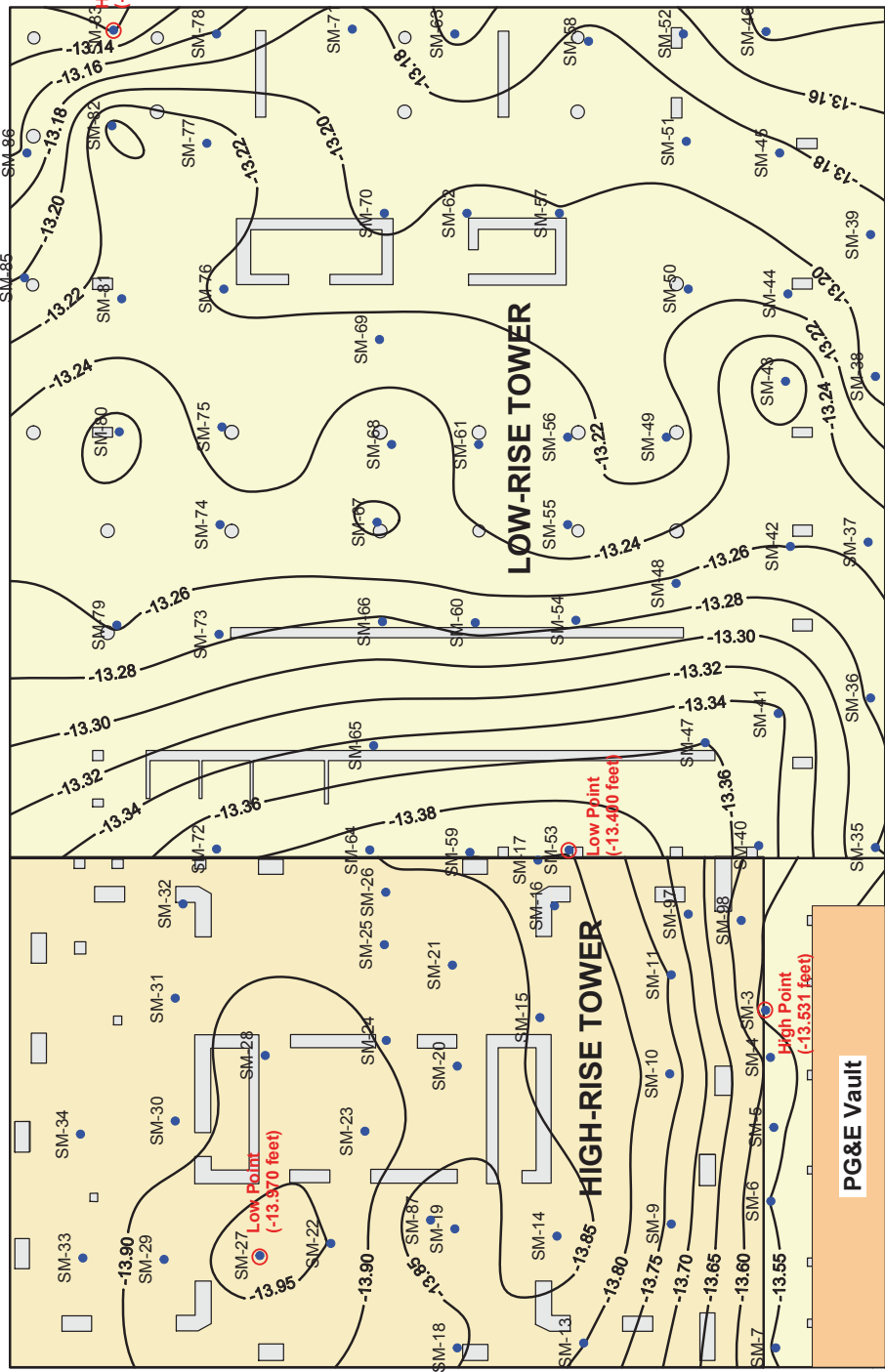
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- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: October 9, 2013 Survey

Mission Street

Fremont Street

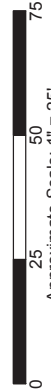
Beale Street



Date of Survey Reading:
October 9, 2013

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.439 feet (5.268 inches)
Low-Rise Tower	0.281 feet (3.384 inches)



Approximate Scale: 1" = 25'

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 9, 2013.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

Mid-Rise Parking Structure

Transbay Terminal

High-Rise Tower

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - OCTOBER 9, 2013
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

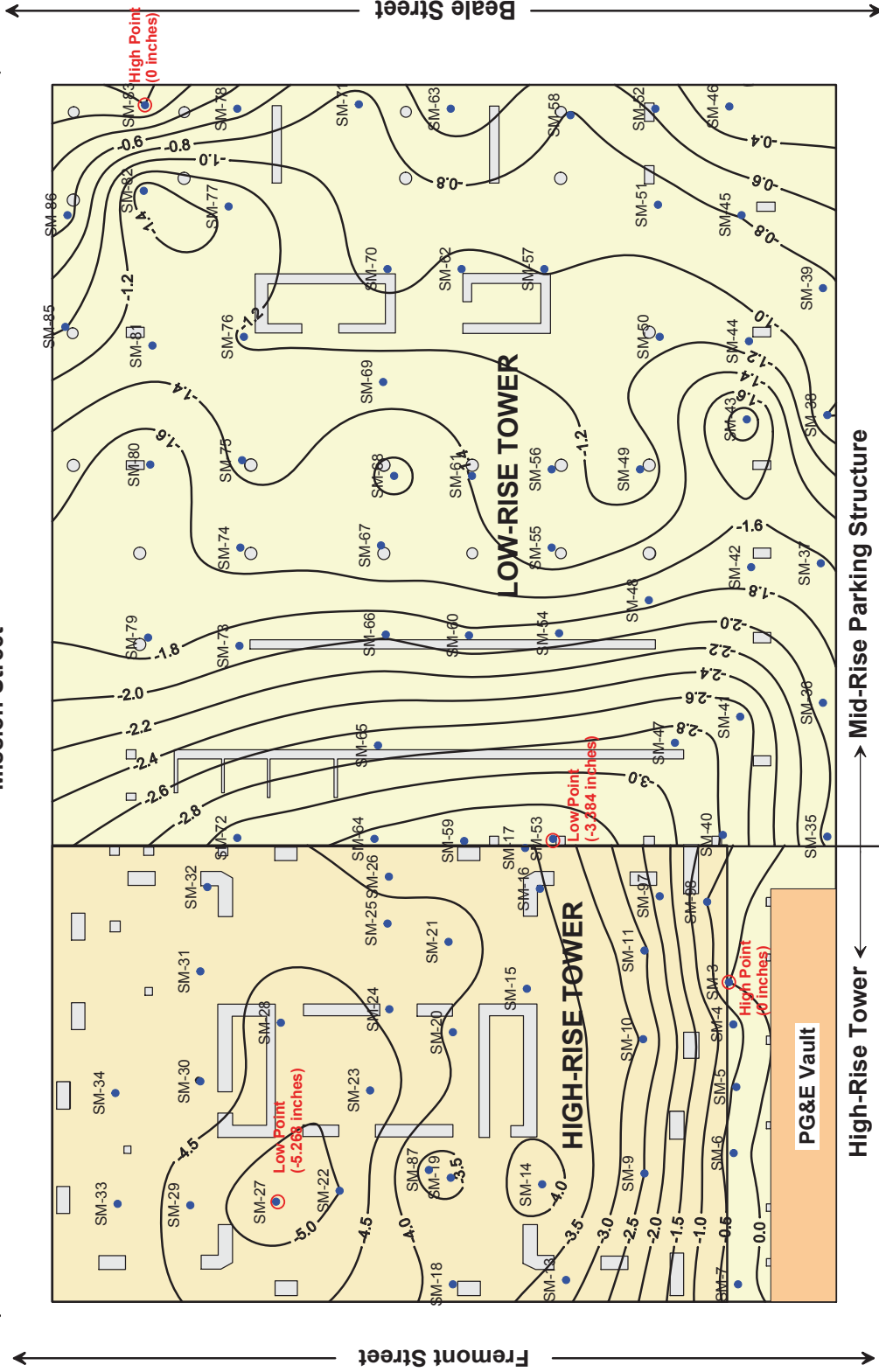
November 2013



PLATE 1

Mission Street

Fremont Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower ← Mid-Rise Parking Structure → Transbay Terminal



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on October 9, 2013.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

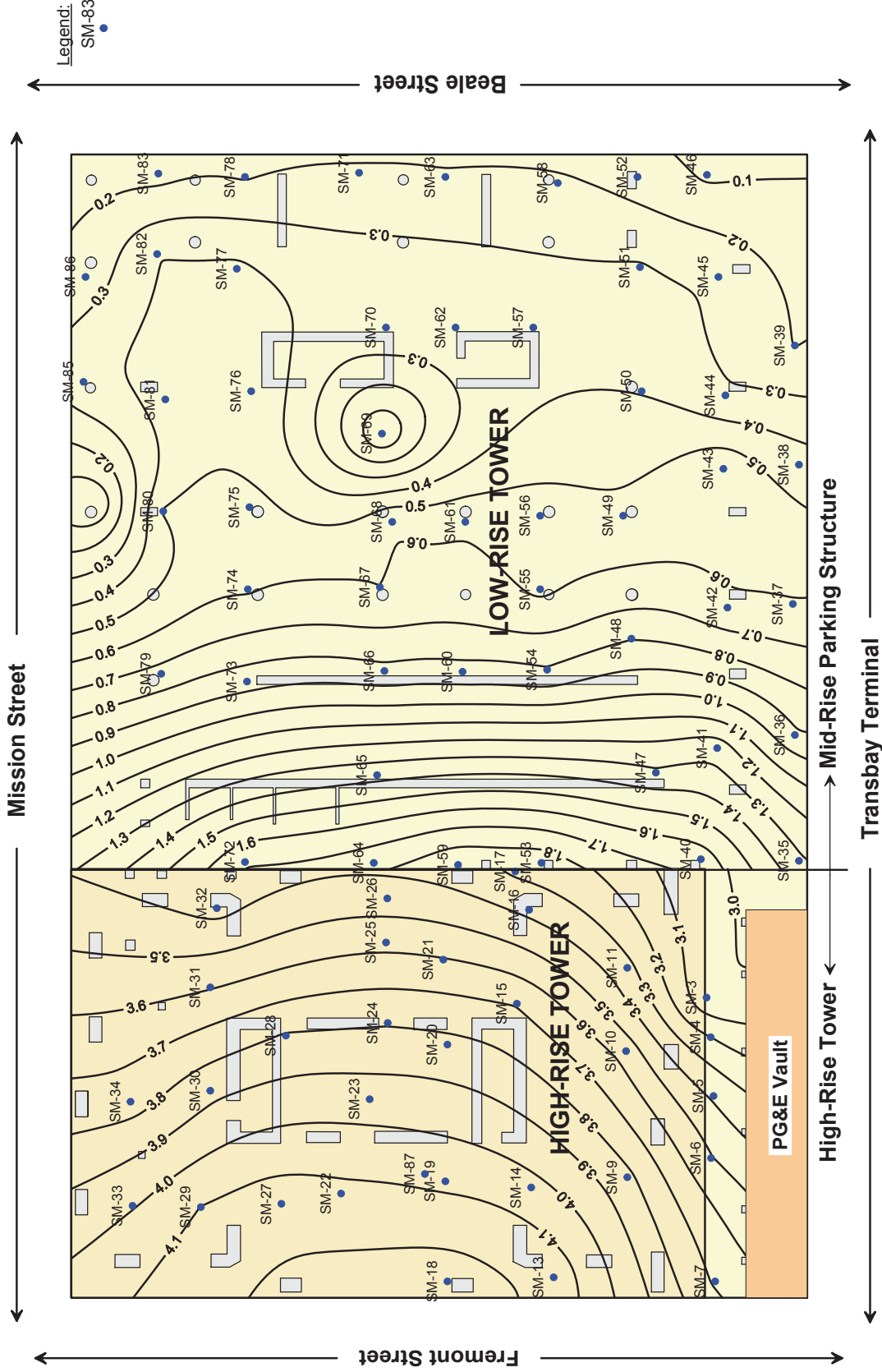
DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 OCTOBER 9, 2013 SURVEY

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

November 2013

ARUP

PLATE 2



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

CONTOURS OF SETTLEMENTS MEASURED AT THE
 1ST LEVEL BASEMENT OF THE 301 MISSION ST
 STRUCTURE BETWEEN 04/30/2009 & 10/09/2013

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

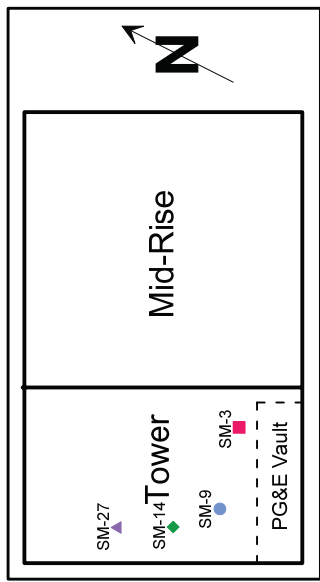
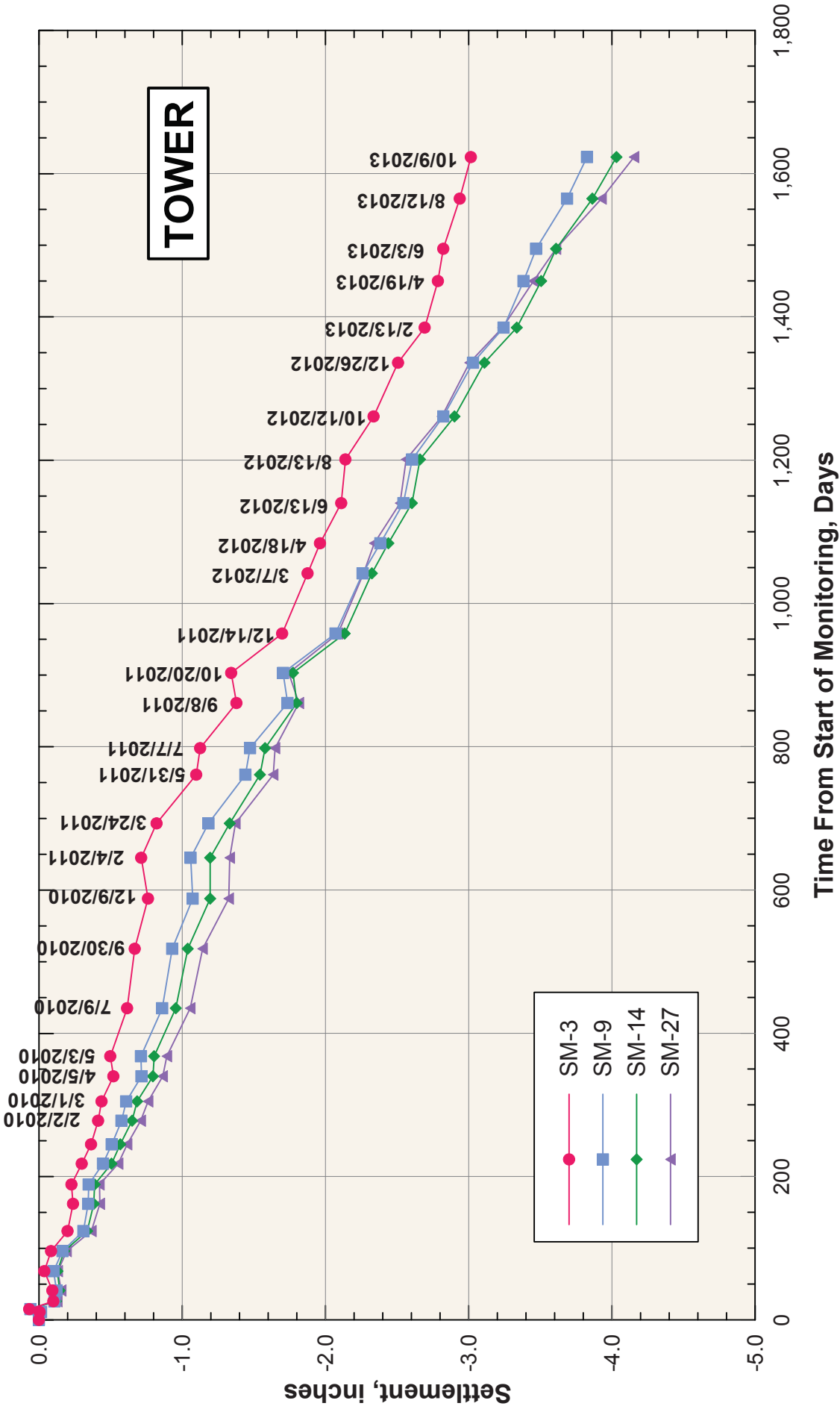
November 2013

ARUP

PLATE 3

Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on October 9, 2013.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.

0 25 50 75
 Approximate Scale: 1" = 25'



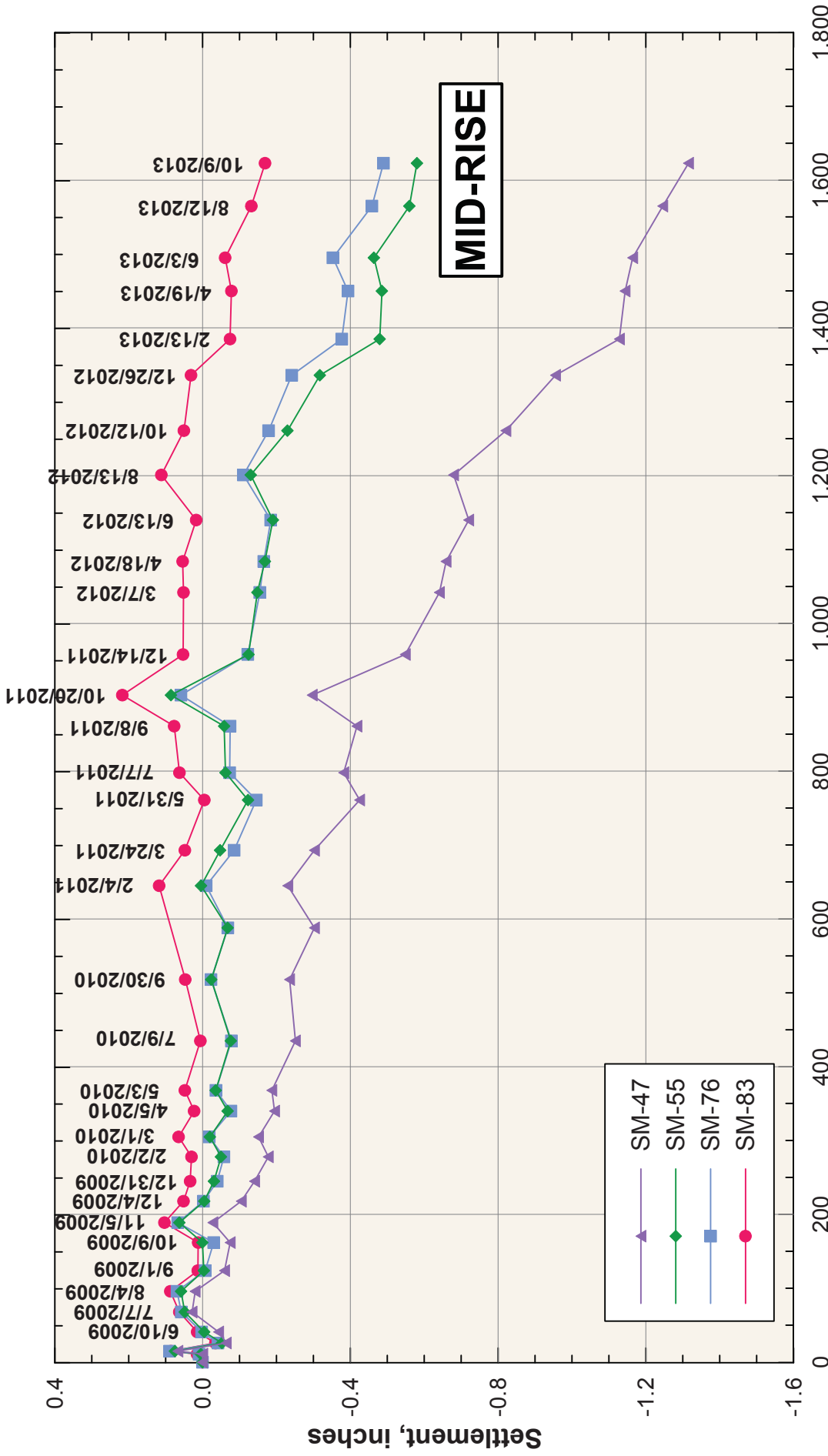
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH OCTOBER 9, 2013**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

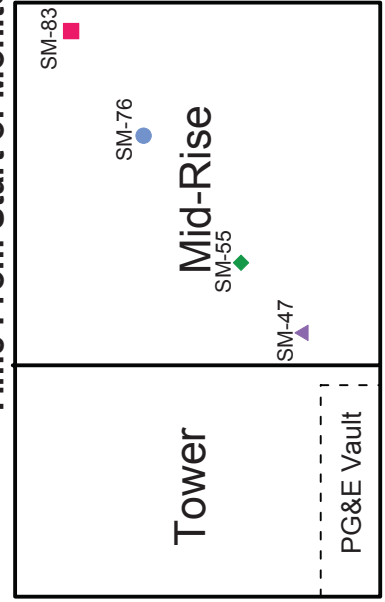
November 2013





MID-RISE

Time From Start of Monitoring, Days



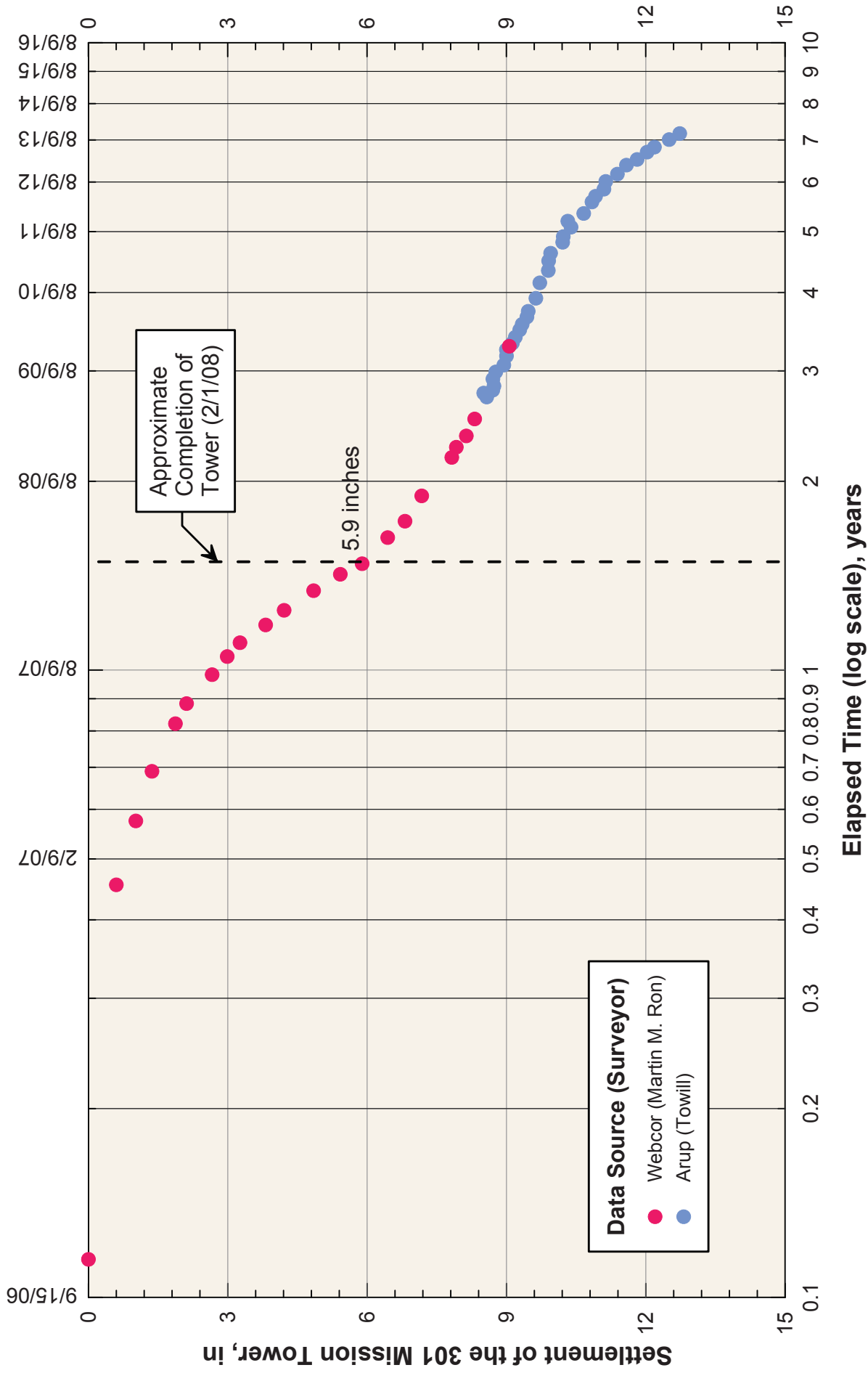
Note:
 Initial (Baseline) reading
 taken on 04/30/09

**SETTLEMENT OVER TIME
 FLOOR ELEVATIONS AT LEVEL B-1
 OF 301 MISSION PROPERTY- MID-RISE:
 APRIL 30, 2009 THROUGH OCTOBER 9, 2013**

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

November 2013





Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

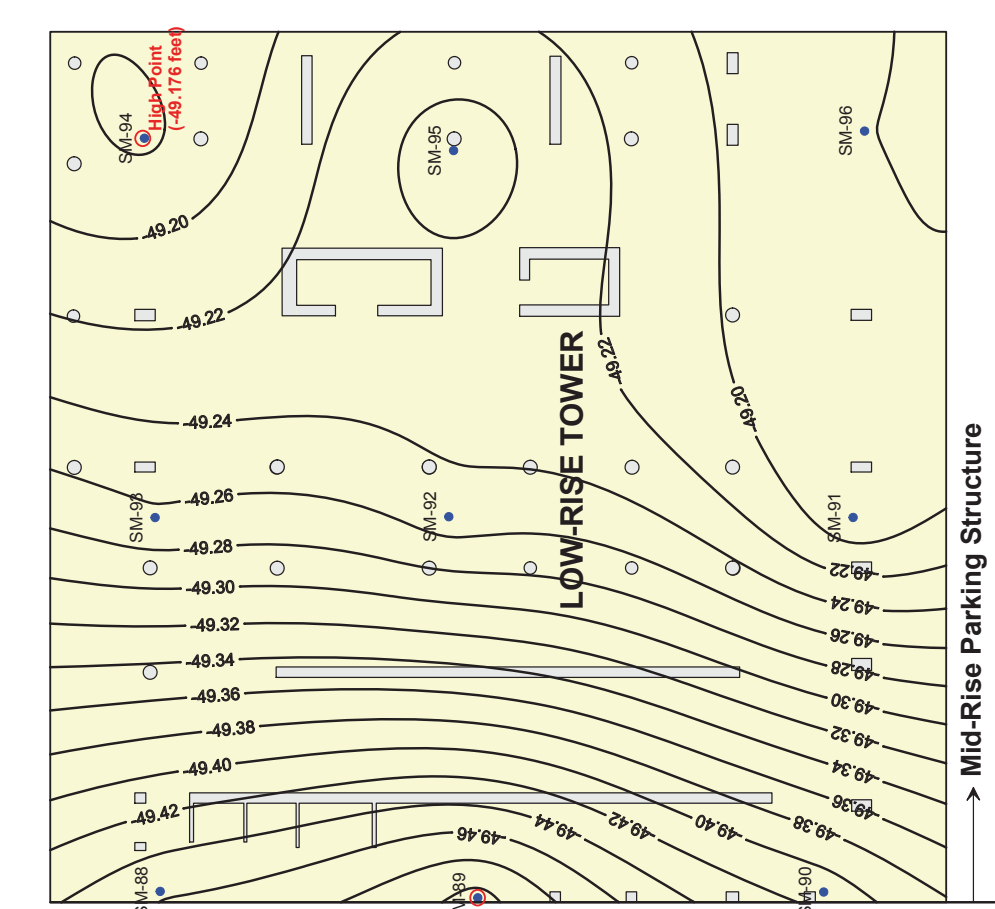
SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

November 2013



Mission Street



Fremont Street

Beale Street

Mid-Rise Parking Structure

Transbay Terminal

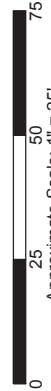
Date of Survey Reading:
October 9, 2013

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.331 feet (3.972 inches)



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 9, 2013.



Approximate Scale: 1" = 25'

J:\S-F\1320001\322424 Internal Project Data\4-05 Reports & Narratives\221_301 Mission - October 2013 Survey\Plates\B-5 Elevations (2013_10.09).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: OCTOBER 9, 2013 SURVEY

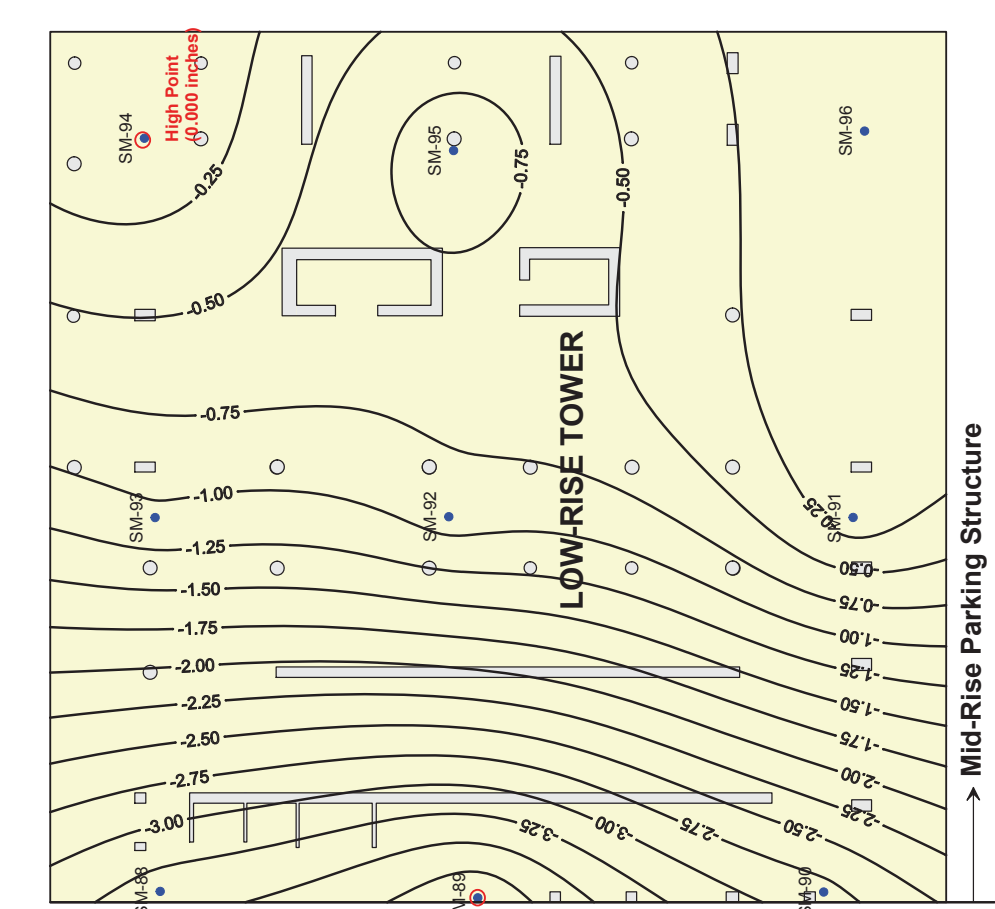
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

November 2013

ARUP

PLATE 7

Mission Street



Date of Survey Reading:
October 9, 2013

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.331 feet (3.972 inches)

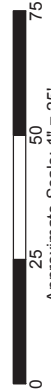
Fremont Street

Fremont Street

LOW-RISE TOWER

Mid-Rise Parking Structure

Transbay Terminal



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 9, 2013.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: OCTOBER 9, 2013 SURVEY
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

November 2013

ARUP

PLATE 8

From: Brian Dykes <bdykes@transbaycenter.org>
Sent: Thursday, January 09, 2014 3:24 PM
To: Steven Hood
Cc: Dennis Turchon; Mark Zabaneh; Stephen McLandrich <stephen.mclandrich@arup.com> (stephen.mclandrich@arup.com)
Subject: FW: TTC - 301 Mission December 2013 Survey Memo
Attachments: 2014-01-09 Memo_301 Mission Settlement - Dec 2013 Survey.pdf; 301 Mission Monitoring Survey 12172013.xls

Steven,
Here are the settlement marker readings taken on December 17, 2013.
Stephen,
Thanks for sending these settlement readings. Please also send me the latest inclinometer readings.
Thanks, Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Thursday, January 09, 2014 2:58 PM
To: Brian Dykes
Cc: 'rvolenec@pcparch.com' (rvolenec@pcparch.com); George Metzger; Nick O'Riordan; Jeff Dunn
Subject: TTC - 301 Mission December 2013 Survey Memo

Brian,

Please find the attached memo summarizing the latest monitoring data from the survey of the 301 Mission settlement markers.

Additionally, I attach the raw files from the surveyor.

Let me know if you have any questions.

Regards,
Stephen

Stephen McLandrich PE GE
Senior Geotechnical Engineer

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA
t +1 415 957 9445 d +1 415 946 0245
f +1 415 957 9096 c +1 415 310 1095
www.arup.com

Arup named ENR California's
DESIGN FIRM OF THE YEAR 2013

Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	9 January 2014
Copies	Randy Volenec (PCPA) George Metzger (AAI)	Reference number	132242-60/MHG
From	Stephen McLandrich (Arup)	File reference	4-05 224
Subject	Transbay Transit Center: Results of December 2013 Settlement Survey at 301 Mission Property Page 1 of 1		

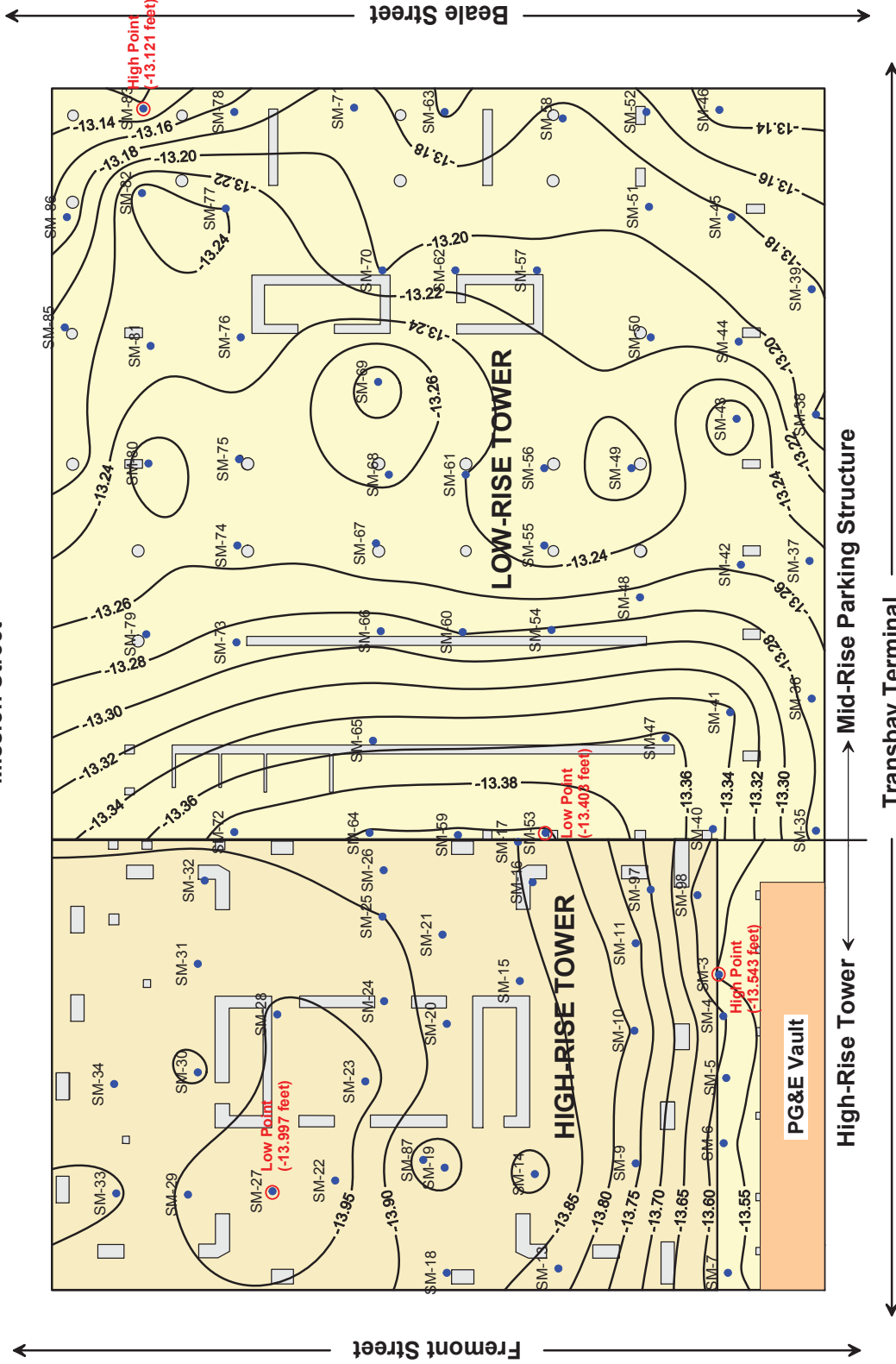
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- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: December 17, 2013 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: December 17, 2013 Survey

Mission Street

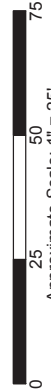
Fremont Street



Date of Survey Reading:
December 17, 2013

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical
Survey Methods)

Maximum Differential	
High-Rise Tower	0.454 feet (5.446 inches)
Low-Rise Tower	0.281 feet (3.374 inches)



Approximate Scale: 1" = 25'

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on December 17, 2013.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - DECEMBER 17, 2013

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

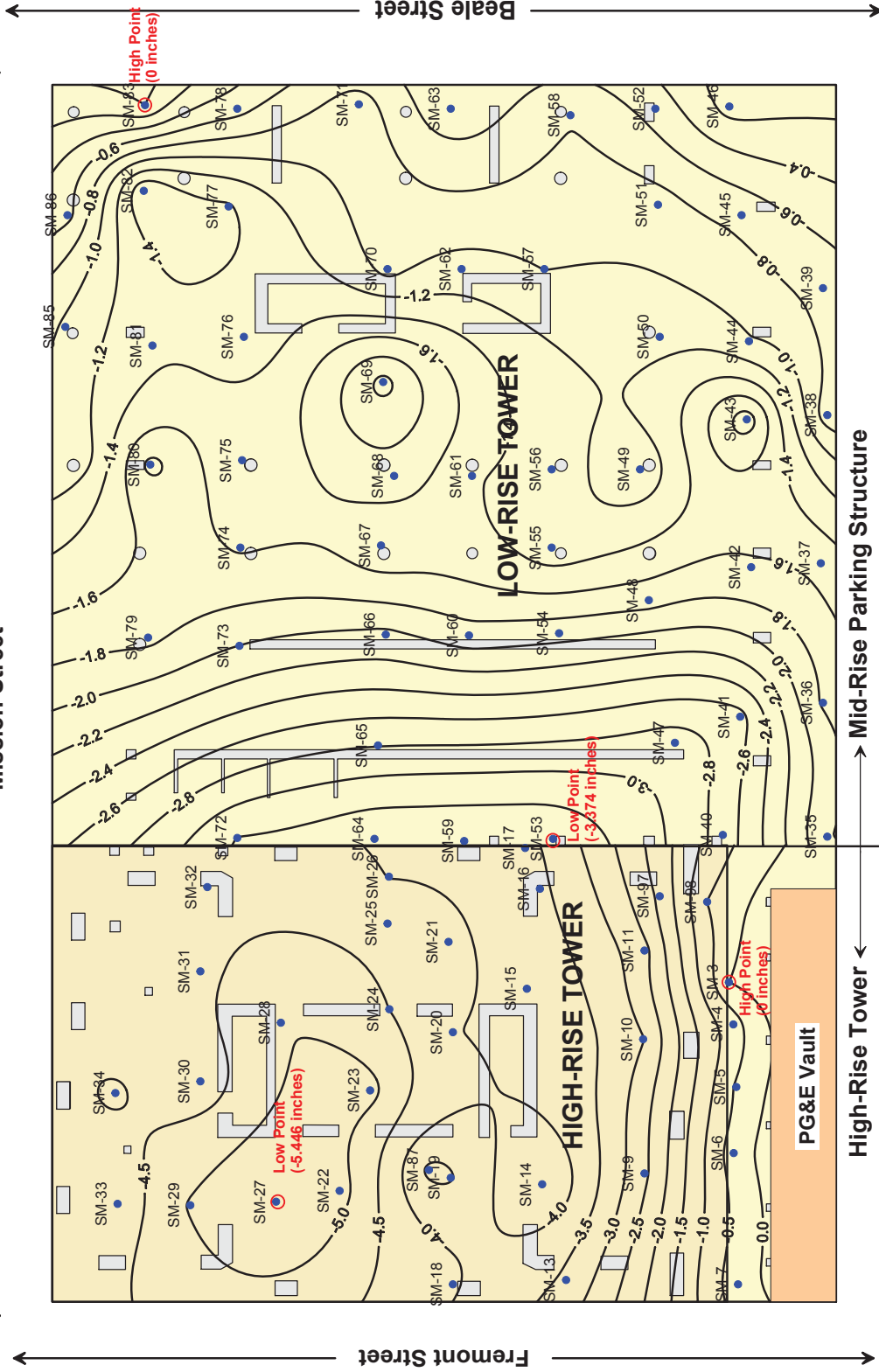
January 2014

ARUP

PLATE 1

Mission Street

Fremont Street

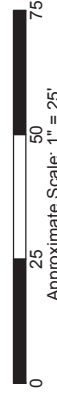


Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

Mid-Rise Parking Structure

High-Rise Tower

Transbay Terminal



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on December 17, 2013.
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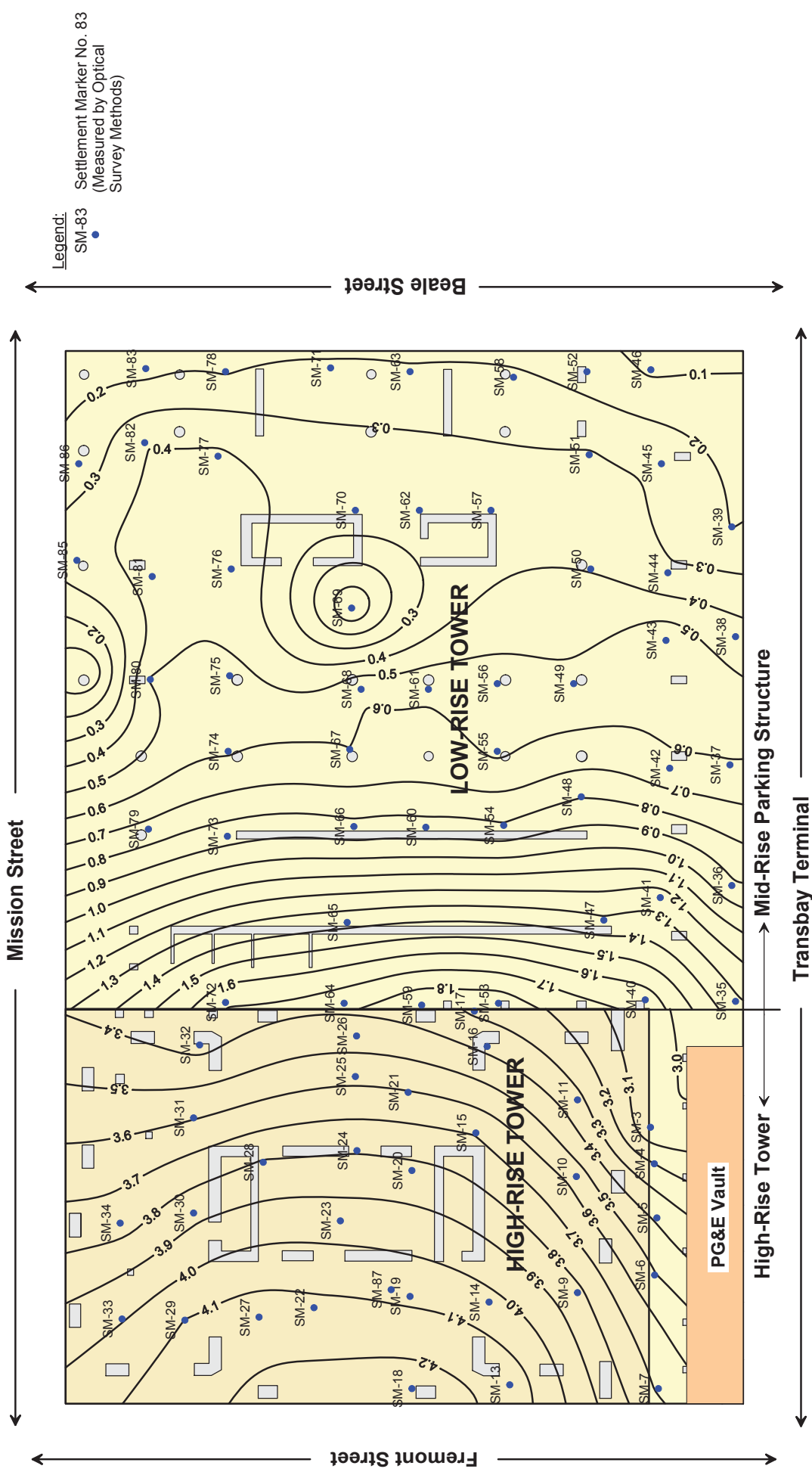
DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 DECEMBER 17, 2013 SURVEY

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

January 2014

ARUP

PLATE 2



Legend:

SM-83


Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

**CONTOURS OF SETTLEMENTS MEASURED AT THE
 1ST LEVEL BASEMENT OF THE 301 MISSION ST
 STRUCTURE BETWEEN 04/30/2009 & 12/17/2013**

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

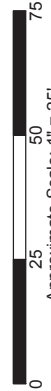
January 2014



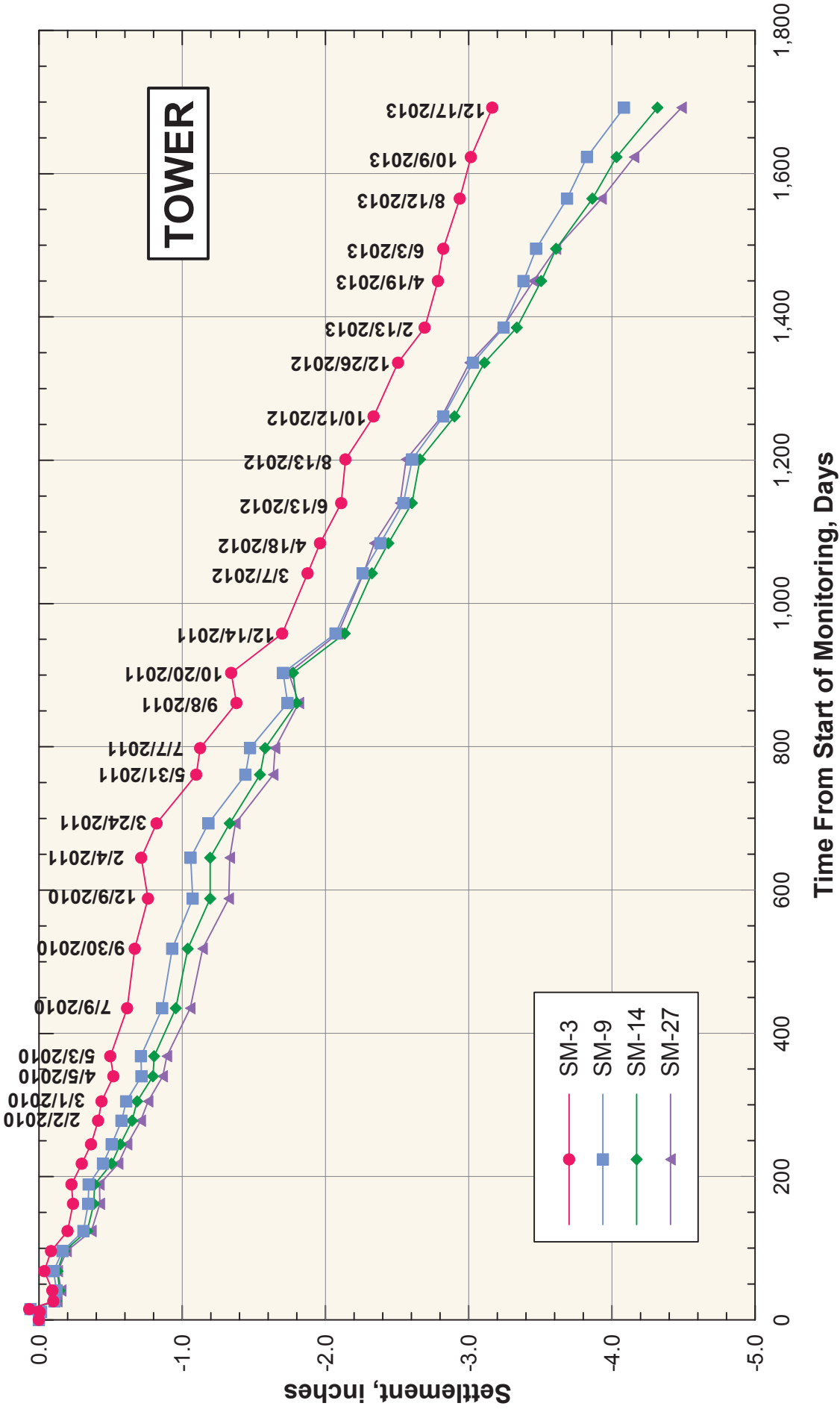
Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on December 17, 2013.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

The PG&E vault is inaccessible for monitoring.

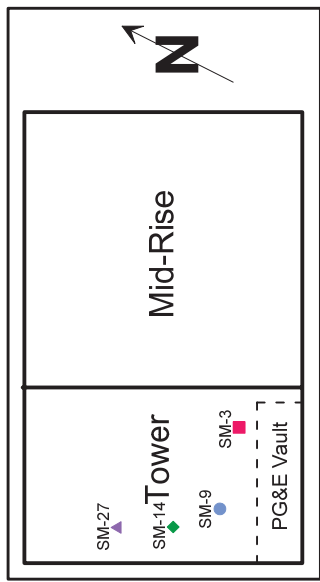
Negative values of settlement (within Low-rise Tower) indicate uplift.



Approximate Scale: 1" = 25'



Time From Start of Monitoring, Days



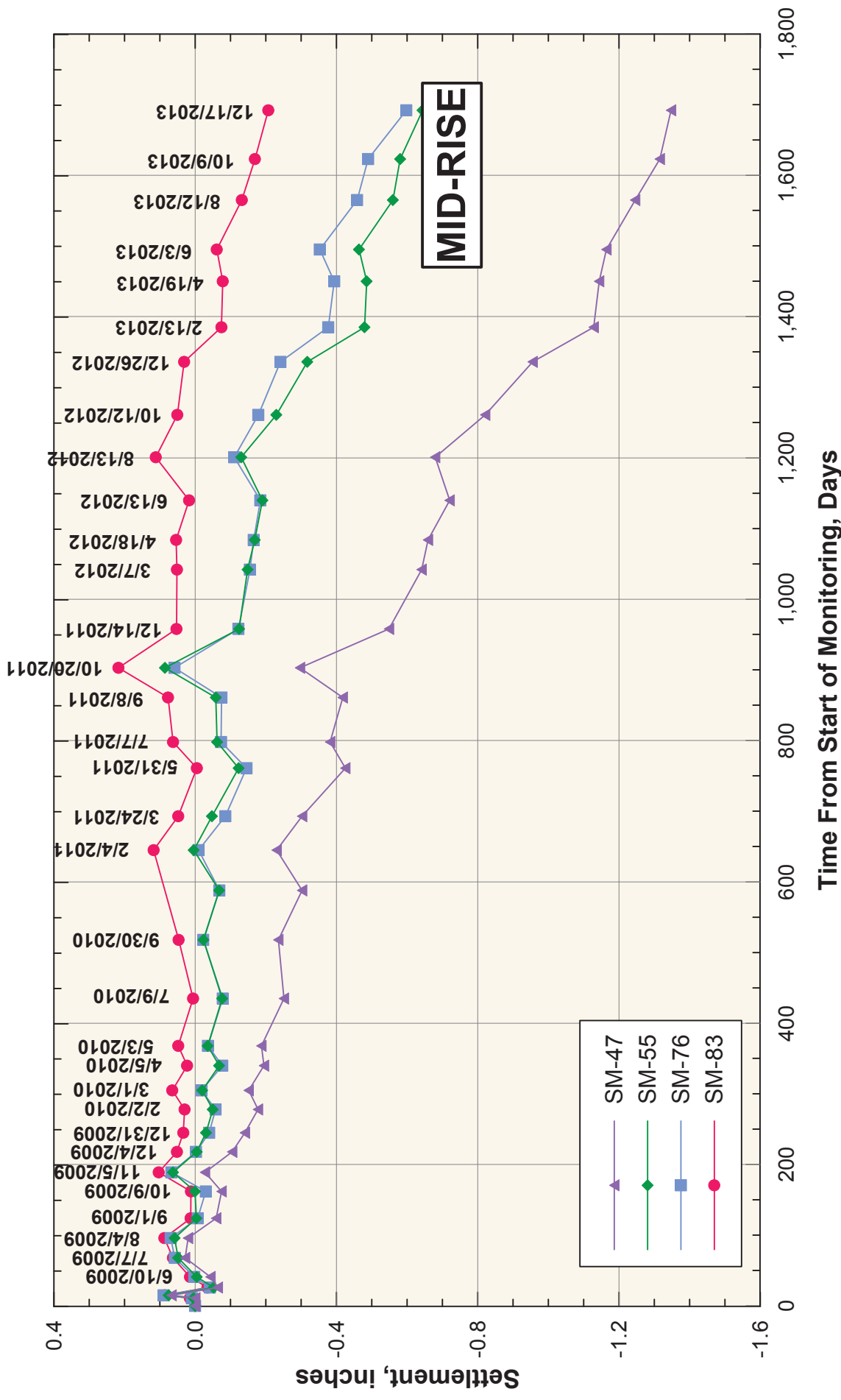
Note:
Initial (Baseline) reading
taken on 04/30/09

SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH DECEMBER 17, 2013

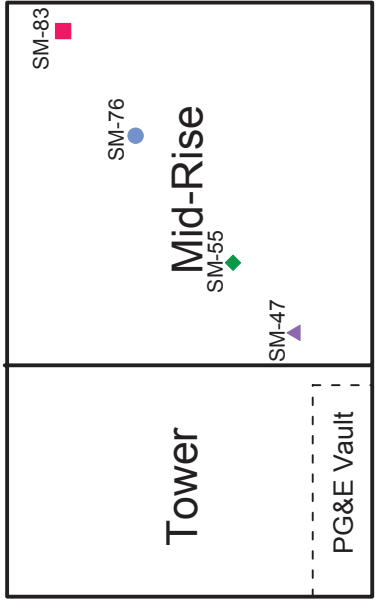
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

January 2014





Time From Start of Monitoring, Days



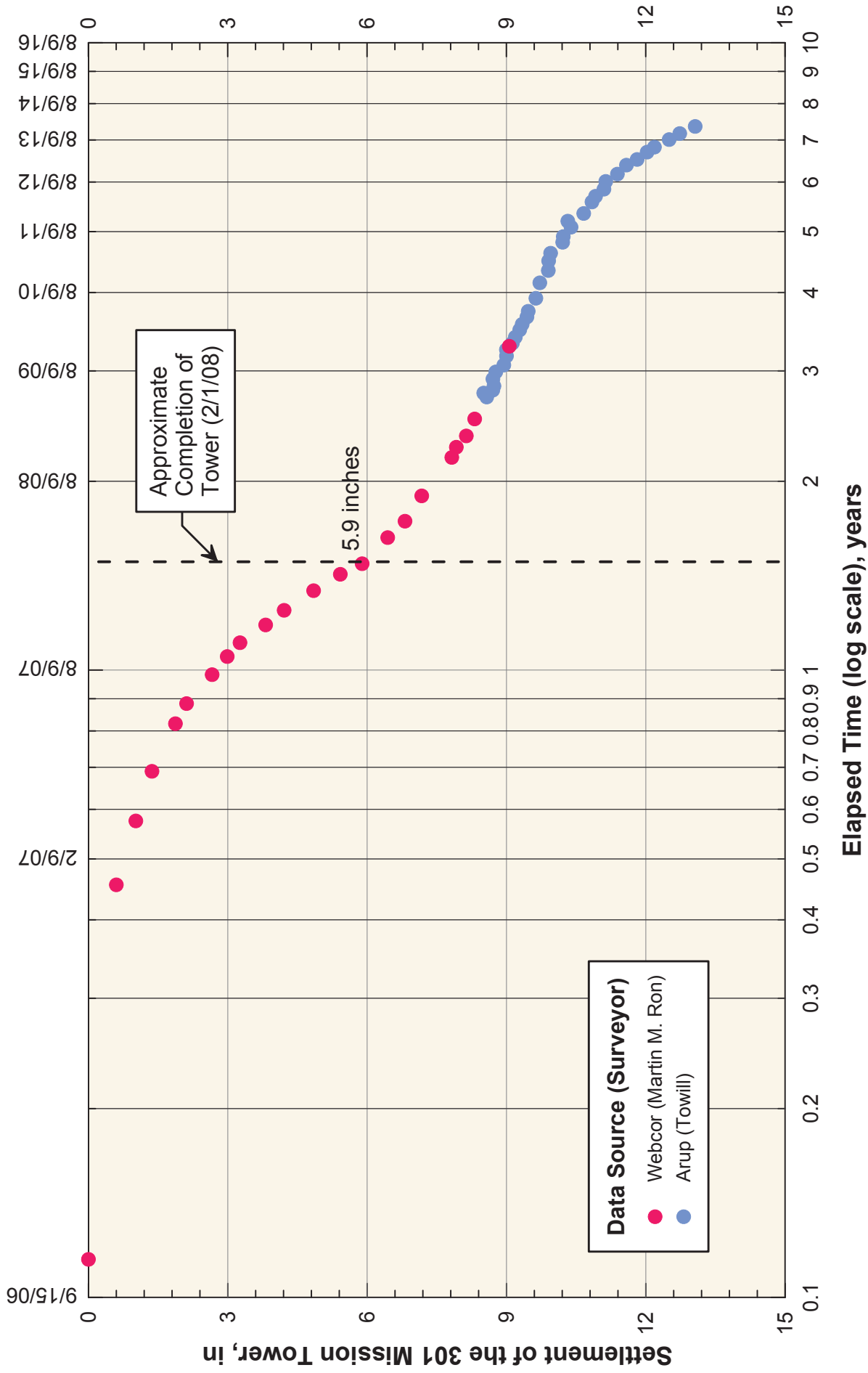
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH DECEMBER 17, 2013**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California



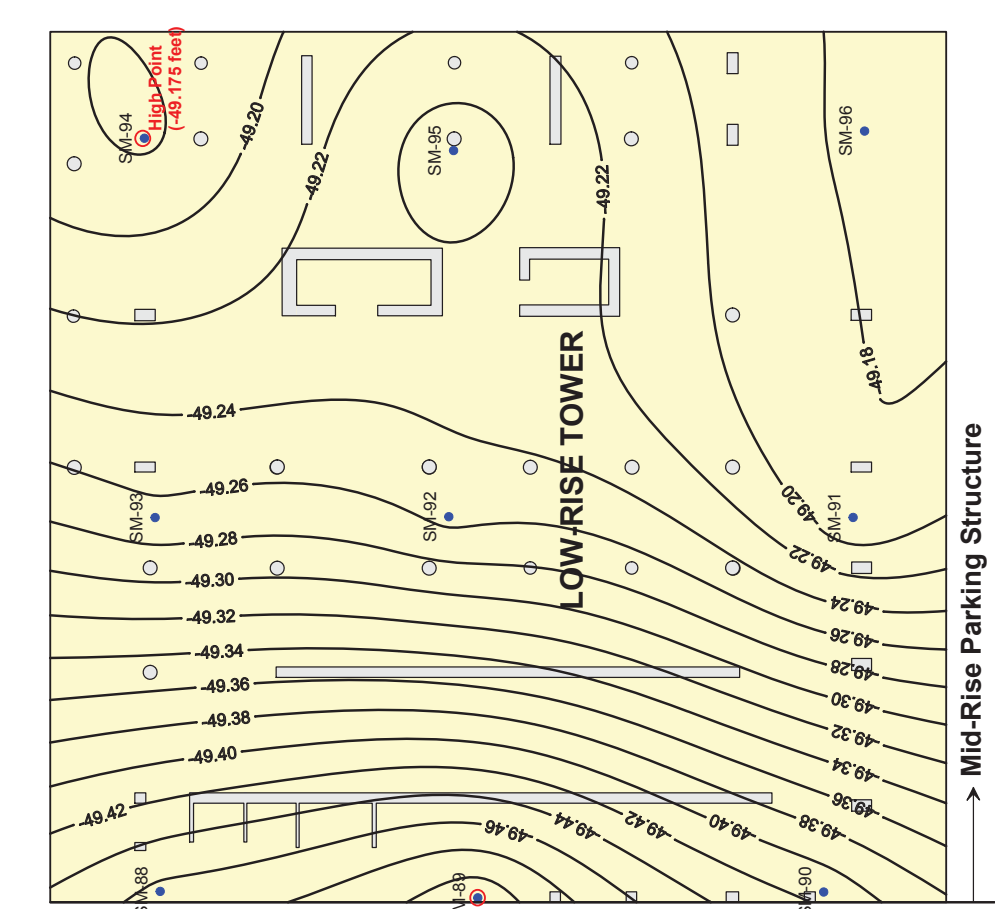
January 2014



Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)



Mission Street



Date of Survey Reading:
December 17, 2013

Legend:
 SM-88 Settlement Marker No. 88
 (Measured by Optical Survey Methods)

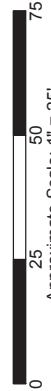
Maximum Differential
B-5 Level Basement
0.340 feet (4.076 inches)

Fremont Street

Beale Street



Notes:
 Contours represent elevation, in feet (CCSF Datum), from survey readings taken on December 17, 2013.

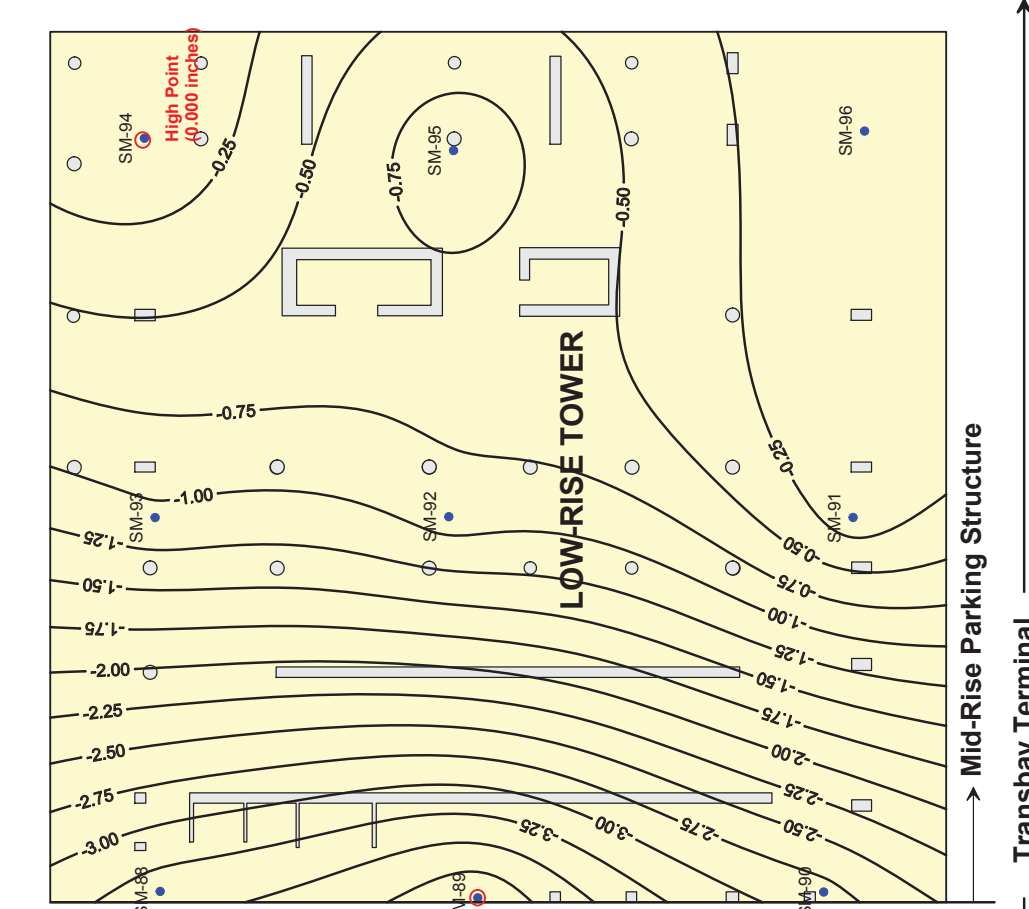


Approximate Scale: 1" = 25'

January 2014



Mission Street



Date of Survey Reading:
December 17, 2013

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

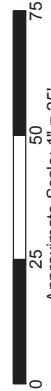
Maximum Differential
B-5 Level Basement
0.340 feet (4.076 inches)

Fremont Street

Beale Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on December 17, 2013.



Approximate Scale: 1" = 25'

J:\S\F1320001\322424 Internal Project Data\4-05 Reports & Narratives\224-301 Mission - December 2013 Survey\PlatesB-5 Differential Elevations (2013.12.17).srf

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: DECEMBER 17, 2013 SURVEY

Transbay Transit Center
301 Mission Street
Transbay Joint Powers Authority
San Francisco, California

January 2014



PLATE 8

From: Brian Dykes
Sent: Tuesday, March 04, 2014 4:38 PM
To: 'Steven Hood'
Cc: Stephen McLandrich; 'Nick O'Riordan'
Subject: Meeting Request Regarding 301Mission Settlement

Steve,

I am responding to your letter dated February 26, 2014 requesting an early meeting between the engineers representing Millennium Properties and the TJPA.

We are available to meet at 9am on March 11, 13, 14, 17 and 18. Please let us know your preferred day or days as soon as possible.

In order to cover the number of items listed in your letter, please send us your Item 5 "Settlement curve as plotted by De Simone Consulting" this week so we can review it prior to the meeting.

I have attached above the Arup Memo for survey results through February 13, 2013 and their excel spread sheet with the raw data.

All bulk excavation was completed on February 7 and the last tie down micro pile was installed on February 28.

Regards, Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	28 February 2014
Copies	Randy Volenec (PCPA) George Metzger (AAI)	Reference number	132242-60/MHG
From	Stephen McLandrich (Arup)	File reference	4-05 224
Subject	Transbay Transit Center: Results of February 2014 Settlement Survey at 301 Mission Property	Page 1 of 1	

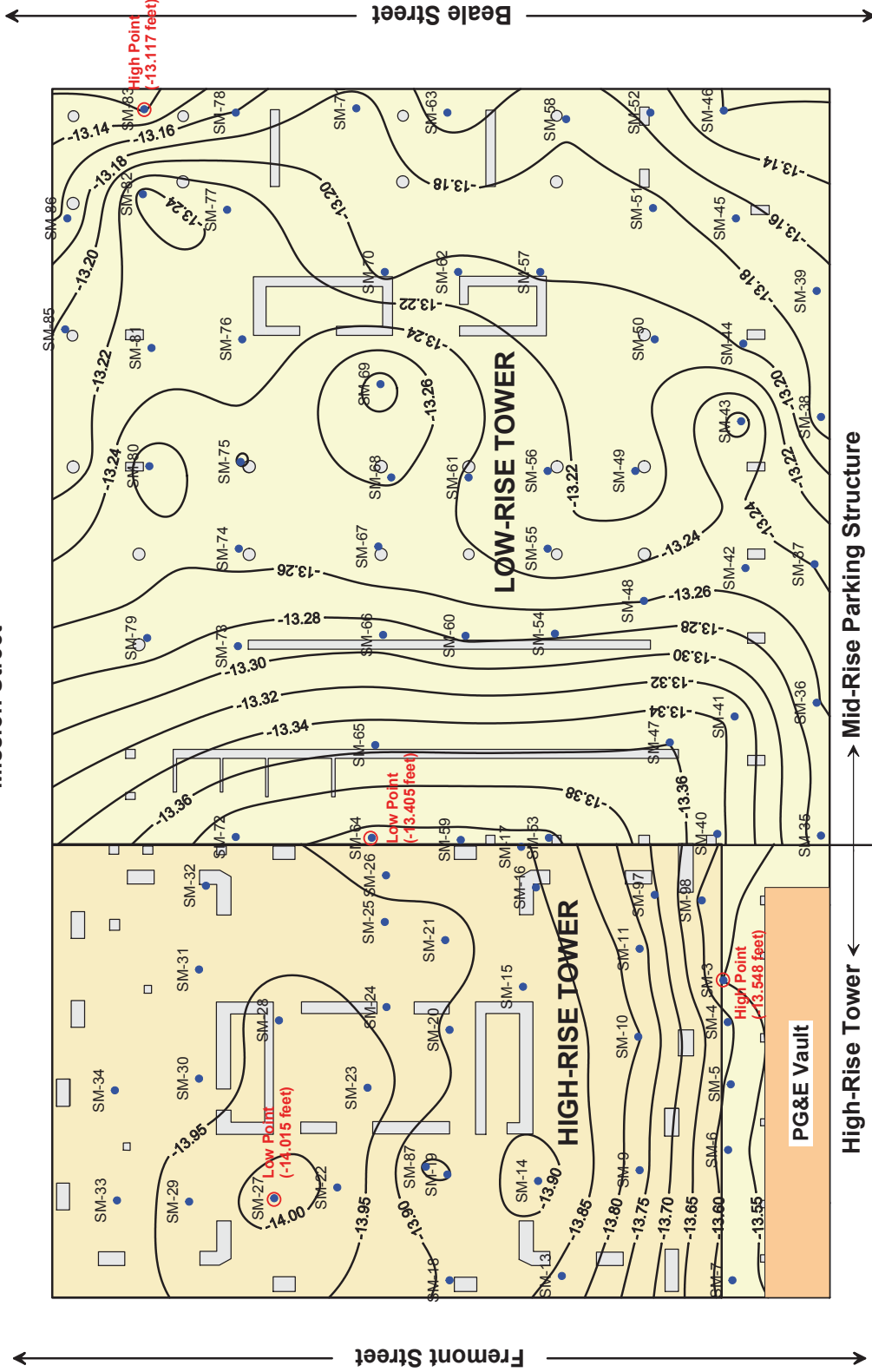
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated January 9, 2014 with measurements made through February 2014.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – February 13, 2014
- Plate 2 Differential Floor Elevation (Inches) – February 13, 2014 Survey
- Plate 3 Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St. Structure Between 04/30/2009 & 2/13/2014
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through February 13, 2014
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through February 13, 2014
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: February 13, 2014 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: February 13, 2014 Survey

Mission Street

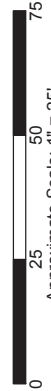
Fremont Street



Date of Survey Reading:
February 13, 2014

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.467 feet (5.603 inches)
Low-Rise Tower	0.288 feet (3.455 inches)

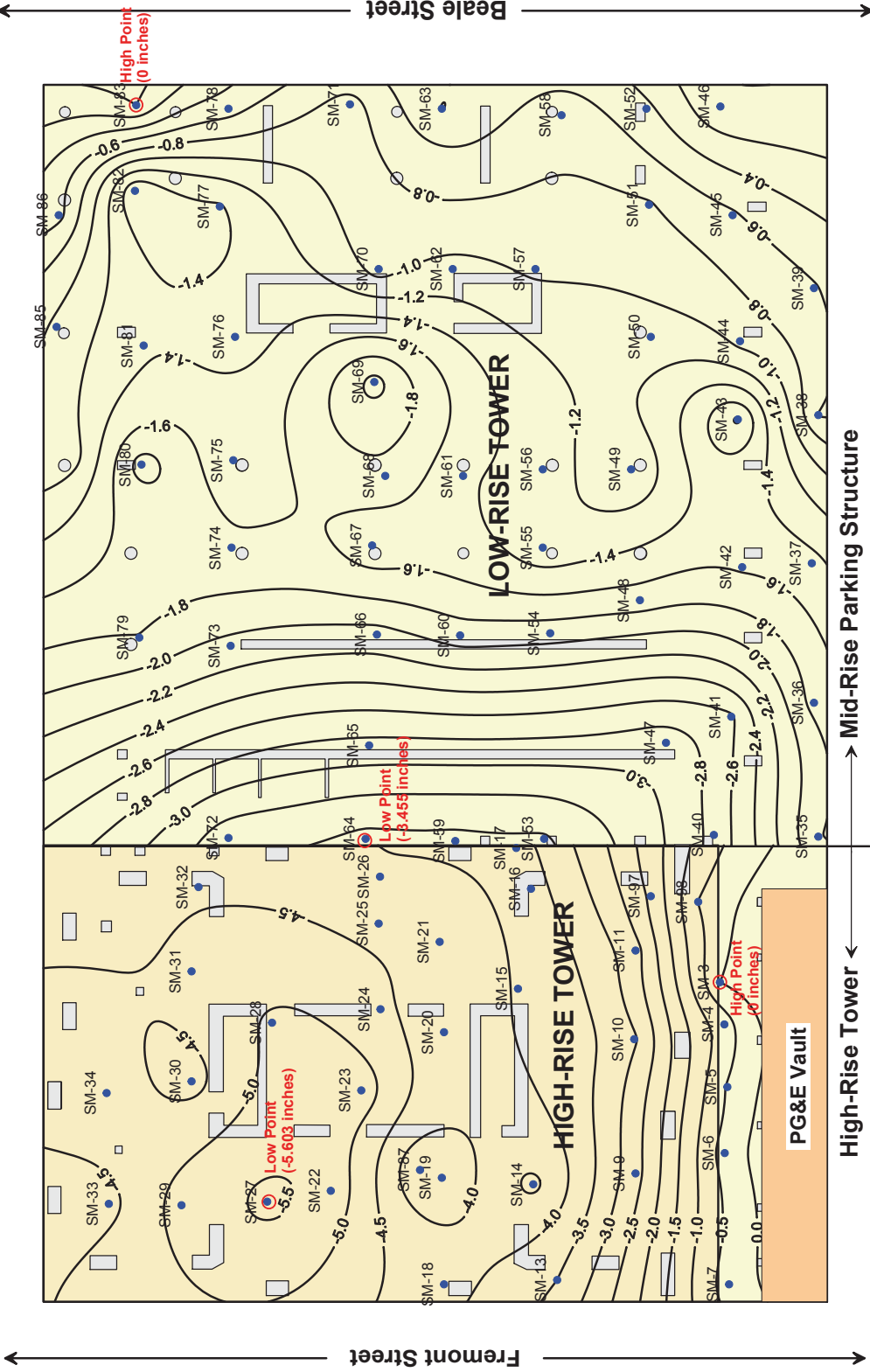


Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on February 13, 2014.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - FEBRUARY 13, 2014
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

Mission Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

Mid-Rise Parking Structure

Transbay Terminal

High-Rise Tower

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 FEBRUARY 13, 2014 SURVEY

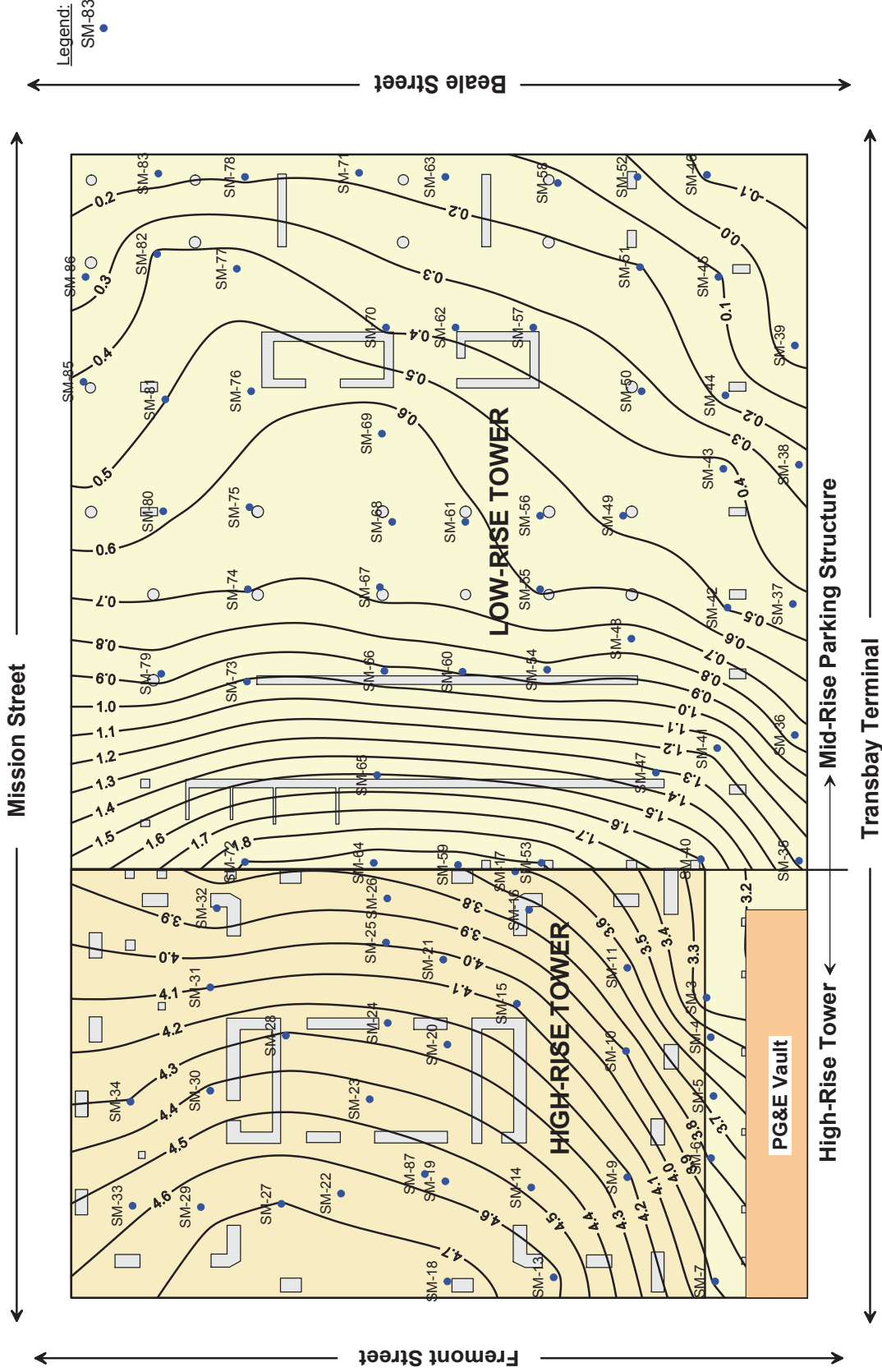
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

February 2014
ARUP

PLATE 2

Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on February 13, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



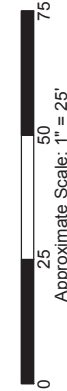
CONTOURS OF SETTLEMENTS MEASURED AT THE
 1ST LEVEL BASEMENT OF THE 301 MISSION ST
 STRUCTURE BETWEEN 04/30/2009 & 12/17/2013

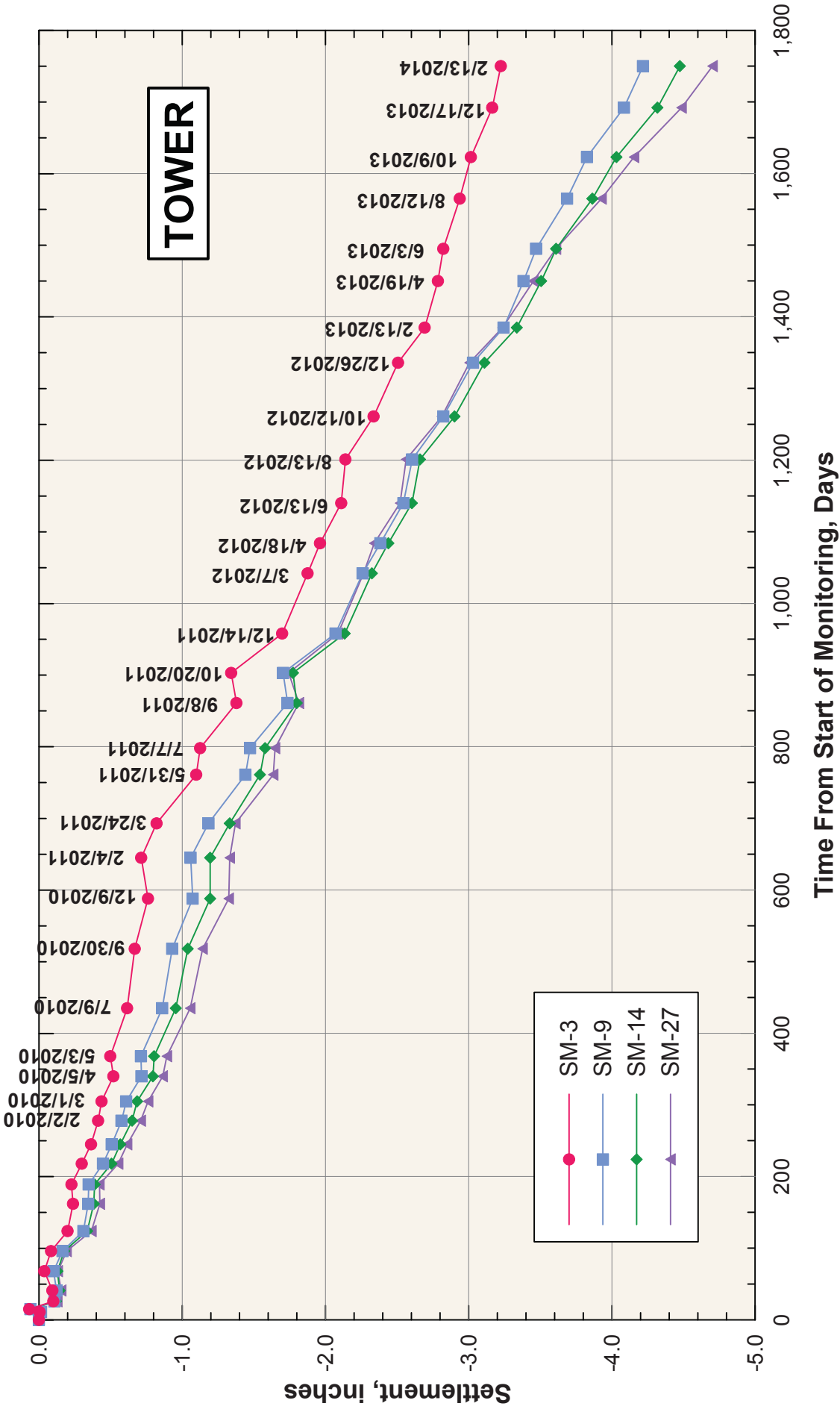
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

February 2014
ARUP

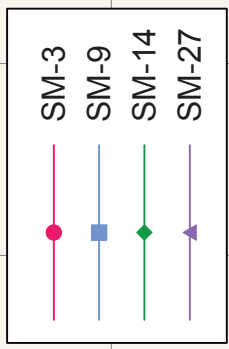
PLATE 3

Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on February 13, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.

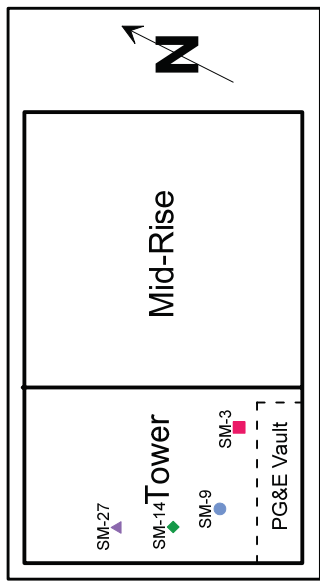




TOWER



Time From Start of Monitoring, Days



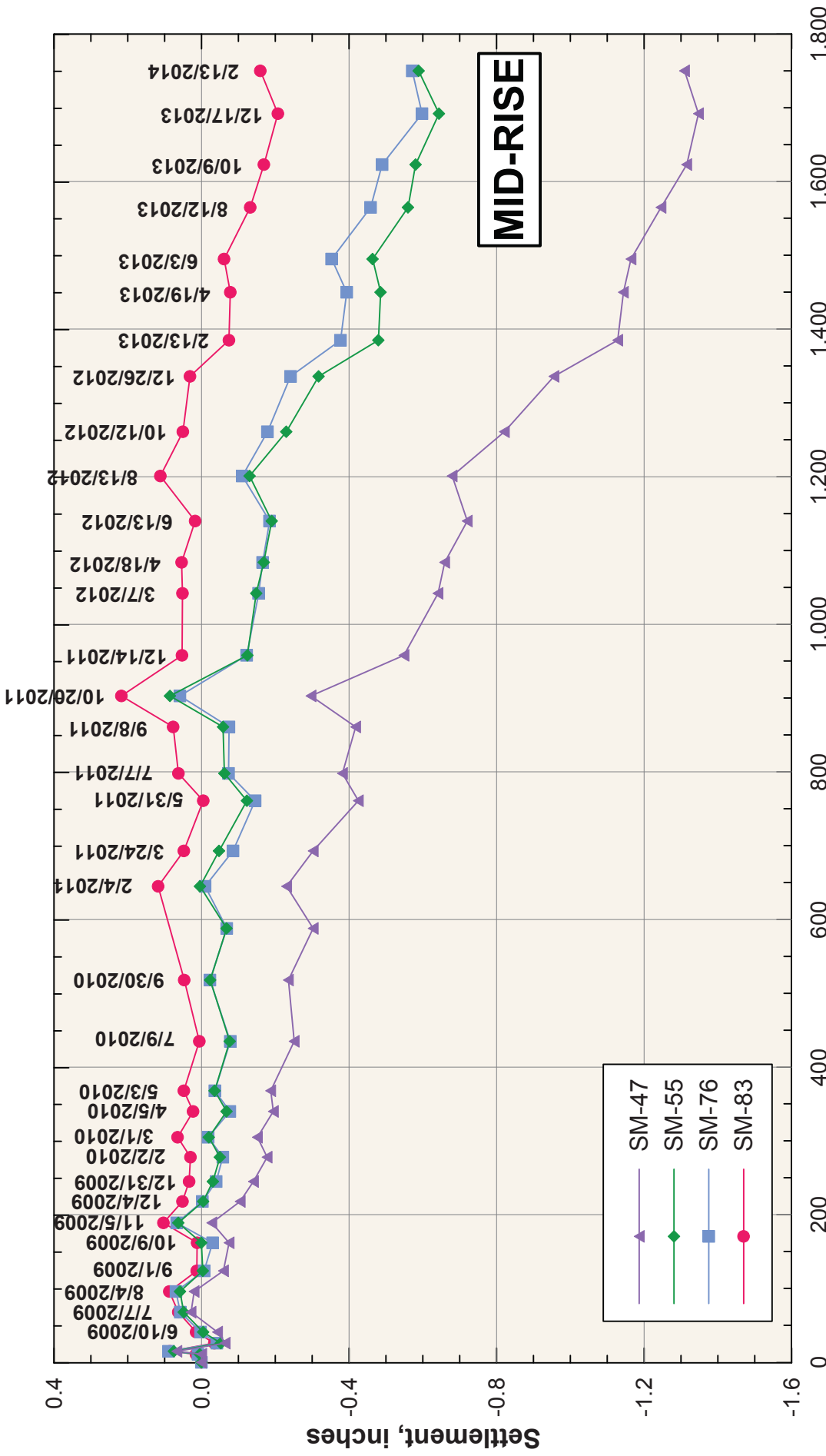
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH FEBRUARY 13, 2014**

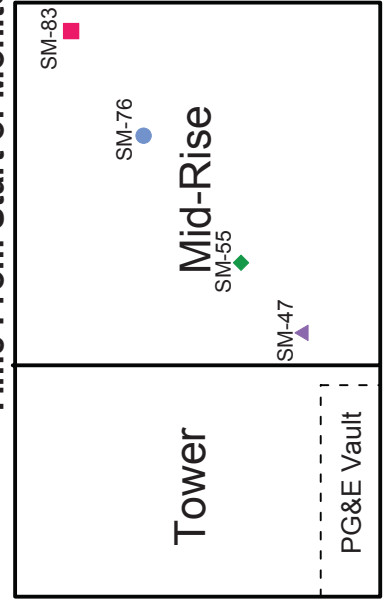
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

February 2014





Time From Start of Monitoring, Days



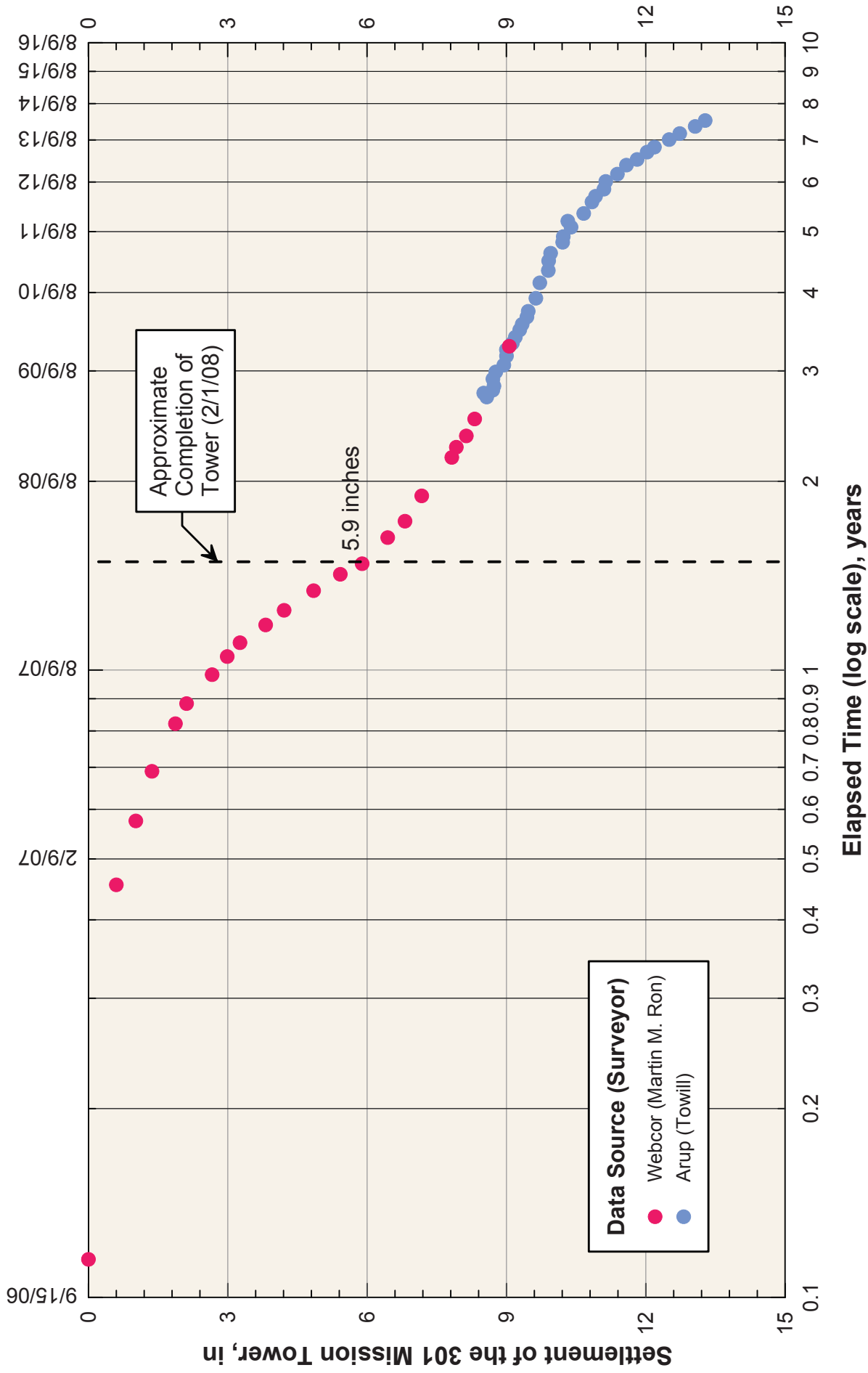
**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH FEBRUARY 13, 2014**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

February 2014

ARUP

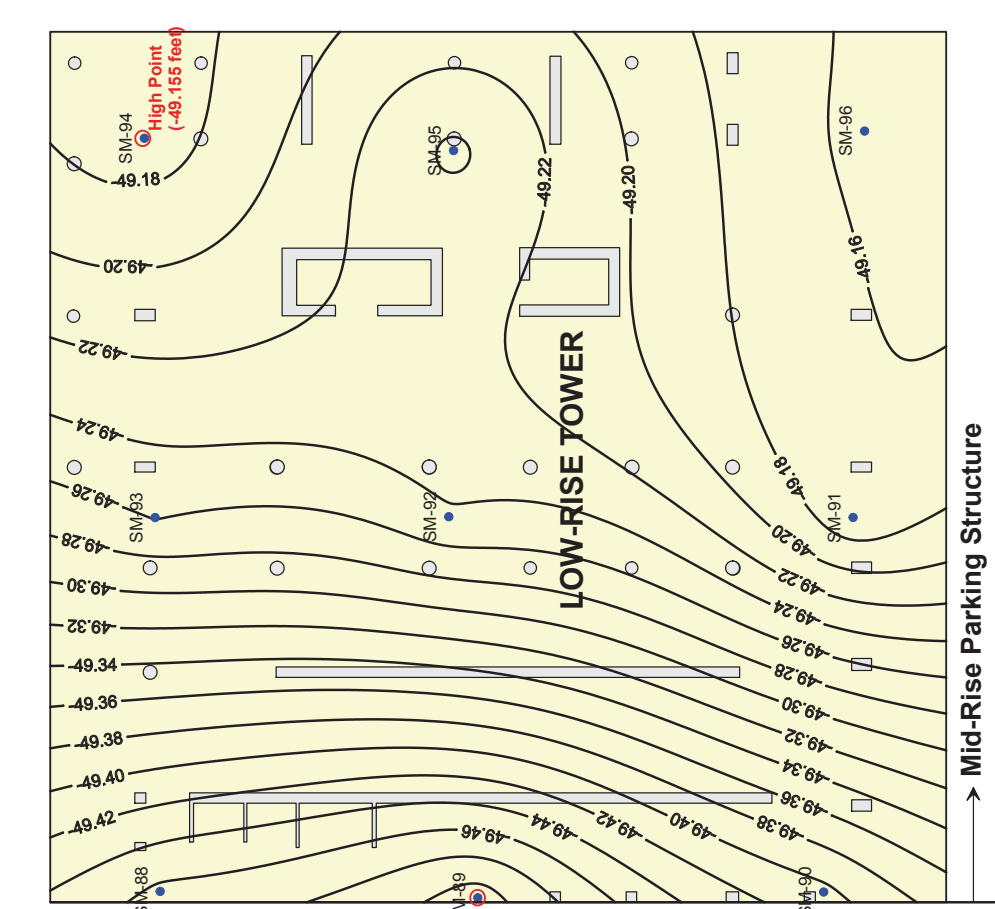
**Note:
Initial (Baseline) reading
taken on 04/30/09**



Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)



Mission Street



Fremont Street

Beale Street

Mid-Rise Parking Structure

Transbay Terminal

LOW-RISE TOWER

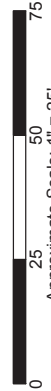
Date of Survey Reading:
February 13, 2014

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.356 feet (4.270 inches)



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on February 13, 2014.



Approximate Scale: 1" = 25'

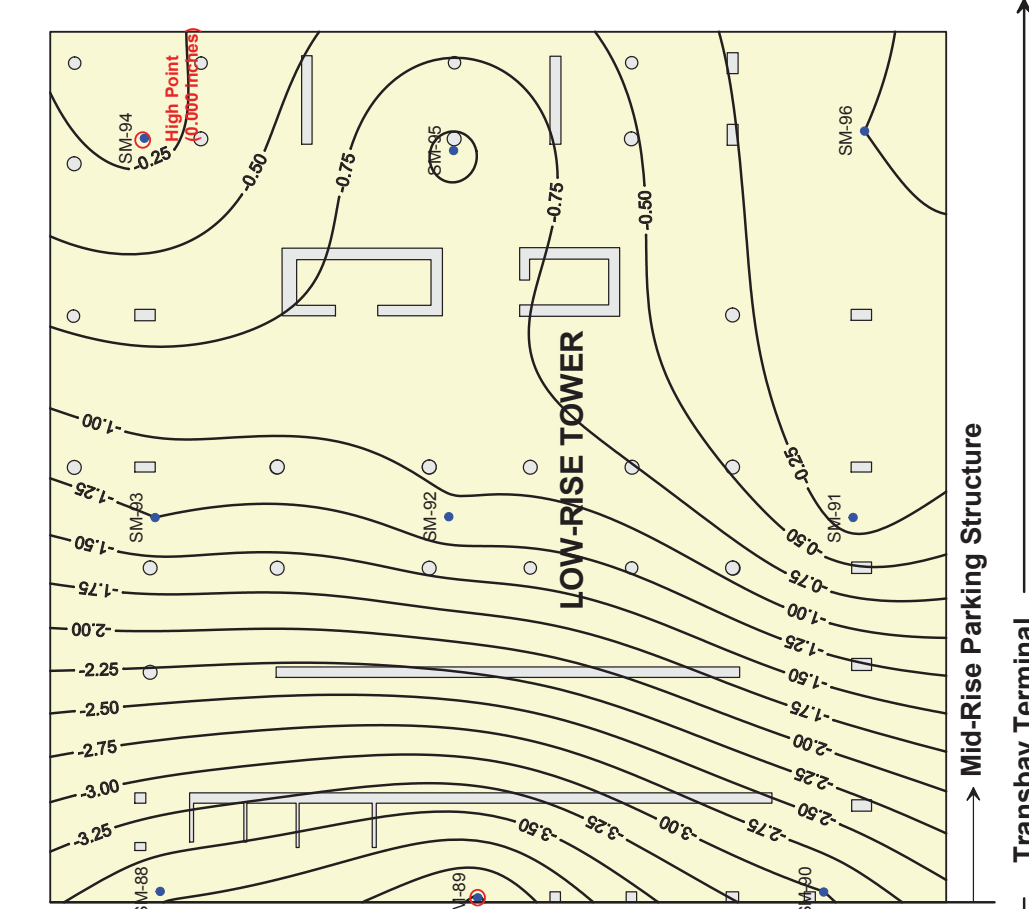
J:\S\F1320001\322424 Internal Project Data\4-05 Reports & Narratives\229 301 Mission - February 2014 Survey\Plates\B-5 Elevations (2014.02.13).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: FEBRUARY 13, 2014 SURVEY
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California
February 2014

ARUP

PLATE 7

Mission Street



Date of Survey Reading:
February 13, 2014

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

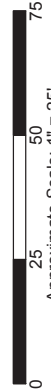
Maximum Differential
B-5 Level Basement
0.356 feet (4.270 inches)

Fremont Street

Beale Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on February 13, 2014.



Approximate Scale: 1" = 25'

J:\S-F1320001\322424 Internal Project Data\4-05 Reports & Narratives\25 301 Mission - February 2014 Survey\Plates\B-5 Differential Elevations (2014.02.13).sr

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: FEBRUARY 13, 2014 SURVEY

Transbay Transit Center
301 Mission
Transbay Joint Powers Authority
San Francisco, California

February 2014

ARUP

PLATE 8

From: Brian Dykes
Sent: Wednesday, May 07, 2014 3:23 PM
To: Steven Hood
Cc: Margie Cleland; Nila Gonzales
Subject: FW: 301 Mission Monitoring Memo - April Survey
Attachments: 2014-05-07 Memo_301 Mission Settlement - Apr 2014 Survey.pdf; 301 Mission Monitoring Survey 04112014.xlsx

Steven,
Here are the settlement readings taken on April 11, 2014.

Margie,
Please file this email and the attachments with the 201 Mission Street correspondence.

Thanks, Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Wednesday, May 07, 2014 2:20 PM
To: Brian Dykes
Cc: 'rvolenec@pcparch.com' (rvolenec@pcparch.com); George Metzger; Jeff Dunn; Nick O'Riordan
Subject: 301 Mission Monitoring Memo - April Survey

Brian,

Please find the attached survey memo for the April 2014 survey. Additionally, I attach the raw survey data as we have been sending this as well now.

Let me know if you have any questions.

Regards,
Stephen

Stephen McLandrich PE GE
Senior Geotechnical Engineer

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA
t +1 415 957 9445 d +1 415 946 0245
f +1 415 957 9096 c +1 415 310 1095
www.arup.com

Arup named ENR California's
DESIGN FIRM OF THE YEAR 2013

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date May 7, 2014
Copies	Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242
From	Stephen McLandrich (Arup)	File reference 4-05 236
Subject	Transbay Transit Center: Results of April 2014 Settlement Survey at 301 Mission Property	Page 1 of 1

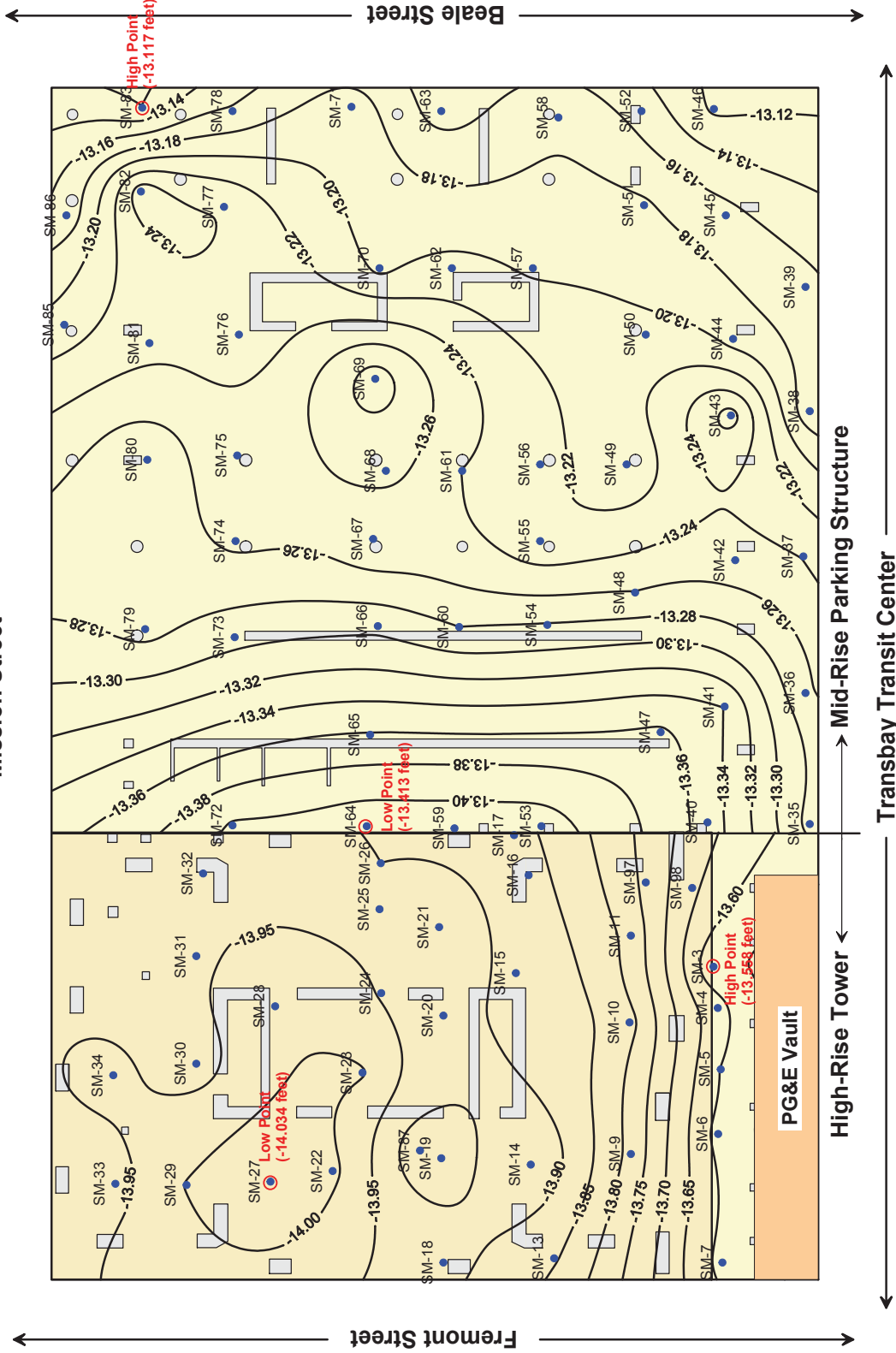
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated February 28, 2014 with measurements made through April 2014.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – April 11, 2014
- Plate 2 Differential Floor Elevation (Inches) April 11, 2014 Survey
- Plate 3 Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St. Structure Between 04/30/2009 & 4/11/2014
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through April 11, 2014
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through April 11, 2014
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: April 11, 2014 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: April 11, 2014 Survey

Mission Street

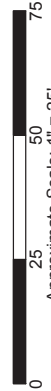
Fremont Street



Date of Survey Reading:
April 11, 2014

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

High-Rise Tower	Maximum Differential
0.476 feet (5.714 inches)	Mid-Rise Parking 0.296 feet (3.552 inches)



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on April 11, 2014.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - APRIL 11, 2014

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

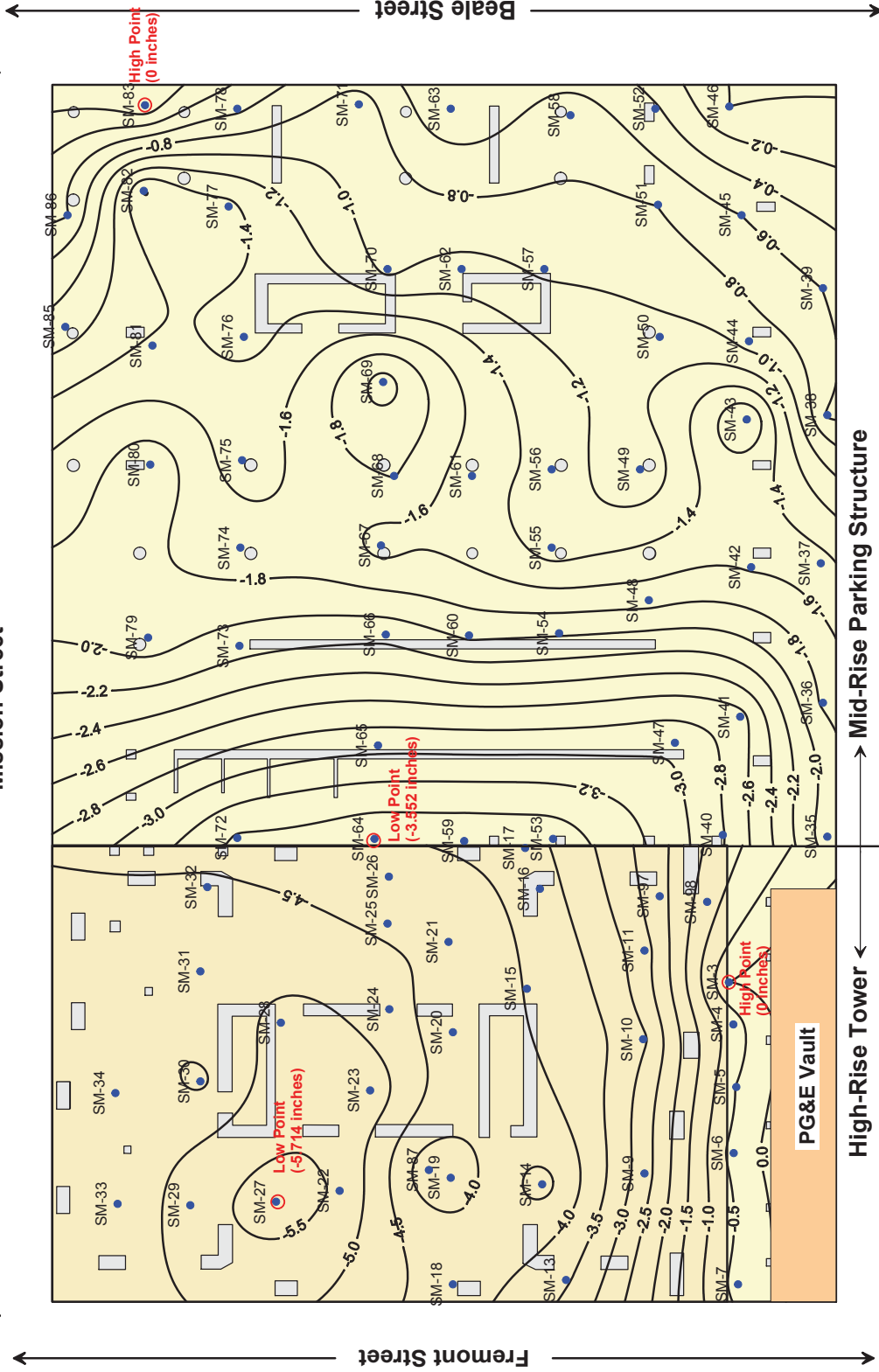
May 2014

ARUP

PLATE 1

Mission Street

Fremont Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower ← Mid-Rise Parking Structure

Transbay Transit Center



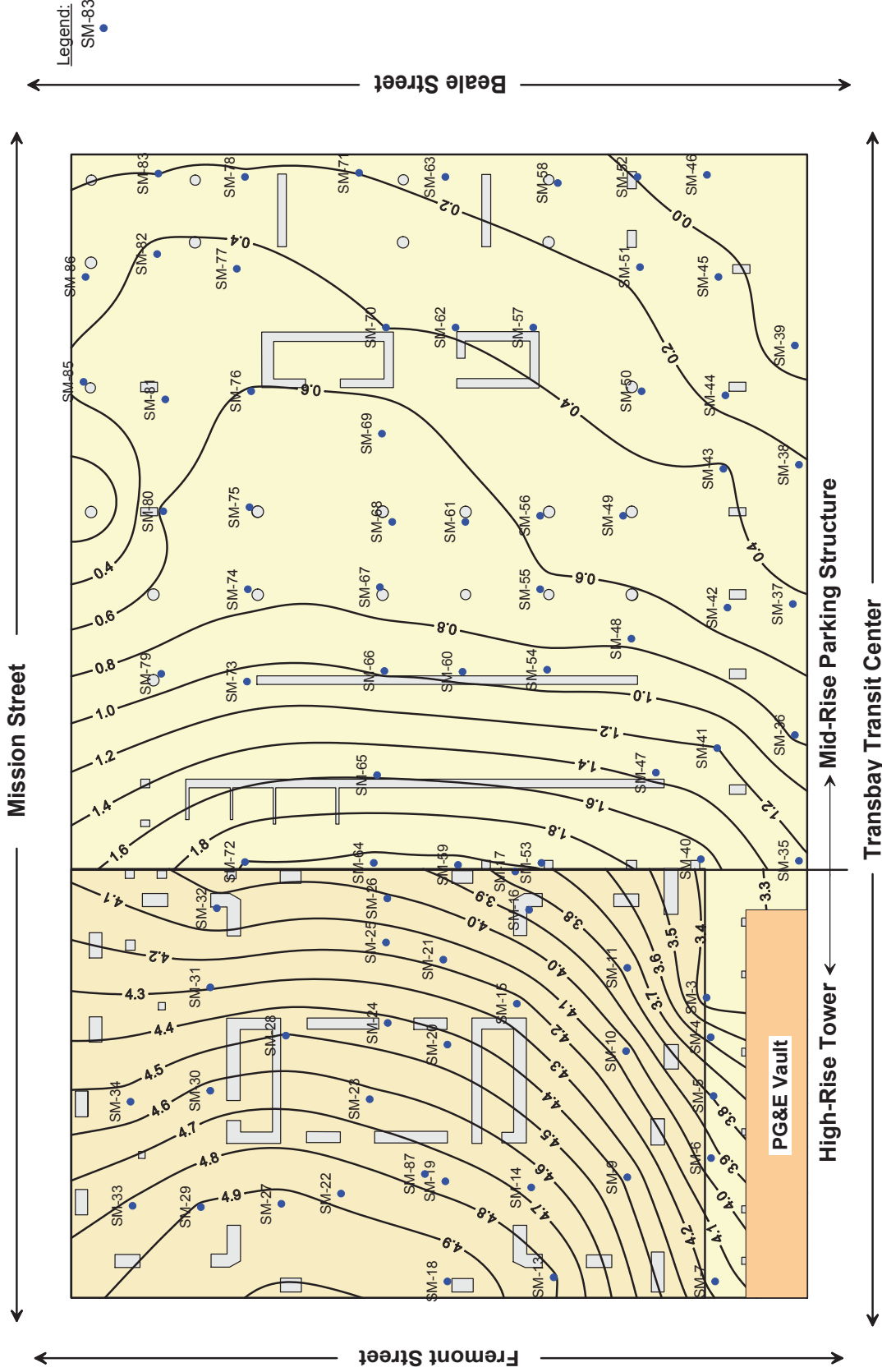
Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on April 11, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 APRIL 11, 2014 SURVEY

Transbay Transit Center
 307 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

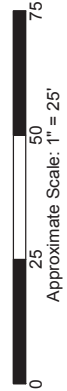
May 2014
ARUP

PLATE 2



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on April 11, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.



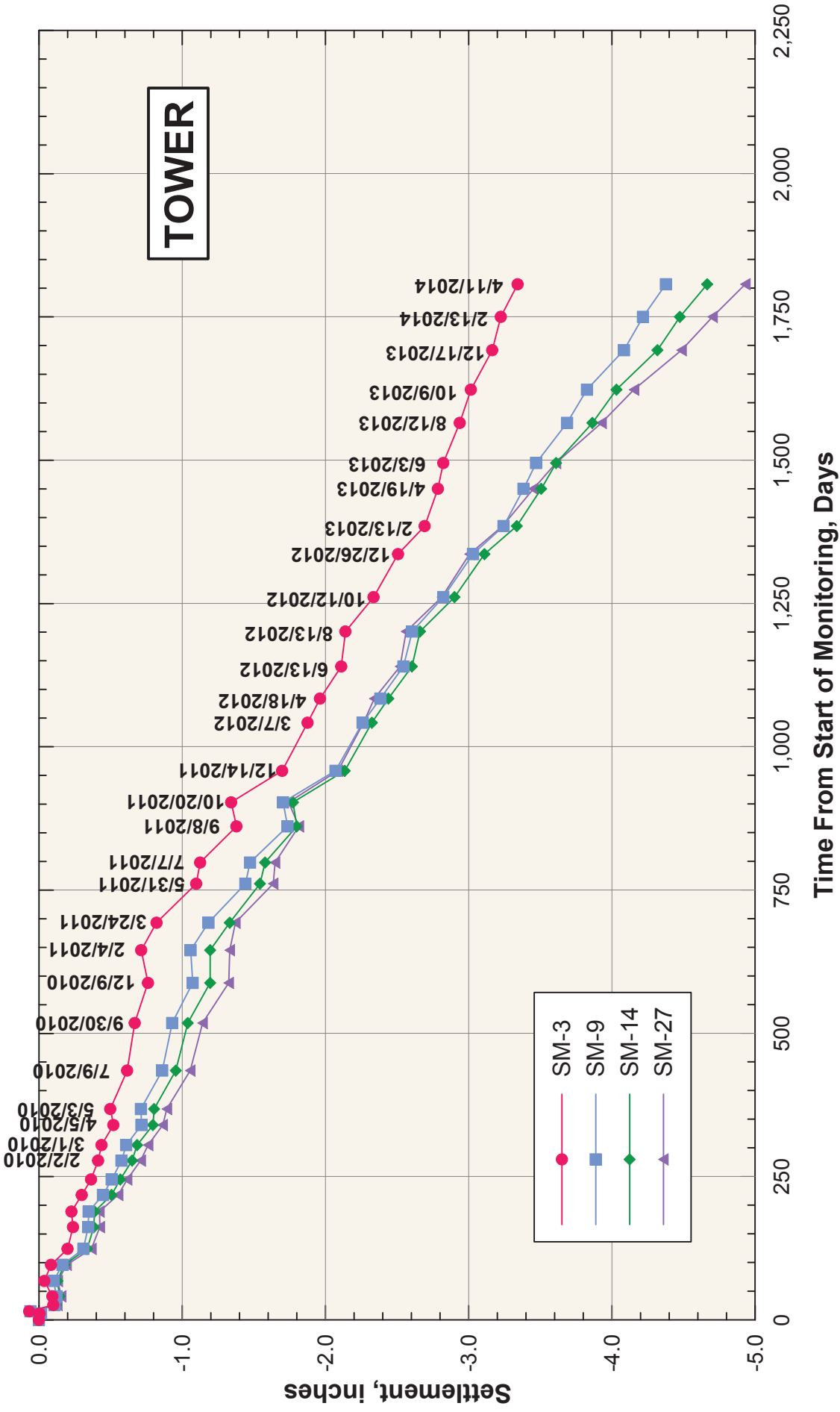
CONTOURS OF SETTLEMENTS MEASURED AT THE
 1ST LEVEL BASEMENT OF THE 301 MISSION ST
 STRUCTURE BETWEEN 04/30/2009 & 4/11/2014

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

May 2014

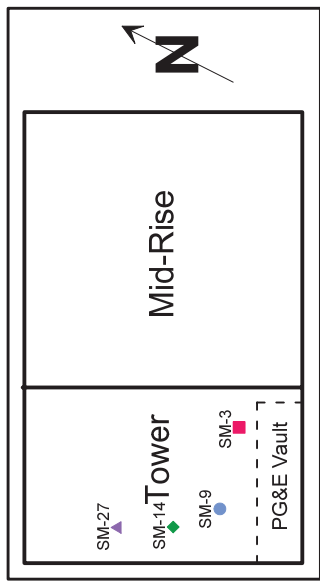
ARUP

PLATE 3



TOWER

Time From Start of Monitoring, Days



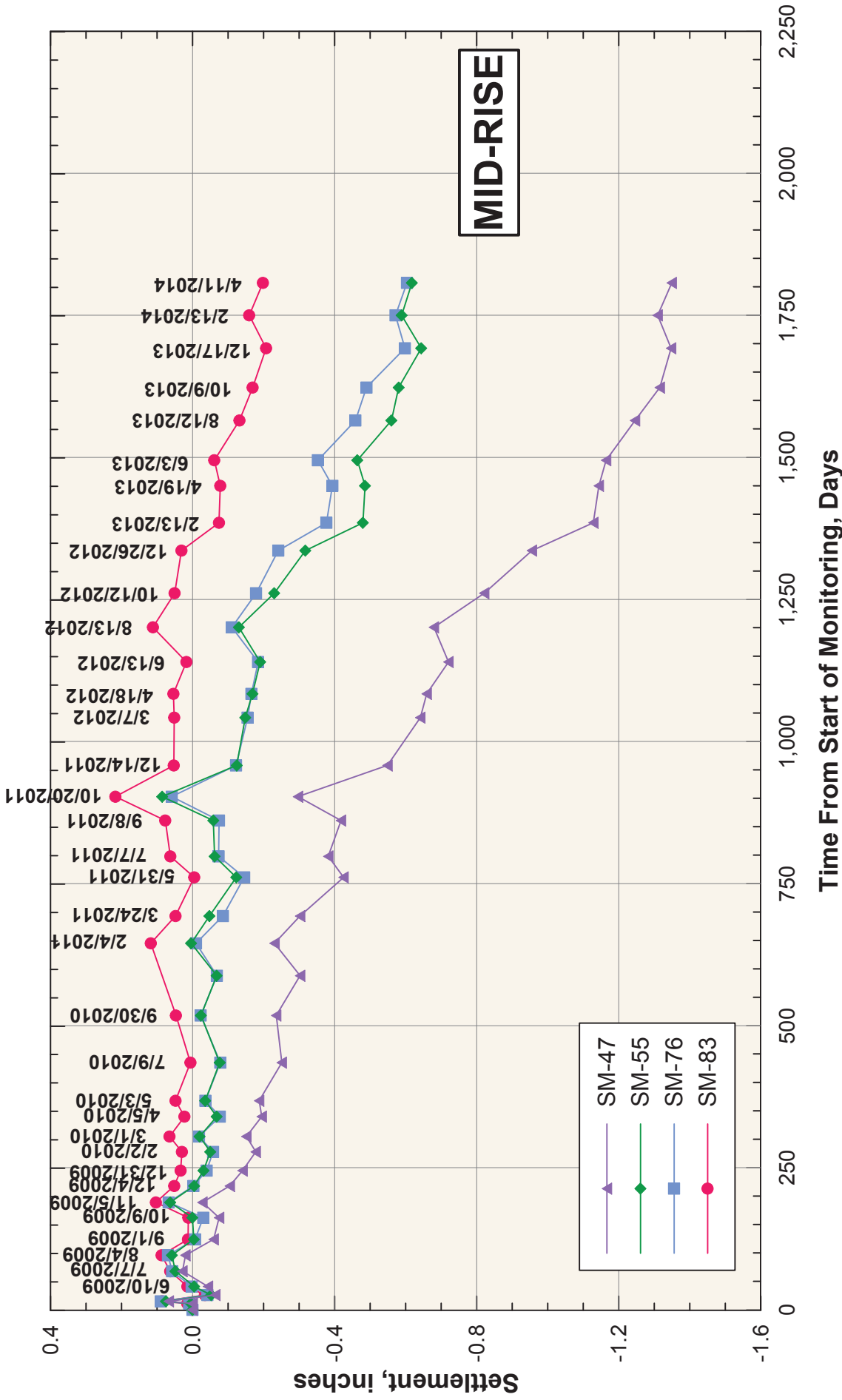
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH APRIL 11, 2014**

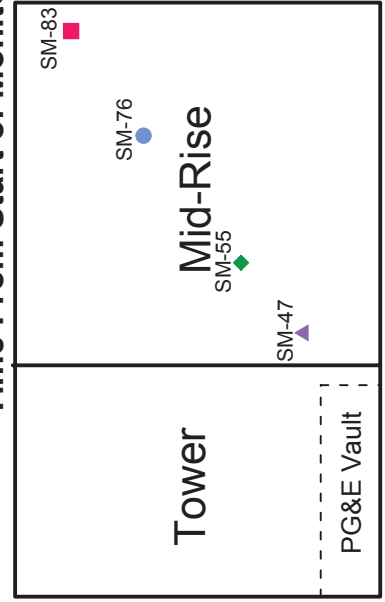
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

May 2014

ARUP



Time From Start of Monitoring, Days



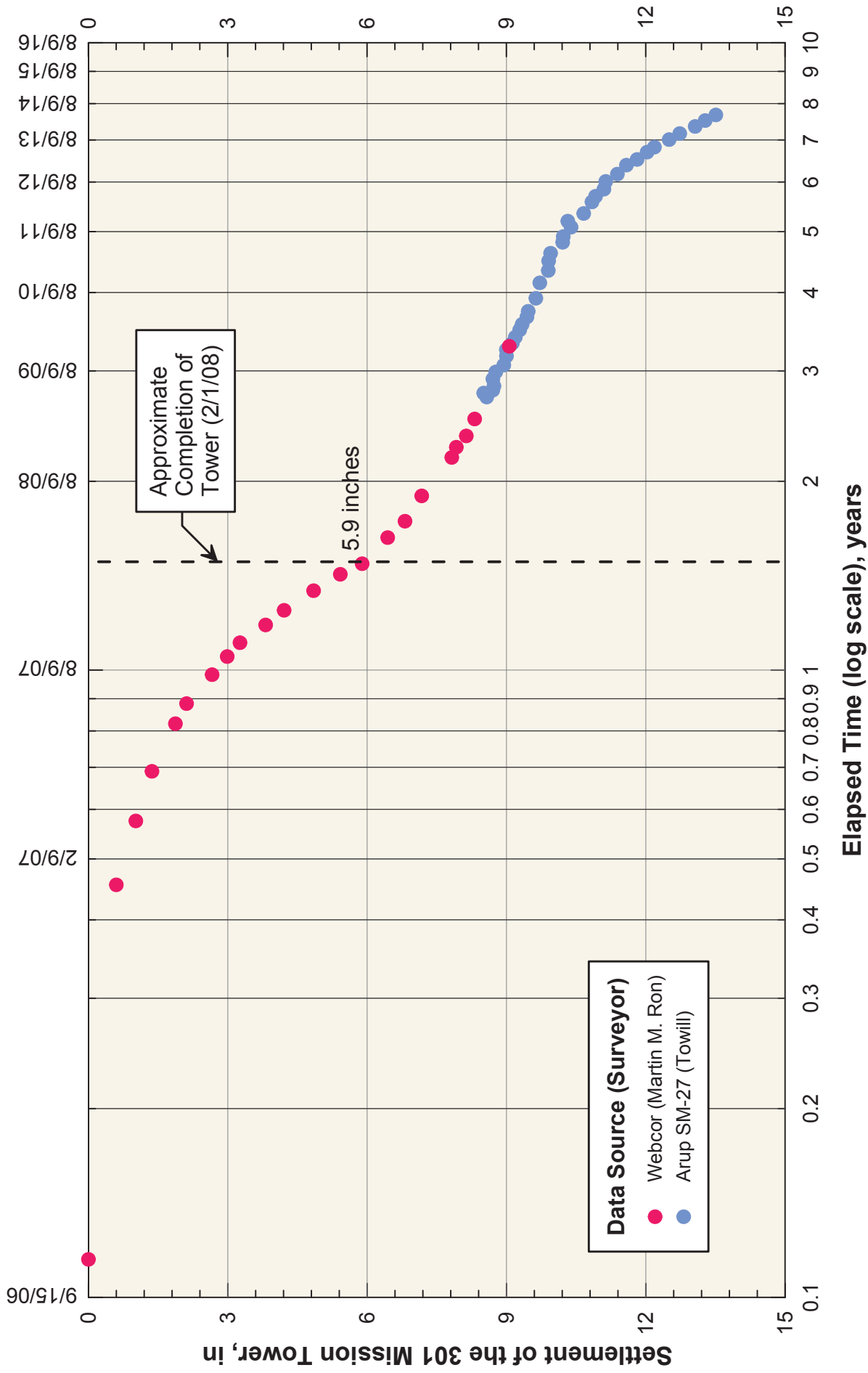
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH APRIL 11, 2014**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California



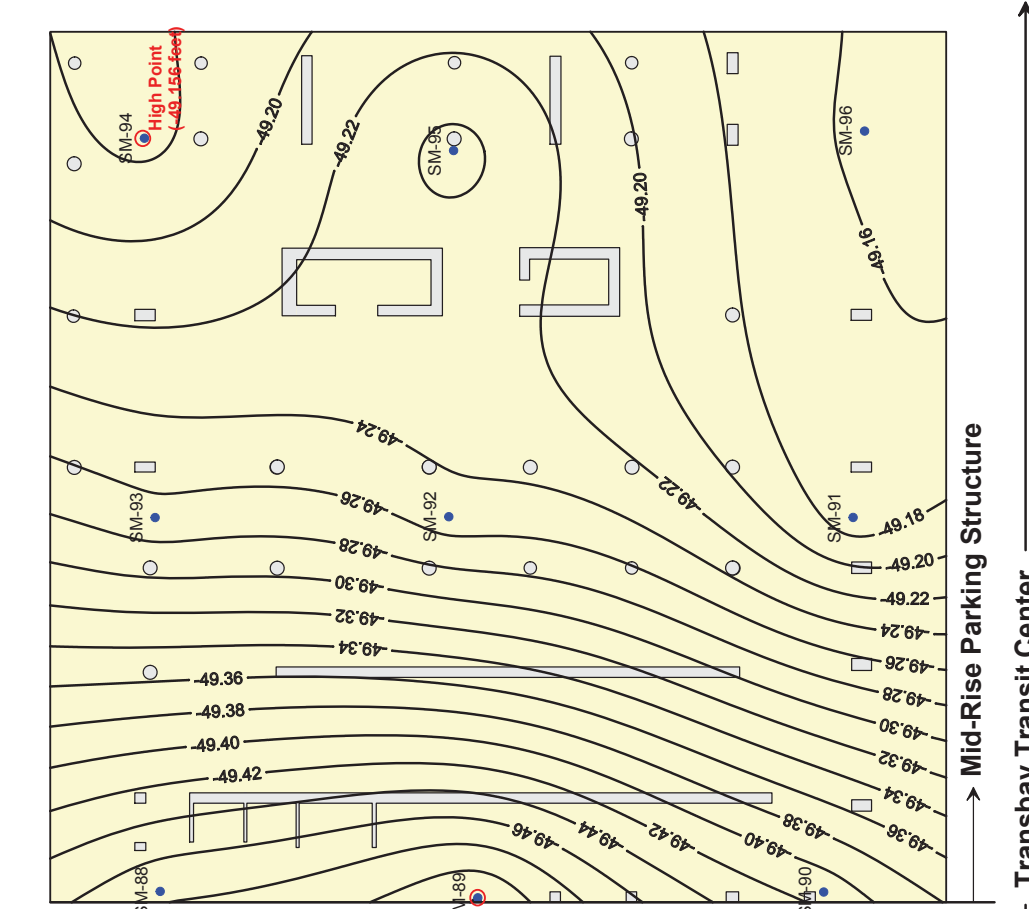
May 2014



Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)



Mission Street



Date of Survey Reading:
April 11, 2014

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.365 feet (4.379 inches)

Fremont Street

Fremont Street

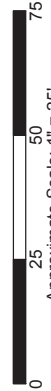
Beale Street

Mid-Rise Parking Structure

Transbay Transit Center



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on April 11, 2014.



Approximate Scale: 1" = 25'

J:\S-F\132000\1322424 Internal Project Data\4-05 Reports & Narratives\236 301 Mission - April 2014 Survey\PlatesB-5 Elevations (2014.04.11).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: APRIL 11, 2014 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

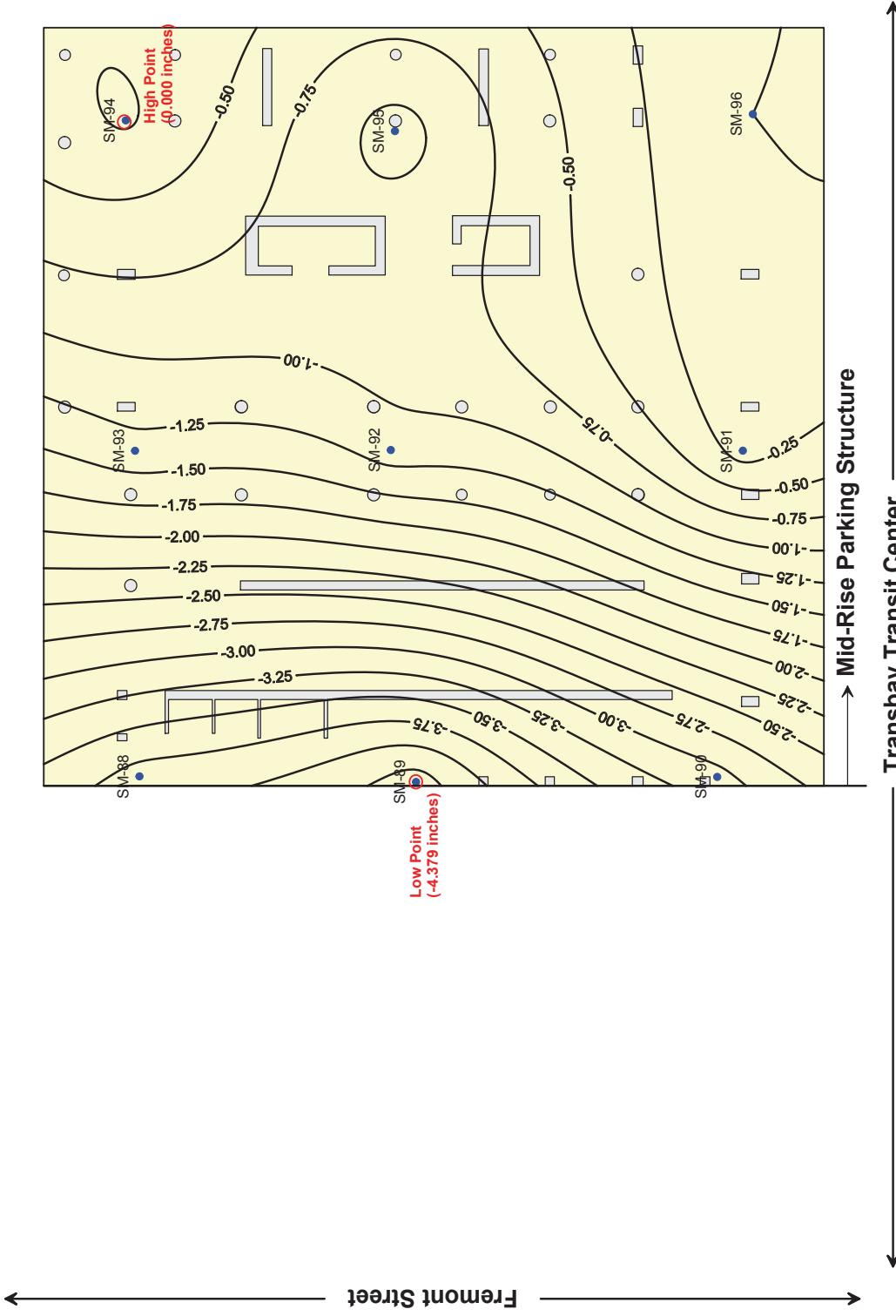
May 2014



PLATE 7

Mission Street

Beale Street



Date of Survey Reading:
April 11, 2014

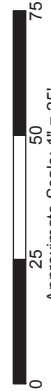
Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.365 feet (4.379 inches)

Fremont Street

Mid-Rise Parking Structure

Transbay Transit Center



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on April 11, 2014.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: APRIL 11, 2014 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

May 2014

ARUP

PLATE 8

From: Brian Dykes
Sent: Friday, August 22, 2014 3:13 PM
To: Steven Hood
Subject: FW: TTC - 301 Mission June Survey

Steve,

This email and the attached settlement records were sent to me the day after I disconnected the email forwarding to my cell phone and left for a long vacation in France and England. I returned this week and have worked backwards through more than 800 emails. So I am now forwarding these results to you.

I am sorry for the delay as it does not appear that anyone else on the copy list forwarded the readings to you.
Regards, Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Thursday, July 24, 2014 10:39 AM
To: Brian Dykes
Cc: Dennis Turchon; Andrew W. Schwartz (schwartz@smwlaw.com); schexnayder@smwlaw.com; 'rvolenec@pcparch.com' (rvolenec@pcparch.com); George Metzger; Nick O'Riordan; Jeff Dunn
Subject: TTC - 301 Mission June Survey

Brian,

Please find the attached 301 Mission settlement memo for the June survey. We completed it last month however I forgot to transmit it to you until this morning. Also, I attach the latest raw data file from the surveyor.

Let me know if you have any questions.

Regards,
Stephen

Stephen McLandrich PE GE
Senior Geotechnical Engineer

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA
t +1 415 957 9445 d +1 415 946 0245
f +1 415 957 9096 c +1 415 310 1095
www.arup.com

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date June 27, 2014
Copies	Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242
From	Stephen McLandrich (Arup)	File reference 4-05 238
Subject	Transbay Transit Center: Results of June 2014 Settlement Survey at 301 Mission Property	Page 1 of 1

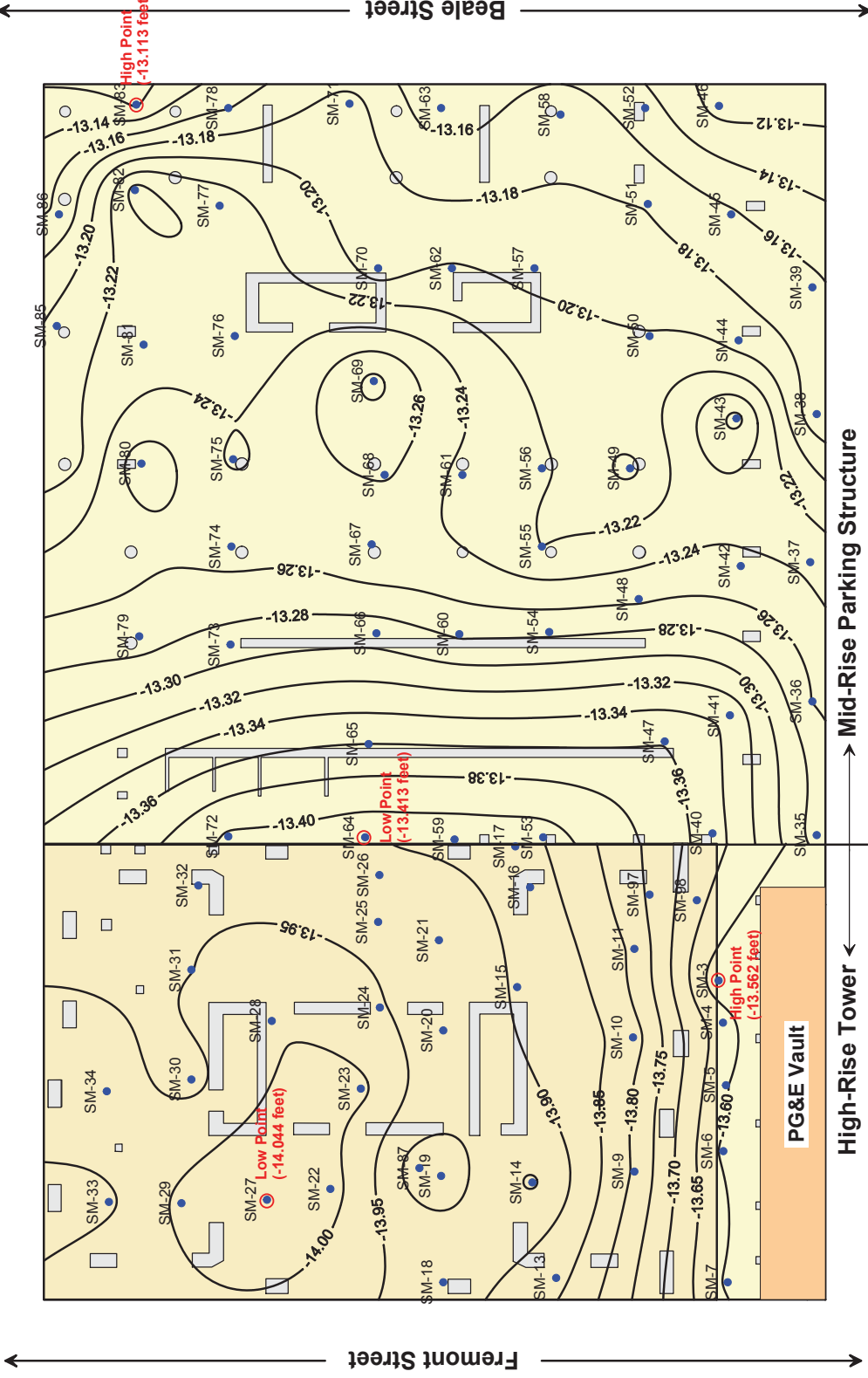
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated May 7, 2014 with measurements made through June 2014.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – June 11, 2014
- Plate 2 Differential Floor Elevation (Inches) June 11, 2014 Survey
- Plate 3 Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St. Structure Between 04/30/2009 & 6/11/2014
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through June 11, 2014
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through June 11, 2014
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: June 11, 2014 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: June 11, 2014 Survey

Mission Street

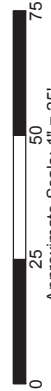
Beale Street



Date of Survey Reading:
June 11, 2014

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

High-Rise Tower	Maximum Differential
0.482 feet (5.786 inches)	Mid-Rise Parking 0.300 feet (3.599 inches)



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 11, 2014.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - JUNE 11, 2014

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2014

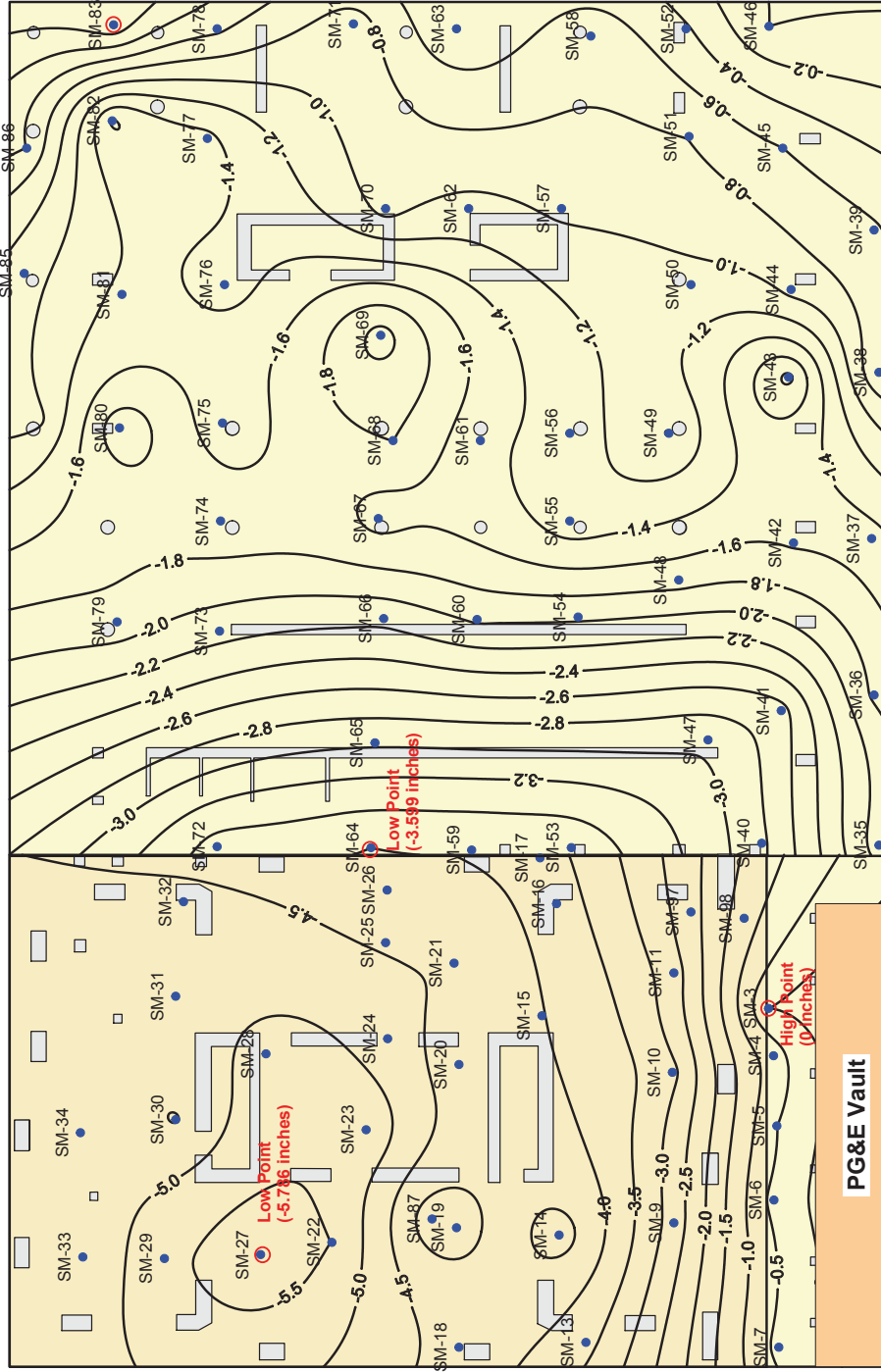
ARUP

PLATE 1

Mission Street

Fremont Street

Beale Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

High-Rise Tower ← Mid-Rise Parking Structure

Transbay Transit Center



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on June 11, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

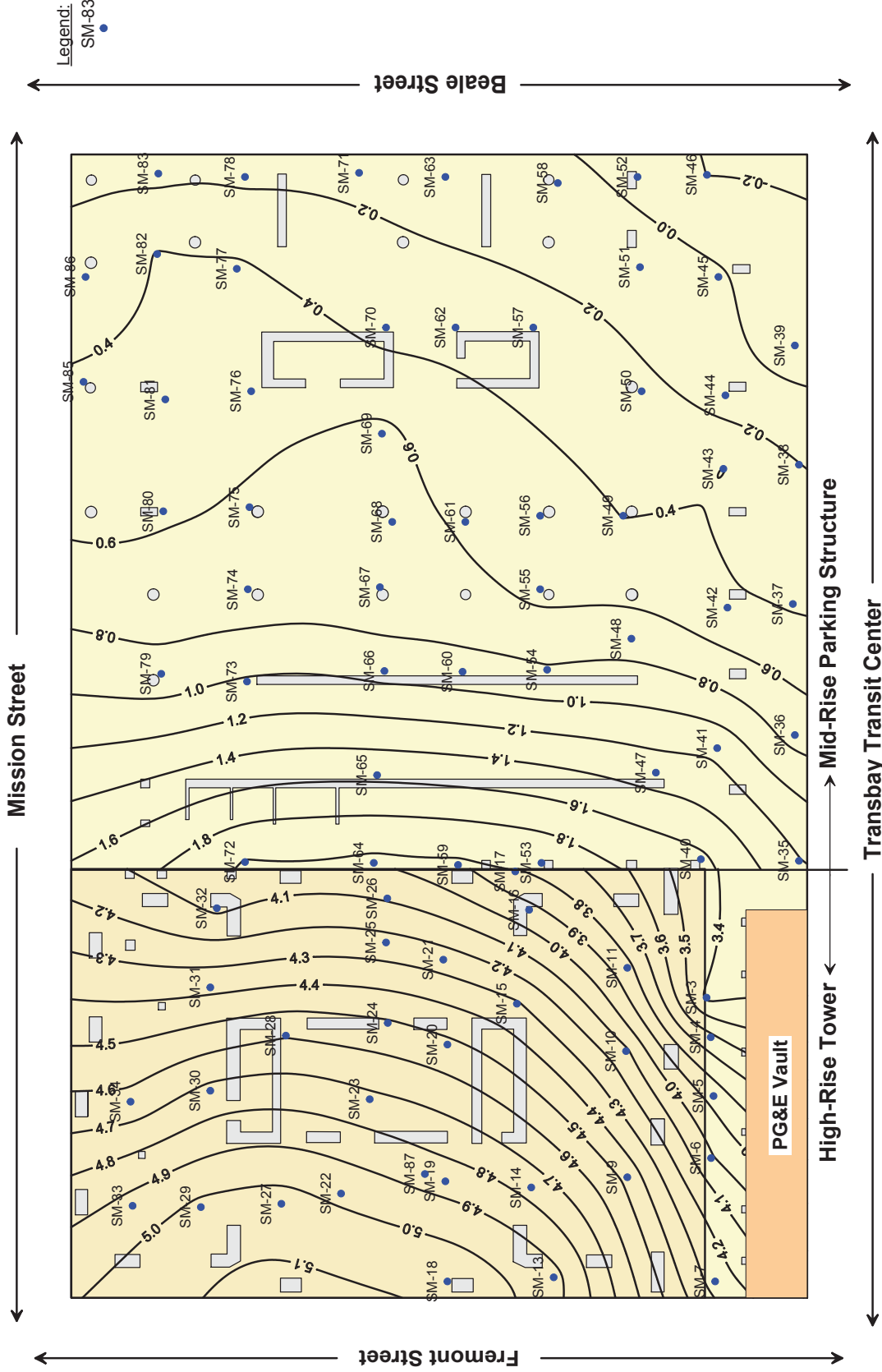
DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 JUNE 11, 2014 SURVEY

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

June 2014

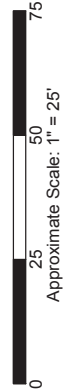
ARUP

PLATE 2



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on June 11, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.



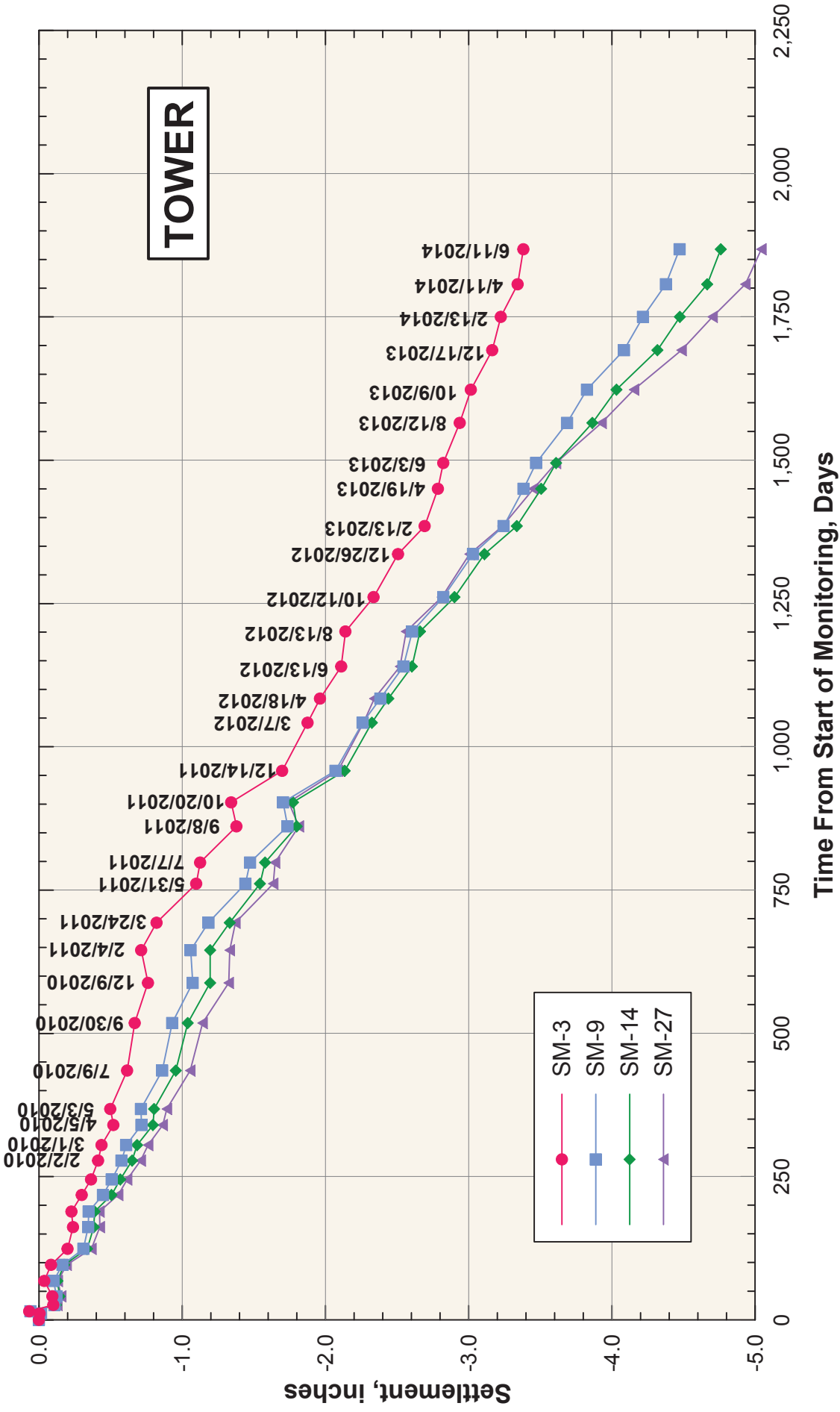
CONTOURS OF SETTLEMENTS MEASURED AT THE
 1ST LEVEL BASEMENT OF THE 301 MISSION ST
 STRUCTURE BETWEEN 04/30/2009 & 6/11/2014

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

June 2014

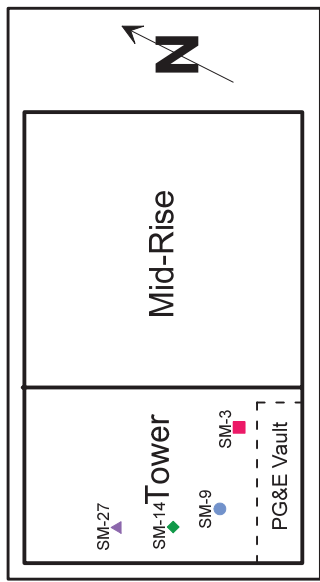
ARUP

PLATE 3



TOWER

Time From Start of Monitoring, Days



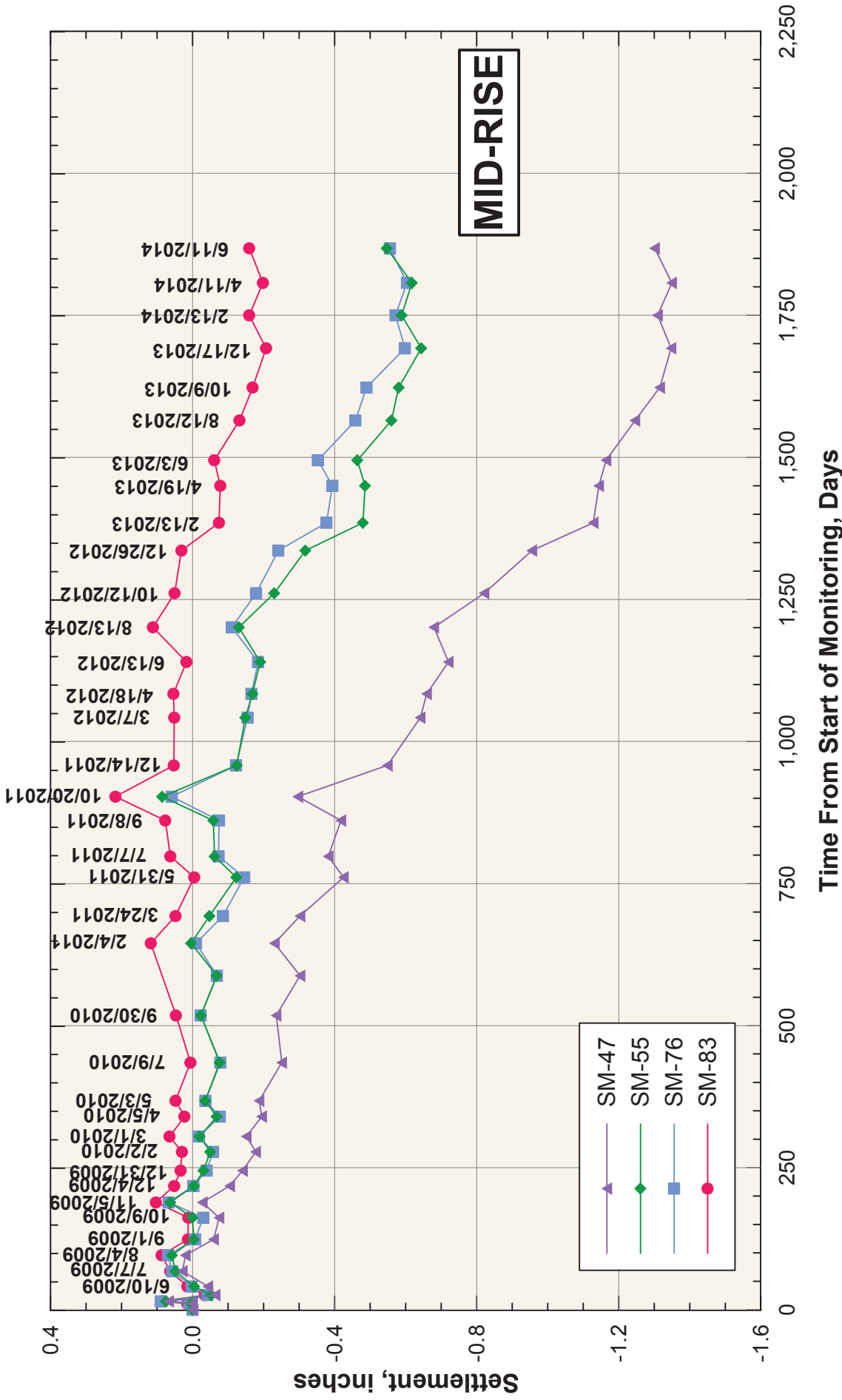
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH JUNE 11, 2014**

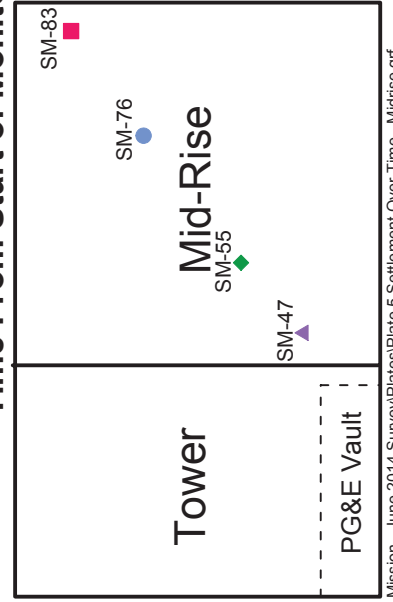
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2014

ARUP



Time From Start of Monitoring, Days



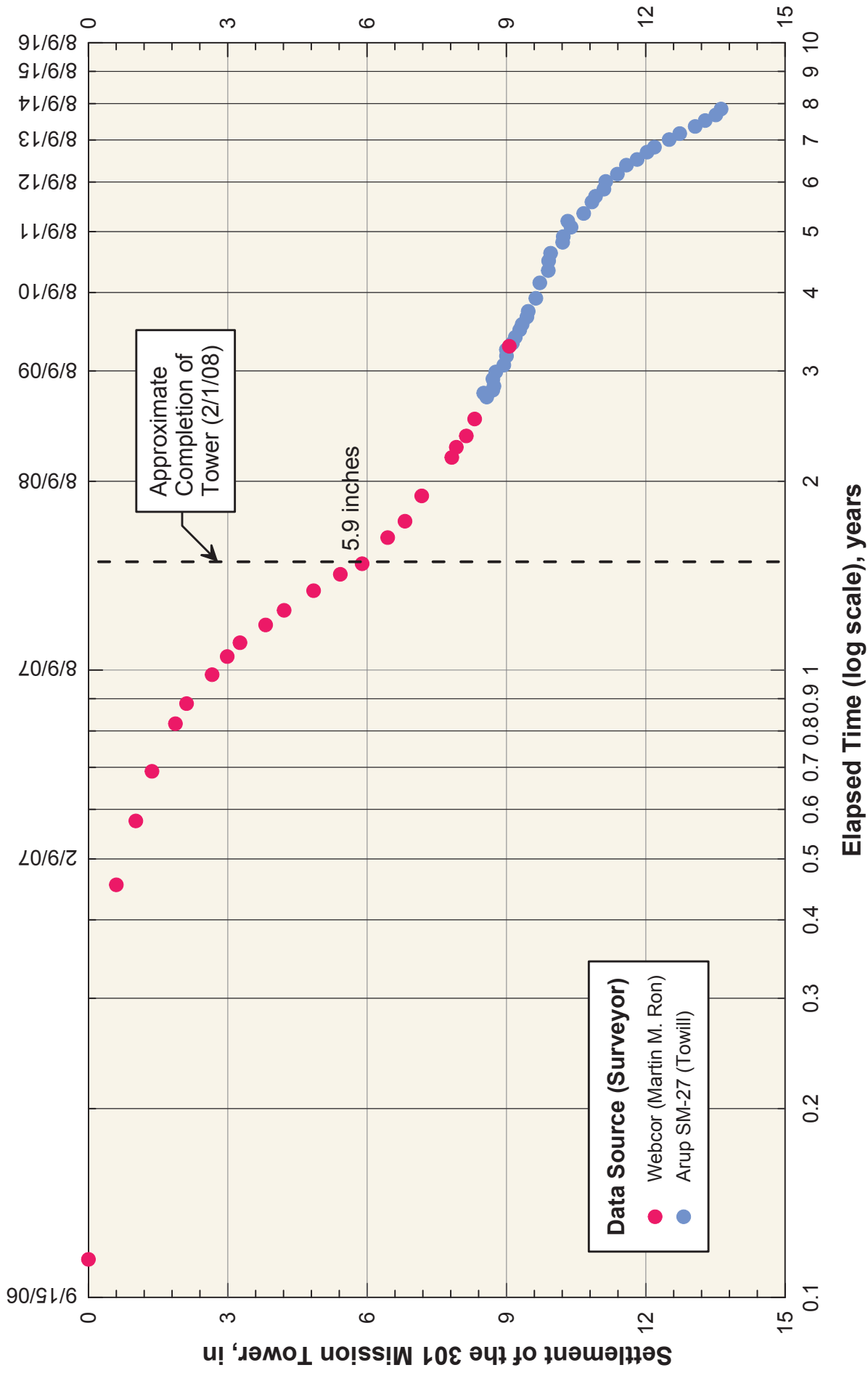
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH JUNE 11, 2014**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2014



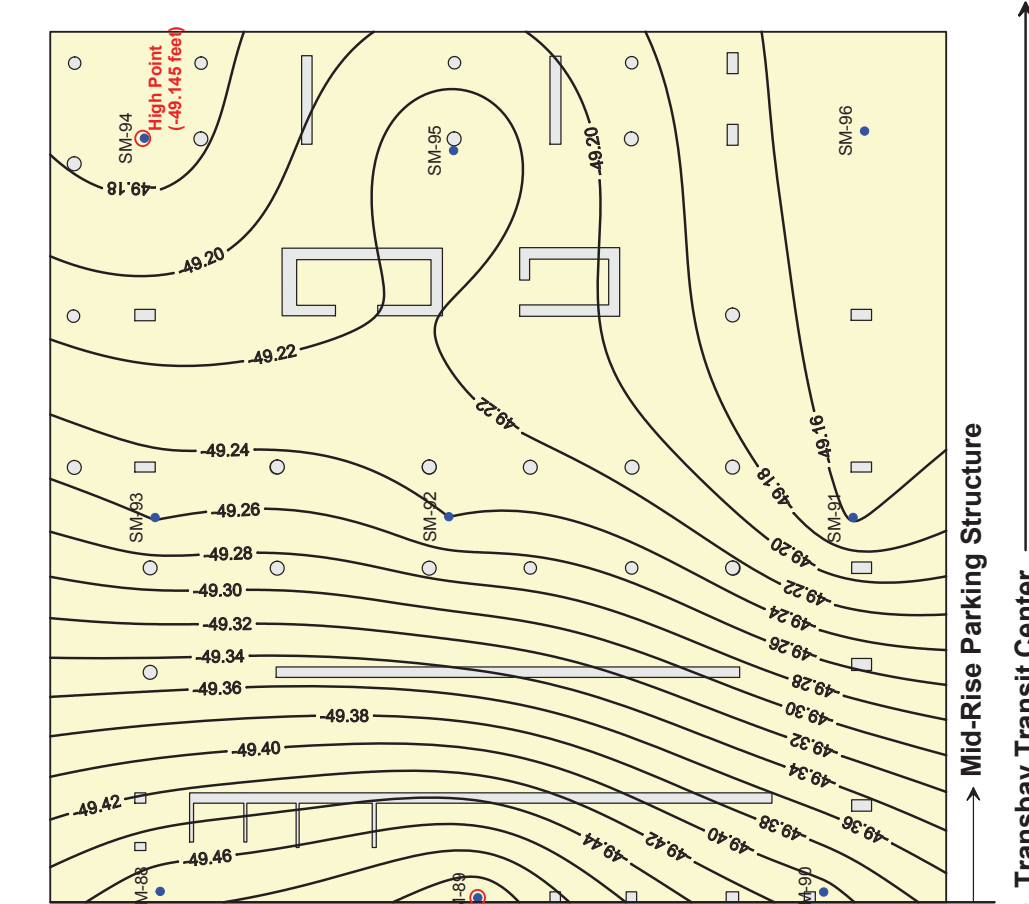


Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

June 2014



Mission Street



Date of Survey Reading:
June 11, 2014

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.371 feet (4.457 inches)

Fremont Street

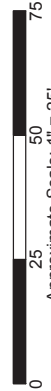
Fremont Street

Mid-Rise Parking Structure

Transbay Transit Center



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 11, 2014.



Approximate Scale: 1" = 25'

J:\S-F132000\1322424 Internal Project Data\4-05 Reports & Narratives\238 301 Mission - June 2014 Survey\PlatesB-5 Elevations (2014.06.11).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: JUNE 11, 2014 SURVEY

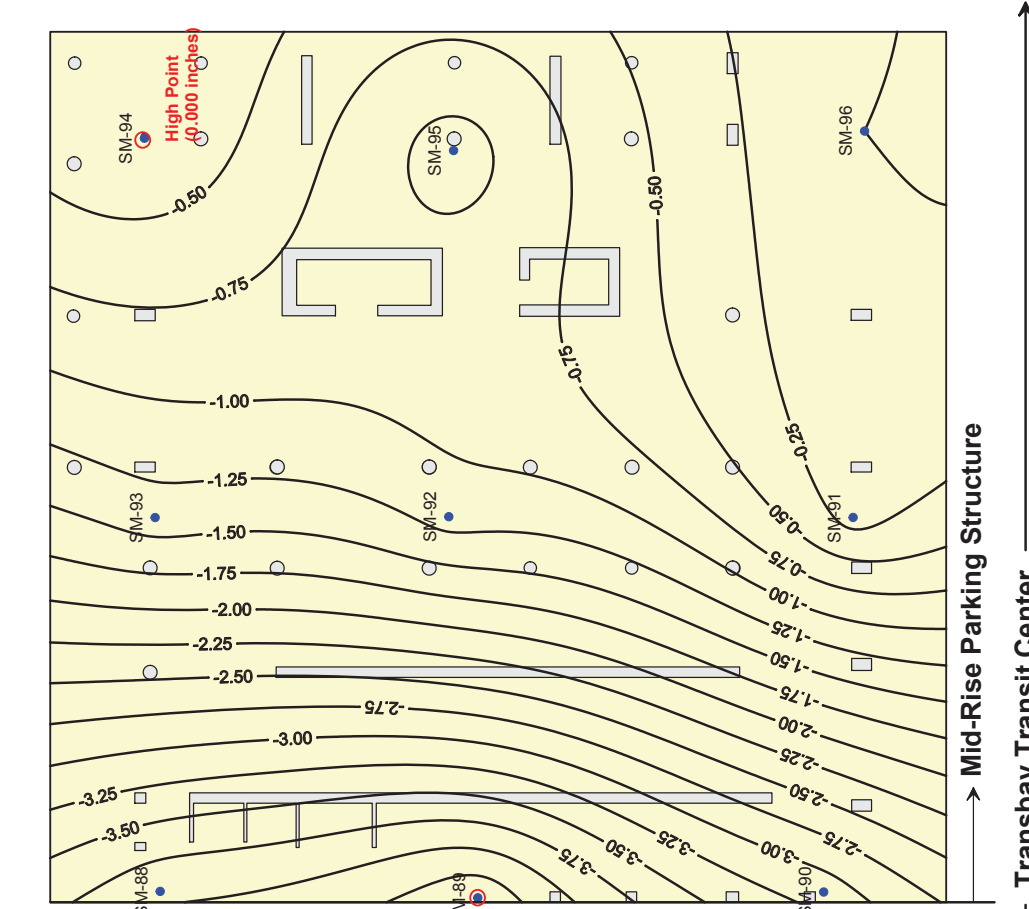
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2014

ARUP

PLATE 7

Mission Street



Date of Survey Reading:
June 11, 2014

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.371 feet (4.457 inches)

Fremont Street

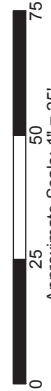
Beale Street

Mid-Rise Parking Structure

Transbay Transit Center



Notes:
Contours represent differential elevation, in inches, between the highest point and all other points taken on June 11, 2014.



Approximate Scale: 1" = 25'

From: Brian Dykes
Sent: Monday, September 08, 2014 8:22 AM
To: Steven Hood
Cc: Margie Cleland
Subject: FW: TTC - Latest 301 Mission monitoring memo - August readings

Steve,
Here is the latest set of survey readings taken on August 5, 2014.
Margie,
Please copy to the files.
Thanks, Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Thursday, September 04, 2014 5:32 PM
To: Brian Dykes
Cc: Andrew W. Schwartz (schwartz@smwlaw.com); George Metzger; 'rvolenec@pcparch.com' (rvolenec@pcparch.com); Nick O'Riordan; Jeff Dunn; DeeDee Maggi; Dennis Turchon
Subject: TTC - Latest 301 Mission monitoring memo - August readings

Brian,

Please find the attached monitoring memorandum and survey readings.

Regards,
Stephen

Stephen McLandrich PE GE
Senior Geotechnical Engineer

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA
t +1 415 957 9445 d +1 415 946 0245
f +1 415 957 9096 c +1 415 310 1095
www.arup.com

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date September 4, 2014
Copies	Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242
From	Stephen McLandrich (Arup)	File reference 4-05 240
Subject	Transbay Transit Center: Results of August 2014 Settlement Survey at 301 Mission Property	Page 1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated June 27, 2014 with measurements made through August 2014.

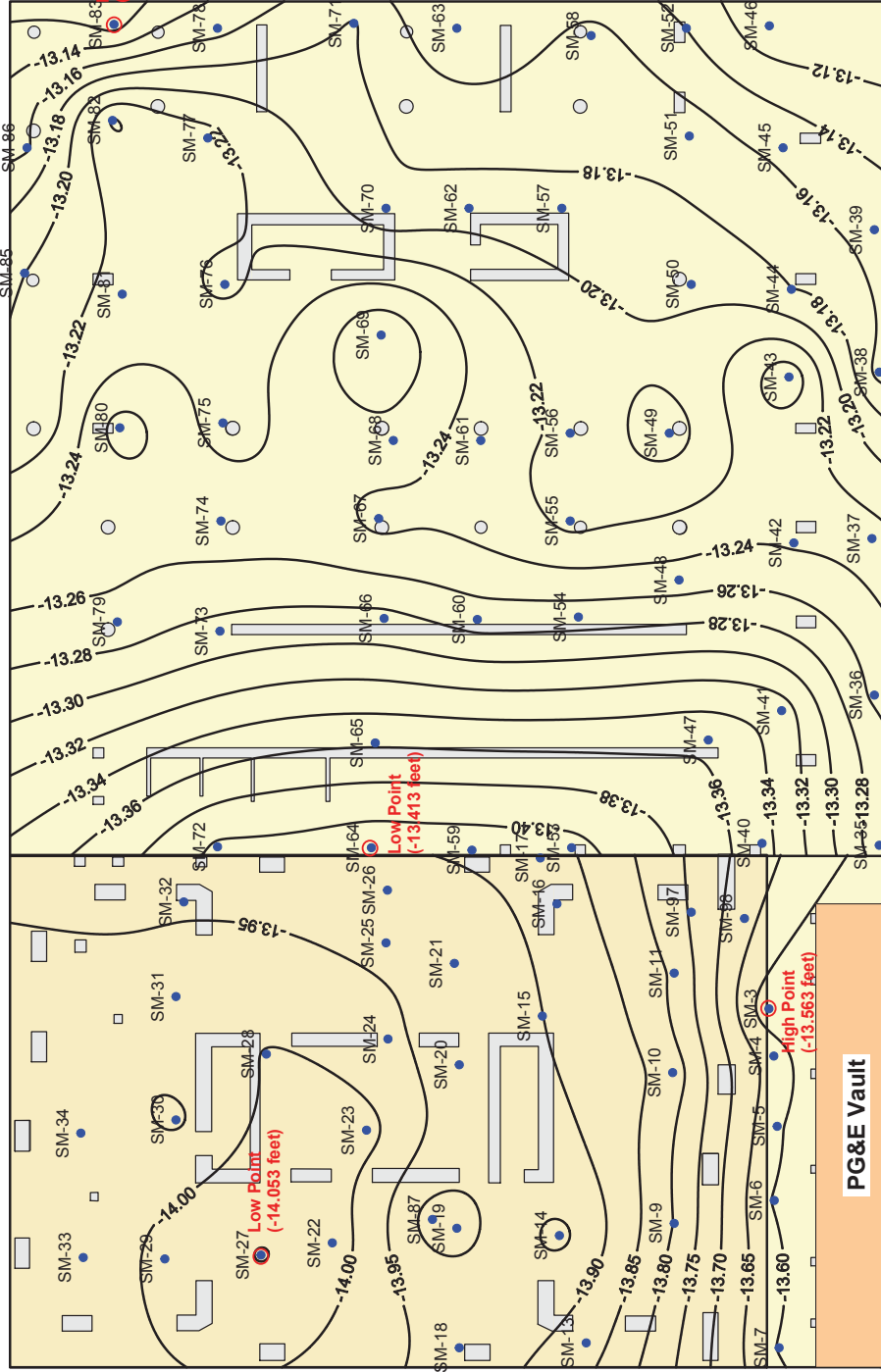
List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – August 5, 2014
- Plate 2 Differential Floor Elevation (Inches) August 5, 2014 Survey
- Plate 3 Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St. Structure Between 04/30/2009 & 8/5/2014
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through August 5, 2014
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through August 5, 2014
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: August 5, 2014 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: August 5, 2014 Survey

Mission Street

Beale Street

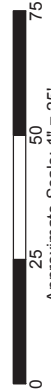
Fremont Street



Date of Survey Reading:
August 5, 2014

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.489 feet (5.869 inches)
Mid-Rise Parking	0.307 feet (3.689 inches)



Approximate Scale: 1" = 25'

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on August 5, 2014.

Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1 OF 301 MISSION PROPERTY PERIODIC SURVEY - AUGUST 5, 2014

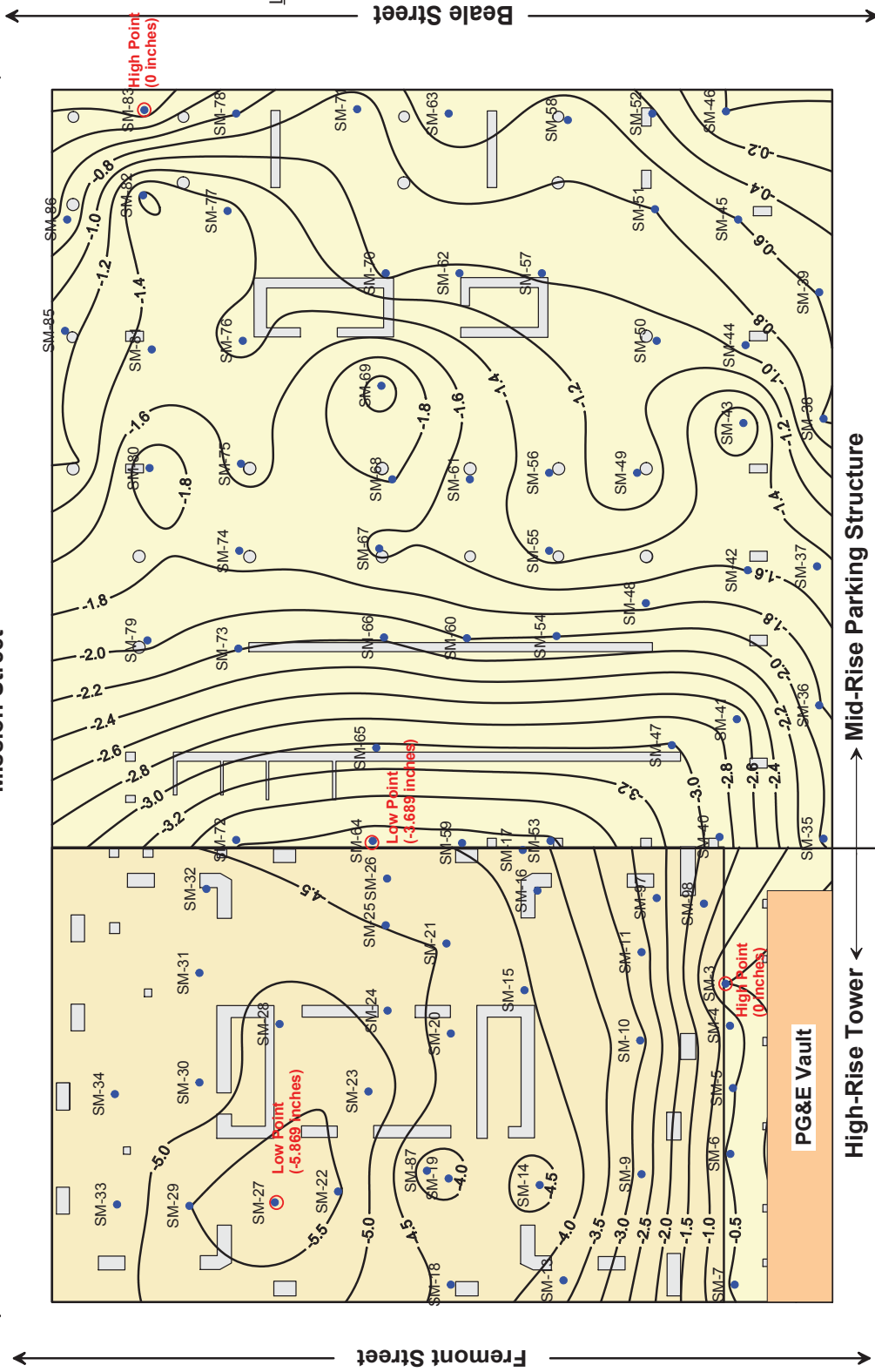
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

September 2014

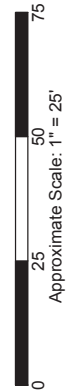


Mission Street

Fremont Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

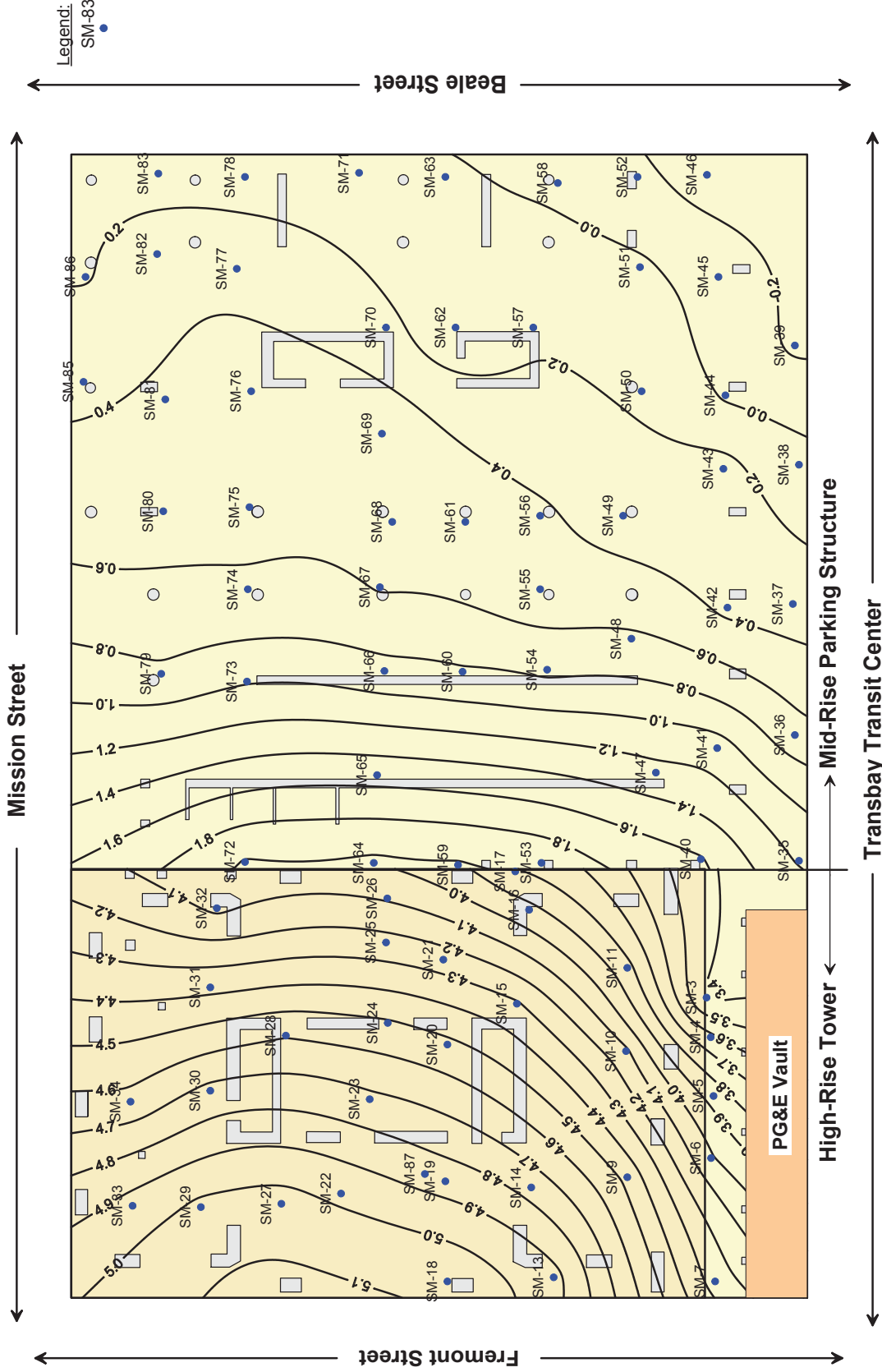


Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on August 5, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 AUGUST 5, 2014 SURVEY
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

September 2014
ARUP

Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



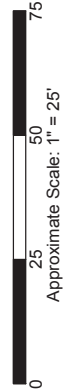
Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St Structure Between 04/30/2009 & 8/5/2014

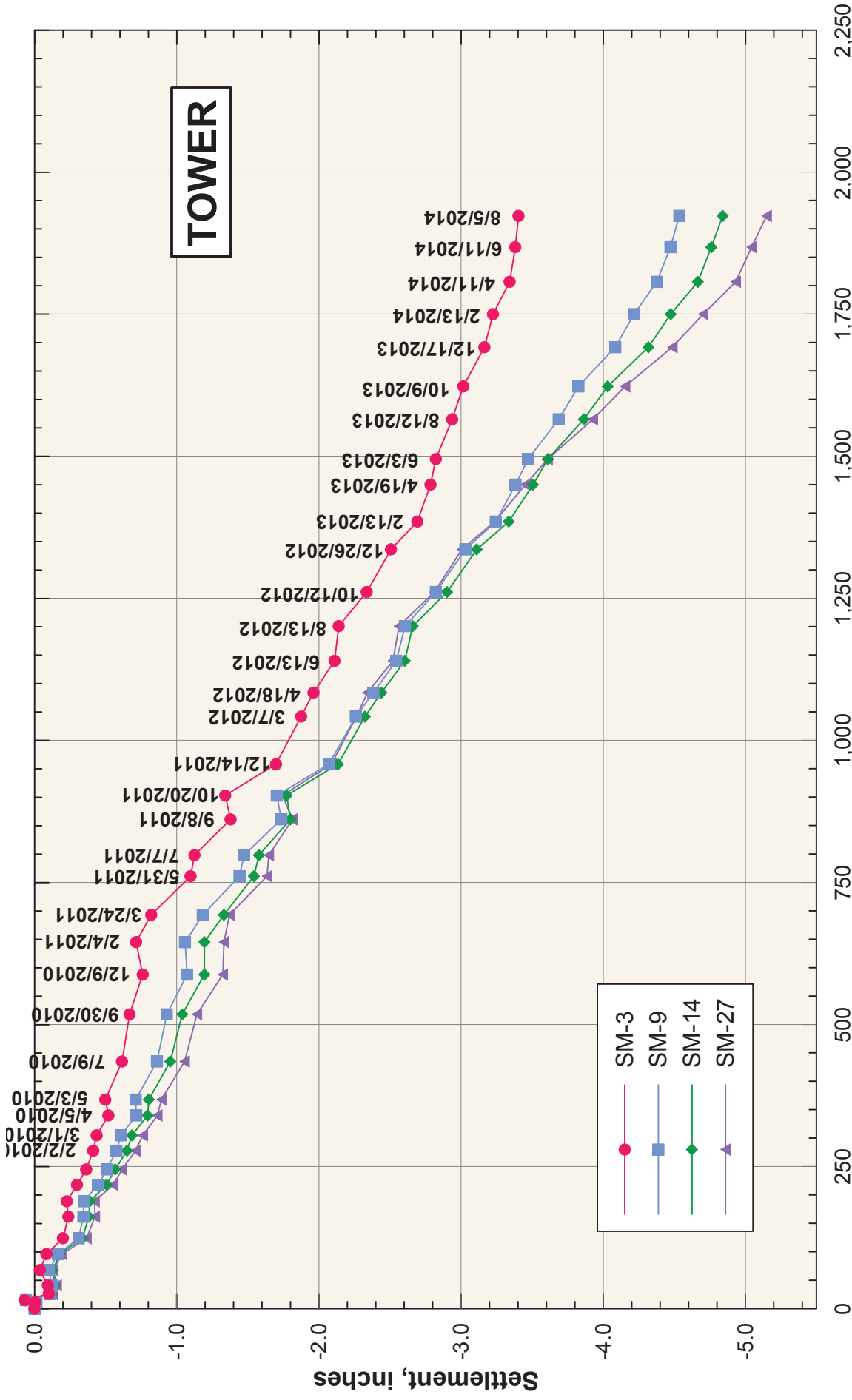
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

September 2014



Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on August 5, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.





TOWER

Time From Start of Monitoring, Days



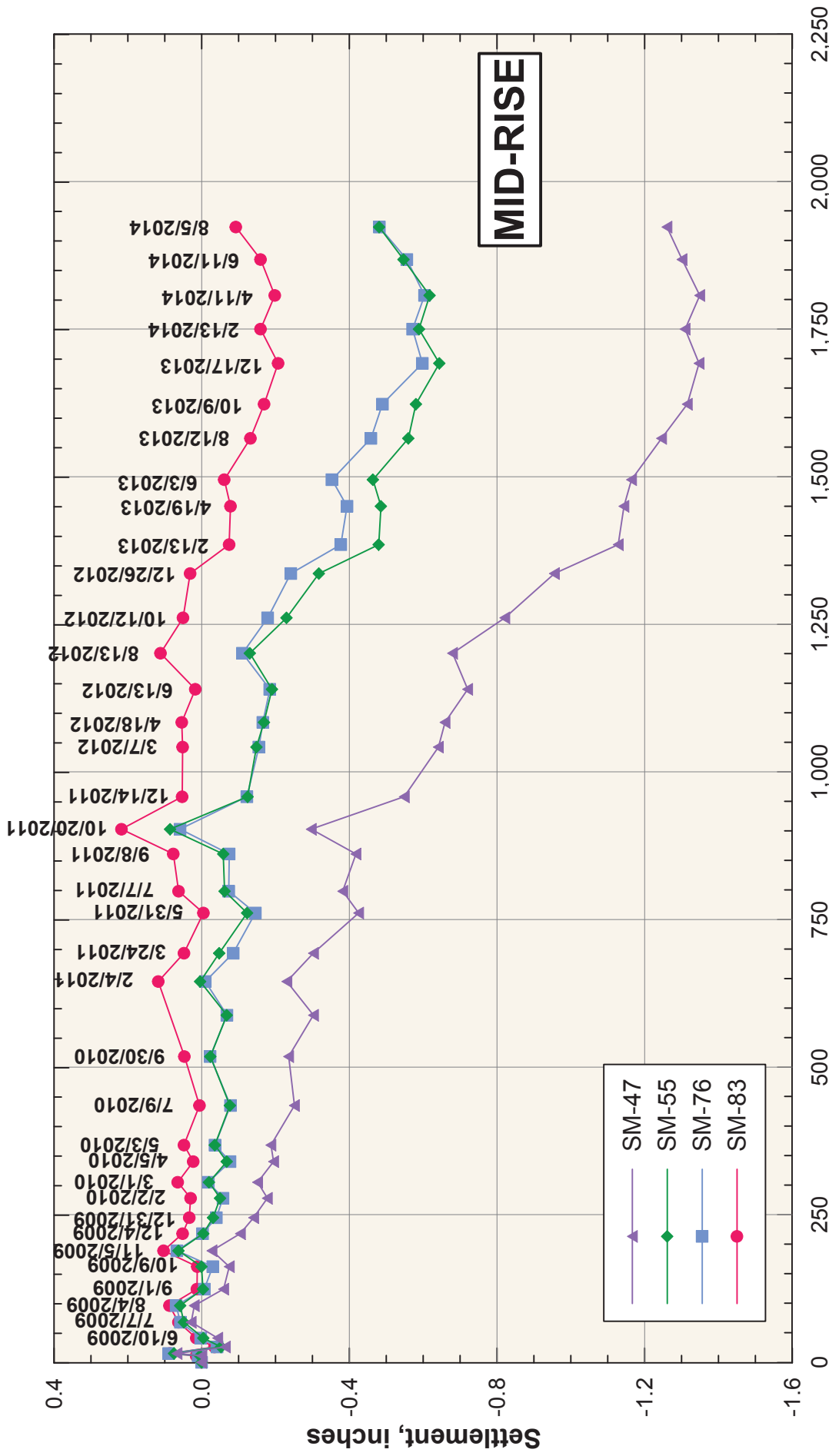
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH AUGUST 5, 2014**

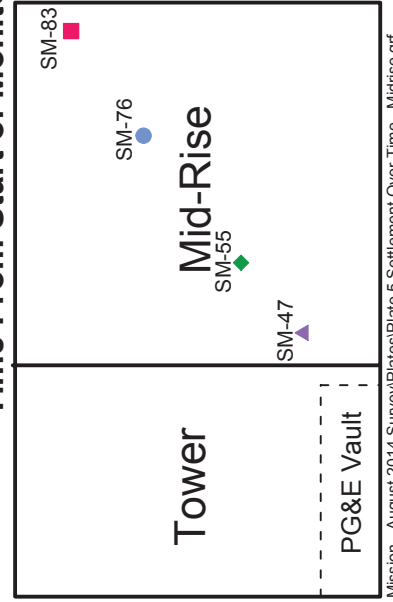
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

September 2014

ARUP



Time From Start of Monitoring, Days



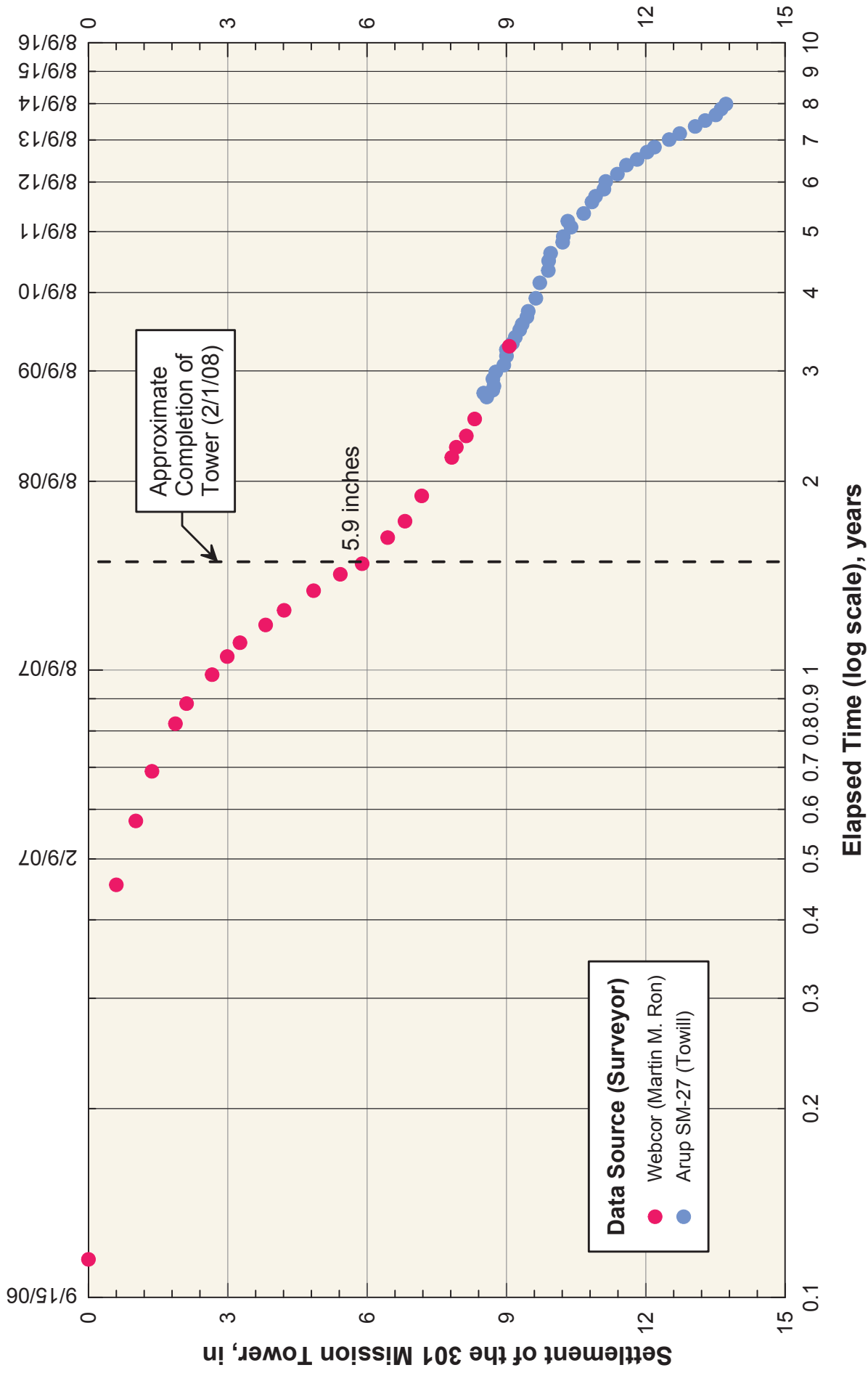
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH AUGUST 5, 2014**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

September 2014





Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

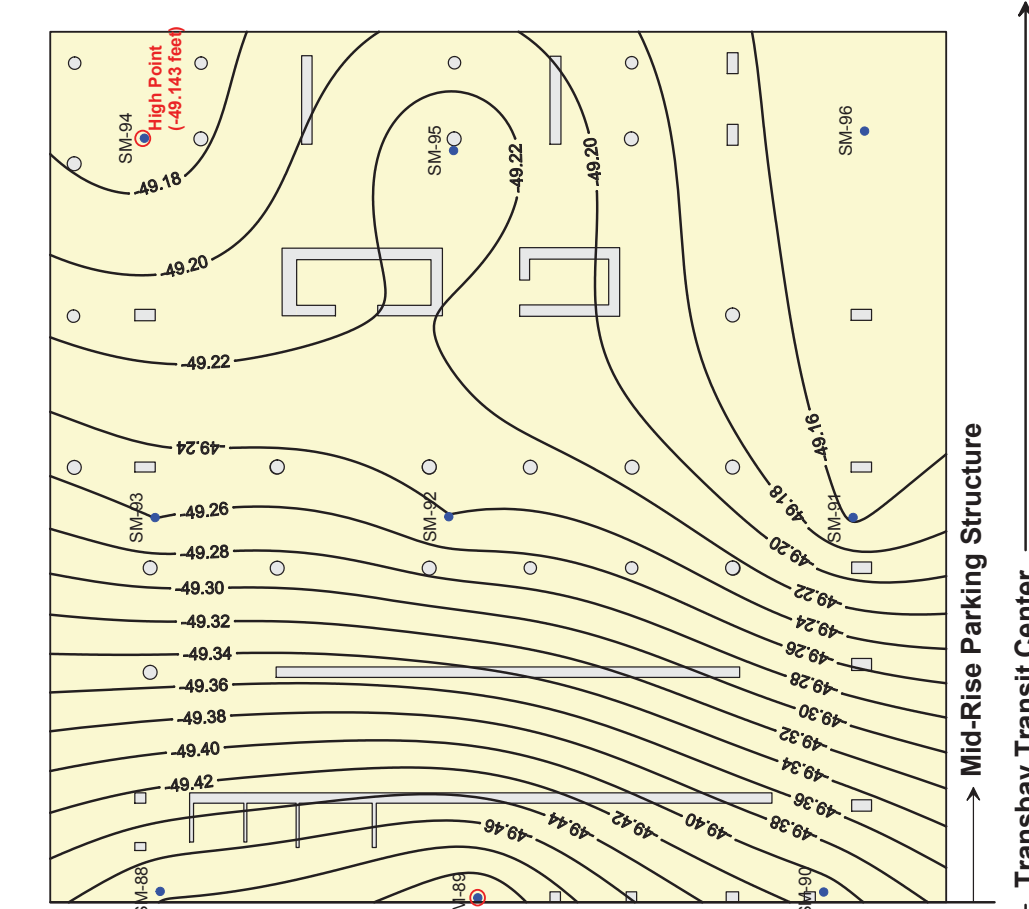
SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

September 2014



Mission Street



Date of Survey Reading:
June 11, 2014

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

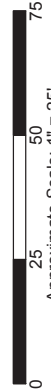
Maximum Differential
B-5 Level Basement
0.376 feet (4.513 inches)

Fremont Street

Beale Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 11, 2014.



Approximate Scale: 1" = 25'

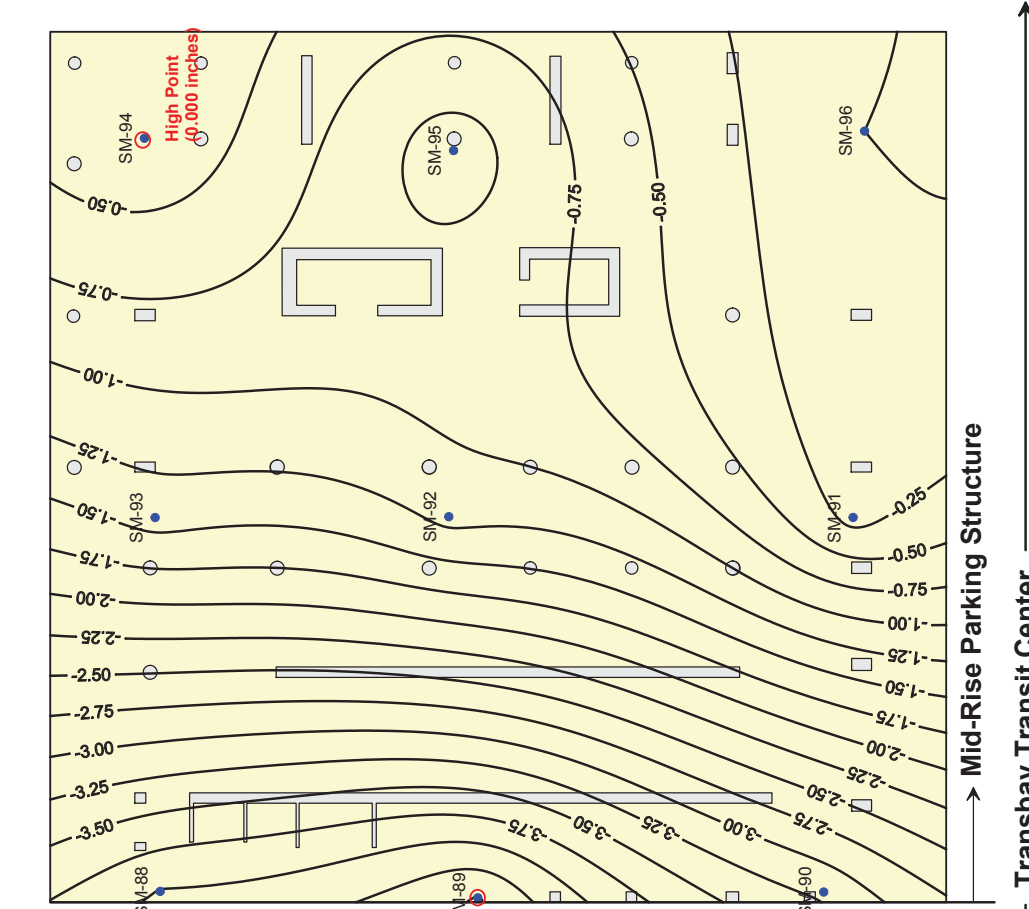
J:\S\F\132000\132424 Internal Project Data\4-05 Reports & Narratives\240 301 Mission - August 2014 Survey\Piles\B-5 Elevations (2014.06).srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: AUGUST 5, 2014 SURVEY
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California
September 2014

ARUP

PLATE 7

Mission Street



Mid-Rise Parking Structure

Transbay Transit Center

Date of Survey Reading:
August 5, 2014

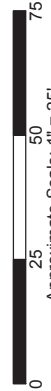
Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.376 feet
(4.513 inches)

Fremont Street

Fremont Street

Beale Street



Approximate Scale: 1" = 25'

Notes:

Contours represent differential elevation, in inches, between the highest point and all other points taken on August 5, 2014.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: AUGUST 5, 2014 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

September 2014

ARUP

PLATE 8

From: Brian Dykes
Sent: Thursday, December 18, 2014 3:40 PM
To: Steven Hood
Cc: Margie Cleland
Subject: FW: 301 Mission - October & December Survey

Steve,
Attached are the settlement survey results for October 21 and December 11, 2014.
Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Thursday, December 11, 2014 12:12 PM
To: Brian Dykes
Cc: Dennis Turchon; 'rvolenec@pcparch.com' (rvolenec@pcparch.com); George Metzger; Nick O'Riordan; John Eddy
Subject: 301 Mission - October & December Survey

Brian,

Please find the attached survey memos for 301 Mission.

When I opened the file from the October memo to create this December memo, I noticed that the October memo was not pdf'd and therefore we did not transmit it to you. I am transmitting it now. I have kept the date as October 21, 2014.

Regarding inclinometers and piezometers, we continue to take periodic readings during the build-out. We are not regularly publishing these intermediate readings however, at your request, we will publish all readings since the last memo which was October 17, 2014.

Let me know if you have any questions.

Cheers,
Stephen

Stephen McLandrich PE GE
Senior Geotechnical Engineer

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA

t +1 415 957 9445 **d** +1 415 946 0245

f +1 415 957 9096 **c** +1 415 310 1095

www.arup.com

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date October 21, 2014
Copies	Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242
From	Stephen McLandrich (Arup)	File reference 4-05 243
Subject	Transbay Transit Center: Results of October 2014 Settlement Survey at 301 Mission Property	Page 1 of 1

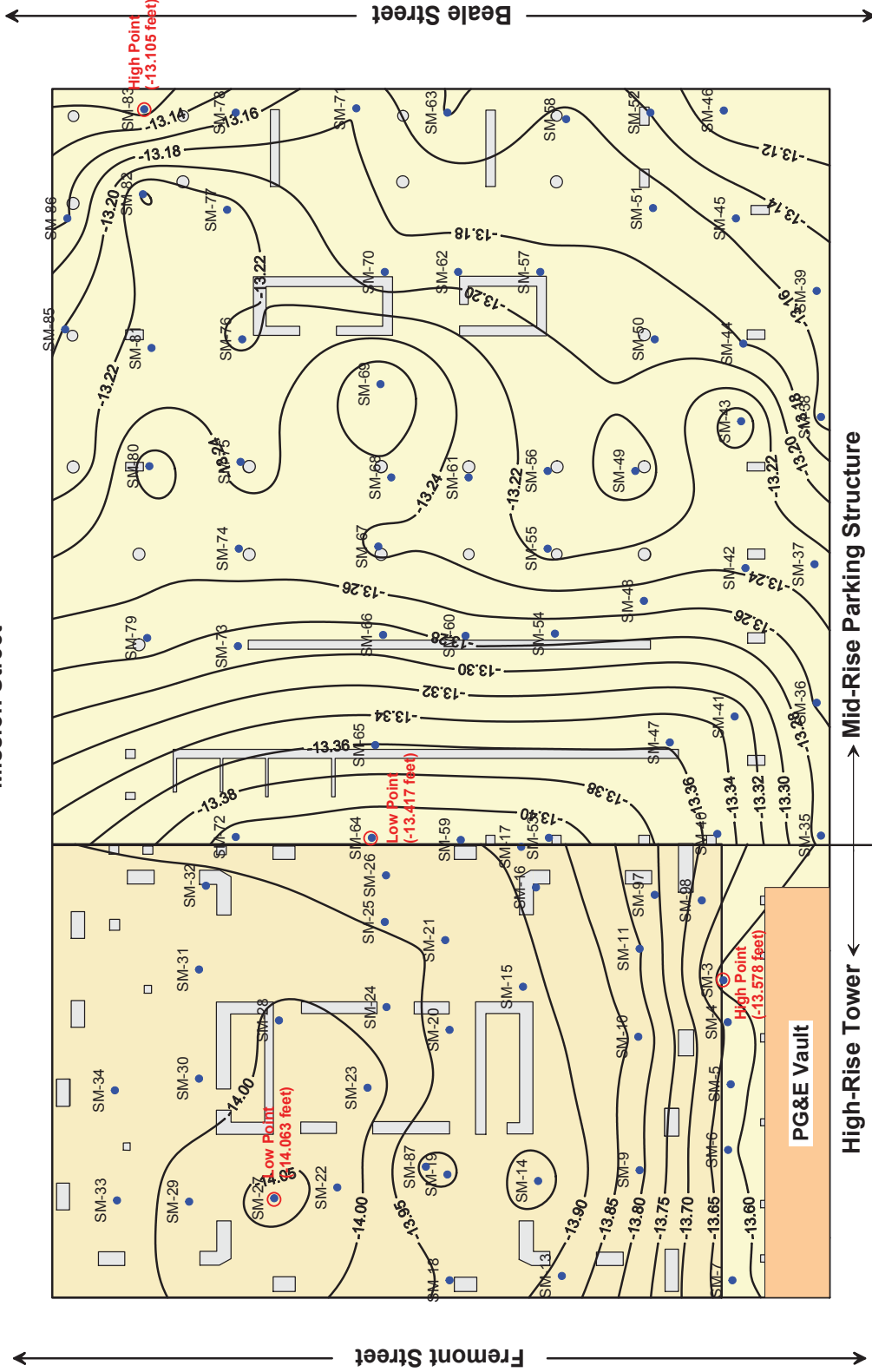
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated September 4, 2014 with measurements made through October 2014.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – October 9, 2014
- Plate 2 Differential Floor Elevation (Inches) October 9, 2014 Survey
- Plate 3 Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St. Structure Between 04/30/2009 & 10/9/2014
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through October 9, 2014
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through October 9, 2014
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: October 9, 2014 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: October 9, 2014 Survey

Mission Street

Fremont Street



Date of Survey Reading:
October 9, 2014

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical
Survey Methods)

Maximum Differential	
High-Rise Tower	0.485 feet (5.820 inches)
Mid-Rise Parking	0.312 feet (3.744 inches)

High-Rise Tower ← Mid-Rise Parking Structure

Transbay Transit Center

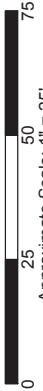
High-Rise Tower ←

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 9, 2014.

Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.

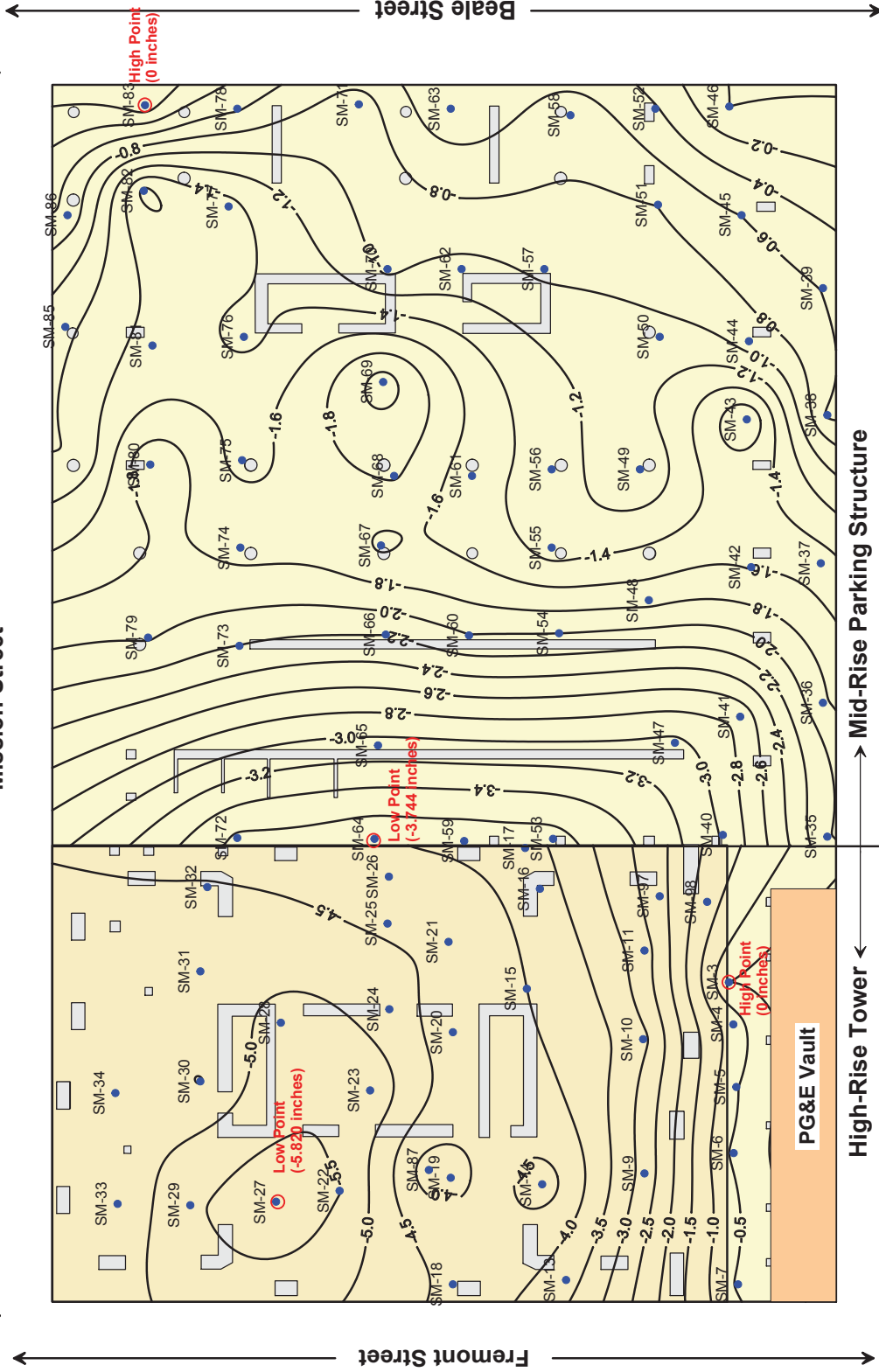
The PG&E vault is inaccessible for monitoring.



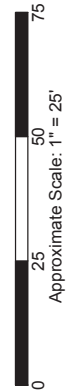
Approximate Scale: 1" = 25'

Mission Street

Fremont Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on October 9, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

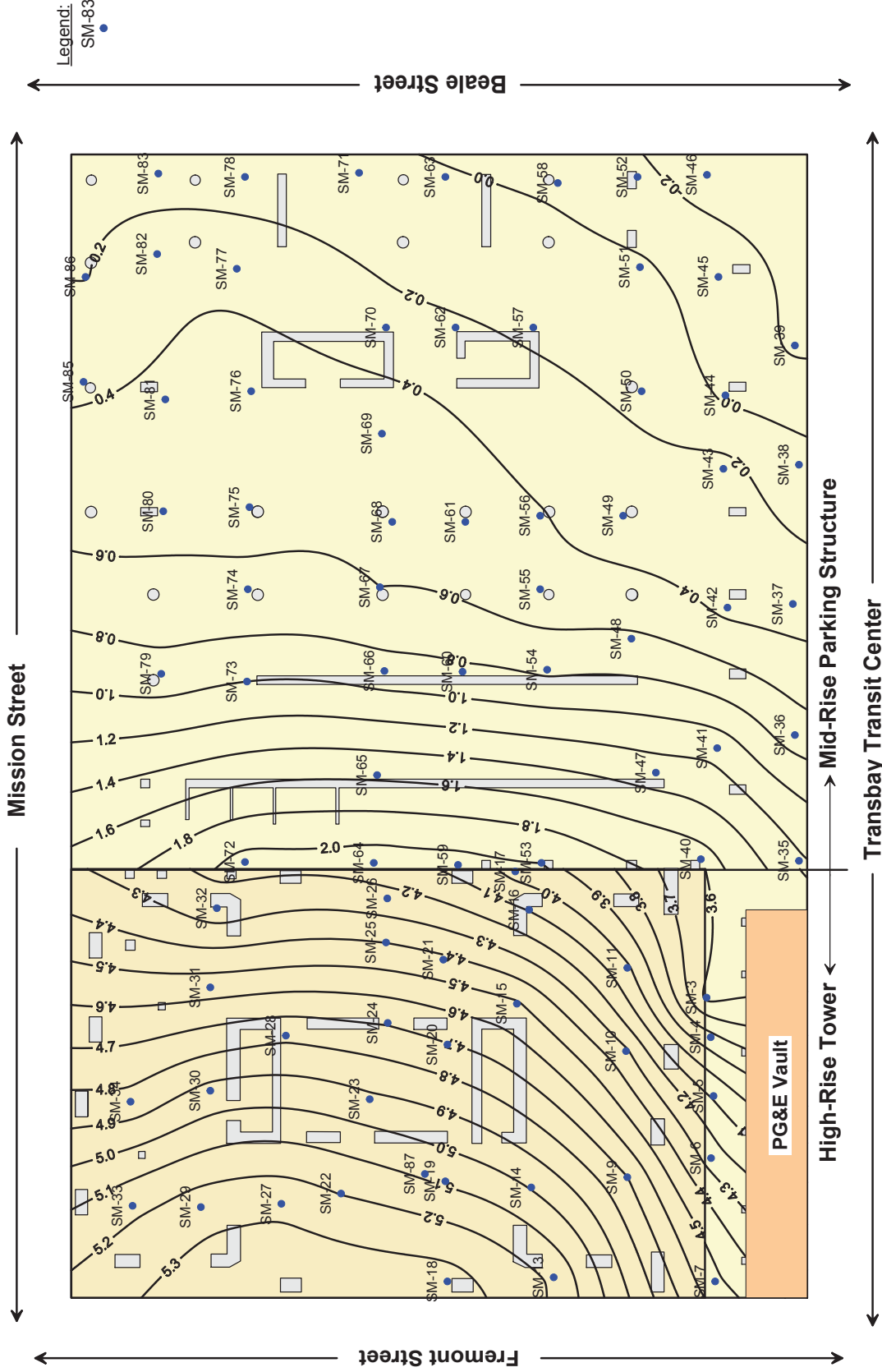
High-Rise Tower ← Mid-Rise Parking Structure
 Transbay Transit Center

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 OCTOBER 9, 2014 SURVEY
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California
 October 2014

ARUP

PLATE 2

Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



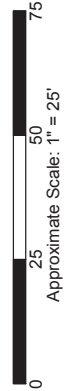
CONTOURS OF SETTLEMENTS MEASURED AT THE
 1ST LEVEL BASEMENT OF THE 301 MISSION ST
 STRUCTURE BETWEEN 04/30/2009 & 10/9/2014

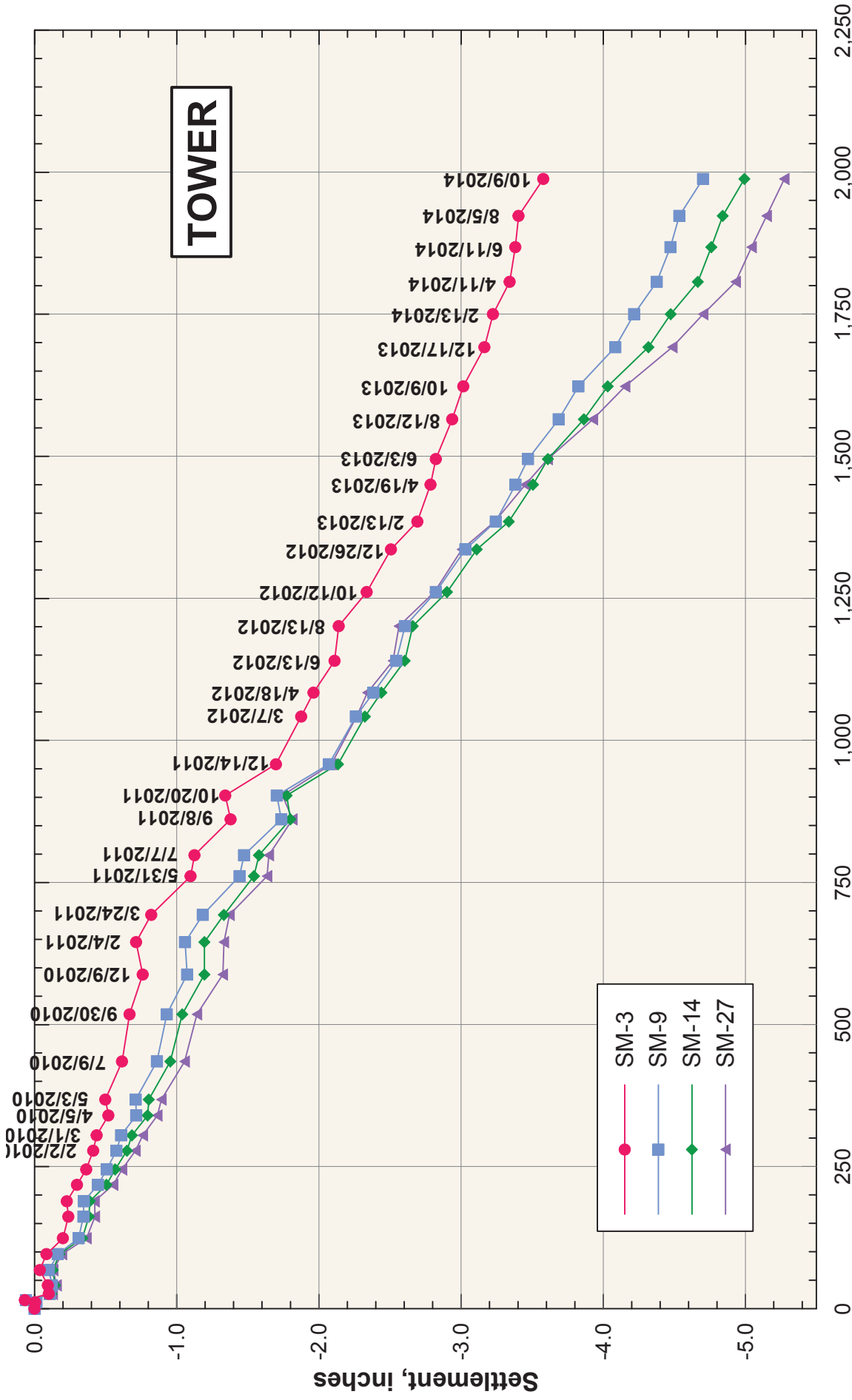
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

October 2014



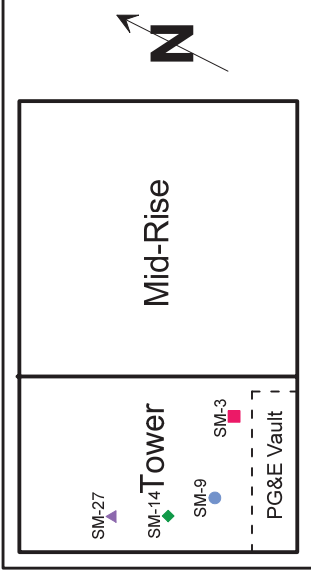
Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on October 9, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.





TOWER

Time From Start of Monitoring, Days



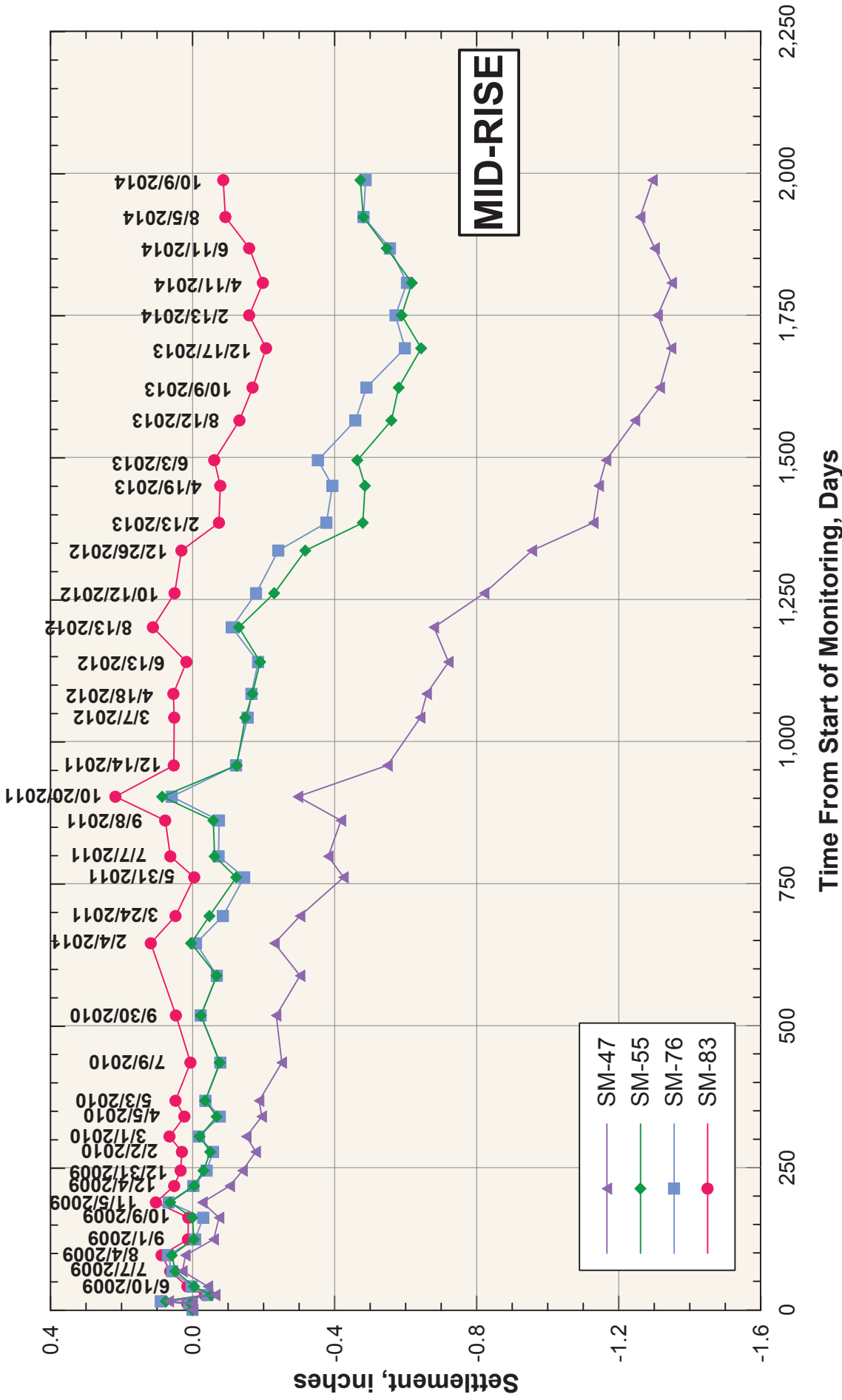
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH OCTOBER 9, 2014**

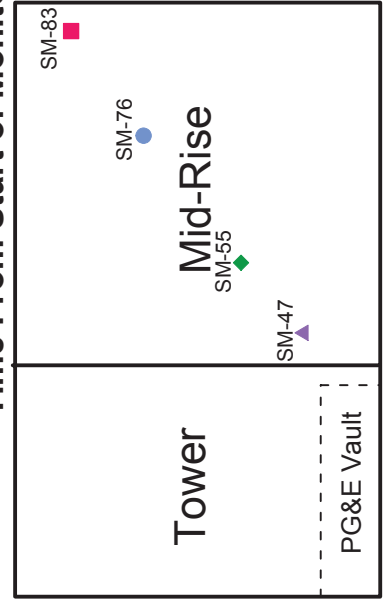
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

October 2014

ARUP



Time From Start of Monitoring, Days



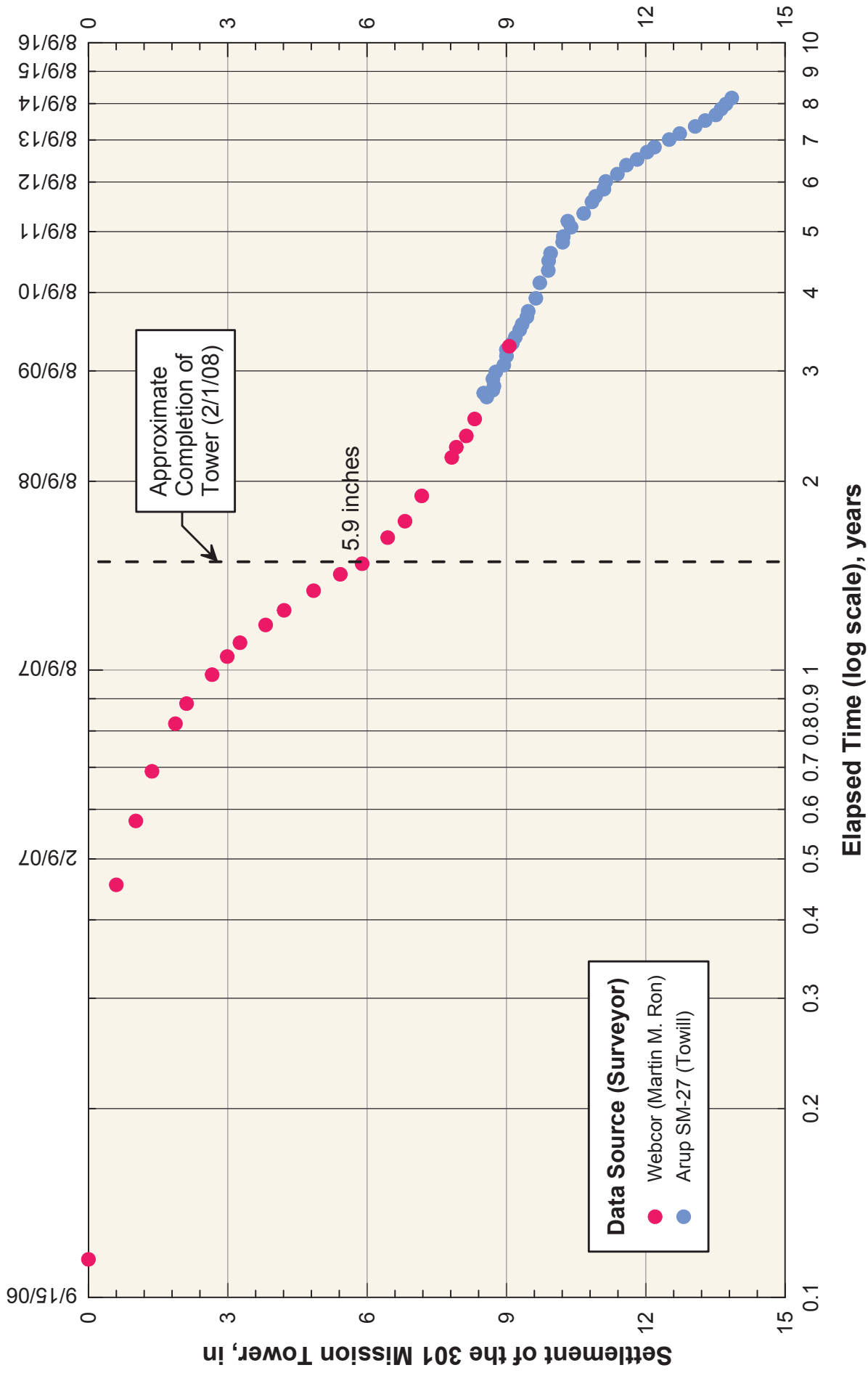
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH OCTOBER 9, 2014**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

October 2014

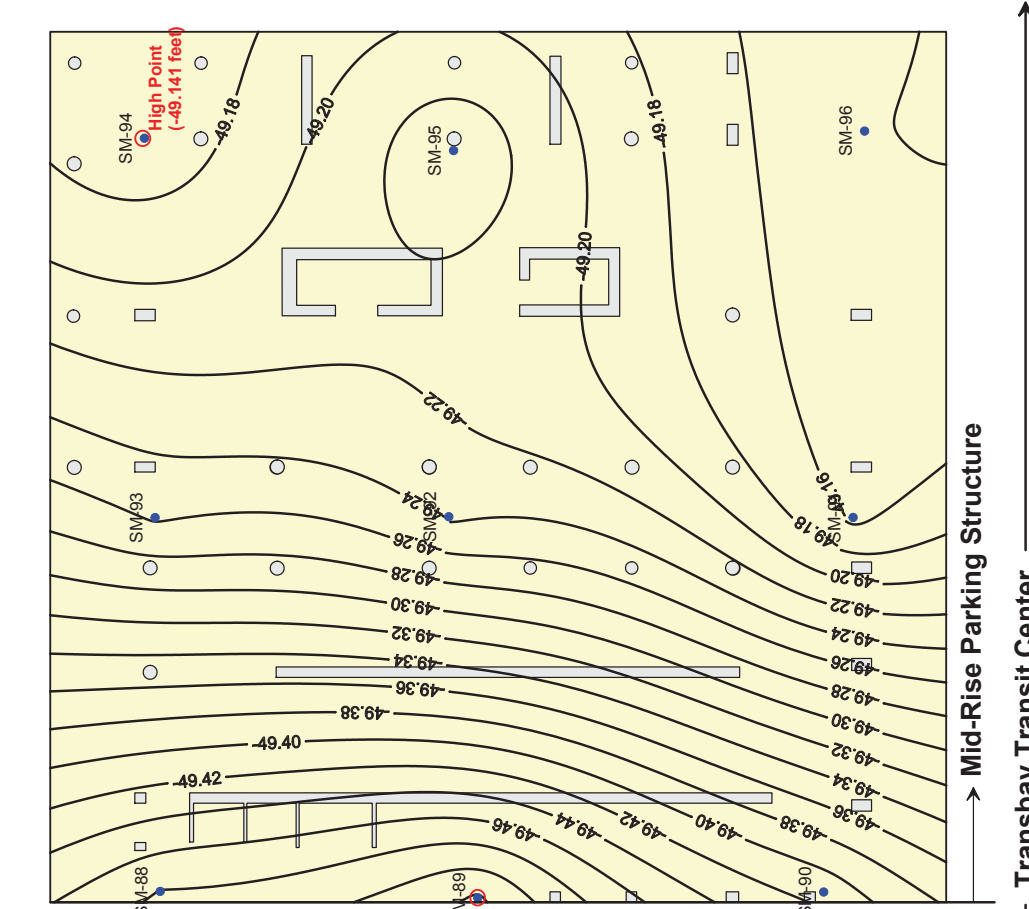




Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)



Mission Street



Date of Survey Reading:
October 9, 2014

Legend:
 SM-88 Settlement Marker No. 88
 (Measured by Optical Survey Methods)

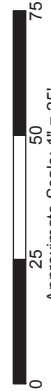
Maximum Differential
B-5 Level Basement
0.381 feet (4.578 inches)

Fremont Street

Fremont Street

Mid-Rise Parking Structure

Transbay Transit Center



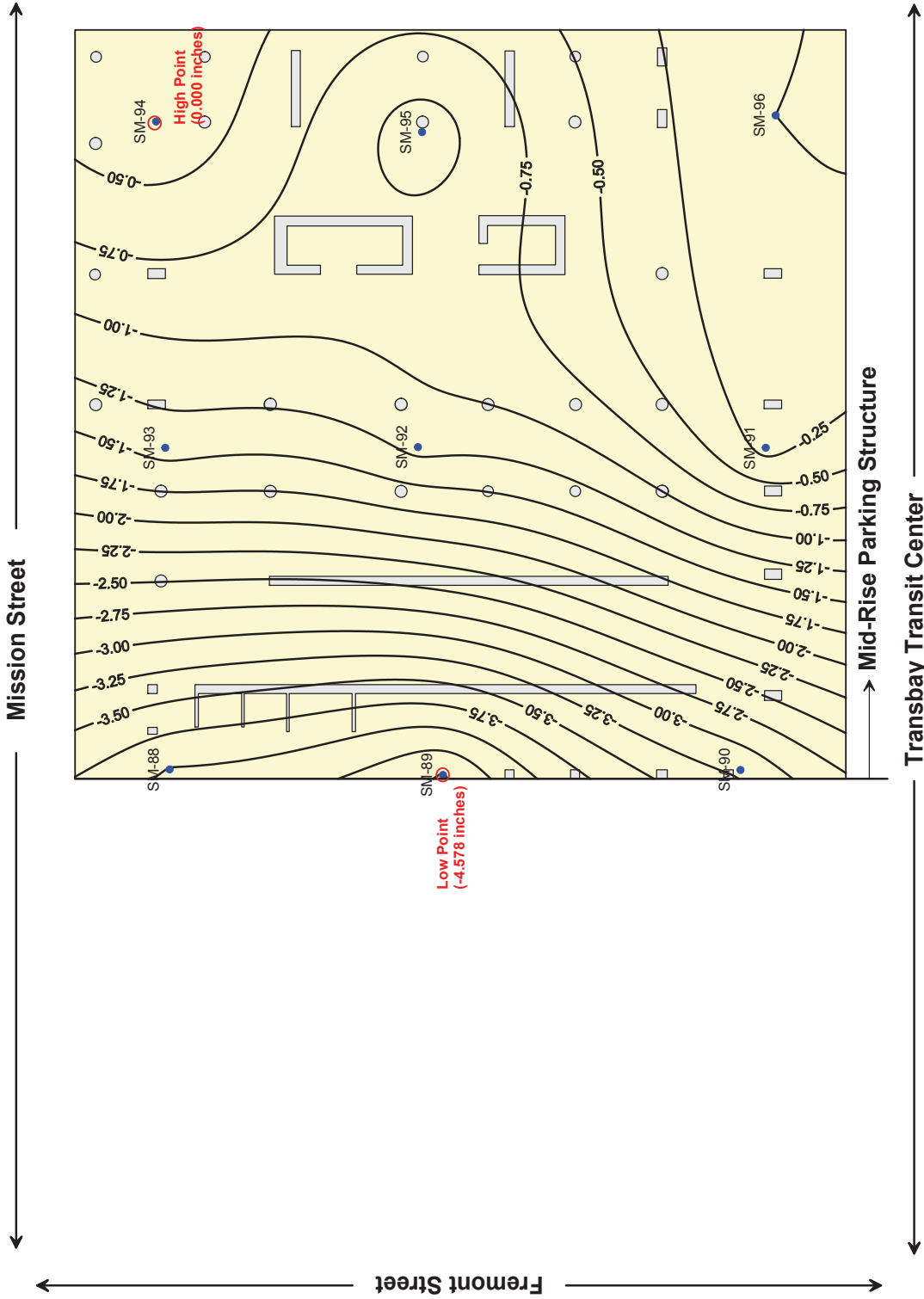
Approximate Scale: 1" = 25'

Notes:
 Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 9, 2014.

FLOOR ELEVATION AT BASEMENT LEVEL B-5
 OF 301 MISSION PROPERTY: OCTOBER 9, 2014 SURVEY
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California
 October 2014

ARUP

PLATE 7

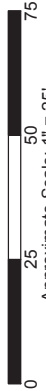


Date of Survey Reading:
October 9, 2014

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.381 feet (4.578 inches)

Notes:
Contours represent differential elevation, in inches, between the highest point and all other points taken on October 9, 2014.



Approximate Scale: 1" = 25'

J:\S-F\1320001\1322424 Internal Project Data\4-05 Reports & Narratives\240 301 Mission - August 2014 Survey\PlateB-5 Differential Elevations (2014.08.05).srf

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: OCTOBER 9, 2014 SURVEY

Transbay Transit Center
301 Mission Street
Transbay Joint Powers Authority
San Francisco, California

October 2014

ARUP

PLATE 8

Memorandum

ARUP

To	Brian Dykes (TJPA)	Date December 11, 2014
Copies	Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242
From	Stephen McLandrich (Arup)	File reference 4-05 243
Subject	Transbay Transit Center: Results of December 2014 Settlement Survey at 301 Mission Property Page 1 of 1	

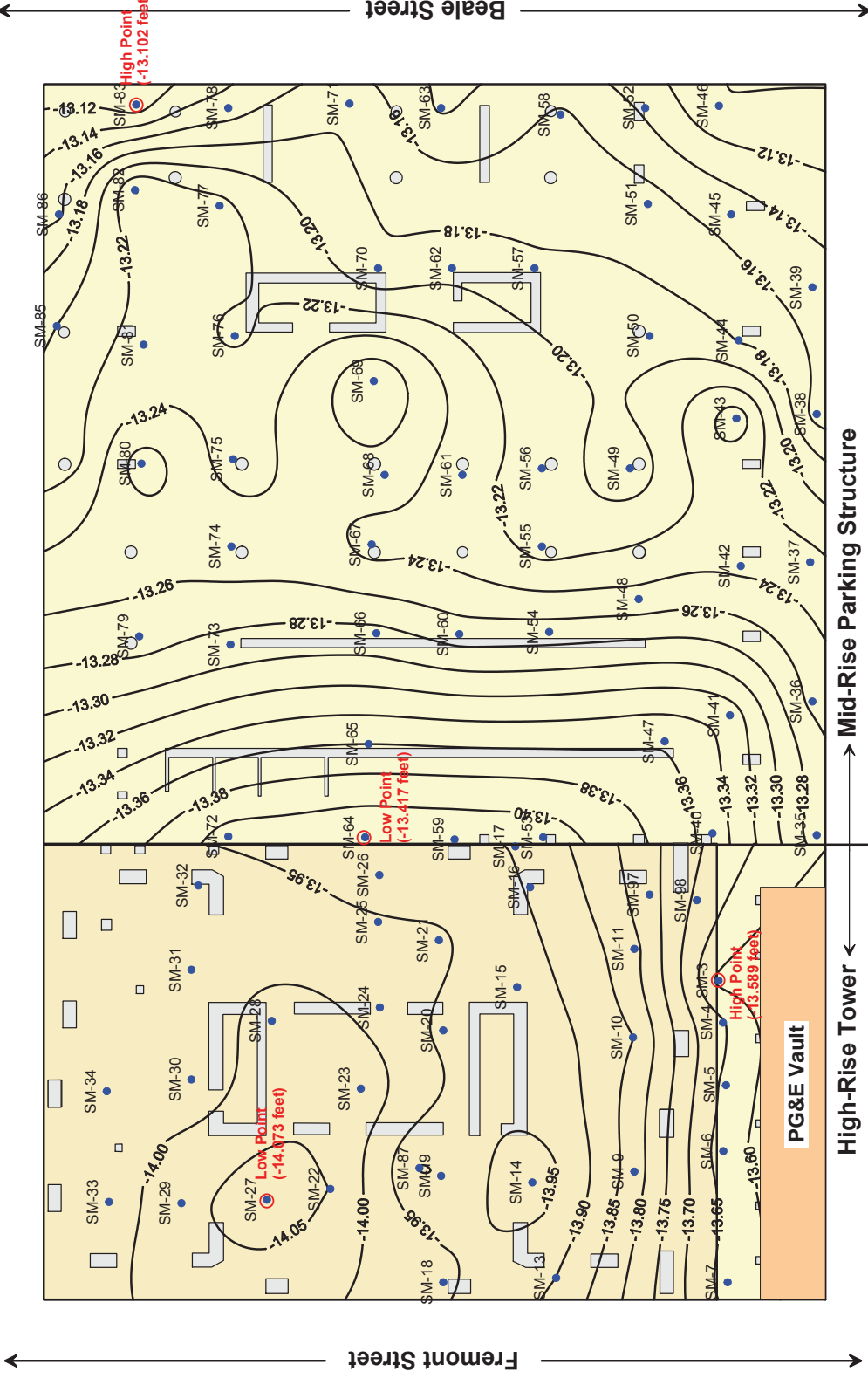
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated October 21, 2014 with measurements made through December 2014.

List of Plates

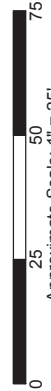
- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – December 3, 2014
- Plate 2 Differential Floor Elevation (Inches) December 3, 2014 Survey
- Plate 3 Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St. Structure Between 04/30/2009 & 12/3/2014
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- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through December 3, 2014
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- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: December 3, 2014 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: December 3, 2014 Survey

Mission Street

Beale Street



Date of Survey Reading: December 3, 2014



Approximate Scale: 1" = 25'

Notes:
 Contours represent elevation, in feet (CCSF Datum), from survey readings taken on December 3, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
 OF 301 MISSION PROPERTY
 PERIODIC SURVEY - DECEMBER 3, 2014

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

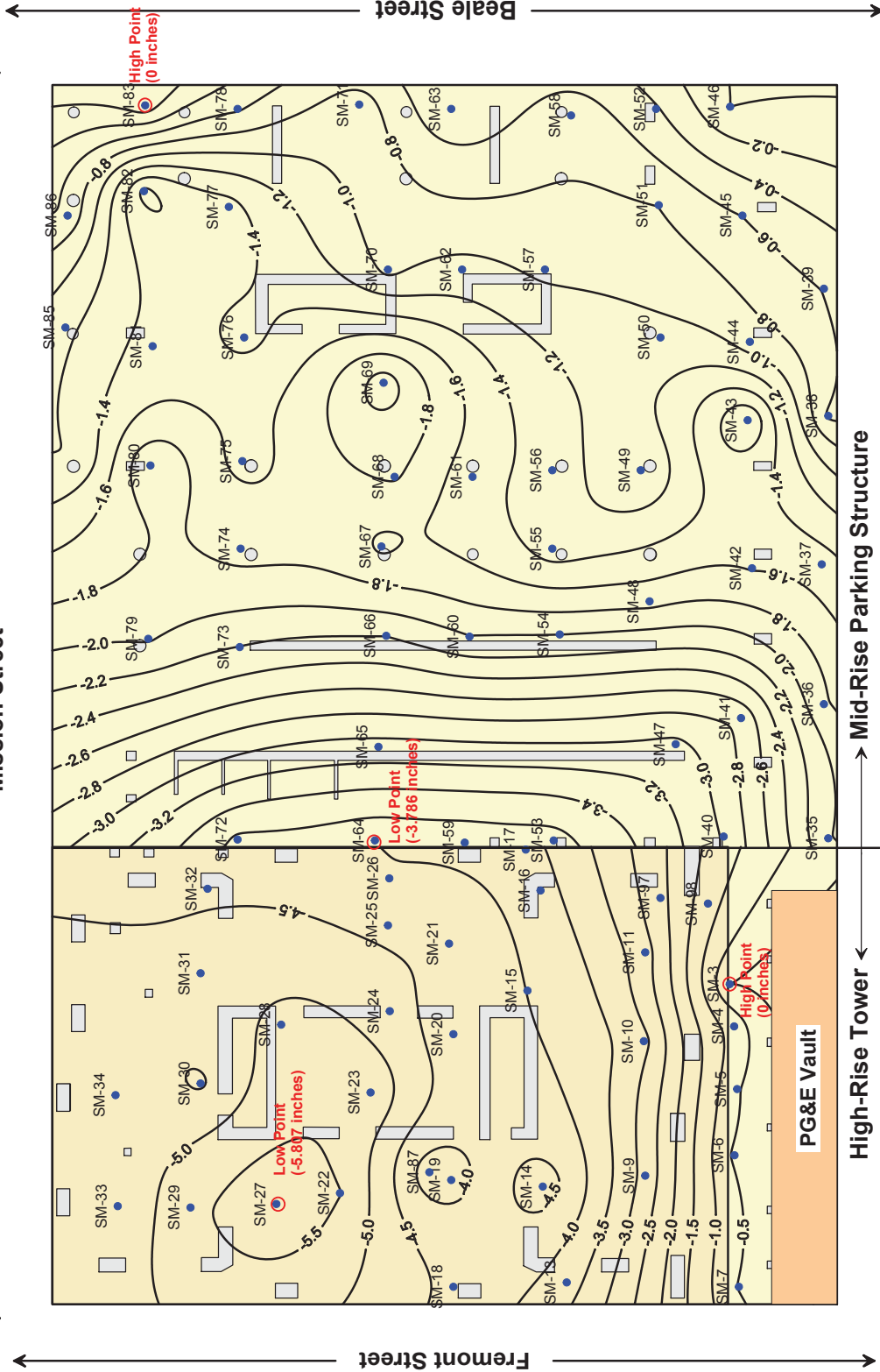
December 2014



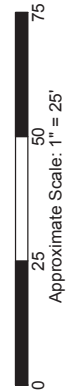
PLATE 1

Mission Street

Fremont Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

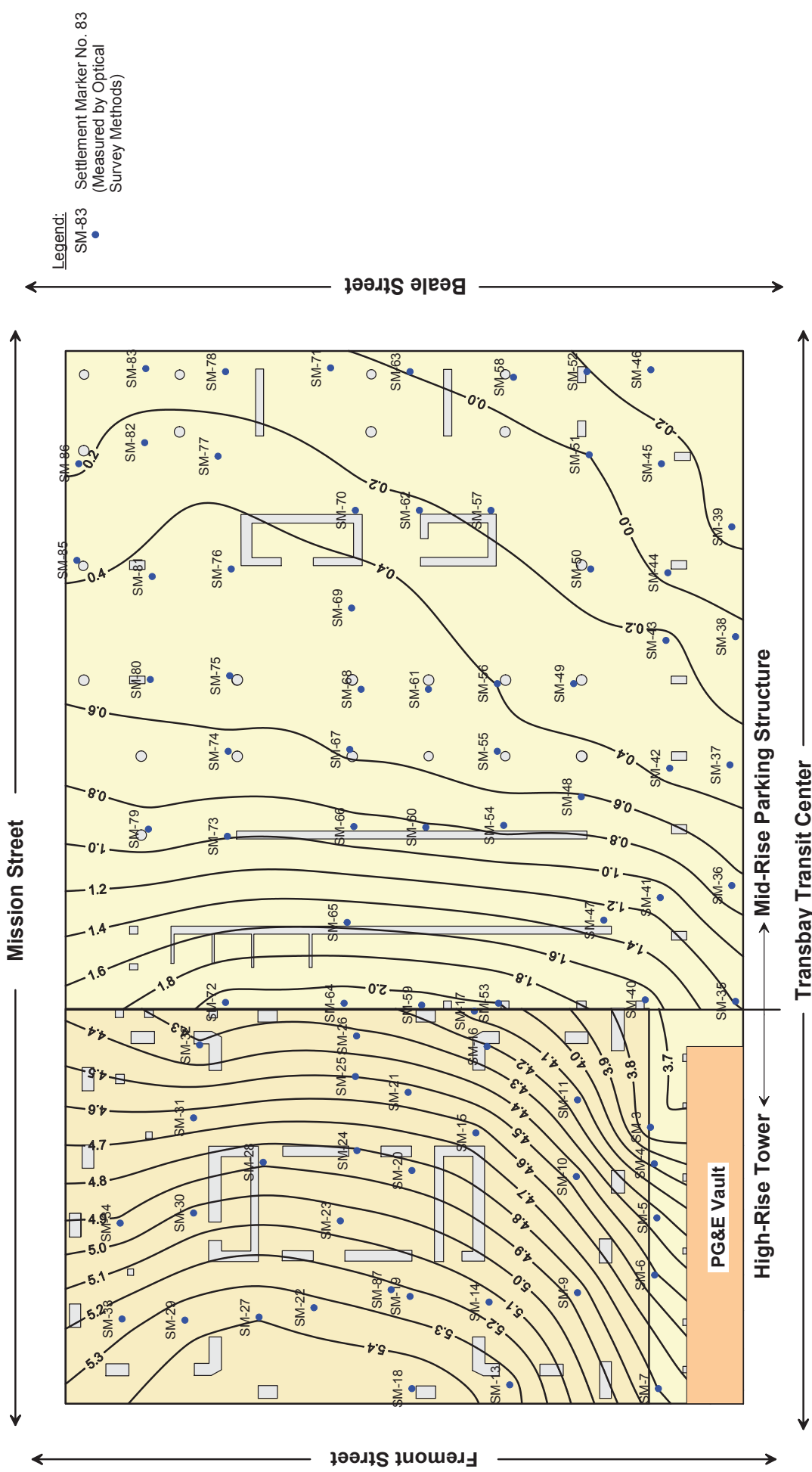


Notes:
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 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 DECEMBER 3, 2014 SURVEY
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

December 2014
ARUP

PLATE 2



Legend:

SM-83
 Settlement Marker No. 83
 (Measured by Optical Survey Methods)

CONTOURS OF SETTLEMENTS MEASURED AT THE 1ST LEVEL BASEMENT OF THE 301 MISSION ST STRUCTURE BETWEEN 04/30/2009 & 12/3/2014

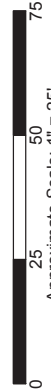
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

December 2014

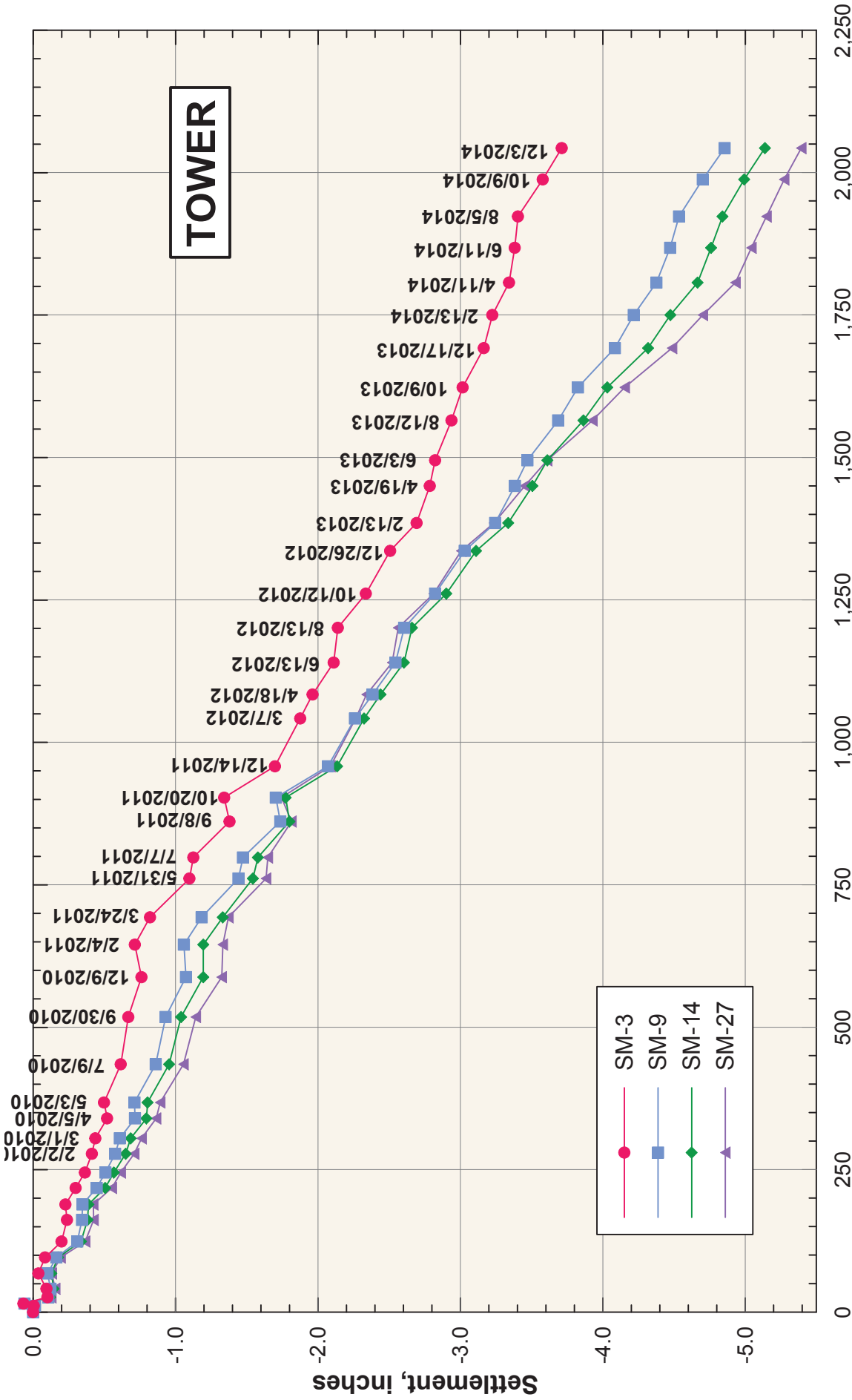


PLATE 3

Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on December 3, 2014.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.



Approximate Scale: 1" = 25'



Time From Start of Monitoring, Days

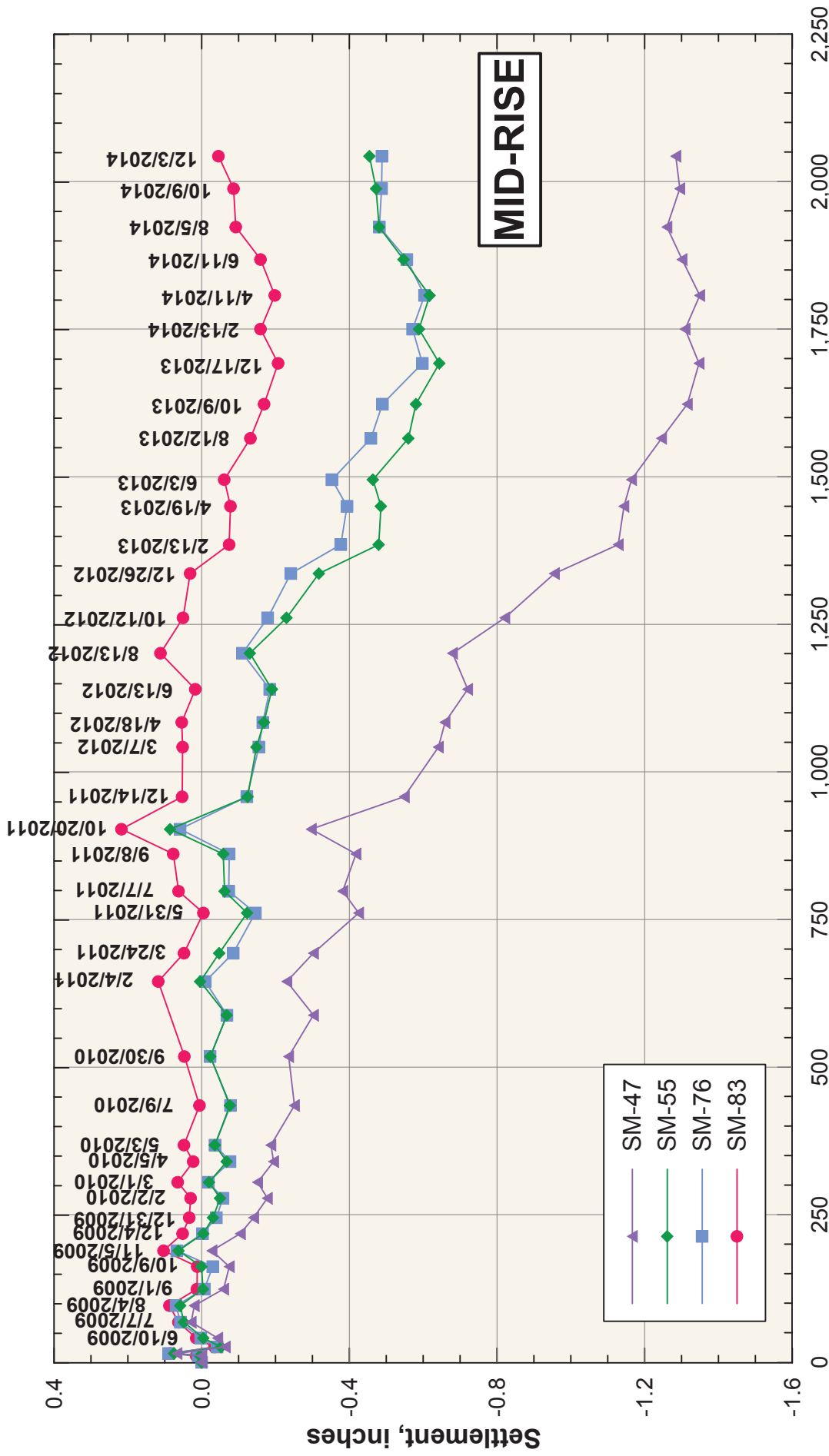


Note:
Initial (Baseline) reading
taken on 04/30/09

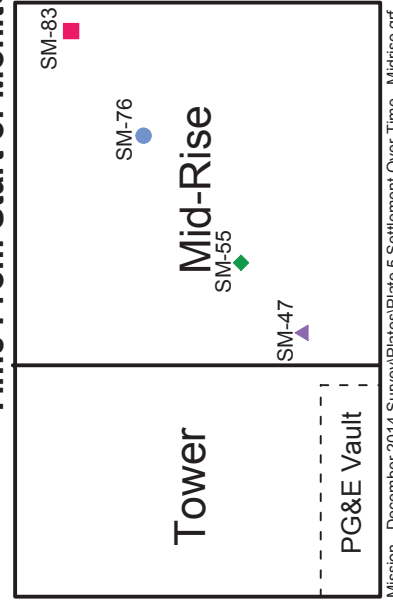
SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH DECEMBER 3, 2014

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California
December 2014

ARUP



Time From Start of Monitoring, Days

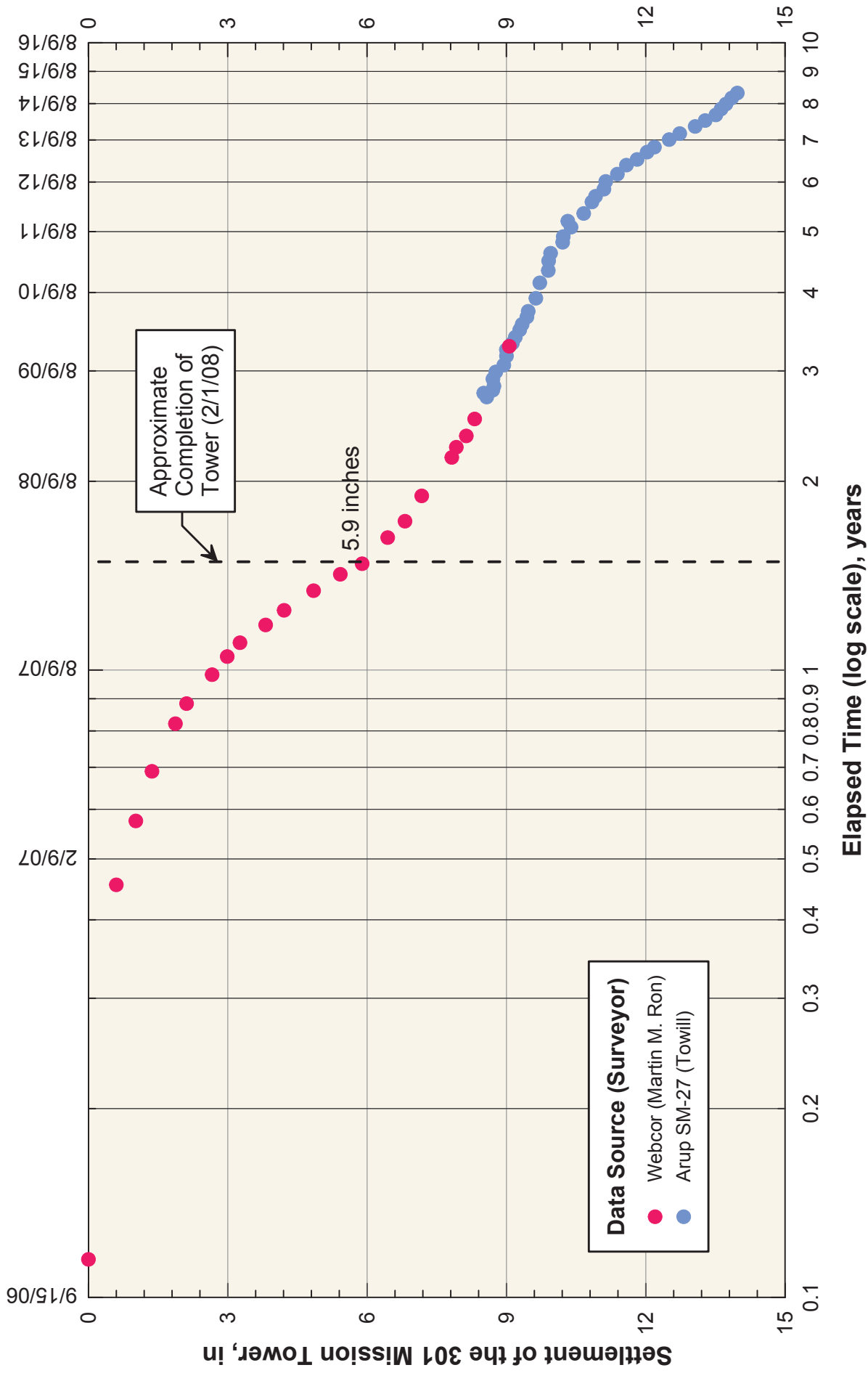


**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH DECEMBER 3, 2014**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

**Note:
Initial (Baseline) reading
taken on 04/30/09**

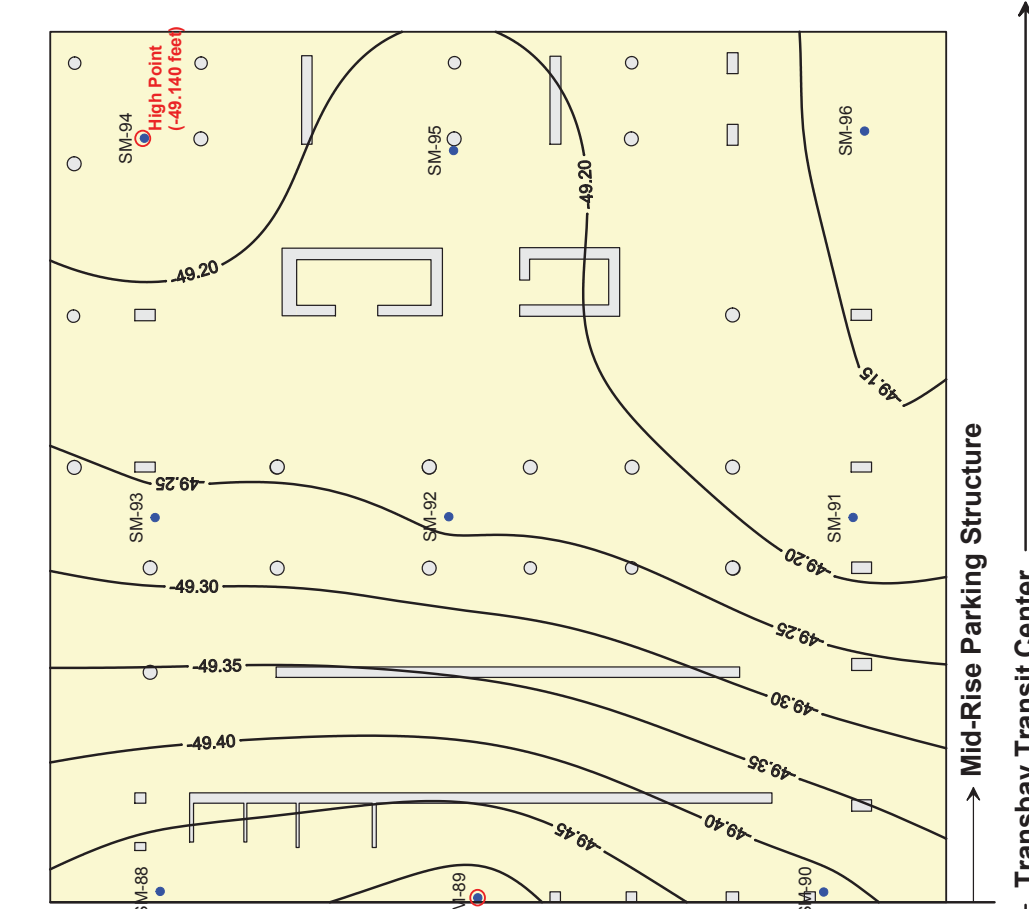
December 2014
ARUP



Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)



Mission Street



Mid-Rise Parking Structure

Transbay Transit Center

Date of Survey Reading:
December 3, 2014

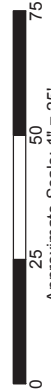
Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.386 feet
(4.628 inches)

Fremont Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on December 3, 2014.



Approximate Scale: 1" = 25'

J:\S-F\132000\1322424 Internal Project Data\4-05 Reports & Narratives\246 301 Mission - December 2014 Survey\Plates\Plate 7 B-5 Elevations.srf

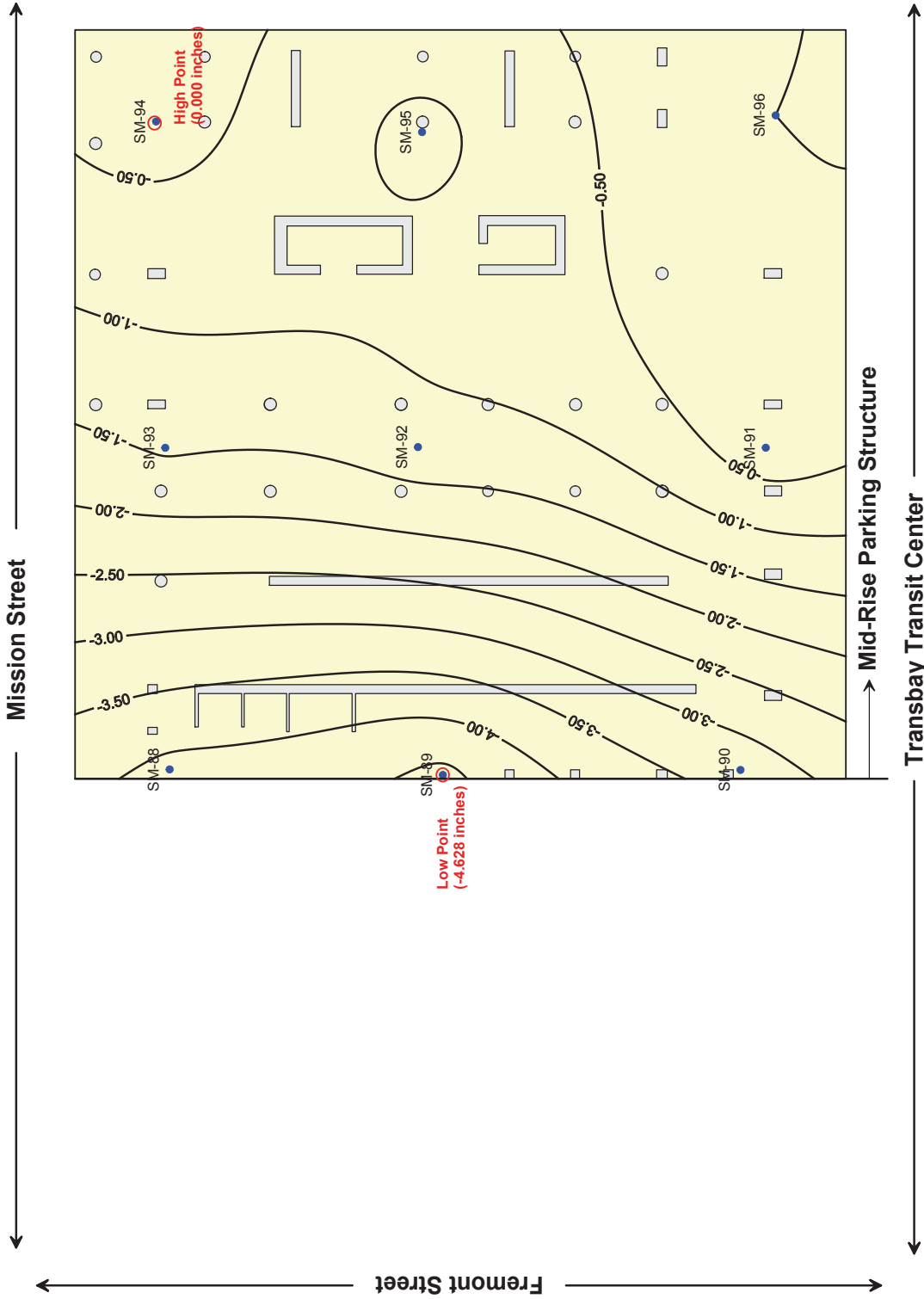
FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY; DECEMBER 3, 2014 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

December 2014

ARUP

PLATE 7



DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: DECEMBER 3, 2014 SURVEY
 Transbay Transit Center
 301 Mission Street
 Transbay Joint Powers Authority
 San Francisco, California
 December 2014



From: Brian Dykes
Sent: Friday, March 06, 2015 11:01 AM
To: 'shood@MillenniumPtrs.com'
Cc: Margie Cleland; Dennis Turchon; Mark Zabaneh; Nila Gonzales
Subject: February Survey Readings
Attachments: 2015-03-04 Memo_301 Mission Settlement - Feb 2015 Survey.pdf; Raw Data 301 Mission Sattlement Survey Feb 2015.xlsx; 2015-03-05 Memo_301 Mission Instruments.pdf

Steve,
Here are the February settlement survey results memorandum and raw data, plus the instrument readings for inclinometers and piezometers.
Regards, Brian.

Margie,
Please file these reports in the correspondence to Millennium Partners.
Thanks, Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax



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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date March 4, 2015
Copies	Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242
From	Stephen McLandrich (Arup)	File reference 4-05 243
Subject	Transbay Transit Center: Results of February 2015 Settlement Survey at 301 Mission Property	Page 1 of 1

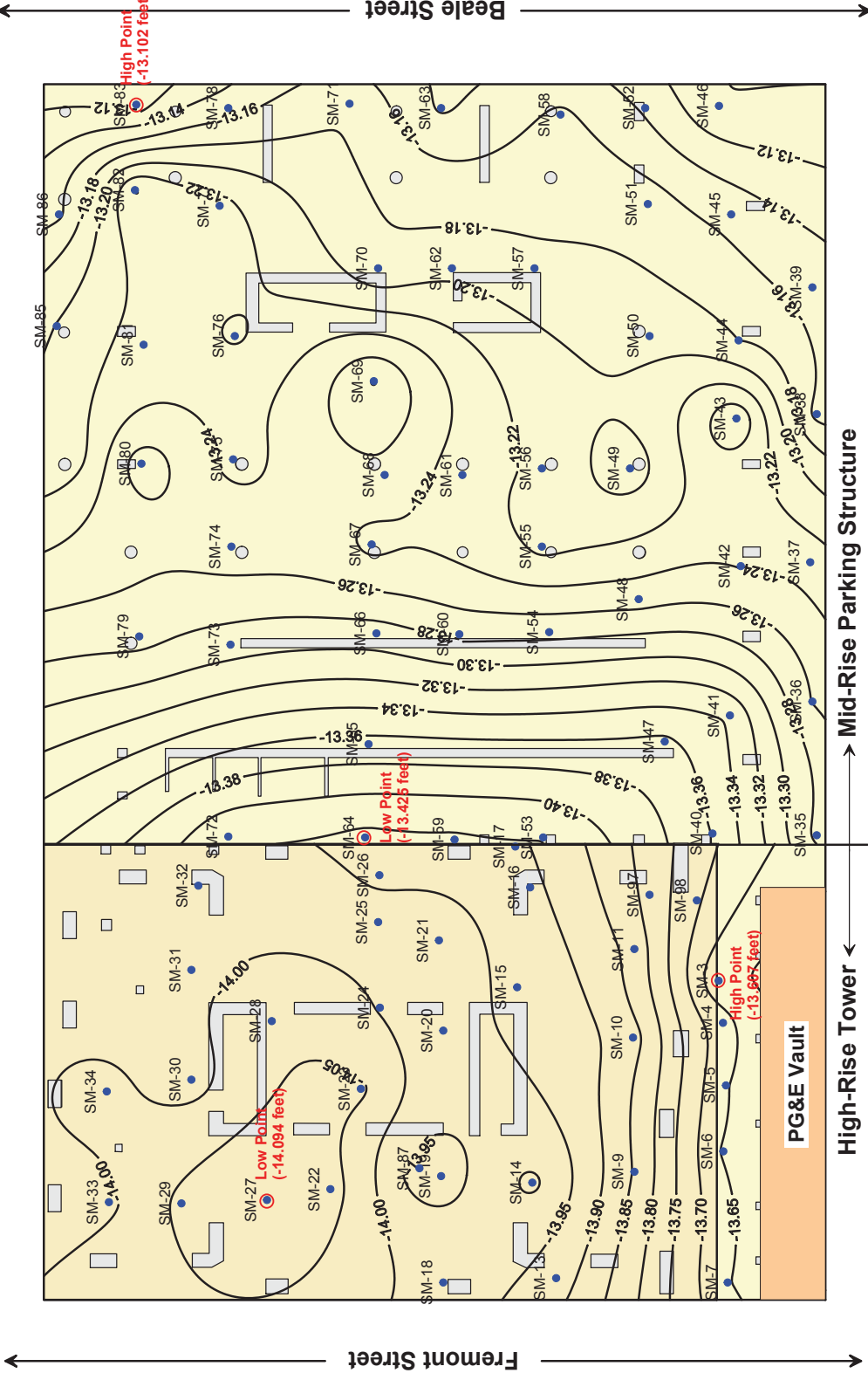
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- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: February 12, 2015 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: February 12, 2015 Survey

Mission Street

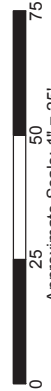
Beale Street



Date of Survey Reading:
February 12, 2015

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.488 feet (5.853 inches)
Mid-Rise Parking	0.323 feet (3.879 inches)



Approximate Scale: 1" = 25'

Notes:

Contours represent elevation, in feet (CCSF Datum), from survey readings taken on February 12, 2015.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

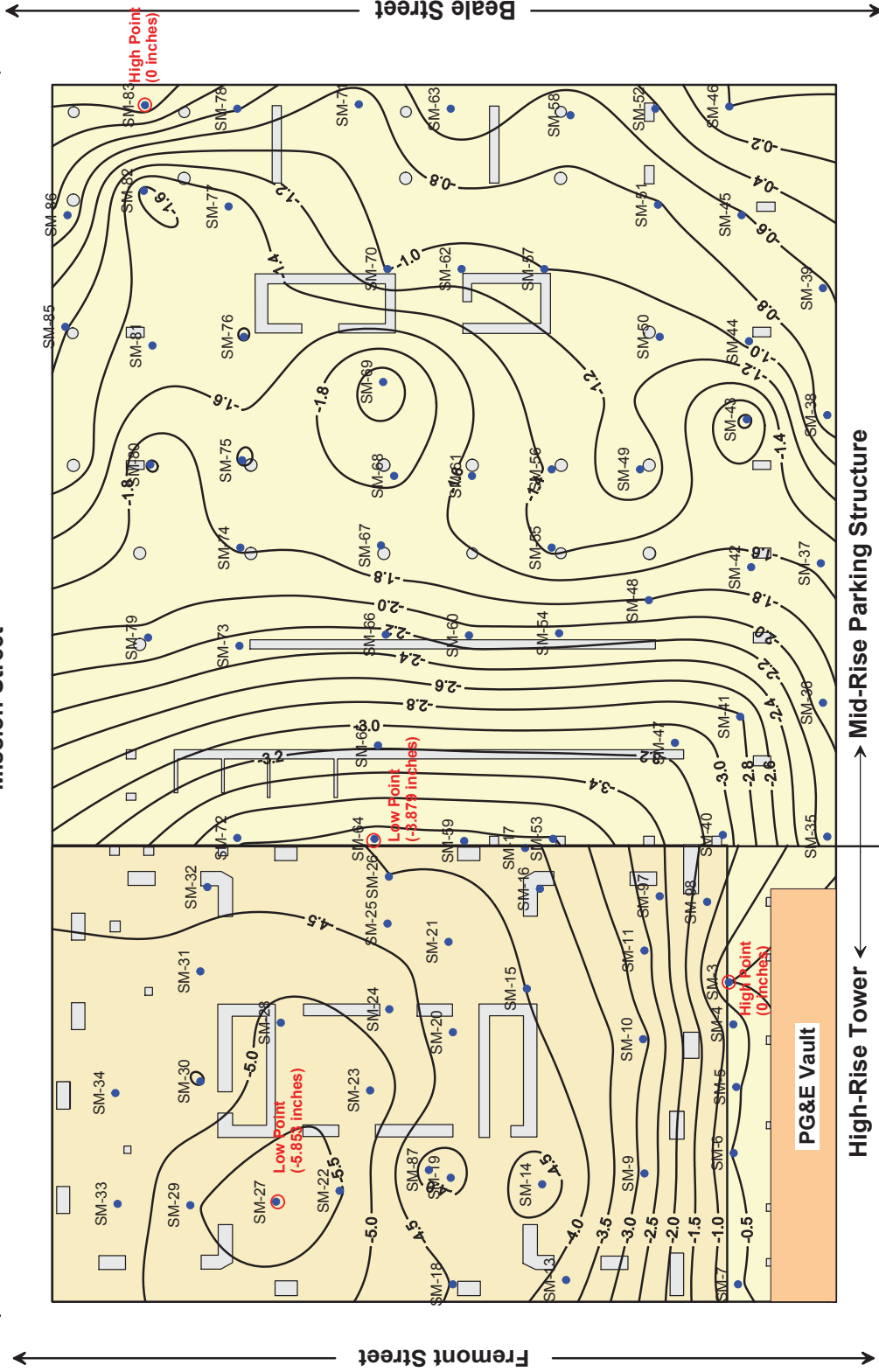
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY
PERIODIC SURVEY - FEBRUARY 12, 2015
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

March 2015



Mission Street

Fremont Street

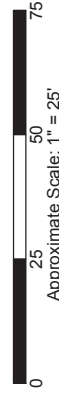


Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

Mid-Rise Parking Structure

High-Rise Tower

Transbay Transit Center



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on February 12, 2015.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
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DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 FEBRUARY 12, 2015 SURVEY

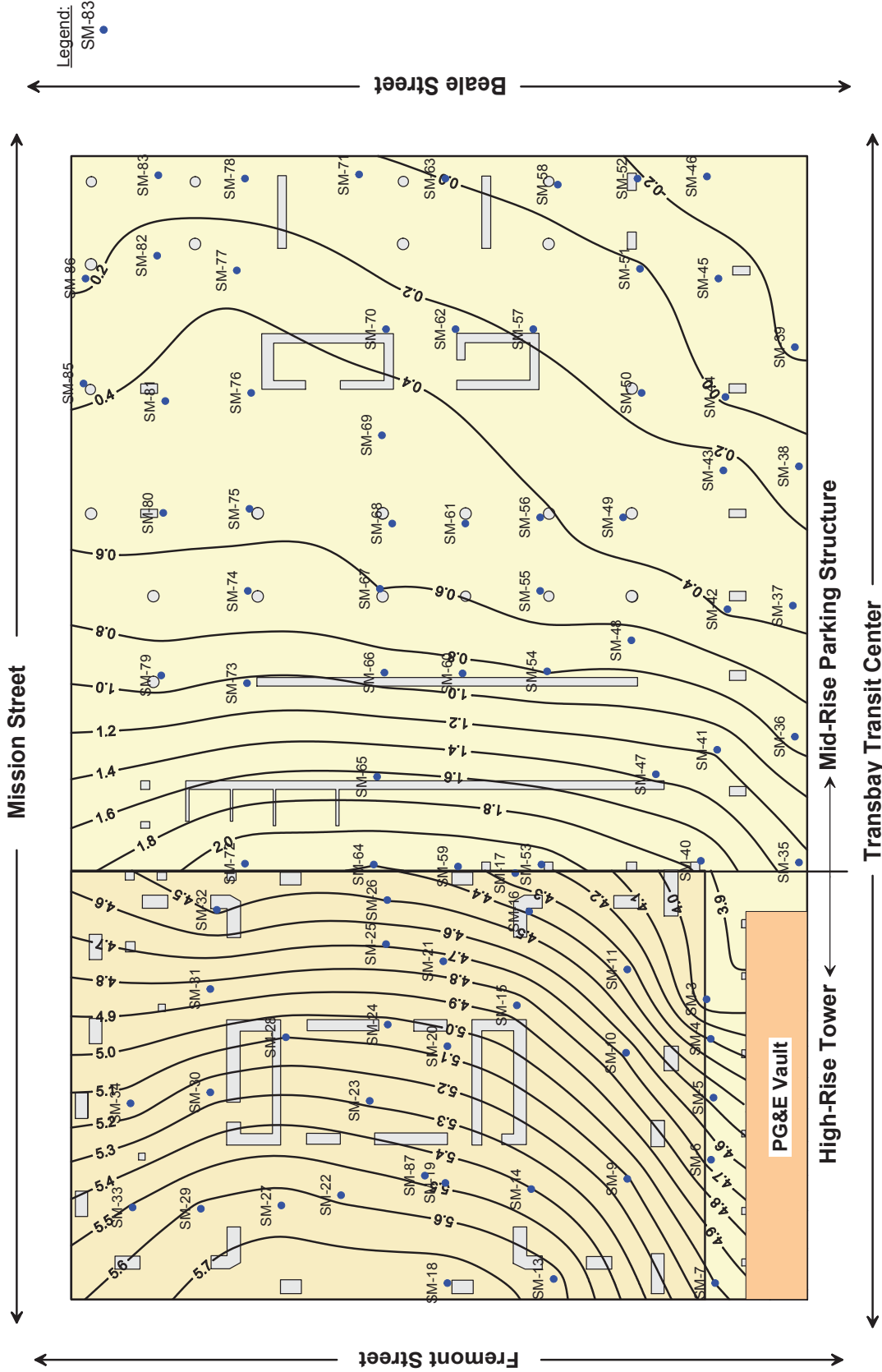
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

March 2015

ARUP

PLATE 2

Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

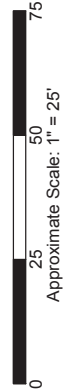


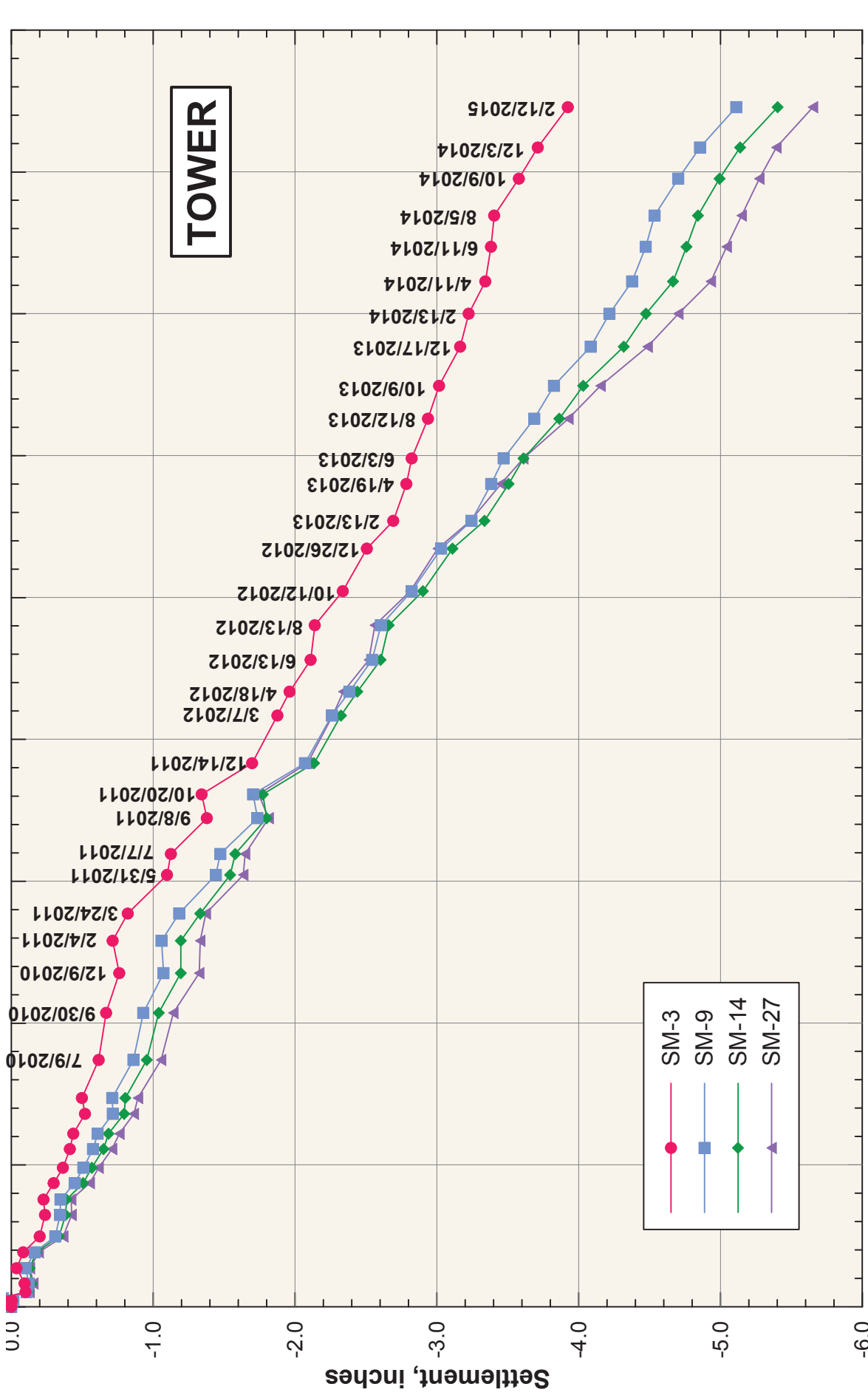
CONTOURS OF SETTLEMENTS MEASURED AT THE
 1ST LEVEL BASEMENT OF THE 301 MISSION ST
 STRUCTURE BETWEEN 04/30/2009 & 02/12/2011

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

March 2015
ARUP
 PLATE 3

Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on February 12, 2015.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.





TOWER



SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH FEBRUARY 12, 2015

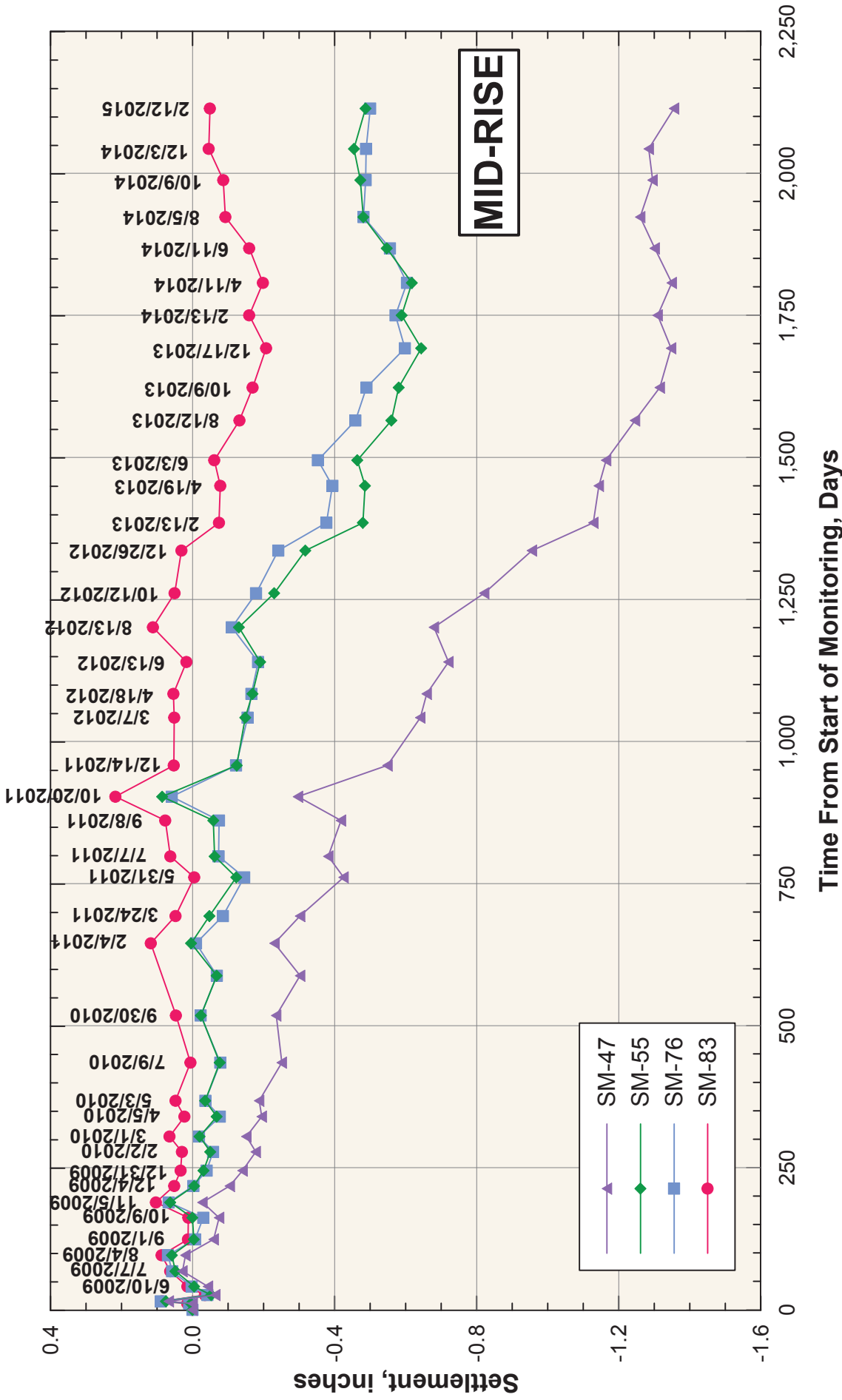
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

March 2015

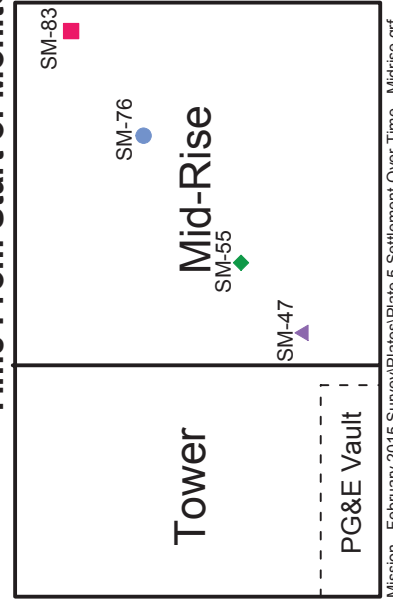
ARUP

PLATE 4

Note:
 Initial (Baseline) reading
 taken on 04/30/09



Time From Start of Monitoring, Days



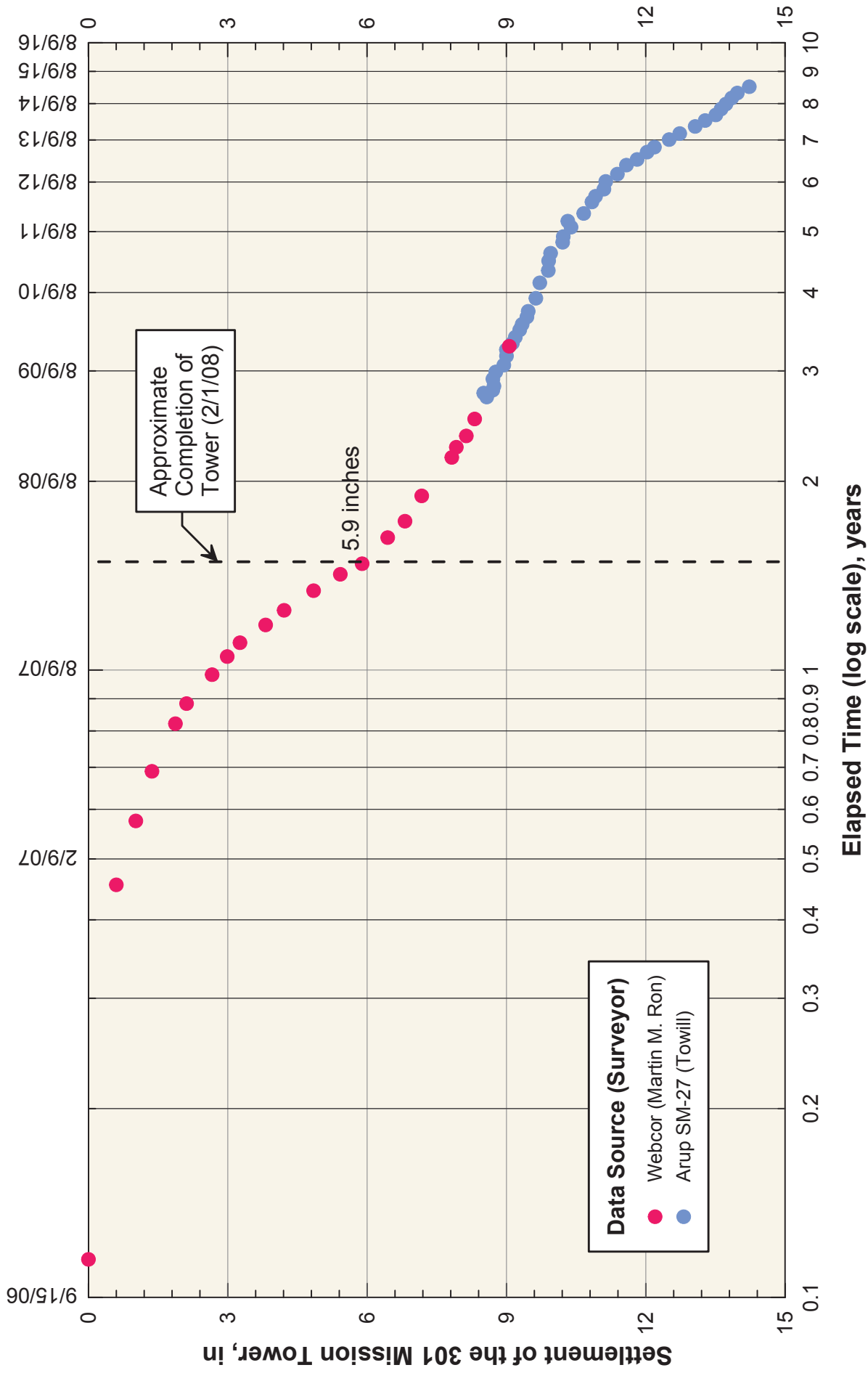
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH FEBRUARY 12, 2015**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California



March 2015

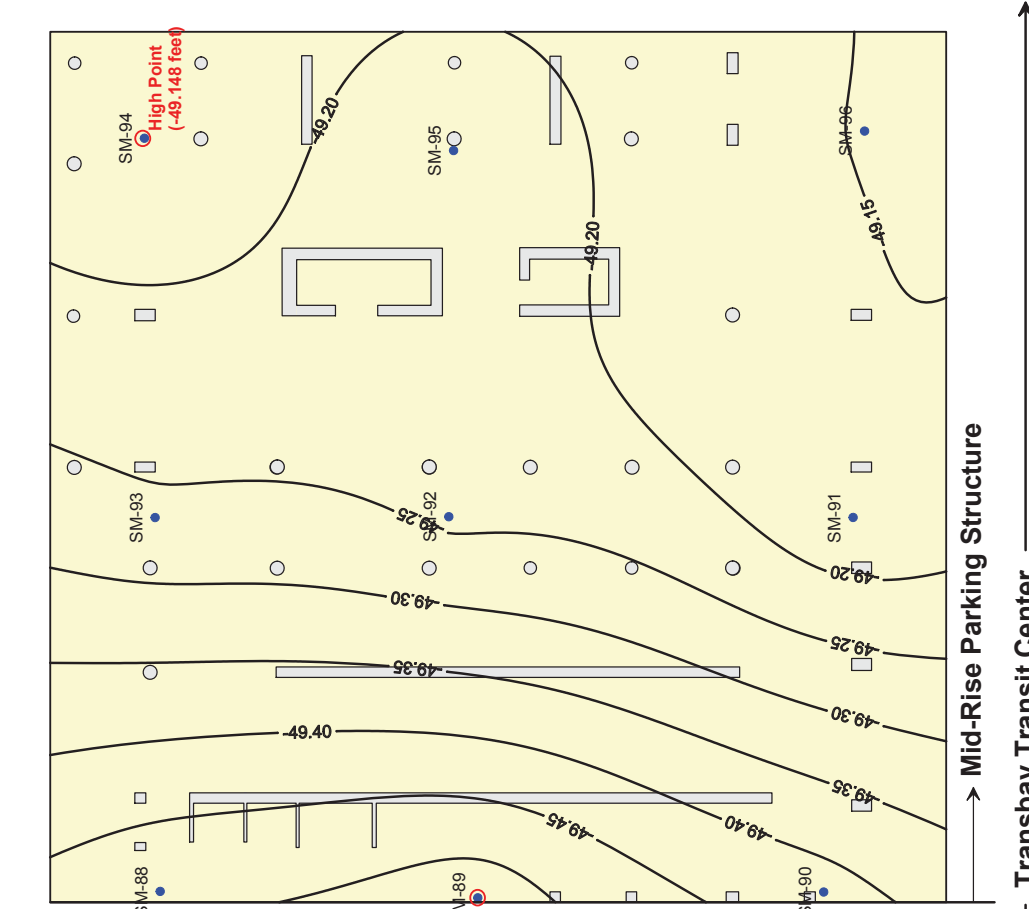


Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

March 2015



Mission Street



Date of Survey Reading:
February 12, 2015

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.384 feet (4.606 inches)

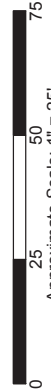
Fremont Street

Mid-Rise Parking Structure

Transbay Transit Center

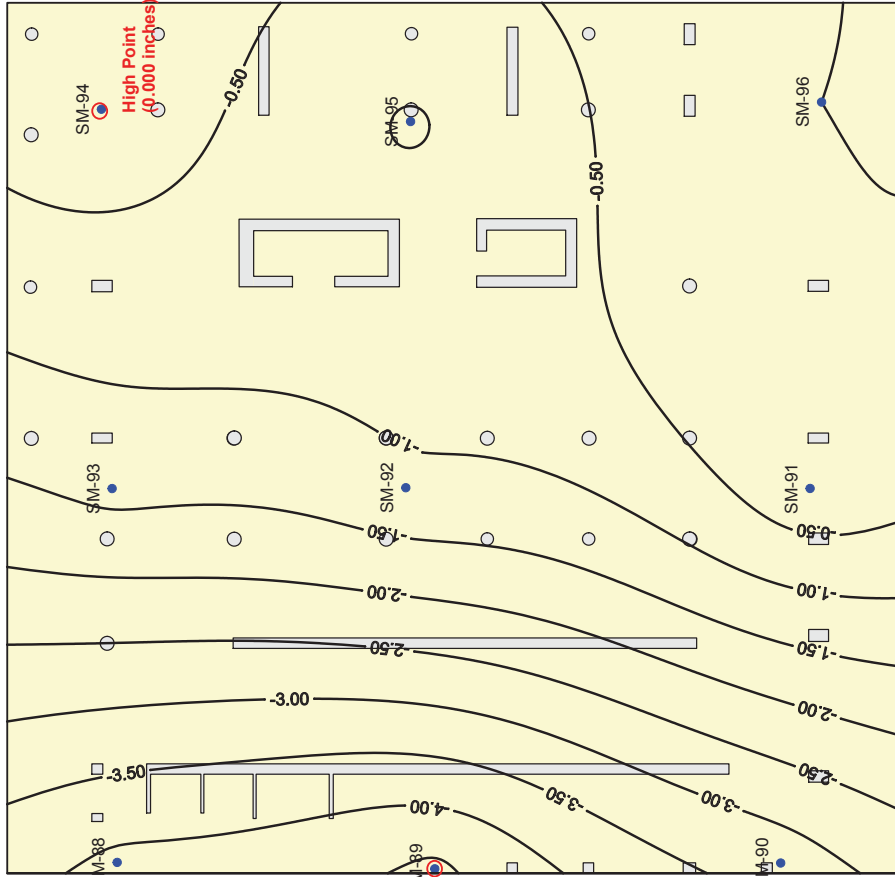


Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on February 21, 2015.



Mission Street

Fremont Street



Date of Survey Reading:
February 12, 2015

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

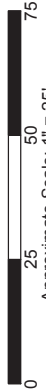
Maximum Differential
B-5 Level Basement
0.384 feet
(4.606 inches)

Beale Street

Mid-Rise Parking Structure
Transbay Transit Center



Notes:
Contours represent differential elevation, in inches, between the highest point and all other points taken on February 12, 2015.



Approximate Scale: 1" = 25'

From: Brian Dykes
Sent: Wednesday, April 22, 2015 3:37 PM
To: 'shood@MillenniumPtrs.com'
Cc: Stephen.mclandrich@arup.com
Subject: Millennium Tower Survey Data

Steve,

Attached is a diagram and two tables on which are plotted the rate of movement of the Millennium Tower over time based on the data the TJPA has already provided to Millennium Partners.

The data appears to show that the tilt of the Tower to the west is increasing.

Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax

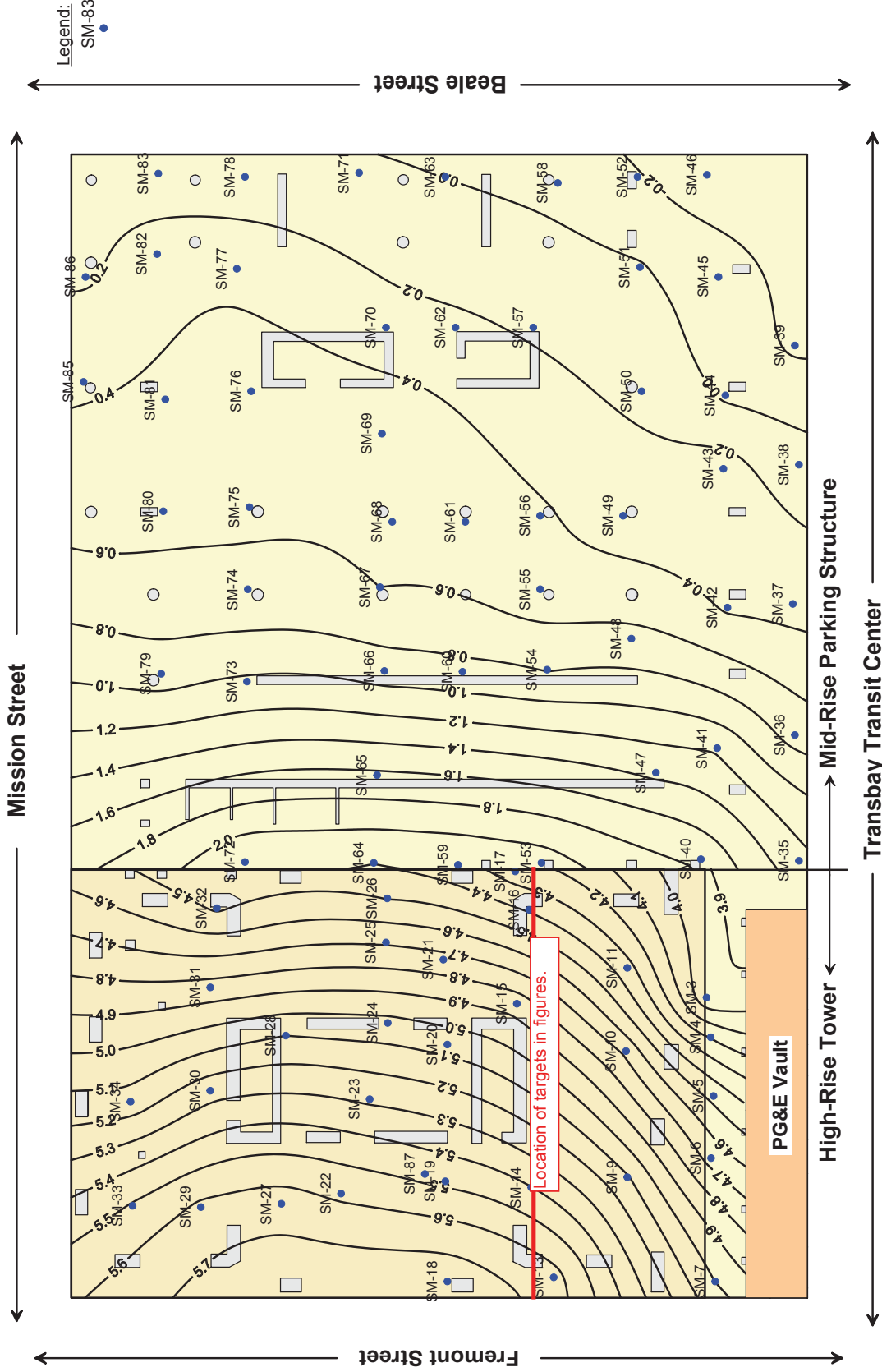


 Please consider the environment before printing this message.

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

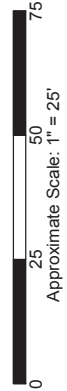
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Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



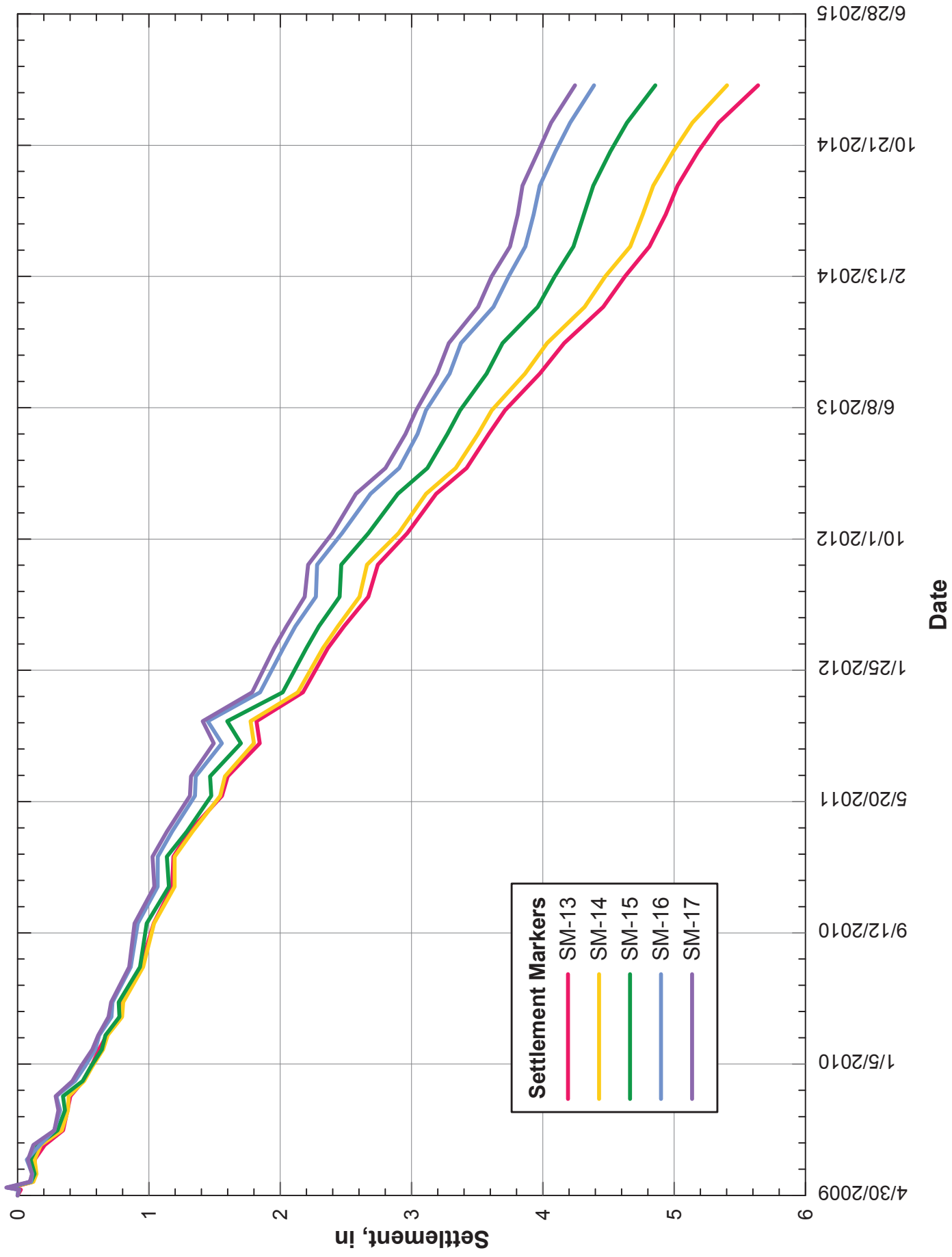
Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on February 12, 2015.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.

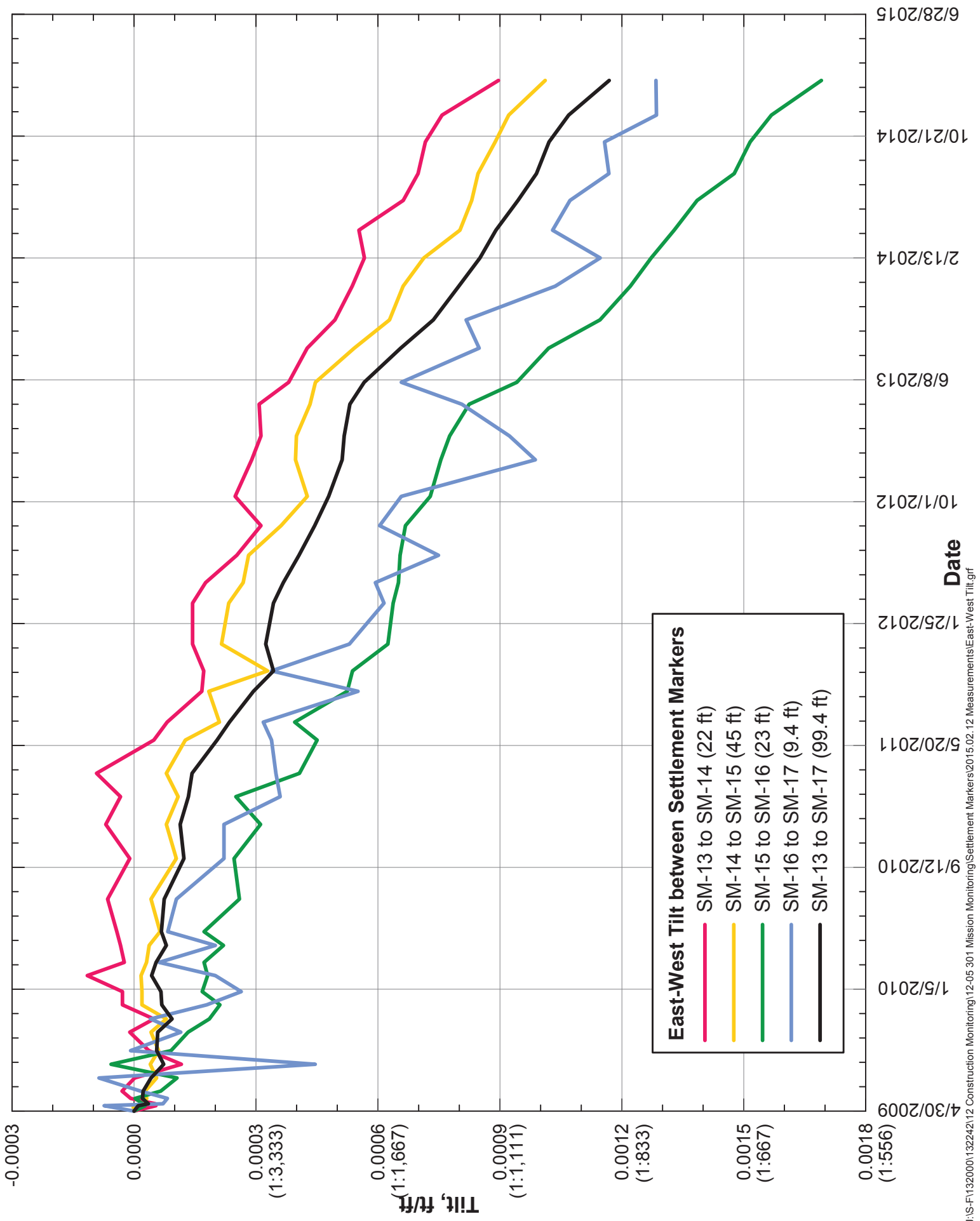
Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on February 12, 2015.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.



Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California







From: Brian Dykes
Sent: Wednesday, July 15, 2015 4:41 PM
To: 'shood@MillenniumPtrs.com'
Subject: FW: TTC - 301 Mission June 2015 Survey

Steve,
Here is the latest survey memorandum from Arup for the settlement readings taken in June 2015 together with the raw data values.
Regards, Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Wednesday, July 15, 2015 12:02 PM
To: Brian Dykes
Cc: Jeff Dunn
Subject: TTC - 301 Mission June 2015 Survey

Brian,

Here is the memo for the June 2015 survey at 301 Mission as well as the raw values.

We hope to get the inclinometer memo to you later this week, however, there are some inclinometers that need to be re-done, so it may be next week.

Let me know if you have any questions.

Regards,
Stephen

Stephen McLandrich PE GE
Senior Geotechnical Engineer

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA
t +1 415 957 9445 d +1 415 946 0245
f +1 415 957 9096 c +1 415 310 1095
www.arup.com

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date July 15, 2015
Copies	Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242
From	Stephen McLandrich (Arup) Taki Vlasakakis (Arup)	File reference 4-05 251
Subject	Transbay Transit Center: Results of June 2015 Settlement Survey at 301 Mission Property	Page 1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated February 12, 2015 with measurements made through June 2015.

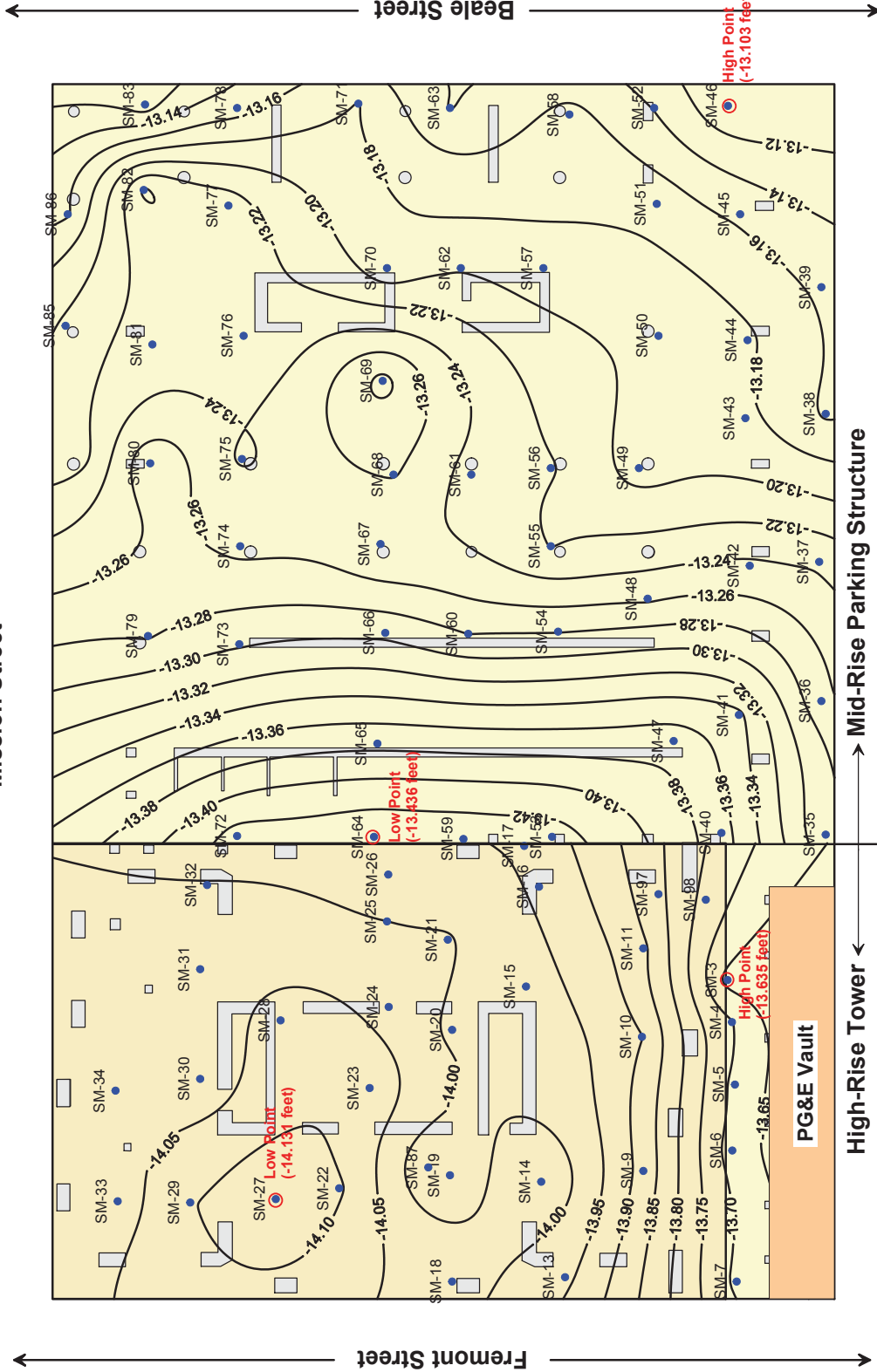
Note Typo: should refer to "March 4, 2015" report

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – June 4, 2015
- Plate 2 Differential Floor Elevation (Inches) June 4, 2015 Survey
- Plate 3 Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St. Structure Between 04/30/2009 & 6/4/2014
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through June 4, 2015
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through June 4, 2015
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: June 4, 2015 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: June 4, 2015 Survey

Mission Street

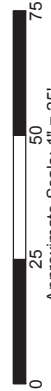
Fremont Street



Date of Survey Reading:
June 4, 2015

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical
Survey Methods)

High-Rise Tower	Maximum Differential
0.497 feet (5.958 inches)	Mid-Rise Parking 0.332 feet (3.989 inches)



Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 4, 2015.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - June 4, 2015

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

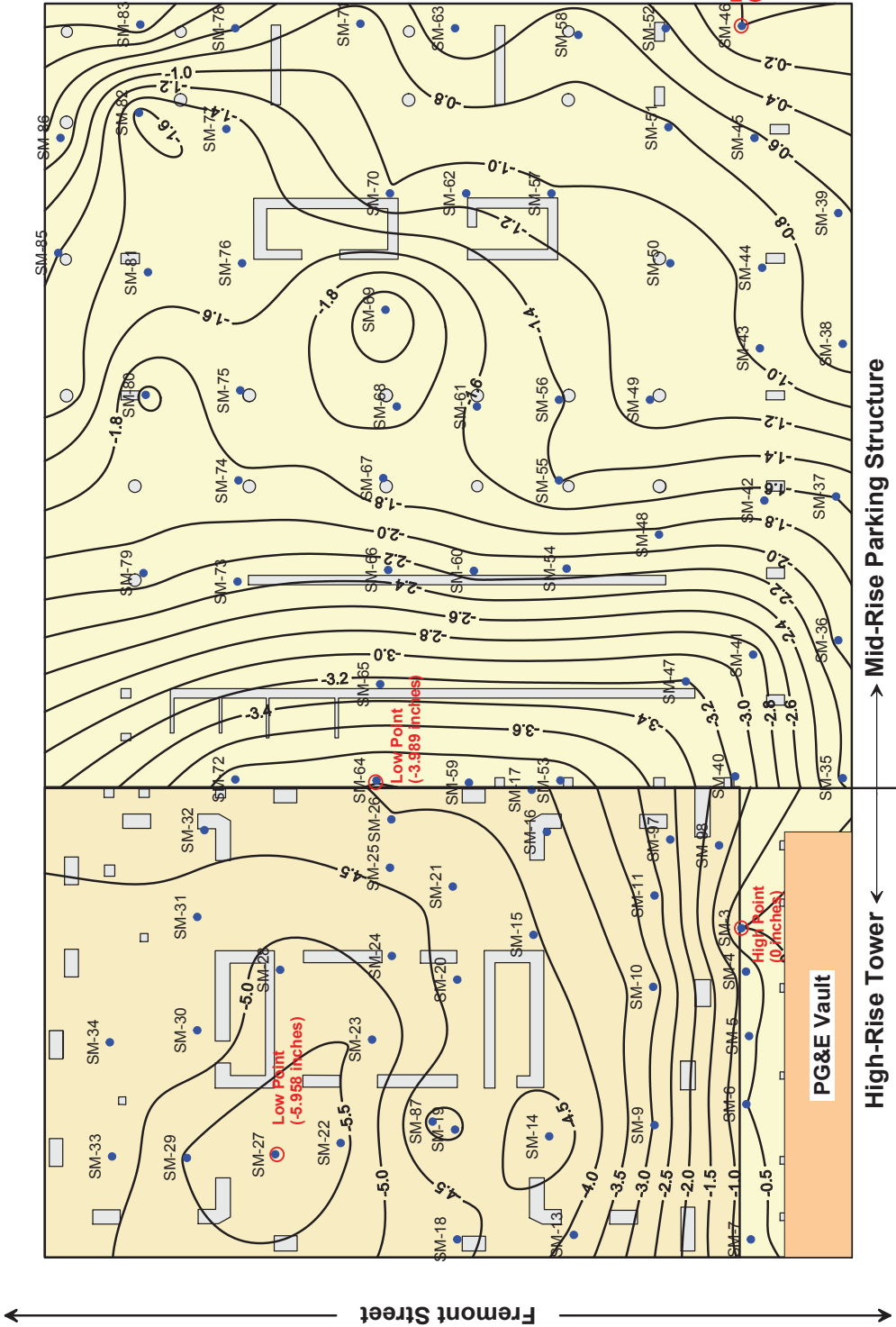
July 2015

ARUP

PLATE 1

Mission Street

Beale Street



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

Mid-Rise Parking Structure

High-Rise Tower

Transbay Transit Center



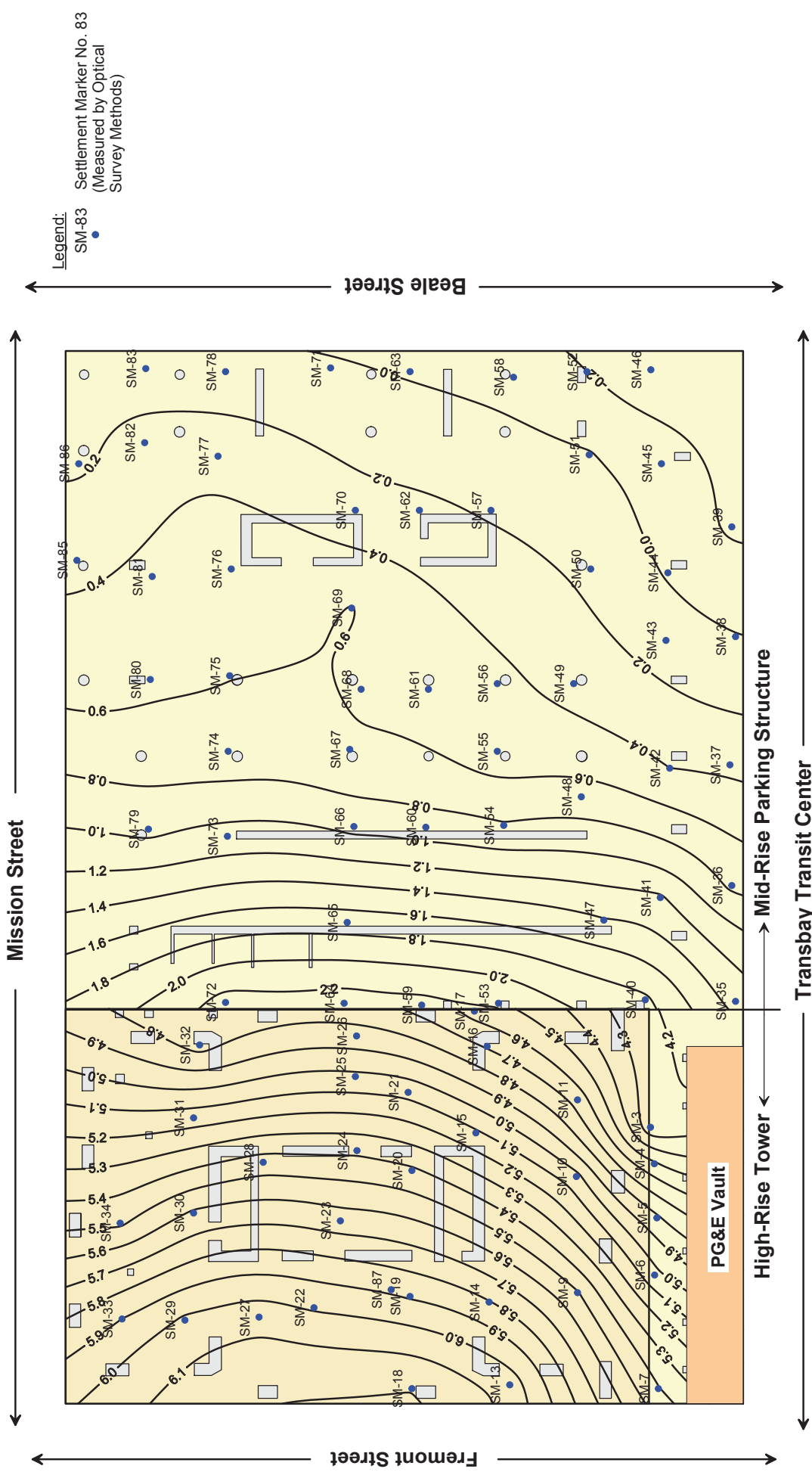
Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on June 4, 2015.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 June 4, 2015 SURVEY
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

July 2015

ARUP

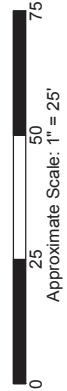
PLATE 2

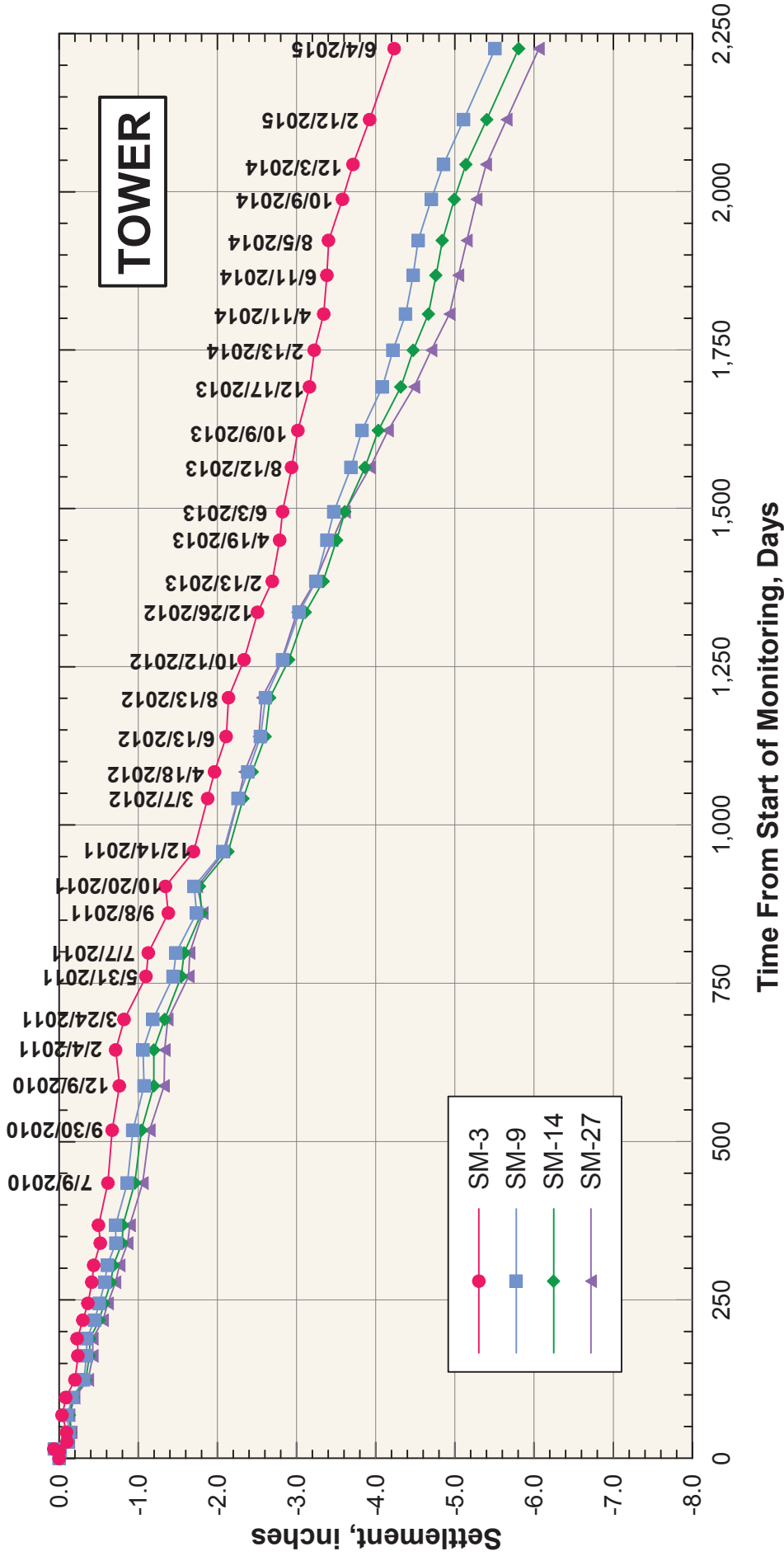


CONTOURS OF SETTLEMENTS MEASURED AT THE 1ST LEVEL BASEMENT OF THE 301 MISSION ST STRUCTURE BETWEEN 04/30/2009 & 6/4/2015
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California
 July 2015



Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on June 4, 2015.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.





Note:
Initial (Baseline) reading
taken on 04/30/09

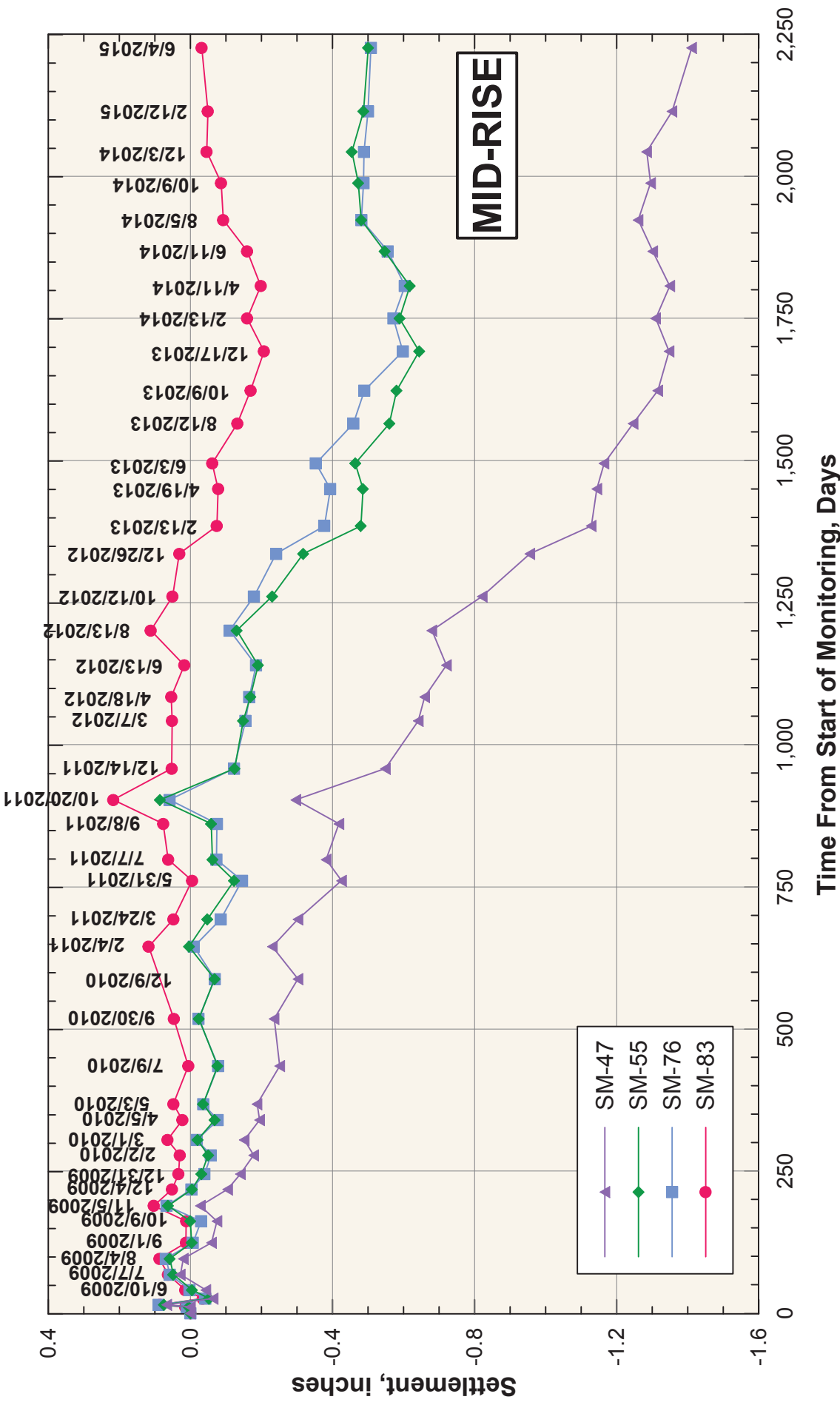


**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH JUNE 4, 2015**

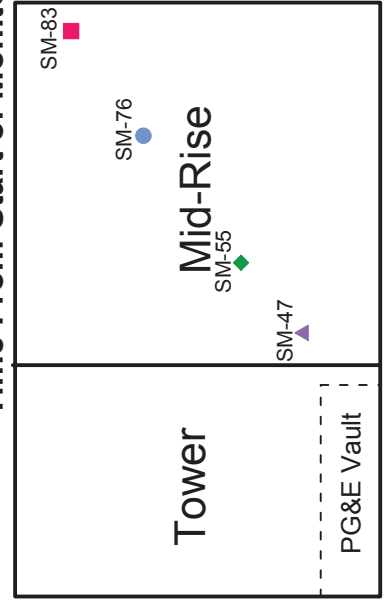
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

July 2015





Time From Start of Monitoring, Days



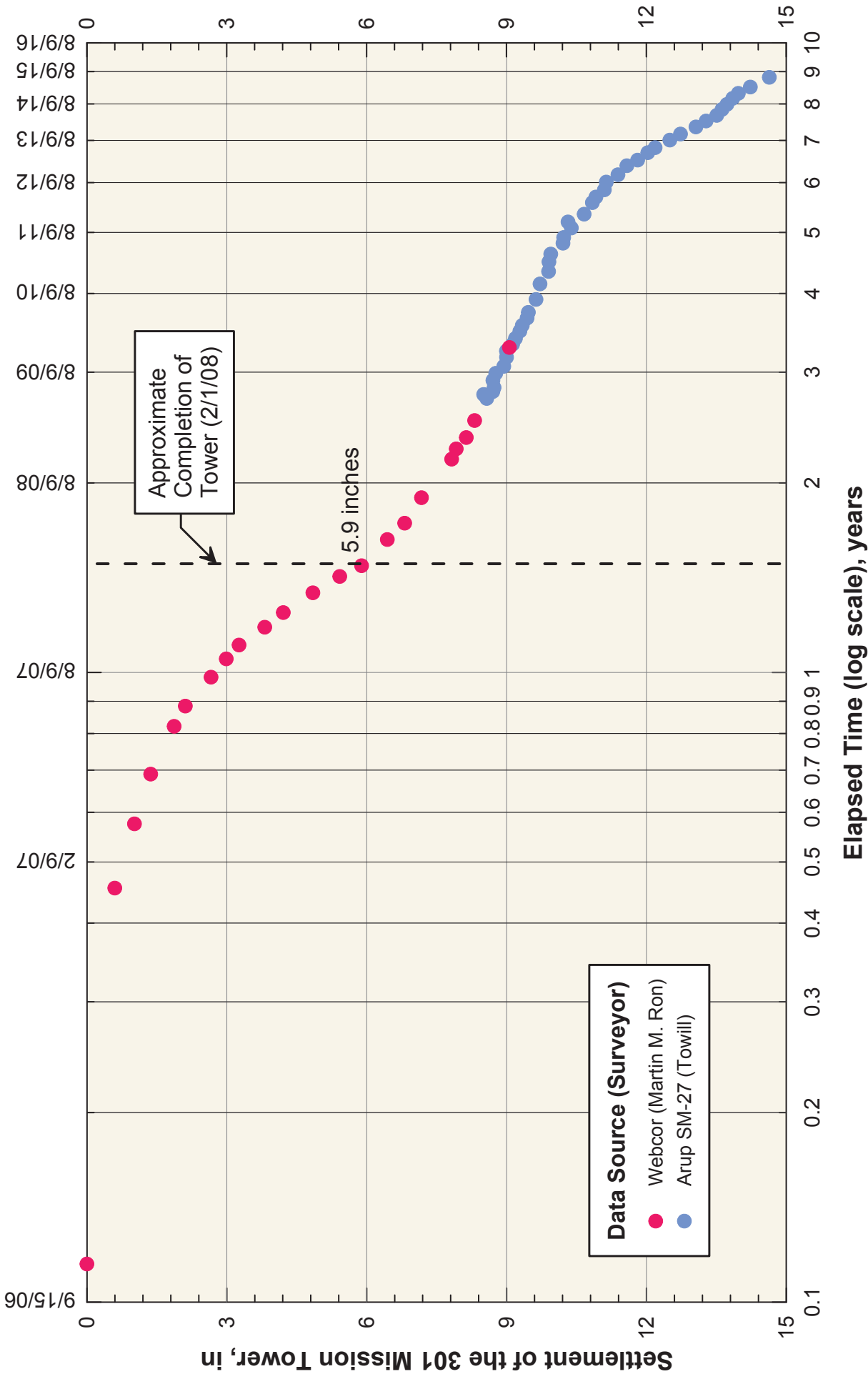
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH JUNE 4, 2015**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

July 2015





Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

**SETTLEMENTS OF THE 301 MISSION TOWER
 INCLUDING MONITORING DURING CONSTRUCTION**

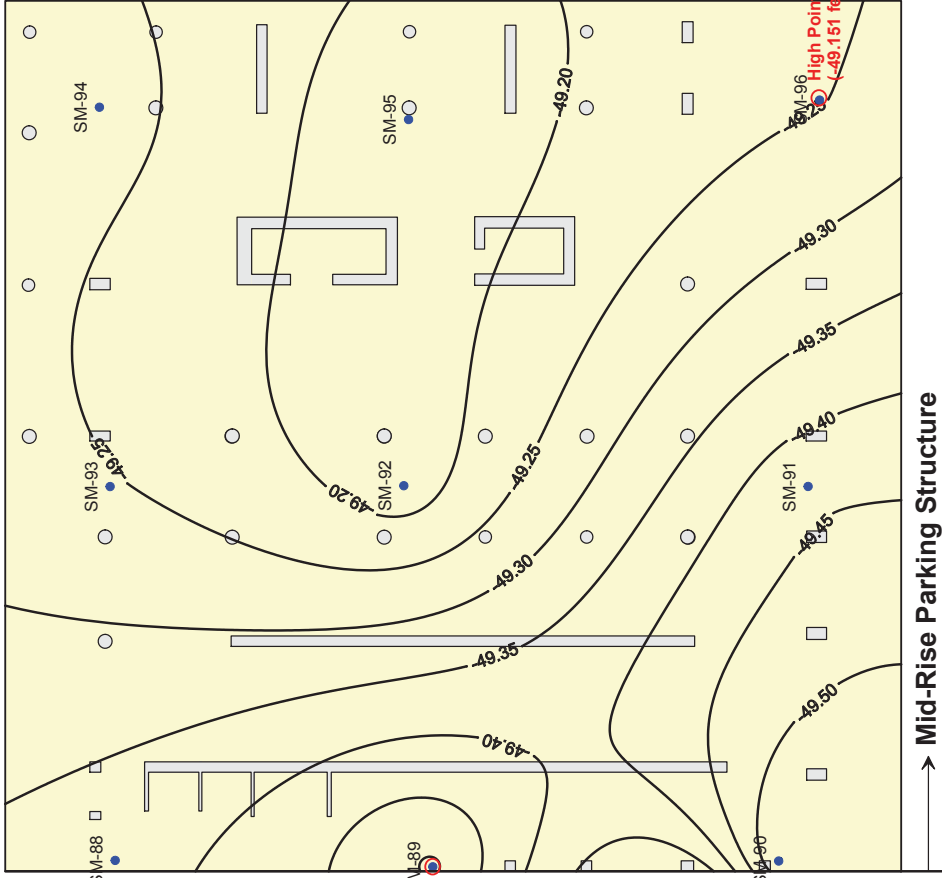
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

July 2015



Mission Street

Fremont Street



Date of Survey Reading:
June 4, 2015

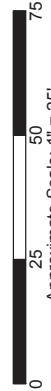
Legend:
 SM-88 Settlement Marker No. 88
 (Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.400 feet (4.798 inches)

Beale Street



Notes:
 Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 4, 2015.

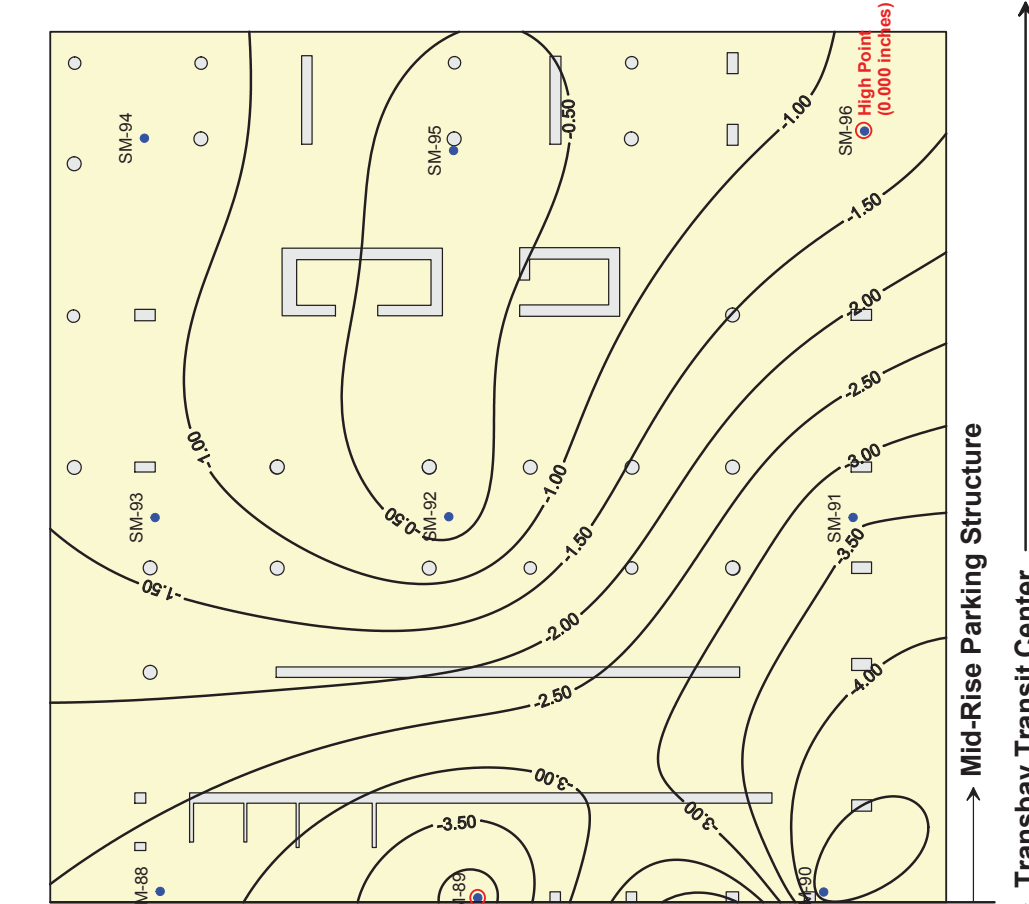


Approximate Scale: 1" = 25'

July 2015



Mission Street



Mid-Rise Parking Structure
Transbay Transit Center

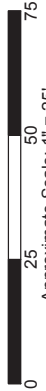
Date of Survey Reading:
June 4, 2015

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

Maximum Differential
B-5 Level Basement
0.400 feet
(4.798 inches)

Fremont Street

Notes:
Contours represent differential elevation, in inches, between the highest point and all other points taken on June 4, 2015.



Approximate Scale: 1" = 25'

From: Brian Dykes
Sent: Wednesday, November 04, 2015 11:56 AM
To: 'shood@MillenniumPtrs.com'
Subject: FW: TTC - 301 Mission monitoring

Steven,
Here are the inclinometer and settlement survey readings taken in October.
I have requested the raw data for the settlement and will forward that to you shortly.
Brian.

From: Stephen McLandrich [<mailto:stephen.mclandrich@arup.com>]
Sent: Tuesday, November 03, 2015 5:23 PM
To: Brian Dykes
Cc: Jeff Dunn; Andrew Yeskoo
Subject: TTC - 301 Mission monitoring

Brian,

Please find the attached memoranda which present the October reads of the survey targets and the inclinometers around 301 Mission.

You will be receiving these memos from Andrew Yeskoo going forward. Our next read is planned for February 2016.

Regards,
Stephen

Stephen McLandrich PE GE
Senior Geotechnical Engineer

Arup
560 Mission Street Suite 700 San Francisco CA 94105 USA

t: +1 415 957 9445 d: +1 415 946 0245

m: +1 415 310 1095

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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date October 30, 2015
Copies	Randy Volenec (PCPA) George Metzger (AAI)	Reference number 132242
From	Stephen McLandrich (Arup) Andrew Yeskoo (Arup)	File reference 4-05 255
Subject	Transbay Transit Center: Results of October 2015 Settlement Survey at 301 Mission Property	Page 1 of 1

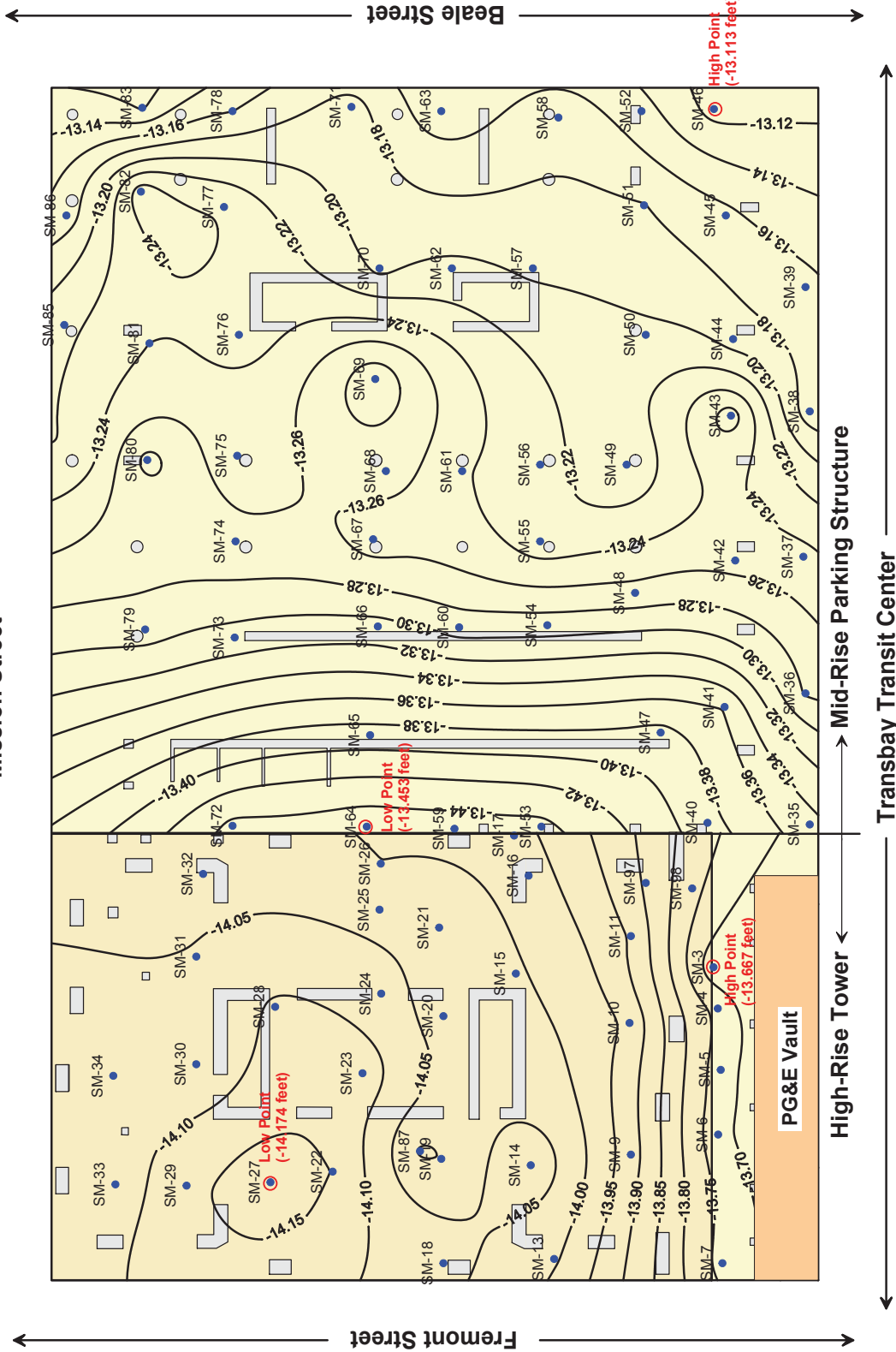
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated July 15, 2015 with measurements made through October 2015.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – October 5, 2015
- Plate 2 Differential Floor Elevation (Inches) October 5, 2015 Survey
- Plate 3 Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St. Structure Between 04/30/2009 & 10/5/2014
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through October 5, 2015
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through October 5, 2015
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: October 5, 2015 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: October 5, 2015 Survey

Mission Street

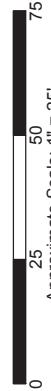
Fremont Street



Date of Survey Reading:
October 5, 2015

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.508 feet (6.091 inches)
Mid-Rise Parking	0.340 feet (4.076 inches)



Approximate Scale: 1" = 25'

Notes:

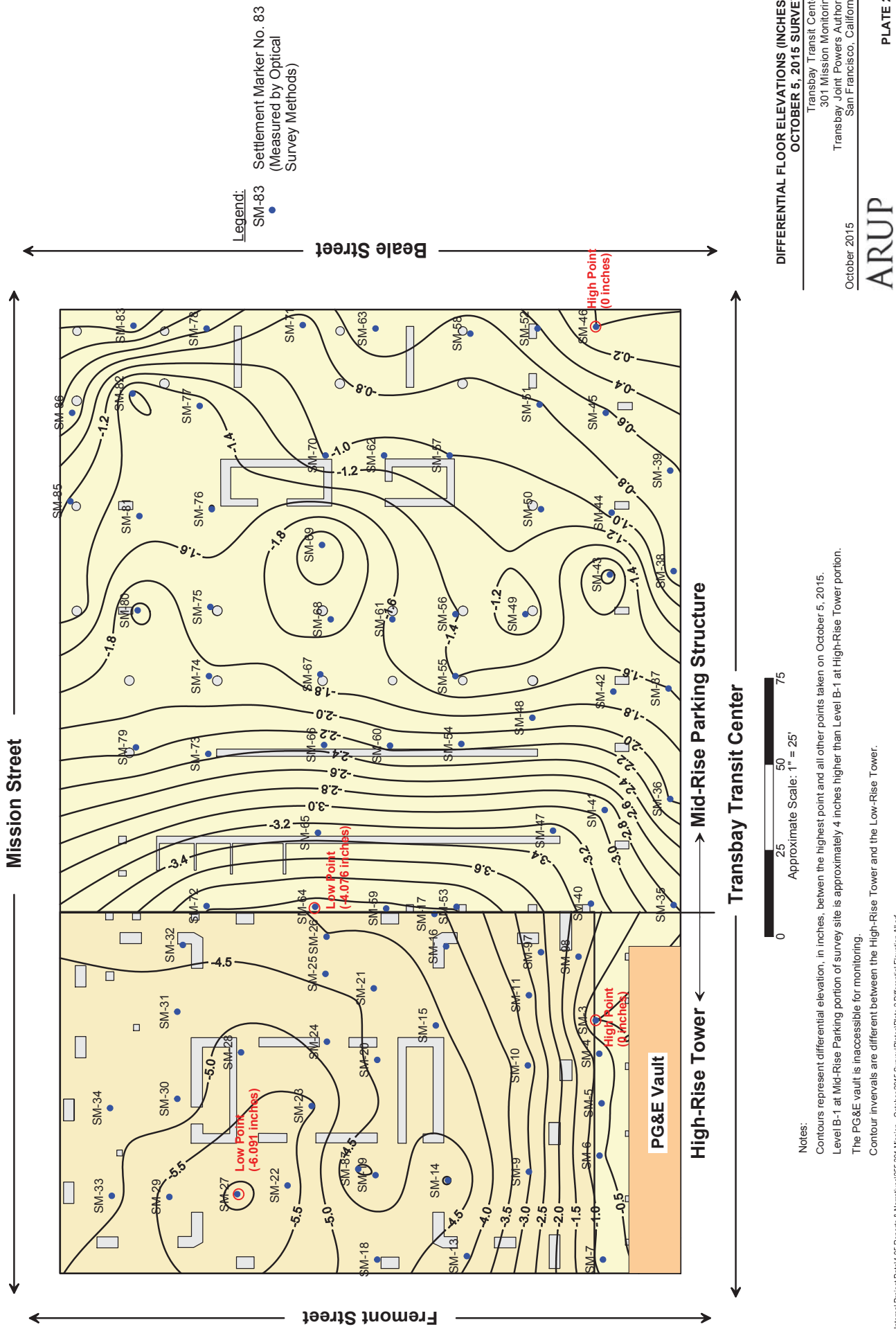
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 5, 2015.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
 OF 301 MISSION PROPERTY:
 PERIODIC SURVEY - OCTOBER 5, 2015

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

October 2015





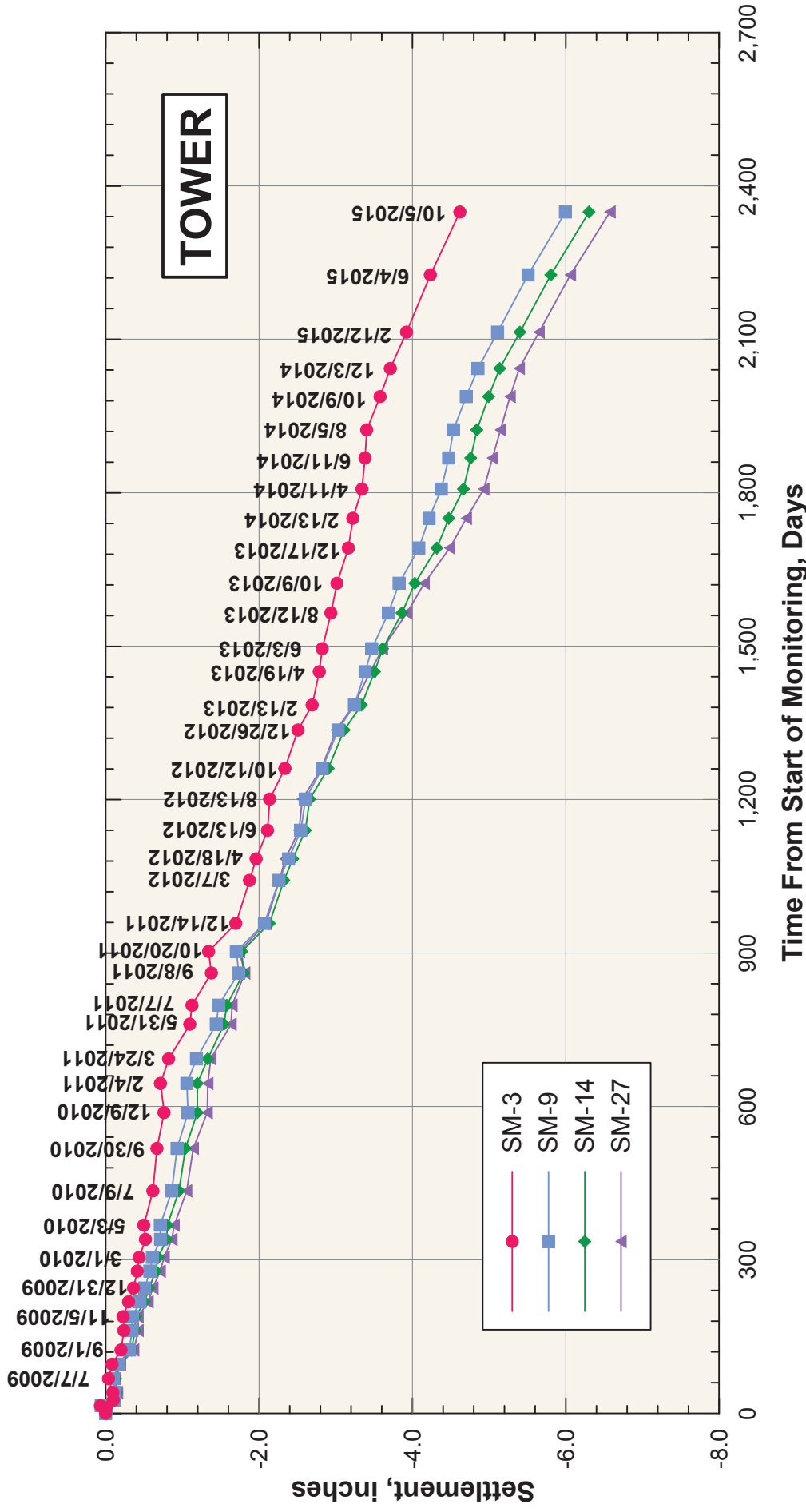
DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 OCTOBER 5, 2015 SURVEY

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

October 2015
ARUP
 PLATE 2

0 25 50 75
 Approximate Scale: 1" = 25'

Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on October 5, 2015.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.



Time From Start of Monitoring, Days



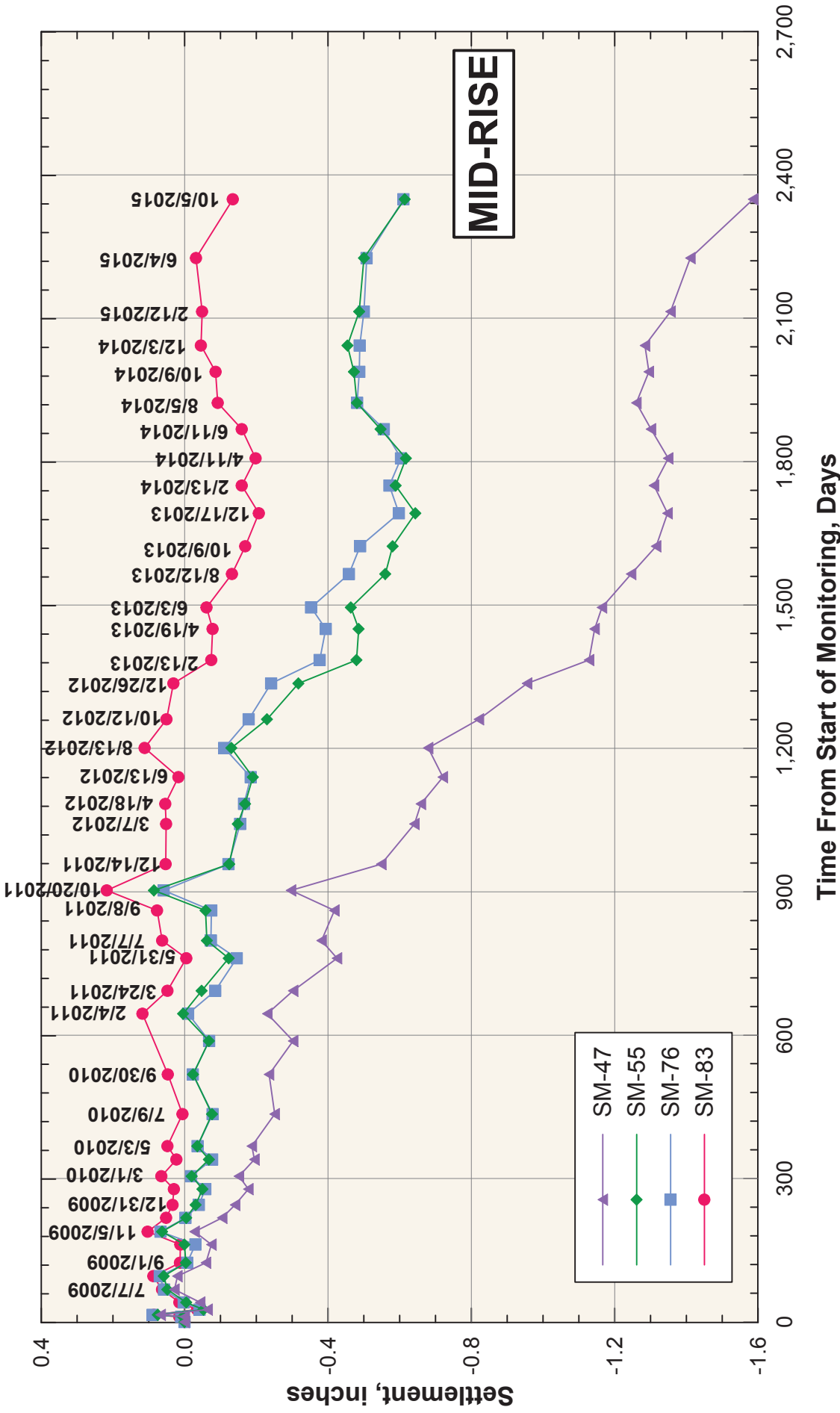
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH OCTOBER 5, 2015**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

October 2015



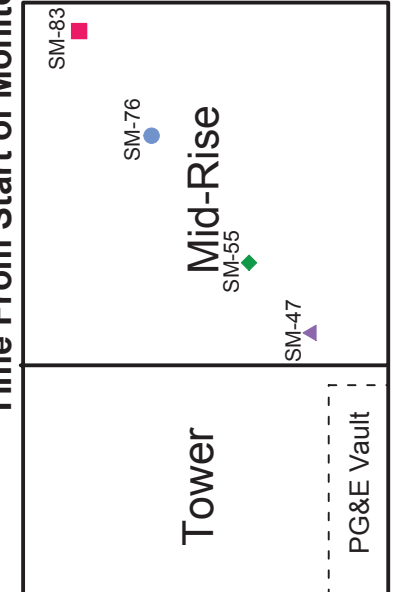


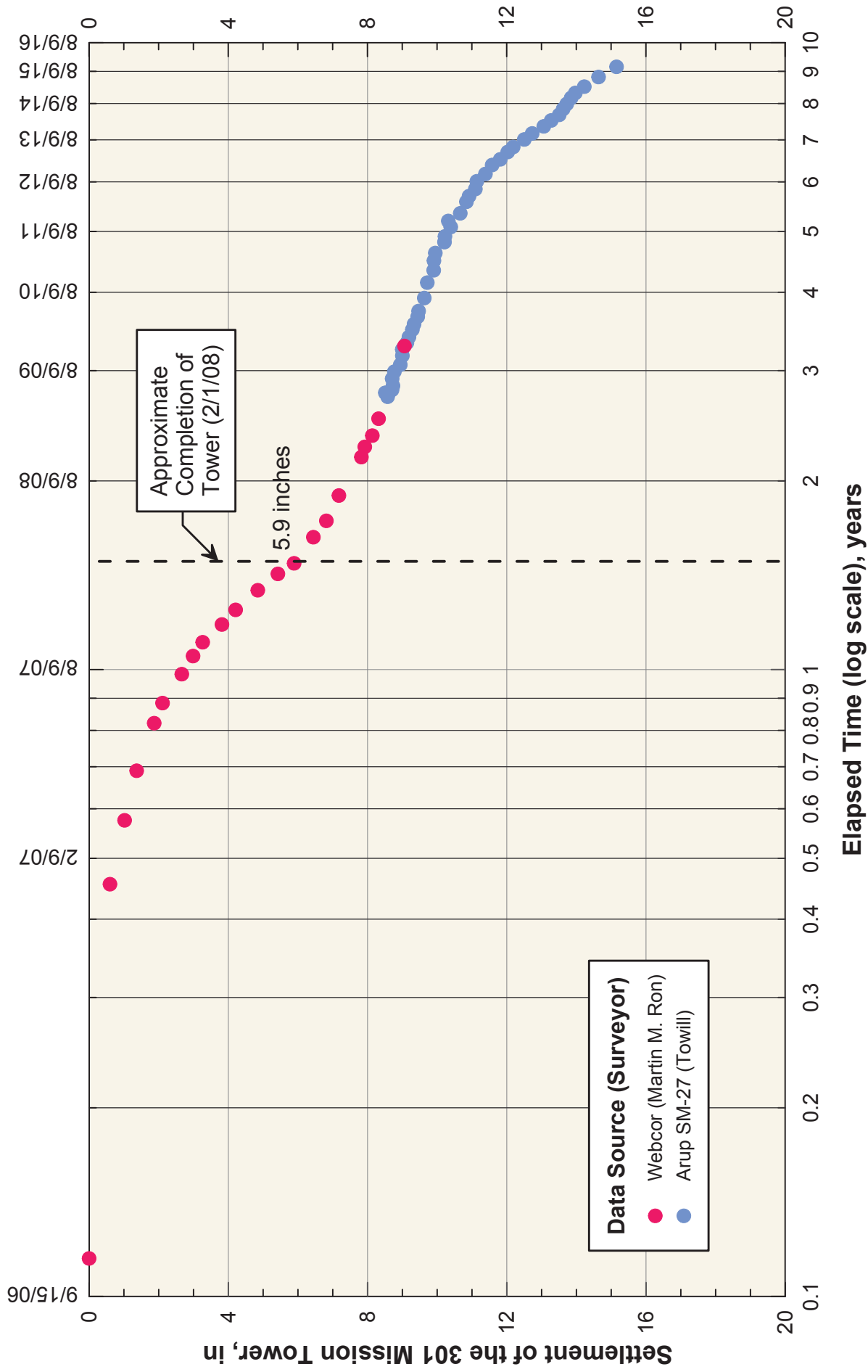
Time From Start of Monitoring, Days

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH OCTOBER 5, 2015**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

**Note:
Initial (Baseline) reading
taken on 04/30/09**





Approximate Completion of Tower (2/1/08)

5.9 inches

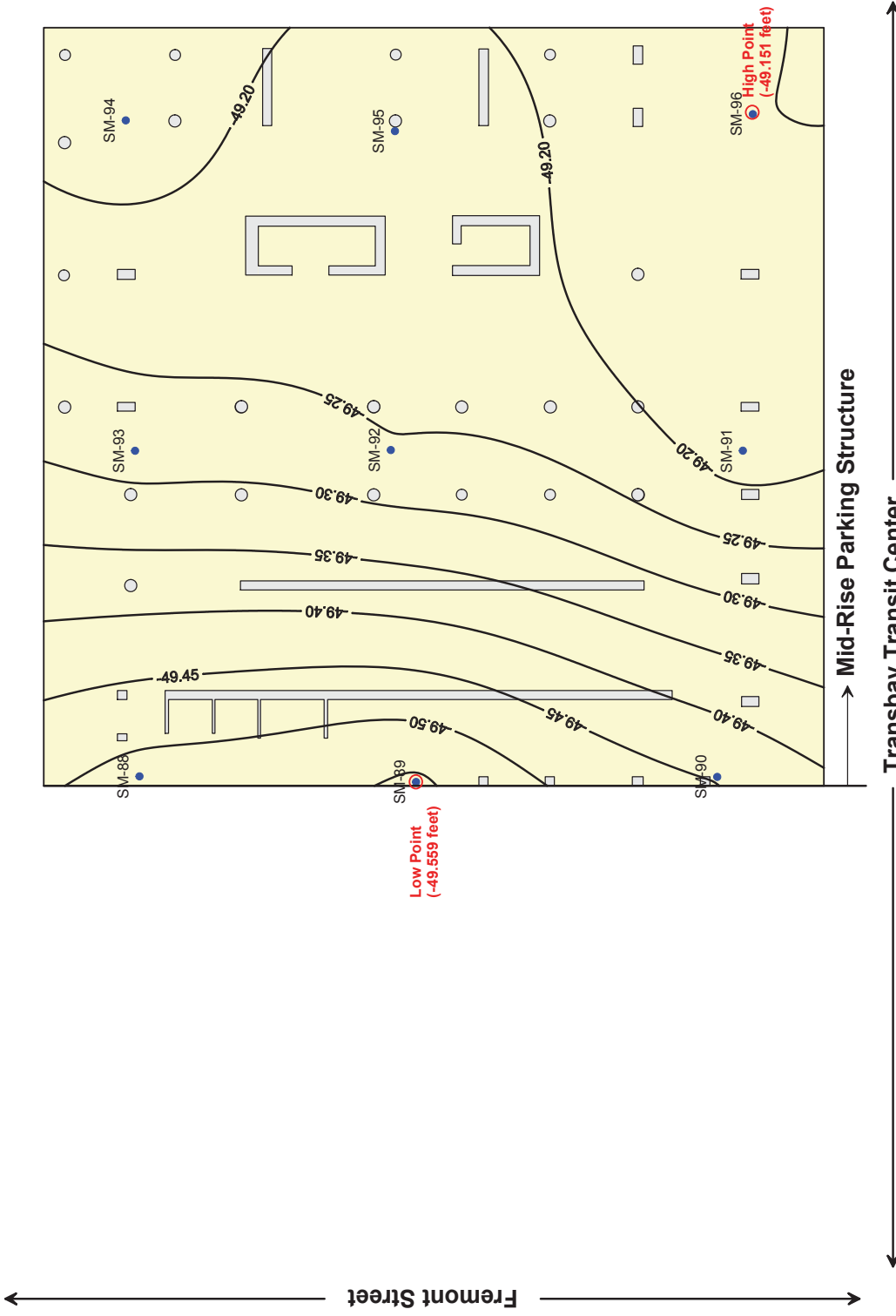
Data Source (Surveyor)
 ● Webcor (Martin M. Ron)
 ● Arup SM-27 (Towill)

Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California
 October 2015



Mission Street



Date of Survey Reading:
October 5, 2015

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

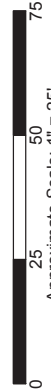
Maximum Differential
B-5 Level Basement
0.408 feet
(4.897 inches)

Fremont Street

Beale Street



Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on October 5, 2015.



Approximate Scale: 1" = 25'

J:\S\F\132000\1322424 Internal Project Data\4-05 Reports & Narratives\255 301 Mission - October 2015 Survey\Plates\Plate 7 B-5 Elevations.srf

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: OCTOBER 5, 2015 SURVEY

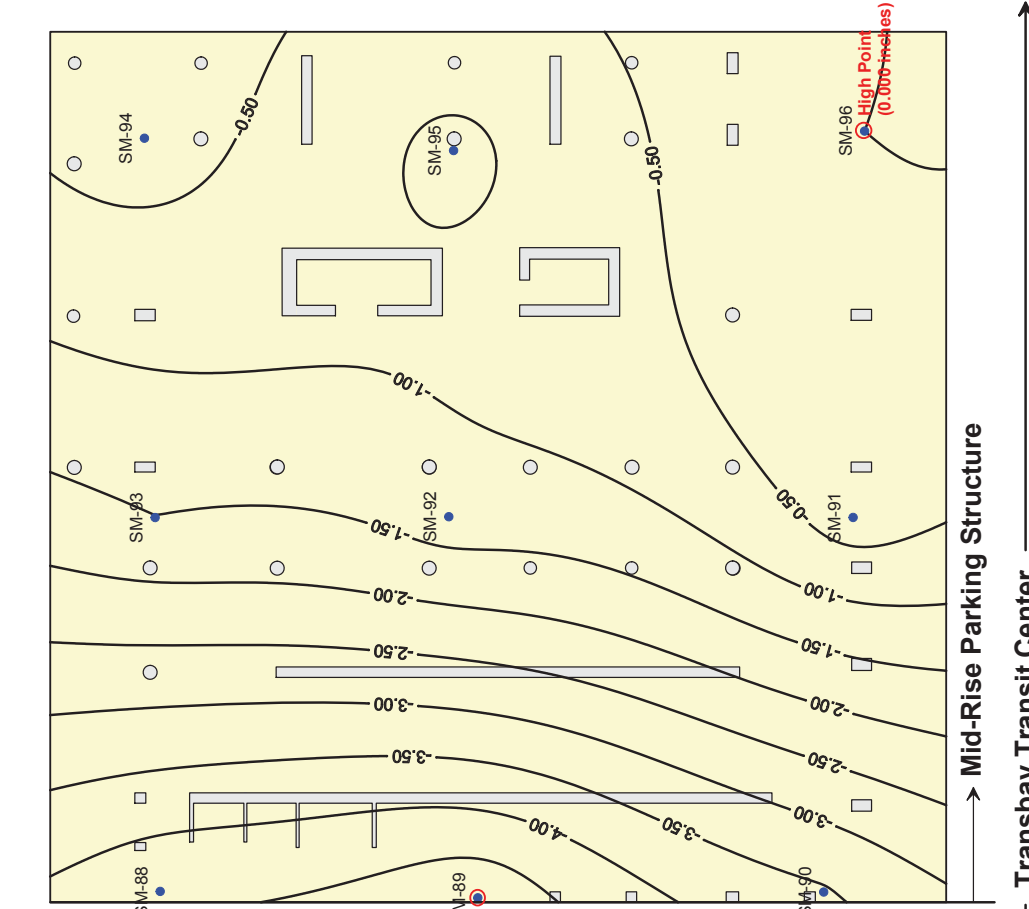
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

October 2015

ARUP

PLATE 7

Mission Street



Date of Survey Reading:
October 5, 2015

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

Maximum Differential
B-5 Level Basement
0.408 feet
(4.897 inches)

Fremont Street

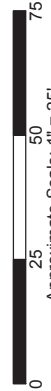
Beale Street

Mid-Rise Parking Structure

Transbay Transit Center



Notes:
Contours represent differential elevation, in inches, between the highest point and all other points taken on October 5, 2015.



Approximate Scale: 1" = 25'

J:\S\F\132000\1322424 Internal Project Data\4-05 Reports & Narratives\255-301 Mission - October 2015 Survey\Fates\Plate 8 B-5 Differential Elevations.srf

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: OCTOBER 5, 2015 SURVEY
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California
October 2015

ARUP

PLATE 8

From: Brian Dykes
Sent: Tuesday, February 23, 2016 10:44 AM
To: 'Steven Hood'
Cc: 'Andrew Yeskoo'; Dennis Turchon; 'Edward T. Schexnayder'; Barbara Pemberton
Subject:

Steven,
Here is the Arup Memorandum for the February 2016 settlement monitoring inside the 301 Mission Street property. Also included is the raw data provided by Towill Company, their surveyor.
This week Arup is taking manual readings of the inclinometers and piezometers outside of your building and I expect to send you that information next week.
Note that the next quarterly readings inside your building are due to be taken at the beginning of June, 2016.
However, we are still awaiting the draft time extension to the entry agreement which you were going to provide in January. The February readings were carried out based on a verbal agreement between the two of us.
Please let me know when we can expect the document for review.
Thanks, Brian.

Barbara,
Please print this message and the attachments in color for the correspondence file and also forward to the electronic file.
Thanks, Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax



 Please consider the environment before printing this message.

Check out our progress at <http://transbaycenter.org/construction-updates/construction-cameras>

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recipient, please notify the sender by telephoning 415-597-4620, or by forwarding an e-mail reply message addressed to TransAdmin@TransbayCenter.org confirming that you have already destroyed (deleted) the original e-mail communication and any and all copies thereof. Thank you.

Memorandum

ARUP

To	Brian Dykes (TJPA)	Date	February 19, 2015
Copies		Reference number	132242
From	Andrew Yeskoo (Arup)	File reference	4-05 258
Subject	Transbay Transit Center: Results of February 2016 Settlement Survey at 301 Mission Property	Page 1 of 1	

Note Typo:
should read
"2016"

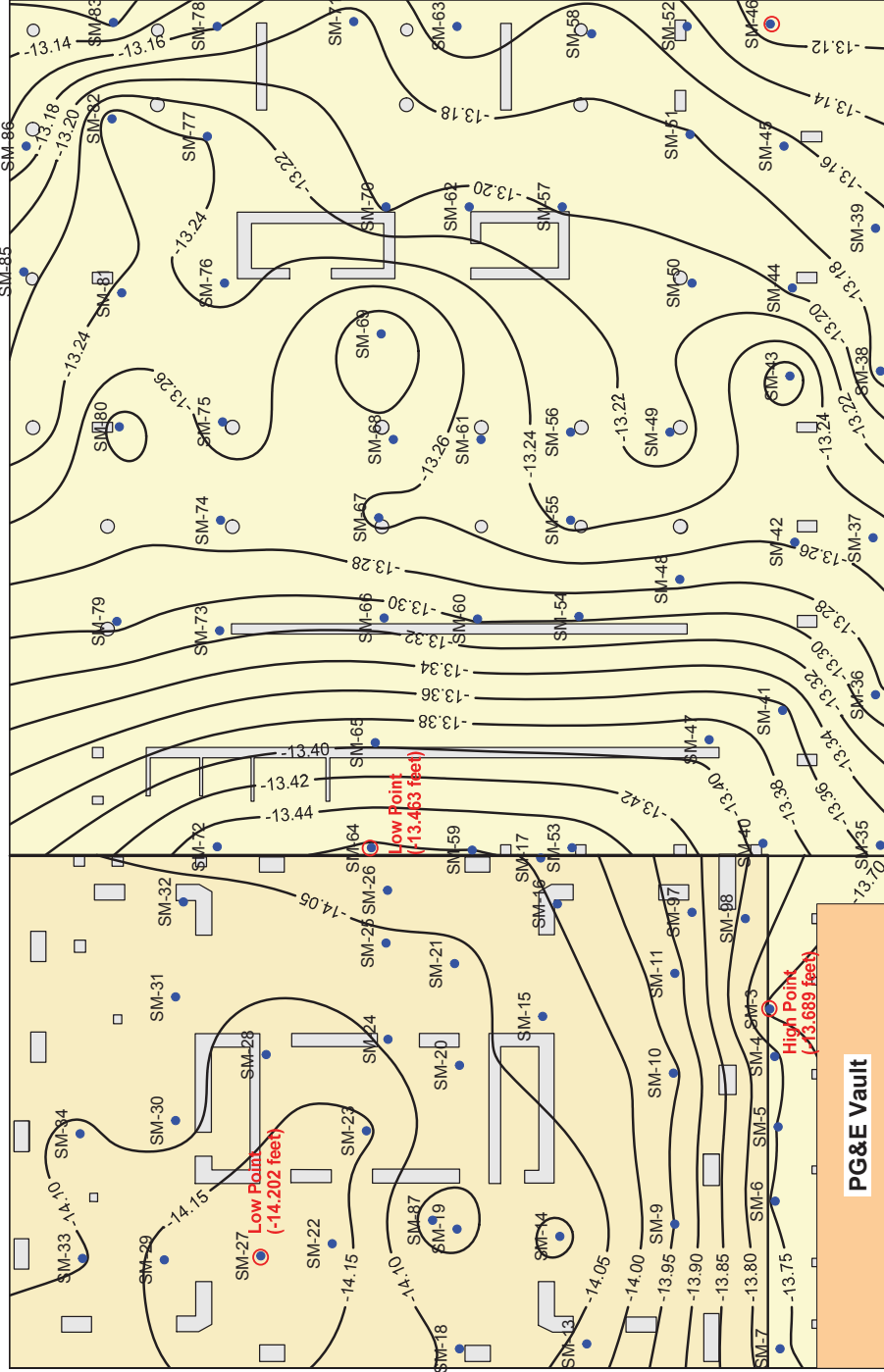
Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated October 30, 2015 with measurements made through February 2016.

List of Plates

- Plate 1 Floor Elevations at Level B-1 of 301 Mission Property: Periodic Survey – February 5, 2016
- Plate 2 Differential Floor Elevation (Inches) February 5, 2016 Survey
- Plate 3 Contours of Settlements Measured at the 1st Level Basement of the 301 Mission St. Structure Between 4/30/2009 & 2/5/2016
- Plate 4 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Tower: April 30, 2009 through February 5, 2016
- Plate 5 Settlement Over Time Floor Elevations at Level B-1 of 301 Mission Property – Mid-Rise: April 30, 2009 through February 5, 2016
- Plate 6 Settlements of the 301 Mission Tower Including Monitoring During Construction
- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: February 5, 2016 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: February 5, 2016 Survey

Mission Street

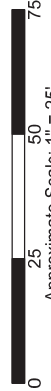
Fremont Street



Date of Survey Reading:
February 5, 2016

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.514 feet (6.163 inches)
Mid-Rise Parking	0.353 feet (4.231 inches)



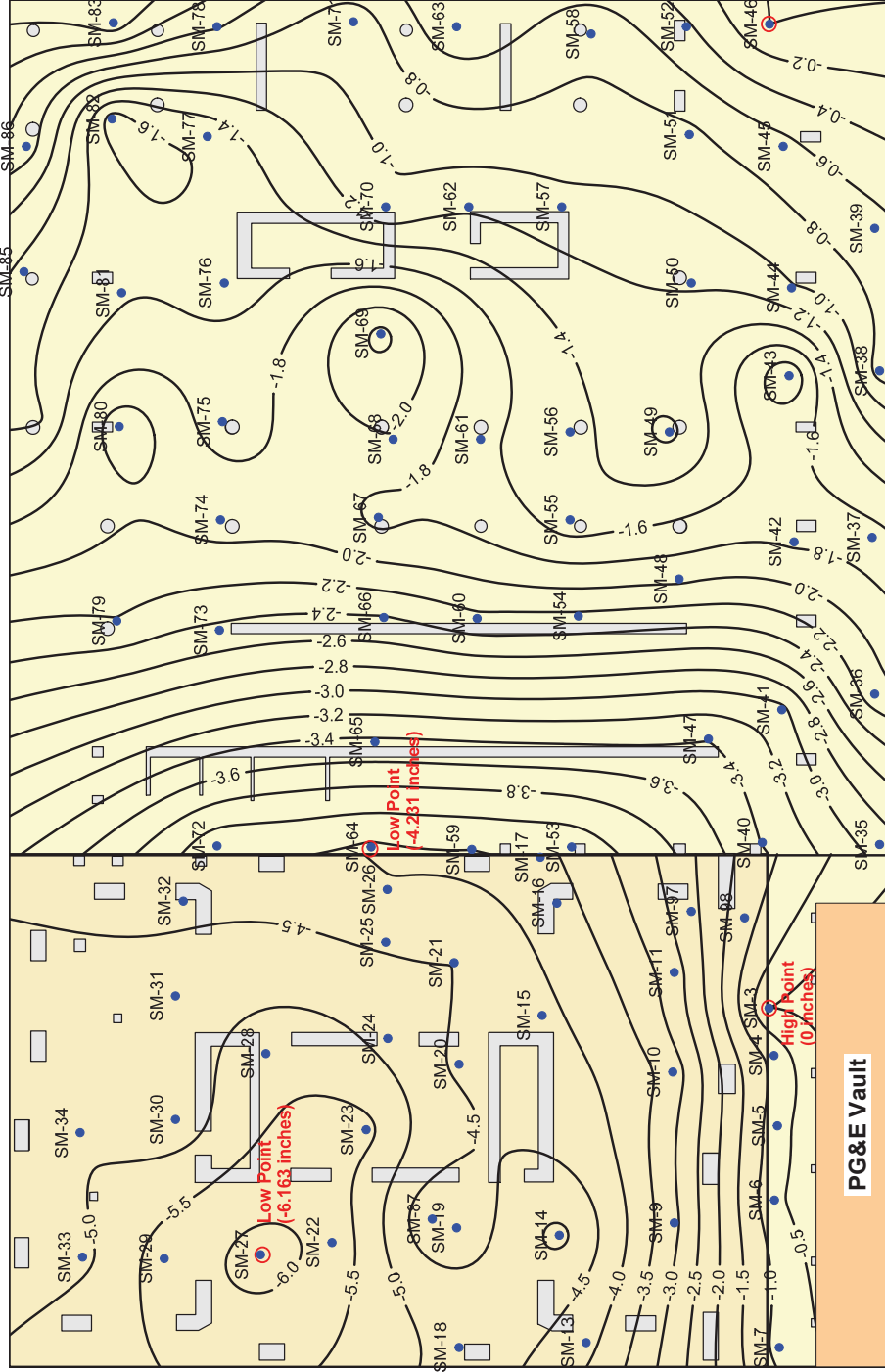
Approximate Scale: 1" = 25'

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on February 5, 2016.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - FEBRUARY 5, 2016
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

Mission Street

Fremont Street



Legend:
 SM-83 Settlement Marker No. 83
 (Measured by Optical Survey Methods)

High-Rise Tower ← Mid-Rise Parking Structure

Transbay Transit Center

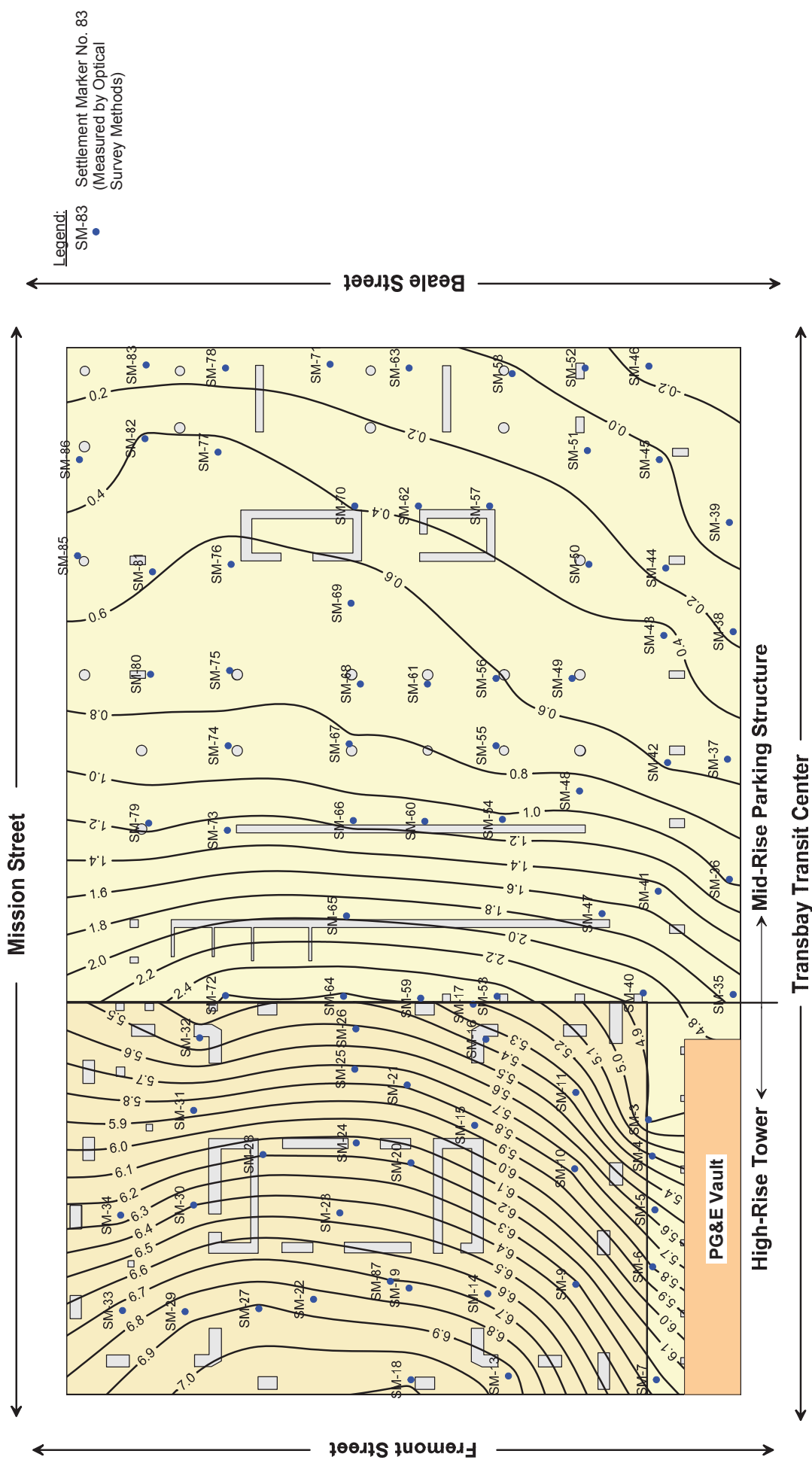


- Notes:
- Contours represent differential elevation, in inches, between the highest point and all other points taken on February 5, 2016.
 - Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 - The PG&E vault is inaccessible for monitoring.
 - Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

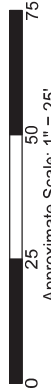
DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 FEBRUARY 5, 2016 SURVEY
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

February 2016
ARUP

PLATE 2



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)



Approximate Scale: 1" = 25'

- Notes:
- Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on February 5, 2016.
 - Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 - The PG&E vault is inaccessible for monitoring.
 - Negative values of settlement (within Low-rise Tower) indicate uplift.

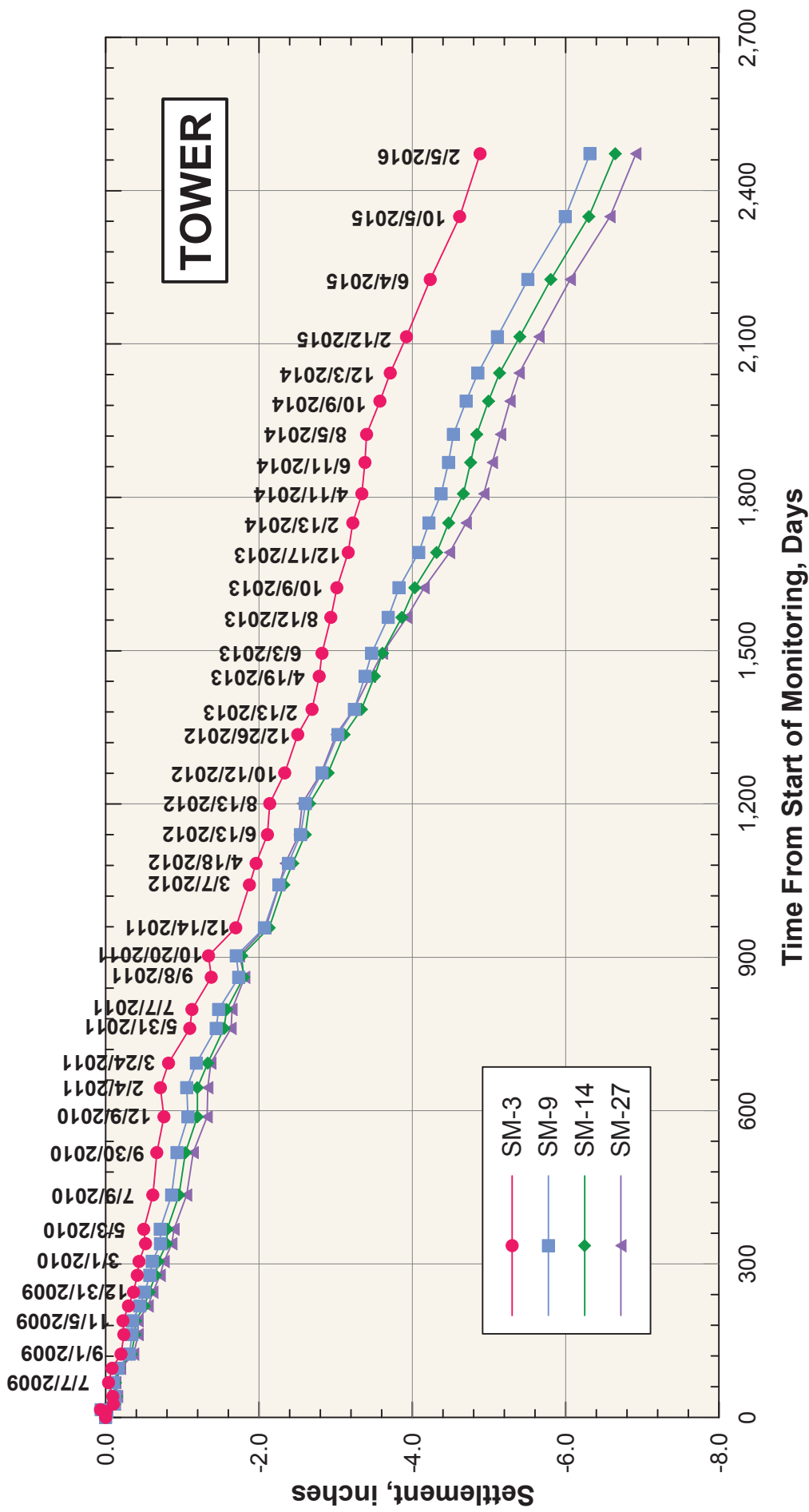
CONTOURS OF SETTLEMENTS MEASURED AT THE
 1ST LEVEL BASEMENT OF THE 301 MISSION ST
 STRUCTURE BETWEEN 4/30/2009 & 2/5/2016

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

February 2016

ARUP

PLATE 3



Time From Start of Monitoring, Days



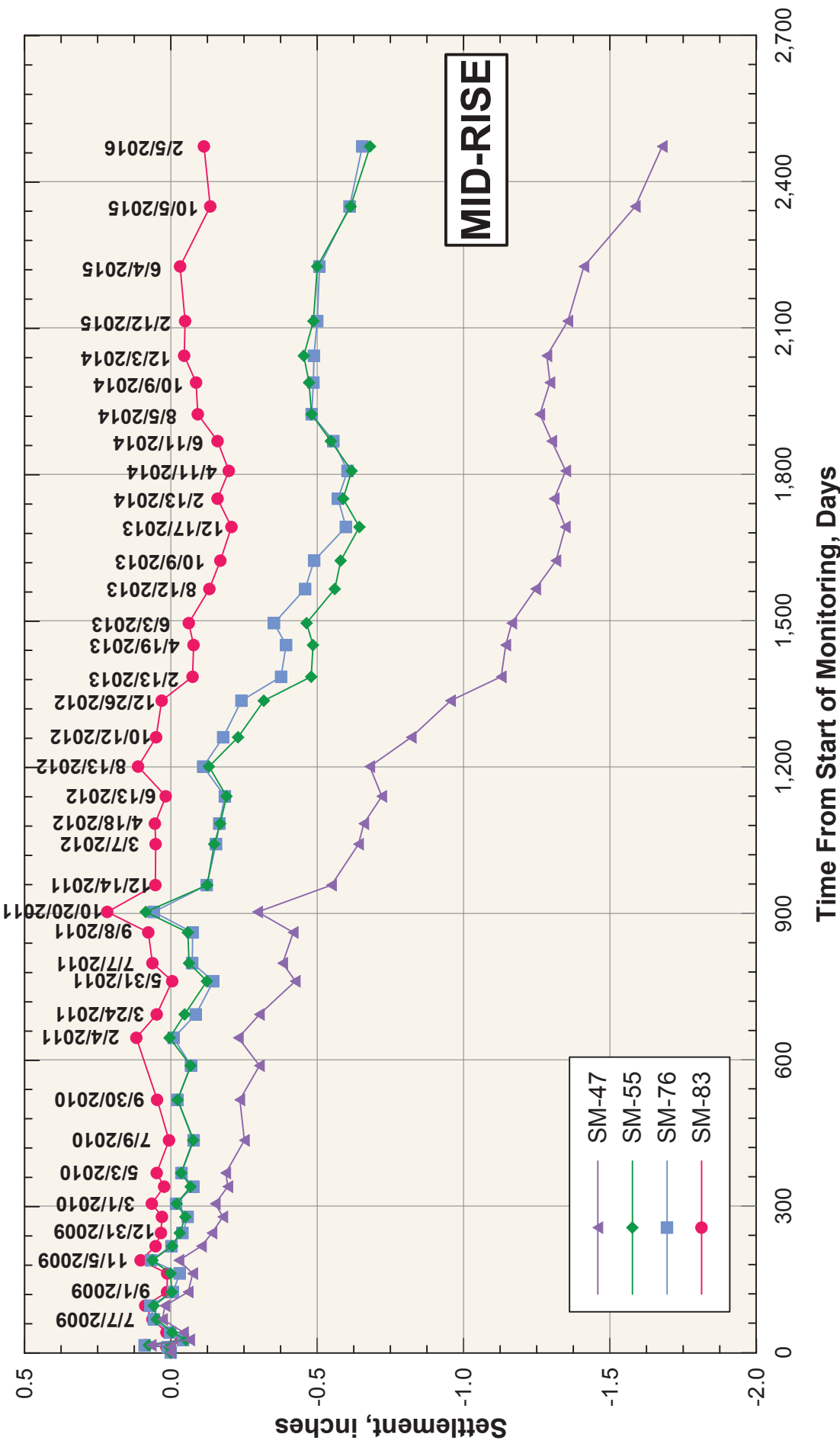
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- TOWER:
APRIL 30, 2009 THROUGH FEBRUARY 5, 2016**

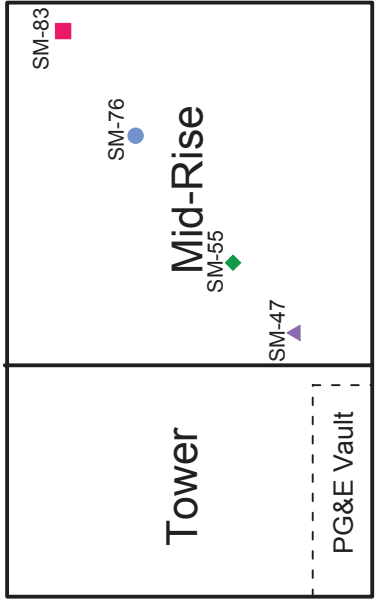
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

February 2016





Time From Start of Monitoring, Days



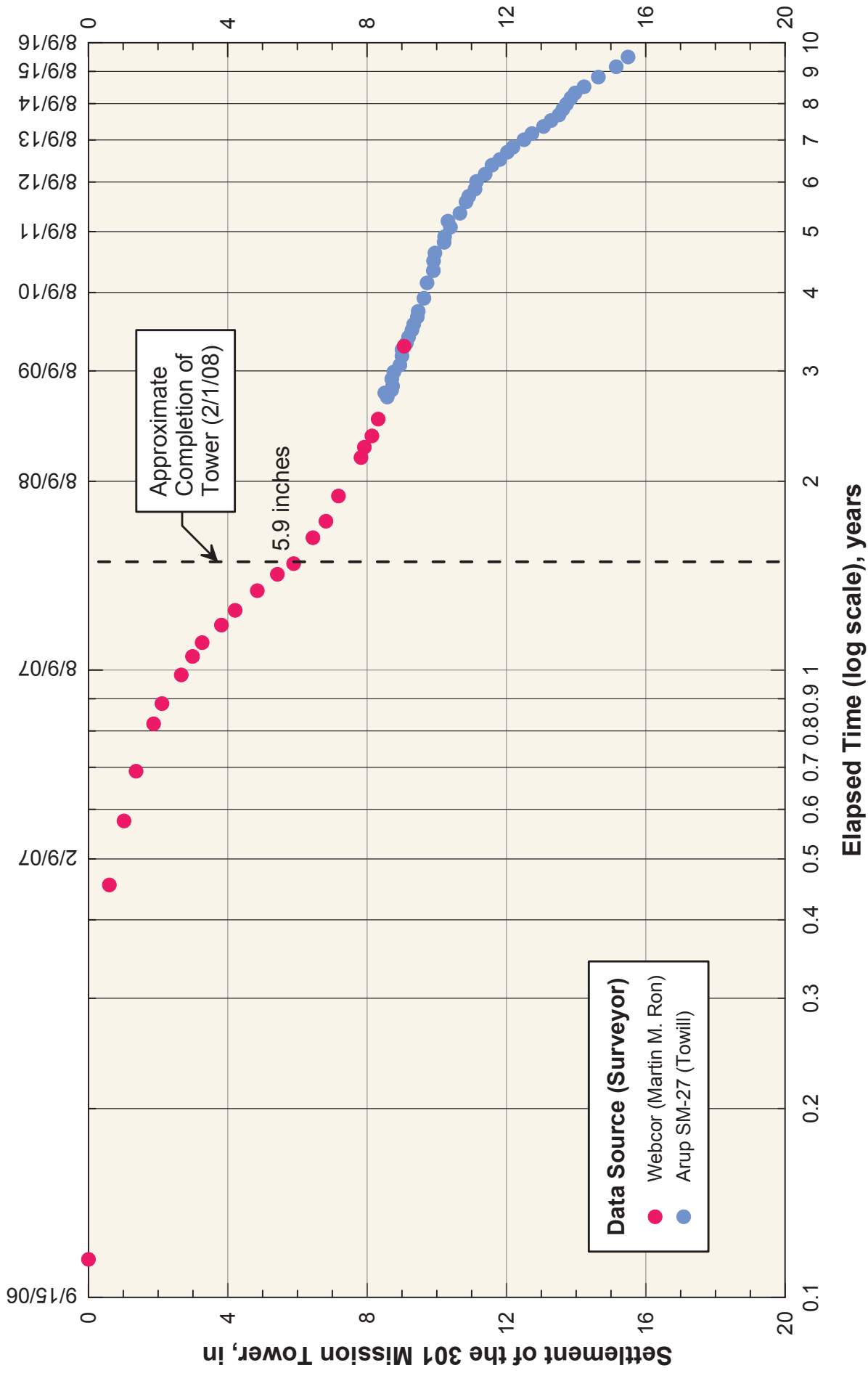
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH FEBRUARY 5, 2016**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California



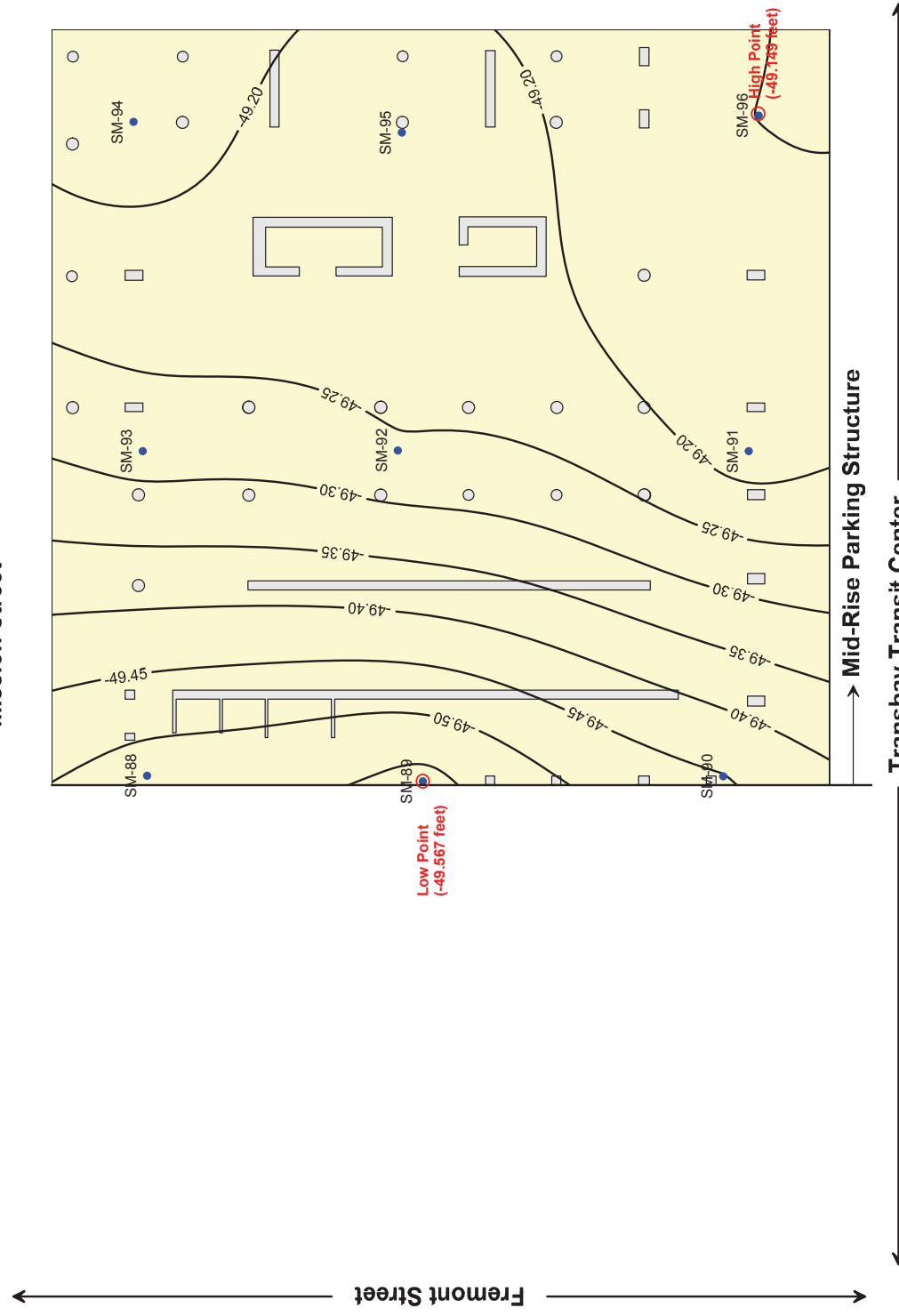
February 2016



Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)



Mission Street



Date of Survey Reading:
February 5, 2016

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical Survey Methods)

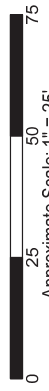
Maximum Differential
B-5 Level Basement
0.417 feet (5.008 inches)

Beale Street

Fremont Street

Mid-Rise Parking Structure

Transbay Transit Center



Approximate Scale: 1" = 25'

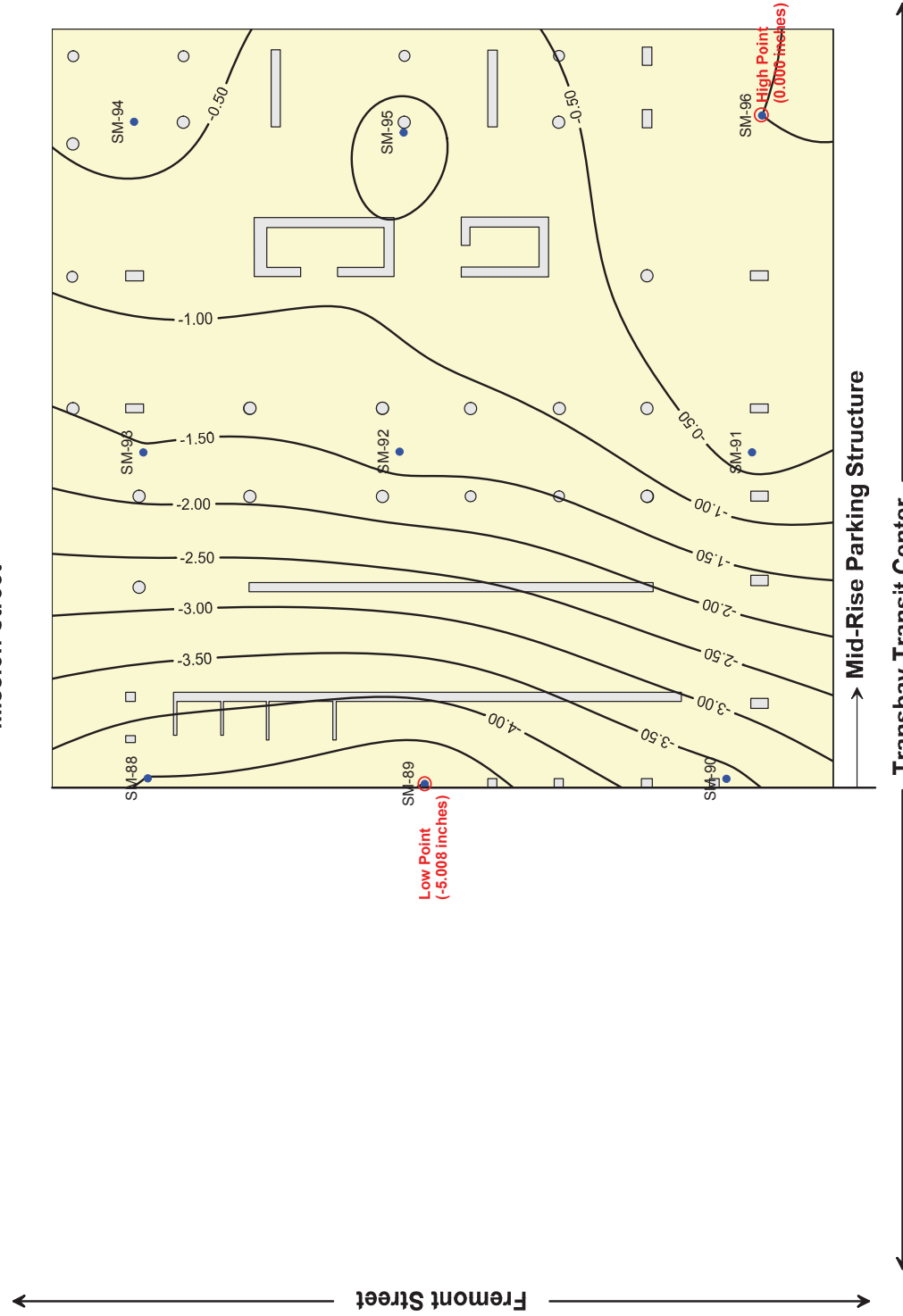
Notes:
Contours represent elevation, in feet (CGCSF Datum), from survey readings taken on February 5, 2016.

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY: FEBRUARY 5, 2016 SURVEY
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

February 2016

ARUP

Mission Street



Date of Survey Reading:
February 5, 2016

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

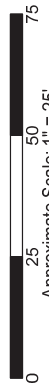
Maximum Differential
B-5 Level Basement
0.417 feet (5.008 inches)

Beale Street

Fremont Street

Mid-Rise Parking Structure

Transbay Transit Center



Notes:
Contours represent differential elevation, in inches, between the highest point and all other points taken on February 5, 2016.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: FEBRUARY 5, 2016 SURVEY
Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

February 2016
ARUP

PLATE 8

From: Brian Dykes
Sent: Wednesday, June 22, 2016 8:48 AM
To: 'Steven Hood'
Cc: Mark Zabaneh; Nila Gonzales
Subject: 301 Mission Street Settlement Readings

Steven,
Here is the June 16 settlement monitoring raw data from Towill and the memorandum report from Arup. Please ignore the incorrect label of February in the file name. The memo is dated June 16, 2016.
Brian.

Brian Dykes
Principal Engineer
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
415 597 4617 phone
415 597 4615 fax



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Memorandum

ARUP

To	Brian Dykes (TJPA)	Date June 16, 2016
Copies		Reference number 132242
From	Andrew Yeskoo (Arup)	File reference 4-05 260
Subject	Transbay Transit Center: Results of June 2016 Settlement Survey at 301 Mission Property	Page 1 of 1

Under Arup's Geotechnical Contract with the Transbay Joint Powers Authority through Pelli Clark Pelli Architects, Arup is required to monitor the settlements of the buildings adjacent to the Transbay Transit Center prior to and during construction. We began the monitoring program for the 301 Mission property in April of 2009. This memorandum and the attached plates present an update to our memorandum dated February 19, 2016 with measurements made through June 2016.

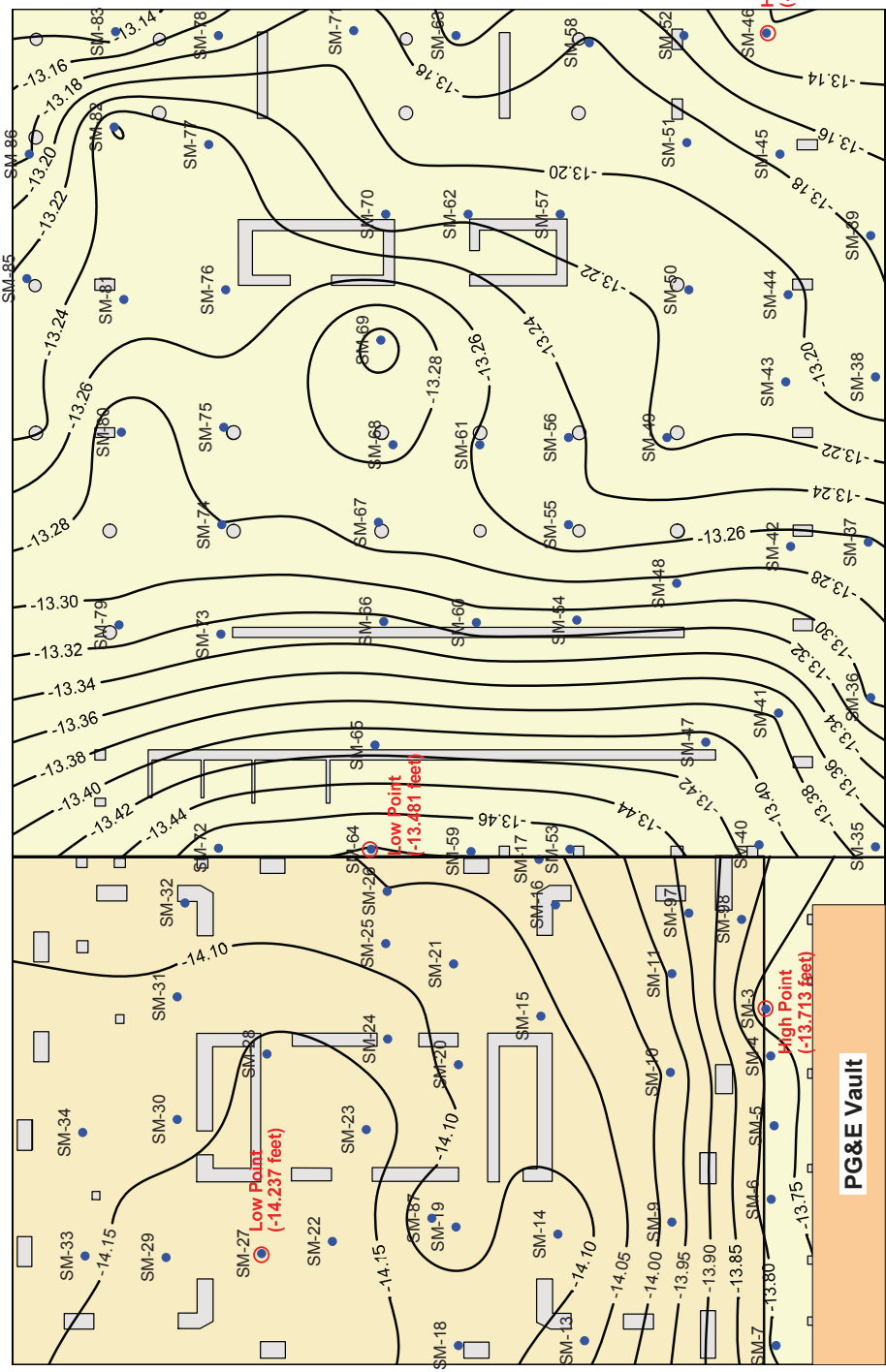
List of Plates

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- Plate 7 Floor Elevation at Basement Level B-5 of 301 Mission Property: June 10, 2016 Survey
- Plate 8 Differential Floor Elevations (Inches) at Basement Level B-5: June 10, 2016 Survey

Mission Street

Beale Street

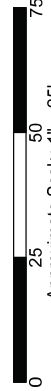
Fremont Street



Date of Survey Reading:
June 10, 2016

Legend:
SM-83 Settlement Marker No. 83
(Measured by Optical Survey Methods)

Maximum Differential	
High-Rise Tower	0.524 feet (6.283 inches)
Mid-Rise Parking	0.361 feet (4.326 inches)



Approximate Scale: 1" = 25'

FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY:
PERIODIC SURVEY - JUNE 10, 2016
Transbay Transit Center
301 Mission
Transbay Joint Powers Authority
San Francisco, California

Notes:
Contours represent elevation, in feet (CCSF Datum), from survey readings taken on June 10, 2016.
Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
The PG&E vault is inaccessible for monitoring.

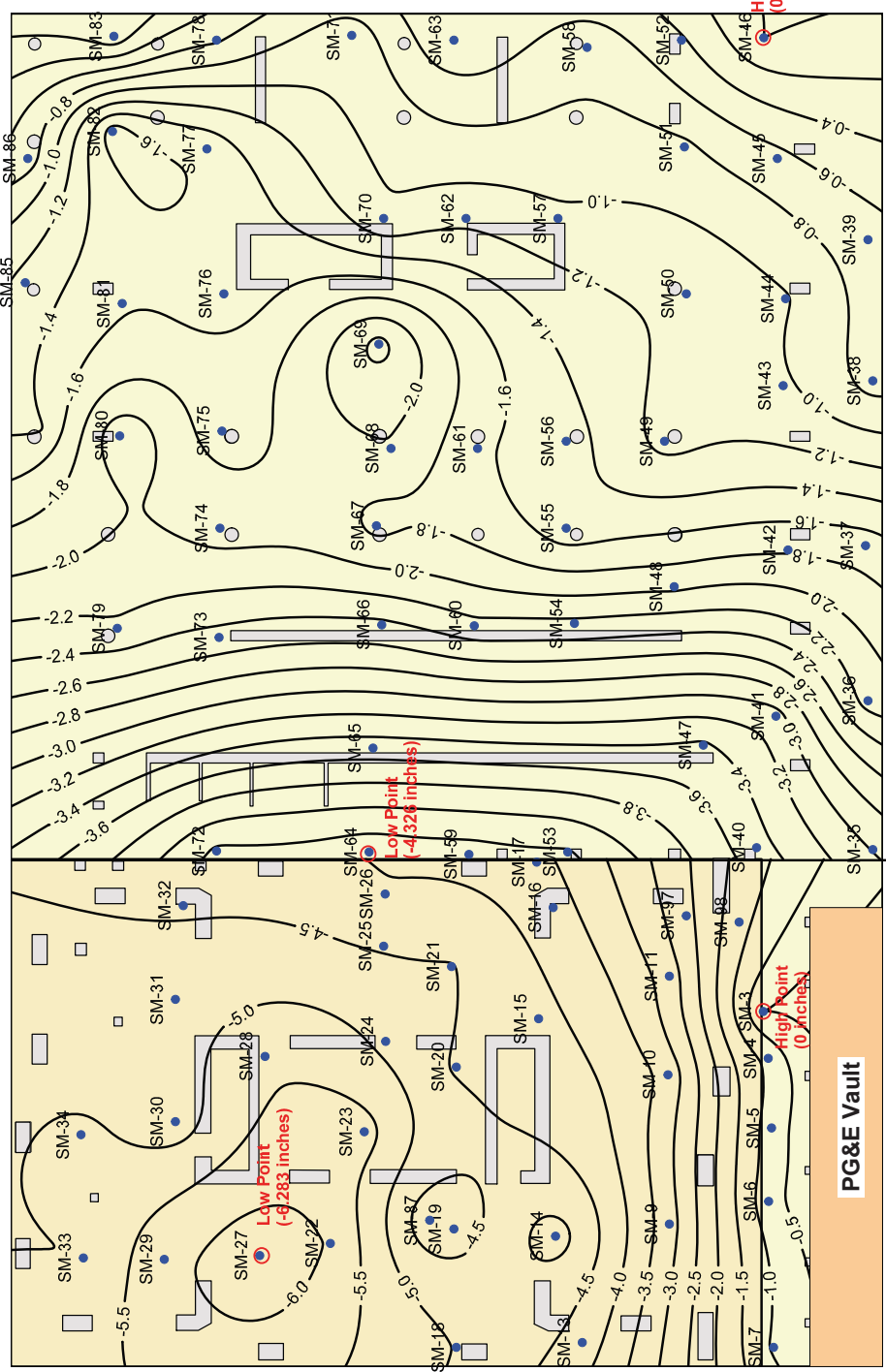
June 2016

ARUP

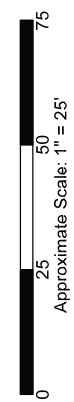
PLATE 1

Mission Street

Fremont Street



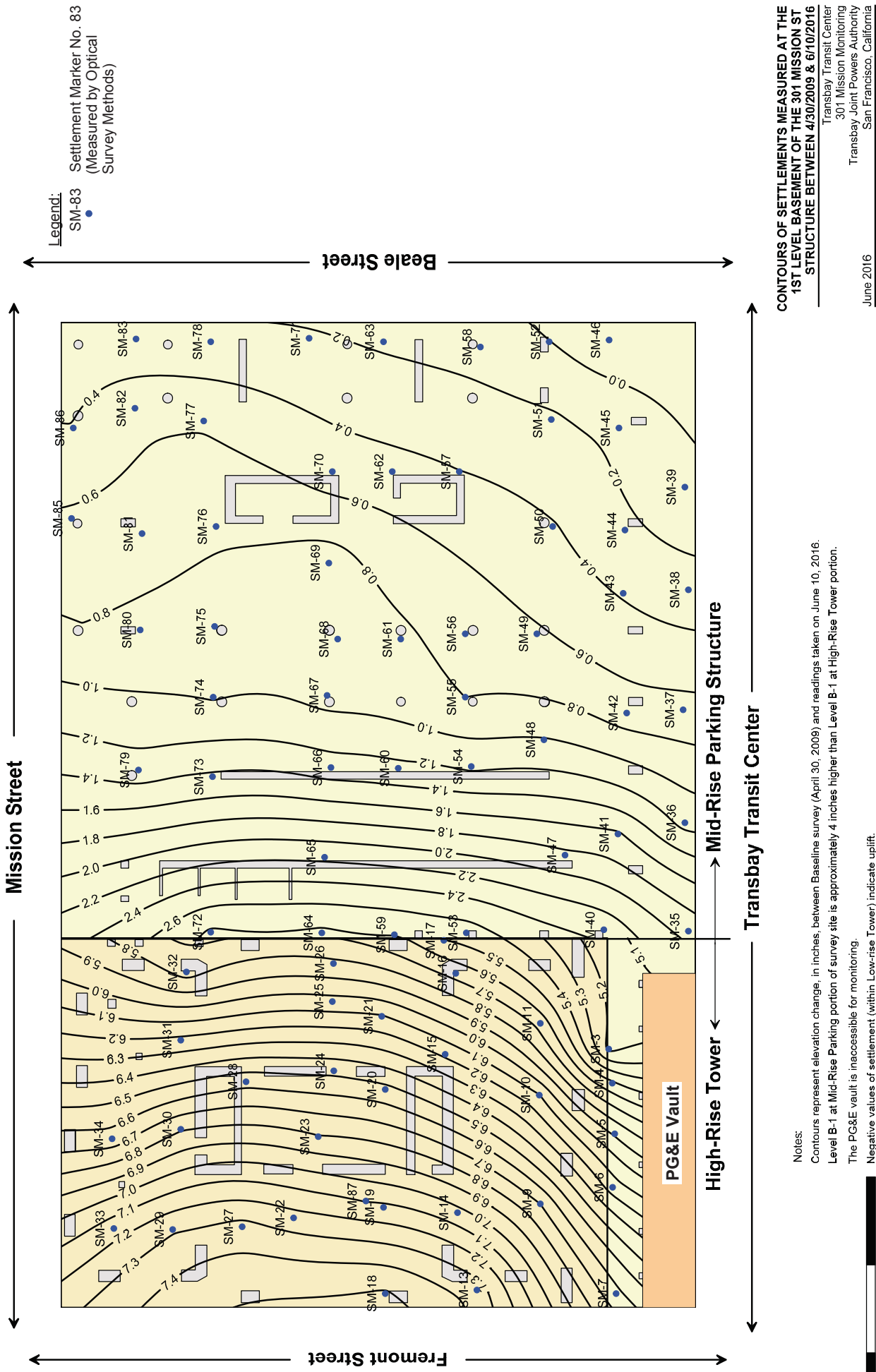
Legend:
 SM-83 Settlement Marker No. 83
 (Measured by Optical Survey Methods)



Notes:
 Contours represent differential elevation, in inches, between the highest point and all other points taken on June 10, 2016.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
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 Contour intervals are different between the High-Rise Tower and the Low-Rise Tower.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
 JUNE 10, 2016 SURVEY
 Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

ARUP
 PLATE 2



Legend:
 SM-83
 Settlement Marker No. 83
 (Measured by Optical
 Survey Methods)

CONTOURS OF SETTLEMENTS MEASURED AT THE
 1ST LEVEL BASEMENT OF THE 301 MISSION ST
 STRUCTURE BETWEEN 4/30/2009 & 6/10/2016

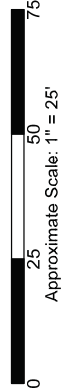
Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

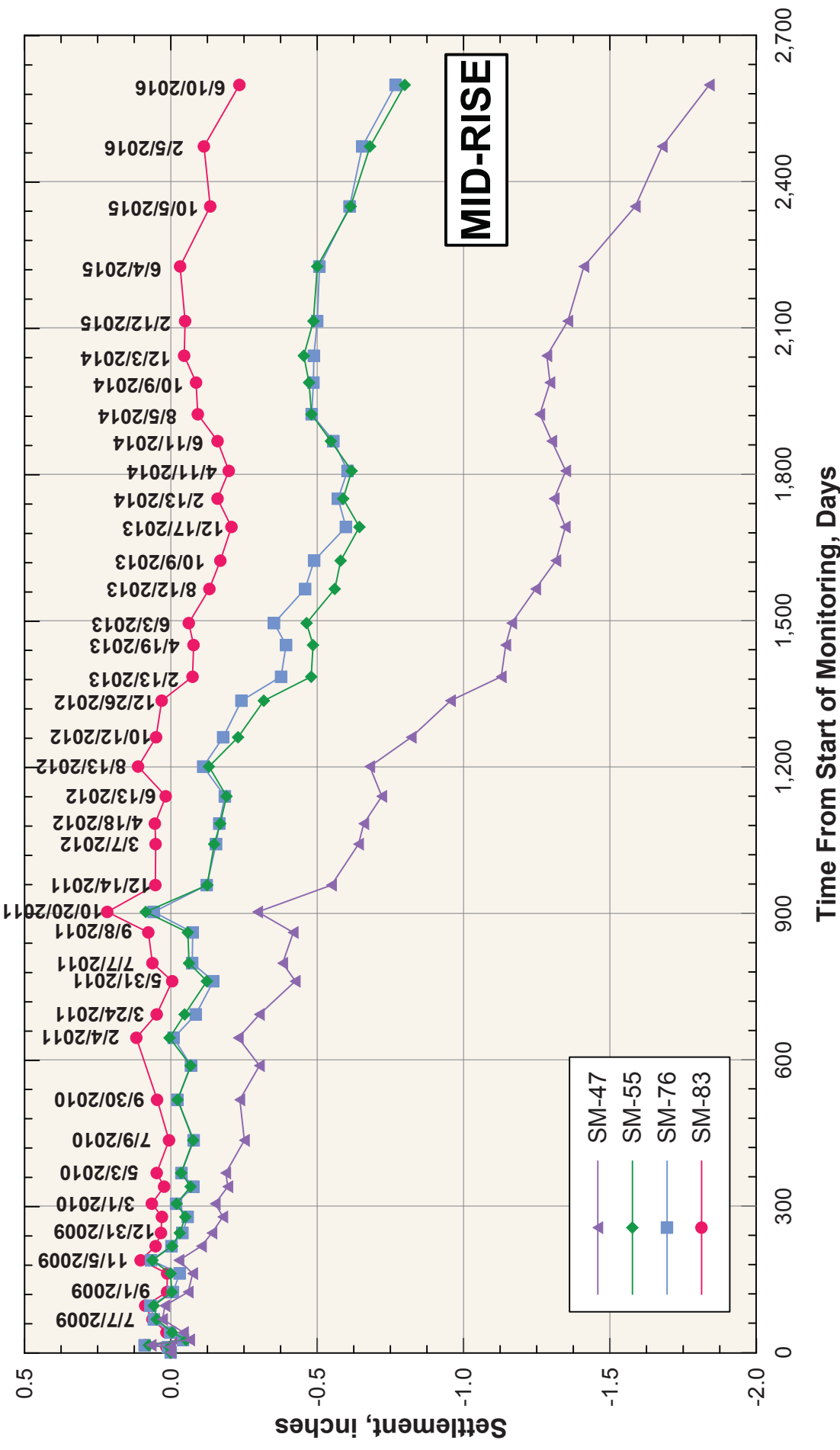
June 2016

ARUP

PLATE 3

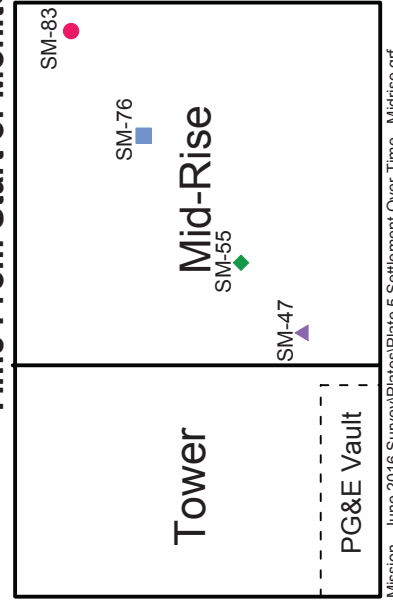
Notes:
 Contours represent elevation change, in inches, between Baseline survey (April 30, 2009) and readings taken on June 10, 2016.
 Level B-1 at Mid-Rise Parking portion of survey site is approximately 4 inches higher than Level B-1 at High-Rise Tower portion.
 The PG&E vault is inaccessible for monitoring.
 Negative values of settlement (within Low-rise Tower) indicate uplift.





MID-RISE

Time From Start of Monitoring, Days



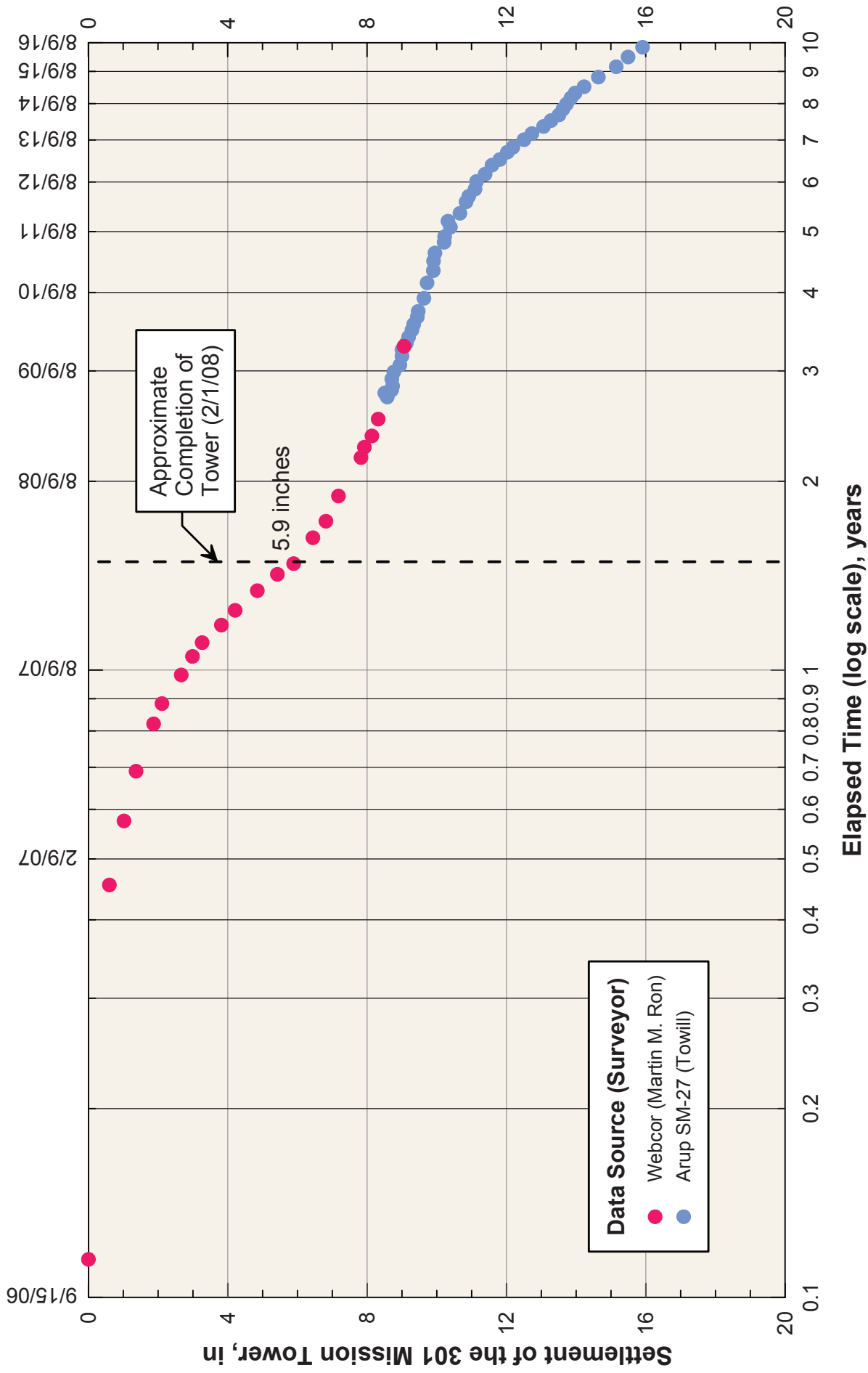
Note:
Initial (Baseline) reading
taken on 04/30/09

**SETTLEMENT OVER TIME
FLOOR ELEVATIONS AT LEVEL B-1
OF 301 MISSION PROPERTY- MID-RISE:
APRIL 30, 2009 THROUGH JUNE 10, 2016**

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2016

ARUP



Beginning of Tower Construction: 8/9/06
 End of Tower Construction: 2/1/08
 Construction Duration: 542 days (1.5 years)

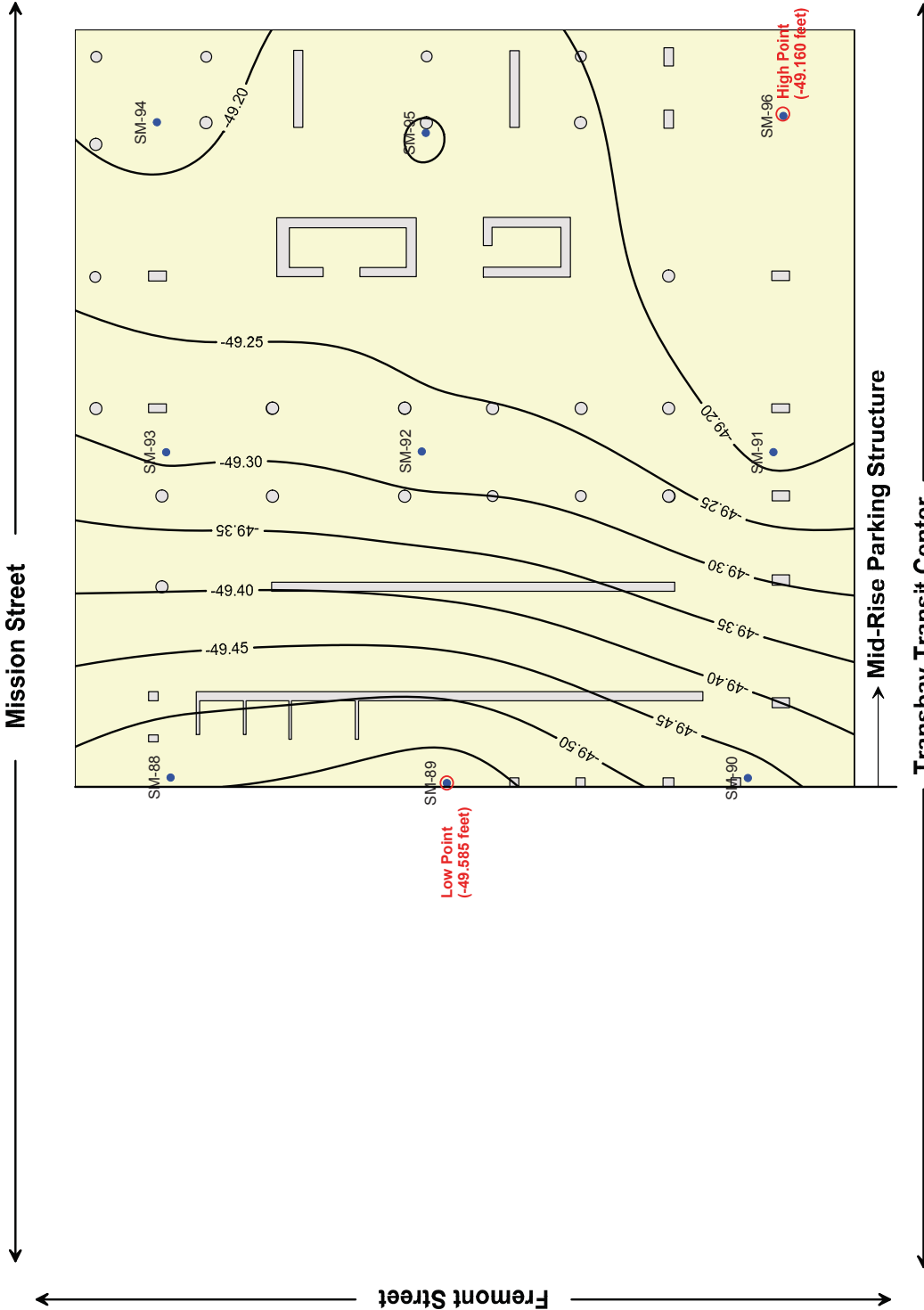
SETTLEMENTS OF THE 301 MISSION TOWER INCLUDING MONITORING DURING CONSTRUCTION

Transbay Transit Center
 301 Mission Monitoring
 Transbay Joint Powers Authority
 San Francisco, California

June 2016



Mission Street



Date of Survey Reading:
June 10, 2016

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

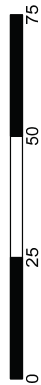
Maximum Differential
B-5 Level Basement
0.425 feet (5.105 inches)

Beale Street

Fremont Street

Mid-Rise Parking Structure

Transbay Transit Center



Approximate Scale: 1" = 25'

FLOOR ELEVATION AT BASEMENT LEVEL B-5
OF 301 MISSION PROPERTY, JUNE 10, 2016 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

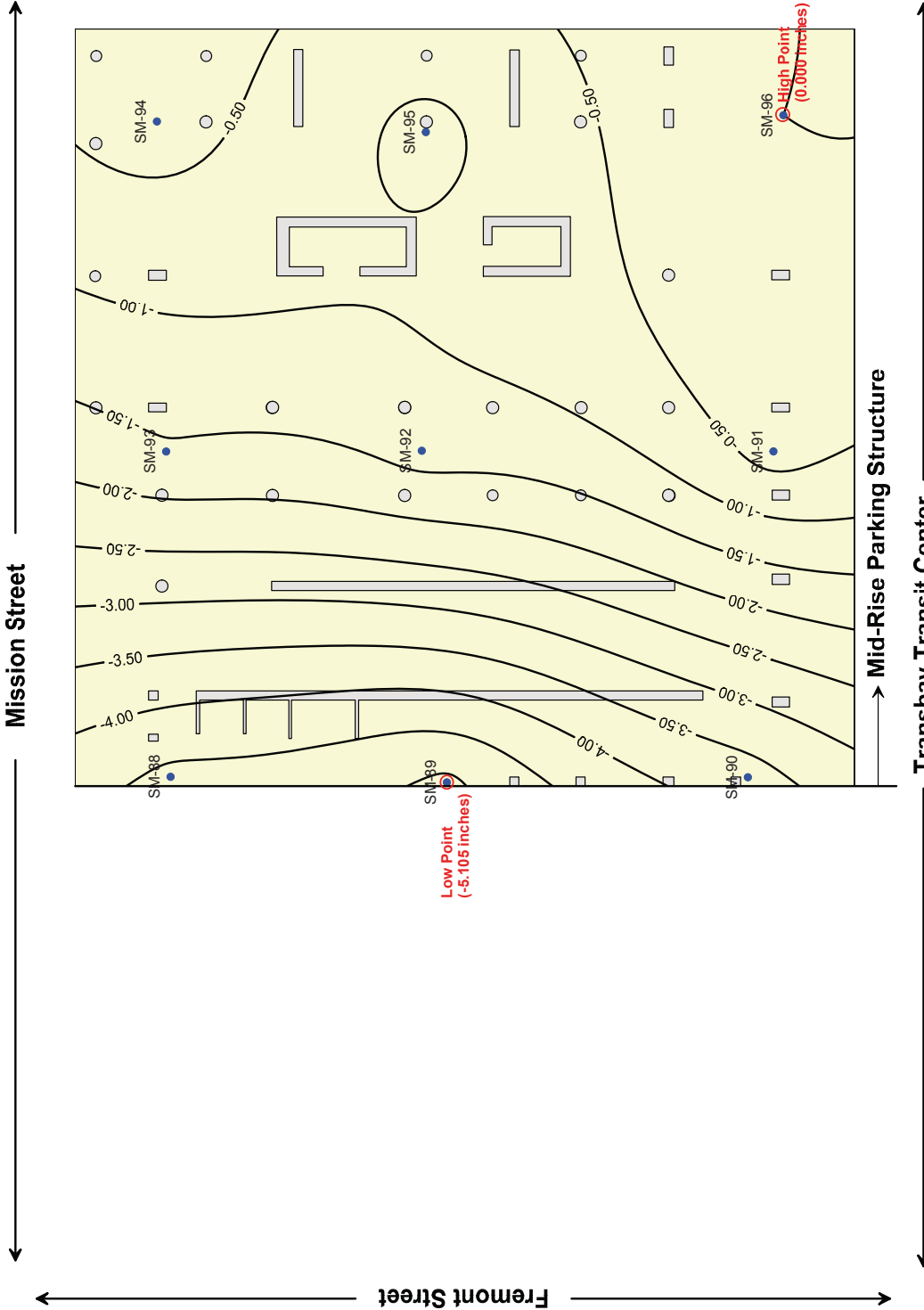
June 2016



PLATE 7

Notes:
Contours represent elevation, in feet (CGCSF Datum), from survey readings taken on June 10, 2016.

Mission Street



Date of Survey Reading:
June 10, 2016

Legend:
SM-88 Settlement Marker No. 88
(Measured by Optical
Survey Methods)

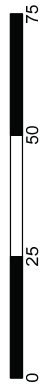
Maximum Differential
B-5 Level
Basement
0.425 feet
(5.105 inches)

Beale Street

Fremont Street

Mid-Rise Parking Structure

Transbay Transit Center



Approximate Scale: 1" = 25'

Notes:
Contours represent differential elevation, in inches, between the highest point and all other points taken on June 10, 2016.

DIFFERENTIAL FLOOR ELEVATIONS (INCHES)
AT BASEMENT LEVEL B-5: JUNE 10, 2016 SURVEY

Transbay Transit Center
301 Mission Monitoring
Transbay Joint Powers Authority
San Francisco, California

June 2016



PLATE 8