CONTINUED FROM SHEET 1

e. Gouges and notches are not permitted. The transitional slope of any area where gouges and notches have been removed shall not exceed 1:5.
f. Material removed by grinding that extends more than 1/16 inch below the surface of the base metal shall be filled with weld metal. The contour of the weld at the ends shall provide a smooth transition, free of notches and sharp corners.

5. Continuity Plate
a. Continuity plates shall be detailed as illustrated in Detail 11 on Sheet 3.
b. The weld attaching the continuity plate to the column flange shall be as follows:
i. Use a CJP groove weld for the full length of the groove preparation.
ii. When backing bars are omitted, the root shall be backgouged and back welded.
iii. When backing bars are used and remain in place, backing bars shall be attached to the column flanges with a reinforcing fillet weld.
iv. Fillet weld shall not be used to connect backing bars to continuity plates.
v. The fillet weld size need not exceed the minimum size requirements of AWS Table 5.8.
c. Weld terminations near the end of the column flange tips may be completed using weld tabs as follows:
i. Weld tabs may be steel or nonfusible material.
ii. Weld terminations near the radius of the column need not be made using weld tabs. The use of small nonfusible weld tabs to assist in weld terminations is permitted.
iii. Weld tabs shall be removed following completion of welding.
d. Continuity plates may be welded to the column web with groove welds, fillet welds, or a combination of the two. Fillet welds shall terminate a minimum distance of 1/4 inch from each end of the joint.

6. Doubler Plate
Web doubler plates, as illustrated in Detail 2, 3, or 4 on Sheet 3, shall be welded using either Detail 5, 6, or 7 on Sheet 3.

7. Requirements for "k" Area
Welds shall terminate short of the "k" area for continuity plates as illustrated in Detail 11 on Sheet 3.

VII. EXEMPTIONS

1. Reduction from certain quality assurance components of this Standard QA Plan, as listed in Part VII Item 2, are permitted for the following buildings or structures:
   a. One or two family dwellings not more than 1 story in height and 2,500 sf of floor area,
   b. Buildings or structures accessory to residential uses (such as carport, storage, garage), and
   c. Miscellaneous structures (such as walkway, canopy, patio cover, gazebo, storage rack).

2. Buildings or structures, as listed in Part VII Item 1, are exempt from providing the following quality assurance components:
   a. Electrode Storage and Atmospheric Exposure, Part IV Item 5(f) and 5(g).
   b. Plastic Hinging Zone Protection, Part IV Item 6.
   c. Additional CVN Notch Toughness Testing, Part IV Item 7.
   d. Non-Destructive Testing, Part IV Item 8.
   e. Preheat and Interpass Temperature, Part V Item 4.
   f. Post Weld Heat Treatment, Part V Item 5.

Table 7. PREQUALIFIED BASE METAL - FILLER METAL COMBINATIONS FOR MATCHING STRENGTH (1, 2, 3, 4)

BASE METAL		FILLER METAL		
Group	Steel Specification	Welding Process	AWS Electrode Specification	Electrode Classification
I	ASTM A36 < 3/4 in.	SMAW	A5.1	E70XX
			A5.5 (6)	E70XX-X
		FCAW	A5.20 (5)	E70XT-X, E7XT-XM
			A5.29 (6)	E70XTX-X, E7XTX-XM
II	ASTM A36 ≥ 3/4 in. ASTM A572 Grade 50 ASTM A913 Grade 50 ASTM A992	SMAW	A5.1	E7015, E7016, E7018, E7028
			A5.5 (6)	E70XX-X
		FCAW	A5.20 (5)	E70XT-X, E7XT-XM
			A5.29 (6)	E70XTX-X, E7XTX-XM
RELATIONSHIP	**BASE METAL(S)**		**FILLER METAL STRENGTH RELATIONSHIP REQUIRED**	
Matching	Any steel to itself or any steel to another in the same group		Any filler metal listed in the same group	
	Any steel in one group to any steel in another		Any filler metal listed for a lower strength group [SMAW electrodes shall be the low-hydrogen classification]	
Under-Matching	Any steel to any steel to any group			

NOTES:
1. The base metal/filler metal strength relationships above shall be used to determine whether matching or under-matching filler metals are required. Refer to AWS D1.1/D1.1M:2002, Section 3.3.
2. Preheating of joints involving base metals of different groups shall be in conformance with the requirements applicable to the higher strength group.
3. When welds are to be stress-relieved, the deposited weld metal shall not exceed 0.05 percent vanadium.
4. Adapted with permission from the AWS D1.1 Committee on Structural Welding, Structural Welding Code - Steel, AWS D1.1/D1.1M: 2002, Miami: American Welding Society, Table 3.1.
5. FCAW electrodes with the -2, -2M, -3, -4, -7, -10, -11, -13, -14, G, -GS suffix shall be excluded and electrodes with the -11 suffix shall be excluded for thicknesses greater than 1/2 in.
6. Filler metals of alloy group B3, B3L, B4, B4L, B5, B5L, B6, B6L, B7, B7L, B8, B8L, B9, or any BXH grade in AWS A5.5 or A5.29 are not prequalified for use in the as-weld condition.

Table 5. PREQUALIFIED WPS REQUIREMENTS (1, 2, 3)

VARIABLE	POSITION OF WELD	WELD TYPE	SMAW	FCAW
Maximum Electrode Diameter	Flat (F)	Fillet (4)	5/16 in.	1/8 in.
		Groove (4)	1/4 in.	
		Root Pass	3/16 in.	
	Horizontal (H)	Fillet	1/4 in.	1/8 in.
		Groove	3/16 in.	
	Vertical (V)	All	3/16 in.	3/32 in.
	Overhead (OH)	All	3/16 in.	5/64 in.
Maximum Current	All	Fillet	Within the range of recommended operation by the filler metal manufacturer and a WPS approved by engineer of record.	Within the range of recommended operation by the filler metal manufacturer and a WPS approved by engineer of record.
	All	Groove weld root pass with opening		
		Groove weld root pass without opening		
		Groove weld fill passes		
		Groove weld cap pass		
Maximum Root Pass Thickness (5)	Flat (F)	All	3/8 in.	3/8 in.
	Horizontal (H)		5/16 in.	5/16 in.
	Vertical (V)		1/2 in.	1/2 in.
	Overhead (OH)		5/16 in.	5/16 in.
Maximum Fill Pass Thickness	All	All	3/16 in.	1/4 in.
Maximum Single Pass Fillet Weld Size	Flat (F)	Fillet	3/8 in.	1/2 in.
	Horizontal (H)		5/16 in.	3/8 in.
	Vertical (V)		1/2 in.	1/2 in.
	Overhead (OH)		5/16 in.	5/16 in.
Maximum Single Pass Layer Width	All	Root opening >1/2 in.	Not applicable.	Split layers
		Any layer of width w		(5)

NOTES:
1. Applicable provisions of AWS D1.1/D1.1M:2002 Section 3 "Prequalification of WPSs" must be maintained for prequalified status of SMAW and FCAW WPSs.
2. Refer to Detail 13 on Sheet 3 for diagram of weld pass sequence.
3. Adapted with permission from the AWS D1.1 Committee on Structural Welding, Structural Welding Code - Steel, AWS D1.1/D1.1M: 2002, Miami: American Welding Society, Table 3.7.
4. Except root passes.
5. See AWS D1.1/D1.1M:2002, Section 3.7.2, for width-to-depth limitations.
6. In the F, H, or OH positions for nontubulars, split layers when the layer width w > 5/8 inch. In the V position for nontubulars or the 5G or 6G for tubulars, split layers when the width w > 1 inch.

Table 6. STRUCTURAL OBSERVATION CHECKLIST

STRUCTURAL OBSERVATION PROGRAM (Steel Moment Frame for Seismic Application)
☐ Orientation and placement of connected components.
☐ Removal of backing bars, as required on the plans.
☐ Removal of runoff tabs, as required on the plans.
☐ Presence of continuity plates, as required on the plans.
☐ Presence of doubler plates, as required on the plans.
☐ Configuration and finish of weld access holes, if applicable.
☐ Contour of RBS profile, if applicable.
☐ Verify that no welded attachments occur in the plastic hinging region.
☐ Review NDT and deputy inspection reports for general compliance.

NOTES:
1. Weld qualities shall be verified by the Deputy Inspector.
2. The structural observations listed in this Table are in addition to the structural observations that may be required on the structural plans.

Table 1. REPORTS TO BE SUBMITTED TO THE CITY BUILDING INSPECTOR

	PREPARED BY	TYPE OF REPORT
1.	Structural Observer(s)	Structural Observation Reports
2.	Deputy Inspector(s)	Deputy Inspection Reports
3.	NDT Technician(s)	Non-Destructive Testing Reports

Table 2. NON-DESTRUCTIVE TEST LOCATIONS

	REQUIRED LOCATIONS	OMF	IMF	SMF
1.	**CJP Groove Weld** Ultrasonic test shall be performed on all CJP groove welds in materials 5/16 inch (8 mm) thick or greater. In addition, magnetic particle test shall be performed on all beam-to-column CJP groove welds.	B	A	A
2.	**"k" Area** When welding of doubler plates, continuity plates, or stiffeners has been performed in the k-area, the web shall be tested for cracks using magnetic particle testing. The magnetic particle test area shall include the k-area base metal within 3 in. (75 mm) of the weld.	C	B	B
3.	**Beam Cope and Access Hole** At welded splices and connections, thermally cut surfaces of beam copes and access holes shall be tested using magnetic particle testing, when the flange thickness exceeds 1-1/2 in. (38 mm) for rolled shapes.	C	B	B
4.	**Reduced Beam Section Repair** Magnetic particle testing shall be performed on any weld and adjacent area of the RBS plastic hinge region that has been repaired by welding, or on the base metal of the RBS plastic hinge region if a sharp notch has been removed by grinding.	B	B	A
5.	**Base Metal Lamellar Tearing and Laminations at CJP Groove Weld** Base metal thicker than 1-1/2 in. (38 mm) shall be ultrasonically tested for discontinuities behind and adjacent to the fusion line when the base metal is loaded in tension in the through thickness direction in tee and corner joints and the connected material is greater than 3/4 in. (19 mm). Any base metal discontinuities found within t/4 of the steel surface shall be accepted or rejected on the basis of criteria of AWS D1.1 Table 6.2, where t is the thickness of the part subjected to the through-thickness strain.	B	B	A
6.	**End of Weld at Weld Tab Removal Site** Magnetic particle testing shall be performed on the end of welds from which the weld tabs have been removed, except for continuity plate weld tabs.	C	B	B
7.	**PJP Groove Weld** Ultrasonic testing shall be performed on PJP groove welds used in column splices with an effective throat of 3/4 in. (19.1 mm) thick or greater.	C	B	A

NOTE: A, B, and C are the frequencies of non-destructive tests listed in Table 3.

Table 3. NON-DESTRUCTIVE TEST FREQUENCY

	Frequency Designation		
	A	B	C
Ultrasonic Testing (UT)	100% of joints	50% of joints	25% of joints
Magnetic Particle Testing (MT)	50% of joints	25% of joints	Not Required

NOTES:
1. Refer to Table 2 for locations of non-destructive testing.
2. Rate of non-destructive testing may be reduced as permitted in Sheet 1, Part IV, Item 8(d).

Table 4. PREQUALIFIED MINIMUM PREHEAT AND INTERPASS TEMPERATURE

STEEL SPECIFICATION	WELDING PROCESS	THICKNESS OF THICKEST PART AT POINT OF WELDING (in.)	MINIMUM PREHEAT AND INTERPASS TEMPERATURE (°F)
ASTM A36 ASTM A572 Grade 50 ASTM A913 Grade 50 ASTM A992	SMAW with low-hydrogen electrodes, FCAW	1/8 to 3/4 incl.	32
		Over 3/4 to 1-1/2 incl.	50
		Over 1-1/2 to 2-1/2 incl.	150
		Over 2-1/2	225

NOTES:
1. Surfaces to be welded and surfaces adjacent to welds shall be free of moisture pursuant to AWS D1.1/D1.1M:2002 Section 5.15. Use a higher preheat temperature from this Table to remove moisture.
2. Adapted with permission from the AWS D1.1 Committee on Structural Welding, Structural Welding Code - Steel, AWS D1.1/D1.1M: 2002, Miami: American Welding Society, Table 3.2.

SITE ADDRESS:

OWNER:

STANDARD QUALITY ASSURANCE PLAN
For Steel Moment Frames

Engineer of Record

CITY LA DBS DEPARTMENT OF BUILDING AND SAFETY

Date: 06/20/2005

Scale: Not to Scale

Sheet:

Sheet 2 of 3